

.NET Monitoring

release date. 2026. 09. 11.



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.NET Monitoring

WhaTap .NET Application Monitoring provides the monitoring service for .NET-based web application servers in response to .NET Framework 4.6.1.

You can monitor the .NET framework applications. It monitors IIS, consoles, services, and Windows applications. DB queries and outbound calls can be traced to find out which area created the delay.

WhaTap's Application Monitoring can monitor application in real time without reproducing failures.

Key features

- **Real-time transaction monitoring**

WhaTap displays the status of active transactions in real time. Any application issue manifests itself as an increase of active transactions. If you can immediately check SQLs, outbound calls, and method stacks being executed the very moment when transactions increase, you can recognize or analyze the problem very fast.

- **Transaction performance Deep Dive**

WhaTap can collect and analyze the performance history of all transactions. Transaction performance can be traced down to the method level as well as SQLs and HTTP calls.

In particular, the **active stack** function enables you to analyze the method level without a cumbersome task of complicated method profile setting. With WhaTap's proprietary technology, called **Active Stack**, it provides improvement points to locate the source of problems from hidden areas that were not found in other products.

ⓘ Active Stack is only supported in Java, Python and .NET.

- **Analysis of AI-based response distribution patterns**

WhaTap automatically recognizes specific patterns through machine learning and sends alert notifications to operators. This can inform you of the issues that the operator did not recognize. It is also available in on-premises environments, and the scope of application is defined under a separate agreement.

Application number: 10-2020-0037381

- **Post analysis (Cube)**

You can check various metrics at a time based on the time axis. Because it is possible to specify the time zone where the response time, error count, or throughput is high, you can identify problematic factors in the same time zone or accurately view the service status.

Operation method

In case of the .Net program, it is converted to an executable or dll file in the form of Microsoft Intermediate Language (MSIL) after compilation. It works by translating this into native code by the Just-In-Time (JIT) compiler in the Common Language Runtime (CLR). WhaTap monitors running applications through the tracing API provided by the .NET framework.

Tracing Architecture

To use the .NET monitoring service, the monitoring agent must be installed on the monitored application. The agent is provided as an installer that can be installed on Windows.

When the installation is completed, the WhaTap agent is automatically registered in the Windows service.

Getting Started

WhaTap monitoring starts with the following steps:

[Step 1. Sign up](#)

[Step 2. Select a product](#)

[Step 3. Create a project](#)

[Step 4. Check the access key](#)

After confirming the supported environment, proceed to the agent installation step.

Sign up

To use the WhaTap monitoring service, you must first [sign up](#). For more information about signing up, see the [Account Management > Sign Up](#) documentation.

Select a product

1. Log in to the [WhaTap Monitoring Service](#).
2. Select  **All Projects** > **+ Project**.
3. On the **Select product** screen, select the Go product to monitor and then click the Create button.

Create a project

After selecting the product to monitor, create a project before installing the agent.

1. On the **Create project** screen, enter or select the following items to create a project:
 - **Project name** (required): Enter the project name.
 - **Data server region** (required): Select the region where the data server is located. A region is a collection of data centers that provide cloud services. Your data is stored in the selected region.

- **Time zone** (required): Set the time zone that serves as the reference for generating alerts and reports.
- **Notification language setting** (required): Set the language for alert notification messages generated in the project (supports Korean and English).
- **Project groups**: You can group and manage multiple projects. Select a group if there is one to join.
- **Project description**: Enter an additional description for the project.

2. After completing all settings, click the **Creating a project** button.

ⓘ When adding a project with an organization selected, you must set the **Groups of organization** as required. For more information about groups, see [the following documentation](#).

Check the access key

The **access key** is a unique ID for activating the WhaTap service.

In the installation guide section, select the **Getting the access key** button. After automatically issuing the **access key**, proceed to the next step.

ⓘ After creating a project, you are automatically redirected to the **Agent installation** page. If you are not redirected to the **Agent installation** page, select **Management > Agent installation** from the left menu.

Support Environment

Before installing the agent, verify the supported **.NET** environment.

ⓘ Last updated: 2026-01-20

.NET Framework

Supported versions

Platform	Supported versions
.NET Framework	4.61 to 4.8

Operating system

OS	Minimum version
Windows Server	2012 or later

Web server

Server	Minimum version
IIS	8.0 or later

Web frameworks

Library	Supported
ASP.NET MVC (IIS)	✓
ASP.NET Web API 2 (IIS)	✓
ASP.NET Web Forms (IIS)	✓
ASMX Web Service	✓
WCF	✓

Databases

Database	Driver
SQL Server	System.Data.SqlClient
SQL Server	Microsoft.Data.SqlClient
MySQL	MySql.Data
MySQL	MySqlConnector
PostgreSQL	Npgsql
Oracle	Oracle.ManagedDataAccess
SQLite	System.Data.SQLite
Redis	ServiceStack.Redis
Redis	StackExchange.Redis

Database	Driver
MongoDB	MongoDB.Driver.Core

Other libraries

Category	Library
External calls	HttpWebRequest, HttpClient, WebRequest, WebClient

.NET Core

Supported versions

Platform	Supported versions
.NET Core	6, 7, 8, 9

Operating system

OS	Minimum version
Windows Server	2012 or later
Linux Ubuntu	20.04 or later

Web server

Server	Minimum version
IIS	8.0 or later
Kestrel	-

Web frameworks

Library	Supported
ASP.NET Core	

Databases

Database	Driver
SQL Server	System.Data.SqlClient
SQL Server	Microsoft.Data.SqlClient
MySQL	MySql.Data
MySQL	MySqlConnector
PostgreSQL	Npgsql
Oracle	Oracle.ManagedDataAccess.Core
SQLite	Microsoft.Data.Sqlite
Redis	ServiceStack.Redis

Database	Driver
Redis	StackExchange.Redis
MongoDB	MongoDB.Driver.Core

Other libraries

Category	Library
External calls	HttpClient

How to analyze the server support environment

ⓘ Download the analysis tool

Download the analysis tool to verify the supported environment of the server where the agent will be installed.

- [WhaTapDotnetScan.exe](#)
- [WhaTapDotnetScan.zip](#)

Check the server runtime environment

1. Run the downloaded analysis tool.
2. In the **1** Caption field, verify that the Windows Server version is 2012 or later.



```

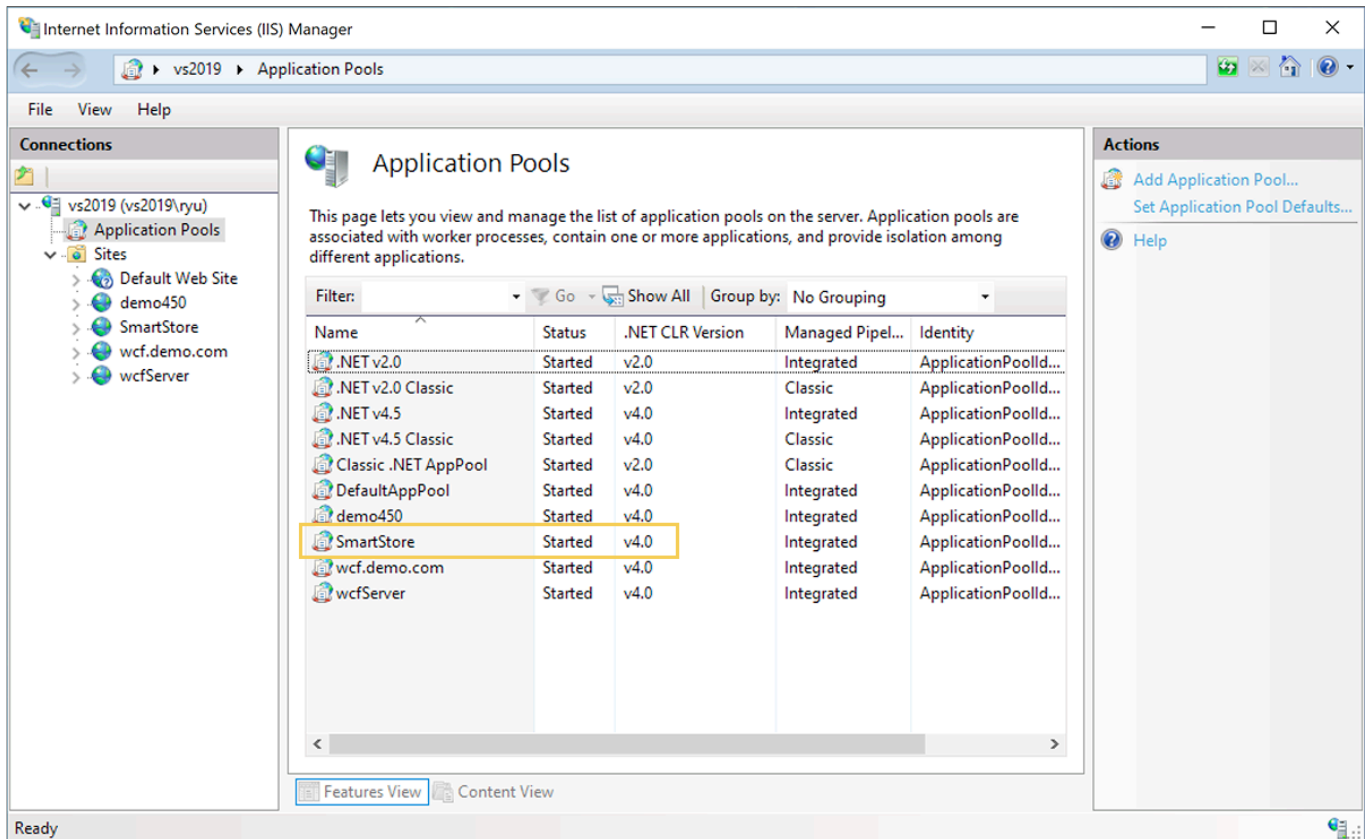
C:\Users\Administrator\Downloads\WhaTapDotnetScan.exe
.....
BuildNumber: 20348
BuildType: Multiprocessor Free
Caption: Microsoft Windows Server 2022 Datacenter
Architecture: 64-bit
FreePhysicalMemory: 13711532
TotalVisibleMemorySize: 16776816
Version: 10.0.20348
.....
IIS Version : Version 10.0
.....
.NET Framework Version : Version: 4.8.09037 or later
.....
.NET SDK:
  Version:      8.0.205
  Commit:       3e1383b780
  Workload version: 8.0.200-manifests.818b3449
Runtime Environment:
  OS Name:      Windows
  OS Version:   10.0.20348
  OS Platform:  Windows
  RID:          win-x64
  Base Path:    C:\Program Files\dotnet\sdk\8.0.205\
.NET workloads installed:
There are no installed workloads to display.
Host:

```

3. In the **2** IIS Version and .NET Framework Version fields, verify that IIS is version 8.0 or later and .NET Framework is version 4.6.1 or later.

Check the application runtime environment

To verify the version used by your application, open **IIS Manager** and click **Application Pools**. In the **Application Pools** list, confirm that the .NET version of the pool used by your application is set to **4.0**.



Common supported environment

Service deployment models

You can use WhaTap Monitoring as a SaaS or on-premises (self-hosted) service. Whichever you choose, you use the same agents and the same monitoring features.

Deployment	Support	Description
SaaS	✓	Connects to collection servers operated by WhaTap. See the firewall section for regional addresses
On-premises (self-hosted)	✓	Collection servers you build and operate yourself (air-gapped environments supported). Contact your sales representative for the scope

ⓘ You can also deploy WhaTap on-premises in air-gapped environments without internet connectivity.

Feature differences by deployment model

Whichever you choose, the monitoring features are the same. The mobile app is the only exception and is available on the service.whatap.io SaaS service only.

ⓘ To use certain features on-premises, a separate agreement is required.

Supporting the browser

WhaTap Monitoring is available in web browsers and mobile Apps.

Browser	Recommended	Supported version
Google Chrome	O	111 or later
Mozilla FireFox	X	Latest version
Edge	X	Latest version
Safari	X	Latest version

ⓘ Support guidance

- For browser compatibility and performance reasons, the latest version of Chrome is recommended.
- The user interface (UI) is implemented using HTML5 standard technologies, so Internet Explorer is not supported.

ⓘ Limitations

WhaTap's web interface does not support mobile browsers. To access WhaTap on a mobile device, install the WhaTap app for Android or iOS. The WhaTap mobile app is optimized for mobile



environments. For more information about the WhaTap mobile app, see [this document](#).

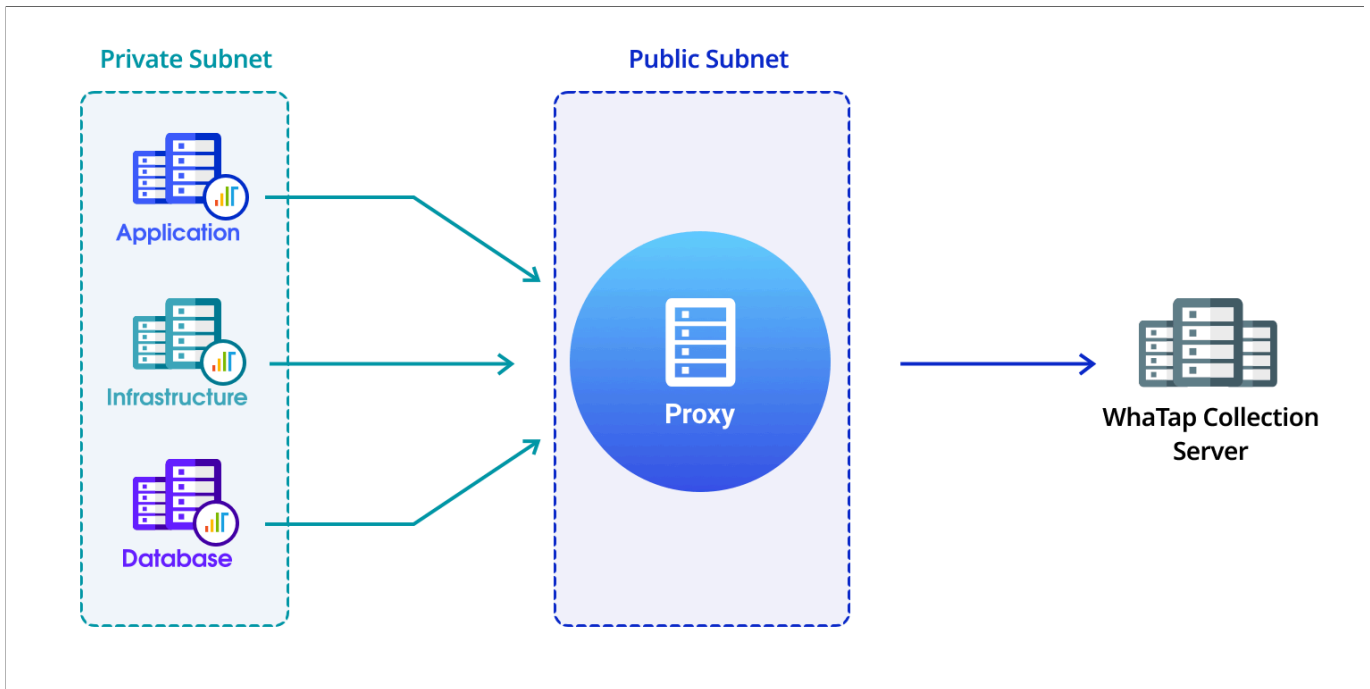
Firewall

The WhaTap agent must be able to access the collection server through **TCP port 6600**. Allow access to the collection server address that is closest to the monitored target.

Source: WhaTap agent

Cloud	Destination	Destination IP	Port
AWS	WhaTap collection server (Seoul)	13.124.11.223 / 13.209.172.35	TCP 6600
	WhaTap collection server (Tokyo)	52.68.36.166 / 52.193.60.176	TCP 6600
	WhaTap collection server (Singapore)	18.138.0.93 / 18.139.67.236	TCP 6600
	WhaTap collection server (Jakarta)	108.136.91.69 / 108.137.158.44	TCP 6600
	WhaTap collection server (Thailand)	43.209.109.219 / 43.209.48.86	TCP 6600
	WhaTap collection server (Mumbai)	13.127.125.69 / 13.235.15.118	TCP 6600
	WhaTap collection server (California)	52.8.223.130 / 52.8.239.99	TCP 6600
	WhaTap collection server (Virginia)	107.23.220.101 / 54.236.221.105	TCP 6600
	WhaTap collection server (Frankfurt)	3.125.142.162 / 3.127.76.140	TCP 6600
Azure	WhaTap collection server (Seoul)	52.231.66.38 / 20.194.5.115	TCP 6600
	WhaTap collection server (Tokyo)	52.246.169.54 / 20.210.27.232	TCP 6600
Kakao	WhaTap collection server (Seoul)	61.109.237.237 / 61.109.238.166	TCP 6600

If the agent cannot directly access the collection server, use the provided proxy module to access it.



Mobile app

The WhaTap mobile app supports both Android and iOS environments. You can install the WhaTap app by following the link or scanning the QR code. For detailed information about the mobile app, see [the following](#).

iOS	Android
	

iOS	Android
iOS 12 or later	Android 5.0 or later

Agent Installation

To use WhaTap monitoring, after [signing up](#), create a project and you can start installing the agent. For details on signing up, refer to [Account Management > Sign up](#).

Once sign-up is complete, follow the installation guide for your operating system (Windows or Linux) to install the agent.

Windows

Provides instructions for installing the agent Windows version on an application server in a .NET environment.

Linux

Provides instructions for installing the agent Linux version on an application server in a .NET environment.

Windows

To create a project, you need to sign up for a WhaTap account in advance. After completing the sign-up, proceed with project creation.

Creating a project

Create a project before installing the agent.

1. Log in to the WhaTap Monitoring Service.
2. In the left side menu, click **All Projects** > **+ Project**.
3. On the **Select product** screen, select the product you want to install.
4. Enter or select the following items:
 - **Project name:** Enter the project name.
 - **Data server region:** Select the data server region. A region is a group of data centers that provide cloud services. Your data will be stored in the selected region.
 - **Time zone:** Set the time zone to be used for alerts and report generation.
 - **Notification language setting:** Set the language for alert notifications. (Supports Korean and English)
 - **Project groups:** Group multiple projects for easier management. Select a group if applicable.
 - **Project description:** Add additional details or a description for your project.
5. After completing all settings, click the **Creating a project** button.

ⓘ If you add a project while an organization is selected, you must set the **Groups of organization** field.
For more information about groups, see the related document.

Checking the access key

The **access key** is the unique ID to enable the WhaTap service.

In the installation guide section, select **Getting the access key**. After the **access key** has been issued automatically, proceed to the next step.

! After a project has been created, the **Agent installation** page appears automatically. If the **Agent installation** does not appear, select **Management > Agent installation** on the left of the screen.

Download agent

Once you receive the **access key**, the download button in the **Agent file download** section will be activated. Select the **EXE Download** or **ZIP Download** button to download the agent installation file.

- For users who cannot download **.exe** files due to security settings, a **.zip** format file is also provided.
- For server security, it is recommended to run the downloaded installation file rather than directly installing through the browser.

Install agent

1. Double-click the downloaded installation file to run it.
2. Following the on-screen instructions, enter the **access key** in the **License Key** field and the **WhaTap server IP** in the **WhaTap IP** field.

You can copy the **access key** and **WhaTap server IP** values from the project creation screen of the WhaTap monitoring service.

.NET installation - 01

3. Click the **Next** button.
4. Click the **Install** button on the next screen. The installation proceeds.

5. Click the **Finish** button to complete the installation.

The agent consists of a tracer for collecting monitoring information and a file for transmitting the collected information to the server. For details about agent files, see the following.

📁 whatap

Start monitoring

When the application server is restarted, the agent starts collecting information. For details about agent updates, refer to [this document](#).

Linux

To create a project, you need to sign up for a WhaTap account in advance. After completing the sign-up, proceed with project creation.

Creating a project

Create a project before installing the agent.

1. Log in to the WhaTap Monitoring Service.
2. In the left side menu, click **All Projects** > **+ Project**.
3. On the **Select product** screen, select the product you want to install.
4. Enter or select the following items:
 - **Project name:** Enter the project name.
 - **Data server region:** Select the data server region. A region is a group of data centers that provide cloud services. Your data will be stored in the selected region.
 - **Time zone:** Set the time zone to be used for alerts and report generation.
 - **Notification language setting:** Set the language for alert notifications. (Supports Korean and English)
 - **Project groups:** Group multiple projects for easier management. Select a group if applicable.
 - **Project description:** Add additional details or a description for your project.
5. After completing all settings, click the **Creating a project** button.

ⓘ If you add a project while an organization is selected, you must set the **Groups of organization** field.
For more information about groups, see the related document.

Checking the access key

The **access key** is the unique ID to enable the WhaTap service.

In the installation guide section, select **Getting the access key**. After the **access key** has been issued automatically, proceed to the next step.

ⓘ After a project has been created, the **Agent installation** page appears automatically. If the **Agent installation** does not appear, select **Management > Agent installation** on the left of the screen.

Download agent

Once you receive the **access key**, the download button in the **Agent file download** section will be activated. Click the **TAR.GZ Download** button to download the agent installation file.

Install agent

1. Extract the downloaded file.

```
tar -xvzf whatap_dotnet_linux.tar.gz
```

2. After extracting, run the installation script. The license key and collection server address are required.

```
sudo ./install.sh <license key> <collection server address>
```

The installation script is included in whatap_dotnet_linux.tar.gz.

📁 whatap

Start monitoring

When the application server is restarted, the agent starts collecting information. For details about agent updates, refer to [this document](#).

Installation Checking Items

If a problem occurs after installing the .NET agent, you can resolve it by checking the appropriate items.

Windows

Check service status

Check that the **WhaTap.NET** service is properly registered and in **Running** status.

Run the `services.msc` command as administrator, or double-click the Services icon in the Control Panel to open the Services manager.

Windows Service manager

The **WhaTap .NET** service transmits collected monitoring data to the WhaTap server. Check agent-related logs at [C:\Program Files\WhaTap .NET\logs](#) and [C:\ProgramData\WhaTap\dotnet\logs](#).

If problems occur after installing the .NET agent, check the following items and resolve the issue. If the problem is not resolved, contact support@whatap.io. You can also get additional support through the chat window that appears when you click the  button in the upper right of the service screen.

Agent log file location

The agent log files may be required when inquiring via email or chat.

- [C:\Program Files\WhaTap .NET\logs](#)
- [C:\ProgramData\WhaTap](#) (If this path does not exist, ignore it.)

When all data is not collected

If data is not collected on all widgets, check the following:

- Verify that the project **access key** and **collection server information** are correctly entered in the [whatap.conf](#) file for agent configuration.

- Check the firewall settings on the server. **Port 6600** must be open for outbound connections.

When hitmap data is not collected

If hitmap information is not collected properly, check the supported environment for the user's application. For the supported environment for .NET application monitoring, refer to [this document](#).

Even if the server's .NET version meets the supported environment, if the application version is not .NET Framework 4.5 or later, data collection for monitoring may not work properly.

When support cannot be determined or the application may be supported

Send the target application's [web.config](#) file to support@whatap.io to inquire. If possible, it is recommended to also provide the project file ([.csproj](#)).

Check system environment variables

1. Run the `sysdm.cpl` command to open the **System Properties** window.
2. Click **Advanced > Environment Variables** to check that the system environment variables are properly registered.

Windows system environment variables

3. System environment variables are automatically registered when installing the agent. Check that the following are registered.

- **WHATAP_APP_TYPE = 7**

Fixed value for the type of agent communicating with the WhaTap server.

- **WHATAP_DOTNET_HOME = C:\Program Files\WhaTap .NET**

Home path of the WhaTap program.

- **WHATAP_DOTNET_TRACE = 1**

Activates the monitoring data collection function.

Check GAC

When installing the agent, DLL files are automatically registered in the GAC. Check the registered files at the [C:\Windows\Microsoft.NET\assembly\GAC_MSIL](#) path.

 Sigil
 Microsoft.Diagnostics.NETCore.Client
 Microsoft.Diagnostics.Runtime
 System.Diagnostics.DiagnosticSource
 System.Memory
 Whatap.Startup
 Whatap.Loader
 Whatap.Tracer

ⓘ Manual GAC deletion

Even after uninstalling the agent, data registered in the GAC is not automatically removed. If necessary, manually delete them from the [C:\Windows\Microsoft.NET\assembly\GAC_MSIL](#) path.

Linux

Check environment variables

Five environment variables are set through the [install.sh](#) installation.

- `WHATAP_DOTNET_HOME = "/usr/whatap/agent/dotnet"`
- `CORECLR_ENABLE_PROFILING = "1"`

- `CORECLR_PROFILER = "{21CAE18A-4E44-4578-83FD-0576AAA47E68}"`
- `CORECLR_PROFILER_PATH = "/usr/whatap/agent/dotnet/Whatap.ClrProfiler.so"`
- `DOTNET_STARTUP_HOOKS = "/usr/whatap/agent/dotnet/Whatap.Startup.dll"`

Check installed files

After installation, files are created at the [/usr/whatap/agent/dotnet](#) path.

 Whatap.ClrProfiler.so	Native CLR profiler
 whatap_dotnet	GO module daemon executable
 Whatap.Tracer.dll	.NET tracer
 Whatap.Loader.dll	.NET loader
 Whatap.Startup.dll	.NET Startup Hook
 whatap.conf	Agent configuration file
 whatap.env	Environment variable file for systemd
 VERSION	File indicating the agent version
 logs/	Agent log directory

Configuration

The Whatap agent writes the necessary settings for each agent in [whatap.conf](#). The agent locates and loads the configuration file through the environment variables. For user convenience, the [WhaTap Monitoring Service](#) also provides the agent configuration function.

Configuring the agent on the service screen

Home > Select Project > **Management** > **Agent CONF**.

You can add, modify, or delete agent configuration options in the [Whatap Monitoring Service](#) without directly modifying the [whatap.conf](#) file that is in the monitoring target server. You can also click **Download configuration file** to download the [whatap.conf](#) file.

- This function is only available to the members with **Edit** role. The members without **Edit** role can only view the settings.
- You can set the options in the following format.
 - Select `true` or `false` for a boolean value.
 - For numeric values, you can enter only number.
 - When entering or modifying a text (string) value, check the option description in detail.
- You cannot select any option that is not editable. (e.g. `license`)
- You may restart each agent depending on the option that has been added, modified, or deleted.
- The option keys that can be applied may differ depending on the application type and agent version.

Adding options

The screenshot shows the 'Agent CONFIG' interface. On the left, the 'Agent list' sidebar shows a table with one agent, '(type)-1-51-w3wp.exe', highlighted. A yellow circle with the number '1' is placed over this agent. The main panel is titled '{(type)-1-51-w3wp.exe}' and contains a 'Write options' section. A yellow circle with the number '2' is placed over the 'Select option' dropdown in this section. Below the dropdown, several configuration options are listed with their default values: 'app_process_name' (w3wp.exe), 'license' (a long alphanumeric string), 'perfcounter.enabled' (true), 'profile_basetime' (0), 'profile_http_parameter_enabled' (true), 'tag_counter_enabled' (true), 'whatap.server.host' (3.39.176.158), and 'whatap.server.port' (6600).

1. In **Agent List**, select the **1** agent to add options to.
2. In **2 Write options**, select options to add.
 - You can find options to add in **Search**. Enter text to filter matching options.
 - If you select **Direct Input**, you can enter the option keys and values.
3. Check the description and default value of the selected option key, and then enter the setting.

Write options

active_stack_count 

Set the maximum count of ActiveStack which can be got at a time. (Default value: 100)

number

- To cancel the selected option, select .
- To add new options, select **Add** and then repeat Step 2.

4. After adding the desired options, select **Apply** on the upper right of the screen.

Apply the selected options and settings to agents.

- To initialize the content in modification, select  on the upper right of the screen.
- If you select **Apply** without entering options, the options are deleted.
- The added options cannot be selected in the option list.
- The option keys that can be applied may differ depending on the application type and agent version.
- The example images may differ depending on the application type and agent version.

Modifying or deleting options

1. Scroll up or down the screen, or select a desired option to edit or delete from the option list on the left.
2. Select or edit the desired value for the option to change. To delete an option, select .
3. Select **Apply** to apply your changes.

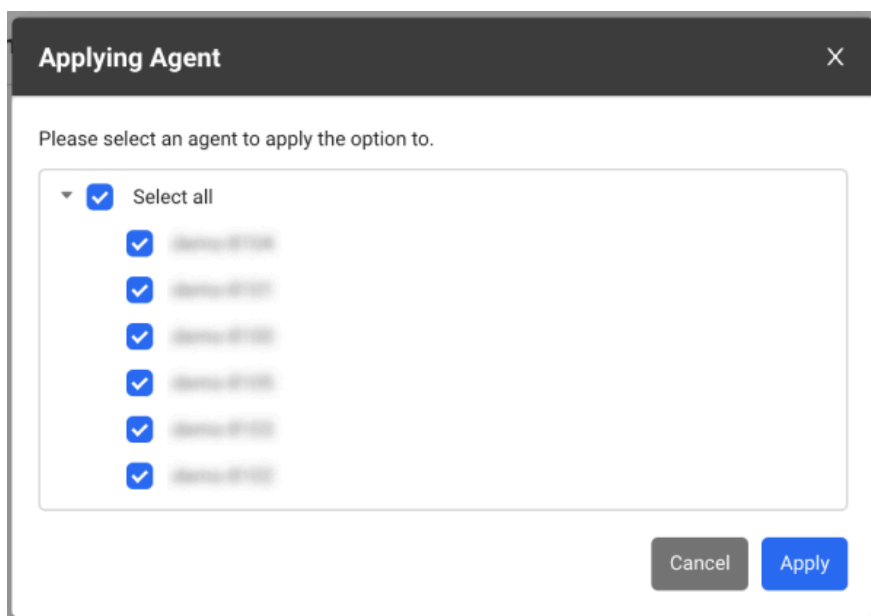
- If you want to move to the top of the screen, select **3 Go to add options**.
- If you select **Apply** without entering options, the options are deleted.

Applying to multiple agents simultaneously

Changed options can be applied simultaneously to multiple agents that belong to a project.

1. If you check **Applying multiple Agent** on the upper right of the screen, checkboxes are created for each option.

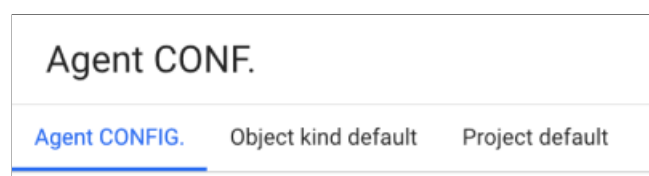
2. Select the checkboxes of the options you want to apply simultaneously. You can select multiple items.
3. On the upper right of the screen, select **Apply**.
4. If the **Applying Agent** window appears, select an agent to apply the changed options to. To select all, select **Select all**.



5. Select **Apply**.

Setting the default values of the agent

To avoid the hassle of repeatedly applying the settings when adding a new agent to a project, you can create and apply default settings for each project and task.



- **Object kind default:** In the `whatap.conf` file, the options can be commonly applied to the agents classified as `whatap.okind`, and the applied options can be checked.
- **Project default:** The options can be commonly applied to all agents belonging to the project, and the applied options can be checked.

- ❗ • If you select **Object kind default** or **Project default** tab and then apply the options, it is useful to commonly manage agents.
- The application order of options is as follows: **Object kind default**, **Project default**, and **Agent CONFIG..**
 - If the value of option b is 1000 in **Project default** and it is 2000 in **Object kind default**, the option value set in **Object kind default**, 2000 takes precedence.
 - If the value of option b is null in **Project default** and it is 2000 in **Object kind default**, the option value set in **Object kind default** takes precedence.

Sharing the agent settings

Agent settings can be saved as a json file, and the file can be loaded and applied to other agents.

1. In the **Agent list**, select an agent to export the settings to a json file.
2. On the upper right of the screen, select .
3. Download the json file.
4. In **Agent list**, select other agents.
5. On the upper right of the screen, select .

Check the agent settings fetched from the json file.

Guide to the agent configuration options

The following links provide descriptions of the options that can be set.

Agent name identification

The following explains how to set the agent name in order to identify the monitoring target.

 Control of agent functions

The .NET application server's functions can be controlled.

 Agent communication settings

It describes the connection settings between the agent and the server.

 Agent performance

This option is for the agent performance.

 Agent Log

The options of the agent log can be set.

 Transactions

The agent traces the transaction performance and provides the following configurable options.

 DB, SQL

It provides the DB and SQL related options of the .NET agent.

 HTTPC, API Call

It provides the HTTPC and API call related options of the .NET agent.

 User count

It aggregates the numbers of real-time users connected to WAS.

 Statistics

The following options are related to the statistics collection for the data collected by the agent.

 Legacy Agent

2 items

Agent Name Identification

WhaTap basically uses the data collected from application servers to identify each server while collecting monitoring data. Basic information uses the application server as a unique identifier by a combination of application server's type, IP address, and such. If necessary, use the name set by the user or change the pattern to a unique value. The agent name must be unique.

The reason why the data extracted from the application server is used, is like the following. When a communication loss caused by the stop of the application server, network disconnection, or agent problem between the collection server and the agent, is restored, the continuity of the data from the reconnected agent is maintained.

Agent naming method

The default patterns used to identify the application server are as follows:

Default pattern

```
{type}-{ip2}-{ip3}-{process}
```

To change the default pattern value, modify [whatap.conf](#) as follows:

whatap.conf

```
object_name={type}-{ip2}-{ip3}-{process}
```

- The agent name takes effect after the **Whatap .NET** service has been restarted.

Variable of the agent name

Variable	Description
{type}	Name of the application server
{ip0}	The first byte of the IPv4 address is used. (e.g. 10 in 10.11.12.13)
{ip1}	The second byte of the IPv4 address is used. (e.g. 11 in 10.11.12.13)
{ip2}	The third byte of the IPv4 address is used. (e.g. 12 in 10.11.12.13)
{ip3}	The fourth byte of the IPv4 address is used. (e.g. 13 in 10.11.12.13)
{process}	Process name of the application server
{hostname}	Host name

Setting the agent name

! • The agent name takes effect after the **Whatap .NET** service has been restarted.

- **object_name** *String*

Default {type}-{ip2}-{ip3}-{process}

It is an agent naming (ONAME) scheme to identify applications. An OID is created based on the ONAME.

- **app_name** *String*

It is a component used in the agent naming (ONAME) scheme to identify applications. It corresponds to the {type} among the object_name options.

- **app_process_name** *String*

It is a component used in the agent naming scheme to identify applications. It sets the target process to collect data of the application server such as CPU and heap memory by using application process names. The value corresponds to the `{process}` of the `object_name`.

- **whatap.okind** *String*

You can configure monitoring units by grouping multiple agents into "type-based" groups. This option allows you to monitor and manage multiple agents in groups, analyze performance metrics, and set the alerts.

! You can check it as a group option classified as **By kind** in the **Dashboard** and **Analysis, Statistics** menus.

- **whatap.onode** *String*

You can configure monitoring units by grouping multiple agents into "node-based" groups. This option allows you to monitor and manage multiple agents in groups, analyze performance metrics, and set the alerts.

! You can check it as a group option classified for nodes in the **Dashboard** and **Analysis, Statistics** menus.

Control Of Agent Functions

The functions of the .NET application server are controlled.

- **stat_enabled** Boolean

Default `true`

The statistics tracing is enabled. The statistical data includes transactions, SQLs, HTTP calls, user agents, and client IPs that are collected every 5 minutes.

- **license** String

Default `NONE`

To install the agent, set the access key granted from the server. The access key includes the agent's project and the encryption key for secured communication.

- **realtime_user_thinktime_max** Milliseconds

Default `300000`

Set the maximum call interval credited by the same user when measuring the number of real-time browser users.

- **time_sync_interval_ms** Milliseconds

Default `300000`

Set the synchronization time interval between the agent and the server. For no synchronization, set it to `0`.

- **text_reset** Int

Default `0`

The WhaTap agent does not transmit the text data once sent until the next day again because it is hashed. If a value is set different from the previous setting, the data is sent again.

ⓘ Transaction URLs and SQL strings correspond to text data.

Agent Communication Settings

It is the network configuration option to communicate with the server for transferring the data collected by the agent.

- **whatap.server.host** `ip_address`

Default `127.0.0.1,127.0.0.1`

Specify the server to transfer the data collected by the agent. If there are multiple IP addresses for collection server redundancy, use comma (,) as the delimiter. The proxy of the collection server must be in listening state for the set IP address.

- **whatap.server.port** `tcp_port`

Default `6600`

Set the collection server port. Because only one port can be set, the collection servers set in the `whatap.server.host` option must use the same port.

- **tcp_so_timeout** `MiliSecond`

Default `120000`

Set the socket time out of the TCP session that communicates with the collection server.

- **tcp_connection_timeout** `MiliSecond`

Default `5000`

Set the connection time out of the TCP session that communicates with the collection server.

- **net_send_max_bytes** `Byte`

Default `5242880`

Maximum data size in bytes the agent can collect and transfer over the network at a time.

- **net_udp_port** `tcp_port`

Default `6600`

The WhaTap agent transfers the data collected by the tracer to the collection server via UDP. You can specify the port of the first UDP server. If the provided port 6600 is in use, you can use this option.

ⓘ To apply the set values, restart IIS.

- **net_send_queue1_size** Int

Default 512

Set the queue buffer for TCP data processing. This queue is for the high-priority data.

- **net_send_queue2_size** Int

Default 1024

Set the queue buffer size for TCP data processing. This queue is for the trace data.

Agent Performance

This option is related to the .NET agent performance.

- ⓘ • The agent performance option is applied only when the whatap .NET Windows service has been restarted after configuration.
- If the agent performance is expanded, the CPU and memory utilization can increase.

- **tx_max_count** Int

Default value: 5000

Specifies the maximum number of transactions to store. If a large number of transactions are processed concurrently, increase this value.

- **tx_default_capacity** Int

Default value: 101

Specifies the initial capacity of the buffer used to store transactions.

- **tx_load_factor** String(Float)

Default value: 0.75

Defines the threshold for gradually increasing the transaction buffer size. When usage exceeds 75% of 101 entries, the buffer size doubles.

- **queue_log_enabled** Boolean

Default value: false

Enables logging related to queues.

- **queue_tcp_enabled** Boolean

Default value: true

Uses a separate queue instead of a Channel for TCP data transmission processing. A priority queue is used for data handling.

- **queue_tcp_sender_thread_count** Int

Default value: 2

Sets the number of threads that handle TCP data transmission. Increasing this value allows faster data transmission.

- **net_send_buffer_size** Int

Default value: 1024

Sets the Channel buffer size for TCP data processing.

- **queue_udp_enabled** Boolean

Default value: false

Uses a separate queue instead of a Channel for UDP data reception processing.

- **queue_udp_size** Int

Default value: 2048

Sets the UDP data reception buffer size. This applies to both Channel and Queue buffers.

- **queue_udp_read_thread_count** Int

Default value: 3

Sets the number of threads that handle UDP data reception. Increasing this value allows faster reading from the UDP buffer.

- **queue_udp_overflowed_size** Int

Default value: 4096

Sets the size of the overflowed queue buffer when a queue is used for UDP data reception.

- **queue_udp_process_thread_count** Int

Default value: 3

Sets the number of threads that process UDP data. Increasing this value allows faster processing of data read from UDP.

- **queue_profile_enabled** Boolean

Default value: false

Uses a separate queue instead of a Channel for trace data processing.

- **queue_profile_size** Int

Default value: 512

Sets the buffer size for trace data processing.

- **queue_profile_process_thread_count** `Int`

Default value: 1

Sets the number of threads that process trace data. Increasing this value allows faster processing.

- **queue_text_enabled** `Boolean`

Default value: false

Uses a queue instead of a Channel for text data processing.

- **queue_text_size** `Int`

Default value: 512

Sets the buffer size for text data processing.

Agent Log

When the application server runs, it starts collecting the monitoring data. The collected data is stored in the log file.

log_keep_days Int

Default 7

Set the retention period of log files.

Transactions

A transaction is a server side Logical Unit of Work (LUW) that processes a request from a user's browser. In a web application, the entire process of receiving a single HTTP request and returning a response constitutes a transaction.

Application performance can be evaluated through transaction processing performance. Transaction performance includes information such as response time from transaction start to completion, resource usage, and caller attributes.

Transaction performance can be analyzed based on response time distributions and statistical data.

Transaction tracing

These agent options allow you to trace the execution path of each transaction within an application in detail.

- **trace_active_transaction_slow_time** Millisecond

Default value 3000

Sets the response time threshold for marking a transaction as slow in the Active Transaction Arc Equalizer graph on the dashboard. If a transaction's response time exceeds this value, it is included in the count of slow active transactions.

- **trace_active_transaction_very_slow_time** Millisecond

Default value 8000

Sets the response time threshold for marking a transaction as very slow in the Active Transaction Arc Equalizer graph on the dashboard. If a transaction's response time exceeds this value, it is included in the count of very slow active transactions.

- **trace_active_transaction_lost_time** Millisecond

Default value 300000

Defines the timeout for waiting for a transaction to complete. If a transaction does not finish within 5 minutes, the agent stops collecting information for that transaction. In the transaction trace, this appears as "Lost Connection".

- **prepend_app_pool_name** Boolean

Default value `false`

When set to `true`, the full application name is prefixed to the transaction URL.

- **expand_transaction_level** Boolean

Default value `false`

When set to `true`, SQL and HTTP calls that occur outside a transaction are treated as transactions and displayed on the hitmap.

- **expand_transaction_basetime** Int

Default value `1000` (1 second) / Minimum value `100` (0.1 second)

When `expand_transaction_level` is set to `true`, only requests whose response time exceeds the specified value are collected. Up to 100 requests per second can be collected.

Exceptional handling

The following options are used to manage and monitor exceptions that occur in applications. You can check the stability of applications by registering business exceptions and collecting related statistics. You can also set whether to ignore specific exceptions or treat them as errors if the HTTP status code is an error. Exception-handled items appear as normal transactions in the **Hitmap** or **Trace analysis** window.

- **transaction_status_error_enable** Boolean

Default value `true`

Determines whether HTTP responses with non-success status codes, such as 401 or 403, are treated as errors.

- **status_ignore** String

Specifies HTTP status codes to ignore. Use a comma (,) to separate multiple values.

whatap.conf

```
# example
status_ignore=408,500
```

✓ Ignore status error/Hitmap display level: Excludes the **INFO** (blue)/error statistics.

- **status_ignore_set** *String*

Ignores specific combinations of URL and HTTP status code so they are not treated as errors.

whatap.conf

```
# example
status_ignore_set=/api/test/timeout/{time};408,/error:500
```

✓ Ignore status error set/Hitmap display level: Excludes the **INFO** (blue)/error statistics.

- **httpc_status_error_enable** *Boolean*

Default `true`

Set whether or not to collect when the HTTP status code is an error. It includes client error responses (`400` or higher) and server error responses (`500` or higher).

ⓘ For more information about the HTTP status codes, see [the following](#).

- **httpc_status_ignore** *String*

If the HTTP status code is an error (`HTTPC_ERROR`), it can be ignored. When listing multiple values, use comma (`,`) as the delimiter.

✓ Ignore HTTP status error code/Exclude error statistics

- **httpc_status_ignore_set** *String*

Prevents specific combinations of URL and status code from being treated as errors in HTTP client external calls.

whatap.conf

```
httpc_status_ignore_set=api.example.com:404,payment.service:500
```

```
# If your application calls api.example.com and receives a 404 response, it is not recorded as an error
```

- ✓ Ignore HTTP status error code/Exclude error statistics

HTTP transaction tracing

The following agent options trace and record various data related to HTTP requests and responses. This allows you to closely monitor and analyze the HTTP transactions for applications. You can add parameter values to the transaction names or exclude specific URLs or HTTP methods. You can also record transactions in detail, including HTTP headers and parameters.

- **profile_http_parameter_keys** *String*

Only the parameters corresponding to the set key are recorded. For multiple values, use comma (,) as the delimiter.

- **profile_http_header_enabled** *Boolean*

Default `false`

To record HTTP headers in the trace details, set it to `true`.

- **profile_http_parameter_enabled** *Boolean*

Default `false`

To record HTTP parameters in the trace details, set this to `true`. Parameters can be viewed by entering a separate security key.

ⓘ Set the security key to 6 digits in `%PROGRAMFILES%\WhaTap .NET\paramkey.txt` of the WAS server. If `paramkey.txt` does not exist, it is automatically generated as a random value.

- **profile_http_parameter_url_prefix** *String*

It is used to define the prefix of URL to record HTTP parameters in the trace details.

- **profile_http_host_enabled** *Boolean*

Default: `false`

Outputs the Host information of a transaction. When set to `false`, only the URI is displayed in the transaction URL. When set to `true`, the URL is displayed in the `/xxx.aaa.com/URL` format.

- **profile_http_body_url_prefix** *String*

It is used to define the prefix of the target URL to record the HTTP body information in the trace history.

- **trace_ignore_url_set** *String*

It sets URLs to exclude from transaction tracing. For multiple values, use comma (,) as the delimiter.

ⓘ The URLs registered through this option are excluded from the **Hitmap, Trace analysis**, or **Transaction information** window for collection.

- **trace_ignore_url_prefix** *String*

Set the prefix of URLs to exclude from transaction collection. URLs matching the set prefix are not collected for transaction performance. To set multiple values, use comma (,) as the delimiter.

ⓘ The URLs registered through this option are excluded from the **Hitmap, Trace analysis**, or **Transaction information** window for collection.

DB, SQL

It provides the DB and SQL related options of the .NET agent.

- **trace_sql_normalize_enabled** Boolean

Default `true`

It enables the function to normalize any SQL statements by extracting the literal part from each SQL statement. The literal part is denoted with "#."

- **profile_sql_resource_enabled** Boolean

Default `false`

It traces the CPU and memory usages during collection of SQLs in the transaction trace.

- **profile_sql_param_enabled** Boolean

Default `false`

It is used to record SQL parameters in the transaction trace details. The parameters can be viewed by entering a separate security key.

① Specify the security key to a 6-letter value in the WAS server's `%PROGRAMFILES% /WhaTap .NET\ paramkey.txt` file. If `paramkey.txt` does not exist, it is automatically created as a random value.

HTTPC, API Call

HTTPC and API call options

It provides the HTTPC and API call related options of the .NET agent.

- **trace_httpc_normalize_enabled** Boolean

Default `true`

It enables the function to parse and normalize HTTPC URLs for transactions.

- **trace_httpc_normalize_urls** String

Default `NONE`

Set the HTTPC URL patterns to normalize. It deletes the path parameter after parsing the call URL patterns.

ⓘ For example, if declared as `/a/{v}/b`, `a/123/b` is replaced by `a/{v}/b`. For multiple values, use comma (,) as the delimiter. A complement is required after arranging substitution patterns.

User Count

Aggregating the user count

It aggregates the numbers of users who connect to the .NET web application server.

! To apply the value set in the following option, restart IIS.

- **trace_user_enabled** Boolean

Default true

Set whether or not to aggregate real-time users. If the user tracing option is set redundantly, the cookie value takes precedence.

- **trace_http_client_ip_header_key** String .NET Agent v2.2.2 or later

Default X-Forwarded-For

This function sets the client IP (remote IP) with a specific HTTP header value. In the proxy environment, the X-Forwarded-For header can be set with the client IP.

If the load balancer like L4 is located before WEB/WAS, in some cases, the IP address of L4 becomes the remote address instead of the IP address of the client. In this situation, if the actual client IP is recorded as a specific key value in the HTTP header, it can be replaced with the corresponding key value.

Statistics

The following options are related to the statistics collection for the data collected by the agent.

- **stat_domain_enabled** Boolean

Default false

It enables the function to collect transaction statistics for each domain that connects to clients.

- **stat_domain_max_count** Int

Default 7000

Maximum number of records of transaction statistics for each domain that collects for 5 minutes.

- **stat_referer_enabled** Boolean

Default false

It collects transaction statistics by referer.

- **stat_referer_max_count** Int

Default 7000

Maximum number of records of transaction statistics for each referer that collects for 5 minutes.

Legacy Agent

Caution

This page applies only to WhaTap .NET agent version 2.4.4 or earlier.

Supported environments for .NET agent 2.4.4 or earlier

Before installing the agent, verify the supported .NET environment.

 Last updated: 2025-11-18

Supported versions

Platform	Supported versions
.NET Framework	4.61 to 4.8
.NET Core	6, 7, 8

Operating system

OS	Minimum version
Windows Server	2008 R2 or later

Web server

Server	Minimum version
IIS	8.0 or later

Libraries

Library	Supported
WebClient / WebRequest	✓
HttpClient / HttpClientHandler	✓
ASP.NET MVC5 (IIS)	✓
ASP.NET Web API 2 (IIS)	✓
ADO.NET (Database)	✓
MS SQL	✓
Oracle	✓
MySQL	✓
Redis	✓

Agent additional options

disabled_section_names [String](#)

Specifies section names to exclude from monitoring. Use a comma (,) to separate multiple values. After applying this option, restart the IIS service.

The following section names are available:

- `AspNetCoreMvc2`, `AspNetMvc`, `AspNetWebApi2`, `AspNetWebForm`, `DbCommand`, `IDbCommand`, `SqlCommand`, `OracleCommand`, `WebRequest`, `HttpMessageHandler`, `HttpClient`, `WebClient`, `ServiceStackRedis`, `StackExchangeRedis`, `StackExchangeRedis2`, `LINQ`

WCF And Web Service Monitoring Configuration

! This page applies only to WhaTap .NET agent version 2.4.4 or earlier.

To monitor libraries that are not officially supported by the WhaTap .NET agent, such as WCF (Windows Communication Foundation), follow the guidance below.

! Extensive configuration may cause excessive traffic.

Configuration guide

The following are agent configuration options for tracing WCF and Web services.

- **webservice_method_enabled** Boolean

Default `false`

If the value has been set to `true`, web services can be traced.

! To apply the set values, restart IIS.

- **webservice_method_prefix** String

Enter the namespace and class name that define the methods you want to trace.

- If you specify up to the class name that contains the methods, all public methods within that class become trace targets.
- Methods that meet the conditions are traced even if they do not use web services. Although this option was designed for monitoring WCF and web services, it can be used for various other purposes.

! Restart IIS to apply the configured values.

See the following example:

whatap.conf

```
webservice_method_prefix=Test.Demo, WebServiceDemo.WebService.
```

- **webservice_method_prefix_realtime** Boolean .NET Agent v2.3.6 or later

Default `false`

If you set the value to `true`, the target of `webservice_method_prefix` is processed in real time as the previous.

- **webservice_method_timeout** Integer

Default `5000` (Millisecond, ms)

If exception handling is not performed in the method to be monitored, it is impossible to know the time when the transaction will end. For such cases, the timeout of web service monitoring occurs by default after 5 seconds. You can adjust the timeout by changing this option value.

Usage examples

Modifying the agent configuration file

See the example for the agent configuration file ([whatap.conf](#)) for the WCF and Web service tracing.

whatap.conf

```
1  license=...
2  whatap.server.host=15.165.146.117
3  whatap.server.port=6600
4  app_process_name=w3wp.exe
5  tag_counter_enabled=true
6  perfcounter.enabled=true
7  app_name=...
8  OID=...
9
10 webservice_method_enabled=true
```

```

11 webservice_method_prefix=Whatap.Service.Controller, Whatap.DotNet.Examples.Service1
12 webservice_method_timeout=10000

```

- The start and end of a function can be handled as a transaction, if the call path of the method containing the namespace is one of the following:

```
Whatap.Service.Controller, Whatap.DotNet.Examples.Service1
```

- Because the `webservice_method_timeout` option has been set to 10,000 (ms), transactions that take more than 10 seconds are automatically terminated.

- ✓ In **Management > Agent CONF.**, some options can be added. For more information about **Agent CONF.**, see [the following](#).

Write options

Select option ▼

Search 🔍

Direct Input

Write options

webservice_method_enabled	true	🗑️
webservice_method_prefix	Whatap.Service.Controller, Whatap.DotNet.Examples.Service1	🗑️
webservice_method_timeout	10000	🗑️

Example of WCF source code to be monitored

The following WCF source code example guides you to a case to be monitored.

```
1 namespace Whatap.DotNet.Examples
```

```

2  {
3      public class Service1 : IService1
4      {
5          public string GetData(int value)
6          {
7              ...
8          }
9
10         public CompositeType GetDataUsingDataContract(CompositeType composite)
11         {
12             ...
13         }
14
15         private string getFromDB()
16         {
17             ...
18         }
19
20         private string getFromHttp()
21         {
22             ...
23         }
24     }
25
26     public class Service2 : IService1
27     {
28         ...
29     }
30
31     public class Service3 : IService1
32     {
33         public string IwantToSeeOnlyThis(int value)
34         {
35             ...
36         }
37     }
38 }

```

The `GetData()` method to be monitored belongs to the `Service1` class of the `Whatap.DotNet.Examples` namespace. Therefore, the call path for the method is:

```
Whatap.DotNet.Examples.Service1.GetData
```

This is treated as a transaction because it starts from the value (`Whatap.DotNet.Examples.Service1`) of the `webservice_method_prefix` specified in the agent configuration file ([whatap.conf](#)).

- The `GetDataUsingDataContract()` method is to be monitored because it is a public method.
- The `getFromDB()` and `getFromHttp()` methods are excluded from monitoring because they are private methods.

For Web Service

For Web Service applications, locate the `.asmx` file in the deployment folder. Open the file in a text editor and check the value specified in the `Class` attribute. This value is the information that must be added to `webservice_method_prefix` .

Web Service

Analysis Of ISAPI Filter-based Transactions

The WhaTap .NET agent provides the ISAPI filtering feature to enable tracing transactions for various applications running on IIS. This allows for a wide range of monitoring, including requests based on technologies other than .NET, such as ASP, ASP.NET, CGI, and ISAPI extensions.

 The ISAPI filter feature is supported starting from WhaTap .NET agent version 2.4.0 through 2.4.4 and later.

Installation

1. Install the .NET agent following the [Agent installation](#) instructions.
2. After installing the agent, copy the `whatap_isapi_filter.dll` file to the root directory of the target site.

```
C:> copy "C:\Program Files\WhaTap .NET\whatap_isapi_filter.dll" C:\inetpub\yoursite
```

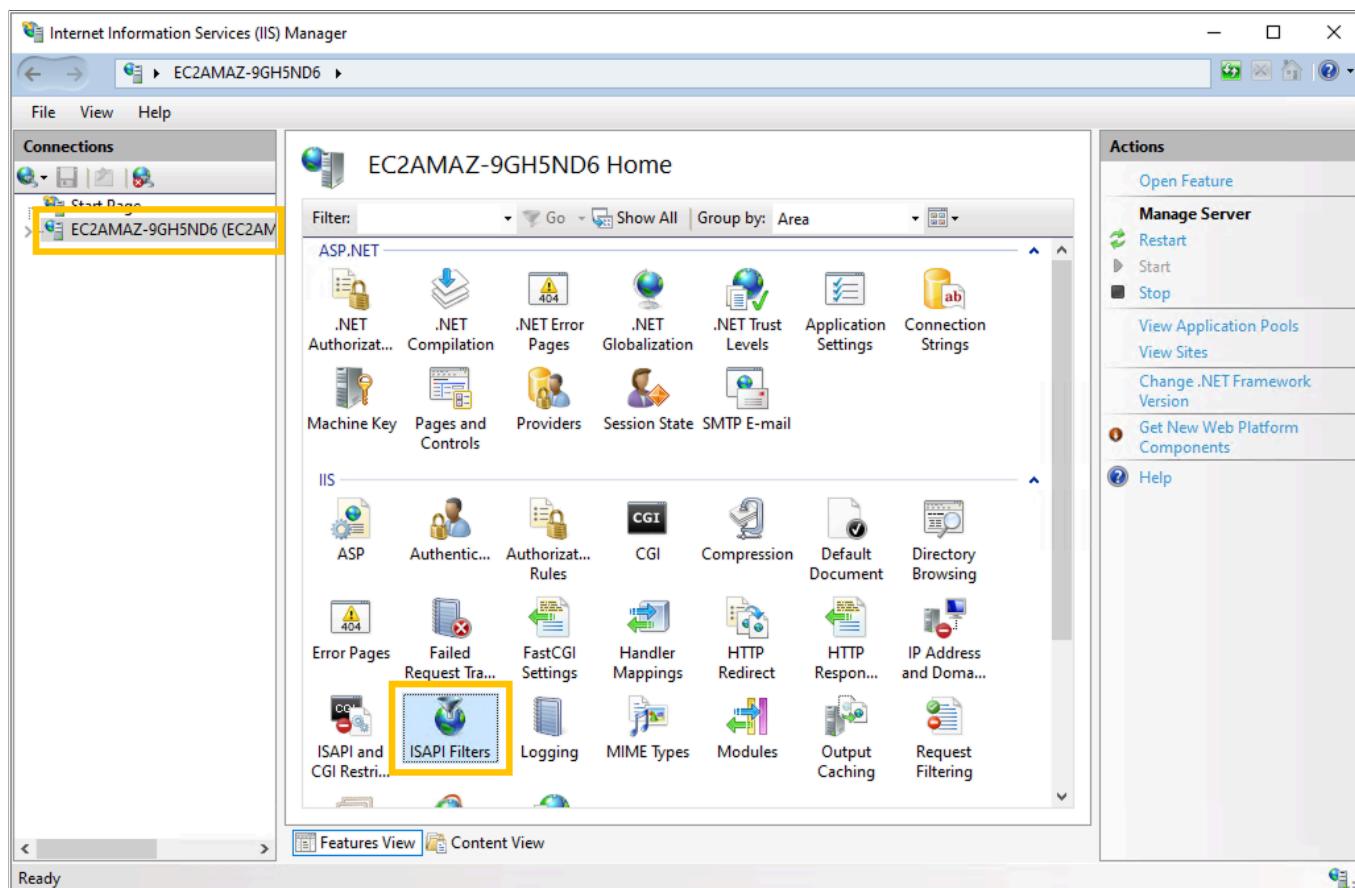
- If you copy the filter file into the directory where the IIS website is running, no additional setup is required.
- The filter file does not necessarily have to be located in the directory where the website is hosted, but the path and file must have **read and execute roles** granted to the **IIS_IUSRS** group.

Setting the ISAPI filter

ISAPI filters can be applied **server-wide** or **individually to sites**.

Applying the server-wide filter

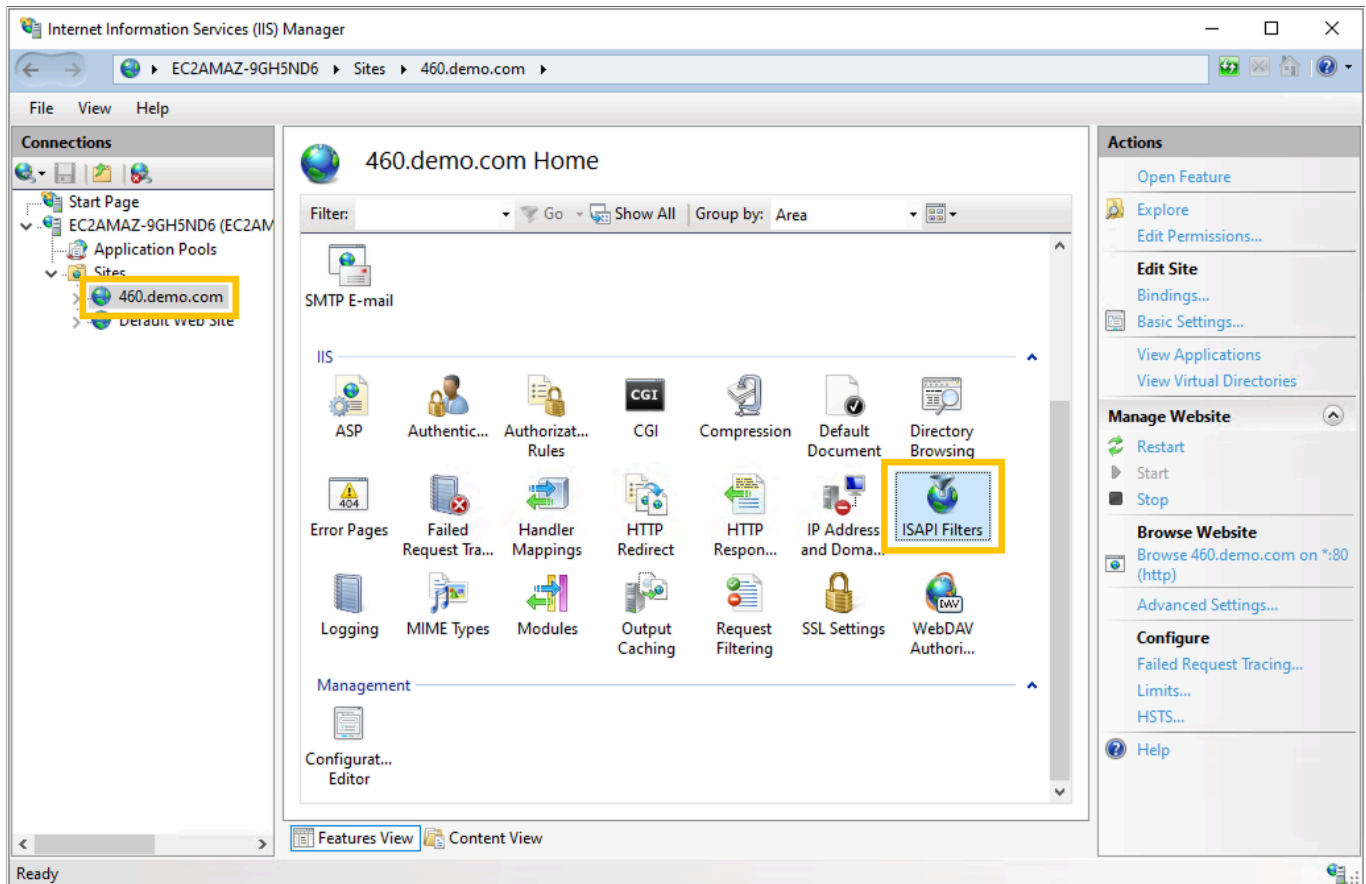
To apply filters to requests from all websites hosted on IIS, set it as follows.



1. Run the IIS Manager.
2. In the tree on the left, select a server node.
3. Double-click the ISAPI filter icon in the center area.

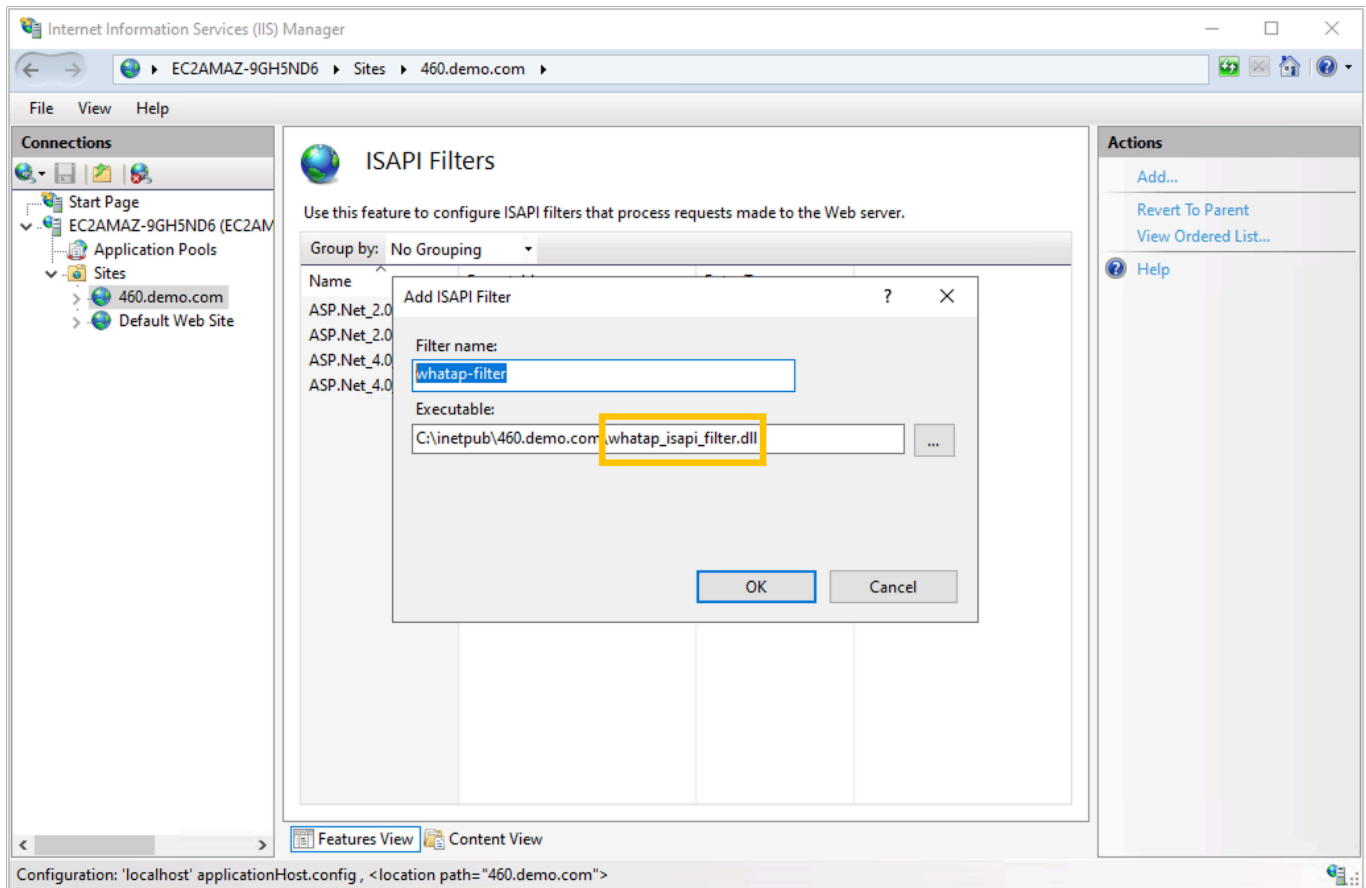
Applying individual site filters

To filter transactions on individual sites, set as follows.



1. Run the IIS Manager.
2. In the tree on the left, select a target site.
3. Double-click the ISAPI filter icon in the center area.

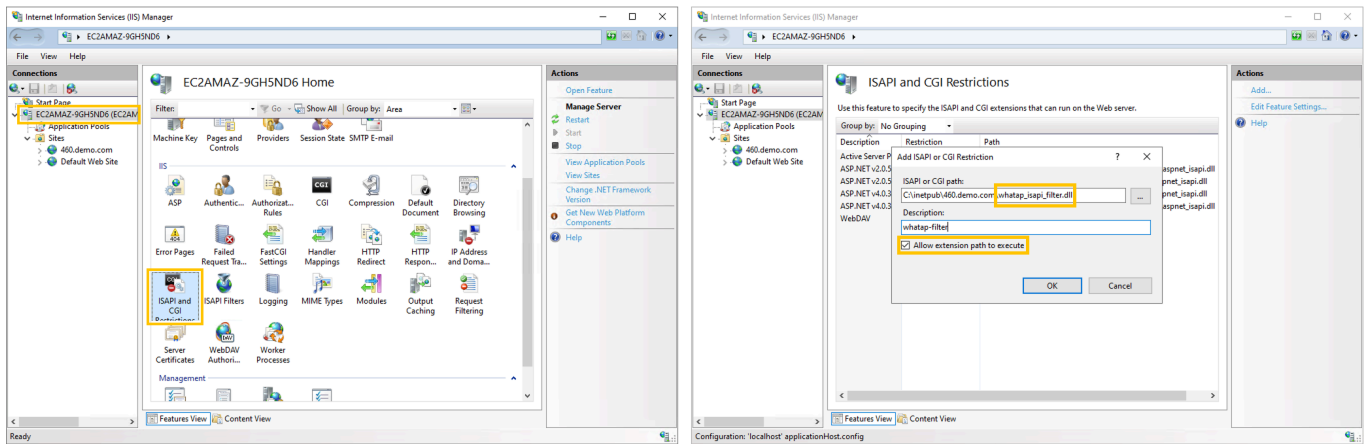
Adding filter items



1. Click the Add button in the task pane on the right.
2. Specify the filter name freely.
3. Locate and select the `whatap_isapi_filter.dll` file.
4. Click.

If the ISAPI filter does not work

If it does not work after setting the filter, you may need to add **ISAPI** and **CGI** restrictions.



1. In the tree on the left in IIS Manager, select a server.
2. Double-click the ISAPI and CGI restriction icons in the center area.
3. Click the Add button in the task pane on the right.
4. Select the `whatap_isapi_filter.dll` file.
5. Enter the item name.
6. Check in the Allow extended path execution.
7. Click.

.NET Management

Agent removal

Remove from the Start menu

1. In Windows, select **Start**  > **All apps**, then search for the **WhaTap .NET** app in the list.
2. Press and hold the app or right click it, then click **Uninstall**.

Remove from Control Panel

1. In Windows, type **Control Panel** in the taskbar search and select it from the results.
2. Navigate to **Programs > Programs and Features**.
3. Select the **WhaTap .NET** program, right click it, and choose **Uninstall** or **Uninstall/Change**.
4. Follow the on screen instructions to remove the agent.
5. Remove the DLL files that were registered during agent installation from the `C:\Windows\Microsoft.NET\assembly\GAC_MSIL` path.

 Sigil
 Microsoft.Diagnostics.NETCore.Client
 Microsoft.Diagnostics.Runtime
 System.Diagnostics.DiagnosticSource
 System.Memory
 Whatap.Startup

 Whatap.Loader Whatap.Tracer

ⓘ Even after uninstalling the agent, data registered in the GAC is not removed automatically. If necessary, manually delete it from the `C:\Windows\Microsoft.NET\assembly\GAC_MSIL` path.

Agent update

To update the agent, you do not need to remove the existing version. Download the new version and run the installation process again.

ⓘ For detailed instructions on installing the .NET agent, see [this document](#).

Dashboard

After installing the WhaTap agent, log in [WhaTap Monitoring Service](#). The initial screen is **Project list**. In **Project list**, you can see the application server in which the agent has been installed. An application server in which the agent has been installed is a project that is a monitoring unit. If a project is selected from the project list, you can enter **Application dashboard**.

What is the dashboard?

Through the dashboard, you can see the overall status of the project at a glance. You can check the total resource size for monitoring and filter the resources to be monitored on the real-time dashboard. It updates the active and terminated transactions in real time and provides visual charts. The administrator can intuitively see the exact status of services and systems. In addition, you can immediately recognize failures and potential problem factors.

From the dashboard, you can see the following information:

- You can adjust the response time range or filter error data through the response time distribution chart.
- The dashboard analyzes the active transactions and updates the terminated transactions in real time.
- You can see the resource status such as TPS, response time, CPU, memory, and real-time usage.
- It provides the real-time monitoring service by automatically updating the latest data.

Learn more about Application Dashboard in the following video clip:

Application Dashboard

Home > Select Project > **Dashboard** > **Application dashboard**



Application dashboard allows you to collect key metrics of applications through agents, configure charts to monitor the metrics in real time, and view the past data. You can quickly identify and analyze application problems by using the widgets on the dashboard.

In case of general charts excluding CPU and memory, the stable data appears in blue and the elements identified as problems appear in red, making it easy to recognize the current status.

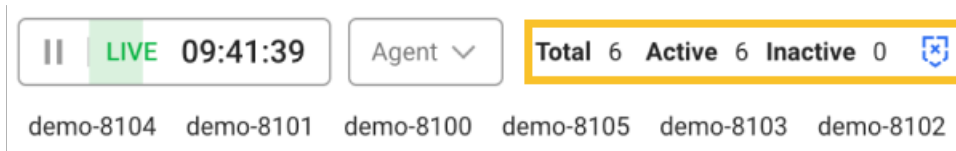
Query Time Setting

The dashboard basically provides the real-time monitoring feature but the past data can be viewed using the time selector at the top of the screen. In the time selector, select **II** and then set the following time. It updates

the data in widgets placed on the dashboard based on the set time.

Agent Check

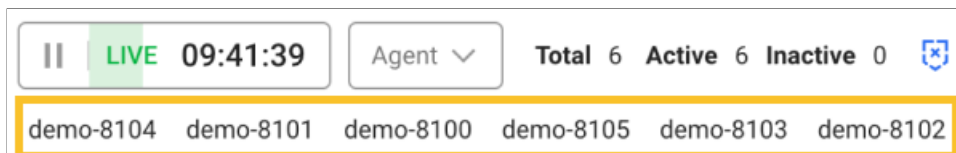
Checking the agent connection status



On the upper left of the screen, the right area of the time selector provides information that allows you to check the status of agents connected to the project. This allows you to immediately check whether the target application server is running.

- **Total:** Number of all agents connected to the project
- **Active:** Number of active agents
- **Inactive:** Number of inactive agents
- : Can display or hide inactive agents.

Agent-based monitoring



By default, the dashboard displays the metrics collected from all agents in charts and you can also view the data by agent. Select one or more agents under the time selector. The data of the widgets on the dashboard is updated with the metrics of the selected agent(s).

- ✓ To select all agents again while one or more agents is selected, deselect them or click [Total](#).

❗ If there are numerous agents connected to the project, it is efficient to set the agent names to be short. For more information about the agent name setting, see [the following](#).

Monitoring each classified agents

You can easily monitor multiple agents by categorizing them in Agent Settings.

- **Agent:** Individual Agent
- **By kind:** Group classified by the agent type (e.g. web server, database). Set it to `whatap.okind`.
- **By server:** Group categorized by the server (node). Set it to `whatap.onode`.
- **Agent by kind:** List of agents classified as `whatap.okind`.
- **Agent by server:** List of agents classified as `whatap.onode`.

❗ For more information about the agent configuration, see [the following](#).

Searching the agent

If the agents connected to the project are numerous and difficult to find, use the agent search function. If you click  **Search** on the upper right of the screen, a box appears where you can enter a string.



The agents that match the entered string appear in the list. To filter the data in the dashboard based on the searched agents, click **Select** on the right of the text entry box.

To reset the selected agent entries, click **Close** on the right of the input field.

Widget Edit

The widgets on the dashboard can be adjusted to the desired size and placed in the desired positions. You can also delete unnecessary widgets or add them again.

Resizing a widget

Click and hold the mouse on the  element at the lower right of the widget, and then drag it to the desired size. Grids with a uniform horizontal-to-vertical ratio appear and the size of the widget can be adjusted in each grid.

Moving a widget

When you move the mouse cursor to the top of the widget, the cursor shape changes to . At this time, you can move the widget by dragging with your left mouse button and move to the desired position.

Deleting a widget

Right-click on a widget to delete. If you select **Delete**, the widget is deleted from the dashboard.

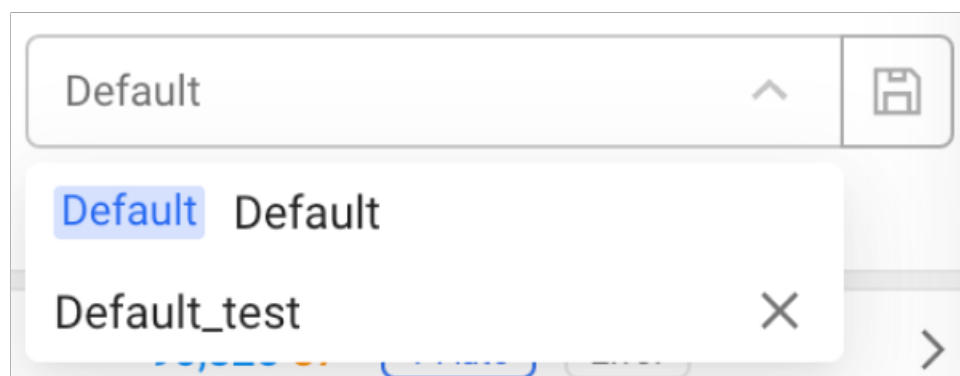
Adding a widget

Move the mouse cursor to an empty space on the dashboard and then right-click on it. Select a widget to add from the pop-up menu. Place the widget to the desired position and then resize it.



- For more information about the widgets that can be placed on the dashboard, see [the following](#).
- The widgets that can be added are fixed, but we plan to increase supports through future updates.
- In addition to the metrics provided by default on the dashboard, you can add the desired metrics. For more information about custom widgets, see [the following](#).

Preset Setting



You can save and load the settings and layouts for widgets on the dashboard. You can create a new preset by adjusting its size and placing it on the desired position.

- Using **Default**, the specified preset cannot be changed.
- You can save or modify the presets with the **Edit project** role. For more information about the member roles, see [the following](#).

Creating a new preset

1. Place the widgets in the desired format on the dashboard. You can also resize and place only the widgets to be frequently checked.
2. On the upper right of the screen, select .
3. Enter a new preset name.

To save the selected agent data, select **Include agent selection history**.

4. Select **Save**.

You can see the newly saved preset from the preset list.

- ⓘ • If any changes are made to the newly created preset, save the preset again. Select  and then save the preset with the same name. Any changes are overwritten in the existing preset.
- If you go to another menu without saving changes on the dashboard, the changes are not saved.
- Presets are saved on a project basis and can be shared with other users.

Deleting presets

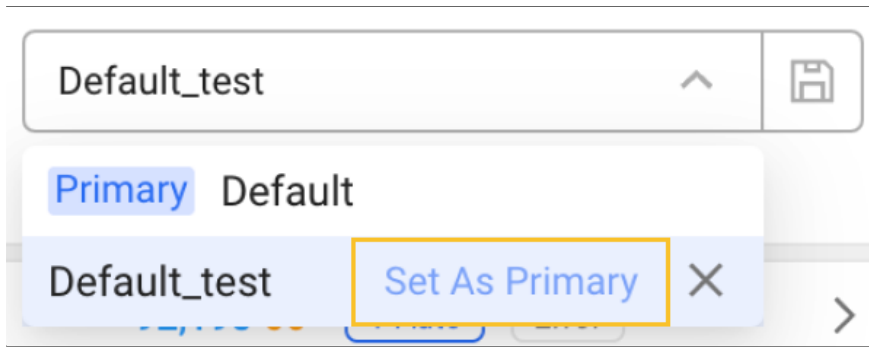
If you have unused presets, you can delete them from the preset list. Select  on the right of the item to delete from the preset list.

- ⓘ The **Default** preset cannot be deleted.

Changing the default preset

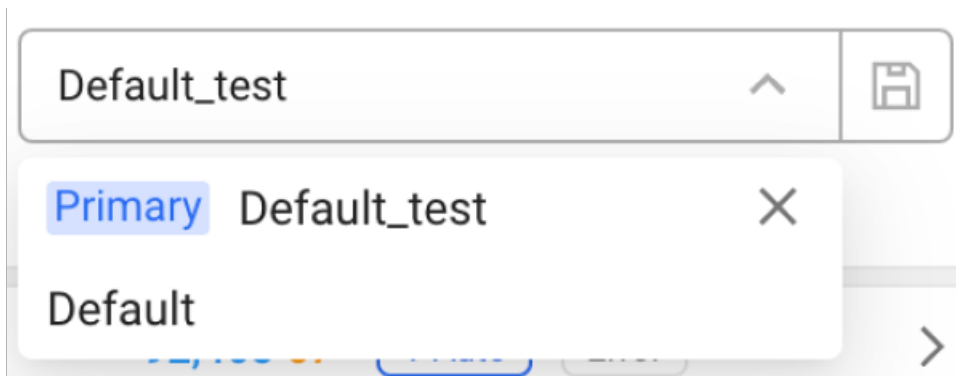
You can change the preset displayed when you first enter the **Application Dashboard** menu.

1. Check the preset selection box on the upper right of the dashboard.
2. Hover your mouse over a desired preset to set it as default.



3. If the **Set as primary** button appears, select it.

The selected preset is changed to the default preset, and the **Primary** tag appears in the preset list.



Widget Options

The icons displayed on the widget function as follows:

ⓘ The provided options may differ depending on the widget.

Learning about the widgets

ⓘ This document mainly describes the widgets placed on the **Application dashboard**. For more

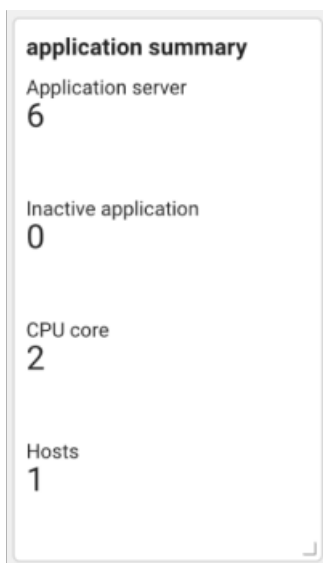
! information about how to analyze transactions and users, services, and resources through **Application dashboard**, see the following documents:

- [Exploring the Application Dashboard](#)
- [HITMAP transaction](#)
- [DB connection delay and connection pool](#)

Agent-related widgets

You can see the application information through the agent installed on the application.

Application summary



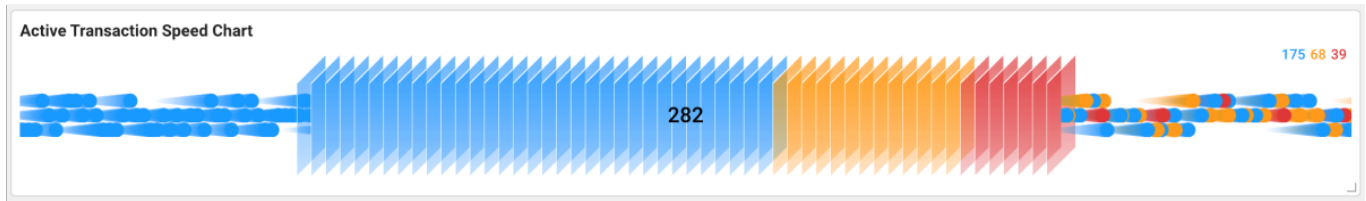
It displays the execution status and number of applications registered in the project, CPU core count, and host count.

Transaction-related widget

The failure status that can be checked through the transaction, can be recognized through the priority response time. If a transaction in progress does not end, this should be considered a failure. WhaTap divides sections for display by the time of the progress status. [Blue \(Normal\)](#) means transactions within the specified response time,

Orange (Slow) means slow transactions with the response time of around 8 seconds, and **Red (Very slow)** means transactions with the response time that is twice as slow as normal. This allows you to intuitively recognize failures as fast as possible.

Active Transaction Speed Chart



You can see the status of active transactions (middle area) and completed transactions (right area). The water drop icon passing from left to right means a transaction. If you click a chart area, a pop-up window appears where you can see a list of active transactions. If you select one of the transaction lists, you can view the transaction details, SQL query, and call stack information.

- Area on the left

This indicates the number of requested transactions and displays data in proportion to the number of transactions.

- Area in the middle

The status of active transactions is color displayed by the speed along with the count at the upper right. The number in the chart is the total number of active transactions. The colors in the chart indicate as follows:

- Blue (**Normal**): 0 to 3 seconds
- Orange (**Slow**): 3 to 8 seconds
- Red (**Very Slow**): 8 seconds or more

- Area on the right

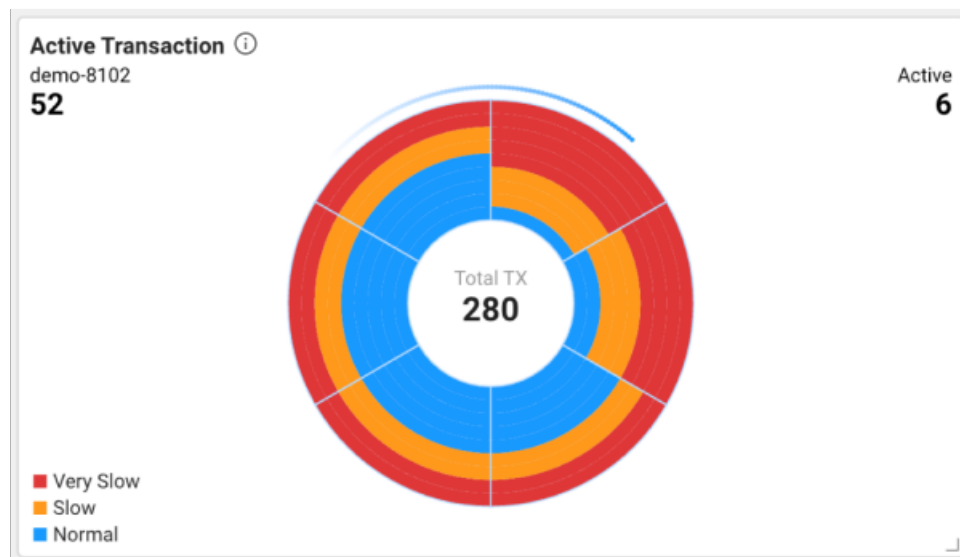
This indicates the Application Performance Index (Apdex). This metric is measured for customer satisfaction of a web application and has a value between 0 and 1. The droplet flying speed is proportional to the total number of Apdex transactions, and the droplet colors mean as follows:

- Blue: **Apdex** satisfied count
- Orange: **Apdex** tolerating count

- Red: **Apdex** frustrated count = Total number of APDEX transactions - (Apdex satisfied count + Apdex tolerating count)

① For more information about the Application Performance Index (Apdex), see [the following link](#).

Active Transaction

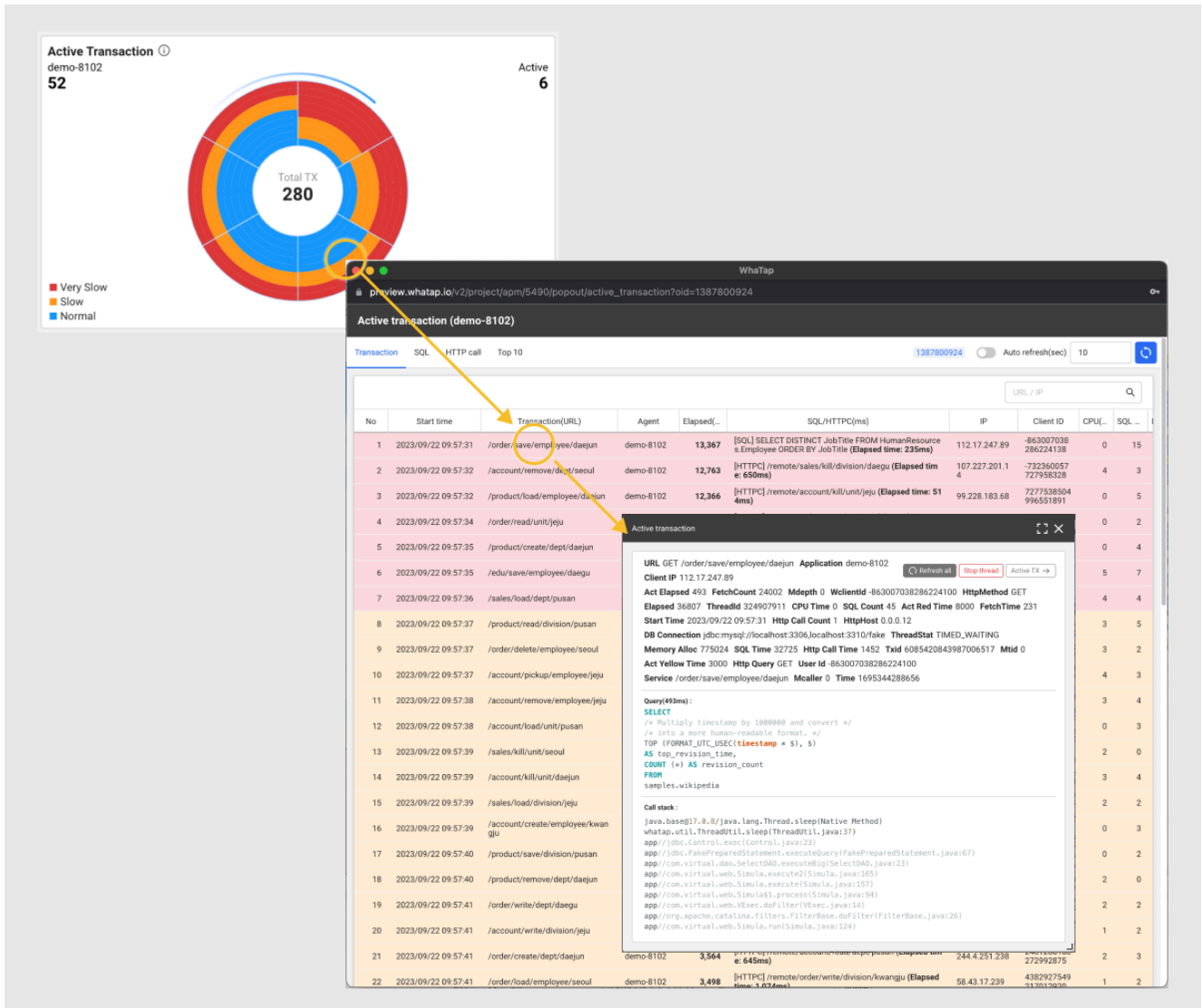


In the **Active Transaction** widget, the transactions in progress are displayed in the **arc equalizer** chart. You can see the status of delays by agent. The arc is divided by the number of agents. By representing the number of requests being processed by the server every 5 seconds, you can tell how long the request has been processed. Requests detected at an interval of 5 seconds are classified by color as follows to determine whether they are dangerous or not.

- Red (**Very Slow**): 8 seconds or more
- Orange (**Slow**): 3 to 8 seconds
- Blue (**Normal**): 0 to 3 seconds

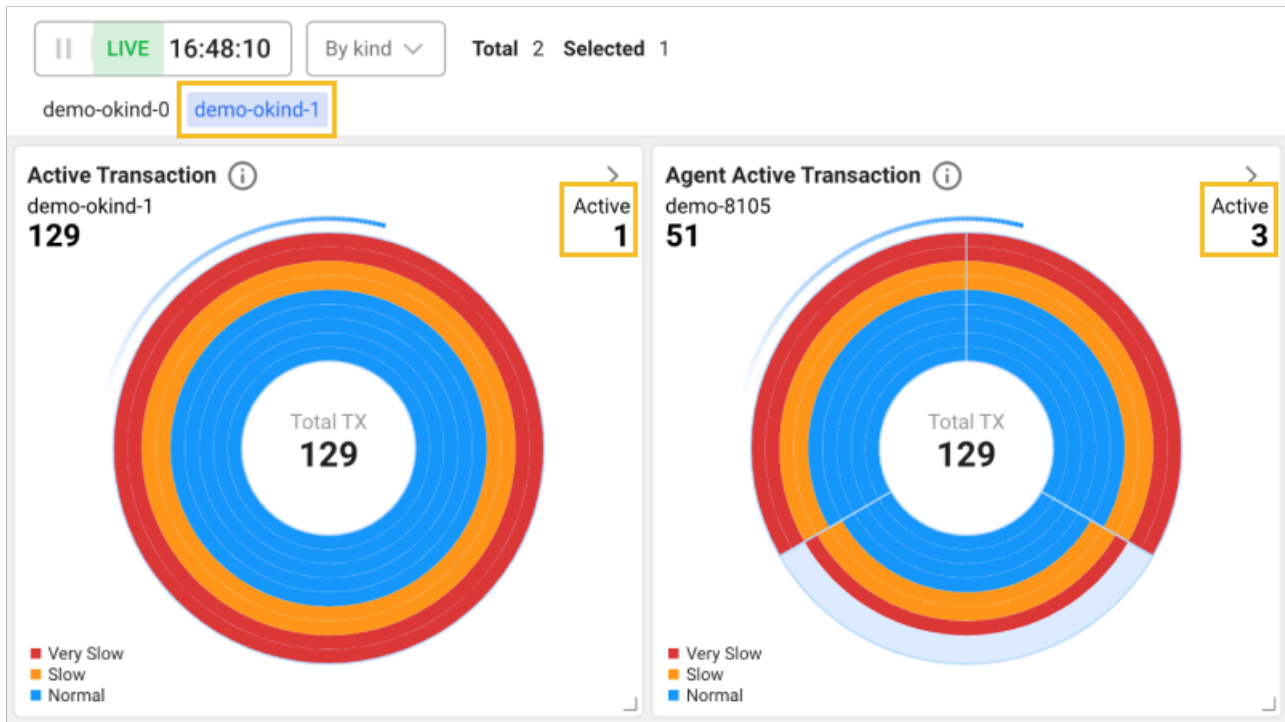
The situation where lots of blue colors are represented is not a problem. You must watch the trend to see whether some of them turn to orange or red. In case of a failure, the number of active transactions increases and the percentage of red color increases. On the other hand, a very responsive system with a high number of process transactions (TPS) might have a low number of active transactions.

- On the upper left, the agent name with the most active transactions appears.
- The middle number is a sum of active transactions of all agents.
- Two bars around active transactions rotate around the chart at a three-step rate based on the throughput (TPS).
- When you select a divided arc area, a pop-up window appears listing the transactions in progress on the agent. To check the transaction details, select an item in the transaction list.



- ① If the item selected in the transaction list is a transaction that has already ended, select **Show trace**. The **Transaction information** window appears. For more information about the **Transaction information** window, see [the following](#).
- For more information about transactions, see [the following](#).

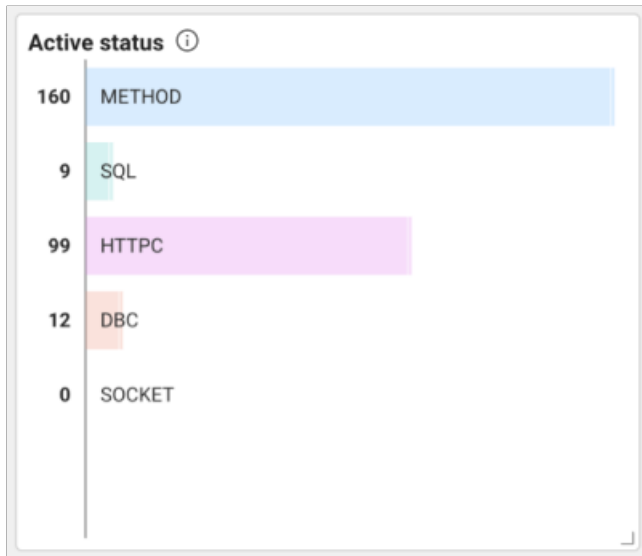
Agent Active Transaction



The **Active Transaction** widget displays on a chart the data merged based on the criteria selected in the agent selection options. On the other hand, the **Agent Active Transaction** widget allows you to individually check the agents included in the selected agent classification criteria.

Right-click the dashboard and then select the **Agent Active Transaction** widget from the widget list.

Active status



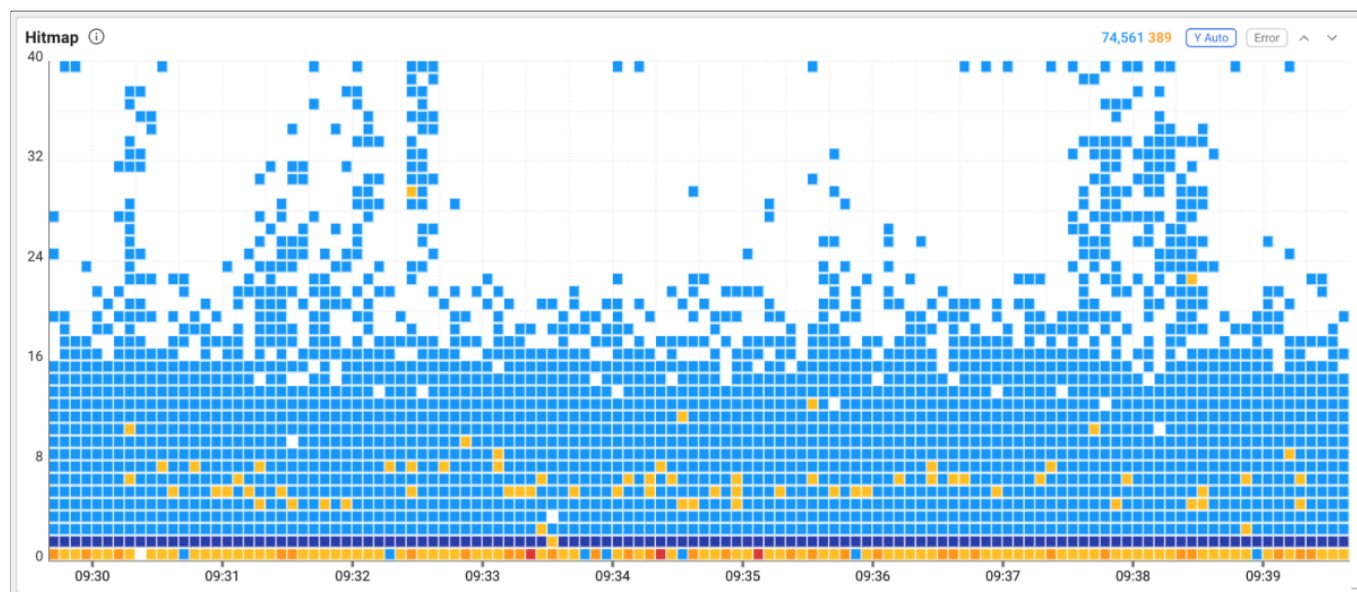
All agents in the project collect the active transaction count every 5 seconds, along with the progress status. The progress status is classified into **METHOD**, **SQL**, **HTTPC**, **DBC**, and **SOCKET**.

- **METHOD**: Status in which the method is executing. Normal situations are displayed in blue.
- **SQL**: SQL is running. If the **SQL** number increases, check for problems connecting to the database server.
- **HTTPC**: It is calling any external API. If the **HTTPC** number increases, it means that the server connected to outside is not responding normally.
- **DBC**: The transaction is attempting to get a new connection from the connection pool. If DB connection pools are insufficient, a delay occurs whenever a new connection request occurs, causing the performance failure. In this case, the **DBC** number increases.

! For more information about the DB connection delay, see [the following](#).

- **SOCKET**: Indicates the TCP connection attempt to an external system. If the **SOCKET** number continues to increase, there is a high possibility of failures due to disconnection of the external system.

Hitmap

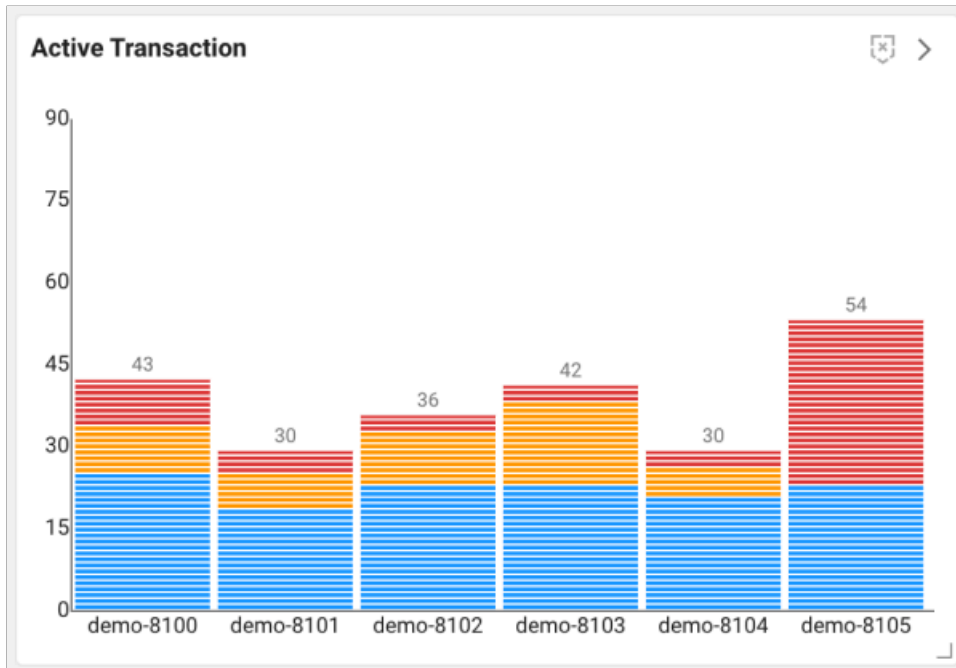


The **Hitmap** chart represents the distribution of response times of completed transactions. The horizontal axis is the transaction end time. The vertical axis is the execution time. Transactions with longer execution times are at the top of the distribution. If you drag the chart area in **Hitmap**, the **Trace analysis** window appears that you can see the transaction information details. For more information about **Trace analysis**, see [the following](#).

- Normal transactions are displayed in light blue → blue → Indigo in order.
- Erroneous transactions are displayed in yellow → orange → red in order.
- The number on the upper right indicates the [transaction count](#)/[error count](#) in the chart.
- If **Y Auto** is selected, the Y-axis (execution time) is automatically adjusted.
- If **Error** is selected, only the error transactions appear.
- Select ^ or v to zoom in/out the chart from 5 seconds to 80 seconds.

- ⓘ
- The detailed information for the transactions with no error whose execution time is less than 500 ms is collected once every 5 minutes for each URL.
 - It does not affect the statistics such as TPS and average response time.
 - You can set a policy through the agent configuration. For more information, see [the following](#).
 - See the following document for the procedure to analyze transactions through the hitmap widget.

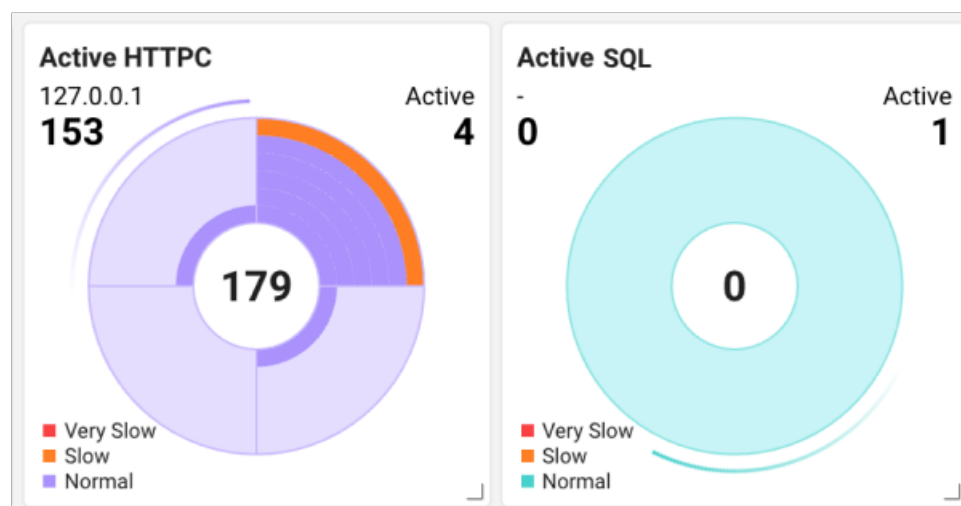
Active Transaction Equalizer



It displays a list of all agents and the total number of active transactions. Hover your mouse over each graph on the chart to display the transaction speed. The transaction speeds are classified into **Normal**, **Slow**, and **Very Slow**.

- To display or hide inactive agents, select .
- If you select , the **Active Transaction** menu appears.

Active HTTPC/SQL



The **Active HTTPC/SQL** widget monitors the performance of external calls (HTTP calls and database queries) occurring in the application in real time.

Unlike the **Active Transaction** widget, which shows all transactions, this widget is specialized for outbound calls, allowing you to quickly identify external system bottlenecks. Placing the two widgets together helps distinguish whether transaction increases are caused by external system delays or internal logic issues, enabling more effective multilayered analysis.

Ongoing HTTPC/SQL operations are visualized as an **Arc Equalizer** chart, showing latency status by host or database URL. The arc is divided by the number of hosts or database URLs, and every 5 seconds it displays the number of requests being processed on the current server and their response times. Requests detected in 5-second intervals are classified into intuitive colors according to their severity.

- Red (**Very Slow**): 8 seconds or more
- Orange (**Slow**): 3 to 8 seconds
- Normal: 0 to 3 seconds
 - Purple (**HTTPC Normal**)
 - Mint (**SQL Normal**)

A large number of Normal values is not a concern. You need to monitor if some values turn orange or red. In failure scenarios, the number of ongoing transactions increases and the proportion of red rises. Conversely, in very fast systems, TPS may be high but the number of ongoing transactions may remain low.

This widget is especially useful in microservice environments to track HTTP communication delays between services or monitor DB performance individually in systems using multiple databases. For services with many external API calls, it allows monitoring of response times by API provider, making dependency management effective.

Arc Equalizer Chart

This is the core visualization element of the widget, dividing ongoing HTTPC/SQL operations by host or database URL. If issues are detected in the overall transactions, this chart helps pinpoint specific external bottlenecks.

- **Top Left Indicator:** Displays the host/database URL with the most active transactions for easy identification of key targets.
- **Center Number:** Shows the total sum of active HTTPC/SQL.
- **TPS-Based Animation:** Bars around the equalizer rotate at three speeds depending on throughput (TPS), visually expressing system load.
- **5-Second Refresh:** Provides near real-time monitoring for immediate response.
- **Arc Segmentation:** Divides arcs by host/database URL for quick identification of where delays are occurring.

Host/Database URL Details

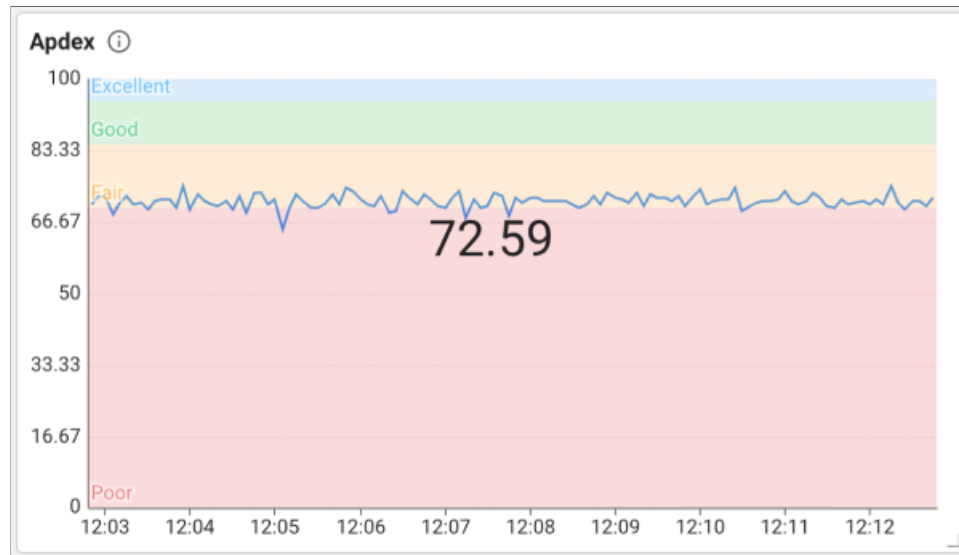
Selecting a segmented arc area opens a popup showing the **Top 100 ongoing transactions** for that host or database URL.

- **Transaction List:** Displays the Top 100 ongoing transactions for the selected host or database URL.
 - **Trend Chart:** Shows TPS, response time, error count, and error rate trends over the last 10 minutes.
 - **Transaction Details:** Selecting a transaction from the list opens detailed information.
 - For already finished transactions, select the **View Transaction** button to open the **Transaction Info** window.
1. In the **Active HTTPC Top 100** popup, check the transaction list and trends.
 2. Select a transaction that requires detailed analysis.
 - a. In the Arc Equalizer, click the arc for the host or database URL you want to analyze.
 3. In the Transaction Info window, review the details.

Service-related widget

The service-related widget can be used as the metric for application performance tuning.

Apdex



Application Performance Index (Apdex) is the indicator of the application performance. You can measure the customer satisfaction about your web applications. It can be used as an indicator of user satisfaction and the value is between 0 and 1.

$$(\text{Number of satisfied cases} + (\text{Number of tolerating cases} * 0.5)) / \text{Total number of requests}$$

- S (Satisfied): No problem in business ≤ 1.2 seconds (Default value)
- T (Tolerating): Business is possible with any delay ≤ 4.8 seconds ($S * 4$)
- F (Frustrated): Business impossible > 4.8 seconds (exceeds T and error)

ⓘ The default value (S) can be modified in **Management > Agent CONFIG..** The value of the setting key is `apdex_time`. It is available only in the agent 2.0 or later.

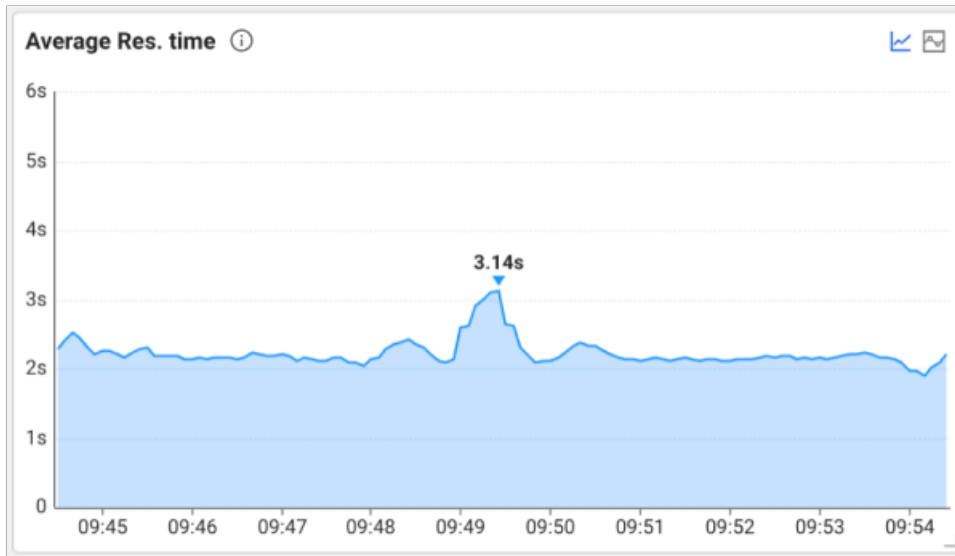
TPS



Transaction Per Second (TPS) indicates the number of transactions processed per second and is the reference for service performance metric. The number of transactions processed every 5 seconds is converted to the number of transactions per second and is expressed with a chart. It displays TPS for the last 10 minutes.

! For more information about analyses for TPS, response time, and CPU utilization, see [the following](#).

Average Res. time



It monitors the times needed for the application server to return the request result. **Average Res. time** is meaningful as a tuning metric. The WhaTap's monitoring service calculates the average response time for transactions every 5 seconds.

! For more information about analyses for TPS, response time, and CPU utilization, see [the following](#).

Resource-related widget

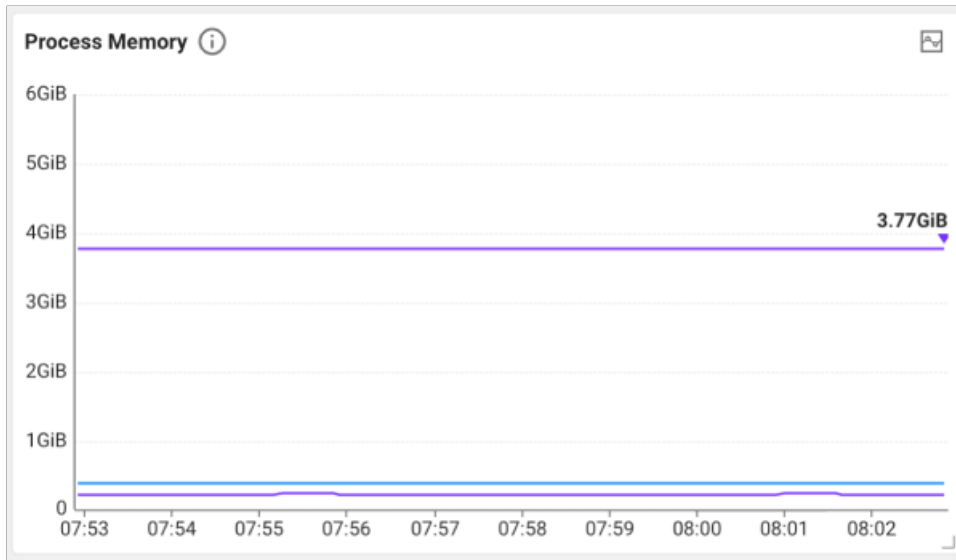
System CPU



It is the CPU usage of the application server. You can see the change trend in CPU usage in real time.

ⓘ For more information about analyses for TPS, response time, and CPU utilization, see [the following](#).

Process Memory



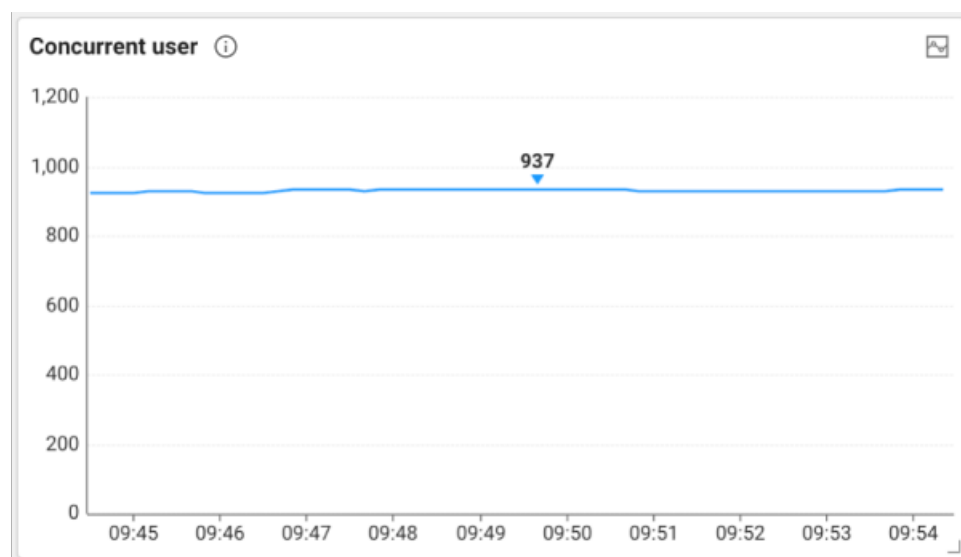
It displays the sum of the maximum system memory available for each server and the memory used by a specified process.

The memory line chart usually ripples continuously. It increases when using memory to process the requests from the application server. It decreases when memory is cleaned up through GC (Garbage Collection). **Process Memory** metric is displayed with average values.



User-related widget

Concurrent user



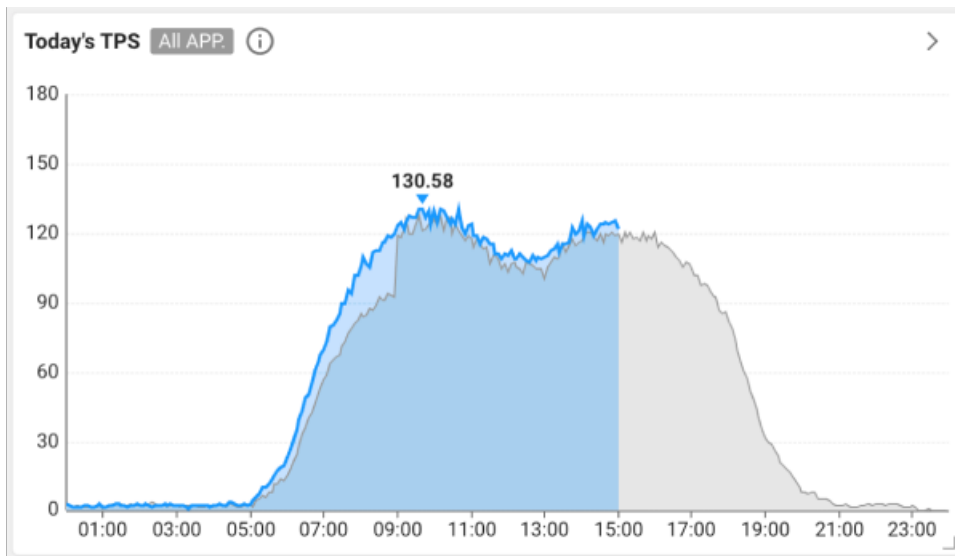
It displays the number of real-time browser users. Every 10 seconds, users who made transactions within the last 5 minutes are counted and displayed without duplicates. Users are counted based on their browser's IP.

- In general, the connected user means a connected user who has access to the current network. However, web systems are different because they use connectionless networks. It does not mean that you are connected, but rather the user who sent the recent request can be measured.
- Real-time (concurrent access) users indicate the users who are using the system in the same time zone. There are various ways to count or measure real-time (concurrent access) users.
- The number of users is calculated by **HyperLogLog** rather than simply adding up. **HyperLogLog** is a probabilistic data structure that estimates the number of elements in a set with very little memory.
- For more information about the configuration of agent options for aggregating the user count, see [the following](#).

Comparison widget on a daily basis

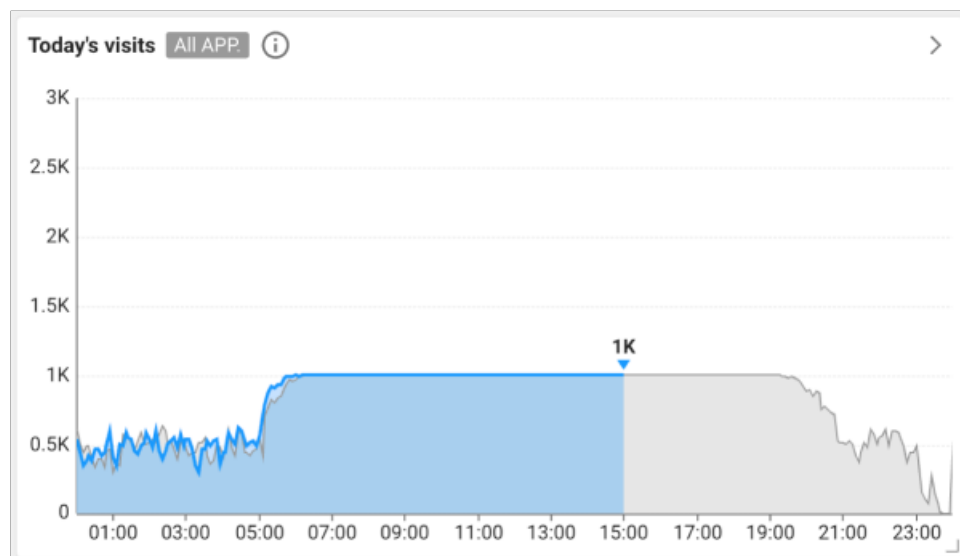
! The widgets marked with the **All APPS.** tag display the data for all agents.

Today's TPS



It displays the TPS for today by hour. You can check it by comparing with the TPS (gray) in the same time zone of yesterday. If you click **>**, **Stat/Report > Daily APP. Status** appears.

Today's visits



This metric shows the number of **Concurrent user** for the day by time zone. You can check it by comparing with the user count (gray) in the same time zone of yesterday. If you click > , **Stat/Report > Daily APP. Status** appears.

Real-time Alert

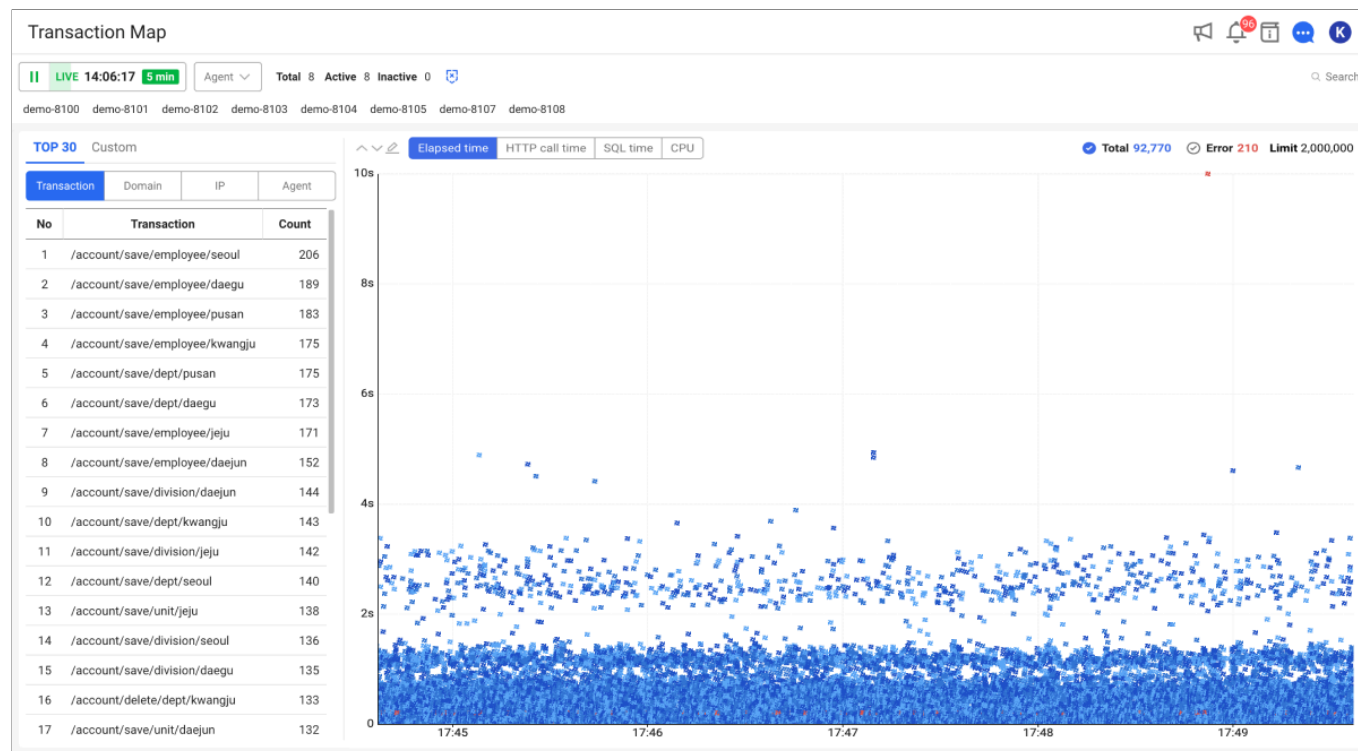
If you select **Alert Status** on the upper right of the screen, the recent events appear. You can turn on or off the browser notifications by clicking the toggle menu.

ⓘ For more information about basic elements in the fixed menu area at the top of the screen, see [the following](#).

Transaction Map

Home > Select Project > **Dashboard** > **Transaction map**

The **Transaction map** chart displays the response times for each completed transaction in the distribution chart form. Same as the hitmap, you can find and analyze problems based on the distribution patterns. **Hitmap** displays the grouped transactions every 5 seconds, but **Transaction map** displays transactions individually.



✓ How is it different from the hitmap analysis?

The hitmap uses the aggregated data to display the overall trend over a long-term period. On the other hand, the transaction map uses individual transactions to check the transaction distribution within a short-term period with no time constraints. It also differs in that it allows users to apply various filters to select only the desired transactions and observe their trends.

- To analyze the distribution of the long-term, high-volume transactions, use the hitmap analysis (**Analysis > Hitmap**).



- To do performance test, or analyze the transaction distribution within 1 to 5 minutes upon a failure, or check the transaction distribution without limiting the execution time, check the **Transaction map**.



- For more information about **Hitmap**, see [the following](#).
- For more information about the analysis method of the **HITMAP transaction** chart, see [the following](#).
- If the user's PC time is set to earlier than the server time, or the difference between two times is 5 minutes or more, the data may not be displayed in the chart.

Analyzing a trace

If you drag the chart area of Transaction map, the **Trace analysis** window appears where you can check the transaction details. You can see the transaction list and the steps under each transaction at once.

After dragging the chart area, you can see up to 1,000 items in the **Trace analysis** window.



- For more information about **Trace analysis**, see [the following](#).

Changing the lookup criteria

Select the chart area of Transaction map and then the button at the upper left to change the data lookup criteria.

- **Elapsed time:** The data is displayed based on the transaction execution time.
- **HTTP call time:** The data is displayed based on the response time against the HTTP call.
- **SQL time:** The data is displayed based on the SQL execution time.
- **CPU usage time:** The data is displayed based on the CPU used time.

Filtering the searched results

In the chart area of Transaction map, you can distinguish the results by selecting Total, Error, and Read phrases in the upper right corner.

Total: Displays total transactions

Error: Only the transactions in which errors occurred, are displayed.

Read: The number of transactions read from the server is displayed.

For example, if you select an error and then drag a transaction on the chart, the **Trace analysis** window appears to display a list of erroneous transactions. To view all transactions, click [Total](#).

✓ Adjusting the Y-axis

- You can easily change the maximum value of the Y-axis by selecting ^ or v on the upper left of the chart. You can also access the same function by pressing the up or down button on the keyboard.
For more information on how to use the ^ or v button or keyboard buttons depending on the Y-axis section, see the following:
 - The segment from 10 to 50 seconds is changed to the 10-second interval.
 - The segment from 50 to 300 seconds is changed to the 50-second interval.
 - For the segment of 300 or more seconds, it is changed to the 100-second interval.
- You can change the maximum value of the Y-axis by directly entering it. Select , enter a desired value, and then select **Apply**.

ⓘ The maximum number of transactions (**Limit**) displayed on the chart in Transaction map is 2,000,000.

When you apply filters for a search, the Read value may be greater than the Total (number displayed on the screen).

Viewing the past data

Transaction map provides the real-time monitoring by default. By default, the data can be viewed in real time for 5 minutes. Click the green button in the time selector to select a desired lookup time.

To view the historical data, click **II** in the time selector. It changes to period viewing mode and you can view the transaction data for up to 1 hour. The chart data of **Transaction map** based on the date and time set by the user is refreshed.

You can stop the query at any time while searching the past data. _ To change the filters, first stop the query, and then change the filters. _ If you press the Search button again without changing the filters, it continues searching from where it was stopped.

To switch to the Realtime mode after a historical inquiry, click .

-  • The range of the historical inquiries may differ depending on the transaction volume.

Applying filters

In case of viewing the past data, you can filter out the data by applying filters.

1. When you click the Pause (**II**) button, the filter input box appears.
2. If you click the filter input box, the list of filters that can be selected appears as follows.
 - General filters

Item	Description
Login ID	Viewing with the login ID of the user
WClientID	Searched by the unique identifier per client (Note: Searching is performed by exact match.)

Item	Description
Transaction ID	Unique ID per transaction (Note: Searching is performed by exact match.)
Referer	Searching is performed using the Referer (referring page address) delivered by a transaction request.
Multi Transaction ID	Unique ID that groups multiple transactions (Note: Searching is performed by exact match.)
Custom TID	Searching by the custom transaction ID
Error(Class, Step, Message)	Searching by error type, step, and message in transactions (partial match included)
City	Searching by the user's town for transactions
Country/Region	Searching by the user's country for transactions
HTTP Method	HTTP request method (GET, POST, etc) (Note: Searching is performed by exact match.)
UserAgent	Searching by browser or client information (user agent) for transaction requests

- STEP Filter

Step indicates the profile data collected while performing transactions. When dragging the hitmap, the sequential data displayed in Table View or Tree View by clicking a transaction in the transaction list is called Step.

Item	Description

DBC	Step that contains the method running while performing transactions
HTTPC	Step that contains the HTTP call

```

|
| MESSAGE | Step that contains various texts while performing transactions
|
| METHOD   | Step that contains the method running while performing transactions
|
| SQL      | Step that contains executed queries
|
| SQL_BIND | Data that does not exist actually but is included in the SQL step. Step with which bind variables
and substitution variables can be viewed during the SQL call (Note: Searching is possible with the authority
and decryption key to view sensitive information.) |
| ALL      | Step with which all the above steps can be searched (Note: Searching is possible with the
authority and decryption key to view sensitive information.) |

```

- Number input filter

Item	Description
Elapsed time	Total time taken for the transaction to be performed
HTTP Call Time	Response time for HTTP Requests
HTTP Call Count	Number of HTTP requests while performing transactions
SQL time	Total SQL execution time for transactions
SQL Count	Number of SQL queries executed for transactions
Status	Transaction status(e.g. Normal, Error, etc.)

3. Enter the desired values for filtering. For filtering, enter all values for the filter key, operators, and values. If there are any filters that have not been entered yet, searching is not possible.
4. After entering all filters, click .

It updates the filtered data in the [Top 30](#) list and the **Transaction map** chart.

- You can perform filtering by setting multiple conditions. Added conditions are applied based on

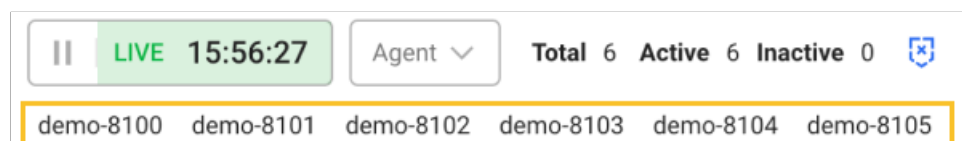


&& . For example, if the transaction is `/account/save/employee/seoul` and the elapsed time is more than 3 seconds, you can apply as follows:

Transaction = `/account/save/employee/seoul` Elapsed time (ms) `>= 3`

Agent Check

Checking the agent connection status



On the upper left of the screen, the right area of the time selector provides information that allows you to check the status of agents connected to the project. This allows you to immediately check whether the target application server is running.

- **Total**: Number of all agents connected to the project
- **Active**: Number of active agents
- **Inactive**: Number of inactive agents
- : Can display or hide inactive agents.

Agent-based monitoring

By default, the chart displays the metrics collected from all agents in charts and you can also view the data by agent. Select one or more agents under the time selector. The chart is updated with the transactions of the selected agent.



To select all agents again while one or more agents is selected, deselect them or click [Total](#).



If there are numerous agents connected to the project, it is efficient to set the agent names to be short.

! For more information about the agent name setting, see [the following](#).

Monitoring each classified agents

You can easily monitor multiple agents by categorizing them in Agent Settings.

- **Agent:** Individual Agent
- **By kind:** Group classified by the agent type (e.g. web server, database). Set it to `whatap.okind` .
- **By server:** Group categorized by the server (node). Set it to `whatap.onode` .
- **Agent by kind:** List of agents classified as `whatap.okind` .
- **Agent by server:** List of agents classified as `whatap.onode` .

! For more information about the agent configuration, see [the following](#).

Searching the agent

If the agents connected to the project are numerous and difficult to find, use the agent search function. If you click  **Search** on the upper right of the screen, a box appears where you can enter a string.

The agents that match the entered string appear in the list. To filter the data in the dashboard based on the searched agents, click **Select** on the right of the text entry box.

To reset the selected agent entries, click **Close** on the right of the input field.

Checking the upper list

In the [Top 30](#) section, the list of top 30 items with the highest transactions performed based on **Transaction**, **Domain**, **IP**, and **Agent**.

- **Transaction:** Top 30 items, aggregated by the transaction URL
- **Domain:** Top 30 items aggregated based on the Internet address specified in the address of the IP connected by the client

- **IP:** Top 30 items, aggregated by the client IP address
- **Agent:** Top 30 items aggregated by the agent included in the project

If you select each item from the list, the data is applied based on the item selected in the Transaction map chart. To select multiple items, hold down the **Ctrl** (Windows/Linux) or **CMD** (Mac) key and then click desired items.

✓ You can move an item in the list of the **Top 30** section by pressing the up or down arrow button on the keyboard.

Add custom IP address

When viewing the number of transactions executed based on **IP** in the **TOP 30** section, the function is provided to check constantly by adding a specific IP address.

1. In the **TOP 30** section, select **IP**.
2. Enter a specific IP address in the field at the top of the list.
3. Click **+**.

TOP 30 Custom		
Transaction	Domain	IP Agent
No	IP	Count
	255.255.255.255	+
1	 255.255.255.255	0
2	127.115.101.81	185

The specified IP address appears at the fixed top of the list.

ⓘ To delete any added IP address, click .

Custom monitoring

It provides the feature to check only the selected items in the response time distribution chart by adding specific transactions, domains, and IPs to the **Custom** tab. This allows users to efficiently monitor and analyze specific problematic items.

1. Click the **Custom** tab.
2. **Transaction** or **Domain**, **IP** can be entered directly, selected from the **Top 30** list, or searched.
3. Click the added item.

TOP 30
Custom

Transaction

▼

1	/account/save/employee/seoul	195	🗑
2	/account/save/employee/daegu	171	🗑

Domain

▼

1	127.0.0.1:8100	6,844	🗑
2	127.0.0.1:8101	6,495	🗑

IP

▼

1	10.237.141.102	169	🗑
2	112.17.247.89	156	🗑

You can see the response time distribution for the selected items filtered in real time on the chart on the right.

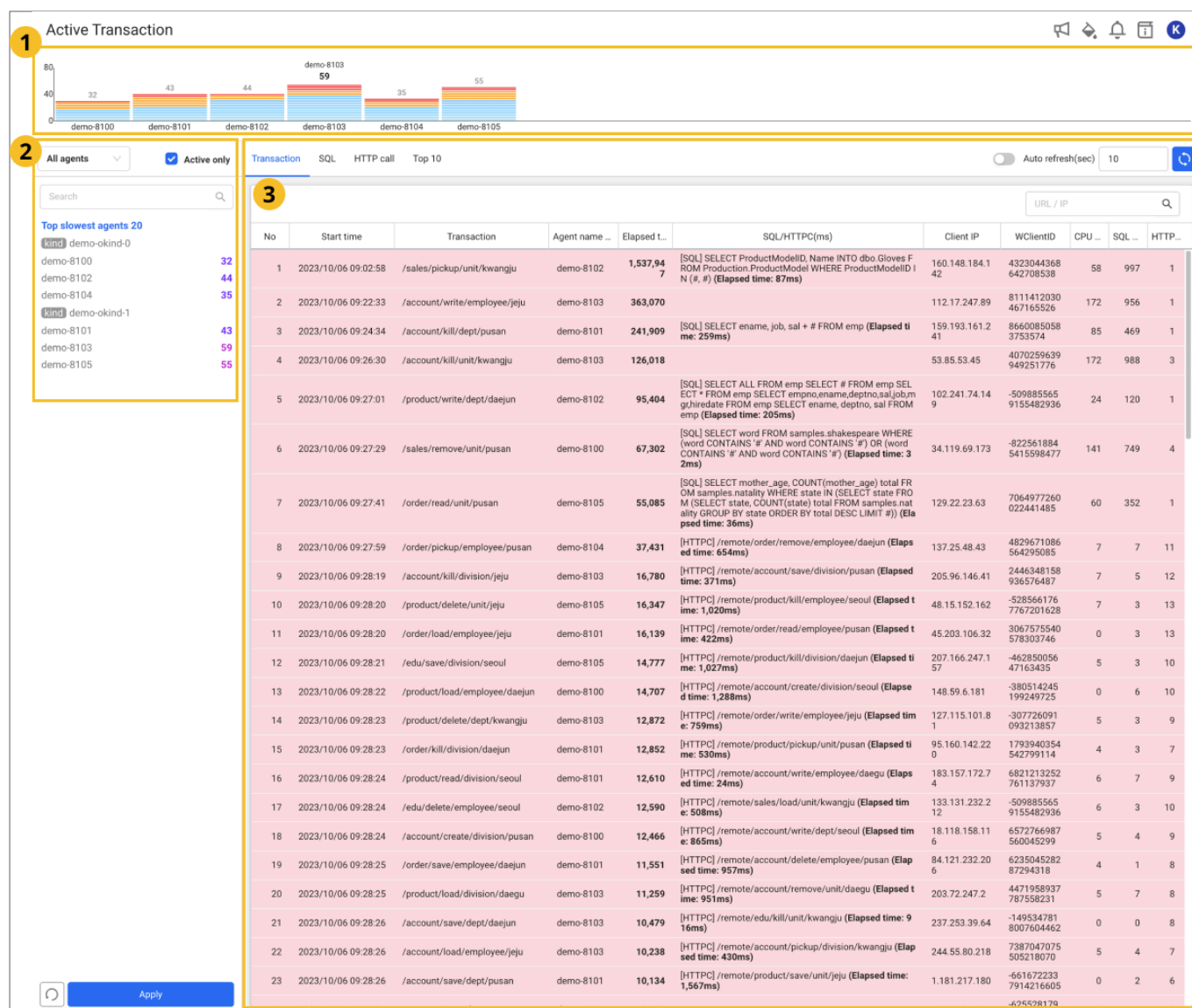
ⓘ To delete any added custom items, click 🗑.

Active Transaction

In Home screen > Select Project > **Dashboard** > **Application Dashboard** > **Active Transaction** widget, select > .

You can quickly recognize abnormal transactions by using URLs, SQLs, and HTTP calls of the active transactions, and can analyze the delayed sections in detail through the transaction trace details.

Screen layout



1 Active transactions for each agent

It displays a list of all application servers and the total number of active transactions. Hover your mouse over each graph on the chart to display the transaction speed. The speed of the transaction state is classified into **Normal**, **Slow**, and **Very Slow**.

2 Agent List

It displays the application server list and the total number of active transactions. If you select the application server, In the 3 transaction list, the detailed information appears.

3 Transaction List

It displays the detailed information of active transactions including URLs, SQLs, and HTTP calls. If you select the Top 10 Items tab, you can see a table of items sorted by the elapsed time in the ascending order. Likewise, the speeds of the transaction state are classified into **Normal**, **Slow**, and **Very Slow**.

Agent list filtering

In 2 Agent List, you can select or search the filtering targets and see them individually in the transaction list.

- To see the active agents, select the **Active only** checkbox.
- Click the **All agents** list box. You can view the agents by category.
- To see active transactions by agent, select an agent and then click **Apply**. To cancel the selection, select ↺.

Automatic refresh

The active transactions can be automatically updated at the set intervals. Select **Auto refresh(sec)** to activate the option, and then enter the refresh interval in the field on the right.

To deactivate the auto refresh setting, select **Auto refresh(sec)** again.

- ! • The time is updated in seconds.
- To update the transaction list when the auto refresh is deactivated, select ↺.

Transaction list filtering

In 3 Transaction List, you can search for URL or IP for filtering. Enter a filtering target in the **URL/IP** field on the

upper right and then press Enter or select . It filters with the transaction list that includes the input text.

To initialize the filtered list, delete text in the [URL/IP](#) field on the upper right, and then press Enter or select .

IIS Perf. Count

Home > Select Project > **Dashboard** > **IIS Perf. Count**

By monitoring the key metrics in real time in **Internet Information Services (IIS)**, you can optimize the server performance and improve the system stability by quickly detecting potential problems. You can also predict and take actions in advance against any impact caused by traffic increase or change in applications.



Performance monitoring

These are items used to evaluate the performance and stability of the web server. Each item traces the server's operation status and performance and helps you quickly find potential problems. The administrator can monitor these metrics and use them for reference to optimize the server performance and troubleshoot issues.

- [Pipeline Instance Count](#)

Number of active pipeline instances. It indicates the number of HTTP requests being processed simultaneously. If this value increases, it indicates that the server got overloaded.

- [Worker Process Restarts](#)

Number of restarted times because the worker process was terminated abnormally. If this metric value increases unexpectedly, investigate the problem as quickly as possible. It is used to evaluate the stability and reliability of applications.

- [Requests Rejected](#)

Number of requests rejected by the server. It indicates the number of requests that return a 503 HTTP status code. This can be generated by too much server load or exceeding the set limits.

- [Requests Queued](#)

Number of pending requests. It is the number of requests that the server cannot process. If the value is high, the server performance can be affected.

- [Current Connections](#)

Number of active TCP connections. You can use it as a reference to check the server's load and trace the network resource usage.

- [Requests/Sec](#)

Number of HTTP requests processed per second. It is the value measured for the application's throughput, which should remain constant within a specific range, excluding other server operations (garbage collection, cache cleanup threads, external server tools, etc.).

- [Errors Total/Sec](#)

Number of errors that occurred while executing HTTP requests. It is the sum of compilation errors, preprocessing errors, and execution errors. You can see it to identify problems with the applications or servers.

- [ISAPI Extension Requests/sec](#)

Number of ISAPI extension requests processed per second. Tasks such as user authentication, database access, and content filtering can all be performed through ISAPI extensions. Through this metric, you can have insight into how frequently the web server are processing dynamic tasks.

Tracing the network status and data transfer

These items are used to trace the server's network activities and data transfer volumes. These metrics help you evaluate the server's network performance and analyze traffic patterns. By monitoring the data transfer volumes and file transfer speeds, you can trace changes in network traffic and optimize the usage of resources.

- [Bytes Sent/sec](#)

Bytes transferred per second. It can be used as a reference to trace the server's network activities and analyze traffic patterns.

- [Bytes Received/sec](#)

Bytes received per second. It can be used as a reference to trace the amount of data transferred from clients to the server.

- [Files Sent/sec](#)

Number of files transferred per second. You can reference it to trace the activities of file services and check the disk I/O usage.

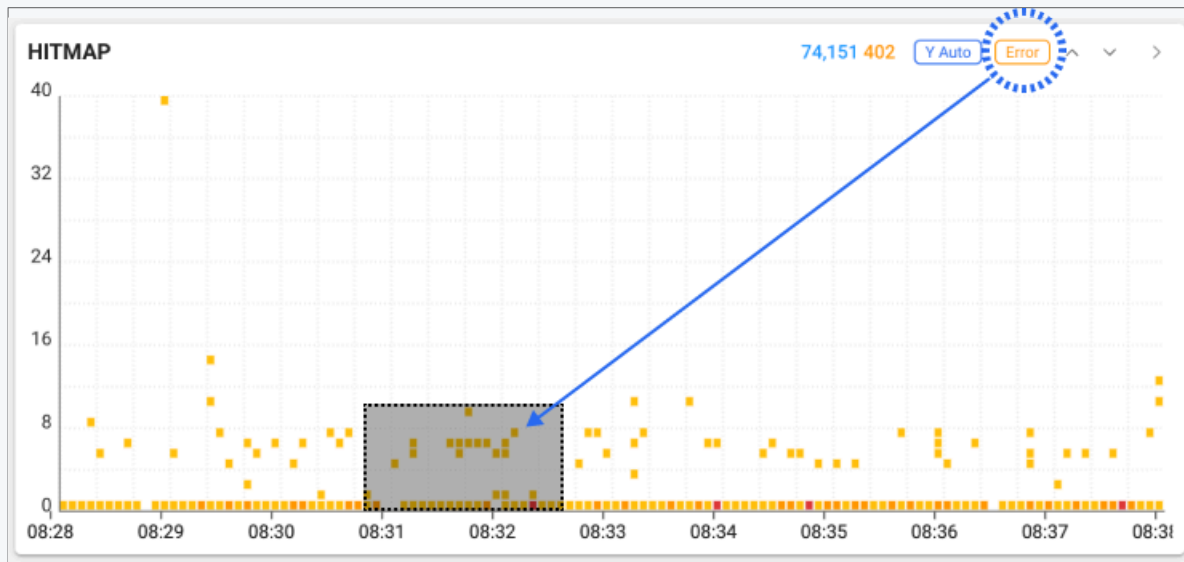
- [Files Received/sec](#)

Number of files received per second. It can be used as a reference to trace the file transfer activities from clients.

HITMAP - Trace Analysis

Through the **Hitmap** widget in **Application Dashboard**, you can open the **Trace analysis** window to check the transaction list and step information of each transaction at once. Drag the desired area on the hitmap widget. The **Trace analysis** window appears that contains the transaction list and sub-steps of the selected area.

- ✓ To classify and see only the transactions with errors, select **Error** on the upper right of the **Hitmap** widget in **Application Dashboard** and then drag the chart area.



Basic screen guide

Trace analysis 15 cases have been inquired. 1 Copy URL													
All A Active Stack M Multi-transaction Error 2				Topology		Column Settings		TXT	CSV	3 Please enter your sea... Q			
4 No	Agent nam...	Transaction	Elapsed time	Start time	End time	HTTP call ...	HTTP call time (...)	SQL count	SQL time	SQL fetch co...	SQL patch tim...	DB CONN. tin	
1	demo-8100	/account/load/...	A	61,290	26/04/06 14:16:32.419	26/04/06 14:17:33.709	22	34,254	12	71	1,541	16	4
2	demo-8100	/sales/write/div...	A	60,619	26/04/06 14:16:23.781	26/04/06 14:17:24.400	22	31,405	12	301	2,456	39	3
3	demo-8100	/account/save/...	A	59,912	26/04/06 14:16:28.263	26/04/06 14:17:28.175	24	31,313	12	753	1,877	24	8
4	demo-8100	/account/kill/d...	M A	58,395	26/04/06 14:16:45.099	26/04/06 14:17:43.494	21	30,937	12	570	2,093	16	27
5	demo-8100	/order/create/d...	A	57,584	26/04/06 14:16:33.561	26/04/06 14:17:31.145	20	28,965	18	30	1,808	29	13
6	demo-8100	/product/create...	A	57,473	26/04/06 14:16:45.165	26/04/06 14:17:42.638	23	30,910	15	17	2,429	25	22
7	demo-8103	/sales/save/uni...	A	57,184	26/04/06 14:17:15.132	26/04/06 14:18:12.316	13	15,398	515	387	248,494	3,219	5,67
8	demo-8100	/edu/load/unit/...	A	56,959	26/04/06 14:16:27.801	26/04/06 14:17:24.760	22	27,989	16	161	1,283	17	22
9	demo-8100	/edu/create/uni...	A	56,045	26/04/06 14:16:27.219	26/04/06 14:17:23.264	17	27,168	12	141	2,187	29	34
10	demo-8100	/account/creat...	A	54,499	26/04/06 14:16:48.751	26/04/06 14:17:43.250	19	26,299	12	10	2,356	23	2

- **1 Transaction lookup count:** You can see the number of transaction lists in the dragged area on the hitmap widget. You can query up to 1000 cases.
- **2 Transaction classification:** By separating **A Active Stack**, **M Multi-transaction**, and **Error**, you can view the list.
- **3 Transaction search:** You can search the transaction list by transaction name, agent name, and error message.
- **4 Sorting the list:** You can sort the lists of transactions by the selected item by clicking a header column in the table.
- The transactions with errors appear in red in the list.

- ✓ You can place, add, or hide desired columns to the front of the list. For more information, see [the following](#).
- If you drag another area in the **Hitmap** widget, a new trace analysis window appears. You can check it by comparing with the previous trace analysis window.
- The transactions that are viewed can be shared with other users. With the transaction item selected (**a**), click **Copy URL** on the trace analysis window. Pass the copied URL address to another user. Any user who has received the URL address can quickly see the same items by entering the URL address in the browser address bar.

Trace analysis 1000 cases have been inquired. ⓘ

Record summary Table view Tree view Methods SQLs HTTP calls Transaction log

/account/kill/employee/daegu

Start : 08/02 08:25:44.017 End : 08/02 08:25:46.409 Elapsed : 2,392ms

Agent name (oname) : star_star Client IP : 2.184.24.254

No	Agent nam...	Transaction	Elapsed time	Start time	End time
5	demo-8103	/product/write/...	2,416	24/08/02 08:25:41.128	24/08/02 08:25:43.544
6	star_star	/account/kill/e...	2,392	24/08/02 08:25:44.017	24/08/02 08:25:46.409
7	demo-8105	/account/delet...	2,371	24/08/02 08:25:40.383	24/08/02 08:25:42.754

Analyzing a trace

Select an item to view details from the transaction list. On the right of the screen, the detailed analysis of the selected transaction appears. In this state, if another transaction item is selected, the detailed analysis of the selected transaction item is changed.

To analyze the transaction performance, WhaTap collects and displays the properties such as name and client data, transaction performance, and detailed execution records for each section.

Trace analysis 378 cases have been inquired. ⓘ

Record summary Table view Tree view Multi transaction Active stack Methods SQLs HTTP calls Transaction log

/account/(aa)/(bb)/(cc)

Start : 08/02 09:32:20.276 End : 08/02 09:32:51.540 Elapsed : 31,264ms Agent name (oname) : demo1

Client IP : 193.209.234.170

No	Agent nam...	Transaction	Elapsed time	Start time	End time	HTTP call ...	HTTP call time
15	demo3	/account/(aa)/(...	31,406	24/08/02 09:33:26.029	24/08/02 09:33:57.435	22	25
16	demo2	/account/(aa)/(...	31,276	24/08/02 09:32:31.982	24/08/02 09:33:03.258	14	16
17	demo1	/account/(aa)/(...	31,264	24/08/02 09:32:20.276	24/08/02 09:32:51.540	25	3
18	demo6	/account/(aa)/(...	31,176	24/08/02 09:32:08.278	24/08/02 09:32:39.454	3	2
19	demo5	/account/(aa)/(...	31,132	24/08/02 09:32:36.202	24/08/02 09:33:07.334	6	8
20	demo4	/account/(aa)/(...	31,055	24/08/02 09:32:06.308	24/08/02 09:32:37.363	22	30
21	demo4	/account/(aa)/(...	31,041	24/08/02 09:31:53.398	24/08/02 09:32:24.439	21	25
22	demo2	/account/(aa)/(...	30,853	24/08/02 09:32:38.313	24/08/02 09:33:09.166	15	20
23	demo3	/sales/save/de...	30,743	24/08/02 09:32:59.481	24/08/02 09:33:30.224	25	25
24	demo6	/product/delete...	30,393	24/08/02 09:33:32.787	24/08/02 09:34:03.180	19	28
25	demo2	/product/write/...	30,370	24/08/02 09:32:50.389	24/08/02 09:33:20.759	15	20
26	demo2	/order/kill/divi...	30,312	24/08/02 09:31:48.304	24/08/02 09:32:18.616	22	25
27	demo3	/product/create...	30,285	24/08/02 09:32:49.944	24/08/02 09:33:20.229	22	28
28	demo1	/product/kill/un...	30,262	24/08/02 09:33:03.011	24/08/02 09:33:33.273	6	8
29	demo6	/edu/read/divis...	30,194	24/08/02 09:32:51.435	24/08/02 09:33:21.629	24	25
30	demo2	/sales/pickup/...	30,165	24/08/02 09:32:10.276	24/08/02 09:32:40.441	22	25
31	demo3	/sales/read/de...	30,093	24/08/02 09:33:25.545	24/08/02 09:33:55.638	23	28
32	demo2	/sales/read/em...	30,090	24/08/02 09:32:48.950	24/08/02 09:33:19.040	14	18
33	demo3	/product/load/...	29,992	24/08/02 09:32:08.434	24/08/02 09:32:38.426	17	18
34	demo3	/order/kill/unit...	29,920	24/08/02 09:32:02.357	24/08/02 09:32:32.277	12	12
35	demo2	/account/(aa)/(...	29,882	24/08/02 09:33:35.839	24/08/02 09:34:05.721	21	28

Method DB Connection SQL HTTP Call Socket Active Stack

Select column TXT SQL

No	Time	Gap	Elapsed	Contents
1	09:32:20.276			Start 2024-08-02 09:32:20.276
2	09:32:20.276			HTTP-HEADERS host=255.255.255.221 gid=gid.23dab7cb-6ad4- referer=http://www.test.com/account/pickup/de pt/daejun
3	09:32:20.276	0	31,264	com.virtual.web.VExec#doFilter
4	09:32:20.276	0	31,264	com.virtual.web.Simula\$1#process
5	09:32:20.276	0	2,331	com.virtual.web.Simula#exec
6	09:32:20.276	0	2,267	com.virtual.dao.RemoteDAO#execute
7	09:32:20.276	0	2,267	[ApacheClient] 127.0.0.1:8094 /remote/
8	09:32:20.276			[Socket] 127.0.0.1:8094
9	09:32:22.543	2,267	0	com.virtual.TestLogger#printin
10	09:32:22.543	0	5	com.virtual.dao.SelectDAO#execute2
11	09:32:22.543	0	1	MYSQL jdbc:mysql://localhost:3306/localho...
12	09:32:22.544	1	0	com.virtual.TestLogger#printin

- In the 5 area, the step data can be seen in various formats. Select a desired type of tab.
- In the 6 area, you can see the basic information for transactions. The information matches the columns in

the list on the left.

- : The statistical data window for the corresponding URL or each execution section appears. Click a desired time on the graph chart in the statistical data window to go to **Statistics** or **Transaction Search**. You can view the statistical data based on the selected time.
- By dragging  to the left or right, you can adjust the screen size. This is useful when you want to see more information.

-  • For more information about **Statistics**, see [the following](#).
- For more information about **Transaction Search**, see [the following](#).
 - If you click  or , you can change the transaction list or analysis details to full screen.

The collected types of **Step** are as follows. The diagrams and texts are color coded.

- **DB Connection** step **START-END**

It includes the performance for connection to RDB. Step information includes the name, response time, and error.

- **SQL** step **START-END**

It includes the performance for JDBC SQL. Step information includes connection data, SQL statements, and errors.

- **HTTP Call** step **START-END**

It includes the performance for the outbound HTTP service call. Step information includes URL, host, port, response time, and errors.

- **Message** step **ADD**

While collecting traces, the message steps are used to collect the records of all irregular sections.

- **Socket** step **ADD**

Step to represent the socket open.

- **Method** step **START-END**

The method response time is traced.

- **Active Stack** step **START-END**

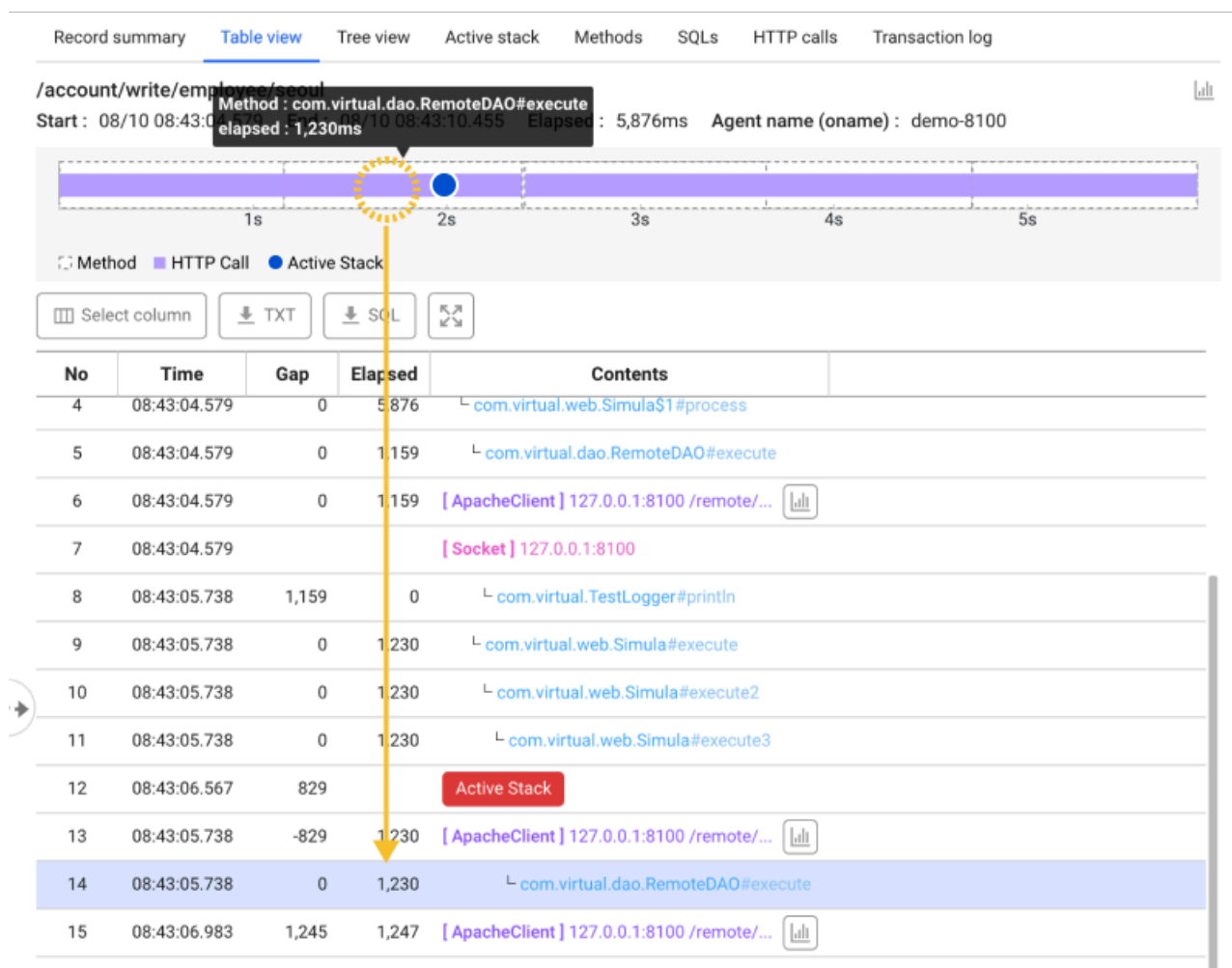
It includes the active stack information. It is created and collected by a separate thread and it is added to the transaction trace.

- In the WhaTap monitoring service, **Step** is used as the same meaning as **Span**.
- To see the updates in the **Trace analysis** function released on July 25, 2023, see [the following](#).

Table view

In the **Table view** tab, you can see the transaction execution steps in chronological order.

- You can classify transactions by each execution section and see them in a diagram. Out of all elapsed times, you can quickly find the times spent for each section and the section that took the longest.
- If you select each section in the diagram, the corresponding table list appears where the step is located.



- The area where the blue circle (●) is located, is the moment when the active stack has been collected. If you select the blue circle, the table list appears where the **Active Stack** button is located. If you click **Active Stack**, you can check the step performed during the section.

- ⓘ In the transaction list, you can see them from the items marked with the **A** icon.
 - For more information about active stacks, see [the following](#).

- Select column:** You can add or hide the memory accumulation and CPU accumulation data as columns in the table list. The columns are as follows:
 - No:** Step occurrence sequence

- **Time:** Start time of each step
- **Gap:** The waited time between the start time of the previous step and the current step may have a difference, while there may be a gap from the elapsed time if a delay happens due to external factors.
- **Elapsed:** Total elapsed time from the start to the end of each method
- **Contents:** Execution details of the step
-  **TXT:** You can download basic transaction data and execution data for each section in a text file.
-  **SQL:** The basic transaction information and SQL execution data can be downloaded as a text file.
 - **Download with substitute value:** It downloads the SQL statistics data after replacing the bind variable value with its original one. If a security key (`paramkey`) is set, the security key input window appears. You must enter the security key for downloading. For more information about the agent configuration related to the security key, see [the following](#).
 - **Download without substitute value:** It downloads SQL statistics data without replacing the bind variable value.
- : You can see only the table list, with hiding the transaction summary and diagrams. If you select , the hidden information reappears. This feature is useful when you have a long list of tables.
- If you select the SQL step, the **SQL** window appears to display parameters. For more information, see [the following](#).

Record summary

To see the basic information for transactions, select the **Record summary** tab. You can see the basic information of the transaction, agent on which the transaction was performed, memory allocation usage, and client information.

Record summary				Table view	Tree view	Methods	SQLs	HTTP calls	Transaction log
Transaction				/account/save/division/daejun					
Original URL									
Project code		5490		Status		200			
Error level		Warning		Error class					
Error message		Internal RuntimeException							
Elapsed time		6,638ms							
Start time		24/09/24 15:49:52.317		End time		24/09/24 15:49:58.955			
User agent		Mozilla/5.0 (X11; U; Linux i686; en-US; rv:1.3) Gecko/20030320							
Transaction ID		-8541160086278366865							
Agent name (oname)		demo-8101		Agent ID (oid)		-877561626			
Agent group name		demo-okind-1		Agent group ID		-628198688			
Agent server name		node-1		Agent server ID		334634079			
HTTP method		GET		SQL time		918ms			
HTTP call time		4,305ms		SQL count		8			
HTTP call count		4		SQL patch time		16ms			
DB CONN. time		249ms		SQL fetch count		1,065			
CPU usage time		0ms		Memory allocation		623,136byte			
Client IP		152.4.69.63		Operating system		Linux			
Domain		255.255.255.196		Country/Region		US			
City		Chapel Hill		Client type		Other			
Client name		Other		WClientID		-1744550593			
methodCount		0		methodTime		0			

Classification	Properties	Description
Transaction	Transaction	API or URL call executed by the application, and the path of the transaction. It converts to a specific format using regular expressions.
	Original URL	It is the URL path that was actually called. A concrete request path that does not include variables. If there is an original URL, the original URL appears. If there is no original URL, it is not displayed.
	Project code	Identification code of the project registered in the WhaTap monitoring service.

Classification	Properties	Description
	Status	HTTP response status code for the transaction.
	Error level	Level of the error that occurred in the transaction. It is displayed as Warning or Critical.
	Error class	Class of the error that occurred in the transaction.
	Error message	Message of the error that occurred in the transaction.
	Elapsed time	Transaction execution time.
	Start time	Transaction start time.
	End time	Transaction end time.
	User agent	Browser used to extract client-related data.
	Referer	Page address or incoming path used by the browser of the client.
	Transaction ID	It is a unique ID of the transaction.
	Multi transaction ID	It is a unique ID of the multi-transaction. It appears when executed in parallel with transactions of other applications.
Agent	Agent name (oname)	Agent name
	Agent ID (oid)	It is a unique ID of the agent.
	Agent group name	Agent group name set with the <code>okind</code> option.
	Agent group	It is a unique ID of the agent group.

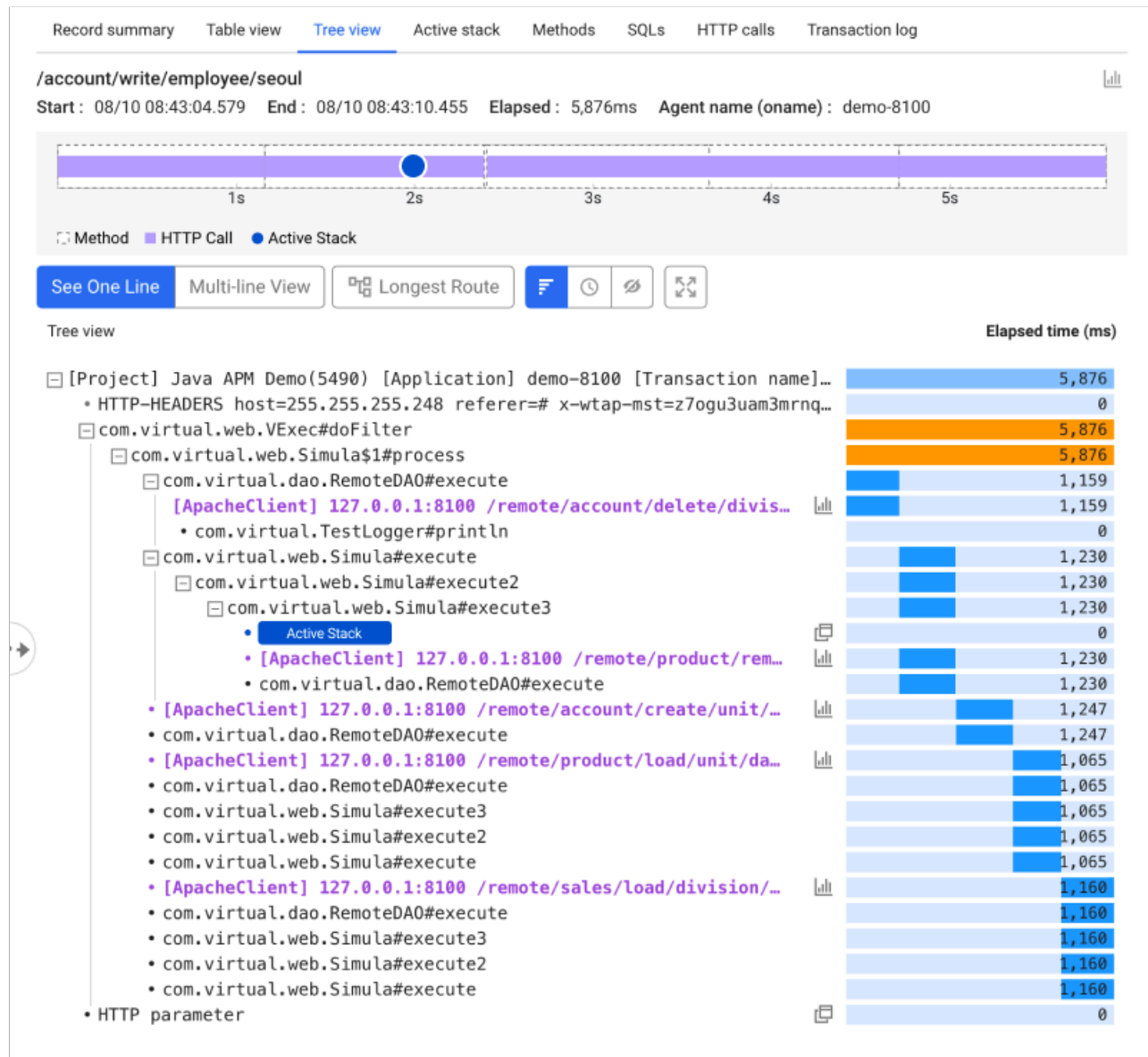
Classification	Properties	Description
	ID	
	Agent server name	Agent server name set with the <code>ondoe</code> option.
	Agent server ID	It is a unique ID of the agent server.
Step	HTTP method	HTTP method. (GET, POST, PUT, HEAD, etc.)
	HTTP call time	Outbound HTTP call time.
	HTTP call count	Number of outbound HTTP calls.
	DB CONN. time	Time taken to connect to the database.
	SQL time	SQL execution time.
	SQL count	SQL execution count.
	SQL patch time	Time taken to search for the record. Nesting may occur or other logic may be included.
	SQL fetch count	Number of the records retrieved from SQL.
Resource	CPU usage time	CPU time used for processing transactions.
	Memory allocation	Amount of memory used by the transaction.
Containers	Pod name	It is the name of the Kubernetes Pod that processed the transaction.

Classification	Properties	Description
	Container Id	It is a unique identifier for a specific container running within a Pod.
Client	Client IP	Client IP address.
	OS	OS environment in which the browser runs.
	Domain	Internet address assigned to the IP address that the client connected to.
	Country/ Region	Client's country.
	City	City in the client's country.
	Client type	Browser type used by the client.
	Client name	Device name used by the client.
	WClientID	This is a unique ID of the client.
Method	methodCount	Number of methods called by transactions.
	methodTime	Time taken for method execution.

- The collected data may differ depending on the application type, settings, and step type. **Container** entries appear only when the application is running in the container environment.
- Error related items are displayed when an error occurs from the transaction.
- Some transaction properties provide statistical features. If you select the  button, a window appears where you can see the status of transactions occurred during the query time through a time series chart. If you select a bar graph in the chart, you can go to the **Analysis > Transaction Search** menu to view details.
- WhaTap basically stores the client-related information. For more information about the agent settings for user data collection, see [the following](#).

Tree view

To see the transaction execution steps in a tree format, select the **Tree view** tab. You can see the details of each transaction and its trace details, trace start time, step time, and call relationship. If you select each section of the diagram, the tree view of the step appears.



- **Single-line View:** You can arrange the tree format at intervals by displaying the texts displayed in the execution data for each section in a single line.

- **Multi-line View:** All the texts displayed in the execution data for each section, appear by wrapping words.
- **Longest Path:** The longest route can appear.
-  **Show Time Bar:** The elapsed times are displayed in a bar chart.
-  **Show Time:** The timestamps, gaps, and elapsed times for each segment are displayed in text.
 - 8 seconds or more: **Excessive delay** state is distinguished in **red**.
 - Between 3 and 8 seconds: **Delay** state is distinguished in **orange**.
 - Less than 3 seconds: **Normal** state is distinguished in **blue**.
-  **Hide Time:** The time is hidden.
- : You can see only the tree view that hides transaction summary and diagrams. If you select , the hidden information reappears. This feature is useful when the tree view list is long.
- : A window appears where you can view SQL variables and HTTP queries. For more information, see [the following](#).

 In case of start and step times, the time differences caused by the transaction call environment are corrected on the screen through traces and mappings in the parent transactions. Accordingly, there may be differences from the actual time data.

Active Stack

Record summary
Table view
Tree view
Active stack
Methods
SQLs
HTTP calls
Transaction log

/account/load/division/daegu

Stack

Active Stack analysis
Beta

Start : 04/06 14:16:32.419
End : 04/06 14:17:33.709
Elapsed : 61,290ms
Agent name (oname) : demo-8100
Client IP : 167.109.194.221

Active Stack (6)

No	Time
30	14:16:37.807
70	14:16:48.223
80	14:16:58.504
81	14:17:08.542
82	14:17:18.547
108	14:17:28.575

```

java.base@17.0.12/sun.nio.ch.SocketDispatcher.read0(Native Method)
java.base@17.0.12/sun.nio.ch.SocketDispatcher.read(SocketDispatcher.java:47)
java.base@17.0.12/sun.nio.ch.NioSocketImpl.tryRead(NioSocketImpl.java:266)
java.base@17.0.12/sun.nio.ch.NioSocketImpl.implRead(NioSocketImpl.java:317)
java.base@17.0.12/sun.nio.ch.NioSocketImpl.read(NioSocketImpl.java:355)
java.base@17.0.12/sun.nio.ch.NioSocketImpl$1.read(NioSocketImpl.java:808)
java.base@17.0.12/java.net.Socket$SocketInputStream.read(Socket.java:966)
app//org.apache.http.impl.io.SessionInputBufferImpl.streamRead(SessionInputBu
fferImpl.java:139)
app//org.apache.http.impl.io.SessionInputBufferImpl.fillBuffer(SessionInputBu
fferImpl.java:155)
app//org.apache.http.impl.io.SessionInputBufferImpl.readLine(SessionInputBuff
erImpl.java:284)

```

Select the **Active stack** tab to view the list of active stacks collected from the transaction.

- Select a collection point (No, Time) from the **Active Stack** list on the left to display the stack information for that point on the right.
- **Stack**: You can download the active stack details as a TXT file.

- ! • You can check the active stack from items marked with the icon in the transaction list.
- For more information about active stacks, see [the following](#).

AI Active Stack Analysis

Beta

Click the **Active Stack Analysis** button to automatically analyze collected active stacks with AI. It identifies performance issues based on the stack dumps of in-progress transactions and suggests improvements.

The analysis results consist of the following 4 sections:

- **Summary:** Summarizes the number of analyzed stacks and the overall execution flow.
- **Common Patterns:** Displays repeatedly observed execution patterns, including pattern name, occurrence count, and description.
- **Issues Found:** Displays identified performance issues with severity levels (**High**, **Medium**, **Low**) along with the stack information used for the assessment.

Severity	Criteria
High	Deadlock, complete blocking, same blocking repeated 4+ times
Medium	I/O wait, 2-3 lock contentions, slow external calls
Low	Single-occurrence wait, minor optimization opportunities

- **Recommendations:** Suggests specific improvement actions by priority.

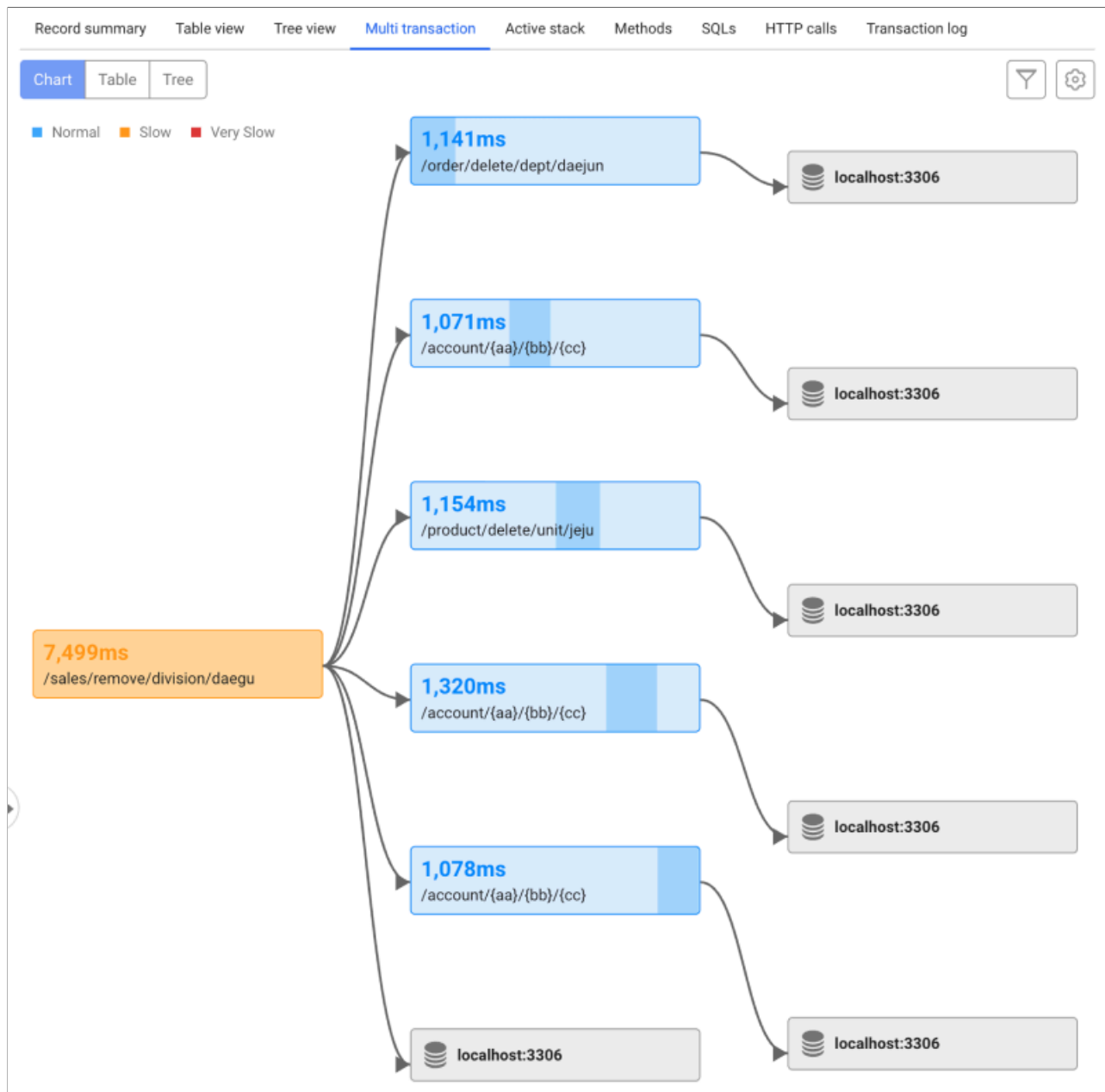
Each analysis item displays the collected stack number (`No.N`). Click the stack number to view the original stack.

- ⓘ • The analysis results are generated by AI and may differ from actual conditions. Use them as reference material.
- **Member** role or above is required.

Multi-transaction

Multi-transaction indicates the transaction involving other agents or projects. In the **Multi transaction** tab, you can see the call relationships between applications registered in the WhaTap monitoring service.

- ✓ To trace multi-transactions, set the `mtrace_enabled` option to `true` in **Management > Agent CONF.** For more information about the agent configuration, see [the following](#).



- **Chart:** Provides the call relationships for each transaction in a flowchart. Select a transaction node to see the trace analysis for the transaction node. In **Chart** mode, you can use the mouse to go to a desired position or zoom in or out by scrolling.
 - **Chart view settings:** You can display or hide the elements on the chart.
- **Table:** In the form of table, you can check the data for each transaction included in the multi-transaction. You

can select the  column selection icon to edit the table header columns. You can see the trace analysis data by selecting each transaction item.

- **Tree:** You can see the call relationships between transactions in a tree format. The related additional functions are the same as those of the **Tree view** tab.
-  **Project selection:** You can select or deselect projects to be displayed on the chart.

- You can see them in the transaction list marked with the  icon.
- For more information about the multi-transaction, see [the following](#).

Methods

Record summary Table view Tree view Active stack Methods SQLs HTTP calls Transaction log							
/account/read/unit/jeju							  Method
No	Class	Method	Parameter/Return	Count	Sum (ms)	Max (ms)	
1	com.virtual.dao.Remot...	execute	()V	27	39,063	2,776	
2	com.virtual.dao.PITest	exec	(Ljava/sql/PreparedSta...	3	0	0	
3	com.virtual.dao.InsertD...	execute2	(Ljava/lang/String;)V	2	4	3	
4	com.virtual.dao.Update...	execute2	(Ljava/lang/String;)V	2	18	14	
5	com.virtual.dao.Delete...	execute	()V	2	3	2	
6	com.virtual.dao.Select...	execute2	(Ljava/lang/String;)V	1	5	5	
7	com.virtual.dao.Update...	execute	()V	1	4	4	
8	com.virtual.dao.Select...	execute2	()V	1	7	7	
9	com.virtual.dao.Select...	execute	()V	1	9	9	
10	com.virtual.dao.InsertD...	execute2	()V	1	3	3	

To see only the method data, select the **Methods** tab. It displays the method name and step time for which tracing has been set on the agent. When unnecessary logics are repeatedly executed, it can be used as analysis data to improve the method logic by finding the case where the execution takes longer than the low count.

- : You can see the **Transaction statistics** information. If a graph on the chart is selected, the **Analysis > Transaction Search** menu appears. You can see the list of transactions for the selected time zone.

-  **Method:** You can download the method-related details as a TXT file.

 For more information about the agent configuration options on methods, see [the following](#). Method tracing support may differ depending on the product in use.

SQLs

Record summary	Table view	Tree view	Active stack	Methods	SQLs	HTTP calls	Transaction log
/account/read/unit/jeju							 SQL
No	Database	SQL	Count	Sum (ms)	Max (ms)		
1	jdbc:mysql://localhost:...	DELETE FROM Custom...	2	0	0		
2	jdbc:mysql://localhost:...	SELECT distance, lat, lo...	1	0	0		
3	jdbc:mysql://localhost:...	SELECT distance, lat, lo...	1	0	0		
4	jdbc:mysql://localhost:...	UPDATE emp set e.ena...	1	0	0		
5	jdbc:mysql://localhost:...	update table set x=# w...	1	0	0		
6	jdbc:mysql://localhost:...	SELECT p.Name AS Pr...	1	0	0		
7	jdbc:mysql://localhost:...	SELECT customer_info...	1	0	0		
8	jdbc:mysql://localhost:...	INSERT INTO EMP VAL...	1	1	1		

To check the SQL statement information, select the **SQLs** tab. In case of unnecessarily repetitive execution, it can be used as analytical data to improve query performance by finding the case where the execution time takes longer compared to the low count.

- : You can see the **Transaction statistics** information. If a graph on the chart is selected, the **Analysis > Transaction Search** menu appears. You can see the list of transactions for the selected time zone.
-  **SQL:** You can download the SQL-related details as a TXT file.

HTTP calls

Record summary	Table view	Tree view	Active stack	Methods	SQLs	HTTP calls	Transaction log
----------------	------------	-----------	--------------	---------	------	------------	-----------------

/account/read/unit/jeju							 HTTP
No	Remote server	URL	Count	Sum (ms)	Max (ms)		
1	127.0.0.1:8105	/remote/account/save...	2	4,116	2,776		
2	127.0.0.1:8105	/remote/order/save/di...	1	238	238		
3	127.0.0.1:8105	/remote/sales/pickup/...	1	922	922		
4	127.0.0.1:8105	/remote/sales/remove...	1	1,980	1,980		
5	127.0.0.1:8105	/remote/order/save/de...	1	2,639	2,639		
6	127.0.0.1:8105	/remote/edu/kill/unit/p...	1	1,519	1,519		
7	127.0.0.1:8105	/remote/order/read/de...	1	1,467	1,467		
8	127.0.0.1:8105	/remote/order/delete/...	1	485	485		
9	127.0.0.1:8105	/remote/sales/kill/emp...	1	2,210	2,210		

To see the count, time sum, average time, and such for HTTP calls, select the **HTTP calls** tab. If unnecessary external calls are repeatedly executed, it can be used as analytical information to determine whether the transaction delays are external or internal by finding the cases where the execution time takes longer compared to the low count.

- : You can see the **Transaction statistics** information. If a graph on the chart is selected, the **Analysis > Transaction Search** menu appears. You can see the list of transactions for the selected time zone.
-  **HTTP**: You can download the HTTP call-related details as a TXT file.

Transaction log

To see the logs of the transaction, select the **Transaction log** tab.

Transaction information				
Record summary	Table view	Tree view	Multi transaction	Methods
SQLs	HTTP calls	Transaction log		

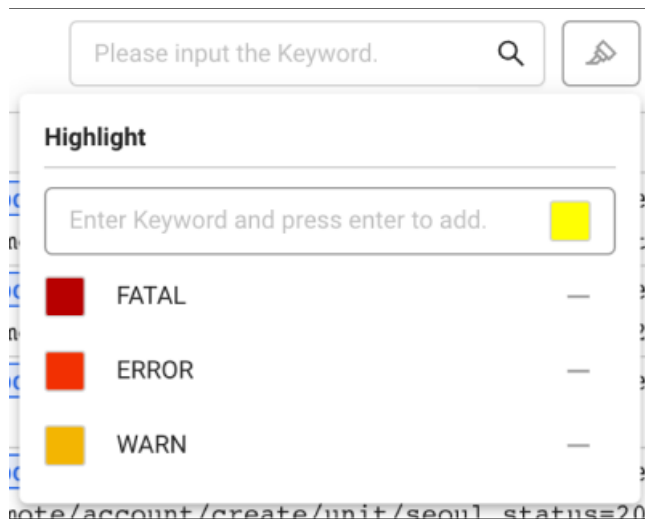
/sales/save/division/daejun				
Log search > Please input the Keyword.    				
▶	oname	Timestamp	Log	
▶	java-demo2	2025-04-16 09:17:12.571	@txid 2737043795003671073 pcode 8 onodeName node-1 oid -1737750367 okind 867318026 oname java-demo2 agentime 1744762632114 select distinct pp.lastname, pp.firstname	
▶	java-demo2	2025-04-16 09:17:12.773	@txid 2737043795003671073 pcode 8 onodeName node-1 oid -1737750367 okind 867318026 oname java-demo2 agentime 1744762632155 select	
▶	java-demo2	2025-04-16 09:17:12.773	@txid 2737043795003671073 pcode 8 onodeName node-1 oid -1737750367 okind 867318026 oname java-demo2 agentime 1744762632193 select productid, avg(orderqty) as averagequantity, sum(linetotal) as total	

- : You can see the **Transaction statistics** information. If a graph on the chart is selected, the **Analysis > Transaction Search** menu appears. You can see the list of transactions for the selected time zone.
- **Log Search**: You can go to Log Search to easily find the desired log data.
- **Keyword search**: Enter the desired text to search in the keyword search field, and then press Enter or select the  button. It highlights the keywords that match the entered text.
-  **Keyword highlight**: If you set the keyword and color, the texts that match the keyword are automatically highlighted in the log list. For more information, see [the following](#).
-  **Column settings**: You can add columns or change the order of columns displayed in the log list table. For more information, see [the following](#).
-  **Log view detail setting**: You can configure the items to be displayed in the log list. For more information, see [the following](#).

-  • To enable the **Transaction log** tab, apply the agent setting options related to the logs. For more information about the log settings, see [the following](#).
- The **Transaction log** tab can be accessed by only the members with the **View log** role. For more information about the member roles, see [the following](#).

Setting the keyword highlight

1. To add keywords to highlight, select .



2. Enter a desired keyword.
3. Select the color icon and then select a desired color.
4. Press Enter. The added keywords are added in the list.

Deleting the keyword highlight

To delete the items unused from the highlight list, select —.

Displaying or hiding the table columns

1. Select  on the upper right of the table.
2. If the **Column settings** window appears, select or unselect the desired item in the list on the left.
You can also hide columns by selecting the  button in the list on the right.
3. After all settings are finished, select **Confirm**. The set content is applied to the table.

Reordering the table columns

1. Select  on the upper right of the table.
2. When the **Column settings** window appears, change the order by dragging the desired items from the list on the right.

3. After all settings are finished, select **Confirm**. The set content is applied to the table.

Setting to display the table content

1. Select  on the upper right of the table.
2. When the **Log view detail setting** window appears, set the desired options.
 - Select **content** or **Tag** to determine whether or not to display the log content.
 - **Tag management**: Tags are displayed in the log in the order of addition. The order of tags can be changed by dragging. Disabled tags do not appear in the logs.
3. After all settings are finished, click **X**. The set content is applied to the table.

 For more information about **Log view detail setting**, see [the following](#).

Additional options

Viewing HTTP parameters

You can view the HTTP parameters of the transaction in the **Table view** tab.

1. Scroll down the page to the final step of the transaction.
2. Select the  **HTTP parameters** item.
3. If the **HTTP-PARAMETERS** window appears, select **Password**.
4. Enter the specified Param Key. You can see the hidden parameters.

 • For the agent settings for HTTP parameters, see [the following](#).

- **Password**: You can see the decrypted parameter value. The password is a 6-digit string in the `WHATAP_HOME /paramkey.txt` file. You can change it to another string. The key in `paramkey.txt` is required to view the SQL variables and HTTP queries, and stop the threads.

Viewing SQL parameters

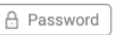
Select the SQL step in the **Table view** tab or select  in the **Tree view** tab. The **SQL** window appears to display parameters.

SQL

Connection URL jdbc:mysql://localhost:3306,localhost:3310/fake@BasicDataSource

CPU accumulation 3ms

Memory accumulation 329,752byte

Query (Hash: -2057375474)    

SID 107

```
insert into
dept
values(
#, '#', '#')
```

Substitution variables

The parameter does not exist or decryption has failed.
Please check your password at [paramkey.txt] in the agent installation path to decrypt parameters.

- **Password:** You can see the decrypted parameter value. The password is a 6-digit string in the `WHATAP_HOME /paramkey.txt` file. You can change it to another string.

 The key in `paramkey.txt` is required to view the SQL variables and HTTP queries, and stop the threads.

- **SQL format:** You can indent and format your SQL statements for better readability.
- : A SQL statement can be copied to the clipboard.
- **Statistics:** Go to **Statistics > SQL**.

 To search SQL variables and HTTP queries, add the following options to the agent settings.

- For agent settings related to recording SQL parameters, see [the following](#).
- For agent settings related to recording the HTTP parameters, see [the following](#).

whatap.conf



SQL parameter lookup option: If the option is applied, SQL parameters are collected after being encrypted.

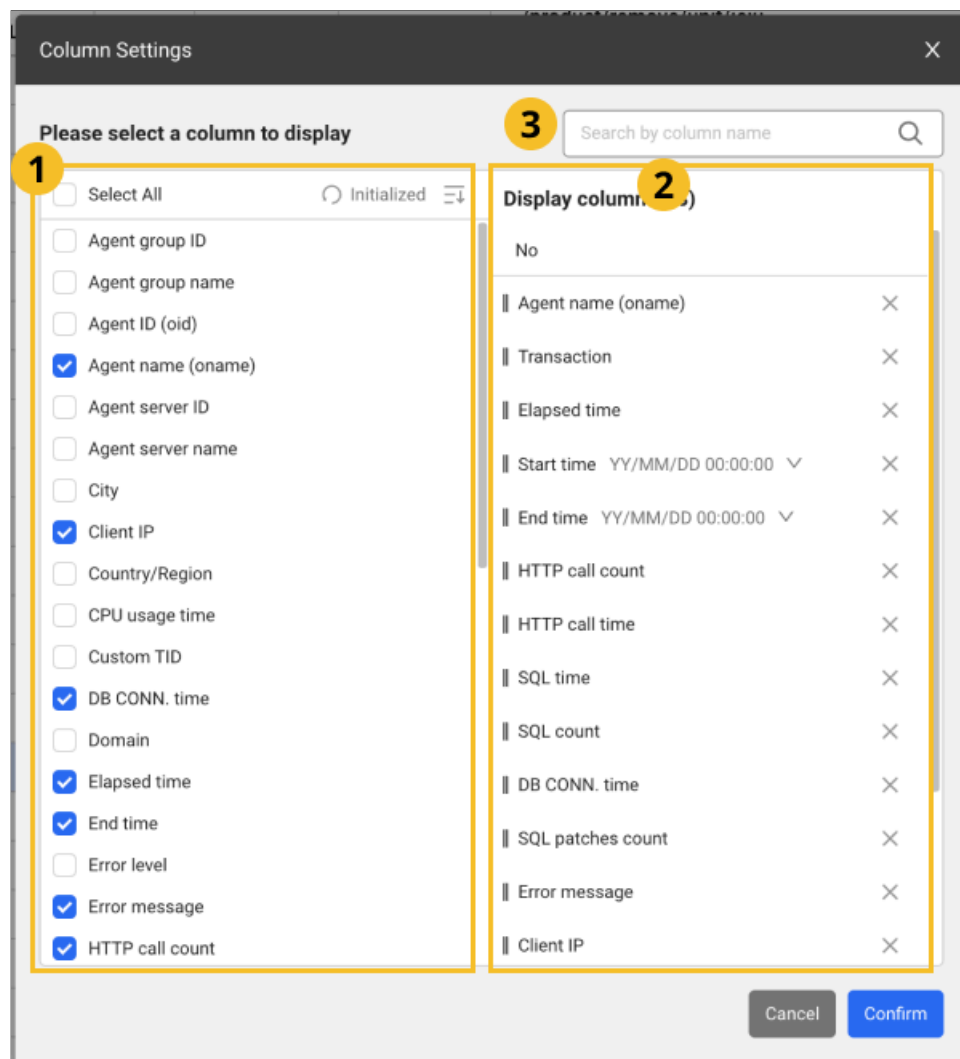
`profile_sql_param_enabled=true`

// HTTP parameter lookup option: If the option is applied, HTTP query parameters are collected after being encrypted.

`profile_http_parameter_enabled=true`

Configuring the table columns

In the transaction list, you can hide the table header columns or add any of them. You can also change the column order. Select  **Column Settings**.



- After configuration, select **Confirm** to apply the settings in the table.
- In the (3) search bar, enter text to search the desired columns. Only the columns that meet the entered text are displayed.

Adding columns

From the (1) list, select the items to add as table header columns. To select all items, select **Select All**.

Deleting columns

From the ① list, unselect the columns to delete. Alternatively, select ✕ on the right of the item to delete from the ② list.

Changing the column order

Drag an item to reposition from the ② list, and then move it to the desired position.

Initializing the configuration

To cancel all changes and reset them, select ↺ **Initialized**.

Downloading the viewed data

To download the data output in the table in .txt file format, select ⬇ [TXT](#).

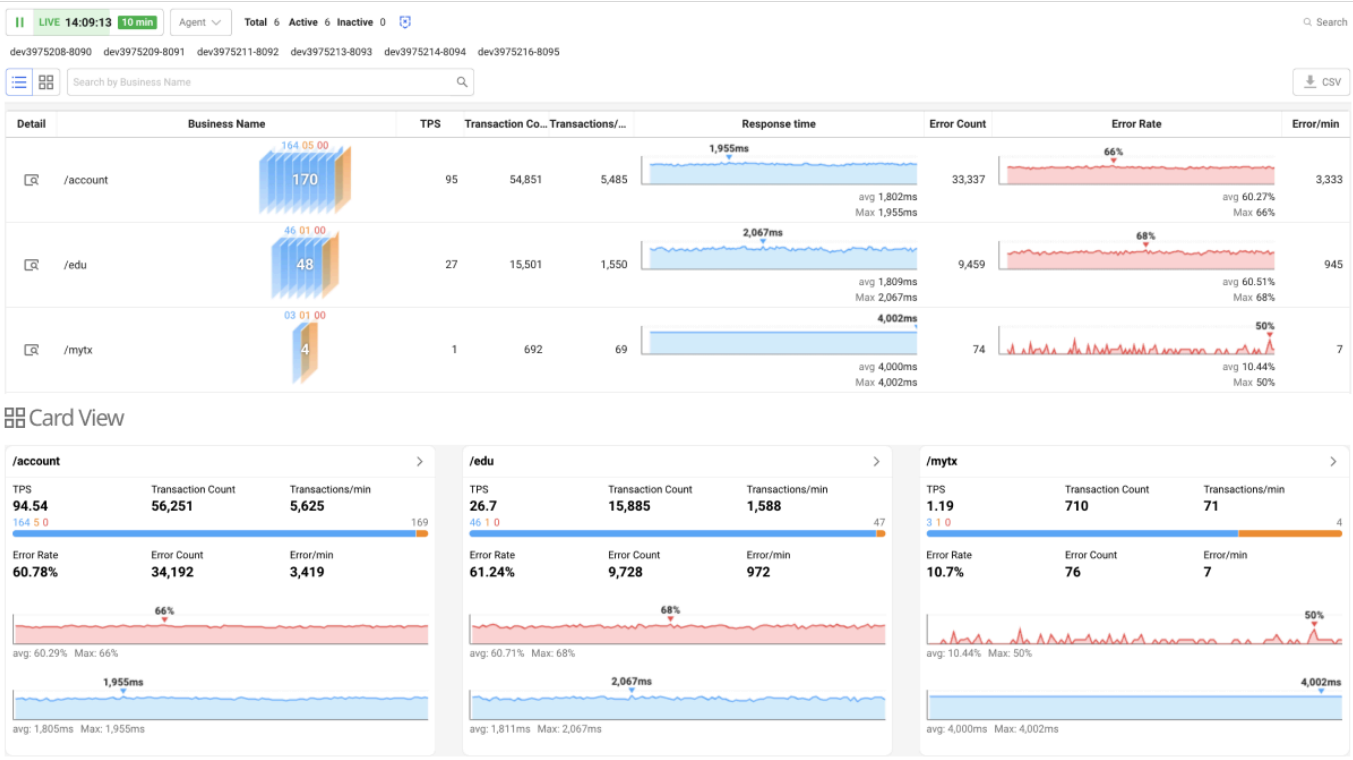
Business Dashboard

Home > Select Project > Dashboard > Business Dashboard

The **Business Dashboard** allows you to monitor application performance by business unit (App Context). You can analyze both real-time and historical performance data for each business context, defined by URL patterns or paths.

By viewing key metrics like TPS, response time, and error rate per business context, you can quickly identify performance issues in specific operations or services.

Layout Overview



Time Range

Use the time selector at the top left to set the desired time range for data retrieval.

To the right of the time selector, you can view the status of agents connected to the project to immediately check whether the monitored servers are running.

- **Live Mode:** Auto-refreshes every 5 seconds, displaying data from the last 10 minutes.
- **Historical Mode:** Allows you to query data up to the past month.
- **Data aggregation unit:**
 - Under 3 hours: Raw data
 - 3 hours to 3 days: 5-minute statistics
 - Over 3 days: 1-hour statistics

Agent Selection

Below the time selector, you can see the list of agents under the selected project.

Click an agent to highlight it with a blue tag and filter the dashboard to show only its data.

! For more information on agent selection, see the [following](#).

View Mode

You can toggle between two view modes based on your preference by clicking the icons on the top left:

-  **Table View**
Displays all business items in a table format, making it easy to compare and sort data.
Suitable for quickly understanding the overall situation at a glance.
-  **Card View**
Presents each business item as a card.
You can choose from 1 to 4 columns, making it flexible depending on your monitor size or working environment.
Ideal for dashboard-style viewing or focusing on specific business performance.

Sort Options

You can select a metric to sort data by task in both the table view and the card view.

Search by Business Name

Use the search field to quickly locate a specific business by name.

Task Alias Settings

Click the button to open a drawer where you can assign aliases to task names displayed as URL prefixes.

- Enter the task name (URL prefix) to apply the alias to in the left column
- Enter the alias to apply to the task name in the right column
- Use the **Add Item** button to add an entry, and the **Delete** button to remove an entry
- Click the **Apply** button at the bottom to apply the changes

CSV Download

Click the  icon next to the search bar (top-right) to download performance data for all business items on the screen as a CSV file.

Business Performance Metrics

For each business unit, the following key performance indicators are available.

These metrics include both real-time data and aggregated stats over the selected time range.

Charts are available for **active transactions**, **response time**, and **error rate**.

- **Active Transactions:** Shows the number of currently processing transactions via a speedometer for intuitive real-time load insight.
- **TPS (Transactions Per Second):** Measures system throughput.
- **Transaction Count:** Total transactions collected during the selected period.
- **Transactions/min:** Average number of transactions per minute, helpful for identifying traffic patterns.

- **Response Time:** Includes average and max response times; trends are shown in charts.
- **Error Count:** Total errors during the selected period.
- **Error Rate (%):** Percentage of failed transactions.
- **Errors/min:** Average number of errors per minute.

Business Detail Analysis

Top Transaction Stats

Click the detail icon in either the table or card view to open a drawer on the right showing the top 30 transactions for the selected business context.

✓ How to open detail view:

- Table View: Click  in the left-most column.
- Card View: Click the arrow (>) at the top right of the card.

Steps:

1. Click the detail icon in table or card view.
2. A drawer will open on the right displaying top 30 transactions for that business.
3. Use the sort dropdown (default: by count).
4. Available transaction data includes:
 - Transaction name
 - Detailed analysis ()
 - Count
 - Errors
 - Avg time (ms)
 - Max time (ms)
 - Avg CPU time

- Avg memory allocation
 - SQL count
 - Avg SQL time (ms)
 - SQL fetch count
 - Avg SQL fetch count
 - HTTP call count
 - Avg HTTP call time (ms)
5. Use the search bar at the top of the drawer to filter specific transactions.
 6. Click the detailed analysis icon  for each transaction to view more information.
 7. If a transaction event based on the URL occurs within the selected time range, the configured level is displayed.
If the level is  (Warning) or  (Critical), you can click the icon in the Health column to view the event history.

Event History

If a transaction event based on **context** is triggered within the selected time range, the defined level is displayed. Click the icon to view the event history.

- You can check the event name, occurrence time, and message.
- Use the search function to find specific events.

Agent Configuration

To use the Business Dashboard, agent configuration is required.

Supported Agent Versions

- .NET: 2.4.3 or higher

Required Setting

```
# Enable business context monitoring  
app_context_enabled=true
```

Optional Settings

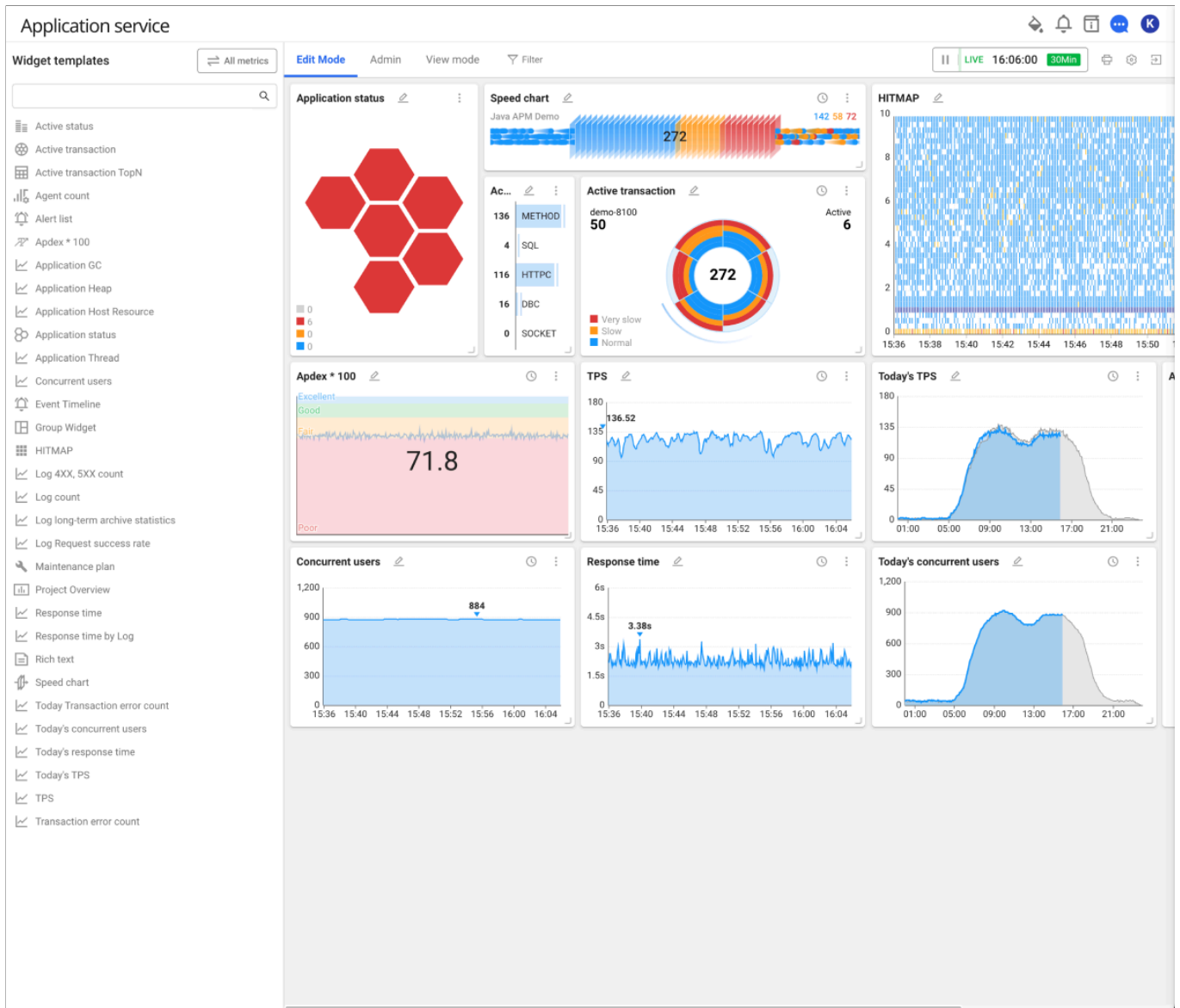
```
# Parser type (default/prefix/match)  
app_context_parser=default  
  
# Reset parser's internal cache/settings  
whatap.app_context_parser_reset=0  
  
# Depth of path segment to extract  
whatap.app_context_path_depth=1  
  
# Mapping of names to monitored paths (comma-separated)  
whatap.app_context_path_set=name1@url1,name2@url2,url3,name4@url4
```

- ✓ • If no data appears in the dashboard, verify the agent settings.
- If the agent version is too old, upgrade to the latest supported version.
- Business context can be defined automatically or manually based on URL patterns.

Flex Board

Flex Board is a custom integrated dashboard. You can create a real-time dashboard with the project data such as applications, servers, databases, and containers.

You can quickly complete the initial setup with preconfigured templates and build dashboards in your preferred format. By adding data widgets or modifying properties, you can display information in the form you need, and with filtering functions, you can narrow down monitoring targets. When you set a time range, you can check data from a specific point in time, and by using auxiliary charts, you can analyze data in various ways. Dashboards can be added to favorites for easy access, and personalized dashboards can be copied to other accounts for reuse.



The usage scope of the Flex board differs depending on the following entry:

Home > Integrated Flex Board

- When creating a widget, all projects that can be viewed are provided as options.
- The dashboard is saved in your account and can be shared with other users with the "To copy" feature.
- Individual account dashboards are not affected by the role, but the shared dashboards are read-only and cannot be edited.

Home > Select Project > Dashboard > Flex Board

- When creating a widget, the related project data is automatically entered.
- The created Flex board is automatically shared with other project members.
- The users with the project **Edit** role or **Project flexboard update** role, and **site admin** role can modify the board.

✓ Users with edit permissions for the Flex Board can use the following features:

- Export and import dashboards as JSON files
- Check data requests and responses within the dashboard
- View and edit widget configuration options in JSON format

ⓘ In the **Flex Board** menu within the project, only the users with the dashboard editing role can access **Edit Mode**, **Admin Mode**, and **Filter**.

- Accessible member permissions
 - Project **Edit** role
 - **Project flexboard update** role
 - **Site Admin** role
- For more information about the **View mode** and **Filter**, see [the following](#).
- For more information about the member roles, see [the following](#).

Using Flex Board

- ✓ You can build dashboards using various widget templates, including metrics widgets.
For details on the features and usage of each template, see the [Widget template](#) document.

Apply a preset template

Use a preset template to speed up the initial setup, then modify it as needed.

1. Select the **Flex Board** menu.
2. From the **Template** list on the left, select the template you want.
3. When the **Flex board management** window appears, enter a name in **Rename**.
 - In **Layout**, select a widget and drag it to the position you want.
4. Click the **Save** button. A Flex board is created based on the selected template.
 - You can check the created board in the board list of **Flex Board**.

Create a Flex board

You can create a Flex board and place widgets to build your own dashboard.

1. In **Flex Board**, click the **Create Dashboard** button at the top right.
2. When the **Create Dashboard** window appears, enter the dashboard **Name** in the input box.
3. Select a widget placement method, then click the **Create Dashboard** button.
 - **Fixed layout flexboard**: free widget placement with pixel basis
 - **Responsive flexboard**: responsive grid layout based on browser size (configure the grid, then click the **Create Dashboard** button)
4. In the **Widget templates** selection screen, choose the widgets to place on the dashboard.

- To add metrics widgets, click the **All Metrics** button on the right of **Widget templates**.

- ! • **Widget templates:** choose from a predefined widget list that summarizes key indicators commonly used in monitoring.
- **All metrics:** create widgets based on all metrics data collected in your project. For details about metrics widgets, see [the following document](#).

5. Move the placed widgets or adjust their size.
 - When a crosshair cursor appears at the top of a widget, click and drag the widget to move it.
 - When an arrow cursor appears at the bottom right of a widget, click and drag to resize it.
6. After you finish placing widgets, select **View mode** to review the layout. To edit the layout again, select **Edit Mode** and adjust widget placement.
7. When all steps are complete, click the  (**Go to list**) icon at the top right.
 - You can check the created board in **Flex Board** under **Dashboard list**. Select the created board to view the new Flex board.

- ! We plan to add dashboard templates or widgets based on customer feedback. If you need a specific dashboard template or widget, contact us at support@whatap.io.

Edit a Flex board

! Flex board edit permissions

- **Home > Integrated Flex Board:** this is a personal account dashboard, so permissions do not apply; however, dashboards shared as read only cannot be edited.
- **Home > Select project > Dashboard > Flex Board:** users with project edit permission, project Flex board edit permission, or Site Admin permission can edit.

For details on member permissions, see [the following document](#).

1. In **Flex Board** under **Dashboard list**, click the edit icon . The **Flex board management** window appears on the right.
2. In the **Flex board management** window, configure Name, Project, Layout, widget.json, and option.json.
 - **Rename:** edit the dashboard name.
 - **Project:** select the project from which widgets will fetch data.

 You can configure the **Project** option only in **Home > Integrated Flex Board**. If you entered from **Integrated Flex Board**, you can select the data source project for each widget.

1. Click the **+** button at the top right of a widget, then search and select one or multiple projects.
2. After selecting projects, click the **Apply** button.

- **Layout**
 - Drag widgets to move them.
 - Click and drag the bottom right of a widget to resize it.
 - To delete a widget, click the  icon at the top right of the widget.
- **Widget.json:** import dashboard widget settings in JSON format. Click the  icon to copy the JSON.
- **Option.json:** import dashboard option settings in JSON format. Click the  icon to copy the JSON.

Delete a Flex board

1. In **Flex Board > Dashboard list**, click the  icon for the item to delete.
2. In the confirmation message, click the **Delete** button.

 Dashboard deletion behavior differs for owners and shared users.

- If the dashboard owner deletes a dashboard, it is deleted for all user accounts with whom it was shared.



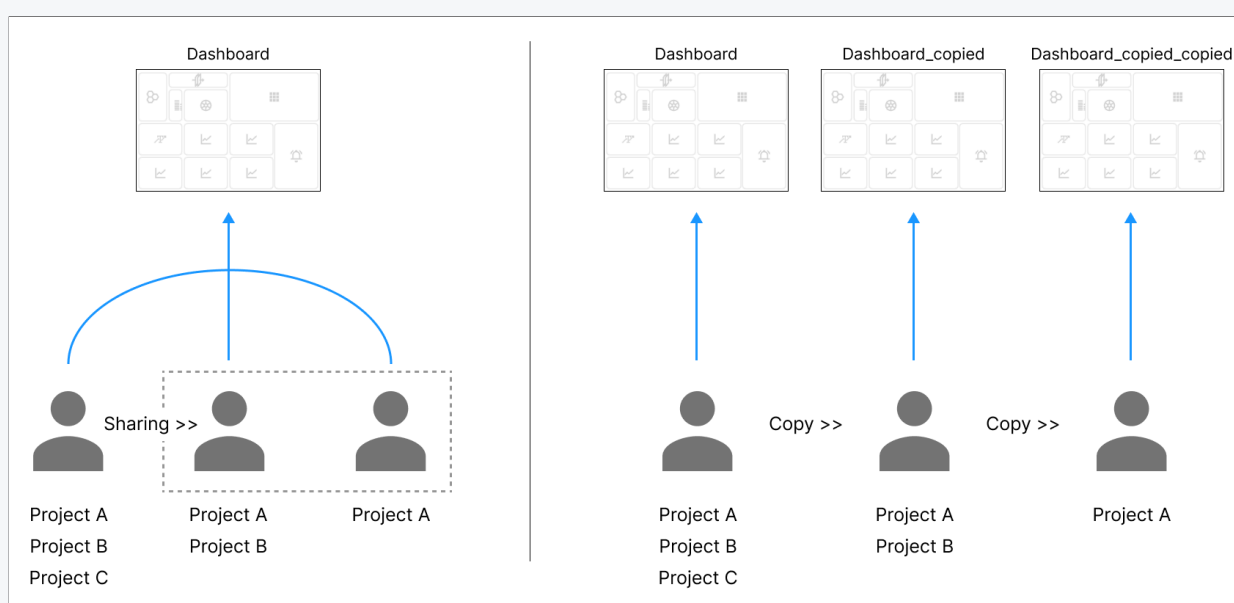
- If a user who received a shared dashboard deletes it, it is deleted only from that user's **Dashboard list**. The original dashboard remains.

Share a Flex board



- The Flex board sharing feature is available only in **Home > Integrated Flex Board**. It is not provided in a project's **Flex board** menu.

! Difference between share and copy



- Share: all members you share with view the same dashboard.
- Copy: if you copy a dashboard to another member or to yourself, you view a separate copied dashboard.
- Dashboards shared or copied as **Read only** cannot be edited. They can be edited only if shared as **Edit mode**.
- Members who receive a dashboard as **Read only** can also **re-share as read only** or **copy** that dashboard.



- You can share a dashboard only with members who belong to at least **one** of the projects included in the dashboard. Check whether the member to share or copy to belongs to the relevant project.

☆ test

K8S-JINS-OKD-TEST, K8S-JINS-TEST-MICROK8S, DB-M...

Updated: 2023/12/22 11:10:24 AM



You can share a Flex board created in **Integrated Flex Board** with other members. When the owner edits a shared dashboard, the changes apply to all members it was shared with.

- In **Integrated Flex Board** under **Dashboard list**, click the icon for the dashboard to share.
- When the **Sharing a dashboard** window appears, select one or multiple members to share with, or enter accounts directly.
 - If you select **Read only**, members cannot edit the shared dashboard.
 - Share targets must belong to at least one of the projects included in the dashboard.
- Click the **Share** button.
 - Shared items display the **Shared** tag. Hover over the **Shared** tag to view information about the members you shared with.
 - Items shared as read only display the **Read only** tag.

When you receive a shared dashboard	When you share a dashboard (dashboard owner)



Dashboard sharing conditions

- The dashboard sharing feature is available only in **Home > Integrated Flex Board**.



- Anyone can share their own dashboard, and you can re-share or copy a dashboard you received.
- Dashboards received as **Read only** cannot be edited; dashboards received as **Edit mode** can be edited.
- If the **owner** deletes a dashboard, it is deleted for all accounts that received it.
- If a **recipient** deletes a dashboard, it is removed only from that user's **Dashboard list** and the original remains.
- For projects in a received dashboard where you do not have **View** permission, you cannot view data.

Copy a Flex board

Users can copy a Flex board and send it to other members.

1. In **Integrated Flex Board** under **Dashboard list**, click the  icon.
2. Choose a copy option.
 - **Copy to me:** copy to your own account.
 - a. An item with the `_copied` suffix is added to **Dashboard list**.
 - **Copy to others:** copy to another member's account.
 - a. Click **+ Account**.
 - b. Select the email of the member to copy to and click the **Copy dashboard** button.
 - c. An item with the `_copied` suffix is added to that member's **Dashboard list**.

Share as a JSON file

You can export Flex board settings to a JSON file to share with other members, or import settings from other members.

Export

1. Go to **Integrated Flex Board** or a project's **Flex board** menu.
2. In **Dashboard list**, click the  button.
3. Choose an export option.
 - **Include Project Information:** include dashboard project information in the JSON file when sharing.
 - **Except Project Information:** share without including dashboard project information in the JSON file.
4. Download the JSON file and send it to the member you want to share with.

Import

1. Go to **Integrated Flex Board** or a project's **Flex board** menu.
2. Click the  **Import** button at the top right.
3. Select the downloaded JSON file.

 Only members with **Edit** permission for the project can use this feature.

Flex board screen modes

Features vary by Flex board screen mode.

Accessible member permissions

Only users with **Edit** permission in a project's **Flex Board** menu can access **Edit Mode**, **Admin**, and **Filter**. For details on member permissions, see [the following document](#).

- **Project Edit** permission
- **Project flexboard update** permission
- **Site Admin** permission

Modes

Available features differ by **Flex Board** screen mode.

- **Edit Mode:** place widgets from the widget template list on the Flex board layout; edit, delete, or reposition widgets.
- **Admin:** manage widget properties in JSON format. Click the  button at the top right of a widget on the layout.
- **View mode:** after finishing layout, sizing, and detailed options, monitor each widget's data in real time like a dashboard.

Common features

- Data filtering
- Real time data time range settings
- Print mode
- Flex board management
- Data merge options

Data filtering

Use data filtering to narrow monitoring targets and build an efficient Flex board.

1. At the top of the screen, click the  **Filter** tab.
2. In the **Filter** window on the right, select filter targets. To select all filter targets, choose **Select all**.
 - **Agent** option: select agent types or an application list, with **Search** available
 - **Metrics** option: select a project or agent type; add **+ And** conditions, or auto select by string with **Contain** or **Exclude**
3. After selecting filter targets, click the **Apply** button.
4. Save frequently used conditions with the **Save filter** button.
 - a. Enter a filter name and select **Save**. **Saved filters** appears at the bottom of the **Filter** window.

Filtering conditions

Filtering conditions are divided into agent type and metrics type.

Agents provide only basic monitoring targets as selectable options, while metrics provide selectable tags for all metrics data collected in the project. The metrics type is useful when you collect data in a non agent form and want to apply filtering. For details on metrics, see [the following document](#).

Type	Agent	Metrics
Selection options	WhaTap project monitoring targets (applications, servers, databases, containers, Kubernetes PODs and NODEs)	All metrics tags including agents
Scope	All widgets	All widgets that use metrics data
Filtering method	Checkboxes	Equal, Contain, Exclude

Set the lookup time

Use the time selector at the top right of **Flex Board** to set data lookup time for widgets.

- : stop real time mode and set a specific lookup time
- : switch back to real time mode

Print

You can save the Flex board screen as a PDF and print it.

1. On the Flex board screen, click the  icon at the top right to switch to print mode.
2. Configure options.
 - **Viewing filter options:** toggle filter options on the screen
 - **Convert to {mode} orientation / Convert to {mode} orientation:** change orientation to horizontal or vertical
3. After finishing, select **PDFDownload**.

4. To exit print mode, click the  **Exit print mode** at the top right.

Flex board management

You can change the Flex board layout; move, resize, or rename widgets; and use other management features. You can also open **Flex board management** by clicking the  icon in **Dashboard > Flex Board** under **Dashboard list**.

1. On the Flex board screen, click the  icon at the top right to open the **Flex board management** window.
 - **Rename:** change the Flex board name
 - **Layout:** move, resize, and delete widgets
 - **Don't Allow Other Users to Modify.:** restrict modifications
 - Members with edit permission can edit, delete, and modify; if you enable the option, it changes to **Don't Allow Other Users to Modify.: On**
 - **Widget.json:** edit and manage widgets on the Flex board in JSON
 - **Option.json:** edit and manage Flex board settings in JSON (project info, Flex board filters, time selection, and other settings)

 The **Widget.json** and **Option.json** features are available only to dashboard administrators.

2. After completing all settings, click the **Save** button.

Add a dashboard to favorites

You can add a Flex board you created to favorites for quick access. In **Dashboard > Flex Board** under **Dashboard list**, click the  button for the dashboard to add. It changes to .

Managing The Widgets

You can customize your dashboard by handling the widgets placed on the Flex board.

- ✓ You can build dashboards using various widget templates, including metrics widgets.
For details on the features and usage of each template, see the [Widget template](#) document.

Adding a widget

You can add any widget to the created Flex board.

1. In **Dashboard list** of **Flex Board**, select a dashboard to add the widget.
 2. On the upper left of the screen, select **Edit Mode**.
 3. Select a desired widget from the **Widget templates** list on the left. To add a metrics widget, select **All metrics** and then click a desired widget.
- If you have entered **Integrated Flex Board** on the Home screen and added a widget, click **Project selection** and then select target projects to collect.
 - If you have more widgets to add, repeat the same procedure.
4. After all steps are finished, select **View mode** to check the layout and then select  (**Go to list**).

Changing the widget attributes

In **Dashboard list** of **Flex Board**, select a board to change the widget properties. It goes to **Edit Mode**.

Changing the widget name

1. On the right of the widget name to change, select .
2. Set the widget values for **Title**, **Font size**, and **Color**, and then select **Save**.

- If the **Apply to the entire widget** toggle button is enabled, the font size and color are applied to other widgets.
- To lock the widget title, select [Configuration icon](#) and then click **Save**.

Time Setting

1. On the upper right of the widget to set the time, select ⌚.
2. Set the time in the **Select a time** window.
 - To apply the set time to the dashboard, check **Use dashboard settings**. The time setting on the dashboard is located on the upper right.
 - To apply a desired time setting, uncheck **Use dashboard settings**. Use < or > to set the desired time.
3. After setting the time, select ✕.

ⓘ Depending on the data type of the widget, the time setting may not be available.

Setting the output data options

By setting the output data options of the chart widget, you can select the desired data.

1. At the top right of the widget, click the ⋮ icon to configure the output data options.
 - You can filter data by selecting types for project, agent, application, etc.
 - You can change the type of the graph displayed on the chart by selecting individual or merged data.
 - Select ⋮ > ⚙️. You can change the option details through the **Chart settings** window. The options that can be set are as follows.
 - **Chart type:** This option allows you to display the current aggregated figures on the chart.
 - **y axis Chart max value:** The chart maximum value on the Y axis can be selected with one of **Auto** and **Fix**.
 - **Set horizontal line:** Select **Add** to display the threshold or range as a horizontal line. You can

apply multiple items added. After adding the horizontal line, select **Apply** to apply it to the chart.

- **Show chart max value:** The maximum value of the graph is displayed on the chart.
 - **Sub-chart:** You can add a sub-chart to the main charts of the widget. Select a type of sub-chart and then select its layout, size, and whether or not to merge data. To apply to other widgets, select **Apply to the entire widget**. Sub-charts are useful to view data in various ways.
2. After setting all options, on the left of the **Chart settings** window, click **×** or click the outside of the **Chart settings** window.

ⓘ Depending on the widget's data type, available options may differ.

Changing the metrics widget data

You can change the data query conditions of the metrics widget.

1. In **Flex Board > Dashboard list**, select the dashboard where you want to change the widget data.
2. In **Edit Mode**, click the **⋮** icon at the top right of the widget you want to modify.
3. Click the **<>** icon to open the data settings edit window.
4. Change the settings referencing the following, and then select **< Apply to the widget**.
 - Metrics options that are created by default when creating a widget appear on the tab.
 - Metrics options are **Category**, **Field**, and **Tag**.
 - The **Category** currently restricts the editing function.
 - In **Field** and **Tag**, multiple items can be selected. The chart data is grouped using the selected tag options.
 - Select **🔍** to query the original data.
 - For more information about **Object Merge** and **Time merge**, see the [Data merge options](#).

Data merge options

The metrics widget placed on the **All metrics** list of the Flex board provides the data merge options. Data merge provides the following methods: **Object Merge** and **Time merge**.

- **Object Merge**

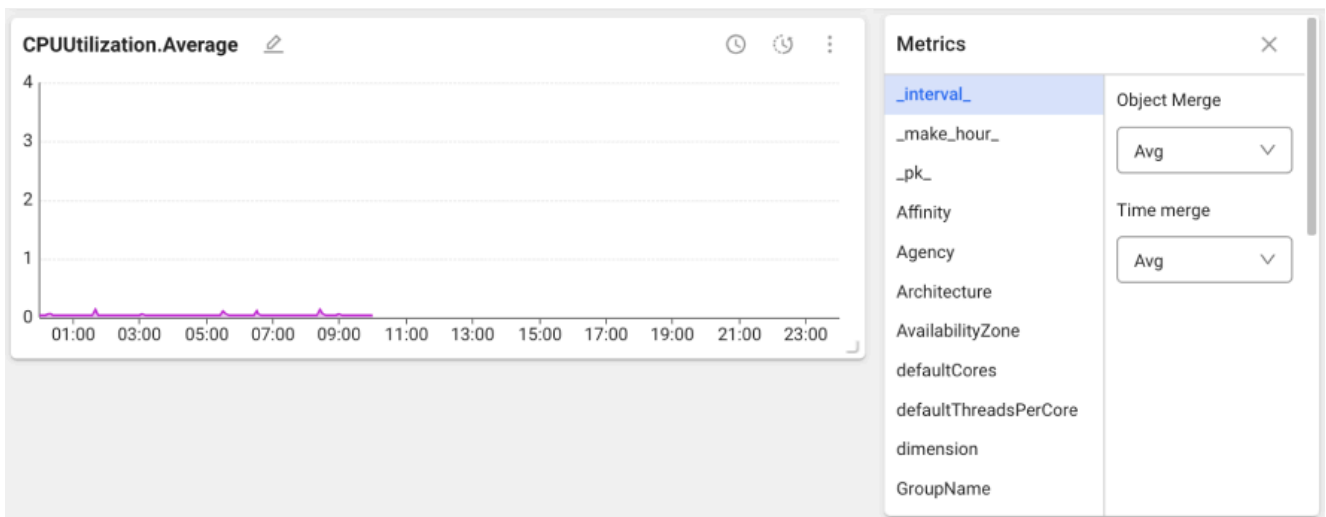
It is used to group the chart data based on the tag (e.g. agent name) selected on the left. At this time, if the tags match among the data with different fields (e.g. CPU), the corresponding data is merged.

- **Time merge**

It is mainly used if the lookup time is too long. Data with the same fields in the original data are merged at regular time intervals (5 minutes or 1 hour) depending on the time range. This method is called "Time Merge."

- **AWS ColudWatch Metrics**

In case of AWS monitoring metrics, the statistical method is added after the field name in the form of suffix. Data merging defaults reference this suffix.



1. In **Edit Mode**, select **All metrics** and then change the **Widget templates** list to the **All metrics** list.
2. Place the metrics widget on the layout.
3. On the upper right of the metrics widget, select **:**.
4. If a tag (e.g. agent name) option is selected, the data merge options appear. Depending on the widget size, the metrics option's location may differ.

Copying a widget

1. Click  on the upper right of the widget.
2. Click .
3. If the **Copy** window appears, click **+ Add widget**.
4. Change the widget name in the list.
5. Click **Apply**.
6. In **Edit Mode**, you can see the copied widget.

Delete Widget

1. Click  on the upper right of the widget.
2. Click .
3. If the confirmation message appears, click **Delete**. To cancel the deletion, select **Cancel**.

Analysis

It provides a menu that allows you to analyze the application environment from various perspectives. You can identify the zones with high load or poor performance and provide various performance metrics to check the daily status. You can also trace and analyze transactions for performance measurement.

Through the analysis provided by WhaTap, you can analyze key performances, identify the problems, and respond to any failures that may occur.

Daily APP. Status

You can check the daily trends of the application's key performance metrics through the hourly chart. For more information, see [the following](#).

Performance Trend

By charting the trends of key application performance metrics for a specific period, you can quickly identify the zones with high load or poor performance, and point the time zone when a problem occurred. For more information, see [the following](#).

Metrics Chart

You can search the metrics through visualized charts. For more information, see [the following](#).

Metrics Search

You can view the performance metrics for categorized applications by using the data organized based on the tags and fields. For more information, see [the following](#).

Stack

It collects transaction stacks and provides the usage statistics for executing methods and the statistics on commonly used stacks. Through the stacks for running transactions, you can identify long-running methods or short-running but frequently running methods. For more information, see [the following](#).

Cube

Performance statistics created every 5 minutes are called "Cubes." A statistical analysis tool for post analysis can set a zone with high response time, error count, and throughput. During the same time zone, the problem factors can be identified or the services can be monitored. The geographic traffic distribution and resource usage can be identified. For more information, see [the following](#).

Hitmap

It provides a distribution chart expressing the response time to user requests over time. Depending on the type of distribution chart, it is helpful to identify the type of failure occurred. For more information, see [the following](#).

Multiple Transaction Trace

It traces calls between transactions associated with different agents or projects. The transactions and trace data are provided so that you can see various call relationships at a glance within or between systems, and identify where problems occurred for improvement. For more information, see [the following](#).

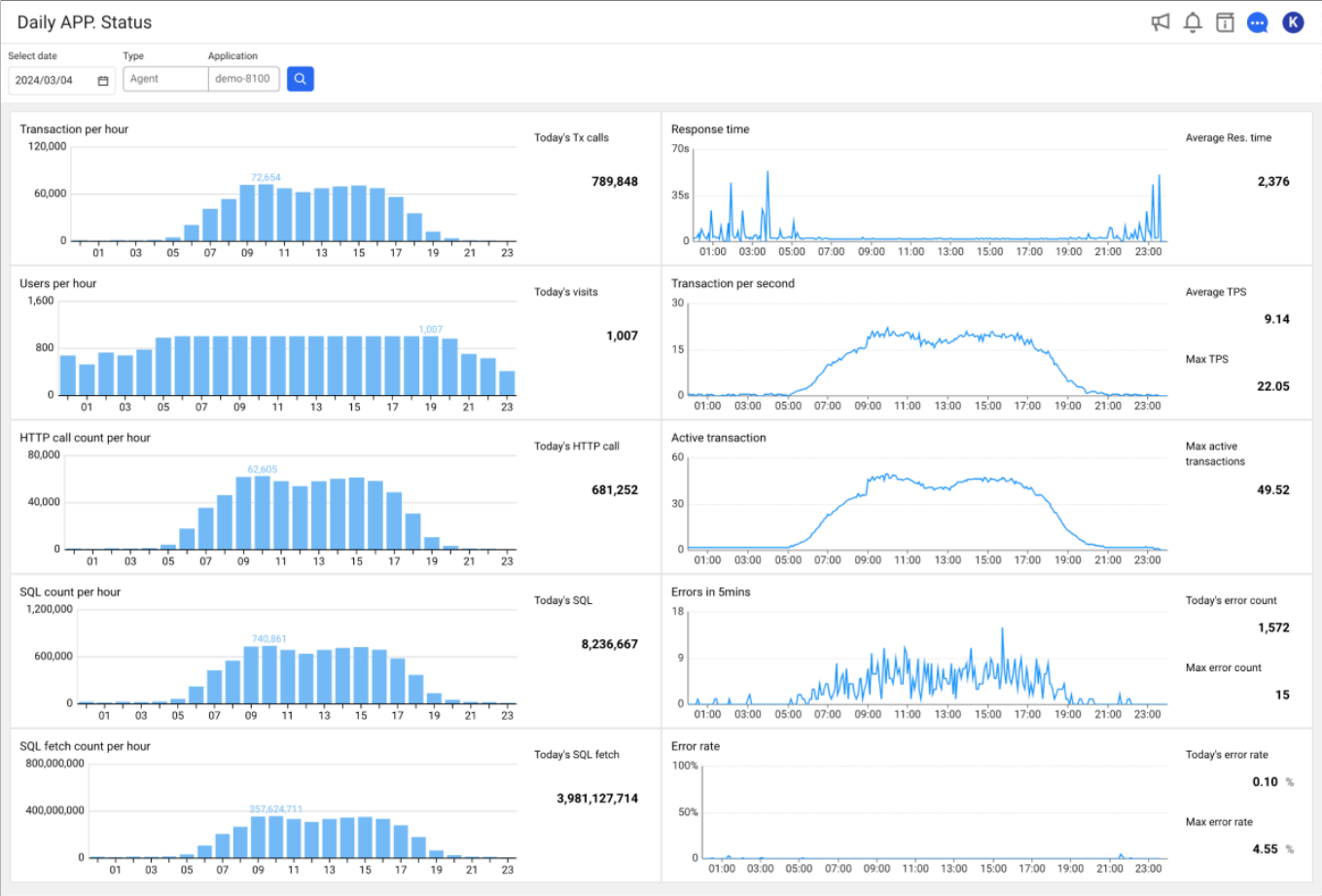
Transaction Search

You can view the statistics on the performance properties and execution status for each transaction for a specific period of time. You can view all transactions and quickly check their status (normal or error). Through the provided information, you can find which transactions are busy and resource-consuming. Various filters can be enabled depending on the transaction properties, making it useful in finding transactions with specific conditions. For more information, see [the following](#).

Daily Application Status

Home > Select Project > Analysis > **Daily APP. Status**

You can check the daily trends of the application's key performance metrics through the hourly chart.



Classification	Description
Agent kind	Group unit categorized as the <code>whatap.okind</code> option in agent settings
Agent node	Group unit categorized as the <code>whatap.onode</code> option in agent settings

The provided charts are as follows: The numbers on the right of the chart display the accumulated value or average, and maximum value for the day.

- Transaction per hour
- Users per hour

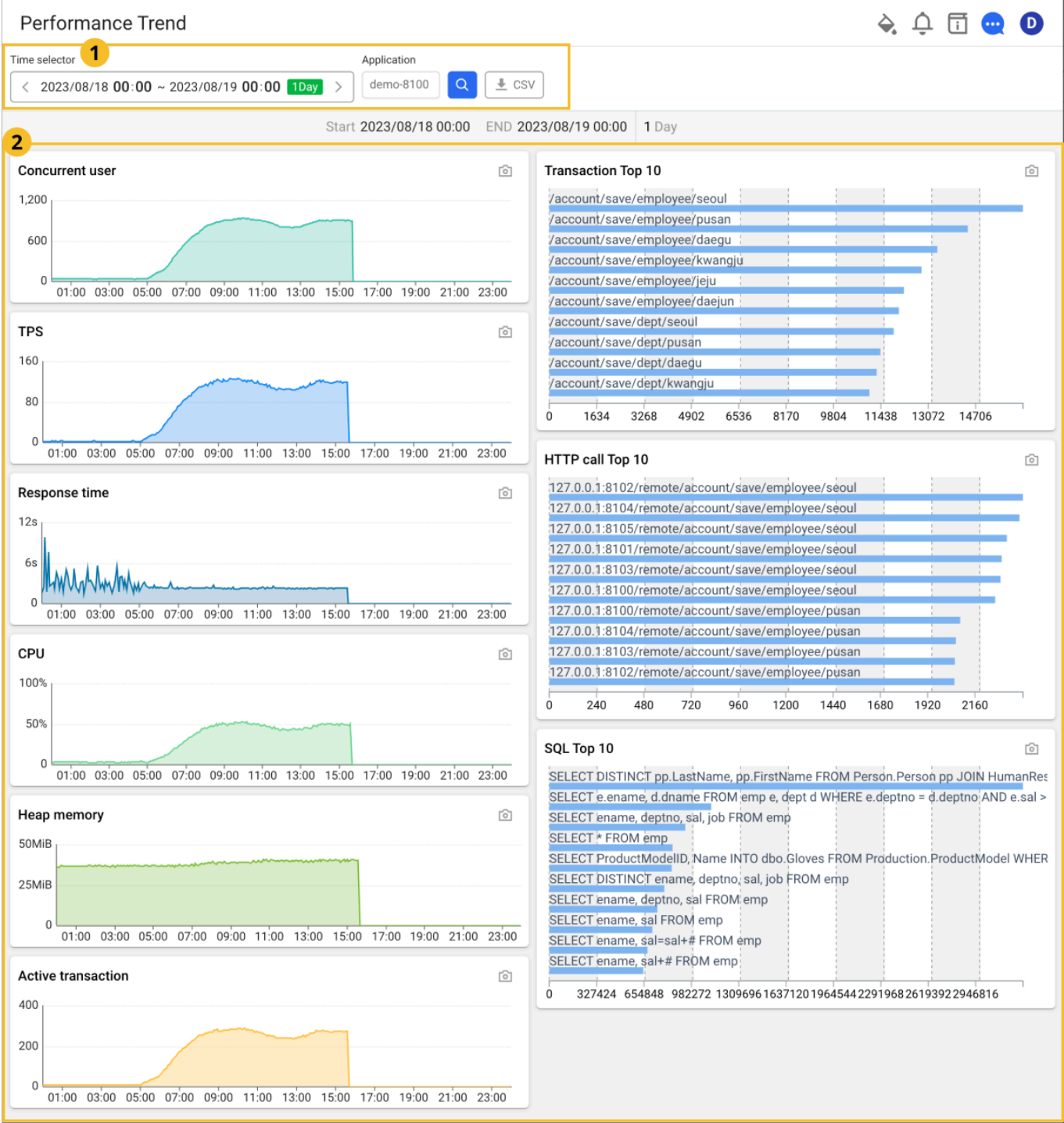
ⓘ **Today's visits** is the sum of users accumulated for the day without duplication. Instead of simply adding up, it is calculated using **HyperLogLog**. **HyperLogLog** is a probabilistic data structure that estimates the number of elements in a set with very little memory.

- HTTP call count per hour
- SQL count per hour
- SQL fetch count per hour
- Response time
- Transaction per second
- Active transaction
- Errors in 5mins
- Error rate

Performance Trend

Home > Select Project > **Analysis** > **Performance Trend**

On the initial screen of the WhaTap Monitoring service, select a project and then click **Analysis** > **Performance Trend**. You can see numerous metrics about the performance within the specific time range to view.



1 Performance trend search conditions

- The time selector allows you to select a time range to search. The default search period is **1 day**.
 - If the selected range is 3 hours or less, a 5-second trend is displayed using raw data.
 - If the selected range is within 3 days, a 5-minute trend is displayed using 5-minute statistics.
 - If the selected range exceeds 3 days, a 1-hour trend is displayed using 1-hour statistics.
- The application selector allows you to select all or specific applications to view.
- Select  **CSV** download icon, you can download the list data displayed on the screen as a CSV file.

2 Performance Trend Chart

- You can see the specified lookup time range at the top of the chart.
- In the chart area, you can see the **Concurrent user, TPS, Response time, CPU, Heap memory, Active transaction, Transaction, Top 10, HTTP call Top 10, SQL Top 10** and such.
- By selecting the  **Snapshot** icon, you can snapshot charts except for widget options.

Concurrent user

Real-time users are counted based on unique browser IP addresses.

- When using raw data, the number of unique browser IPs that sent requests within 10 seconds is counted.
- When using 5-minute statistics, the number of unique browser IPs that sent requests in the past 5 minutes is counted.
- When using 1-hour statistics, the number of unique browser IPs that sent requests in the past hour is counted.

TPS

TPS (Transaction Per Second) means the number of transactions processed per second.

Response time

It indicates the average response time for requests. If the average is very high, there may be many slow

transactions or failures at any specified time.

CPU

It indicates the CPU usage of the application server. You can see the trend in usage change.

Memory

It indicates the **memory** usage of the monitored process.

Active transaction

Active transaction indicates a transaction in progress. For more information about active transactions, see [the following](#).

Transaction Top 10

We use the transaction call statistics to provide you with the top 10 list with the most frequent transaction calls.

HTTP call Top 10

We use the HTTPC statistics to provide the top 10 list with the highest numbers of HTTP call URLs.

SQL Top 10

It provides the top 10 list with the highest numbers of SQL calls using SQL statistics.

Stack

Home > Select Project > **Analysis** > **Stack**

You can check the call stack frequency and detailed information about methods and transactions in a specific time period. You can view **Top stack**, **Unique stack**, and **Active stack**. **Top stack** displays the usage of frequently called methods, while **Unique stack** analyzes the frequency of the same call stack. **Active stack** enables real-time performance analysis by regularly collecting stack information of active transactions.

! The stack analysis is supported in the **Java**, **Python**, and **.NET** product platforms.

Guide to major features

The following major features are available. Stack viewing allows you to quickly identify and resolve performance issues in your application. By checking the frequency of a specific method call, call path, response time, and the like, you can devise measures to improve the performance.

Stack



Top stack

Unique stack

Active stack

Time selector

Application

< 2024/05/21 00:00 ~ 2024/05/22 00:00 1Day >

All selected



Select Column

+ Compare

The comparison can be used within one day with the same filter condition.

View as Diagram

• Selecting a stack type

You can select a desired stack from **Top stack**, **Unique stack**, and **Active stack** for a view.

- **Top stack:** Information of the stack with the most frequent calls is provided. For more information, see [the following](#).
- **Unique stack:** Statistical information about the cases where the set of executed methods is the same, is provided. For more information, see [the following](#).
- **Active stack:** The stack information of the running transaction is provided. For more information, see [the following](#).

- **Time selector / Start date:** Set the time to view. You can view the stacks for a specific time period or set a desired time period. Depending on the stack type, the lookup period may be restricted.

 The maximum period to view **Top stack** and **Unique stack** is 3 days.

- **Application:** You can select an agent to view. You can select a specific agent. If nothing is selected, all agents in the project are viewed.
-  **Select Column:** You can display or hide the desired columns.
- **Compare:** When searching within 1 day by the same filter conditions, you can compare the selected stacks over time. This allows you to see the changes in the call stack over time and see the performance trend. For more information, see [the following](#).
- : When you expand a stack or transaction in the table list for each stack type, a snapshot icon appears on the utmost right. Selection of this icon allows you to save the stack or transaction information as an image file.

Basic usage guide

1. Select a desired stack type to view on the screen.
2. In **Time selector** or **Start date**, set the desired viewing time.
3. In **Application**, select an agent to view. If nothing is selected, all agents are viewed.
4. Select .

You can see the search results in the list of the stack table.

Top stack

Top stack provides information on the most frequently called methods. Through the call frequency of the method at the top of the stack, you can quickly find the method that has the most impact on the service. By checking the frequency of method calls, you can analyze the cause of the load on the CPU or memory. Through this, the measures to improve the performance can be derived.

WhaTap can use the thread stacks collected every 10 seconds (default value) to analyze the performance delay

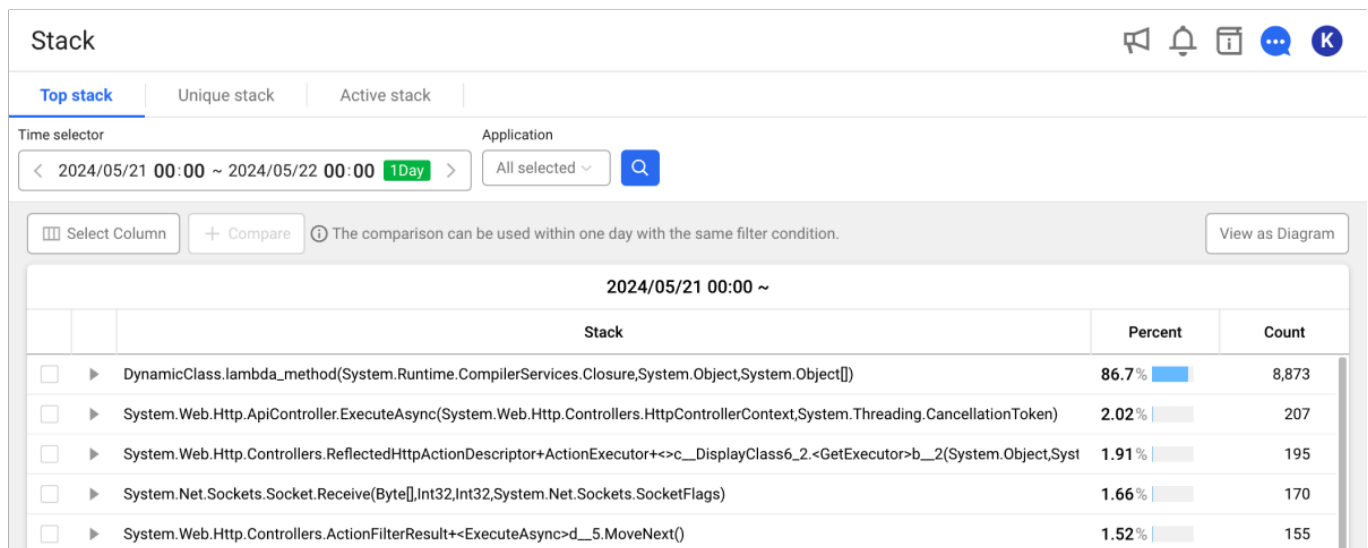
sections in the method level.

```
DynamicClass.lambda_method(System.Runtime.CompilerServices.Closure,System.Object,System.Object[])
demo450.Controllers.DelayTestController.Get(Int32)
System.Threading.Thread.Sleep(Int32)
System.Web.Http.ApiController.ExecuteAsync(System.Web.Http.Controllers.HttpControllerContext,System.Threading.CancellationToken)
System.Web.Http.Controllers.ActionFilterResult.ExecuteAsync(System.Threading.CancellationToken)
System.Runtime.CompilerServices.AsyncTaskMethodBuilder`1[[System.__Canon,mscorlib]].Start[[System.Web.Http.Controllers.ActionFilterResult, System.Web.Http, Version=5.2.0.0, Culture=neutral, PublicKeyToken=31bf3856ad364e35]](ByRef)
System.Web.Http.Controllers.ActionFilterResult+<ExecuteAsync>d__5.MoveNext()
System.Web.Http.Controllers.ApiControllerActionInvoker.InvokeActionAsync(System.Web.Http.Controllers.HttpActionContext,System.Threading.CancellationToken)
System.Web.Http.Controllers.ApiControllerActionInvoker.InvokeActionAsyncCore(System.Web.Http.Controllers.HttpActionContext,System.Threading.CancellationToken)
...
```

In the example stack, the **top line** is `lambda_method`.

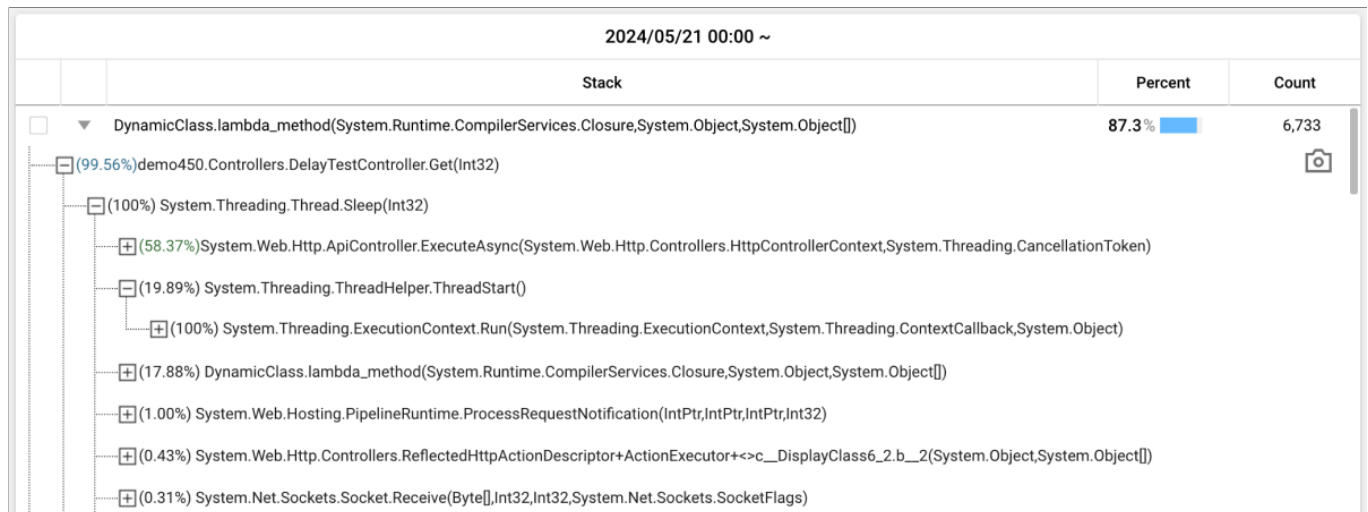
```
DynamicClass.lambda_method(System.Runtime.CompilerServices.Closure,System.Object,System.Object[])
```

Top line indicates that the thread to be dumped is executing that method. It may be caught momentarily, but it appears on the stack as a percentage of the sum of the module processing times. By calculating the frequency of this **top line** method, you can determine the method-level performance. WhaTap calls the **top line frequency statistics** as **Top stack**.



Through the **Top stack** analysis, you can analyze the frequencies of methods that were called. Based on each step on the stack trace, it provides the call rates between steps as percentage. The backlog frequency of the top

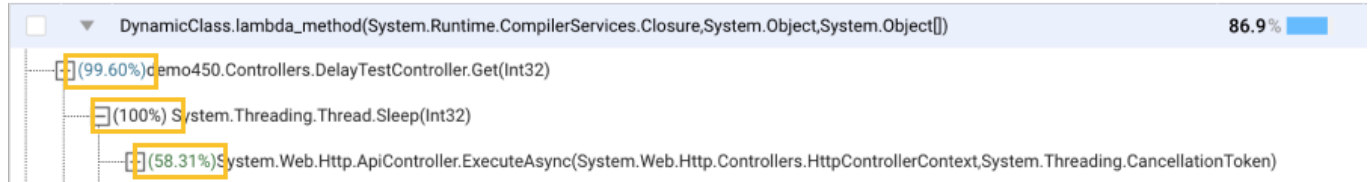
step is calculated as percentage and the results are sorted in descending order.



If you select ► on the utmost left of each step, the call frequency reference of the upper step that calls the step is calculated as percentage.

The **Top stack** statistics are good to make decision with enough data. If the number of collected stacks is a prime number of less than 10, it is insufficient to have a statistical significance.

Top stack is useful to find tuning points that were difficult to recognize while tuning. The most frequent stacks can be determined to cause the most response delays in the application server. The rate on the utmost left is how much it affects the performance of the application server.



Even if it is a stable application server, a stack with a high call frequency is likely to cause performance degradation, so it is recommended to look at the class carefully.

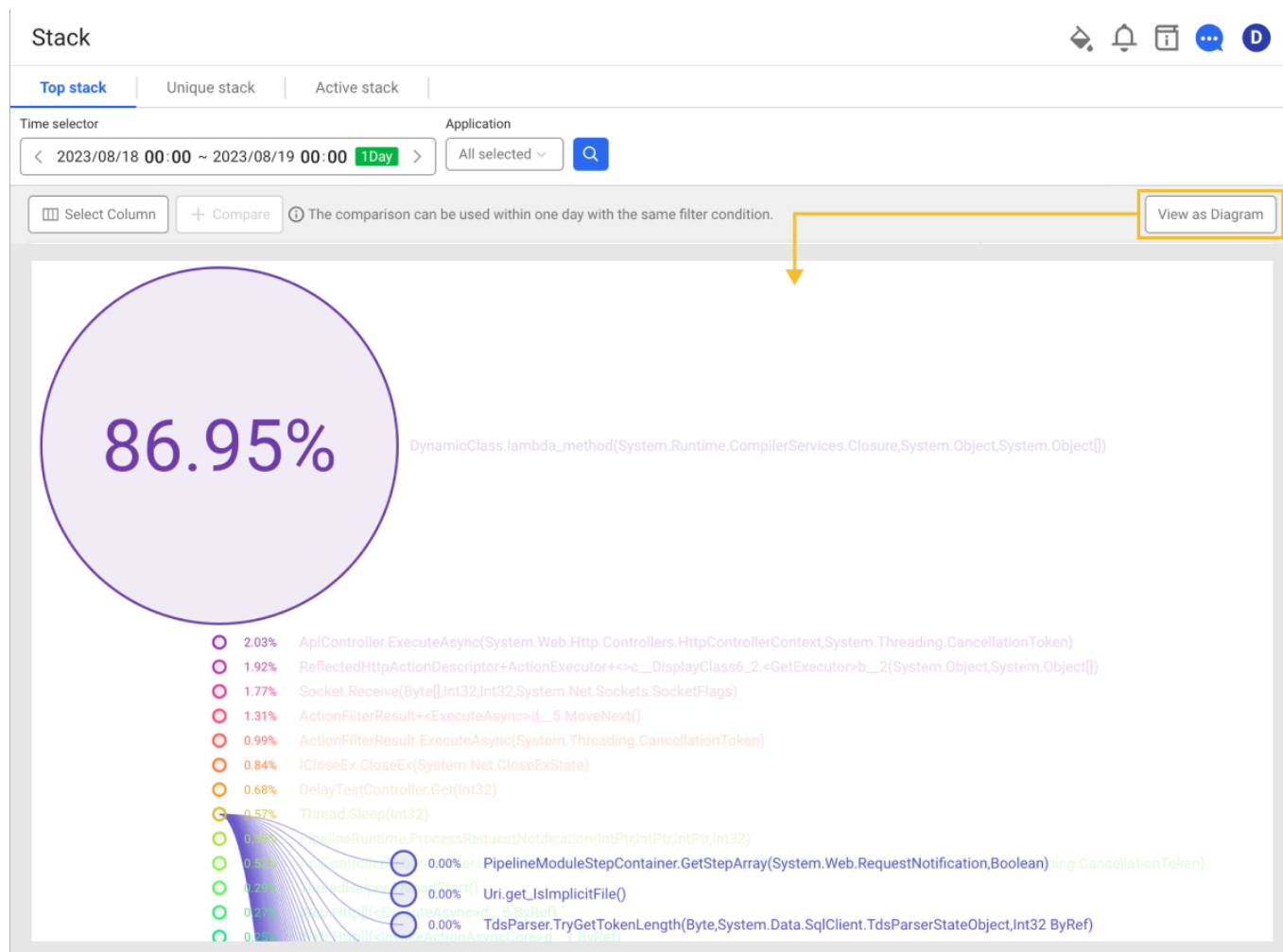
If you click **Top stack**, the frequency of calls on the top stack can be checked. Because the call relationship of the **Top stack** is one-to-one, the data accuracy may decrease as the depth of the **Top stack** goes down. Use the information on the sub-depths for reference purposes and proceed with tuning.

To improve the application performance, the module with a high backlog rate in the top-level step must be checked for bottleneck. For modules with high backlog rates, even a small performance improvement can lead

to significant enhancement throughout all applications.

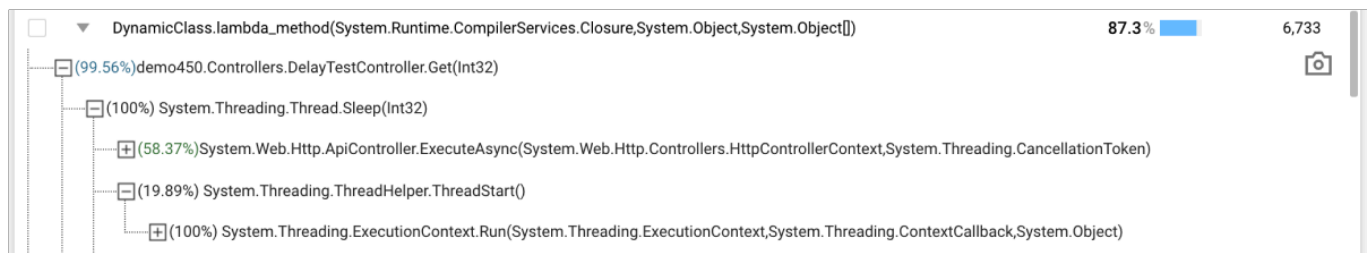
View as Diagram

It provides the diagram chart to help you easily understand the call steps of complex stacks. Select **View as Diagram** at the upper right of the stack table. This allows you to see at a glance the call frequencies and execution paths of each step.



- If you select each node, the stacks of lower depths appear.
- You can zoom in/out by scrolling the mouse or move it by dragging.
- To go back to the list of stack table, select **View as table**.

Precautions



```
System.Threading.Thread.Sleep(Int32)
```

```
// The call rate of System.Web.Http.ApiController.ExecuteAsync is 58.37%.
```

```
System.Web.Http.ApiController.ExecuteAsync(System.Web.Http.Controllers.HttpControllerContext,System.Threading.CancellationToken)
```

```
// The call rate of System.Web.Http.Controllers.ActionFilterResult.ExecuteAsync is 99.99%.
```

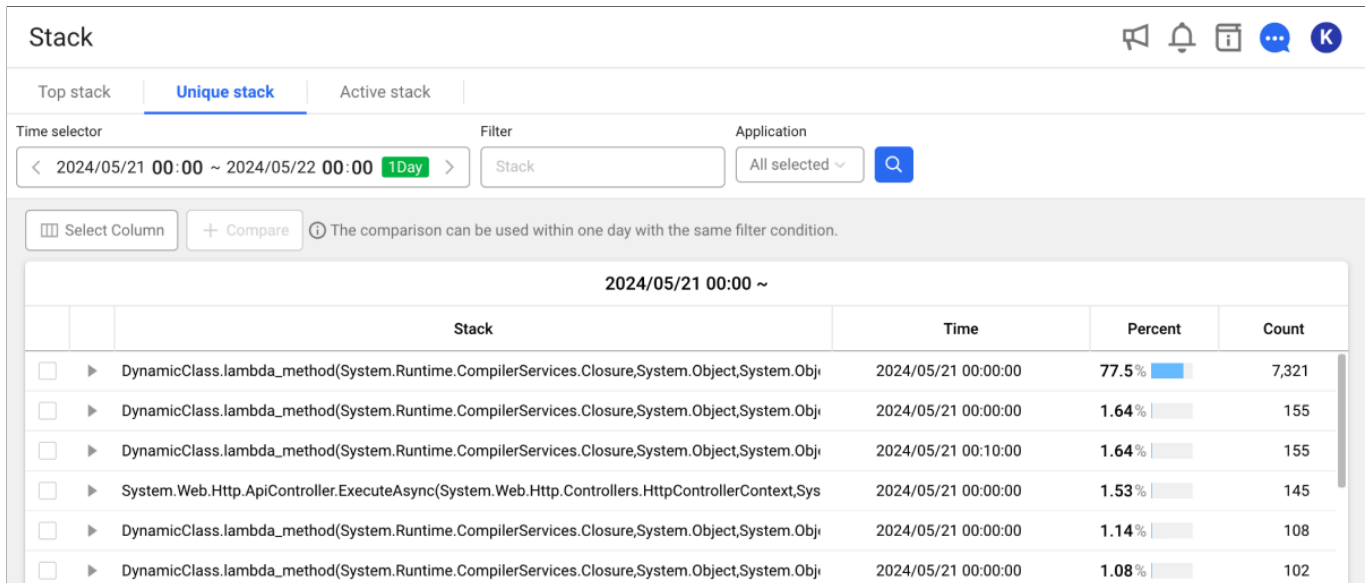
```
System.Web.Http.Controllers.ActionFilterResult.ExecuteAsync(System.Threading.CancellationToken)
```

The call rate of `System.Threading.Thread.Sleep` ← `System.Web.Http.ApiController.ExecuteAsync` ← `System.Web.Http.Controllers.ActionFilterResult.ExecuteAsync` does not mean $58.37\% * 99.99\%$. This is because there is a possibility of calling other modules in `System.Web.Http.ApiController.ExecuteAsync`.

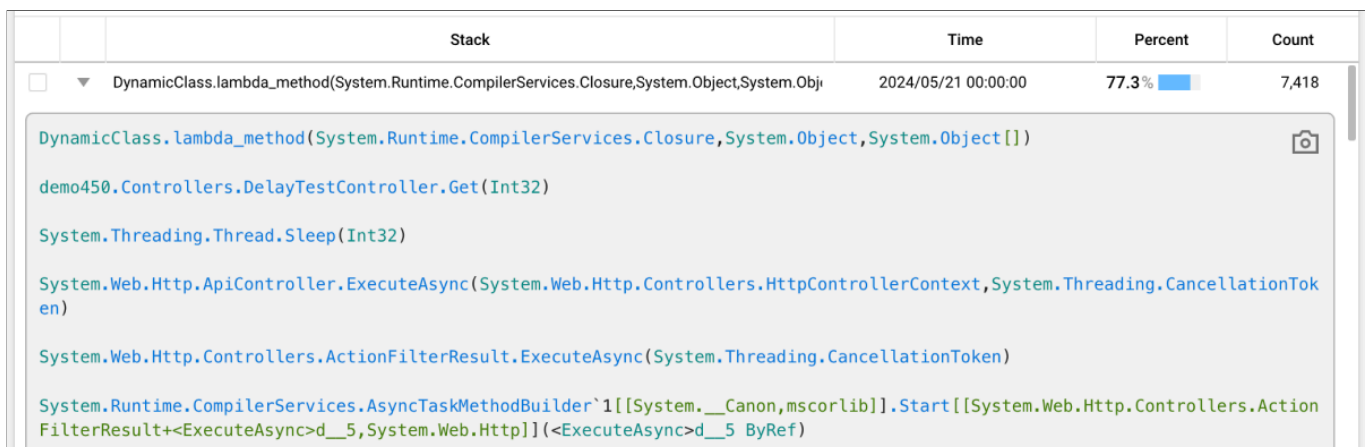
When determining the call rate through **Top stack**, do not multiply the call rates between steps to calculate the overall call relationship. Because the call rate of the **top stack** is the result of the call rates between steps of the data exposed on the stack trace, the total call rate derived with the call rates between steps can lead to a distorted result.

Unique stack

Unique stack provides statistical information about the cases where the set of methods executed based on the exact call information throughout all stack traces is the same.

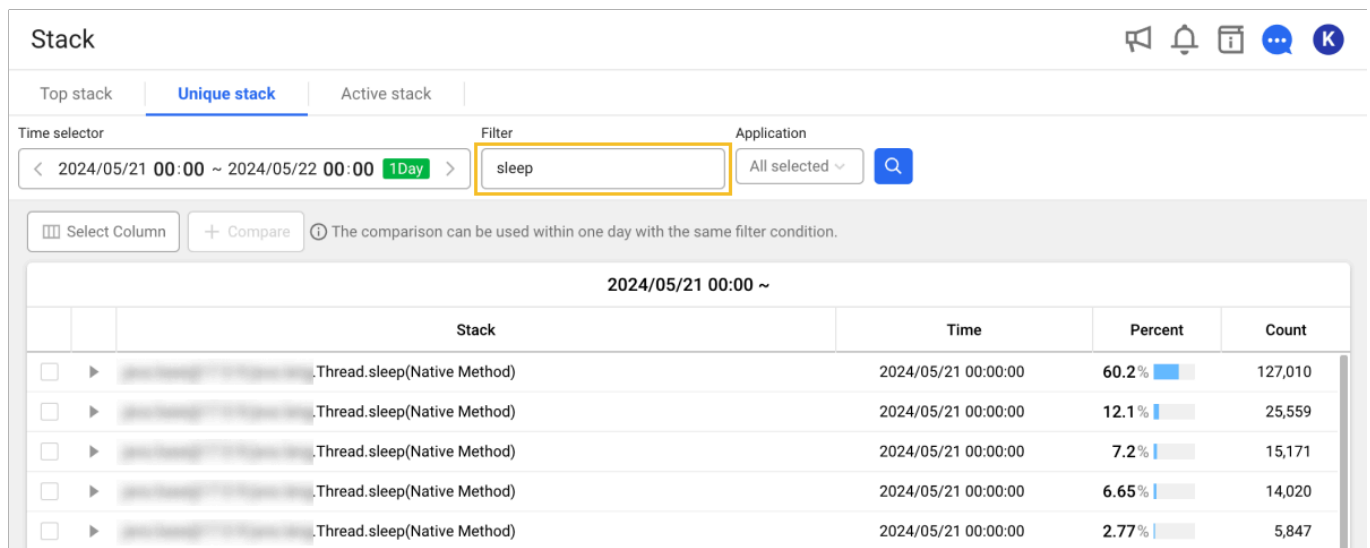


You can find information about the most frequently used stack. Even if the same stack is repeated multiple times, duplicates can be removed to identify the stack with the highest call frequency. For example, you can identify the stack traces with high backlog rates. You can also determine whether abnormal modules exist on the call path by reviewing detailed call steps.



Each stack displays the call path (**Stack**), occupied percentage (**Percent**), and total call count of the method. Displays (**Count**). If you select ► on the utmost left of each step, useful information for problem analysis is provided, such as method name, file name, and line number of the call stack.

Filtering

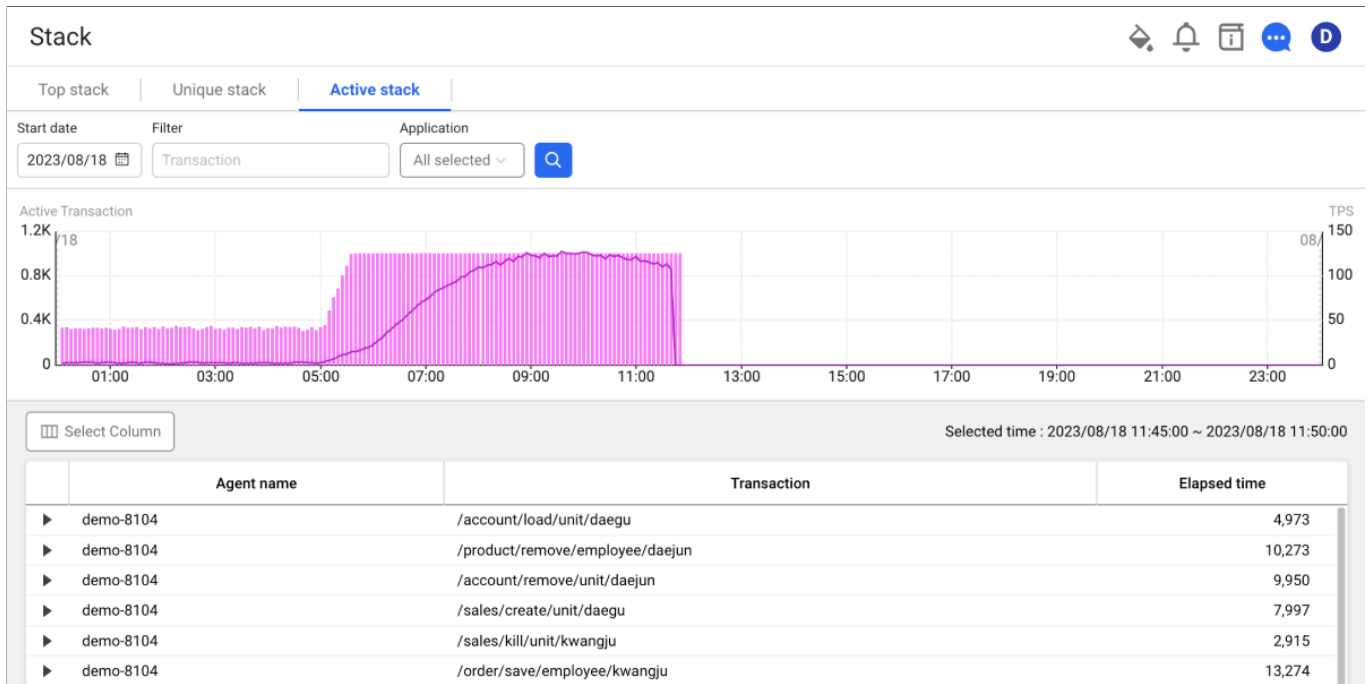


You can filter the search results by entering the method name in **Filter**. Enter the string and then select .

Active stack

Transactions in progress are called "active transactions." **The stacks regularly dumped by active transactions** are called **Active stack**.

In **Active stack**, you can see the collected **Active stack** in a time-series chart. The ratios for long-running methods and short-running but frequently executed methods allow you to understand the status of active transactions in real time.



The chart uses the 5-minute unit statistical data to display the number of **active transactions** on a bar graph and **TPS** on a line graph. If you click the bar graph for a specific time zone, you can see a list of **active transactions** for the time zone.

Agent name	Transaction	Elapsed time
{type}-1-51-w3wp.exe	/api/delaytest	40,197
Application server	OID	Transaction ID
{type}-1-51-w3wp.exe	3116402	6612447915709521445
	Active stack SEQ	Start time
	4606621491188750739	2024/05/21 13:44:23
	Elapsed time	40,197 ms
Call stack		
DynamicClass.lambda_method(System.Runtime.CompilerServices.Closure, System.Object, System.Object[]) demo450.Controllers.DelayTestController.Get(Int32) System.Threading.Thread.Sleep(Int32) System.Web.Http.ApiController.ExecuteAsync(System.Web.Http.Controllers.HttpControllerContext, System.Threading.CancellationToken) System.Web.Http.Controllers.ActionFilterResult.ExecuteAsync(System.Threading.CancellationToken) System.Runtime.CompilerServices.AsyncTaskMethodBuilder`1[[System.__Canon, mscorlib]].Start[[System.Web.Http.Controllers.ActionFilterResult+<ExecuteAsync>d__5, System.Web.Http]](<ExecuteAsync>d__5 ByRef) System.Web.Http.Controllers.ActionFilterResult+<ExecuteAsync>d__5.MoveNext() System.Web.Http.Controllers.ApiControllerActionInvoker.InvokeActionAsync(System.Web.Http.Controllers.HttpActionContext, System.Threading.CancellationToken)		

If you select ► on the utmost left of the transaction list, you can see the **Active stack** information of the transaction.



- For more information about collection of **active transactions**, see [the following](#). For other agent

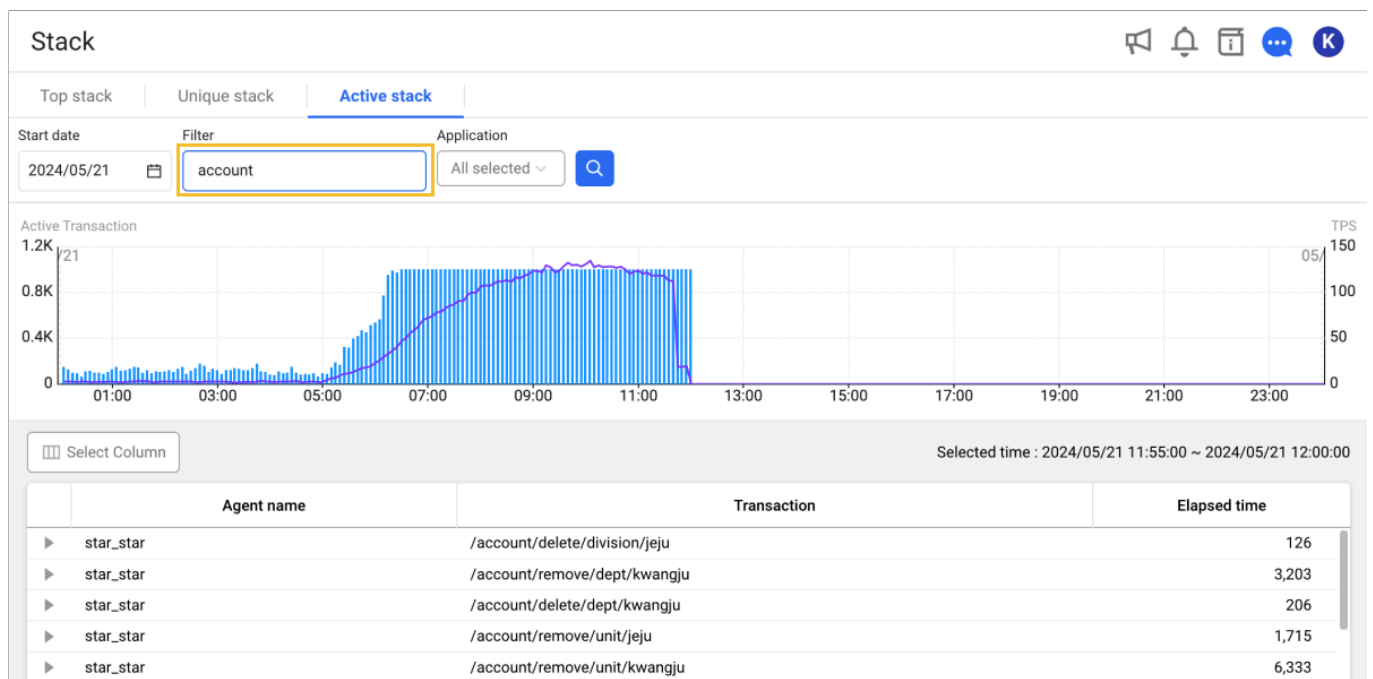
! options related to the collection, see [the following](#).

- The WhaTap agent transmits **active stacks** dumped from **active transactions** to the server every 10 seconds (optional). For the agent option about the collection interval, see the following example.

whatap.conf

```
active_stack_second=10
```

Filtering



You can filter the search results by entering the transaction name in **Filter**. Enter the string and then select .

Comparing stacks

Top stack and **Unique stack** provide the history of rate changes and collection counts over time based on a specific period of time.

Set the time to view in **Time selector**, and then select **Compare**. You can compare stacks over time when viewing the **within 1 day** period under the same filtering condition. This allows you to see the changes in the call stacks over time and see the performance trend. It can also be used as useful data for checking incident points and comparison before/after the performance improvement.

Stack

Top stack

Unique stack

Active stack

Time selector

Application

< 2024/05/20 00:00 ~ 2024/05/21 00:00 1Day >

All selected

Select Column

+ Compare

The comparison can be used within one day with the same filter condition.

View as Diagram

2024/05/21 00:00 ~			2024/05/20 00:00 ~		
	Stack	Percent	Count	Percent	Count
☐	java.lang.reflect.Method.invoke(Method)	50.3%	180,905	(▲ +1.12) 49.27%	553,337
☐	java.lang.reflect.Method.invoke(Method)	44.9%	161,417	(▼ -0.98) 45.94%	515,937
☐	app.com.android.webview WebView.loadDataWithBaseURL(String, String, String, int, String)	4.61%	16,549	(▼ -0.11) 4.72%	53,059
☐	java.lang.reflect.Method.invoke(Method)	0.01%	42	0.01%	134
☐	java.lang.reflect.Method.invoke(Method)	0%	16	0.00%	32
☐	app.com.android.webview WebView.loadDataWithBaseURL(String, String, String, int, String)	0%	6	0.00%	37

- **Percent:** You can see the rate changes of the selected stack during the inquiry period.
- **Count:** The number of collected stacks is proportional to the number of active transactions. For example, if the collection amount increased in a specific section, it can be seen that there was a service delay or a sudden increase in inflow.

ⓘ If **Compare** is not enabled, you may have exceeded the inquiry time range or there is no enough data for comparison. Set the inquiry time range in **Time selector** to enable the **Compare** button.

CUBE

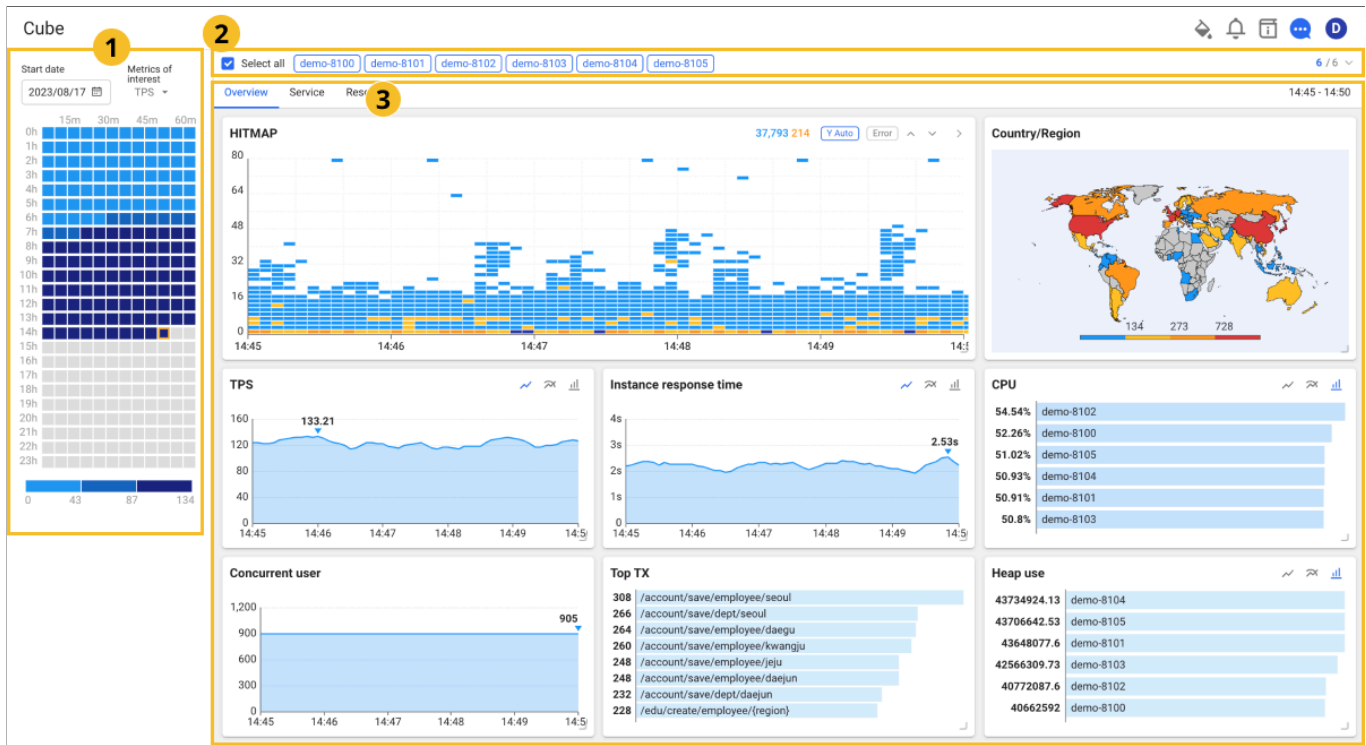
Home > Select Project > **Analysis** > **Cube**

It provides information for connections, hitmap, transactions, TOP transactions, TPS, response times, and resource usage for each country.

- See the application performance trends over time. You can quickly identify the changes in application performance by using statistical data at an interval of 5 minutes.
- You can see the geographic distribution of the traffic. Through the traffic data for applications, you can see the geographic distribution of traffic data and compare the performances across regions.
- You can see the usage of resources. You can see the usage of resources used by applications and analyze the causes of poor performance.

What is Cube?

We call the performance statistics generated every 5 minutes as **Cube**. Cube analysis uses each 5-minute performance data stored in cubes.



1 Cube selection panel

Select a cube based on the specific time in the cube selection panel in the left 1 area. Because the cubes are stored every 5 minutes, select a specific time.

- Panel interest metric
 - TPS
 - Response time
 - TX error count
 - Active TX count
 - Concurrent user
- Cube color

The cubes are displayed in different colors depending on the number of the selected metrics.

- Dark blue: high figure

- Light blue: low figure

2 Application selection

You can select data for a specific application through the application selection option in the top 2 area. If you select $\vee$ on the right, you can see all the applications that can be selected as follows.

- **Select all:** All applications are viewed. By default, **Select all** and **Active application** are selected.
- **Active application:** Among the applications, the active applications are specified for inquiry.
- **View only selected:** Among the applications, only the specified applications are queried.
- **Search:** If there are many applications, you can search for them through the input field.
- **Number/Number:** Displays the number of applications specified/number of all applications.

3 Cube data

In the area of 3, the cube data can be checked through the charts for **Hitmap**, **Country/Region**, **TPS**, **Instance response time**, **CPU**, **Concurrent user**, **Top TX**, and **Heap use**.

- **Hitmap**

It displays the distribution of transactions over the cube time. Detailed trace analysis is possible.

- **Country/Region**

By mapping countries based on the client IP, it displays from which country the transactions are coming. The colors on the map display the relative amount of transactions.

❗ WhaTap basically stores the client-related information. For more information about the agent settings for user data collection, see [the following](#).

- **TPS**

Transaction Per Second ([TPS](#)) means the number of transactions processed per second.

- **Instance response time**

Average response time for transactions

- **CPU**

After sorting the project applications (agents) by the IP, it displays CPUs of the busy server with a bar chart.

- **Concurrent user**

It displays the number of real-time browser users.

- **Top TX**

It displays 5 transactions of high invocation. Transaction statistics provide more detailed data.

- **Heap use**

Among the applications (instances), the instances are displayed in order of heap memory usage.

- If you select the  icon on the upper right of the chart, merged line charts are provided.
- If you select the  icon on the upper right of the chart, individual line charts are provided.
- If you select the  icon on the upper right of the chart, the bar-type chart appears.

- WhaTap uses the IP2Location LITE database for [IP geolocation](#).

HITMAP

What is Transaction Tracing?

While the transaction performance means the summary metrics or attributes between the start and end of transaction, the transaction profile traces the steps during transactions. If any transaction is slow or erroneous, the execution records must be traced step by step to find the cause. This is called **transaction tracing**.

The types of steps collected for transaction performance tracing are as follows.

- **DB connection step** START-END

It includes the performance for connection to RDB. Step information includes the name, response time, and error.

- **SQL Step** START-END

It includes the performance for JDBC SQL. Step information includes connection data, SQL statements, and errors.

- **HTTP Call step** START-END

It includes the performance for the outbound HTTP service call. Step information includes URL, host, port, response time, and errors.

- **Message step** ADD

While collecting traces, the message steps are used to collect the records of all irregular sections.

- **SOCKET Step** ADD

Step to represent the socket open.

- **METHOD Step** START-END

The method response time is traced.

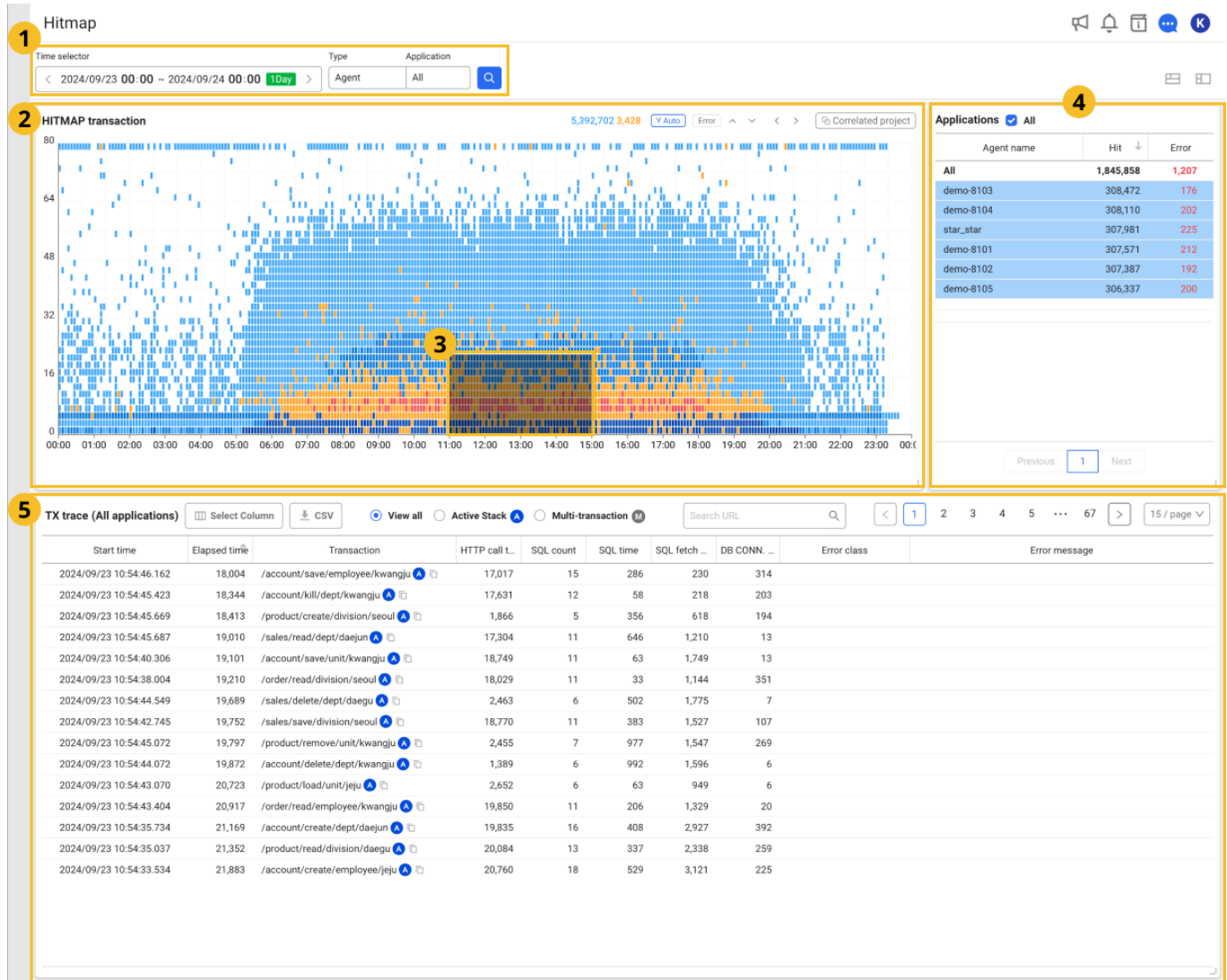
- **ACTIVE STACK Step** START-END

It includes the active stack information. It is created and collected by a separate thread and it is added to the transaction trace.

! In the WhaTap monitoring service, **Step** is used as the same meaning as **Span**.

Detailed analysis

Home > Select Project > **Analysis** > Hitmap



1. In **1 Time selector**, select a time period to see the hitmap.

2. In **1 Type** and **Application**, select the targets to view.

3. Select .
4. In  **HITMAP transaction**, drag a desired area as in .
5. If the list appears in  **TX trace**, select a transaction to analyze.

The **Transaction information** window appears where you can check properties such as client information for transaction performance analysis, transaction processing performance, and detailed execution history for each section.

-  • For more information about the **Hitmap** menu, see [the following](#).
- For more information about the hitmap widgets on the application dashboard, see [the following](#).

Guide to transaction information window

Transaction information

Record summary **Table view** Tree view Methods SQLs HTTP calls Transaction log

/account/create/employee/daejun

Start : 11/06 03:11:02.994 End : 11/06 03:11:10.650 Elapsed : 7,656ms Agent name (oname) : demo-8104 Client IP : 77.131.96.144

1s 2s 3s 4s 5s 6s 7s

Method SQL HTTP Call

Select column TXT SQL

No	Time	Gap	Elapsed	Contents
1	03:11:02.994			Start 2023-11-06 03:11:02.994
2	03:11:02.994			HTTP-HEADERS host=255.255.255.159 x-wtap-mst=x4716m89sq3jmt,1,zmeu5ongdb33 7,x5rs
3	03:11:02.994	0	7,656	com.virtual.web.VExec#doFilter
4	03:11:02.994	0	7,656	com.virtual.web.Simula\$1#process
5	03:11:02.994	0	1,356	com.virtual.dao.RemoteDAO#execute
6	03:11:02.994	0	1,356	[ApacheClient] 127.0.0.1:8104 /remote/a. 
7	03:11:02.994			[Socket] 127.0.0.1:8104
8	03:11:04.350	1,356	0	com.virtual.TestLogger#printIn
9	03:11:04.350	0	138	com.virtual.web.Simula#execute
10	03:11:04.350	0	138	com.virtual.web.Simula#execute2
11	03:11:04.350	0	138	com.virtual.web.Simula#execute?
12	03:11:04.351	1	137	DELETE FROM Customers WHERE CustomerName='S' AND Conta ctName='S' 
13	03:11:04.350	-1	138	com.virtual.dao.DeleteDAO#execute
14	03:11:04.489	139	430	insert into emp values(\$, '\$', '\$', \$, to date('\$','\$').... 
15	03:11:04.488	-1	431	com.virtual.dao.InsertDAO#execute2
16	03:11:04.488	0	431	com.virtual.web.Simula#execute3
17	03:11:04.488	0	431	com.virtual.web.Simula#execute2 

- In the 1 area, the step data can be seen in various formats. Select a desired type of tab.
- In the 2 area, you can see the basic information for transactions.
- 3 : The statistical data window for the corresponding URL or each execution section appears. Click a desired time on the graph chart in the statistical data window to go to **Statistics** or **Transaction Search**. You can view the statistical data based on the selected time.

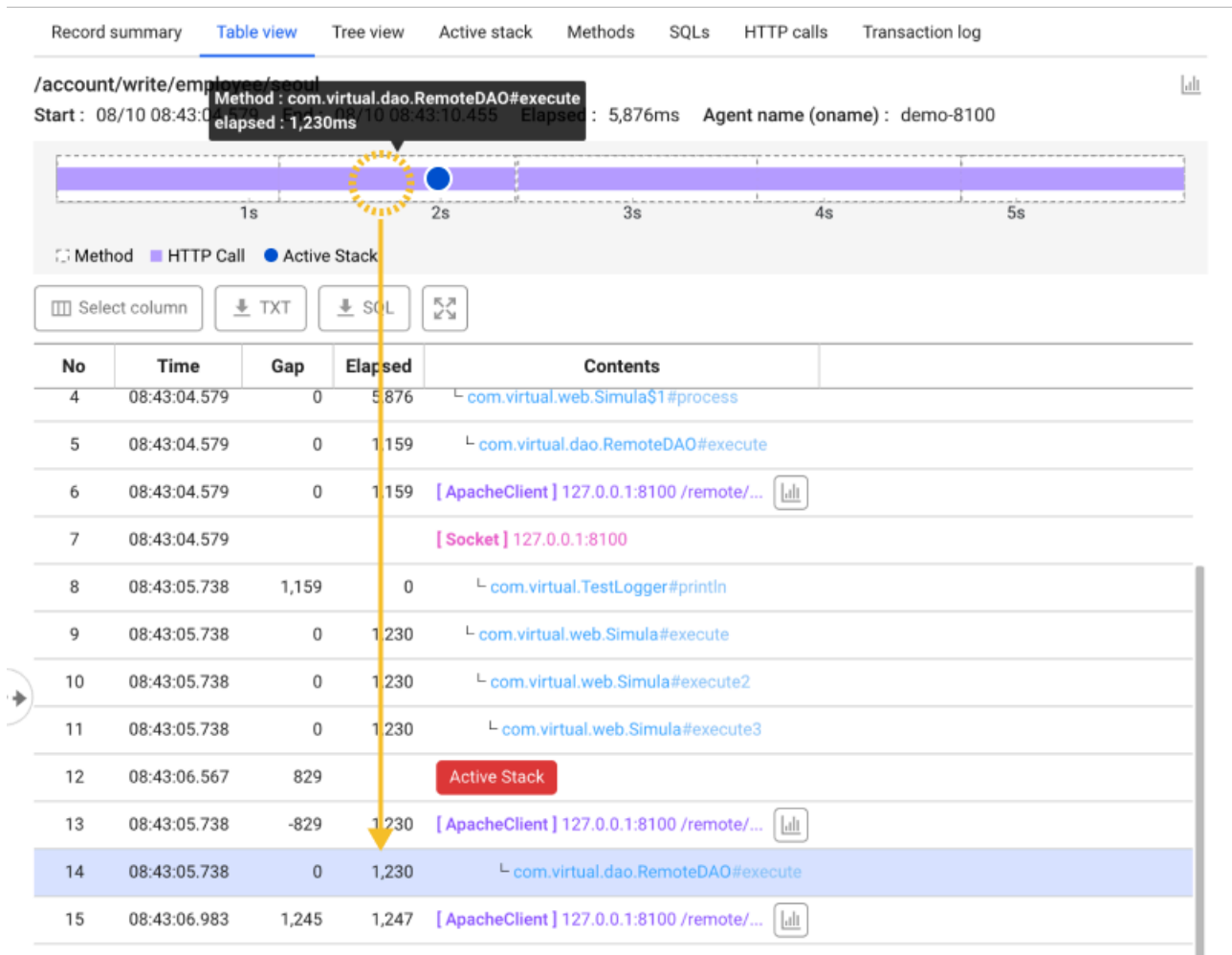
- ①
 - For more information about **Statistics**, see [the following](#).
 - For more information about the **Transaction Search** menu, see [the following](#).

- If you select **4** SQL step, the SQL variables and HTTP queries can be viewed. For more information, see [the following](#).

Table view

In the **Table view** tab, you can see the transaction execution steps in chronological order.

- You can classify transactions by each execution section and see them in a diagram. Out of all elapsed times, you can quickly find the times spent for each section and the section that took the longest.
- If you select each section in the diagram, the corresponding table list appears where the step is located.



- The area where the blue circle (●) is located, is the moment when the active stack has been collected. If you select the blue circle, the table list appears where the **Active Stack** button is located. If you click **Active Stack**, you can check the step performed during the section.

- In the transaction list, you can see them from the items marked with the **A** icon.
 - For more information about active stacks, see [the following](#).

- Select column:** You can add or hide the memory accumulation and CPU accumulation data as columns in the table list. The columns are as follows:
 - No:** Step occurrence sequence

- **Time:** Start time of each step
- **Gap:** The waited time between the start time of the previous step and the current step may have a difference, while there may be a gap from the elapsed time if a delay happens due to external factors.
- **Elapsed:** Total elapsed time from the start to the end of each method
- **Contents:** Execution details of the step
-  **TXT:** You can download basic transaction data and execution data for each section in a text file.
-  **SQL:** The basic transaction information and SQL execution data can be downloaded as a text file.
 - **Download with substitute value:** It downloads the SQL statistics data after replacing the bind variable value with its original one. If a security key (`paramkey`) is set, the security key input window appears. You must enter the security key for downloading. For more information about the agent configuration related to the security key, see [the following](#).
 - **Download without substitute value:** It downloads SQL statistics data without replacing the bind variable value.
- : You can see only the table list, with hiding the transaction summary and diagrams. If you select , the hidden information reappears. This feature is useful when you have a long list of tables.
- If you select the SQL step, the **SQL** window appears to display parameters. For more information, see [the following](#).

Record summary

To see the basic information for transactions, select the **Record summary** tab. You can see the basic information of the transaction, agent on which the transaction was performed, memory allocation usage, and client information.

Record summary

Table view

Tree view

Methods

SQLs

HTTP calls

Transaction log

Transaction

/account/save/division/daejun

Original URL

Project code5490Status200

Error levelWarningError class

Error messageInternal RuntimeException

Elapsed time6,638ms

Start time24/09/24 15:49:52.317End time24/09/24 15:49:58.955

User agentMozilla/5.0 (X11; U; Linux i686; en-US; rv:1.3) Gecko/20030320

Transaction ID-8541160086278366865

Agent name (oname)demo-8101Agent ID (oid)-877561626

Agent group namedemo-okind-1Agent group ID-628198688

Agent server name node-1Agent server ID334634079

HTTP methodGETSQL time918ms

HTTP call time4,305msSQL count8

HTTP call count4SQL patch time16ms

DB CONN. time249msSQL fetch count1,065

CPU usage time0msMemory allocation623,136byte

Client IP152.4.69.63Operating systemLinux

Domain255.255.255.196Country/RegionUS

CityChapel HillClient typeOther

Client nameOtherWClientID-1744550593

methodCount0methodTime0

Classification	Properties	Description
Transaction	Transaction	API or URL call executed by the application, and the path of the transaction. It converts to a specific format using regular expressions.
	Original URL	It is the URL path that was actually called. A concrete request path that does not include variables. If there is an original URL, the original URL appears. If there is no original URL, it is not displayed.
	Project code	Identification code of the project registered in the WhaTap monitoring service.

Classification	Properties	Description
	Status	HTTP response status code for the transaction.
	Error level	Level of the error that occurred in the transaction. It is displayed as Warning or Critical.
	Error class	Class of the error that occurred in the transaction.
	Error message	Message of the error that occurred in the transaction.
	Elapsed time	Transaction execution time.
	Start time	Transaction start time.
	End time	Transaction end time.
	User agent	Browser used to extract client-related data.
	Referer	Page address or incoming path used by the browser of the client.
	Transaction ID	It is a unique ID of the transaction.
	Multi transaction ID	It is a unique ID of the multi-transaction. It appears when executed in parallel with transactions of other applications.
Agent	Agent name (oname)	Agent name
	Agent ID (oid)	It is a unique ID of the agent.
	Agent group name	Agent group name set with the <code>okind</code> option.
	Agent group	It is a unique ID of the agent group.

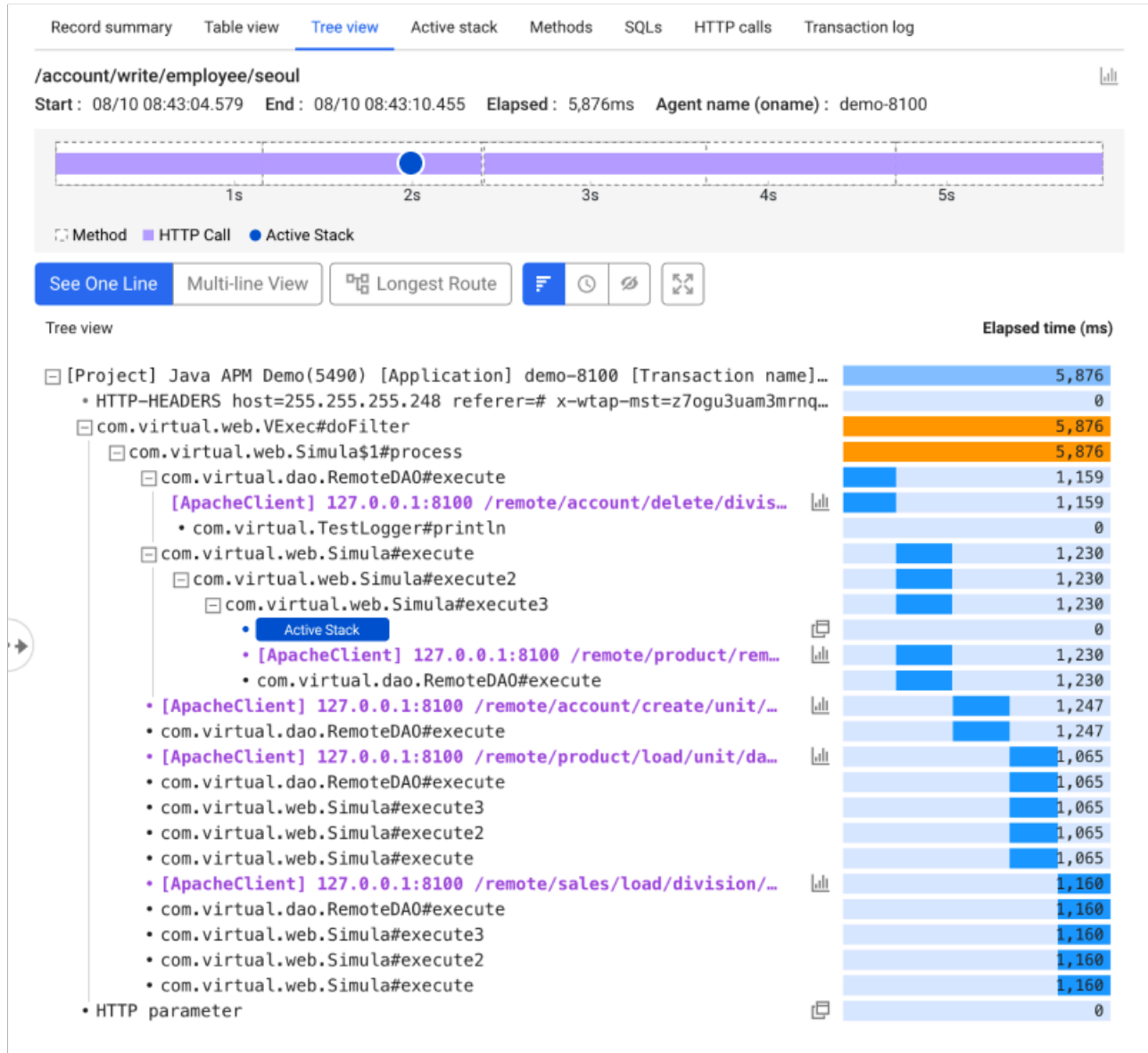
Classification	Properties	Description
	ID	
	Agent server name	Agent server name set with the <code>ondoe</code> option.
	Agent server ID	It is a unique ID of the agent server.
Step	HTTP method	HTTP method. (GET, POST, PUT, HEAD, etc.)
	HTTP call time	Outbound HTTP call time.
	HTTP call count	Number of outbound HTTP calls.
	DB CONN. time	Time taken to connect to the database.
	SQL time	SQL execution time.
	SQL count	SQL execution count.
	SQL patch time	Time taken to search for the record. Nesting may occur or other logic may be included.
	SQL fetch count	Number of the records retrieved from SQL.
Resource	CPU usage time	CPU time used for processing transactions.
	Memory allocation	Amount of memory used by the transaction.
Containers	Pod name	It is the name of the Kubernetes Pod that processed the transaction.

Classification	Properties	Description
	Container Id	It is a unique identifier for a specific container running within a Pod.
Client	Client IP	Client IP address.
	OS	OS environment in which the browser runs.
	Domain	Internet address assigned to the IP address that the client connected to.
	Country/ Region	Client's country.
	City	City in the client's country.
	Client type	Browser type used by the client.
	Client name	Device name used by the client.
	WClientID	This is a unique ID of the client.
Method	methodCount	Number of methods called by transactions.
	methodTime	Time taken for method execution.

- The collected data may differ depending on the application type, settings, and step type. **Container** entries appear only when the application is running in the container environment.
- Error related items are displayed when an error occurs from the transaction.
- Some transaction properties provide statistical features. If you select the  button, a window appears where you can see the status of transactions occurred during the query time through a time series chart. If you select a bar graph in the chart, you can go to the **Analysis > Transaction Search** menu to view details.
- WhaTap basically stores the client-related information. For more information about the agent settings for user data collection, see [the following](#).

Tree view

To see the transaction execution steps in a tree format, select the **Tree view** tab. You can see the details of each transaction and its trace details, trace start time, step time, and call relationship. If you select each section of the diagram, the tree view of the step appears.



- **Single-line View:** You can arrange the tree format at intervals by displaying the texts displayed in the execution data for each section in a single line.

- **Multi-line View:** All the texts displayed in the execution data for each section, appear by wrapping words.
- **Longest Path:** The longest route can appear.
-  **Show Time Bar:** The elapsed times are displayed in a bar chart.
-  **Show Time:** The timestamps, gaps, and elapsed times for each segment are displayed in text.
 - 8 seconds or more: **Excessive delay** state is distinguished in **red**.
 - Between 3 and 8 seconds: **Delay** state is distinguished in **orange**.
 - Less than 3 seconds: **Normal** state is distinguished in **blue**.
-  **Hide Time:** The time is hidden.
- : You can see only the tree view that hides transaction summary and diagrams. If you select , the hidden information reappears. This feature is useful when the tree view list is long.
- : A window appears where you can view SQL variables and HTTP queries. For more information, see [the following](#).

 In case of start and step times, the time differences caused by the transaction call environment are corrected on the screen through traces and mappings in the parent transactions. Accordingly, there may be differences from the actual time data.

Active Stack

Record summary
Table view
Tree view
Active stack
Methods
SQLs
HTTP calls
Transaction log

/account/load/division/daegu

Stack

Active Stack analysis
Beta

Start : 04/06 14:16:32.419
End : 04/06 14:17:33.709
Elapsed : 61,290ms
Agent name (oname) : demo-8100
Client IP : 167.109.194.221

Active Stack (6)

No	Time
30	14:16:37.807
70	14:16:48.223
80	14:16:58.504
81	14:17:08.542
82	14:17:18.547
108	14:17:28.575

```

java.base@17.0.12/sun.nio.ch.SocketDispatcher.read0(Native Method)
java.base@17.0.12/sun.nio.ch.SocketDispatcher.read(SocketDispatcher.java:47)
java.base@17.0.12/sun.nio.ch.NioSocketImpl.tryRead(NioSocketImpl.java:266)
java.base@17.0.12/sun.nio.ch.NioSocketImpl.implRead(NioSocketImpl.java:317)
java.base@17.0.12/sun.nio.ch.NioSocketImpl.read(NioSocketImpl.java:355)
java.base@17.0.12/sun.nio.ch.NioSocketImpl$1.read(NioSocketImpl.java:808)
java.base@17.0.12/java.net.Socket$SocketInputStream.read(Socket.java:966)
app//org.apache.http.impl.io.SessionInputBufferImpl.streamRead(SessionInputBu
fferImpl.java:139)
app//org.apache.http.impl.io.SessionInputBufferImpl.fillBuffer(SessionInputBu
fferImpl.java:155)
app//org.apache.http.impl.io.SessionInputBufferImpl.readLine(SessionInputBuff
erImpl.java:284)

```

Select the **Active stack** tab to view the list of active stacks collected from the transaction.

- Select a collection point (No, Time) from the **Active Stack** list on the left to display the stack information for that point on the right.
- **Stack**: You can download the active stack details as a TXT file.

- ! • You can check the active stack from items marked with the icon in the transaction list.
- For more information about active stacks, see [the following](#).

AI Active Stack Analysis

Beta

Click the **Active Stack Analysis** button to automatically analyze collected active stacks with AI. It identifies performance issues based on the stack dumps of in-progress transactions and suggests improvements.

The analysis results consist of the following 4 sections:

- **Summary:** Summarizes the number of analyzed stacks and the overall execution flow.
- **Common Patterns:** Displays repeatedly observed execution patterns, including pattern name, occurrence count, and description.
- **Issues Found:** Displays identified performance issues with severity levels (**High**, **Medium**, **Low**) along with the stack information used for the assessment.

Severity	Criteria
High	Deadlock, complete blocking, same blocking repeated 4+ times
Medium	I/O wait, 2-3 lock contentions, slow external calls
Low	Single-occurrence wait, minor optimization opportunities

- **Recommendations:** Suggests specific improvement actions by priority.

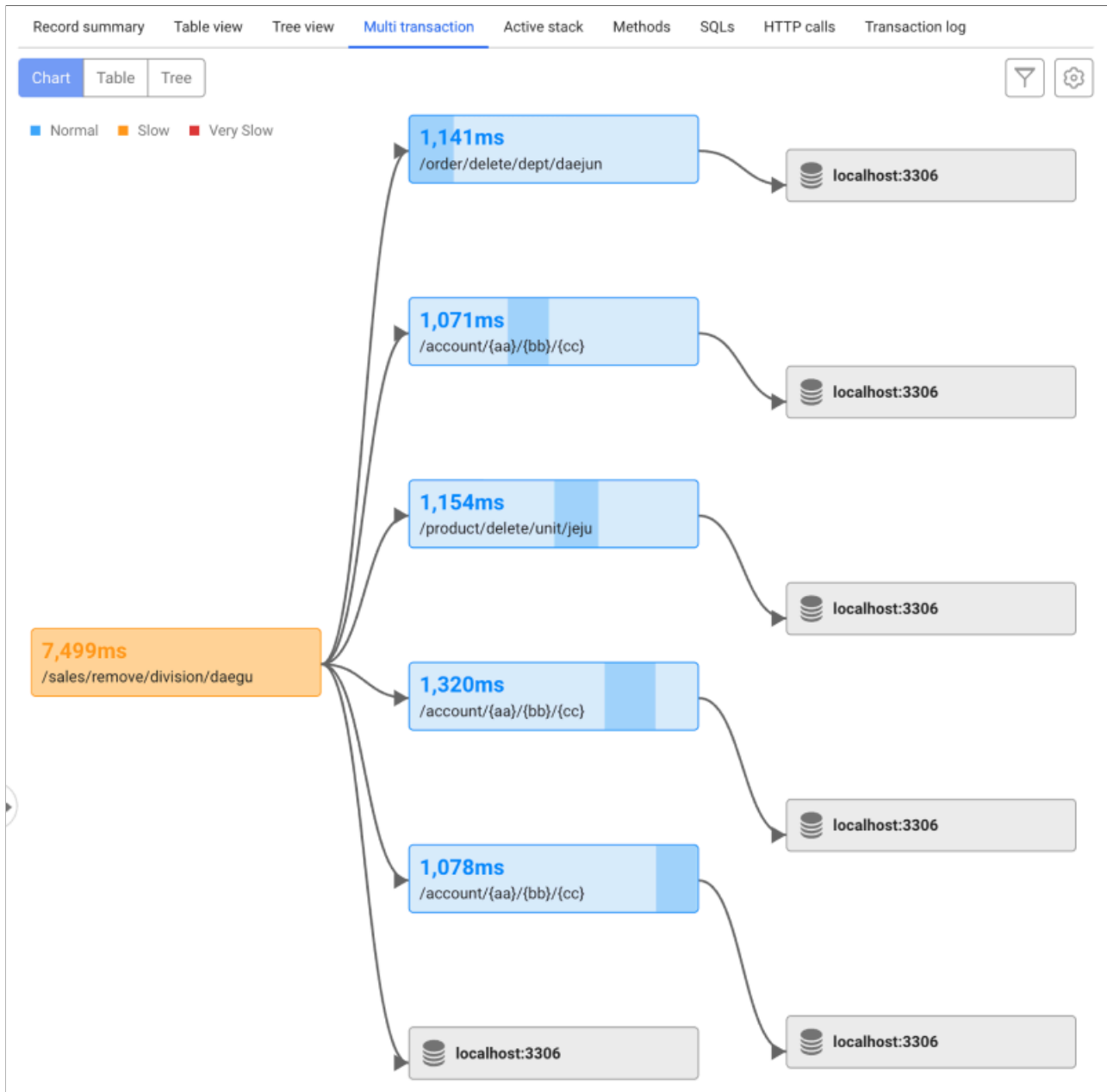
Each analysis item displays the collected stack number (`No.N`). Click the stack number to view the original stack.

- ⓘ • The analysis results are generated by AI and may differ from actual conditions. Use them as reference material.
- **Member** role or above is required.

Multi-transaction

Multi-transaction indicates the transaction involving other agents or projects. In the **Multi transaction** tab, you can see the call relationships between applications registered in the WhaTap monitoring service.

- ✓ To trace multi-transactions, set the `mtrace_enabled` option to `true` in **Management > Agent CONF.** For more information about the agent configuration, see [the following](#).



- **Chart:** Provides the call relationships for each transaction in a flowchart. Select a transaction node to see the trace analysis for the transaction node. In **Chart** mode, you can use the mouse to go to a desired position or zoom in or out by scrolling.
 - **Chart view settings:** You can display or hide the elements on the chart.
- **Table:** In the form of table, you can check the data for each transaction included in the multi-transaction. You

can select the  column selection icon to edit the table header columns. You can see the trace analysis data by selecting each transaction item.

- **Tree:** You can see the call relationships between transactions in a tree format. The related additional functions are the same as those of the **Tree view** tab.
-  **Project selection:** You can select or deselect projects to be displayed on the chart.

- You can see them in the transaction list marked with the  icon.
- For more information about the multi-transaction, see [the following](#).

Methods

Record summary Table view Tree view Active stack Methods SQLs HTTP calls Transaction log							
/account/read/unit/jeju							  Method
No	Class	Method	Parameter/Return	Count	Sum (ms)	Max (ms)	
1	com.virtual.dao.Remot...	execute	()V	27	39,063	2,776	
2	com.virtual.dao.PITest	exec	(Ljava/sql/PreparedSta...	3	0	0	
3	com.virtual.dao.InsertD...	execute2	(Ljava/lang/String;)V	2	4	3	
4	com.virtual.dao.Update...	execute2	(Ljava/lang/String;)V	2	18	14	
5	com.virtual.dao.Delete...	execute	()V	2	3	2	
6	com.virtual.dao.Select...	execute2	(Ljava/lang/String;)V	1	5	5	
7	com.virtual.dao.Update...	execute	()V	1	4	4	
8	com.virtual.dao.Select...	execute2	()V	1	7	7	
9	com.virtual.dao.Select...	execute	()V	1	9	9	
10	com.virtual.dao.InsertD...	execute2	()V	1	3	3	

To see only the method data, select the **Methods** tab. It displays the method name and step time for which tracing has been set on the agent. When unnecessary logics are repeatedly executed, it can be used as analysis data to improve the method logic by finding the case where the execution takes longer than the low count.

- : You can see the **Transaction statistics** information. If a graph on the chart is selected, the **Analysis > Transaction Search** menu appears. You can see the list of transactions for the selected time zone.

-  **Method:** You can download the method-related details as a TXT file.

 For more information about the agent configuration options on methods, see [the following](#). Method tracing support may differ depending on the product in use.

SQLs

Record summary	Table view	Tree view	Active stack	Methods	SQLs	HTTP calls	Transaction log
/account/read/unit/jeju							 SQL
No	Database	SQL	Count	Sum (ms)	Max (ms)		
1	jdbc:mysql://localhost:...	DELETE FROM Custom...	2	0	0		
2	jdbc:mysql://localhost:...	SELECT distance, lat, lo...	1	0	0		
3	jdbc:mysql://localhost:...	SELECT distance, lat, lo...	1	0	0		
4	jdbc:mysql://localhost:...	UPDATE emp set e.ena...	1	0	0		
5	jdbc:mysql://localhost:...	update table set x=# w...	1	0	0		
6	jdbc:mysql://localhost:...	SELECT p.Name AS Pr...	1	0	0		
7	jdbc:mysql://localhost:...	SELECT customer_info...	1	0	0		
8	jdbc:mysql://localhost:...	INSERT INTO EMP VAL...	1	1	1		

To check the SQL statement information, select the **SQLs** tab. In case of unnecessarily repetitive execution, it can be used as analytical data to improve query performance by finding the case where the execution time takes longer compared to the low count.

- : You can see the **Transaction statistics** information. If a graph on the chart is selected, the **Analysis > Transaction Search** menu appears. You can see the list of transactions for the selected time zone.
-  **SQL:** You can download the SQL-related details as a TXT file.

HTTP calls

Record summary	Table view	Tree view	Active stack	Methods	SQLs	HTTP calls	Transaction log
----------------	------------	-----------	--------------	---------	------	------------	-----------------

/account/read/unit/jeju							 HTTP
No	Remote server	URL	Count	Sum (ms)	Max (ms)		
1	127.0.0.1:8105	/remote/account/save...	2	4,116	2,776		
2	127.0.0.1:8105	/remote/order/save/di...	1	238	238		
3	127.0.0.1:8105	/remote/sales/pickup/...	1	922	922		
4	127.0.0.1:8105	/remote/sales/remove...	1	1,980	1,980		
5	127.0.0.1:8105	/remote/order/save/de...	1	2,639	2,639		
6	127.0.0.1:8105	/remote/edu/kill/unit/p...	1	1,519	1,519		
7	127.0.0.1:8105	/remote/order/read/de...	1	1,467	1,467		
8	127.0.0.1:8105	/remote/order/delete/...	1	485	485		
9	127.0.0.1:8105	/remote/sales/kill/emp...	1	2,210	2,210		

To see the count, time sum, average time, and such for HTTP calls, select the **HTTP calls** tab. If unnecessary external calls are repeatedly executed, it can be used as analytical information to determine whether the transaction delays are external or internal by finding the cases where the execution time takes longer compared to the low count.

- : You can see the **Transaction statistics** information. If a graph on the chart is selected, the **Analysis > Transaction Search** menu appears. You can see the list of transactions for the selected time zone.
-  **HTTP**: You can download the HTTP call-related details as a TXT file.

Transaction log

To see the logs of the transaction, select the **Transaction log** tab.

Transaction information			
Record summary	Table view	Tree view	Multi transaction
Methods	SQLs	HTTP calls	Transaction log

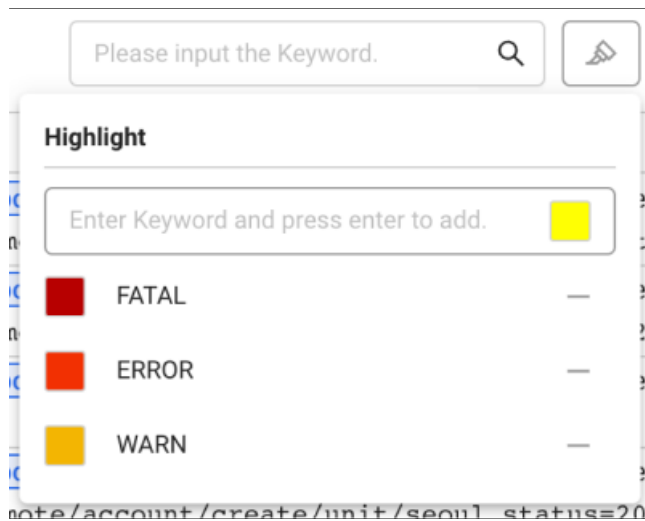
/sales/save/division/daejun			
Log search > Please input the Keyword.    			
▶	oname	Timestamp	Log
▶	java-demo2	2025-04-16 09:17:12.571	@txid 2737043795003671073 pcode 8 onodeName node-1 oid -1737750367 okind 867318026 oname java-demo2 agentime 1744762632114 select distinct pp.lastname, pp.firstname
▶	java-demo2	2025-04-16 09:17:12.773	@txid 2737043795003671073 pcode 8 onodeName node-1 oid -1737750367 okind 867318026 oname java-demo2 agentime 1744762632155 select
▶	java-demo2	2025-04-16 09:17:12.773	@txid 2737043795003671073 pcode 8 onodeName node-1 oid -1737750367 okind 867318026 oname java-demo2 agentime 1744762632193 select productid, avg(orderqty) as averagequantity, sum(linetotal) as total

- : You can see the **Transaction statistics** information. If a graph on the chart is selected, the **Analysis > Transaction Search** menu appears. You can see the list of transactions for the selected time zone.
- **Log Search**: You can go to Log Search to easily find the desired log data.
- **Keyword search**: Enter the desired text to search in the keyword search field, and then press Enter or select the  button. It highlights the keywords that match the entered text.
-  **Keyword highlight**: If you set the keyword and color, the texts that match the keyword are automatically highlighted in the log list. For more information, see [the following](#).
-  **Column settings**: You can add columns or change the order of columns displayed in the log list table. For more information, see [the following](#).
-  **Log view detail setting**: You can configure the items to be displayed in the log list. For more information, see [the following](#).

-  To enable the **Transaction log** tab, apply the agent setting options related to the logs. For more information about the log settings, see [the following](#).
- The **Transaction log** tab can be accessed by only the members with the **View log** role. For more information about the member roles, see [the following](#).

Setting the keyword highlight

1. To add keywords to highlight, select .



2. Enter a desired keyword.
3. Select the color icon and then select a desired color.
4. Press Enter. The added keywords are added in the list.

Deleting the keyword highlight

To delete the items unused from the highlight list, select —.

Displaying or hiding the table columns

1. Select  on the upper right of the table.
2. If the **Column settings** window appears, select or unselect the desired item in the list on the left.
You can also hide columns by selecting the  button in the list on the right.
3. After all settings are finished, select **Confirm**. The set content is applied to the table.

Reordering the table columns

1. Select  on the upper right of the table.
2. When the **Column settings** window appears, change the order by dragging the desired items from the list on the right.

3. After all settings are finished, select **Confirm**. The set content is applied to the table.

Setting to display the table content

1. Select  on the upper right of the table.
2. When the **Log view detail setting** window appears, set the desired options.
 - Select **content** or **Tag** to determine whether or not to display the log content.
 - **Tag management**: Tags are displayed in the log in the order of addition. The order of tags can be changed by dragging. Disabled tags do not appear in the logs.
3. After all settings are finished, click **×**. The set content is applied to the table.

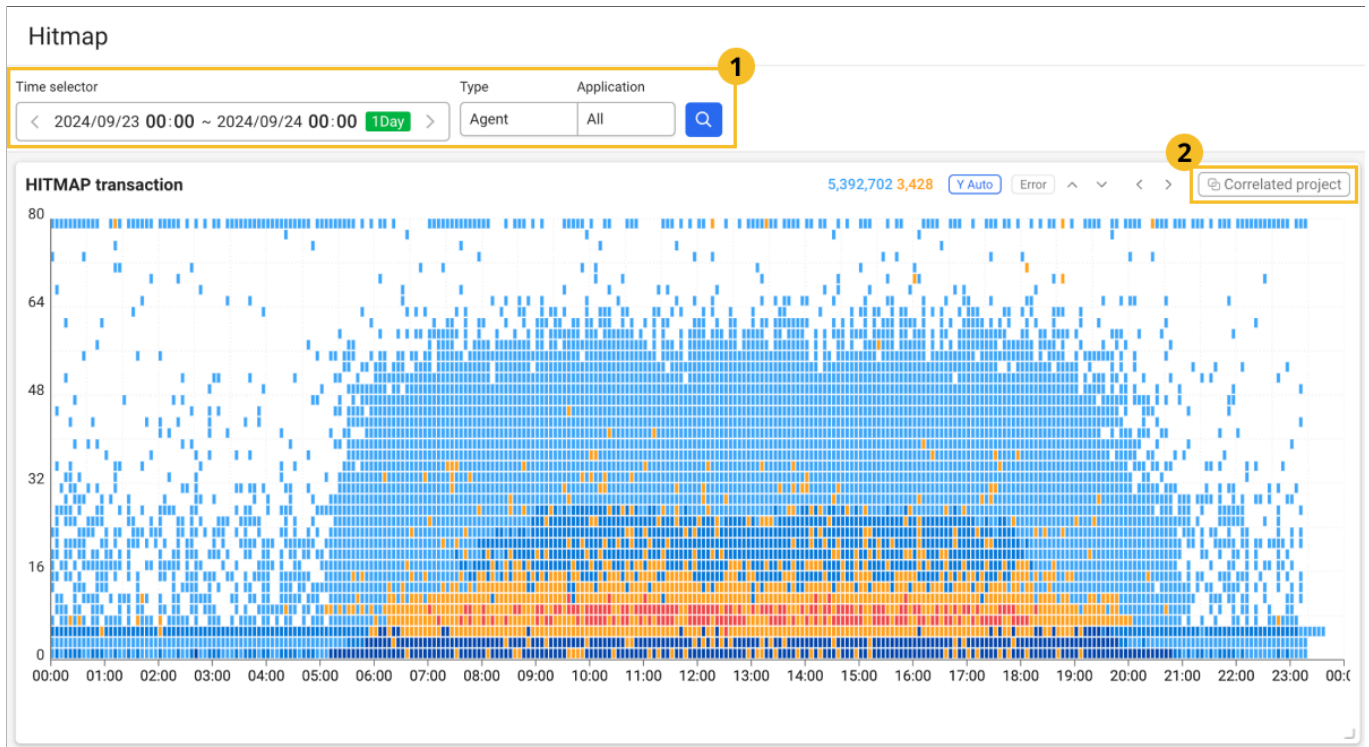
 For more information about **Log view detail setting**, see [the following](#).

Additional options

Checking the correlated project metrics

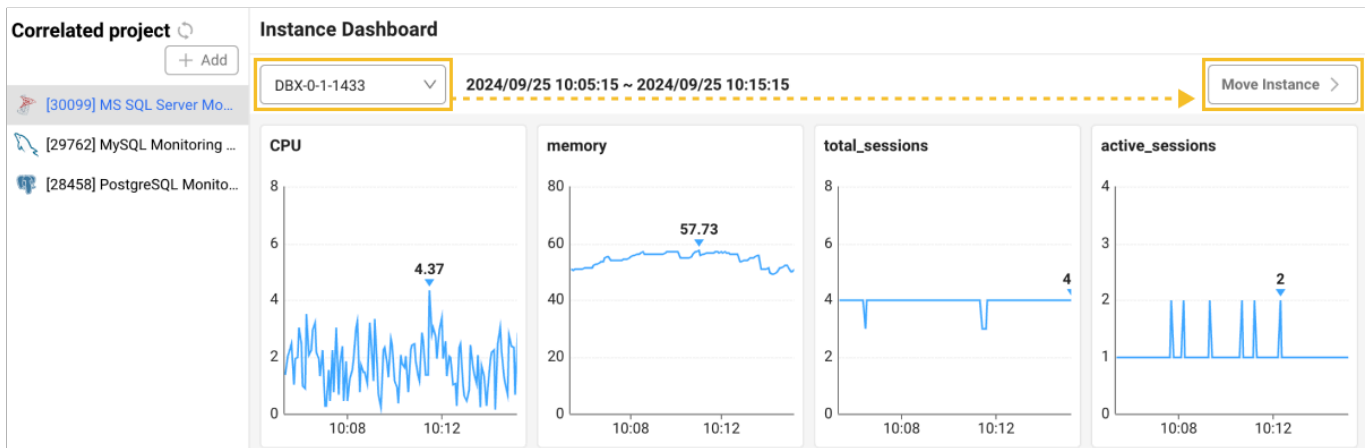
If you have created a database monitoring (DPM) project and an application monitoring (APM) project, you can relate the two projects for monitoring the data collected from DPM in the APM project. You can see performance metrics of the correlated projects while querying transactions via the **Correlated project** feature on the upper right of the **HITMAP transaction** section.

The **Correlated project** feature is useful when analyzing transactions in the APM project. When you found a slow SQL, it is difficult to determine exactly in which DB the problem occurred in the environment using multiple similar DBs.



1. Set the time and **Application** for viewing the transactions, and then select .
2. In the **HITMAP transaction** section, select **Correlated project** on the upper right.
3. A new window appears where you can check the metrics for the correlated project.

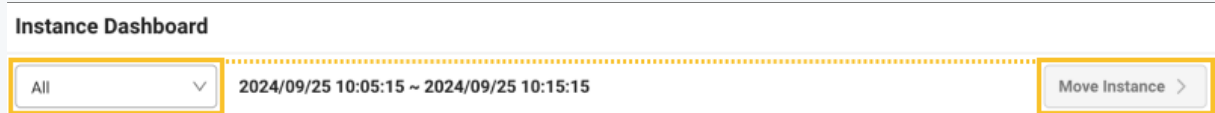
Select the correlated project from the left list and then check the metrics in the **Instance dashboard** section.



To navigate to the dashboard menu for a selected project, select an instance and then click **Move instance** on

the upper right. Go to **Dashboard > Monitoring a Database Instance**.

- The **HITMAP transaction** button in the **Correlated project** section appears only when there is an associated project. For more information about adding a correlated project, see [the following](#).
- You can add a project by selecting **Correlated project** at the top of the left **Add** list.
- The **Move instance** button is disabled when **All** is selected.



- Depending on the database product type, you can navigate to the **Analysis > Counts Trend** menu.

Viewing HTTP parameters

You can view the HTTP parameters of the transaction in the **Table view** tab.

1. Scroll down the page to the final step of the transaction.
2. Select the  **HTTP parameters** item.
3. If the **HTTP-PARAMETERS** window appears, select **Password**.
4. Enter the specified Param Key. You can see the hidden parameters.

- For the agent settings for HTTP parameters, see [the following](#).
- **Password:** You can see the decrypted parameter value. The password is a 6-digit string in the `WHATAP_HOME /paramkey.txt` file. You can change it to another string. The key in `paramkey.txt` is required to view the SQL variables and HTTP queries, and stop the threads.

Viewing SQL parameters

Select the SQL step in the **Table view** tab or select  in the **Tree view** tab. The **SQL** window appears to display parameters.

SQL

Connection URL jdbc:mysql://localhost:3306,localhost:3310/fake@BasicDataSource

CPU accumulation 3ms

Memory accumulation 329,752byte

Query (Hash: -2057375474)

SID 107

🔒 Password

SQL format

📄

Statistics >

```
insert into
dept
values(
#, '#', '#')
```

Substitution variables

The parameter does not exist or decryption has failed.

Please check your password at [paramkey.txt] in the agent installation path to decrypt parameters.

- **Password:** You can see the decrypted parameter value. The password is a 6-digit string in the `WHATAP_HOME /paramkey.txt` file. You can change it to another string.

❗ The key in `paramkey.txt` is required to view the SQL variables and HTTP queries, and stop the threads.

- **SQL format:** You can indent and format your SQL statements for better readability.
- 📄: A SQL statement can be copied to the clipboard.
- **Statistics:** Go to **Statistics > SQL**.

✅ To search SQL variables and HTTP queries, add the following options to the agent settings.

- For agent settings related to recording SQL parameters, see [the following](#).
- For agent settings related to recording the HTTP parameters, see [the following](#).

whatap.conf

```
# SQL parameter lookup option: If the option is applied, SQL parameters are collected after being encrypted.
profile_sql_param_enabled=true
```

```
// HTTP parameter lookup option: If the option is applied, HTTP query parameters are collected after being encrypted.
```

213



```
profile_http_parameter_enabled=true
```

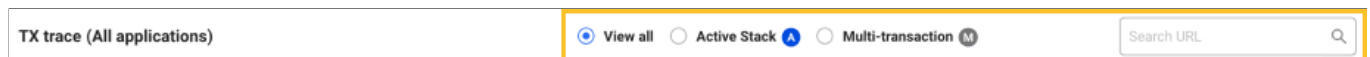
Setting the columns in the trace list

You can additionally see the details about the search result by setting the columns in the **TX trace** section.

1. In the **TX Trace** area, click the  **Select Column** button.
2. Select or deselect the desired column items. The changes are immediately reflected in the table.
 - **Select all:** It selects all columns.
 - **Deselect all:** All columns are unselected.
 - **Initialize(default):** The column is set as the default value.
3. Once finished, click the  icon in the upper-right corner.

Filtering the trace list

You can filter the results retrieved from the **TX trace** section using the following options:



- **View all:** You can see all transactions in the viewed result.
- **Active Stack:** Only the transactions that include active stacks can be viewed in the searched result.
- **Multi-transaction:** Only the transactions including multi-transactions can be checked in the searched result.
- **Search URL:** Only transactions containing items that match the entered string are displayed. Enter a desired string and then press  on the keyboard.
 - **Transaction**
 - **Client IP**
 - **Domain**
 - **Error class**
 - **Error message**

Downloading the viewed list

You can download the results retrieved from the **TX trace** section as a CSV file. The formation of the downloaded CSV file is **profile** {project_code} YYYYMMDD .csv.

1. After viewing the transactions, select .
2. Enter a desired value in the **Maximum CSV lines** option.
3. Select **Download**.

Multiple Transaction Trace

Multi-transaction means the transaction involving a different agent or project. **Multiple Transaction Trace** is to trace calls between the application services registered in the WhaTap project.

! Enabling the multi-transaction

To trace multi-transactions, set the `mtrace_enabled` option to `true` in **Management > Agent CONFIG..** For more information about the agent configuration, see [the following](#).

Checking the multi-transaction ID

To use the **Multiple Transaction Trace** menu, **MTID** (Multi Transaction ID) is required. Through the following procedure, you can find the **MTID** value.

1. In **Analysis > Hitmap**, drag the chart area.
2. The transaction information in the dragged chart area is displayed in the **TX trace** list below as follows.

TX trace (All applications)									
Start time	Elapsed time	Transaction	HTTP call t.	SQL count	SQL time	SQL patch..	DB CONN..	Error class	Error message
2023/10/06 09:56:10.918	40.275	/account/read/unit/darun	17.686	2	86	421	40		
2023/10/06 09:54:39.622	40.338	/account/kill/division/seoul	18.513	3	425	1,231	160		
2023/10/06 09:57:15.090	40.481	/account/remove/division/pusan	4.609	4	35,854	1,693	4	SLOW_SQL	SLOW_SQL
2023/10/06 10:06:56.588	40.521	/product/load/division/darun	14.292	7	528	0	7		
2023/10/06 09:54:42.541	40.554	/product/remove/employee/darun	12.413	8	444	713	175		
2023/10/06 09:59:29.442	40.649	/account/delete/dept/darun	20.826	4	53	426	32		
2023/10/06 10:02:54.198	40.763	/info/delete/unit/kwangju	15.399	8	156	1,036	10		
2023/10/06 10:02:52.457	41.140	/account/create/employee/kwangju	15.916	4	102	1,483	10		
2023/10/06 10:02:52.815	41.179	/order/remove/division/seoul	15.472	6	323	276	9		
2023/10/06 09:58:59.804	41.278	/sales/read/dept/seoul	18.451	1	0	0	2		
2023/10/06 10:07:00.078	41.356	/product/write/unit/kwangju	15.122	5	398	0	106		
2023/10/06 09:58:38.422	41.664	/account/read/unit/darun	13.241	7	7,308	1,817	12		
2023/10/06 09:56:02.316	41.820	/account/remove/dept/pusan	18.508	1	16	631	3		
2023/10/06 09:59:03.822	41.949	/account/kill/employee/kwangju	19.084	2	56	0	2		
2023/10/06 09:54:53.750	41.953	/account/pickup/employee/kwangju	15.812	3	105	865	149		

3. If you select the trace with the **M** icon displayed, the **Transaction information** window appears.
4. In the **Record summary** tab, you can see the **Multi transaction ID** value.

Transaction information			
Record summary Table view Tree view Multi transaction Methods SQLs HTTP calls Transaction log			
Transaction	/account/read/unit/daejun		
Original URL			
Project code	5490	Status	200
Error level	0		
Elapsed time	539ms		
Start time	24/09/24 02:58:54.321	End time	24/09/24 02:58:54.860
User agent	Mozilla/5.0 (Windows; U; Windows NT 6.1; en-US; rv:2.0b10) Gecko/20110126 Firefox/4.0b10		
Transaction ID	1042214955815327991	Multi transaction ID	1313271254884040742
Agent name (oname)	demo-8104	Agent ID (oid)	-1143239575
Agent group name	demo-kind-0	Agent group ID	-1383513482
Agent server name	node-0	Agent server ID	1693789385

- The same **Multi transaction ID** is generated even if the transaction makes an external call. Even if projects are separated by service, all transactions between applications can be found through the initially issued **Multi transaction ID**. For more information about the detailed analysis of transaction trace through the **Transaction information** window, see [the following](#).
- If you select **Multi transaction ID** in the **Transaction information** window, the **Multi transaction** tab appears. The transactions and trace data are provided so that you can see various call relationships at a glance within or between systems, and identify where problems occurred for improvement.

Using the multi-transaction tracing feature

1. Go to **Analysis > Multiple Transaction Trace**.
2. Enter the **MTID** value found in the **Transaction information** window into the **Search by MTID / CUSTID** field.
3. Select the date and project you want to query.
4. Click the **Apply** button at the bottom of the screen.
 - The **Apply** button becomes disabled in the following cases:
 - When the same filter values (MTID/CUSTID, date, selected project) as the previous search are set.
 - When none of the filter values (MTID/CUSTID, date, selected project) are entered.
5. The right **Chart** tab displays a diagram and a table that allow you to understand the call relationships of

each transaction.

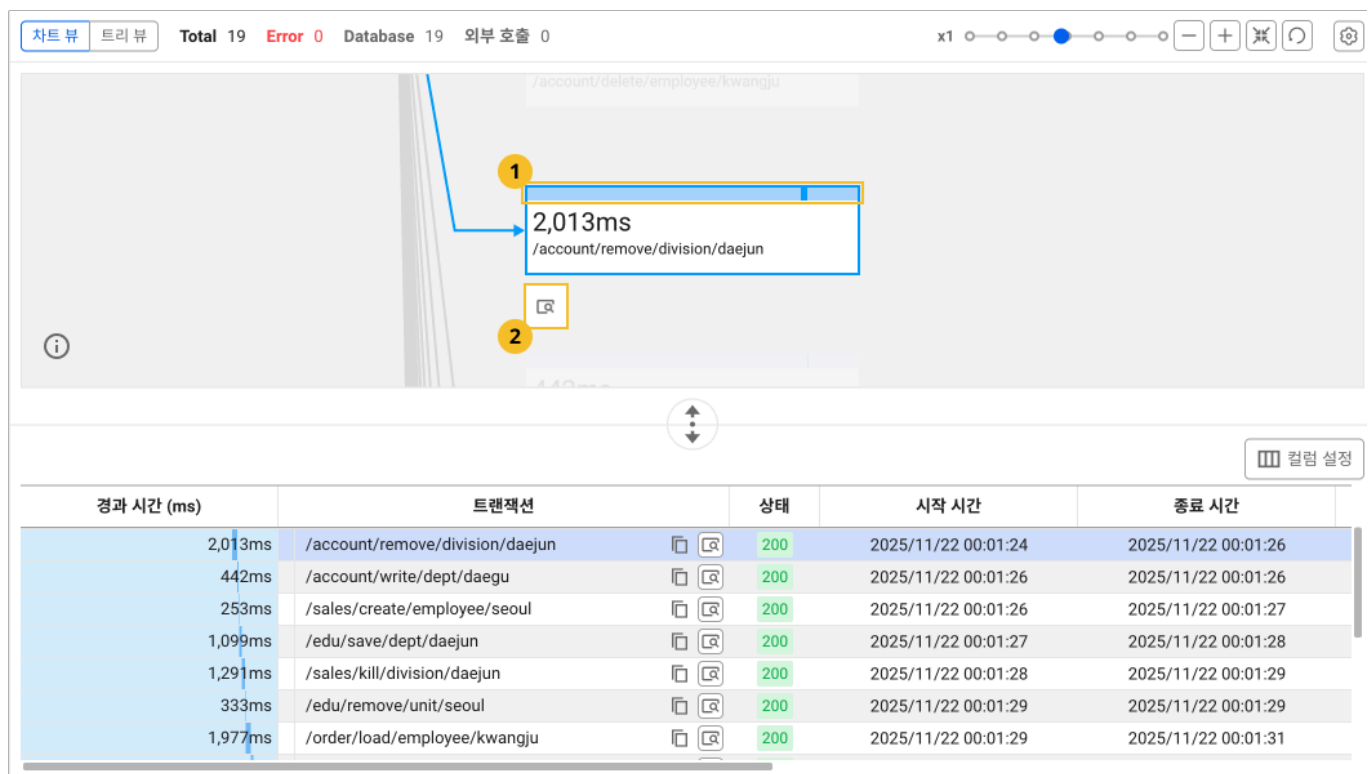
- ✓ The diagram and table areas are divided vertically, and you can adjust their ratio manually.
 - Clicking the upward arrow makes the table occupy the entire area. However, if the diagram area was occupying the entire area, the diagram and table will split into equal halves.
 - Clicking the downward arrow makes the chart (diagram) area occupy the entire area. However, if the table area was occupying the entire area, the diagram and table will split into equal halves.

Chart

Chart provides a fast and clear view of the call relationships between transactions.

You can check the individual execution times of transaction services that share the same **Multi transaction ID**.

The elapsed time displayed at the top of each transaction node (**1 Time Bar**) allows you to understand the call flow between transactions.



✓ You can freely move, zoom in, or zoom out of the chart with your mouse.

- Drag within the chart area to move it.
- Scroll within the chart area to move vertically or horizontally.
 - Vertical scroll: move up/down
 - Horizontal scroll: move left/right
- Hold **Ctrl** + scroll up/down to zoom in or out.
 - Pinch zoom on a touchpad is also supported.

When you select a transaction, only the connected nodes remain active, while all unrelated nodes are dimmed. The **Detail View** button (2) at the bottom of the selected transaction becomes active.

Clicking it opens the **Transaction information** window, where you can view detailed transaction information.

For more details on analyzing transaction traces using the **Transaction information** window, refer to the following document: [Transaction Info](#).

-  **Zoom In**
-  **Zoom Out**
-  **Fit to Screen**: Display all nodes to fit the visible area.
-  **Reset Zoom**: Restore the initial chart zoom and position.
-  **Chart View Settings**: Show or hide chart elements.
 - **More information**: Show/hide application name, project info, IP, status code.
 - **Database / External**: Display other database connections or external HTTP calls as nodes in the chart.

Table

In the **Table** tab, you can see information for each transaction included in a multi-transaction in the table format.

If you select each transaction, the **Transaction information** window for the selected transaction appears, similar to selecting a node on the **Chart** tab. The transaction trace allows you to see the transaction details. For more information about the detailed analysis of transaction trace through the **Transaction information** window, see [the following](#).

 **Column Settings**: You can edit the columns in the table.

Tree

In the **Tree** tab, you can see each transaction and its trace details. The transactions within the overall transaction time or start times and step times of each trace to provide transaction call relationships in a tree format.

-  **Single-line View:** You can arrange the tree format at intervals by displaying the texts displayed in the execution data for each section in a single line.
-  **Multi-line View:** All the texts displayed in the execution data for each section, appear by wrapping words.
- **Longest Path:** The longest route can appear.
-  **Show Time Bar:** The elapsed times are displayed in a bar chart.
-  **Show Time:** The timestamps, gaps, and elapsed times for each segment are displayed in text.
 - 8 seconds or more: **Excessive delay** state is distinguished in **red**.
 - Between 3 and 8 seconds: **Delay** state is distinguished in **orange**.
 - Less than 3 seconds: **Normal** state is distinguished in **blue**.

 In case of start and step times, the time differences caused by the transaction call environment are corrected on the screen through traces and mappings in the parent transactions. Accordingly, there may be differences from the actual time data.

-  **Hide Time:** The time is hidden.

 If you select  button or  button, you can see the summary window such as **HTTP call statistics** and **Active stack**.

-  To search SQL variables and HTTP queries, add the following options to the agent settings.
 - For agent settings related to recording SQL parameters, see [the following](#).
 - For agent settings related to recording the HTTP parameters, see [the following](#).

whatap.conf

```
# SQL parameter lookup option: If the option is applied, SQL parameters are collected after being encrypted.
```




```
profile_sql_param_enabled=true
```

```
// HTTP parameter lookup option: If the option is applied, HTTP query parameters are collected after being encrypted.
```

```
profile_http_parameter_enabled=true
```

Transaction Search

Home > Select Project > **Analysis** > **Transaction Search**

You can view the statistics on the performance properties and execution status for each transaction for a specific period of time. You can view all transactions and quickly check their status (normal or error). Through the provided information, you can find which transactions are busy and resource-consuming. Various filters can be enabled depending on the transaction properties, making it useful in finding transactions with specific conditions.

Transaction Search

Time selector

Application

< 2024/03/06 00:00 ~ 2024/03/06 23:59 1Day > All selected

Filter

+ Elapsed time

+ Error message

+ HTTP call count

+ SQL count

+ SQL fetch count

+ Transaction

+ Client IP

+ Domain

+ User agent

+ Referer

+ Transaction ID

+ Multi transaction ID

+ WClientID

+ Login ID

☐ Errors only

🔍

📄 CSV

Select Column

	Agent name (oname)	Start time	End time	Elapsed time	Transaction	CPU usage...	HTTP call ...	SQL count	SQL fetch c...
ⓘ Please use filter for detailed search It supports data search by multiple search conditions. If the search range is too large, there is a limit to data extraction.									

Set the query time and then select the target from the **Application** option. Select . Then the searched results appear in the table. If you select desired items from the result list, the **Transaction information** window appears. For more information about the detailed analysis of transaction trace through the **Transaction information** window, see [the following](#).

- To search for transactions in error, click **Errors only** and then select .
- It is recommended to set the search time as short as possible because a response delay may occur depending on the search conditions.

Editing columns

Select all Deselect all Initialize(default)
×

☐ Agent	☐ Client	☐ Error	☐ HTTP call	☐ Resource	☐ SQL	☐ Transaction
☐ Container Id	☐ City	☐ Error class	☒ HTTP call count	☒ CPU time	☐ DB CONN. time	☐ Active
☐ Agent ID	☐ Client OS Pro	☐ Error level	☐ HTTP call time	☐ Memory allocation	☒ SQL fetch count	☐ Custom TID
☐ Agent group ID	☐ Country/Region	☐ Error message			☐ Fetch time	☐ Domain
☐ Agent group	☐ IP				☐ URL hash	☒ Elapsed time
☒ Agent name	☐ Login				☒ SQL count	☒ Endtime
☐ Agent node ID	☐ UserAgent				☐ SQL time	☐ Multi caller
☐ Agent node	☐ UserAgent hash					☐ Call depth
☐ pcode	☐ User type					☐ HTTP method
☐ Pod name	☐ Client ID					☐ Multi-transaction ID
☐ Sub type						☐ referer
						☒ URL

When viewing results, click  **Select Column** and then select the columns to be checked.

Applying filters

Use filters for more details. Data exploration is supported using multiple search conditions. After setting a filter(s), select .

- Some filters may not be supported depending on the product.

Elapsed time

Transaction Search

Time selector: < 2024/03/06 00:00 ~ 2024/03/06 23:59 **1Day** > Application: All selected

Filter: **- Elapsed time** 1000 5000 + Error message + HTTP call count + SQL count + SQL fetch count + Transaction + Client IP + Domain + User agent + Referer + Transaction ID + Multi transaction ID + WClientID + Login ID ☐ Errors only

Search CSV

Select Column

	Agent name (oname)	Start time	End time	Elapsed time	Transaction	CPU usage...	HTTP call ...	SQL count	SQL fetch c...
1	demo-8101	2024/03/06 00:00:00.034	2024/03/06 00:00:01.101	1,067	/account/save/dept/daejun	1	0	11	6,789
2	demo-8104	2024/03/06 00:00:00.176	2024/03/06 00:00:01.333	1,157	/product/remove/dept/pusan	2	0	11	7,112
3	demo-8100	2024/03/06 00:00:00.326	2024/03/06 00:00:01.466	1,140	/account/load/employee/daejun	1	0	11	6,406
4	demo-8103	2024/03/06 00:00:00.419	2024/03/06 00:00:01.485	1,066	/account/delete/dept/kwangju	1	0	11	5,260

Search based on the transaction response time. Search by entering two values above and below the reference.

Error message

Transaction Search

Time selector: < 2024/03/06 00:00 ~ 2024/03/06 23:59 **1Day** > Application: All selected

Filter: + Elapsed time - **Error message** Exception + HTTP call count + SQL count + SQL fetch count + Transaction + Client IP + Domain + User agent + Referer + Transaction ID + Multi transaction ID + WClientID + Login ID ☐ Errors only

Search CSV

Select Column

	Agent name (oname)	Start time	End time	Elapsed time	Transaction	CPU usage...	HTTP call ...	SQL count	SQL fetch ...	Error message
1	demo-8103	2024/03/06 00:12:53.906	2024/03/06 00:12:58.573	4,667	/account/remove/unit/seoul	3	4	3	1,087	Sql Exception
2	demo-8100	2024/03/06 00:16:25.087	2024/03/06 00:22:23.228	358,141	/product/read/employee/kwangju	0	5	1,002	496,079	Internal RuntimeExcepti on
3	demo-8101	2024/03/06 00:38:34.574	2024/03/06 00:38:40.742	6,168	/edu/remove/division/seoul	2	3	4	0	Internal RuntimeExcepti on
4	demo-8105	2024/03/06 00:40:54.078	2024/03/06 00:40:59.192	5,114	/product/save/employee/jeju	3	4	3	1,166	Sql Exception

Search based on the transaction error message. In the default state, error-related columns may not be seen. Select a column.

! Transactions in error are displayed in red.

HTTP call count

Transaction Search

Time selector: < 2024/03/06 00:00 ~ 2024/03/06 23:59 1Day > Application: All selected

Filter: + Elapsed time + Error message **- HTTP call count 3** + SQL count + SQL fetch count + Transaction + Client IP + Domain + User agent + Referer + Transaction ID + Multi transaction ID

+ WClientID + Login ID ☐ Errors only

Search CSV

Select Column

	Agent name (oname)	Start time	End time	↓ Elapsed time	Transaction	CPU usage...	HTTP call count	SQL count	SQL fetch c...
1	demo-8104	2024/03/06 00:00:00.176	2024/03/06 00:00:07.006	6,830	/account/read/unit/kwangju	0	4	3	1,139
2	demo-8105	2024/03/06 00:00:01.949	2024/03/06 00:00:07.857	5,908	/product/read/dept/pusan	0	4	4	760
3	demo-8101	2024/03/06 00:00:01.034	2024/03/06 00:00:09.403	8,369	/product/kill/dept/pusan	0	6	8	3,343
4	demo-8102	2024/03/06 00:00:01.650	2024/03/06 00:00:09.475	7,825	/account/delete/division/kwangju	0	5	3	0

It searches for the transactions that exceed the specified number based on the number of calls for external HTTP services.

SQL count

Transaction Search

Time selector: < 2024/03/06 00:00 ~ 2024/03/06 23:59 1Day > Application: All selected

Filter: + Elapsed time + Error message + HTTP call count **- SQL count 1200** + SQL fetch count + Transaction + Client IP + Domain + User agent + Referer + Transaction ID + Multi transaction ID

+ WClientID + Login ID ☐ Errors only

Search CSV

Select Column

	Agent name (oname)	Start time	End time	↓ Elapsed time	Transaction	CPU usage...	HTTP call ...	SQL count	SQL fetch co...
1	demo-8101	2024/03/06 00:00:00.034	2024/03/06 00:04:50.282	290,248	/sales/read/unit/kwangju	0	9	2,002	992,790
2	demo-8101	2024/03/06 00:24:06.096	2024/03/06 00:29:00.821	294,725	/product/create/division/daejun	327	2	2,002	993,322
3	demo-8103	2024/03/06 00:20:19.152	2024/03/06 00:29:31.244	552,092	/account/write/employee/kwangju	0	2	2,002	1,001,229
4	demo-8103	2024/03/06 00:24:30.544	2024/03/06 00:46:15.140	1,304,596	/edu/read/unit/pusan	352	1	2,000	1,000,654

It searches for the transactions where the number of SQL executions per transaction is greater than or equal to the specified number. Exceptionally, this is used to search transactions that call SQLs excessively.

SQL fetch count

Transaction Search

Time selector: < 2024/03/06 00:00 ~ 2024/03/06 23:59 1Day > Application: All selected

Filter: + Elapsed time + Error message + HTTP call count + SQL count + SQL fetch count 500000 + Transaction + Client IP + Domain + User agent + Referer + Transaction ID + Multi transaction ID

+ WClientID + Login ID ☐ Errors only

Search CSV

Select Column

	Agent name (oname)	Start time	End time	Elapsed time	Transaction	CPU usage...	HTTP call ...	SQL count	SQL fetch count
1	demo-8103	2024/03/06 00:00:00.419	2024/03/06 00:02:27.984	147,565	/order/pickup/division/jeju	0	5	1,006	505,725
2	demo-8101	2024/03/06 00:00:00.034	2024/03/06 00:04:50.282	290,248	/sales/read/unit/kwangju	0	9	2,002	992,790
3	demo-8102	2024/03/06 00:03:48.478	2024/03/06 00:05:01.167	72,689	/account/load/dept/kwangju	165	15	1,006	507,850
4	demo-8104	2024/03/06 00:03:55.851	2024/03/06 00:05:07.832	71,981	/account/write/unit/jeju	167	15	1,005	502,953

After executing an SQL, it searches for the transactions exceeding the specified number based on the number of DB patches. Use this to search transactions that perform excessive data fetches.

Transaction

Transaction Search

Time selector: < 2024/03/06 00:00 ~ 2024/03/06 23:59 1Day > Application: All selected

Filter: + Elapsed time + Error message + HTTP call count + SQL count + SQL fetch count + Transaction account + Client IP + Domain + User agent + Referer + Transaction ID + Multi transaction ID

+ WClientID + Login ID ☐ Errors only

Search CSV

Select Column

	Agent name (oname)	Start time	End time	Elapsed time	Transaction	CPU usage...	HTTP call ...	SQL count	SQL fetch c...
1	demo-8101	2024/03/06 00:00:00.034	2024/03/06 00:00:01.101	1,067	/account/save/dept/daejun	1	0	11	6,789
2	demo-8100	2024/03/06 00:00:00.326	2024/03/06 00:00:01.466	1,140	/account/load/employee/daejun	1	0	11	6,406
3	demo-8103	2024/03/06 00:00:00.419	2024/03/06 00:00:01.485	1,066	/account/delete/dept/kwangju	1	0	11	5,260
4	demo-8100	2024/03/06 00:00:01.326	2024/03/06 00:00:02.566	1,240	/account/write/unit/daejun	2	0	11	6,106

It searches based on the transaction. The entered search string is compared and searched by inclusion (partial matching).

Client IP

Transaction Search

Time selector: < 2024/03/06 00:00 ~ 2024/03/06 23:59 1Day > Application: All selected

Filter: + Elapsed time + Error message + HTTP call count + SQL count + SQL fetch count + Transaction + Client IP 50.182 + Domain + User agent + Referer + Transaction ID + Multi transaction ID

+ WClientID + Login ID ☐ Errors only

Search CSV

Select Column

	Agent name (oname)	Start time	End time	Elapsed time	Transaction	Client IP	CPU usage...	HTTP call ...	SQL count	SQL fetch c...
1	demo-8104	2024/03/06 00:00:05.938	2024/03/06 00:00:06.996	1,058	/account/delete/unit/jeju	50.182.206.151	1	0	11	6,898
2	demo-8105	2024/03/06 00:01:09.381	2024/03/06 00:01:10.530	1,149	/account/remove/division/daegu	50.182.206.151	1	0	11	5,140
3	demo-8101	2024/03/06 00:05:46.335	2024/03/06 00:05:47.728	1,393	/edu/kill/dept/kwangju	50.182.206.151	2	0	11	4,359
4	demo-8101	2024/03/06 00:10:10.715	2024/03/06 00:10:11.958	1,243	/order/read/dept/jeju	50.182.206.151	1	0	11	4,997

It searches transactions based on the client IP. However, IP strings are searched by prefix comparison (forward matching).

Domain

Transaction Search

Time selector: < 2024/03/06 00:00 ~ 2024/03/06 23:59 1Day > Application: All selected

Filter: + Elapsed time + Error message + HTTP call count + SQL count + SQL fetch count + Transaction + Client IP + Domain 255.255.255.255 + User agent + Referer + Transaction ID + Multi transaction ID

+ WClientID + Login ID ☐ Errors only

Search CSV

Select Column

	Agent name (oname)	Start time	End time	Elapsed time	Transaction	Domain	CPU usage...	HTTP call ...	SQL count	SQL fetch c...
1	demo-8102	2024/03/06 00:01:37.696	2024/03/06 00:01:47.736	10,040	/edu/kill/employee/kwangju	255.255.255.255	4	8	2	509
2	demo-8102	2024/03/06 00:03:27.111	2024/03/06 00:03:30.926	3,815	/edu/remove/unit/daegu	255.255.255.255	0	2	1	471
3	demo-8104	2024/03/06 00:14:19.100	2024/03/06 00:14:22.568	3,468	/sales/kill/dept/seoul	255.255.255.255	2	3	0	0
4	demo-8101	2024/03/06 00:24:06.096	2024/03/06 00:29:00.821	294,725	/product/create/division/daejun	255.255.255.255	327	2	2,002	993,322

Retrieve transactions based on the HTTP service domain (host:port). The search conditions must match the domain completely (full match).

User agent

Transaction Search

Time selector: < 2024/03/06 00:00 ~ 2024/03/06 23:59 **1Day** > Application: All selected

Filter: + Elapsed time + Error message + HTTP call count + SQL count + SQL fetch count + Transaction + Client IP + Domain **- User agent** Chrome + Referer + Transaction ID + Multi transaction ID

+ WClientID + Login ID ☐ Errors only

Search CSV

Select Column

	Agent name (oname)	Start time	End time	↓ Elapsed time	Transaction	CPU usage...	HTTP call ...	SQL count	SQL fetch ...	User agent
1	demo-8103	2024/03/06 00:00:00.419	2024/03/06 00:00:01.485	1,066	/account/delete/dept/kwangju	1	0	11	5,260	Mozilla/5.0 (X11; U; Linux x86_64; en-US; AppleWebKit/532.2 (KHTML, like Gecko) Chrome/4.0.222.5 Safari/532.2
2	demo-8105	2024/03/06 00:00:01.950	2024/03/06 00:00:03.379	1,429	/account/save/dept/daegu	2	0	11	5,293	Mozilla/5.0 (Macintosh; AMD Mac OS X 10.8.2) AppleWebKit/535.22 (KHTML, like Gecko) Chrome/18.6.872

Search transactions based on the user agent (partial match).

Transaction ID

Transaction Search

Time selector: < 2024/02/28 00:00 ~ 2024/02/28 23:59 **1Day** > Application: All selected

Filter: + Elapsed time + Error message + HTTP call count + SQL count + SQL fetch count + Transaction + Client IP + Domain + User agent + Referer **- Transaction ID** 6703915381101427655 + Multi transaction ID

+ WClientID + Login ID ☐ Errors only

Search CSV

Select Column

	Agent name (oname)	Start time	End time	↓ Elapsed time	Transaction	CPU usage...	HTTP call ...	SQL count	SQL fetch ...	Transaction ID
1	demo-8101	2024/02/28 00:00:00.419	2024/02/28 00:00:01.798	1,379	/product/kill/employee/daejun	2	0	11	5,748	6703915381101427655

Search transactions based on their transaction ID (full match). For transaction IDs, the search indexes are created for searching at a high speed.

- ! The transaction ID can be found in the **Record summary** tab of the **Transaction information** window. For more information, see [the following](#).
- If you are not using the latest version of the agent, a full scan may occur rather than using indexes.

Multi transaction ID

Transaction Search

Time selector: < 2024/03/06 00:00 ~ 2024/03/06 23:59 **1Day** > Application: All selected

Filter: + Elapsed time + Error message + HTTP call count + SQL count + SQL fetch count + Transaction + Client IP + Domain + User agent + Referer + Transaction ID **- Multi transaction ID 846085190067870005**

+ WClientID + Login ID ☐ Errors only

🔍 CSV

Select Column

	Agent name (oname)	Start time	End time	↓ Elapsed time	Transaction	CPU usage...	HTTP call ...	SQL count	SQL fetch ...	Multi transaction ID
1	demo-8104	2024/03/06 00:00:00.176	2024/03/06 00:00:01.333	1,157	/product/remove/dept/pusan	2	0	11	7,112	846085190067870005

Search transactions based on the multi-transaction ID (full match).

- If you are not using the latest version of the agent, a full scan may occur rather than using indexes.
- When searching with the **Multi transaction ID** filter applied, only the **Transaction ID** filter can be additionally applied.

WClientID

Transaction Search

Time selector: < 2024/03/06 00:00 ~ 2024/03/06 23:59 **1Day** > Application: All selected

Filter: + Elapsed time + Error message + HTTP call count + SQL count + SQL fetch count + Transaction + Client IP + Domain + User agent + Referer + Transaction ID + Multi transaction ID

- WClientID + Login ID ☐ Errors only

🔍 CSV

Select Column

	Agent name (oname)	Start time	End time	↓ Elapsed time	Transaction	CPU usage...	HTTP call ...	SQL count	SQL fetch ...	WClientID
1	demo-8104	2024/03/06 00:00:00.176	2024/03/06 00:00:01.333	1,157	/product/remove/dept/pusan	2	0	11	7,112	14468178612
2	demo-8101	2024/03/06 00:06:45.921	2024/03/06 00:06:46.979	1,058	/product/pickup/employee/daejun	1	0	11	3,811	14468178612
3	demo-8102	2024/03/06 00:07:10.522	2024/03/06 00:07:16.853	6,331	/account/save/employee/daejun	2	4	2	0	14468178612
4	demo-8103	2024/03/06 00:07:27.810	2024/03/06 00:07:28.867	1,057	/product/create/employee/kwangju	1	0	11	5,251	14468178612

The client ID (`wClientID`) is an ID given by the WhaTap agent to identify users. Search transactions based on this ID (full match). There is no separate index for searching.

! WhaTap basically stores the client-related information.

Applying multiple filters

You can apply multiple filters to see the list of desired transactions. The following case is for the elapsed time between 5 and 8 seconds, 5 or more HTTP calls, and the transaction path including "account."

Transaction Search

Time selector: < 2024/03/06 00:00 ~ 2024/03/06 23:59 1Day > Application: All selected

Filter: -- Elapsed time 5000 8000 + Error message -- HTTP call count 5 + SQL count + SQL fetch count -- Transaction account + Client IP + Domain

+ User agent + Referer + Transaction ID + Multi transaction ID + WClientID + Login ID ☐ Errors only

🔍 CSV

	Agent name (oname)	Start time	End time	Elapsed time	Transaction	CPU usage...	HTTP call ...	SQL count	SQL fetch c...
1	demo-8102	2024/03/06 00:00:01.650	2024/03/06 00:00:09.475	7,825	/account/delete/division/kwangju	0	5	3	0
2	demo-8100	2024/03/06 00:00:19.877	2024/03/06 00:00:26.727	6,850	/account/pickup/dept/kwangju	3	6	1	849
3	demo-8102	2024/03/06 00:01:07.095	2024/03/06 00:01:14.188	7,093	/account/save/dept/kwangju	0	6	3	346
4	demo-8104	2024/03/06 00:01:37.539	2024/03/06 00:01:44.531	6,992	/account/delete/unit/kwangju	3	5	3	940

! When searching with the **Multi transaction ID** filter applied, only the **Transaction ID** filter can be additionally applied.

Downloading the searched results

The searched results can be downloaded as a CSV file according to the filter conditions set by the user.

1. Click 🔍 to view the searched results.
2. Select CSV.
3. Enter the maximum number of CSV lines. You can save the searched results as many lines as you enter.
4. Select **Download** to download the CSV file.

ⓘ The CSV file name's format is `profile_{pcode}_YYMMDD.csv`.

MSA Analysis

What is the MSA analysis?

The MSA analysis function analyzes the proportion of calls between transactions collected through the WhaTap's **Multiple transaction trace** function. Based on this, dependencies between microservices can be checked at the URL level rather than instance-centric basis.

Microservice Architecture Pattern

For example, there are five microservices: A, B, C, D, and E. If a user calls A, it is assumed that the following three call patterns occur according to the logic.

1. A→B, C calls
2. A→B, C calls + then B→D call
3. A→B, C calls + then B→D, E calls

If these three patterns have been performed once, MSA analysis can check the association analysis data depending on the reference URL.

Microservice Architecture Caller & Callee

! For more information about **multiple transaction trace**, see [the following](#).

MSA Transaction Statistics

Home > Select Project >  **Sitemap** > **Analysis** > **MSA Analysis**

The **MSA Analysis** menu is a tool that can effectively analyze the performance and stability for each service in the microservice environment. By analyzing the detailed call relationships for transactions, you can optimize the system performance and proactively identify potential problems based on the analysis.

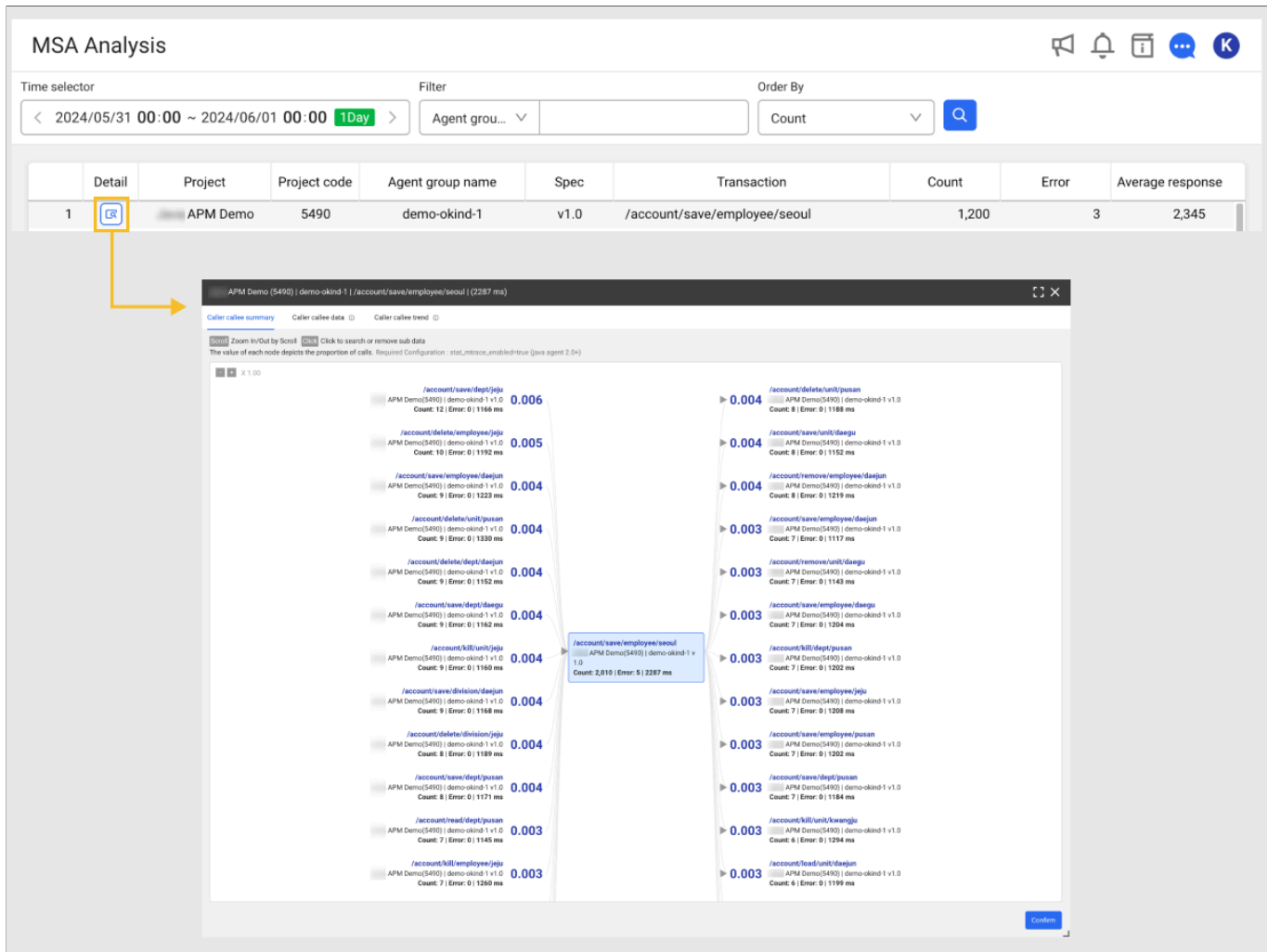
MSA Analysis									
Time selector			Filter			Order By			
< 2024/05/31 00:00 ~ 2024/06/01 00:00 1Day >			Agent grou... ▾			Count ▾			
	Detail	Project	Project code	Agent group name	Spec	Transaction	Count	Error	Average response
1		APM Demo	5490	demo-okind-1	v1.0	/account/save/employee/seoul	1,200	3	2,345
2		APM Demo	5490	demo-okind-0	v1.0	/account/save/employee/seoul	1,186	3	2,279
3		APM Demo	5490	demo-okind-1	v1.0	/account/save/employee/pusan	1,120	2	2,355
4		APM Demo	5490	demo-okind-1	v1.0	/account/save/employee/daegu	1,105	1	2,123
5		APM Demo	5490	demo-okind-0	v1.0	/account/save/employee/pusan	1,088	1	2,284
6		APM Demo	5490	demo-okind-1	v1.0	/account/save/employee/kwangju	994	1	2,470
7		APM Demo	5490	demo-okind-1	v1.0	/account/save/employee/daejun	987	1	2,267
8		APM Demo	5490	demo-okind-0	v1.0	/account/save/employee/daegu	983	1	2,318
9		APM Demo	5490	demo-okind-0	v1.0	/account/save/employee/jeju	977	2	2,239
10		APM Demo	5490	demo-okind-1	v1.0	/account/save/dept/seoul	950	0	2,335
11		APM Demo	5490	demo-okind-0	v1.0	/account/save/employee/kwangju	944	1	2,323
12		APM Demo	5490	demo-okind-0	v1.0	/account/save/employee/daejun	937	0	2,222
13		APM Demo	5490	demo-okind-1	v1.0	/account/save/employee/jeju	916	0	2,314
14		APM Demo	5490	demo-okind-1	v1.0	/account/save/dept/pusan	909	0	2,174
15		APM Demo	5490	demo-okind-0	v1.0	/account/save/dept/seoul	905	2	4,158

- **Time selector:** Select a desired search period. You can view a list of transactions including callers and callees on a daily basis.
- **Filter:** By filtering based on **Agent group name**, **Spec**, and **Transaction**, you can perform the search.
- **Order By:** Based on **Count**, **Error**, and **Time avg** (average response time), the list can be sorted.

- ⓘ • The time range that can be searched in **Time selector** is up to 1 day (24 hours). For more information on how to use the **Time selector** option.
- **Agent group name** is the group name classified as `whatap.okind` in the agent configuration options.
 - After setting the conditions, select to update the transaction list.

Analyzing in detail

When you select for the item to view in the transaction list, the Display Detail window appears. You can view the caller and callee for the transaction in the Display Detail window.



Each tab provides the following analysis features:

- **Caller callee summary:** It provides a visualized diagram for the relationship between the caller and callee of the transaction.
- **Caller callee data:** It provides the details of the transaction such as call count, error count, and response time.
- **Caller callee trend:** It provides a time series chart for performance changes in the number and rate of transaction calls over time.



- You can view it in full screen when the button is selected on the upper right of the Display Detail window.

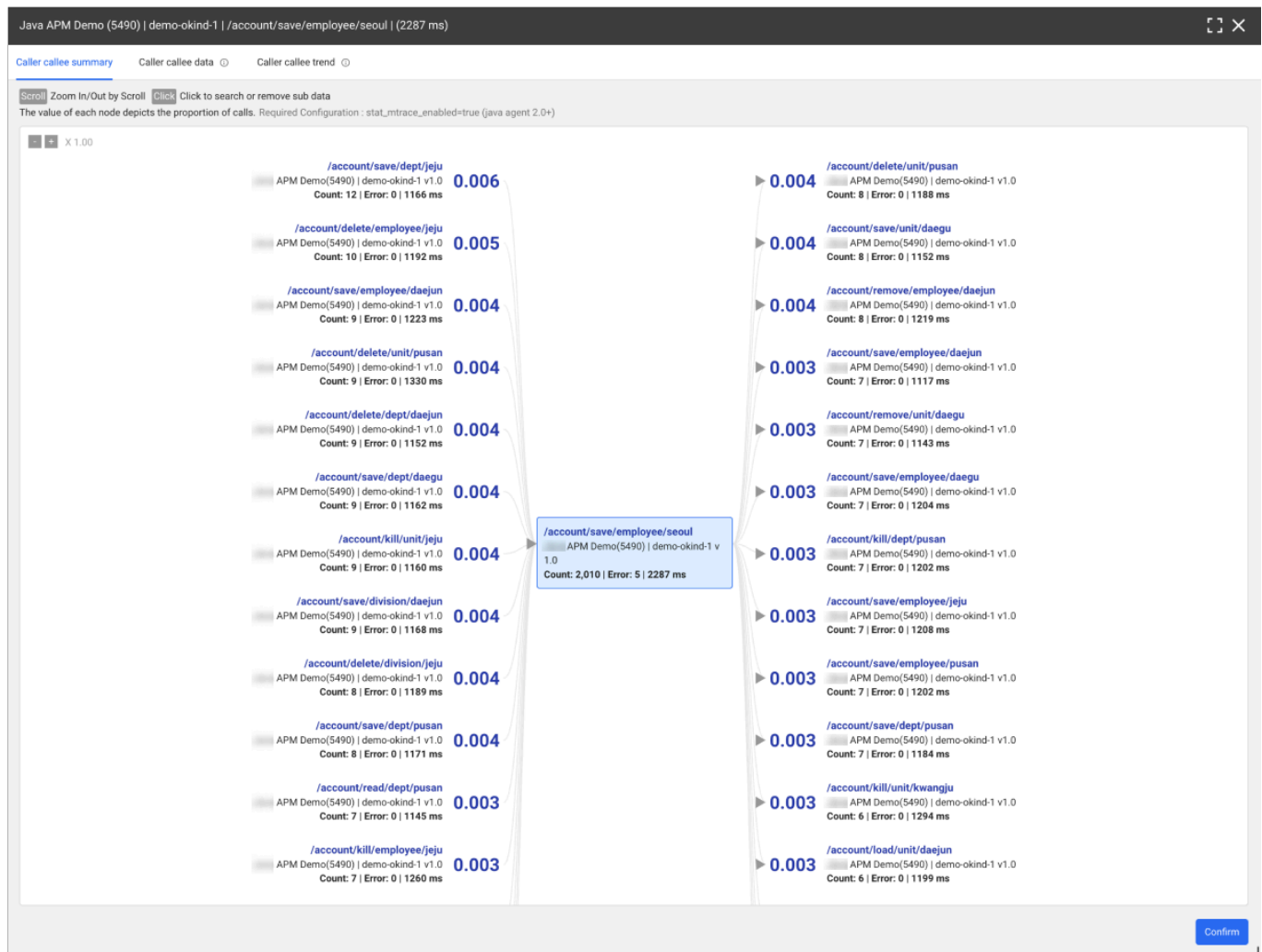


- To close the Display Detail window, select **Confirm** at the lower right or press the ESC key.

Caller callee summary

The **Caller callee summary** tab displays the dependency between the caller and callee of a transaction selected from the transaction list in a visualized diagram. You can intuitively understand the call relationships between services. Call paths and dependencies can be visually identified, which is advantageous for analyzing the causes of problems.

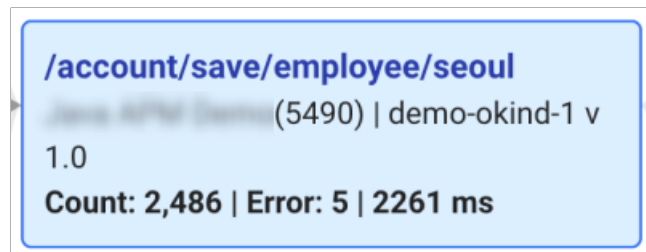
Analyzing call relationships



Caller and callee nodes display numerical data whose maximum is 1 such as 0.004 and 0.003, which represents its proportion among all callers. Likewise, the weight of each callee is displayed together on the right.

Through the above screen, you can analyze the dependencies between callers and callees based on the [/account/save/employee/seoul](#) transaction. You can visually see from and to which services the transactions are called.

Checking the performance metrics

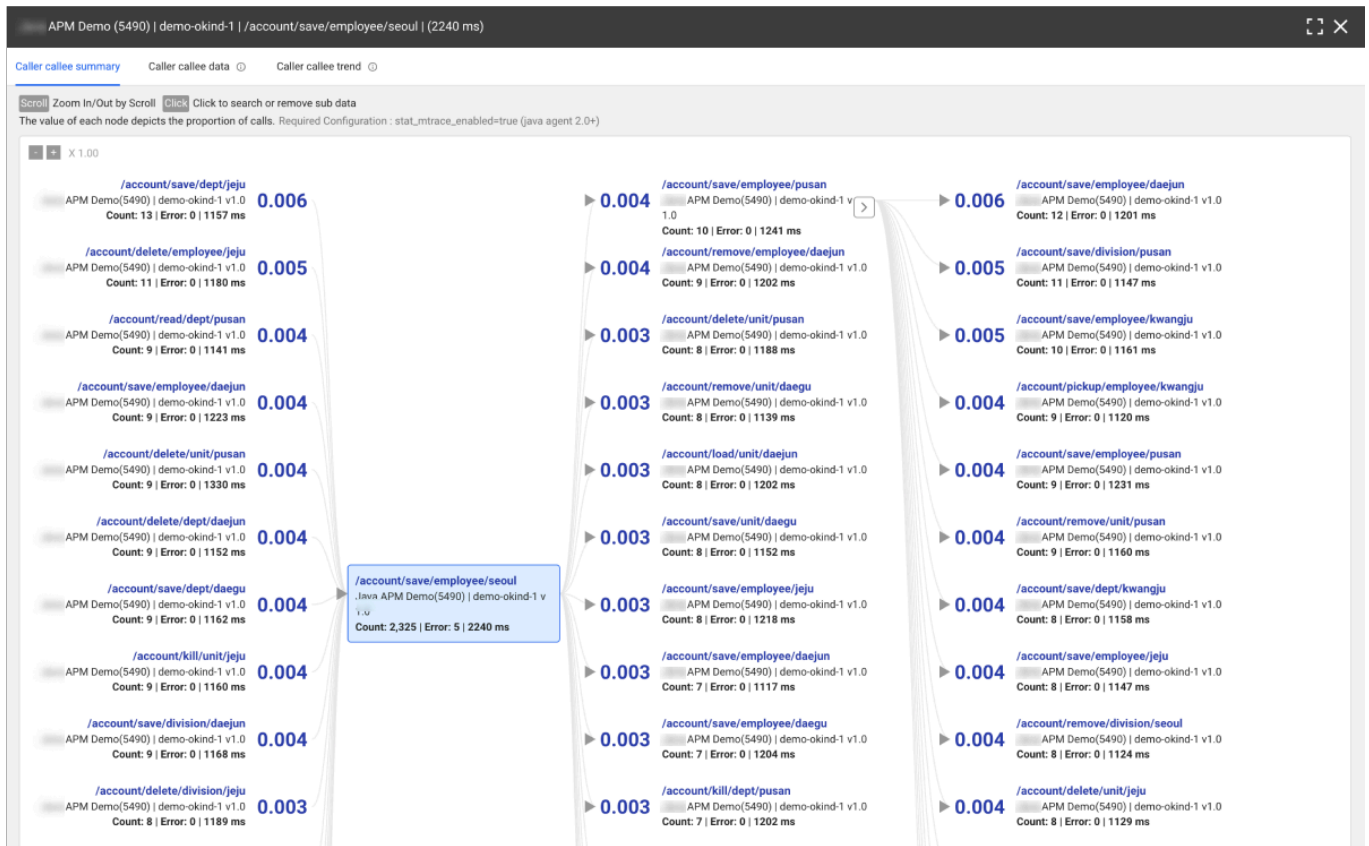


Each node consists of a transaction URL, project name, agent group name, and the following performance data:

- **Count:** Number of calls for the transaction
- **Error:** Number of errors occurred for calls
- **Average response time:** Average response time for the transaction, in milliseconds (ms)

Finding the transaction flow

When you hover your mouse over a caller or callee node, the **>** button appears. If you select this button, it expands into subnodes. By checking the entire flow of transactions, you can get answers in finding where problems occur.



- To close the subnodes, select > again.
- You can enlarge or reduce the screen using the scroll feature of the mouse. Or click the +/- buttons on the upper left of the screen.

Caller callee data

The **Caller callee data** tab displays the correlation between caller and callee for the reference URL (e.g. </account/save/employee/seoul>) in a tabular format. You can specifically check the details of each transaction (call count, error count, average response time, etc.), enabling a precise, data-based analysis.

APM Demo (5490) | demo-okind-1 | /account/save/employee/seoul | (2303 ms)

Caller callee summary [Caller callee data](#) [Caller callee trend](#) [Download CSV data](#)

ID	Type	Project code	Project	Agent group name	Transaction	Depth	Count	Error	Average response	Weight	Parent ID
id-0--1485863373		5490	APM Demc	demo-okind-1	/account/save/employee/seoul	0	2938	5	2303		
▶ id-caller1-964802511	Caller	5490	APM Demc	demo-okind-1	/account/save/dept/jeju	1	15	0	1156	0.0051	id-0--1485...
▶ id-caller1--2119639160	Caller	5490	APM Demc	demo-okind-1	/account/delete/employee/jeju	1	12	0	1170	0.0041	id-0--1485...
▶ id-caller1--703921046	Caller	5490	APM Demc	demo-okind-1	/account/delete/unit/pusan	1	11	0	1317	0.0037	id-0--1485...
▶ id-caller1--339409101	Caller	5490	APM Demc	demo-okind-1	/account/save/employee/daegu	1	11	0	1197	0.0037	id-0--1485...
▶ id-caller1--1166726544	Caller	5490	APM Demc	demo-okind-1	/account/save/dept/daegu	1	11	0	1163	0.0037	id-0--1485...
▶ id-caller1--96498228	Caller	5490	APM Demc	demo-okind-1	/account/read/dept/pusan	1	10	0	1154	0.0034	id-0--1485...
▶ id-caller1--1619760719	Caller	5490	APM Demc	demo-okind-1	/account/delete/dept/daegu	1	10	0	1156	0.0034	id-0--1485...
▶ id-caller1--1344577787	Caller	5490	APM Demc	demo-okind-1	/account/remove/unit/seoul	1	10	0	1181	0.0034	id-0--1485...
▶ id-caller1--1080234343	Caller	5490	APM Demc	demo-okind-1	/account/kill/unit/jeju	1	10	0	1153	0.0034	id-0--1485...
▶ id-caller1--806444592	Caller	5490	APM Demc	demo-okind-1	/account/save/employee/daegu	1	9	0	1223	0.0031	id-0--1485...
▶ id-caller1--324476759	Caller	5490	APM Demc	demo-okind-1	/account/kill/employee/jeju	1	9	0	1236	0.0031	id-0--1485...
▶ id-caller1--1543262602	Caller	5490	APM Demc	demo-okind-1	/account/save/division/pusan	1	9	0	1175	0.0031	id-0--1485...
▶ id-caller1--1080842845	Caller	5490	APM Demc	demo-okind-1	/account/remove/employee/jeju	1	9	0	1138	0.0031	id-0--1485...
▶ id-caller1-1820299183	Caller	5490	APM Demc	demo-okind-1	/account/delete/dept/kwangju	1	9	0	1174	0.0031	id-0--1485...
▶ id-caller1-1888852742	Caller	5490	APM Demc	demo-okind-1	/account/delete/unit/jeju	1	9	0	1166	0.0031	id-0--1485...
id-caller1-others	Caller	0			others	1	2383	0	1175	0.8111	id-0--1485...
▶ id-callee1-1699366673	Callee	5490	APM Demc	demo-okind-1	/account/save/employee/pusan	1	14	0	1201	0.0048	id-0--1485...
▶ id-callee1--1816628101	Callee	5490	APM Demc	demo-okind-1	/account/save/unit/daegu	1	12	0	1127	0.0041	id-0--1485...
▶ id-callee1--322752839	Callee	5490	APM Demc	demo-okind-1	/account/load/unit/daegu	1	10	0	1174	0.0034	id-0--1485...
▶ id-callee1--806444592	Callee	5490	APM Demc	demo-okind-1	/account/save/employee/daegu	1	9	0	1124	0.0031	id-0--1485...
▶ id-callee1--339409101	Callee	5490	APM Demc	demo-okind-1	/account/save/employee/daegu	1	9	0	1207	0.0031	id-0--1485...
▶ id-callee1--3777951	Callee	5490	APM Demc	demo-okind-1	/account/delete/dept/pusan	1	9	0	1174	0.0031	id-0--1485...
▶ id-callee1--1080842845	Callee	5490	APM Demc	demo-okind-1	/account/remove/employee/jeju	1	9	0	1199	0.0031	id-0--1485...
▶ id-callee1-1470942974	Callee	5490	APM Demc	demo-okind-1	/account/save/employee/jeju	1	9	0	1201	0.0031	id-0--1485...
▶ id-callee1-2136474304	Callee	5490	APM Demc	demo-okind-1	/account/save/division/jeju	1	9	0	1192	0.0031	id-0--1485...
▶ id-callee1-446621542	Callee	5490	APM Demc	demo-okind-1	/account/remove/employee/daegu	1	9	0	1202	0.0031	id-0--1485...
▶ id-callee1-888826450	Callee	5490	APM Demc	demo-okind-1	/account/save/dept/pusan	1	9	0	1190	0.0031	id-0--1485...
▶ id-callee1-703921046	Callee	5490	APM Demc	demo-okind-1	/account/delete/unit/pusan	1	8	0	1188	0.0027	id-0--1485...
▶ id-callee1--479076859	Callee	5490	APM Demc	demo-okind-1	/account/remove/unit/daegu	1	8	0	1139	0.0027	id-0--1485...
▶ id-callee1--153113744	Callee	5490	APM Demc	demo-okind-1	/account/save/dept/seoul	1	8	0	1155	0.0027	id-0--1485...
▶ id-callee1--2045378290	Callee	5490	APM Demc	demo-okind-1	/account/remove/dept/seoul	1	8	0	1152	0.0027	id-0--1485...

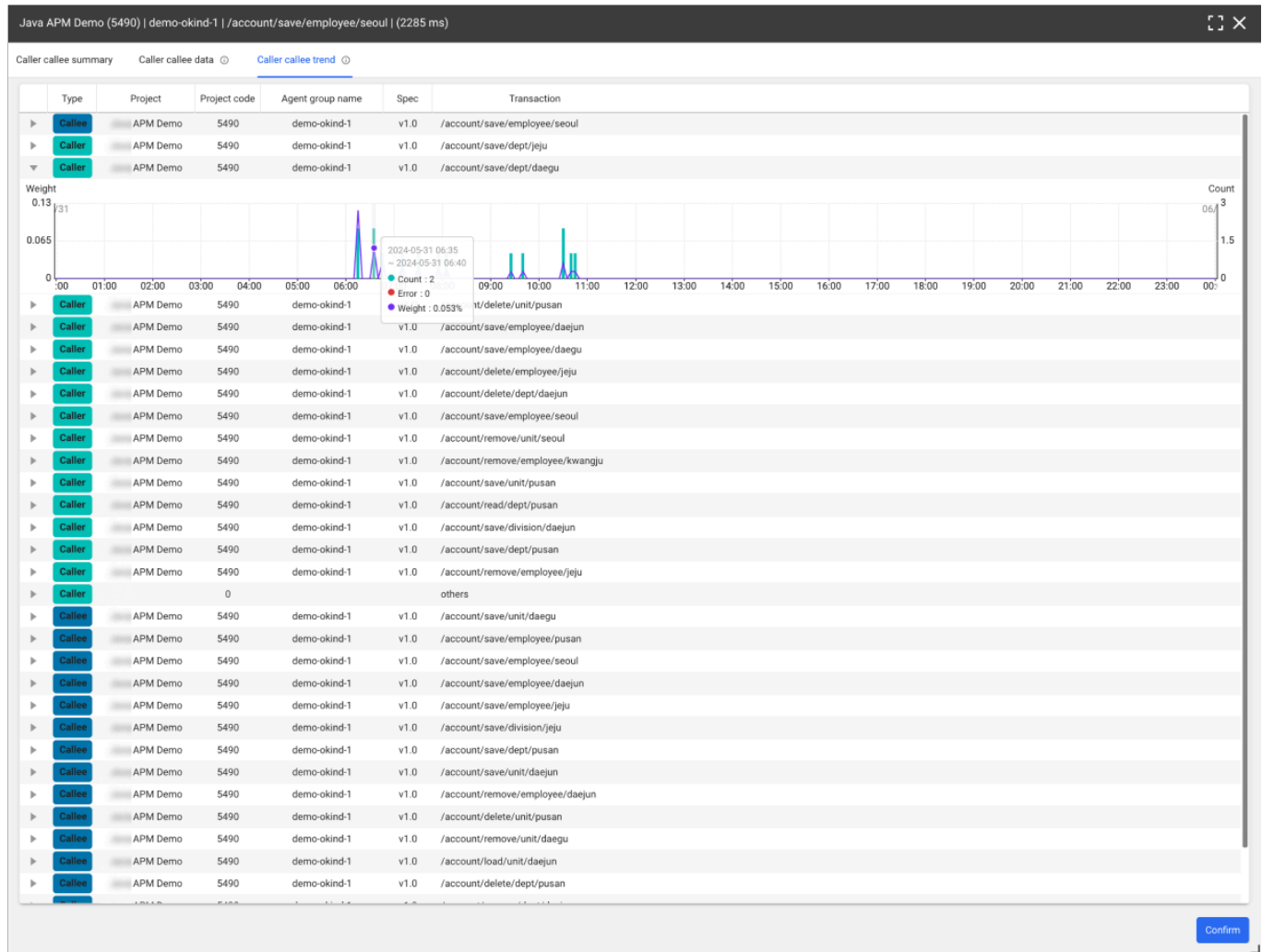
Confirm

- It can be used to analyze performance issues by checking the number and rate of calls, number of errors, and average response time of each transaction.
- Through the **Type** column, you can easily distinguish between caller and callee and find the call relationship.
- By selecting ▶ for each transaction, you can additionally check the transactions related to the transaction.
- To save the data list in CSV format, select **Download CSV data** at the upper right.

Caller callee trend

The **Caller callee trend** tab allows you to visually analyze the call relationships and performance data of the reference URL (</account/save/employee/seoul>) over time. This can help you find the pattern in the performance

of transactions.



- You can see performance changes at a glance by visualizing the number and ratio of calls for specific transactions on a graph over time.
- Through the **Type** column, you can easily distinguish between caller and callee and find the call relationship.
- When you hover your mouse over the time series chart, you can see the numerical data through the tooltip.
- When you click a specific time zone on the chart, the **Analysis > Transaction Search** menu appears. You can view a list of transactions in the selected time zone.

Metrics

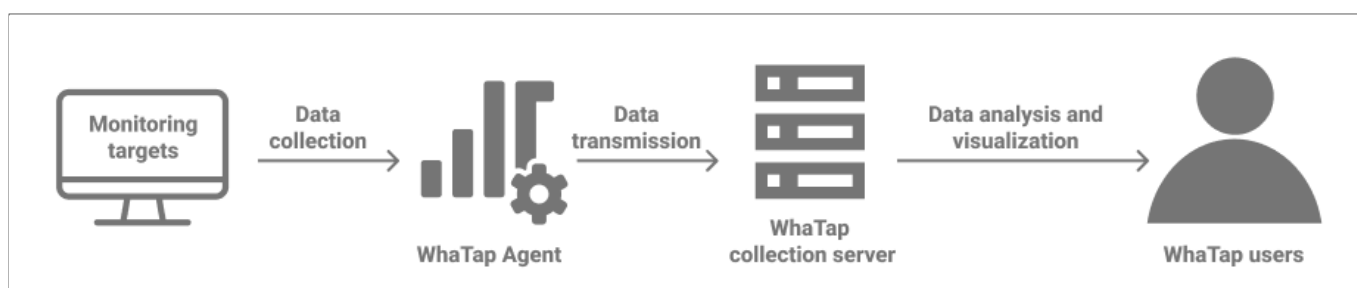
What is a metric?

A **metric** is time-series data that represents the state of a monitoring target as numerical values. It is the result of processing performance data collected by the WhaTap agent from monitoring targets.

Through metrics, you can view key performance indicators such as memory usage per server and DB connection time at a glance. After identifying a problem, you can perform detailed analysis through logs and traces.

Resource usage statistics help you estimate the required amount of resources, which can also be used for cost optimization.

How WhaTap collects metrics



To collect metrics, install the WhaTap agent on the monitoring target. Metrics sent by the agent are stored on the WhaTap collection server.

For example, to monitor **.NET applications**, first [install the agent](#). See [Application metrics](#) for available metrics.

Metric components

WhaTap **metrics** consist of the following components:

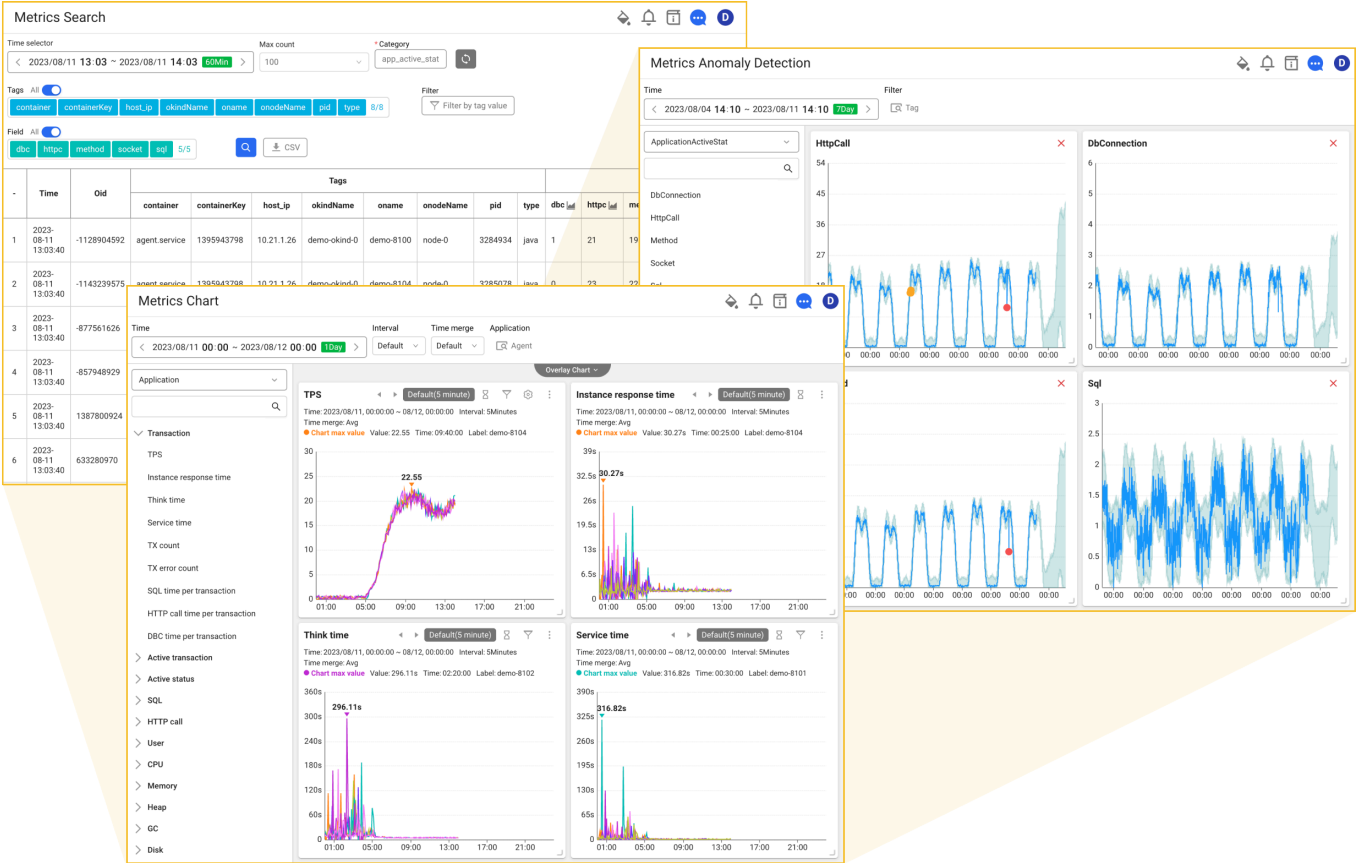
- **Category:** A name that groups related metrics.

- **Tags:** Labels that identify collection targets. Stores rarely-changing unique information such as IP, Oname, and Host. A metric can contain multiple tags.
- **Fields:** Stores actual measured values. A metric can contain multiple fields.
- **Time:** The time when the metric was collected.
- **Oid:** The unique number of the agent that collected the metric.
- **Oname:** The name of the agent that collected the metric.

Viewing and visualizing metrics

WhaTap provides menus to view collected metrics in various ways.

- **Metrics Search:** View the original metric data.
- **Metrics Chart:** View metric data through visualized charts.
- **Metrics Anomaly Detection:** Detect anomalies by comparing with metric patterns learned by AI.



Application Metrics

Home > Select Project > **Analysis** > **Metrics Search**

Metrics available in the **Metrics Search** menu. Each metric contains the following information. Some metrics may not have tag information.

- **Tags:** Information to identify the collection target (agent name, IP, etc.)
- **Fields:** Actual measured values (CPU usage, response time, etc.)

agent_status_summary

This category collects metrics related to agent status every 10 seconds.

Fields

Field	Type	Unit	Description
inActTime	-	Millisecond(ms)	Amount of time the agent remains inactive
isActive	Boolean	-	Whether the agent is active or not
isRestart	Boolean	-	Whether the agent was restarted recently (<code>true</code> / <code>false</code>)
lastActTime	-	Millisecond(ms)	Last time when the agent was activated (<code>0</code> : Disabled)
oid	-	-	Unique IDs for each agent in the project
startTime	-	Millisecond(ms)	Timestamp when the agent was started.

app_active_stat

- Collects active transaction step metrics
- Collection interval: 5 seconds
- Statistical data: 5 minutes, 1 hour

Tags

Tag	Type	Unit	Description
container	-	-	Container name (unique)
containerKey	-	-	Container key (unique)
host_ip	-	-	Host IP address (unique)
okindName	-	-	Group name categorized as whatap.okind
oname	-	-	Agent name (unique)
onodeName	-	-	Group name categorized as whatap.onode
pid	-	-	Unique ID for the process
type	-	-	Platform type (application development language)

Fields

Field	Type	Unit	Description
dbc	-	Count	Number of transactions in progress for database connection
httpc	-	Count	Number of transactions in progress for HTTP call

Field	Type	Unit	Description
method	-	Count	Number of transactions during execution of the method logic
socket	-	Count	Number of transactions in progress for socket connection
sql	-	Count	Number of transactions in progress for SQL query

app_actx_meter

- Collects various activity metrics for active transactions including HTTP requests, SQL queries, and data transfers
- Collection interval: 5 seconds
- Statistical data: 5 minutes, 1 hour

Tags

Tag	Type	Unit	Description
alias	-	-	Agent Alias
container	-	-	Container name
containerKey	-	-	Container's key value
host_ip	-	-	Host IP Address
okindName	-	-	Group name categorized as whatap.okind
oname	-	-	Agent name
onodeName	-	-	Group name categorized as whatap.onode

Fields

Field	Type	Unit	Description
active_httpc	-	Count	Active HTTP client request count
active_sql	-	Count	Active SQL query count
data	-	byte	Data transfer volume
txcaller_group	-	Int	A constant to identify the group of the transaction caller
txcaller_oid	-	Int	A constant to identify the agent ID of the transaction caller
txcaller_unknown	-	Int	A constant to identify the unknown transaction caller

app_counter

- Collects various application performance metrics and statistics
- Collection interval: 5 seconds
- Statistical data: 5 minutes, 1 hour

Tags

Tag	Type	Unit	Description
alias	-	-	Alias of the application (unique)
container	-	-	Container name (unique)
containerKey	-	-	Container key (unique)
host_ip	-	-	Host IP address (unique)

Tag	Type	Unit	Description
okindName	-	-	Group name categorized as whatap.okind
oname	-	-	Agent name (unique)
onodeName	-	-	Group name categorized as <code>whatap.onode</code>
pid	-	-	Process ID
type	-	-	Platform type (application development language)

Fields

Field	Type	Unit	Description
active_tx_0	-	Count	Number of transactions in the section within 3 seconds
active_tx_3	-	Count	Number of transactions in the section between 3 seconds and 8 seconds
active_tx_8	-	Count	Number of transactions in the section over 8 seconds
active_tx_count	-	Count	Number of all transactions in progress
apdex_satisfied	-	Count	Number of APDEX satisfactions
apdex_tolerated	-	Count	Number of APDEX toleration cases
apdex_total	-	Count	Total number of APDEX transactions
arrival_rate	-	Percent	Transaction request rate
httpc_count	-	Count	Number of HTTP outbound calls
httpc_error	-	Count	Number of HTTP outbound call errors

Field	Type	Unit	Description
httpc_time	-	Millisecond(ms)	Mean time of HTTP outbound calls
metering	-	Core	Number of cores on the host where the applications are running (limit cpu for containers)
resp_time	-	Millisecond(ms)	Average response time
sql_count	-	Count	Number of completed SQL cases
sql_error	-	Count	Number of SQL errors
sql_fetch_count	-	Count	Number of SQL fetches
sql_fetch_time	-	Millisecond(ms)	Execution time of the SQL fetch
sql_time	-	Millisecond(ms)	Mean time for SQL execution
tps	-	Count	Number of transactions per second
tx_count	-	Count	Number of transactions processed
tx_dbc_time	-	Millisecond(ms)	Mean time for DB connection
tx_error	-	Count	Number of transaction errors
tx_httpc_time	-	Millisecond(ms)	Mean time of HTTP calls
tx_sql_time	-	Millisecond(ms)	Average of the sum of SQL execution times per transaction
tx_time	-	Millisecond(ms)	Transaction execution time
tx_time_sqr_sum	-	Count	Used to obtain statistical metrics such as sum of squares of transaction execution times and variance or standard deviation of transaction execution times.

app_counter_okind

- Calculates `app_counter` metrics by `whatap.okind` group
- Collection interval: 5 seconds
- Statistical data: 5 minutes, 1 hour

Tags

Tag	Type	Unit	Description
okindName	-	-	Group name categorized as whatap.okind

Fields

Field	Type	Unit	Description
active_tx_0	-	Count	Number of transactions in the section within 3 seconds
active_tx_3	-	Count	Number of transactions in the section between 3 seconds and 8 seconds
active_tx_8	-	Count	Number of transactions in the section over 8 seconds
active_tx_count	-	Count	Number of all transactions in progress
apdex	-	number	APDEX (Application Customer Satisfaction)
apdex100	-	Percent	Apdex percentage
apdex_satisfied	-	Count	Number of APDEX satisfactions
apdex_tolerated	-	Count	Number of APDEX toleration cases
apdex_total	-	Count	Total number of APDEX transactions

Field	Type	Unit	Description
arrival_rate	-	Percent	Transaction request rate
num_of_agent	-	Count	Number of active agents in the group
realtime_user	-	Count	Number of concurrent users
sql_count	-	Count	Number of completed SQL cases
sql_error	-	Count	Number of SQL errors
sql_fetch_count	-	Count	Number of SQL fetches
sql_fetch_time	-	Millisecond(ms)	Execution time of the SQL fetch
sql_time	-	Millisecond(ms)	Mean time for SQL execution
tps	-	Count	Number of transactions per second
tx_count	-	Count	Number of transactions processed
tx_dbc_time	-	Millisecond(ms)	Mean time for DB connection
tx_error	-	Count	Number of transaction errors
tx_httpc_time	-	Millisecond(ms)	Mean time of HTTP calls
tx_sql_time	-	Millisecond(ms)	Average of the sum of SQL execution times per transaction
tx_time	-	Millisecond(ms)	Transaction execution time

app_counter_project

- Calculates `app_counter` metrics on a project basis

- Collection interval: 5 seconds
- Statistical data: 5 minutes, 1 hour

Fields

Field	Type	Unit	Description
active_tx_0	-	Count	Number of transactions in the section within 3 seconds
active_tx_3	-	Count	Number of transactions in the section between 3 seconds and 8 seconds
active_tx_8	-	Count	Number of transactions in the section over 8 seconds
active_tx_count	-	Count	Number of all transactions in progress
apdex	-	number	APDEX (Application Customer Satisfaction)
apdex100	-	Percent	Apdex percentage
apdex_satisfied	-	Count	Number of APDEX satisfactions
apdex_tolerated	-	Count	Number of APDEX toleration cases
apdex_total	-	Count	Total number of APDEX transactions
arrival_rate	-	Percent	Transaction request rate
num_of_agent	-	Count	Number of active agents in the project
realtime_user	-	Count	Number of concurrent users
sql_count	-	Count	Number of completed SQL cases
sql_error	-	Count	Number of SQL errors
sql_fetch_count	-	Count	Number of SQL fetches

Field	Type	Unit	Description
sql_fetch_time	-	Millisecond(ms)	Execution time of the SQL fetch
sql_time	-	Millisecond(ms)	Mean time for SQL execution
tps	-	Count	Number of transactions per second
tx_count	-	Count	Number of transactions processed
tx_dbc_time	-	Millisecond(ms)	Mean time for DB connection
tx_error	-	Count	Number of transaction errors
tx_httpc_time	-	Millisecond(ms)	Mean time of HTTP calls
tx_sql_time	-	Millisecond(ms)	Average of the sum of SQL execution times per transaction
tx_time	-	Millisecond(ms)	Transaction execution time

app_host_resource

- Collects application server resource metrics
- Collection interval: 5 seconds
- Statistical data: 5 minutes, 1 hour

Tags

Tag	Type	Unit	Description
alias	-	-	Application's alias
container	-	-	Container name

Tag	Type	Unit	Description
containerKey	-	-	Container's key value
host_ip	-	-	Host IP Address
okindName	-	-	Group name categorized as whatap.okind
oname	-	-	Agent name
onodeName	-	-	Group name categorized as whatap.onode
pid	-	-	Unique ID of a specific process
type	-	-	Platform type (application development language)

Fields

Field	Type	Unit	Description
cpu	-	percent	Host's CPU utilization
cpu_cores	-	Positive number	Number of CPU cores of the host
cpu_irq	-	percent	CPU IRQ utilization of the host
cpu_proc	-	percent	CPU utilization of the Java process
cpu_steal	-	percent	CPU steal utilization of the host
cpu_sys	-	percent	CPU SYS utilization of the host
cpu_usr	-	percent	CPU user utilization of the host
cpu_wait	-	percent	CPU wait utilization of the host
disk	-	percent	Root file system's disk utilization

Field	Type	Unit	Description
mem	-	percent	Memory utilization of the host
swap	-	percent	SWAP utilization of the host

app_remote_active_stat

- Measures transaction counts by response time range for DB connections and HTTP calls
- Collection interval: 5 seconds

Tags

Tag	Type	Unit	Description
alias	-	Unique value	Application's alias
container	-	Unique value	Container name
host_ip	-	Unique value	Host IP Address
okindName	-	-	Group name categorized as whatap.okind
oname	-	Unique value	Agent name
onodeName	-	-	Group name categorized as whatap.onode

Fields

Field	Type	Unit	Description
act0	-	count	Number of active transactions with the response time of 3 seconds or less

Field	Type	Unit	Description
act3	-	count	Number of active transactions with the response time between 3 seconds and 8 seconds
act8	-	count	Number of active transactions with the response time of 8 seconds or more
actx	-	count	Sum of act0, act3, and act8
count	-	count	Total number of active transactions collected during the monitoring period
error	-	count	Number of erroneous transactions
id	Int32	-	Unique ID to identify active transactions
timeSum	number	-	Total response time for active transactions
type	string	-	db(DB Connection) or httpc(HTTP Call)

app_user

- Collects application user metrics
- Collection interval: 10 seconds
- Statistical data: 5 minutes

Tags

Tag	Type	Unit	Description
host_ip	-	-	Host IP address (unique)
oname	-	-	Agent name (unique)
okindName	-	-	Group name categorized as whatap.okind

Tag	Type	Unit	Description
onodeName	-	-	Group name categorized as whatap.onode

Fields

Field	Type	Unit	Description
logbits	-	byte	User log bit information (unit of data created by user activity events)
realtime_user	-	count	Number of concurrent users

db_pool_detail

- Collects database connection pool detail metrics
- Collection interval: 5 seconds
- Statistical data: 5 minutes, 1 hour

Tags

Tag	Type	Unit	Description
\$okind	-	-	Group name categorized as whatap.okind
\$onode	-	-	Group name categorized as whatap.onode
oname	-	-	Agent name
pool	-	-	Type of database pool
class	-	-	Database pooling class

Fields

Field	Type	Unit	Description
act	-	count	Number of active database connections
idle	-	count	Number of idle database connections

event_5sec

- Collects events occurring every 5 seconds
- Collection interval: 5 seconds

Tags

Tag	Type	Unit	Description
type	-	-	Event type
no_cache	-	-	Presence of event information caching

Fields

Field	Type	Unit	Description
curtime	-	Millisecond(ms)	Event occurrence time (UNIX epoch time, millisecond)

event_cube_done

- Collects events when cube operations are completed
- Collection interval: 5 seconds

Tags

Tag	Type	Unit	Description
type	-	-	Event type
no_cache	-	-	Presence of event information caching

Fields

Field	Type	Unit	Description
cubetime	-	Millisecond(ms)	Cube operation completion time (UNIX epoch time, millisecond)
date	-	date	Convert cubetime to YYYYMMDD format
date9	-	date	Convert date field value to GMT+9 time zone
hhmmss	-	time	Convert cubetime to HHMMSS format
hhmmss9	-	time	Convert hhmmss field value to GMT+9 time zone

visitor

- Collects application user statistics
- Collection interval: 1 hour

- Statistical data: 1 hour

Tags

Tag	Type	Unit	Description
host_ip	-	Unique value	Host IP Address
oname	-	Unique value	Agent name
okindName	-	-	Group name categorized as whatap.okind

Fields

Field	Type	Unit	Description
logbits	-	byte	User log bit information (unit of data created by user activity events)
visit_user	-	count	Number of visitors during the search period

app_proc_counter

A category of the data collected for application process metrics

- Collection interval: 5 seconds
- Statistical data: 5 minutes, 1 hour

Tags

Field	Type	Unit	Description
alias	-	-	Alias of the application (unique)

Field	Type	Unit	Description
container	-	-	Container name (unique)
containerKey	-	-	Container key (unique)
host_ip	-	-	Host IP address (unique)
okindName	-	-	Group name categorized as whatap.okind
oname	-	-	Agent name (unique)
onodeName	-	-	Group name categorized as whatap.onode
pid	-	-	Unique ID of a specific process
type	-	-	Platform type (application development language)

Fields

Field	Type	Unit	Description
cputime	-	Millisecond(ms)	Transaction CPU time
db_num_active	-	count	DB Connection Pool Active count
db_num_idle	-	count	Idle DB connection pool count
gc_count	-	count	GC occurrence count
gc_oldgen_count	-	count	Old Generation GC Count
gc_time	-	Millisecond(ms)	GC execution time
heap_max	-	byte	Maximum size of heap memory (-Xmx value)
heap_perm	-	byte	Memory usage in the Perm area

Field	Type	Unit	Description
heap_tot	-	byte	Total amount of allocated heap memory
heap_use	-	byte	Amount of heap memory in use
pending_finalization	-	count	Number of objects waiting to finalize during GC
proc_fd	-	count	Number of file descriptors open by the count process
proc_fd_max	-	count	Maximum number of file descriptors that can be opened by the process
thread_count	-	count	Total number of threads running in the JVM
thread_daemon	-	count	Number of daemon threads running in the JVM
thread_peak_count	-	count	Maximum number of threads observed while the JVM is running
thread_total_started	-	count	Total number of threads created since the start of JVM
threadpool_activeCount	-	count	Number of threads in the thread pool running

Application Performance Counter

The WhaTap agent collects various data related to the application performance. The data can be broadly classified into 3 categories:

- **User:** Real-time user or visitor
- **Service:** Transaction, SQL, outbound call count and response, error rate, etc.
- **Resource:** System and process resource usage

User Counter

User is a client using the monitoring system. In the client, users are counted based on the browser.

In the web system performance, user is important because it is the start point that generates the load. For user tracing, it is required to consider what criteria users are classified with and how to count them.

User types

The WhaTap agent provides various options to identify users.

- **Remote IP**

Remote IP is used by default to identify the user. Remote IP has limitations when distinguishing actual users.

- **Cookie**

Users are identified using the cookie. UUID is saved in the cookie named **WHATAP** for all connected clients.

whatap.conf

```
whatap.trace_user_using_ip=false
```

- **Header Key**

Users can be identified using the value passed to the HTTP header.

whatap.conf

```
whatap.trace_user_header_ticket=USER
```

User counting

Depending on the counting method, it is used differently. Real-time users are measured to see how many users are using the system. Daily Active User is a measure for business management on how many users are interested in the service for a day.

- **Real-time user**

The number of users is counted in the last 5 minutes. Users are counted by shifting every 5 seconds. The numbers counted on each server are merged through the HyperLogLog algorithm.

- **Daily Active User (DAU)**

The users who accessed the system for a day are counted. The number of users logged in for 24 hours is calculated through HyperLogLog.

✔ WhaTap collects byte blocks for user data by the server to count long-term users. If the data is merged by HyperLogLog, the visitors for more than a month can be theoretically calculated.

Service Counter

Performance metrics for transactions include the number of SQLs or outbound calls used by transactions, the number of response time errors, etc.

- **Transaction Counter**

A counter starts measuring when any transaction is performed.

- **Count**
- **Response Time**
- **Error Count**

- **Active Transaction Counter**

It counts the number of transactions in progress.

- **Count**
- **Active Status**

Progress status is fixed into five: METHOD, SQL, HTTPC, DBC, SOCKET.

- METHOD - Calling a general function
- SQL - Running DB SQL
- HTTPC - Calling an HTTP outbound API (service)
- DBC - DB connection is requested; it is usually taken from the pool
- SOCKET - Connecting the TCP session

- **SQL**

It counts the status of SQL running.

- **Count**
- **Response Time**
- **Error Count**
- **Patch Count**

- **HTTP Call**

It counts outbound HTTP calls.

- **Count**
- **Response Time**
- **Error Count**

Resource Counter

It counts the server resources or resource uses inside the node processes.

- **CPU** (sys, usr, wait, steal, irq, cores)

CPU usage %. The data is collected for each type. Steal is meaningful only in the virtual environment. The number of CPU cores is also collected.

- **Process CPU**

CPU % used by the process.

- **Memory**

System memory usage (%).

- **Swap**

Swap memory usage (%).

- **Disk**

Disk is the process utilization (%) of the current directory

- **Heap** (Total, Used, Perm)

Total, Used, and Perm amounts of the heap memory. The data unit is KBytes.

- **DB Connection Count**

It collects the connection pool counts.

Apdex

Apdex (Application Performance Index) is a performance metric that complies with the open standards. Apdex is based on the response time and is quantified as percentages of satisfied and accepted requests out of total requests. The Apdex graph has been added to the dashboard.

Apdex can be used as a metric for user satisfaction and have a value between 0 and 1.

$$(\text{Number of satisfied cases} + (\text{Number of tolerating cases} * 0.5)) / \text{Total number of requests}$$

Status	Description
Satisfied (S)	No problem with the work ≤ 1.2 secs (S as the default)

Status	Description
Tolerating (T)	Users feel delay but working is possible ≤ 4.8 secs ($S * 4$)
Frustrated (F)	Working is impossible > 4.8 secs (exceeds T and error)

- **whatap.apdex_time** millisecond

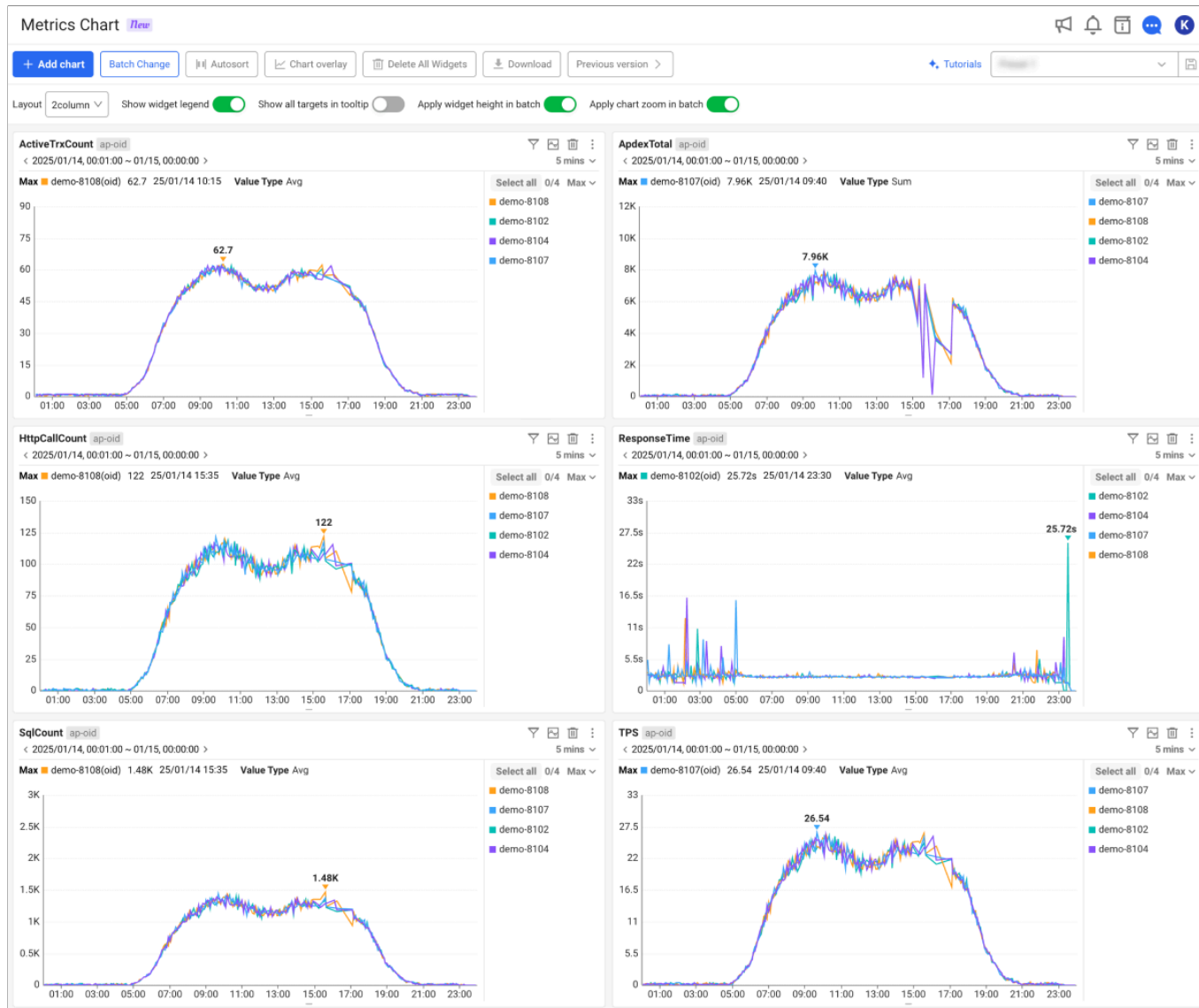
Default 1200

The default value (S) can be modified in Agent CONFIG.

Metrics Chart

Home > Select Project > **Analysis** > **Metrics Chart** *New*

The **Metrics Chart** *New* menu is a core feature of the WhaTap monitoring solution, which provides the data collected from various monitoring targets in a visualized time-series chart. This allows users to effectively monitor the system performance, quickly identify anomalies, and gain insights for resolving issues.



- You can visually check various metrics via time series charts, and analyze multiple metrics upon failure at a time.
- You can select a specific time range to view past data and analyze the performance at that period.
- You can filter data based on specific time zones or conditions for more accurate analysis.
- Users can place their desired charts on the screen and freely adjust the layout.
- Users can arrange desired metrics and save them as presets for loading at any time.

! Difference from the **Metrics Chart** menu

The following are the changes since the [Service 2.8.0](#) update. To check the changes on the screen after the update, select **Tutorials** on the upper right.

- User experience (UX) has been improved so that users can set the time, target, and interval options, and then specify the metrics to monitor and add charts.
- You can change the time range of a chart view without deleting the widgets placed on the dashboard.
- It provides a batch **Batch Change** feature that allows you to apply options to all widgets placed on the dashboard at once.
- The preset feature allows you to save and load the widgets placed on the dashboard.
- You can adjust the layout of the dashboard and the functionality of the widgets through various options provided.

Adding a chart widget

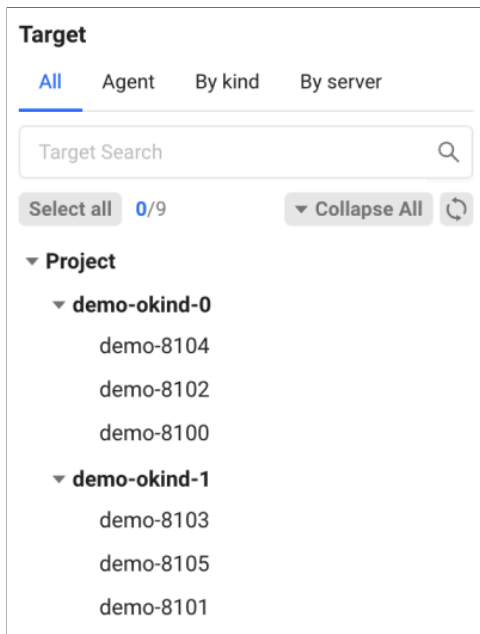
To add a metric as a widget to the dashboard, select **Add chart** on the upper left.

Setting the lookup time

In **Time**, set the date and time to view the metric.

Selecting a target

Select a desired target from the agents in the project. You can select an individual agent or a group classified by the agent configuration.

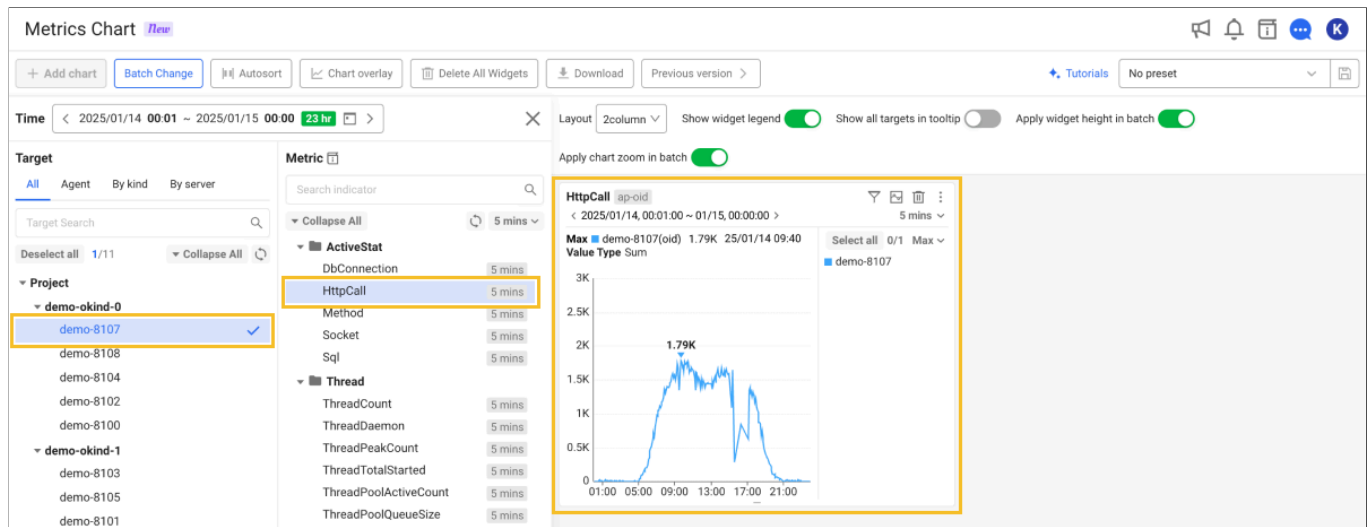


- **Agent:** You can select an individual agent or all agents.
- **By kind:** Agents can be monitored in each group classified by `whatap.okind` in the agent configuration.
- **By server:** Agents can be monitored in each group classified by `whatap.onode` in the agent configuration.

- Depending on the set time and date, available targets may change.
- You can select or deselect targets by clicking in the agent list. You can also select multiple agents at once by using the `Shift` key.
- By clicking **Select all** or **Deselect all**, you can select or deselect related sub-targets at once.
- If a desired agent does not appear in the list, select **Refresh**.
- By selecting **Collapse All** or **Expand All**, you can hide or expand the list by group.

Selecting a metric

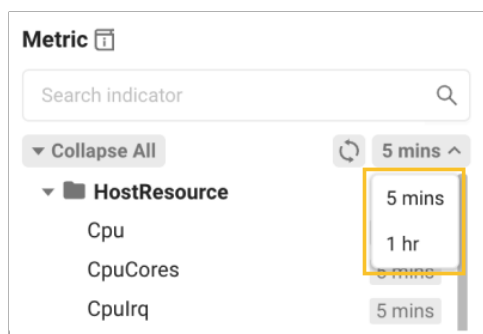
Select a target agent to monitor. Then the list that can be selected on the **Metric** panel appears. Select a desired metric in the list.



A chart widget for the selected metric is placed on the dashboard on the right. You can add chart widgets by selecting additional metrics. To enlarge the chart area, select **×** on the right of the **Time** option. The **Target** and **Metric** panels disappear, leaving only the chart area visible on the screen.

- If you enter a string in the **Search indicator** field, you can quickly search for a desired metric.
- You can also search by metric category and field name. For more information about the categories and fields, see [the following](#).
- By selecting **Collapse All** or **Expand All**, you can hide or expand the metrics list by category.
- If a desired metric does not appear in the list, select **Refresh**.

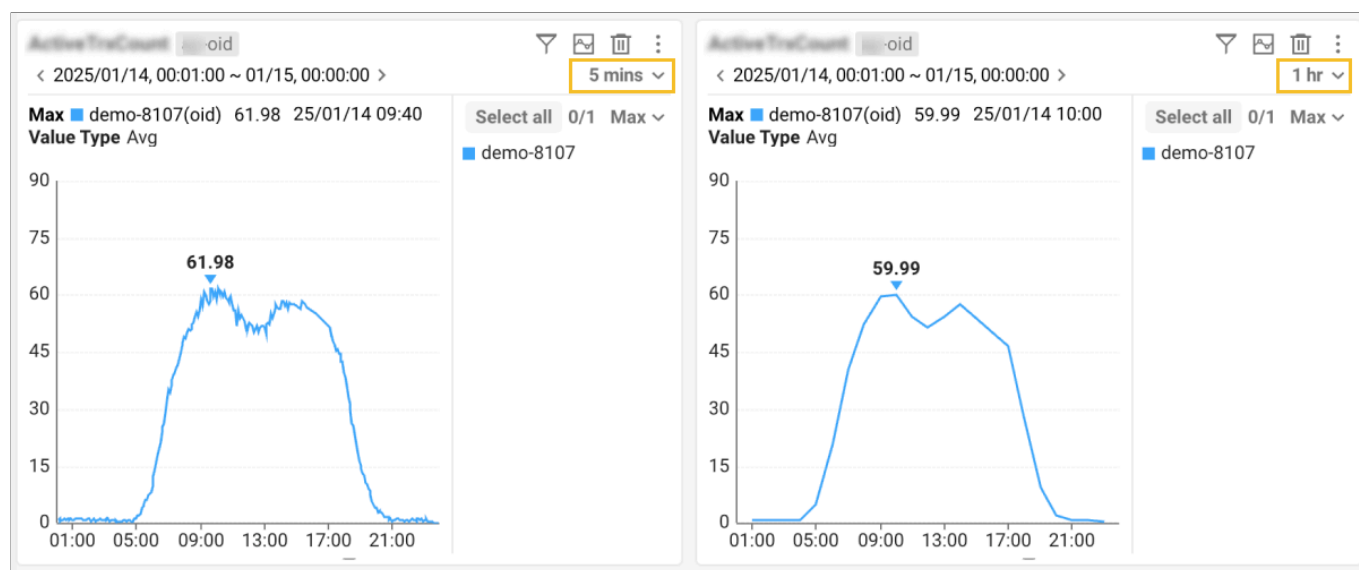
Setting the interval



You can set intervals for each chart, allowing you to adjust the aggregation unit of data to visualize at different time intervals. If you select ⌚ on the upper right of the **Metric** panel, you can select an interval option.

Each metric has a different default interval time, and the interval time changes depending on the query time range.

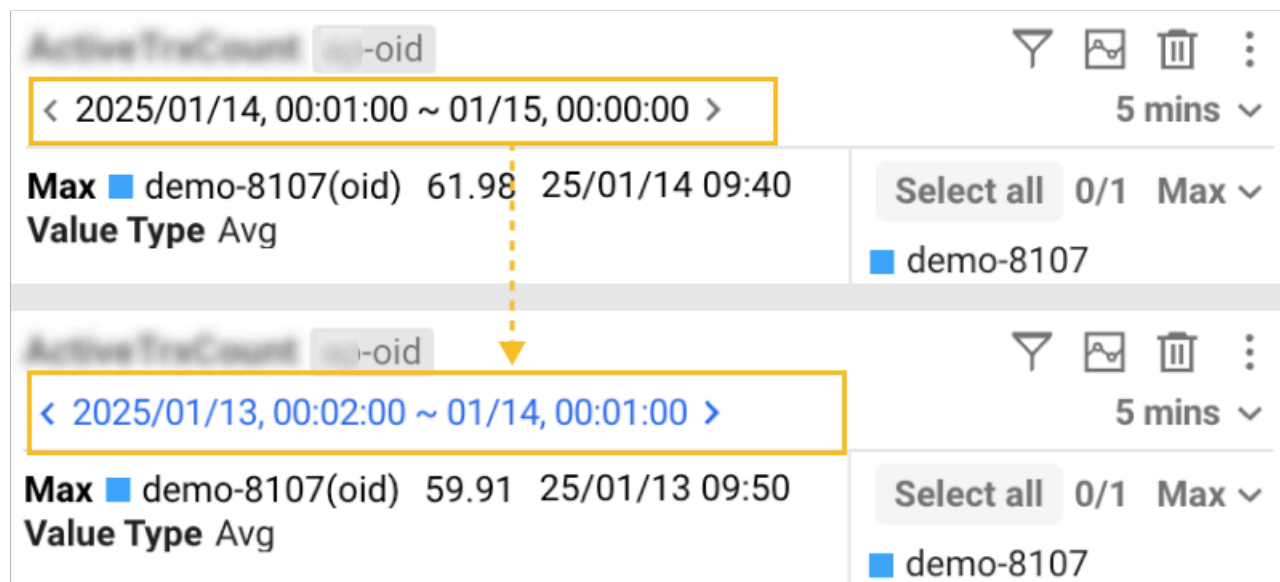
For example, the **5 min** interval displays average values for 5-minute intervals, and the **1 hour** interval displays average values for every one hour.



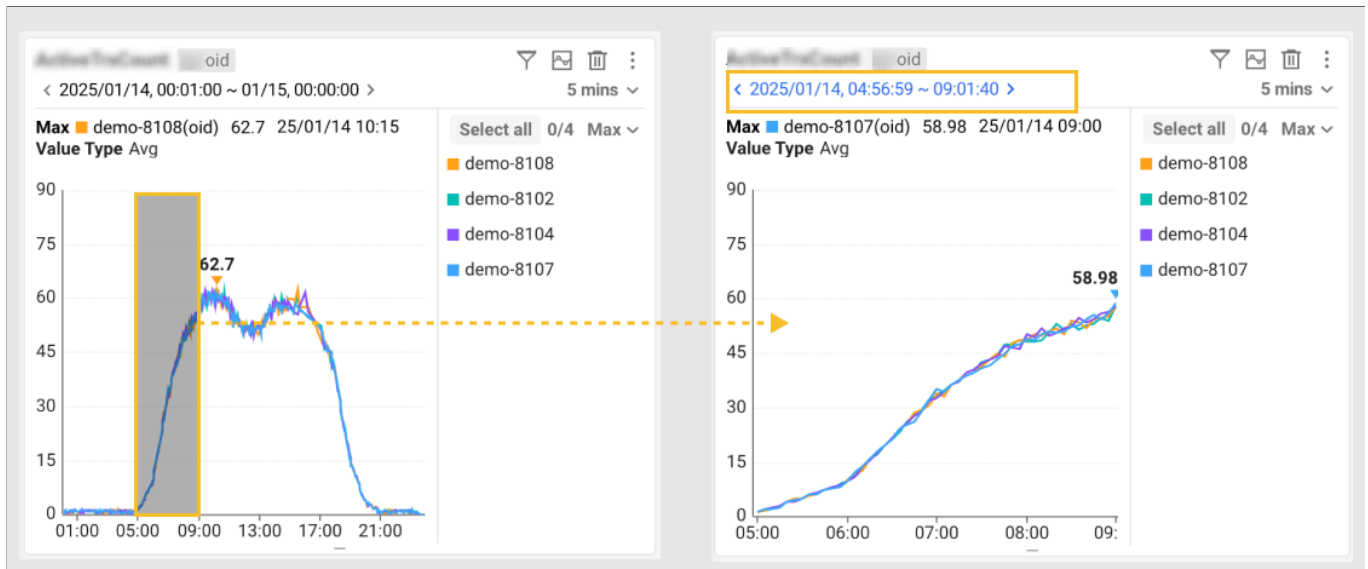
- ✓ By adjusting the interval option, you can analyze the data from different perspectives, from detailed data over a short time to overall trend over a long time.

Changing the query time

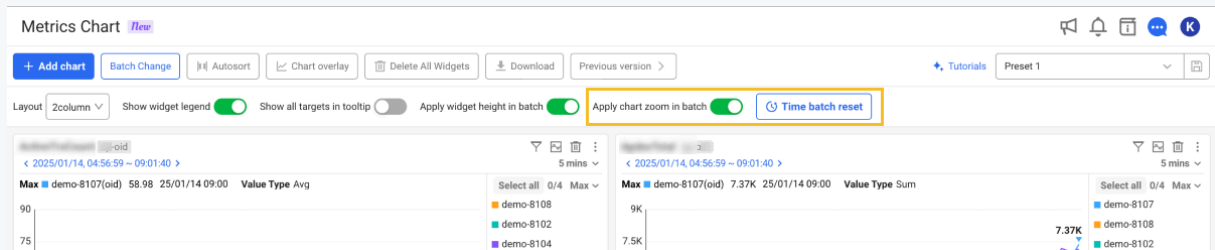
To change the chart query time range for an individual widget, select **<** or **>** at the top of the widget. The time change range is the same as the time reference set in the **Time** option. For example, if the **Time** option is set to **1 day** and you select **<** or **>**, you can change the time to a daily interval.



Alternatively, by dragging a specific area of the chart, you can change the time according to the dragged range for a view.



- ✓ You can change the time for all widgets by changing for each widget with the **Apply chart zoom in batch** option enabled at the top of the screen.

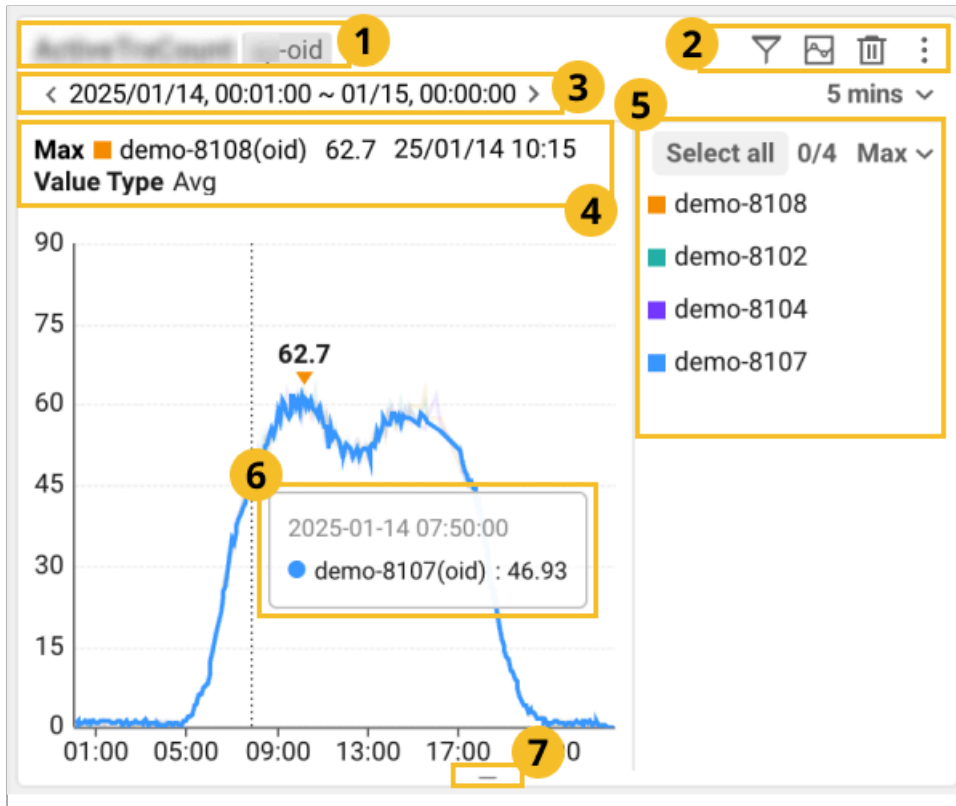


- To change the query time range and then change it back to a recent time, select .
- If the **Apply chart zoom in batch** option is enabled at the top of the screen, the  **Time batch reset** button appears. By selecting this button, you can reset the time for all widgets.

- ! By using the **Batch Change** feature, you can change the time for all widgets and change the monitoring target and interval. For more information, see [the following](#).

Chart details

See details for each item displayed in the chart widget.



- **1 Metric name and category:** It displays the metric name of the chart widget. On the right of the metric, the categories of the query targets are displayed in tag format. The category name may differ depending on the product.
 - `*oid` : It is displayed when an individual agent is selected.
 - `project` : It is displayed when the target is selected on a project basis.
 - `okind` : It is displayed when a group classified as `whatap.okind` is selected in the agent configuration.
 - `onode` : It is displayed when a group classified as `whatap.onode` is selected in the agent configuration.
- **2 Widget option:** Option menu of the chart widget. For more information, see [the following](#). For more information about the interval options, see [the following](#).
- **3 Time:** It displays the time range for which data in the chart is viewed. By selecting `<` or `>`, you can adjust

the time range for a query.

- **4 Data:** You can check the maximum value (**Max**) of the data viewed from the monitoring targets and the data merge method (**Value Type**).
- **5 Legend:** It displays the monitoring targets as a legend. For more information about the display of legend, see [the following](#).
- **6 Chart:** It displays the viewed data in a time series graph. If you hover your mouse pointer over the graph, you can see detailed information through a tooltip. By dragging a specific area of the chart, you can change the time according to the dragged range for a view.
- **7 Resize:** You can adjust the size by dragging the center of the bottom of the chart widget.

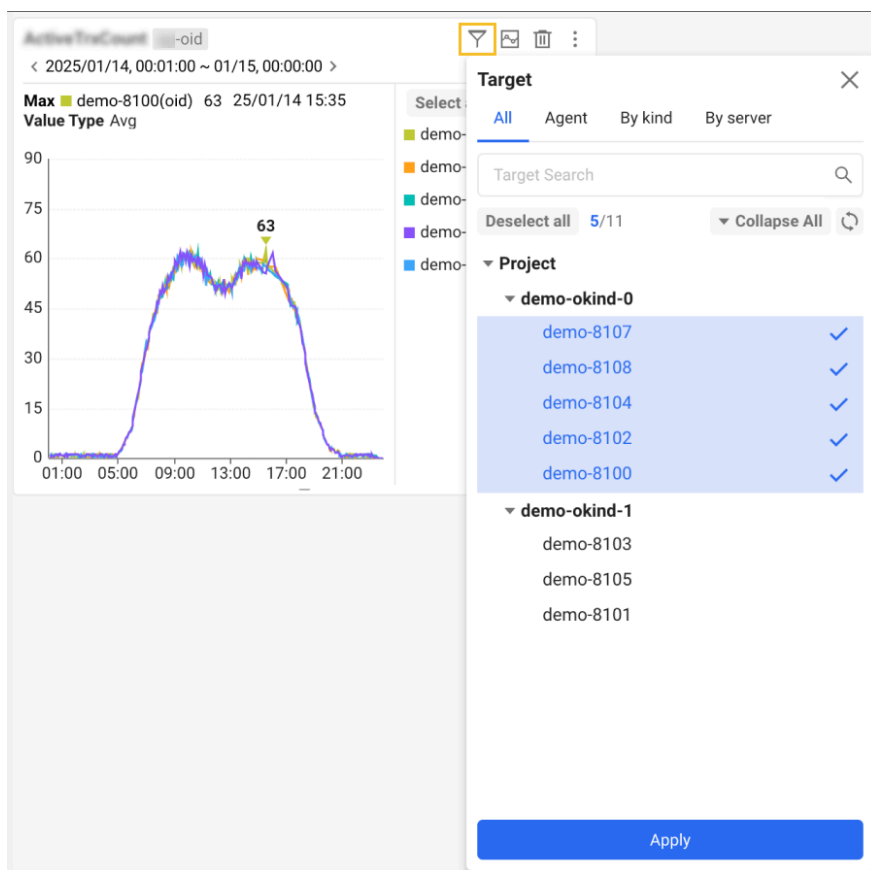
Using the chart widget options

Various features can be used through the option buttons on the upper right of the chart widget.

Filtering targets

You can add or remove monitoring targets to/from the chart widget added to the screen.

1. If you select , a pop-up menu appears for you to select monitoring targets.



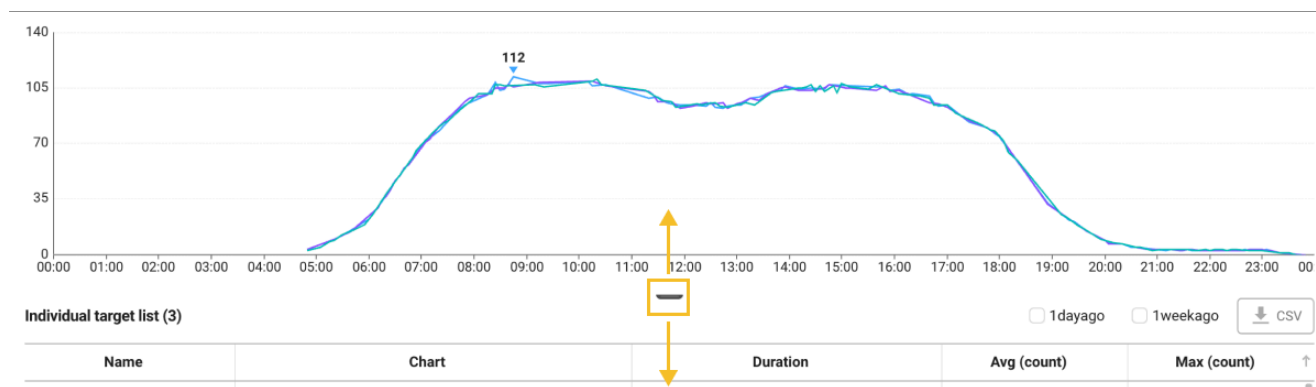
2. Select the desired targets according to the instructions on the screen.
3. Select **Apply**.

Viewing the details

To check the detailed information about the chart data in a wider screen, select . The **View details** window appears. You can view charts, averages, and maximum values for individual targets.



- **1dayago:** You can compare the data with that from the previous day.
- **1weekago:** You can compare the data with that of the previous week.
- **↓ CSV:** The viewed data can be downloaded as a CSV file.
- You can resize the chart by dragging the icon at the bottom of the graph.

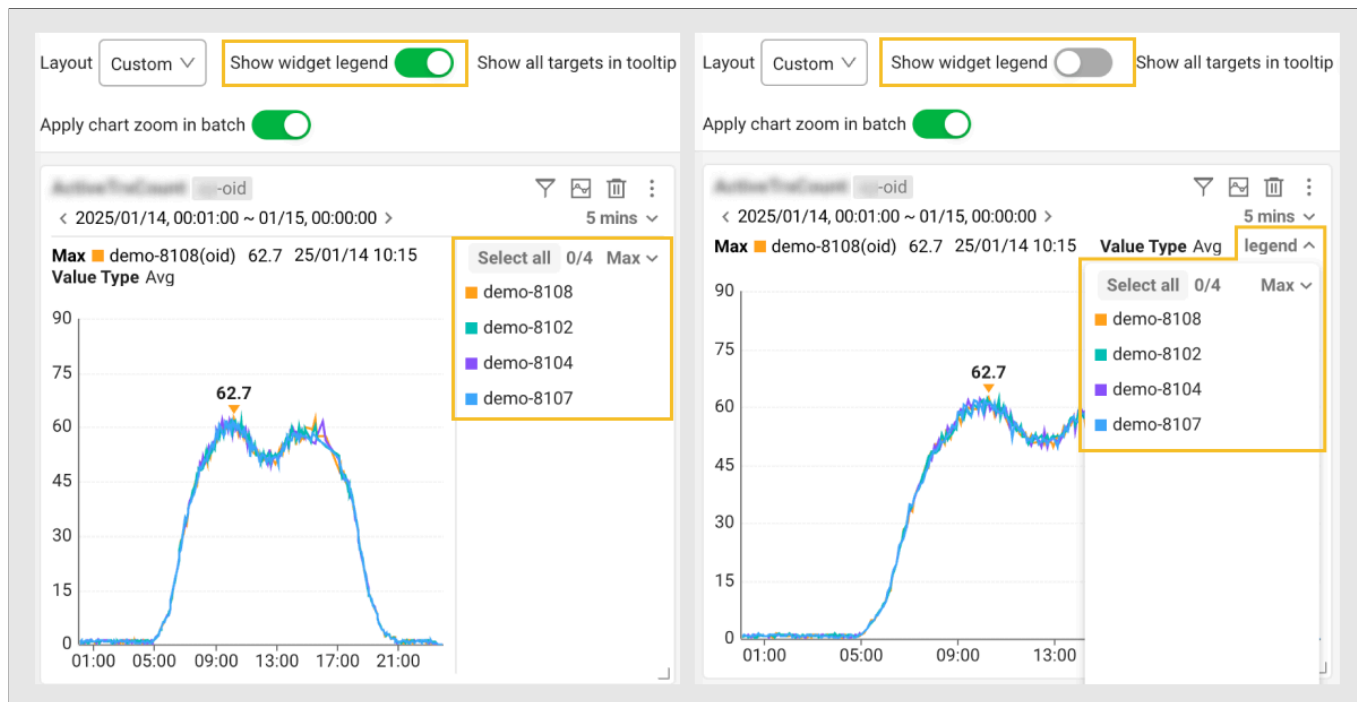


Removing the chart widget

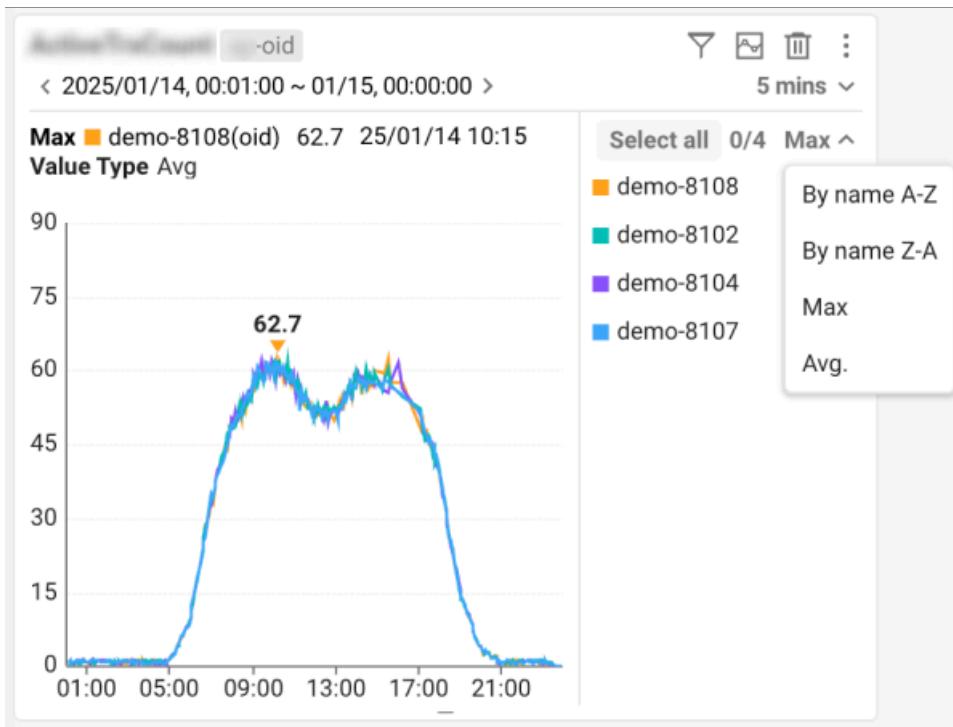
To remove any chart widgets placed on the screen, select .

Using the legend

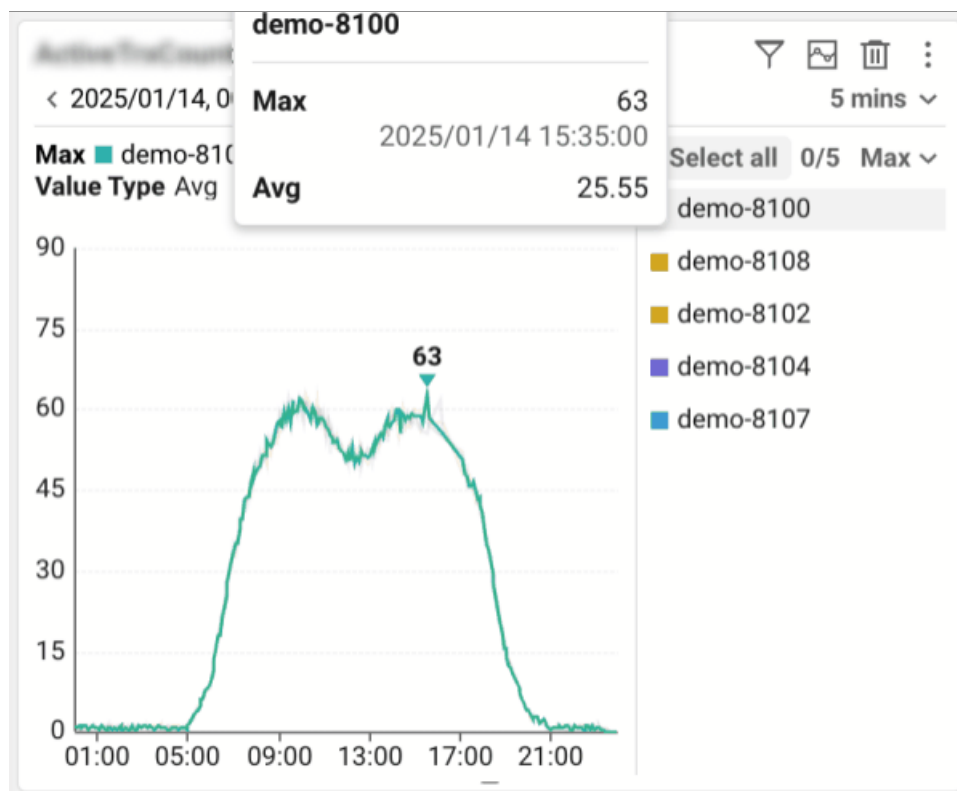
You can check the monitoring targets displayed on the chart through the legend and then sort or filter them by desired criteria. You can show or hide the legend on the right of the widget's chart by turning on or off the **Show widget legend** option at the top of the screen. With the option turned off, you can check and select the monitoring targets by clicking **legend**.



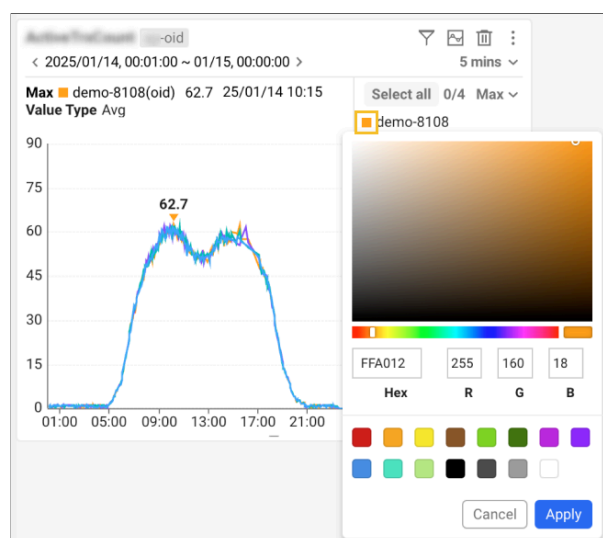
- You can select or unselect monitoring targets by selecting **Select all/Deselect all**.
- In the legend list, you can sort monitored objects by name, maximum value, or average value.



- If you hover the mouse over each item in the legend list, the highlighted graph for the monitoring targets appears and a tooltip indicating the specific time at which the maximum value is recorded. Alternatively, you can filter by selecting a target from the legend list.



Changing the legend color



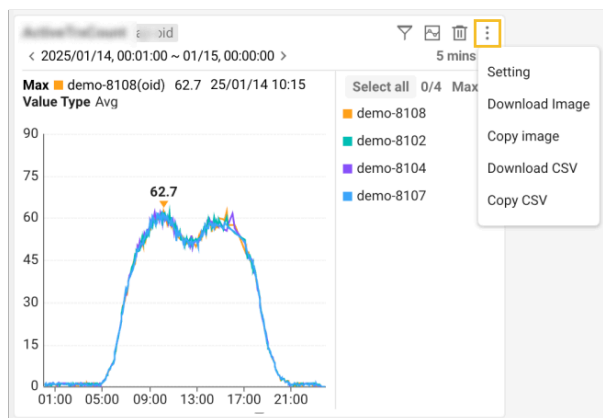
You can change the graph color corresponding to a monitoring target. In the legend list, select the square box

on the left of the target to change its color. Select a desired color and then click **Apply**.

! The set colors are not saved via the preset feature. This feature is to be provided in a future update.

Using additional options

If you select  on the upper right of the chart widget, you can select the following additional options.



- **Setting**

- **Use Y axis automatically:** The size of the Y-axis can be automatically adjusted within the searched range.
- **Show maximum value:** You can display the maximum value in the graph area of the chart.

- **Download Image:** You can download the chart as an image file.
- **Copy image:** You can copy the chart to the clipboard as an image format.
- **Download CSV:** You can download the data searched from the chart as a CSV file.
- **Copy CSV:** You can copy the data viewed in the chart to the clipboard in a CSV format.

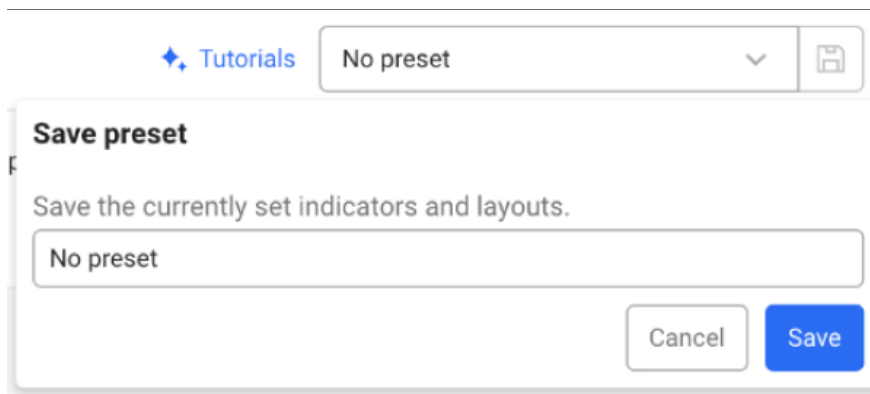
Setting presets

You can save and load the settings and layouts for widgets on the dashboard. You can create a new preset by adjusting its size and placing it on the desired position.

- ! You can save or modify the presets with the **Edit project** role. For more information about the member roles, see [the following](#).

Creating a new preset

1. Place the widgets in the desired format on the dashboard. You can also resize and place only the widgets to be frequently checked.
2. On the upper right of the screen, select .
3. Enter a new preset name.



4. Select **Save**.

You can see the newly saved preset from the preset list.

- !
- If any changes are made to the newly created preset, save the preset again. Select  and then save the preset with the same name. Any changes are overwritten in the existing preset.
 - If you go to another menu without saving changes on the dashboard, the changes are not saved.
 - Presets are saved on a project basis and can be shared with other users.
 - The targets saved in the preset are the layout of the dashboard, the widgets placed on the dashboard, and the options (**Target**, **Interval**) modified in the widgets. The **Time** option at the top of the screen is not saved.
 - To change the widget query time after loading a preset, use the **Batch Change** feature. For more information, see [the following](#).

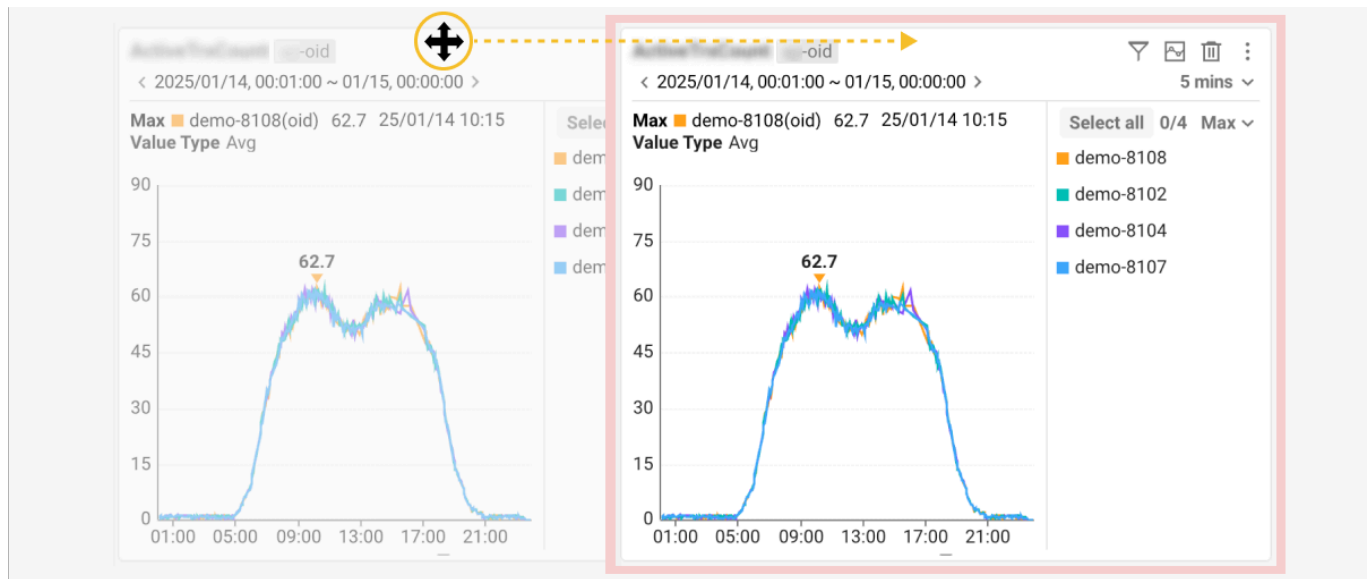
Deleting presets

If you have unused presets, you can delete them from the preset list. Select **×** on the right of the item to delete from the preset list.

Editing a dashboard widget

The widgets placed on the dashboard can be placed and resized to the user's desired location.

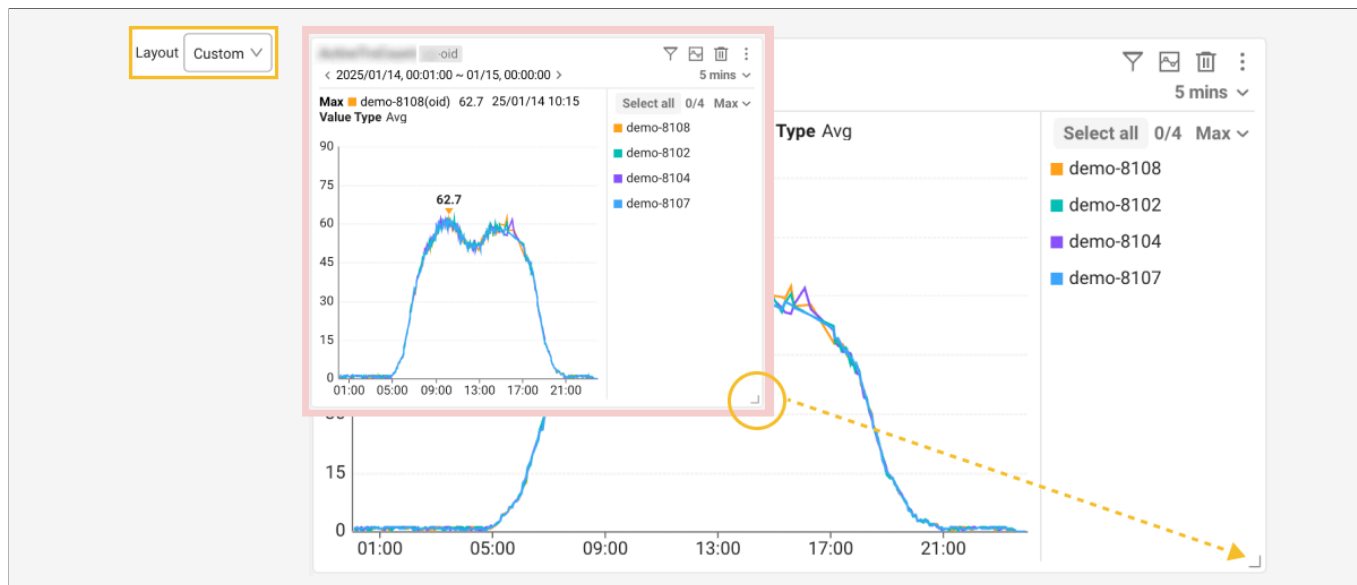
Moving a widget



When you move the top part of the widget by using the mouse pointer, it changes to the **+** shape. At this time, you can move the widget by dragging with your mouse to the desired position.

Resizing a widget

If **Layout** among the dashboard options is set to **Custom**, you can resize the widget.

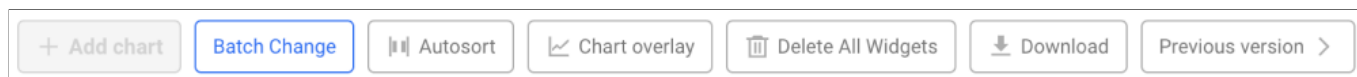


Click and hold the mouse on the  element at the lower right of the widget, and then drag it to the desired size.

ⓘ If **Layout** is not set to **Custom**, you can adjust only the height of the widget. Resize the widget with the bottom center of the widget clicked with your mouse.

Using the dashboard options

You can apply various settings to the chart widget at once using the Option menu located at the top of the screen. You can also customize the dashboard layout to your desired format.



Batch update of the chart widget options

It provides the feature to apply detailed options to the chart widgets on the screen at once. On the upper left of the screen, select **Batch Change**. If the **Batch Change** window appears, set the desired options and then select **Apply**.

Batch Change

Time

<

2025/01/15 00:00 ~ 2025/01/15 23:59

23 hr

>

Target

All

Agent

By kind

By server

Target Search

Deselect all

5/11

Collapse All

▼ Project

▼ demo-okind-0

demo-8107

demo-8108

demo-8104

demo-8102

demo-8100

▼ demo-okind-1

demo-8103

demo-8105

demo-8101

Interval

no change

5 mins

1 hr

Apply widget

Select all

☐ ActiveTrxCount

2025/01/14, 00:01:00 ~ 01/15, 00:00:00

ap-oid 5 mins

☐ ApdexTotal

2025/01/14, 00:01:00 ~ 01/15, 00:00:00

ap-oid 5 mins

☐ HttpCallCount

2025/01/14, 00:01:00 ~ 01/15, 00:00:00

ap-oid 5 mins

☐ ResponseTime

2025/01/14, 00:01:00 ~ 01/15, 00:00:00

ap-oid 5 mins

☐ SqlCount

2025/01/14, 00:01:00 ~ 01/15, 00:00:00

ap-oid 5 mins

☐ TPS

2025/01/14, 00:01:00 ~ 01/15, 00:00:00

ap-oid 5 mins

Cancel

Apply

- **Time:** You can set the data query range for the chart.
- **Target:** Select a monitoring target. You can select an individual agent or a group classified by the agent configuration.
 - **Agent:** You can select an individual agent or all agents.
 - **By kind:** Agents can be monitored in each group classified by `whatap.okind` in the agent configuration.
 - **By server:** Agents can be monitored in each group classified by `whatap.onode` in the agent configuration.
- **Interval:** You can adjust the data aggregation unit to various time intervals.

286

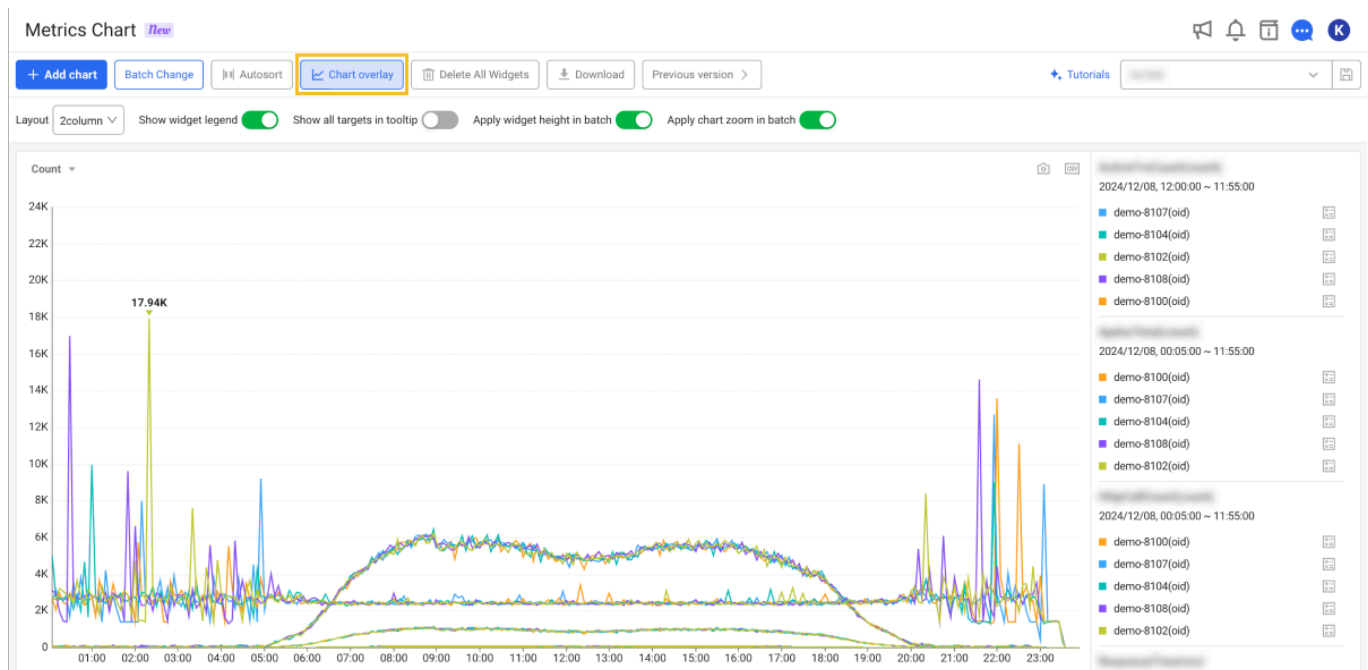
- **Apply widget:** Select a chart widget to apply the options to change. You can apply changed options to the selected widget at once.

Auto-aligning the dashboard

To auto-align the widgets placed on the dashboard, select **Autosort**. It auto-aligns widgets in order of their width and height, from smallest to largest. If the widths are the same, it aligns them in order of height, from smallest to largest.

Comparing multiple charts

This feature allows you to view data from multiple charts placed on the dashboard in a single chart. This feature allows you to compare multiple metrics from the same time period with others. Select **Chart overlay**. You can place overlay charts on the screen.



- If you select **Count** on the upper left of the overlay chart, a list appears where you can change the data criteria for the x-axis chart. You can compare the data of the chart by selecting a desired item.
- : You can download the chart as an image file based on the current view.
- : You can download the chart as a CSV file based on the current view.

- In the right section, you can see a list of agents for each metric. The colors of individual agents match the graph colors on the chart.

Batch deletion of placed widgets

You can delete multiple widgets placed on the dashboard all at once. Select **Delete All Widgets**. When the confirmation message appears, select **Delete**.

Downloading as a CSV file

You can download data from the widgets placed on the dashboard as a CSV file. Select **Download > Download CSV**. You can check the data of metrics for each time zone.

Downloading as an image file

You can download all the widgets placed on the dashboard as a single image file. Select **Download > Download Image**. You can save a captured image of the dashboard screen as is.

Using the previous version

To use the **Metrics Chart** menu of the previous version, select **Previous version**. Alternatively, you can see in the  **Sitemap > Analysis > Metrics Chart *Old*** path.

! For more information about **Metrics Chart *Old***, see [the following](#).

Using other options

Other options below allow you to adjust the layout of the dashboard or easily and conveniently batch set the applied options to the widgets.



- **Layout:** You can set the number of columns in the dashboard (or the number of widgets that can be placed in

a row). You can set up to 4 columns. If **Custom** is selected, widgets can be placed regardless of the number of columns.

❗ In **Custom**, you can freely adjust the width and height of the widget. If you select another option, you can only adjust the height of the widget.

- **Show widget legend:** Turning the option on or off shows or hides the legend on the right of the widget's chart. With the option turned off, you can check and select the monitoring targets by clicking **legend**. For more information about the use of legend, see [the following](#).
- **Show all targets in tooltip:** When you hover your mouse pointer over the chart, you can see the value for the point on the graph through a tooltip. Turn on the option to view data for all targets in the time zone where the mouse pointer is located through the tooltip.
- **Apply widget height in batch:** Enabling this option forces all widgets to have the same height.
- **Apply chart zoom in batch:** When changing the data query time of an individual chart widget, turn on this option to also change the chart times for other widgets.

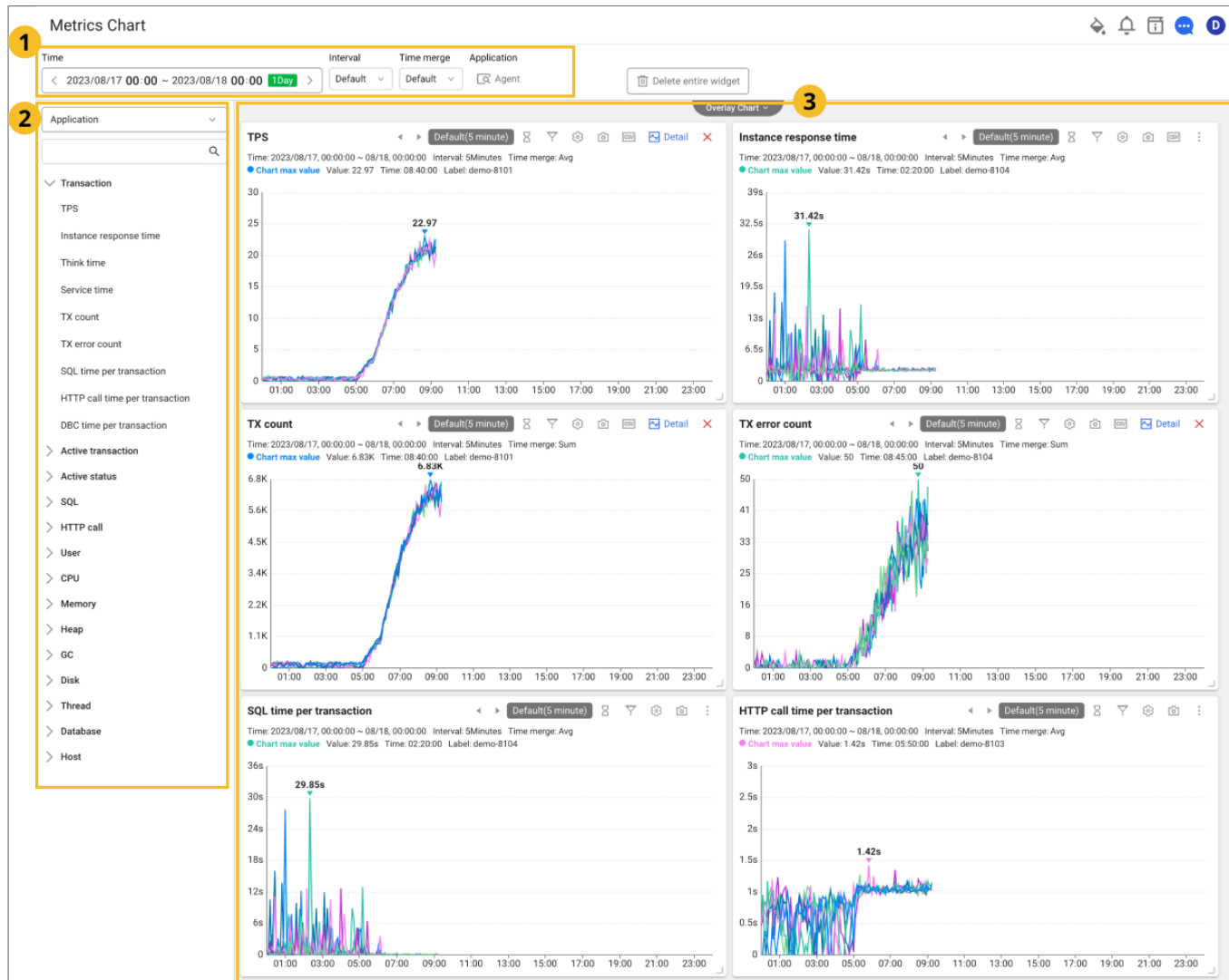
Using the tutorial

When you select **Tutorials** on the upper right of the screen, you can check the changes after the [Service 2.8.0](#) update.

Metrics Chart

[Sitemap](#) > [Analysis](#) > [Metrics Chart](#) Old

In **Metrics Chart**, you can view the metrics data collected from the monitoring targets in a chart as follows. Specifying the time and metrics is required.



Options at the top

In the **1** area, you can specify the time range of the chart and the agent to be monitored through the options at the top of **Metrics Chart**.

- **Time:** You can specify the start and end of the X-axis as the total range in time.

① For more information on how to use the **Time** option.

- **Interval:** You can specify the X-axis data interval as the time interval.
- **Time merge:** As one of the data merging methods, you can merge data within the time specified by intervals.

For example, **Avg** indicates the average value of data within 1 hour.

- **Agent:** You can specify the agents to query. If not specified, all items are queried.

Metrics list

The **2** area is a list of metrics to query for options. First select a **Category**. After querying the metrics under the selected **Category**, select a desired metric. If you select the **Category** and metric, Based on the data within the time range specified in the top menu of the area **1**, you can see the chart widgets in the **3** area.

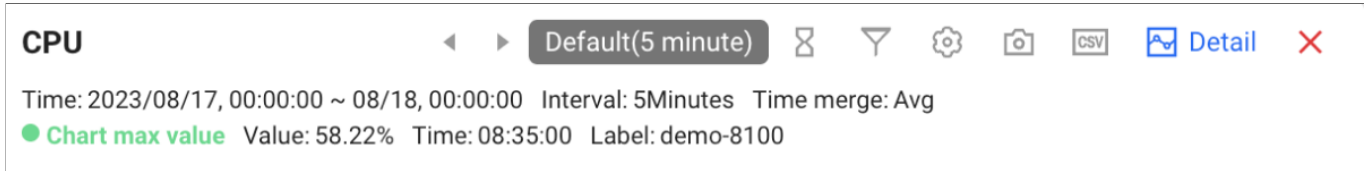
① Data Merge

Data merge provides the following methods: **Object Merge** and **Time merge**.

- **Time merge** merges data with the same field values at regular intervals in the original data.
- **Object Merge** merges data with matching tags among data with different field values.

Chart widget

On the top left of **3**, you can see the metric name. On the top right of the chart widget, you can see the following options:



- Time movement: ◀ ▶ Using the left arrow button or right arrow button, it can be moved by -1 or +1 as much as the selected time range.

For example, if the time range is between 00:00 on February 13 and 00:00 on February 14, when you select the ◀ left arrow button, you can see the data within the time range between 00:00 on February 12 and 00:00 on February 13.

- Interval/Time Merge: In the menu at the top of ❶, you can modify the specified interval and time merge.
- By selecting the monitoring target: ⌵, you can specify the monitoring targets. If not selected, it searches for all.
- Time comparison: If you select ⌛, you can compare the current trend of the same metric with that of the previous time zone.
- By selecting the snapshot: 📷 icon, you can snapshot charts except for widget options.
- By selecting the CSV: CSV icon, you can download the plot data on the chart as a CSV file.
- **Detail:** By selecting the 📊 icon, the detailed view can be seen. When there are many monitoring targets, you can see the metrics trends for each monitoring target individually.

❗ If you do not see any options at the top of the metrics chart widget, select the ⋮ icon.

Deleting a widget

To delete all widgets placed on the screen, select 🗑 **Delete All Widgets** on the screen.

Metrics Search

Home > Select Project > **Analysis** > **Metrics Search**

You can query specific metrics based on tags in **Metrics Search**.

1 Metrics Search

Time selector: < 2023/08/17 07:57 ~ 2023/08/17 08:57 60Min > Max count: 100 Category: app_counter

2 Tags: All ☒ Filter: Filter by tag value

Field: All ☒ active_tx_3 active_tx_8 active_tx_count apex_satisfied apex_tolerated apex_total arrival_rate httpc_count httpc_error httpc_time meterlog resp90 resp95 resp_time sql_count sql_error sql_fetch_count sql_fetch_time sql_time tps tx_count tx_doc_time tx_error tx_http_time tx_sql_time tx_time tx_time_agg_sum 5/29

3

	Time	Oid	Tags								Fields				
			container	containerKey	hostIp	okindName	oname	onodeName	pid	type	active_tx_3	arrival_rate	sql_time	tps	tx_error
1	2023-08-17 07:57:40	633280970	agent.service	1395943798	10.21.1.26	demo-okind-1	demo-8103	node-1	3285013	java	10	20.57942	7.822286	20.94554	0
2	2023-08-17 07:57:40	-857948929	agent.service	1395943798	10.21.1.26	demo-okind-1	demo-8105	node-1	3284721	java	10	17.974834	10.626543	20.609276	0

1 Time and category selection

In the **1** area, you can specify the **Time selector**, **Max count**, and **Category** for the collected metrics. **Time selector** and **Category** must have been specified.

- **Time selector:** You can query by specifying the time when metrics were collected. The default value is **1 hour**. In addition to the lookup time provided as the default option, you can specify the date and time after selecting the **Time selector** tab.

! For more information on how to use the **Time selector** option.

- **Max count:** You can specify the maximum number of metrics to search in the **3** list. You can set the count up to **10**, **50**, **100**, **200**, **300**, **1000**, **2000**, and **3000**.
- **Category:** It is a classification unit for the related metrics. You can set the desired **Category** after selecting the **Category** tab.
- **Refresh categories, tags, and field options:** **Category**, **Tags**, and **Field** options can be fetched.

2 Tag and field selection

In the 2 area, select **Tags** and **Field**. The default setting is "Select All," unless specified separately by user.

- **Tags:** Unique data that can identify the collected targets.
- **Field:** Metrics collected from the monitored targets.
- **Filter:** Select  **Filter by tag value** and then set the tag value for filtering.

For example, you can search filtered data by setting the value of `oname` to `demo-8101`.

-  **Search:** If you set the conditions and then select **Search**, you can search the source data of the metric in the 3 area.
-  : You can download the source data of the metric as a CSV file.

3 Metrics table

Because the metrics to be collected cannot be specified in advance, it is important to check the source data for all metrics being collected. After setting the desired conditions in the condition area above, you can search the original data of the metric in a table format in the 3 area. Columns in the table are changed when you specify the conditions for **Tags** and **Field**.

- To search metrics, **Time selector** and **Category** must have been specified.
- To search metrics, **Tags** and **Field** are optional.

Metric Anomaly Detection

Home > Select Project >  Sitemap > Metrics Anomaly Detection

You can compare the patterns of various metrics with the expected patterns learned by the AI. Anomaly detections that deviate from the expected patterns can be viewed through the graph chart. You can check recurring patterns based on the past data and use them to predict future metrics values.

- ❗ • The widgets placed on the screen are not saved and reset when you go to another menu.
- It is similar to **Analysis > Metrics Chart** except for the pattern and anomaly display.
- The alert, **Anomaly detection** is based on the **Metric anomaly detection**. For more information about the **Anomaly detection** alert setting, see [the following](#).

Checking the widgets



- ❶ The bright color areas of the graph are the estimated patterns analyzed by the AI.
- ❷ The blue graph is the metrics trend of the project.
- If it deviates from the expected pattern analyzed by the AI, it displays dots on the graph in Orange and Red steps. The values that are far from the expected pattern range appear in red.

Placing the widgets



1. In **1 Time**, set a desired time interval. You can set the interval up to 1 month.
2. In **2 Filter**, select a range of the metrics.
3. In the following list, select a metric for monitoring.

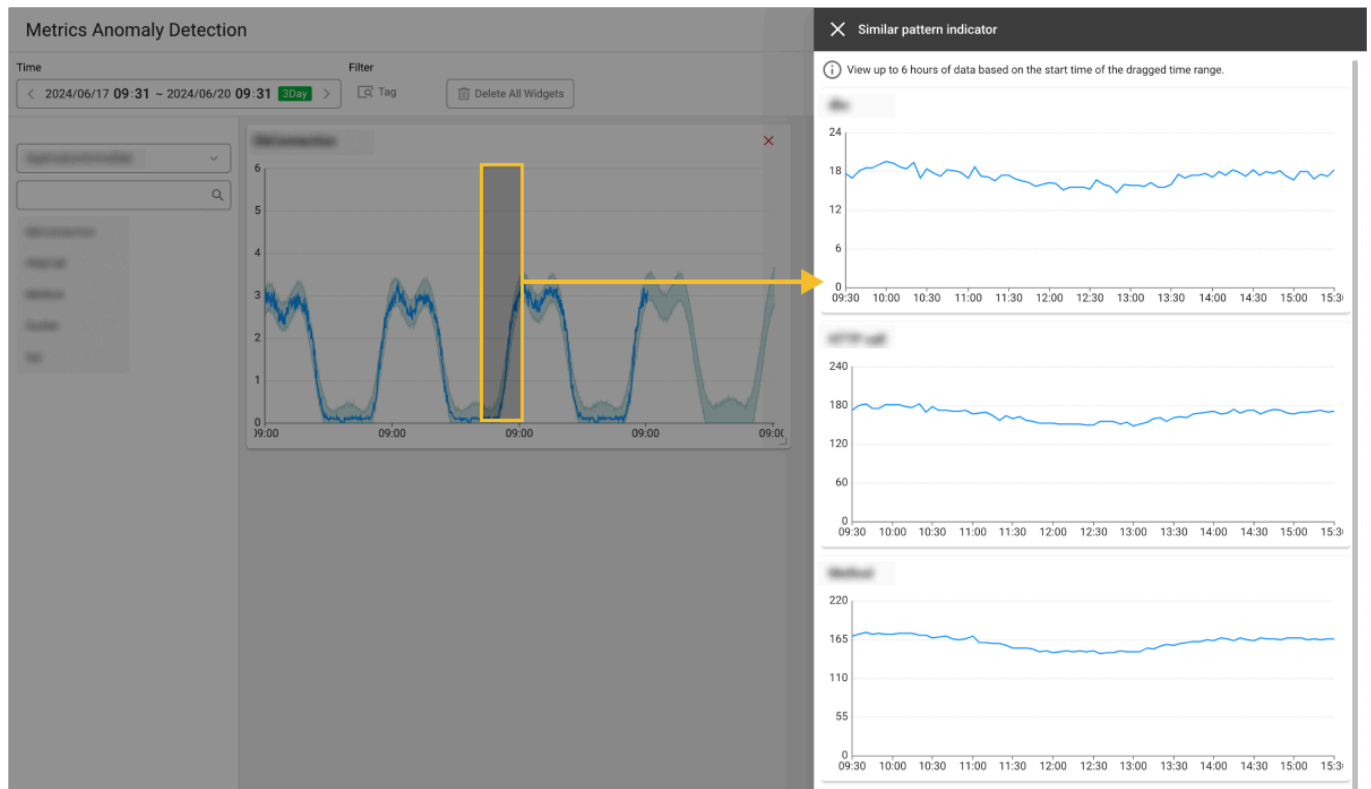
Place the selected metric to the right of the screen.

- Select **2 Tag** to check the metrics separately by selecting a monitoring target. A tag selection list appears on the right of the screen. Select desired items, and then add widgets.
- The widgets placed on the screen are not reflected in the chart even if the **Time** or **Tag** values have been changed.
- Select **X** on the upper right of the widget on the screen to delete.
- You can reposition a widget by dragging it while selecting the upper left part of the widget.
- You can resize a widget by selecting the upper right part of the widget and then dragging it.

Deleting a widget

To delete all widgets placed on the screen, select **Delete All Widgets** on the screen.

Checking the related metrics



Drag part of the chart in the widget. The **Similar pattern indicator** window appears on the right of the screen. You can search the related metrics for up to 6 hours based on the start time of the time range you dragged.

Transactions

What is Transaction?

Transaction means the logical unit of work (LUW) on the server side for processing a user browser request. The process for an individual web service (URL) request is a transaction. A transaction in a web application is the process from receiving an HTTP request for a web service (URL) to returning a response.

The performance of the application can be summarized as the performance of these transactions. Transaction performance includes information such as transaction start-to-end time, response time, resource usage, or attributes of the transaction caller.

Basically, the transaction performance can be analyzed through the response distribution and statistics.

Transaction name

The transaction name is URL. However, the Get parameter (query string) is excluded.

Browser Request

```
http://www.whatap.io/hr/apply.do?name='kim'
```

Transaction Name

```
/hr/apply.do
```

ⓘ In WhaTap, the [web service name](#) and [transaction name](#) are used interchangeably. It can be viewed as a module for handling service-specific URLs and requests to them. Because it means a process of a transaction request, the names of both can be called as URL.

Normalizing the transaction name

As the MSA-based systems evolve, instead of URL + ? argument parameter type, it is better to use the methods to put parameters in the URL path.

```
http://www.whatap.io/hr/kim/apply.do
```

If the path parameter is used as the transaction name as it is, it is difficult to analyze the performance from a statistical point of view. You need to normalize this. Whatap provides options and functions for normalization.

whatap.conf

```
trace_normalize_urls=/hr/{name}/apply.do
```

If set as the above, the transaction name is replaced for collection: [/hr/kim/apply.do](#) → [/hello/:name/apply.do](#). To leave the target URL setting as it is and turn off only the function, specify the option as follows. The default value is `true`.

whatap.conf

```
trace_normalize_enabled=false
```

Analyzing The Transactions

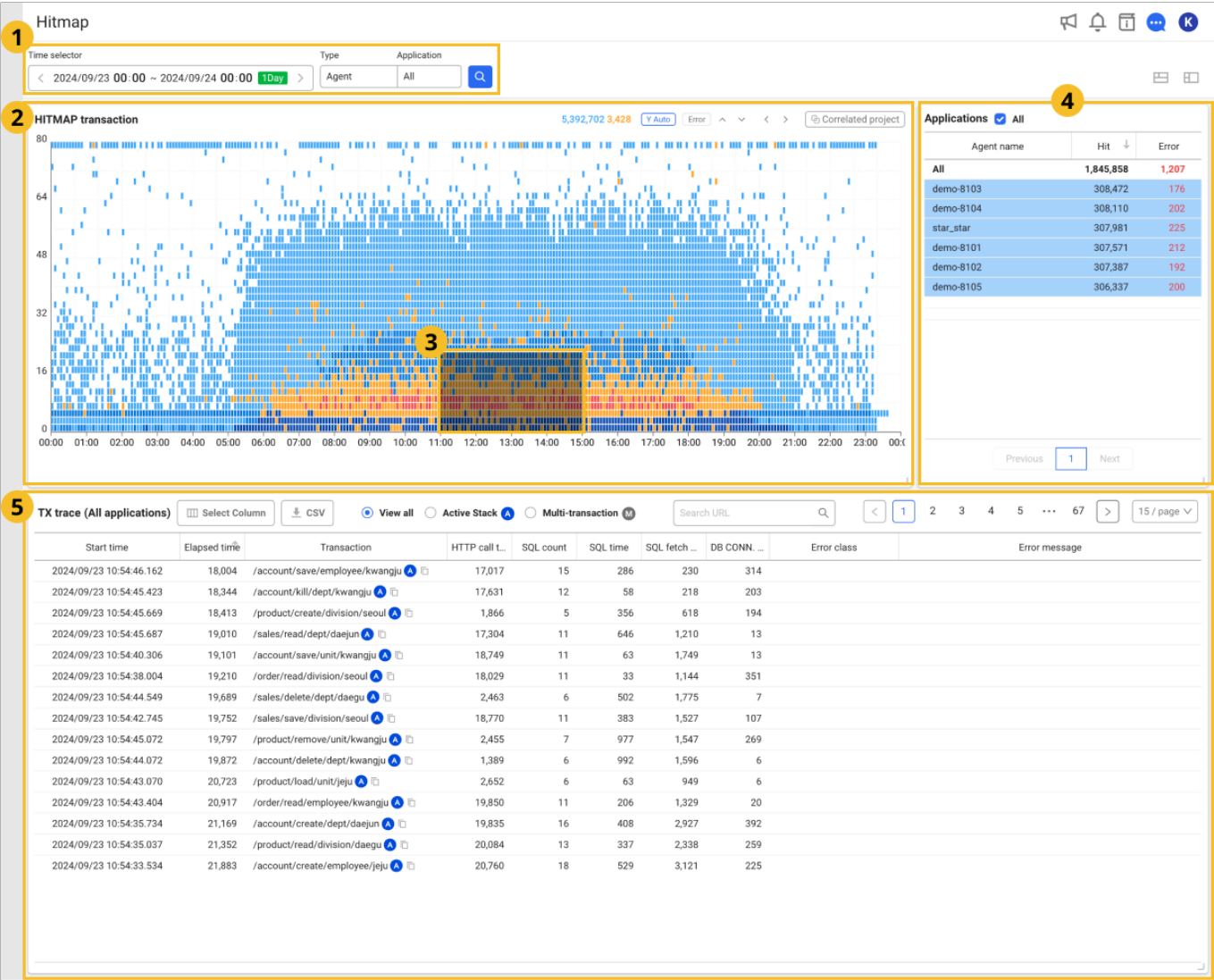
Hitmap

Home > Select Project > **Analysis** > **Hitmap**

On the initial screen of the WhaTap Monitoring service, select a project and then click **Analysis** > **Hitmap**.

ⓘ **Hitmap** can be also accessed through the **Hitmap** widget in **Dashboard** > **Application Dashboard**.

Detailed analysis



1 agent area

You can filter by selecting agents linked with the current project. If you select the  icon, the **HITMAP transaction** chart can be viewed in the **2** area.

2 HITMAP transaction

If transactions with latency issues are included, they appear in **orange** or **red** on the **HITMAP transaction** chart. If only normal transactions are included, they appear in **blue**.

3 Selection area

If you drag the real-time hitmap chart, the **5 TX trace** list appears where **4 Applications** list and transaction information can be viewed in the selected area.

4 Applications

You can check the numbers of transactions and errors included in the selected area on the chart. If you select the desired application in the list, the information details of the application appear in **5 TX trace**.

5 TX trace

The **TX trace** list contains information details. If you select a desired transaction from the list, the **Transaction information** window appears. In the **Transaction information** window, you can see the detailed trace details for the transaction. For more information, see [the following](#).

Understanding the hitmap patterns

The hitmap is a distribution chart whose X-axis is the transaction end time, and Y-axis is the response time. A normal web application displays a distribution concentrated in a few seconds or less.

hitmap-pattern

Analyzing the hitmap lines

- **Vertical line (LOCK symptom) pattern**

If a temporary lock (not only DB lock) occurs during transaction processing, the processing is queued. If the lock is released, pending transactions are finished together at a similar time. This creates vertical lines as follows:

hitmap-lock

Detecting locks in vertical line patterns is a very powerful concept. Especially in the microservice architecture, locks from backend systems can be equally detected.

hitmap-front-api-db

The vertical lines for response patterns in the front applications are also detected when any lock occurs in the DB used by the back-end system.

- **Horizontal line (timeout) pattern**

In the 10-second timeout condition, if the resources are insufficient, the transactions wait for 10 seconds until a timeout error occurs. At this time, horizontal lines appear near 10 seconds of the hitmap as follows:

hitmap-timeout

If there is a logic to retry after timeout, the horizontal lines repeat every 10 seconds as shown in the figure. The following is the hitmap for **failures**.

hitmap-error

(1) The response time increased in the section and (2) the red lines in the section are **horizontal line patterns**.
 (1) ConnectionPool is exhausted due to section load, (2) the secondary **timeout** failure occurred due to insufficient ConnectionPool.

Using the pattern analysis

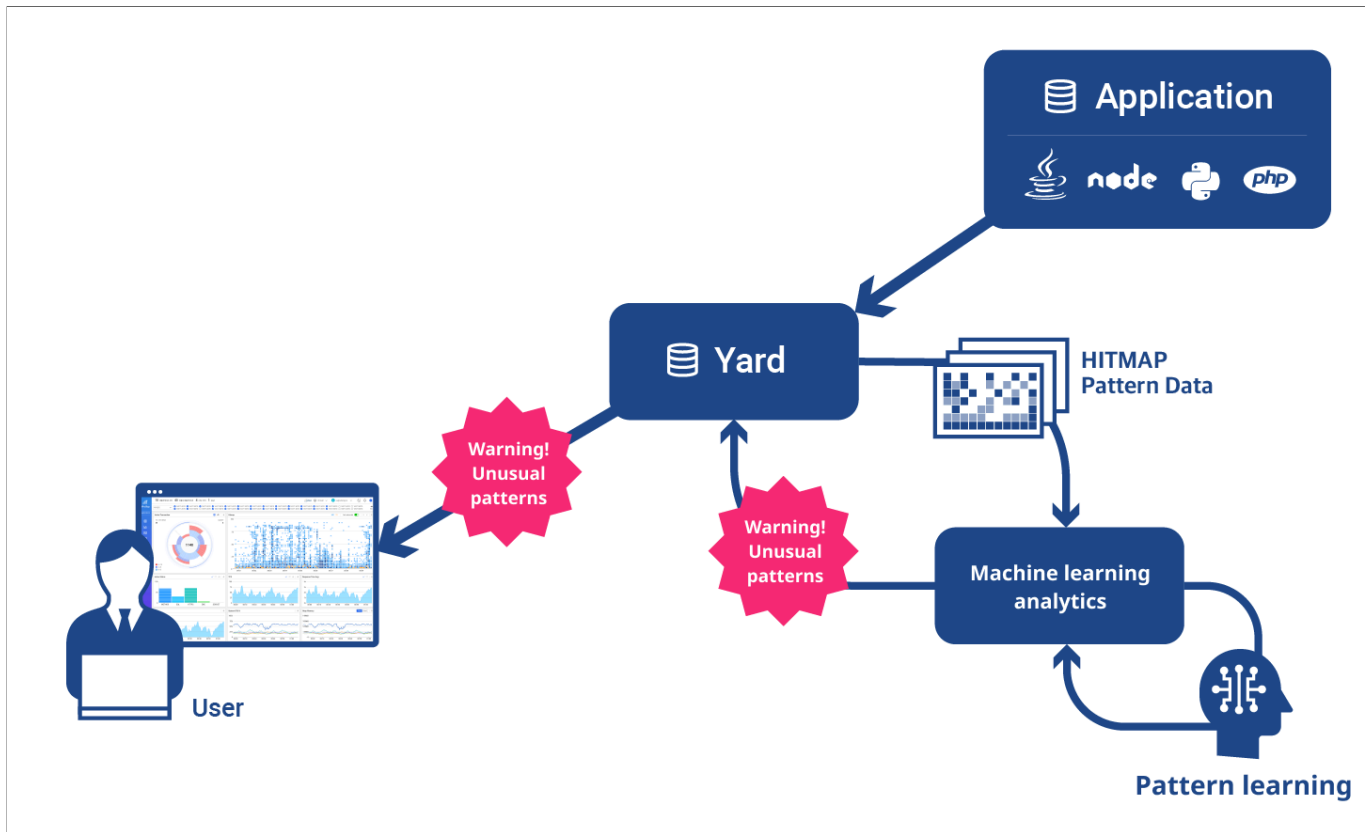
A line in the transaction response distribution indicates a bottleneck. If the lock is temporary, a vertical line is generated. If the bottleneck is release by timeout, a horizontal line is generated.

hitmap-pattern-analysis

When analyzing a problem, you can quickly pinpoint a transaction included in the line for selective analysis.

Analyzing the machine learning based response patterns

This function automatically detects abnormalities after analyzing the hitmap patterns with an aid of machine learning technology and then issues an alert.



Abnormal pattern example

It learns abnormal patterns from hundreds of TB of performance data every month and issues an alarm when a pattern similar to the learned abnormal one is detected.

- Vertical line pattern

hitmap-abnormal1

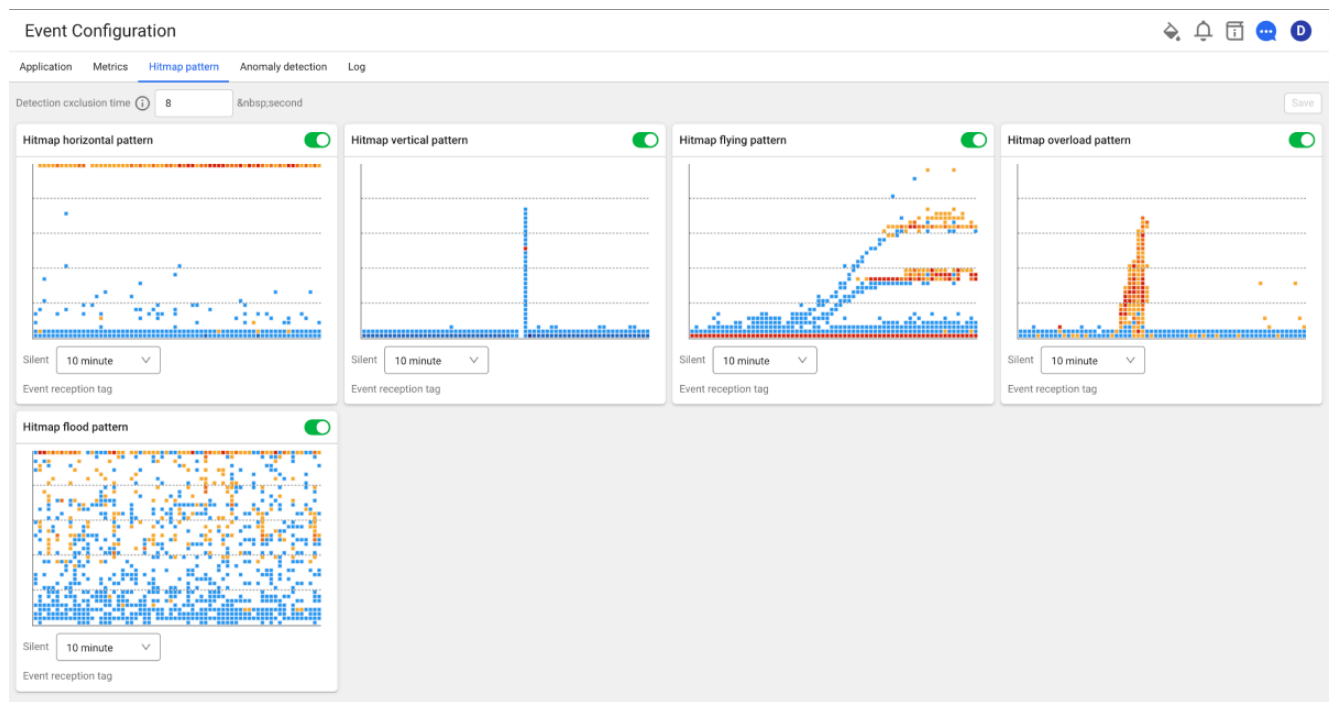
- Horizontal line pattern

hitmap-abnormal2

- Composite pattern

hitmap-abnormal3

- Hitmap alarm



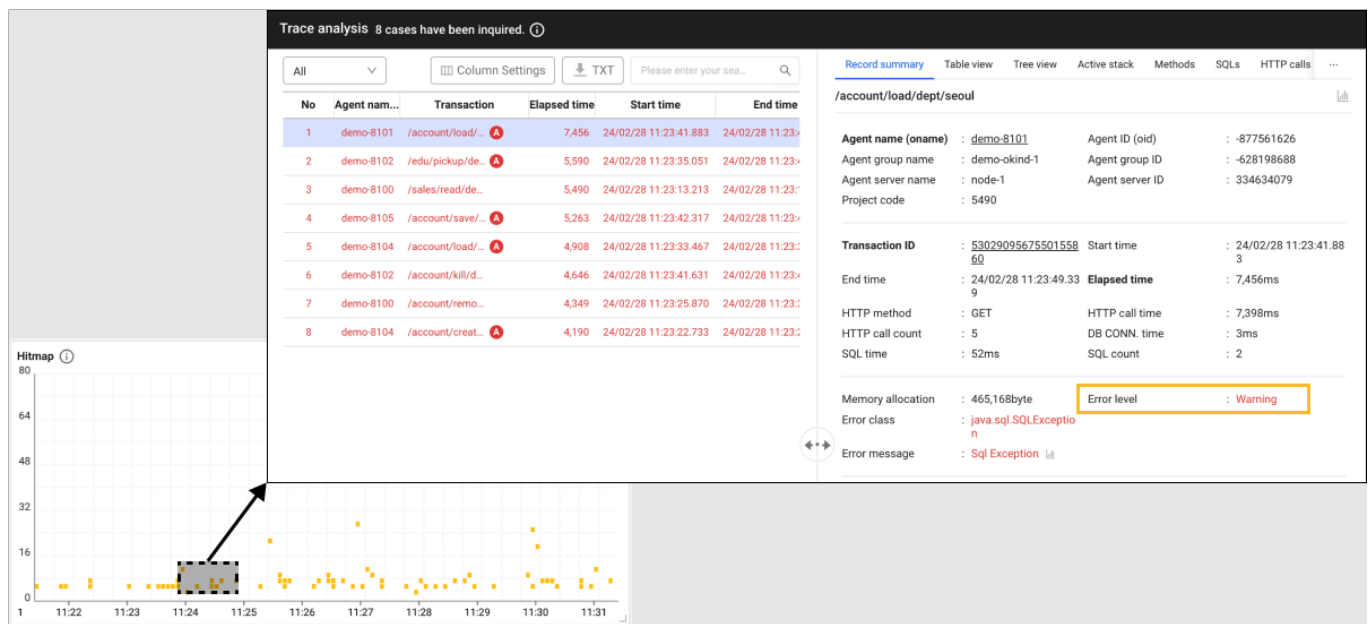
! For more information about the analysis method of the **HITMAP transaction** chart, see [the following](#).

Exception handling (WARNING) criteria

The following describes the criteria for exception handling by the .NET agent for errors that occur in the .NET application environment. The .NET agent handles errors only in the following cases:

- In case an unhandled exception occurs in the application environment
- In case Status Code 400 occurs

Error display on the service screen



Most **Error level** that can be seen through the **Hitmap** widget and **Trace analysis** window are for the **WARNING** level.

Status Code 400 or higher error handling

If the HTTP response code is 400 or more, it is treated as an error even if no exception class occurs. The following is the agent option that sets whether or not to enable error handling based on the HTTP status code.

whatap.conf

```
transaction_status_error_enable=true
```

! For more information about the `transaction_status_error_enable` option, see [the following](#).

Transaction error step INFO processing

Some errors can be displayed as normal or ignored through the agent settings. The level displayed in the

Hitmap widget is **INFO** (blue).

If the following conditions are met, they are not treated as errors.

- In case the value of the `transaction_status_error_enable` option is `false`

whatap.conf

```
# default true
transaction_status_error_enable=false
```

- In case the status code is defined in the `status_ignore` option

whatap.conf

```
# Separated by commas(,)
status_ignore=400,404,500
```

- In case the combination of URL and status code is defined in the `status_ignore_set` option

whatap.conf

```
# URL:StatusCode
status_ignore_set=/api/auth/token:401,/health-check:503
```

- ! • The agent settings can be configured in [whatap.conf](#) and they can be viewed in the **Management > Agent CONFIG.** menu. For more information, see [the following](#).
- For more information about the agent configuration options, see the following documents:
 - `transaction_status_error_enable`
 - `status_ignore`
 - `status_ignore_set`

Transaction Tracing

What is Transaction Tracing?

While the transaction performance means the summary metrics or attributes between the start and end of transaction, the transaction profile traces the steps during transactions. If any transaction is slow or erroneous, the execution records must be traced step by step to find the cause. This is called **transaction tracing**.

The types of steps collected for transaction performance tracing are as follows.

- **DB connection step** **START-END**

It includes the performance for connection to RDB. Step information includes the name, response time, and error.

- **SQL Step** **START-END**

It includes the performance for JDBC SQL. Step information includes connection data, SQL statements, and errors.

- **HTTP Call step** **START-END**

It includes the performance for the outbound HTTP service call. Step information includes URL, host, port, response time, and errors.

- **Message step** **ADD**

While collecting traces, the message steps are used to collect the records of all irregular sections.

- **SOCKET Step** **ADD**

Step to represent the socket open.

- **METHOD Step** **START-END**

The method response time is traced.

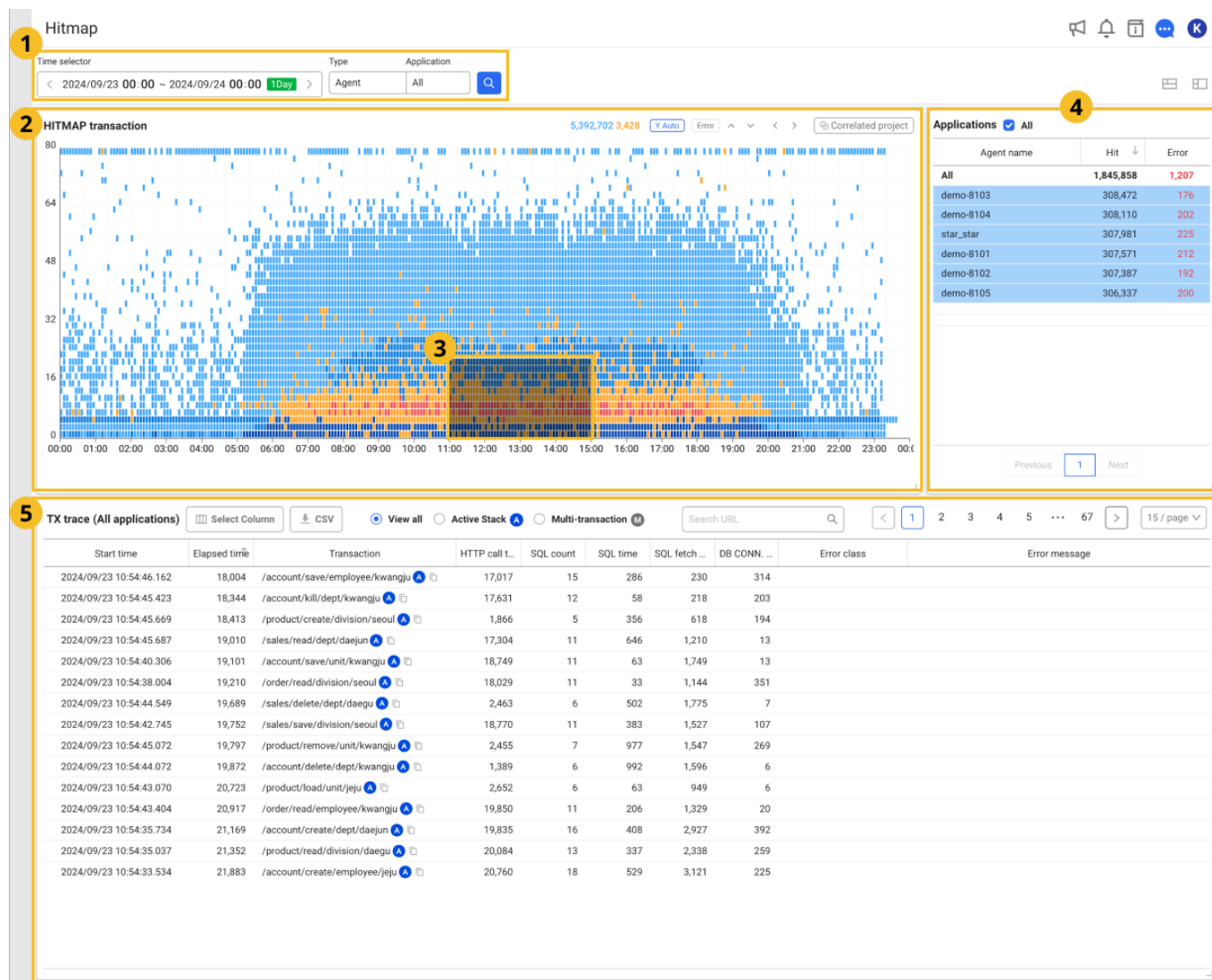
- **ACTIVE STACK Step** **START-END**

It includes the active stack information. It is created and collected by a separate thread and it is added to the transaction trace.

! In the WhaTap monitoring service, **Step** is used as the same meaning as **Span**.

Detailed analysis

Home > Select Project > **Analysis** > **Hitmap**



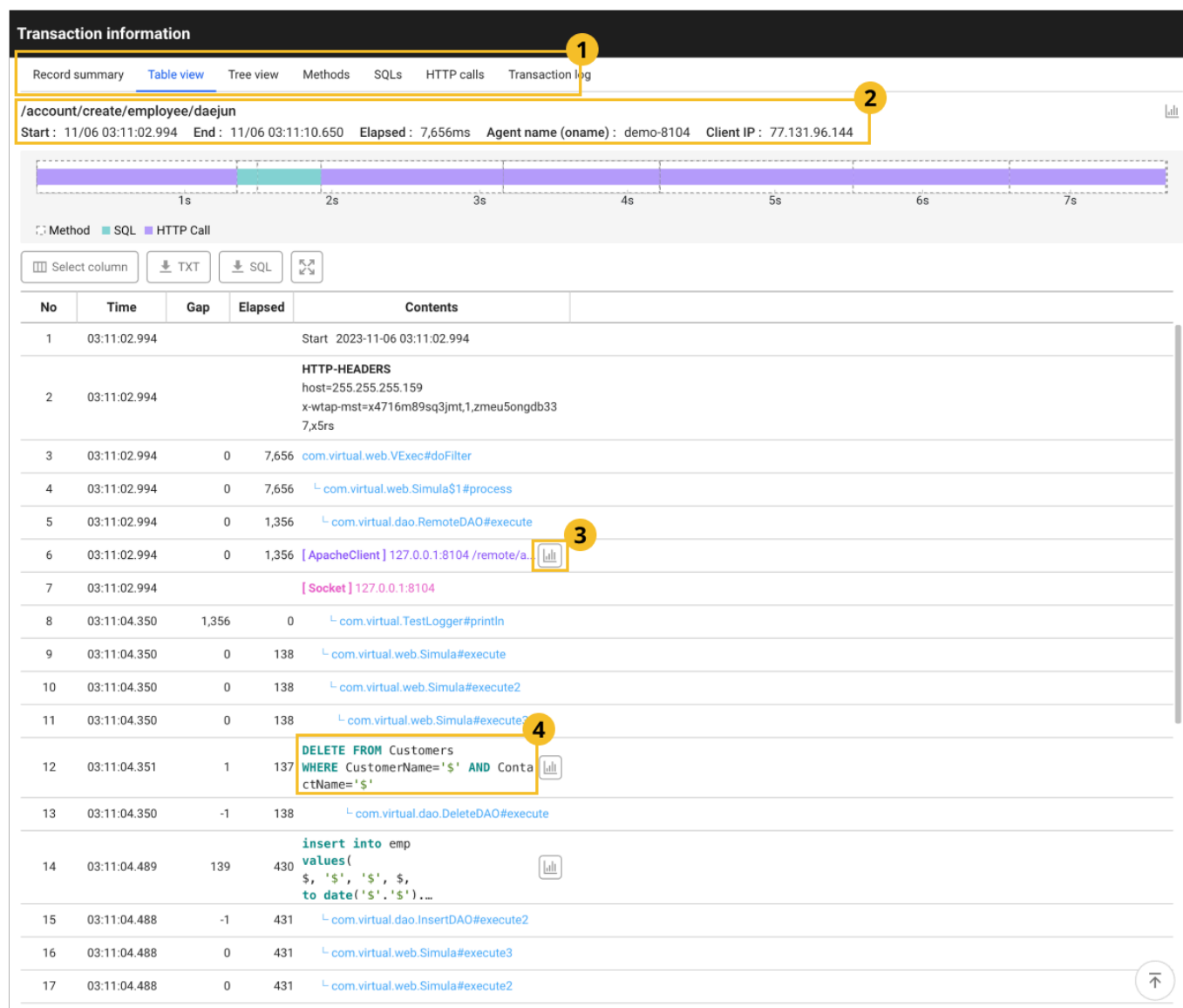
1. In **1** Time selector, select a time period to see the hitmap.
2. In **1** Type and Application, select the targets to view.

3. Select .
4. In  **HITMAP transaction**, drag a desired area as in .
5. If the list appears in  **TX trace**, select a transaction to analyze.

The **Transaction information** window appears where you can check properties such as client information for transaction performance analysis, transaction processing performance, and detailed execution history for each section.

-  • For more information about the **Hitmap** menu, see [the following](#).
- For more information about the hitmap widgets on the application dashboard, see [the following](#).

Guide to transaction information window



- In the 1 area, the step data can be seen in various formats. Select a desired type of tab.
- In the 2 area, you can see the basic information for transactions.
- 3: The statistical data window for the corresponding URL or each execution section appears. Click a desired time on the graph chart in the statistical data window to go to **Statistics** or **Transaction Search**. You can view the statistical data based on the selected time.

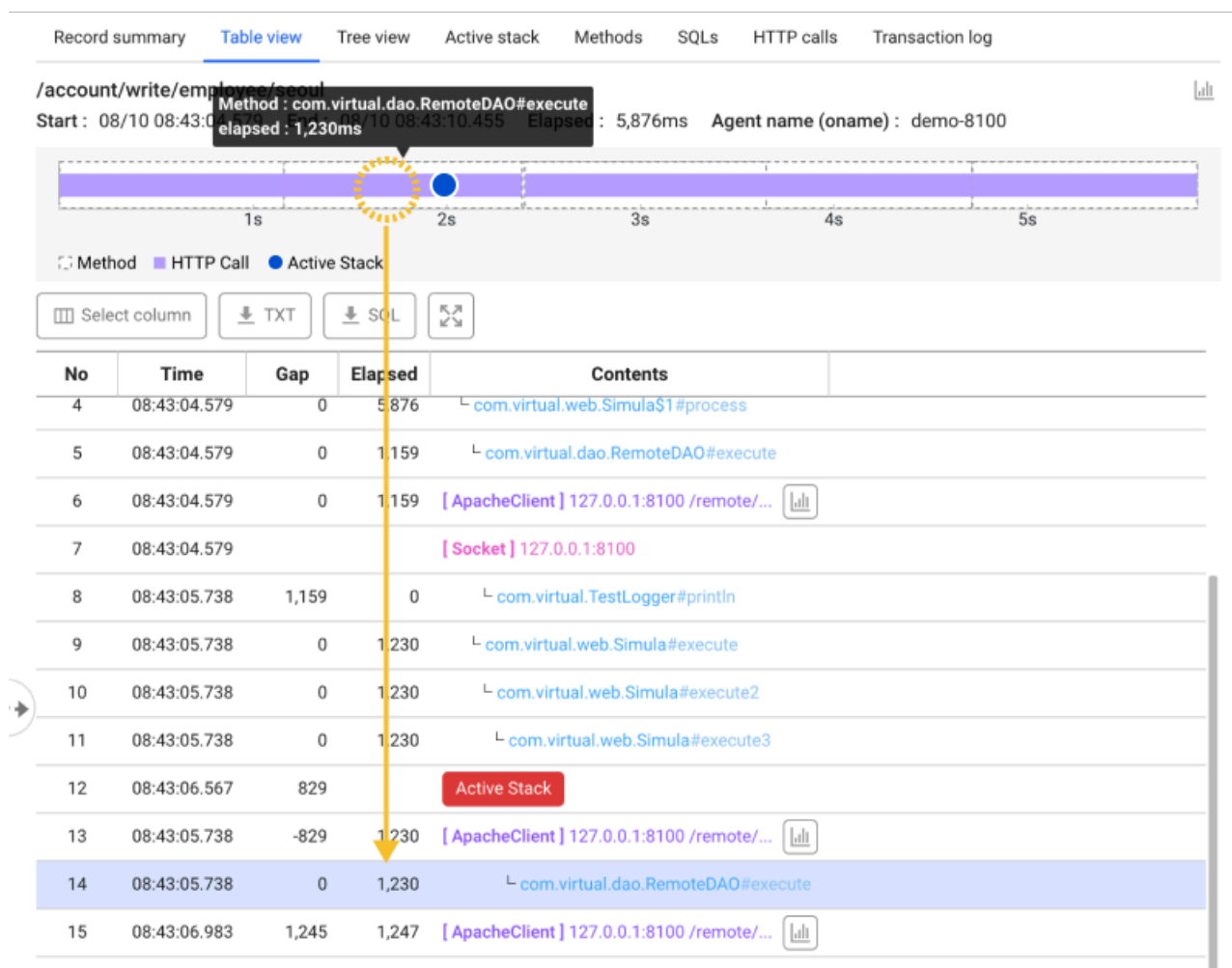
- ①
 - For more information about **Statistics**, see [the following](#).
 - For more information about the **Transaction Search** menu, see [the following](#).

- If you select **4** SQL step, the SQL variables and HTTP queries can be viewed. For more information, see [the following](#).

Table view

In the **Table view** tab, you can see the transaction execution steps in chronological order.

- You can classify transactions by each execution section and see them in a diagram. Out of all elapsed times, you can quickly find the times spent for each section and the section that took the longest.
- If you select each section in the diagram, the corresponding table list appears where the step is located.



- The area where the blue circle (●) is located, is the moment when the active stack has been collected. If you select the blue circle, the table list appears where the **Active Stack** button is located. If you click **Active Stack**, you can check the step performed during the section.

- In the transaction list, you can see them from the items marked with the **A** icon.
 - For more information about active stacks, see [the following](#).

- Select column:** You can add or hide the memory accumulation and CPU accumulation data as columns in the table list. The columns are as follows:
 - No:** Step occurrence sequence

- **Time:** Start time of each step
- **Gap:** The waited time between the start time of the previous step and the current step may have a difference, while there may be a gap from the elapsed time if a delay happens due to external factors.
- **Elapsed:** Total elapsed time from the start to the end of each method
- **Contents:** Execution details of the step
-  **TXT:** You can download basic transaction data and execution data for each section in a text file.
-  **SQL:** The basic transaction information and SQL execution data can be downloaded as a text file.
 - **Download with substitute value:** It downloads the SQL statistics data after replacing the bind variable value with its original one. If a security key (`paramkey`) is set, the security key input window appears. You must enter the security key for downloading. For more information about the agent configuration related to the security key, see [the following](#).
 - **Download without substitute value:** It downloads SQL statistics data without replacing the bind variable value.
- : You can see only the table list, with hiding the transaction summary and diagrams. If you select , the hidden information reappears. This feature is useful when you have a long list of tables.
- If you select the SQL step, the **SQL** window appears to display parameters. For more information, see [the following](#).

Record summary

To see the basic information for transactions, select the **Record summary** tab. You can see the basic information of the transaction, agent on which the transaction was performed, memory allocation usage, and client information.

Record summary

Table view

Tree view

Methods

SQLs

HTTP calls

Transaction log

Transaction

/account/save/division/daejun

Original URL

Project code

5490

Status

200

Error level

Warning

Error class

Internal RuntimeException

Error message

Internal RuntimeException

Elapsed time

6,638ms

Start time

24/09/24 15:49:52.317

End time

24/09/24 15:49:58.955

User agent

Mozilla/5.0 (X11; U; Linux i686; en-US; rv:1.3) Gecko/20030320

Transaction ID

-8541160086278366865

Agent name (oname)

demo-8101

Agent ID (oid)

-877561626

Agent group name

demo-okind-1

Agent group ID

-628198688

Agent server name

node-1

Agent server ID

334634079

HTTP method

GET

SQL time

918ms

HTTP call time

4,305ms

SQL count

8

HTTP call count

4

SQL patch time

16ms

DB CONN. time

249ms

SQL fetch count

1,065

CPU usage time

0ms

Memory allocation

623,136byte

Client IP

152.4.69.63

Operating system

Linux

Domain

255.255.255.196

Country/Region

US

City

Chapel Hill

Client type

Other

Client name

Other

WClientID

-1744550593

methodCount

0

methodTime

0

Classification	Properties	Description
Transaction	Transaction	API or URL call executed by the application, and the path of the transaction. It converts to a specific format using regular expressions.
	Original URL	It is the URL path that was actually called. A concrete request path that does not include variables. If there is an original URL, the original URL appears. If there is no original URL, it is not displayed.
	Project code	Identification code of the project registered in the WhaTap monitoring service.

Classification	Properties	Description
	Status	HTTP response status code for the transaction.
	Error level	Level of the error that occurred in the transaction. It is displayed as Warning or Critical.
	Error class	Class of the error that occurred in the transaction.
	Error message	Message of the error that occurred in the transaction.
	Elapsed time	Transaction execution time.
	Start time	Transaction start time.
	End time	Transaction end time.
	User agent	Browser used to extract client-related data.
	Referer	Page address or incoming path used by the browser of the client.
	Transaction ID	It is a unique ID of the transaction.
	Multi transaction ID	It is a unique ID of the multi-transaction. It appears when executed in parallel with transactions of other applications.
Agent	Agent name (oname)	Agent name
	Agent ID (oid)	It is a unique ID of the agent.
	Agent group name	Agent group name set with the <code>okind</code> option.
	Agent group	It is a unique ID of the agent group.

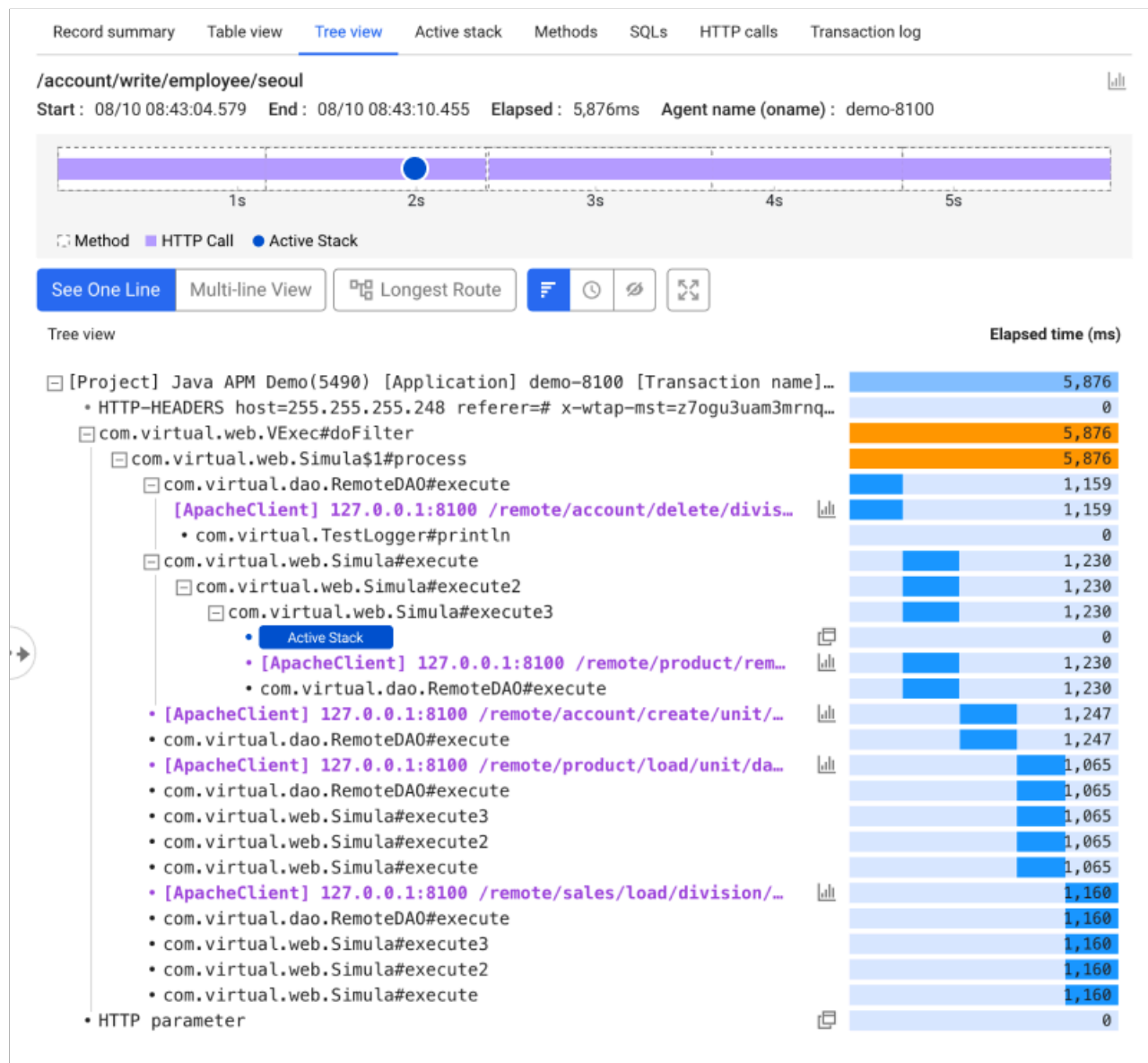
Classification	Properties	Description
	ID	
	Agent server name	Agent server name set with the <code>ondoe</code> option.
	Agent server ID	It is a unique ID of the agent server.
Step	HTTP method	HTTP method. (GET, POST, PUT, HEAD, etc.)
	HTTP call time	Outbound HTTP call time.
	HTTP call count	Number of outbound HTTP calls.
	DB CONN. time	Time taken to connect to the database.
	SQL time	SQL execution time.
	SQL count	SQL execution count.
	SQL patch time	Time taken to search for the record. Nesting may occur or other logic may be included.
	SQL fetch count	Number of the records retrieved from SQL.
Resource	CPU usage time	CPU time used for processing transactions.
	Memory allocation	Amount of memory used by the transaction.
Containers	Pod name	It is the name of the Kubernetes Pod that processed the transaction.

Classification	Properties	Description
	Container Id	It is a unique identifier for a specific container running within a Pod.
Client	Client IP	Client IP address.
	OS	OS environment in which the browser runs.
	Domain	Internet address assigned to the IP address that the client connected to.
	Country/ Region	Client's country.
	City	City in the client's country.
	Client type	Browser type used by the client.
	Client name	Device name used by the client.
	WClientID	This is a unique ID of the client.
Method	methodCount	Number of methods called by transactions.
	methodTime	Time taken for method execution.

- The collected data may differ depending on the application type, settings, and step type. **Container** entries appear only when the application is running in the container environment.
- Error related items are displayed when an error occurs from the transaction.
- Some transaction properties provide statistical features. If you select the  button, a window appears where you can see the status of transactions occurred during the query time through a time series chart. If you select a bar graph in the chart, you can go to the **Analysis > Transaction Search** menu to view details.
- WhaTap basically stores the client-related information. For more information about the agent settings for user data collection, see [the following](#).

Tree view

To see the transaction execution steps in a tree format, select the **Tree view** tab. You can see the details of each transaction and its trace details, trace start time, step time, and call relationship. If you select each section of the diagram, the tree view of the step appears.



- **Single-line View:** You can arrange the tree format at intervals by displaying the texts displayed in the execution data for each section in a single line.

- **Multi-line View:** All the texts displayed in the execution data for each section, appear by wrapping words.
- **Longest Path:** The longest route can appear.
-  **Show Time Bar:** The elapsed times are displayed in a bar chart.
-  **Show Time:** The timestamps, gaps, and elapsed times for each segment are displayed in text.
 - 8 seconds or more: **Excessive delay** state is distinguished in **red**.
 - Between 3 and 8 seconds: **Delay** state is distinguished in **orange**.
 - Less than 3 seconds: **Normal** state is distinguished in **blue**.
-  **Hide Time:** The time is hidden.
- : You can see only the tree view that hides transaction summary and diagrams. If you select , the hidden information reappears. This feature is useful when the tree view list is long.
- : A window appears where you can view SQL variables and HTTP queries. For more information, see [the following](#).

 In case of start and step times, the time differences caused by the transaction call environment are corrected on the screen through traces and mappings in the parent transactions. Accordingly, there may be differences from the actual time data.

Active Stack

Record summary
Table view
Tree view
Active stack
Methods
SQLs
HTTP calls
Transaction log

/account/load/division/daegu

Stack

Active Stack analysis
Beta

Start : 04/06 14:16:32.419
End : 04/06 14:17:33.709
Elapsed : 61,290ms
Agent name (oname) : demo-8100
Client IP : 167.109.194.221

Active Stack (6)

No	Time
30	14:16:37.807
70	14:16:48.223
80	14:16:58.504
81	14:17:08.542
82	14:17:18.547
108	14:17:28.575

```

java.base@17.0.12/sun.nio.ch.SocketDispatcher.read0(Native Method)
java.base@17.0.12/sun.nio.ch.SocketDispatcher.read(SocketDispatcher.java:47)
java.base@17.0.12/sun.nio.ch.NioSocketImpl.tryRead(NioSocketImpl.java:266)
java.base@17.0.12/sun.nio.ch.NioSocketImpl.implRead(NioSocketImpl.java:317)
java.base@17.0.12/sun.nio.ch.NioSocketImpl.read(NioSocketImpl.java:355)
java.base@17.0.12/sun.nio.ch.NioSocketImpl$1.read(NioSocketImpl.java:808)
java.base@17.0.12/java.net.Socket$SocketInputStream.read(Socket.java:966)
app//org.apache.http.impl.io.SessionInputBufferImpl.streamRead(SessionInputBu
fferImpl.java:139)
app//org.apache.http.impl.io.SessionInputBufferImpl.fillBuffer(SessionInputBu
fferImpl.java:155)
app//org.apache.http.impl.io.SessionInputBufferImpl.readLine(SessionInputBuff
erImpl.java:284)

```

Select the **Active stack** tab to view the list of active stacks collected from the transaction.

- Select a collection point (No, Time) from the **Active Stack** list on the left to display the stack information for that point on the right.
- **Stack**: You can download the active stack details as a TXT file.

- ! • You can check the active stack from items marked with the icon in the transaction list.
- For more information about active stacks, see [the following](#).

AI Active Stack Analysis

Beta

Click the **Active Stack Analysis** button to automatically analyze collected active stacks with AI. It identifies performance issues based on the stack dumps of in-progress transactions and suggests improvements.

The analysis results consist of the following 4 sections:

- **Summary:** Summarizes the number of analyzed stacks and the overall execution flow.
- **Common Patterns:** Displays repeatedly observed execution patterns, including pattern name, occurrence count, and description.
- **Issues Found:** Displays identified performance issues with severity levels (**High**, **Medium**, **Low**) along with the stack information used for the assessment.

Severity	Criteria
High	Deadlock, complete blocking, same blocking repeated 4+ times
Medium	I/O wait, 2-3 lock contentions, slow external calls
Low	Single-occurrence wait, minor optimization opportunities

- **Recommendations:** Suggests specific improvement actions by priority.

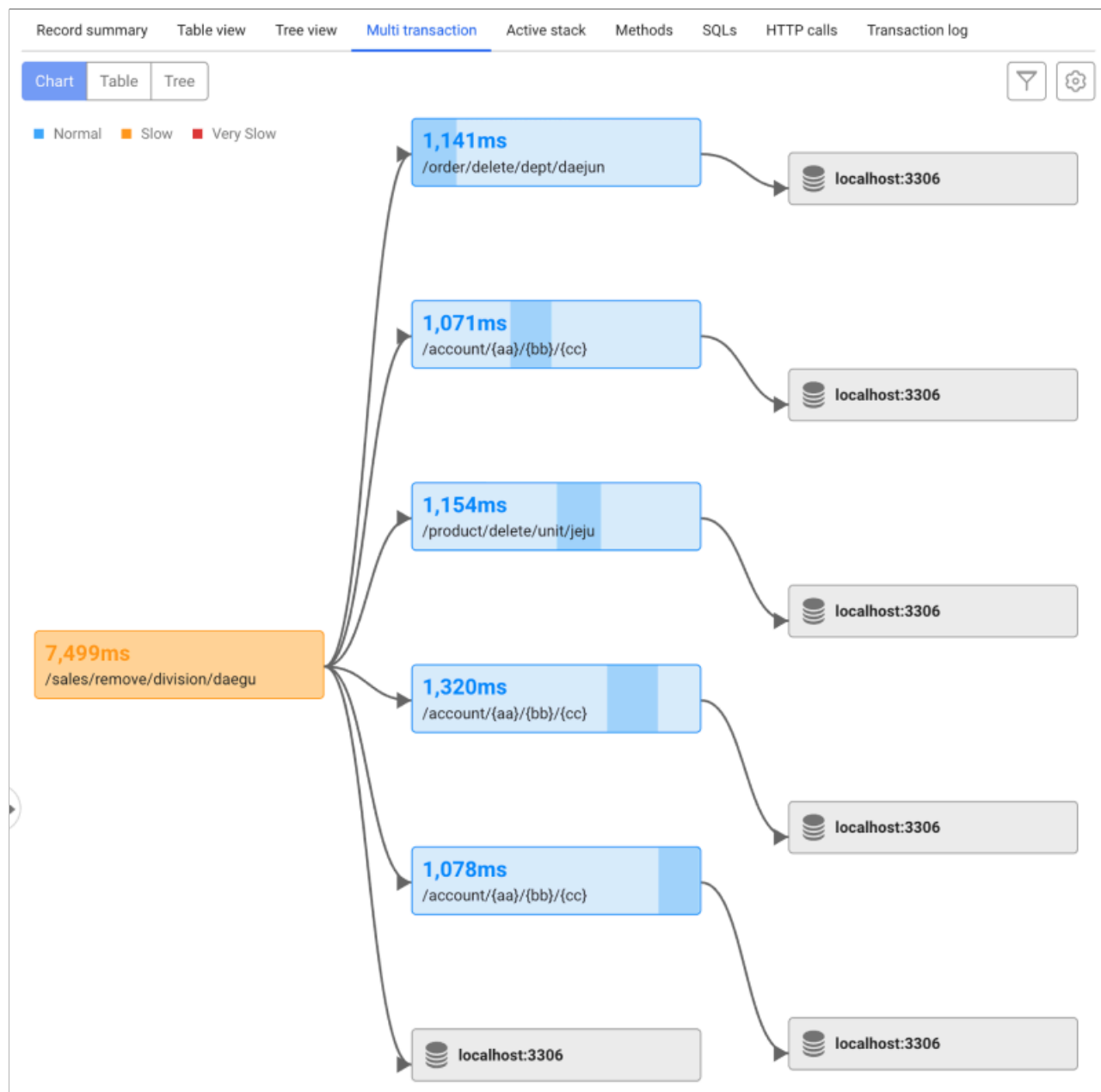
Each analysis item displays the collected stack number (`No.N`). Click the stack number to view the original stack.

- ⓘ • The analysis results are generated by AI and may differ from actual conditions. Use them as reference material.
- **Member** role or above is required.

Multi-transaction

Multi-transaction indicates the transaction involving other agents or projects. In the **Multi transaction** tab, you can see the call relationships between applications registered in the WhaTap monitoring service.

- ✓ To trace multi-transactions, set the `mtrace_enabled` option to `true` in **Management > Agent CONF.** For more information about the agent configuration, see [the following](#).



- **Chart:** Provides the call relationships for each transaction in a flowchart. Select a transaction node to see the trace analysis for the transaction node. In **Chart** mode, you can use the mouse to go to a desired position or zoom in or out by scrolling.
 - **Chart view settings:** You can display or hide the elements on the chart.
- **Table:** In the form of table, you can check the data for each transaction included in the multi-transaction. You

can select the  column selection icon to edit the table header columns. You can see the trace analysis data by selecting each transaction item.

- **Tree:** You can see the call relationships between transactions in a tree format. The related additional functions are the same as those of the **Tree view** tab.
-  **Project selection:** You can select or deselect projects to be displayed on the chart.

- You can see them in the transaction list marked with the  icon.
- For more information about the multi-transaction, see [the following](#).

Methods

Record summary Table view Tree view Active stack Methods SQLs HTTP calls Transaction log							
/account/read/unit/jeju							  Method
No	Class	Method	Parameter/Return	Count	Sum (ms)	Max (ms)	
1	com.virtual.dao.Remot...	execute	()V	27	39,063	2,776	
2	com.virtual.dao.PITest	exec	(Ljava/sql/PreparedSta...	3	0	0	
3	com.virtual.dao.InsertD...	execute2	(Ljava/lang/String;)V	2	4	3	
4	com.virtual.dao.Update...	execute2	(Ljava/lang/String;)V	2	18	14	
5	com.virtual.dao.Delete...	execute	()V	2	3	2	
6	com.virtual.dao.Select...	execute2	(Ljava/lang/String;)V	1	5	5	
7	com.virtual.dao.Update...	execute	()V	1	4	4	
8	com.virtual.dao.Select...	execute2	()V	1	7	7	
9	com.virtual.dao.Select...	execute	()V	1	9	9	
10	com.virtual.dao.InsertD...	execute2	()V	1	3	3	

To see only the method data, select the **Methods** tab. It displays the method name and step time for which tracing has been set on the agent. When unnecessary logics are repeatedly executed, it can be used as analysis data to improve the method logic by finding the case where the execution takes longer than the low count.

- : You can see the **Transaction statistics** information. If a graph on the chart is selected, the **Analysis > Transaction Search** menu appears. You can see the list of transactions for the selected time zone.

-  **Method:** You can download the method-related details as a TXT file.

 For more information about the agent configuration options on methods, see [the following](#). Method tracing support may differ depending on the product in use.

SQLs

Record summary Table view Tree view Active stack Methods <u>SQLs</u> HTTP calls Transaction log						
/account/read/unit/jeju						
  SQL						
No	Database	SQL	Count	Sum (ms)	Max (ms)	
1	jdbc:mysql://localhost:...	DELETE FROM Custom...	2	0	0	
2	jdbc:mysql://localhost:...	SELECT distance, lat, lo...	1	0	0	
3	jdbc:mysql://localhost:...	SELECT distance, lat, lo...	1	0	0	
4	jdbc:mysql://localhost:...	UPDATE emp set e.ena...	1	0	0	
5	jdbc:mysql://localhost:...	update table set x=# w...	1	0	0	
6	jdbc:mysql://localhost:...	SELECT p.Name AS Pr...	1	0	0	
7	jdbc:mysql://localhost:...	SELECT customer_info...	1	0	0	
8	jdbc:mysql://localhost:...	INSERT INTO EMP VAL...	1	1	1	

To check the SQL statement information, select the **SQLs** tab. In case of unnecessarily repetitive execution, it can be used as analytical data to improve query performance by finding the case where the execution time takes longer compared to the low count.

- : You can see the **Transaction statistics** information. If a graph on the chart is selected, the **Analysis > Transaction Search** menu appears. You can see the list of transactions for the selected time zone.
-  **SQL:** You can download the SQL-related details as a TXT file.

HTTP calls

Record summary	Table view	Tree view	Active stack	Methods	SQLs	HTTP calls	Transaction log
----------------	------------	-----------	--------------	---------	------	------------	-----------------

/account/read/unit/jeju							 HTTP
No	Remote server	URL	Count	Sum (ms)	Max (ms)		
1	127.0.0.1:8105	/remote/account/save...	2	4,116	2,776		
2	127.0.0.1:8105	/remote/order/save/di...	1	238	238		
3	127.0.0.1:8105	/remote/sales/pickup/...	1	922	922		
4	127.0.0.1:8105	/remote/sales/remove...	1	1,980	1,980		
5	127.0.0.1:8105	/remote/order/save/de...	1	2,639	2,639		
6	127.0.0.1:8105	/remote/edu/kill/unit/p...	1	1,519	1,519		
7	127.0.0.1:8105	/remote/order/read/de...	1	1,467	1,467		
8	127.0.0.1:8105	/remote/order/delete/...	1	485	485		
9	127.0.0.1:8105	/remote/sales/kill/emp...	1	2,210	2,210		

To see the count, time sum, average time, and such for HTTP calls, select the **HTTP calls** tab. If unnecessary external calls are repeatedly executed, it can be used as analytical information to determine whether the transaction delays are external or internal by finding the cases where the execution time takes longer compared to the low count.

- : You can see the **Transaction statistics** information. If a graph on the chart is selected, the **Analysis > Transaction Search** menu appears. You can see the list of transactions for the selected time zone.
-  **HTTP**: You can download the HTTP call-related details as a TXT file.

Transaction log

To see the logs of the transaction, select the **Transaction log** tab.

Transaction information			
Record summary	Table view	Tree view	Multi transaction
Methods	SQLs	HTTP calls	Transaction log

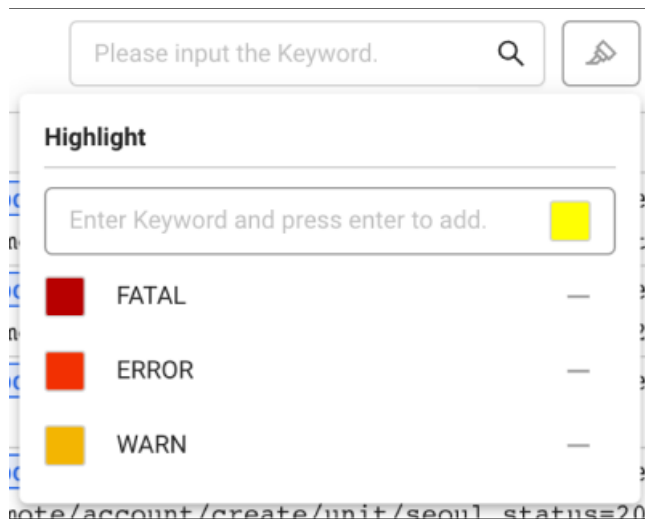
/sales/save/division/daejun			
Log search > Please input the Keyword.    			
▶	oname	Timestamp	Log
▶	java-demo2	2025-04-16 09:17:12.571	@txid 2737043795003671073 pcode 8 onodeName node-1 oid -1737750367 okind 867318026 oname java-demo2 agentime 1744762632114 select distinct pp.lastname, pp.firstname
▶	java-demo2	2025-04-16 09:17:12.773	@txid 2737043795003671073 pcode 8 onodeName node-1 oid -1737750367 okind 867318026 oname java-demo2 agentime 1744762632155 select
▶	java-demo2	2025-04-16 09:17:12.773	@txid 2737043795003671073 pcode 8 onodeName node-1 oid -1737750367 okind 867318026 oname java-demo2 agentime 1744762632193 select productid, avg(orderqty) as averagequantity, sum(linetotal) as total

- : You can see the **Transaction statistics** information. If a graph on the chart is selected, the **Analysis > Transaction Search** menu appears. You can see the list of transactions for the selected time zone.
- **Log Search**: You can go to Log Search to easily find the desired log data.
- **Keyword search**: Enter the desired text to search in the keyword search field, and then press Enter or select the  button. It highlights the keywords that match the entered text.
-  **Keyword highlight**: If you set the keyword and color, the texts that match the keyword are automatically highlighted in the log list. For more information, see [the following](#).
-  **Column settings**: You can add columns or change the order of columns displayed in the log list table. For more information, see [the following](#).
-  **Log view detail setting**: You can configure the items to be displayed in the log list. For more information, see [the following](#).

-  To enable the **Transaction log** tab, apply the agent setting options related to the logs. For more information about the log settings, see [the following](#).
- The **Transaction log** tab can be accessed by only the members with the **View log** role. For more information about the member roles, see [the following](#).

Setting the keyword highlight

1. To add keywords to highlight, select .



2. Enter a desired keyword.
3. Select the color icon and then select a desired color.
4. Press Enter. The added keywords are added in the list.

Deleting the keyword highlight

To delete the items unused from the highlight list, select —.

Displaying or hiding the table columns

1. Select  on the upper right of the table.
2. If the **Column settings** window appears, select or unselect the desired item in the list on the left.
You can also hide columns by selecting the  button in the list on the right.
3. After all settings are finished, select **Confirm**. The set content is applied to the table.

Reordering the table columns

1. Select  on the upper right of the table.
2. When the **Column settings** window appears, change the order by dragging the desired items from the list on the right.

3. After all settings are finished, select **Confirm**. The set content is applied to the table.

Setting to display the table content

1. Select  on the upper right of the table.
2. When the **Log view detail setting** window appears, set the desired options.
 - Select **content** or **Tag** to determine whether or not to display the log content.
 - **Tag management**: Tags are displayed in the log in the order of addition. The order of tags can be changed by dragging. Disabled tags do not appear in the logs.
3. After all settings are finished, click **×**. The set content is applied to the table.

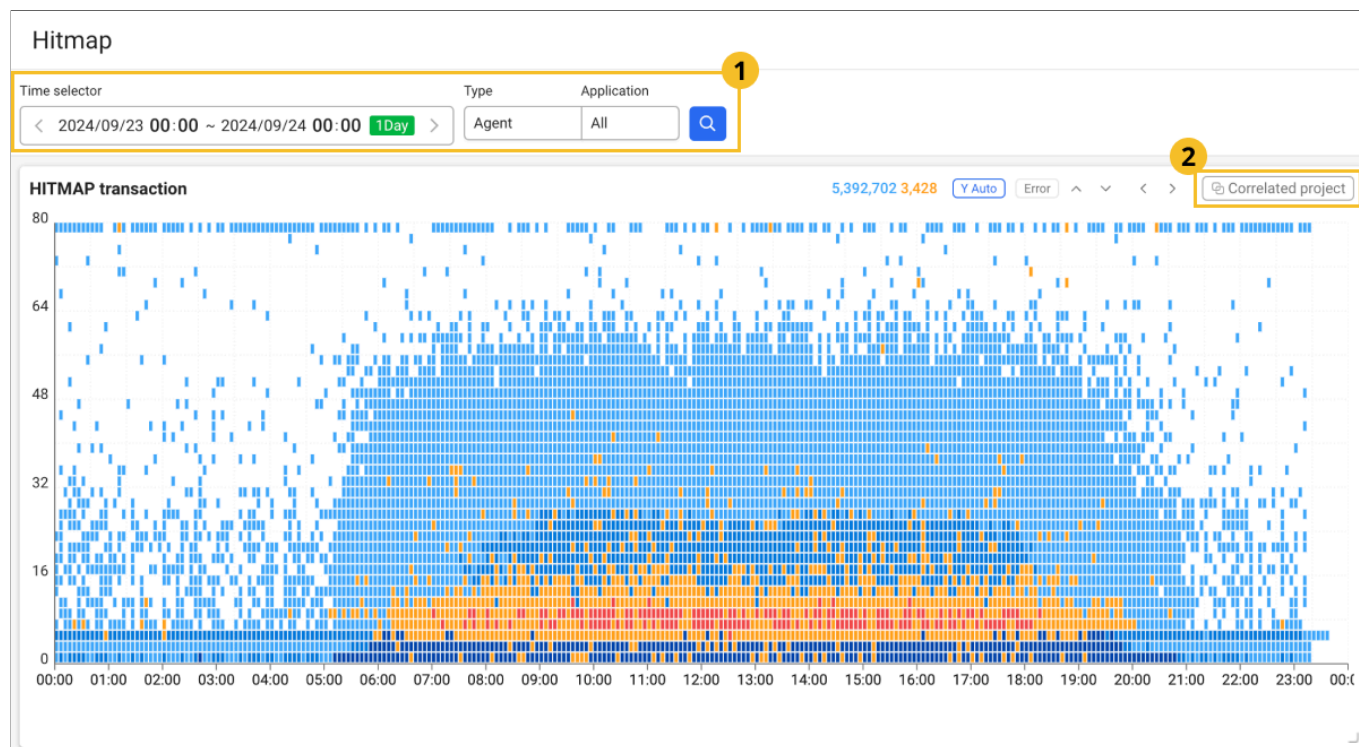
 For more information about **Log view detail setting**, see [the following](#).

Additional options

Checking the correlated project metrics

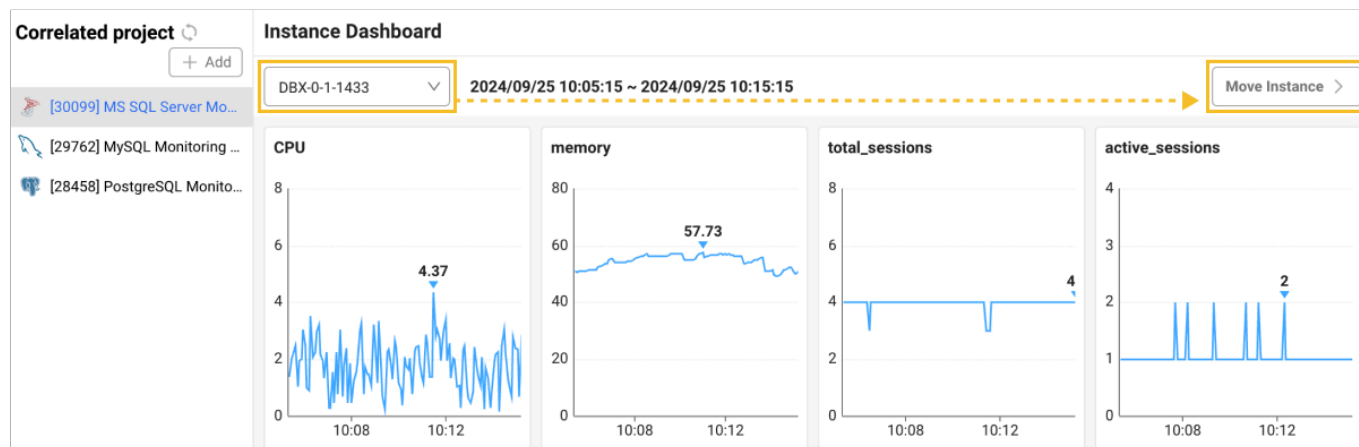
If you have created a database monitoring (DPM) project and an application monitoring (APM) project, you can relate the two projects for monitoring the data collected from DPM in the APM project. You can see performance metrics of the correlated projects while querying transactions via the **Correlated project** feature on the upper right of the **HITMAP transaction** section.

The **Correlated project** feature is useful when analyzing transactions in the APM project. When you found a slow SQL, it is difficult to determine exactly in which DB the problem occurred in the environment using multiple similar DBs.



1. Set the time and **Application** for viewing the transactions, and then select .
2. In the **HITMAP transaction** section, select **Correlated project** on the upper right.
3. A new window appears where you can check the metrics for the correlated project.

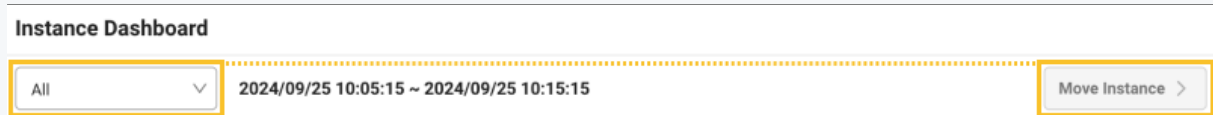
Select the correlated project from the left list and then check the metrics in the **Instance dashboard** section.



To navigate to the dashboard menu for a selected project, select an instance and then click **Move instance** on

the upper right. Go to **Dashboard > Monitoring a Database Instance**.

- The **HITMAP transaction** button in the **Correlated project** section appears only when there is an associated project. For more information about adding a correlated project, see [the following](#).
- You can add a project by selecting **Correlated project** at the top of the left **Add** list.
- The **Move instance** button is disabled when **All** is selected.



- Depending on the database product type, you can navigate to the **Analysis > Counts Trend** menu.

Viewing HTTP parameters

You can view the HTTP parameters of the transaction in the **Table view** tab.

1. Scroll down the page to the final step of the transaction.
2. Select the  **HTTP parameters** item.
3. If the **HTTP-PARAMETERS** window appears, select **Password**.
4. Enter the specified Param Key. You can see the hidden parameters.

- For the agent settings for HTTP parameters, see [the following](#).
- **Password:** You can see the decrypted parameter value. The password is a 6-digit string in the `WHATAP_HOME /paramkey.txt` file. You can change it to another string. The key in `paramkey.txt` is required to view the SQL variables and HTTP queries, and stop the threads.

Viewing SQL parameters

Select the SQL step in the **Table view** tab or select  in the **Tree view** tab. The **SQL** window appears to display parameters.

SQL

Connection URL jdbc:mysql://localhost:3306,localhost:3310/fake@BasicDataSource

CPU accumulation 3ms

Memory accumulation 329,752byte

Query (Hash: -2057375474)

SID 107

🔒 Password

SQL format

📄

Statistics >

```

insert into
dept
values(
#, '#', '#')

```

Substitution variables

The parameter does not exist or decryption has failed.

Please check your password at [paramkey.txt] in the agent installation path to decrypt parameters.

- **Password:** You can see the decrypted parameter value. The password is a 6-digit string in the `WHATAP_HOME /paramkey.txt` file. You can change it to another string.

❗ The key in `paramkey.txt` is required to view the SQL variables and HTTP queries, and stop the threads.

- **SQL format:** You can indent and format your SQL statements for better readability.
- 📄: A SQL statement can be copied to the clipboard.
- **Statistics:** Go to **Statistics > SQL**.

✅ To search SQL variables and HTTP queries, add the following options to the agent settings.

- For agent settings related to recording SQL parameters, see [the following](#).
- For agent settings related to recording the HTTP parameters, see [the following](#).

whatap.conf

```
# SQL parameter lookup option: If the option is applied, SQL parameters are collected after being encrypted.
profile_sql_param_enabled=true
```

```
// HTTP parameter lookup option: If the option is applied, HTTP query parameters are collected after being encrypted.
```

332



```
profile_http_parameter_enabled=true
```

Setting the columns in the trace list

You can additionally see the details about the search result by setting the columns in the **TX trace** section.

1. In the **TX Trace** area, click the **Select Column** button.
2. Select or deselect the desired column items. The changes are immediately reflected in the table.
 - **Select all:** It selects all columns.
 - **Deselect all:** All columns are unselected.
 - **Initialize(default):** The column is set as the default value.
3. Once finished, click the icon in the upper-right corner.

Filtering the trace list

You can filter the results retrieved from the **TX trace** section using the following options:

- **View all:** You can see all transactions in the viewed result.
- **Active Stack:** Only the transactions that include active stacks can be viewed in the searched result.
- **Multi-transaction:** Only the transactions including multi-transactions can be checked in the searched result.
- **Search URL:** Only transactions containing items that match the entered string are displayed. Enter a desired string and then press on the keyboard.
 - **Transaction**
 - **Client IP**
 - **Domain**
 - **Error class**
 - **Error message**

Downloading the viewed list

You can download the results retrieved from the **TX trace** section as a CSV file. The formation of the downloaded CSV file is **profile** {project_code} YYYYMMDD .csv.

1. After viewing the transactions, select .
2. Enter a desired value in the **Maximum CSV lines** option.
3. Select **Download**.

Active Transaction

A transaction in progress is called "active transaction." **A stack that has been regularly dumped by an active transaction is called active stack.**

❗ The WhaTap agent dumps active stacks for active transactions every 10 seconds (optional) and sends them to the server. `active_stack_second=10`

Collecting the compact active stacks

Because the active stack regularly performs thread dumps, it can add lots of overheads to the agent if implemented incorrectly. WhaTap has various options to collect active stacks while minimizing the agent load.

✅ In [Sitemap](#) > [Thread List/Dump](#), from the thread list, the overhead can be determined by checking the CPU time of the [WhaTap-ActiveStackDump](#) thread.

Optimized data collection

- Dump the stack only for the thread that is performing transactions.
- You can adjust the active stack dump time interval.

```
active_stack_second=10
```

- It is limited to the maximum line of the active stack. It collects 50 lines from the top line by default.

```
trace_active_callstack_depth=50
```

- Each hashed line of the active stack is collected. Text is collected only once.
- The maximum number of active stacks collected at a time is limited.

```
active_stack_count=100
```

Active Stack for Background Threads

Basically, the **active stack** means the stack of the thread in which transactions are being processed. You may need to analyze the stack for some background threads as well. At this time, the ****** for the background thread can be obtained using the option. It is available in the Java agent 1.6.2 or later.

- If the value of `async_stack_enabled` is set to `true`, the function is enabled.

whatap.conf

```
async_stack_enabled=false
```

- The stack dump interval depends on the foreground active stack setting.

whatap.conf

```
active_stack_second=10
```

- When setting the target thread name, use `*` to specify the string pattern.

whatap.conf

```
async_thread_match=http*,abc*
```

It identifies the stack dump target with the thread name. You can specify multiple matches using comma (,) as the delimiter.

- When the Top method of the stack is a class or method registered in `async_thread_parking`, it determines that the thread has been parked and does not generate a dump.

whatap.conf

```
async_thread_parking_class=sun.misc.Unsafe  
async_thread_parking_method=park
```

References

- [Active Transaction](#)
- [Active transactions that can detect failures quickly](#)

Multi-transaction

Multi-transaction means the transaction involving a different agent or project. **Multiple Transaction Trace** is to trace calls between the application services registered in the WhaTap project.

! Enabling the multi-transaction

To trace multiple transactions, set the `mtrace_enabled` option to `true` in **Management > Agent CONF..** For more information about the agent configuration, see [the following](#).

How to Use Multi-Transaction Trace

1. Go to **Analysis > Multiple Transaction Trace**.
2. Enter the **MTID** value checked in the **Transaction information** window into the **Search by MTID / CUSTID** field.
3. Select the date and project to query.
4. Click the **Apply** button at the bottom of the screen.
 - The **Apply** button will be disabled under the following conditions:
 - When the same filter values (MTID/CUSTID, date, selected project) as the previous search are applied.
 - When none of the filter values (MTID/CUSTID, date, selected project) are entered.
5. The right-side **Chart** tab displays a diagram and a table that show the call relationships between each transaction.

✓ The diagram and table areas are divided vertically, and you can adjust their ratio manually.

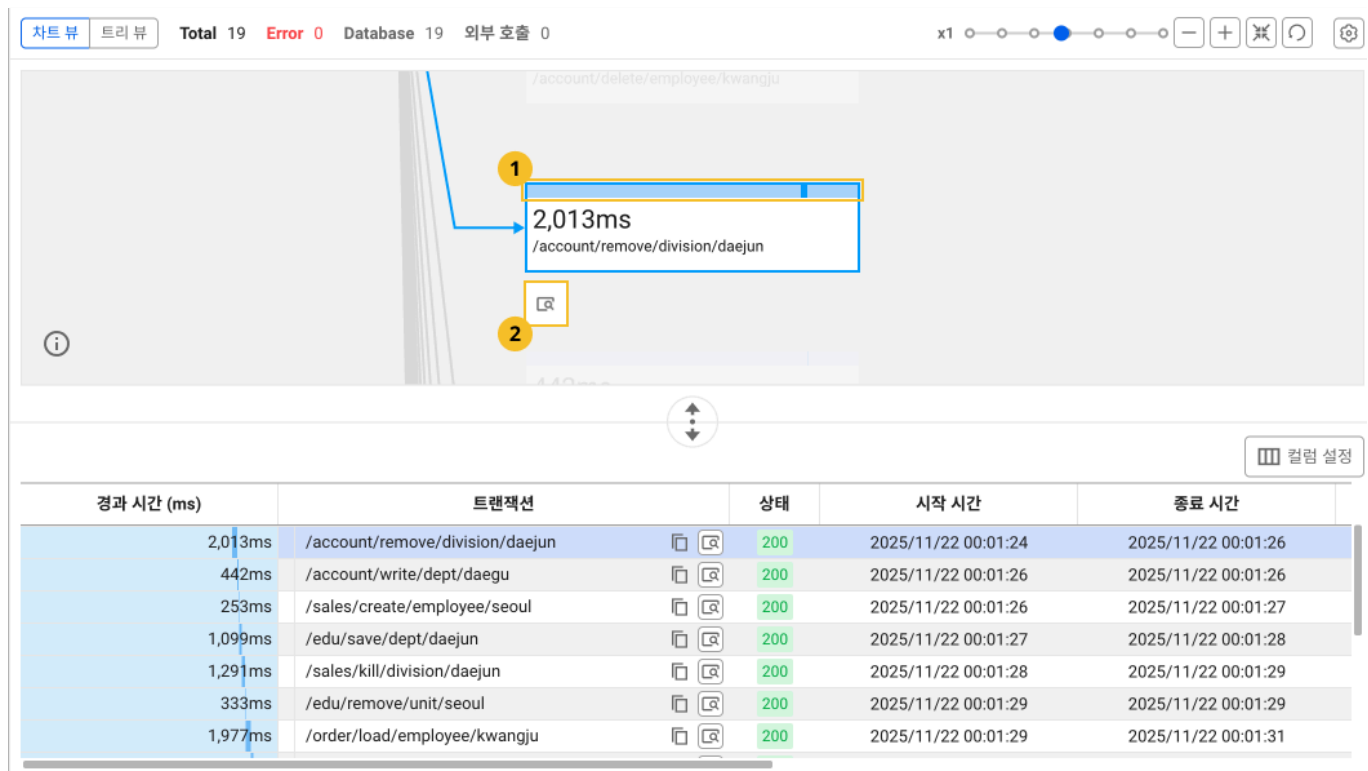
- Clicking the upper arrow expands the table to full height.
If the diagram was previously full height, the layout resets to a 50/50 split.
- Clicking the lower arrow expands the chart area to full height.



If the table was previously full height, the layout resets to a 50/50 split.

Chart

Chart provides users with a fast and clear view of the call relationships between transactions. You can check the individual execution time of transaction services that share the same **Multi transaction ID**. The elapsed time displayed at the top of each transaction node (**1 Time Bar**) allows you to understand the call flow between transactions.



You can freely move, zoom in, or zoom out the chart with your mouse.

- Drag within the chart area to move the view.
- Use scroll inside the chart:



- Vertical scroll: move up/down
- Horizontal scroll: move left/right
- Use **Ctrl** + vertical scroll to zoom in/out.
(Touchpad pinch gestures are also supported.)

When you select a transaction, only the related nodes remain active, while all unrelated nodes become dimmed. The **Detail View** button (2) below the selected transaction becomes enabled, and clicking it opens the **Transaction information** window.

There you can view the transaction's detailed trace.

For more information on analyzing transaction traces using the **Transaction information** window, see the [Transaction Info Documentation](#).

- **Zoom In**: Increase zoom level
- **Zoom Out**: Decrease zoom level
- **Fit to Screen**: Adjust all nodes to fit the screen
- **Reset Zoom**: Reset zoom and position to default state
- **Chart View Settings**: Show or hide chart elements
 - **More information**: Toggle application name, project information, IP, and status codes
 - **Database / External**: Display database connections or external HTTP Calls as nodes in the chart

Table

In the **Table** tab, you can view each transaction included in the multi-transaction trace in a table format.

When you select a transaction, its corresponding **node** in the **Chart** diagram becomes highlighted, and related nodes are emphasized.

Clicking the detail button in the transaction column will open the **Transaction information** window, where you can inspect the full transaction trace details.

For more information, refer to the [Transaction Info Documentation](#).

- **Column Settings** — Edit visible columns in the table

Tree

When you select the **Tree** button, you can view detailed information for each transaction and its associated traces.

This view visualizes the start time and elapsed time of each sub-transaction or trace within the overall transaction execution time, providing a tree-structured representation of the call hierarchy.

-  **Project selection:** Select or deselect the projects displayed in the chart.
-  **Single-line View:** Display each execution segment's text in a single line to simplify the tree layout.
-  **Multi-line View:** Display each execution segment's text in multiple lines (with line breaks).
- **Longest Path:** Jump to the longest path.
-  **Show Time Bar:** Display elapsed time as bar charts.
-  **Show Time:** Display timestamps, gaps, and elapsed time for each segment in text form.
 - 8 seconds or more: Displayed in **red** as an **over-delay**.
 - 3 to 8 seconds: Displayed in **orange** as a **delay**.
 - Less than 3 seconds: Displayed in **blue** as **normal**.

 Start time and elapsed time may differ from actual collected values because they are adjusted based on mapping logic that accounts for time discrepancies between parent transactions and their traces.

-  **Hide Time:** Hide time information.

-  • Selecting the trace's  button or  button allows you to view detailed information such as **HTTP call statistics**, **Active stack**, or **SQL**.
- Clicking the  button on a SQL step copies the SQL query text.

Transaction Step Collection Method

The application monitoring agent provides linear and circular collection methods.

Linear collection

Individual transaction traces cannot collect steps indefinitely. Store trace steps in buffers of limited length for each transaction. For each transaction, the maximum number of steps that can be collected is specified as an option.

- **profile_step_max_count**

Default 1024

Maximum number of steps that can be collected.

- **profile_step_normal_count**

Default 800

Number of steps that are generally collected without any restrictions.

- **profile_step_heavy_count**

Default 1000

If the normal count is exceeded, only the steps with slow response time and the active stack steps are collected.

- **profile_step_heavy_time**

Default 100

The reference time to collect steps within heavy count is `profile_step_heavy_time` .

`step_buffer`

If the number of steps in the profile being collected exceeds the heavy count, only active stacks are collected. Even in this case, the maximum number of steps does not exceed `profile_step_max_count` .

Circular collection

Linear collection collects the front part of the trace and discards the later part, if it exceeds the buffer size. On the other hand, circular collection discards the front step.

```
circular_profile_enabled=true
```

```
circular_profile
```

The buffer size is set in `profile_step_max_count` .

```
profile_step_max_count=1024
```

Application Topology

Application topology visually displays the database and external service calls related to the transaction flow. You can clearly see the entire request path—from user request to database calls and external service integrations—making it easy to identify performance bottlenecks.

- Visualize the path from user request → DB/external service
- Filtering based on URL patterns
- Check transaction performance status (slow/error, etc.)
- Identify bottlenecks and view detailed information

Viewing Topology

After selecting the time range and application, configure the search scope using the options below. Each query opens in a new tab. When hovering over a tab, a tooltip shows the search conditions, and clicking the pop-out button in the tooltip opens the topology in a separate window.

Transaction URL Search

Displays only the domains that called transactions matching a specific URL pattern. You can use wildcards (`*`) to define patterns.

Examples

- `/api/*` : All URLs starting with `/api/`
- `*/users/*` : All URLs containing `users`
- `/api/v1/users` : Exact match

 **Be careful when combining slashes(`/`) and wildcards(`*`).**

- `/api/*` : Does **not** match `/api` ; it requires a path after `/api/`
(e.g.,  `/api/users` ,  `/api`)
- `/api*` : Matches `/api` itself



(e.g.,  /api , /api/users , /apitest)

Pattern Limitations

- **Must contain at least one non-wildcard character**
 -  Not allowed: `***` , `**`
 -  Allowed: `a*` , `*a` , `*a*` , `/api*`
- **Empty string** or null is not matched.
- **Consecutive wildcards** (`**`) behave the same as `*`.
- **Complex patterns** with 3+ `*` are not fully supported.
- **Regular expressions** are not supported.
- **Case sensitive** matching.
- **Cannot escape** `*` to match it literally.

Trace Limit Count

Maximum number of transaction traces (profiles) to retrieve.

Higher limits show more data but increase query time.

- Default: 10,000
- Max: 1,000,000



Even if you increase the limit, you may still not retrieve all matching transactions.
A warning appears when the limit is reached.

Time Limit

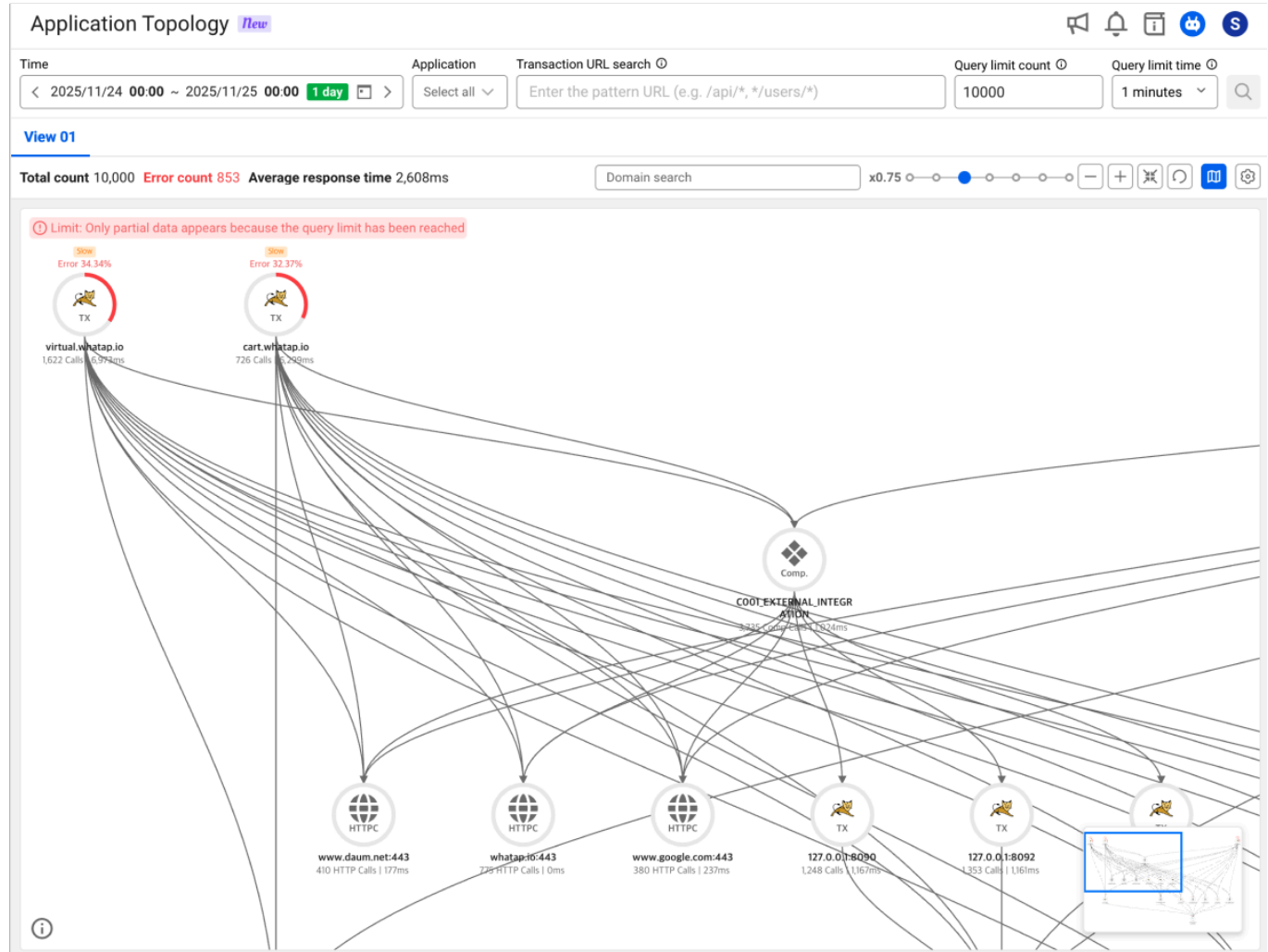
When the time limit is reached, only data up to that point is shown, and a warning appears.

- Range: 30 seconds ~ 5 minutes

- Default: 1 minute

Screen Structure & Visualization

The screen visualizes transaction flow using circular **nodes** and **connecting lines**.



Node Structure

Nodes are arranged vertically based on transaction execution flow: upper nodes call lower nodes.

Node Types

Nodes are arranged in order: User → TX → DB/HTTPC.

Node Type	Description
User	Number of users who invoked the transaction
TX (Transaction)	Application transactions (HTTP domain/URL)
DB (Database)	Database queries and connections
HTTPC (HTTP Call)	External HTTP calls

Node Visual Elements

- **Error Gauge:** Circular error-rate gauge on node border
- **Performance Tags:** “Slow” (orange) / “Very Slow” (red)
- **Hover Effect:** Gray border + highlight connected edges
- **Selected Effect:** Blue border + highlight connected edges

Connecting Lines

Color changes based on average elapsed time:

- **Gray:** Normal
- **Orange:** Slow (≥ 3 sec by default)
- **Red:** Very Slow (≥ 8 sec by default)

Summary Metrics

Displayed at the top:

- **Total Count**

- Error Count
- Average Response Time

Screen Interaction

Category	Action	Description
Scroll & Zoom	Mouse wheel	Vertical scroll
	Shift + wheel	Horizontal scroll
	Ctrl + wheel	Zoom in/out
Drag	Canvas drag	Move entire topology
	Node drag	Adjust individual node position
Node Interaction	Hover	Highlight connected paths
	Click	Select node + show details
	Re-click	Deselect
Zoom Controls	Zoom in/out	Range 0.1x ~ 2.0x
	Fit to screen	Auto-fit
	Reset	Reset zoom
	Slider	Fine zoom control
Export	PNG Download	Export current chart
Mini-map	Map view	Shows current viewport
	Toggle icon	Show/hide

Category	Action	Description
Domain Search	Input search	Highlight matching nodes

Display Settings

Node Labels

- Call count
- Error count (percentage or number)
- Average elapsed time
- Name (domain, DB URL)
- Type (TX, DB, HTTPC, User)

Edge Labels

- Display mode: Always / On hover or click
- Call count
- Error count / error rate
- Average elapsed time (color-coded)

Other Options

- Edge animation for slow paths
- Show/hide User nodes
- Hide isolated nodes
- Merge identical nodes
- Merge HTTPC and corresponding TX nodes

Slow Thresholds

- **Slow** (orange): default 3 sec
- **Very Slow** (red): default 8 sec

Node Details

Tooltip

- Node type & name
- Call count
- Error count / rate
- Average elapsed time
- For merged nodes: top 10 source-domain stats

Detail Drawer

- Performance metrics
- Merged-node performance table
- Caller transaction list (up to 1,000)
 - Status filter
 - Text search
 - Sorting
 - CSV download
 - Click row → trace popup

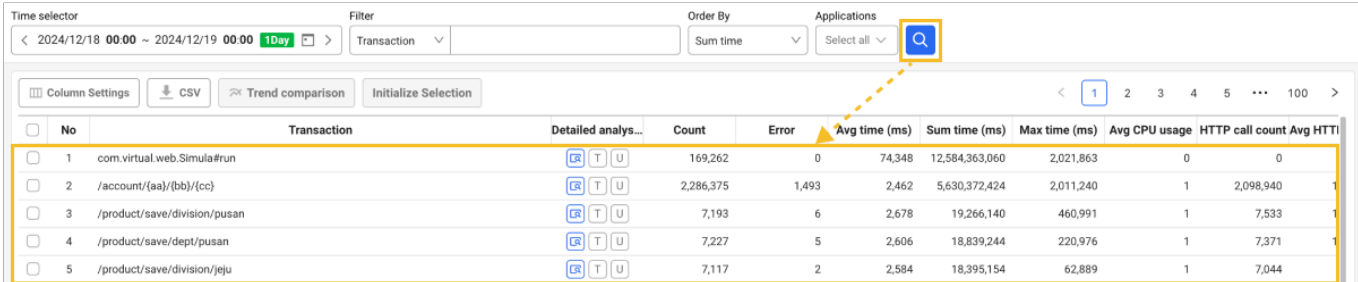
Statistics

Home > Select Project > **Statistics**

Select a project in the initial screen of the WhaTap monitoring service, and then select a sub menu under **Statistics**. The WhaTap agent collects statistical data for the key traces such as transaction information and SQL. A list is created every 5 minutes and it is sent to the server.

Basic screen guide

Set the **Time selector**, **Filter**, **Order By**, and **Applications** and then select .



Time selector										
< 2024/12/18 00:00 ~ 2024/12/19 00:00 1Day >										
Filter										
Transaction										
Order By										
Sum time										
Applications										
Select all										
Column Settings CSV Trend comparison Initialize Selection										
No	Transaction	Detailed analys...	Count	Error	Avg time (ms)	Sum time (ms)	Max time (ms)	Avg CPU usage	HTTP call count	Avg HTTP...
☐	1 com.virtual.web.Simula#run		169,262	0	74,348	12,584,363,060	2,021,863	0	0	
☐	2 /account/{aa}/{bb}/{cc}		2,286,375	1,493	2,462	5,630,372,424	2,011,240	1	2,098,940	
☐	3 /product/save/division/pusan		7,193	6	2,678	19,266,140	460,991	1	7,533	
☐	4 /product/save/dept/pusan		7,227	5	2,606	18,839,244	220,976	1	7,371	
☐	5 /product/save/division/jeju		7,117	2	2,584	18,395,154	62,889	1	7,044	

- Each **Statistics** tab provides sorting options by **Sum**, **Max**, **Time avg**, and **Count** for viewing the list from your desired perspective.
- You can add or exclude columns to view from the list as well as the default values by using the **Column Settings** button.
- When you select , the  button appears above the search list along with the search results. If you select the button, you can download the searched list as a CSV file.

 If you click  without selecting  after a statistics list appears, you can download the CSV file with the changed conditions.

- If you select the  **Display Detail** icon in the statistics list, you can check the number of cases and average time chart, and additional charts are provided to compare the case count, error count, and response time. If you select the time to search in the chart, the **Transaction Search** menu appears.

- If you select **T** in the statistics list, the **Top stack of URL** menu appears.
- If you select **U** in the statistics list, the **Unique stack URL** menu appears.

! • You can view the data for up to 31 days. However, you can view the data for up to 7 days in **Client IP**.

Transaction statistics

Home > Select Project > **Statistics** > **Transaction**

It collects statistics for transactions. Every 5 minutes, up to 5,000 URL-specific performance statistics are collected and sent to the server. If the number of URLs for 5 minutes exceeds 5,000, this is ignored.

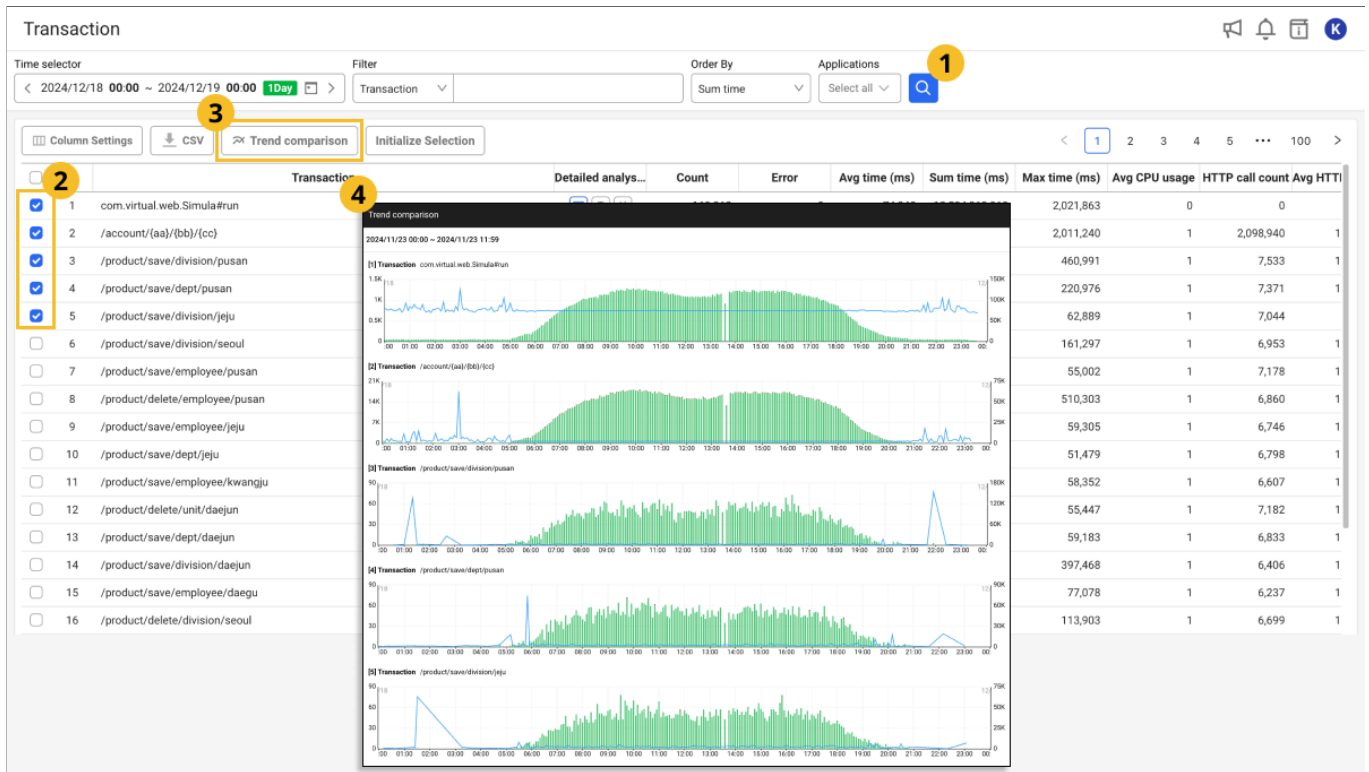
Columns	Description
Transaction	Transaction address
Count	Number of execution cases
Error	Error occurrence count for the executed transactions
Avg time (ms)	Average of the total response time
Sum time (ms)	Sum of response times
Max time (ms)	Maximum response time
Avg CPU usage	Average of the CPU usage time
HTTP call count	HTTP Call Count
Avg HTTP call time (ms)	Total HTTP call time / Number of transactions
Average time per HTTP call (ms)	Total HTTP call time / Total number of HTTP calls in transactions
SQL count	SQL execution count

Columns	Description
Avg SQL time (ms)	Total SQL time / Number of transactions
Average time per SQL (ms)	Total SQL time / Total number of SQL patches in transactions
SQL fetch	SQL Fetch Count
Avg SQL fetch time (ms)	Total SQL patch time / Number of transactions
Average time per SQL patch (ms)	Total SQL patch time / Total number of SQL patches in transactions

ⓘ **Avg memory allocation** requires to set the `trace_malloc_enabled=true` option in the agent configuration ([whatap.conf](#)) for collection. The default value is `false`.

Using the trend comparison feature

You can use the **Trend comparison** feature to compare multiple transaction trends at a glance. This feature is useful for quickly identifying key issues and resolving traffic issues when there are a large number of transactions to check.



1. Select the time and monitoring target for a query, and then select the .
2. Select one or more transactions to compare from the transaction list.
3. Select **Trend comparison**.
4. The **Trend comparison** window appears listing the trend graphs for the selected transactions.

Check the trend graph in the **Trend comparison** window to compare traffic patterns between transactions. You can compare traffic distributions for specific time periods and service paths.

- ! You can select and view up to 100 transactions.
- If there are a lot of transactions selected, the loading time may increase.
- For accurate analysis, use the **Filter** option appropriately.

Transaction domain statistics

Home > Select Project > **Statistics** > **Domain**

The WhaTap agent can collect transaction statistics for each domain. In the systems where multiple domains are separated and serviced on a server, domain-specific analysis may be required. Set the following option:

whatap.conf

```
stat_domain_enabled=true
```

Through the collected data, you can identify the processing status of URLs for each domain.

Columns	Description
Domain	Service domain
Transaction	Transaction address
Count	Number of execution cases
Error	Error occurrence count for the executed transactions
Time avg (ms)	Average of the total response time
Time sum (ms)	Sum of response times

Transaction caller statistics

Home > Select Project > **Statistics** > **Caller**

If the multi server is connected by a rest call, the relationship statistics between **callers** and **callees** can be collected. To collect this data, set the following options:

whatap.conf

```
mtrace_rate=100
mtrace_spec=v1
stat_mtrace_enabled=true
```

msa-system

In the above architecture, the **Caller & Callee** statistics can be viewed only in api1 and api2. The system called by the user browser cannot see the **Caller** statistics.

However, because the server on the **caller** side must transfer data, the relevant settings must be entered for all servers.

whatap.conf of [front]

```
mtrace_rate=100
mtrace_spec=v1
stat_mtrace_enabled=true
```

whatap.conf of [api1] & [api2]

```
mtrace_spec=v1
stat_mtrace_enabled=true
```

The statistical data collected is as follows. The data must be viewed from the **callee** side.

Columns	Description
Caller Pcode	Project code corresponding to the caller
Caller agent kind	Group unit to which the agent corresponding to the caller belongs
Caller URL	Address of the caller transaction
Transaction	Callee transaction address
Count	Number of execution cases
Error	Error occurrence count for the executed transactions

Columns	Description
Time avg (ms)	Average of the total response time

ⓘ The maximum number of CSV lines that can be downloaded at one time from the **Caller** menu is 10,000.

IP transaction statistics

Home > Select Project > **Statistics** > **IP Transaction**

It provides the feature to view the URLs and number of calls from applications for each specific IP address. This feature is useful for identifying potential security threats or performance issues by checking IP addresses with unusually high request volumes and analyzing the URLs called from those IP addresses. You can block unnecessary or malicious requests based on this information.

You can filter IP addresses or transaction addresses through the **Filter** option to quickly retrieve data that meets your criteria. This is useful when analyzing specific IPs or transaction address patterns.

Columns	Description
IP	IP address of the client that made the request.
Transaction	Addresses of the transactions called and specific path variables are marked with <code>{ }</code> .
Count	Total number of requests made from the IP address.
Error	Number of errors occurred for requests.
Time avg (ms)	Average response time for the request (milliseconds, ms).

- ✓ • **Abnormal traffic detection:** It can detect IPs with an abnormally high number of calls, analyze transaction address patterns from those IPs, and block potential attacks. For example, if there are excessive requests to the `/account/{aa}/{bb}/{cc}` URL from a specific IP, you can block the IP or



take action to limit requests.

- **Response time analysis:** It can detect IPs with abnormally high average response times to identify and improve performance issues on the network or server side.
- **Error occurrence analysis:** When multiple errors occur from a specific IP, you can diagnose whether there is a problem with the requests from the IP or a problem with the system.

Transaction referer statistics

Home > Select Project > **Statistics** > **Referrer**

The WhaTap agent can collect transaction statistics for each referer. Set the following option: The default value is `false`.

whatap.conf

```
stat_referer_enabled=true
```

Through the collected data, you can see the referer data on the statistics.

Columns	Description
Referer	Referer address
Transaction	Transaction address
Count	Number of execution cases
Error	Error occurrence count for the executed transactions
Time avg (ms)	Average of the total response time
Time sum (ms)	Sum of response times

Error Statistics

Home > Select Project > **Statistics** > **Error**

They are statistics on the service errors that occurred for 5 minutes. They collect different errors and transaction names with the keys. They provide the stacks upon error occurrence. The statistics appear for up to 1,000 errors every 5 minutes.

Columns	Description
Class	Error Class
Transaction	Transaction address
Message	Error Message
Count	Error Count
Agent	Agent name
Agent node	Group unit categorized as <code>whatap.onode</code>
Agent kind	Group unit categorized as <code>whatap.okind</code>
Initial creation time	Statistical time (5 minutes or 1 hour) when the transaction error was first generated during the query period

SQL execution statistics

Home > Select Project > **Statistics** > **SQL**

The SQL execution statistics for 5 minutes are collected. A maximum of 5,000 SQL statements are allowed in 5 minutes. If a single Java process generates SQL statements that exceed the limit, they are discarded from statistical data.

Columns	Description
Database	Database Type
SQL	SQL query statement
Transaction	Data randomly collected from one of the URLs that called the SQL
CRUD	Create, Read, Update, Delete
Count total	Query execution count
Error count	Number of errors among executed queries
Avg time (ms)	Average of the total query execution time
Sum time (ms)	Sum of query execution times
Std dev	Standard deviation for the query execution time

ⓘ Transaction collects one of the URLs (last call URL) that called the SQL for 5 minutes for analysis.

HTTP call execution statistics

Home > Select Project > **Statistics** > **Remote HTTP Call**

They collect the statistics of calls outside the applications for 5 minutes via the HTTP and HTTPS protocols. A maximum of 5,000 HTTP call statements are allowed in 5 minutes. If a single application process generates external HTTP call statements that exceed the limit, they are discarded from statistical data.

Columns	Description
HTTP call URL	HTTP call URL hash
Transaction	Data randomly collected from one of the URLs that requested the HTTP API

Columns	Description
Host	Host or IP address
Port	TCP port
Total	Total execution count
Error	Error Count
Time avg (ms)	Average of the total response time
Time sum (ms)	Sum of response times
Time min (ms)	Minimum response time
Time max (ms)	Maximum response time
Std dev (ms)	Standard deviation for the HTTP call time

Number of calls for each client IP region

Home > Select Project > **Statistics** > **Client IP**

The physical distance between the server and the client is proportional to the data transfer time. It statistically collects call counts for each region of the client IP. The number of different IPs that can be collected per 5 minutes is up to 70,000 per instance.

Columns	Description
Client IP	Client IP address
Country/Region	User access country
City	User access city

Columns	Description
Count	Total call count

- The data about the client IP can be viewed for up to 7 days.
- WhaTap basically stores the client-related information. For more information about the agent settings for user data collection, see [the following](#).

Share chart by region

The share chart collects user access locations and presents them for each country and city.

- If a country is selected, the detailed chart appears to display each country's cities and connected user IPs.
- If you select the center circle, it goes to the country selection chart.

Call counts for each user agent

Home > Select Project > **Statistics** > **User-Agent**

The numbers of calls for each hash of the user agent string are collected. There is a maximum of 500 different user agent hashes for each instance that can be collected every 5 minutes.

Columns	Description
UserAgent	User agent of the browser
OS	OS environment in which the browser runs
Browser	Browser type
Count	Total collection count

Client Browser Statistics

Home > Select Project > **Statistics** > **Client Browser**

By analyzing the user agent strings, it provides the statistical information based on the browser type and OS used by the end users. You can check the market share through a pie chart created based on the collected statistical information.

Columns	Description
UserAgent	User agent of the browser
OS	OS environment in which the browser runs
Browser	Browser type
Count	Total collection count

Report

Home > Select Project > **Report**

Report is a document that reports the service usage status and failure records for individual projects. The persons in charge of service monitoring share the status report with the people of related departments.

The monitoring data analysis is important because it serves as a metric for determining the direction of improvement. However, it is cumbersome to aggregate and document data from multiple dashboards.

WhaTap's **Report** menu supports **automated report creation**. Through the **Report** menu, you can create weekly reports, share reports at the set times, and manage various templates.

✔ To download, print, or schedule to send **reports** or emails, click the button. Downloading is available in the HTML format.

Difference between the report and integrated report

- **Report** is the menu that generates a report for a single project. You can select a project and then enter the **Report** menu in the side menu.
- **Integrated report** is the menu to generate a report for multiple projects. You can enter it from the side menu on the Home screen without selecting a project. For more information about **Integrated report**, see [the following](#).

Report types

The basic report is a form that is actually used by large enterprises, government agencies, and IT service companies. If you have any desired form, please send a request to support@whatap.io. The requested report template is to be added in the **Report** list.

Add Report Template

- If the requested form is universal, it is additionally provided to the **Report** list.
- Addition is easy when HTML and CSS forms are provided upon request.

Requested form example



When requesting an additional report form, it is recommended to attach the desired HTML and CSS forms as shown in the example. See the following example file for more details.

- **Example file:** After downloading, unzip the **ZIP** format to see the example file in the **HTML** format. Instructions to CSS and HTML areas for customization are described in the comments in the file.



Constraints

- If you need to add, modify, or delete each item in the report template provided by WhaTap Monitoring, it can be provided.
- To add data or analyze the results that are not included in the provided report template, review is required by developers.
- Data addition and processing is limited to the data (metrics) collected and stored by WhaTap Monitoring. Other tools and external data cannot be added.
- It is difficult to provide a non-universal report form that meets the needs of a specific client company.
- For more information, contact support@whatap.io or the sales representative.

Email delivery schedule

To receive regular reports via email, select **Reservation of Report Email**. You can replace various service checking tasks performed right after going to work with email confirmation.

Reservation of Report Email

ⓘ Report will be sent on 04~06 o'clock from tomorrow.

ⓘ Maximum 5 report mail settings can be registered.

Report type

Registration Mail Report

Report time

00:00

~

23:59

Weekdays

☒ Mon

☒ Tue

☒ Wed

☒ Thu

☒ Fri

☐ Sat

☐ Sun

Emails

Input email and enter

+ Save

366

Application Report

Home > Select Project > **Report**

If you click  in **Report** on the screen, you can see various analysis reports classified by daily, weekly, and monthly. Select a desired report format, and then set the date and time to view and filtering options. You can check the selected report by selecting .

 When generating the weekly and monthly reports, it may take some time depending on the scope of the data view.

Daily Report

It provides the report to check changes in application performance for the day. The provided report form as a daily report is as follows:

- **Application Daily Report**
- **Application Peak Performance Comparison**
- **Application User Statistics**
- **Daily Metric Trend Charts(Avg/Max)**
- **Application Daily Custom Report**

Application Daily Report

This report provides a comprehensive analysis of key metrics for application performance for the day.

 For more information about key terms and metrics, see [the following](#).

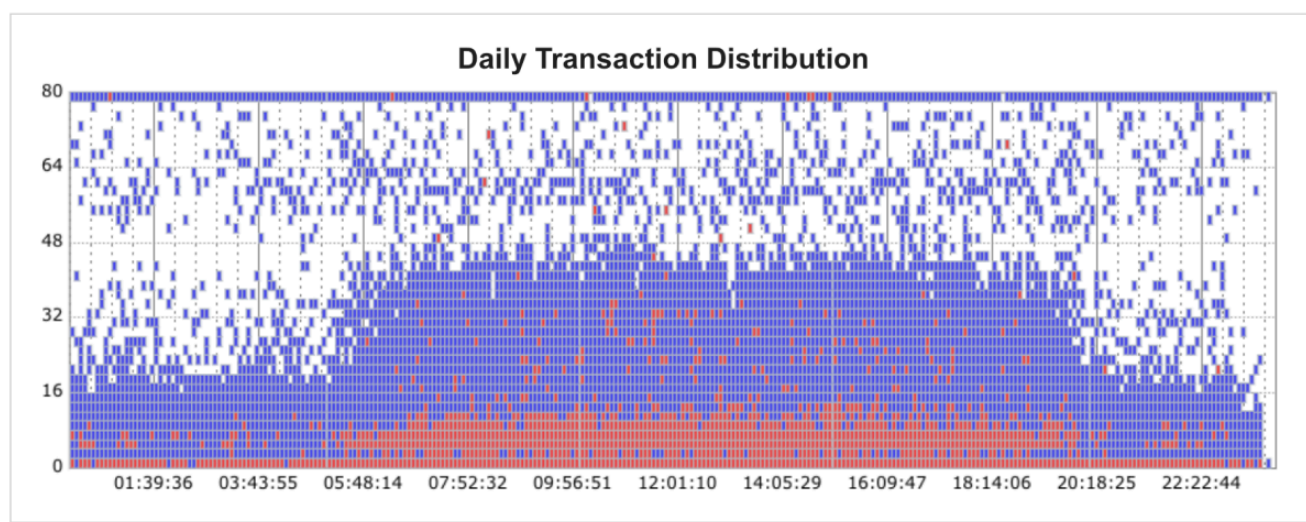
- **Intro:** You can see the key performance metrics of the application.
- **PeakTime Summary:** You can see the time of the day when the throughput (TPS) was the highest and the

metric value of that time.

- **Average/Maximum Value by Metrics:** You can check the average values for each key metric for the day and the maximum value based on the time of occurrence.
- **Trend Chart:** This time series chart visually displays key metrics of the system. You can check the numbers of key metrics over time. It is an important metric in evaluating the system stability and performance.

- ⓘ • **Application Weekly Report** provides additional daily changes.
 - On the upper right of the chart, select [CSV](#) to download the data in a CSV file format.

- **Daily Transaction Distribution:** You can see the distribution of transactions and error occurrences by time zone for the day at a glance. The x-axis of the graph represents the end times for each transaction, and the y-axis represents the response times (seconds). Normal transactions are displayed in [blue](#), and erroneous transactions are displayed in [red](#).



- **Application Summary:** You can check the status for each monitored agent. **Active Count** indicates the number of active transactions.
- **Transaction TOP 10:** Based on the **Transaction Count**, **Error Count**, and **Response time average**, you can see the top 10 transactions.
- **Top Stack TOP 10:** Based on the steps on the stack trace, you can view simplified data calculated as call frequency rates between steps.

❗ In **Analysis > Stack > Top stack**, you can view the stack information details.

- **SQL Time Average TOP 10:** This is the statistical data sorted by the average response time for the used SQL query statements.

❗ ◦ **Increase %:** This figure is calculated for the percentage increase by comparing the average data for three days up to the day before the search and the data of the search.

e.g. 4/25 00:00 to 23:59 data inquiry → comparison with 4/22 00:00 to 4/24 23:59 data

If the figure is greater than 10%, it appears in **red**, and it is between 5% and 10%, it appears in **orange**. The growth rates less than 5% are not displayed.

- In **Statistics > SQL**, you can view the occurrence time and performance for each query.

Application Peak Performance Comparison

For each monitored agent, the application's maximum performance metric appears by comparing with the data for the day (**red**), the previous day (**blue**), and the previous week (**blue**). Each metric displays the maximum value in a specific time zone and the metric value for the corresponding time. This allows you to see performance changes for each application at a glance.

❗ For more information about key terms and metrics, see [the following](#).

Application User Statistics

This report provides a time series chart of the numbers of concurrent users at intervals of 10 seconds, 5 minutes, and 30 minutes and the number of visitors per hour. This report can provide valuable data to help you understand usage patterns and effectively manage user traffic.

- **10s Concurrent User:** You can closely monitor real-time traffic changes to identify the time zone when the number of users suddenly increased. You can also establish a strategy to provide content and services during the time zone when users are most concentrated.

- **5m / 30m Concurrent User:** Server resources and network bandwidth can be efficiently distributed by analyzing short- to medium-term user patterns. You can also predict the peak time zone and plan to allocate more resources to the period.
- **1h Visitor:** You can analyze the user visiting patterns over time and use them in marketing strategies and operation plans.

Daily Metric Trend Charts(Avg/Max)

This report provides various performance metrics for applications in a time series chart. The average and maximum values for each metric are visually displayed. This allows you to monitor the system performance trends and use the data needed for performance optimization and troubleshooting.

The title of the chart is in the **Category[Field]** format. For more information about the application performance metrics, see [the following](#).

- **Avg.:** It is distinguished by the **blue** line. It displays the average values for each time zone.
- **Max.:** It is distinguished by the **red** line and it represents the maximum values for each time zone.

Application Daily Custom Report

You can create a report by selecting the desired metrics. You can create reports that provide time series charts based on the selected metrics.

레이아웃 설정

1단 2단 3단

카운트 선택

전체 선택

☒ TPS
 ☐ 액티브 TX 건수
 ☐ 정상 액티브 TX 건수
 ☐ 느린 액티브 TX 건수
 ☒ 매우느린 액티브 TX 건수
 ☐ METHOD
 ☐ SQL
 ☐ HTTPC
 ☐ DBC
 ☐ SOCKET
 ☐ TX 건수
 ☐ 합계 TX 건수
 ☐ TX 에러 건수
 ☐ TX 응답시간
 ☐ SQL 건수
 ☐ 합계 SQL 건수
 ☒ SQL 에러 건수
 ☐ SQL 수행 시간
 ☐ SQL 패치 건수
 ☐ SQL 패치 시간
 ☐ HTTPC 건수
 ☐ 합계 HTTPC 건수
 ☐ HTTP 호출 에러 건수
 ☐ HTTP 호출 응답 시간
 ☒ CPU
 ☐ CPU Core 개수
 ☐ CPU System 사용률
 ☐ CPU User 사용률
 ☐ CPU Wait 사용률
 ☐ CPU Steal 사용률
 ☐ CPU IRQ 사용률
 ☒ 프로세스 CPU 사용률
 ☒ 메모리
 ☐ 스왑
 ☒ 디스크
 ☐ 동시접속 사용자
 ☐ Heap 크기
 ☐ Heap 최대 사용량
 ☐ Heap 사용량
 ☐ Heap Perm 영역 사용량
 ☐ Heap Pending Finalization 개수
 ☒ GC 건수
 ☐ GC 시간
 ☐ Old Generation GC 건수
 ☐ Thread 수
 ☐ DaemonThread 수
 ☐ Peak Thread 수
 ☐ DB Pool 개수
 ☐ DB Active 개수
 ☐ DB Idle 개수
 ☐ ThreadPool Active 개수
 ☐ ThreadPool 개수
 ☐ Host 개수

1. In **Report** on the screen, select **Application Daily Custom Report**.
2. In **Layout setting**, set the desired number of columns.
3. Select desired metrics. To select all, click **Select all**.
4. Select .

The report is generated.

Application Weekly Report

This report can provide a comprehensive analysis of key metrics for applications during the week.

! For more information about key terms and metrics, see [the following](#).

- **Intro:** Provides the total number of visitors and transactions for the week.
- **Operating Rate:** This is the percentage of time when the application ran during a specified period of time. For example, an uptime of 100% means that the application continued to run without a single interruption during the search period. On the other hand, a low uptime rate indicates that the application stopped or abnormal operations happened during the search period.
- **Trend Chart:** This time series chart visually displays key metrics of the system. You can check the numbers of key metrics over time. It is an important metric in evaluating the system stability and performance.

- !
 - It provides daily variations and daily average and maximum values.
 - On the upper right of the chart, select [CSV](#) to download the data in a CSV file format.

- Based on the **Transaction TOP 10 Comparison: Transaction Count, Error Count, and Response time average**, the top 10 transactions can be seen. It provides the number of executions, increases, and decreases for each transaction from a week ago and the week of inquiry.
- **Top Stack TOP 10 Comparison:** A list of top 10 stack traces by comparing the percentage and number of cases from the current week with those from a week ago. You can identify the most frequently called stack.

! In **Analysis > Stack > Top stack**, you can view the stack information details.

- **SQL Time Average TOP 10 Comparison (Over 100 execute count):** This list has been created after comparing top 10 SQL statements based on the SQL average response time. For each SQL statement, it provides the number of executions, average response time, and increase/decrease time for a week ago and the week of the search.

- **Errors in this Project(included Error Msg):** This statistical information provides the error statistics for the week's projects based on the error class and messages.

Application Monthly Report

This report provides a comprehensive analysis of key metrics for the application performance during the period of one month.

! For more information about key terms and metrics, see [the following](#).

- **Intro:** You can see the key performance metrics of the application.
- **Application Summary:** You can check the **IP Address**, **OS Information**, and **Operating Rate** for each agent.
- **Trend Chart:** This time series chart visually displays key metrics of the system. You can check the numbers of key metrics over time. It is an important metric in evaluating the system stability and performance.

! On the upper right of the chart, select [CSV](#) to download the data in a CSV file format.

- Based on the **Transaction TOP 10 Comparison: Transaction Count, Error Count, and Response time average**, the top 10 transactions can be seen. It provides the number of executions and increases and decreases for each transaction from one month ago and for the current month.
- **Top Stack TOP 10 Comparison:** This is a list comparing the percentage and number of views for the top 10 stack traces from a month ago and for the current month. You can identify the most frequently called stack.

! In **Analysis > Stack > Top stack**, you can view the stack information details.

- **SQL Time Average TOP 10 Comparison:** A list comparing the top 10 SQL statements based on the SQL average response time. For each SQL statement, it provides the number of executions, average response time, and increase/decrease times for one month ago and the current month.

Guide to key terms and metrics

The following lists the key metrics displayed for each report.

Item	Description
Visitor(DAU) (DAU, Daily Active User) / Total Users	It is the number of daily active users or number of users who used the application for a day.
Weekly User	Total number of visitors who used the application for a week
Monthly Active Users (MAU, Monthly Active User)	Number of unique users who used the application at least once in a month
Concurrent User	Number of concurrent users with duplicates removed
Users / Realtime Visitor	Number of users who accessed the application at a specific time zone
Transaction Count	Number of all requested transactions
Total Transaction / Daily Transaction Count	Total number of transactions processed for a day
Weekly Transaction Count	Number of transactions requested for a week
Daily Transaction Distribution	This distribution chart allows you to see the distribution of transactions and errors by time zone for a day at a glance.
Error Ratio(%)	Error rate out of the total number of transactions
Event Count	Number of metrics events in Critical level
Error Count	Number of failed transactions due to errors encountered while processing transactions

Item	Description
Application Count	Number of applications (number of agents) monitored during the search period
Total Core	Number of CPU cores used during the search period
APDEX*100** (Application Performance Index)	It indicates the customer performance satisfaction with the application for the query period.
TPS (TPS, Transaction Per Second)	Number of transactions processed per second
Avg Response(ms) / Response Time	Average response time for transactions
CPU Core	Number of used CPU cores
Visitor Per Hour	Number of visitors per hour during the search period
Server CPU Used Percent	CPU utilization of the server
Server Memory Used Percent	Memory utilization of the server
Active Count / Active TX Count	Number of transactions in progress
CPU	CPU utilization
Heap(Min)	Minimum heap memory usage
Operating Rate	This is the percentage of the normal operation time for the application during a given period of time.

Integrated Report

Home > Integrated Report

You can create and share reports that have integrated multiple projects. You can also create a report by selecting a report type and the projects to include, and check the task progress in the creation list. If an error occurs in a specific project, you can see the error details. The reports that have been created can be viewed immediately or shared with the download and print features.

Integrated Report

Report type

Create Report

Application Daily Error Statistics Report

Application Daily Http Call Report

Application Weekly Okind Error Statistics Report

Application Kinds Weekly Avg Resp Time Statistics Report

Daily DB Report

Weekly DB Report

Application Daily Error Statistics Report

Application Weekly Okind Error Statistics Report

Kube Daily Cpu/Memory Report

Kube Weekly Cpu/Memory Report

Daily Server Report

Monthly Server Report

Report generation list ⓘ

All My report

Report title, Project

No reports were generated.

Download

Print



Integrated report

Integrated reports make it easy to create reports for multiple projects.

GuideShortcut

! The **Integrated Report** menu can generate only the reports for projects of **Application**, **Server**, **Kubernetes**, and **Database** products.

Guide to major features

The **Integrated Report** menu provide the following features:

- **Supporting multiple projects**

It is convenient to be able to generate reports at once by selecting multiple projects. The **Report** menu available in any project can generate reports only for a desired project.

- **Create Report by Kind**

In the **Create Report** feature, you can select projects by the work unit to save as a template. This feature is useful in the Micro Service Architecture (MSA) environment where projects are usually divided by the work unit.

- **Big Data Optimization**

With an aid of this, the report creation time has been drastically reduced. Even if an error occurs while creating a project report, you can view the result of the report.

- **Simultaneous operation during report generation**

You can do other tasks while generating a report. In the **Report** menu available in any project, you must wait until the report generation is completed.

In **Integrated Report**, you can go to another page while creating a report. You can also see its progress and view the created report from the report result list.

- **Sharing the report work**

Any user with project permission can view the created reports. You can check whether the related report has already been created, so you can avoid creating duplicates.

Difference between the report and integrated report

The **Report** menu available in any project generates reports for the project. You can access it through **Report** or **Stat/Report** in the side menu after selecting a project on the initial screen.

The **Integrated Report** menu can generate reports for multiple projects. It can be accessed from Home screen without selecting a project.

Create Report

Selecting the report type

If you select a desired report type in the **Report type** list, the **Create Report** button is activated. The [icon](#) before the report name indicates the project platform that supports report creation.

-  indicates the **Application** project platform.
-  indicates the **Database** project platform.
-  indicates the **Kubernetes** project platform.
-  indicates the **Server** project platform.

Report type

Create Report

</> Application Daily Error Statistics Report

</> Application Daily Http Call Report

</> Application Weekly Okind Error Statistics Report

</> Application Kinds Weekly Avg Resp Time Statistics Report

🗄️ Daily DB Report

🗄️ Weekly DB Report

⊗ Application Daily Error Statistics Report

⊗ Application Weekly Okind Error Statistics Report

⊗ Kube Daily Cpu/Memory Report

⊗ Kube Weekly Cpu/Memory Report

📋 Daily Server Report

📋 Monthly Server Report

Configuring in detail

When the **Create Report** window appears, set each item.

- **Title:** If there are multiple reports of the same type, the report names make it easier to distinguish the report results.
- **Time:** Select a period for the data to be used in the report. The

period differs depending on the report type (daily, weekly, monthly).

- **Project:** Select a project to create a report. You can select a group or project. The desired project can be searched via the **Search** field.
- **Save report template:** You can save the settings of the current report as a template. You can load it from the **Type** list when creating a new report.

After configuration, select **Create Report**.

Create Report

Type: Application Daily Error Statistics Report

Title: Application Daily Error Statistics Report

Time: < 2025/01/15 00:00 ~ 2025/01/16 00:00 1 day >

Project

Search

▼ Project Select all

[34786] .NET APM Demo [31130] Go APM Demo [5490] Java APM Demo

[6969] Node.js APM Demo [35917] OpenTelemetry Monitoring Demo

[39251] petclinic-Mysql-apm [40824] petclinic-Postgresql-apm

[31324] PHP APM Demo [29744] Python APM Demo

Save report template Create Report

✓ The methods how to set the query period depending on the format of the selected report are as follows:

- **Daily report:** You can select the start/end date and time.



- **Weekly report:** Simply select a start date. Then the end date is selected automatically after calculation.
- **Monthly report:** Simply select a start date. Then the end date is selected automatically after calculation.
 - If the start date is the 1st date, up to the end of the month is automatically selected.
 - If the start date is not the 1st date, up to the date before the next month is automatically selected.

Example 1: If the start date is **January 1**, from **January 1 00:00:00** to **January 31 23:59:59** is automatically selected.

Example 2: If the start date is **January 10**, from **January 10 00:00:00** to **February 9 23:59:59** is automatically selected.



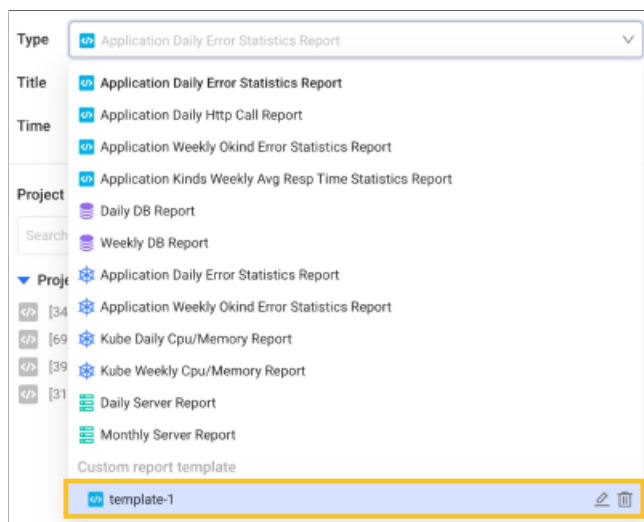
- For more information on how to use the **Time** option, see [the following](#).
- For more information on how to load the saved report forms, see [the following](#).

Loading the report forms

When creating a new report, the form saved with the **Save report template** feature can be checked in **Type** when creating a subsequent report.

Users who frequently use projects as work units can find this highly useful.

- : You can modify any saved report form.
- : You can delete any saved report form.



Checking the report list

You can see the reports that were created and are being created in **Report generation list**.

- In the **All** tab, you can see the reports created by you and the reports created by users with the same roles.
- In the **My report** tab, you can see only the reports created by you.
- If you select  on the upper right of a report item, you can use a feature to copy or delete the report.

Report generation list ⓘ

All
My report


Application Daily Http Call Report
✓
⋮

2023-08-22 00:00~2023-08-22 23:59
Java APM Demo, .NET APM Demo, Go APM Demo

- A report created with no error has the ✓ icon. In case of a report with any error, the ⚠ warning icon is displayed together. If you select the ⚠ icon, you can see in which project the error occurred.
- The generated reports are stored for 7 days, up to a maximum of 100 records.

Viewing and sharing

- **Viewing on the screen**

In the **Report generation list** list, if you select a created report, you can see its details.

- **Download**

Select **Download** to download the viewed report as an HTML file. You can share the report with users who do not have the monitoring management role.

• **Printing and saving PDF**

Select **Print** to print the report via a printer or save it as a PDF file.

DownloadPrint

Application Daily Http Call Report

Search Condition :2023-08-22(Tue) 00:00:00 ~ 2023-08-22(Tue) 23:59:59 (GMT+9)

[5490] Java APM Demo

Application Daily Http Call Report

Search Condition 2023-08-22(Tue) 00:00:00 ~ 2023-08-22(Tue) 23:59:59 (GMT+9)

Http Call Delay Top 5

No.	URL	Call URL	Host	Port	Total	Error	Average Time(m s)	Total Time(m s)	Maximum s)
1	/remote/account/save/dept/kwangju	/account/load/dept/daejun	127.0.0.1	8105	2264	0	1247	2823259	

Alert Notifications

This feature delivers notifications to users based on predefined conditions when issues occur in monitored systems or applications. Notifications can be sent through various channels such as email, SMS, messengers, and mobile push notifications.

For example, you can configure alert thresholds for key performance indicators such as CPU usage, memory usage, disk I/O, network traffic, transaction count, error occurrences, and response time latency. When these thresholds are exceeded or abnormal behavior is detected, notifications are automatically sent.

With WhaTap's AI-based alerting, you do not need to define complex conditions manually. The AI learns normal application behavior patterns and automatically detects and notifies anomalies. Additionally, by using tag-count alerts, you can define conditions on values aggregated by specific tags, enabling precise detection even in complex scenarios.

Key Features

- **Event Configuration:** Configure threshold-based alert conditions and notification channels
- **Event Notification Settings:** Configure notification channels and time schedules per user
- **Event History:** View the history of alert occurrences

Permissions

To add or configure events, the **Alert Configuration** permission is required.

- **View:** To view metrics event configurations, the **View & Analyze** permission is required.
- **Add/Edit/Delete:** To modify configurations, the **Alert Configuration** permission is required.
- **Receive Notifications:** To receive notifications, the **Alert Receive** permission is required.

Reference

For more details, see [Member Permissions](#).

Event Configuration

Home screen > Select project  **Alert** > **Event Configuration**

In **Event setting**, you can configure and manage events based on anomaly conditions that may occur in monitored systems or applications. When the configured conditions are met, notifications can be delivered through your preferred channels such as email, SMS, messengers, or app push notifications. You can tailor event configurations according to your monitoring objectives.

Metrics

Metrics events allow you to monitor system and application performance indicators based on real-time data.

Composite Metrics

The composite metrics feature allows you to create events using complex rules and send alert notifications.

Hitmap Patterns

Hitmap patterns automatically detect anomalies based on changes in distributions such as response time and call density, and send alert notifications.

Anomaly Detection

The anomaly detection feature allows you to configure alert notifications by detecting unexpected patterns.

 Real-time logs

Sends alert notifications when event conditions configured in real-time collected logs are detected.

 Transaction

Transaction events allow you to closely monitor transactions based on specific URLs, errors, status codes, and other conditions.

Home Screen > Select Project >  **Alert** > **Event Configuration**

Event setting provides features to configure and manage events based on anomaly signals that may occur in monitored systems or applications. When configured conditions are met, you can receive notifications through your preferred channels such as email, SMS, messengers, or app push notifications. You can design event configurations according to your monitoring objectives.

 Metrics

Metrics events allow you to monitor system and application performance indicators based on real-time data.

 Composite Metrics

The composite metrics feature allows you to create events using complex rules and send alert notifications.

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Hitmap patterns automatically detect anomalies based on changes in distributions such as response time and call density, and send alert notifications.

Anomaly Detection

The anomaly detection feature allows you to configure alert notifications by detecting unexpected patterns.

Real-time logs

Sends alert notifications when event conditions configured in real-time collected logs are detected.

Transaction

Transaction events allow you to closely monitor transactions based on specific URLs, errors, status codes, and other conditions.

Reference

- When configuring events, use appropriate threshold values to prevent unnecessary event generation.
- When setting up notifications, consider enabling recovery notifications (alerts sent when issues are resolved) to support effective operational response.

Common Features

All event configurations can be downloaded in **JSON or Excel format**. By sharing the same type of product configuration, you can reduce repetitive event setup work.

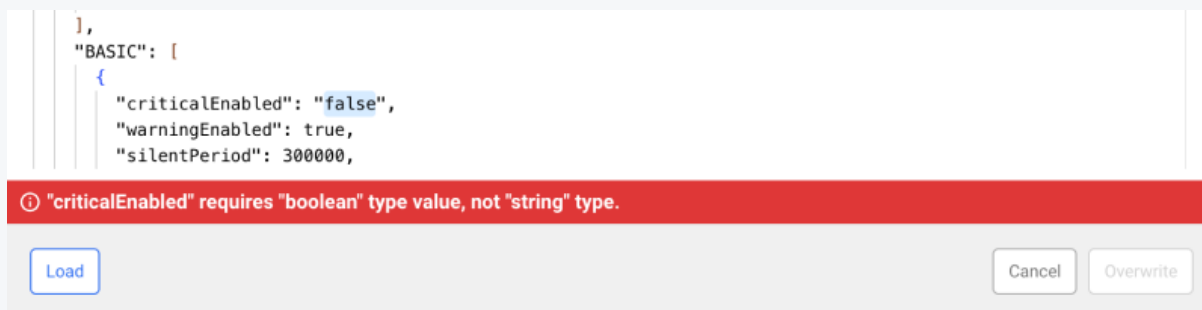
- **Batch JSON Edit:** Edit all event conditions in bulk using JSON format.
- **Batch JSON Download:** Save all currently registered event conditions as a JSON file.
- **Batch Excel Download:** Download the event list as an Excel file for external reporting or backup purposes.

Batch JSON Edit

1. Click the [Batch JSON Edit] button at the top of the screen.
2. Import a JSON file downloaded via the **Batch JSON Download** feature, or edit the content directly.
3. Click the [Overwrite] button to save.
4. When a confirmation message appears, click the [Overwrite] button.

⚠ After overwriting, you cannot restore the previous event configuration.

- Arbitrarily modifying the values of the `productType` or `platform` properties may cause events to malfunction in other projects.
- The JSON editor includes built-in validation. If the format or values are invalid, an error message appears below the editor and the [Overwrite] button is disabled.



JSON Data Structure



```

{
  "productType": "{productType}",
  "platform": "{platform}",
  "events": {
    "HITMAP": {
      ...
    },
    "LOG_REALTIME": [
      { ... }
    ],
    ...
  }
}

```




```
"METRICS": [
  {...}
],
"COMPOSITE_LOG": [
  {...}
],
"BASIC": [
  {...}
],
"COMPOSITE_METRICS": [
  {...}
],
"ANOMALY": [
  {...}
]
}
}
```

JSON Field	Description
productType	Product type (e.g. APM, Infra)
platform	Platform information (e.g. java, node)
events	Event data
⬠ HITMAP	Hitmap pattern
⬠ LOG_REALTIME	Real-time log events
⬠ METRICS	Metrics
⬠ COMPOSITE_LOG	Composite log events
⬠ BASIC	Basic events
⬠ COMPOSITE_METRICS	Composite metrics

JSON Field	Description
◇ ANOMALY	Anomaly detection

Batch JSON Download

Click the [Batch JSON Download] button at the top of the screen.

- The JSON file name follows the format `integrated-event-YYYYMMDD.json`.
- The structure of the JSON data and the sub-properties under the `events` attribute may vary depending on the product (`platform`) or product type (`productType`).

⚠ If you arbitrarily modify the values of the `productType` or `platform` properties in the JSON data, events may not function correctly in other projects.

Batch Excel Download

Click the [Batch Excel Download] button at the top of the screen.

Metrics

Home > Select Project >  **Alert** > **Event Configuration** > **Metrics** tab

You can view the complete list of all metrics-based events configured for the project. You can review, edit, or delete existing metrics events, or add new events as needed.

Default Options

- **Event Level:** Indicates the severity of an event and is classified into three levels: Normal (**Info**), Warning (**Warning**), and Critical (**Critical**).
- **Duplicate Agent Alert Suppression:** If two or more agents with the same name run simultaneously, events are not triggered for the selected duration (30 seconds, 1 minute, 3 minutes, 5 minutes, 10 minutes).
- **Search:** Search events by event name.
- **JSON Download/Upload:** Edit event rules directly in the JSON editor, or download them as a file, modify them, and upload them again.
- **+ Add Event:** Add a new metrics event.
- **Resize Columns:** Adjust column widths by dragging column borders.

Table | Metrics Event List Structure

Item	Description
No.	Event sequence number
	Event activation status – Enabled: An event is triggered when conditions are met – Disabled: The event does not run and conditions are not evaluated
	Edit or delete event settings
Event Name	User-defined event name – Up to 255 characters

Item	Description
Rule	Event trigger conditions
Target	Monitoring targets to which the event applies
Trigger Count	The time window and number of occurrences required to trigger an event – An event is triggered when conditions are met the configured number of times within the selected duration
Pause	Temporarily suppresses the same event after an alert is triggered – Available durations: Disabled, 5 min, 10 min, 15 min, 20 min, 30 min, 1 hr, 2 hrs, 3 hrs, 6 hrs, 12 hrs, 1 day – If recovery notifications are enabled, alerts are not triggered for the selected duration after a RECOVERED notification is sent
Recovery Notification	Whether to receive a RECOVERED (normal) notification when Critical or Warning events are resolved – Enabled: Sends a RECOVERED notification when the status changes from in progress to normal and allows viewing active and resolved states in event history – Disabled: Triggers a one-time event each time the threshold is exceeded
Event Recipients	Users or groups that receive notifications for the event (recipient tags)

Event Configuration

Metrics events allow you to define events based on conditions that occur in monitored targets and configure notifications so you can respond efficiently.

Add Event

To add a metrics event, go to **Event Configuration > Metrics** tab, then click the [+ Add Event] button in the upper-right corner.

How to Add a Metrics Event

Step 1. Select Template: Choose the basic structure of the event.

Step 2. Define Event Conditions: Configure the conditions that determine when the event is triggered.

Step 3. Select Event Target: Select the monitoring targets where the event applies.

Step 4. Basic Information and Notification Settings: Configure the event name, message, and recipients.

Select Template

- Depending on how you want to configure the event, select one of the three templates on the left side of the screen.
 - Create New:** Freely configure categories and metrics from scratch. This option is suitable for advanced users who need complex conditions or fine-grained monitoring rules.
 - Quick Setup:** Provides predefined categories, metrics, and default thresholds. You can apply it quickly by adjusting only the threshold values, which makes it suitable for beginners.
 - Advanced Setup:** Add conditions or freely modify settings based on predefined categories and metrics.

ⓘ Metrics events support multiple configuration approaches. The available templates may vary depending on the monitoring platform.

Define Event Conditions

In the **Define Event Conditions** step, configure the metrics that determine when the event is triggered, along with the trigger count, pause settings, recovery notifications, and event active time.

Metric Settings

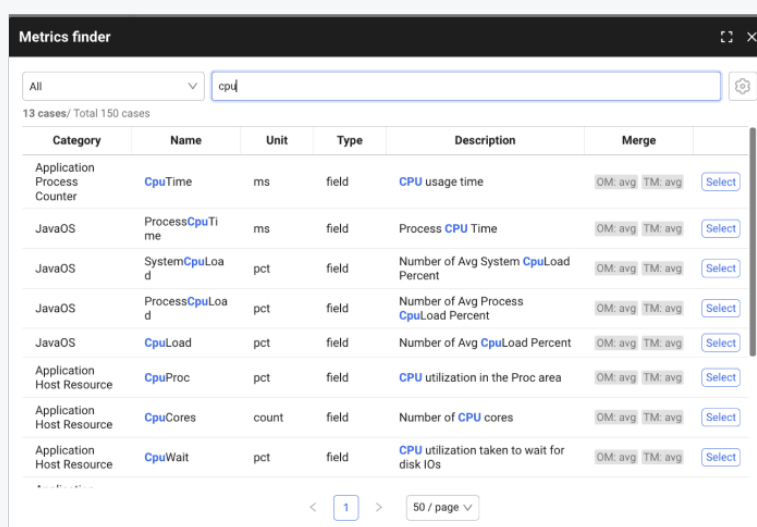
- Enter a category in the search field, or select a category (metric) from the category list. You must select a category to proceed with metric configuration.

- The category list shows the category name, data collection interval, and key. It displays metrics data collected in the project within the last 3 hours.
2. If the metric you need is not listed, select **Direct Input** and enter the category manually.

❗ **If you are not sure about categories or metrics, use the Metrics Finder.**

When configuring metrics for the first time, the Metrics Finder helps you locate metrics more quickly.

- Search for a metric in the Metrics Finder to view related categories and detailed information.
- Click the [Select] button for a metric in the search results to automatically apply the selected value to the event configuration screen.



3. Select the event level (**Critical**, **Warning**, Info). You can configure multiple levels for a single metric.

❗ **Event Level Behavior**

Even when multiple conditions are satisfied, only the highest-priority level (**Critical** → **Warning** → **Info**) triggers an event. For details, see the [Level Action Guide](#).

- Event levels are classified as Critical (**Critical**), Warning (**Warning**), and Info (Info).



- It is recommended to configure multiple levels for the same metric with stepwise thresholds.

4. Enter the field, operator, and value for the selected event level.

a. Click + **Add** to add more conditions.

- **&&** : An event is triggered only when **all conditions are satisfied simultaneously**
- **||** : An event is triggered when **at least one condition is satisfied**

b. Click — to remove the condition.



For condition syntax and supported operators, refer to the [Condition Settings Guide](#).

Trigger Count

Configure how many times a condition must be met before an event is triggered. This is useful for detecting persistent issues only.

1. Select the trigger frequency.

- **Consecutive:** An event is triggered when the condition occurs consecutively for the configured number of times.
- **Recent:** An event is triggered when the condition occurs the configured number of times within the selected time window.
 - Available durations: 5 seconds , 10 seconds , 15 seconds , 30 seconds , 1 minute , 2 minutes , 3 minutes , 4 minutes , 5 minutes , 10 minutes , 30 minutes , 1 hour

2. Enter the trigger count.

- The **Interval** value corresponds to the data collection interval of the selected category. (Interval: 10s)

Pause

To prevent excessive event generation, select a pause duration for event execution. After an event occurs, the same event will not be triggered again during the configured time period.

- Available durations: Disabled , 5 minutes , 10 minutes , 15 minutes , 20 minutes , 30 minutes , 1 hour , 2 hours , 3 hours , 6 hours , 12 hours , 1 day

! When recovery notifications are enabled

Even if the same event condition is met again, no notification is sent until the configured time has passed since the **RECOVERED** notification was received.

Resolved Notification

When the resolved notification feature is enabled, you can track state changes after an event occurs (in progress → resolved). The event is shown as an ongoing event in the **Event History** menu.

- Resolved notifications apply only to **Critical** and **Warning** levels. Info-level events always operate as one-time events.
- When a **Critical** or **Warning** event is resolved, a notification with the RECOVERED (normal) state is sent.
- Click the toggle button to **enable** or **disable** this feature.
 -  **Enabled:** Events operate based on state. They enter an in-progress state when the threshold is exceeded and transition to a resolved state when the value recovers below the threshold.
 -  **Disabled:** A one-time event is generated each time the threshold is exceeded.

Event Operation Time

Configure tags so that events operate only during specific time periods (such as business hours, non-business hours, or maintenance windows). If no tag is configured, events operate continuously for 24 hours while enabled.

1. Click **+ Add**.
2. In Event Operation Time, click **+ Create New Tag**.

3. In **Create Event Operation Time Tag**, select the **tag name, days, time, and color**, then click the [Apply] button.
4. You can view created tags in the tag list, and apply them by selecting the checkbox.
5. To modify or delete a tag, click the  icon and update or delete it in **Edit Event Operation Time Tag**.

 When a tag is deleted, it is removed from all users to whom it was applied. However, tags that are currently in use by event rules cannot be deleted.

Simulation

The simulation feature lets you pretest configured event conditions using historical data. If the expected number of events is too high or too low, you can adjust the conditions to find optimal threshold values.

- **Rule Validation:** Verify how newly created event rules would behave when applied to historical data.
- **Threshold Tuning:** Adjust thresholds to an appropriate level when events occur too frequently or not at all.

Start Simulation

1. After completing event condition settings, click the [Simulation] button.
2. Review the expected number of events and the visualized results.

Understanding Simulation Results

1. Time-Series Data

A graph displays metric changes over time along with threshold lines for each level, allowing you to intuitively identify when events are triggered.

2. Event Counts by Level

The number of events for the Critical, Warning, and Info levels is shown on the right side of the screen. This helps you understand overall event distribution and frequency.

3. Target-Level Details

Hover over a specific point on the chart to see the exact metric value and monitoring target at that moment. When multiple targets exist, they are distinguished by color. If patterns differ by target, you can use filtering to analyze them individually.

4. Peak Interval Identification

Identify periods where metrics spike sharply to understand when issues occur most frequently or to recognize recurring patterns.

✓ Simulation Tips

- **Simulate Different Time Ranges**

Run simulations for weekdays vs. weekends and peak vs. off-peak hours to set optimal thresholds for each time period.

- **Include Actual Incident Periods**

Include past outage periods in simulations to verify whether current rules accurately detect real incidents.

- **Add Target Filtering**

When many targets are monitored, simulation results can become complex. Use filters to focus on specific targets for clearer insights.

- **Adjust Thresholds Gradually**

Instead of making large changes at once, adjust thresholds incrementally, such as in 10 percent steps, to find optimal values.

Select Event Target

If no event target is specified, events are triggered for all targets in the project, which can result in excessive events. It is therefore recommended to clearly define the targets to which the event applies.

ⓘ If you change the event targets, the number of events may change. Click the **Simulation** button and run it again to check the updated expected event count.

Target Selection

You can specify the targets to which the event applies using either **Select Input** or **Direct Input**.

- **Select Input** **Direct Input**

1. Select or enter a tag, operator, and value.
 - a. If it is difficult to find a tag, you can search for it using the **Metrics Finder**.
2. Click + **Add** to add event targets using conditions (`&&` , `||`).

Enter the tag, operator, and value of the target to monitor directly.

- When you choose direct input, a list of available tags (**Tag Select Input**) is provided below the input field.

```
ex. endsWith(okindName, 'example_name') && container == 'prod.billing'
ex. ${4xxErrorType} == '401'
```

 If you change the input method, any content you have entered will be reset.

Basic Information and Notification Settings

Configure the **event name**, **message**, and **recipients**. Because this information is displayed as is in event history and actual notification messages, it should be clear and easy to identify.

Event Activation

Configure whether the event is triggered when the defined conditions are met.

-  **Enabled:** The event is triggered when the configured conditions are satisfied.
-  **Disabled:** Conditions are not evaluated.

Event Name

Enter the event name to be used as the event title. The configured event name is displayed in the **Event List** and **Event History** menus and can be used as a search keyword.

Message

Enter the event message. The message you enter is used in event history and notifications. Click the  icon to view previously written message history. You can include variables in the message to insert actual values at the time the event occurs.

- **Variable Usage Rules**

- Variable format: `${metric_name}`
- Only metrics within the **same category as the configured category** can be used as variables.
- You can combine multiple variables to create a more detailed message.
- The list of available variables can be found in the **Metrics Query** menu.

- **Variable Usage Example**

	Event Configuration	When Event Occurs
Title	Disk Usage Increase	Disk Usage Increase
Message	Disk = <code>\${disk}%</code>	Disk = 89.9%

Event Recipients

Specify the members who will receive event notifications.

- **Receive All Receive by Tag Selection**

Notifications are sent to all targets (members and channels) in the project that have event reception enabled.

Notifications are sent to project members who have the selected tag.

1. Select **Receive by Tag Selection**.
2. In the **Reception Tag** section, click the [+ Add Tag] or [+] button.
3. Under the **Event Reception Tag** window, click + **Create New Tag**.
4. In the **Create Tag** window, enter a tag name, select a color, and click the [Create Tag] button.
5. You can edit or delete created tags by clicking the  icon in the tag list.

6. In the **Event Reception Tag** window, select the desired tag from the **Tag List** to apply it.

ⓘ Reception Tags

Reception tags are a feature for managing users or channels that receive notifications **at a group level**. When a reception tag is assigned to an event, notifications are delivered only to users associated with that tag. If no reception tag is set, notifications are sent to all users in the project.

Edit/Delete Event

1. Go to **Alert Notifications > Event Settings** and open the **Metrics** tab.
2. In the event list, click the  icon for the event you want to edit or delete.
3. In the **Edit Event Rule** window, update the options and click the [Save] button.
 - a. To delete the selected event, click the [Delete] button in the upper-right corner of the **Edit Event Rule** window.

Event Sharing

You can save metric event settings as a JSON file to share configurations with other users or import settings created by others.

- JSON file name: `event-rules-YYYYMMDD.json`

Export

1. Click the [**JSON** ] button at the top right of the screen.
2. When the JSON editor opens, click the [ Export] button.
 - If you use the export function after searching for events, only the searched list will be downloaded as a JSON file.
3. After the JSON file is downloaded, share it with other users.

Import

1. Click the [] button at the top right of the screen.
2. Select the JSON file downloaded using the **Export** function.
3. When the JSON editor opens, choose either [Add to List] or [Overwrite].

 It is recommended to use this feature between projects of the same product type. You can import event settings from projects of different products, but they may not function correctly.

Edit in JSON Format

1. Click the [**JSON** ] button at the top right of the screen.
2. When the editor opens, modify the content according to the JSON format.
3. After completing the edits, click the [Save] button at the bottom of the screen.

 If the modified content does not conform to the JSON format, an error message will be displayed at the bottom of the screen and the content cannot be saved. The error message may vary depending on the type of formatting issue.

JSON error

JSON Data Structure

```
{
  "version": 2,
  "eventId": "zcef7s7f27rum1",
  "enabled": true,
  "stateful": false,
  "title": "Active Transaction",
  "message": "Active Transaction = ${active_tx_count}",
  "category": "app_counter",
  "alertLabel": [
    "oid"
  ],
  "repeatCount": 1,
  "repeatDuration": 0,
```

```

"silent": 300000,
"receiver": [],
"timeTag": [],
"selectString": "",
"conditions": [
  {
    "level": 20,
    "enabled": true,
    "rule": "active_tx_count > 100"
  }
],
"createTime": 1763632674345,
"lastModifiedTime": 1763632674347,
"lastModifiedUser": "support@whatap.io",
"basic": true,
"metaId": "java004",
"selectCondition": {
  "oid": [
    "-1010758404",
    "-250906941"
  ]
}
}

```

Table | JSON Data Structure

JSON Field	Type	Description	Notes
version	Integer	Version of the event rule	Restricted
eventId	String	Unique identifier of the event rule	
enabled	boolean	Whether the event is enabled	
stateful	boolean	Whether the event is state-based	
title	String	Event rule name defined by the user	
message	String	Event rule message defined by the	

JSON Field	Type	Description	Notes
		user	
category	String	Data category	
alertLabel	List<String>	Default identifier (primary key) value assigned per category for event state management	Restricted
repeatCount	Integer	Number of repetitions	
repeatDuration	Long	Duration for repetition	
silent	Integer	Pause duration	
receiver	List<String>	List of recipient tag keys	
timeTag	List<String>	List of operation-time tag keys	
selectString	String	Target selection	
conditions	List<Object>	List of trigger conditions by level	
◇ level	byte	Level value	Critical : 30, Warning : 20, Info : 10
◇ enabled	boolean	Whether the level is enabled	
◇ rule	String	Trigger condition for the level	
createTime	Long	Initial creation time of the event rule	
lastModifiedTime	Long	Last modification time of the event rule	
lastModifiedUser	String	Account that last modified the event rule	

JSON Field	Type	Description	Notes
basic	boolean	Whether the event was created using Quick Setup	Restricted
metaId	String	Unique identifier of the Quick Setup template	Restricted: This value exists only for events created via Quick Setup (basic=true).
selectCondition	Object	Target selection value for Quick Setup	This value exists only for events created via Quick Setup (basic=true).

 Fields marked as “Restricted” may affect event behavior, so it is recommended not to modify their values.

Appendix

Trigger Conditions and Target Selection Guide

Metric alert trigger conditions and event target selection use the same syntax. However, trigger conditions use the field key as the variable, while target selection uses the tag key as the variable.

Level Behavior Guide

Event levels are categorized into Critical, Warning, and Info.

1. Priority-based Event Triggering

When multiple level conditions are met at the same time, only the event with the highest priority is triggered.

Example

Configuration:

- Warning: CPU > 70%
- Critical: CPU > 90%

Current state: CPU 95%

→ Result: Only the Critical event is triggered (Warning is suppressed)

2. Level Escalation

For events that maintain an in-progress state, when a higher-level condition is met while a lower-level event is already in progress, both levels enter the in-progress state.

Example

Configuration:

- Warning: CPU > 70%
- Critical: CPU > 90%

Scenario:

- 1) CPU 80% → Warning triggered (in progress)
- 2) CPU 95% → Warning (in progress), Critical (in progress)

3. Level De-escalation

For events with an in-progress state, when the level transitions from a higher level to a lower level, the higher-level event is resolved while the lower-level event remains active.

Example

Configuration:

- Warning: CPU > 70%
- Critical: CPU > 90%

Scenario:

- 1) CPU 97% → Critical triggered
- 2) CPU 85% → Critical resolved, Warning remains
- 3) CPU 65% → Warning resolved

4. Execution Flow

- Warning: CPU > 70%

- Critical: CPU > 90%

Metric value: 60% → 75% → 92% → 85% → 60%

State: Info Warning Critical Warning Info
 (triggered) (triggered) (maintained) (resolved)
 Warning
 (maintained)

- ⓘ Events that have an in-progress state remain active as long as their conditions are met and continue until those conditions are cleared.

Condition Configuration Guide

- ⓘ If a metric name starts with a number or contains special characters, you must wrap it in the `${metric_name}` format.

- Brackets `()`, `[]`
- Operators `+`, `-`, `*`, `/`, `%`
- Delimiters `:`, `@`, `#`, `,`, `,`, (space)
- Other special characters `!`, `^`, `&`, `|`, `~`, ```, `"`, `=`

Examples using `${}` :

```
${cpu(xos)} > 50
${mem[0]} >= 100
${cpu-usage} > 80
${namespace:cpu} > 70
${metric name} > 60
${4xx_error} > 10
```

Usable without `${}` : Metric names that contain only alphabetic characters, underscores (`_`), or dots (`.`)



```
cpu > 80
cpu_usage > 50
CPUUtilization.Average > 0.8
```

1. Comparison Operators

Numeric Comparison

```
Greater than:      cpu > 80
Greater than or equal:  cpu >= 80
Less than:         memory < 1000
Less than or equal:  memory <= 1000
Equal to:          status == 200
Not equal to:       error != 0
```

String Comparison

```
status == 'OK'
region == "us-east-1"
```

2. Arithmetic Operators

- Basic arithmetic operations

```
Addition:      cpu + 10 >= 90
Subtraction:    memory - 100 >= 500
Multiplication: cpu * 2 >= 100
Division:       disk / 1024 >= 100
Modulo:         value % 10 == 0
```

- Controlling precedence with parentheses

```
(cpu + memory) * 2 >= 200
(disk - used) / total >= 0.2
((cpu + memory) / 2) >= 50
```

- Negative values

```
cpu > -100
```

3. Logical Operators

- AND operator (&&)

```
cpu > 80 && memory > 1000  
${cpu(xos)} > 50 && ${mem(xos)} > 60
```

- OR operator (| |)

```
cpu > 90 | | memory > 90  
disk < 10 | | network > 1000
```

- Combined logical operations

```
(cpu > 50 && memory > 50) | | disk < 20  
cpu > 80 && (memory > 1000 | | disk > 500)
```

4. Pattern Matching Operators

- LIKE operator

```
oname like 'prod-*'  
url like '*error*'  
message like 'WARN%'
```

- NOT LIKE operator

```
oname not like 'test-*'  
url not like '*debug*'
```

5. Built-in Functions

- Null check functions

```

isNull(value)      # Checks whether the value is null
isNotNull(value)   # Checks whether the value is not null
nvl(value, 0)      # Returns a default value if null
isEmpty(str)       # Checks whether the string is empty
isNotEmpty(str)    # Checks whether the string is not empty

```

- Aggregate functions

```

sum(cpu, memory, disk)    # Sum
avg(cpu, memory)          # Average
max(cpu, memory, disk)    # Maximum
min(cpu, memory, disk)    # Minimum
count(value1, value2, value3) # Count

```

- Math functions

```

round(cpu, 2)    # Rounds to 2 decimal places

```

- String functions

```

length(str)      # String length
startsWith(str, 'prefix') # Checks prefix
endsWith(str, 'suffix') # Checks suffix
indexOf(str, 'search') # String index
substring(str, 0, 10) # Substring
trim(str)        # Trims whitespace
replace(str, 'old', 'new') # String replacement
hasStr(str, 'search') # Checks string containment

```

- Conditional functions

- **if:** A conditional function that returns the `trueValue` if the condition evaluates to `true`, or the `falseValue` if it evaluates to `false`

Syntax

```

if(condition, trueValue, falseValue)

```

Example

```
if(value >= 90, 'High', 'Medium') == 'High'
```

- **decode:** Compares a value against conditions and returns the result of the matching condition, or a default value if no match is found

Syntax

```
decode(value, condition1, result1, condition2, result2, ..., conditionN, resultN, defaultValue)
```

Example

```
decode(value, 1, 'Low', 2, 'Medium', 3, 'High', 'Unknown') == 'Unknown'
```

- **in:** Returns `true` if the value matches any of the specified candidates; otherwise returns `false`

Syntax

```
in(value, candidate1, candidate2, ..., candidateN)
```

Example

```
in(status, 200, 201, 204) == false
```

! Writing Guidelines

- Recommended
 - Use simple variable names without `${}` (e.g. `cpu`, `memory`)
 - Always use `${}` when special characters are included
 - Use parentheses to clearly separate complex expressions
 - Enter function names exactly as defined (case-sensitive)
- Avoid



- Incomplete expressions (e.g. `cpu > , memory && )`)
- Mismatched parentheses (e.g. `(cpu > 80 && cpu > 70) )`)
- Consecutive or invalid operators (e.g. `cpu >> 80 , cpu >< 80 )`)

Composite Metrics

Home > Select Project >  **Alert** > **Event Configuration** > **Composite metrics** tab

You can create events and send alert notifications using complex rules.

Default Options

- **Search:** Search for specific events by selecting an event name or an event recipient tag
- **JSON Download/Upload:** Edit event rules directly in the JSON editor, or download them as a file, modify them, and upload them again
- **Alert Message Settings:** Select detailed fields for alert messages and edit the content for each field
- **+ Add Event:** Add a new composite metrics event

Permissions

To configure **Composite metrics** events, you must have **Alert Settings** permission. You can grant this permission by clicking the  icon for the member in **Home > Select Project > Management > Integrated Member Management**.

Table | Composite Metrics Event List Layout

Item	Description
Event Title	User-defined event name - Up to 255 bytes
Condition	Event trigger conditions
Notify on Event Recovery	Whether to receive RECOVERED (normal) notifications when Critical or Warning events are resolved – Enabled: Sends a RECOVERED notification when the state changes from in-progress to normal, and allows you to distinguish in-progress and resolved states in event history – Disabled: Triggers a one-time event each time the threshold is exceeded

Item	Description
Event Recipient Tag	Users or groups that receive notifications for the event
	Edit or delete the event
	Event enablement status – Enabled: Event is triggered when conditions are met – Disabled: Event does not run and conditions are not evaluated

Event Configuration

Composite metrics events define event conditions based on **MXQL**, the metric data query language. The **Create from Chart** feature provides a combo box to support MXQL auto-completion.

Add Event

1. Click the **Composite metrics** tab from  **Alert > Event Configuration**.
2. Click the [+ Add Event] button on the right side of the screen.
3. In the **Composite metrics** window, click **Create from Chart**.
 - a. You can use the provided templates.
4. In the **Event Configuration** screen, first query the event data, then configure the event conditions.

Query Event Data

Query event data to build charts. In the **Event Configuration** screen, select either the **Widget** or **Text** option under **Query event data** on the right to configure events.

- Widget Text

Using the options for configuring a time series chart, you can automatically complete the **MXQL** used for event configuration.

1. Select the date range for querying data.
2. Select the **Category** (target) for querying data.
3. Click + **Add Filter** under **Filter** to create event conditions.
 - a. In the filter window, select an expression, tag, and filter value.
 - b. Click + **Add** to add additional conditions.
 - c. To delete a condition, click the – icon next to it.
4. Under **Grouping**, select the grouped metric data. Multiple selections are supported.
5. Under **Time Unit**, set the time interval for grouped data by selecting `seconds` , `minutes` , or `hours` .
6. Under **Field**, select the fields to be used for event trigger conditions. Multiple selections are supported.

 MXQL entered in text mode is not compatible with widget mode.

An editor appears where you can directly modify **MXQL**.

1. Edit **MXQL** directly and click the **Query** button.
2. After selecting a date, you can view the results as a chart or graph.

Notification

Enter the basic information for alert notification settings.

- **Enable Event:** When the toggle is enabled, the event becomes active.
- **Level:** Select the event level (Critical, Warning, Info).
 - **Notify on Event Recovery:** When the toggle is enabled, a notification is sent when the event is resolved and enters the normal (RECOVERED) state.
- **Title:** Enter a title for the event rule.
- **Message:** Enter the content of the alert message delivered when the event is triggered. You can use variables in the message to include actual values at the time the event occurs.

Message example

✔ Variable Usage Rules

- Variable format: `${metricName}`
- Only metrics within the **same category as the configured category** can be used as variables.
- You can combine multiple variables to compose a detailed message.
- The list of available variables can be checked in **Metric Query**.

Event Trigger Conditions

- **Data Query Range:** Select the real-time data query window.
 - Available ranges: 30 seconds , 1 minute , 2 minutes , 5 minutes , 10 minutes , 30 minutes , 1 hour , 2 hours , 3 hours
- **Condition:** Enter the event trigger condition. Only fields included in the event data query can be used.

Additional Information

- **Interval:** The alert condition is evaluated at the selected interval (1 minute , 5 minutes , 10 minutes , 30 minutes , 1 hour , 12 hours).
- **Silence:** After an event is triggered, the same event is suppressed for the selected duration (unset , 1 minute , 5 minutes , 10 minutes , 30 minutes , 1 hour , 12 hours).
- **Event Active Time:** Configure tags to control when the event runs, such as working hours, non-working hours, or maintenance windows. If no tag is set, the event runs continuously for 24 hours while it is enabled.
 1. Click + **Add**.
 2. Under **Event Active Time**, click + **Create New Tag**.
 3. In **Create Event Active Time Tag**, select a **Tag Name**, **Days**, **Time**, and **Color**, then click the [Apply] button.
 4. Created tags appear in the tag list and can be applied by selecting the checkbox.
 5. To edit or delete a tag, click the  icon and modify or remove it in **Edit Event Active Time Tag**.

 When a tag is deleted, it is removed from all users to whom it is applied. However, tags that are

 currently in use by event rules cannot be deleted.

- **Event Recipient Tags:** When recipient tags are configured, notifications are sent to project members who have those tags. If no recipient tag is set, notifications are sent to all users in the project.

1. Click + **Add Tag** or the + icon.
2. Click + **Create New Tag** at the bottom of the **Event Recipient Tags** window.
3. In the **Create Tag** window, enter a tag name, select a color, and click the [Create Tag] button.
4. To edit or delete a created tag, click the  icon in the tag list.
5. Select the desired tag from the **Tag List** in the **Event Recipient Tags** window to apply it.

 When configuring events, selecting event recipient tags allows notifications to be sent to project members and third-party plugins associated with those tags. You can assign tags to project members and third-party plugins separately via **Alert > Notifications**.

Test Event Rules

You can test the configured conditions against historical data to estimate how many events would have been triggered.

1. Select the date for testing the event rules and click the [Confirm] button.
2. Click the [Run] button to check the number of triggered events.

Edit/Delete Event

1. Go to the **Alert > Notifications > Composite metrics** tab.
2. In the composite metrics list, click the  icon of the event you want to edit or delete.
3. In the **Notifications** screen, update the options and click the [Save] button.
 - a. To delete the selected event, click the [Delete] button in the upper right corner of the **Notifications** screen.

Event Sharing

You can save metric event settings as a JSON file to share configurations with other users or import settings created by others.

- JSON file name: `event-rules- YYYYMMDD .json`

Export

1. Click the [**JSON** ] button at the top right of the screen.
2. When the JSON editor opens, click the [ Export] button.
 - If you use the export function after searching for events, only the searched list will be downloaded as a JSON file.
3. After the JSON file is downloaded, share it with other users.

Import

1. Click the [] button at the top right of the screen.
2. Select the JSON file downloaded using the **Export** function.
3. When the JSON editor opens, choose either [Add to List] or [Overwrite].

 It is recommended to use this feature between projects of the same product type. You can import event settings from projects of different products, but they may not function correctly.

Edit in JSON Format

1. Click the [**JSON** ] button at the top right of the screen.
2. When the editor opens, modify the content according to the JSON format.
3. After completing the edits, click the [Save] button at the bottom of the screen.

 If the modified content does not conform to the JSON format, an error message will be displayed at the

! bottom of the screen and the content cannot be saved. The error message may vary depending on the type of formatting issue.

JSON error

Alert Message Settings

You can select detailed fields for the messages to be received and edit the content for each field.

Appendix

MXQL Syntax Guide

Composite metrics operates based on MXQL queries. For detailed syntax, refer to the [MXQL Syntax Guide](#).

Hitmap Patterns

Home > Select Project >  **Alert** > **Event Configuration** > **Hitmap pattern** tab

Hitmap pattern automatically detects anomalies based on time-based pattern changes in application execution ranges, such as response time distribution and call density.

Without manually configuring complex conditions or thresholds, the system analyzes Hitmaps collected in real time and automatically triggers alert notifications when patterns deviate from normal behavior. Hitmap pattern alerts are especially useful in the following situations.

- When a specific transaction becomes excessively concentrated during certain time periods compared to normal behavior
- When traffic distribution or response patterns differ from the usual baseline
- When pattern-based anomaly detection is required beyond what condition-based rules can capture

Event Configuration

Configure the options for the event patterns to be detected.

Activation

When the toggle is turned on, an alert notification is sent when the corresponding pattern is detected.

-  **Enabled:** An event is triggered when conditions are met.
-  **Disabled:** No event is triggered, and conditions are not evaluated.

Silence

After an event is triggered, the event is suppressed for the selected duration and is not recorded in **Event History**.

Event Recipient Tags

When recipient tags are configured, notifications are sent to project members who have those tags. If no recipient tag is set, notifications are sent to all users in the project.

1. Click + **Add Tag** or the + icon.
2. Click + **Create New Tag** at the bottom of the **Event Recipient Tags** window.
3. In the **Create Tag** window, enter a tag name, select a color, and click the [Create Tag] button.
4. To edit or delete a created tag, click the  icon in the tag list.
5. Select the desired tag from the **Tag List** in the **Event Recipient Tags** window to apply it.

Event Active Time

Configure tags to control when events run, such as working hours, non-working hours, or maintenance windows. If no tag is set, events run continuously for 24 hours while they are enabled.

1. Click + **Add**.
2. Under **Event Active Time**, click + **Create New Tag**.
3. In **Create Event Active Time Tag**, select a **Tag Name**, **Days**, **Time**, and **Color**, then click the [Apply] button.
4. Created tags appear in the tag list and can be applied by selecting the checkbox.
5. To edit or delete a tag, click the  icon and modify or remove it in **Edit Event Active Time Tag**.

 When a tag is deleted, it is removed from all users to whom it is applied. However, tags that are currently in use by event rules cannot be deleted.

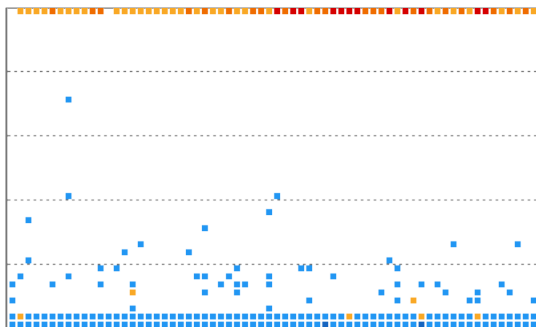
Hitmap Pattern Types

When you turn on the toggle for each pattern, an event is triggered when the corresponding pattern is detected.

Hitmap Horizontal Line Pattern

This pattern appears when multiple transactions complete within a similar response time range. Requests cluster around a specific latency band, which indicates increasing service delay or unstable responses from external resources.

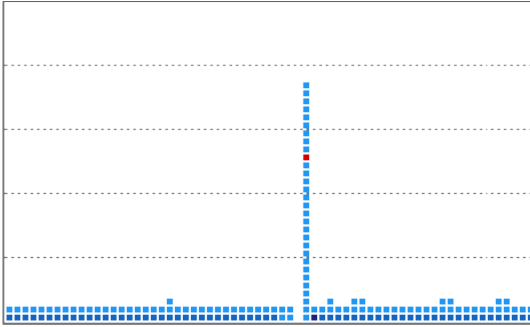
- Timeouts or delays occurring in external API, DB, or HTTPS calls
- Requests waiting for a certain duration before being processed all at once
- Repeated latency in shared I/O or network paths



Hitmap Vertical Line Pattern

In this pattern, transactions start at different times but finish simultaneously. Multiple requests are processed at the same moment, which indicates a bottleneck in a shared resource.

- Increased wait time due to shared resources such as DB locks or file locks
- Concurrent processing delays in queues or thread pools
- Temporary request suspension followed by simultaneous resumption due to system pauses such as GC pauses

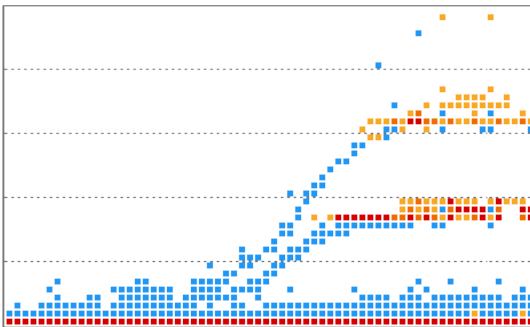


- ✓ A Hitmap vertical line pattern is a signal that lock contention or bottleneck resources should be inspected.

Hitmap Flying Pattern

This pattern appears when response times rise and fall in waves at regular intervals due to shortages in shared resources such as specific system components or logs.

- Shortages in shared resources such as GC, connection pools, or file handles
- Periodic latency factors such as log flushing or storage I/O
- Batch jobs or background jobs that periodically consume resources

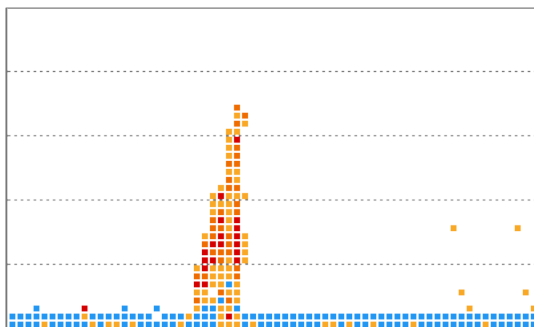


- ✓ A Hitmap flying pattern strongly indicates periodic bottlenecks or resource shortages.

Hitmap Overload Pattern

This pattern occurs when transactions become abnormally concentrated within a specific response time range. It appears when requests fail to distribute normally and instead pile up in a narrow band due to temporary load spikes or early signs of failure.

- Transactions accumulate in a queue due to temporary failures or delays and are then processed in bulk
- Backend service response latency
- Insufficient processing capacity caused by traffic concentration during specific time periods

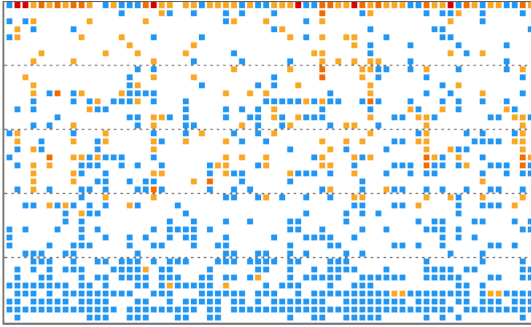


✓ An overload pattern indicates temporary service quality degradation or load balancing failure.

Hitmap Flood Pattern

This pattern indicates an overall increase in response times caused by excessive requests or load. It reflects a broad performance degradation across the service.

- Sudden spikes in user traffic or automated traffic
- System resource shortages such as CPU, memory, or GC pressure
- Overall response quality degradation due to backend bottlenecks



- ✓ A flood pattern requires immediate investigation.

Anomaly Detection

Home > Select Project >  **Alert** > **Event Configuration** > **Anomaly detection** tab

Anomaly detection identifies abnormal rising or falling patterns in metric data and triggers events when movements that differ from the usual behavior are detected.

Default Options

- **Search:** Search for specific events by selecting an event name or an event recipient tag.
- **+ Add Event Rule:** Add a new anomaly detection event.

Table | Anomaly Detection Event List Layout

Item	Description
Event Message	Message sent when an event is triggered
Category	Unit used to classify metric data and serve as the basis for metric event configuration
Field	Metric field used to detect anomalies
Filter	Conditions that limit the data range subject to anomaly detection
Rising/Falling Pattern	Sensitivity of rising or falling patterns
Event Recipient Tag	Users or groups that receive notifications for the event
	Edit event settings
	Delete event
	Event enablement status - Enabled: Event is triggered when conditions are met - Disabled: Event does not run and conditions are not evaluated

Event Configuration

You can configure alert notifications to be sent when metric values rise or fall in a way that differs from their usual behavior.

Add Event Rules

1. Click the [+ Add Event Rule] button on the right side of the screen.
2. Configure **Event Basic Information**, **Metrics**, **Anomaly Detection**, and **Additional Information** in order.

Event Basic Information

1. Select the event level (**Critical**, **Warning**, Info).
 - This determines the event priority and alert level.
2. Enter the alert message to be delivered when the event is triggered.
 - You can use variables in the message to include actual values at the time the event occurs.

! Available Variables

- `$pcode` : Project code
- `$category` : Category
- `$field` : Field
- `$value` : Triggered value
- `$oname` : Event target

Metrics

1. Select a **Category**.
 - This category serves as the baseline for the metric data used to detect anomalies.

2. Select the **Field** to be used for the event trigger conditions. Multiple selections are supported.
3. Select filters that define the event condition targets used to narrow the event scope. Multiple selections are supported.

Anomaly Detection

1. Select the sensitivity levels for **Rising Pattern** and **Falling Pattern**.
2. Use the toggle buttons to enable or disable each pattern.
 - To detect only rising patterns: Rising Pattern **ON**, Falling Pattern **OFF**
 - To detect only falling patterns: Falling Pattern **ON**, Rising Pattern **OFF**

Additional Information

Event Active Time

Configure tags to control when an event runs, such as working hours, non-working hours, or maintenance windows. If no tag is set, the event runs continuously for 24 hours while it is enabled.

1. Click **+ Add**.
2. Under **Event Active Time**, click **+ Create New Tag**.
3. In **Create Event Active Time Tag**, select a **Tag Name**, **Days**, **Time**, and **Color**, then click the [Apply] button.
4. Created tags appear in the tag list and can be applied by selecting the checkbox.
5. To edit or delete a tag, click the  icon and modify or remove it in **Edit Event Active Time Tag**.

 When a tag is deleted, it is removed from all users to whom it is applied. However, tags that are currently in use by event rules cannot be deleted.

Event Recipient Tags

When event recipient tags are configured, notifications are sent to project members who have those tags. If no recipient tag is set, notifications are sent to all users in the project.

1. Click + **Add Tag** or the + icon.
2. Click + **Create New Tag** at the bottom of the **Event Recipient Tags** window.
3. In the **Create Tag** window, enter a tag name, select a color, and click the [Create Tag] button.
4. To edit or delete a created tag, click the  icon in the tag list.
5. Select the desired tag from the **Tag List** in the **Event Recipient Tags** window to apply it.

✓ When configuring events, selecting event recipient tags allows notifications to be sent to project members and third-party plugins associated with those tags. You can assign tags to project members and third-party plugins separately via **Alert > Notifications**.

Edit Event

1. Go to the **Alert > Event Configuration > Anomaly detection** tab.
2. In the **Anomaly Detection** list, click the  icon on the right of the event you want to edit.
3. In the **Anomaly Detection** window, update the options and click the [Save] button.

Delete Event

1. Go to the **Alert > Event Configuration > Anomaly detection** tab.
2. In the **Anomaly Detection** list, click the  icon on the right of the event you want to delete.
3. In the delete confirmation window, click the [Delete] button.

Real-time Log Events

Home > Select Project >  **Alert** > **Event Configuration** > **Real-time Log** tab

You can set alert notifications by filtering collected log data against conditions. Log monitoring must be activated to use log events. For more information on **activating log monitoring**, refer to the log documentation for each product.

- **Real-time log event:** An event is triggered when the configured event conditions are met in real-time collected logs.

Default options

- **Search:** Search for events by selecting an event name or event notification tag
- **JSON download/upload:** Event rules can be directly edited through the JSON editor, or downloaded as a file, modified, and re-uploaded
- **Notification message settings:** Select detailed items for the message to receive and edit the content for each item
- **+ Add event:** Add a new log event

Table | Real-time log event list configuration

Item	Description
Event name	Event name used as the notification title - Up to 255 bytes
Category	Log classification name (log folder name)
Search key	The field to search for in log data - Example: To access an HTTP response status code, use the search key <code>status</code>
Search value	The actual value corresponding to the search key. An alert is sent when logs contain the specified value

Item	Description
	- Example: If the search key is <code>status</code> and the search value is <code>200</code>, an alert is triggered when logs containing HTTP status code 200 are collected
Pause event notifications	Pauses the same event notification for a specified time after an event notification is triggered - Available times: Disabled, 5 min, 10 min, 15 min, 20 min, 30 min, 1 hour, 2 hours, 3 hours, 6 hours, 12 hours, 1 day - If resolved notifications are enabled, no notification is sent for the same event during the selected time after receiving a normal (RECOVERED) status notification
Event target filtering	Conditions that define the targets to which the event applies - If no condition is set, alerts are evaluated for all collected data - Select input: Build conditions by selecting tags, operators, and values - Direct input: Manually enter conditions to specify targets
Event notification tags	User or group (notification tag) to receive the event notification
	Edit and delete events
	Whether the event is active - Enabled: Event occurs when conditions are met - Disabled: Event does not operate and conditions are not checked

Event settings

Log events allow you to configure alert notifications when logs are collected in real time or when logs that meet specific conditions accumulate.

Add real-time log event

1. Click the **Real-time Log** tab in **Alert > Event Configuration**.

2. Click the [+ Add event] button on the right side of the screen.
3. Set the log event conditions in the **Add event rule** window.
 - **Event name:** Enter a name to use as the event title.
 - **Event activation:** When the toggle button is activated, an event occurs when conditions are met.
 - **Level:** Select the event level (**Critical**, **Warning**, **Info**).
 - **Message:** Enter the notification message to receive when the event is triggered. You can use variables in the message to include actual values at the time of event occurrence.

✓ **Variable usage rules**

- Variable format: `${metricName}`
 - Only metrics within the **same category as the configured category** can be used as variables.
 - You can combine multiple variables to compose a detailed message.
 - A list of available variables can be checked in **Metrics Query**.
- **Category:** Select the log classification name (log folder name) from the list or enter it directly. You must select a category before entering a search key and search value.
 - **Search key:** Enter the field you want to search for in log data.
 - Example: To access an HTTP response status code, use the search key `status`.
 - **Search value:** Enter the actual value corresponding to the **search key**. An alert is sent when logs contain the specified value.
 - Example: If the **search key** is `status` and the **search value** is `200`, an alert is triggered when logs containing HTTP status code 200 are collected.
 - **Event target filtering:** Enter conditions to define the targets to which the event applies. If no value is entered, alerts are evaluated for all collected data.
 - **Select input:** Select a tag, operator, and value to set the target conditions.

ⓘ For condition expression syntax and supported operators, refer to the [Condition](#)

! settings guide.

- **Direct input:** Enter conditions directly.
- **Pause event notifications:** Select a duration to temporarily suppress alerts. After the event is triggered, the same event will not occur during the selected time.
 - Available times: Disabled , 1 min , 2 min , 3 min , 5 min , 10 min , 20 min , 30 min , 1 hour , 3 hours , 6 hours , 12 hours
- **Event operation time:** Set tags to activate the event during specific time periods (work/non-work/maintenance hours, etc.). If no tag is set, the event operates 24 hours a day when activated.
 1. Click + **Add**.
 2. Click + **Create new tag** in **Event operation time**.
 3. In **Create event operation time tag**, select the **tag name, day of week, time, and color**, then click the [**Apply**] button.
 4. Created tags can be viewed in the tag list and are applied by selecting the checkbox.
 5. Click the  icon for the tag to modify or delete, and edit or delete the tag in **Edit event operation time tag**.

! Deleting a tag removes the tag for all users to whom it has been applied. However, tags in use by event rules cannot be deleted.

- **Event notification tags:** If notification tags are set for an event, notifications are sent to project members with those tags. If no recipient tags are set, notifications are sent to all users in the project.
 1. Click + **Add tag** or +.
 2. Click + **Create new tag** at the bottom of the **Event notification tags** window.
 3. In the **Create tag** window, enter the tag name, select a color, and click the [**Create tag**] button to create the tag.

4. Edit or delete created tags by clicking the  icon in the tag list.
5. Select the desired tag from the **tag list** in the **Event notification tags** window to apply it.

✓ When configuring events, you can send notifications to project members and 3rd-party plugins with the selected event notification tags. You can assign tags to project members and 3rd-party plugins respectively in **Alert notifications > Event notification settings**.

4. When configuration is complete in the **Add event rule** window, click the [Save] button.

Edit/delete events

1. Go to the **Real-time log** tab in **Alert > Event Configuration**.
2. Click the  icon for the event to edit or delete in the log event list.
3. Modify options in the **Event settings** screen and click the [Save] button.
 - a. To delete the selected event, click the [Delete] button in the upper right of the **Event settings** screen.

Event sharing

You can save metric event settings as a JSON file to share configurations with other users or import settings created by others.

- JSON file name: **event-rules- YYYYMMDD .json**

Export

1. Click the [**JSON** ] button at the top right of the screen.
2. When the JSON editor opens, click the [ Export] button.
 - If you use the export function after searching for events, only the searched list will be downloaded

as a JSON file.

3. After the JSON file is downloaded, share it with other users.

Import

1. Click the [] button at the top right of the screen.
2. Select the JSON file downloaded using the **Export** function.
3. When the JSON editor opens, choose either [Add to List] or [Overwrite].

 It is recommended to use this feature between projects of the same product type. You can import event settings from projects of different products, but they may not function correctly.

Edit in JSON Format

1. Click the [JSON ] button at the top right of the screen.
2. When the editor opens, modify the content according to the JSON format.
3. After completing the edits, click the [Save] button at the bottom of the screen.

 If the modified content does not conform to the JSON format, an error message will be displayed at the bottom of the screen and the content cannot be saved. The error message may vary depending on the type of formatting issue.

JSON error

Appendix

Trigger Conditions and Target Selection Guide

Metric alert trigger conditions and event target selection use the same syntax. However, trigger conditions use the field key as the variable, while target selection uses the tag key as the variable.

Level Behavior Guide

Event levels are categorized into Critical, Warning, and Info.

1. Priority-based Event Triggering

When multiple level conditions are met at the same time, only the event with the highest priority is triggered.

Example

```
Configuration:  
- Warning: CPU > 70%  
- Critical: CPU > 90%  
  
Current state: CPU 95%  
→ Result: Only the Critical event is triggered (Warning is suppressed)
```

2. Level Escalation

For events that maintain an in-progress state, when a higher-level condition is met while a lower-level event is already in progress, both levels enter the in-progress state.

Example

```
Configuration:  
- Warning: CPU > 70%  
- Critical: CPU > 90%  
  
Scenario:  
1) CPU 80% → Warning triggered (in progress)  
2) CPU 95% → Warning (in progress), Critical (in progress)
```

3. Level De-escalation

For events with an in-progress state, when the level transitions from a higher level to a lower level, the higher-level event is resolved while the lower-level event remains active.

Example

Configuration:

- Warning: CPU > 70%
- Critical: CPU > 90%

Scenario:

- 1) CPU 97% → Critical triggered
- 2) CPU 85% → Critical resolved, Warning remains
- 3) CPU 65% → Warning resolved

4. Execution Flow

- Warning: CPU > 70%
- Critical: CPU > 90%

Metric value: 60% → 75% → 92% → 85% → 60%

State:	Info	Warning	Critical	Warning	Info
		(triggered)	(triggered)	(maintained)	(resolved)
			Warning		
			(maintained)		

- ⓘ Events that have an in-progress state remain active as long as their conditions are met and continue until those conditions are cleared.

Condition Configuration Guide

- ⓘ If a metric name starts with a number or contains special characters, you must wrap it in the `${metric_name}` format.

- Brackets `()`, `[]`
- Operators `+`, `-`, `*`, `/`, `%`
- Delimiters `:`, `@`, `#`, `,`, `.` (space)
- Other special characters `!`, `^`, `&`, `|`, `~`, `"`, `=`

Examples using `${}` :



```

${cpu(xos)} > 50
${mem[0]} >= 100
${cpu-usage} > 80
${namespace:cpu} > 70
${metric name} > 60
${4xx_error} > 10

```

Usable without `${}` : Metric names that contain only alphabetic characters, underscores (`_`), or dots (`.`)

```

cpu > 80
cpu_usage > 50
CPUUtilization.Average > 0.8

```

1. Comparison Operators

Numeric Comparison

```

Greater than:      cpu > 80
Greater than or equal:  cpu >= 80
Less than:         memory < 1000
Less than or equal:  memory <= 1000
Equal to:          status == 200
Not equal to:       error != 0

```

String Comparison

```

status == 'OK'
region == "us-east-1"

```

2. Arithmetic Operators

- Basic arithmetic operations

```

Addition:    cpu + 10 >= 90
Subtraction: memory - 100 >= 500
Multiplication: cpu * 2 >= 100

```

```
Division:  disk / 1024 >= 100
Modulo:    value % 10 == 0
```

- Controlling precedence with parentheses

```
(cpu + memory) * 2 >= 200
(disk - used) / total >= 0.2
((cpu + memory) / 2) >= 50
```

- Negative values

```
cpu > -100
```

3. Logical Operators

- AND operator (&&)

```
cpu > 80 && memory > 1000
${cpu(xos)} > 50 && ${mem(xos)} > 60
```

- OR operator (||)

```
cpu > 90 || memory > 90
disk < 10 || network > 1000
```

- Combined logical operations

```
(cpu > 50 && memory > 50) || disk < 20
cpu > 80 && (memory > 1000 || disk > 500)
```

4. Pattern Matching Operators

- LIKE operator

```
oname like 'prod-*'
url like '*error*'
```

```
message like 'WARN%'
```

- NOT LIKE operator

```
oname not like 'test-*'
url not like '*debug*'
```

5. Built-in Functions

- Null check functions

```
isNull(value)      # Checks whether the value is null
isNotNull(value)   # Checks whether the value is not null
nvl(value, 0)      # Returns a default value if null
isEmpty(str)       # Checks whether the string is empty
isNotEmpty(str)    # Checks whether the string is not empty
```

- Aggregate functions

```
sum(cpu, memory, disk)  # Sum
avg(cpu, memory)        # Average
max(cpu, memory, disk)  # Maximum
min(cpu, memory, disk)  # Minimum
count(value1, value2, value3) # Count
```

- Math functions

```
round(cpu, 2)          # Rounds to 2 decimal places
```

- String functions

```
length(str)           # String length
startsWith(str, 'prefix') # Checks prefix
endsWith(str, 'suffix') # Checks suffix
indexOf(str, 'search')  # String index
substring(str, 0, 10)   # Substring
```

```
trim(str)          # Trims whitespace
replace(str, 'old', 'new') # String replacement
hasStr(str, 'search') # Checks string containment
```

- Conditional functions

- **if:** A conditional function that returns the `trueValue` if the condition evaluates to `true`, or the `falseValue` if it evaluates to `false`

Syntax

```
if(condition, trueValue, falseValue)
```

Example

```
if(value >= 90, 'High', 'Medium') == 'High'
```

- **decode:** Compares a value against conditions and returns the result of the matching condition, or a default value if no match is found

Syntax

```
decode(value, condition1, result1, condition2, result2, ..., conditionN, resultN, defaultValue)
```

Example

```
decode(value, 1, 'Low', 2, 'Medium', 3, 'High', 'Unknown') == 'Unknown'
```

- **in:** Returns `true` if the value matches any of the specified candidates; otherwise returns `false`

Syntax

```
in(value, candidate1, candidate2, ..., candidateN)
```

Example

```
in(status, 200, 201, 204) == false
```

Writing Guidelines

- Recommended
 - Use simple variable names without `${}` (e.g. `cpu`, `memory`)
 - Always use `${}` when special characters are included
 - Use parentheses to clearly separate complex expressions
 - Enter function names exactly as defined (case-sensitive)
- Avoid
 - Incomplete expressions (e.g. `cpu >` , `memory &&`)
 - Mismatched parentheses (e.g. `(cpu > 80 && cpu > 70)`)
 - Consecutive or invalid operators (e.g. `cpu >> 80` , `cpu >< 80`)

Transaction

Home > Select Project >  **Alert** > **Event Configuration** > **Transaction** tab

Transaction events provide fine-grained monitoring of transactions based on specific URLs, errors, status codes, and more. When transactions that meet the configured conditions are detected, an event is triggered.

Transaction data is analyzed in 1-minute intervals, and notifications are sent when the number of transactions that satisfy the conditions exceeds the defined threshold.

Latest Agent Versions

To use transaction events, you must install an agent that meets or exceeds the minimum supported version.

Language	Minimum Supported Version
Java	2.2.50 or later
PHP	Not specified (use the latest version or contact support)
Node.js	0.5.21 or later
Python	1.7.8 or later
.NET	2.3.5 or later
Go	Not specified (use the latest version or contact support)

Default Options

- **Event Level:** Indicates the severity of the event and is classified into three levels: Info, **Warning**, and **Critical**.
- **Search:** Search for events by event name or event reception tag.
- **+ Add Event:** Add a new transaction event.

- **Resize Columns:** Drag the boundary of each column to adjust its width.

Table | Transaction Event List Structure

Item	Description
No.	Event sequence number
	Whether the event is enabled - Enabled: The event is triggered when conditions are met - Disabled: The event does not operate and conditions are not evaluated
	Edit or delete event settings
Event Name	User-defined event name - Up to 255 bytes
Condition Type	Type of event trigger condition (elapsed time, error occurrence, pattern only)
Aggregation Basis	Criteria used to aggregate transaction counts
Target Pattern	Include/exclude patterns to which the event applies (URL, status code, etc.)
Trigger Count	Number of occurrences required to trigger the event - Aggregation period: fixed at 1 minute (based on each minute from :00 to :59 seconds; the period cannot be changed) - The event is triggered when transactions that meet the condition occur at least the configured number of times within that 1-minute period
Pause	Temporarily suppresses repeated occurrences of the same event after an alert is sent - Available durations: Disabled, 5 min, 10 min, 15 min, 20 min, 30 min, 1 hr, 2 hr, 3 hr, 6 hr, 12 hr, 1 day - If recovery notifications are enabled, no alert is sent for the same event during the selected time after a RECOVERED notification is received

Item	Description
Event Recipients	Users or groups that receive the event notification (reception tags)

Event Configuration

Transaction events are configured through the steps of **event conditions**, **target patterns**, and **basic information and notification settings**.

With event configuration, you can detect specific transaction patterns and receive alerts.

Add Event

To add a transaction event, go to **Event Configuration > Transaction** tab, then click the [+ Add Event] button in the upper-right corner of the screen.

How to Add a Transaction Event
Step 1. Define Event Conditions: Define the criteria that trigger the event.
Step 2. Select Event Target: Select the monitoring targets where the event applies.
Step 3. Basic Information and Notification Settings: Configure the event name, message, and recipients.

Define Event Conditions

Configure the conditions under which a transaction event is triggered.

Condition Type

Select the criteria used to trigger the event.

- **Elapsed Time:** Transactions that take longer than the specified time (ms).
 - **Elapsed Time Threshold:** When the condition type is Elapsed Time, enter the value in milliseconds. An

event is triggered when a transaction takes longer than the configured time (ms).

- **Error Occurred:** Transactions in which an error occurs.
- **Pattern Only:** Transactions that match a specific pattern (such as hitmap patterns).

Aggregation Criteria

Select the unit by which alert conditions are aggregated.

- Aggregation criteria: per agent, per URL of each agent, per error class of each agent, per business of each agent, per URL, per error class, per business, or overall.

Trigger Count (Required)

Configure how many times the condition must be met before a notification is sent.

Example: trigger count **1** sends a notification immediately if even one transaction meets the condition within 1 minute, while trigger count **3** requires at least 3 transactions meeting the condition to accumulate within the same 1 minute before a notification is sent.

Pause

Select a pause duration to prevent excessive alert notifications.

- After an event occurs, the same event will not trigger again during the configured time period.
- Available durations: 1 minute , 5 minutes , 10 minutes , 15 minutes , 30 minutes , 1 hour , 2 hours , 3 hours , 6 hours , 12 hours , 1 day

Event Operation Time

Configure the time periods during which the event is active. This allows you to **suppress alerts during non-business hours or maintenance windows**. If no tag is configured, the event runs continuously for 24 hours while enabled.

1. Click + **Add**.
2. In Event Operation Time, click + **Create New Tag**.
3. In **Create Event Operation Time Tag**, select the **tag name, days, time, and color**, then click the [Apply]

button.

4. The created tag appears in the tag list. Select the checkbox to apply it.
5. To edit or delete a tag, click the  icon and update or remove it in **Edit Event Operation Time Tag**.

 When a tag is deleted, it is removed from all alerts where it is applied. However, tags currently in use by event settings cannot be deleted.

Select Event Target

Configure patterns for transaction filtering.

Pattern Configuration

- You can enter multiple patterns, separated by pressing **Enter**.
- If no pattern is configured, events apply to all transactions in the project.
- Patterns of the same type are applied with an **OR** condition.
- Patterns of different types are applied with an **AND** condition.
- You can use wildcards (*****) in patterns. Up to two wildcard positions are allowed.
- Each pattern must include at least one character other than the wildcard (*****) and slash (**/**).

Be careful when combining slashes (**/**) and wildcards (*****)

- `/api/*` : `/api` alone does not match. A path must follow `/api/` (e.g.,  `/api/users`,  `/api`)
- `/api*` : `/api` itself also matches (e.g.,  `/api`,  `/api/users`,  `/apitest`)

Match Patterns

Filter data that matches the specified items. After being applied, match patterns are displayed as **blue tags**. You can enter up to 10 patterns for each item.

Item	Description
Operation Name	Operation name pattern
URL	Transaction URL pattern - Example: <code>/api/*</code> , <code>*/users/*</code>
Error Class	Error class name pattern - Example: <code>*Exception</code> , <code>*Error</code>
Error Message	Error message content pattern
Status Code	HTTP status code pattern - Example: <code>4**</code> , <code>5**</code>

Exclude Patterns

Exclude data that matches the specified items from the filtering targets. After being applied, exclude patterns are displayed as **red tags** and use the same format as match patterns. You can enter up to 10 patterns for each item.

Pattern Examples

- Exact Match

```
Pattern: "hello"
"hello" → Match
"Hello" → No match (case-sensitive)
```

- Prefix Match

```
Pattern: "hello*"
"hello" → Match
"helloworld" → Match
"hi" → No match
```

- Suffix Match

```

Pattern: "*world"
"world"    → Match
"helloworld" → Match
"hello"    → No match

```

• Substring Match

```

Pattern: "*ell*"
"hello"    → Match (h'ell'o)
"excellent" → Match (exc'ell'ent)
"welcome"  → No match (does not contain "ell")

```

• Composite Patterns

```

Pattern: "hello*world"
"hellobeautifulworld" → Match

Pattern: "hello*test*"
"hellomytestcase"     → Match

Pattern: "*test*world"
"mytestcaseworld"     → Match

```

Table | Practical Usage Examples

Pattern Type	Examples
URL Patterns	- <code>/api/*</code>: All URLs that start with <code>/api/</code> - <code>/users/*</code>: All URLs that contain <code>users</code> - <code>/api/v1/users</code>: Only the URL that matches exactly
Error Class Patterns	- <code>Exception</code>: All errors that end with <code>Exception</code> - <code>java.lang.*</code>: All classes that start with <code>java.lang</code> - <code>Timeout*</code>: All errors that contain <code>Timeout</code>
Status Code Patterns	- <code>4**</code>: All 4xx status codes - <code>404</code>: Only the 404 status code

Pattern Type	Examples
	- 5** : All 5xx status codes

Pattern Limitations

- **Required characters:** Each pattern must include at least one character other than the wildcard (*). A pattern cannot consist of wildcards only.
 -  Not allowed: **, *
 -  Allowed: a*, a, a*, /api*
- **Empty strings:** Empty strings or null values are not matched.
- **Consecutive wildcards:** Consecutive * characters are treated as a single wildcard.
- **Complex patterns:** Patterns containing three or more wildcards are not supported.
- **No regular expressions:** Character classes ([a-z]), quantifiers (+ , ?), and grouping (()) are not supported.
- **Case sensitivity:** All pattern matching is case-sensitive.
- **No escaping:** There is no way to escape characters for literal matching.

Basic Information and Notification Settings

Configure the basic information of the event and how notifications are delivered.

Event Activation

Configure whether notifications are sent when an event occurs.

-  **Enabled:** Notifications are sent when the configured conditions are met.
-  **Disabled:** Notifications are not sent even if the configured conditions are met.

Event Name (Required)

Enter the event name to be used as the notification title.

Event Level (Required)

Select the event level (Info, **Warning**, **Critical**).

Event Recipients

Specify the members who will receive event notifications.

- **Receive All** **Receive by Tag**

Notifications are sent to all targets (members and channels) with event reception enabled in the project.

Notifications are sent to project members who have the selected tag.

1. Select **Receive by Tag**.
2. In the **Receiver Tags** section, click [+ Add Tag] or [+].
3. Click + **Create New Tag** at the bottom of the **Event Receiver Tags** window.
4. In the **Create Tag** window, enter a tag name, choose a color, and click [Create Tag].
5. To edit or delete a created tag, click the  icon in the tag list.
6. In the **Event Receiver Tags** window, select the desired tag from the **Tag List** to apply it.

Receiver Tags

Receiver tags are a feature for managing notification recipients (users or channels) at a group level. When you assign receiver tags to an event, notifications are delivered only to users who have those tags.

If no receiver tag is set, notifications are sent to all users in the project.

Reference. Example of Event Behavior

This is an example of an actual transaction event occurrence.

Configuration Conditions



- Aggregation criteria: By agent
- Occurrence count: 2 times
- Pause: 5 minutes
- URL patterns: `/api/posts/**` , `/delete/*` , `/*test*/`
- Error class patterns: `*TimeoutException*` , `*NullPointerException`
- Status code pattern: `4**`
- Excluded error class: `*IOException`
- Excluded status code: `5**`

Example of a Triggered Notification Message

The transaction information in the event message displays the values from the most recent transaction that matched the conditions. The event message includes both the configured conditions and the details of the actual transaction that triggered the alert, allowing you to clearly identify which conditions caused the notification.

```
(ignored count: 3)
[Per Agent] limit: 2, count: 3
[Condition]
url patterns: /api/posts/**, /delete/*, */test/*
error class patterns: *TimeoutException*, *NullPointerException
status patterns: 4**
exclude error class patterns: *IOException
exclude status patterns: 5**
[Transaction]
url: /api/posts/test/timeout
txid: 408093121470636540
status: 408
error class: java.util.concurrent.TimeoutException
```

Explanation of Event Message Composition

- **(ignored count: n):** The number of transactions that met the conditions but did not trigger a notification during the pause period. This item is not displayed if there are no ignored transactions during the pause period.
- **Aggregation Information:** Displayed differently depending on the configured aggregation method.

- **By Agent:** [Per Agent] limit: n, count: n
- **By URL:** [Per Url] limit: n , followed by a list of each URL and its occurrence count
- **By Error Class:** [Per Error Class] limit: n , followed by a list of each error class and its occurrence count
- **By Context:** [Per Context] limit: n , followed by a list of each context and its occurrence count
- **By Agent & URL:** [Per Agent & Url] limit: n , followed by a list of each URL and its occurrence count
- **By Agent & Error Class:** [Per Agent & Error Class] limit: n , followed by a list of each error class and its occurrence count
- **By Agent & Context:** [Per Agent & Context] limit: n , followed by a list of each context and its occurrence count
- **Total:** [Total] limit: n, count: n
- **[Condition]:** Displays the conditions that were configured at the time the event was triggered. Only configured patterns are shown.
 - **context patterns:** Context match patterns
 - **url patterns:** URL match patterns
 - **error class patterns:** Error class match patterns
 - **error message patterns:** Error message match patterns
 - **status patterns:** Status code match patterns
 - **exclude context patterns:** Context exclusion patterns
 - **exclude url patterns:** URL exclusion patterns
 - **exclude error class patterns:** Error class exclusion patterns
 - **exclude error message patterns:** Error message exclusion patterns
 - **exclude status patterns:** Status code exclusion patterns
- **[Transaction]:** Detailed information about the most recent transaction that met the conditions.
 - **url:** Transaction URL
 - **txid:** Unique transaction identifier
 - **status:** HTTP response status code (not displayed for non-HTTP transactions)
 - **error class:** Error class (not displayed if no error class exists)
 - **error message:** Error message (not displayed if no error message exists)

 Notes

- Transaction events are aggregated and processed in 1-minute intervals.
- If the condition type is **Pattern Only**, at least one match or exclusion pattern must be configured.
- Pattern matching is case-sensitive.
- Notification messages include detailed information about the most recent transaction that met the conditions.

Application

Home > Select project >  **Alert** > **Event Configuration** classic

You can configure alert notifications based on conditions such as **server resource usage (CPU, memory, disk)**, **number of active transactions**, **transaction errors**, and **increased response time**.

- ! The classic event configuration is a separated menu that allows continued use of the legacy event configuration method.
- For more advanced features, use [Event configuration](#).

Default options

Inactive agent alert

An event occurs when no data is received from an agent for the configured period. You can enable or disable this feature using the toggle button.

-  **Enabled:** An inactive agent event occurs when no data is received for a certain period.
-  **Disabled:** No event occurs regardless of data reception status.

- ! The legacy inactive agent check interval can be configured under **Management > Agent list**.

Send notification when event is resolved

After an event occurs due to threshold conditions, you can choose whether to send a **Recovered** notification when the state returns to normal. Use the toggle button to enable or disable this feature.

-  **Enabled:** Events operate in a state based manner. When thresholds are exceeded, the status becomes ongoing, and when values recover below thresholds, the status changes to recovered.
-  **Disabled:** A one time event occurs each time the threshold is exceeded.

Duplicate agent alert

If two or more agents with the same name run simultaneously, normal monitoring may be affected, so an event is generated. However, duplicate agent events do not occur again within the configured time window.

- To check whether agent names are duplicated, review the related options in the **Event Configuration** menu.
- Available durations: 30 seconds , 1 minute , 3 minutes , 5 minutes , 10 minutes

Conditions

You can configure event trigger conditions per item. Input formats vary depending on the item.

- **Server CPU / Server memory / Server disk**
- **Active transactions / Transaction errors**
- **Transaction response time**

Condition (%)

Set two threshold levels: **Warning** and **Critical**.

Alerts are triggered when thresholds are exceeded, with **Critical** taking priority.

- Left value: Warning threshold (**Warning**)
- Right value: Critical threshold (**Critical**)

Condition (count)

Enter the count used as the event trigger threshold. If the count exceeds the configured value for the specified duration, an event occurs.

Condition (count)

Configure the condition. An event is triggered when the number of transactions exceeding the configured response time reaches or exceeds the specified count.

Condition (response time)

Select the baseline response time.

- Available times: 1 second , 2 seconds , 3 seconds , 5 seconds , 10 seconds , 15 seconds , 30 seconds , 1 minute , 2 minutes , 3 minutes , 5 minutes , 10 minutes , 30 minutes , 1 hour

- Example: If the count threshold is **10**, the response time threshold is **1 second**, and the duration is **5 seconds**, then an event occurs when 10 or more transactions exceed 1 second and the condition persists for 5 seconds.

Duration

An event occurs when the configured condition persists for the selected duration.

- Available durations: 5 seconds , 10 seconds , 15 seconds , 30 seconds , 1 minute , 2 minutes , 3 minutes , 5 minutes , 10 minutes , 30 minutes , 1 hour

Silence

After an event occurs, no additional events with the same condition occur during the selected silence period. Setting an appropriate silence duration helps prevent excessive alerts.

- Available durations: 1 minute , 2 minutes , 3 minutes , 5 minutes , 10 minutes , 30 minutes , 1 hour , 2 hours , 3 hours , 6 hours , 12 hours , 1 day

Event enablement

You can control event behavior using the toggle button.

-  **Enabled:** An event occurs when the configured conditions are met.
-  **Disabled:** Conditions are not evaluated.

Event configuration

You can configure events for the following items to monitor system status in real time. After configuring each item, click the **Save** button at the top right of the screen.

Server CPU / Server memory / Server disk

An event occurs when server resource usage exceeds the configured threshold (%). You can set different thresholds for **Warning** and **Critical** levels.

- Example: If CPU usage is set to **Warning**: 80% and **Critical**: 90%, a **Critical** event occurs when usage exceeds 90%.

Active transactions

Monitors the number of transactions currently being processed. An event occurs when the count exceeds the configured threshold and persists for the configured **duration**. This is useful for detecting situations with a large number of concurrent transactions.

- Default occurrence count: 100

Transaction errors

Transactions that do not complete normally are treated as errors. An event occurs when the error count exceeds the configured threshold and persists.

- Collection interval: 5 seconds

Transaction response time

Events are configured based on the time required for each transaction to complete (response time). You can detect service slowdowns relative to expected response time.

- Example: If the response time threshold is 10 seconds and the count threshold is 10
"An event occurs when 10 or more transactions exceed 10 seconds and the condition persists for 5 seconds."

Event Notification Settings

Home > Select Project >  **Alert** > **Notifications**

Event Notification Settings per User

 Information about other members in **Event notification settings per-user** can only be viewed by members with the **Member Management** permission. For all other members, required information is masked.

- Mobile device management for bulk event notification receipt settings and access control can be managed in **Account Information**.
- For detailed information about member permissions, refer to the [following document](#).

Notification Methods

Alerts are available via [Email](#), [SMS](#), [WhatsApp](#), and [Mobile](#).

In the **Event notification settings per-user** section, select the checkbox for the desired notification method to receive alerts. If you clear the checkbox for a notification method, alerts will not be sent through that channel.

 All users except the project super administrator can change only their own notification settings.

Email Alerts

Email alerts are sent to the email address provided during sign-up.

SMS Alerts

You can receive alerts via SMS.

ⓘ The SMS alert feature is available only for paid projects.

1. Click your **profile icon** at the top right of the screen, then go to **Manage Accounts**.
2. In **Account Information**, click the [General Mobile Phone] button in the **User Phone Number** section.
3. Enter the **phone number** that will receive the verification code.
 - Only **Korean mobile phone numbers** can be registered to receive SMS alerts.
4. Click the [Save] button.

✔ Change or delete the registered phone number

- To change the phone number, click the [Change] button. SMS verification is required.
- To delete the phone number, click the [Delete] button. After deletion, you will no longer receive alerts via SMS.

WhatsApp Alerts

You can receive alerts via WhatsApp.

ⓘ The WhatsApp alert feature is available only for paid projects.

1. Click your **profile icon** at the top right of the screen and go to **Manage Accounts**.
2. In **Account Information**, click the [WhatsApp] button in the **User Phone Number** section.
3. Enter the **phone number** that will receive the verification code.
4. Click the [Send Verification Code] button.
5. Enter the 6-digit verification code sent to your WhatsApp application.
 - If you do not receive the verification code within 10 minutes, click the [Resend Verification Code] button.
6. Click the [Verify] button.

Mobile Alerts

Users who need to receive mobile alerts must install the WhaTap application on their mobile device and log in.

- Download the WhaTap application – [Android](#)
- Download the WhaTap application – [iOS](#)

Repeated Alerts (Escalation) Settings

If the alert condition is not resolved after an alert is triggered, you can configure repeated alert intervals based on the time of the initial alert. This setting applies only to **Critical** level alerts.

For example, to repeat alerts immediately (0 minutes), 1 hour later, and 1 day later after the initial alert, enter `0,1H,1D` in the **Repeated Alerts (Escalation)** column.

1. Go to **Alert > Notifications** and navigate to the **Event notification settings per-user** section.
2. Configure the settings in the **Repeated Alerts (Escalation)** field.
 - **M**: minutes, **H**: hours, **D**: days. If the unit is omitted, the value is interpreted as minutes.
 - Enter a number or a number with a unit (**M**, **H**, **D**). If the input format is invalid, an error message is displayed.
3. Click the [Save] button. The settings will not be applied unless they are saved.

Event Reception Tags

When configuring events, you can select **event reception tags** to send alerts to project members and 3rd-party plugins associated with those tags. If no event reception tag is set, alert notifications are sent to **all project members**.

Add / Edit / Delete Event Reception Tags

 Event reception tags that are **currently applied to an event** cannot be deleted.

1. Go to **Alert > Notifications**.

2. In the user list under the **Event notification settings per-user** section, click + **Add Tag** or +.
3. In the **Event reception tag** window, click + **Create New Tag**.
4. In the **Create Tag** dialog, enter a tag name, select a color, and click the [Create Tag] button.
5. To edit or delete a created tag, click the  icon in the tag list.
6. Select the desired tag from the **Tag List** in the **Event reception tag** window to apply it.

Remove Event Reception Tags

1. Go to **Alert > Notifications** and open the **Event notification settings per-user** section.
2. Click + in the **Event reception tag** field for the user whose event reception tag you want to remove.
3. In the **Event reception tag** window, click the **X** on the tag you want to remove. The tag will be removed.

Receive Alerts Without Reception Tags

When configuring events, you can select event reception tags to send alerts to project members and 3rd-party plugins associated with those tags.

- To receive alerts **without event reception tags**, enable the **Receive alerts without reception tags** option.
- If you want to receive **only alerts that have event reception tags**, disable this option.

 To stop receiving all alerts, disable this option and make sure that no **Event reception tag** is selected.

Selecting the event reception mode

In the **Event notification settings per-user** section, you can select the event alert reception scope per member or third-party channel from the following three modes. The reception mode is selected in the **Event reception tags** column of each member or channel row.

Mode	Description
Receive all alerts	Receive all alerts regardless of the event reception tags
Receive alerts for selected tags	Receive only alerts that have the selected event reception tags. Select at least

Mode	Description
only	one tag
Receive no alerts	Receive no event alerts. The selected tags are preserved without being deleted

- In the **Receive alerts for selected tags only** mode, select at least one tag to receive alerts in the tag selection area.
- To also receive alerts that have no event reception tag specified, select the **Unclassified** virtual tag in the tag selection area. The **Unclassified** tag can be selected or deselected like a normal tag, but the tag itself cannot be edited or deleted.

ⓘ In the **Receive no alerts** mode, the corresponding member or channel receives no event alerts at all. The selected tags are preserved without being deleted, so if you switch back to the **Receive alerts for selected tags only** mode, you can use the previously selected tag settings as is.

Select Notification Language

You can choose the language in which you receive alert notifications.

1. Go to **Alert > Notifications**.
2. In the user list under the **Event notification settings per-user** section, click the ► button at the far left of the user whose language you want to configure.
3. Select the **Notification Language**.

Day and Time-based Notification Settings

You can configure whether a user receives notifications by day of the week and time of day.

1. Go to **Alert > Notifications**.
2. In the user list under the **Event notification settings per-user** section, click the ► button at the far left of the user whose day and time settings you want to configure.

3. Select the days and/or enter the time ranges during which you want to receive alerts.

- Settings can be configured separately for each notification method.

3rd-party Plugins

You can receive alert notifications through external applications.

- **Supported applications:** Slack, Telegram, Teams, Teams Workflows, Jandi, AlertNow, Webhook, Webhook JSON, Opsgenie, PagerDuty, LINE, ilert

ⓘ Internal messengers that are not included in WhaTap Labs' supported scope can be integrated via standard **Webhook** or **Webhook JSON**.

Table | 3rd-party Plugin List

Item	Description
Plugin Name	Name of the plugin
Auth Key	Authentication key
Auth Value	Authentication value
Receive Level	Notification level: Warning, All, or Critical
Repeated Alerts (Escalation)	Re-notification interval from the initial alert time if the issue is not resolved - Applies only to Critical alerts
Smart Message (AI)	AI-powered notifications available when adding the Telegram plugin - Supported languages: Korean, English, Japanese
Event Reception Tag	Whether to receive alerts for specific members or teams in the project
Delete	Delete the 3rd-party plugin

Add a 3rd-party Plugin

1. Go to **Alert > Notifications**.
2. In the **3rd-party Plugins** section, click **Add**.
3. In the **Add 3rd-party Plugin** window, select the desired service tab.
4. Follow the instructions for the selected service (see [How to add 3rd-party plugin notifications](#)).
5. Click **Test Receive** to verify the configuration.
6. When finished, click **Add** or **Register**.

How to Add 3rd-party Plugin Notifications

Slack

- ⓘ In the **Add 3rd-party Plugin** window, click the [**Add To Slack**] button on the **Slack** tab to register **WhaTapNotiBot** to your Slack team and channel.

Telegram

- ⓘ
1. In **Telegram**, search for **@WhaTapApmNotiBot**.
 2. Select the bot and click the [**Start**] button.
 3. In the chat window, enter the `/license` command followed by the access key of the project for which you want to receive alerts.

Telegram

ⓘ Available commands

- `/help` : View the list of commands
- `/license` : Enter the access key of the project to receive alerts

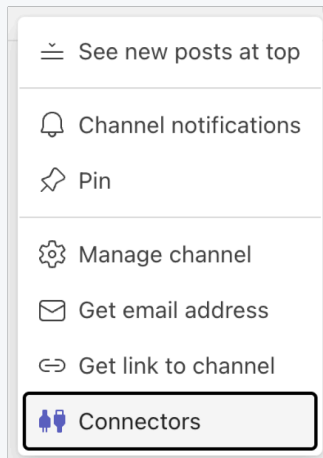


- `/remove` : Enter the project code for which you want to stop receiving alerts
- `/list` : View the list of project codes currently receiving alerts

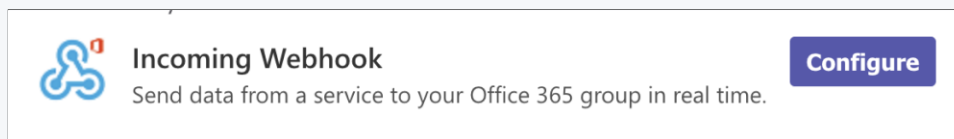
Teams



1. Go to the **connector** of the channel where you want to receive alerts.



2. Add a **Webhook** and click the [Configure] button.



3. Enter a webhook name and click the [Create] button.



Incoming Webhook

[Send feedback](#)

The Incoming Webhook connector enables external services to notify you about activities that you want to track. To use this connector, you'll need to create certain settings on the other service, which needs to support a webhook that's compatible with the [Office 365 connector format](#).

Fields marked with * are mandatory

To set up an Incoming Webhook, provide a name and select Create. *

Customize the image to associate with the data from this Incoming Webhook.

Upload Image



Default Image

Create

Cancel

4. Copy the generated **Webhook URL**.

Copy the URL below to save it to the clipboard, then select Save. You'll need this URL when you go to the service that you want to send data to your group.

<https://whatap.webhook.office.com/webhook>



Url is up-to-date.

Done

Remove

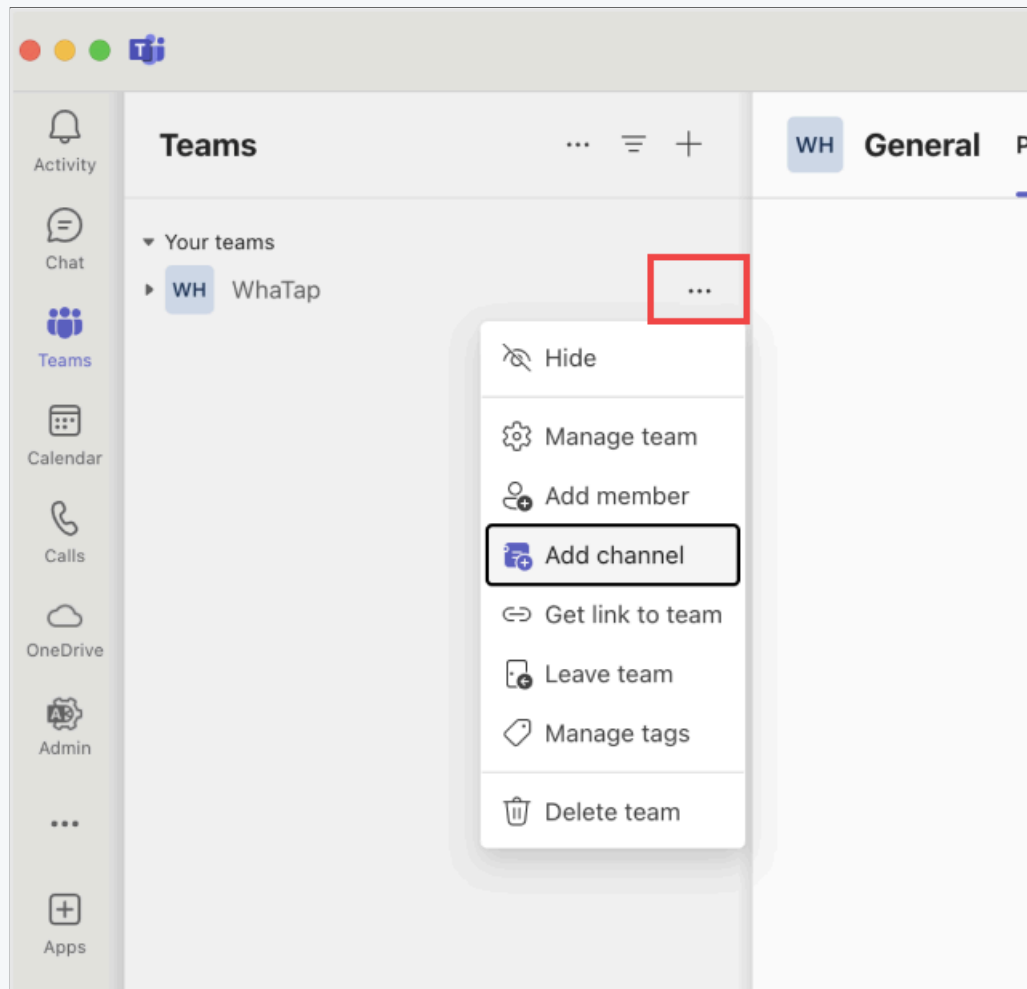
5. Return to the **Add a third-party plug-in** window in the WhaTap Monitoring service, and enter values for **Channel Name** and **Webhook URL** at the bottom of the **Teams** tab.
6. Click the [**Registration**] button.

Teams Workflows



- ⓘ To use workflows, you need an account that can access **Microsoft Teams** and a **Business plan subscription**.

1. In the **Teams** menu, click **More actions (...)** > **Add channel**.



2. In the **Create a channel** window, enter the **Channel name** and **Description**. For **Channel type**, select **Standard**, then click the [Create] button.



Create a channel

Channel name *

WhaTap Event Channel

Description

Help others find the right channel by providing a description

Choose a channel type * ⓘ

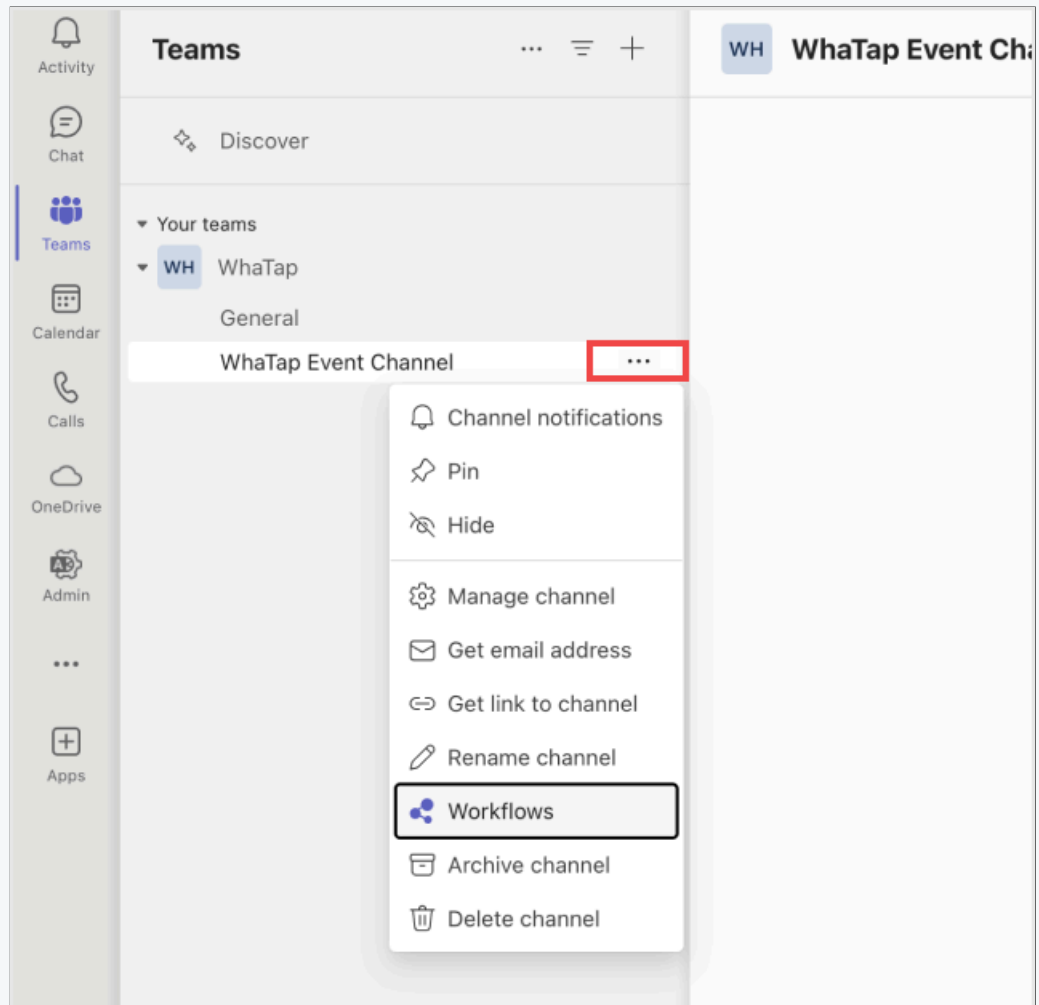
Select

- Standard**
Everyone on the team has access.
- Shared**
People or teams in your org or outside your org can have access.
- Private**
Specific people on the team have access.

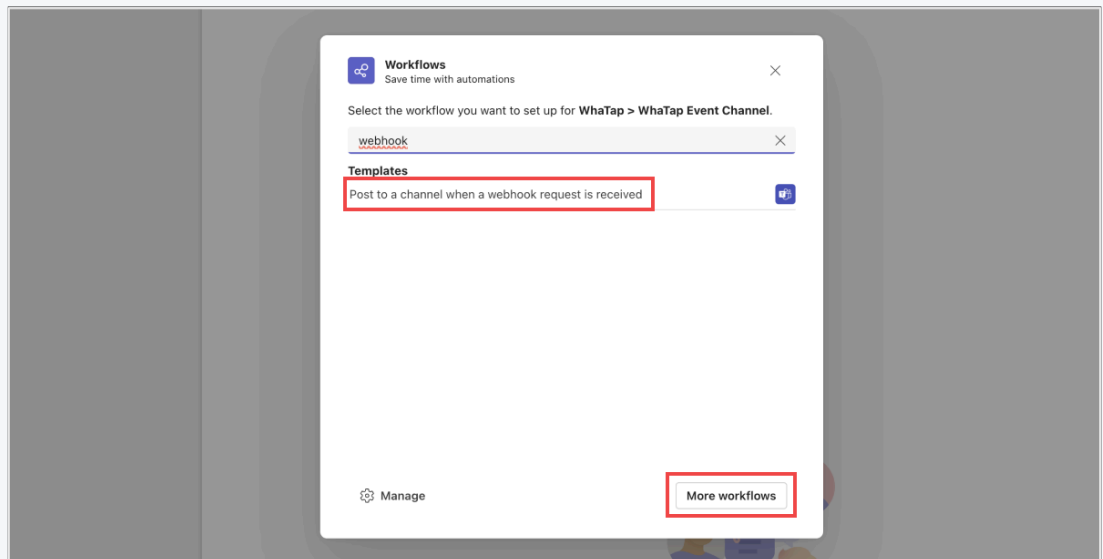
Cancel Create

ⓘ If you select **Shared** as the channel type, workflows cannot be used. If you select **Private**, workflows can be added but notifications cannot be received.

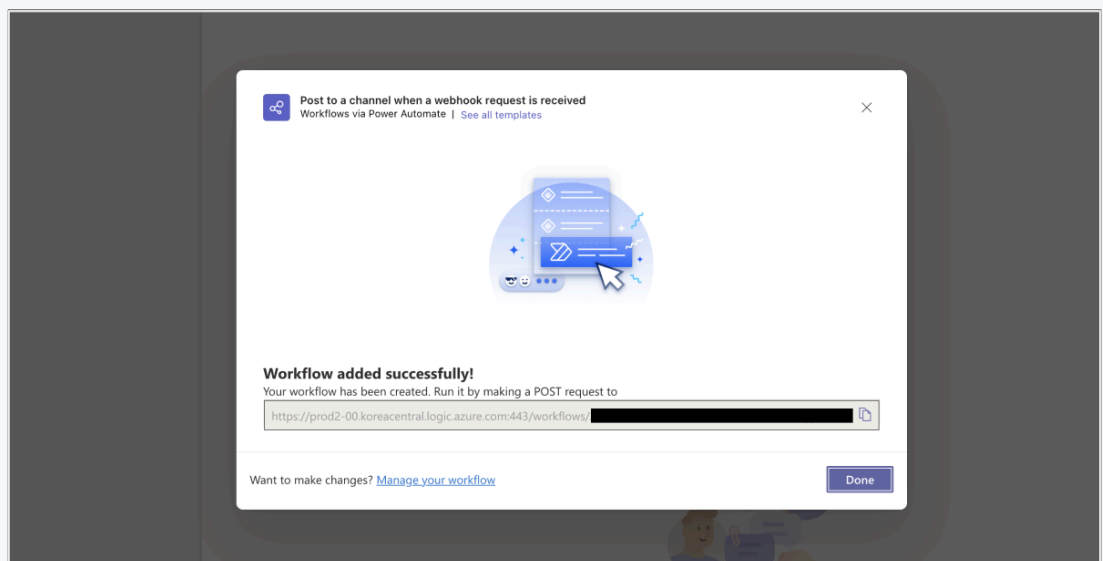
3. Click **More actions (...)** of the created channel, then select **Workflows**.



4. In the **Workflows** dialog, select **Post to a channel when a webhook request is received** from the workflow list, then click the [Add workflow] button.



5. Check the **Name** and **Connection** status, then click the [Next] button.
6. Review the **Details**, then click the [Add workflow] button.
7. The workflow has been added. Copy the generated URL.



8. Return to the **Add a third-party plug-in** window in the WhaTap Monitoring service, and enter values for **Channel Name** and **Webhook URL** at the bottom of the **Teams Workflows** tab.



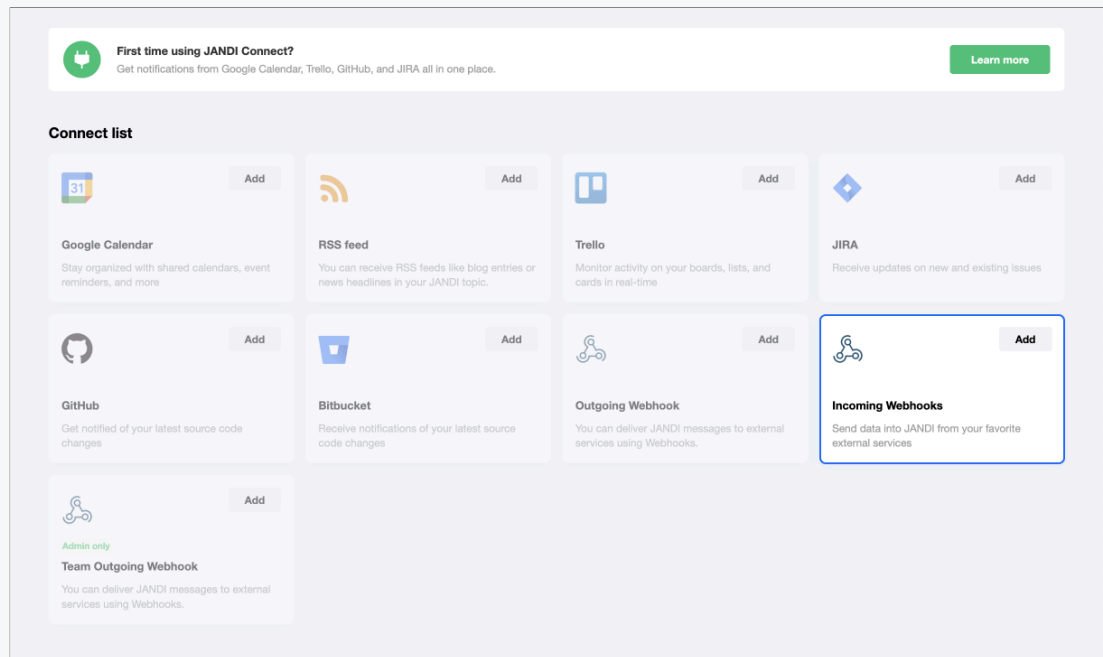
9. Click the [**Registration**] button.



Jandi



1. Go to **Jandi Connect settings** in the topic or chat where you want to receive notifications.
2. In the **Connect list**, find **Webhook Receiver (Incoming Webhook)** and click the [**Connect**] button.



3. Click the [**Add Webhook Receiver**] button.
4. Copy the Webhook URL from the **Register Webhook URL** section.



Connect settings

Profile settings

Change the name or profile image that appears for messages from this integration



Incoming Webhooks

Topic / JANDI selection

Please select a topic or DM to receive integration messages. You change it after saving it.

JANDI

Webhook URL Registration

Webhook URL

Copy the generated Webhook URL and register with the service.

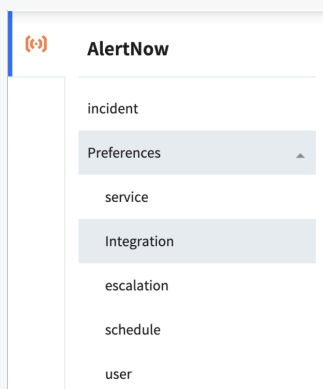
<https://wh.jandi.com/connect-api/webhook/31257583/d3...> Copy

- Return to the **Add a third-party plug-in** window in the WhaTap Monitoring service, and enter values for **Channel Name** and **Webhook URL** at the bottom of the **Jandi** tab.
- Click the [**Registration**] button.

AlertNow



- Access the **AlertNow** service, then go to **Settings > Integration**.



- On the **Integration** screen, click the [Create Integration] button.
- From the list of integration types, select **WhaTap**.
- On the **Create Integration** screen, configure the **Name** and **Naming Rules**.

Integration

Entire

Integration name *

Enter integration name

Integration type *

WhaTap

Set naming convention *

Define and manage incident naming rules.

naming convention

[[level]][title] {projectName} {oname} {oid}

Preview rule settings

Incident names are limited to 3500 bytes in length.

[Warning]CPU Used > 10 % OTE-SERVER ote-front-330494549

sample data

```
{
  "metricName": "cpu",
  "pcode": 188,
  "level": "Warning",
  "metricValue": "26.888296",
  "oid": "-330494549",
  "title": "CPU Used > 10 %",
  "message": "MEMORY is too high 98%",
  "uid": "4dfe0b7686-c4335f0ef4cfcfa45754",
  "metricThreshold": "18.0",
  "oname": "ote-front",
  "time": 1592887274971,
  "projectName": "OTE-SERVER",
  "status": "on"
}
```

56/1600 byte

5. Click the [Confirm] button to create the integration.
6. Check the list of created integrations and select the newly created integration.

Integration

Create integration

Enter search term

Last update: 2024-02-21 11:31:17

Integration name	Integration type	Integration key	service name
whatap-test	WhaTap		whatap-test

7. On the details screen, click the copy icon on the right side of the URL to copy it.

Integration

whatap-test

Basic Information

Integration type

WhaTap

Integration key

fda527a5140

URL

https://alertnowitgr.opsnow.com/integration/whatap/v1/

Copy to clipboard

constructor

Lisa

8. Return to the **Add a third-party plug-in** window in the WhaTap Monitoring service, and enter values for **Channel Name** and **Webhook URL** at the bottom of the **AlertNow** tab.
9. Click the [**Registration**] button.

Webhook



1. Register the Webhook that will receive notifications. The alert `title` and `text` are sent to the registered URL via the **POST** method.

```
{
  "title": "Alert Title",
  "text": "Sample warning message"
}
```

2. Enter values for **Webhook Name** and **Webhook URL**.
3. Click the [**Registration**] button.

Webhook JSON



1. Register the Webhook that will receive notifications. Alert data is sent to the registered URL in **JSON format** via the **POST** method. For substitution variables that can be included in the JSON payload, see **Available Variables**.
 - `${something}` represents a substitution value provided by WhaTap. Refer to **Available Variables** for the full list and descriptions.
 - The event status (`status`) is categorized as **event triggered** (`on`) or **event recovered** (`off`).
 - The `level` is categorized as `None` , `Info` , `Warning` , or `Critical` .

```
{
  "pcode": "${pcode}",
  "projectName": "${projectName}",
  "time": "${time}",
  "oid": "${oid}",
  "oname": "${oname}",
  "title": "${title}",
  "message": "${message}",
  "level": "${level}",
  "status": "${status}",
}
```



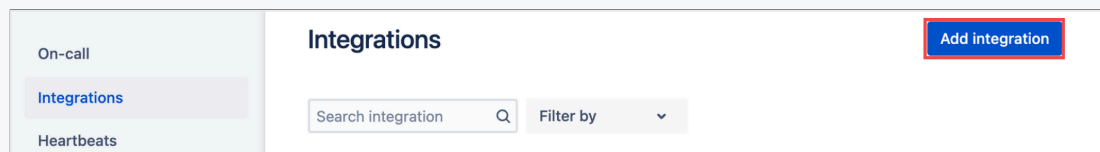
```
"metricName": "${metricName}",
"metricValue": "${metricValue}",
"metricThreshold": "${metricThreshold}",
"uuid": "${uuid}",
"okind": "${okind}",
"onode": "${onode}"
}
```

2. Enter values for the **Webhook Name** and **Webhook URL** fields.
3. To add a header value, click + **Add** in **Add user header value**, then enter the key and value.
4. Click the [**Registration**] button.

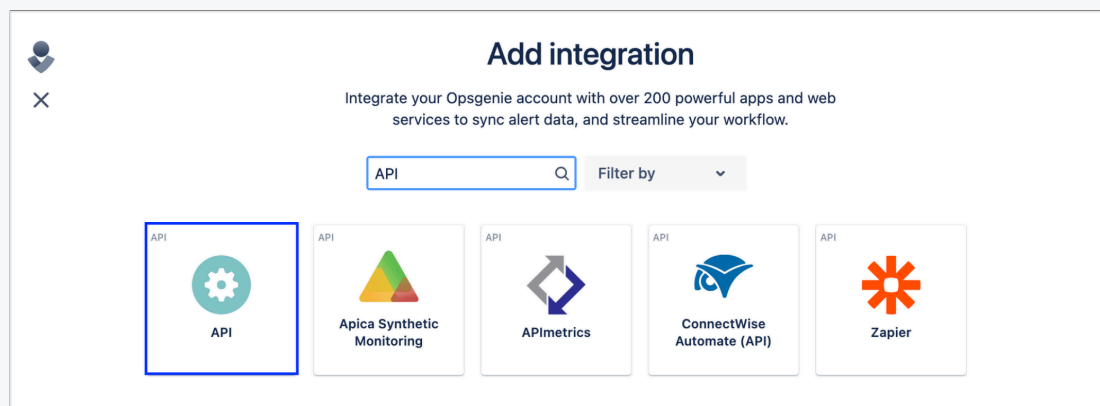
Opsgenie



1. In the **Teams** menu, select the team that will receive notifications.
2. Go to the **Integration** menu and click the [Add Integration] button.



3. In the integration list, search for and select **API**.





4. Set the API name, assign a team, configure the required permissions, and then click the [Save Integration] button.

5. Return to the **Add a third-party plug-in** window in the WhaTap monitoring service, and enter values for **Name** and **API Key** at the bottom of the **Opsgenie** tab.
6. Click the [**Registration**] button.

PagerDuty



1. Sign up for a [PagerDuty](#) account and log in.
2. In PagerDuty, go to **Services > Service Directory**, then click the [+ New Service] button.

PagerDuty

3. Enter the service information (**Name**) and click the [Next] button.

PagerDuty

4. Configure the **Escalation Policy**, then click the [Next] button.



PagerDuty

5. Configure **Alert Grouping** and **Transient Alerts**, then click the [Next] button.

PagerDuty

6. In **Integrations**, select **Event API V2**, then click the [Create Service] button.

PagerDuty

7. On the created service page, copy the **Integration Name** and **Integration Key** values.

PagerDuty

8. Return to the **Add a third-party plug-in** screen in the WhaTap monitoring service and enter the **Integration Name** and **Integration Key** values.
9. Click the [Register] button.

ⓘ If you do not receive messages or the plugin is not registered, check whether the **Integration Name** or **Integration Key** values are correct.

LINE



1. Install the LINE app.
2. Scan the QR code below to add the official **WhaTapLabs** channel as a friend.

Add LINE 3rd-party plugin

3. Use the following commands to link your project with LINE and configure notifications.

Commands

```
/help # Show available commands
/list # View the list of linked projects
/license [ACCESS_KEY] # Add a new project linkage
/remove [PROJECT_CODE] # Remove a linked project
/language [ko|ja|en] # Set notification language (Korean/Japanese/English)
```



- You can find the project access key under **Management > Project Management**.
- Using the `/language` command in LINE applies **only to the current LINE chat room**. It does not change the notification language for other 3rd-party plugins or projects.

Examples

```
/license XXXXXXXXXX # Link a project
/language ko # Set language to Korean
/list # Check linked projects
```



- **Project access key:** Available under **Management > Project Management** in the WhaTap project.
- **Language settings:** The `/language` command applies only within the LINE chat room and does not affect other notification channels.

ilert



1. In the ilert console, click [+ Create alert source] at the top right of the **Alert sources** page.
2. In the **Integration type** step, enter `WhaTap` in the **Filter integrations** search field at the bottom to search.
3. From the search results, select the **WhaTap** tile and click the [Next] button.
4. Enter the alert source name and assign a team, then click the [Next] button.
 - You can create a new escalation policy or select an existing one.
5. Select the alert grouping method and click the [Continue setup] button.
 - The initially selected **Do not group alerts** option can be changed later.
6. On the next screen, you can configure additional settings such as **alert templates and priorities**. For now, click the [Finish setup] button to complete the setup.
7. When the setup is complete, an **API key** or **Webhook URL** will be generated on the completion screen.



8. Copy the generated **Webhook URL** from the **Webhook JSON** tab and paste it into the **Webhook URL** input field below.
9. Click the [Register] button.

Preventing Alert Storms

If a large number of alerts occur within a short period, alert notifications are temporarily paused for a specified duration. For example, if 20 events occur within 5 minutes, alert notifications will be suspended for the next 5 minutes. Once the configured **Pause Duration** has elapsed, the alert-storm prevention feature is automatically released.

1. Go to **Alert > Notifications > the Avoids a large number of alerts** section.
2. Click the toggle button to **Enable** or **Disable** the feature.
 -  **Enabled:** Temporarily pause alerts when an alert storm is detected
 -  **Disabled:** Resume alert notifications
3. Configure the **Detection Time**, **Detection Count**, and **Pause Duration**.
 - If the number of events exceeds the **Detection Count** within the **Detection Time**, alert notifications are paused for the configured **Pause Duration**.



When alerts are blocked due to an alert storm, a notification banner is displayed. To immediately release the alert-storm block, click the **Stop Alert Storm Prevention** button in the banner.

Event Notification Format

Common Alert Template

The common template can be applied in most cases. It allows you to receive alerts in a consistent format across various environments.

- Product Type: Application, Database, Kubernetes
- Event Type: Application Alerts, Database Alerts, Metrics Alerts
- Event Channel: SMS, Mobile, 3rd-party plugins, Plugins

Event Title

Event title format

```
[Level][Platform][ProjectName][ApplicationName][EventTitle]
```

Event title example

```
[Info][JAVA][Application Project][TC-0-1-8081][CRITICAL_HIGH_MEMORY]
```

❗ If ApplicationName is not set, it is omitted from the event title.

- Platform is displayed as one of the following.
 - JAVA
 - NODEJS
 - PYTHON
 - PHP
 - DOTNET
 - GO
 - POSTGRESQL



- ORACLE
- MYSQL
- MSSQL
- BSM_JAVA
- CLOUDWATCH
- TIBERO
- KUBERNETES
- KUBE_NS
- URLCHECK
- URLCHECK_ADMIN
- CUBRID
- ALTIBASE
- CLUSTER
- REDIS
- MONGODB
- VR
- RUM

Event Message

This section describes the information that can be included in the event message. If `optional` is set to `false`, the item is always included in the message. If `optional` is set to `true`, the item is displayed only when the data is available.

Event message example

```
Project Name : Application Project
Project Code : 3
Agent Name : TC-0-1-8081
Message : RECOVERED: Memory is too high. less than 10%
```

Event Time : 2022-04-12 18:53:24 +0900
 Event OFF Time : 2022-04-12 18:53:24 +0900
 Alert Type : APPLICATION_MEMORY
 Metric Name : memory
 Metric Value : 20
 Metric Threshold : 10
 Stateful : true

Table | Event Message Components

En	Ko	Supported Alert Types	Description
Project Name	Project name	All	-
Project Code	Project code	All	-
Agent Name	Agent name	All (optional)	oname
Message	Event message	All	-
Alert Type	Alert type	All	See the AlertType table below
Event Time	Event occurrence time	All	In 2022-04-13 10:40:49 +0900, +0900 indicates the GMT offset
Event Off Time	Event recovery time	All (optional)	In 2022-04-13 10:40:49 +0900, +0900 indicates the GMT offset
Metric Name	Metric name	All (optional)	Name of the metric used to evaluate the event condition
Metric Value	Metric value	All (optional)	Included when the metric value exceeds the threshold
Metric Threshold	Metric threshold	All	Threshold value used to determine the event

En	Ko	Supported Alert Types	Description
		(optional)	condition
Stateful	Recovered-event notification	All (optional)	<code>true</code> if recovered-event notification is enabled; otherwise <code>false</code>
Event Rule	Event trigger condition	Metrics alerts	-
Target Filter	Event target filter	Metrics alerts	Evaluates event conditions only for metrics collected from specific targets
Repeat Count	Event repeat count	Metrics alerts	The event is triggered when the condition is met the specified number of times within the repeat duration
Repeat Duration	Event repeat duration	Metrics alerts	Time window used to evaluate the repeat count
Receiver	Receiver	Metrics alerts	-
Query	MXQL query	Composite metrics alerts	-
Rule	Event trigger condition	Composite metrics alerts	-
Query Period	Query period	Composite metrics alerts	-
Query Interval	Query interval	Composite	-

En	Ko	Supported Alert Types	Description
		metrics alerts	
Silent Time	Silent time	Composite metrics alerts	-
Query	URL	Exception alerts	URL of the request that caused the exception
TXID	Transaction ID	Exception alerts	-
Class	Error class name	Exception alerts	-
Log Message	Log message	Server – file log alerts	-
Log File	Log file path	Server – file log alerts	-
IP	IP address	All server alerts	-
CPU	CPU usage	All server alerts	Snapshot at the time the event occurred
CPU_load1	CPU load (1 min)	All server alerts	Snapshot at the time the event occurred
CPU_loadPerCore	CPU load per core	All server	Snapshot at the time the event occurred

En	Ko	Supported Alert Types	Description
		alerts	
Memory	Memory usage	All server alerts	Snapshot at the time the event occurred
Swap	Swap usage	All server alerts	Snapshot at the time the event occurred
Disk Name Used Percent Free Size IO Percent	Disk performance	All server alerts	Snapshot at the time the event occurred
Name Bps Pps	Network traffic performance	All server alerts	Snapshot at the time the event occurred
Message Time Name	Acknowledgement information	All server alerts	-

ⓘ This section displays as much information as possible that can be provided for the event.

- **AlertType** is displayed as one of the following values.

AlertType	Description
APPLICATION_CPU	Application CPU alert
APPLICATION_MEMORY	Application memory alert
APPLICATION_DISK	Application disk alert
APPLICATION_ACTIVE_TRANSACTION	Application active transaction alert
APPLICATION_ERROR_TRANSACTION	Application error transaction alert



AlertType	Description
APPLICATION_SLOW_TRANSACTION	Application slow transaction (response time) alert
METRICS	Metrics alert
COMPOSITE_METRICS	Composite metrics alert
ANOMALY	Anomaly detection alert
LOG_REALTIME	Real-time log alert
COMPOSITE_LOG	Composite log alert
SERVER_REBOOT	Server reboot alert
SERVER_NO_DATA	Server no-data alert
SERVER_PORT	Server port alert
SERVER_NETWORK_IOPS	Server network IOPS alert
SERVER_NETWORK_BPS	Server network BPS alert
SERVER_DISK_IO	Server disk I/O alert
SERVER_DISK_QUOTA	Server disk usage alert
SERVER_DISK_INODE	Server inode alert
SERVER_CPU	Server CPU alert
SERVER_MEMORY	Server memory alert
SERVER_CPU_STEAL	Server CPU steal alert



AlertType	Description
SERVER_MEMORY_SWAP	Server swap memory alert
SERVER_LOG_FILE	Server log file alert
SERVER_WINDOW_EVENT	Server Windows event alert
SERVER_OFF	Server alert OFF notification
SERVER_ACKNOWLEDGE	Server acknowledge notification
SERVER_PROCESS_COUNT	Server process count alert
SERVER_PROCESS_CPU	Server process CPU alert
SERVER_PROCESS_MEMORY	Server process memory alert
SERVER_PROCESS_OFF	Server process alert OFF notification
AGENT_ACTIVE	Agent activated alert
AGENT_INACTIVE	Agent deactivated alert
AGENT_REACTIVATED	Agent reactivated alert
URL	URL alert
TOO_MANY_EVENT	Too many events alert
CLOUD_WATCH	CloudWatch alert
EXCEPTION	Exception alert

Application Alert Notifications

Application alerts provide both an Event Title and an Event Message. When using the **Additional notifications when the event state is resolved.** feature, an Event Off Message is sent when the event trigger condition is cleared.

Event Type	Event Level	Event Title	Event Message	Event Off Message
Server CPU	Warning	HIGH_CPU	CPU is high. <code>\${value}%</code> (<code>>= \${threshold}%</code>)	RECOVERED: CPU is high. less than <code>\${threshold}%</code>
Server CPU	Critical	CRITICAL_HIGH_CPU	CPU is too high. <code>\${value}%</code> (<code>>=</code> <code>\${threshold}%</code>)	RECOVERED: CPU is too high. less than <code>\${threshold}%</code>
Server Memory	Warning	HIGH_MEMORY	Memory is high. <code>\${value}%</code> (<code>>=</code> <code>\${threshold}%</code>)	RECOVERED: Memory is high. less than <code>\${threshold}%</code>
Server Memory	Critical	CRITICAL_HIGH_MEMORY	Memory is too high <code>\${value}%</code> (<code>>=</code> <code>\${threshold}%</code>)	RECOVERED: Memory is too high. less than <code>\${threshold}%</code>
Server Disk	Warning	HIGH_DISK	Disk is high <code>\${value}%</code> (<code>>= \${threshold}%</code>)	RECOVERED: Disk id high. less than <code>\${threshold}%</code>
Server Disk	Critical	CRITICAL_HIGH_DISK	Disk is too high <code>\${value}%</code> (<code>>=</code> <code>\${threshold}%</code>)	RECOVERED: Disk is too highf. less than <code>\${threshold}%</code>
Normal Transactions	Warning	HIGH_ACTIVE_TRANSACTION	Active Transaction Count is over <code>\${value}</code> (<code>>= \${threshold}</code>)	RECOVERED: Active Transaction Count is less than <code>\${threshold}</code>
Error	Warning	HIGH_ERROR_TRANSACTION	Error Transaction Count	RECOVERED: Error

Event Type	Event Level	Event Title	Event Message	Event Off Message
Transactions			is over \${threshold} (\${value})	Transaction Count is less than \${threshold}
Slow Transactions	Warning	TOO_MANY_SLOW_TX	Too many delayed transactions (\${value}, above \${time} ms)	RECOVERED: Too many delayed transactions. less than \${threshold}

Event History And Monitoring

Home > Select Project >  **Alert** > **Event History**

Event History allows you to view events that have occurred in the project and analyze their detailed information. It supports Elasticsearch DSL queries, enabling you to find events that match specific conditions quickly and accurately.

Viewing Event History

Click the **event title** in the search results to move to a screen where you can analyze detailed data for the time period when the event occurred. This allows you to comprehensively understand the situation before and after the event.

1. Go to **Alert > Event History**.
2. In the **Event History** screen, use **Time Selection** to set the period for viewing event records.
3. Enter a query in the filter input field and click the [Magnifying Glass] button.
 - If no query is entered, all events are displayed.

Column Settings

You can choose which columns to display or hide.

1. In the **Event History** screen, click the [ Column Settings] button at the top left.
2. In the **Column Settings** window, select the columns you want to show or hide.
 - You can change the column order in **Displayed Items**.
 - You can search for specific columns using the **Column Name Search** field.

Column Item	Description
Event Name	The title of the event

Column Item	Description
Message	The event message or snapshot information
Event Status	The current status of the event
Agent Name	The name (Oname) of the agent where the event occurred - Displayed as blank if the event is not associated with a specific agent
Agent Group	The agent type (OkindName) where the event occurred - Displayed as blank if the event is not associated with a specific agent
Agent Node	The server (OnodeName) of the agent where the event occurred - Displayed as blank if the event is not associated with a specific agent
Event Occurred Time	The time when the event occurred
Event Resolved Time	The time when the event was resolved - Displayed as - for events without a resolved state

3. After completing the settings, click the [Confirm] button to apply the column configuration.

↓ CSV Download

You can download the query results as a CSV file.

1. Go to **Alert > Event History** and click the [CSV] button.
2. The list of events that match the current filter conditions is saved as a CSV file.

View Only Events in Progress

You can view only events that are currently in progress.

1. Go to **Alert > Event History** and click the [View Only Events in Progress] button.
2. The following condition is automatically added to the filter query and applied to the search.

Stateful: **true** and Status : **"ON"**

Event Search

- **Precise Search:** Specify exact conditions to retrieve only the events you need
- **Composite Conditions:** Search across multiple fields at once to handle complex conditions in a single query
- **Flexible Patterns:** Supports various search methods such as wildcards and partial matches
- **High Performance:** Fast searches powered by indexed data

Searchable Fields

Field names and values are not case sensitive.

- **Field Name Tag:** Event types that support the field
- **Field Type:** The data type of the field
 - **#:** Number
 - **T:** String
 - **☑:** Boolean
 - **📅:** Date

Event Information Fields

Field Name	Type	Description	Example Value
Title	String	Event title	"Database Connection Error"
OffTitle	String	Event recovery title	"RECOVERED: Database Connection Error"
Message	String	Event message	"Connection timeout occurred"
OffMessage	String	Event recovery message	"RECOVERED: Connection timeout occurred"

Field Name	Type	Description	Example Value
Level	String	Current event level	Critical, Warning, Info
OriginLevel	String	Original event level	Critical, Warning, Info
Status	String	Event status	ON, OFF, CANCEL, ACKNOWLEDGE, MAINTENANCE, DISABLED
ActCount	Number	Number of occurrences	2
MetricName	String	Metric name	"memory"
MetricValue	String	Metric value	"85.5"
OffValue	String	Recovery value	"72.8"
MetricThreshold	String	Threshold value	"80"
alertType	String	Event type	"BASIC", "METRICS", "TRANSACTION", etc.
alertId	String	Unique identifier of the event rule	"zf3uojer0fv4v7"

Type-specific Supported Fields

ⓘ These fields are supported only for specific event types. If the event type does not match, the value may be empty.

Field Name	Type	Event Type	Description	Example Value
eventRule	String	Basic, Metrics	Event trigger rule	"memory ≥ 80"
field	String	Real-	Log search	"content"

Field Name	Type	Event Type	Description	Example Value
		time Log	key	
keyword	String	Real-time Log	Log search value	"Error"
logCategory	String	Real-time Log	Log category	"AppLog"
logContent	String	Real-time Log	Log content	"00:00000:00009:2025/04/06 23:03:52.55 server Error: 1601, Severity: 17, State: 3\n00:00000:00009:2025/04/06 23:03:52.55 server There are not enough 'user connections' available to start a new process."

Target Fields

Field Name	Type	Description	Example Value
Oid	Number	Agent unique identifier	-98765432
Oname	String	Agent name	"web-server-01"
Okind	Number	Agent type unique identifier	867318026
OkindName	String	Agent type name	"web-server"
Onode	Number	Agent node unique identifier	334634079
OnodeName	String	Agent node name	"production-node-1"

Unique Event Fields

Field Name	Type	Description	Example Value
Id	Number	Unique identifier of the event	5768121
UUID	String	Unique event identifier	"550e8400-e29b-41d4-a716"

State / Flag Fields

Field Name	Type	Description	Example Value
Stateful	Boolean	Whether the event is state based	true, false
Disabled	Boolean	Whether the event is disabled	true, false
Escalation	Boolean	Whether escalation is applied	true, false
SystemEvent	Boolean	Whether it is a system event	true, false

Query Syntax by Search Type

! For the basic search syntax, refer to the [WhaTap log search query syntax](#) documentation.

1. Keyword Search

Events that contain the string "Database Connection"

```
title: "Database Connection"
```

2. Multiple Value Search

Retrieves events that include any one of the specified values.

```
title: Database Connection
```

Events whose current event level is Info or Warning

```
level: info warning
```

3. Pattern Search

You can search using patterns with wildcards.

Find events that occurred on specific agents using a name pattern

```
oname: web-*-prod
```

タイトルが Connection で終わるイベントを検索

```
title: *Connection
```

4. Complex Condition Search

You can combine multiple conditions to perform precise searches.

Events with a Critical level and a title containing Database

```
level: critical and title: Database
```

Warning or Critical events from a specific agent

```
oname: web-server-01 and level: Warning Critical
```

5. OR Condition Search

Retrieves events that satisfy **at least one** of the specified conditions.

Events where the title or message contains a specific keyword

```
title: Connection or message: Connection
```

6. Exclusion Conditions

You can exclude specific conditions from the search.

All events except those with an Info level

```
not level: info
```

Real-time Notifications

The **Alert status** feature displays pop-up notifications when events configured in **Event Configuration** occur. You can receive alerts immediately when an event is triggered, allowing you to quickly recognize issues and respond. You can also review notifications that have already occurred or were missed, helping you understand and resolve situations where real-time response was difficult.

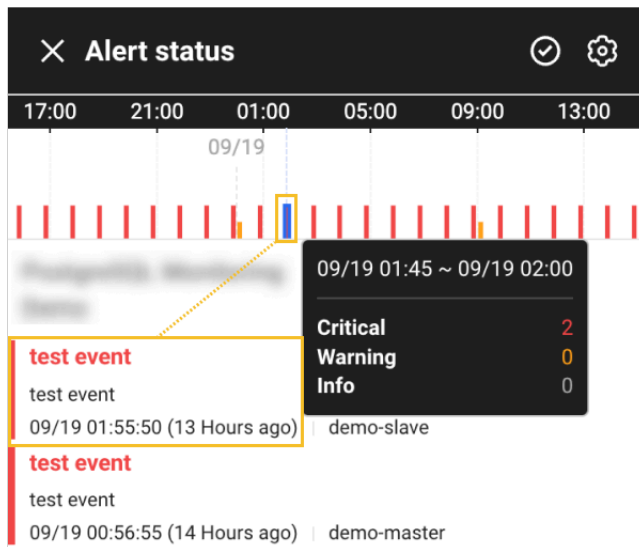
Viewing Real-time Notifications

Real-time notifications appear as pop-ups in the upper-right corner of the screen. You can check the time, title, and message of each notification.

- To close an individual notification, click the  button in the upper-right corner of the message.
- To close all pop-up notifications displayed on the screen, click **Close All Notifications**.

Viewing Notification History

1. Click the  icon at the top of the screen after selecting a project.
2. The **Alert status** window appears.
 - You can view up to 100 notifications from the past 24 hours for the current project.
 - Selecting an individual event item navigates you to the related menu.
 - In the time-based chart within the **Alert status** window, selecting a specific time range takes you to the corresponding event items.



- To view the full notification history, click **View All Notification History**. This navigates to **Alert > Event History**.

ⓘ If the **Alert status** list is empty, the **View All Notification History** button is displayed. Disable the **Receive notifications without reception tags** option.

Resolving Events in Bulk

You can resolve all ongoing events at once from the **Alert status** list. The bulk resolution process may take approximately 30 seconds to 1 minute to complete.

- When using the **Add Acknowledge** feature, a large number of recovery (resolved) notifications may be generated for currently ongoing events.
- Even after using the **Add Acknowledge** feature, events may occur again if the event rules remain enabled and the data still exceeds the threshold.
- Recovery notifications can be disabled by editing the event in **Alert > Event Configuration**. Disable **Send additional notification when the event is resolved** or **Recovered notification**.

How to use:

1. Click the  icon at the top of the screen after selecting a project.
2. When the **Real-time Notifications** window appears, click the  icon in the upper-right corner.
3. When the message `Resolve all ongoing events in the real-time notification list.` appears, click the **Resolve** button.

Configuring Real-time Notifications

1. Click the  icon at the top of the screen after selecting a project.
2. When the **Alert status** window appears, click the  icon in the upper-right corner.
3. Configure each option in the real-time notification settings window.
 - **Popup notifications:** Displays notifications as pop-ups even when the **Alert status** window is closed.
 - **Show resolved events:** Allows resolved events to be displayed in the **Alert status** list.
 - **Preview notification sound:** Lets you preview browser notification sounds. Click the  button next to **Critical** or **Warning**. If you cannot hear the sound, check your browser settings.

System Events

WhaTap Monitoring provides common system events that are automatically detected and generated across the platform. This document explains the types of events generated by the system, their trigger conditions, and recommended response actions.

EVENT_BLOCKED_BY_SYSTEM

If an excessive number of events occurs within a short period of time in a project, the WhaTap system detects this situation and blocks further events. When events are blocked, the system delivers the following message to the user. If you encounter this event, review and adjust your event configuration settings.

 **Critical**



Event Message

Excessive events detected, event blocked for stability. name: server agent

Project No	8
Project Name	new server
Target	server agent
Event Title	EVENT_BLOCKED_BY_SYSTEM
Event Time	(GMT+0900) 2024-11-18 17:58:58

Log In to WhaTap

Events are blocked as a result of excessive events in the server agent of new server project. If no events occur in server agent for a period of time, it is automatically unblocked.

Blocking Criteria

Events are blocked based on the following criteria:

1. Agent-level blocking

If **10 events** occur within **1 minute** from a single agent, all subsequent events from that agent are blocked.

2. Project-wide blocking triggered by multiple agents

If **3 or more agents** are blocked within **1 minute** according to condition 1, events from the entire project are blocked.

3. Project-level blocking

If **100 events** occur within **1 minute** in a single project, all events from that project are blocked.

How to Release the Block

When events are blocked by the system, no events must occur from the affected agent or project for **1 minute**.

- Disable all configured events from **Alert > Event Configuration**. **Review your event settings and adjust thresholds to prevent excessive event generation.**
- Before configuring events, use the **Simulation** feature to estimate how many events may occur.

Instance Performance Management

Home > Select Project > **Instance Performance Management**

You can see the application environment along with the performance-related settings. You can see detailed information of agents and applications.

- You can filter the desired items through the text field on the upper right of the screen.
- If changes to agents and applications located on the monitored server are not automatically applied, select  **Refresh**.

Agent list

You can check the list of agents assigned to the project in the application list on the left of the screen. If you select an individual agent, you can view information for environment variables, agent settings, and performances set on the right of the screen.



No.	Application
1	demo-8100
2	demo-8101
3	demo-8102
4	demo-8103
5	demo-8104
6	demo-8105

After updating the agent list or restarting a disabled agent, if it is not automatically displayed in the list, select .

Runtime ENV. Variable

Home > Select Project > **Instance Performance Management** > **Runtime ENV. Variable**

Runtime ENV. Variable			
No.	Application	Name	Detail
1	EC2AMAZ-NO1BAVA-1-51-w3...	whatap.version	2.2.6.0
		framework.version	4.8.04161
		runtime.version	7.0.5
		whatap.home	C:\Program Files\WhaTap.NET
		whatap.starttime	1717555664037
		whatap.ონame	EC2AMAZ-NO1BAVA-1-51-w3wp.exe
		whatap.name	{type}-{ip2}-{ip3}-{process}
		whatap.ip	10.21.1.51
		whatap.port	
		whatap.hostname	EC2AMAZ-NO1BAVA
		whatap.type	EC2AMAZ-NO1BAVA
		whatap.process	w3wp.exe
		whatap.pid	7436
		os.arch	amd64
		os.name	windows
		os.productname	Windows Server 2022 Datacenter

You can view environment variables for agent execution. Important information among environment variables or application status can be stored on the WaTap server so that they can be retrieved even if the agent is down. You can see the version, installation path, name, and IP address of the agent. You can download environment variables by clicking **Download CSV**. The following are key points to check:

- (Application).version : You can check the application version.
- file.encoding : You can check the file encoding format such as utf-8 .
- os.name : You can check the current OS.
- user.language : You can check the user language.

System ENV. Variable

Home > Select Project > **Instance Performance Management** > **System ENV. Variable**

System ENV. Variable			
No.	Application	Name	Detail
1	(type)-1-51-w3wp.exe	ALLUSERSPROFILE	C:\ProgramData
		APPDATA	C:\Windows\system32\config\systemprofile\AppData\Roaming
		AWS_EXECUTION_ENV	EC2
		CommonProgramFiles	C:\Program Files\Common Files
		CommonProgramFiles(x86)	C:\Program Files (x86)\Common Files
		CommonProgramW6432	C:\Program Files\Common Files
		COMPUTERNAME	EC2AMAZ-NO1BAVA
		ComSpec	C:\Windows\system32\cmd.exe
		DriverData	C:\Windows\System32\Drivers\DriverData
		EC2LAUNCH_TELEMETRY	1
		LOCALAPPDATA	C:\Windows\system32\config\systemprofile\AppData\Local
		NUMBER_OF_PROCESSORS	4
		OS	Windows_NT
		Path	C:\Program Files\Microsoft\jdk-17.0.7- hotspot\bin;C:\Windows\system32;C:\Windows;C:\Windows\System32\Wbem;C:\Windows\System32\WindowsPowerShell\v1.0\;C:\Windows\System32\OpenSSH\;C:\Program Files\Amazon\cfn-bootstrap\;C:\Program Files (x86)\Microsoft SQL Server\160\Tools\Binn\;C:\Program Files\Microsoft SQL Server\160\Tools\Binn\;C:\Program Files\Microsoft SQL Server\Client SDK\ODBC\170\Tools\Binn\;C:\Program Files\Microsoft SQL Server\160\DTSDTS\Binn\;C:\Program Files\dotnet\;C:\Program Files (x86)\Microsoft SQL Server\160\DTSDTS\Binn\;C:\Program Files\Azure Data Studio\bin\;C:\Program Files\nodejs\;C:\Program Files\WhaTap .NET\;C:\Program Files\Bandizip\;C:\Windows\system32\config\systemprofile\AppData\Local\Microsoft\WindowsApps

You can view environment variables for application execution. The **Boot environment** menu collects and provides environment variables at the time of query. It uses `System.getProperty()` to retrieve the value of the key passed as a parameter. The following are key points to check:

- `(Application).version` : You can check the application version.
- `file.encoding` : You can check the file encoding format such as `utf-8` .
- OS environment variables: For example, they are provided in the suffix `(env)` format, such as `(env) LANG` environment variable.

Agent log

Home > Select Project > **Instance Performance Management** > **Agent Log**

Agent Log

No. Application

1 (type)-1-51-w3wp.exe

Name	Length
dotnet-profiler.log	8,489,244
whatap-boot-20240318.log	549
whatap-boot-20240319.log	571
whatap-boot-20240320.log	575
whatap-boot-20240321.log	571
whatap-boot-20240322.log	571
whatap-boot-20240323.log	571
whatap-boot-20240324.log	571
whatap-boot-20240325.log	0

0 Go << < > >> END

2024/03/18 00:00:06
2024/03/18 00:00:06 ## OPEN LOG FILE boot 20240318 00:00:06.29 ##
2024/03/18 00:00:06
2024/03/18 01:00:00 [WA10702] Text Map Reset
2024/03/18 02:00:00 [WA10702] Text Map Reset
2024/03/18 03:00:00 [WA10702] Text Map Reset
2024/03/18 04:00:00 [WA10702] Text Map Reset
2024/03/18 04:23:50 [WA612-05] header size error ofsset=81 packsize=89
2024/03/18 05:00:00 [WA10702] Text Map Reset
2024/03/18 06:00:00 [WA10702] Text Map Reset
2024/03/18 07:00:00 [WA10702] Text Map Reset
2024/03/18 08:00:00 [WA10702] Text Map Reset

You can view the agent logs stored on the monitored server. The name of the log file is in the format of **whatap-YYYYMMDD.log**. You can select each log to access information about the errors and events captured in the logs.

! For the agent settings for the log, see [the following](#).

Correlated Project Management

Home > Select Project > Management > Correlated Project Management

If you have created a database monitoring (DPM) project and an application monitoring (APM) project, you can relate the two projects for monitoring the data collected from DPM in the APM project.

Correlated Project Management

Add a project to correlate

Select the project you want to correlate, then click the add button. (Supported types: Server, MySQL, PostgreSQL, Oracle, Oracle Pro, Redis, MSSQL, Altibase, MongoDB, Cubrid, Java, Kubernetes, Namespace)

Project selection

Add

Correlated project list

pcode	Project name	Group	Type	
28458	PostgreSQL Monitoring Demo	Demo Project	PostgreSQL	
29762	MySQL Monitoring Demo	Demo Project	MySQL	
29763	Server Monitoring Demo	Demo Project	Server	
30099	MS SQL Server Monitoring Demo	Demo Project	MSSQL	
33194	Kubernetes Monitoring Demo(EKS)	Demo Project	Kubernetes	

The **Correlated Project Management** feature allows you to go beyond product-/equipment-centric monitoring and view monitoring data across multiple projects. This is useful for analyzing how different system components such as applications and databases, interact together. In particular, when performance degradation occurs, you can quickly determine whether it is a hardware problem or an individual application problem, which can significantly reduce the troubleshooting time. Through **Correlated Project Management**, you can comprehensively analyze performance data at the user system level and obtain more visible insights.

- !

Notes before you begin

 - Supportable databases: PostgreSQL, Oracle, MySQL, SQL Server, CUBRID, Altibase, Redis, MongoDB

Adding any linked project

- Go to **Management > Correlated Project Management**.
- In the **Add a project to correlate** section, select the **Project selection** input field.

Add a project to correlate

Select the project you want to correlate, then click the add button. (Supported types: Server, MySQL, PostgreSQL, Oracle, Oracle Pro, Redis, MSSQL, Altibase, Mong)

Project selection

☐ OTE-APM@Front Java 13 OTE-SELF

☐ DB-REDIS-JINS-TEST Redis 19 Jinslab

☐ DB-MARIADB-JINS-TEST MySQL 20 Jinslab

☐ hsnam-ecs-1 Kubernetes 29

☐ hsnam & vm Server 38

☐ DB-POSTGRESQL-JINS-TEST PostgreSQL 60 Jinslab

☐ SQLServer-V1 MSSQL 82

☐ rum_previous Java 88 swlim

☐ java-apm-docker Java 181 bspark-test

Add

3. If you see a list of projects, select a project to link to. You can also enter a string to search for matching projects.
4. Select one or more projects and then select **Add** that is active.

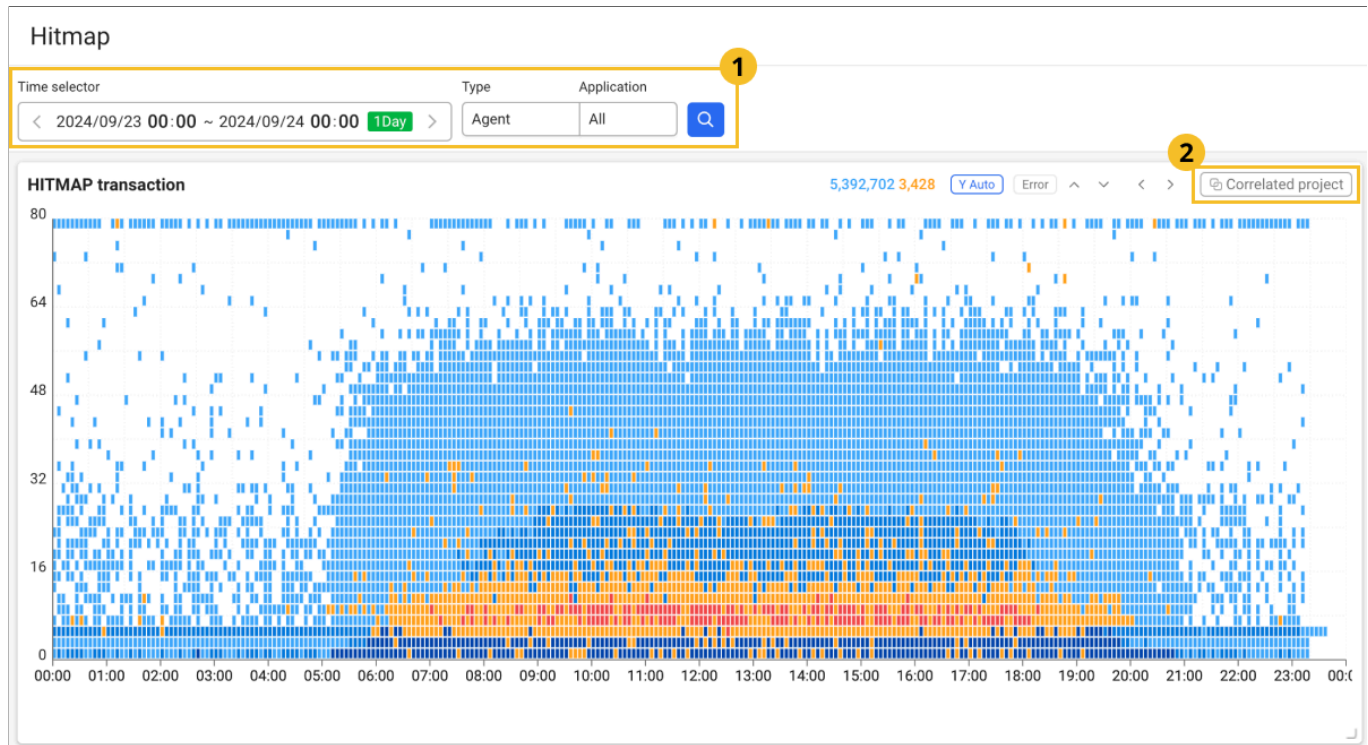
The selected project is added in **Correlated project list**.

! You need the **Edit** role on the project to add a linked project. If you have the **Edit** role, the **Add** button is enabled in the **Correlated Project Management** menu.

Checking the metrics of the linked project

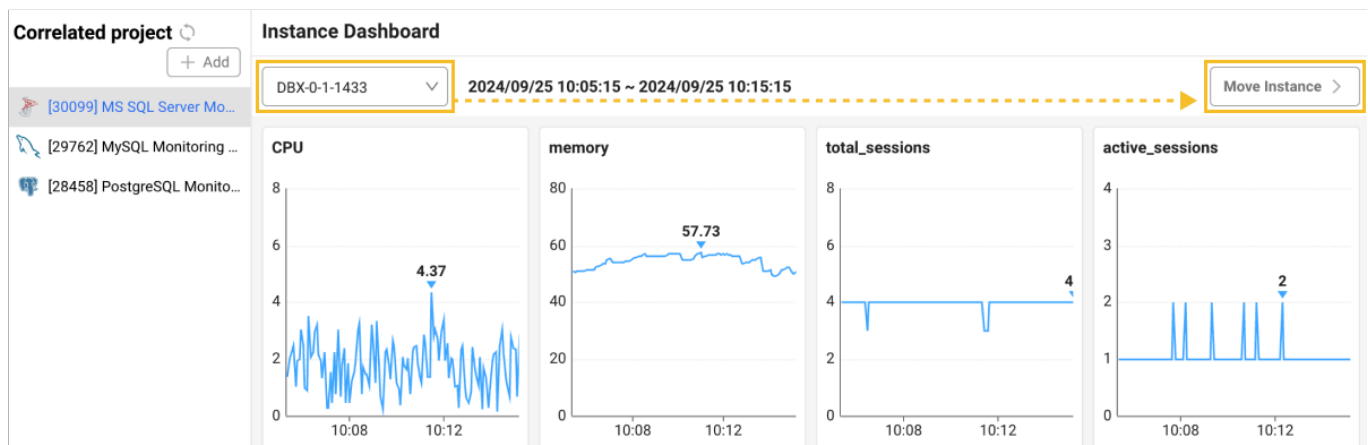
Metrics related to the added project can be checked in the **Analysis > Hitmap** menu. You can also see performance metrics for the linked project while viewing transactions.

This feature is useful when analyzing transactions in the APM project. When you found a slow SQL, it is difficult to determine exactly in which DB the problem occurred in the environment using multiple similar DBs.



1. Set the time and **Application** for viewing the transactions, and then select .
2. In the **HITMAP transaction** section, select **Correlated project** on the upper right.
3. A new window appears where you can check the metrics for the correlated project.

Select the correlated project from the left list and then check the metrics in the **Instance dashboard** section. **Instance dashboard** allows you to view key performance metrics of the database associated with the transactions executed in the application.



To navigate to the dashboard menu for a selected project, select an instance and then click **Move instance** on the upper right. Go to **Dashboard > Monitoring a Database Instance**.

- The **HITMAP transaction** button in the **Correlated project** section appears only when there is an associated project. For more information about adding a correlated project, see [the following](#).
- You can add a project by selecting **Correlated project** at the top of the left **Add** list.
- The **Move instance** button is disabled when **All** is selected.



- Depending on the database product type, you can navigate to the **Analysis > Counts Trend** menu.

Removing any linked project

1. Go to **Management > Correlated Project Management**.
2. To delete a project to unlink from the **Correlated project list** section, select  on the utmost right of the list.
3. When the confirmation message appears, select **Delete**.

The deleted project is excluded from the **Correlated project list** section.

Laboratory

This menu provides new or experimental features to users. Through  **Laboratory** or **Sitemap** in the side menu, you can access it. The provided features may differ depending on the product.

 The functionality of the **Laboratory** menu is currently in Beta version and may cause unexpected errors. Be careful when using the **Laboratory** menu. It is not recommended to use the menu in handling important data or in the operating environment. If you have any feedback or issues, feel free to contact the support team at support@whatap.io.

- **MXQL Data**

MXQL is a query language to flexibly query WhaTap's performance data (metrics). It is used to comprehensively search and use the metrics collected from multiple agents in a project. For more information about **MXQL**, see [the following](#).

- **Alert Message**

It provides a customization function to allow to modify the alert messages that are delivered to project members via email or third-party plugins. For more information, see [the following](#).

 In the side menu, if the  **Laboratory** menu does not appear, you can access it through **Sitemap**.
Under the side menu, select . If the **Sitemap** window appears, select a desired menu in the **Laboratory** section on the lower right of the window.