# VMware vFabric AppInsight User's Reference

vFabric AppInsight 1.1

This document supports the version of each product listed and supports all subsequent versions until the document is replaced by a new edition. To check for more recent editions of this document, see http://www.vmware.com/support/pubs.

**vm**ware®

You can find the most up-to-date technical documentation on the VMware Web site at:

http://www.vmware.com/support/

The VMware Web site also provides the latest product updates.

If you have comments about this documentation, submit your feedback to:

docfeedback@vmware.com

# Contents

# About vFabric AppInsight User's Reference

vFabric AppInsight is a performance management product for application owners who deploy applications on hybrid clouds and in dynamic virtual environments. AppInsight monitors the availability, performance, and cost of those applications.

vFabric AppInsight provides you with an at-a-glance health state for your application. With AppInsight, you can focus on problematic areas in all levels of code, middleware, and Infrastructure. You can then apply one or more remedial actions.

Monitoring can include:

- Network-based monitoring

- Code-level monitoring

- Application middleware overview

- Application infrastructure overview

- Application cost monitoring

## Intended Audience

This information is intended for anyone who wants to use vFabric AppInsight to monitor service levels such as availability, performance, and cost of applications.

# General Concepts in vFabric AppInsight

**1**

vFabric AppInsight monitors the health of applications by collecting and analyzing metrics to generate key performance indicators (KPIs). Understanding AppInsight concepts and terms helps you to understand and use AppInsight.

## vFabric AppInsight Overview

After installing AppInsight and deploying probes and various agents, you create an application and add components to logical tiers such as the Web tier or the Application tier.

Metrics are gathered by the probes and agents and key performance indicators are calculated. You can define alerts that generate notifications when behavior breaches specified thresholds. Optionally, you can also specify remedial actions in this situation.

AppInsight includes the following key objects.

| | |
|---|---|
| **Application** | An application is a logical unit of Web software. For example, in a Web business program, you might define the processes related to the human resources department as one application and the processes related to accounting as another application. |
| **Tier** | A logical group of components. |
| **Component** | When you install AppInsight network probes, and optionally VMware agents and complementary VMware products, they detect the computing traffic and suggest potential application components. |
| | You must add at least one component to an application so that AppInsight can determine the entire application structure, study transactions, and show monitoring data. |
| | Web Application components are Web servers for which the network traffic is monitored. |
| | Code agent components are application server components that installed code agents detect. Each component represents an individual WAR file. For example, if you have three applications on a single server, the topology structure shows one application server and three application code agent components. If a code agent is not installed, the topology structure shows only the application server and a Web application component. |
| **Transaction** | A cross-tier action between transaction elements. For example, a login transaction. |
| **Transaction Element** | The smallest building block within a component. |

## Storage of Monitored Data

Over time, metrics become less relevant to the current state of an application and are disgarded. The length of time for which data is stored in the AppInsight database depends on the time range over which it was acquired.

| Time Period During Which Metric was Gathered | Storage Period |
| --- | --- |
| 30 seconds | 30 minutes |
| 2 minutes | 3 hours |
| 10 minutes | 1 week |
| 1 hour | 30 days |
| 1 day | 3 years |

## Viewing vFabric AppInsight Details

AppInsight includes several functions so that you can quickly see more details about items of interest.

- You can use the Time Picker to select the period for which you want to see data. The Time Picker pane also shows a graph for the Hit Rate metric over the period.

  Note that the server displays data for the closest resolution to the selected time.

- You can use a click and drag action in any graph to select a specific time range. Use the "handles" on either start of the selection to adjust the selected range. Click **Zoom** in the selected area to focus the graph on that area. The time displayed on the Time Picker matches that of the selected range.

- When you point to an application object, a pop-up window provides additional high-level detail.

- Many application objects are clickable links. When you select an application object, a new page or window opens that presents details of that object. Depending on the application object that you select, you can navigate through several layers of detail.

# Best Practices in vFabric AppInsight 2

Use best practices to optimize the performance of vFabric AppInsight.

## Virtual Machine Configuration

Consider the following points, related to configuring a virtual machine.

- In the event that the host of a virtual machine is stopped and restarted, it is important that the virtual machine is restarted as soon as possible, to minimize data loss. You set auto restart parameters for the machine in the vSphere Client.

- For accurate data monitoring, use VMware Tools in the vSphere Client to synchronize the time of the guest operating system on the virtual machine with the time of the host.

## Adding Components

To limit skewed metrics, do not add network-monitored application components and code-monitored application components in the same tier. Such practice might affect latency calculations because network monitoring also includes the network overhead latency.

## Monitoring Options

Consider the following points, related to monitoring applications.

- If possible, implement code monitoring through code agents to monitor application components. If you cannot use code monitoring, use network monitoring.

- You cannot monitor a virtual machine using both a network probe and the code agent. However, you can change the monitoring method after installation. See "Altering the Monitoring Method of a Component," on page 21.

# Monitoring Data Using Complementary VMware Products

# 3

You can integrate complementary VMware products into AppInsight to increase the volume of information that is monitored, to define workflow actions, and to focus on specific areas of interest.

You install complementary VMware products as their respective documentation describes. You then must register an AppInsight adapter for the product, so that monitoring can occur.

| | |
|---|---|
| **vCenter Chargeback** | Monitors the monetary cost of an application. |
| **vFabric Hyperic** | Monitors the virtual machines and the services running on those virtual machines. |
| **vCenter Orchestrator** | Enables workflows, such as starting a virtual machine or sending a notification in the event of an alert, to be created to automate action performance in AppInsight. |

This chapter includes the following topics:

- "Register Adapters for Integrating Complementary VMware Products," on page 11
- "Integrating vCenter Chargeback to Monitor Application Cost," on page 12
- "Integrating vFabric Hyperic to Monitor Application Performance," on page 13
- "Integrating vFabric Application Director to Monitor Application Director Applications," on page 13

## Register Adapters for Integrating Complementary VMware Products

You can integrate complementary VMware products with AppInsight to enhance its monitoring capabilities. As part of the integration process, you must register adapters for each product.

### Prerequisites

- Verify that you have registered the vCenter Server adapter. This is required for all complementary VMware products. See the *VMware vFabric AppInsight Installation Guide*.
- If you are adding vCenter Chargeback, the cost model that you want to apply in AppInsight must be set in vCenter Chargeback.
- Verify that you have appropriate login details and server machine details for the adapter that you are adding.

| Product | Minimum Required User Permissions |
|---------|-----------------------------------|
| vCenter Chargeback | Report Generator, or an equivalent custom role |
| vCenter Orchestrator | ■ Execute rights for running workflows.<br>■ Read rights on the Root object to search for vCenter objects through the Soap API. |
| vFabric Hyperic | Super User |

**Procedure**

1   In the **Admin** module, click the **Adapters** tab.

2   Click **Add** and select the type of adapter to configure.

3   Type a name for your adapter in the **Adapter Name** text box.

The additional text boxes that appear depend on the adapter type that you select.

When default values are specified, the values appear in the text boxes. The values are editable, but VMware recommends that you do not change them unnecessarily.

4   Type appropriate information in all the other text boxes.

Enter user name and password credentials that already exist for the agent or complementary VMware product for which you are configuring the adapter.

The user that you specify must have sufficient permissions to read and write to the complementary product. Minimum permissions for each product are provided in its product-specific integration topic.

5   Click **Save** and when prompted, select the check box to accept the certificate.

6   Click **Save**.

The adapter appears in the list at the top of the **Adapters** tab.

AppInsight starts monitoring using the installed product, or in the case of Orchestrator, is available to perform actions as required.

## Integrating vCenter Chargeback to Monitor Application Cost

vCenter Chargeback is an application that helps you see the cost of virtual machines. You can integrate vCenter Chargeback with AppInsight to compute the cost of virtual machines, tiers, applications, and components, and to identify correlations between application performance indicators and application cost. You can also receive notifications when operational costs exceed threshold specifications.

When vCenter Chargeback is integrated with AppInsight, it can calculate the cost of each application. It can also calculate the individual cost of the following computing resources of an application:

■   CPU

■   Disk read and write

■   Memory

■   Storage

■   vCPU

Costs are calculated over one hour, for example between 13:00 and 14:00, and for 24-hour periods, from 00:00 to 23:59 according to the vCenter Chargeback server time. You can see the costs by opening the **Application** module and selecting the **Cost** KPI in the **Metrics** tab.

The cost currency is taken from the vCenter Chargeback cost model that you specify.

When you first integrate vCenter Chargeback with AppInsight, it might take up to two hours before you can view data.

### Requirements for vCenter Chargeback Integration

You configure the virtual machines on which to monitor application cost in vCenter Chargeback.

■ All of the virtual machines that are being monitored for cost must be part of a hierarchy in vCenter Chargeback. Data does not appear for virtual machines that are not configured in this manner.

It is good practice to locate all the virtual machines for AppInsight in a single hierarchy in vCenter Chargeback.

■ AppInsight supports vCenter Chargeback v. 2.0.

■ Verify that the cost model that you want to use in AppInsight is available in vCenter Chargeback.

You must register vCenter Server adapter before you can use this product.

To use vCenter Chargeback with AppInsight, you must register vCenter Chargeback in the AppInsight Adapter Manager. See, "Register Adapters for Integrating Complementary VMware Products," on page 11.

## Integrating vFabric Hyperic to Monitor Application Performance

vFabric Hyperic is an application that helps you view the performance of servers and the services that run on them. You can integrate vFabric Hyperic 4.5, or later, with AppInsight to monitor virtual machines and the servers running on those virtual machines.

You install a Hyperic agent on each of the virtual machines to monitor.

Note that when configuring a Hyperic adapter to retrieve data from the Hyperic server, the collection intervals of the Hyperic "Availability" metrics might change to one collection per minute.

For information about how to deploy agents, see the vFabric Hyperic documentation set appropriate to your version.

You must register vCenter Server adapter before you can use this product.

To use vFabric Hyperic with AppInsight, you must register vFabric Hyperic in the AppInsight Adapter Manager. See "Register Adapters for Integrating Complementary VMware Products," on page 11.

If you have multiple instances of AppInisght server that you are connecting to the vFabric Hyperic server, you must use a unique user name and password for each AppInisght server.

Ensure that the Hyperic server and AppInisght server are time synchronized with the Hyperic agents.

## Integrating vFabric Application Director to Monitor Application Director Applications

vFabric Application Director accelerates and automates the configuration and deployment of multi-tier applications. You can import an application that has already been deployed in Application Director, and has one or more network probes or code agents installed, and monitor it using AppInsight.

You import an Application Director application to AppInsight from the **Applications** tab of the **Admin** module. The **Import** button is only enabled when the Application Director adapter is installed.

After you import an Application Director application, all monitored components appear in the application topography in a single tier. You can perform actions such as moving components between tiers or clustering components, as with other AppInsight components. The installed probes and agents return monitoring data to AppInsight.

If the import of an Application Director application is only partially successful, because some of its virtual machines do not have probes or agents installed, or because they are not visible to AppInsight, the Import Partially Successful dialog box includes a list of the unmonitored virtual machines. If you add a probe or code agent to an unmonitored virtual machine, the virtual machine is added to the list of components in the AppInsight Mapped Components table. You can then add the virtual machine to the application's topology. See Chapter 6, "Adding Components," on page 19.

If you have multiple virtual machines to add to an Application Director application after it has been imported to AppInsight, you can add the machines simultaneous by deleting the application from AppInsight, installing the probes or agents in Application Director, and reimporting the application to AppInsight.

## Requirements for vFabric Application Director Integration

Several conditions must be satisfied before Application Director applications can be imported to AppInsight.

■ You must register the vCenter Server adapter before you can use Application Director with AppInsight.

■ To use vFabric Application Director with AppInsight, you must register vFabric Application Director in the AppInsight Adapter Manager. The credentials that you specify when registering the adapter must be sufficient to allow you to perform administrative tasks. "Register Adapters for Integrating Complementary VMware Products," on page 11

■ You must install probes and agents on an application that AppInsight will import and monitor, before the application is imported to AppInsight.

# Integrating vCenter Orchestrator to Manage Remedial Actions

# 4

vCenter Orchestrator, which is installed with the vCenter Server, provides a library of extensible workflows for creating and running processes that you can use to manage remedial actions in AppInsight. You must register Orchestrator with AppInsight before you can use it.

After you register the Orchestrator adapter, you can perform default actions.

You can also define additional actions in the **Admin** module, in the **Alerts** view. You can add actions to provide email notifications when a change in state occurs. If an action requires a user to enter data, a dialog box appears with relevant prompts.

After you register the vCenter Server adapter, you must register vCenter Orchestrator in the AppInsight Adapter Manager. See "Register Adapters for Integrating Complementary VMware Products," on page 11.

This chapter includes the following topics:

- "Add Orchestrator Workflows," on page 15

- "Delete an Orchestrator Action," on page 16

## Add Orchestrator Workflows

You can add Orchestrator workflows that are not included in the default workflow actions provided in AppInsight. You use JMX to add workflow actions from Orchestrator to AppInsight.

- You can only add workflow actions to AppInsight that fit these protocols:

  - The action can only have a single virtual machine as a parameter, or the action can only contain basic parameters, such as int, Boolean, and so on. You cannot add a workflow that has a virtual machine and basic parameters.

  - The action cannot require movement from one virtual machine or host to another.

After you register the Orchestrator adapter, you can perform default actions.

- Reset virtual machine and stand by.

- Power off virtual machine and stand by.

- Start virtual machine and stand by.

- Revert to current snapshot.

- Reboot the guest operating system.

- Send notification by email.

You access these default actions by clicking the Actions arrow at the top of the **Summary** tab of a virtual machine.

You can also define actions in the **Admin** module, in the **Alerts** view. You can add actions to provide email notifications when a change in state occurs. If an action requires a user to enter data, a dialog box appears with relevant prompts.

**Prerequisites**

- Verify that you are logged in to AppInsight. If you are not already logged in, you are prompted to do so before you can access the JMX Web page.

- Verify that you have vCenter Orchestrator version 4.1.0 installed.

**Procedure**

1  Add a workflow to Orchestrator, or select an existing workflow.

   Refer to the Orchestrator documentation if you need assistance.

2  In your Web browser, go to https://[AppInsight Server IP]:8443/am-apm-web/jmx/mbean.jsp?mbean=com.vmware.am.apm.action.svc:name=ConfiguredActionService&platform=true.

3  On the JMX Web page, locate the `addAction` operation.

   a  In the **Parameters** text box, type the exact name of the workflow that you specified in Orchestrator.

   b  Click the addAction **Hit Me!** button.

   A new tab appears in the browser to confirm that the workflow was successfully created.

Depending on the workflow action that you create, the action either appears in the **Actions** menu, or on the **Alerts** tab of the **Admin** menu.

- If you add a workflow that has a virtual machine, the workflow is added to the VM Actions list on the **Summary** tab. This workflow can only contain a single virtual machine.

- If you add a basic parameters workflow, or a workflow without any parameters, click the **Alerts** tab, click **Add Action** and select the new workflow from the menu.

# Delete an Orchestrator Action

You can delete the Orchestrator actions that you added to AppInsight.

**Procedure**

1  In your Web browser, go to https://[AppInsight Server IP]:8443/am-apm-web/jmx/mbean.jsp?mbean=com.vmware.am.apm.action.svc:name=ConfiguredActionService&platform=true.

2  On the JMX Web page, locate the `deleteAction` operation.

   a  In the **Parameters** text box, type the exact name of the workflow that you are deleting.

   b  Click the deleteAction **Hit Me!**.

The action is deleted from the appropriate menu.

# Create Applications

**5**

You create applications in the **Admin** module. After you create the application, you must add one or more components so that monitoring can begin.

**Procedure**

1    (Optional) In the **Applications** tab of the **Admin** module, click **New Application**.

2    In the Add New Application dialog box, type a name for the new application in the **Name** text box.

3    (Optional) Add a description of the application.

4    Click **OK**.

The application is created.

**What to do next**

Add one or more components to the application. See Chapter 6, "Adding Components," on page 19.

# Adding Components

**6**

Before AppInsight can start to monitor your application, you must add at least one component.

You add components in the **Structure** tab of the **Application** module. The **Structure** tab is visible when you are in the **Manage** view of the **Application** module.

In the Mapped Components table in the **Structure** tab, you can see a list of all the components that AppInsight has detected, their virtual machine names and the monitoring type, such as network or code, and their protocol. such as HTTP, HTTPS, and so on.

For network probe monitoring, MSSQL, MySQL, Oracle, HTTP and HTTPS protocols are supported. For the code agent, MSSQL, MySQL, Oracle, HSQLDB, PostgreSQL, SQLFire, HTTP and HTTPS are supported.

After you add the first component to an application, you can toggle the lightbulb icon at the top of each tier in the topology map to display or hide hints about other potential components that you can add to the application. Tiers are not visible in the topology until after the first component is added to the application.

To limit skewed metrics, do not add network-monitored application components and code-monitored application components in the same tier. Such practice might affect latency calculations because network monitoring also includes the network overhead latency.

When dependencies between IP addresses are discovered, a hint appears to indicate the dependencies. Each IP address has a separate hint. A hint that is located to the left of the virtual machine indicates an incoming dependency. A hint that is located to the right of the virtual machine indicates an outgoing dependency.

If a port for incoming traffic is detected for the virtual machine, the hint includes a plus sign (**+**). Clicking the sign adds the component and removes the component from the Mapped Components table. If more than one port is discovered for a single IP address, a component is added for each port.

When an IP address is detected, a hint appears, but you cannot add the component until the port is known.

This chapter includes the following topics:

- "Add a Mapped Component to an Application," on page 19
- "Add Multiple Components to an Application," on page 20
- "Add an Unmapped Component to an Application," on page 21
- "Altering the Monitoring Method of a Component," on page 21

## Add a Mapped Component to an Application

You can add components to your application that AppInsight has detected.

### Prerequisites

Verify that you created an application. See Chapter 5, "Create Applications," on page 17.

**Procedure**

1  Select the application to which you are adding a component.

2  On the **Topology** tab of the **Application** module, verify that the Mapped Components table is visible on the left of the page.

The Mapped Components table lists all of the components that AppInsight has detected.

A map of the application's topology appears on the right, showing components and the tiers to which they are added. Before you add the first component to the application, the map area is blank.

3  Select an object in the Mapped Components table, and click **Add to Application**.

4  Select the tier to which the component is to be added from the tier menu.

If you are adding the first component to the application, type a name for the first tier in the **New Tier Name** text box.

5  (Optional) If the component uses HTTPS protocol, select an SSL key.

AppInsight supports PEM and PKCS format SSL keys.

6  (Optional) If the component uses HTTPS protocol, and you have set the SSL key, you can set a password for the key.

7  Click **OK**.

The component is added to the map. If the tier was not already in the map, it is added.

If you switch from the topology Map View to Table View, the component is in the table.

# Add Multiple Components to an Application

You can select several components to add simultaneously to a tier in the application. You can also merge the components so that you can monitor them as a single entity.

**Prerequisites**

Verify that you created an application. See Chapter 5, "Create Applications," on page 17.

**Procedure**

1  On the **Topology** tab of the **Application** module, verify that the Mapped Components table is visible on the left of the page.

The Mapped Components table lists all of the components that AppInsight has detected.

A map of the application's topology appears on the right, showing components and the tiers to which they are added. Before you add the first component to the application, the map area is blank.

2  Select multiple components in the Mapped Components table and click **Add to Application**.

The selected components can be of different types and monitored in different ways.

3  Select the **Add as a cluster** check box to merge the selected components as a cluster that can be monitored as a single entity.

You must specify a name for the cluster.

If one or more components in the cluster is an HTTPS component, specify the SSL key.

4  Select the tier to which the cluster is to be added from the tier menu.

If you are adding the first components to the application, type a name for the first tier in the **New Tier Name** text box.

5    (Optional) If one or more components use HTTPS protocol, select the SSL key.

AppInsight supports PEM and PKCS format SSL keys.

When you use this method of creating a cluster, all HTTPS components in the cluster must use the same SSL key.

6    To add HTTPS components with different SSL keys, add them individually to the tier, then click **Actions** and select **Cluster** to add them to the cluster.

7    (Optional) If the component uses HTTPS protocol, and you have set the SSL key, you can set a password for the key.

8    Click **OK**.

The cluster is added to the map. If the tier was not already in the map, it is added.

# Add an Unmapped Component to an Application

You can add components that AppInsight has not detected to your application.

You can add a new component in either the map or table view.

**Procedure**

1    On the **Topology** tab of the **Application** module, verify that the Mapped Components table is visible on the left of the page.

The Mapped Components table lists all of the components that AppInsight has detected.

A map of the application's topology appears on the right, showing components and the tiers to which they are added. Before you add the first component to the application, the map area is blank.

2    Below the Mapped Components table, click the **Add an unmapped component** link.

3    Type data in the **Name**, **IP**, and **Port** text boxes.

4    Select the tier for the component from the menu.

If you are adding the first component to the application, type a name for the first tier in the **New Tier Name** text box.

5    Select the protocol for the component from the menu.

6    Click **OK**.

The component is added to the map. If the tier was not already in the map, it is added.

If you switch from the topology Map View to Table View, the component is in the table.

7    (Optional) If you selected the HTTPS protocol, you must set the SSL key.

    a    Click **Actions**, and select **Set SSL key**.

    b    Select the SSL key.

    c    (Optional) Set a password for the key.

    d    Click **OK**.

# Altering the Monitoring Method of a Component

You can change a network-monitored component to become a code-monitored component.

A virtual machine can be monitored by the code agent or a network probe, not both.

You can use the code agent to monitor the code of HTTP- or HTTPS-type application components. Code monitoring uses metrics that provide you with a more in-depth view of your application component than network monitoring provides.

When you switch the method by which a component is monitored, the existing component is removed from the topology and becomes available in the Mapped Components table. The component with the new monitoring method is added to the tier in place of the one that was removed.

When the network-monitored component is removed from the application topology, all its transactions that have their root in the component are also removed. The code agent must detect and monitor the transactions following the switch.

To change the monitoring method of an application component that is part of a cluster, remove the component from the cluster to switch monitoring methods, then re-add it to the cluster.

## Change the Component Monitoring Method

You can switch a component to code monitoring to increase the number of monitored metrics.

### Prerequisites

Verify that the code agent is installed on the application server on which the application is running. See the *VMware vFabric Installation Guide*.

### Procedure

◆ Change the component monitoring type.

| Option | Description |
| --- | --- |
| **Change the component monitoring type in the application's topology map.** | a   In the topology map on the **Structure** tab of the **Application** module, select the application component to be monitored with the code agent and click **Actions**.<br><br>The component cannot be part of a cluster.<br>b   Select **Switch to Code Monitoring**.<br><br>The network monitored component is deleted from the application topology and replaced with a code monitored component.<br>The network monitored component appears in the Mapped Components table. |
| **Change the component monitoring type from the Mapped Components table.** | a   In the Mapped Components table select a code monitored component for the same virtual machine as a network monitored component that is already in the application's topology and click **Add Component**.<br><br>The component cannot be part of a cluster.<br><br>You are prompted to confirm that you want to replace the network monitored component with the code monitored component.<br>b   Click **OK**.<br>The code monitored component appears in the application's topology. The network monitored component appears in the Mapped Components table. |

# Transaction Management 7

Some transactions are detected and monitored by AppInsight. Other detected potential transactions are not automatically monitored, but you can add them and have AppInsight calculate their KPIs.

You can view and manage transactions for your application by clicking **Transactions** in any transactions widget to open the Transactions dialog box.

On the **Metrics** tab of the **Application** module, when you select a table view of a KPI that relates to transactions, you can click **Transactions** to open the Transactions dialog box.

When you select an application in the **Applications** tab of the **Admin** module, you can click **Transactions** to open the Transactions dialog box.

## Transactions Pool Table

The Transactions dialog box shows a table of transactions and potential transactions. The icon at the far left of each row denotes whether the item is a potential transaction (light colored icon) or an actual transaction (dark colored icon.)

The table specifies the name of each transaction or potential transaction and, in the case of transactions, specifies in the Source column whether it was added and monitored by AppInsight or was changed by a user from a potential transaction to a transaction.

**Table 7-1.** Transaction Pool Table

| Column Name | Description |
|---|---|
| Name | Name of the transaction or potential transaction.<br>You can change the name of a transaction by selecting it and clicking **Rename**. |
| Source | Whether a transaction was automatically detected and monitored by AppInsight, or whether it was changed from a potential transaction to a transaction by a user. |
| Tier | Left-most tier on which the transaction begins. |
| Component | Left-most component to which the transaction relates. |
| Latency | Latency of the transaction. |
| Hits | Number of hits on the transaction. |

When you select a transaction in the table, its topology appears in the map below the table.

When you select a potential transaction in the table and click **Start Monitoring**, the item becomes a transaction and monitoring of its Performance, Usage and Health KPIs begins.

# Manually Add a Transaction Element

You can add a transaction element manually using JMX.

**Prerequisites**

Verify that you are logged in to AppInsight. If you are not already logged in, you are prompted to do so before you can access the JMX Web page and add actions.

**Procedure**

1   In your Web browser, go to https://[AppInsight Server IP]:8443/am-apm-web/jmx/mbean.jsp?
    mbean=com.vmware.am.apm.app:name=InitialConfigurationService&platform=true.

2   On the JMX Web page, locate the `addWebTransactionElementByComponentName` operation.

    a   In the Parameters **ComponentName** text box, type the name of the component to which the
        transaction element relates.

    b   In the Parameters **URL** text box, type the URL of the transaction element.

        You can group multiple URLs and add them as a single transaction element by using wildcards for
        specific sections of the URL. For example, /inbox/john /inbox/tim /inbox/<username> might be
        grouped to one transaction element using the URL inbox/*.

3   Click the addWebTransactionByComponentName **Hit Me!** button.

    A new tab appears in the browser to confirm that the workflow was successfully created.

After a few minutes, the transaction element appears in the topology.

# Adding Tiers to the Topology 8

You can add tiers to the topology of an application, to logically group components.

Tiers are not visible in an application's topology until the first component is added to the application. After one tier is added to the topology, additional tiers can be added on the left or right sides.

**Prerequisites**

Add a component to the application, so that a tier appears in the application's topology. See Chapter 6, "Adding Components," on page 19.

**Procedure**

1   Click **Actions** and select **Add Tier on Right** or **Add Tier on Left**.

2   Type a name for the tier and click **OK**.

The tier appears in the topology.

**What to do next**

Add components to the tier. See Chapter 6, "Adding Components," on page 19.

# Configure KPI Metrics Thresholds 9

Every key performance indicator (KPI) metric has a threshold defined that shows how it is behaving relative to expectation. You can set static thresholds or they can be dynamically configured by AppInsight. The thresholds that are set determine when the color of the KPI changes.

You set KPI thresholds in the **Application** module.

**Procedure**

1   In the **Metrics** tab, click the gear wheels icon in the top right corner of the KPIs menu to open the threshold editor.

2   Verify that the **Calculate KPI State** button is toggled **On** so that other settings can be edited.

You can toggle the button **Off** after saving your changes, to prevent the KPI from being included in the monitored objects.

3   (Optional) To have AppInsight determine thresholds, click **Dynamic** and proceed to step .

Dynamic thresholds are calculated based on historic data for the same hour of the same day.

A Warning threshold is calculated as twice the standard deviation.

A Critical threshold is calculated as four times the standard deviation.

4   (Optional) To manually set thresholds, click **Static**.

5   Adjust the thresholds as required.

| Option | Description |
|---|---|
| **Performance KPI** | Use the text boxes on the left of the graph to set the warning and critical thresholds. |
| | In the **Single Hit Time** menu, you can set the acceptable time limit for a reply to be sent back to the origin of the request. The time that you select represents the length of time that is tolerated (**t**). The Frustrated time is four times **t**. |
| **Usage KPI** | In the Hits section, the text boxes on the left of the graph represent the low hits and high hits thresholds. Hits are counted per minute. Errors are counted as a percentage. |
| | Use the **Hits** and **Errors** buttons to toggle between thresholds for hits and for errors. Set upper and lower thresholds for hits because too many or too few hits might cause a change in state. |
| **Middleware KPI** | Use the text boxes to set the warning and critical percentages for the total number of servers on which a component runs. If the stated percentage is equalled or exceeded, the color of the KPI changes. |
| **Infrastructure KPI** | Use the text boxes to set the warning and critical percentages. If the stated percentage of the total number of virtual machines is equalled or exceeded, the color of the KPI changes accordingly. |

| Option | Description |
| --- | --- |
| **Transaction Health KPI** | Use the text boxes to set the warning and critical percentages. If the stated percentage of the total number of an object's transactions is equalled or exceeded, the color of the KPI changes accordingly. |
| **Tier Health KPI** | Use the text boxes to set the warning and critical percentages. If the stated percentage of the total number of tiers is equalled or exceeded, the color of the KPI changes accordingly. |
| **Component Health KPI** | (Visible when a tier is selected.) Use the text boxes to set the warning and critical percentages. If the stated percentage of the total number of objects is equalled or exceeded, the color of the KPI changes accordingly. |
| **Cost KPI** | Use the text boxes to set the warning and error values. The two fields on the left of the graph represent the warning and critical thresholds. |

When the thresholds appear on a graph, the red threshold line might be above or below the yellow threshold line. The positioning of the thresholds depends on whether the seriousness of the state relates to a metric being too high or too low. For example, in the Cost KPI, a high cost is serious so the red threshold is above the yellow threshold. In a performance index score, a low score is more serious so the red threshold is below the yellow threshold.

Thresholds in the graph cover the period of the last seven days, assuming that the application has been installed for at least that time, and the predicted thresholds for the next seven days.

The thresholds appear on the graph as red and yellow lines.

6   Click **Save** to apply your changes.

# Monitoring Application Performance 10

By monitoring the performance of your applications, you can detect areas to adjust to achieve service level agreements. AppInsight comprises views that show different perspectives of the monitored data.

The **Application** module is divided into views. Within each view, you can focus on areas of information to see in-depth information.

AppInsight uses several modules to monitor application performance, and for administration purposes.

This chapter includes the following topics:

- "vFabric AppInsight Dashboard," on page 29
- "Application Module," on page 30
- "Admin Module," on page 34

## vFabric AppInsight Dashboard

The AppInsight dashboard provides you with a high-level overview of your applications and their health. You can select an application to view more detail.

You can hover over an application icon, to view high-level detail about it.

The dashboard shows all of the applications that AppInsight is monitoring. The size of each application circle indicates its number of hits relative to the other monitored applications. The color of the circle indicates its health state.

**Table 10-1.** Health Status Indicator Colors

| Color | Health Status |
| --- | --- |
| Green | Item is within specified thresholds for acceptable performance |
| Yellow | Item is within the specified thresholds for warning about performance |
| Red | Item is outside specified thresholds for acceptable performance |

In addition to the applications, widgets list the five most used applications, the five slowest applications, and the five most prominent notifications for the monitored applications. You can select an application in a widget to focus in on more detail.

When you select an application, the Application module Summary view appears. You can click **Manage** to modify the application's structure, or manage its transactions.

# Application Module

In the **Application** module, you can view summary data, metrics, topology mapping, event notifications and samples for your application.

## Key User Interface Elements in the Application Module

Some user interface elements are common to all views in the **Application** module.

**Table 10-2.** User Interface Elements in the Application Module

| User Interface Element | Comment |
|---|---|
| **Time Picker** button | Expands the Time Picker pane, which shows a graph of the period of time for which data is provided. |
| | In the Time Picker pane, you can select alternative time periods. |
| | By default, the **Time Picker** button name is the range of time related to the time period that you selected. If you have not selected a time period, the default of ten minutes is used. |
| **Inventory** button | Shows a group of icons for tiers, transactions, components, and virtual machines that represent the items on which data is monitored. |
| | The number next to each icon indicates how many instances of the item are being monitored. |
| | You can click the **Inventory** button to expand the Navigation pane, which shows a table listing the names of the monitored items and their health status. |

## Customizing Views in the Application Module

- You can click **Customize** in the title bar of a line graph widget in the **Application** module to select additional metrics to show in the graph. Note that selecting additional metrics might change the default colors of the display.

- You can click **Notifications** in the title bar of a KPI graph to display or hide notification markers on the graph. When you click a notification marker, information relevant to the notification appears. You can click the link in the notification description dialog box to open the Notifications view, to see additional information.

  The letter that appears in the notification marker indicates its type.

  | | |
  |---|---|
  | A | Alert notification |
  | I | Infrastructure notification |
  | C | Configuration notification |

  You can filter the notifications that you see on a graph by clicking the filter arrow on the left of the **Notifications** button and selecting the checkboxes for the notification types that you want to see. The filter list contains only the notification types that exist in the application in the selected time range.

The **Application** module includes several views.

-

  In the **Summary** view, you see widgets that provide an overview of the AppInsight object that you selected, for the selected period.

- Metrics View on page 31

    In the **Metrics** view, you can see summaries of performance, use, application infrastructure, cost, and the health of transactions and tiers.

- Topology View on page 32

    In the **Topology** view, you see the virtual machines, components, and transactions of your application, including the identities of the virtual machines on which the application is running. The information that you see depends on the object that you have selected.

- Notifications View on page 33

    In the **Notifications** view, a table shows information related to AppInsight alerts and configuration changes in your application.

- Samples View on page 34

    AppInsight samples transactions that network probes or code agents monitor. Transactions with high latency are prioritized for collection. A sample traces a transaction element to identify its topology and monitoring data.

## Summary View

In the **Summary** view, you see widgets that provide an overview of the AppInsight object that you selected, for the selected period.

The widgets that appear depend on the type of AppInsight object that you select. Generally, the following widgets appear.

| | |
|---|---|
| **General Details Widget** | The General Details widget provides high level information about the object, including average latency, performance index score, hits and errors rates, and so on. |
| **Transactions Widget** | The Transactions widget provides health, performance index, latency, hits and errors data for each of the object's transactions. |
| **Key Metrics Widget** | The Key Metrics widget provides information about the average latency, hit rate, and error rate for the object. |
| **Notifications Widget** | The Notifications widget provides information about recent alerts and logging data. |
| **State Over Time Widget** | The State Over Time Widget provides information about the changes in the state of the object that have occurred during the specified period. |

You can click a link in a widget to focus in on a detail of interest.

## Metrics View

In the **Metrics** view, you can see summaries of performance, use, application infrastructure, cost, and the health of transactions and tiers.

The type of information that is available depends on the KPI metric that you select.

When you select a KPI metric, you can select latency displays by clicking the icons at the bottom of the page. You see the name of each icon when you point to it.

**Table 10-3.** Description of KPI Metrics

| KPI Metric | Description |
| --- | --- |
| Performance | The Performance KPI represents the performance index score, calculated as the response time of all the transaction elements of the selected object, relevant to the thresholds.<br><br>A performance index score is an industry standard used for reporting and comparing the performance of software applications in computing. |
| Usage | The Usage KPI comprises the Hits KPI and the Errors KPI. The Usage KPI is based on all the application's hits.<br><br>The KPI represents the worst case between the hit rate and the error percentage, relevant to the thresholds. |
| Middleware | The Middleware KPI is available when the vFabric Hyperic agent is installed.<br><br>■ The Application Middleware KPI for the virtual machine is the availability and other metrics, taken from the vFabric Hyperic agent.<br>■ The Application Middleware KPI for an application component is the availability of the server.<br>■ The Application Middleware KPI for a tier is calculated as a percentage of its application component's appinfra states.<br>■ The Application Middleware KPI for an application is calculated as a percentage of its tiers appinfra states. |
| Infrastructure | The Infrastructure KPI is calculated as the percentage of virtual machines in warning/critical state, relevant to thresholds.<br><br>The infrastructure state of a virtual machine is calculated by vCenter server. vFabric Hyperic. |
| Transaction Health | The Transaction Health KPI is calculated as the percentage of transactions in warning/critical state, relevant to thresholds. |
| Tier Health | The Tier Health KPI is calculated as the percentage of tiers in warning/critical state, relevant to thresholds. |
| Component Health | The Component Health KPI state is calculated as the percentage of components in warning/critical state, relevant to thresholds. |
| Cost | The Cost KPI is available when the vCenter Chargeback agent is installed.<br><br>The Cost KPI represents the cost of the selected object, relevant to thresholds. The cost is calculated per virtual machine. |

## Topology View

In the **Topology** view, you see the virtual machines, components, and transactions of your application, including the identities of the virtual machines on which the application is running. The information that you see depends on the object that you have selected.

You can view application topology as a logical map or in table format.

The color of the icons in the map indicate their health status.

**Table 10-4.** Health Status Indicator Colors

| Color | Health Status |
|---|---|
| Green | Item is within specified thresholds for acceptable performance |
| Yellow | Item is within the specified thresholds for warning about performance |
| Red | Item is outside specified thresholds for acceptable performance |

You cannot edit information in the **Topology** view. To edit information, click **Manage**.

## Map

Each box in the map represents an application component.

The map is divided by tier.

You can view the following data in the application component box, depending on the selected object.

| Information Type | Example |
|---|---|
| Component health status indicator | yellow (warning) |
| Virtual machine health status indicator | green (OK) |
| Virtual machine on which the component is running | virtual machine #1 |
| IP address of the virtual machine on which the component resides and its port | |
| Monitoring level | network, code |
| Protocol | HTTP, JBoss, MySQL |

Key monitored data for the application component appears in a bar across the bottom of the box. This information includes the number of hits per minute and can also include data about the latency and, for data monitored using complementary VMware products, the latency when calling external components.

When you are viewing the map of a transaction, you see the transaction element name in the application component box, and the transaction element's monitored data. You do not see virtual machine data.

## Table

The table shows the same information as that in the map, in tabular format. The table is categorized by tier.

Each row in the table represents an individual application component within the specified tier.

# Notifications View

In the **Notifications** view, a table shows information related to AppInsight alerts and configuration changes in your application.

The information that you see includes a variety of data.

| Data | Description |
|---|---|
| Type | Whether the notification was generated by an alert, or because of a detected code, configuration or infrastructure change. |
| Description | ■ In the case in which KPI thresholds have been defined, when a threshold has been exceeded you see details of the deterioration or improvement.<br>■ In the case of a configuration change, for example if the Tomcat server.xml file changes, you see the original text and the changed text.<br>■ In the case of WAR or JAR files, the list of files within the archive that changed. |

| Data | Description |
|---|---|
| Object | The name of the object for which the notification was generated. |
| Time | Time that the action that caused the notification occurred. |
| Generator | The source from which the notification originated, including vFabric AppInsight, vSphere and vFabric Hyperic. |

When you click on an Alert-type entry in the Notifications List table, additional details about the notification appear in the Notification Details pane. The time that the details are based on is shown in the Notification Details pane.

## Samples View

AppInsight samples transactions that network probes or code agents monitor. Transactions with high latency are prioritized for collection. A sample traces a transaction element to identify its topology and monitoring data.

In the case of network monitoring, the sample data includes the content of its requests and replies. In the case of code agent monitoring, the sample data includes internal calls and methods.

Sample data appears in tabular format. When you select a sample in the table, additional details appear in the Sample Details pane.

**Table 10-5.** Samples Table Content

| Column | Description |
|---|---|
| Start Time | The time at which the sample was taken. |
| Transaction Element | The name of the transaction element from which the sample was taken. |
| Component | The component of which the transaction element is a part. |
| VM | The virtual machine on which the component is running. |
| Latency | The time in milliseconds that elapsed from the time the request was sent until a response was received. |
| Bytes | The number of bytes received in the response. |
| Error Status | `OK` or `Error`, according to the sample. An error sample is a sample that received an HTTP 5xx error code reply, or had an exception in its execution. |
| Sample Type | `Network HTTP`, `Code HTTP` or `Code Internal`, depending on how the data was detected. |
| Client | The client name or IP address of the component that initiated the request. |

# Admin Module

In the **Admin** module, you can register adapters for agents and complementary VMware products so they can be integrated in AppInsight and view the adapters' status, access the probe deployment page, view and configure alerts, download the client log for troubleshooting purposes, manage users and configure auto refresh options.

## Getting Started

Use the links on the **Getting Started** tab to navigate through the basic configuration tasks that are necessary for starting the monitoring process.

## Adapters

Use the links on the **Adapters** tab to register or delete adapters for agents and complementary VMware products.

## Applications

Use the **Applications** tab to add, edit, or delete applications.

## Alerts

Use the **Alerts** tab to define new alerts, or edit or cancel existing ones and to view data about configured alerts.

## Support

Use the **Support** tab to:

- Download the client log for troubleshooting

- Go to the Support page and download the support package

- Enable auto refresh and specify the number of milliseconds between refresh cycles

## Users

Use the **Users** tab to add or delete users, allocate permissions and create passwords.

Non-Administrator users can change their own password in this tab.

## Define Alerts

You can define the conditions under which AppInsight generates an alert, and specify one or more actions to take when an alert is generated. Alerts can be generated for any AppInsight application, tier, component, virtual machine, or transaction that has a state.

You can define new alerts, or edit or cancel existing ones. If you are defining a new alert, follow all the steps in the procedure. If you are editing an existing alert, follow the appropriate steps in the procedure to make the necessary changes.

**Procedure**

1   In the **Admin** module, click **Alerts**.

    A table appears with key data for all active alerts.

2   Click **New Alert**.

3   Type a name for the alert in the **Alert Name** text box.

4   Select the AppInsight object type from the **Object Type** menu.

    If you choose an object type other than **Application**, additional menus appear.

5   (Optional) For an object type other than **Application**, provide application and object information.

    a   Select the application to which the object belongs from the **Choose Application** menu.

    b   Select the object for which you are defining the alert from the object-specific menu.

6    In the Actions pane, define when an alert is generated.

    a    Select the KPI to which the alert relates.

    b    Select the state change that generates the alert.

    c    Select the time frame over which the state is calculated.

       AppInsight analyses the object over the entire time period to determine the state.

7    (Optional) Specify the actions to occur when an alert generates a notification.

    If you do not specify an action, notifications appear only in the Notifications table.

| Option | Description |
| --- | --- |
| **Click Add Action in the left pane** | Specify an action when an alert is generated when a state deteriorates. |
| **Click Add Action in the right pane** | Specify an action when an alert is generated when a state improves. |

    a    From the **Choose Action** menu, select the action to be performed when the alert is generated .

       The parameters that appear relate to the action that you select. **Send notification** is the only default action.

    b    Type relevant data for each of the parameters and click **OK** in the Choose Action area.

       The action for the new alert appears in place of the Choose Action area.

    c    (Optional) Click the delete icon in an action to delete it from the alert.

    d    (Optional) Click **Add Action** to add more actions to be performed when the alert is generated.

    e    Click **Save**.

The alert appears in the Alerts table.

## Create a vFabric AppInsight Support Package for Troubleshooting

An AppInsight support package is a collection of logs, configuration files, and internal databases. If you encounter difficulties with AppInsight, the VMware technical support representative might ask you to create and submit an AppInsight support package.

You access the support package creation page through the **Deployment** module.

**Procedure**

1    On the **Support** tab of the **Admin** module, click **Go to Support page and download support package**.

2    In the Diagnostic Support area, select either **Default** or a **Custom** option.

| Option | Description |
| --- | --- |
| **Default** | Collects all of the logs, configuration, and server databases of the AppInsight server and its probes and agents for the previous four days. |
| **Custom: Server only** | Collects all of the logs, configuration, and server databases of the AppInsight server, excluding data from probes and agents. |
| **Custom: Commands only** | Includes server commands, but excludes probe data, logs, and database data. |
| **Custom: Time delineated** | Enables you to select a period of time in hours. |

3    Click **Create Support Package**.

Support package creation might take several minutes.

4   When the support package is created, click **Support Package Directory** to access the support package.

The support packages are date stamped in the format *yyyymmdd*.

# Delete an Application

<span style="font-size:3em">11</span>

If an application is no longer relevant, you can delete if from AppInsight.

**Prerequisites**

Open the application to delete.

**Procedure**

1    In the **Applications** tab of the **Admin** module, select an application and click **Delete**.

2    In the Confirm Deletion dialog box click **Yes**.

The application, its tiers, and all of its components, transactions, and transaction elements are deleted from AppInsight.

# Delete a Tier 12

If a tier is no longer relevant, you can delete if from AppInsight.

**Prerequisites**

Open the application that contains the tier to delete.

**Procedure**

1   In the **Application** module, click **Manage** and open the **Structure** tab to see the application map.

2   Click **Actions** and select **Delete Tier**.

3   In the Confirm Deletion dialog box, click **Yes**.

The tier and all of its components, transactions, and transaction elements are deleted.

Components revert to potential components. Transactions revert to potential transactions.

# Managing AppInsight Users

**13**

You manage AppInsight users in the **Admin** module. Users can have either an Administrator or an Application Owner role.

General user management tasks, such as creating or deleting users, assigning permissions, and so on can only be performed by Administrator users. Application Owner users can change their passwords.

When you select a user in the Users table, their details appear in the User Details pane.

## User Roles and Permissions

**Administrator**  A user with the Administrator role has read/write permissions for all parts of AppInsight. An Administrator cannot view other users' passwords, but can specify a new password for a user when necessary.

**Application Owner**  The permissions that an Application Owner has are specified by the Administrator.

| Permission | Description |
| --- | --- |
| View | User can view content. |
| Perform VM Actions | User can perform AppInsight actions such as resetting virtual machines or reverting to the current snapshot. |
| Write | User can manage topology and thresholds, and can create and edit alerts. |

For each application, the Administrator can specify certain permissions.

There are a number of actions an administrator can do on user accounts.

- Add a New User on page 44

  You create AppInsight users in the **Users** view of the **Admin** tab.

- Change a Password on page 44

  If you are an Administrator, you can change passwords on the **Users** tab of the **Admin** module.

- Unlock a User Account on page 44

  If a user enters an incorrect password multiple times, the account is locked.

- Delete a User Account on page 45

  You delete AppInsight user accounts on the **Users** tab of the **Admin** module. Only users with an Administrator role can delete users.

# Add a New User

You create AppInsight users in the **Users** view of the **Admin** tab.

**Procedure**

1   On the **Users** tab, click **New User**.

2   Type a user name for the user.

3   Select either **Application Owner** or **Administrator** from the **Role** menu.

4   Type a password in the **New Password** text box and retype it in the **Confirm Password** text box.

5   Click **Add**.

    The new user name appears in the list in the Users table.

6   Ensure that the new user's name is selected, and for each application, select the check boxes that define the permissions for the user.

    An unselected check box means that the user does not have that permission.

7   Click **Save**.

The new user account is created.

# Change a Password

If you are an Administrator, you can change passwords on the **Users** tab of the **Admin** module.

If you have the Application Owner role, you can change your own password.

**Procedure**

1   In the Users table, select the name of the user whose password is being changed.

    The attributes for the user appear in the User Details pane.

2   Type a password for the user in the **New Password** text box.

3   Confirm the password in the **Confirm Password** text box.

4   Click **Update Password**.

5   Advise the user of the new password.

# Unlock a User Account

If a user enters an incorrect password multiple times, the account is locked.

The account unlocks after 15 minutes.

**Procedure**

1   Wait for 15 minutes and enter the correct password.

2   (Optional) If you have forgotten your own password, contact your AppInsight Administrator to have a new password defined.

The lock is removed from the account.

# Delete a User Account

You delete AppInsight user accounts on the **Users** tab of the **Admin** module. Only users with an Administrator role can delete users.

**Procedure**

1   On the **Users** tab, select the name of the user to delete.

2   Click **Delete User**.

3   Click **Yes** when you are prompted to confirm the action.

The user account is deleted from the table of users.

# Index