

Extending Dynatrace AI through Plugins and APIs

 **dynatrace**
Perform

HOT Day
sponsored by



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Agenda

Overview ◀

Set up environment

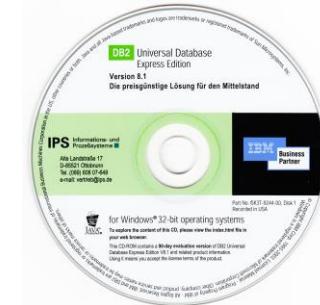
OneAgent Plugin

ActiveGate Plugin

API

Roadmap and best
practices

The 90s



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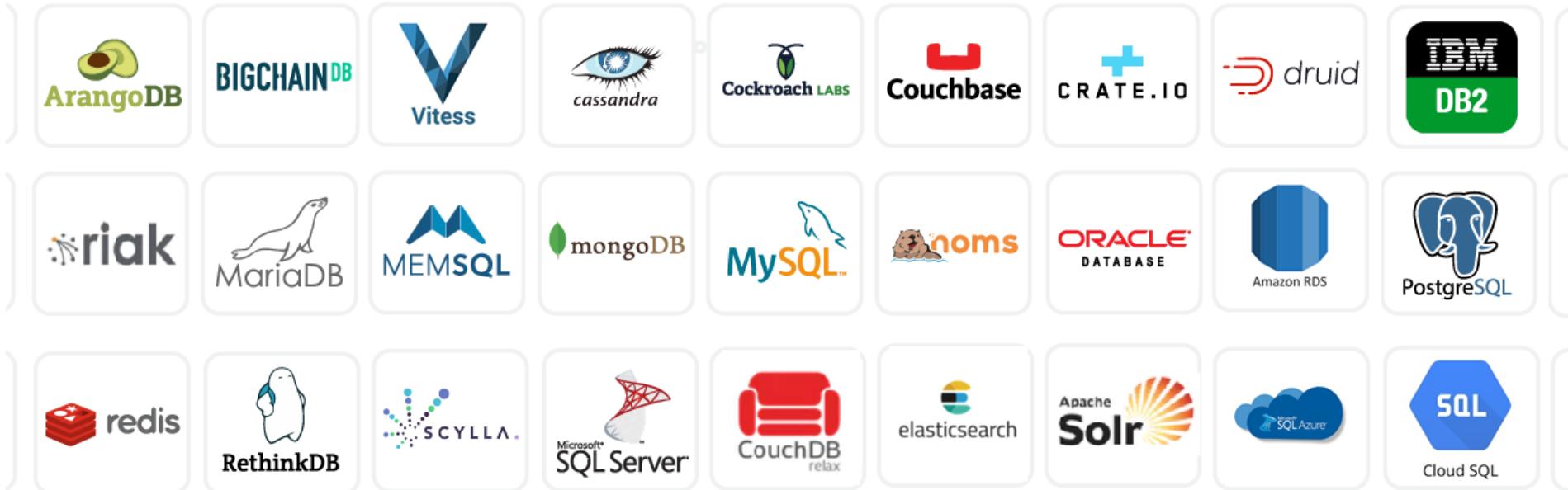
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2019 Databases



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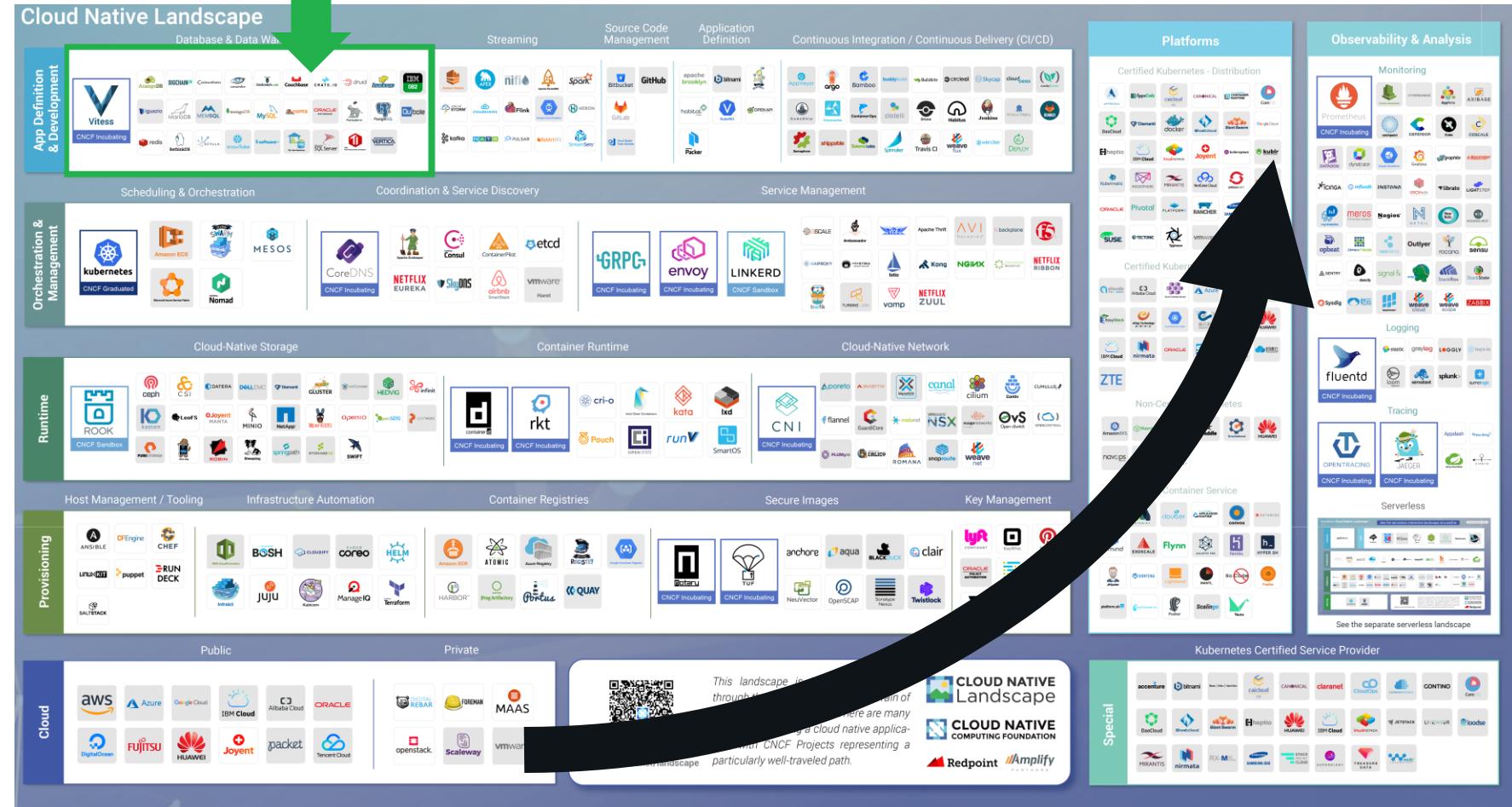
ActiveGate Plugin

API

Roadmap and best practices

Number of technologies has grown rapidly

Databases



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Roadmap and best practices

The ActiveGate plugins framework architecture



Host



Environment ActiveGate



ActiveGate plugin module

Python VM

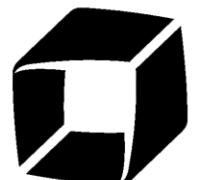
ActiveGate plugin

1 min

Technology



- metrics
- properties
- events
- topology data



Dynatrace server

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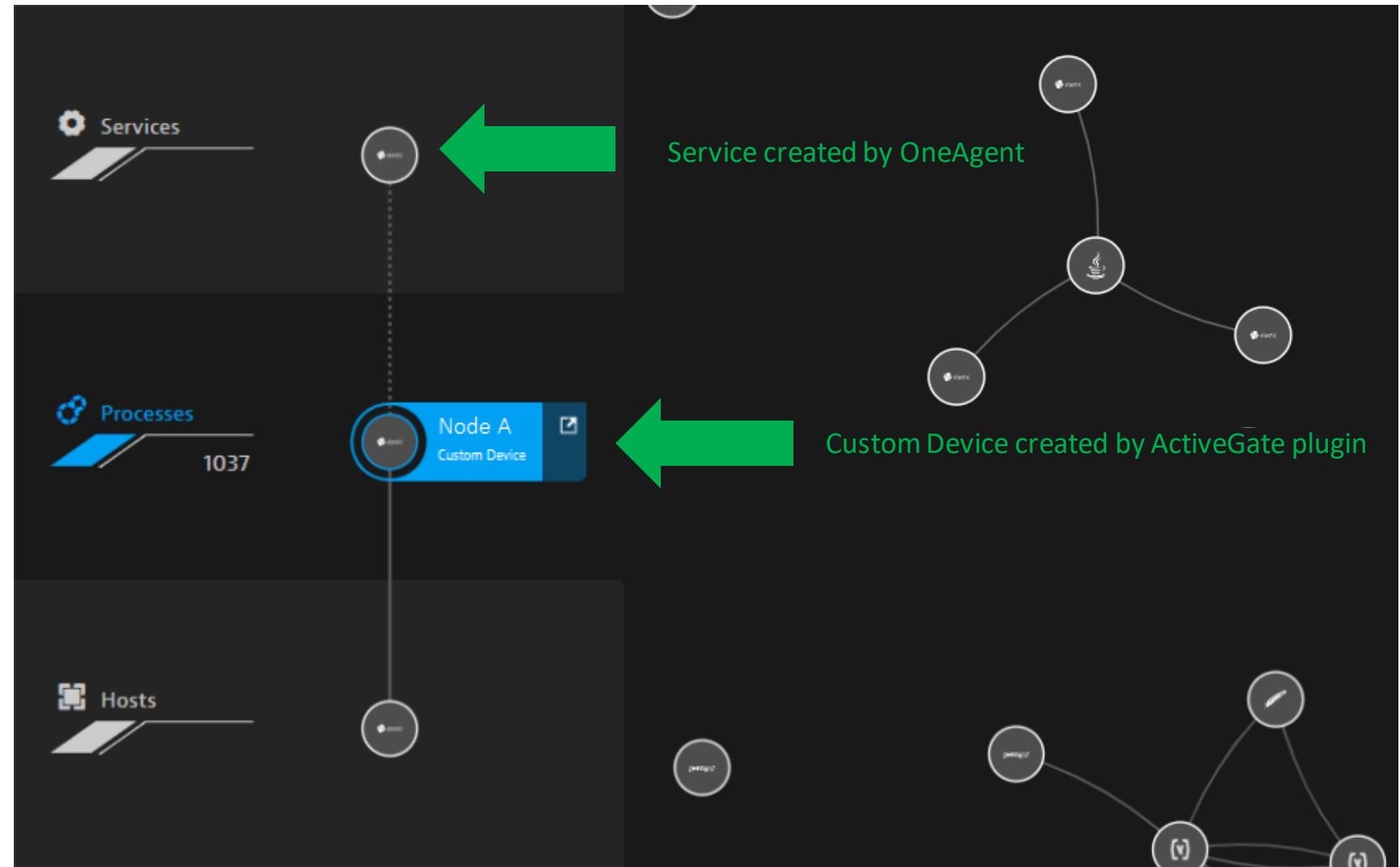
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Data gathered by plugins is integrated and analyzed by the AI



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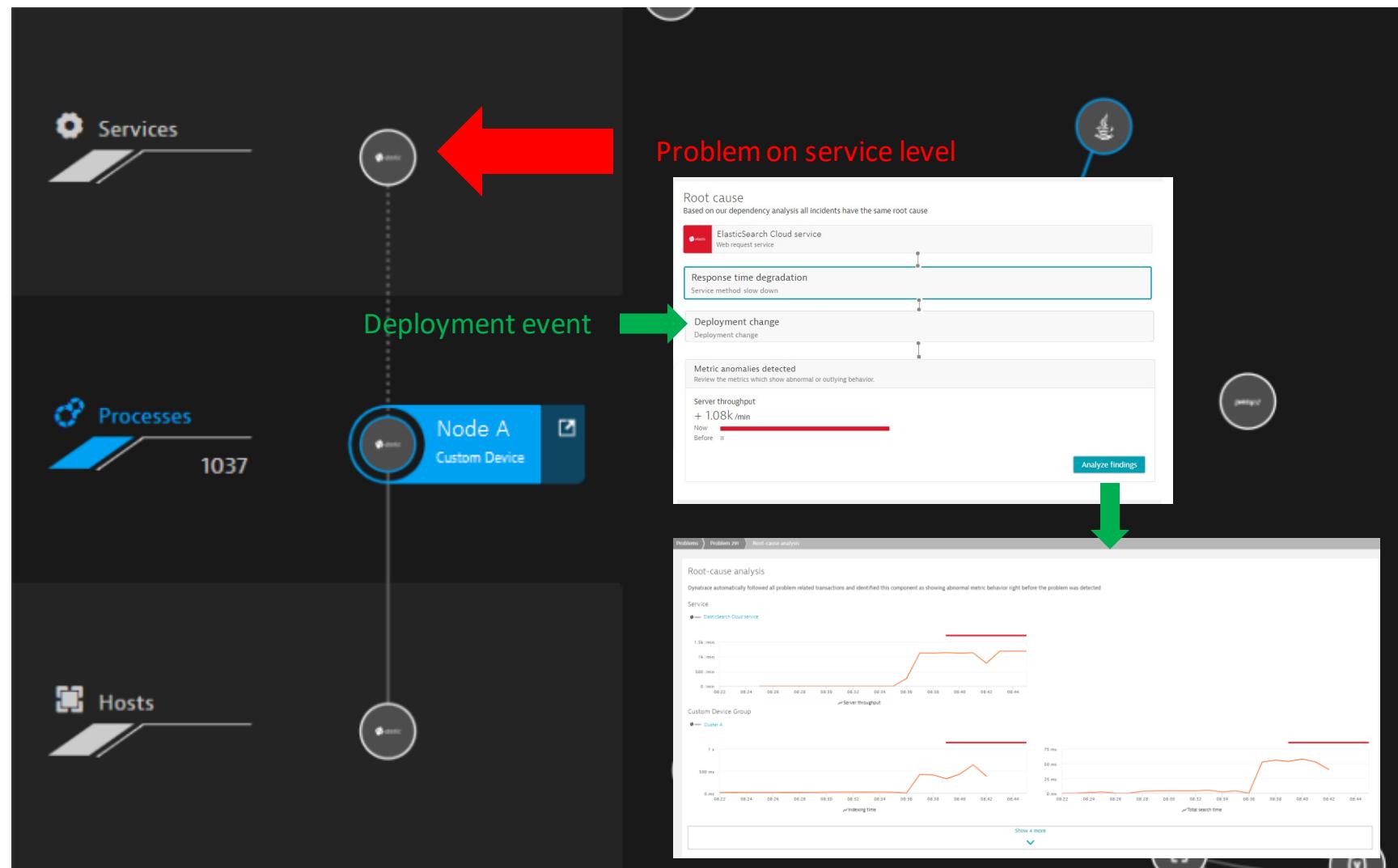
OneAgent Plugin

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AI 2.0 detects root-causes in plugin metrics without thresholds



* Support for custom devices which work as proxies hasn't been yet released

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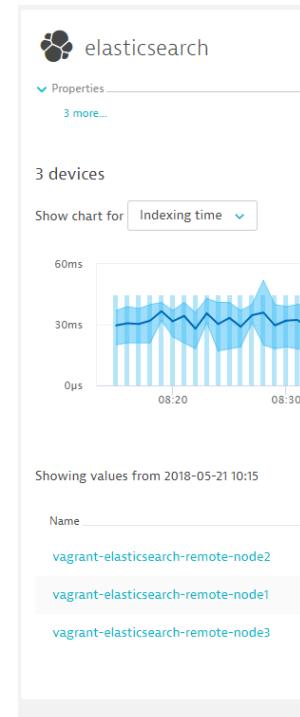
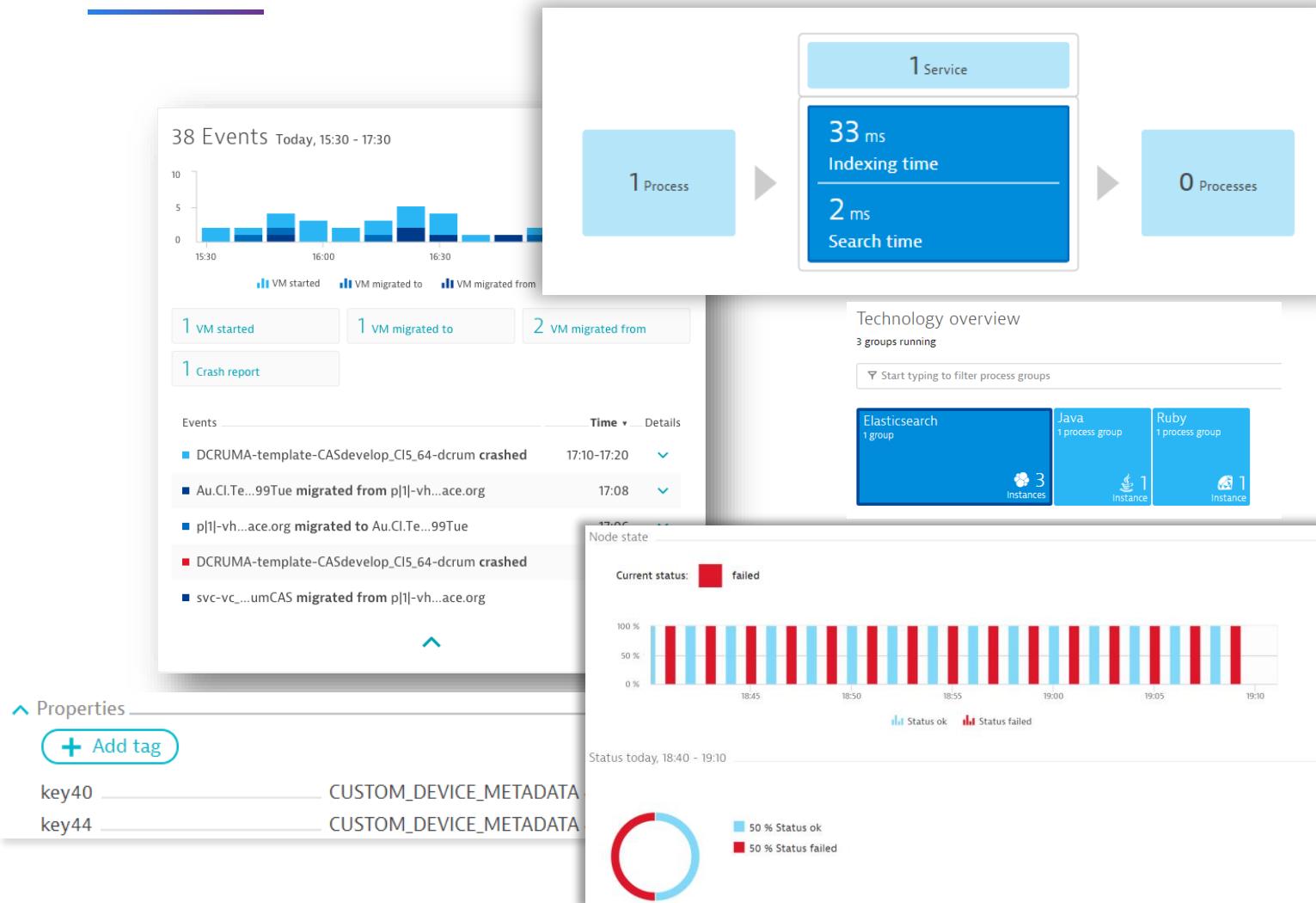
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Metrics, events, properties and more



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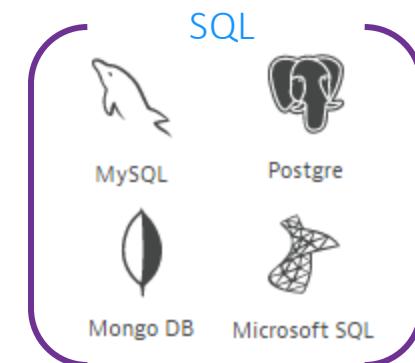
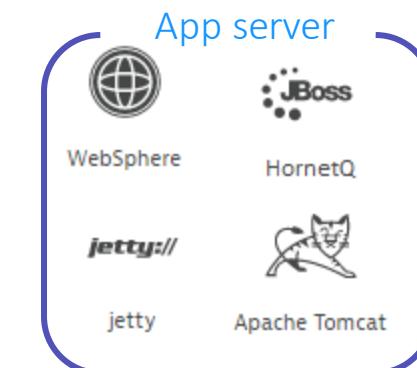
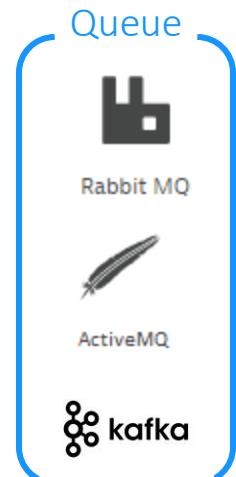
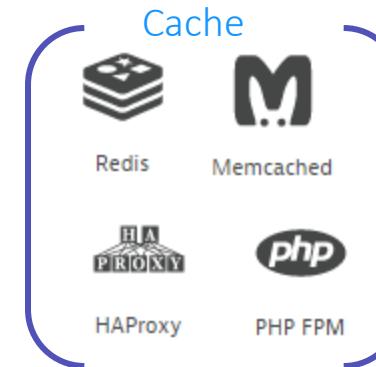
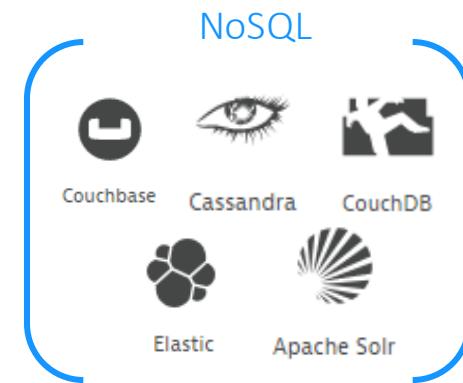
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Roadmap and best practices

We use plugins to extend OOTB Dynatrace support



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Available options

Settings → Monitoring → Monitored technologies → Add new technology monitoring

Settings → Monitoring → Monitored technologies

Monitored technologies

Looking for container technology support? Find the [container monitoring](#) page here. Dynatrace provides out-of-the-box monitoring of major technologies listed in the Supported technologies tab. Specify the technologies you want to monitor or set global monitoring settings.

To integrate any technology, detect its performance problems and get its metrics, add technology monitoring via custom plugins or Dynatrace API.

[Add new technology monitoring](#)

Supported technologies

Technology	Type
Plugin manager	OneAgent plugin
Couchbase	OneAgent plugin
CouchDB	OneAgent plugin

Settings → Monitoring → Monitored technologies → Add new technology monitoring

Add new technology monitoring

Add new technology monitoring via custom plugins or Dynatrace API to integrate external metrics, events and topology with Dynatrace AI.

Monitor a technology on host with OneAgent

Monitor Java or WebSphere based technologies

Use JMX/PMI plugin editor to add custom metrics without coding.

[Add JMX/PMI plugin](#)

Monitor any technology

Use OneAgent plugins to monitor technologies detected by OneAgent.

[Add OneAgent plugin](#)

Monitor remote technologies(Beta)

Monitor remote technologies with Python Plugins

Use ActiveGate plugins to monitor remote technologies that expose external interface, without installing OneAgent on a host.

[Add ActiveGate plugin](#)

Monitor technologies with API

In case you do not want to use Python, utilize the API to monitor remote technology. Use your favorite language to write an API client.

[Add integration with API](#)

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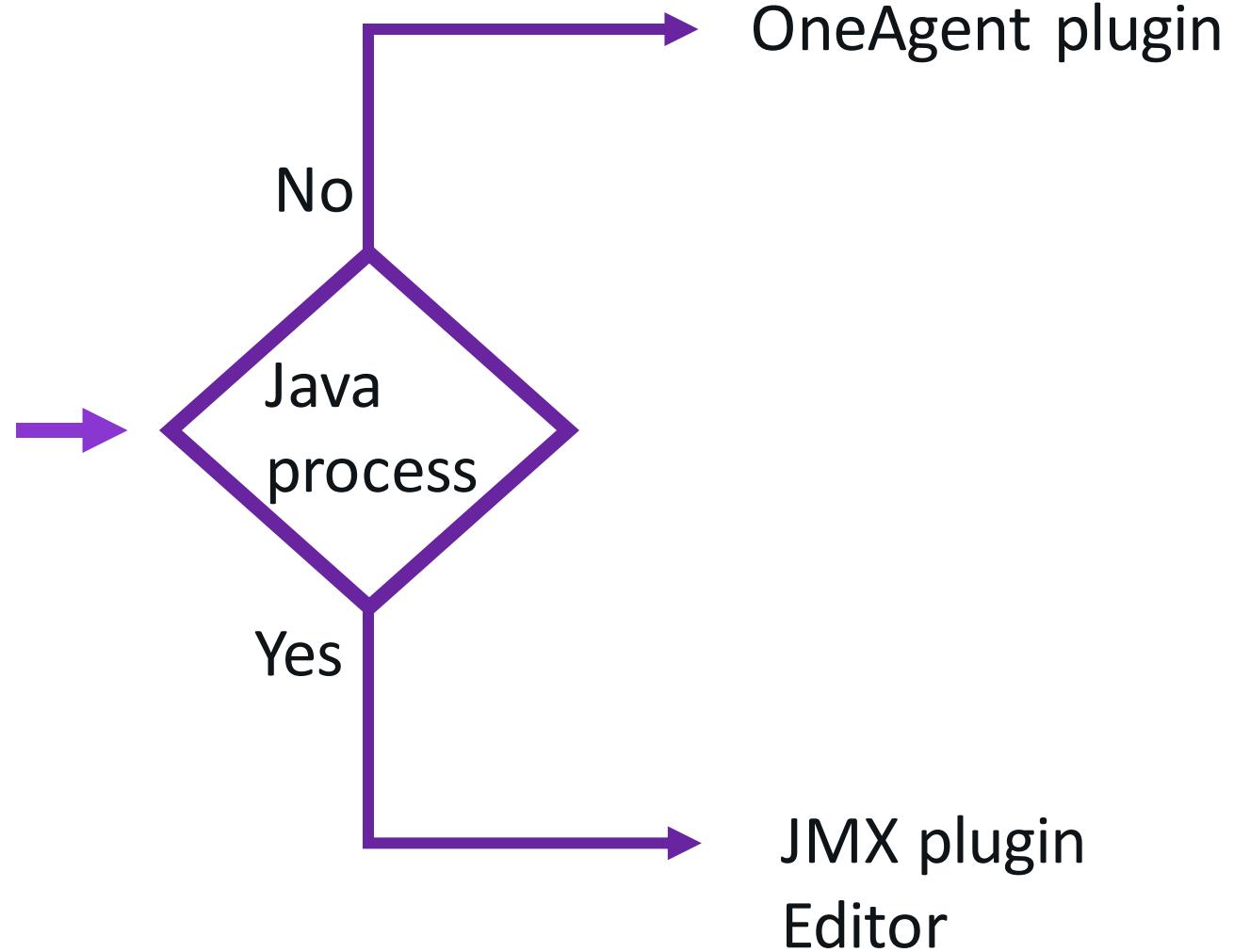
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JMX/PMI and OneAgent plugins



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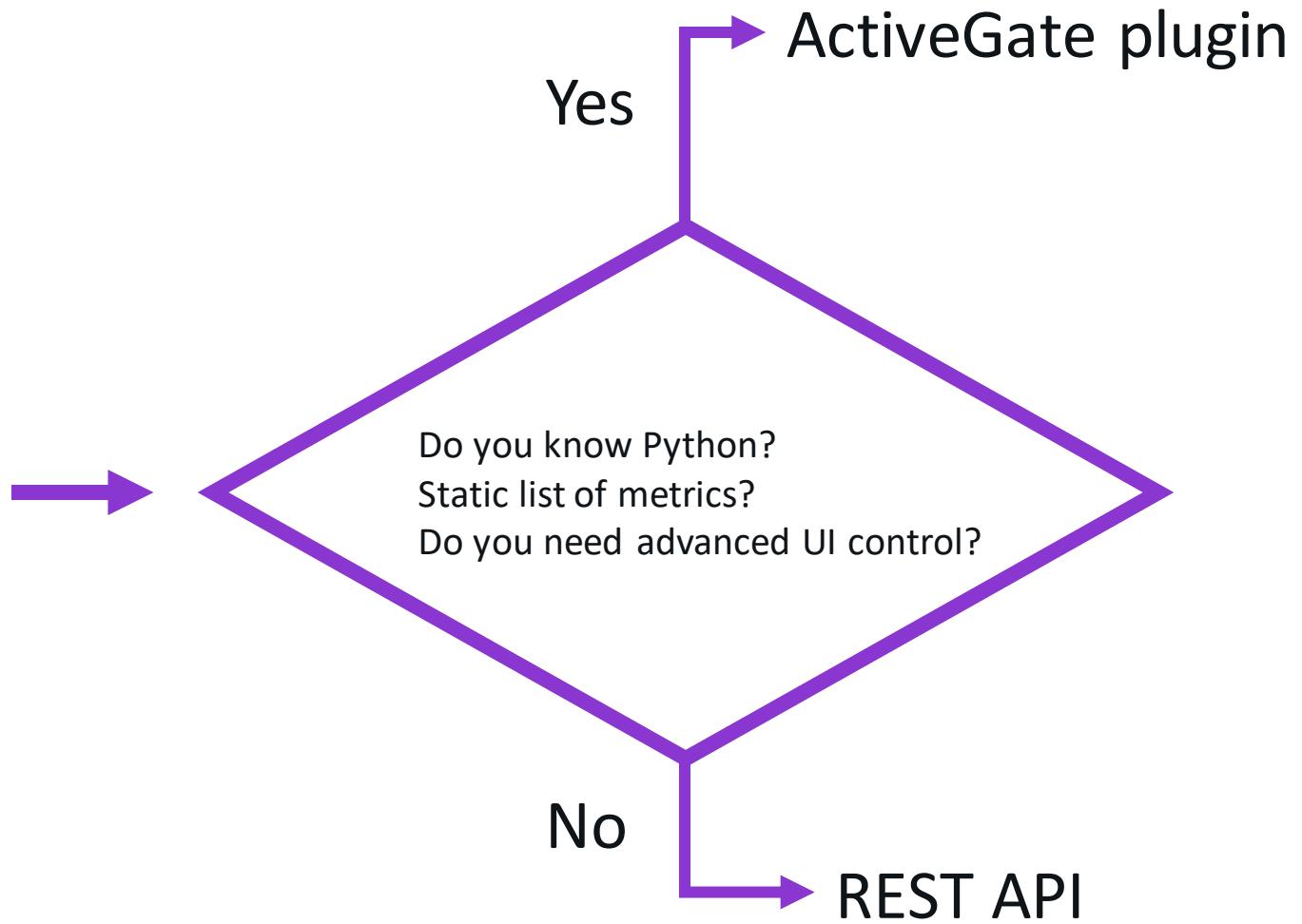
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ActiveGate plugins or API



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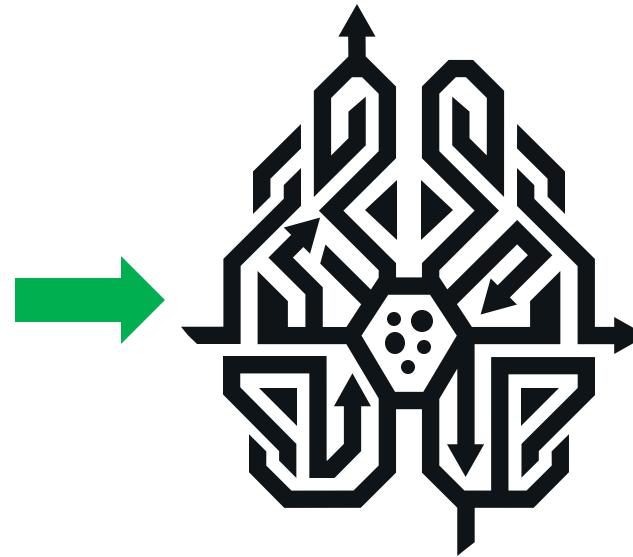
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Feed Davis our AI



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Set up environment

- Connect to your environment using the IP, username and password on the note you received
 - Use remote desktop connection, WIN + R, mstsc
- Download the latest version of the lab
 - Execute the “Setup” batch file on the desktop
- Already installed
 - Firefox
 - Chrome
 - Python 3.6 64-bit
 - Visual Studio Code with Python support
 - Notepad++
 - Java
 - Git

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Set up environment ◀

OneAgent Plugin

Active Gate Plugin

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Roadmap and best
practices

Environment - Dynatrace OneAgent and SDK

- Download and install the Dynatrace OneAgent from your environment
 - The environment is on the note which was handed out
 - Go to Deploy Dynatrace -> Start installation -> Windows -> Download
 - Execute the installer and follow the instructions
- Download and install the OneAgent Plugin SDK
 - Go to Settings -> Add new technology monitoring -> Add OneAgent plugin
 - Unzip and install the SDK by executing the following from a command prompt
 - `py -m pip install oneagent_sdk-[enter version]-py3-none-any.whl`

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Set up environment

OneAgent Plugin ◀

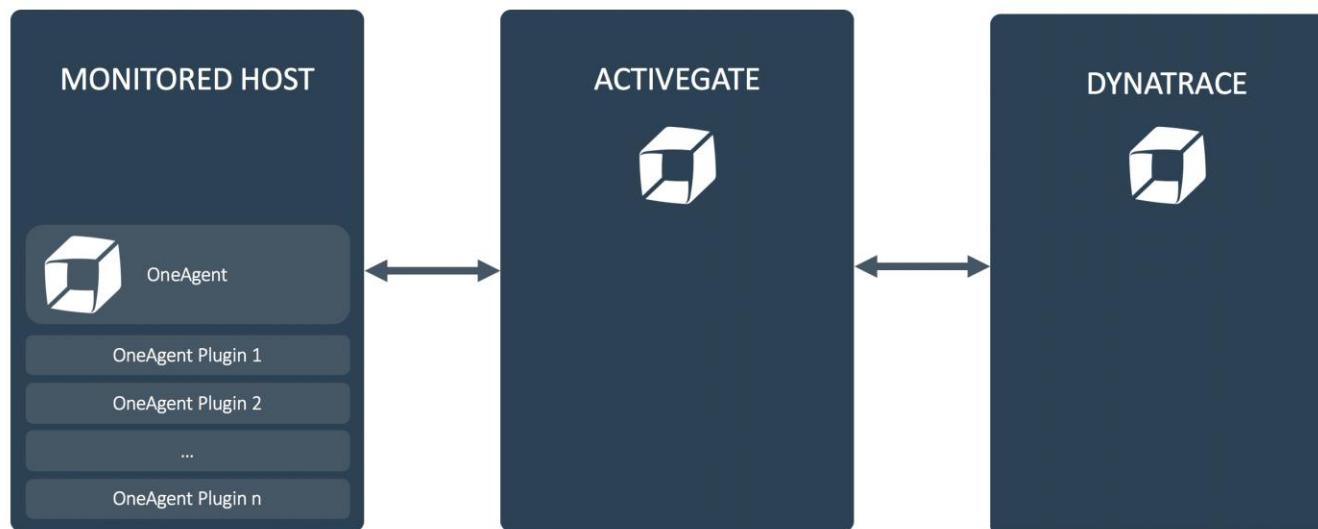
Active Gate Plugin

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Roadmap and best
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OneAgent Plugin

- Required components
 - Definition – plugin.json
 - Python code
- Optional components
 - Properties
 - Simulator snapshot



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Set up environment

OneAgent Plugin ◀

Active Gate Plugin

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Roadmap and best
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OneAgent Plugin – plugin.json

- Answers the following questions:
 - Where is the code?
 - Folder name
 - File name
 - Class name
 - What version is it?
 - What type of plugin is it?
 - Python
 - JMX
 - When should I start?
 - Should I run one copy per process or singleton?
 - What library requirements are there?
 - What metrics are there?
 - How should the metrics be presented?
 - What are the properties required to execute the plugin?

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Set up environment

OneAgent Plugin ◀

Active Gate Plugin

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OneAgent Plugin – Python code

- The query method executes once every minute
- Linked to an existing process, gets the process id
- Gets data from the process
- Sends data to Dynatrace
 - Relative metrics
 - Absolute metrics
 - Properties
 - Events

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OneAgent Plugin ◀

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OneAgent Plugin – Demo plugin

- Start demo application
 - py -m plugin_sdk.demo_app

```
C:\>py -m plugin_sdk.demo_app
Bottle v0.12.15 server starting up (using WSGIRefServer()).
Listening on http://0.0.0.0:8769/
Hit Ctrl-C to quit.
```

- Navigate to the folder [OneAgent SDK]/examples/demo_plugin/
- Execute oneagent_build_plugin --no_upload
- Upload the plugin manually, the path is in the output
- **Do not click the “Upgrade now” button**
- If successful, you should have a “Further details” button on the plugin_sdk.demo_app process after a couple of minutes

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Set up environment

OneAgent Plugin

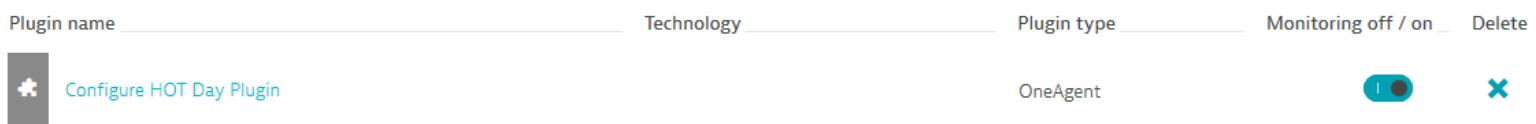
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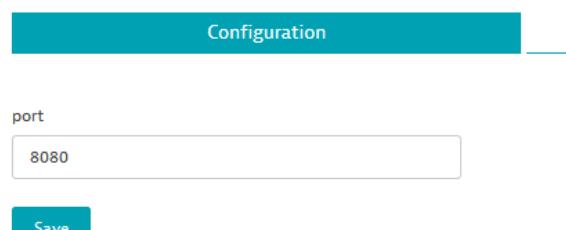
Roadmap and best
practices

OneAgent Plugin – Build and deploy plugin

- Build custom plugin
 - In a command prompt, navigate to the folder `perform-2019\python\hotday_oneagent_plugin__99_final_\hotday_plugin`
 - Execute `oneagent_build_plugin --no_upload`
 - Upload the plugin manually, the path is in the output
 - Click “Configure HOT Day Plugin”



- Set the port to 8080 and click “Save”



A screenshot of a configuration dialog box. At the top, there is a teal bar with the text "Configuration". Below it, there is a form field labeled "port" containing the value "8080". At the bottom of the dialog is a teal "Save" button.

- **Do not click the “Upgrade now” button**

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OneAgent Plugin

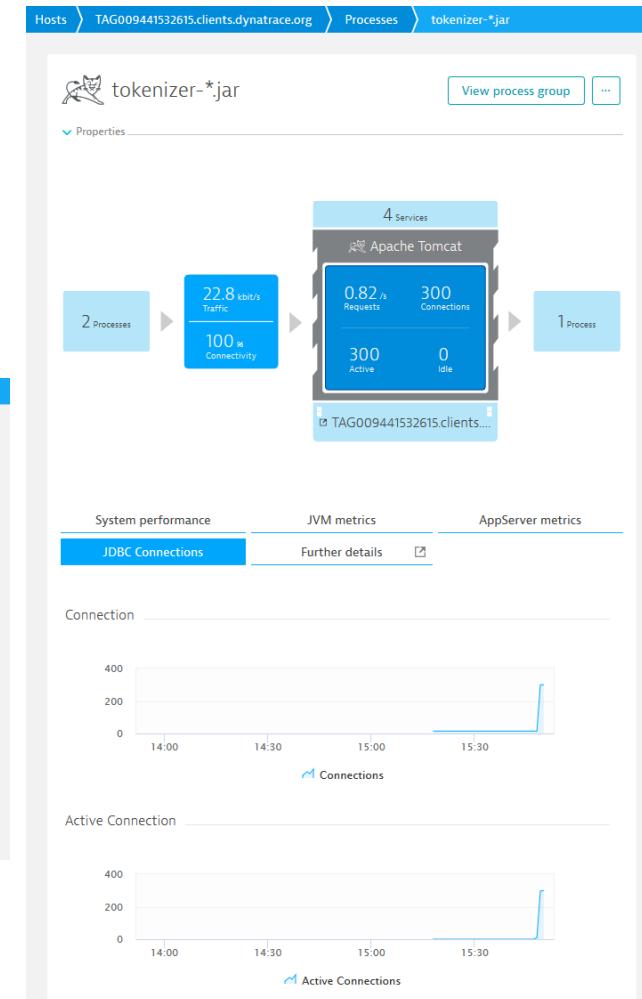
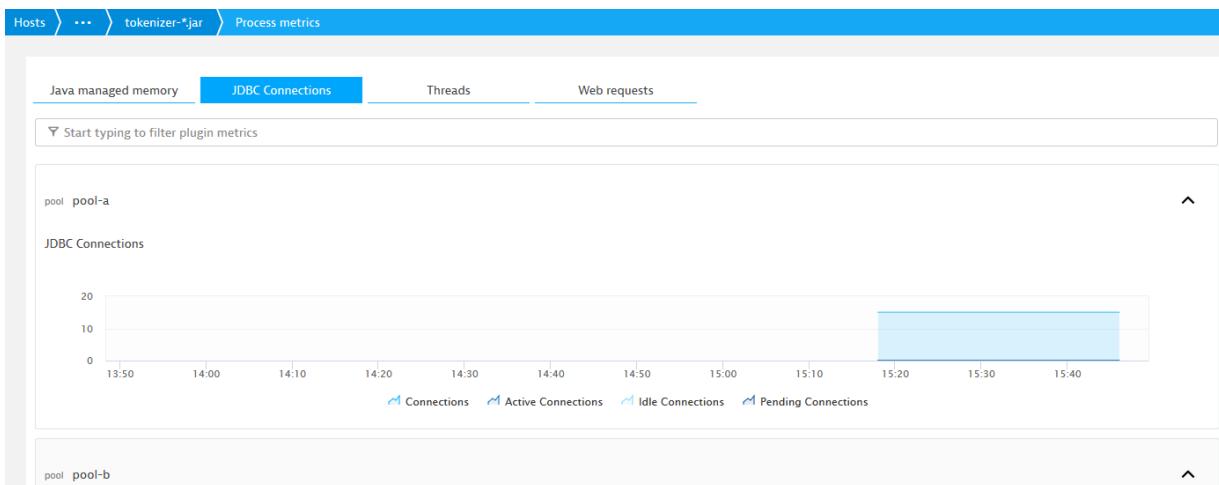
Active Gate Plugin

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OneAgent Plugin – Validate custom metrics

- Make sure that you see the JDBC Connection metrics for the process



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OneAgent Plugin ◀

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OneAgent Plugin – Custom metrics as root cause

- Trigger a problem
 - Navigate to `http://localhost:8080/`
 - Click on “destabilize”
- Find the service related problem reported on by the Dynatrace AI
- Make sure that the problem sees a custom metric as the root cause of the problem



INDEX

Your application is **healthy**

[stabilize](#)

[destabilize](#)

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OneAgent Plugin

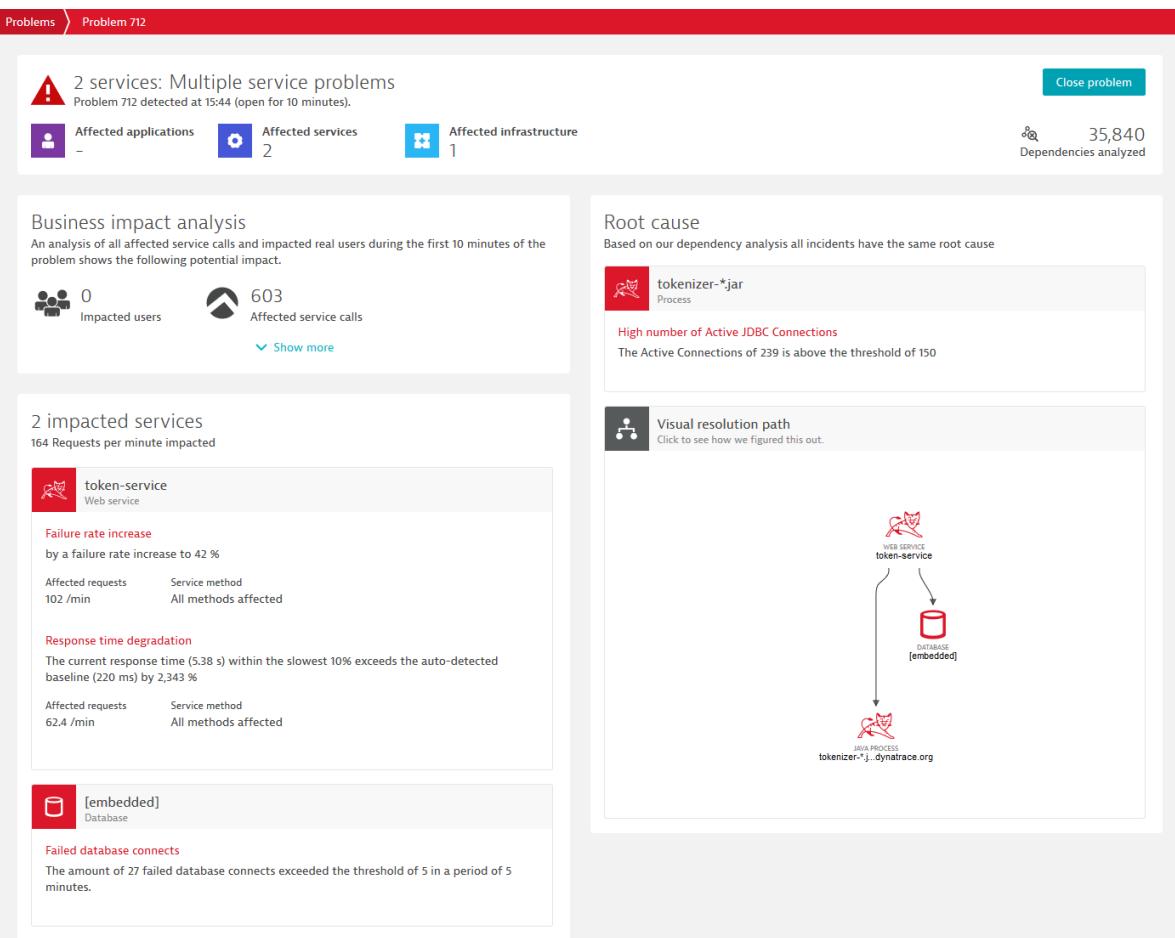
Active Gate Plugin

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Roadmap and best
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OneAgent Plugin – AI 1.0

- Custom metric as root cause thanks to raising a problem on the process.



The screenshot shows the Dynatrace interface for a detected problem (Problem 712). The main header indicates "2 services: Multiple service problems" detected at 15:44 (open for 10 minutes). Key metrics shown are 0 Affected applications, 2 Affected services, and 1 Affected infrastructure. A total of 35,840 Dependencies were analyzed.

Business impact analysis: An analysis of all affected service calls and impacted real users during the first 10 minutes of the problem shows the following potential impact:

- 0 Impacted users
- 603 Affected service calls

Root cause: Based on our dependency analysis all incidents have the same root cause. The root cause is identified as "tokenizer-*jar Process" due to a "High number of Active JDBC Connections". It states that the Active Connections of 239 is above the threshold of 150.

Visual resolution path: Click to see how we figured this out. This section shows a flowchart illustrating the dependency chain from the Java process "tokenizer-*jar.dynatrace.org" down to the "tokenizer-service" web service, which is further broken down into its "embedded" database component.

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OneAgent Plugin – AI 2.0

- Custom metric as root cause without fixed threshold thanks to metric anomaly detection

Problems > Problem 541

token-service: Failure rate increase
Problem 541 detected at 10:14 (open for 20 minutes).

Affected applications: - Affected services: 1 Affected infrastructure: 1 Dependencies analyzed: 15,120

Business impact analysis
An analysis of all affected service calls and impacted real users during the first 25 minutes of the problem shows the following potential impact.

Impacted users: 0 Affected service calls: 3.19k

Root cause
Based on our dependency analysis all incidents have the same root cause

tokenizer-*jar
Process Group

2 Failure rate increases
Service method token has failure rate increase
Today, 10:14 - 10:34

3 Performance events
The Active Connections of 300 is above the threshold of 150
Today, 10:16 - 10:34

Metric anomalies detected
Review the metrics which show abnormal or outlying behavior.

Active Connections: + 285
Now: 
Before: 

Active Connections: + 285
Now: 
Before: 

Active Connections: + 285
Now: 
Before: 

Pending Connections: + 1
Now: 
Before: 

Comments

Add comment

No comments posted

Show 1 more

Analyze findings

Agenda

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OneAgent Plugin ◀

Active Gate Plugin

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OneAgent Plugin – Simulator

- Don't want to send data to Dynatrace while developing?
- `simulator_snapshot.json`
 - Contains the process information normally passed from the OneAgent, for example process type and process arguments
 - Example found in demo plugins
 - Manually provide the snapshot information
 - Current snapshot found in `C:\ProgramData\dynatrace\oneagent\log\plugin\pluginDevLoggerOsAgentDefault.log`
- Run the plugin manually in a command prompt using `oneagent_sim`

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OneAgent Plugin

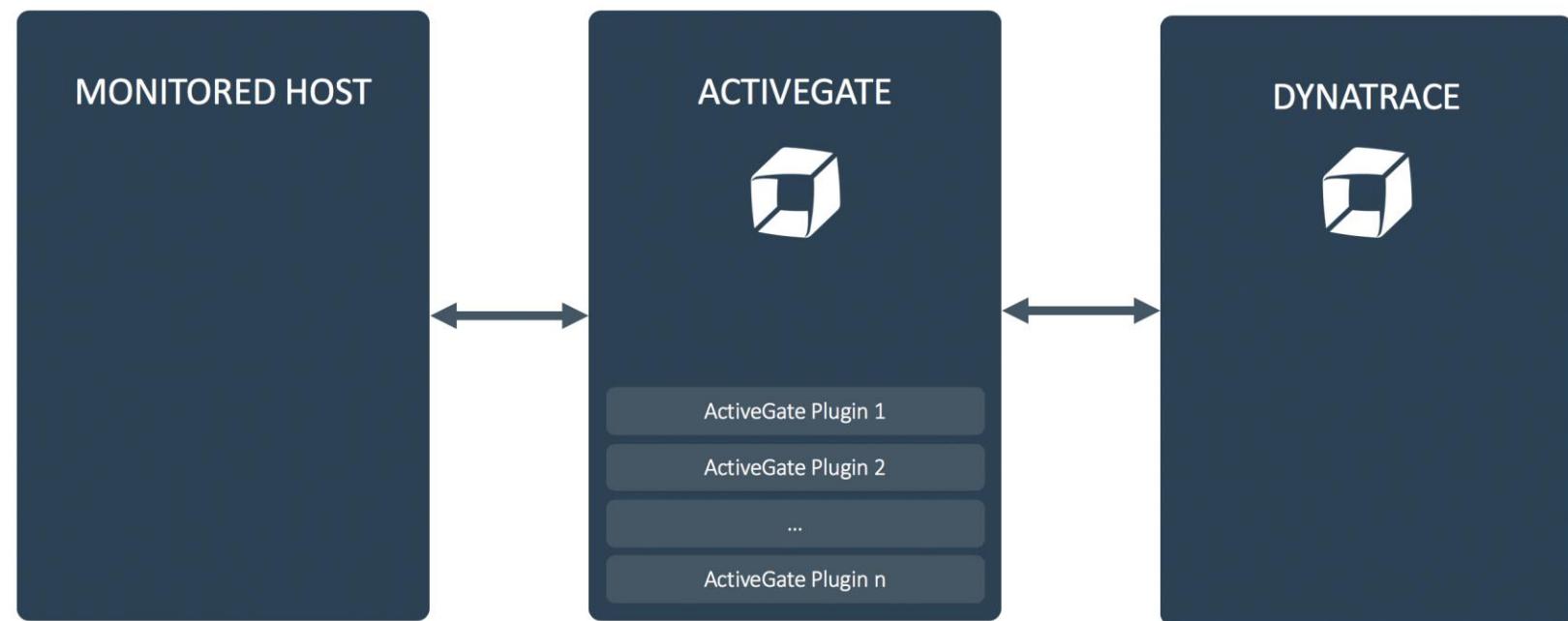
Active Gate Plugin ◀

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ActiveGate Plugin

- Required components
 - Definition – plugin.json
 - Python code



Installation Instructions

Check Deployment Status

Download & Install Active Gate

Download & Install Plugin Module

Validate Installation

Install an ActiveGate

The screenshot shows the Dynatrace web interface with a sidebar on the left containing various navigation links such as Dashboards & reports, Dashboards, Create custom chart, Reports, Analyze, Problems, User sessions, Log files, Smartscape topology, Diagnostic tools, Monitor, Applications, Synthetic, Transactions & services, Databases, Hosts, Network, Technologies, VMware, AWS, Azure, Docker, Cloud Foundry, Manage, Deploy Dynatrace, Deployment status, and Settings. The main content area is titled 'Deployment status' with the sub-instruction 'Manage your Dynatrace deployment'. It features three tabs: 'Recently connected hosts (last 72h)', 'All hosts', and 'Dynatrace ActiveGates' (which is currently selected). Below these tabs is a table with one row, showing a shield icon, the host name 'EC2AMAZ-S70VKM0', and its IP address 'IP address: 172.31.72.200'. At the top right of the main content area, there is a green banner with a checkmark icon and the text 'Task completed!'. To the right of the banner are two buttons: 'Add new host' and 'Install ActiveGate'.

Installation Instructions

Deployment Status

Download & Install
Active Gate

Download & Install
Plugin Module

Validate Installation

Install an ActiveGate

The screenshot shows the Dynatrace web interface with a dark theme. On the left is a sidebar with various navigation links. In the center, there's a main content area with a header 'Deploy Dynatrace > Install ActiveGate'. Below the header, the text 'Download Dynatrace ActiveGate' is displayed in green. A detailed description follows: 'Dynatrace ActiveGates pose as proxy servers that bundle and forward all traffic to Dynatrace Server. Additionally they enable monitoring of VMware activity by connecting to your vCenter instances. Select the platform where you want to install ActiveGate.' It also mentions 'By continuing you agree to our [Terms of Service](#)'. At the bottom of this section are two buttons: 'Windows' and 'Linux'. Further down, there's a 'Need help?' section with a link to 'Dynatrace Help or chat with a service rep.'

Installation Instructions

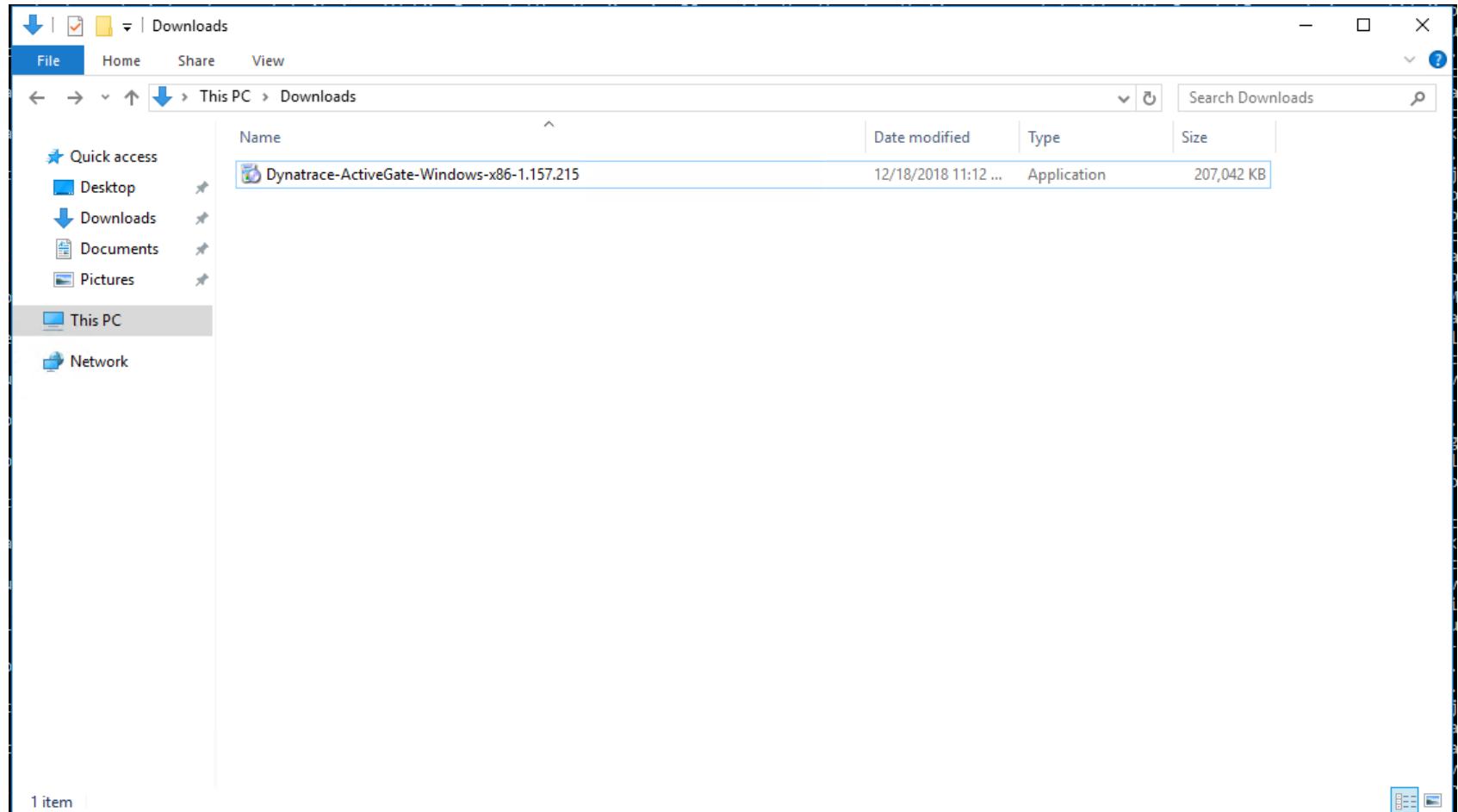
Deployment Status

Download & Install
Active Gate

Download & Install
Plugin Module

Validate Installation

Install an ActiveGate



Installation Instructions

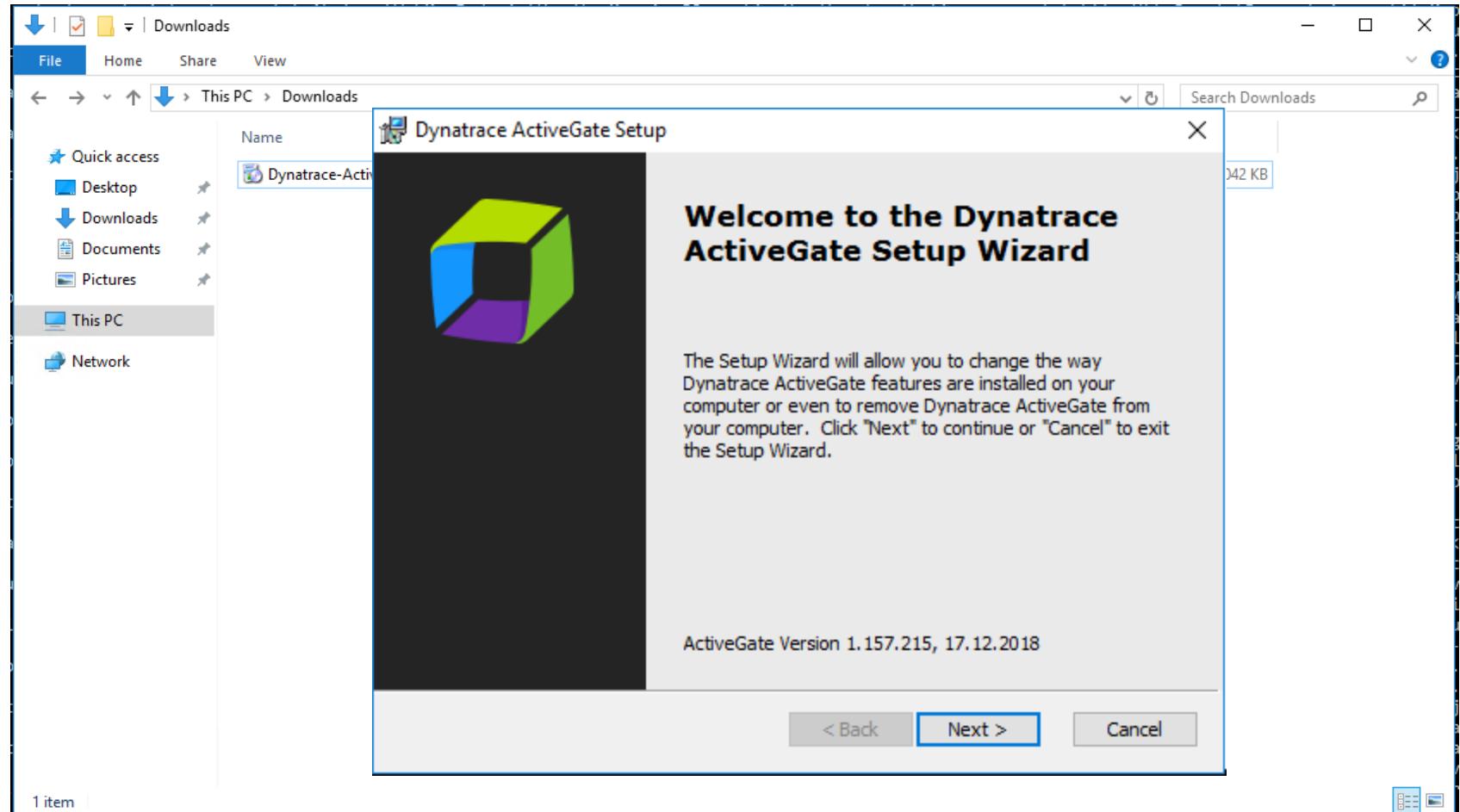
Deployment Status

Download & Install
Active Gate

Download & Install
Plugin Module

Validate Installation

Install an ActiveGate



Installation Instructions

Deployment Status

Download & Install Active Gate

Download & Install Plugin Module

Validate Installation

Install the Plugin Module

The screenshot shows the Dynatrace web interface with the title "Deployment status" at the top. On the left is a navigation sidebar with various monitoring and management options. The main content area displays a table for managing host deployments. A single row is visible for the host "EC2AMAZ-S70VKM0", which has an IP address of 172.31.72.00. It shows that the "Installed ActiveGate version" is 1.157. Below the table is a button labeled "Add ActiveGate plugin module". The top right corner of the interface features a green bar with the message "Task completed!" and other user interface elements.

Installation Instructions

Deployment Status

Download & Install
Active Gate

Download & Install
Plugin Module

Validate Installation

Install the Plugin Module

The screenshot shows the Dynatrace web interface with a dark theme. The left sidebar contains a navigation menu with items like Dashboards & reports, Dashboards, Create custom chart, Reports, Analyze, Problems, User sessions, Log files, Smartscape topology, Diagnostic tools, Monitor, Applications, Synthetic, Transactions & services, Databases, Hosts, Network, Technologies, VMware, AWS, Azure, Docker, Cloud Foundry, Manage, Deploy Dynatrace, Deployment status, and Settings. The main content area has a breadcrumb path: Deploy Dynatrace > Install ActiveGate plugin module > Windows. A green banner at the top right says "Task completed!". The central area is titled "Install module on a new ActiveGate" and contains two numbered steps: 1. Download and add ActiveGate plugin module on EC2AMAZ-S7OVKM0 ActiveGate server. It includes a button labeled "Download plugin module installer". 2. Add ActiveGate plugin. It includes a button labeled "Upload ActiveGate plugin" and a note: "Upload the plugin you already developed or find out [how to create it](#)".

Installation Instructions

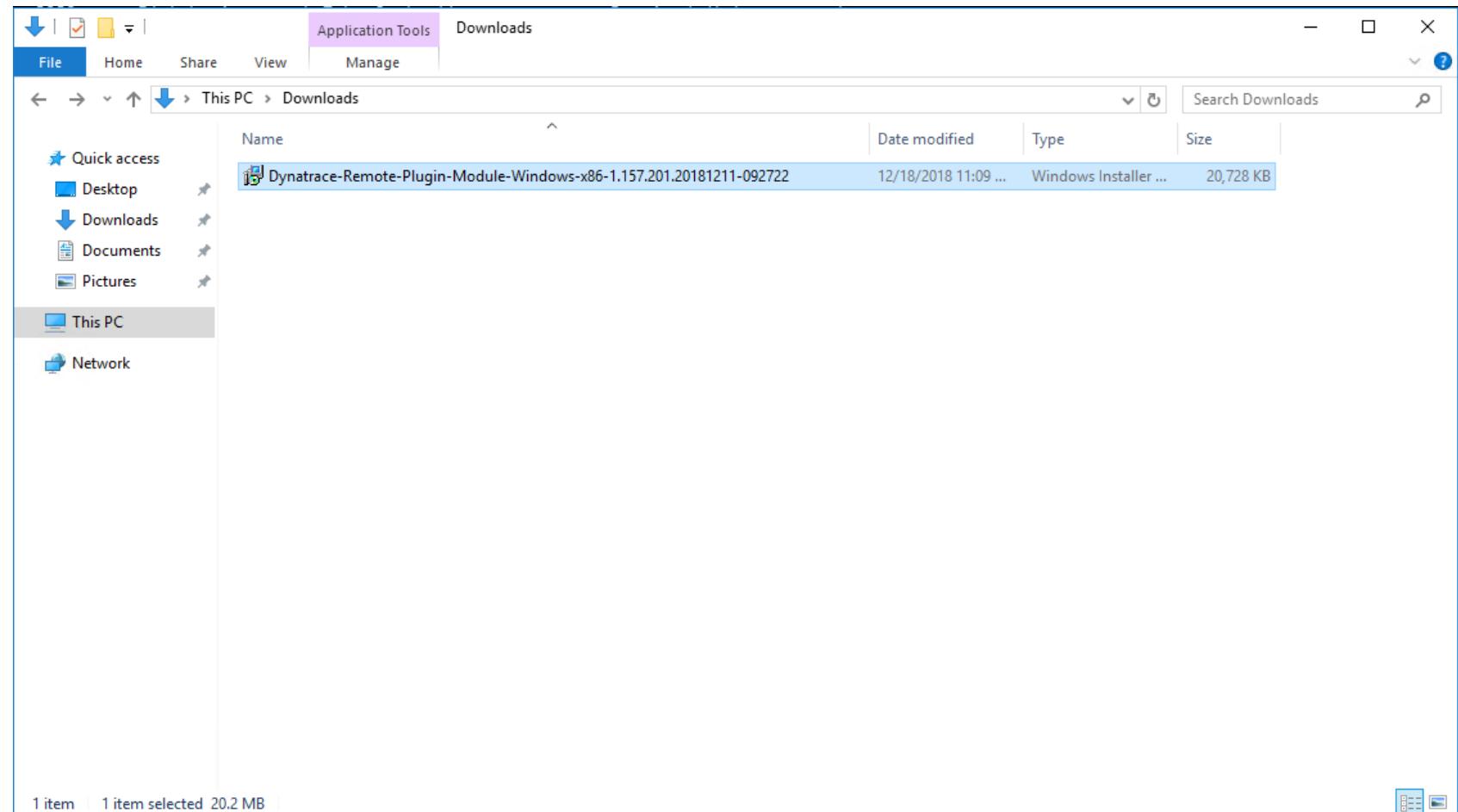
Deployment Status

Download & Install
Active Gate

Download & Install
Plugin Module

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Install the Plugin Module



Installation Instructions

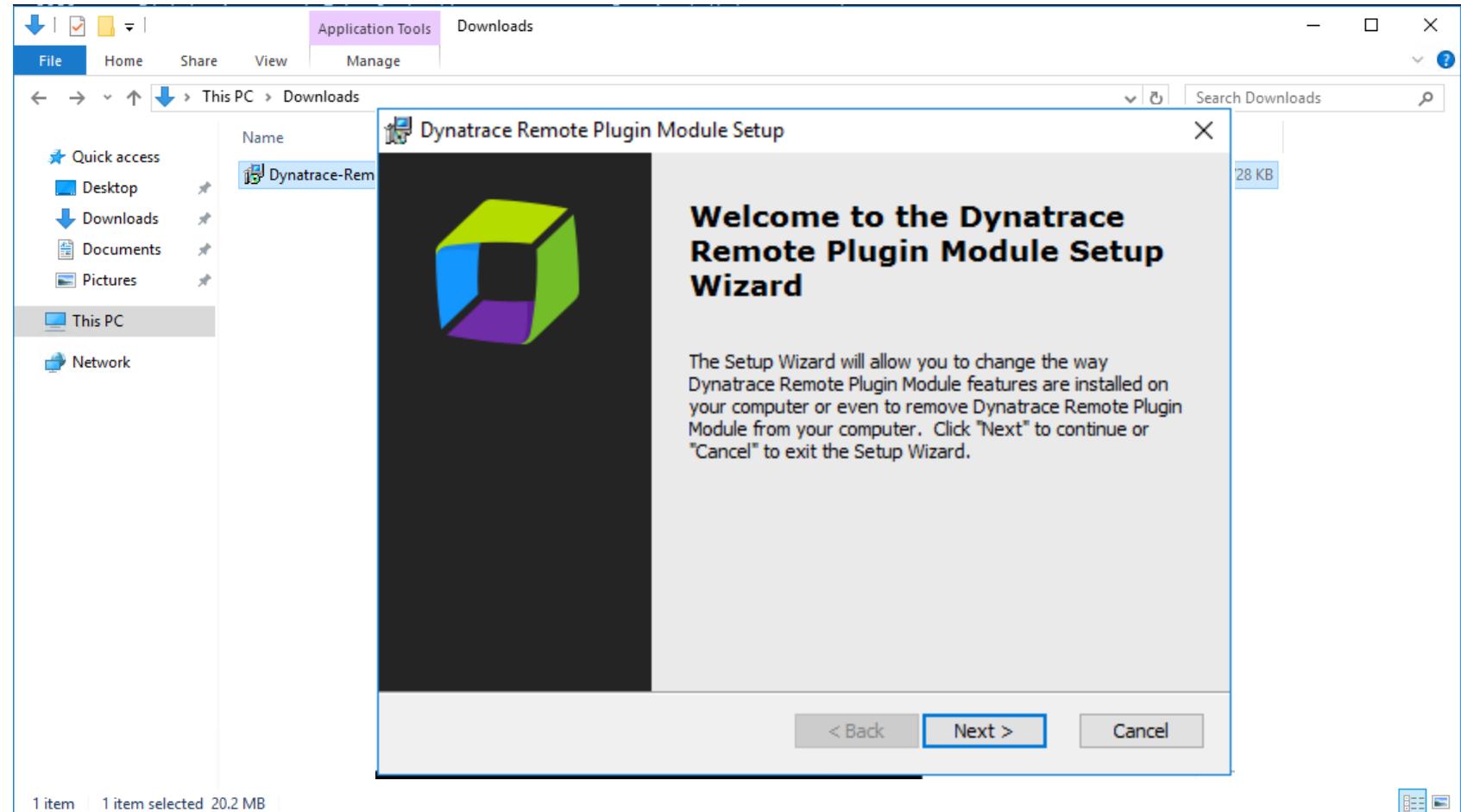
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Install the Plugin Module



Installation Instructions

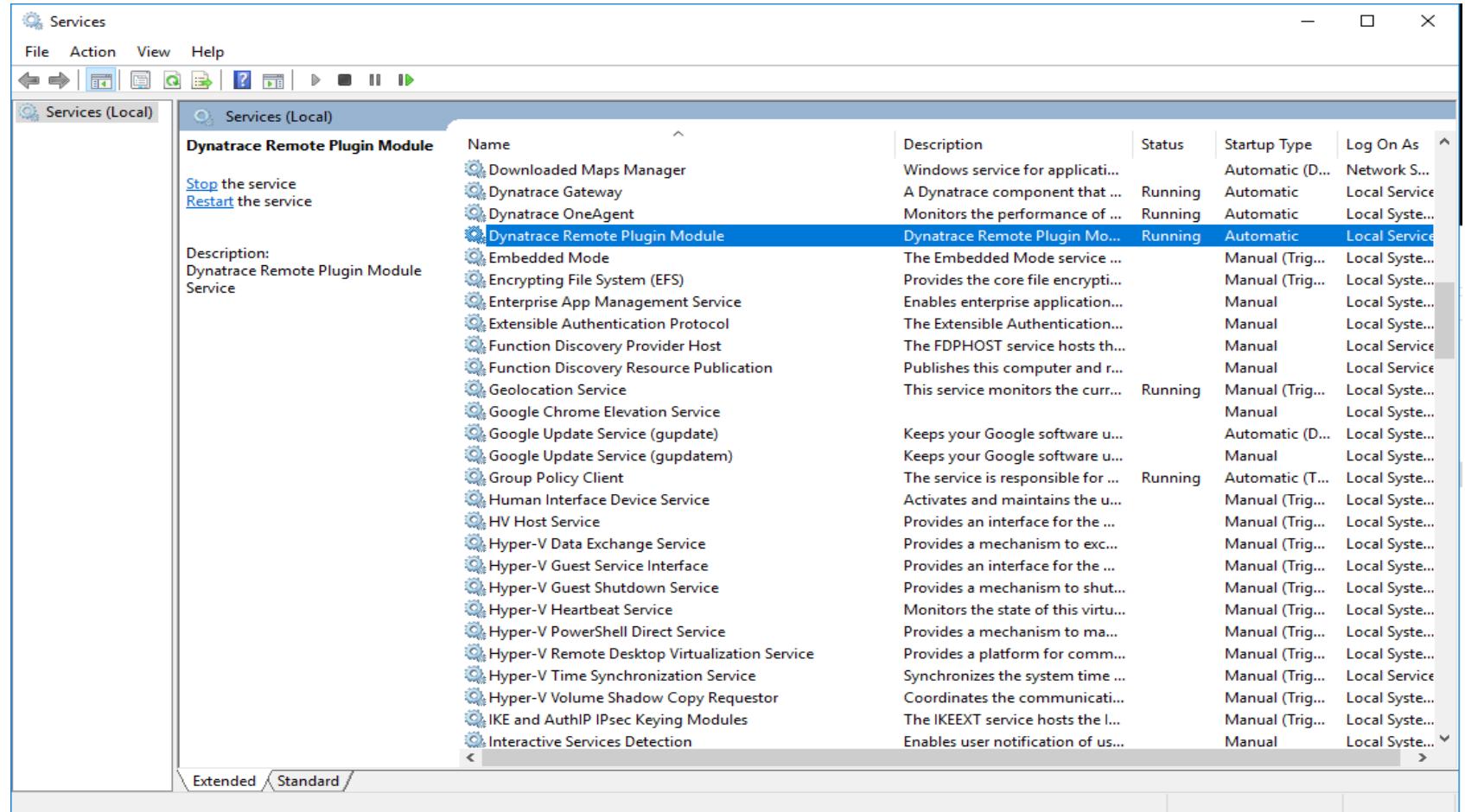
Deployment Status

Download & Install
Active Gate

Download & Install
Plugin Module

Validate Installation ◀

Validate the Installation

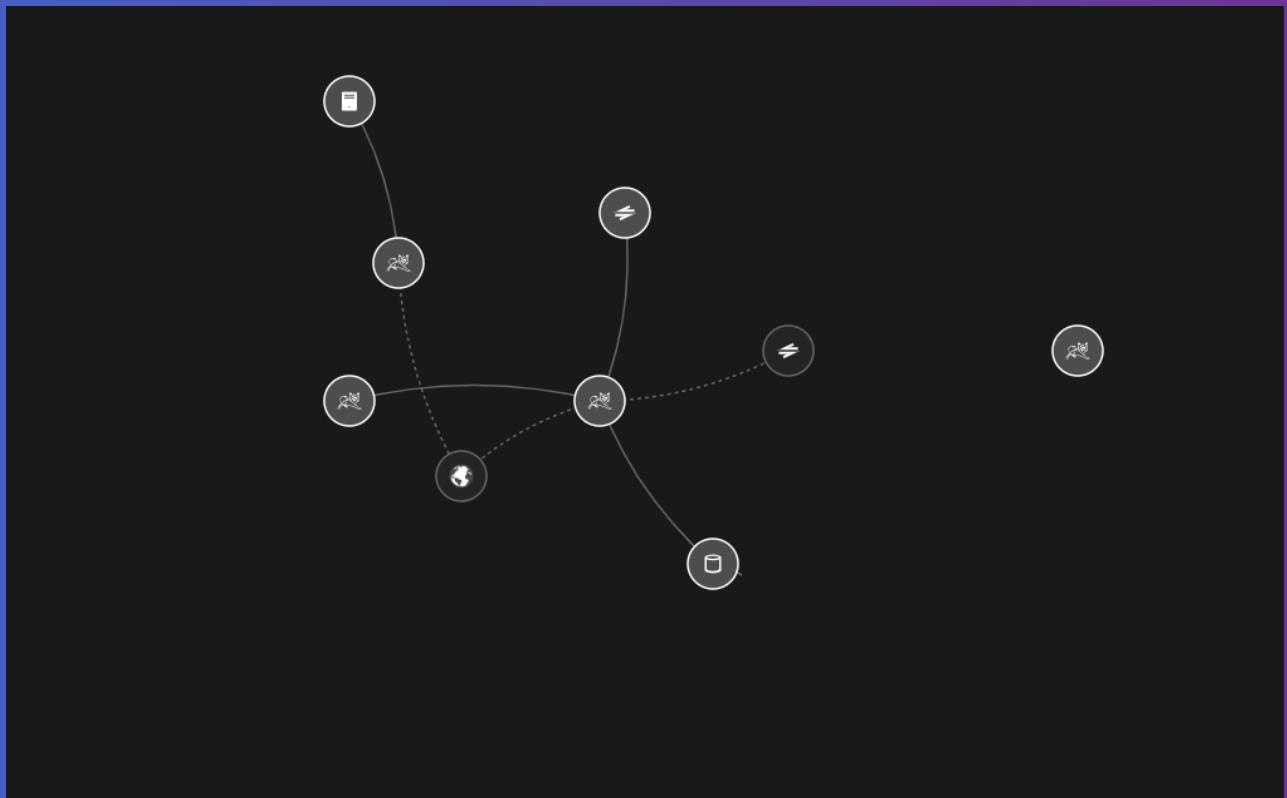


The screenshot shows the Windows Services snap-in window. The title bar reads "Services". The main pane displays a list of services, with the "Dynatrace Remote Plugin Module" service highlighted. The service details pane on the left shows the service name is "Dynatrace Remote Plugin Module Service" and its description is "Dynatrace Remote Plugin Module". The status of the service is "Running". The table lists various system services with their names, descriptions, statuses, startup types, and log on accounts.

Name	Description	Status	Startup Type	Log On As
Downloaded Maps Manager	Windows service for applic...	Automatic (D...)	Network S...	
Dynatrace Gateway	A Dynatrace component that ...	Running	Automatic	Local Syste...
Dynatrace OneAgent	Monitors the performance of ...	Running	Automatic	Local Syste...
Dynatrace Remote Plugin Module	Dynatrace Remote Plugin Mo...	Running	Automatic	Local Service
Embedded Mode	The Embedded Mode service ...	Manual (Trig...)	Local Syste...	
Encrypting File System (EFS)	Provides the core file encrypti...	Manual (Trig...)	Local Syste...	
Enterprise App Management Service	Enables enterprise application...	Manual	Local Syste...	
Extensible Authentication Protocol	The Extensible Authentication...	Manual	Local Syste...	
Function Discovery Provider Host	The FDHOST service hosts th...	Manual	Local Service	
Function Discovery Resource Publication	Publishes this computer and r...	Manual	Local Service	
Geolocation Service	This service monitors the curr...	Running	Manual (Trig...)	Local Syste...
Google Chrome Elevation Service	Manual	Local Syste...		
Google Update Service (gupdate)	Automatic (D...)	Local Syste...		
Google Update Service (gupdatem)	Manual	Local Syste...		
Group Policy Client	The service is responsible for ...	Running	Automatic (T...)	Local Syste...
Human Interface Device Service	Activates and maintains the u...	Manual (Trig...)	Local Syste...	
HV Host Service	Provides an interface for the ...	Manual (Trig...)	Local Syste...	
Hyper-V Data Exchange Service	Provides a mechanism to exc...	Manual (Trig...)	Local Syste...	
Hyper-V Guest Service Interface	Provides an interface for the ...	Manual (Trig...)	Local Syste...	
Hyper-V Guest Shutdown Service	Provides a mechanism to shut...	Manual (Trig...)	Local Syste...	
Hyper-V Heartbeat Service	Monitors the state of this virt...	Manual (Trig...)	Local Syste...	
Hyper-V PowerShell Direct Service	Provides a mechanism to ma...	Manual (Trig...)	Local Syste...	
Hyper-V Remote Desktop Virtualization Service	Provides a platform for comm...	Manual (Trig...)	Local Syste...	
Hyper-V Time Synchronization Service	Synchronizes the system time ...	Manual (Trig...)	Local Service	
Hyper-V Volume Shadow Copy Requestor	Coordinates the communicati...	Manual (Trig...)	Local Syste...	
IKE and AuthIP IPsec Keying Modules	The IKEEXT service hosts the l...	Manual (Trig...)	Local Syste...	
Interactive Services Detection	Enables user notification of us...	Manual	Local Syste...	

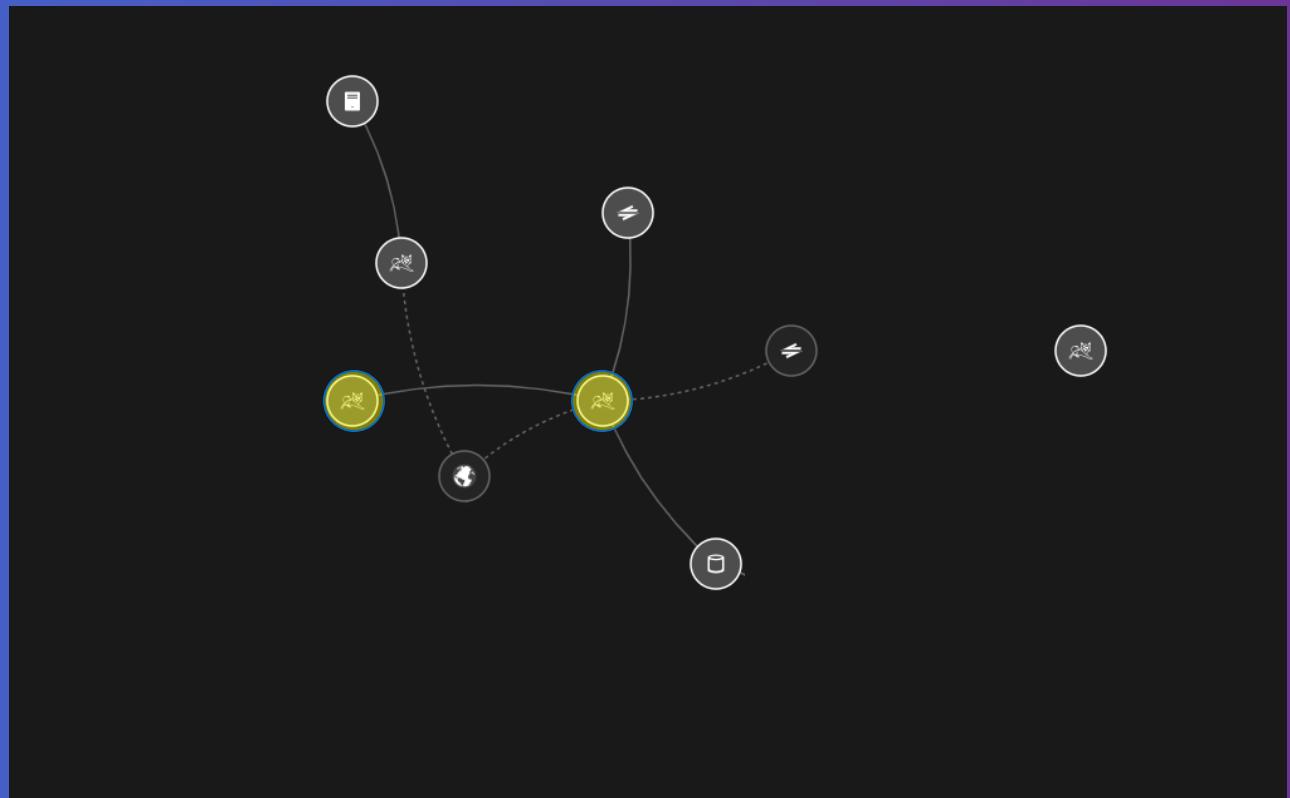
OneAgent Plugins

- Already monitored by OneAgent
- Already part of the Topology
- Additional value
 - Metrics
 - Thresholds



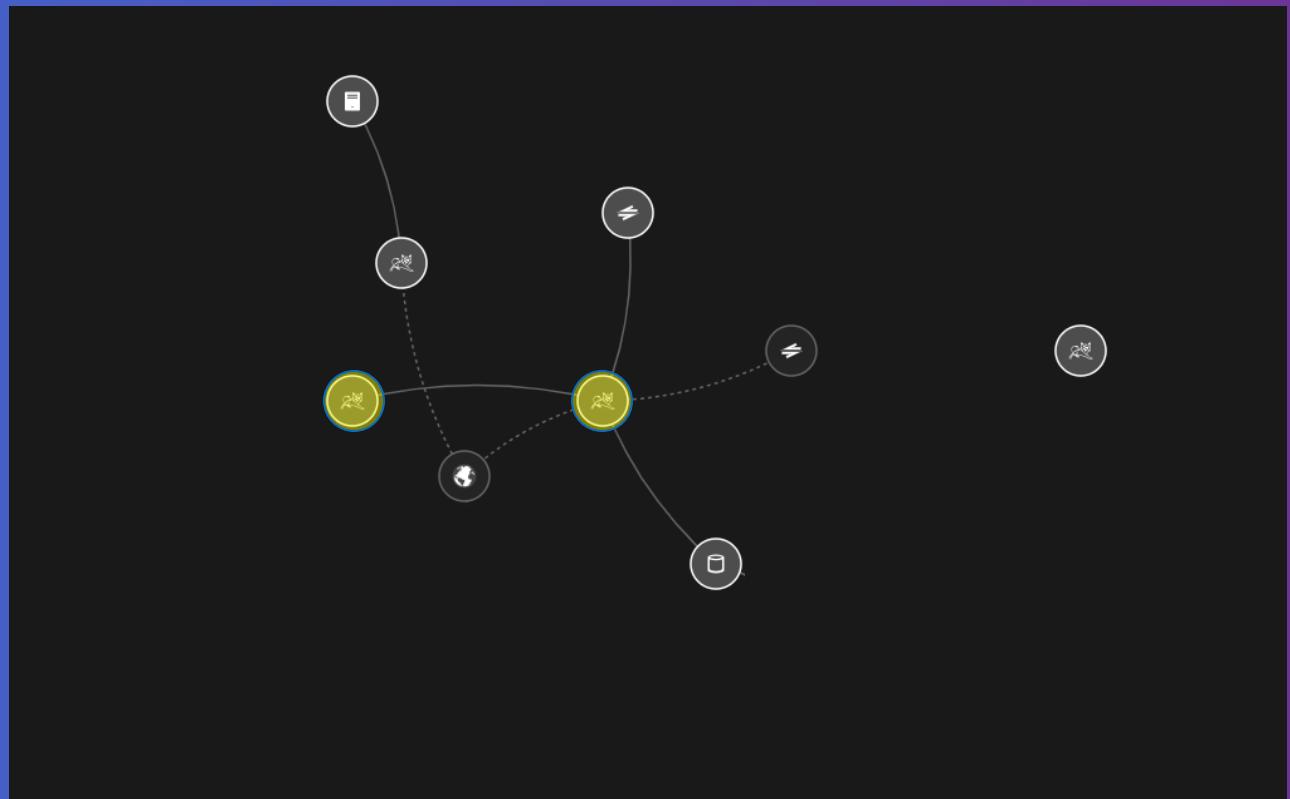
OneAgent Plugins

- Already monitored by OneAgent
- Already part of the Topology
- Additional value
 - Metrics
 - Thresholds



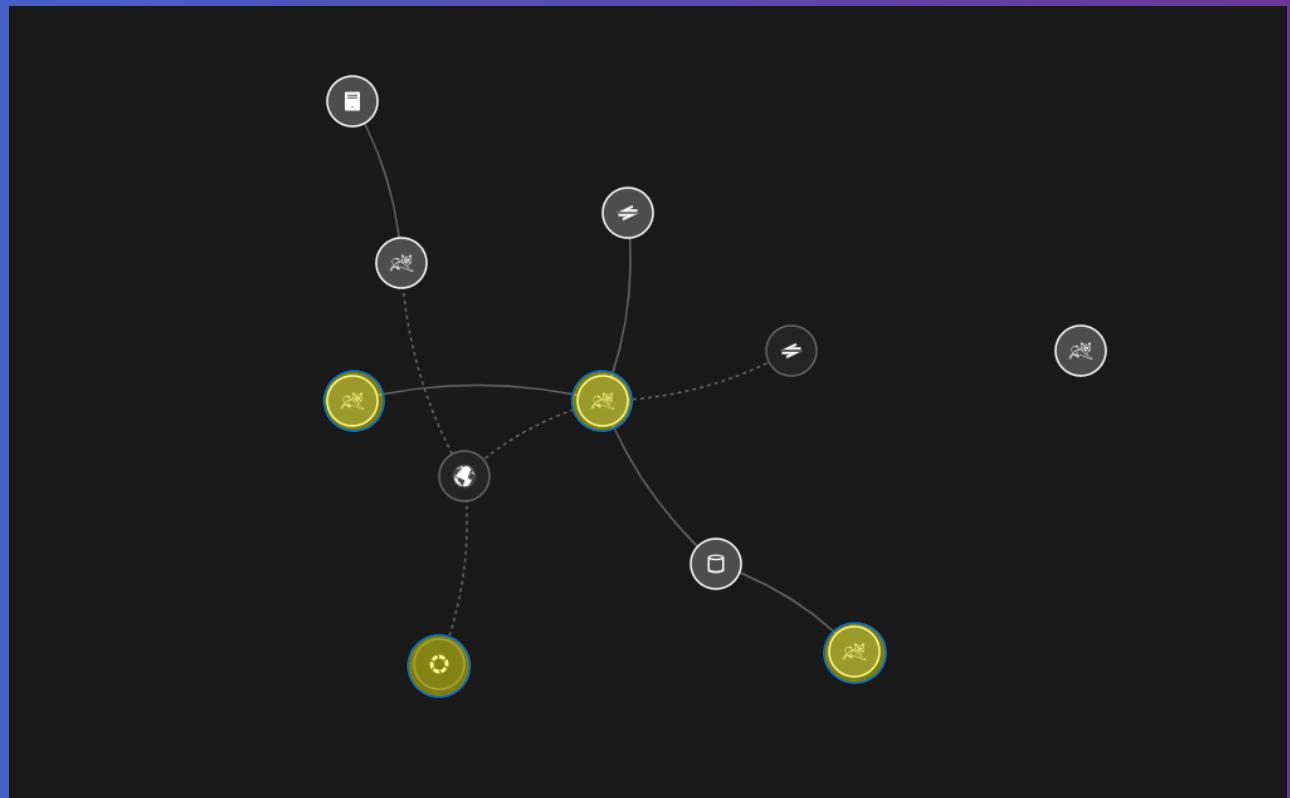
ActiveGate Plugins

- Building Topology from scratch
- Additional Value
 - Custom Devices
 - Properties
 - Metrics
 - Thresholds
 - Events



ActiveGate Plugins

- Building Topology from scratch
 - Additional Value
 - Custom Devices
 - Properties
 - Metrics
 - Thresholds
 - Events



ActiveGate Plugin Metadata

```
1 {  
2   "name": "custom.python.hotday",  
3   "version": "1.4",  
4   "type": "python",  
5   "favicon": "https://styles.lab.dynatrace.org/assets/resource/  
6   "entity": "PROCESS_GROUP_INSTANCE",  
7   "processTypeNames": [ "JAVA"],  
8   "source": {  
9     "package": "hotday_plugin",  
10    "className": "HOTDayPlugin",  
11    "install_requires": ["requests>=2.6.0"],  
12    "activation": "Singleton"  
13  },
```

```
1 {  
2   "name": "custom.remote.python.hotday",  
3   "version": "1.16",  
4   "type": "python",  
5   "entity": "CUSTOM_DEVICE",  
6   "processTypeNames": [ "PYTHON"],  
7   "technologies": [ "Apache Tomcat"],  
8   "favicon": "https://styles.lab.dynatrace.org/assets/resource/  
9   "source": {  
10    "package": "hotday_activegate_plugin",  
11    "className": "HOTDayPluginRemote",  
12    "install_requires": ["requests>=2.6.0", "urllib"],  
13    "activation": "Remote"  
14  },  
15}
```

ActiveGate Plugin Metadata

```
1 {  
2   "name": "custom.python.hotday",  
3   "version": "1.4",  
4   "type": "python",  
5   "favicon": "https://styles.lab.dynatrace.org/assets/resource/  
▶     entity": "PROCESS_GROUP_INSTANCE",  
7   "processTypeNames": [ "JAVA"],  
8   "source": {  
9     "package": "hotday_plugin",  
10    "className": "HOTDayPlugin",  
11    "install_requires": ["requests>=2.6.0"],  
12    "activation": "Singleton"  
13  },
```

```
1 {  
2   "name": "custom.remote.python.hotday",  
3   "version": "1.16",  
4   "type": "python",  
▶     "entity": "CUSTOM_DEVICE",  
6   "processTypeNames": [ "PYTHON"],  
7   "technologies": [ "Apache Tomcat"],  
8   "favicon": "https://styles.lab.dynatrace.org/assets/resource/  
9   "source": {  
10    "package": "hotday_activegate_plugin",  
11    "className": "HOTDayPluginRemote",  
12    "install_requires": ["requests>=2.6.0", "urllib"],  
13    "activation": "Remote"  
14  },  
"  "  "
```

ActiveGate Plugin Metadata

```
1 {  
2   "name": "custom.python.hotday",  
3   "version": "1.4",  
4   "type": "python",  
5   "favicon": "https://styles.lab.dynatrace.org/assets/resour  
6   "entity": "PROCESS_GROUP_INSTANCE",  
7   "processTypeNames": [ "JAVA"],  
8   "source": {  
9     "package": "hotday_plugin",  
10    "className": "HOTDayPlugin",  
11    "install_requires": ["requests>=2.6.0"],  
12    "activation": "Singleton"  
13  },
```

```
1 {  
2   "name": "custom.remote.python.hotday",  
3   "version": "1.16",  
4   "type": "python",  
5   "entity": "CUSTOM_DEVICE",  
6   "processTypeNames": [ "PYTHON"],  
7   "technologies": [ "Apache Tomcat"],  
8   "favicon": "https://styles.lab.dynatrace.org/assets/resour  
9   "source": {  
10    "package": "hotday_activegate_plugin",  
11    "className": "HOTDayPluginRemote",  
12    "install_requires": ["requests>=2.6.0", "urllib"],  
13    "activation": "Remote"  
14  },  
15}
```

ActiveGate Plugin Metadata

```
161 "configUI": {  
162   "displayName": "HOT Day Plugin",  
163   "properties": []  
164   {  
165     "key" : "port",  
166     "displayName" : "port",  
167     "displayHint": "8080"  
168   }  
169 }]  
170 }
```

```
162 "configUI": {  
163   "displayName": "HOT Day ActiveGate Plugin",  
164   "properties": [  
165     {  
166       "key" : "url",  
167       "displayName" : "URL",  
168       "displayHint": "http://localhost:8080"  
169     }  
170   ]  
171 }  
172 }
```

Agenda

Overview

Set up environment

OneAgent Plugin

ActiveGate Plugin ◀

API

Roadmap and best
practices

ActiveGate Plugin – Scheduling the Plugin

Settings > Monitoring > Monitored technologies > HOT Day ActiveGate Plugin

Settings

- Monitoring
- Setup and overview
- Monitored technologies**
- Monitoring overview
- Host naming
- Processes and containers
- Detection and naming
- Web & mobile monitoring
- Real user & synthetic monitoring
- Cloud and virtualization
- Connect vCenter, Azure, Cloud Foundry o...
- Server-side service monitoring
- Manage & customize service monitoring
- Log Analytics
- Set up management of logs
- Anomaly detection
- Configure detection sensitivity

HOT Day ActiveGate Plugin
Version: 116 Type: ActiveGate plugin

Customize your plugin

Add alerts, adjust charts and more. See [ActiveGate plugin help](#)
Upload the zip archive with Python script and JSON to deploy your changes.

[Download plugin](#) [Upload plugin](#)

[Endpoint configuration](#) [Metrics](#) [Changelog](#)

Add new endpoint

Endpoint name	Status	Monitoring off/on	Delete	Edit
EC2AMAZ-S70VKM0	Ok	<input checked="" type="button"/>		

Endpoint name: EC2AMAZ-S70VKM0 URL: http://ec2-52-41-83-14.us-west-2.compute.amazonaws.com

Choose ActiveGate: EC2AMAZ-S70VKM0

[Cancel](#) [Update](#)

Agenda

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ActiveGate Plugin ◀

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Roadmap and best practices

ActiveGate Plugin – Custom Devices

Technologies › Token Gateway › ec2-52-41-83-14.us-west-2.compute.amazonaws.com

 ec2-52-41-83-14.us-west-2.compu... ...

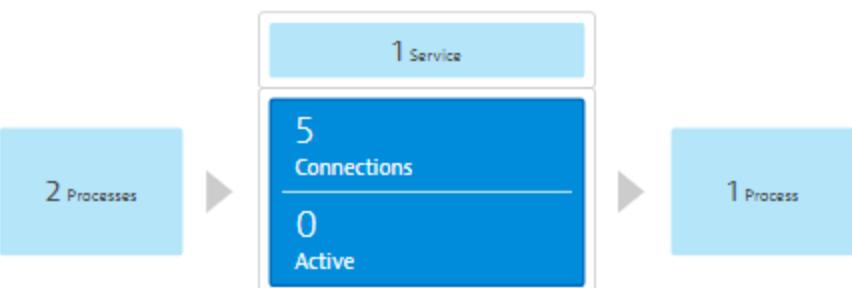
Properties

+ Add tag

Custom device ID	ec2-52-41-83-14.us-west-2.compute.amazonaws.c...
Ports	8080
IP addresses	52.41.83.14
Operating System	Linux 4.15.0-1029-aws
Time Zone	Etc/UTC

No problems Today, 13:10 - 13:40

No events Today, 13:10 - 13:40



The diagram illustrates a data flow process. It starts with a light blue box labeled "2 Processes". An arrow points to a larger central box divided into three horizontal sections: a top section labeled "1 Service", a middle section labeled "5 Connections" with a line separator, and a bottom section labeled "0 Active". Another arrow points from the central box to a final light blue box labeled "1 Process".

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Set up environment

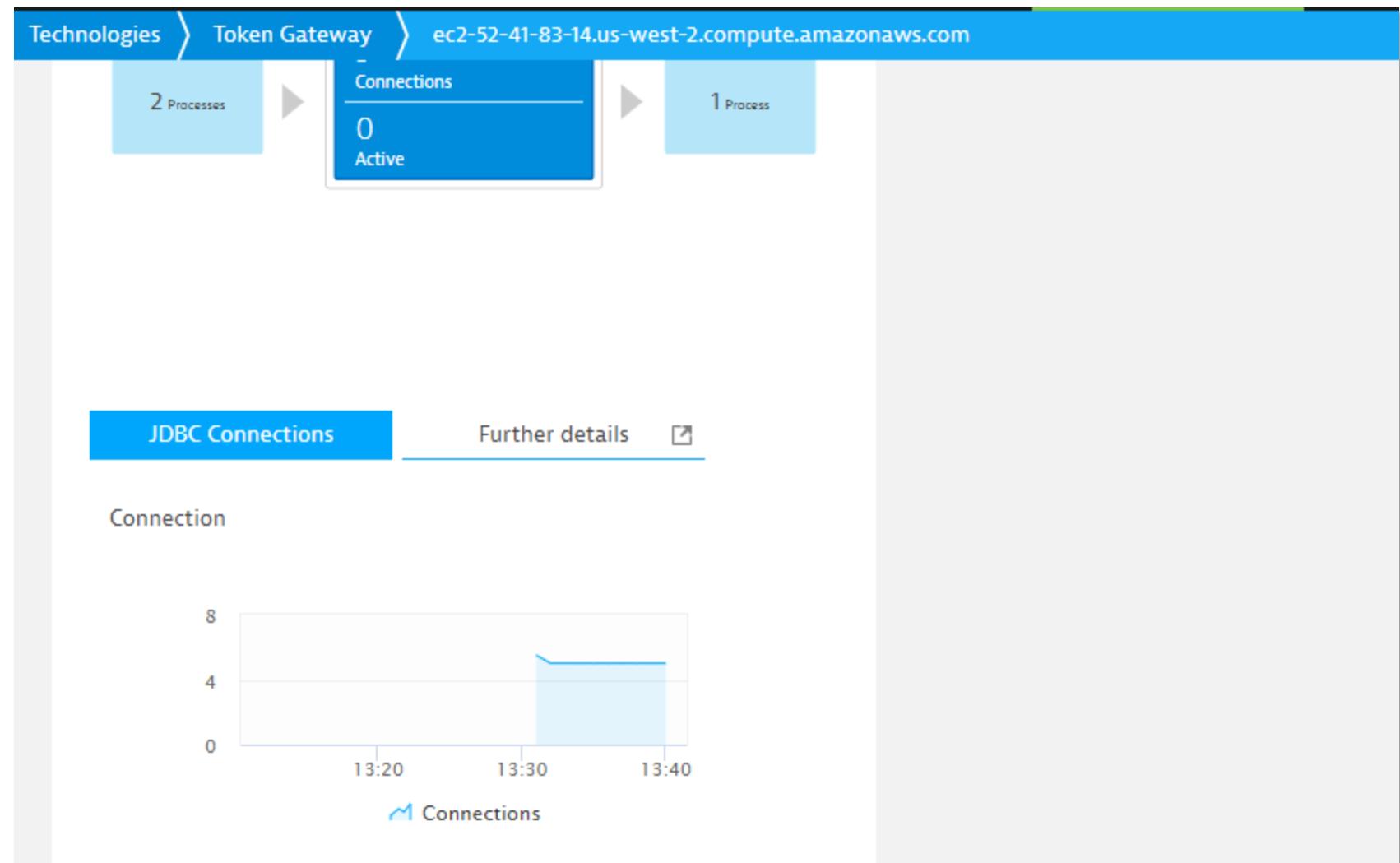
OneAgent Plugin

ActiveGate Plugin ◀

API

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practices

ActiveGate Plugin – Custom Metrics



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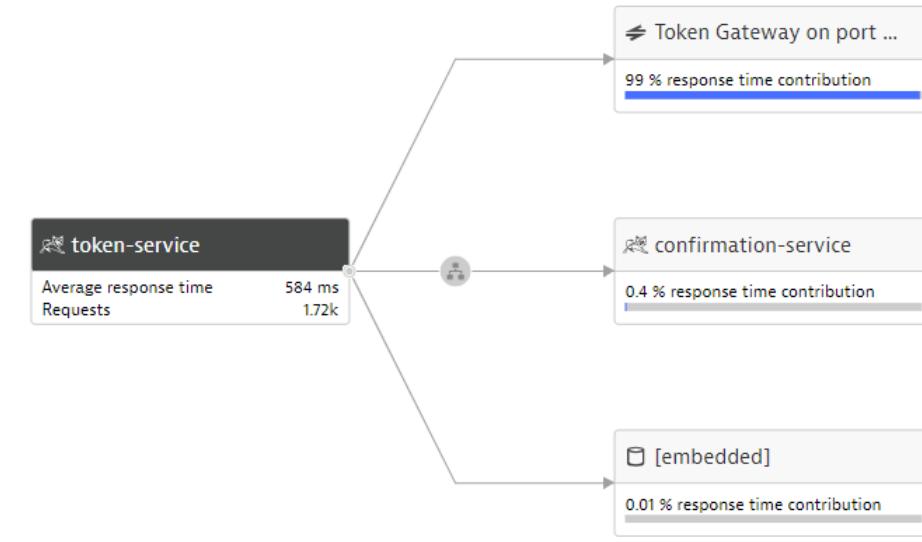
Roadmap and best
practices

ActiveGate Plugin – Service Flow

Transactions & services > token-service > Details > Service flow

Showing service flow of requests of 'token-service'

Today, 13:14 - 13:44 (30 Minutes) | Apply | Show | Response time | Throughput | Add filter



Token Gateway on port ...
99 % response time contribution

confirmation-service
0.4 % response time contribution

[embedded]
0.01 % response time contribution

Passing transactions Infrastructure

token-service

- Avg. response time 584 ms
- Avg. time spent in called services 582 ms
- Requests 1.72k
- Failed requests 986
- Calls to other services 2.46k

See every single request in PurePath view [View PurePaths](#)

Understand and analyze which web requests are the most expensive and most frequently called [View web requests](#)

No service selected
Select any service in the service flow to get more details and perform deeper analysis

Agenda

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Set up environment

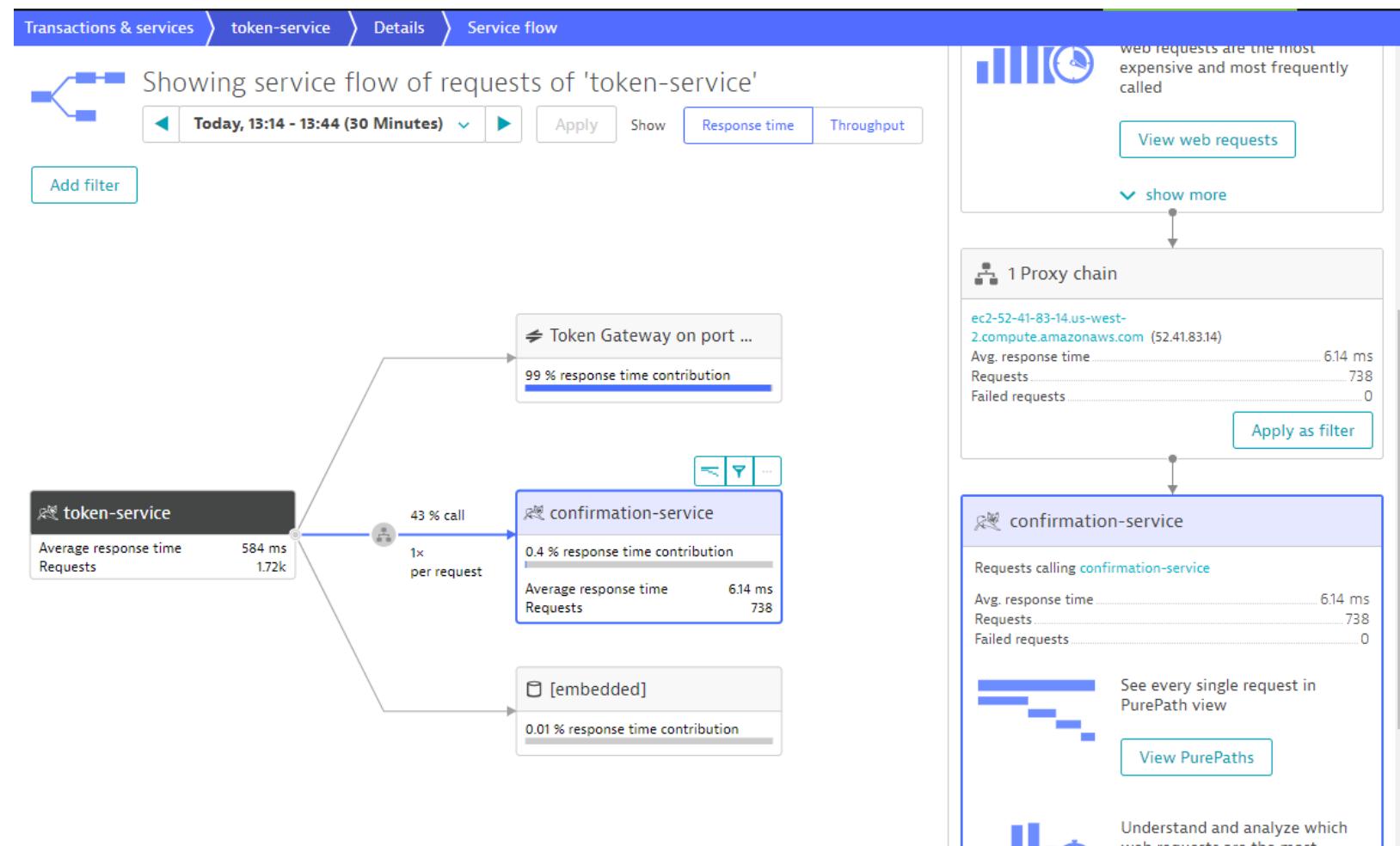
OneAgent Plugin

ActiveGate Plugin ◀

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ActiveGate Plugin – Service Flow



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Plugins vs API ◀

API Explorer

Register Metric

Publish Timeseries

Validate Results

Thresholds

API



API

Plugins vs API ◀

API Explorer

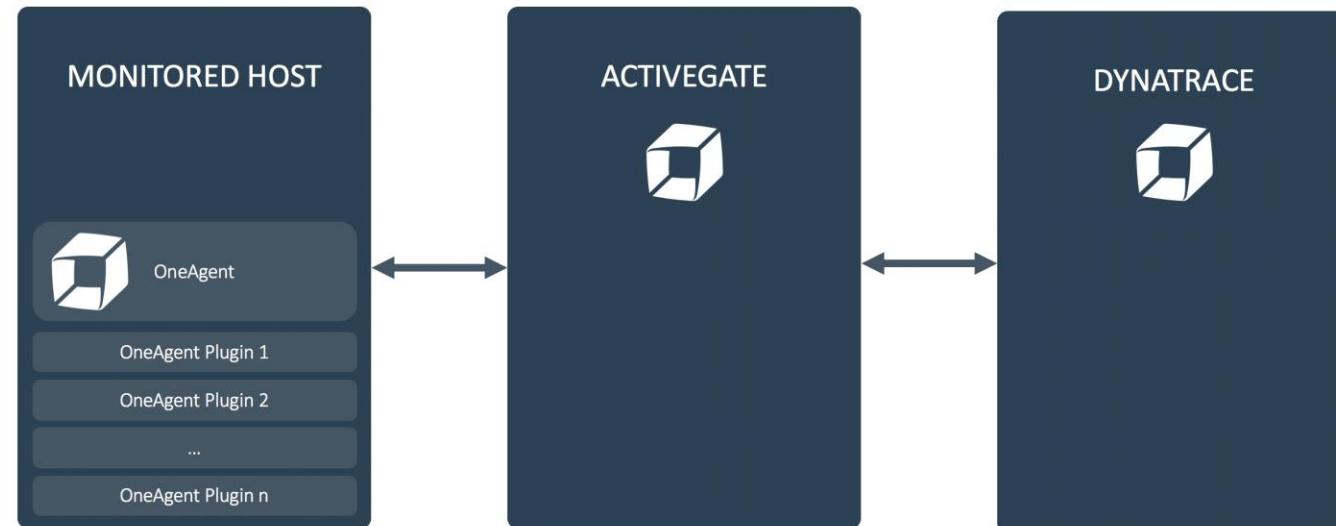
Register Metric

Publish Timeseries

Validate Results

Thresholds

Plugins vs API



API

Plugins vs API ◀

API Explorer

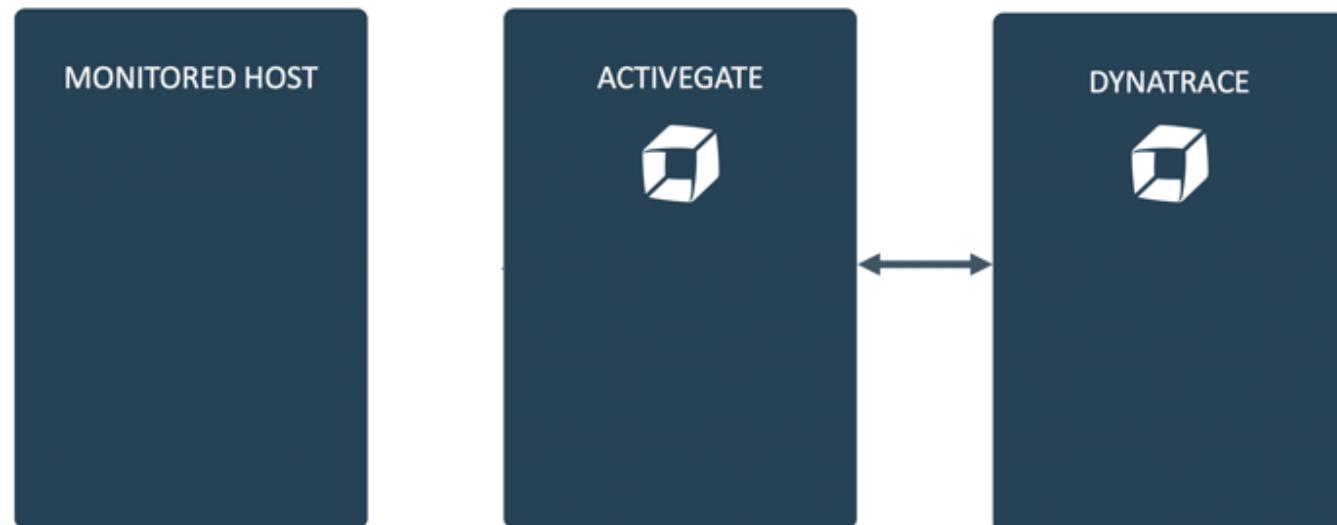
Register Metric

Publish Timeseries

Validate Results

Thresholds

Plugins vs API



API

Plugins vs API ◀

API Explorer

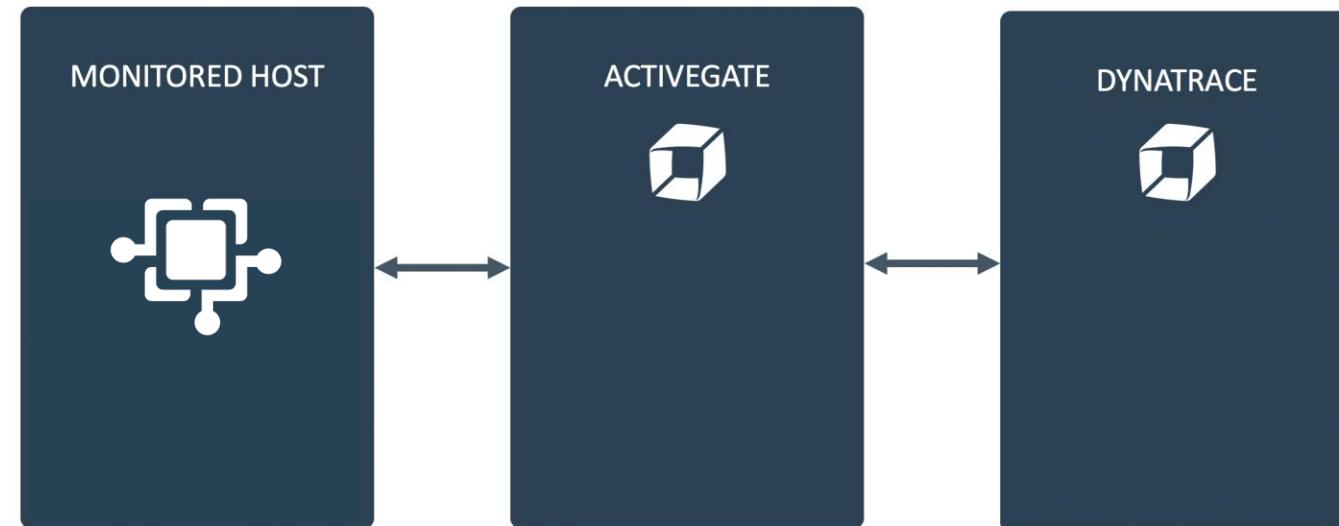
Register Metric

Publish Timeseries

Validate Results

Thresholds

Plugins vs API



API

Plugins vs API ◀

API Explorer

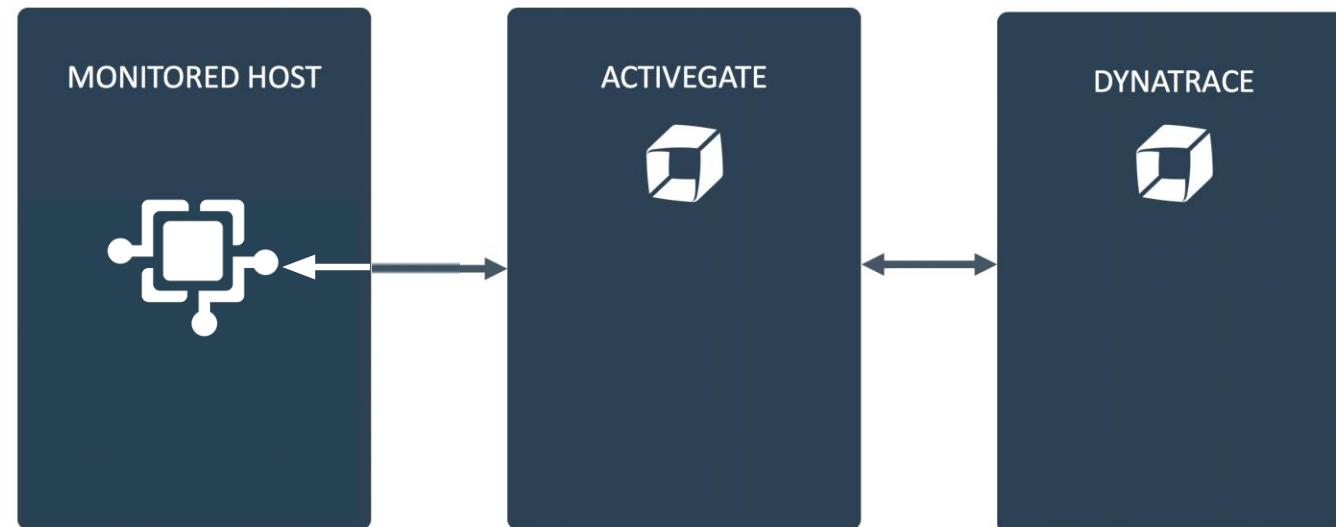
Register Metric

Publish Timeseries

Validate Results

Thresholds

Plugins vs API



API

Plugins vs API ◀

API Explorer

Register Metric

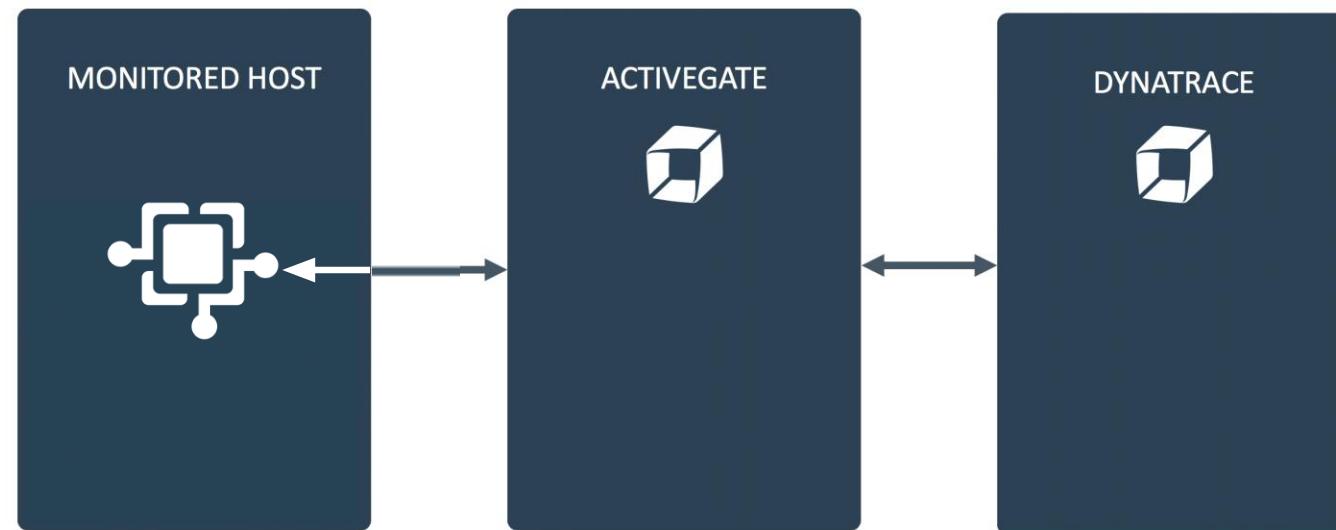
Publish Timeseries

Validate Results

Thresholds

Plugins vs API

- REST API
- Manually scheduled
 - No Dynatrace Component involved



API

Plugins vs API

API Explorer ◀

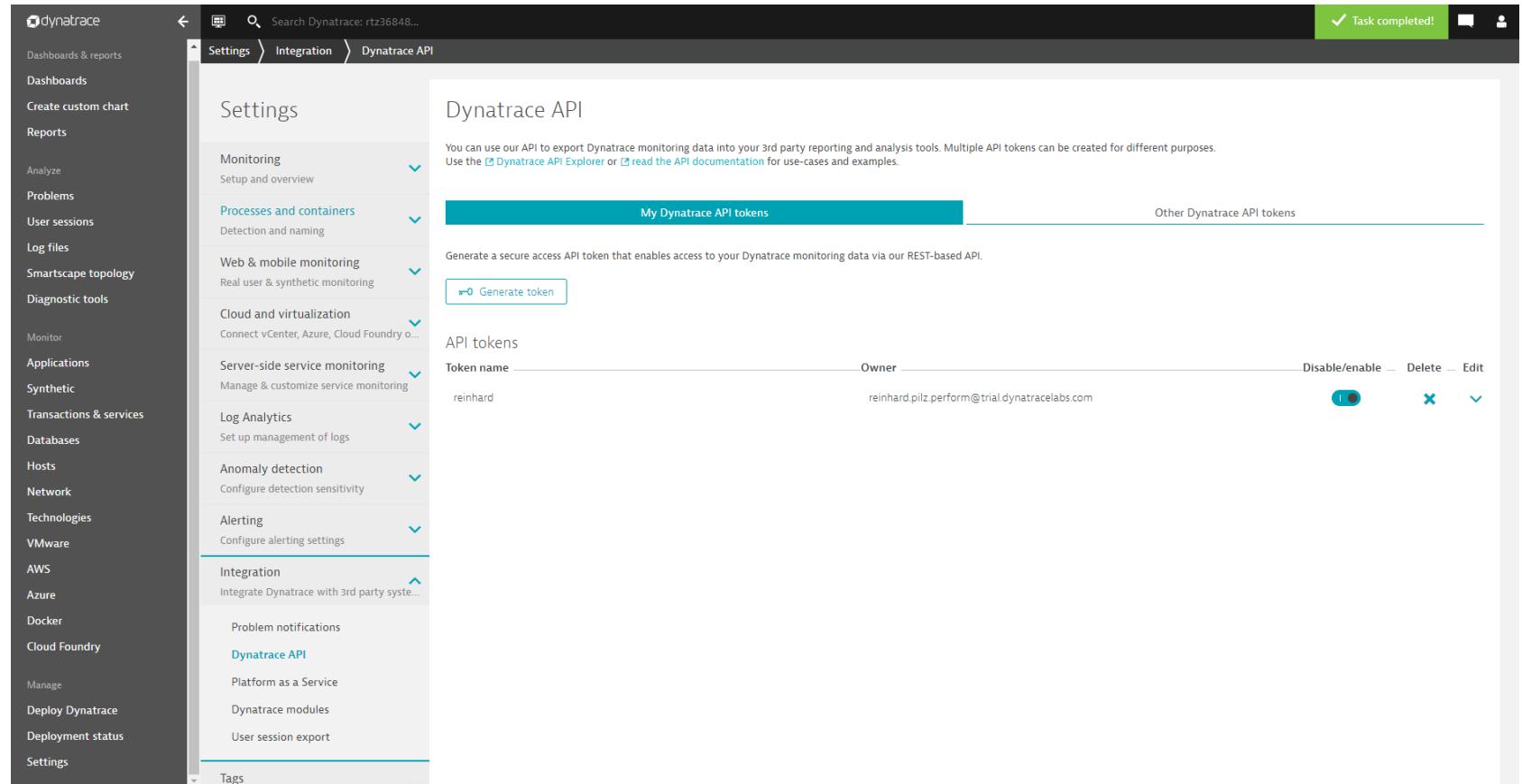
Register Metric

Publish Timeseries

Validate Results

Thresholds

API Explorer



The screenshot shows the Dynatrace API Explorer interface. The left sidebar lists various monitoring and management sections such as Dashboards, Reports, Problems, User sessions, Log files, Smartscape topology, Diagnostic tools, Monitor, Applications, Synthetic, Transactions & services, Databases, Hosts, Network, Technologies, VMware, AWS, Azure, Docker, Cloud Foundry, Manage, Deploy Dynatrace, Deployment status, and Settings. The main content area is titled "Dynatrace API" and contains the following text: "You can use our API to export Dynatrace monitoring data into your 3rd party reporting and analysis tools. Multiple API tokens can be created for different purposes. Use the [Dynatrace API Explorer](#) or [read the API documentation](#) for use-cases and examples." Below this is a section titled "My Dynatrace API tokens" which includes a "Generate token" button. A table lists existing tokens: "reinhard" (Owner: reinhard.pilz.perform@trial.dynatracelabs.com). The table has columns for Token name, Owner, Disable/enable, Delete, and Edit.

Token name	Owner	Disable/enable	Delete	Edit
reinhard	reinhard.pilz.perform@trial.dynatracelabs.com			

API

Plugins vs API

API Explorer ◀

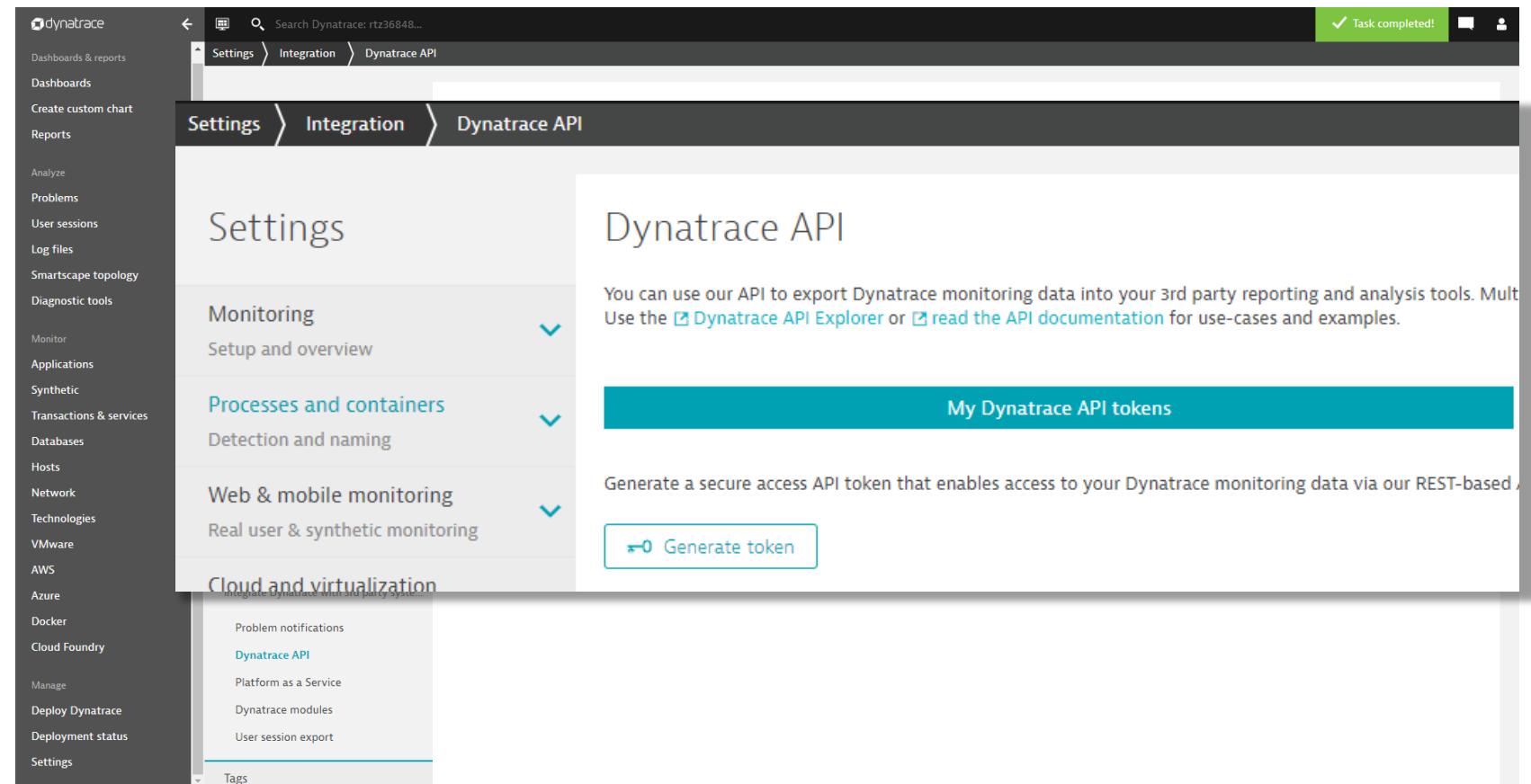
Register Metric

Publish Timeseries

Validate Results

Thresholds

API Explorer



The screenshot shows the Dynatrace web interface with the following navigation path:

- Left sidebar: Dashboards & reports, Dashboards, Create custom chart, Reports, Analyze, Problems, User sessions, Log files, Smartscape topology, Diagnostic tools, Monitor, Applications, Synthetic, Transactions & services, Databases, Hosts, Network, Technologies, VMware, AWS, Azure, Docker, Cloud Foundry, Manage, Deploy Dynatrace, Deployment status, Settings.
- Top header: Search bar (Search Dynatrace: rtz36848...), Task completed! icon.
- Current location: Settings > Integration > Dynatrace API
- Main content area:
 - Settings**
 - Dynatrace API**: You can use our API to export Dynatrace monitoring data into your 3rd party reporting and analysis tools. Mult... Use the [Dynatrace API Explorer](#) or [read the API documentation](#) for use-cases and examples.
 - My Dynatrace API tokens**: Generate a secure access API token that enables access to your Dynatrace monitoring data via our REST-based API.
 - Generate token** button.
- Bottom footer: Integrate Dynatrace with third-party systems.

API

Plugins vs API

API Explorer ◀

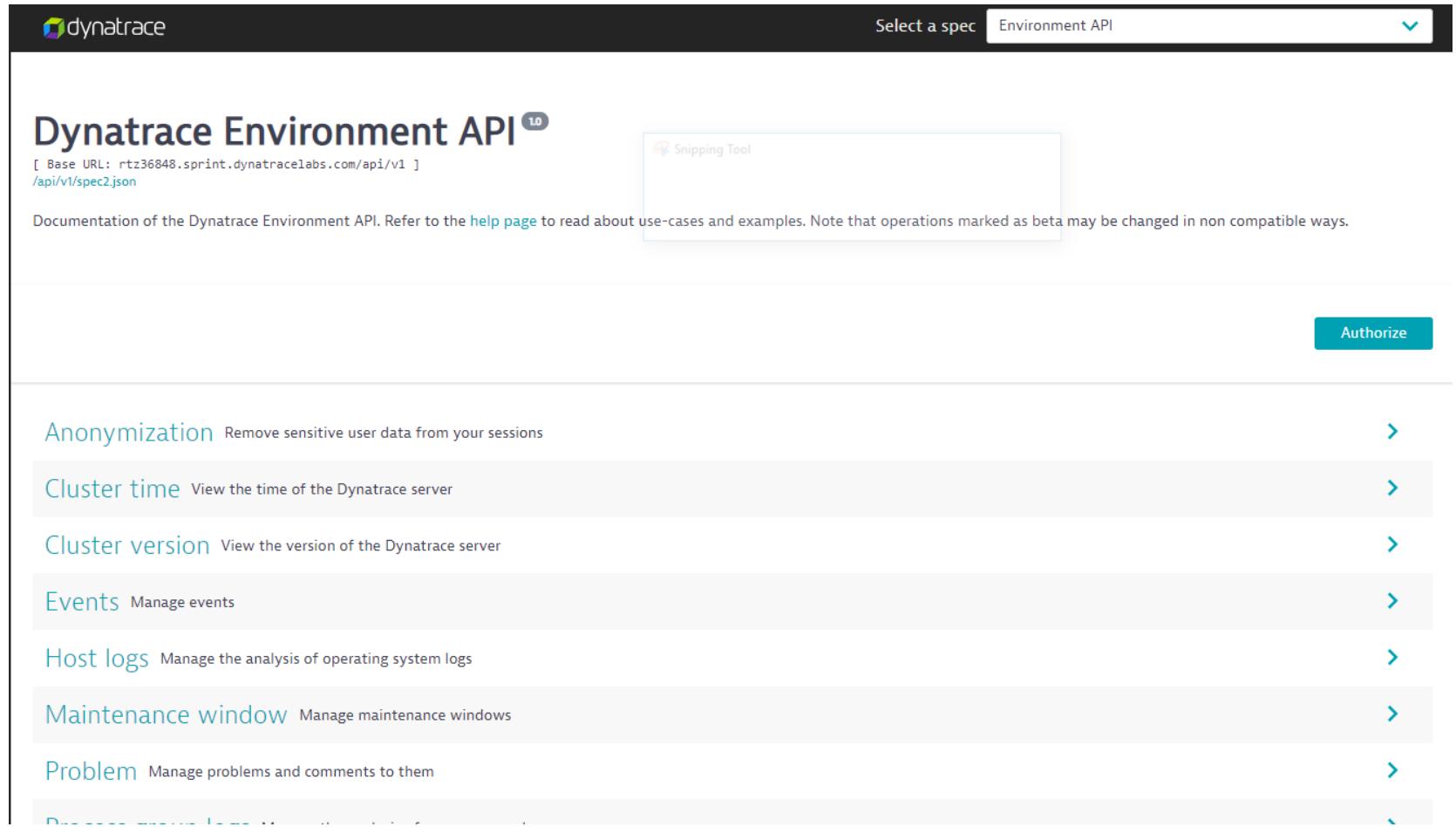
Register Metric

Publish Timeseries

Validate Results

Thresholds

API Explorer



The screenshot shows the Dynatrace Environment API Explorer interface. At the top, there is a navigation bar with the Dynatrace logo, a dropdown menu labeled "Select a spec" set to "Environment API", and a "Authorize" button. Below the header, the title "Dynatrace Environment API" is displayed with a version indicator "(1.0)". A note indicates the base URL: "Base URL: rtz36848.sprint.dynatracelabs.com/api/v1" and a specific endpoint: "/api/v1/spec2.json". A "Snipping Tool" icon is present in a box. A descriptive text block states: "Documentation of the Dynatrace Environment API. Refer to the [help page](#) to read about use-cases and examples. Note that operations marked as beta may be changed in non compatible ways." A list of API endpoints is shown, each with a description and a right-pointing arrow:

- Anonymization Remove sensitive user data from your sessions
- Cluster time View the time of the Dynatrace server
- Cluster version View the version of the Dynatrace server
- Events Manage events
- Host logs Manage the analysis of operating system logs
- Maintenance window Manage maintenance windows
- Problem Manage problems and comments to them

API

Plugins vs API

API Explorer ◀

Register Metric

Publish Timeseries

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Thresholds

API Explorer

Threshold Manage thresholds

Timeseries Manage metrics

GET /timeseries Lists all metric definitions, along with parameters of each metric

GET /timeseries/{timeseriesIdentifier} Gets the parameters of the specified metric and, optionally, its data points

POST /timeseries/{timeseriesIdentifier} Lists all available metric data points, matching specified parameters

PUT /timeseries/{timeseriesIdentifier} Creates a new custom metric

DELETE /timeseries/{timeseriesIdentifier} Deletes the specified custom metric

Topology & Smartscape - Application Manage applications

Topology & Smartscape - Custom device Create a custom device and push data to it

POST /entity/infrastructure/custom/{customDeviceId} Creates/updates a custom device, or reports metric data points to the custom device.

Topology & Smartscape - Host Manage hosts

API

Plugins vs API

API Explorer

Register Metric ◀

Publish Timeseries

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Thresholds

API Explorer

PUT

/timeseries/{timeseriesIdentifier} Creates a new custom metric

API

Plugins vs API

API Explorer

Register Metric ◀

Publish Timeseries

Validate Results

Thresholds

Metric Registration

PUT

/timeseries/{timeseriesIdentifier} Creates a new custom metric

Body	Cookies (1)	Headers (11)	Test Results
<pre> Pretty Raw Preview JSON ▾ 1 ▾ { 2 "timeseriesId": "custom:received.coffees", 3 "displayName": "Received Coffees", 4 "dimensions": [5 "CUSTOM_DEVICE", 6 "coffee" 7], 8 "unit": "Count (count)", 9 "detailedSource": "API", 10 "types": [11 "Coffee Machines" 12], 13 "aggregationTypes": [14 "AVG", 15 "SUM", 16 "MIN", 17 "MAX" 18], 19 "filter": "CUSTOM" 20 } </pre>			

API

Plugins vs API

API Explorer

Register Metric ◀

Publish Timeseries

Validate Results

Thresholds

Metric Registration

PUT

/timeseries/{timeseriesIdentifier} Creates a new custom metric

Body	Cookies (1)	Headers (11)	Test Results
<pre> Pretty Raw Preview JSON ▾ 1 ▾ { 2 "timeseriesId": "custom:received.coffees", 3 "displayName": "Received Coffees", 4 "dimensions": [5 "CUSTOM_DEVICE", 6 "coffee" 7], 8 "unit": "Count (count)", 9 "detailedSource": "API", 10 "types": [11 "Coffee Machines" 12], 13 "aggregationTypes": [14 "AVG", 15 "SUM", 16 "MIN", 17 "MAX" 18], 19 "filter": "CUSTOM" 20 } </pre>	ived.coffees		
		DESCRIPTION	
			Description

API

Plugins vs API

API Explorer

Register Metric

Publish Timeseries ◀

Validate Results

Thresholds

Publishing Timeseries for a Custom Device

POST

/entity/infrastructure/custom/{customDeviceId} Creates/updates a custom device, or reports metric data points to the custom device.

API

Plugins vs API

API Explorer

Register Metric

Publish Timeseries ◀

Validate Results

Thresholds

Publishing Timeseries for a Custom Device

POST

/entity/infrastructure/custom/{customDeviceId} Creates/updates a custom device, or reports metric data points to the custom device.

POST https://rtz36848.sprint.dynatracelabs.com/api/v1/entity/infrastructure/custom/coffeeMachine

Params Authorization Headers (2) **Body** Pre-request Script Tests

none form-data x-www-form-urlencoded raw binary **JSON (application/json)**

```

1  {
2    "displayName": "Coffee Machine",
3    "group": "Central Kitchen",
4    "ipAddresses": [
5      "10.0.0.1"
6    ],
7    "listenPorts": [
8      80
9    ],
10   "favicon": "https://www.freecodecamp.org/favicon.ico",
11   "configUrl": "http://coffee-machine.dynatrace.internal.com/coffeemachine/manage",
12   "type": "Coffee Machines",
13   "properties": {},
14   "tags": [
15     "office-linz"
16   ],
17   "series": [
18     {
19       "timeseriesId": "custom:received.coffees",
20       "dimensions": {
21         "coffee": "Espresso"
22       },
23       "dataPoints": [
24         [
25           1546858611000,
26           13
27         ]
28       ]
29     },
30   ],
31   "hostNames": []
32   "coffee-machine.dynatrace.internal.com"
33 ]
34 }
```

API

Plugins vs API

API Explorer

Register Metric

Publish Timeseries ◀

Validate Results

Thresholds

Publishing Timeseries for a Custom Device

POST

/entity/infrastructure/custom/{customDeviceId} Creates/updates a custom device, or reports metric data points to the custom device.

POST https://rtz36848.sprint.dynatracelabs.com/api/v1/entity/infrastructure/custom/coffeeMachine

Params

none

```
{
  "displayName": "Coffee Machine",
  "group": "Central Kitchen",
  "ipAddresses": [
    "10.0.0.1"
  ],
  "listenPorts": [
    80
  ],
  "favicon": "https://www.freecodecamp.org/freecodecamp/cup-of-coffee.png",
  "configUrl": "http://coffee-machine.dynatrace.internal.com/config",
  "type": "Coffee Machines",
  "properties": {},
  "tags": [
    "office-linz"
  ],
  "hostNames": [
    "coffee-machine.dynatrace.internal.com"
  ]
}
```

API

Plugins vs API

API Explorer

Register Metric

Publish Timeseries ◀

Validate Results

Thresholds

Publishing Timeseries for a Custom Device

POST

/entity/infrastructure/custom/{customDeviceId} Creates/updates a custom device, or reports metric data points to the custom device.

POST

Params

none

```
1 {  
2   "series": [  
3     {  
4       "timeseriesId": "custom:received.coffees",  
5       "dimensions": {  
6         "coffee": "Espresso"  
7       },  
8       "dataPoints": [  
9         [  
10            1546862119000,  
11            13  
12          ]  
13        ]  
14      ]  
15    }  
16  ],  
17  "hostNames": [  
18    "coffee-machine.dynatrace.internal.com"  
19  ]  
20}  
21}  
22}  
23}  
24}  
25}  
26}  
27}  
28}  
29}  
30}  
31}  
32 COFFEE-MACHINE.DYNATRACE.INTERNAL.COM  
33 }  
34 }
```

API

Plugins vs API

API Explorer

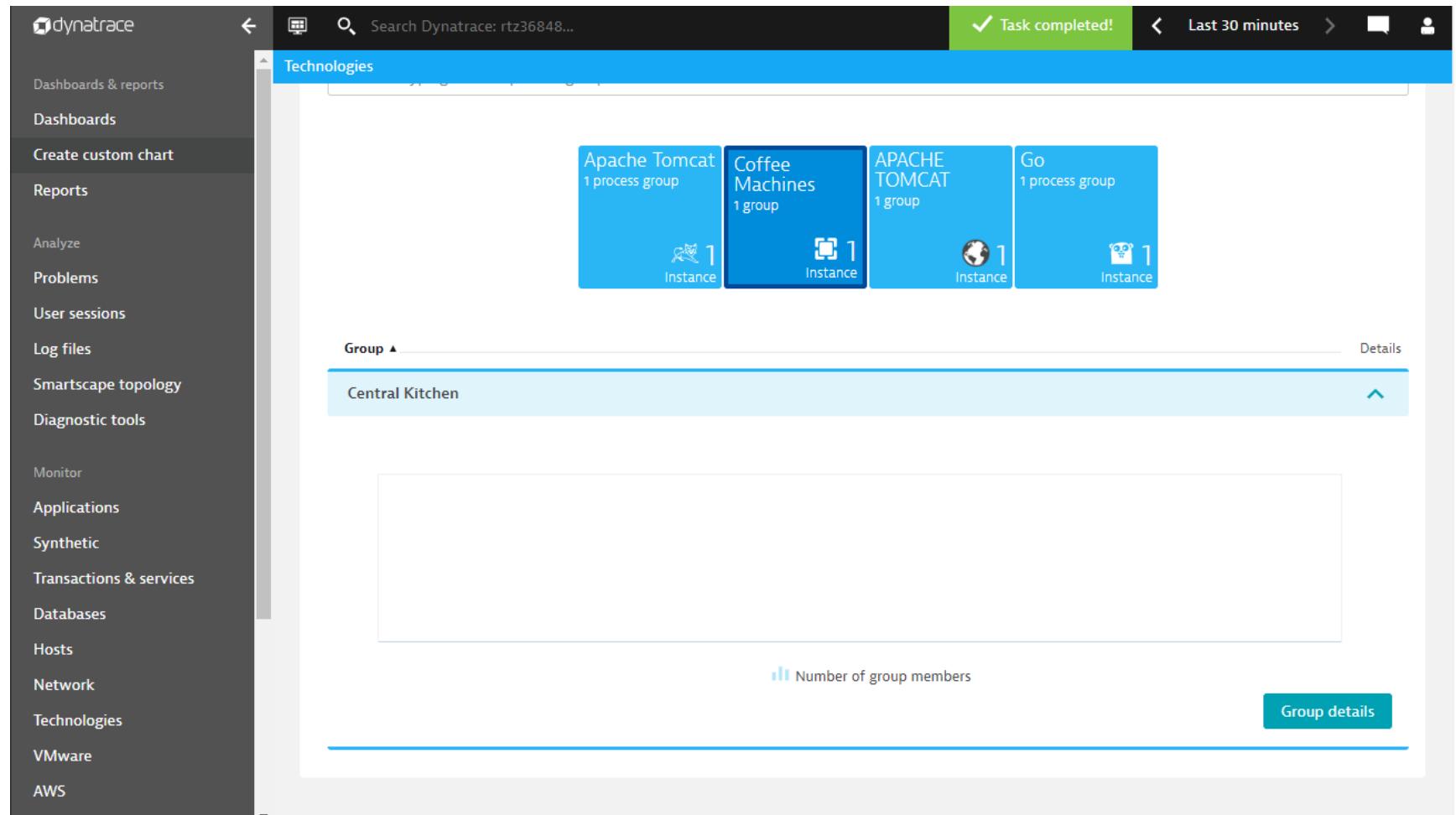
Register Metric

Publish Timeseries

Validate Results ◀

Thresholds

Custom Devices pushed in via API



API

Plugins vs API

API Explorer

Register Metric

Publish Timeseries

Validate Results

Thresholds ◀

Thresholds for Custom Metrics

Threshold Manage thresholds

GET

/thresholds Gets all configured thresholds for plugins and custom events in your environment

PUT

/thresholds/{thresholdId} Creates or updates an existing threshold for a plugin or a custom event

DELETE

/thresholds/{thresholdId} Deletes the specified threshold

API

Plugins vs API

API Explorer

Register Metric

Publish Timeseries

Validate Results

Thresholds ◀

Thresholds for Custom Metrics

PUT

/thresholds/{thresholdId} Creates or updates an existing threshold for a plugin or a custom event

1 impacted infrastructure component

PUT

Parame



Coffee Machine
Custom Device

Re

Too many coffees made

The coffee machine must not produce a number of coffees above 3.

1
2
3
4
5
6
7
8
9
10
11
12
13

```
"violatingSamples": 1,  
"dealertingSamples": 1,  
"eventType": "AVAILABILITY_EVENT",  
"eventName": "Too many coffees made",  
"description": "The coffee machine must not produce a number of coffees {alert_condition} {threshold}.",  
"enabled": true  
13 }|
```

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Roadmap and best
practices

Best practices – Python plugins

- Stay away from “generic” plugins, make sure that the plugin solves a specific problem
- Is your plugin taking more than a minute to run? Multi threading is your friend
- Use logger instead of print – Gets added to the OOTB plugin log once live
- Events sent are limited to 100 per minute, don’t resend known events every minute
- OneAgent plugin.json - activation: “SnapshotEntry” makes finding the process easier and is more future proof than activation: “Singleton”
- Custom metrics license is per entity, per metric, per dimension. Only create what you need
- Use the simulator as much as possible, it saves a lot of time over having to upload the plugin and wait for it to be executed and then go through the log files
- If possible, avoid native python libraries, as they are OS and Python version bound
- Considering spending a lot of time creating a plugin? Reach out to extensions@dynatrace.com, maybe something already is created or is coming. Also a good contact point for custom services engagements
- Do not use the above email for generic questions. Use the Dynatrace community forum, that way everyone can learn from your question

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practices

Best practices – When do I use what?

- Metrics / Events
 - OneAgent JMX plugin
 - The process is instrumented and the metric can be extracted using JMX
 - OneAgent python plugin
 - The process is instrumented, but the metric isn't available using JMX
 - ActiveGate plugin
 - No OneAgent installation allowed/possible
 - Custom devices API
 - Change application code to call the Dynatrace API
 - Unknown metric/dimension names
- Native SDK (wrapper)
 - Deep monitoring required but the application isn't supported by OneAgent
- Java/.NET/JavaScript SDK
 - Service flow/PurePath split in two due to unsupported transport libraries
- OpenKit
 - User sessions / User Actions required, for example an IOT device or a rich client

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Roadmap

ActiveGate integrated installer
and auto update

ActiveGate plugins REST API

Improved SDK help content

OneAgent plugins REST API

OneAgent plugins new features: Python
Events, Custom properties, New configuration UI
controls, State metrics, PGtable, PGcharts



Thank you



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