



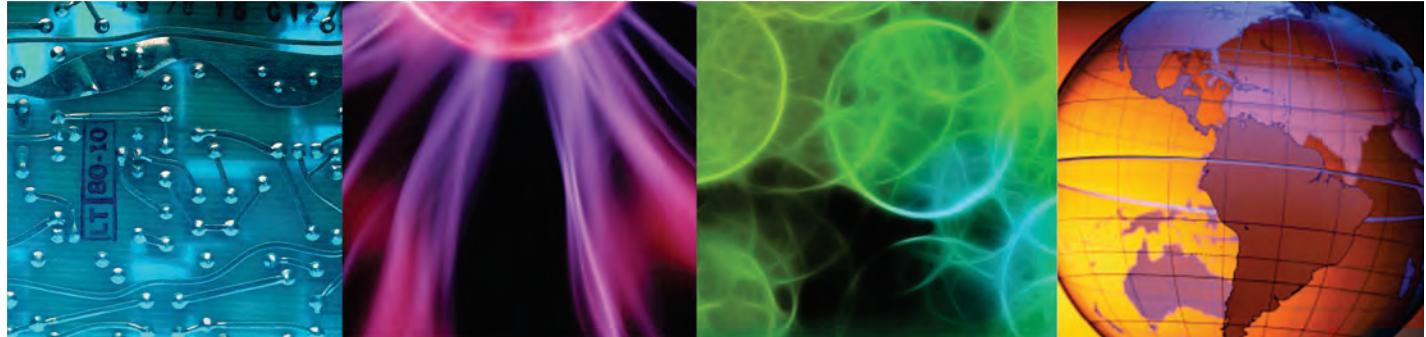
# IBM Training

## IBM Monitoring 8.1.3 Implementation and Administration

### Course Guide

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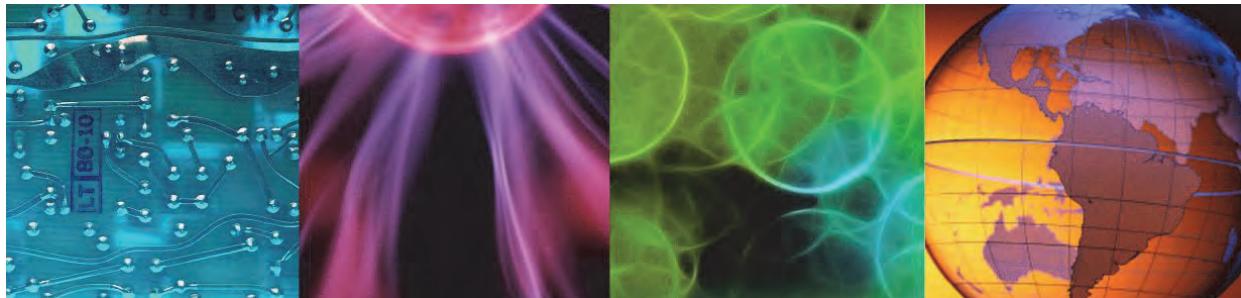
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# About this course



## IBM Monitoring 8.1.3 Implementation and Administration



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IBM® Monitoring v8.1.3 monitors the performance and availability of computer operating systems and applications. In this 2-day classroom course, you learn about the IBM Monitoring architecture and how to install and configure the product. You learn how to navigate the Performance Management console. You also learn how to manage events and manage user authorities, and how to integrate with other products including with Netcool/OMNibus, IBM Tivoli® Monitoring, and IBM Operations Analytics Log Analysis. This course is designed for users, administrators, and implementers. It is intended to help new users of IBM Monitoring v8.1.3 to use the tools to effectively manage their enterprise monitoring.

There are six units.

1. Introduction to IBM Monitoring
2. Installation
3. Administering and using IBM Performance Management
4. Managing events and thresholds

5. Integrating IBM Monitoring with other products
6. Reporting and 7-day comparison

The lab environment for this course uses several platforms:

- SUSE Linux 11
- Red Hat Enterprise Linux 6.6
- Windows Server 2008 R2

For information about other related courses, visit the Cloud & Smarter Infrastructure education training paths website:

[ibm.com/software/software/tivoli/education/](http://ibm.com/software/software/tivoli/education/)

Details	
<b>Delivery method</b>	Classroom or instructor-led online (ILO)
<b>Course level</b>	ERC 1.0
	This course is a new course.
<b>Product and version</b>	IBM Monitoring v8.1.3
<b>Duration</b>	2 days
<b>Skill level</b>	Intermediate

## About the student

This course is designed for users, administrators, and implementers.

Before taking this course, make sure that you have the following skills:

- The ability to navigate Linux and Windows applications
- A working knowledge of an Internet browser

# Learning objectives

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## Objectives

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In this course, you learn to perform the following tasks:

- Describe the IBM Monitoring architecture.
- Install and configure IBM Monitoring.
- Administer, use, and navigate the Performance Management Console to monitor and manage a monitoring solution that is built with IBM Monitoring.
- Manage events effectively by using facilities that are provided with IBM Monitoring.
- Integrate IBM Monitoring with other products.
- Run reports and a 7-day comparison.

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# Course agenda

The course contains the following units:

## 1. [Introduction to IBM Monitoring](#)

This unit starts with an overview and introduction to IBM Monitoring with a description of the architecture. The agents that are available with IBM Monitoring are explained. The products that IBM Monitoring integrates with are presented.

In these exercises, you verify the lab environment.

## 2. [Installation](#)

This unit covers installation of the Performance Management server and monitoring agents on both the Windows and Linux environments. You learn about packaging, prerequisites, and the step-by-step instructions on how to install the Performance Management server. You also learn how to install and configure monitoring agents.

The exercises guide you through the installation of the Performance Management server and several monitoring agents.

## 3. [Administering and using IBM Performance Management](#)

This unit teaches how to manage the components of the Performance Management Server, and also teaches how to use and administer the Performance Management console.

In these exercises, you validate the installation of the Performance Management Server and the Monitoring agents. You create applications that are composed of the data from the monitoring agents. You create new users and assign capabilities to those users. You also explore the Attribute details of various agents and save customized charts with other users.

## 4. [Managing events and thresholds](#)

This unit covers how to create, update, and delete thresholds, which in turn create events. You explore the Threshold Manager, where you create and modify thresholds that in turn create events if the thresholds defined are met. You also learn how to use the resource group manager. The resource group manager determines which agents running on specific servers evaluate the thresholds that are defined.

In these exercises, you learn the relationship between thresholds and events. You create thresholds that test for simple and multiple conditions. You create thresholds that run commands to solve the issue it detected. You adjust resource groups and learn the impact of these adjustments on thresholds and events.

## 5. [Integrating IBM Monitoring with other products](#)

This unit covers integrating IBM Monitoring with other products. Specifically, it describes how to integrate the products IBM Tivoli Monitoring, Netcool/OMNibus, IBM Operations Analytics Log Analysis, and Dashboard Application Services Hub and other products. This unit also describes event notification that uses email and other advanced configuration settings.

In these exercises, you integrate IBM Monitoring with IBM Tivoli Monitoring, IBM Netcool/OMNIbus, and IBM Dashboard Application Services. You also configure email notification and examine other advanced configuration options.

6. [Reporting and 7-day comparison](#)

In this unit, you display the historical 7-day comparison and learn how to install and run reports.

In IBM Monitoring, certain widgets that display information are compared against the same time frames from other days. That is the purpose of Historical 7-Day Comparison.

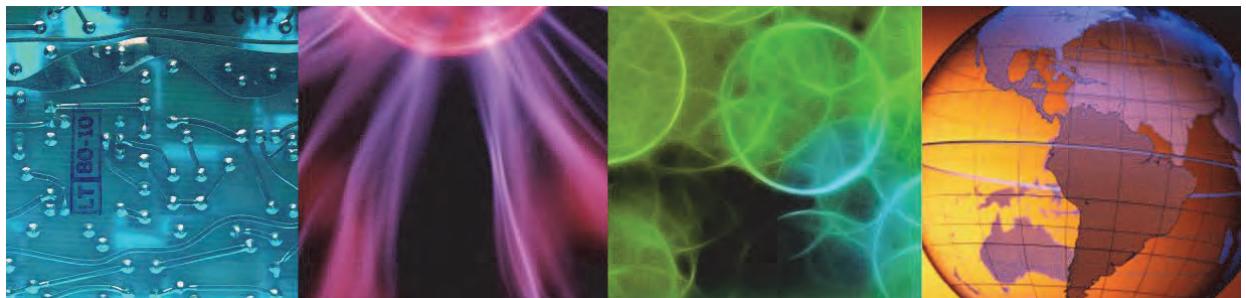
In these exercises, the objective is to learn how to use the Historical 7-Day Comparison and how to install and access Tivoli Common Reporting reports.



# 1 Introduction to IBM Monitoring



## 1 Introduction to IBM Monitoring



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This unit starts with an overview and introduction to IBM Monitoring with a description of the architecture. The agents that are available with IBM Monitoring are explained. The products that IBM Monitoring integrates with are presented.

## Objectives

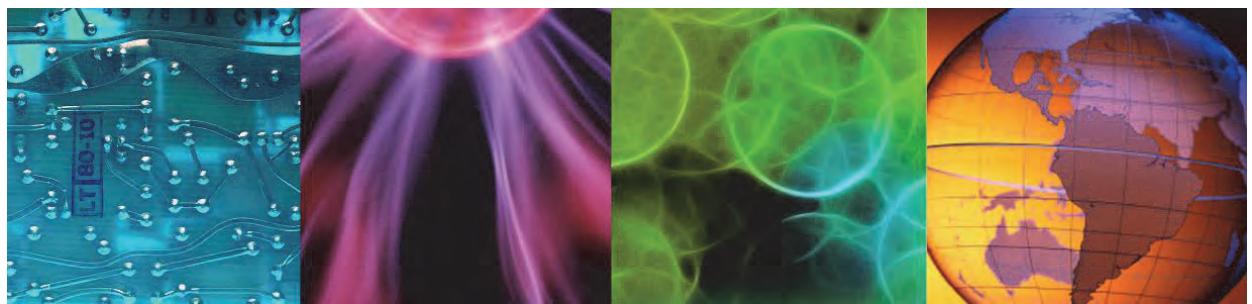
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In this unit, you learn to perform the following tasks:

- Describe IBM Performance Management
- Describe the architecture
- Define application based monitoring
- Explain which agents are available
- Explain integration with other products



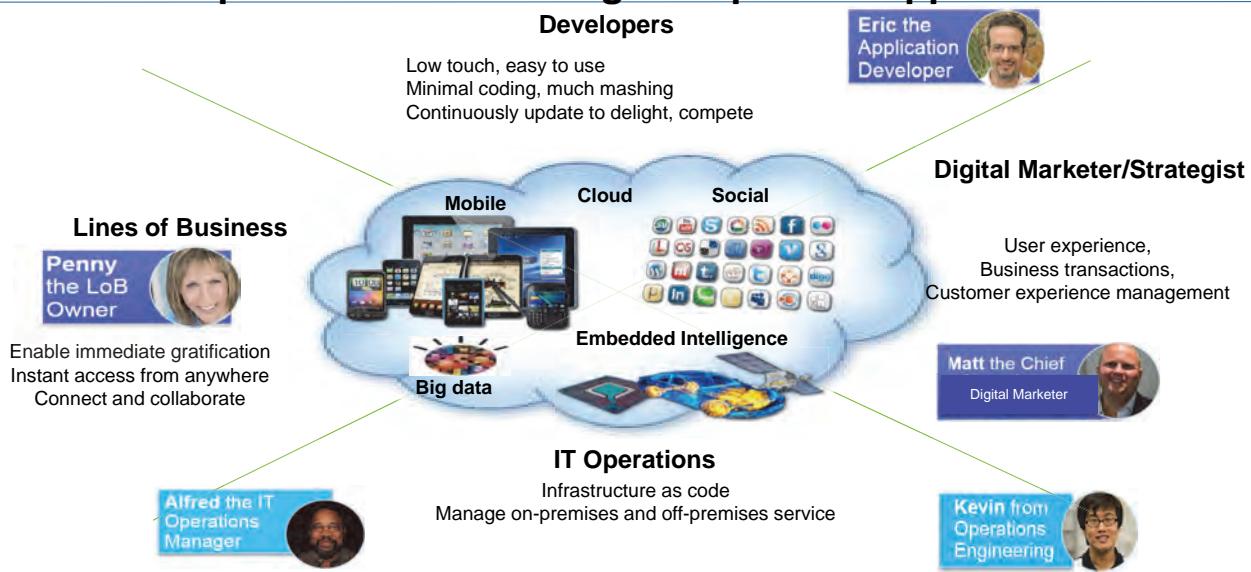
# Lesson 1 Overview and architecture



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In this lesson, you learn how to describe the IBM Monitoring solution and architecture.

## Consumer expectations are driving disruption in application teams



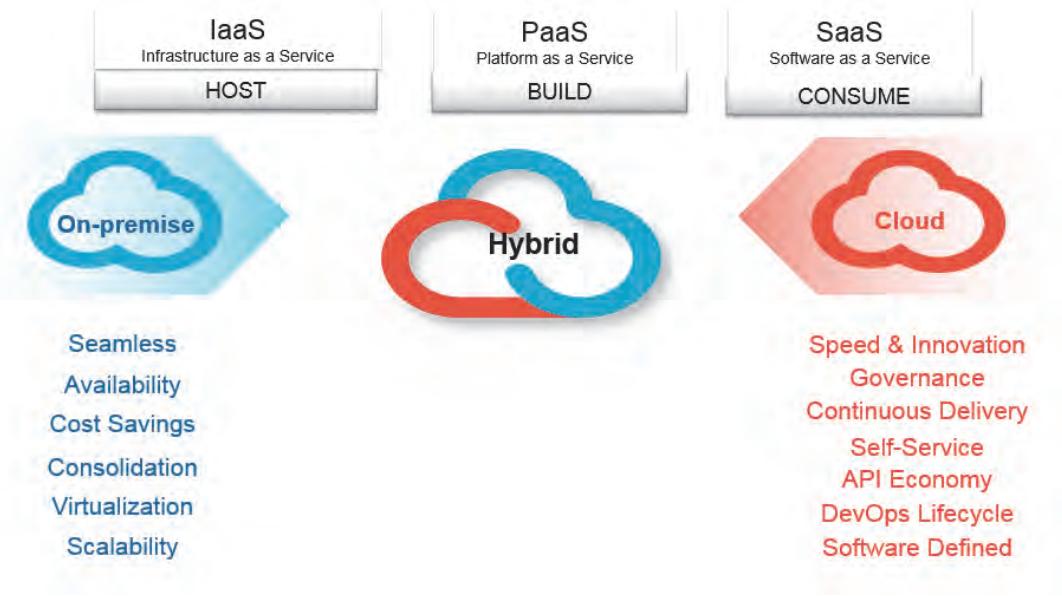
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### Consumer expectations are driving disruption in application teams

Consumer expectations are driving disruption in application teams. Business applications are the core of business strategies, revenue generation, and service offerings. The stakeholders in the health and performance of business applications are from the traditional IT departments to developers, line-of-business operators, marketers, and strategists. There is a need for application-centric monitoring that all stakeholders can use.

## The Cloud landscape



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### *The Cloud landscape*

The cloud landscape alters where and how applications are built, deployed, and used. Platforms and software are moving from the traditional on premises deployment to cloud-based services for various reasons. With this change comes the need to monitor and manage the existing and new deployment models together with one solution.

## IBM Performance Management



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### IBM Performance Management

IBM® Performance Management is a comprehensive solution that helps manage the performance and availability for complex applications that might run in a data center, public cloud, or hybrid combination. This solution provides you with visibility of your applications to ensure optimal performance and efficient use of resources.

The Performance Management solution collects data from both Performance Management agents and IBM Tivoli Monitoring agents. Data is displayed in the Application Performance Dashboard for both Performance Management agents and their hybridized IBM Tivoli Monitoring counterparts.

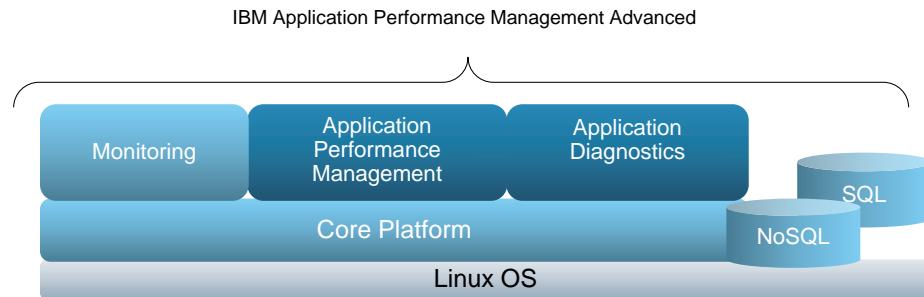
The installation of your monitoring infrastructure is done in under an hour. The installation of your agents is done in minutes. You can immediately log on to the Performance Management console to add applications that consists of the managed systems, and view in the Application Performance Dashboard for a status check.

The Application Performance Dashboard navigator is hierarchical, giving a status overview of your applications, the health of their components, and the quality of the user experience. For more details about your monitored resource, you can click a navigator item or a link in the Status Overview tab.

Consider, for example, that your application has slow response time. The issue is revealed in the dashboard. Starting from your dashboard, you can follow the problem to the source by clicking links to discover the cause: high CPU utilization on a system due to an out-of-control process.

## IBM Performance Management architecture and offerings

- Single architecture for both SaaS and on-premises
- Common offerings between SaaS and on-premises
- Expand the functions of the new simplified IBM Monitoring offering

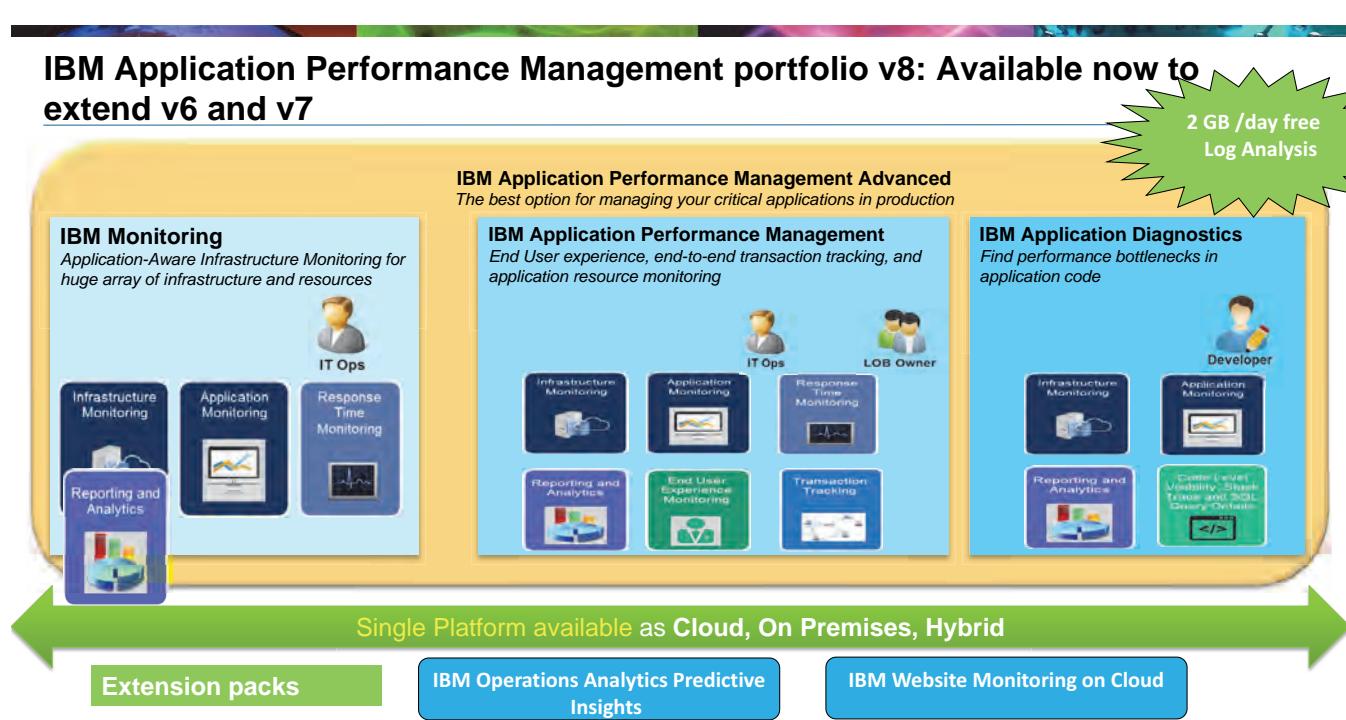


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### IBM Performance Management architecture and offerings

With IBM Performance Management V8.1.3, on-premises and Cloud use a single architecture and common offerings.



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### IBM Application Performance Management portfolio v8: Available now to extend v6/7 IBM

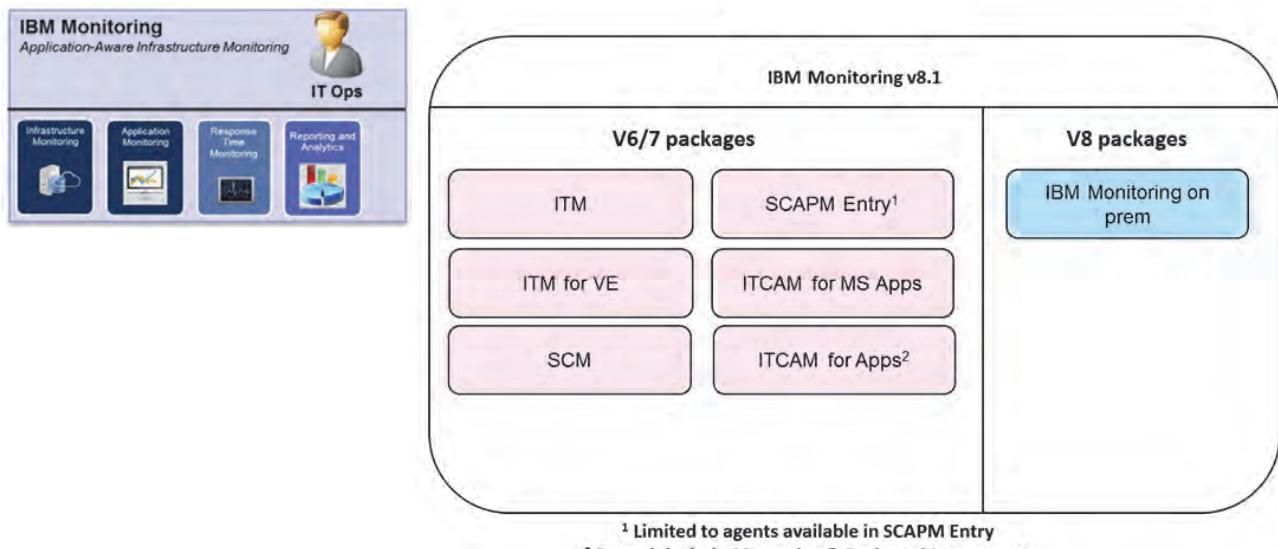
Performance Management strives to meet the growing needs of this changing landscape. This diagram shows the products that make up the IBM Performance Management portfolio.

IBM Monitoring is a comprehensive solution that helps manage the performance and availability for complex applications that might run in a data center, public cloud, or hybrid combination. It provides monitoring of infrastructure, applications, and response time with reporting and analytics.

IBM Application Performance Management provides all the functions of IBM Monitoring and adds more monitored domains, user experience monitoring, and transaction tracking.

IBM Application Diagnostics provides diagnostics into application servers and application frameworks. It can be purchased separately or in combination with IBM Monitoring or IBM Application Performance Management.

## IBM Monitoring packaging



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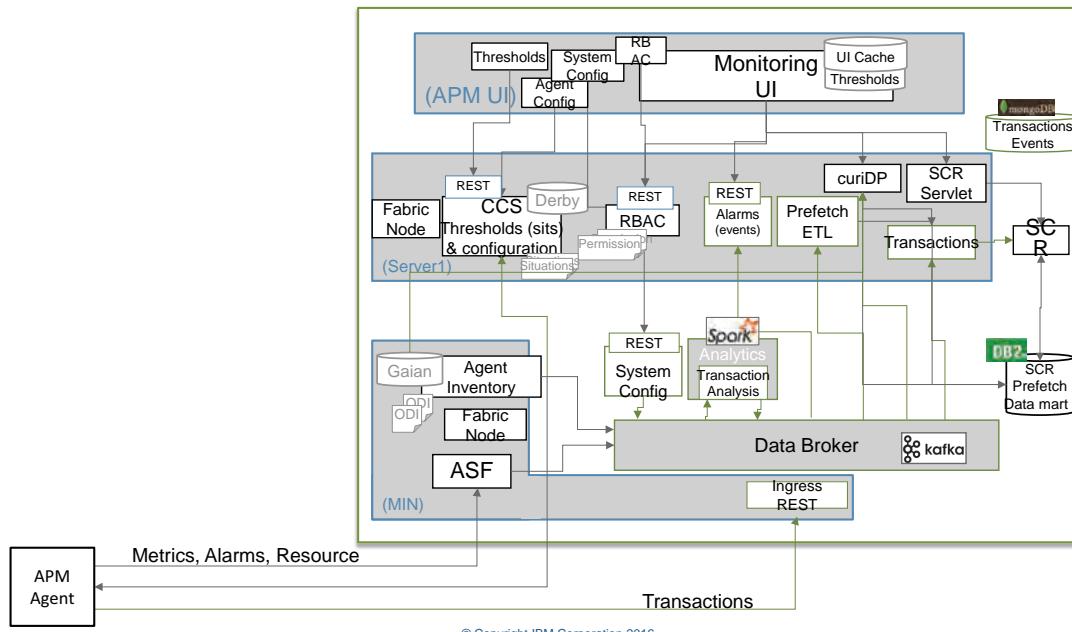
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### IBM Monitoring packaging

Features of IBM Monitoring include these examples:

- Performance Management server with Performance Management console
- IBM Monitoring agents
- IBM Monitoring agent reports
- Agent Builder
- IBM Hybrid gateway

## Application Performance Management architecture



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Application Performance Management architecture

A key feature in the APM Architecture is the use of the REST API. REST stands for Representational State Transfer. This open interface creates multiple benefits to APM.

The REST API is the way that agents send data into APM. Data flows from the agents into APM, and is not returned as a response to a request for information from APM. This is a key architectural difference between IBM Tivoli Monitoring v6 and APM v8.

The data is ingested by a Data Broker component and placed in queues. You can think of it as a message bus. It is implemented in Kafka. The data broker can provide the data to applications that create topologies, run analytics, or analyze the data for alarms and thresholds.

The REST API is also the way that Monitoring and Analytics user interfaces accesses the data, as displayed by the use of the REST API at the top of the screen.



# Lesson 2 Monitoring agents and categories



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In this lesson, you learn how to describe IBM Monitoring agents and three other product offerings.

## Monitoring agents by product and platform

Agent	IBM Monitoring	IBM Application Performance Management	IBM Application Diagnostics	IBM Application Performance Management Advanced	Add-ons	Linux	AIX	Windows
Monitoring Agent for Cisco UCS	Yes	Yes	No	Yes	No	Yes	No	Yes
Monitoring Agent for Citrix Virtual Desktop Infrastructure	+	+	No	+	Infrastructure Extension Pack	Yes	No	Yes
Monitoring Agent for DataPower®	Yes	Yes	No	Yes	No	Yes	Yes	No
Monitoring Agent for DB2®	Yes	Yes	No	Yes	No	Yes	Yes	Yes
Monitoring Agent for Hadoop	+	+	No	+	Data Analytics Extension Pack	Yes	Yes	Yes
Monitoring Agent for HMC Base	Yes	Yes	No	Yes	No	No	Yes	No
Monitoring Agent for HTTP Server	Yes	Yes	No	Yes	No	Yes	Yes	No
Monitoring Agent for IBM Integration Bus	No	Yes	No	Yes	No	Yes	Yes	Yes
Monitoring Agent for JBoss	Yes	Yes	No	Yes	No	Yes	No	No
Monitoring Agent for Linux KVM	Yes	Yes	No	Yes	No	Yes	No	No
Monitoring Agent for Linux OS	Yes	Yes	Yes	Yes	No	Yes	No	No
Monitoring Agent for Microsoft Active Directory	Yes	Yes	No	Yes	No	No	No	Yes

In the table, a plus sign (+) indicates that the agent is available as an add-on to the offering.

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### Monitoring agents by product and platform

This slide and the three slides that follow it are a list of monitoring agents that are included with each product at the time this presentation was created.

For descriptions of the agents, open this URL:

[http://www.ibm.com/support/knowledgecenter/SSHLNR\\_8.1.3/com.ibm.pm.doc/install/overview\\_agentdescriptions.htm](http://www.ibm.com/support/knowledgecenter/SSHLNR_8.1.3/com.ibm.pm.doc/install/overview_agentdescriptions.htm)

The red highlighted entry is for an agent new in the latest release.

## Monitoring agents by product and platform (continued)

Agent	IBM Monitoring	IBM Application Performance Management	IBM Application Diagnostics	IBM Application Performance Management Advanced	Add-ons	Linux	AIX	Windows
Monitoring Agent for Microsoft Cluster Server	Yes	Yes	No	Yes	No	No	No	Yes
Monitoring Agent for Microsoft Exchange Server	Yes	Yes	No	Yes	No	No	No	Yes
Monitoring Agent for Microsoft Hyper-V Server	Yes	Yes	No	Yes	No	No	No	Yes
Monitoring Agent for Microsoft Internet Information Services	Yes	Yes	No	Yes	No	No	No	Yes
Monitoring Agent for Microsoft Lync Server	Yes	Yes	No	Yes	No	No	No	Yes
Monitoring Agent for Microsoft .NET	Yes	Yes	Yes	Yes	No	No	No	Yes
Monitoring Agent for Microsoft SharePoint Server	Yes	Yes	No	Yes	No	No	No	Yes
Monitoring Agent for Microsoft SQL Server	Yes	Yes	No	Yes	No	No	No	Yes
Monitoring Agent for MongoDB	Yes	Yes	No	Yes	No	Yes	No	No
Monitoring Agent for MySQL	Yes	Yes	No	Yes	No	Yes	No	Yes

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*Monitoring agents by product and platform (continued)*

## Monitoring agents by product and platform (continued)

Agent	IBM Monitoring	IBM Application Performance Management	IBM Application Diagnostics	IBM Application Performance Management Advanced	Add-ons	Linux	AIX	Windows
Monitoring Agent for Node.js	Yes	Yes	Yes	Yes	No	Yes	No	No
Monitoring Agent for Oracle Database	Yes	Yes	No	Yes	No	Yes	Yes	Yes
Monitoring Agent for PHP	Yes	Yes	No	Yes	No	Yes	Yes	No
Monitoring Agent for PostgreSQL	Yes	Yes	No	Yes	No	Yes	No	No
Monitoring Agent for Python	Yes	Yes	No	Yes	No	Yes	No	No
Monitoring Agent for Ruby	Yes	Yes	No	Yes	No	Yes	No	No
Monitoring Agent for SAP Applications	No	Yes	No	Yes	No	Yes	No	Yes
Monitoring Agent for SAP HANA Database	No	+	No	+	SAP Extension Pack	Yes	Yes	Yes
Monitoring Agent for Synthetic Playback	No	Yes	No	Yes	No	Yes	No	No
Monitoring Agent for Tomcat	Yes	Yes	No	Yes	No	Yes	No	No
Monitoring Agent for UNIX OS	Yes	Yes	Yes	Yes	No	No	Yes	No

In the table, a plus sign (+) indicates that the agent is available as an add-on to the offering.

### Monitoring agents by product and platform (continued)

The red highlighted entry is for an agent new in the latest release.

## Monitoring agents by product and platform (continued)

Agent	IBM Monitoring	IBM Application Performance Management	IBM Application Diagnostics	IBM Application Performance Management Advanced	Add-ons	Linux	AIX	Windows
Monitoring Agent for VMware VI	Yes	Yes	No	Yes	No	Yes	No	Yes
Monitoring Agent for WebLogic	Yes	Yes	No	Yes	No	Yes	Yes	Yes
Monitoring Agent for WebSphere Applications	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Monitoring Agent for WebSphere Infrastructure Manager	Yes	Yes	Yes	Yes	No	Yes	No	No
Monitoring Agent for WebSphere MQ	No	Yes	No	Yes	No	Yes	Yes	Yes
Monitoring Agent for Windows OS	Yes	Yes	Yes	Yes	No	No	No	Yes
Response Time Monitoring Agent	Yes	Yes	No	Yes	No	Yes	Yes	Yes

### Monitoring agents by product and platform (continued)

## Create custom agents with IBM Agent Builder

- Integrates with both IBM Performance Management on premises or SaaS
- Summary and details dashboards for selected attributes are packaged and installed with agent
- Existing IBM Performance Management agent must be installed on the agent host

The image contains two side-by-side screenshots of the IBM Application Dashboard. The left screenshot shows the 'Status Overview' for 'My Windows Application' with a summary of 0 red, 1 yellow, and 1 green status. The right screenshot shows a detailed 'Availability' view for 'WIN2:00' with a table of monitored attributes. The table includes columns for Name, Status, Page Faults, and Working Set. The attributes listed are: DB9 (DOWN), DB10 (UP), DB11 (DOWN), DB12 (DOWN), DB13 (DOWN), DB14 (UP), DB15 (DOWN), DB16 (DOWN), and LogicalDiskCombined (DOWN). The bottom of each screenshot shows a navigation bar with links like 'Status Overview', 'Events', and 'Attribute Details'.

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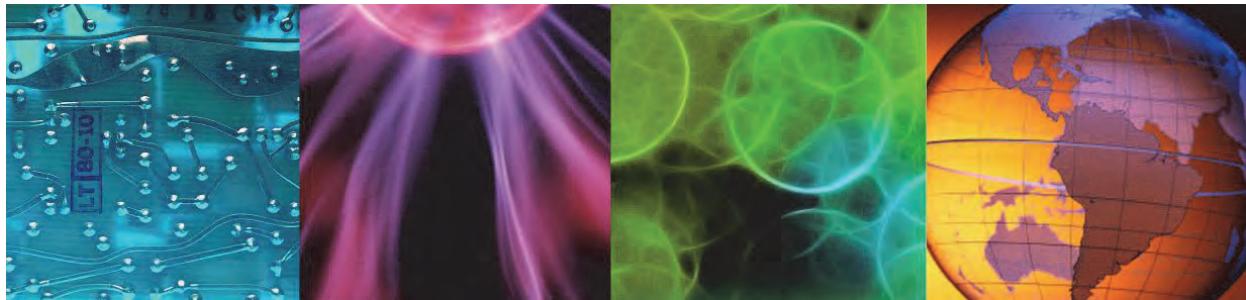
### Create custom agents with IBM Agent Builder

IBM Agent Builder agents can be deployed within an IBM Performance Management on-premises or cloud environment. With Agent Builder, you can create Web User Interface definitions for the Application Performance Dashboard in an IBM Performance Management environment. The Additional Attributes view provides access to all monitored attributes.

# Lesson 3 Application-based monitoring



## Lesson 3 Application-based monitoring



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In this lesson, you learn how to describe the basics of application-based monitoring.

## Application-based monitoring overview

- With Application Performance Management, you can manage applications made up of resources.
- You are able to easily create applications made up of agents that are installed and connected to the Performance Management Server.
- The Performance Management console is the web-based user interface into the product.



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### Application-based monitoring overview

The Performance Management console is the user interface for Performance Management. This unified user interface provides a single view across hybrid applications. You use the console to view the status of your applications and quickly assess and fix performance and availability issues.

The dashboards in the console simplify problem identification so you can isolate bottlenecks that affect application performance. With simple dashboard navigation, you move from a view of application status to code level detail. You have visibility into source code problems at the exact moment of an issue. You can search and diagnose problems by using integrated search analytics.

## Application-based monitoring overview (continued)

- Application health is determined by threshold events.
- Threshold events can be created from any attribute that an agent collects.



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*Application based monitoring (continued)*

## Identify problems and events



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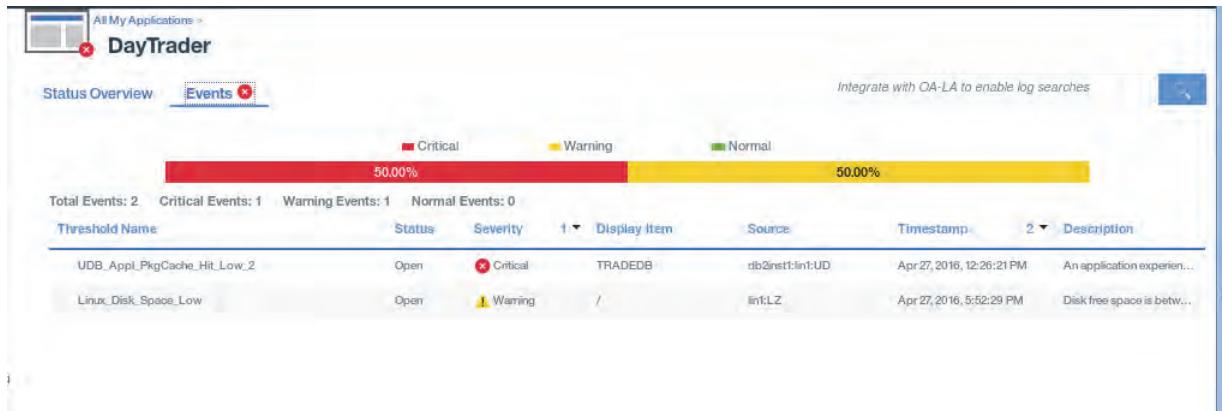
20

### Identify problems and events

The arrows on this slide indicate the events that are true for this application. One is a warning, and one is critical.

Selecting the Event Severity Summary (the widget at the center of the screen) drills down to the Event Severity Summary.

## View events



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### View events

Use the Event Status to get a summary overview of open events for the selected navigator item and to respond to events with a critical or warning status by drilling down to detailed dashboards.

The status indicators are for events from the thresholds that are running on your managed systems. When you configure the Hybrid Gateway, the events can also be from situations that are running on the managed systems in your IBM® Tivoli® Monitoring domain. When your environment includes IBM Operations Analytics Predictive Insights, any detected anomalies are also displayed.

## Navigate to component summary



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### Navigate to component summary

The Application Performance Dashboard navigator in the console is hierarchical, giving a status overview of your applications, the health of their components, and the quality of the user experience. For more details about your monitored resource, you can click a navigator item or a link in the **Status Overview** tab. Consider, for example, that your application has a slow response time. The issue is revealed in the dashboard from a threshold event. Starting from your dashboard, you can follow the problem to the source by clicking links to discover the cause: a DB2® problem.

Identify a red or yellow component. Click the component bar to navigate to the component summary. Click the summary to view the component details.

## View component and event details

The screenshot shows the IBM Monitoring interface for the 'db2inst1:lin1:UD' component. On the left, the 'Status Overview' tab is active, displaying various performance metrics in a grid format. On the right, the 'Events' tab is selected, showing a summary of events: Total Events: 1, Critical Events: 1, Warning Events: 0, Normal Events: 0. A specific event is highlighted, showing its details: Node: db2inst1:lin1:UD, Threshold ID: UDB\_App\_PkgCache\_Hit\_Low\_2, Global Timestamp: Jun 6, 2016, 9:22:06 PM, Type: Sampled, Description: An application experiences low package cache hit ratio. (Pkg Cache Hit Ratio < 50.00), and Formula: UDB\_App\_PkgCache\_Hit\_Low\_2.

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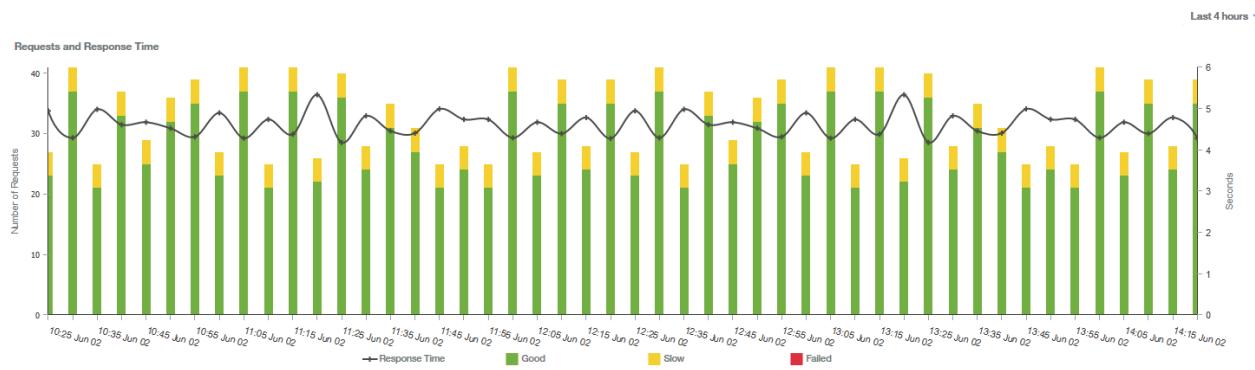
23

### View component and event details

Click a resource instance widget to access resource detail dashboards, and click the event tab to investigate the threshold event.

## Monitor user experience

- Monitors the performance and availability of HTTP requests from users to your application
- Includes these monitoring components
  - Response time agent for monitoring incoming HTTP transactions



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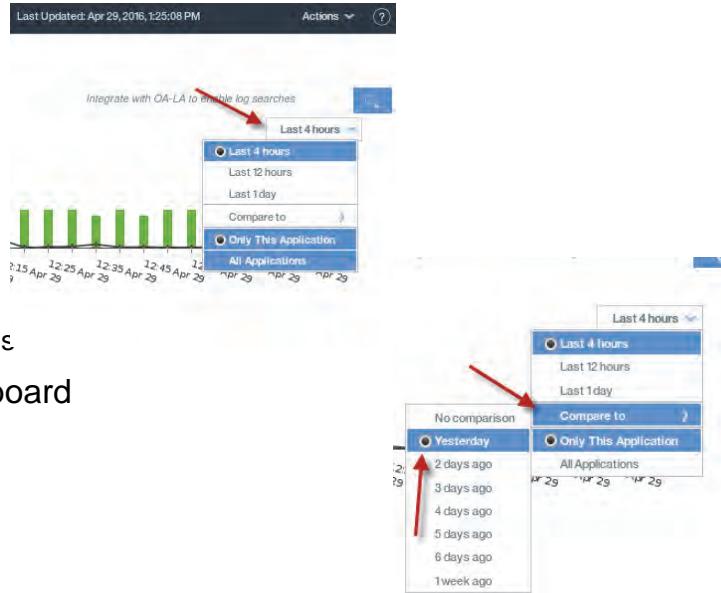
### Monitor user experience

End User Transactions dashboards now include user and device information, which was previously displayed in the Authenticated Users and Mobile Devices Users dashboards in the Users group.

User, session, and device information are now sorted by location (country, state, and city) based on the IP address of the user. The updated dashboards help administrators to understand user volumes and whether issues are isolated to specific sets of users.

## Viewing historical data

- Plot charts, bar charts
- Default last 4 hours
- Options for other time spans
  - Last 12 hours
  - Last 1 day
  - Last 1 week
    - Some limitations
  - Only this application or all applications
- Applies to all widgets on a dashboard



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### Viewing historical data

The dashboard user can determine the time span for certain widgets that show data that is plotted over time. The default behavior is to show the past 4 hours. The other available options are last 12 hours, last day, and last week. Certain history widgets, such as in the WebSphere monitor, are limited to a maximum of 1 day to avoid excessive load on the Monitoring Infrastructure Node server.

You can choose to apply the time span change to only the current application or all applications. You should keep in mind that increasing the time span increases the load on the Monitoring Infrastructure Node server and can slow your response time, possibly by a significant amount.

## Opening reports from the application dashboard

The screenshot shows the IBM Performance Management Application Dashboard. In the center, there's a detailed report for the 'DayTrader' application under 'All My Applications'. The report includes sections for 'Status Overview' and 'Events'. A dropdown menu titled 'Actions' is open, showing options like 'Copy URL', 'Trace level', and 'Launch To Reports'. The 'Launch To Reports' option is highlighted. Below the report, there's a bar chart titled 'Current Components Stability' showing stability levels for Linux\_02, WebSphere\_02, DB2, and HTTP\_Server across three categories: Critical, Warning, and Normal.

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### Opening reports from the application dashboard

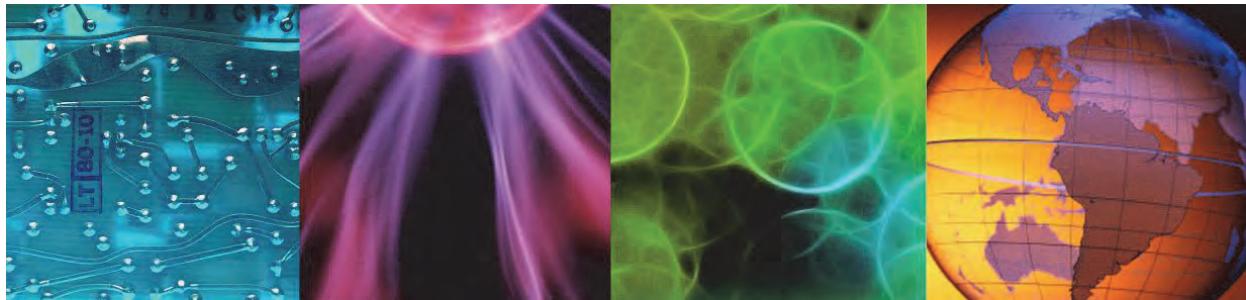
The reports can be launched in context from the dashboard. When you are positioned on the All My Applications dashboard, you can run the All My Applications report. When you are viewing application details, and that application has transactions, you can run the other three reports in the context of the currently selected application.

Select an application from the **Application Dashboard > Applications**. The slide shows an example of selecting the DayTrader application. From the **Actions** drop-down menu, select **Launch To Reports**. From the next drop-down menu, more choices can be available, depending on which application is initially selected.

# Lesson 4 Monitoring agent examples



## Lesson 4 Monitoring agent examples



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In this lesson, you learn how to describe monitoring agent output.

## The Application Dashboard navigator

The Application Dashboard navigator provides a central hub for monitoring application performance. It includes sections for Applications, Groups, and Instances, each with its own set of metrics and status indicators. A sidebar allows users to select an application to view groups. The 'My Components' view also includes a 'Status Overview' and an 'Event Severity Summary'.

- Application Dashboard is the starting navigator
- More navigators can be clicked to see more agent information

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### *The Application Dashboard navigator*

After you log in to the Application Performance Management console and selecting **Performance > Application Performance Dashboard**, the Application Dashboard opens. This navigator is the beginning of steps that drill down to display more information.

## My Components: A summary of events and agents



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### *My Components: A summary of events and agents*

Clicking any of the bars open widgets with more information about the events or agents. The colors of the bars are listed in the legend. Green bars indicate that the agent is active.

## Monitoring agents for Linux OS, UNIX OS, and Windows OS

### Basic operating system statistics

- CPU
- Memory
- Disk
- Network

**Note:** Linux OS, UNIX OS, and Windows OS agents are configured and started automatically.



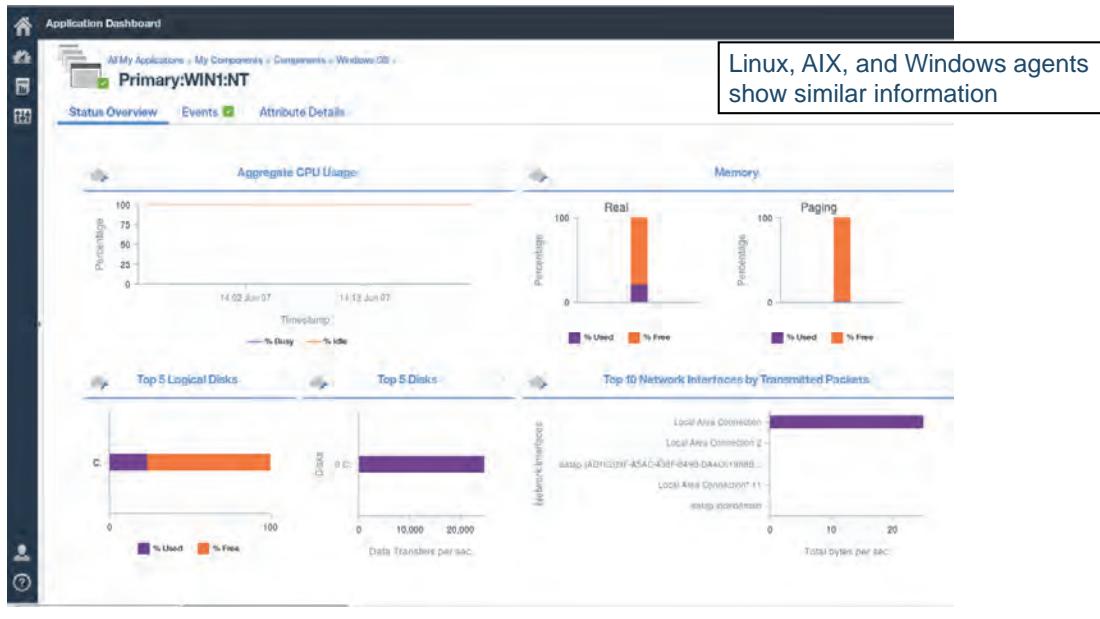
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### Monitoring agents for Linux OS, UNIX OS, and Windows OS

The operating system monitoring agents provide the basic operating system metrics such as CPU, memory, disk, and network. The status overview shows you the server's health at a glance. The entire widget is a hyper-link that you can use to gather more details.

## Example of Windows OS agent details



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### Example of Windows OS agent details

The instance details show you information about the Aggregate CPU Usage, Memory, top five logical disks, and the top ten Network interfaces over the past 2 hours.

The graphic is an example of the Windows OS monitoring agent, but the UNIX OS and Linux OS monitoring agents show you the same information in the same views.

## Example of Windows OS agent details (continued)

The screenshot shows the Application Dashboard interface for a Windows OS agent named 'Primary:WIN1:NT'. The top navigation bar includes links for 'All My Applications', 'My Components', 'Components', and 'Windows OS'. The main content area has tabs for 'Status Overview' (selected), 'Events' (with a green checkmark), and 'Attribute Details'. Under 'Status Overview', there are three sections: 'Processes Information', 'Log Files', and 'System Information'. The 'Processes Information' section displays metrics like Number of processes (42), Number of threads (605), and Number of mutexes (1,033). The 'Log Files' section shows log files for Security, Application, and System, with details like Date/time last modified (Jun 3, 2016 9:22:14 PM), Usage (represented by a bar chart), Number of events (e.g., 2,960 for Security), and Log size (e.g., 2,116 KB for Security). The 'System Information' section provides system details such as Operating System (Windows 2008 R2 - 5.1), POD Name (win1.ibm.edu), Computer Name (VMware Virtual Platform), Host addresses (192.168.1.103 - c1), System uptime (days) (3), and Hyper-Threading (Disabled). A footer at the bottom left reads 'WIN1-WINDOWSOS'.

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### Example of Windows OS agent details (continued)

Scrolling further down the page shows you processes information, log files, system information, and log details.

## Example of Events tab

The screenshot shows the IBM Monitoring interface with the following details:

- Header:** All My Applications > My Components > Components > Windows OS > Primary:ITM:NT.
- Top Navigation:** Status Overview, Events (selected), Attribute Details.
- Event Summary:** Total Events: 2, Critical Events: 2, Warning Events: 0, Normal Events: 0.
- Event Legend:** Critical (red bar), Warning (yellow bar), Normal (green bar). The bar is at 100.00%.
- Event Table Headers:** Threshold Name, Status, Severity, Display Item, Source, Timestamp, Description.
- Event Data:**

Threshold Name	Status	Severity	Display Item	Source	Timestamp	Description
NT_Logical_Disk_Space_Critical	Open	Critical	C:\	Primary:ITM:NT	Jun 7, 2016, 2:54:17 PM	Opens an e
NT_Logical_Disk_Space_Critical	Open	Critical	C:\	Primary:WIN1:NT	Jun 7, 2016, 2:50:06 PM	Opens an e
- Bottom:** © Copyright IBM Corporation 2016.

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### Example of Events tab

This slide is an example of the **Events** tab.

## Monitoring Agent for IBM HTTP Server: Summary dashboard

- The IBM HTTP Server can be installed in one or multiple directories (copy, instance) in an operating system.
- A web server has one or multiple websites configured.
- Each website has its unique port.

All My Applications > My Components > Components > **HTTP Server**

**HU:lin1\_httpd:HUS**

Server status	<input checked="" type="checkbox"/> Running
Server name	lin1.ibm.edu
Up time	1d 2h 2m
Total web sites	1
Request rate (RPM)	9.00
Transfer rate (KB/m)	87.00
Failed request rate (RPM)	<input checked="" type="checkbox"/> 0.00
Server failure rate (RPM)	<input checked="" type="checkbox"/> 0.00
Configuration file	/opt/IBM/HTTPServer/conf...

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### Monitoring Agent for IBM HTTP Server: Summary dashboard

The monitoring agent for HTTP helps you monitor Availability, Performance, and Activity of your web server and associated websites.

On the highest-level dashboard, a summary widget is displayed, which returns data for these items:

- Server name
- Status
- Up time

In addition, data is displayed for these items:

- Total websites that are configured on this server instance.
- Request rate per minute.
- Transfer rate, in kilobytes per minute, and per-minute statistics for other rates:
  - Failed requests rate
  - Server failure rate
  - Failed login rate

The location of the configuration file is also provided.

## IBM HTTP Web Server: Detail dashboard with website list

The Web Server Details dashboard provides this information:

- List of websites on this web server
- Historical graphs:
  - Request Rate
  - Transfer Rate
  - Failed Rate, and
  - Successful and Failed Login Rate
- Web site-specific data when you select a website in the list for review

The screenshot shows a dashboard titled "All My Applications > Credit Card Processing > Components > HTTP Server > HU:nc9098036112\_http:HUS". Below the title, there are three tabs: "Status Overview" (selected), "Events", and "Attribute Details". The main area is titled "Web Site List" and contains a table with two rows of data. The columns are: Web Site Name, Status, Web Server Name, Failed Request Rate, Failed Page Rate, Server Failure Rate, Failed Login Rate, Successful Logins, and Successful Requests.

Web Site Name	Status	Web Server Name	Failed Request Rate	Failed Page Rate	Server Failure Rate	Failed Login Rate	Successful Logins	Successful Requests
9.98.36.112(0)	Running	9.98.36.112	12	12	0	0	0	12
nc9098036112.tivlab.austin.ibm.com	Running	nc9098036112.tivlab.a...	0	0	0	0	0	0

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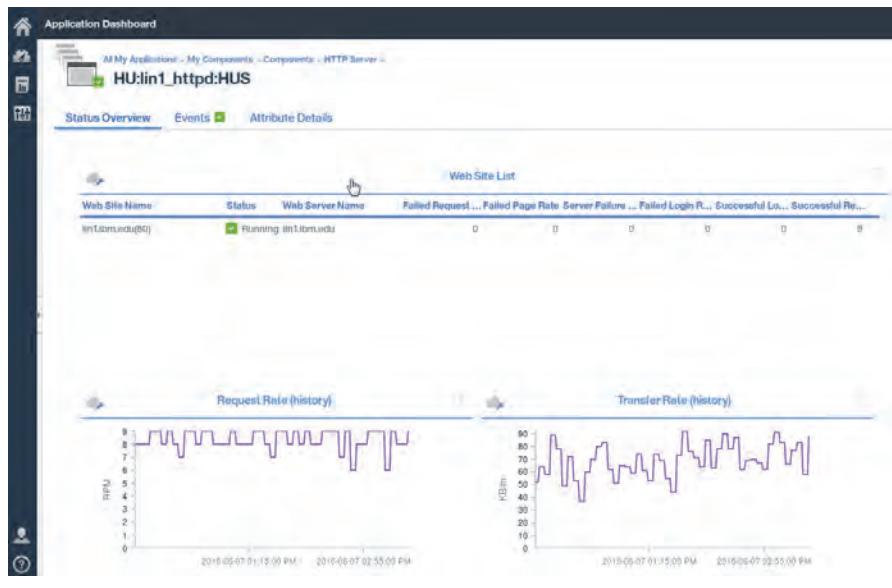
### IBM HTTP Web Server: Detail dashboard with website list

With the Web Server Detail dashboard, you determine the successful and failed requests to the web server, and to the websites on this server. In addition, you can determine the number of kilobytes that are sent to the web server and the number of failed and successful logins to the website.

## IBM HTTP Web Server: Detail dashboard with one website selected

The Details dashboard provides the following information:

- Historical graphs:
  - Request Rate
  - Transfer Rate
  - Failed Rate
  - Successful and Failed Login Rate
- Web site-specific data



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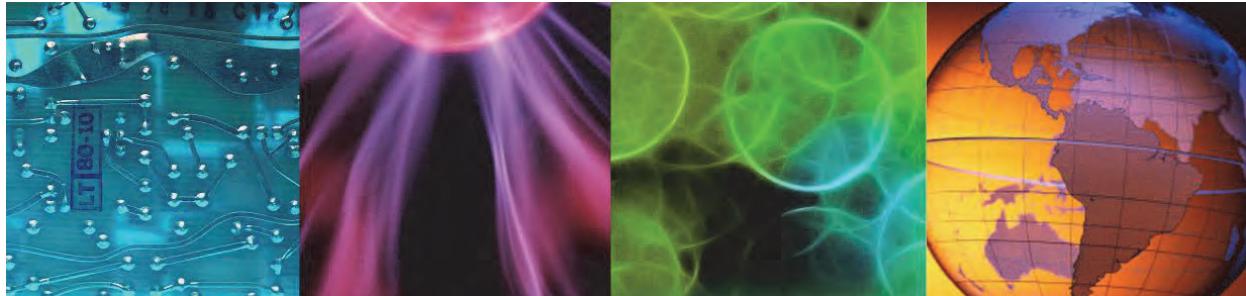
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*IBM HTTP Web Server: Detail dashboard with one website selected*

# Lesson 5 Integrating with IBM Performance Management



## Lesson 5 Integrating with IBM Performance Management



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In this lesson, you learn how to describe how IBM Performance Management can integrate with other IBM products to expand your monitoring solution.

## Integrating with IBM Performance Management overview

- IBM Tivoli Monitoring
  - Hybrid gateway
  - Coexistence of V6/7 and V6 agents
  - Sending V8 data to V6 data warehouse
- IBM Bluemix
- IBM Netcool/OMNIbus
- IBM Operations Analytics Log Analysis
- IBM Operations Analytics Predictive Insights
- IBM Alert Notification
- IBM Control Desk
- Dashboard Application Services Hub



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### *Integrating with IBM Performance Management overview*

IBM Performance Management integrates with many other IBM offerings.

## Hybrid Gateway overview

- Customers need to manage both IBM Tivoli Monitoring 6 On Premises and IBM Performance Management agents. In an environment that includes both IBM Tivoli Monitoring and IBM Performance Management products, you can install the IBM Performance Management Hybrid Gateway to provide a consolidated view of managed systems from both domains.
- The Hybrid Gateway can help customers migrate from IBM Tivoli Monitoring 6 to IBM Performance Management.
- The Hybrid Gateway must be installed in your IBM Tivoli Monitoring environment on a system with Red Hat Enterprise Linux (RHEL) Server 6 Update 2 or higher.
- The Hybrid Gateway can support 1500 - 2000 IBM Tivoli Monitoring on-premises agents.

### Hybrid Gateway overview

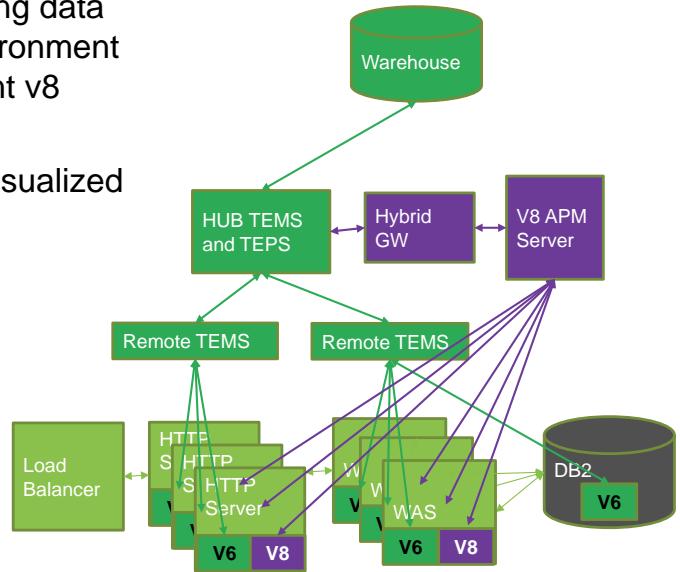
When your monitored environment includes both IBM Tivoli Monitoring and IBM Monitoring products, you can install the IBM Performance Management Hybrid Gateway to get a consolidated view of managed systems from both domains.

When the Performance Management Hybrid Gateway is installed and configured, you can view managed systems from a Tivoli Monitoring domain in the Performance Management console. This gateway must be installed on systems with Red Hat Enterprise Linux Server 6 Update 2 or later.

Having more than 2000 managed systems can degrade performance. You can view a limit of 2000 managed systems.

## Adding in the Hybrid Gateway

- With the Hybrid Gateway, you can bring data from an IBM Tivoli Monitoring V6 environment into an IBM Performance Management v8 environment.
- Both metric data and events can be visualized in IBM Performance Management v8



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### Adding in the Hybrid Gateway

This is a simplified application topology to give you an idea what the process would look like adding APM capabilities for .NET, IIB/Broker, MQ. The business application components are in *blue*. IBM Tivoli Monitoring v6/v7 components are in *green*. APM v8 components are in *purple*.

## Viewing hybrid agents in the dashboard

The screenshot displays two main sections: 'All My Applications' and 'Windows OS'.

**All My Applications:** Shows a summary of components, including 'My Components' which lists 'WIN1 - WINDOWSOS' and 'ITM - WINDOWSOS'.

**Windows OS:** Provides a 'Status Overview' and 'Events' section. It compares two agents:

- ITM - WINDOWSOS:**
  - Online logical processors: 4
  - Aggregate CPU usage (%): 0.00%
  - Memory usage (%): ~50%
  - Total disk usage (%): ~50%
  - Network usage (Pkts/sec): Line chart showing activity over time.
  - Total real memory (MB): 4,095
  - Total disk space (GB): 35.0
  - Number of processes: 95
- WIN1 - WINDOWSOS:**
  - Online logical processors: 5
  - Aggregate CPU usage (%): 0.00%
  - Memory usage (%): ~50%
  - Total disk usage (%): ~50%
  - Network usage (Pkts/sec): Line chart showing activity over time.
  - Total real memory (MB): 4,095
  - Total disk space (GB): 100.0
  - Number of processes: 45

**WIN1 - WINDOWSOS and ITM - WINDOWSOS Details:** These sections provide more detailed monitoring data for each agent, including:
 

- Aggregate CPU Usage:** Shows CPU usage over time (10:00 Aug 19 to 11:00 Aug 19).
- Memory:** Breaks down memory into % Real, % Shared, % Paged, and % Free.
- Top 5 Logical Disks:** Shows disk usage by volume.
- Top 5 Disks:** Shows disk usage by volume.
- Top 10 Network Interfaces by Transmitted Packets:** Shows network interface activity.

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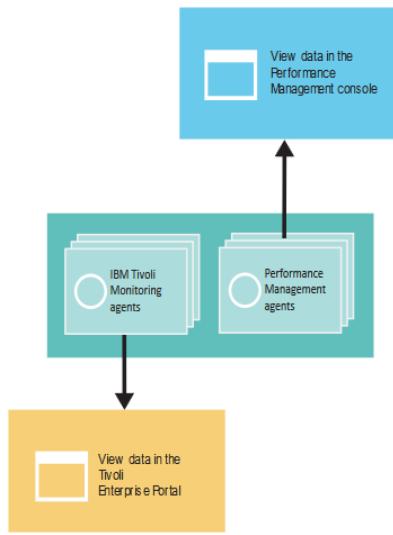
### Viewing hybrid agents in the dashboard

Hybrid agents can be viewed in the Application Performance Management UI application dashboard. In a hybrid environment, you can see information representing agents from traditional monitoring systems and from IBM Performance Management. In the example, views display the IBM Tivoli Monitoring Linux agents, and counts of agents from Tivoli Monitoring and from IBM Performance Management.

Note the icons on the views representing the Status Overview and the Details that are in the upper left corner of each view. It looks like a building with a wrench on it. This icon indicates agents from a traditional Tivoli Monitoring environment or domain that are displayed in IBM Monitoring using the hybrid agent.

## Coexistence of v6 and v7 agents with v8 agents

- You can install IBM Performance Management agents (version 8) on the same computer where IBM Tivoli Monitoring agents (versions 6 or 7) are installed.
- Both agent types cannot be installed in the same directory.
- When agents coexist on the same computer, data from version 8 agents is available in the Performance Management console and data from versions 6 or 7 agents is available in the Tivoli Enterprise Portal.
- When version 6 or 7 agents, which coexist on the same computer as version 8 agents and monitor different resources, are integrated with the IBM Performance Management Hybrid Gateway, data from both agents is available in the Performance Management console.



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### Coexistence of v6 and v7 agents with v8 agents

The goal is to provide users with the ability to install both IBM Tivoli Monitoring and Application Performance Management agents on the same system. Areas of conflict are resolved in the implementation, such as file system locations, and registry settings. If coexisting agents are monitoring the same resources, the following scenarios are not supported:

Both agents store data in the same IBM Tivoli Data Warehouse. For example, if both agents send data to the same Tivoli Data Warehouse, do not use the version 8 WebSphere MQ agent and the version 6 or 7 WebSphere MQ agent to monitor the same queue manager on your system. This scenario also applies to multi-instance agents. For more information, see Tivoli Data Warehouse for historical reporting.

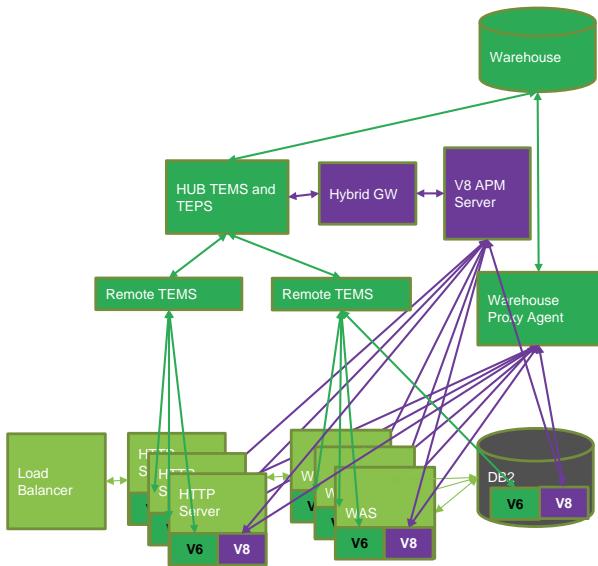
Version 6 or 7 agents are integrated with the Hybrid Gateway to display data from both agents in the Performance Management console. For example, if version 6 or 7 agents are connected to the same Performance Management server through the Hybrid Gateway, do not use the version 8 IBM Integration Bus agent and the version 6 or 7 ITCAM Agent for WebSphere Message Broker to monitor the same broker on your system.

If a Tivoli Monitoring agent, which is integrated with the Hybrid Gateway to display data in the Performance Management console, is monitoring a resource and you want your Performance Management agent to monitor that resource, complete the following steps:

- Remove the Tivoli Monitoring agent from any applications that include it.
- Remove the Tivoli Monitoring agent from the Tivoli Monitoring managed system group that Performance Management is configured to use.
- Wait at least 24 hours and then install the Performance Management agent and add it to an application.

## Integrating Application Performance Management v8 agents with IBM Tivoli Monitoring v6 Tivoli Data Warehouse

- Starting with IBM Performance Management 8.1.3, customers can store historical data in the IBM Tivoli Monitoring v6 Tivoli Data Warehouse (TDW)
- Only Agents with a corresponding v6/v7 Agent are supported  
New metrics unique to IBM Performance Management v8 will not be stored
- Data is sent from the Application Performance Management v8 agents to the Warehouse Proxy and then inserted into the Tivoli Data Warehouse
- Allows for enterprise-wide reporting



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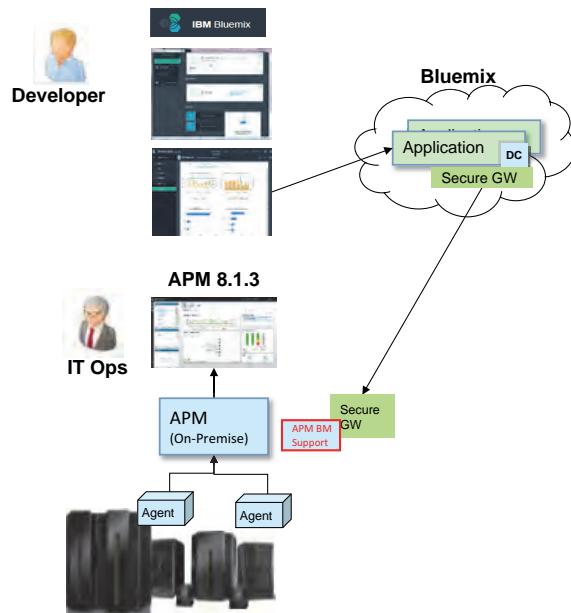
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### Integrating Application Performance Management v8 agents with IBM Tivoli Monitoring v6 Tivoli Data Warehouse

Sample history files for agents are available on your Performance Management server. Use the sample file for your agent as the basis for creating the history configuration xml file on the Performance Management server. The server propagates the configuration to all agents of this type. The history file specifies the Warehouse Proxy agent address, the data sets to collect samples from, the frequency of data collection, and how long to keep the data locally.

## Integrating IBM Bluemix and APM on-premises

- Enable the monitoring of the Bluemix application to be fed into the on-premises APM Server  
Data fed from the IBM Secure Gateway
- Integrates Monitoring and deep-dive Data  
Availability Monitoring and Log Analysis are not integrated

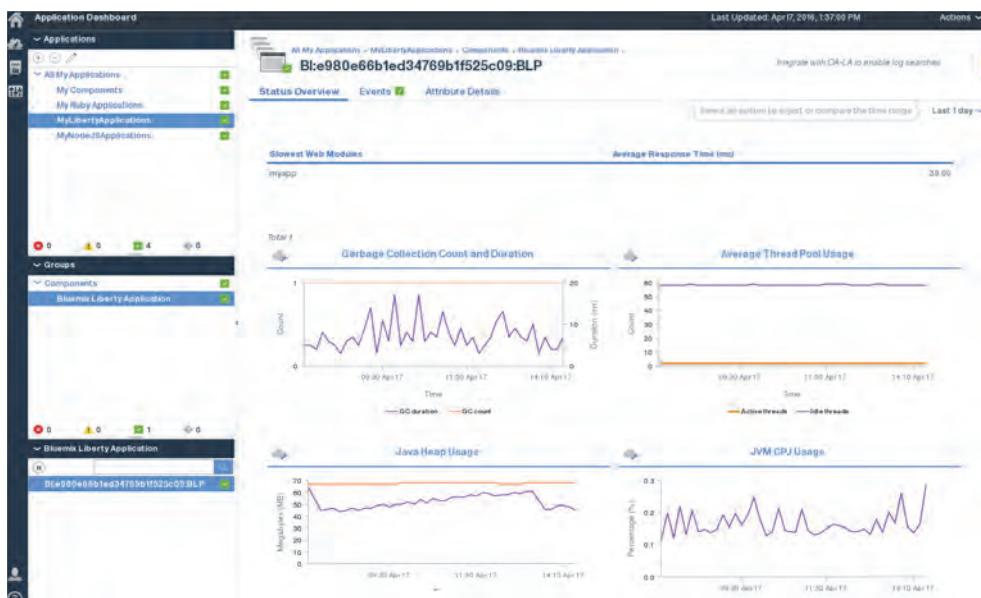


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*Integrating IBM Bluemix and Application Performance Management on-premises*

## On-premises example of a Bluemix Liberty Application



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*On-premises example of a Bluemix Liberty Application*

## Integrating with Netcool/OMNIbus

- This agent forwards alerts that were generated in Performance Management to the customer's on-premises OMNIBUS, providing one method for doing event management.
- Integration Agent is in reality a gateway between Application Performance Management and on-premises software.
  - Forwards alerts through customer's firewall from Application Performance Management to Customer's On-Premise OMNIBUS
  - Contains an HTTPS gateway server in the Performance Management and a gateway client in the customer's environment
  - Coexists with firewalls, uses HTTPS that is initiated from the customer's environment
  - Queues Alerts in case OMNIBUS is temporally not available
  - Alerts follow the standard EIF format that is used in existing IBM Monitoring.

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### *Integrating with Netcool/OMNIbus*

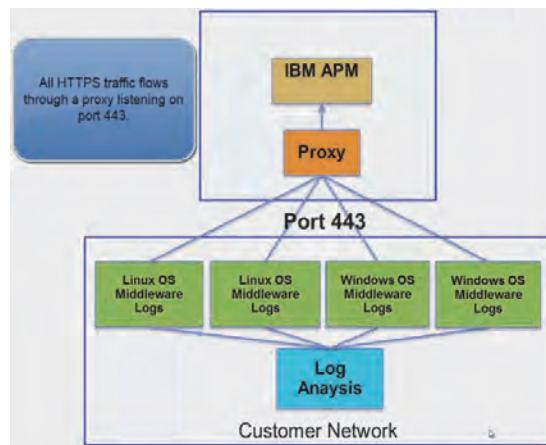
The Integration agent forwards alerts that were generated in Performance Management on Cloud to the customer's on-premises OMNIBUS. Customers use this feature to integrate their Performance Management alerts with their on-premises alerts, providing one method for event management.

On-premises IBM Monitoring can forward alerts directly to a customer's on-premises OMNIBUS.

## Integrating with IBM Operations Analytics Log Analysis

Integration features:

- Application Performance Management Cloud search, enter error information from events into the search field
- Search starts an on premises version of IBM Operations Analytics Log Analysis
- IBM Operations Analytics Log Analysis provides insight by analyzing error patterns in log files. It also provides expert advice for errors.



### Integrating with IBM Operations Analytics Log Analysis

You can integrate IBM Performance Management with IBM Operations Analytics Log Analysis. With this integration, you search for error messages from various locations in the customer environment. IBM Operations Analytics Log Analysis supports expert advice, which improves the usability of the messages that are issued by indicating what actions to take to address the errors that are detected.

## Integrating with IBM Operations Analytics Predictive Insights

- IBM Operations Analytics Predictive Insights on Cloud
  - This new component extends the capabilities of IBM Performance Management by providing early detection of service and application issues to help avoid service disruptions and outages that affect your business.
  - Predictive Insights automatically learn the normal operational behavior of complex infrastructures, such as a cloud, and is designed to identify problems before you know to look for them.
- IBM Operations Analytics Predictive Insights
  - Provides real-time performance analysis for business services
  - Analyzes monitoring data to learn the normal behavior of a business service and create a performance model
  - Generates an alarm when behavior outside normal behavior is detected (anomaly)



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### *Integrating with IBM Operations Analytics Predictive Insights*

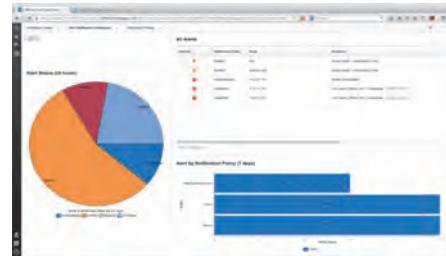
IBM Operations Analytics Predictive Insights on Cloud provides real-time performance analysis for business services. Earlier detection of service and application issues helps you avoid service disruptions and outages that affect your business.

The Predictive Insights product automatically learns the normal operational behavior of complex infrastructures, such as a cloud. The product is designed to identify problems before you know to look for the anomaly.

The Predictive Insights User Interface provides dynamic views of identified anomalies and all relevant metrics. The normalized view supports metric comparison and trend identification.

## Integrating with IBM Alert Notification (Cloud)

- The product IBM Alert Notification is a notification system. It meets increasing demands for agility and efficient collaboration among IT operations team members.
- You can use IBM Alert Notification to provide email notification of alerts when application performance exceeds thresholds.
- IBM Alert Notification is offered with IBM Performance Management (Cloud). When subscribed for Application Performance Management Cloud, IBM Alert Notification is made available automatically.
- The situations from Application Performance Management Cloud can be forwarded to IBM Alert Notification to send email notifications. The source for the alert data is from on premises monitoring agents.
- Another version of IBM Alert Notification is available as part of the Collaborative Operations offering, with the following results:
  - Integrating with IBM Operations Control Desk to open a ticket as a service request.
  - Adding REST API for integrating with other event sources.



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### Integrating with IBM Alert Notification (Cloud)

IBM IT Alert Notification is a simple notification system. It meets the increasing demand for agility and efficient collaboration among IT operations team members that use multiple monitoring tools. It gives IT staff instant notification of alerts for any issues in your IT operations environment, optimizing your business performance, increasing customer satisfaction, and protecting revenue.

Because IBM IT Alert Notification is provided as a service, the required server infrastructure is installed and managed by IBM, reducing your time-to-value and offering low-maintenance ownership. IBM IT Alert Notification is offered with IBM Performance Management on Cloud. You can activate IBM IT Alert Notification with your IBM ID and password on IBM Marketplace:

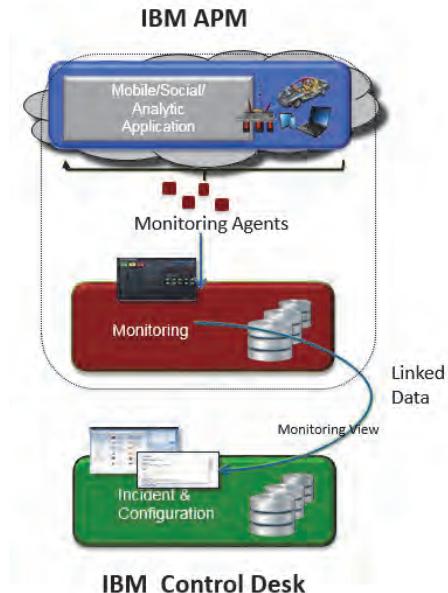
<https://www.ibm.com/marketplace/cloud/us/en-us>

IBM IT Alert Notification can be integrated with IBM Performance Management on Cloud in a few clicks. The data from the on-premises monitoring agents is the source for the alert data. IBM Performance Management on Cloud can also be integrated with an existing physical on-premises installation of Tivoli Netcool/OMNIbus.

When the Collaborative Operations product is available, an integration with IBM Control Desk becomes available. With this integration, a ticket can be opened as a service request.

## Integrating with IBM Control Desk (Cloud)

- When IBM Performance Management detects an issue with your application, it can automatically open a service request in IBM Control Desk.
- Your specialists can fix problems in your applications before users have time to report them.
- Your help desk spends more time solving application issues and less time answering support calls.



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### *Integrating with IBM Control Desk (Cloud)*

The integration of IBM Performance Management and IBM Control Desk provides business value by making your help desk more efficient. When IBM Performance Management detects an issue with your application, it can automatically open a service request in IBM Control Desk. With this automation, your specialists can fix problems in your applications before users have time to report them. Your help desk spends more time solving application issues and less time answering support calls.

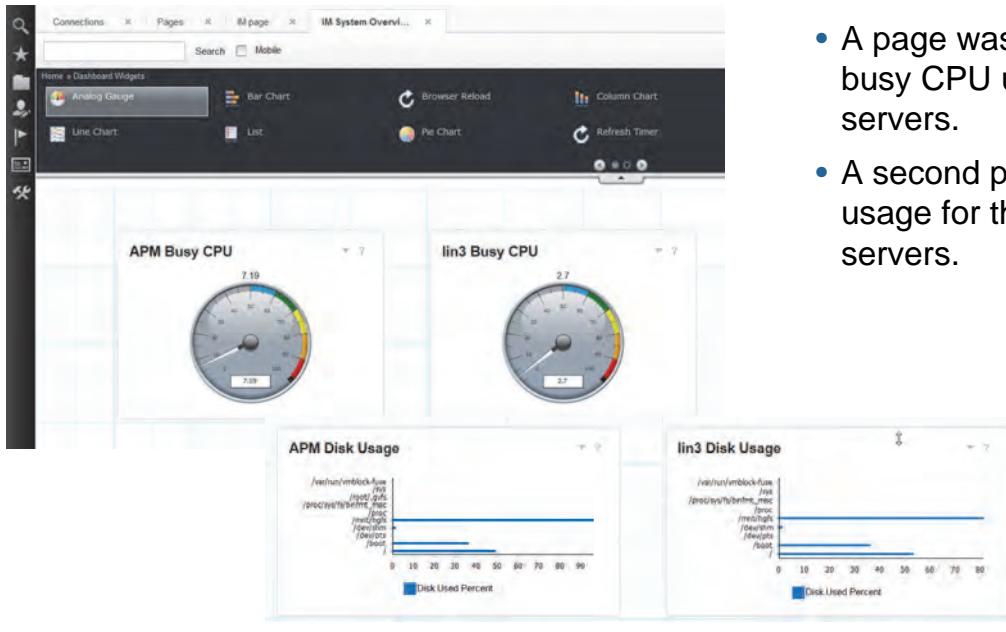
## Integrating with Dashboard Application Services Hub

- The Dashboard Application Services Hub integrates with IBM Performance Management.
- IBM Dashboard Application Services Hub provides a single console for administering IBM products and related applications.
- Dashboard Application Services Hub is the user interface for Jazz for Service Management.
- You can integrate these products, for example:
  - IBM Monitoring with DASH to view monitoring agent data
  - Netcool/Impact with DASH to view the Netcool/Impact GUI
  - Netcool/OMNibus with DASH to view the OMNibus alerts
- The IBM Dashboard Application Services Hub provides a set of features to customize the console and build custom dashboards.
- Pages are created that contain widgets, which you use to build charts, gauges, and tables that contain monitoring data.

### *Integrating with Dashboard Application Services Hub*

The Dashboard Application Services Hub is used to create pages of customized IBM Performance Management agent data.

## Creating a custom dashboard page and widgets



- A page was created showing busy CPU usage for two servers.
- A second page shows disk usage for the same two servers.

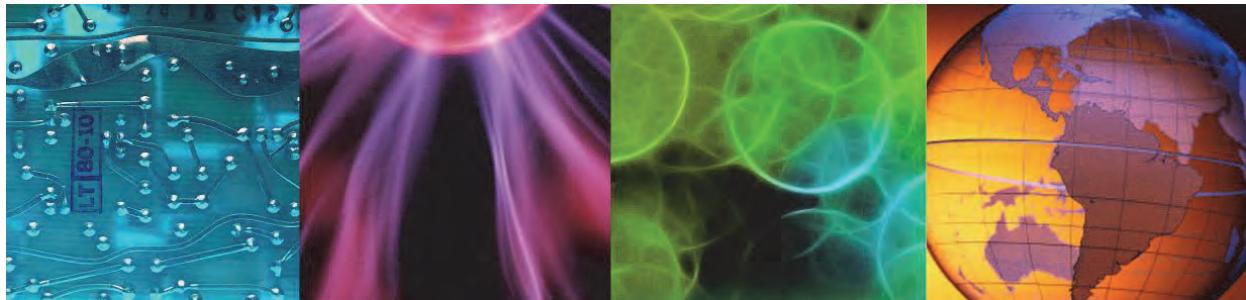
### Creating a custom dashboard page and widgets

This slide shows parts of two Dashboard pages that are created to show data from IBM Performance Management agents. The gauge widgets are used with the KLZ\_CPU data set to show CPU usage on two servers. The bar chart widgets use the KLZ\_Disk dataset and show the disk usage by mount point for the same two servers.

# Lesson 6 The IBM Monitoring lab environment



## Lesson 6 The IBM Monitoring lab environment



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In this lesson, you learn how to describe the lab environment that is used for this course.

## The IBM Monitoring solution in the lab environment

- The environment has preexisting IBM Tivoli Monitoring, Tivoli Common Reporting, and Netcool/OMNIbus.
- A Linux server exists for installing the IBM Monitoring software.
- These IBM Monitoring components are installed:
  - Management Information Node
  - Operating system agents
  - HTTP, WebSphere Application Server, and DB2 agents
- Two applications are built on the IBM Monitoring server to manage agents and components.
- Products are integrated with IBM Monitoring.

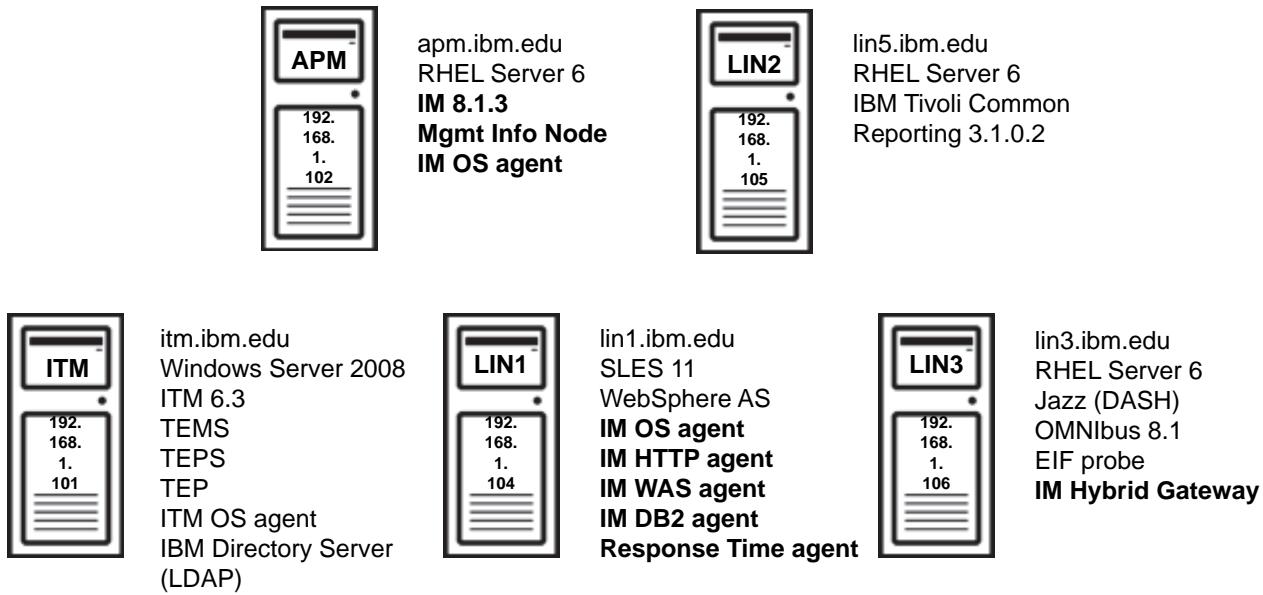
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### *The IBM Monitoring solution in the lab environment*

This slide shows what you work with and what you accomplish in the lab environment.

## The VMware lab environment



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### The VMware lab environment

The bold items on the slide are installed during the lab exercises.

---

## Student exercises



Perform the exercises for this unit in the Course Exercises Guide.

### *Student exercises*

---

## Summary

You now should be able to perform the following tasks:

- Describe IBM Performance Management
- Describe the architecture
- Explain which agents are available
- Explain integration with other products

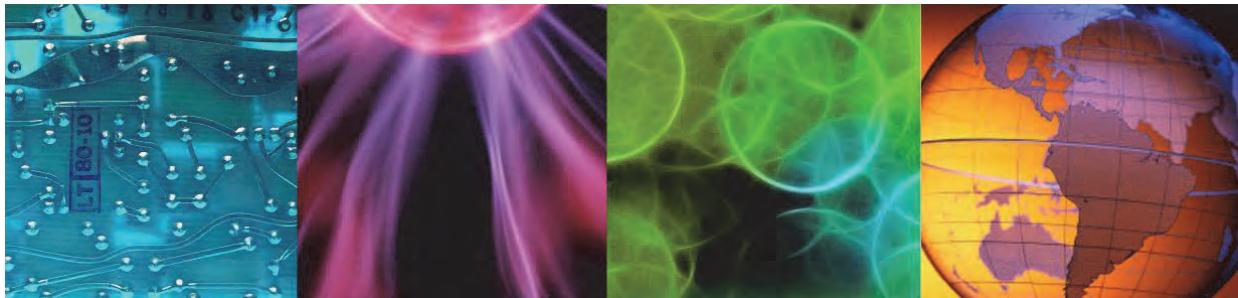
### *Summary*



## 2 Installation



## 2 Installation



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This unit covers installation of the Performance Management server and monitoring agents on both the Windows and Linux environments. You learn about packaging, prerequisites, and the step-by-step instructions on how to install the Performance Management server. You also learn how to install and configure monitoring agents.

## Objectives

In this unit, you learn to perform the following tasks:

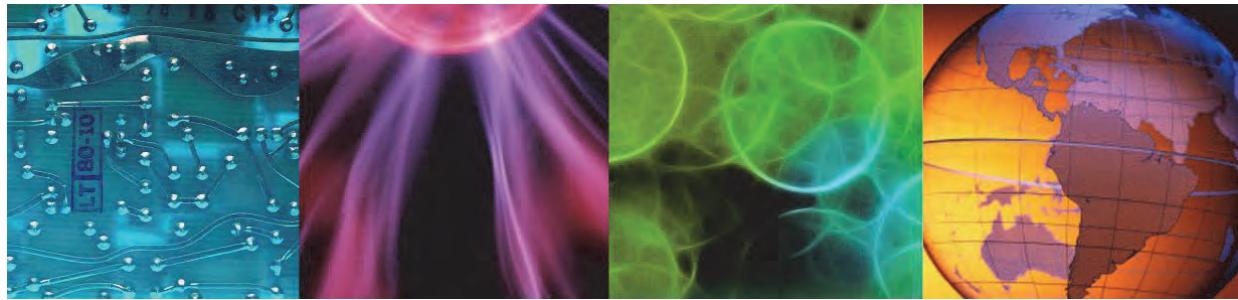
- Describe the installation process differences between on Cloud and on-premises environments.
- Explain the prerequisites and the prerequisite checker.
- Install and configure the Performance Management Server.
- Install and configure the different types of IBM Monitoring agents.



# Lesson 1 Overview of installation



## Lesson 1 Overview of installation



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In this lesson, you learn to describe the similarities and the differences of the installation process on premises and in a SaaS environment.

## **Installation and configuration impacts of on cloud versus on premises**

- For IBM Performance Management (on cloud):
  - Because IBM hosts the Performance Management Server in IBM Marketplace, you don't install or configure it.
  - You download IBM Monitoring agents from packages on IBM Marketplace, and they are preconfigured to connect to your unique Performance Management Server.
- For IBM Performance Management (on premises):
  - You install the Performance Management Server on your local hardware.
  - You create the preconfigured agent packages, and they are stored on your Performance Management Server depot.
- For IBM Performance Management (both on cloud and on premises):
  - You install the agents on the targets.
  - The only difference from the agent installation and configuration is where you obtain the software:
    - For on cloud, download the agent software from the IBM Marketplace instance.
    - For on premises, download the agent software from the Performance Management Server.

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*Installation and configuration impacts of on cloud versus on premises*

## On-cloud installable content

- For IBM Performance Management (on cloud), you can choose offering types:
  - IBM Monitoring
  - IBM Application Diagnostics
  - IBM Application Performance Management
  - IBM Application Performance Management Advanced
- Agent images:
  - ibm-monitoring-agents-aix.tar
  - ibm-monitoring-agents-win-32bit.zip
  - ibm-monitoring-agents-win-64bit.zip
  - ibm-monitoring-agents-xlinux-32bit.tar
  - ibm-monitoring-agents-xlinux-64bit.tar
- To integrate on premises applications with on cloud, this image is delivered:
  - IPMaaS\_Hybrid\_Gateway\_Install

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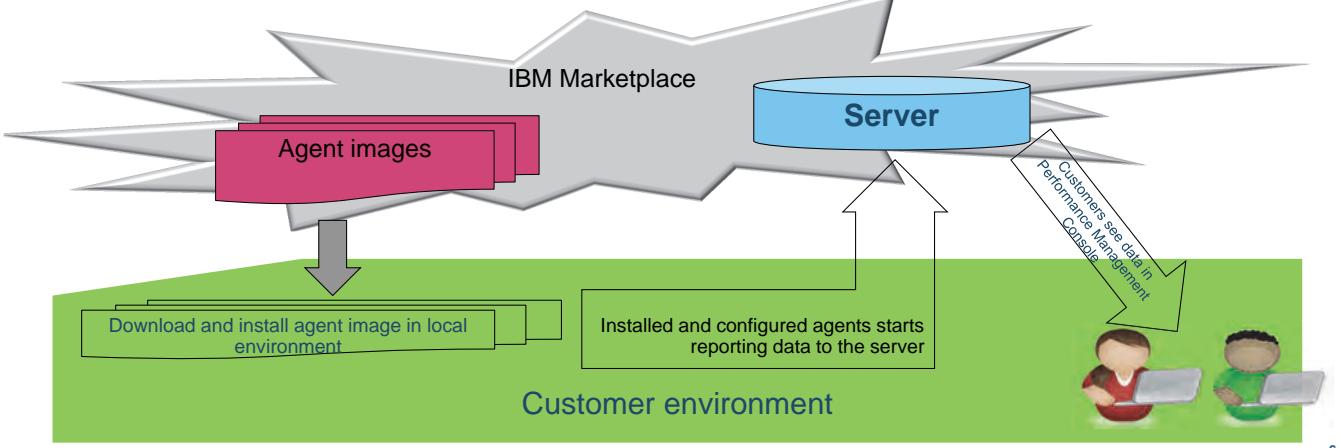
5

### On-cloud installable content

With IBM Performance Management on Cloud, customers can purchase any of four offerings: They can then download the agent images and integration components that they need. This slide lists the various software components that customers can download.

## On-cloud implementation process

- User requests new Performance Management service.
- Monitoring server is installed and runs in cloud on IBM Marketplace (IBM site).
- Users download the agents that are preconfigured to connect a Performance Management server that runs on IBM Marketplace.
- Users install agents in their environment (customer site: cloud or on premises).



On-cloud implementation process

This slide shows the deployment process for IBM Performance Management on Cloud. The customer requests a new Performance Management service from IBM Marketplace. The Performance Management is deployed and runs in the cloud on the IBM Marketplace servers. The customer downloads the agents, which are preconfigured to connect to a Performance Management Server that runs on IBM Marketplace. Customers install the agents in their environments, be that on a server, in the cloud, or on premises.

## On-premises installable content

- For on-premises content, you can choose from four offerings:
  - IBM Monitoring
  - IBM Application Diagnostics
  - IBM Application Performance Management
  - IBM Application Performance Management Advanced
- Server image:
  - ipm\_monitoring\_8.1.3.tar
- Agent images:
  - ipm\_monitoring\_agents\_aix.8.1.3.tar
  - ipm\_monitoring\_agents\_win.8.1.3.zip
  - ipm\_mon\_agents\_win\_32bit.8.1.3.zip
  - ipm\_monitoring\_agents\_xlinux.8.1.3.tar
- Hybrid gateway
  - ipm\_hybrid\_gateway.tar
- Reports image:
  - ipm\_reports\_8.1.3.zip
- Agent builder image
  - ipm\_agent\_builder.tar

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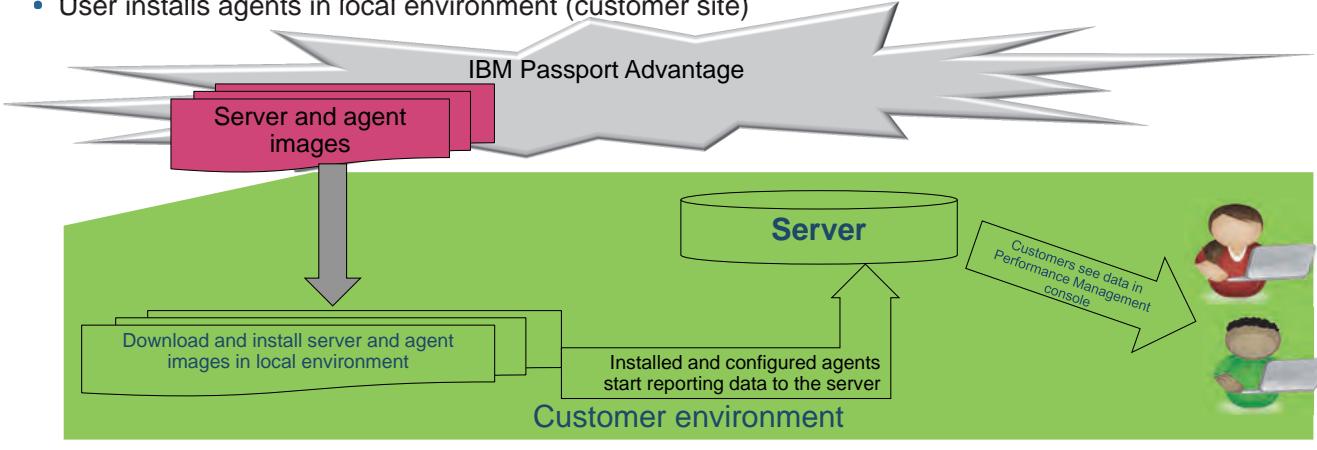
7

### On-premises installable content

With IBM Performance Management on premises, the customer can purchase any of four offerings. They can then download the server image and the agent images and integration components that they need. This slide lists the various software components that the customer can download.

## On-premises implementation process

- User downloads and installs monitoring server in local environment (customer site)
- User downloads and preconfigures agent images to connect to locally installed server
  - Agent image preconfiguration process can be performed at these times:
    - During server installation
    - As a separate step after the server installation
- User installs agents in local environment (customer site)



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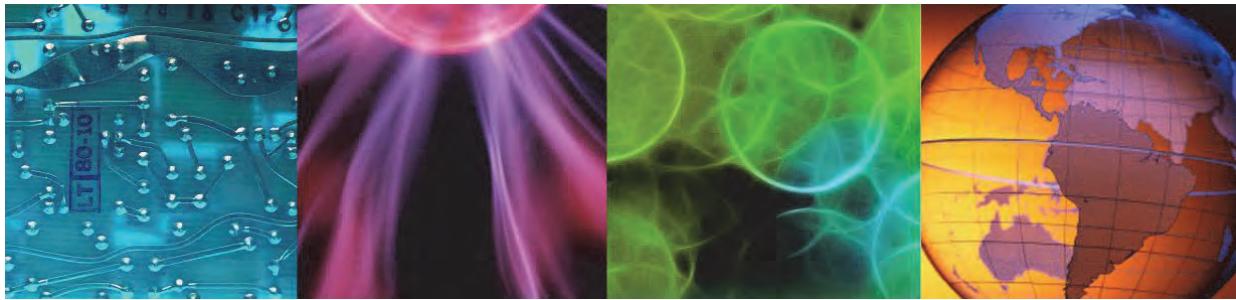
### On-premises implementation process

This slide shows the deployment process for IBM Monitoring on premises. Customers purchase IBM Monitoring and can then download the software from IBM Passport Advantage®. Customers download and install Performance Management server in their local environments. They also download and preconfigure agent images to connect to locally installed servers. This preconfiguration process can be performed either during the server installation or as a separate step after the server installation. Customers can then install agents in their local environments.

# Lesson 2 Prerequisites and the prerequisite checker



## Lesson 2 Prerequisites and the prerequisite checker



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In this lesson, you learn how to research the prerequisites for a successful installation.

## Server installation prerequisite checker

- Prerequisite checking is the first step of the installation flow
  - Installation stops if the prerequisite checker fails.
  - Prerequisite checking is skipped when SKIP\_PRECHECK=1 is set in environment.  
Use: `export SKIP_PRECHECK=1`
  - Take caution when skipping the prerequisite checker. The prerequisites are there for a reason.
  - When all of the user input is collected, the installer runs IBM Prerequisite Scanner (PRS) to ensure that the server meets the requirements.
- PRS can return one of the three values:
  - PASS: The server meets all of the prerequisites.
  - WARNING: The user must decide whether the installation should be continued on the server.
  - ERROR: At least one of the prerequisites is not met. The installation stops.

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### *Server installation prerequisite checker*

The server installer first checks for prerequisites. If the prerequisite checker fails, the installation stops. You can skip the prerequisites checker by setting the SKIP\_PRECHECK variable to 1. When the prerequisites checker finishes, it displays a list of found and expected prerequisites properties.

## Server prerequisites: Platform

The Performance Management server requires a Red Hat Enterprise Linux (RHEL) Server version 6 operating system.

Memory, processor, and storage requirements based on system configuration			
Hardware Component	Minimum Requirements		
	Medium configuration	Small configuration	Very small configuration
Free memory	16 GB	12 GB	8 GB
Number of processors	6	4	2-4
Available disk space	50 - 450 GB	30 - 50 GB	30 GB
Number of agents	1000-4000	50-1000	Less than 50

**Note:** When customer's system does not meet prerequisites for "Very small configuration", prerequisite checking fails.

### Server prerequisites: Platform

This slide lists the platform prerequisites for the Performance Management server, including supported operating system, RAM, processors, and disk space. Notice that the prereq checker fails if the minimum requirements for a very small configuration are not met.

## Server prerequisites: Ports

The Performance Management server requires several ports to be available for the prerequisite checker to allow an installation:

Port	Description
80	HTTP port for the Agent Subscription Facility (ASF) and Central Configuration Server.
443	HTTPS port for the Agent Subscription Facility (ASF) and Central Configuration Server.
8080	HTTP port for the Performance Management console user interface.
9443	HTTPS port for the Performance Management console user interface.
13245	Port 1 for role-based access control
13246	Port 2 for role-based access control
13247	Port 3 for role-based access control
13248	Port 4 for role-based access control
50000	Port for DB2®.

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### Server prerequisites: Ports

Ports that are used by the Performance Management server are listed on this slide.

## Ports that are used for internal communications between server components

The Performance Management server requires several ports to be open for internal communications:

Port	Description
1527	Port for Service Component Registry database. The port is labeled SCRDERBYDB in the prerequisite scanner output.
2181	Port for Zookeeper process of Kafka Message Broker. The port is labeled ZOOKEEPER in the prerequisite scanner output.
6066	Port for Spark applications 2. The port is labeled SPARKAAPPS2 in the prerequisite scanner output.
6414	Port for Gaian database. The port is labeled FNGAIANDB in the prerequisite scanner output.
7077	The port is labeled SPARKAAPPS1 in the prerequisite scanner output.
18080	The port is labeled SPARKMASTER in the prerequisite scanner output.
18085	The port is labeled SPARKWORKER in the prerequisite scanner output.
8090	Port for Performance Management consoles back end connection. The port is labeled SERVER1HTTP in the prerequisite scanner output.
8091	Port for secure Performance Management consoles back end connection. The port is labeled SERVER1HTTPS in the prerequisite scanner output.

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### *Ports that are used for internal communications between server components*

This slide lists the ports that the Performance Management server firewall must open to be available for remote connections.

## Ports that are used for internal communications between server components (continued)

The Performance Management server requires several ports to be open for internal communications:

Port	Description
8099	The port is labeled OIDCHTTPS in the prerequisite scanner output.
9092	Port for Kafka Message BrokerThe port is labeled KAFKA1 in the prerequisite scanner output.
9989	Port for Kafka Message BrokerThe port is labeled KAFKA2 in the prerequisite scanner output.
9998	Port for EIF receiverThe port is labeled FNEIFRCVR in the prerequisite scanner output.
10001	Port for Open Services for Lifecycle Collaboration service provider. The port is labeled OSLCPM in the prerequisite scanner output.
12315	Port for Service Component Registry Java back end. The port is labeled SCRJAVABKEND in the prerequisite scanner output.
27000	Port for MongoDB document store database. The port is labeled MONGODB in the prerequisite scanner output.
32105	Port for internal messaging. The port is labeled FNINTMSG in the prerequisite scanner output.

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*Ports that are used for internal communications between server components (continued)*

This slide lists the ports that the Performance Management server firewall must open to be available for internal connections.

## Software requirements for the Performance Management Server

- Software: Red Hat Enterprise Linux (RHEL) Server 6
  - Update 2 or later
  - Hardware: x86-64
  - Bitness: 64-Exploit
- Dependencies:
  - Checked by the prerequisite scanner
  - Notable dependencies include:
    - Maximum number of user processes.  
os.ulimit=[type:maxprocesseslimit]4096+
    - Maximum number of open files  
os.ulimit=[type:filedescriptorlimit]32768+
- Library dependencies:
  - os.lib.libc\_64=regex{libc\.\.so\.\*}
  - os.lib.libgcc\_64=regex{libgcc\.\.so\.\*}
  - os.lib.libstdc++\_64=regex{libstdc++\.\.so\..5}
  - os.lib.libstdc++\_64=regex{libstdc++\.\.so\..6}
  - os.lib.libstdc++\_32=regex{libstdc++\.\.so\..6}
  - os.lib.pam\_64=regex{libpam\.\.so\.\*}
  - os.lib.pam\_32=regex{libpam\.\.so\.\*}
  - os.package.sg3\_utils=sg3\_utils
  - bash
  - ksh

## Consistent time settings

To ensure a consistent time setting, use NTP (Network Time Protocol):

- NTP still requires setting a consistent and appropriate time zone.
- NTP is supported on all platforms where IBM Monitoring runs.
- Enabling NTP varies by operating system.
- For RHEL 6:

- Examine **/etc/ntp.conf** to be sure that it contains a list of public NTP servers

```
# Use public servers from the pool.ntp.org project.  
# Please consider joining the pool (http://www.pool.ntp.org/join.html).  
server 0.rhel.pool.ntp.org iburst  
server 1.rhel.pool.ntp.org iburst ←  
server 2.rhel.pool.ntp.org iburst  
server 3.rhel.pool.ntp.org iburst
```

- Make sure **/etc/ntp.conf** has proper file permissions.

- Restart (or start) the NTP daemon:

```
service ntpd restart
```

- Make sure that the NTP daemon starts at boot time:

```
chkconfig ntpd on
```

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### Consistent time settings

Network Time Protocol (NTP) is a networking protocol for clock synchronization between computer systems over packet-switched, variable-latency data networks.

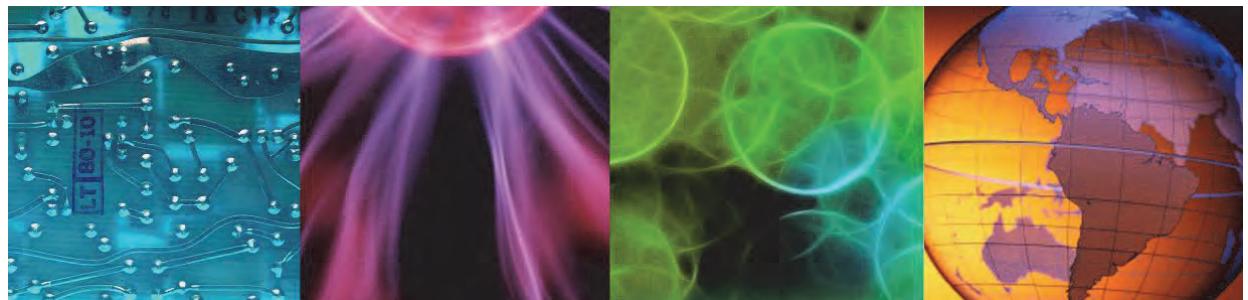
## Browser support

Browser	Version	
Apple Safari	8.0 and future fix packs	Support Safari desktop 6.0 or above on Mac.
Google Chrome	42 and future fix packs	
Microsoft Internet Explorer	10.0 and future fix packs	
Microsoft Internet Explorer	11.0 and future fix packs	
Mozilla Firefox ESR	31 and future fix packs	
Mozilla Firefox ESR	38 and future fix packs	

# Lesson 3 Installing the Performance Management Server



## Lesson 3 Installing the Performance Management server



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In this lesson, you learn how to install the Performance Management server.

## Server installation application

- Download server image:  
**ipm\_monitoring\_8.1.3.tar**
- Unpack on local system and run the installation program:  
**install.sh**
  - By default server is installed to this directory:  
**/opt/ibm/**

**Note:** You can customize installation path.

- In the 8.1.3 release, CLI installation only is supported.
- Perform the installation as the root user.

## DB2 installation on a remote server

---

- DB2 can be installed on a local machine by the Performance Management Server installer.
- You can alternatively connect to a DB2 server on a remote machine.
- You must create the DB2 database on the remote machine before you start the installation of the Performance Management Server.
  - DB2 Version 10.5 fix pack 5 must be installed and licensed.
  - DB2 user db2apm must be created and in the db2iadm1 group
  - DB2 user itmuser must be created and in the dasadm1 group
- Scripts and configuration details are in the documentation.
- At installation time, you are prompted for the DB2 connection details to the remote DB2 database.

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### *DB2 installation on a remote server*

You can connect to a remote DB2 server to adhere to your organization's database server administration policies. Connecting to a remote DB2 server also reduces the load on the Performance Management server, which improves performance. Consider a remote DB2 setup when the necessary disk I/O performance cannot be achieved on the hardware that is allocated for your Performance Management server.

## MongoDB installation on a remote server

- MongoDB is always installed on a local machine without prompting the user
- MongoDB is configured and started for each type of offering
- User can decide to disable the local installation of MongoDB, install MongoDB on a remote server, and configure the monitoring server to use the remote installation
- The documentation provides a step-by-step procedure on how to install MongoDB on a remote server and configure the server to use the remote MongoDB.

### *MongoDB installation on a remote server*

MongoDB is a NoSQL open source database that is installed with the Performance Management server. The MongoDB stores data for the transaction tracking feature that is available with the IBM Application Performance Management offering, and threshold event data. You can install and configure the MongoDB on a remote system from the server. In large-scale environments, an external MongoDB can be used to reduce load at the server.

## Server installation application

Default user ID	Purpose	Default Password	Directory and script that can be used the change the default password after the installation
gaiandb	Used to access the Performance Management embedded Derby configuration database	gian08pW0rd	None
apmadmin	Used to log in to the Performance Management console	apmpass	/opt/ibm/ccm/apmpasswd.sh
smadmin	Used to authenticate with server1 Liberty process	apmpass	/opt/ibm/ccm/tools/smapasswd.sh
itmuser	Used to access the Prefetch data store and SCR database	db2Usrpasswd@08	/opt/ibm/ccm/db2_users_passwd.sh
db2apm db2fenc1 dasusr1	DB2 instance users	db2Usrpasswd@08	/opt/ibm/ccm/db2_users_passwd.sh
admin user	Used to access the MongoDB, which stores Transaction Tracking data.	mongoUsrpasswd@08	/opt/ibm/ccm/tools/mongopasswd.sh

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### Server installation application

This slide describes the users that are set up by default and their respective passwords.

## Server installation application on premises

- Download server image:
- Unpack on local system and run the installation program:  
`install.sh`
  - Server is installed to any directory (default):  
`/opt/ibm`

Note: Installation path is customizable

- In 8.1.3 release, CLI installation is supported only.
- Use root to install

### *Server installation application on premises*

This slide describes how to start the Performance Management server installer, some of the requirements to run the installer and some of the results. The installer is in the `ibm-monitoring.tar` file. Copy and extract it onto the target system and run the `install.sh` command. In the 8.1.3 release, only the command-line interface (CLI) installer is supported, and you must be root to perform the installation. The server installs into the `/opt/ibm` directory by default, but you can change the destination.

The installer creates the four users show in the previous slide with the default password previously shown, but you can change this by setting the passwords in the `install.properties` file before running the installer.

The installer supports using an existing DB2 installation and if DB2 users exist, the user must provide valid passwords in the `install.properties` file.

The following slides cover each of these phases in more detail.

## Server installation flow

- Collecting user input
  - Upgrading or new installation
  - Change installation directory
  - License agreement
  - Set APM administrator password
  - Preconfigure agent packages (optional)
  - Use a different web server
  - Install database or use existing DB2
- Running prerequisite scanner (optional)
- Installation process runs
  - Installing DB2.
  - Installing Server components
  - Installing Support
  - Creating the Metric Cache database (Prefetch database)
  - Creating the Topology database (SCR database)
- Installation process runs (continued)
  - Finalizing database creation
  - Configuring Summarization and Pruning agent
  - Configuring Messaging Broker (configuring Kafka)
  - Starting server components of IBM Monitoring
    - performance management server
    - server1
    - asfrest
    - apmui
  - Configuring server components of IBM Monitoring
  - Configuring agent installation images (optional)
  - Install summary

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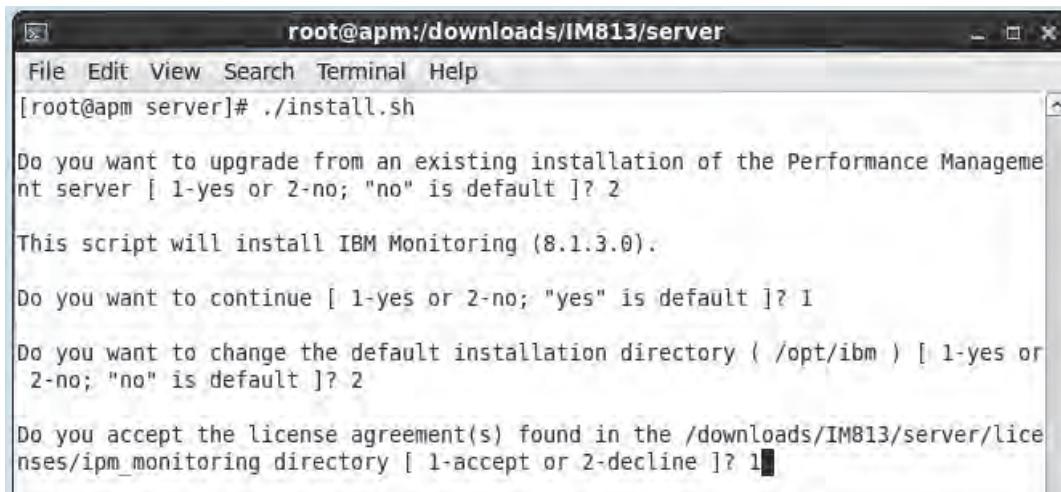
24

### Server installation flow (OPO)

This slide shows the basic actions of the server installer that is divided into three phases: user input, prereq scanner, and installation process. The following slides cover each of these phases in more detail.

## User input: Server license agreement

In the first installation step, you must accept license agreement.



The screenshot shows a terminal window titled "root@apm:/downloads/IM813/server". The window contains the following text:

```
File Edit View Search Terminal Help
[root@apm server]# ./install.sh

Do you want to upgrade from an existing installation of the Performance Management server [ 1-yes or 2-no; "no" is default ]? 2

This script will install IBM Monitoring (8.1.3.0).

Do you want to continue [ 1-yes or 2-no; "yes" is default ]? 1

Do you want to change the default installation directory ( /opt/ibm ) [ 1-yes or 2-no; "no" is default ]? 2

Do you accept the license agreement(s) found in the /downloads/IM813/server/licenses/ipm_monitoring directory [ 1-accept or 2-decline ]? 1
```

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### User input: Server license agreement

This slide shows the first required customer input: acceptance of the license agreement.

## User input: admin password and agent preconfiguration

- Keep default admin password or change.

```
License agreement was accepted, installation will proceed...
Do you want to change the default password for the administrator account [ 1-yes
or 2-no; "no" is default ]? 1
Enter the password:
Confirm the password:
The password was accepted and will be used for the administrator account.
```

- Choose whether to preconfigure agents or location of the depot during installation.

```
Agent installation images must be configured to connect to this server. If you h
ave downloaded the agent images to the same system as the server, you can config
ure the agent images now.

Do you want to configure the compressed (*.zip or *.tar) agent installation file
s now [ 1-yes or 2-no; "yes" is default ]? 1

Enter the path to the directory where you downloaded the compressed agent (and/o
r Hybrid Gateway) installation images (e.g. /opt/agents).
Enter the path: /downloads/IM813/agents/

Enter the path to the directory where configured agent installation images can b
e stored.
Enter the path or accept the default [/opt/ibm/ccm/depot]:
```

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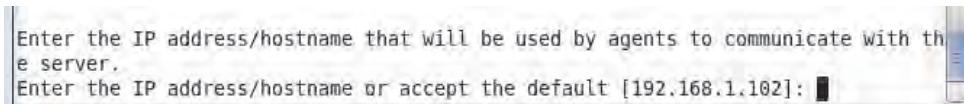
26

### *User input: admin password and agent preconfiguration*

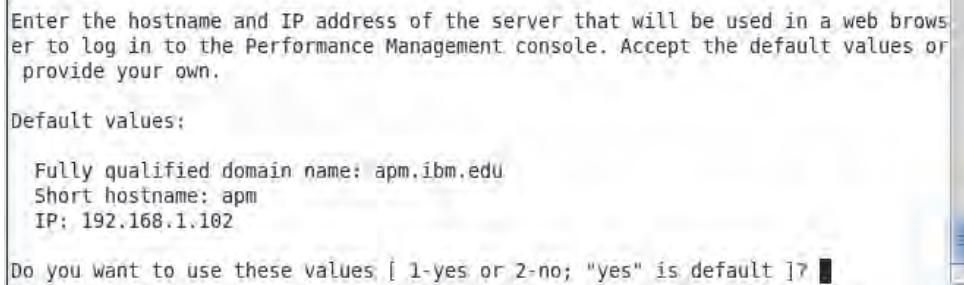
This slide shows the additional customer input that is needed for the server installation. The user has an opportunity to change the default Application Performance Management administrator password, which is apmpass. The user also has an opportunity to preconfigure the agent packages. If the user preconfigures the agent package, the user must provide the location of the packages, which must all be in one directory.

## User input: Agent preconfiguration and Web Server change

- In the preconfiguration process, the user is asked to provide IP address or host name of target Performance Management server



- Do you want to change web servers?



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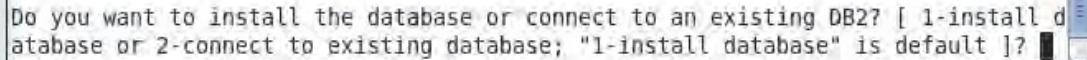
27

### User input: Agent preconfiguration and Web Server change

This slide shows additional customer input that is needed for the server installation. You must also supply the host name or IP address that is used by the agents to communicate with the Performance Management server. Additionally, you decide whether to use an existing DB2 or install a new DB2 database.

## User input: DB2

Do you want to install the database or connect to an existing DB2?



Do you want to install the database or connect to an existing DB2? [ 1-install database or 2-connect to existing database; "1-install database" is default ]? [ ]

### *User input: DB2*

This slide shows the remaining customer input that is needed for the server installation.

## Prerequisites are checked and installation proceeds

```
root@apm:downloads/IM813/server
File Edit View Search Terminal Help

Running Prerequisite Scanner. This may take a few minutes depending on the number of checked components and machine's performance.
Setting Prerequisite Scanner output directory to user defined directory: /opt/ibm/ccm/logs/apm-prs_20160607_211139

Reading Prerequisite Scanner configuration files from uscenario: Prerequisite Scan
pt/ibm/ccm/logs/apm-prs_20160607_211139/config

IBM Prerequisite Scanner
Version: 1.2.0.17
Build : 20150827
OS name: Linux
User name: root

Machine Information
Machine name: apm
Serial number: VMware-56 4d 32 09 5e 87 4d 1e-8f 5b 72
Scenario: Prerequisite Scan

IPDB2 - IBM Performance Management and IBM DB2 Server [version 08010300]:
Overall result: PASS

Detailed results are also available in /opt/ibm/ccm/logs/apm-prs_20160607_211139
/result.txt

No further user input is required. The installation and configuration of components is now starting and may take up to one hour to complete. The installation log is available at "/opt/ibm/ccm/logs/apm-server-install_20160607_211139.log".

Installing DB2. Please wait...
```

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Prerequisites are checked and installation proceeds

This slide shows a successful prerequisite check.

## Server installation process



The screenshot shows a terminal window titled "root@apm:/downloads/IM813/server". The window displays the following text:

```
root@apm:/downloads/IM813/server
File Edit View Search Terminal Help
Installing DB2. Please wait...
Installing the Performance Management server. Please wait...
Starting components of the Performance Management server...
-----
Configuring components of the Performance Management server...
All components are configured successfully.
Configuring agent installation images...
Agent installation images have been configured and are available in the following directory: /opt/ibm/ccm/depot.
The configuration of agent installation images can also be done manually.
To do this manual configuration, first create configuration packages by using the following script: /opt/ibm/ccm/make_configuration_packages.sh. Then, use the output packages from the first script and run the following one: /opt/ibm/ccm/configure_agent_images.sh.
Installer has detected existing keyfiles and/or agent configuration directories.
They have been renamed to . If you want to use them to configure your server and/or agents please review the documentation.
Finalizing the installation...
The server size has been configured as 'extra_small' based on the number of CPUs,
amount of memory and free disk space. To reconfigure the server size, run script /opt/ibm/ccm/server_size.sh with the desired size as a parameter. Valid sizes
are: extra_small, small, medium.
Please review the documentation at http://ibm.biz/m0n doc for more information.
To begin using the product, copy the configured agent images to the systems running the applications you want to monitor and install the agents. Log in to the Performance Management console using https://apm.ibm.edu:9443 and review the topics on the "Getting Started" page.
[root@apm server]#
```

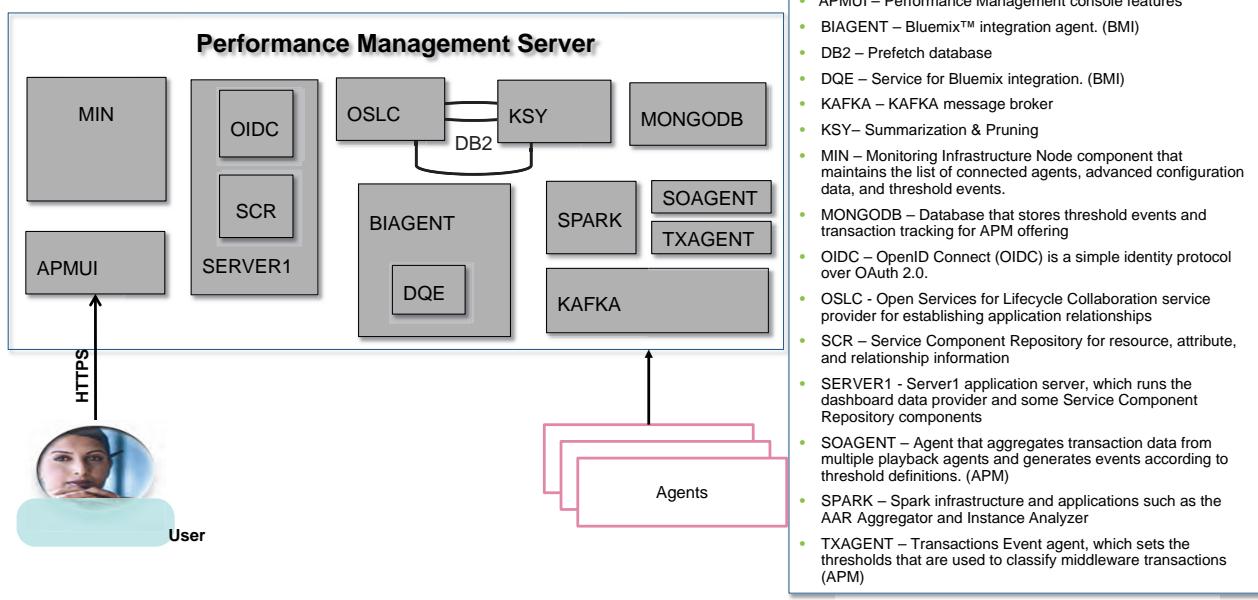
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### Server installation process

This slide shows some of the steps that are taken during the server installation process. Notice that after installing all of the server components, the preconfiguration of agents occurs (if requested). Then the server components are started.

## Main components



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### Main components

This slide lists and describes each of the main services of the Performance Management server. Notice that the agents connect to the server through the ASFREST service and users access the Performance Management console through the APMUI service.



# Lesson 4 Installing IBM Monitoring agents



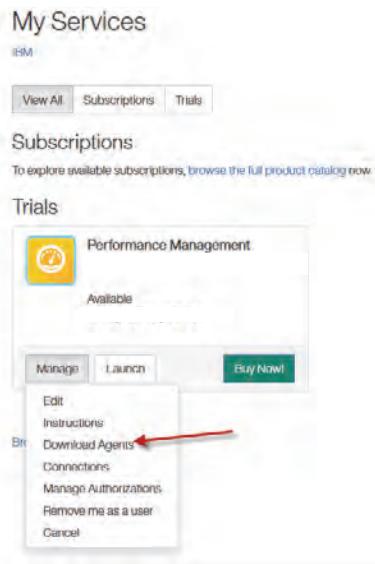
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In this lesson, you learn how to install and configure IBM Monitoring agents.

## Installation and configuration impact of Cloud versus on premises

For IBM Performance Management (both Cloud and on premises):

- You install the agents on the targets.
- The only difference from the agent installation and configuration is where you obtain the software:
  - For Cloud, download the agent software from the IBM Marketplace instance.
  - For on premises, download the agent software from the Performance Management Server (by default the `/opt/ibm/ccm/depot` directory).



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### *Installation and configuration impact of Cloud versus on premises*

There are some common tasks to be performed on the installation whether you are installing in a Cloud environment or on premises.

## Agent image preconfiguration

- Agent images that are downloaded from Passport Advantage are not preconfigured to connect to any particular server.
  - Agent packages that are not preconfigured cannot connect to the Performance Management Server.
- Preconfiguration process updates agent image:
  - Information about server component location (host name or IP address)
  - GSKit encryption keys
  - Secure communication certificates (optional) when agent-server communication is configured to HTTPS
- User can preconfigure agent images:
  - During server installation
  - After server installation by using:  
`/opt/ibm/ccm/make_configuration_packages.sh`  
and then on Performance Management server, by using:  
`configure_agent_images.sh`

**Note:** After agent installation, the user cannot reconfigure installed agents to start reporting to a different server.

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### Agent image preconfiguration

Agent images that are downloaded from Passport Advantage are not preconfigured to connect to any particular server and are not functional until they are preconfigured. The second bullet lists how the agent image is modified during the preconfiguration process. As stated earlier, you can preconfigure during or after the server installation. You use the **make\_configuration\_packages.sh** script to preconfigure the agent packages.

## Agent image preconfiguration outside server installation

```
root@apm:/opt/ibm/ccm
File Edit View Search Terminal Help
[root@apm ccm]# ./make_configuration_packages.sh -h
make_configuration_packages.sh -s <server_ip> [-d <config_packages_dir>] [-p <protocol>]
server_ip - IP address or fully qualified domain name of the server.
config_packages_dir - Optional. Path to the directory where you want to store
                      the configuration packages after you create them.
protocol - Optional. Protocol used for communication between
           agents and the server. Should be "http" (default) or "https".
make_configuration_packages.sh -h
      Displays help for this command.
[root@apm ccm]#
```

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### Agent image preconfiguration outside server installation

This slide shows the help screen for the make\_configuration\_packages.sh script. The screen shows that you can run the command with all parameters for a silent installation. Otherwise, you can run the command by itself, and then answer the prompts for each parameter. As was shown during the server installation, for preconfiguration you must enter the path to the unpreconfigured packages, the IP address of host name of the Performance Management server, and the protocol to be used: HTTP or HTTPS.

## Agent image preconfiguration outside server installation (continued)

```
[root@apm ccm]# ./configure_agent_images.sh -h
configure_agent_images.sh -p <configuration_package_dir> -s <agent_images_dir> [
-a <agent_frameworks_dir>] [-d <pre-configured_images_dir>] [-t]

configuration_package_dir - Path to the directory where
                           the configuration packages that contain
                           the parameters for connecting the agents to
                           the server are stored. The packages are in
                           *.zip format for Windows systems or *.tar
                           format for Linux or AIX systems.

agent_images_dir - Path to the directory where the agent images
                   and/or the Hybrid Gateway image are stored.

agent_frameworks_dir - Optional. Path to the directory where agent
                      offering framework packages are stored. By default it is
                      <installation directory>/ccm/AgentFrameworks

pre-configured_images_dir - Optional. Path to directory where you want
                           the pre-configured images to be stored. If
                           you do not specify a directory and you
                           extracted the images then the
                           pre-configuration is done to the extracted
                           images. Otherwise, the pre-configured
                           images are stored in <installation directory>/ccm/depot by
                           default.

configure_agent_images.sh -h

Displays help for this command.
```

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### *Agent image preconfiguration outside server installation (continued)*

This slide shows the help screen for the configuration\_agent\_images.sh script. As was shown during the server installation, for preconfiguration you must enter the path to the unpreconfigured packages, the IP address of host name of the Performance Management server, and the protocol to be used: HTTP or HTTPS.

## Installing an agent

- Copy the appropriate package to the server and extract its contents.
- Change into the installation directory and run installer script.
  - On premises: ./installAPMAgents.sh
  - Cloud: ./installAPMaaSAgents.sh

```
Terminal
File Edit View Terminal Help
Line:/downloads/agents/APM_Agent_Install_8.1.3 # ./installAPMAgents.sh
The following products are available for installation:
1) Monitoring Agent for Linux OS
2) Monitoring Agent for Ruby
3) Monitoring Agent for MongoDB
4) Monitoring Agent for MySQL
5) Monitoring Agent for PostgreSQL
6) Monitoring Agent for PHP
7) Monitoring Agent for Python
8) Monitoring Agent for Linux KVM
9) Monitoring Agent for Nodejs
10) Monitoring Agent for HTTP Server
11) Response Time Monitoring Agent
12) Monitoring Agent for Oracle Database
13) Monitoring Agent for WebLogic
14) Monitoring Agent for Tomcat
15) Monitoring Agent for VMware VI
16) Monitoring Agent for DB2
17) Monitoring Agent for Websphere Applications
18) Monitoring Agent for JBoss
19) Monitoring Agent for Websphere Infrastructure Manager
20) Monitoring Agent for DataPower
21) Monitoring Agent for Cisco UCS
22) all of the above

Type the numbers that correspond to the products that you want to install. Type "q" to quit selection.
If you enter more than one number, separate the numbers by a space or comma.

Type your selections here (For example: 1,2):
```

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### Installing an agent

To install an agent, copy the appropriate preconfigured package to the target server, extract the contents, and run the installAPMAgents script. The slide shows the first part of the installation flow.

## Installing an agent (continued)

```
Type the numbers that correspond to the products that you want to install. Type "q" to quit selection.  
If you enter more than one number, separate the numbers by a space or comma.  
Type your selections here (For example: 1,2): 17  
The following agents will be installed:  
Monitoring Agent for WebSphere Applications  
Are your selections correct [ 1-Yes, 2-No; default is 1 ]? 1  
Please specify the agent home (default: /opt/ibm/apm/agent):  
The agent will be installed in /opt/ibm/apm/agent  
Do you accept the license agreement(s) found in the directory /downloads/agents/APM_Agent_Install_8.1.3/licenses?  
Please enter [ 1-to accept the agreement, 2-to decline the agreement ] : 1  
User has accepted the license agreement(s).  
Monitoring Agent for WebSphere Applications will be installed.  
Installing Monitoring Agent for WebSphere Applications.
```

```
File Edit View Terminal Help  
#####
The following agents were installed successfully into the /opt/ibm/apm/agent directory:  
Monitoring Agent for WebSphere Applications  
Agent status:  
Agent is running. Process ID is 55567  
Server connection status: Connecting  
For more information, see the following file: /opt/ibm/apm/agent/logs/yn_Primary_ServerConnectionStatus.txt  
The installation log file is /opt/ibm/apm/agent/logs/APMAgents_install.log.  
For any agent that is running, the agent is configured with the default settings.  
To configure your agents, use the following detailed instructions:  
For Performance Management on Cloud:  
http://ibm.biz/kc-ipmcloud-configagent  
For Performance Management (on premises):  
http://ibm.biz/kc-ipm-configagent  
As part of the configuration instructions, you will use the following commands to configure and manage each installed agent:  
Monitoring Agent for WebSphere Applications /opt/ibm/apm/agent/bin/was-agent.sh start or stop or status or uninstall  
#####  
Link: /downloads/agents/APM_Agent_Install_8.1.3 #
```

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### Installing an agent (continued)

This slide shows the rest of the agent installation flow. In this case, a data collector requires more configuration, as indicated in the messages.

## Configuring an agent

- Operating system agents require no configuration
  - Monitoring Agent for Linux OS
  - Monitoring Agent for UNIX OS
  - Monitoring Agent for Windows OS
- Because all agents are preconfigured to connect to the Performance Management Server, any required configuration concerns connecting to what is being monitored, not how to connect to the Performance Management Server.
- The required configuration tasks vary by agent:
  - Some agents require prerequisite tasks to be completed before a successful installation.
  - Many agents require a simple configuration command that is either interactive or points to a text file.
  - Other agents require more commands or updates to configuration files such as these examples:
    - Adding include statements to drive plug-ins
    - Running commands to add discovered configurations into the target software that is monitored
    - Running commands to discover the application to be monitored

### Configuring an agent

Some agents require no special configuration, but some agents require configuration. Some domains might have the ability to run multiple instances on the same server, such as DB2, WebSphere, and WebSphere MQ. The agent must be configured for each instance, even if only one instance is running. Some agents require that a data collector is added to the monitored domain. Consult the product documentation for specific instructions for each agent.

## Configuration summary

Agent	Prerequisite tasks that are required	Multi-instance
Monitoring Agent for Cisco UCS	Yes	Yes
Monitoring Agent for Citrix Virtual Desktop Infrastructure	Yes	Yes
Monitoring Agent for DataPower®	Yes	Yes
Monitoring Agent for DB2®		Yes
Monitoring Agent for Hadoop	Yes	
Monitoring Agent for HMC Base		Yes
Monitoring Agent for HTTP Server		
Monitoring Agent for IBM Integration Bus		Yes
Monitoring Agent for JBoss		Yes
Monitoring Agent for Linux KVM	Yes	Yes
Monitoring Agent for Linux OS		
Monitoring Agent for Microsoft Active Directory	Yes	
Monitoring Agent for Microsoft Cluster Server	Yes	

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### Configuration summary

This table shows which agents require tasks to be completed before the agent can collect data. These tasks include setting up special permissions in the target software to be monitored, installing prerequisite software, or setting up secure connections between the monitoring agent and the target.

The red highlighted entry is for an agent new in the latest release.

## Configuration summary (continued)

Agent	Prerequisite tasks that are required	Multi-instance
Monitoring Agent for Microsoft Exchange Server	Yes	
Monitoring Agent for Microsoft Hyper-V Server	Yes	
Monitoring Agent for Microsoft Internet Information Services		
Monitoring Agent for Microsoft Lync Server3		
Monitoring Agent for Microsoft .NET	Yes	
Monitoring Agent for Microsoft SharePoint Server	Yes	
Monitoring Agent for Microsoft SQL Server	Yes	Yes
Monitoring Agent for MongoDB		Yes
Monitoring Agent for MySQL	Yes	Yes
Monitoring Agent for Node.js	Yes	
Monitoring Agent for Oracle Database	Yes	Yes
Monitoring Agent for PHP	Yes	Yes
Monitoring Agent for PostgreSQL	Yes	Yes

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Configuration Summary (continued)

## Configuration summary (continued)

Agent	Prerequisite tasks that are required	Multi-instance
Monitoring Agent for Python	Yes	Yes
Monitoring Agent for Ruby		Yes
Monitoring Agent for SAP Applications		Yes
Monitoring Agent for SAP HANA		Yes
Monitoring Agent for Synthetic Playback	Yes	Yes
Monitoring Agent for Tomcat		Yes
Monitoring Agent for UNIX OS		
Monitoring Agent for VMware VI		Yes
Monitoring Agent for WebSphere Applications		
Monitoring Agent for WebSphere Infrastructure Manager		Yes
Monitoring Agent for WebSphere MQ		Yes
Monitoring Agent for Windows OS		
Response Time Monitoring Agent	Yes	

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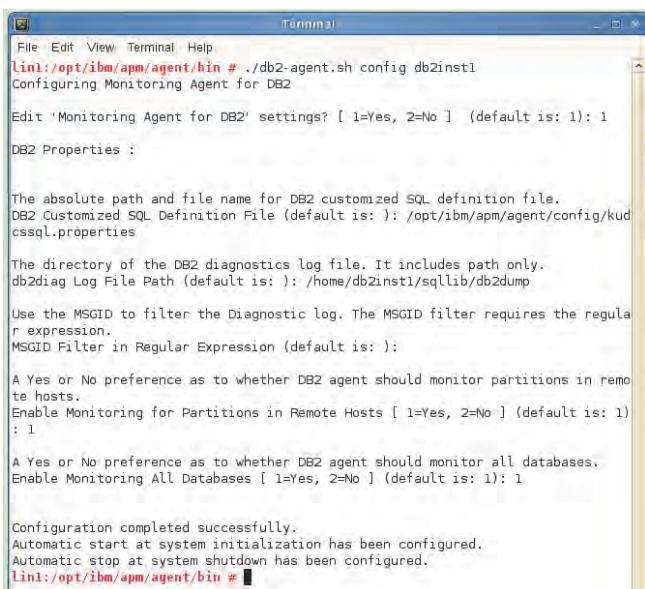
### Configuration Summary (continued)

The red highlighted entry is for an agent new in the latest release.

## Example of an agent configuration: config option

### Multiple-instance agents

- Run the following command:  
`xxx-agent.sh config instancename`
- Example: Monitoring Agent for DB2  
`db2-agent.sh config db2inst1`



The screenshot shows a terminal window titled "Terminal". The user has run the command `./db2-agent.sh config db2inst1`. The terminal displays the configuration options for the DB2 Monitoring Agent. It asks for the absolute path and file name for the DB2 customized SQL definition file, which is set to `/opt/ibm/apm/agent/config/kud.cssql.properties`. It also asks for the directory of the DB2 diagnostics log file, which is set to `/home/db2inst1/sqllib/db2dump`. A MSGID filter regular expression is specified. The configuration then asks if the DB2 agent should monitor partitions in remote hosts, with the answer being "1". It also asks if monitoring should be enabled for partitions in remote hosts, with the answer being "1". Finally, it asks if all databases should be monitored, with the answer being "1". The configuration process is completed successfully, with automatic start and stop at system initialization and shutdown being configured.

```
File Edit View Terminal Help
Lin1:/opt/ibm/apm/agent/bin # ./db2-agent.sh config db2inst1
Configuring Monitoring Agent for DB2

Edit 'Monitoring Agent for DB2' settings? [ 1=Yes, 2=No ] (default is: 1): 1

DB2 Properties :

The absolute path and file name for DB2 customized SQL definition file.
DB2 Customized SQL Definition File (default is: ): /opt/ibm/apm/agent/config/kud.cssql.properties

The directory of the DB2 diagnostics log file. It includes path only.
db2diag Log File Path (default is: ): /home/db2inst1/sqllib/db2dump

Use the MSGID to filter the Diagnostic log. The MSGID filter requires the regular expression.
MSGID Filter in Regular Expression (default is: ):

A Yes or No preference as to whether DB2 agent should monitor partitions in remote hosts.
Enable Monitoring for Partitions in Remote Hosts [ 1=Yes, 2=No ] (default is: 1): 1

A Yes or No preference as to whether DB2 agent should monitor all databases.
Enable Monitoring All Databases [ 1=Yes, 2=No ] (default is: 1): 1

Configuration completed successfully.
Automatic start at system initialization has been configured.
Automatic stop at system shutdown has been configured.
Lin1:/opt/ibm/apm/agent/bin #
```

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### Example of an agent configuration: config option

This slide shows a very simple agent configuration command. In this case, no further configuration is required.

## Example of an agent configuration: Silent configuration option

You can silently configure agents:

1. Update the configuration file:
2. Run the following command:

xxx.agent.sh config path to configfile/configfile.txt

Example: Monitoring Agent for DB2

db2-agent.sh config

/opt/ibm/apm/agent/samples/DB2\_silent\_config.txt

```
Terminal
File Edit View Terminal Help
Lin:~ # cd /opt/ibm/apm/agent/bin/
Lin:/opt/ibm/apm/agent/bin # ./db2-agent.sh config db2inst1 /opt/ibm/apm/agent/
samples/DB2_silent_config.txt
Configuring Monitoring Agent for DB2
Configuration completed successfully.
Automatic start at system initialization has been configured.
Automatic stop at system shutdown has been configured.
```

```
DB2_silent_config.txt
File Edit View Search Tools Document Help
DB2_silent_config.txt
# samples/DB2_silent_config.txt
#
# Syntax rules:
# where <instance_name> is the DB2 instance name you want to monitor
#
#####
# PRIMARY CONFIGURATION #####
CMSCONNECT=NO
#
#####
# DB2 PARAMETERS #####
# DB2_CUSTOM_SQL_PROPERTIES=/opt/ibm/apm/agent/samples/sql.properties
KUD_DIAGLOG_PATH=/home/db2inst1/sqllib/db2dump
#
# The absolute path and file name for DB2 customized SQL definition file
# use the MSGID to filter the Diagnostic log. The MSGID filter requires the
regular expression
KUD_DIAGLOG_MSGID_FILTER=
#
# A Yes or No preference as to whether DB2 agent should monitor partitions
in remote hosts
KUD_MONITOR_REMOTE_PARTITIONS=Yes
#
# A Yes or No preference as to whether DB2 agent should monitor all databases
KUD_MONITOR_ALL_DATABASES=Yes
```

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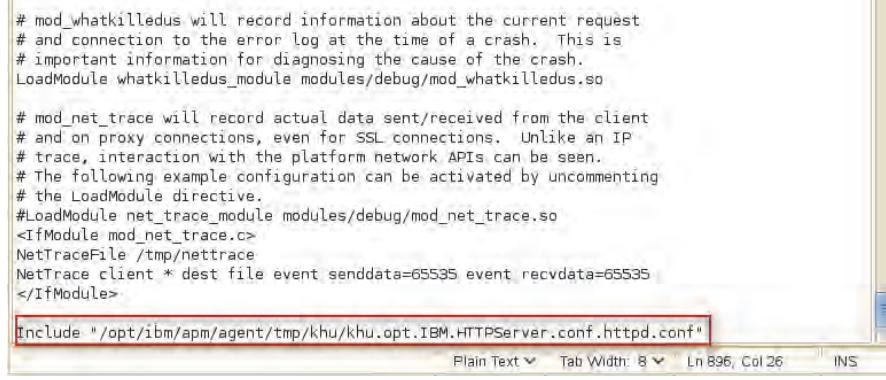
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### Example of an agent configuration: Silent configuration option

This slide shows an example of using the silent configuration option available to configure an agent. Instead of providing input to the configuration by using multiple prompts, the input is placed in a file and the file is provided as input to the configuration script.

## Example of an agent configuration: External data collector

- To monitor some applications, an external data collector must be added to the target application.
- Example 1: Monitoring Agent for HTTP Server
  1. Update the **/opt/IBM/HTTPServer/conf/httpd.conf** file.
  2. Add the Include statement to drive the data collector.
  3. Recycle the HTTP Web Server.



```
# mod_whatkilledus will record information about the current request
# and connection to the error log at the time of a crash. This is
# important information for diagnosing the cause of the crash.
LoadModule whatkilledus_module modules/debug/mod_whatkilledus.so

# mod_net_trace will record actual data sent/received from the client
# and on proxy connections, even for SSL connections. Unlike an IP
# trace, interaction with the platform network APIs can be seen.
# The following example configuration can be activated by uncommenting
# the LoadModule directive.
#LoadModule net_trace_module modules/debug/mod_net_trace.so
<IfModule mod_net_trace.c>
NetTraceFile /tmp/nettrace
NetTrace client * dest file event senddata=65535 event recvdata=65535
</IfModule>

Include "/opt/ibm/apm/agent/tmp/khu/khu.opt.IBM.HTTPServer.conf.httpd.conf"
```

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### Example of an agent configuration: External data collector

This slide shows an example of modifying the software that is monitored by adding an external data collector. External data collectors is a common tool that is used by multiple monitoring agents.

## **Example of an agent configuration: External data collector (continued)**

Example 2: Monitoring Agent for WebSphere Application Server

1. Change to the directory where the config command is located:

```
/opt/ibm/apm/agent/yndchome/7.3.0.11.0/bin
```

2. Run the **config.sh** or **simpleconfig.sh** command.

```
Terminal
File Edit View Terminal Help
lin1:/opt/ibm/apm/agent/yndchome/7.3.0.11.0/bin # ./simpleconfig.sh
Please note, if you have installed your Monitored WebSphere instance using non-root credentials, Ensure that
this user has read and write access to files under dchome directory. For more information, see the Monitoring
Agent for WebSphere Applications Installation Guide.

-----
- Monitoring Agent for WebSphere Applications
- Data Collector Simple Configuration
```

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*Example of an agent configuration: External data collector (continued)*

Some monitoring agents provide custom scripts that are run to configure the external data collectors. The **simpleconfig.sh** command is an example of the script that is provided by the Monitoring Agent for WebSphere Application Server.

## Example of an agent configuration: External data collector (continued)

Example 2: Monitoring Agent for WebSphere Application Server: results

### 3. Select the application server from the list

```
Log file name: /opt/ibm/apm/agent/yndchome/7.3.0.11.0/data/simpleconfig-trace.log.
List of WebSphere Application Server home directories discovered:
Enter a number or enter the full path to a home directory
 1. /opt/IBM/WebSphere/AppServer
Enter a number:
1
Looking for servers under profile AppSrv01
Discovering profile. Please wait...
Configuring. Please wait...

Please ensure the account that was used to run the application server has the read and write privileges to D
CHome/runtime directories.
Configuration completed successfully.
Please restart the WebSphere servers under the selected profile to exploit the full power of Monitoring Agent
for WebSphere Applications Data Collector.
Link: /opt/ibm/apm/agent/yndchome/7.3.0.11.0/bin
```

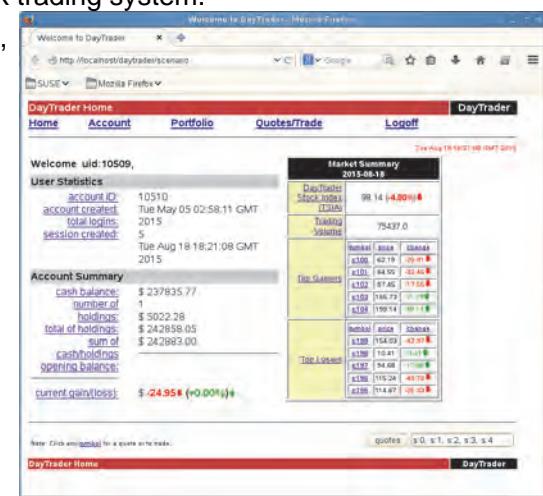
*Example of an agent configuration: External data collector (continued)*

This slide shows the remaining steps of running the **simpleconfig.sh** command.

## Example of an application to monitor: DayTrader

### DayTrader

- DayTrader is benchmark application.
- DayTrader is built around the paradigm of an online stock trading system.
- With this application, users can log in, view their portfolio, look up stock quotes, and buy or sell stock shares.
- In addition to the full workload, the application also contains a set of primitives that are used for functional and performance testing of various Java EE components and common design patterns.



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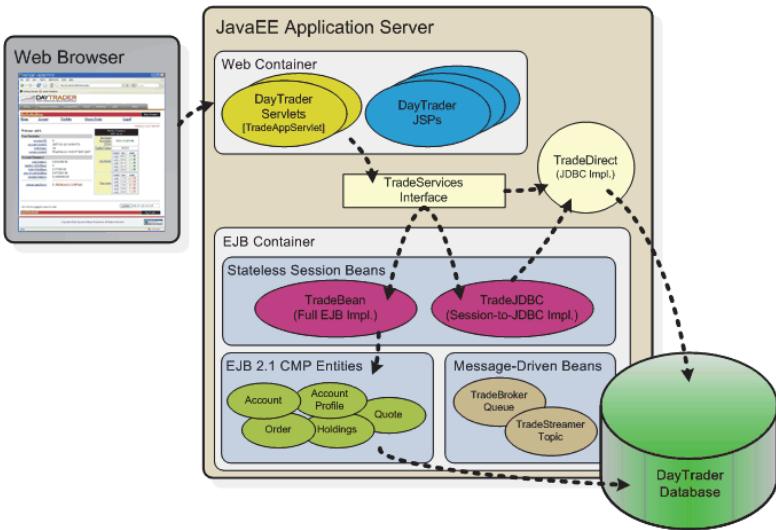
### Example of an application to monitor: DayTrader

DayTrader is commonly used benchmark application that is built around the example of an online stock trading system. It is installed and configured. You use it for the exercises for this class.

## Lab architecture

Five agents combine to give a full view of the components that comprise the DayTrader application:

- Monitoring agent for WebSphere Application Server
- Monitoring agent for DB2
- Monitoring agent for HTTP Server
- Monitoring agent for Linux OS
- Response Time Monitoring Agent



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### Lab architecture

Multiple monitoring agents in this class monitor the DayTrader application. You install and configure the monitoring agents to provide insight into the availability and performance of the components of the application.

## Lab solution: Simple application with five monitoring agents



### Lab solution: Simple application with five monitoring agents

On completion of the lab exercises, you see the data for all of the monitoring agents in a single dashboard.

## Student exercises

---



Perform the exercises for this unit in the Course Exercises Guide.

---

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*Student exercises*

---

## Summary

---

You now should be able to perform the following tasks:

- Describe the installation process differences between Software as a Service (SaaS) and on-premises environments.
- Explain the prerequisites and the prerequisite checker.
- Install and configure the Performance Management Server.
- Install and configure the different types of IBM Monitoring agents.

---

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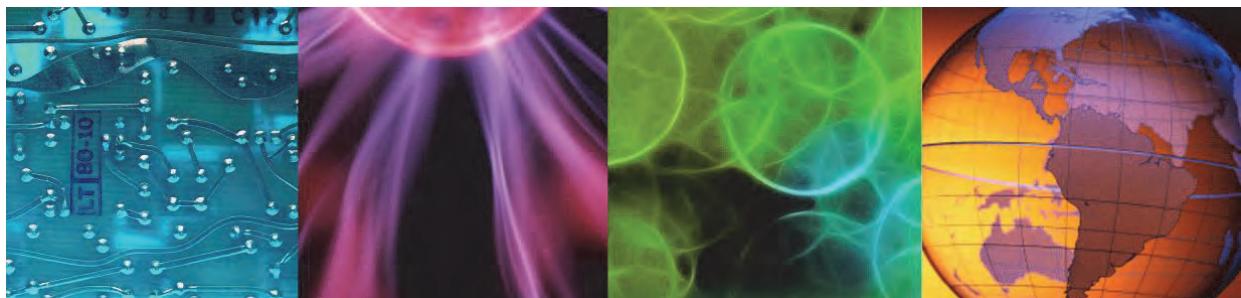
*Summary*



## 3 Administering and using IBM Performance Management



### 3 Administering and using IBM Performance Management



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This unit teaches how to manage the components of the Performance Management Server, and also teaches how to use and administer the Performance Management console.

## Objectives

---

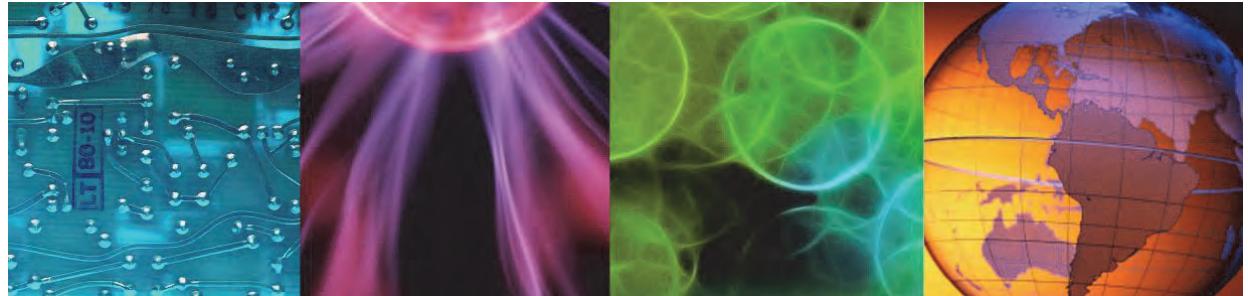
In this unit, you learn to perform the following tasks:

- Manage the Performance Management Server components.
- Start and stop the monitoring agents.
- Start the Performance Management Console.
- Describe the major functions of managing applications.
- Use attribute details to access data from an agent.
- Configure and use the log file agent.
- Manage users of the Performance Management Console.



# Lesson 1 Starting and stopping the Performance Management Server

## Lesson 1 Starting and stopping the Performance Management Server



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In this lesson, you learn how to start and stop components of the Performance Management server.

## List of Performance Management services

Service	Description
apmui	Performance Management console component that handles incoming user interface requests.
asfrest	Agent interface component that includes the agent REST interface and central configuration services HTTP server. Agents use the REST interface to send monitoring data that is persisted in the DB2® server and threshold events. The central configuration service HTTP server handles requests from agents for their configuration files, for example, threshold definitions.
db2	DB2 server that is used to persist monitoring data and applications that are displayed in the Performance Management console.
kafka	Message bus component for internal communication between components.
ksy	Summarization and Pruning Agent for maintaining database partitions and pruning monitoring data in the DB2 server.
min	Monitoring Infrastructure Node component that maintains the list of connected agents, advanced configuration data, and threshold events.
mongodb	MongoDB NoSQL open source database that stores data for threshold events and for the transaction tracking functions that are available with the IBM Application Performance Management offering.
oslc	Open Services for Lifecycle Collaboration service provider that registers the computer system, software server, and application resources that monitor agents in the service component registry.
scr	Service component registry that persists application definitions and their relationships to agent resources in the DB2 server.
server1	Performance Management console backend component that retrieves monitoring data and applications from the DB2 server and persists threshold definitions, resource group definitions, and role-based access control definitions. If you restart server1, you must also restart the apmui service after restarting the server1 service.

### List of Performance Management services

The Performance Management server is made up of 10 services that are listed on this slide.

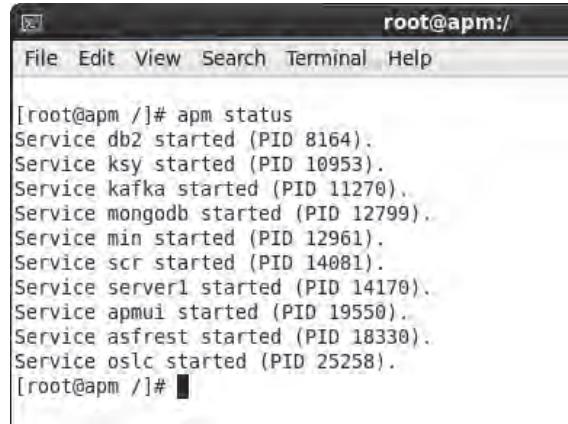
## APM command

- The **apm help** command displays all of the apm command options.

- **# apm help**

- Usage: **apm [-f|--force] command service\_name**
- **-f** or **--force** option applies only to the **stop** command.
- The apm commands are as follows:
  - **status | ss** Show whether service is running or stopped
  - **start | st** Start an apm service by name
  - **start\_all | sta** Start all apm services
  - **stop | sp** Stop an apm service by name
  - **stop\_all | spa** Stop all apm services
  - **restart | rt** Restart a running apm service by name

*service\_name* is one of asfrest, apmui, db2, ksy, kafka, mongodb, min, oslc, scr, server1.



The screenshot shows a terminal window titled 'root@apm:/'. The window has a menu bar with 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. The main area of the terminal displays the output of the command '[root@apm /]# apm status'. The output lists several services and their statuses:

```
[root@apm /]# apm status
Service db2 started (PID 8164).
Service ksy started (PID 10953).
Service kafka started (PID 11270).
Service mongodb started (PID 12799).
Service min started (PID 12961).
Service scr started (PID 14081).
Service server1 started (PID 14170).
Service apmui started (PID 19550).
Service asfrest started (PID 18330).
Service oslc started (PID 25258).
[root@apm /]#
```

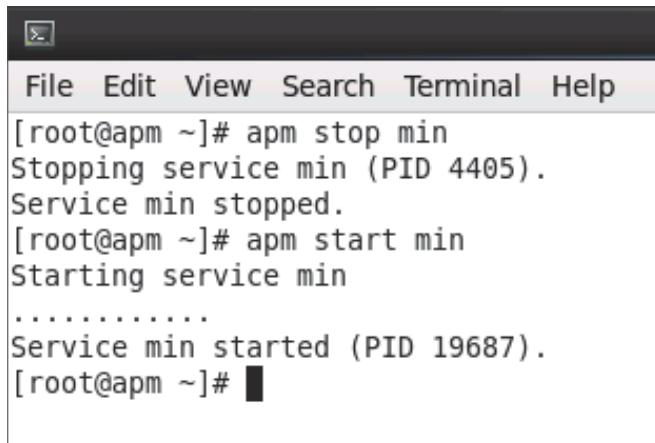
### APM command

With the apm command, you can stop, start, restart, and see the status of the various components that make up the Performance Management server. You can stop and start all services with one command, or you can stop, start, or restart each service independently.

## Managing the Monitoring Infrastructure Node (MIN) service

The Monitoring Infrastructure Node component maintains the list of connected agents, advanced configuration data, and threshold events.

- **apm start min** starts the Monitoring Infrastructure Node component.
- **apm stop min** stops the Monitoring Infrastructure Node.



```
[root@apm ~]# apm stop min
Stopping service min (PID 4405).
Service min stopped.
[root@apm ~]# apm start min
Starting service min
.
.
.
Service min started (PID 19687).
[root@apm ~]#
```

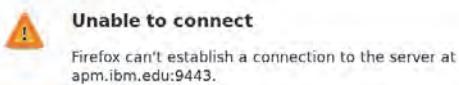
### Managing the Monitoring Infrastructure Node (MIN) service

The Monitoring Infrastructure Node is the key component of the Performance Management server.

## Managing the Performance Management console

The Performance Management console component handles incoming user interface requests.

- **apm start apmui** starts the Performance Management console component.
- **apm stop apmui** stops the Performance Management console.
- When the console stops, the browser connection fails.



```
File Edit View Search Terminal Help
[root@apm ~]# apm stop apmui
Stopping service apmui (PID 6856).
Service apmui stopped.
[root@apm ~]# apm start apmui
Starting service apmui
.....
Service apmui started (PID 9028).
[root@apm ~]# apm status apmui
Service apmui started (PID 9028).
[root@apm ~]#
```

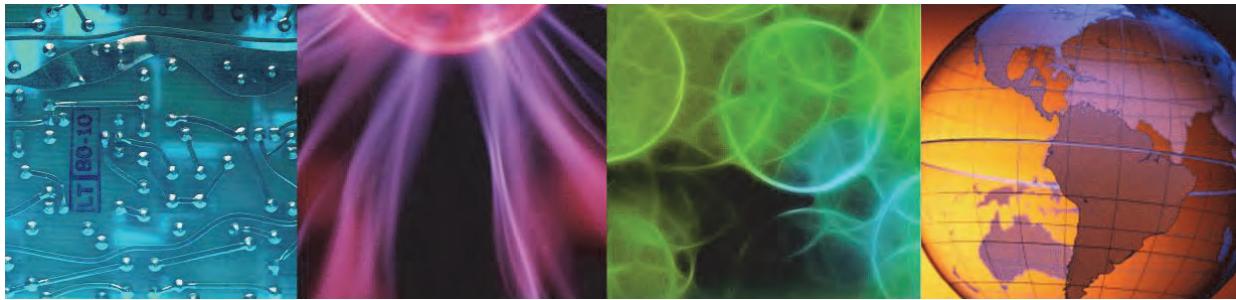
### Managing the Performance Management console

The apmui component controls access to the Performance Management console interface.

## Lesson 2 Starting and stopping agents



## Lesson 2 Starting and stopping agents



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In this lesson, you learn how to start and stop IBM Monitoring agents.

## Commands for managing the monitoring agents

- On Linux

```
cd /opt/ibm/apm/agent/bin  
./<agent-type>agent.sh status<instance_name>  
./<agent-type>agent.sh start <instance_name>  
./<agent-type>agent.sh stop <instance_name>  
./<agent-type>agent.sh config <instance_name>  
./<agent-type>agent.sh uninstall <instance_name>
```

**Note:** Operating system agents start when the server starts.

For example: **./mongodb-agent.sh start mongo1** where *mongo1* is the instance name

- On Windows

```
cd C:\IBM\APM\  
<agent-type>agent.bat status<instance_name>  
<agent-type>agent.bat start <instance_name>  
<agent-type>agent.bat stop <instance_name>  
<agent-type>agent.bat config <instance_name>  
<agent-type>agent.bat uninstall<instance_name>
```

For example: **mysql-agent.bat start mysql1** where *mysql1* is the instance name

### Commands for managing the monitoring agents

You can manage these agents from the command line, whether you are running on Windows or on Linux. There are start, stop, and status options for each agent type. Because most agents can have multiple instances, you provide the instance name in the command.

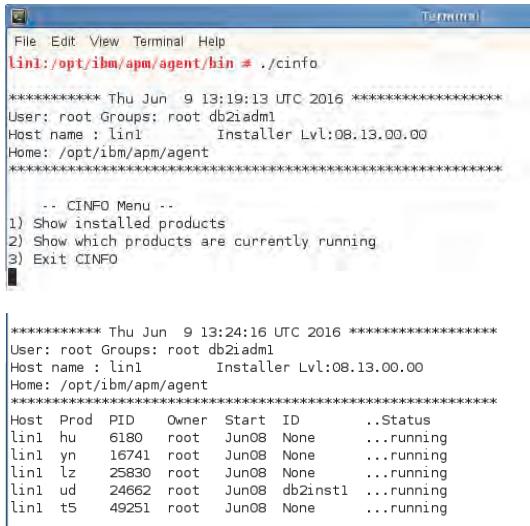
You must be in administrator mode to run the commands on Windows operating systems.

Here is the link to the IBM Performance Management on Cloud IBM Knowledge Center:

[http://www.ibm.com/support/knowledge-center/SSHLNR\\_8.1.3/com.ibm.pm.doc/welcome.htm](http://www.ibm.com/support/knowledge-center/SSHLNR_8.1.3/com.ibm.pm.doc/welcome.htm)

## Determining which agents are installed and running on a server

Use the **cinfo** command to determine which agents are installed or running.



```

Terminal
File Edit View Terminal Help
lin1:/opt/ibm/apm/agent/bin # ./cinfo

***** Thu Jun  9 13:19:13 UTC 2016 *****
User: root Groups: root db2iadm1
Host name : lin1      Installer Lvl:08.13.00.00
Home: /opt/ibm/apm/agent
*****



... CINFO Menu ...
1) Show installed products
2) Show which products are currently running
3) Exit CINFO

***** Thu Jun  9 13:24:16 UTC 2016 *****
User: root Groups: root db2iadm1
Host name : lin1      Installer Lvl:08.13.00.00
Home: /opt/ibm/apm/agent
*****



Host Prod PID Owner Start ID ..Status
lin1 hu 6180 root Jun08 None ...running
lin1 yn 16741 root Jun08 None ...running
lin1 lz 25830 root Jun08 None ...running
lin1 ud 24662 root Jun08 db2inst1 ...running
lin1 t5 49251 root Jun08 None ...running

***** Thu Jun  9 13:21:03 UTC 2016 *****
User: root Groups: root db2iadm1
Host name : lin1      Installer Lvl:08.13.00.00
Home: /opt/ibm/apm/agent
*****



...Product inventory (/opt/ibm/apm/agent)

ax IBM Monitoring Shared Libraries
lx8266 Version: 06.35.11.00

gs IBM GSKit Security Interface
lx8266 Version: 08.00.50.56

hu Monitoring Agent for HTTP Server
lx8266 Version: 01.00.04.00

jr IBM Monitoring JRE
lx8266 Version: 08.02.00.00

lz Monitoring Agent for Linux OS
lx8266 Version: 06.35.11.00

t5 Response Time Monitoring Agent
lx8266 Version: 08.13.00.00

ud Monitoring Agent for DB2
lx8266 Version: 07.10.05.00

yn Monitoring Agent for WebSphere Applications
lx8266 Version: 07.30.11.00
  
```

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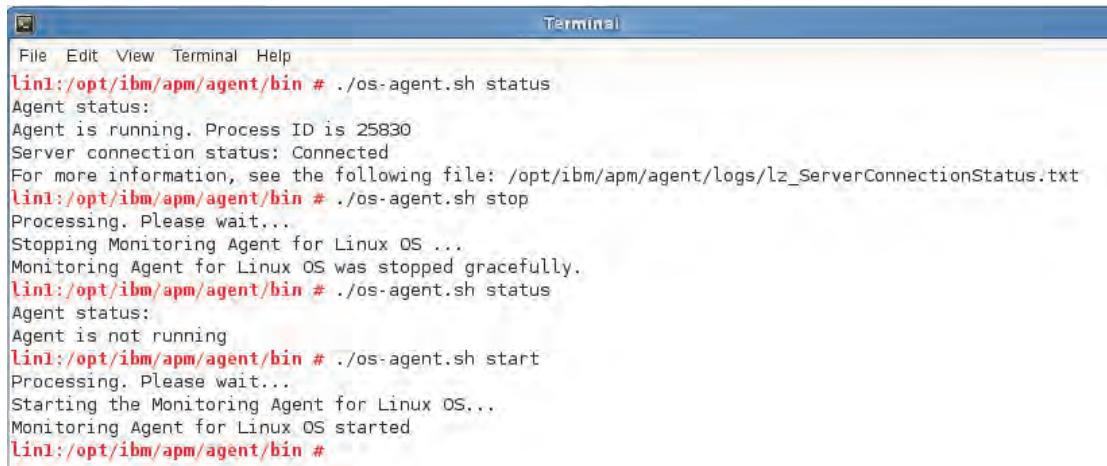
10

*Determining what agents are installed and running on a server*

This slide shows the agent commands that are installed on this server. The agent commands can vary on each server.

## Starting and stopping the Monitoring Agent for Linux OS

Each agent has a shell script or bat file for starting, stopping, or showing the status of the agent.



```
Terminal
File Edit View Terminal Help
lin1:/opt/ibm/apm/agent/bin # ./os-agent.sh status
Agent status:
Agent is running. Process ID is 25830
Server connection status: Connected
For more information, see the following file: /opt/ibm/apm/agent/logs/lz_ServerConnectionStatus.txt
lin1:/opt/ibm/apm/agent/bin # ./os-agent.sh stop
Processing. Please wait...
Stopping Monitoring Agent for Linux OS ...
Monitoring Agent for Linux OS was stopped gracefully.
lin1:/opt/ibm/apm/agent/bin # ./os-agent.sh status
Agent status:
Agent is not running
lin1:/opt/ibm/apm/agent/bin # ./os-agent.sh start
Processing. Please wait...
Starting the Monitoring Agent for Linux OS...
Monitoring Agent for Linux OS started
lin1:/opt/ibm/apm/agent/bin #
```

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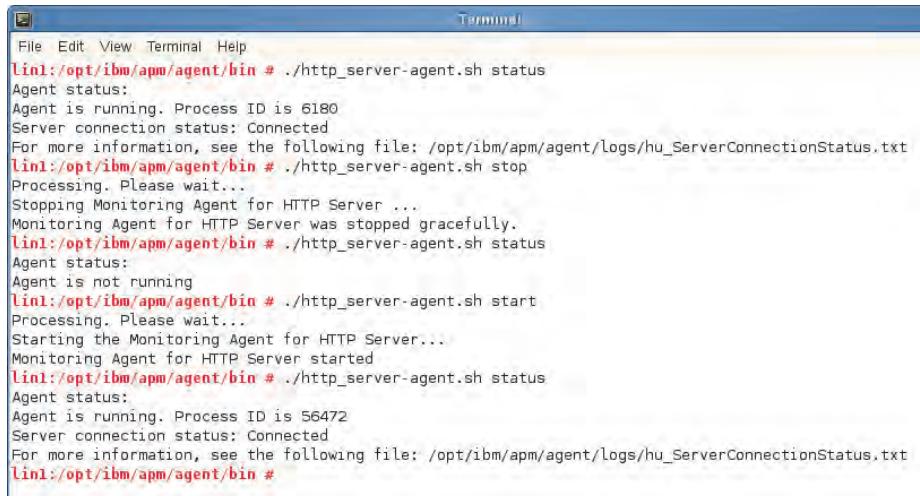
11

### Starting and stopping the Monitoring Agent for Linux OS

This slide shows the Monitoring Agent for Linux OS being stopped gracefully and restarted.

## Starting and stopping the Monitoring Agent for IBM HTTP Server

The **http\_server-agent.sh** command controls the Monitoring Agent for IBM HTTP Server.



A terminal window titled "Terminal" showing the execution of the `http_server-agent.sh` script. The window includes a menu bar with File, Edit, View, Terminal, Help, and a toolbar with icons for copy, paste, and others. The terminal output is as follows:

```
File Edit View Terminal Help
Lin1:/opt/ibm/apm/agent/bin # ./http_server-agent.sh status
Agent status:
Agent is running. Process ID is 6180
Server connection status: Connected
For more information, see the following file: /opt/ibm/apm/agent/logs/hu_ServerConnectionStatus.txt
Lin1:/opt/ibm/apm/agent/bin # ./http_server-agent.sh stop
Processing. Please wait...
Stopping Monitoring Agent for HTTP Server ...
Monitoring Agent for HTTP Server was stopped gracefully.
Lin1:/opt/ibm/apm/agent/bin # ./http_server-agent.sh status
Agent status:
Agent is not running
Lin1:/opt/ibm/apm/agent/bin # ./http_server-agent.sh start
Processing. Please wait...
Starting the Monitoring Agent for HTTP Server...
Monitoring Agent for HTTP Server started
Lin1:/opt/ibm/apm/agent/bin # ./http_server-agent.sh status
Agent status:
Agent is running. Process ID is 56472
Server connection status: Connected
For more information, see the following file: /opt/ibm/apm/agent/logs/hu_ServerConnectionStatus.txt
Lin1:/opt/ibm/apm/agent/bin #
```

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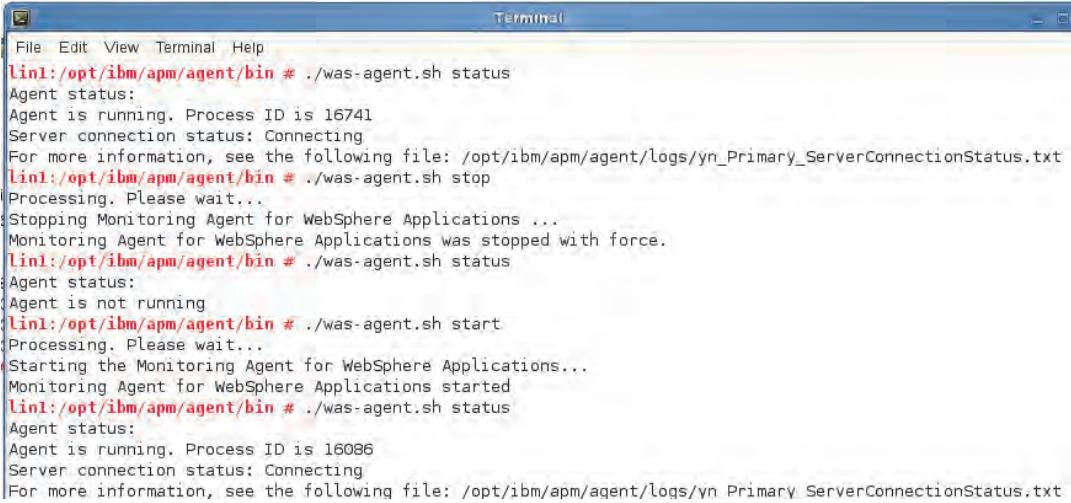
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### Starting and stopping the Monitoring Agent for IBM HTTP Server

This slide shows the Monitoring Agent for HTTP Server stopped gracefully and restarted.

## Starting and stopping the Monitoring Agent for WebSphere Applications Server

The **was-agent.sh** command controls the Monitoring Agent for WebSphere Applications Server.



```
Terminal
File Edit View Terminal Help
Lin1:/opt/ibm/apm/agent/bin # ./was-agent.sh status
Agent status:
Agent is running. Process ID is 16741
Server connection status: Connecting
For more information, see the following file: /opt/ibm/apm/agent/logs/yn_Primary_ServerConnectionStatus.txt
Lin1:/opt/ibm/apm/agent/bin # ./was-agent.sh stop
Processing. Please wait...
Stopping Monitoring Agent for WebSphere Applications ...
Monitoring Agent for WebSphere Applications was stopped with force.
Lin1:/opt/ibm/apm/agent/bin # ./was-agent.sh status
Agent status:
Agent is not running
Lin1:/opt/ibm/apm/agent/bin # ./was-agent.sh start
Processing. Please wait...
Starting the Monitoring Agent for WebSphere Applications...
Monitoring Agent for WebSphere Applications started
Lin1:/opt/ibm/apm/agent/bin # ./was-agent.sh status
Agent status:
Agent is running. Process ID is 16086
Server connection status: Connecting
For more information, see the following file: /opt/ibm/apm/agent/logs/yn_Primary_ServerConnectionStatus.txt
```

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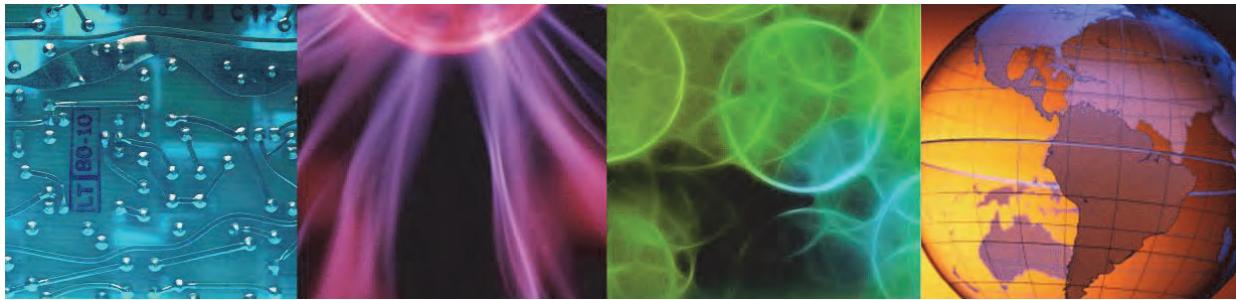
### Starting and stopping the Monitoring Agent for WebSphere Applications Server

This slide shows the Monitoring Agent for WebSphere® Application Server stopped gracefully and restarted.

# Lesson 3 Starting the Performance Management Console



## Lesson 3 Starting the Performance Management Console



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In this lesson, you learn how to log in to the IBM Performance Management console.

## Before starting the Performance Management Console

- Determine the IP address of the Performance Management server.
- To ensure that the user interface is not truncated, use a minimum resolution of 1280 x 1024.
- Use one of the following browsers:

Browser	Version	
Apple Safari	8.0 and future fix packs	Support Safari desktop 6.0 or above on Mac.
Google Chrome	42 and future fix packs	
Microsoft Internet Explorer	10.0 and future fix packs	
Microsoft Internet Explorer	11.0 and future fix packs	
Mozilla Firefox ESR	31 and future fix packs	
Mozilla Firefox ESR	38 and future fix packs	

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*Before starting the Performance Management Console*

## Logging in to the Performance Management Console for on premises

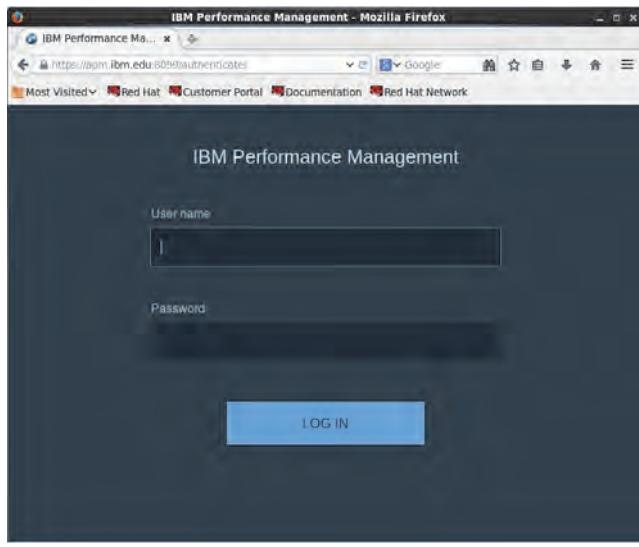
To log in to the Performance Management Console open a supported browser and navigate to this URL:

[https://server\\_host:9443](https://server_host:9443)

After you are prompted for a logon ID, enter the following credentials for the default user:

- User name: **apmadmin**
- Password: **apmpass** (by default)

**Note:** For this course, you use the password of **object00** in the exercises.

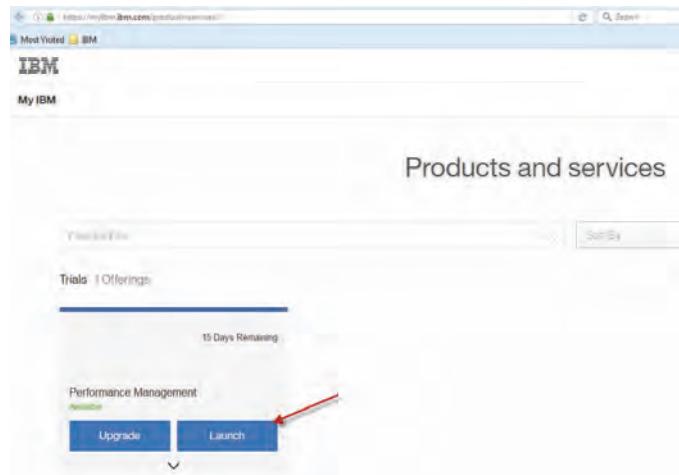


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*Logging in to the Performance Management Console for on premises*

## Logging in to the Performance Management Console on Cloud

- To log in to the Performance Management Console, open a supported browser and navigate to the URL provided to you from IBM Marketplace.
- Log in with the user name and password that you used to register for the service
- In the Performance Management row, click Launch



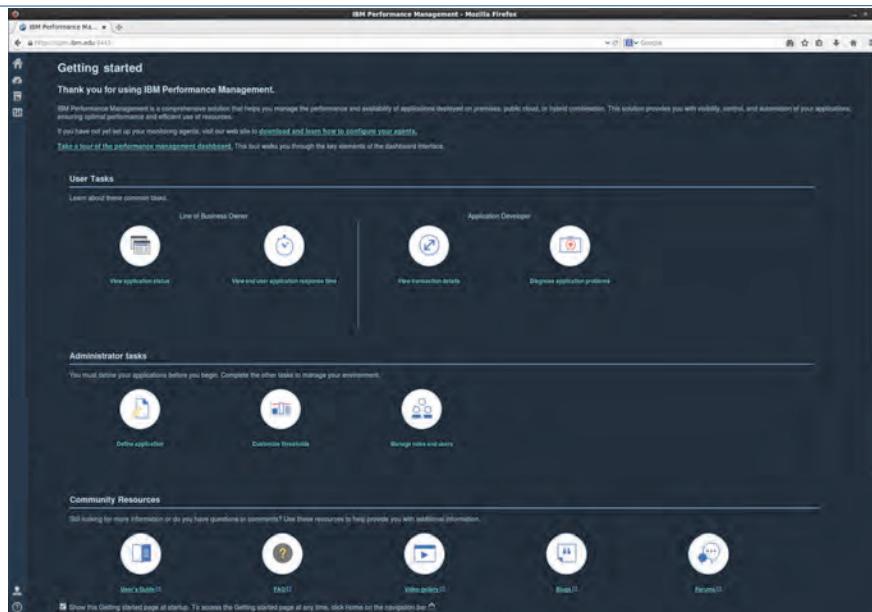
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Logging in to the Performance Management Console on Cloud

## Successful login

After you log in, the Getting Started page is displayed with learning options for User Tasks and Administrator Tasks and links to Community Resources.

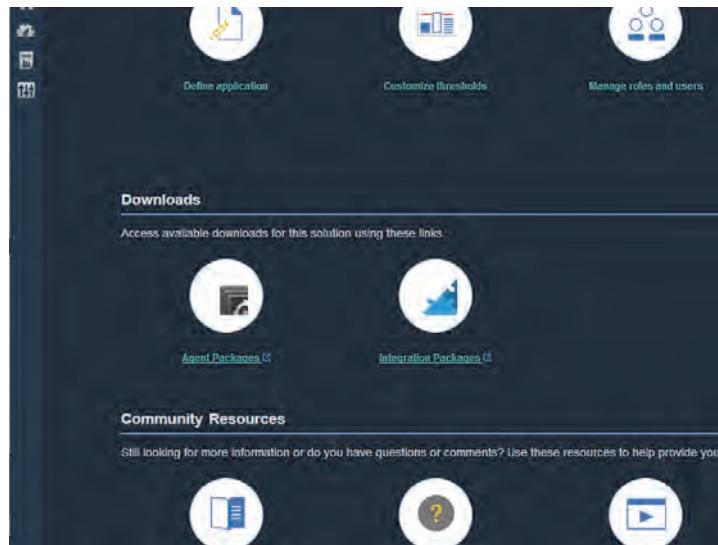


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*Successful login*

## Successful login (continued)

On cloud, there is an additional section for downloads.

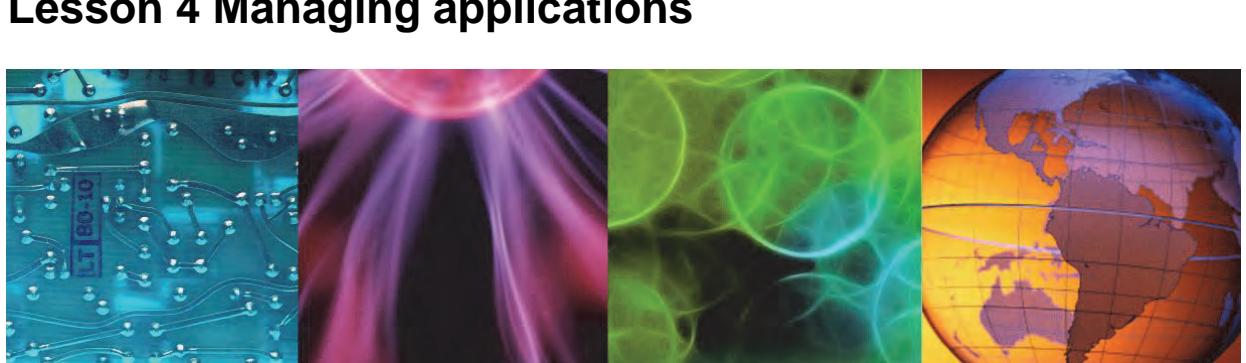


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*Successful login (continued)*



# Lesson 4 Managing applications



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In this lesson, you learn how to perform the following tasks:

- Create, edit, and delete applications
- Access data within a monitoring application

## Major functions of managing applications

Managing applications includes the following tasks:

- Creating, editing, and deleting applications
- Accessing data within the applications that are defined

## Performance Management console

The Performance Management console is an application-centric user interface that features easy navigation from symptom to cause:

- Navigate from a widget to an underlying cause
- Investigate events
- Diagnose transactions

### *Performance Management console*

The Performance Management console is an application-centric web-based user interface that features easy navigation from symptom to cause.

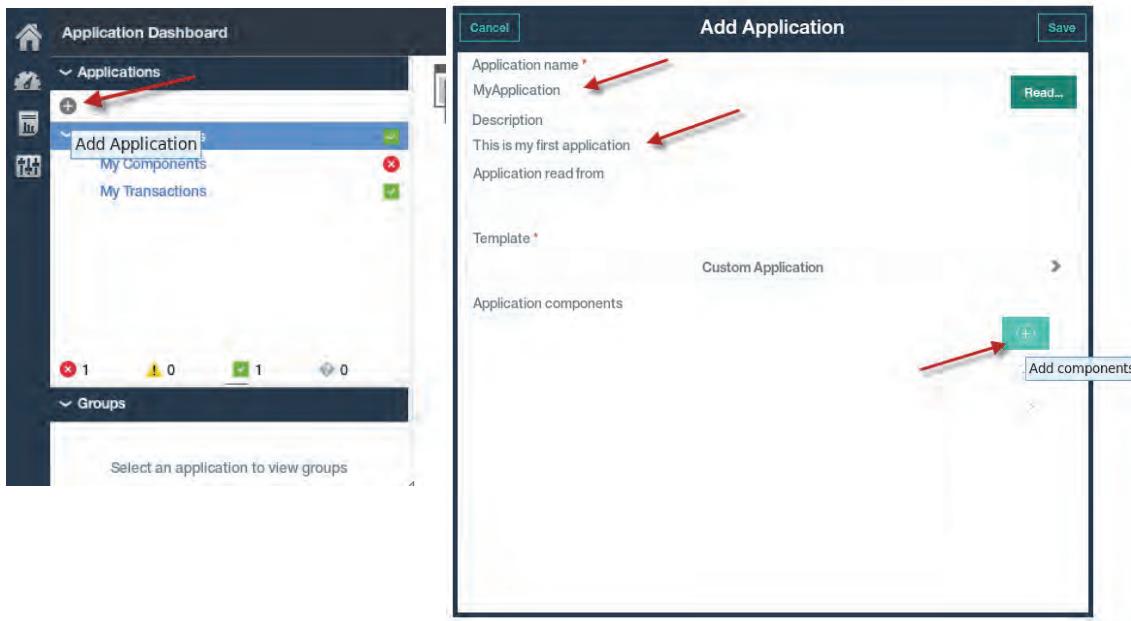
## Defining an application

- Applications are added, modified, or deleted by using the Application Editor.
- To group data from agents in an organized fashion, create applications that are organized by these methods:
  - Location
  - Function
  - Responsibility
- The Application Editor supports adding applications in three ways:
  - Manually
  - By discovery
  - Using templates
- The Application Editor is also used to edit and delete applications.

### *Defining an application*

The following slides explore adding, modifying, and deleting applications in more detail.

## Adding an application manually



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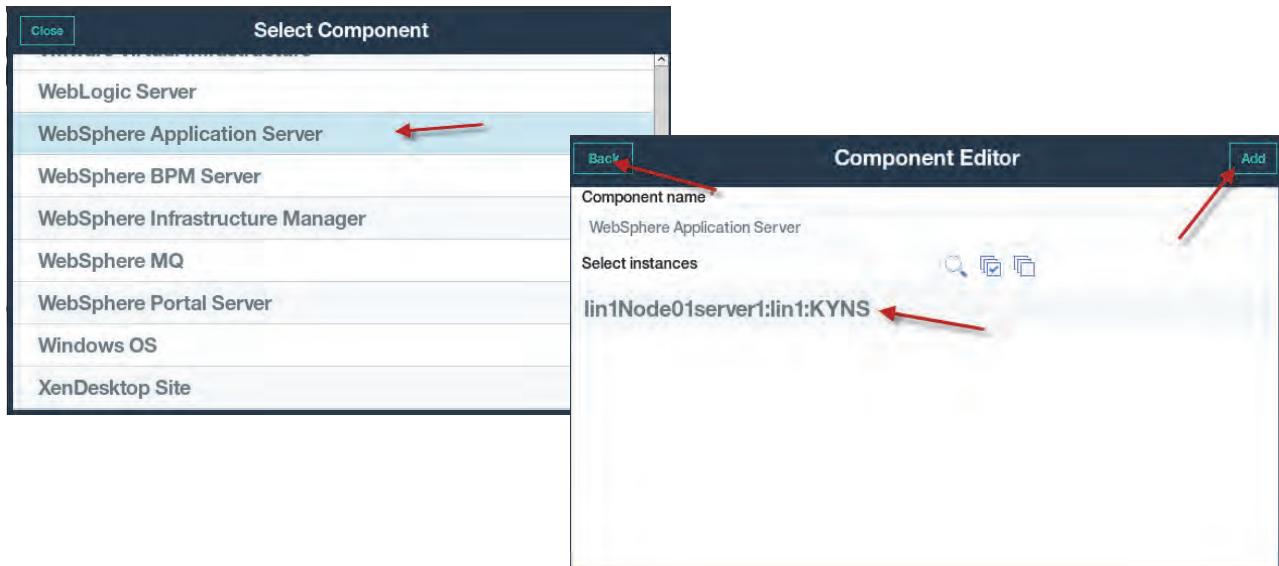
24

### *Adding an application manually*

You can use the Application Editor to add an application manually.

1. Click the plus (+) sign in the Application Dashboard to add components.
2. In the Add Application window, assign your application a name and optional description. Click the highlighted plus sign to add components.

## Adding an application manually (continued)



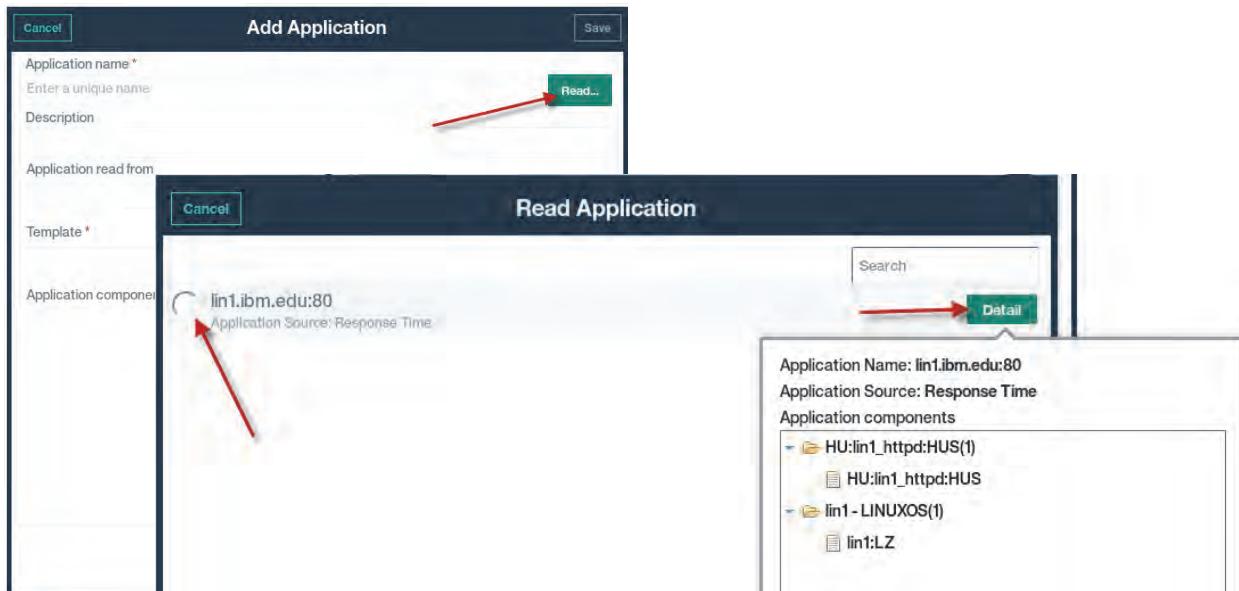
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### *Adding an application manually (continued)*

3. Click the component type that you want to add. In this example, you are adding an instance of WebSphere Application Server.  
A list of known instances of the resource type is displayed.
4. Select the instance in list, and click **Add**.  
You are returned to the list of resource types.
5. Add any additional components to your application.
6. Click **Close**.
7. Click **Save**.

## Discovering applications



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### Discovering applications

You can add application resources that are discovered by the monitoring infrastructure.

1. After opening the Application Editor, give the application a name and optional description. In this example, the application is called *Discovered application*.
2. Click the **Read** button to view discovered resources.
3. Click **Detail** for more information on the selected resource.
4. Click a radio button to select the discovered application that you want to incorporate.

## Discovering applications (continued)

The screenshot shows the 'Add Application' dialog on the left and the 'Application Dashboard' on the right.

**Add Application Dialog:**

- Application name \*: Discovered Application (highlighted with a red arrow)
- Description: This is a discovered application (highlighted with a red arrow)
- Template: Custom Application
- Application components:
  - lin1 - LINUXOS(1)
    - lin1:LZ
  - HU:lin1\_htpd:HUS(1)
    - HU:lin1\_htpd:HUS

**Save** button is highlighted with a red arrow pointing to it.

**Application Dashboard:**

- All My Applications: Discovered Application
- Status Overview: Requests and Response Time chart (20.10 May 09 to 21.25 May 09)
- Aggregate Transaction Topology diagram showing a connection from a BROWSER to a system icon.

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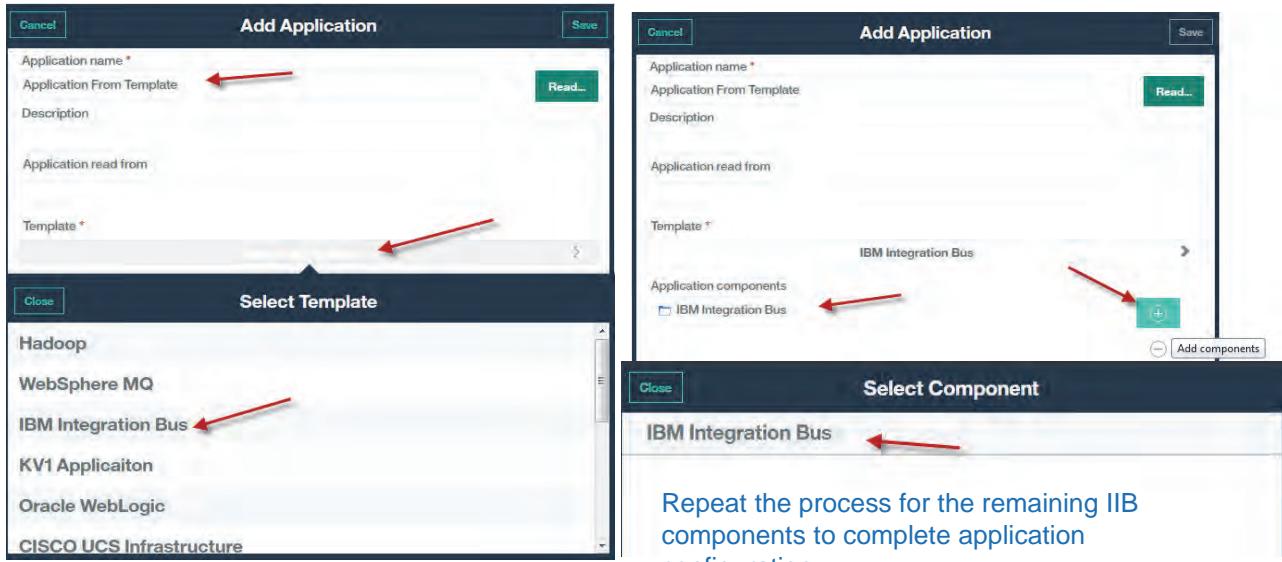
27

### Discovering applications (continued)

- Click **Save** to complete application creation.
- Observe the new application added to the list of All\_My\_Applications.

Bear in mind that the resource and associated monitoring agent already existed. You are making the application visible in the UI.

## Using templates



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### Using templates

You can use the Application Editor to add applications by using templates.

1. After opening the Application Editor, click the highlighted arrow to see the list of available templates. In this example, an IBM Integration Bus is selected.
2. In the Add Application window, assign your application a name and optional description. Click the highlighted plus sign to add components.

## Using templates (continued)

The screenshot illustrates the process of adding IIB components to an application. On the left, the 'Component Editor' shows two selected instances: 'WLBRK9000::KQIB' and 'TRADEBK::KQIB'. Red arrows point from these instances to the 'Add' button at the top right of the editor. On the right, the 'Application Dashboard' shows the 'All My Applications' section. An arrow points from the 'Application From Template' entry in this list to the 'Add' button in the Component Editor. Below this, a callout box contains the text: 'Repeat the process for the remaining IIB components to complete application configuration.' A small icon of a component with a checkmark is also shown.

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### Using templates (continued)

A list of two available IIB components is displayed.

3. Select an instance. Click **Add** to add it to the application.
4. Click **Back** and repeat the process for any other IIB components that you want in the application.
5. When finished, click **Save**.

The application is listed in the Application dashboard after a few moments.

## Editing an application

The screenshot shows the Application Dashboard interface. On the left, there's a sidebar with 'Applications' and 'Groups' sections. In the main area, there's a list of applications under 'All My Applications', with 'DayTrader' selected. A red arrow points to the pencil icon next to the application name. Another red arrow points to the 'Edit Application' button in the list. On the right, there's a 'Status Overview' and 'Events' section, followed by two charts: 'Requests and Response Time' and 'Aggregate Transaction Topolog'. The 'Edit Application' dialog box is open over the dashboard. It has fields for 'Application name' (DayTrader) and 'Description'. Below that is a chart titled 'Response Time'. Under 'Template', it says 'Custom Application'. The main part of the dialog lists 'Application components' with a tree view. Red arrows point to the '+' icon to add a new component, the '-' icon to delete an existing one, and the pencil icon to edit an instance. At the bottom of the dialog, there's a link 'Show all unaccepted component changes.'

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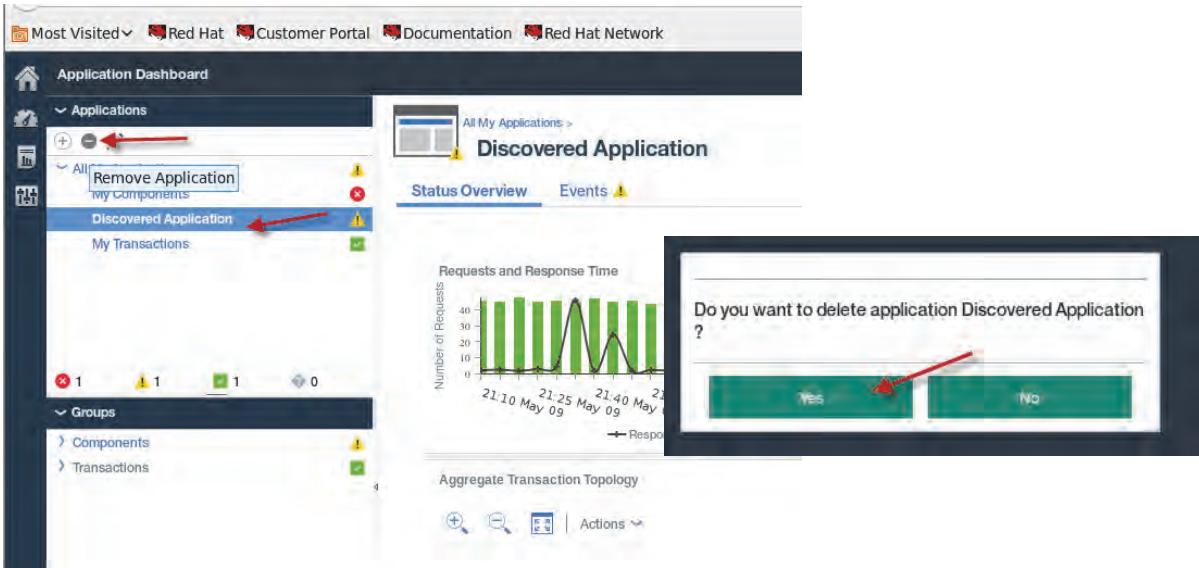
30

### Editing an application

You can use the Application Editor to edit an application:

1. Select the application in the list and click the pencil icon.
2. In the Edit Application window, select the component that you want to modify in the Application Components list.
3. To delete the resource instance, click the minus sign.
4. Confirm the deletion and save the modified application definition.
5. To change or modify instances, click the pencil icon.
6. Make your changes and save the application definition.

## Deleting an application



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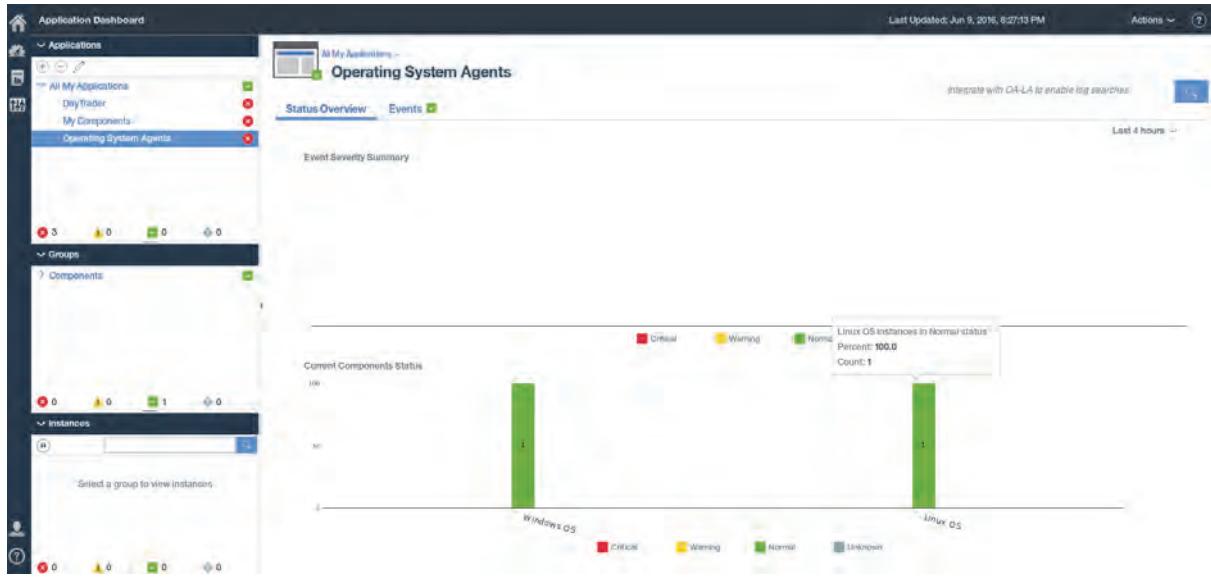
31

### *Deleting an application*

You can use the Application Editor to delete an application:

1. Select the application in the list. Click the minus sign.
2. Click **Yes** to confirm the deletion or **No** to cancel the operation.

## Example: Simple application of operating systems

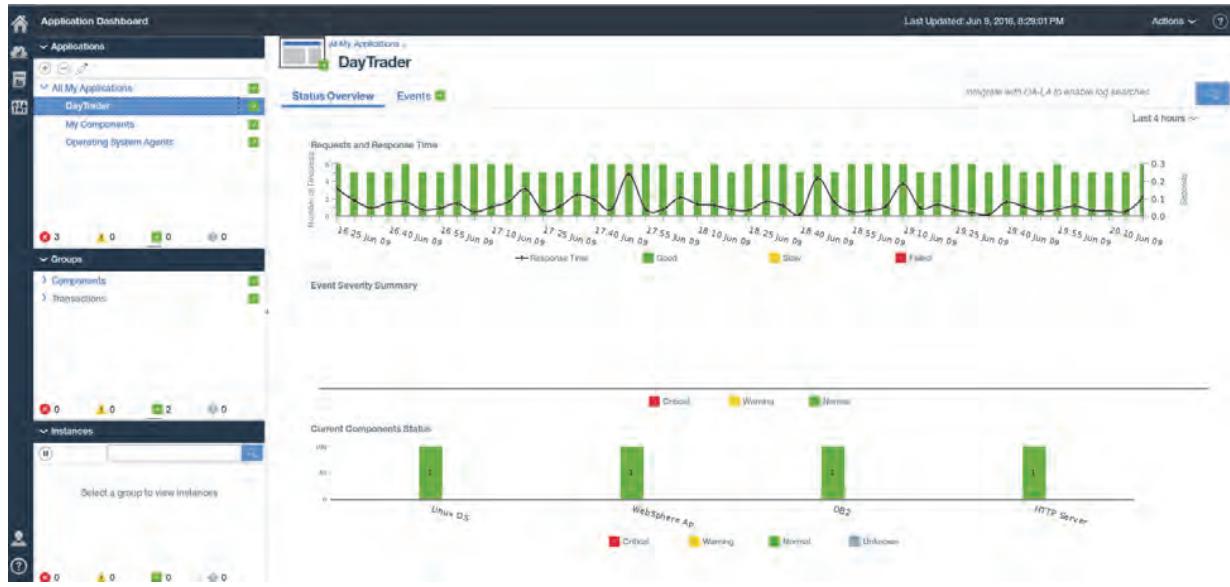


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*Example: Simple application of operating systems*

## Example: Simple application with five agents



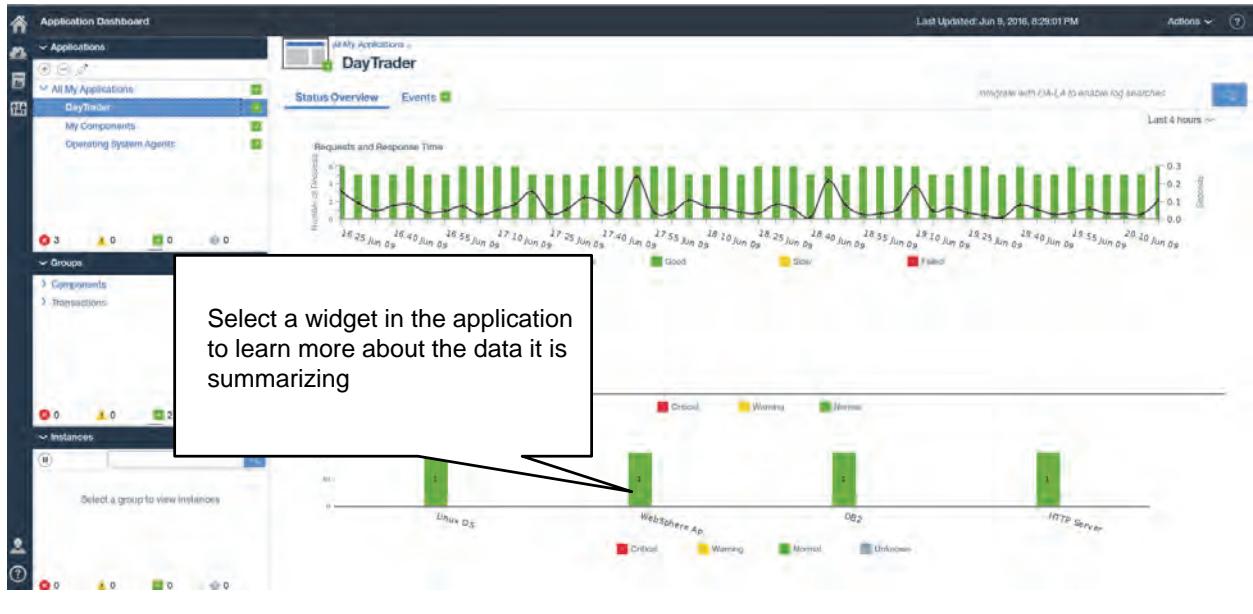
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### Example: Simple application with five agents

This is a screen capture of the monitoring agents for the DayTrader application from the exercises.

## Examining data from an application



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### Examining data from an application

Select a widget in the application to learn more about the data it is monitoring.

## Monitoring agent for WebSphere Application Server

The screenshot shows the 'Status Overview' tab for the 'lin1Node0Server1 - WAS' node. It displays various performance metrics:

- Server status: Connected, Slowest response time (ms): 44
- JVM memory used (KB): 194,930, Errors in log: 0
- JVM memory total (KB): 223,936, Warnings in log: 0
- Heap free after GC(%): 0.00%, Error rate (%): 0.00%
- JVM CPU used (%): 0.00%, Real time(%): 0.00%

A callout box points to the top right corner of the interface with the text: "Select the widget to learn more about the data that it summarizes."

Below the main dashboard, there are two detailed monitoring panels:

- Performance Application Server / WAS**: Shows a histogram of Average Response Time (ms) and a table of recent errors.
- Java GC (Recent)**: Shows a timeline of GC events, including GC Duration (ms) and GC Start time.

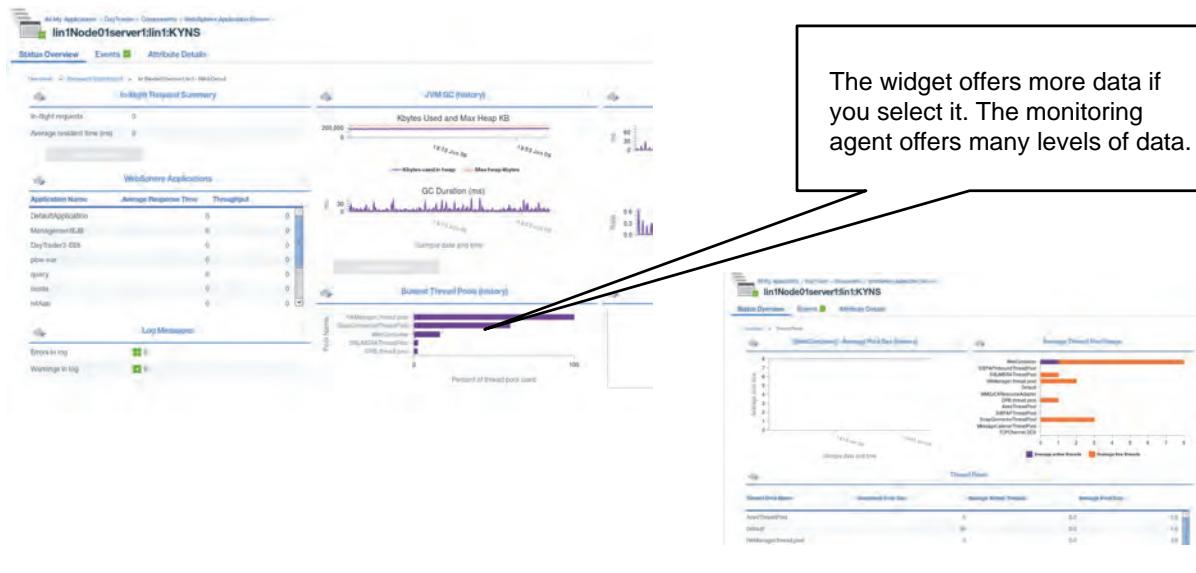
At the bottom of the screen, the copyright notice is visible: © Copyright IBM Corporation 2016.

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### Monitoring agent for WebSphere Application Server

Many Monitoring agents have multiple levels of data, like the Monitoring Agent for WebSphere Application Server.

## Monitoring agent for WebSphere Application Server (continued)

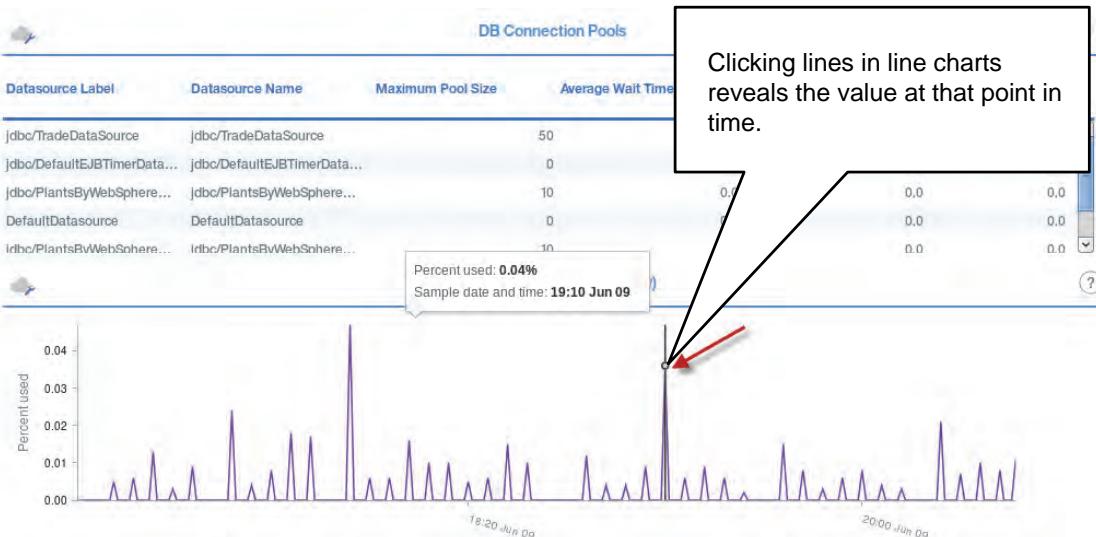


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Monitoring agent for WebSphere Application Server (continued)

## Monitoring agent for WebSphere Application Server (continued)

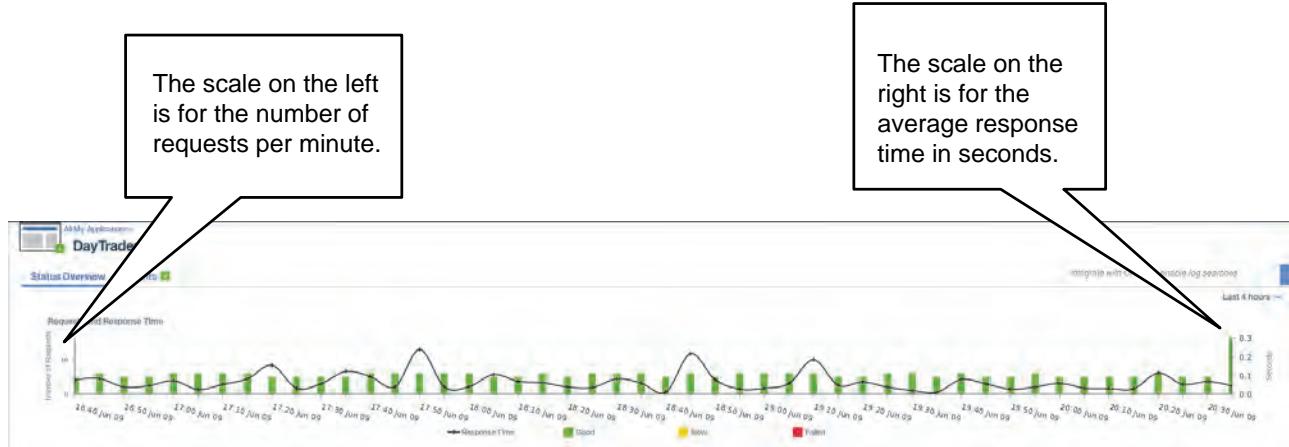


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Monitoring agent for WebSphere Application Server (continued)

## Response Time Agent



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### Response Time Agent

The response time agent has two scales, one for the number of requests (on the left) and one for the response time (on the right). The color of the bar chart changes for failed or slow requests.

## Response Time Agent: Details



Response Time Agent: Details

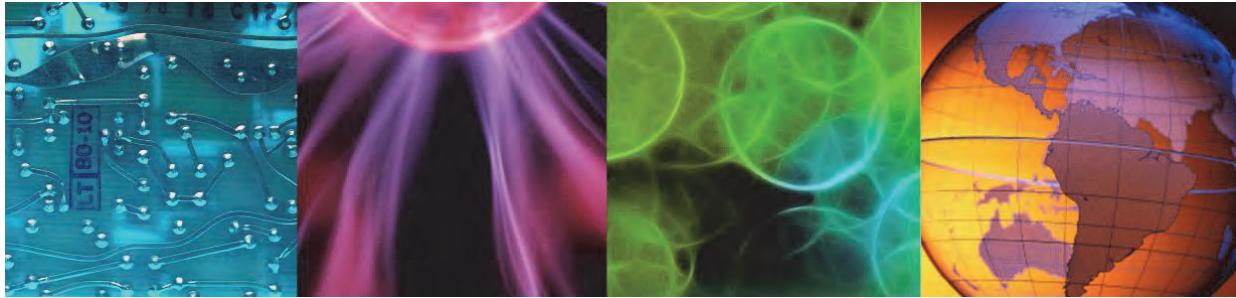
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# Lesson 5 Using attribute details to access data from an agent



## Lesson 5 Using attribute details to access data from an agent



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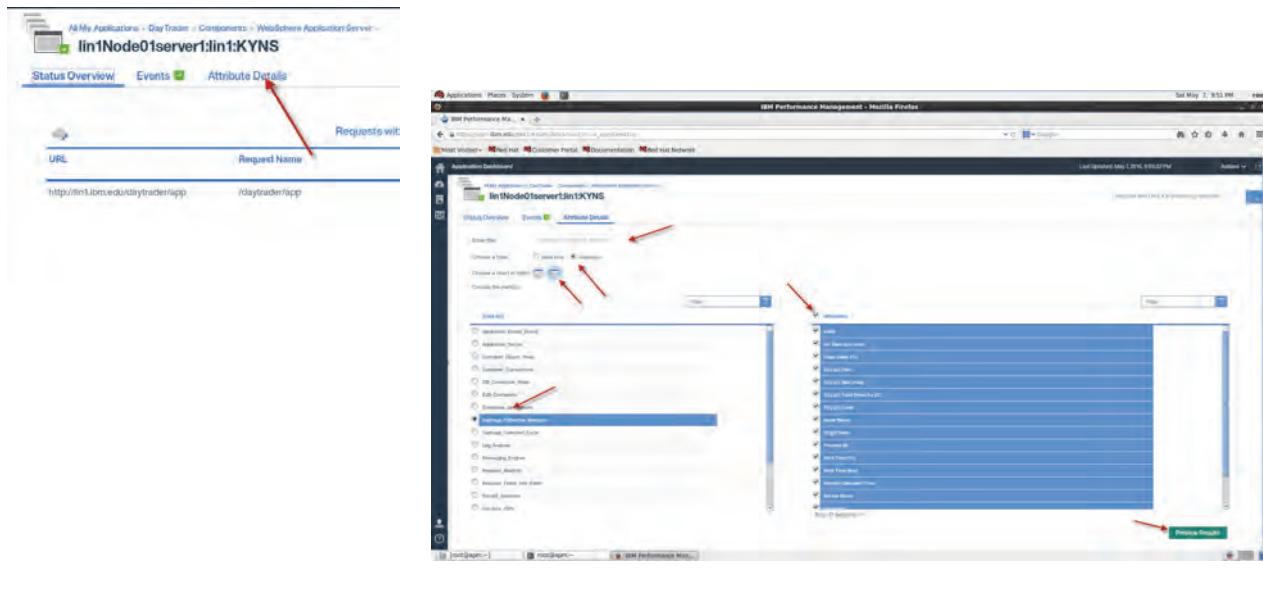
In this lesson, you learn how to perform the following tasks:

- Access attribute details from a monitoring agent.
- Save attribute details customizations for later use.
- Share attribute details customizations with other users.

## Accessing data from an agent with attribute details

- All data that is collected by monitoring agents is available from the attribute details feature.
- Not all data that is collected by an agent is displayed in a widget.
- You access the attribute details for a monitoring agent instance by selecting the attribute details tab.

## Viewing attribute details



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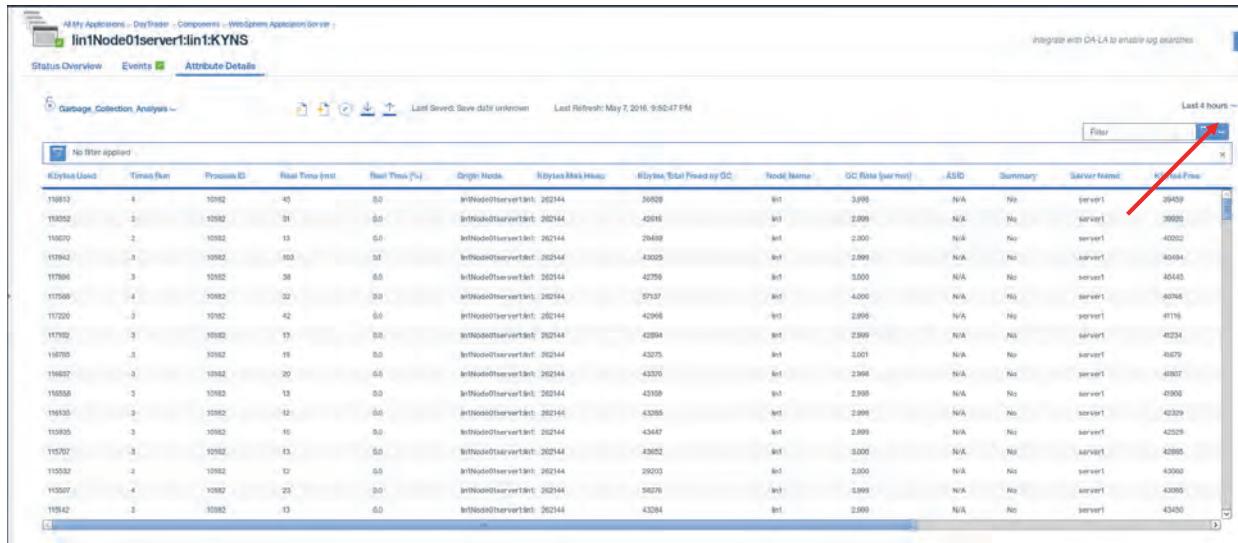
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### Viewing attribute details

The attributes that are included in the Dashboard widgets cannot be changed. Therefore, if you want to see something that is not already on the dashboard, you can use the **Attribute Details** feature to view the values.

1. To view attribute details, click a component instance to select it, and click the **Attribute Details** tab, as shown in this example.
2. Select a type, **Real-time** or **Historical**.
3. Select a chart or a table for your results.
4. Select the data set, also known as attribute group, that contains the attributes of interest. You can select only one data set at a time. Click each attribute that you want to see. Clicking the box marked **Attributes** selects them all.
5. Click **Preview Results**. You cannot change the attributes that are included in the dashboard widgets. Therefore, if you want to see something that is not already on the dashboard, you can use the **Attribute Details** tab to view the values.

## Viewing attribute details (continued)



Kyukuk USED	TimeSpan	Previous ID	Run Time (ms)	Run Time (%)	Origin Node	KBbytes Max/Hour	KBbytes Total Fired by GC	Node Name	GC Rate (per min)	ASID	Summary	Server Name	Keep Prev
110513	4	10162	45	0.0	ln1Node01server1ln1:2KYN5	36029	462144	462144	3.998	N/A	No	server1	39459
110525	3	10162	31	0.0	ln1Node01server1ln1:2KYN5	42616	462144	462144	2.998	N/A	No	server1	39500
110527	2	10162	13	0.0	ln1Node01server1ln1:2KYN5	29469	462144	462144	2.000	N/A	No	server1	40032
117942	3	10162	163	0.1	ln1Node01server1ln1:2KYN5	43025	462144	462144	2.999	N/A	No	server1	40194
117986	3	10162	38	0.0	ln1Node01server1ln1:2KYN5	42776	462144	462144	3.000	N/A	No	server1	40440
117988	4	10162	32	0.0	ln1Node01server1ln1:2KYN5	57137	462144	462144	4.000	N/A	No	server1	40768
117220	3	10162	42	0.0	ln1Node01server1ln1:2KYN5	42958	462144	462144	2.998	N/A	No	server1	41116
117942	3	10162	13	0.0	ln1Node01server1ln1:2KYN5	42894	462144	462144	2.999	N/A	No	server1	40234
116795	3	10162	19	0.0	ln1Node01server1ln1:2KYN5	43275	462144	462144	3.001	N/A	No	server1	41679
116697	3	10162	20	0.0	ln1Node01server1ln1:2KYN5	43330	462144	462144	2.998	N/A	No	server1	41607
116558	3	10162	13	0.0	ln1Node01server1ln1:2KYN5	43168	462144	462144	2.998	N/A	No	server1	41900
116535	3	10162	12	0.0	ln1Node01server1ln1:2KYN5	43285	462144	462144	2.998	N/A	No	server1	42329
113835	3	10162	10	0.0	ln1Node01server1ln1:2KYN5	43447	462144	462144	2.999	N/A	No	server1	42329
115707	3	10162	13	0.0	ln1Node01server1ln1:2KYN5	43652	462144	462144	3.000	N/A	No	server1	42695
115532	2	10162	17	0.0	ln1Node01server1ln1:2KYN5	29203	462144	462144	2.000	N/A	No	server1	43060
115567	4	10162	24	0.0	ln1Node01server1ln1:2KYN5	58276	462144	462144	3.999	N/A	No	server1	43095
119142	3	10162	13	0.0	ln1Node01server1ln1:2KYN5	43284	462144	462144	2.999	N/A	No	server1	43450

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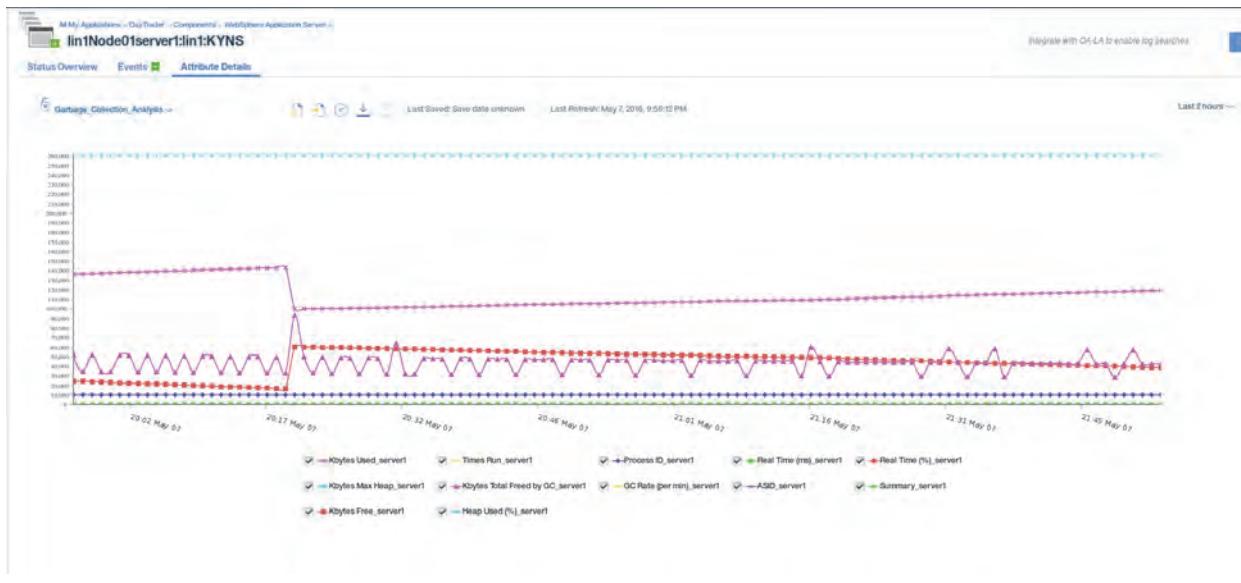
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### Viewing attribute details (continued)

This slide shows an example of selected attribute details from the prior slide. This example is of the Monitoring Agent for WebSphere Application Server Garbage Collection Analysis data set. Depending on how many attributes you selected, you might have to scroll horizontally to see all of them.

Click the Reset tool in the upper right corner to return to change the time frame for the historical data.

## Line charts with the attribute details



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### Line charts with the attribute details

You can also select a line chart. Only attributes that are collected with historical data are able to be charted with the line chart.

## Saving Attribute detail tables and charts

The image consists of two side-by-side screenshots of the Application Dashboard interface. Both screenshots show the 'Attribute Details' tab selected. In the top-left screenshot, a chart titled 'Garbage\_Collection\_Analysis' is displayed. A red arrow points to the 'New' button in the toolbar above the chart. In the bottom-right screenshot, the same chart is shown with a new title 'Garbage Collection Analysis over the past 2 hours' entered in the 'Enter title:' field. A red arrow points to the 'New' button again. The bottom of the interface shows a copyright notice: '© Copyright IBM Corporation 2016'.

### Saving Attribute detail tables and charts

You can provide a name of a chart or a table to save the customization.

1. When you are looking at a chart or a table you want to save with a title, click **New**.
2. Type a title that you want to use.
3. Click **Preview Results** again.

## Saving Attribute detail tables and charts (continued)

The figure consists of three separate screenshots of the IBM Monitoring interface. Each screenshot shows a 'Attribute Details' section with various charts and tables. In each section, there are buttons for saving the data. Red arrows point to these save buttons in each screenshot.

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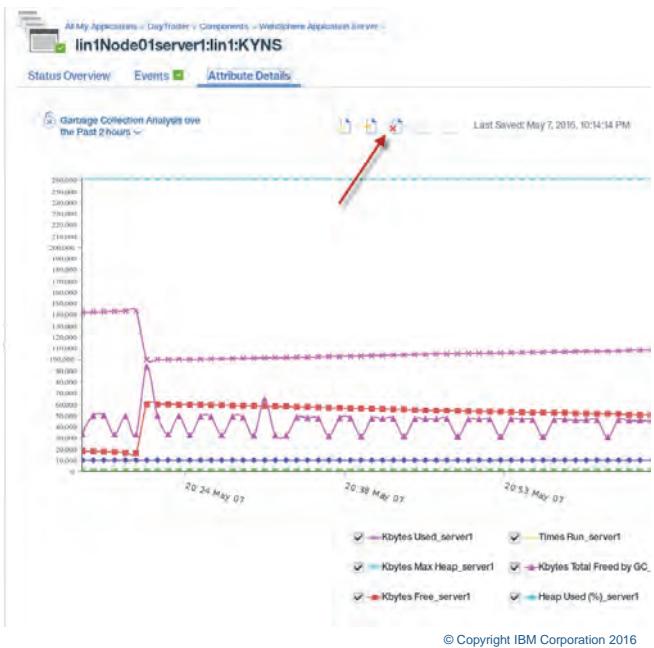
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### Saving Attribute detail tables and charts (continued)

The table or chart is presented.

4. Click **Save for Me** or **Save to Share** to save your customization for either yourself or for others also.

## Deleting saved tables and charts



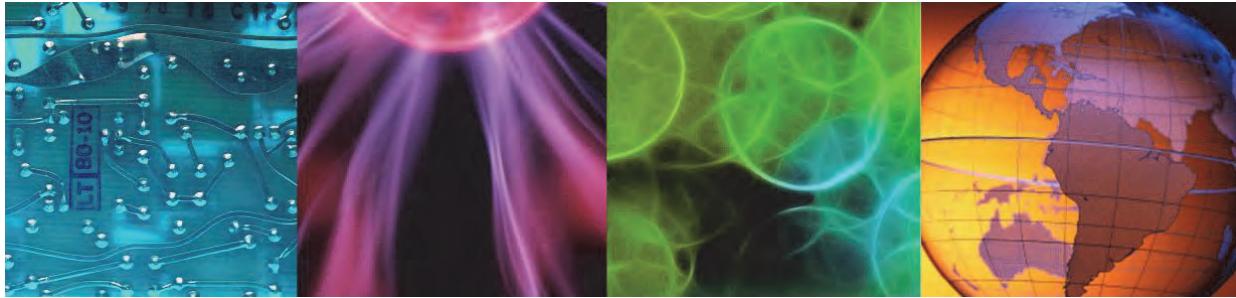
*Deleting saved tables and charts*

When you save a chart, you can delete it by clicking the **Delete** button.

# Lesson 6 Configuring and using the Log File Agent



## Lesson 6 Configuring and using the Log File Agent



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In this lesson, you learn how to configure and use the log file agent.

## Log file overview

- The operating system agents support monitoring log files.
  - Monitors text-based log files
  - Regular expressions can be used for parsing the logs.
  - For compatibility, the OS agent consumes the following information and formats from:
    - IBM Tivoli Monitoring 6.x Log File Agent
    - Tivoli Event Console Log File Adapter
- These format strings allow the agent to filter the log data according to patterns in the format file and submit only the relevant data to an event consumer.
  - The OS Agent sends data to the Performance Management server or through the Event Integration Facility (EIF) to any EIF receiver, such as the OMNIbus EIF probe or IBM Operations Analytics - Log Analysis.
  - Agent provides configurable log file monitoring capability

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### Log file overview

Log files are a common tool for detecting application issues. The ability to display logs and parse logs from the operating system agent reduces the number of agents that are required to manage your enterprise.

## Configuring log file monitoring

- In the Performance Management console, access the Agent configuration task
  - Configuration tabs for all OS types are displayed when any one OS agent is installed
  - The only managed systems listed on the tab are those the user has permission to see
- Create a configuration definition
  - The log file agent requires a pair of files to read and forward log messages from one or more files
    - <useful-name>.conf: Defines what log or logs to read, when to read it, and where to forward it to
    - <useful-name>.fmt: For parsing and reformatting the messages you read from the log file
  - The configuration name must be unique
  - The configuration can be distributed to multiple managed systems

### *Configuring log file monitoring*

Centrally configuring logs from the Performance Management console simplifies the administrators task.

## Configuring log file monitoring (continued)

- Distribute a configuration
  - Request to distribute or undistribute one configuration to one or more managed systems
  - Central Configuration Service performs the distribution
  - The files sent to the managed systems use the configuration name
- Begin monitoring
  - After the configuration is distributed to the agent, access the Application Performance Management UI and drill down to the managed system to see the log file monitoring information.
  - Click in the log file monitoring summary to see the details page for log monitoring.

## A simple log file configuration sample

This example pulls all the messages from a WebSphere Application Server log:

- Configuration file:

```
LogSources=/opt/IBM/WebSphere/AppServer/profiles/AppSrv01/logs/server1/SystemOut.log
UnmatchLog=/tmp/WAS.unmatched
IncludeEIFEventAttr=yes
ConfigFilesAreUTF8=Y
```

- Format file:  
REGEX ALLLINE  
(.\*)  
msg \$1  
END

### *A simple log file configuration sample*

The configuration file points to the file to be parsed. The format file determines what messages are shown in the user interface.

## Log file Configurations List page

- All OS types use this same initial page layout
- **System Configuration> Agent Configuration> Linux OS**
- Click the **New** button above the left table to create a log file configuration

The image contains two screenshots of the IBM Performance Management interface. The top screenshot shows the 'System Configuration' menu with 'Agent Configuration' selected, and the 'Linux OS' tab is highlighted. The bottom screenshot shows the 'Agent Configuration' page for Linux OS, which includes a table for monitoring log files and a 'New' button.

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### Log file Configurations List page

After you have an .fmt file and a .cfg file, you can load them into Application Performance Management to prepare for distribution of those definitions.

## Creating a log file configuration

New Log File Configuration

Configuration Name \* WAS

Configuration Description Display the WebSphere Application Server Log

Select Conf File WAS.conf View

Select FMT File WAS.fmt View

Conf file content

```
LogSources=opt/IBMWebSphere/AppServer/profiles/AppSrv01/logs/server/SystemOut.log
UnmatchLog=imp/WAS.unmatched
IncludeEFEventAttrs=Y
ConfigFilesAreUTF8=Y
ConfigFilesAreUTF16=Y
```

Done Cancel

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### Creating a log file configuration

1. Enter the required configuration name. It must be unique.
2. Enter an optional description for the configuration.
3. Click the **Select a Conf File** button to open the file selector and select a .conf file.
4. Click the **Select an FMT File** button to open the file selector and select an .fmt file
5. Optionally, use the **View** buttons to view the uploaded file contents
6. Click the **Done** button to save this definition and return to the Configuration List page.

Required inputs are validated and as you enter values.

Input is validated when you click **Done**. If something must change, a message opens and the entry field is highlighted.

## Distributing a log file configuration

The screenshot shows the 'Agent Configuration' page for Linux OS. A configuration named 'WAS' is selected, with the description 'Display the WebSphere Application Server Log' and the file name 'WAS.conf'. A modal dialog titled 'Information' displays the message 'Request to deploy the Log Configuration received by server' with a red arrow pointing to the 'Close' button. On the main page, a red arrow points to the 'Apply Changes' button, and another red arrow points to the checkbox in the 'Status' column for the selected managed system 'int1.LZ'. The status is checked, indicating it is selected for deployment.

### Distributing a log file configuration

Your configuration definition is in the list. If no managed systems are listed on the Configurations List page, click the Reset button above the distributions table.

To distribute a configuration, first select the configuration then select one or more managed systems and click **Apply Changes**. Central Config Services are requested to distribute the configuration.

## Undistributing a log file configuration

The screenshot shows the 'Agent Configuration' page for 'Linux OS'. A red arrow points to the 'WAS' configuration entry in the list. Another red arrow points to the 'Apply Changes' button at the bottom of the configuration details panel. The configuration details panel shows the configuration name 'WAS', description 'Display the WebSphere Application Server Log', and file name 'WAS.conf'. The distribution table below shows one managed system named 'lin1:LZ'.

Distributions	Status	Managed system name	Version
lin1:LZ	Green	lin1:LZ	06.35.11

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### Undistributing a log file configuration

Select the log file configuration to be undistributed. The managed systems that are already distributed are automatically selected in the distributions list table.

To undistribute a configuration, clear the managed systems where the configuration should be undistributed and click **Apply Changes**. Central Config Services are requested to undistribute the configuration.

## Deleting a log file configuration

The screenshot shows the 'Agent Configuration' interface for the 'Linux OS' tab. A red arrow points to the 'Delete' button in the toolbar above a table. Another red arrow points to the 'OK' button in a confirmation dialog box.

Use this page to configure monitoring of log files on Linux machines.

Configuration Description	Configuration File Name
WAS	Display the WebSphere Application Server Log

Confirmation

Do you want to remove selected log configurations?

OK Cancel

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### Deleting a log file configuration

1. Select the log file configuration to be deleted.
2. Click the **Delete** button above the left table.

The configuration is deleted on Central Config Services and on the OS agents where it was previously distributed.

## Displaying a log file in the Performance Management console

- You can view the log file monitoring configuration for the OS agents that you deployed to monitor log files.
- Procedure
  - Open the Application Dashboard and click My Components. Click **Groups > Components** and select the OS agent, for example, Linux OS agent.
  - Click **Linux OS > agent name** where *agent name* is the system where you deployed the configuration.
  - To view the Log Files widget, double-click anywhere on the status widget.
  - In the **Status Overview > Log Files** widget, click the profile to view the log monitoring configurations that are distributed and the monitored logs.



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### Displaying a log file in the Performance Management console

Click the log file definitions to display the log files collected. There can be more than one.

## Displaying a log file in the Performance Management console (continued)

### Procedure

In the Monitored Logs window, you can view the configuration details and the monitored logs. The configuration details include the configuration name, description, subnode, configuration file, status, and error code. You can also view the log files monitored by the configuration. Click the log file name to view all the log file events associated with the log file.

The screenshot shows the Application Dashboard interface. At the top, it displays 'All My Applications - DayTester - Components - Linux 06 - lZ:jm1:LZ'. On the right, it says 'Last Updated: May 12, 2016, 7:26:34 AM' and 'Integrate with ODA II'. Below this, there are tabs for 'Status Overview', 'Events ▲', and 'Attribute Details'. Under 'Status Overview', the 'Monitored Logs' section is selected. It shows a table titled 'Configuration Details' with one row for 'WAS'. The 'Monitored Logs' section below it shows a table with one row for a log file named 'com/IBM/WebSphere/...'. The footer of the dashboard includes the copyright notice '© Copyright IBM Corporation 2016' and the page number '59'.

Displaying a log file in the Performance Management console (continued)

Click the log file to display the contents.

## Displaying a log file in the Performance Management console (continued)

### Procedure (continued)

Click the event to view the event details, for example, all the fields that you defined in the **Format** file.

The screenshot shows the IBM Performance Management console interface. On the left, there's a 'Monitored Log' table with the following data:

Configuration	File Name	File Type	File Status	Processed Records	Matched Records	File Size	Client Position	Codepage	Last Modification Time
WAS	/opt/IBMWebSphere... REGULAR_F...	OK		473	473	77553	77553-UTF-8		May 12, 2016 7:25:11 AM

The right side shows the 'Event Details' for the selected log entry. The 'Message' field contains the following text:

[5/12/16 7:25:09.544 UTC] 00000094 SystemOut O #1: Http ports: 9080:"HTTP/1.0/43;"HTTPS/1.0/43;"HTTP/1.1/43;"

Below the message, there are several custom slot fields:

Custom Slot	Value
Custom Slot 1	Custom Slot 1
Custom Slot 2	Custom Slot 2
Custom Slot 3	Custom Slot 3
Custom Slot 4	Custom Slot 4
Custom Slot 5	Custom Slot 5
Custom Slot 6	Custom Slot 6
Custom Slot 7	Custom Slot 7
Custom Slot 8	Custom Slot 8
Custom Slot 9	Custom Slot 9
Custom Slot 10	Custom Slot 10

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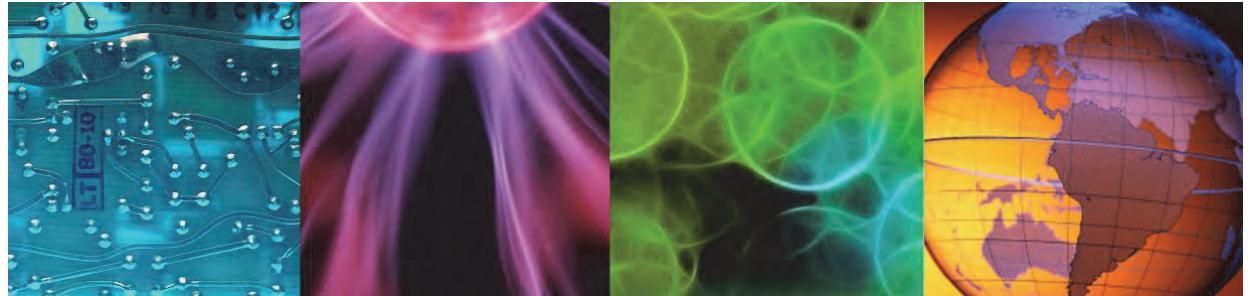
### Displaying a log file in the Performance Management console (continued)

Selecting an entry in a log shows the fields that are parsed.

# Lesson 7 Managing users of the Performance Management Console



## Lesson 7 Managing users of the Performance Management Console



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In this lesson, you learn how to perform the following tasks:

- Use local files to define users and groups.
- Configure IBM Monitoring to use Lightweight Directory Access Protocol (LDAP) to define users and groups.
- Manage user authority with IBM Monitoring by using role-based access control.

## Concept of managing Performance Management Console users

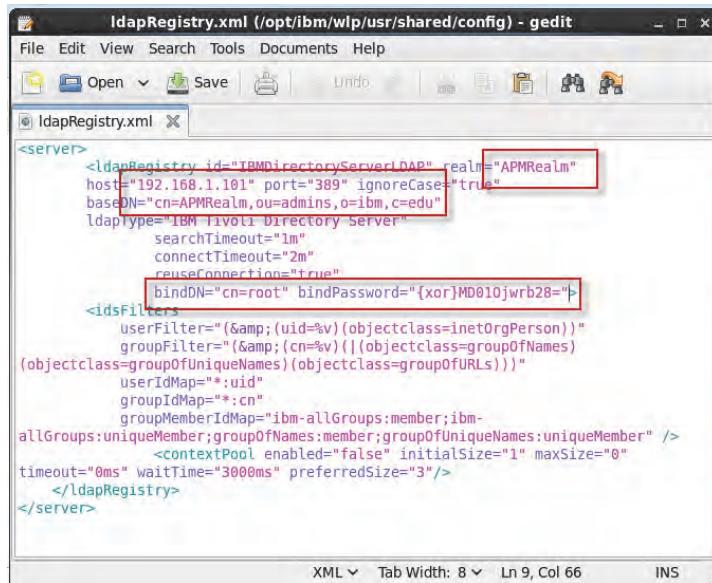
You manage user security with several tools in IBM Monitoring:

- Lightweight Directory Access Protocol (LDAP) or **basicRegistry.xml**
  - These tools manage users, groups, and passwords.
- Role Base Access Control
  - A role is a group of permissions that control the actions you can perform in Performance Management. Use the role-based access control page to manage users and roles.
  - This tool manages which users can do which operations.

## Integrating LDAP with Performance Management

1. To configure Performance Management to use LDAP for user authentication, update the **IdapRegistry.xml** file with your LDAP server information.
2. By default, **IdapRegistry.xml** is in this directory on the Performance Management Server:

**/opt/ibm/wlp/usr/shared/config**



```
<server>
<ldapRegistry id="IBMPdiirectoryServerLDAP" realm="APMRealm"
host="192.168.1.101" port="389" ignoreCase="true"
baseDN="cn=APMRealm,ou=admins,o=ibm,c=edu"
ldapType="IBM Tivoli Directory Server"
searchTimeout="1m"
connectTimeout="2m"
reuseConnection="true"
bindDN="cn=root" bindPassword="{xor}MD010jwrb28=">
<idsFilters>
userFilter="(&uid=%v)(objectclass=inetOrgPerson)"
groupFilter="(&(cn=%v)((objectclass=groupOfNames)
(objectclass=groupOfUniqueNames)(objectclass=groupOfURLs)))"
userldMap="*:uid"
groupIdMap="*:cn"
groupMemberIdMap="ibm-allGroups:member;ibm-
allGroups:uniqueMember;groupOfNames:member;groupOfUniqueNames:uniqueMember" />
<contextPool enabled="false" initialSize="1" maxSize="0"
timeout="0ms" waitTime="3000ms" preferredSize="3"/>
</ldapRegistry>
</server>
```

XML Tab Width: 8 Ln 9, Col 66 INS

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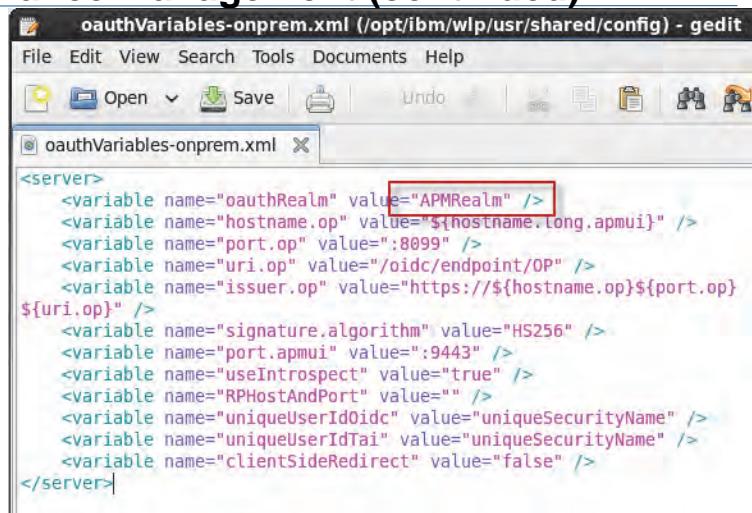
63

### Integrating LDAP with Performance Management

This slide shows the key configuration file, **IdapRegistry.xml**, configured to connect to an LDAP on another server.

## Integrating LDAP with Performance Management (continued)

3. Update the realm name **oauthRealm** value in the **oauthVariables-onprem.xml** file in the **/opt/ibm/wlp/usr/shared/config** directory to match the realm name used in LDAP.



The screenshot shows a text editor window titled "oauthVariables-onprem.xml (/opt/ibm/wlp/usr/shared/config) - gedit". The file contains XML configuration for OAuth variables. A red box highlights the "value" attribute of the "oauthRealm" variable, which is currently set to "APMRealm". Other variables shown include "hostname.op", "port.op", "uri.op", "signature.algorithm", "port.apmui", "useIntrospect", "RPHostAndPort", "uniqueUserIdOidc", "uniqueUserIdTai", and "clientSideRedirect". The "server" tag is also visible at the bottom.

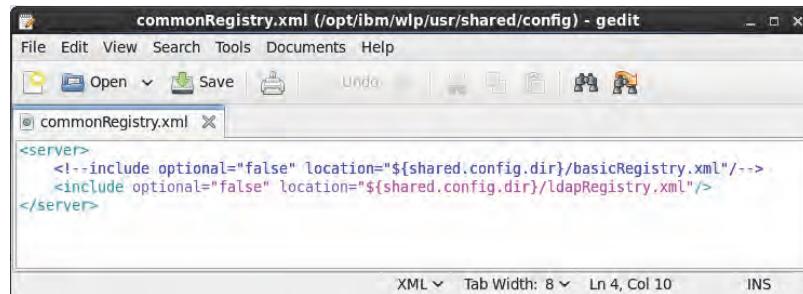
```
<variable name="oauthRealm" value="APMRealm" />
<variable name="hostname.op" value="${hostname.long.apmui}" />
<variable name="port.op" value=":8099" />
<variable name="uri.op" value="/oidc/endpoint/OP" />
<variable name="issuer.op" value="https://${hostname.op}${port.op}
${uri.op}" />
<variable name="signature.algorithm" value="HS256" />
<variable name="port.apmui" value=:9443" />
<variable name="useIntrospect" value="true" />
<variable name="RPHostAndPort" value="" />
<variable name="uniqueUserIdOidc" value="uniqueSecurityName" />
<variable name="uniqueUserIdTai" value="uniqueSecurityName" />
<variable name="clientSideRedirect" value="false" />
</server>
```

### Integrating LDAP with Performance Management (continued)

This slide shows the configuration file, **oauthVariables-onprem.xml**, configured to connect to the APMRealm on an LDAP server.

## Integrating LDAP with Performance Management (continued)

4. Update the **commonRegistry.xml** file in the **/opt/ibm/wlp/usr/shared/config** directory to use **IdapRegistry.xml** and save the file.
5. Update change the comment lines to use the LDAP registry instead of the common registry.



The screenshot shows a window titled "commonRegistry.xml (/opt/ibm/wlp/usr/shared/config) - gedit". The window contains XML code with a highlighted section:

```
<server>
    <!--include optional="false" location="${shared.config.dir}/basicRegistry.xml"-->
    <include optional="false" location="${shared.config.dir}/ldapRegistry.xml"/>
</server>
```

6. Update the **cscsRoleAdmin.new** file with the **apmadmin** information, for example:  
user:APMRealm/cn=apmadmin,cn=APMRealm,ou=admins,o=ibm,c=edu
7. Recycle the Performance Management Server

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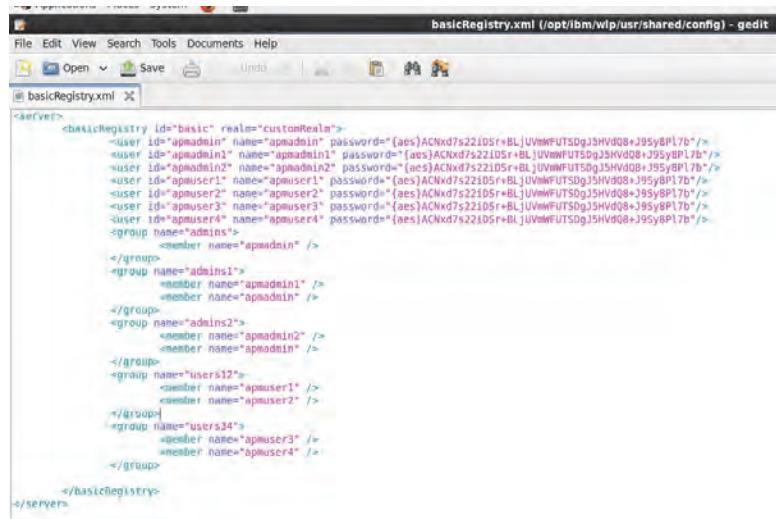
*Integrating LDAP with Performance Management (continued)*

## basicRegistry.xml

- By default, **basicRegistry.xml** is in this directory on the Performance Management Server:

**/opt/ibm/wlp/usr/shared/config**

- This file defines the following information:
  - Users
  - Groups
  - Passwords



```

<server>
  <basicRegistry id="basic" realm="customRealm">
    <user id="apadmin1" name="apadmin1" password="#(es)ACNcd7s210$+BLjUWmUTSDg1SHVd0$+J95yBP17b"/>
    <user id="apadmin2" name="apadmin2" password="#(es)ACNcd7s210$+BLjUWmUTSDg1SHVd0$+J95yBP17b"/>
    <user id="apuser1" name="apuser1" password="#(es)ACNcd7s210$+BLjUWmUTSDg1SHVd0$+J95yBP17b"/>
    <user id="apuser2" name="apuser2" password="#(es)ACNcd7s210$+BLjUWmUTSDg1SHVd0$+J95yBP17b"/>
    <user id="apuser3" name="apuser3" password="#(es)ACNcd7s210$+BLjUWmUTSDg1SHVd0$+J95yBP17b"/>
    <user id="apuser4" name="apuser4" password="#(es)ACNcd7s210$+BLjUWmUTSDg1SHVd0$+J95yBP17b"/>
    <group name="admins">
      <member name="apadmin1" />
    </group>
    <group name="admin1">
      <member name="apadmin1" />
      <member name="apadmin2" />
    </group>
    <group name="admin2">
      <member name="apadmin2" />
      <member name="apadmin1" />
    </group>
    <group name="users12">
      <member name="apuser1" />
      <member name="apuser2" />
    </group>
    <group name="users34">
      <member name="apuser3" />
      <member name="apuser4" />
    </group>
  </basicRegistry>
</server>

```

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*basicRegistry.xml*

This slide shows the **basicRegistry.xml** file that is used for the exercises. You define users and groups in the **basicRegistry.xml** file.

## Role-based access control

- Role-based access control allows for administrators to manage what actions and resources other administrators and users can perform without service interruption
- There are four default roles in Performance Management:
  - Role Administrator
  - Monitoring Administrator
  - System Administrator
  - Monitoring User
- Security policies are applied immediately

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### *Role-based access control*

Role-based access control allows for administrators to manage which actions and resources other administrators and users can perform.

## Role-based access control (continued)

- Access can be restricted for individual users or user groups:
  - By application instance
  - By group instance
  - By specific agents
    - Building applications
    - Building resource groups
    - Agent configuration
    - Private situations
- User interface
  - RBAC component delivers UI page to manage permissions, roles, users, and user groups.
  - Authorized user can create, update, and delete roles.
  - Authorized user can assign and unassign permissions to roles.
  - Authorized user can assign users and user groups to role.

## Default policy structure

	Role Administrator		Monitoring Administrator		System Administrator		Monitoring User	
	View	Modify	View	Modify	View	Modify	View	Modify
<b>System configuration permissions</b>								
Advanced Configuration	✓	N/A	—	N/A	✓	N/A	—	N/A
Agent Configuration	✓	N/A	✓	N/A	—	N/A	—	N/A
Informational Pages	✓	N/A	✓	N/A	✓	N/A	✓	N/A
Search Provider	✓	N/A	✓	N/A	—	N/A	—	N/A
Usage Statistics	✓	N/A	✓	N/A	—	N/A	—	N/A
<b>Resource permissions</b>								
Application Performance Dashboard	✓	✓	✓	✓	✓	—	✓	—
Applications	✓	✓	✓	✓	—	—	✓	—
<i>Individual Application</i>								
Diagnostics Dashboard	✓	N/A	✓	N/A	—	N/A	✓	N/A
Resource Group Manager	✓	N/A	✓	N/A	—	N/A	—	N/A
<i>Individual Resource group</i>								
Resource Groups	✓	✓	✓	✓	—	—	—	—
Synthetic Script Manager	✓	N/A	✓	N/A	✓	N/A	—	N/A
Threshold Manager	✓	N/A	✓	N/A	—	N/A	—	N/A

### Default policy structure

This slide shows the permissions that are granted to the default policies. A green check indicates that members of this role have this permission. A dash indicates that members of this role do not have this permission. N/A indicates that this permission does not exist.

## Roles

The screenshot shows the IBM Performance Management console interface. On the left, there is a sidebar with various management options: System Configuration, Advanced Configuration, Agent Configuration, Role Based Access Control (which has a red arrow pointing to it), Threshold Manager, Synthetic Script Manager, and Resource Group Manager. The main content area is titled 'Role Based Access Control' and displays a table of roles. The 'Roles' tab is selected, indicated by a blue background. The table has columns for 'Role' and 'Description'. It lists four roles: Monitoring Administrator, Monitoring User, Role Administrator, and System Administrator. Each role has a detailed description below it. A red arrow also points to the 'Roles' tab in the main navigation bar above the table.

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### Roles

On the Role Based Access Control main page there are three tables:

1. Roles table
2. User Groups table
3. Individual Users table

Use the highlighted icons to add, delete, or edit a role.

Users can navigate between them using the tabs on the left side. All RBAC pages have a link to the help page in the upper right corner and a breadcrumb in upper left corner. Every table provides a filter box for easy search.

## Individual users

The screenshot shows two panels. The left panel is titled 'Individual Users' and lists users: apmadmin, apmadmin2, apmadmin1, apmuser3, apmuser4, apmuser1, and apmuser2. The user 'apmadmin1' is selected and highlighted with a blue border. A red arrow points from the 'Edit' button at the top right of this panel to the 'Edit' button in the second panel. The right panel is titled 'Roles' and lists four roles: Monitoring Administrator, Monitoring User, Role Administrator, and System Administrator. The 'Monitoring Administrator' role is checked with a checked checkbox icon. A red arrow points from the checked checkbox in the 'Monitoring Administrator' row to the checked checkbox in the 'Role Administrator' row.

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### Individual users

Select the **Individual User** tab and a user. Click **Edit**. On the next screen, you can select and assign multiple roles to the user.

## User groups

The image consists of two side-by-side screenshots of the IBM Performance Management console's Role-Based Access Control (RBAC) interface.

**Left Screenshot:** The title bar says "Home > Role Based Access Control". Below it, the "Role Based Access Control" section has a sub-header "Manage user access using roles...". There are three tabs: "Roles", "User Groups" (which is highlighted in blue), and "Individual Users". A red arrow points to the "User Groups" tab. Below the tabs is a table with columns "User Groups" and "Roles". It lists several entries: "admins", "admin1" (which is selected and highlighted in blue), "admin2", "users12", and "users34". A red arrow points to the "admin1" entry. At the bottom of the table is a "Filter" input field.

**Right Screenshot:** The title bar says "Home > Role Based Access Control > User Group Editor". Below it, the "User Group Editor" section has a sub-header "Use the User Group Editor to quickly edit the roles a user group belongs to. Select a role to view its permissions for this role." It shows a list of roles with their descriptions:

Role	Description
<input checked="" type="checkbox"/> Monitoring Administrator	Users whose primary job function is to use Performance Management to monitor systems. Performs tasks such as adding monitoring applications, creating thresholds, adding groups of resources, and distributing the thresholds to these resource groups.
<input type="checkbox"/> Monitoring User	Users whose primary job function is to configure and maintain the health and state of systems that are monitored by Performance Management.
<input type="checkbox"/> Role Administrator	Users whose primary job function is to create access control policies for Performance Management. This role has all permissions.
<input type="checkbox"/> System Administrator	Users whose primary job function is to perform administration tasks for the Performance Management system. Performs tasks such as configuring the Event Manager, or configuring the Hybrid Gateway.

A red arrow points to the "Monitoring Administrator" role, which is checked.

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### User groups

As with individual users, you can select and edit a group.

## New role creation and configuration

The figure consists of two side-by-side screenshots of the IBM Performance Management Role Editor. The left screenshot shows the 'Assign Users to Role' section, where a red arrow points to the 'Role Name' field containing 'All Admins'. Another red arrow points to the 'User Groups' section, which lists 'users12', 'users34', and three checked boxes: 'admin02', 'admin03', and 'admin01'. A blue arrow points from the 'User Groups' section to the right screenshot. The right screenshot shows the 'Assign Permissions to Role' section, where a red arrow points to the 'Role Name' field containing 'All Admins'. Below it, the 'System Configuration Permissions' tab is selected, showing a list of permissions: 'Advanced Configuration', 'Agent Configuration', 'Informational Pages', 'Search Provider', and 'Usage Statistics'. Under each permission, there is a checkbox; the first four checkboxes are checked, while 'Usage Statistics' has an unchecked checkbox. A red arrow points to the checked 'View' permission under 'Advanced Configuration'.

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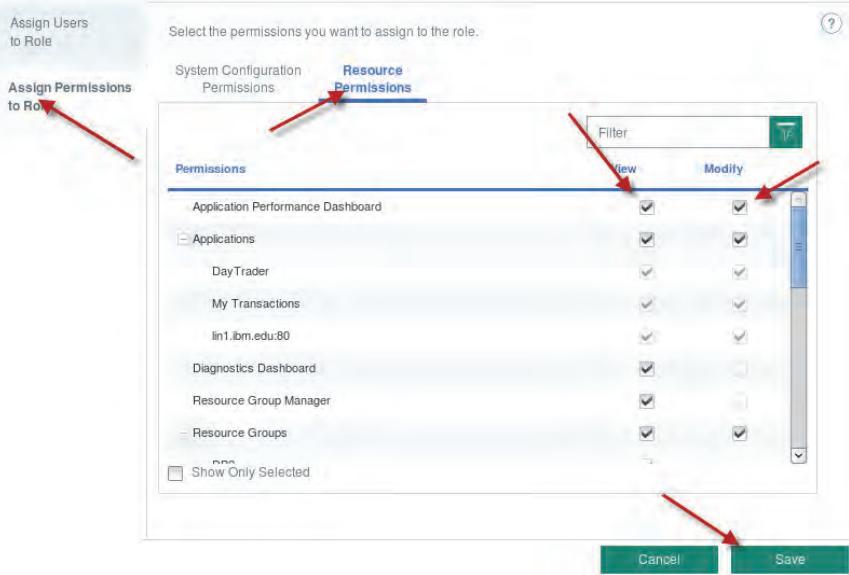
73

### New role creation and configuration

In Role Editor, you can create a role, assign it to users and user groups, and configure permissions.

You can create roles and choose names for them. In this example, the three admin groups are selected for inclusion in the All Admins group.

## New role creation and configuration: Resource permissions



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### New role creation and configuration: Resource permissions

You can restrict access to resources such as applications and resource groups.

## Example: A user with full permissions on a small test system

The screenshot shows the 'Application Dashboard' interface. On the left, a sidebar lists 'Applications' (All My Applications, DayTrader, Keystone, My Components, My Transactions) and 'Groups'. The 'All My Applications' section is expanded, showing 'DayTrader' with a red arrow pointing to it. The main area displays 'All My Applications' with three items: 'DayTrader', 'Keystone', and 'My Components'. Each item has a 'Components' icon, a 'Transactions' icon, and an 'Events' icon. Below this, there are sections for 'My Transactions' (Transactions icon, Events icon) and 'My Components' (Components icon). At the bottom of the dashboard, there are summary counts: 3 critical errors, 0 warnings, 1 info message, and 0 alerts.

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*Example: A user with full permissions on a small test system*

The user **apmadmin** can log in with full permissions to access any applications, resources, or folders.

## Example: A user with no permissions

The screenshot shows a web browser window for the IBM Performance Management console at <https://apm.ibm.edu:9443>. The title bar says "IBM Performance Ma...". The address bar shows the URL. The page content displays a "Not Authorized" message: "You do not have permission to view this application. If you require access to the application, please send the URL that you are attempting to access to your monitoring system administrator." At the bottom left, there is a sidebar with a user icon and the text "apmuser3", followed by "Lock Session" and "Log out". The footer contains copyright information: "© Copyright IBM Corporation 2016" and the number "76".

*Example: A user with no permissions*

The user **apmuser3** can log in but is not in a group and has no permissions to access any applications, resources, or folders.

## Example: A user with no administrative permissions

The screenshot shows the Application Dashboard interface. On the left, there's a sidebar with sections for Applications, Groups, and Instances. The Applications section is expanded, showing 'All My Applications' with items: DayTrader, Keystone, My Components, and My Transactions. A red arrow points to the 'All My Applications' link. The Groups and Instances sections are collapsed. On the right, there are three main panels: 'All My Applications' (with a 'Show Details' checkbox), 'DayTrader' (with 'Components', 'Transactions', and 'Events' sub-sections), and 'My Transactions' (with 'Transactions' and 'Events' sub-sections). At the bottom left of the dashboard, a user profile for 'apmuser1' is shown with options to 'Lock Session' and 'Log out'. The bottom right corner of the dashboard has a copyright notice: '© Copyright IBM Corporation 2016'.

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### Example: A user with no administrative permissions

The user **apmuser2** can log in, but is not in an administrative group and has no permissions to modify any applications, resources, or roles. Observe that All My Applications shows both DayTrader and Keystone applications.

## Example: A user with restricted application access

The screenshot shows the 'Application Dashboard' interface. On the left, a sidebar lists 'Applications' (All My Applications, DayTrader, My Components, My Transactions), 'Groups', and 'Instances'. A red arrow points to the 'DayTrader' entry under 'Applications'. The main area is titled 'All My Applications' and displays a summary of application status: 2 critical (red), 0 warning (yellow), 1 info (green), and 0 success (blue). It includes sections for 'DayTrader' (Components, Transactions, Events), 'My Components' (Components, Events), and 'My Transactions' (Transactions). At the bottom, there are links to 'Select an application to view groups' and 'Select a group to view Instances'.

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### Example: A user with restricted application access

This user can log in but is not in an administrative group and has no permissions to modify any applications, resources, or roles.

All My Applications shows only the DayTrader application. Access to the Keystone application is removed.

---

## Student exercises



Perform the exercises for this unit in the Course Exercises Guide.

---

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*Student exercises*

---

## Summary

You now should be able to perform the following tasks:

- Manage the Performance Management Server components.
- Start and stop the monitoring agents.
- Start the Performance Management Console.
- Describe the major functions of managing applications.
- Use attribute details to access data from an agent.
- Configure and use the log file agent.
- Manage users of the Performance Management Console.

---

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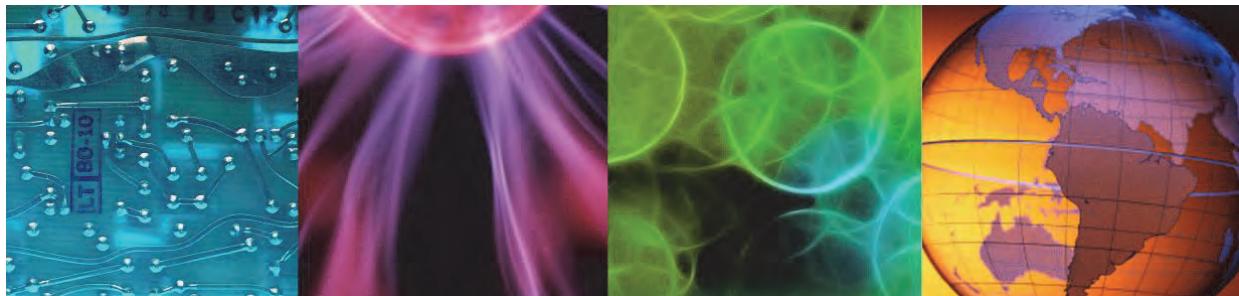
*Summary*



## 4 Managing events and thresholds



### 4 Managing events and thresholds



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This unit covers how to create, update, and delete thresholds, which in turn create events. You explore the Threshold Manager, where you create and modify thresholds that in turn create events if the thresholds defined are met. You also learn how to use the resource group manager. The resource group manager determines which agents running on specific servers evaluate the thresholds that are defined.

## **Objectives**

---

In this unit, you learn to perform the following tasks:

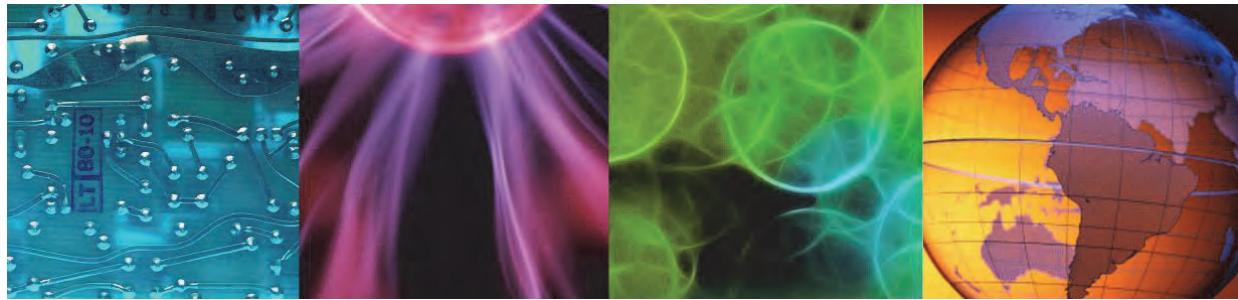
- Discuss the use of events in Application Performance Management.
- Describe how thresholds are used to create events.
- Create resource groups to manage the events for different managed systems in your enterprise.



# Lesson 1 Events



## Lesson 1 Events



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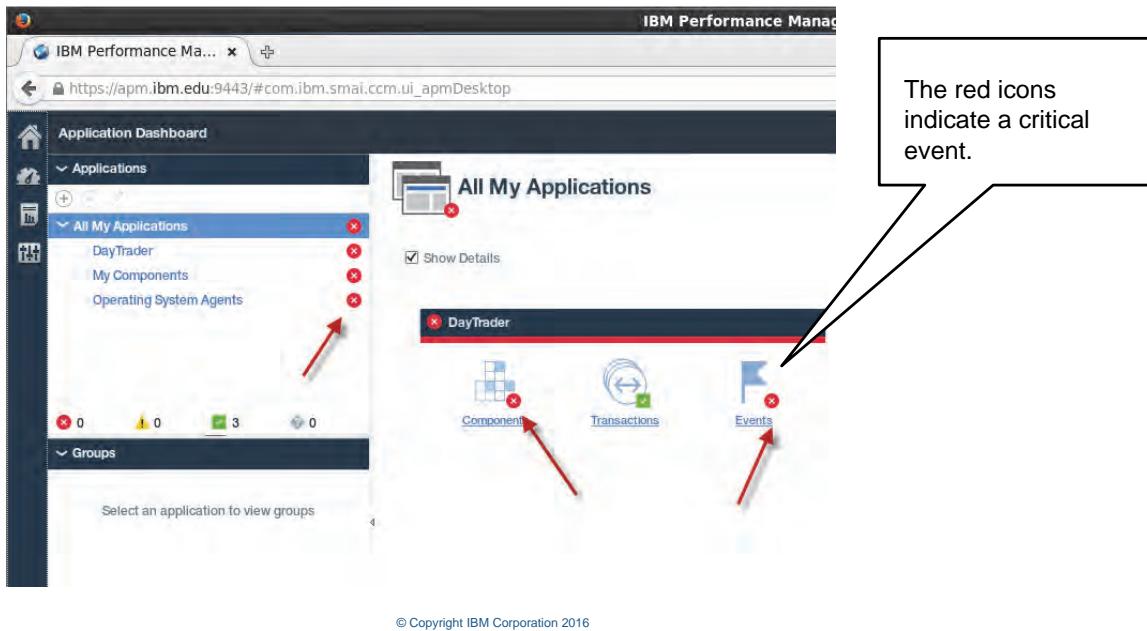
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In this lesson, you learn how to view events in IBM Monitoring.

## Event overview

- Event thresholds detect specific application behaviors and conditions based on actively monitored definitions.
- Predefined thresholds are available for each agent, and you can define new thresholds for monitoring.
- In the Application Performance Dashboard, after you select an application, the **Events** tab is displayed.
- The **Events** tab shows the open events for the current application.
- You can drill down to detailed dashboards with performance metrics to help you determine the cause of the event.

## Event indicators



### Event indicators

When a critical event is detected, visual indicators show with the navigators and on the application summary.

The status indicators consolidate the event severities from the event thresholds:

- Critical status indicates all events with a Fatal or Critical severity.
- Warning status indicates all events with a Minor and Warning severity.
- Normal status indicates all events with an Unknown severity.

## Event status

Status	Icon
Critical	
Warning	
Normal	

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### Event status

Each navigator item has a critical, warning, or normal status indicator, and each section presents a count of each status severity.

## Investigating an event

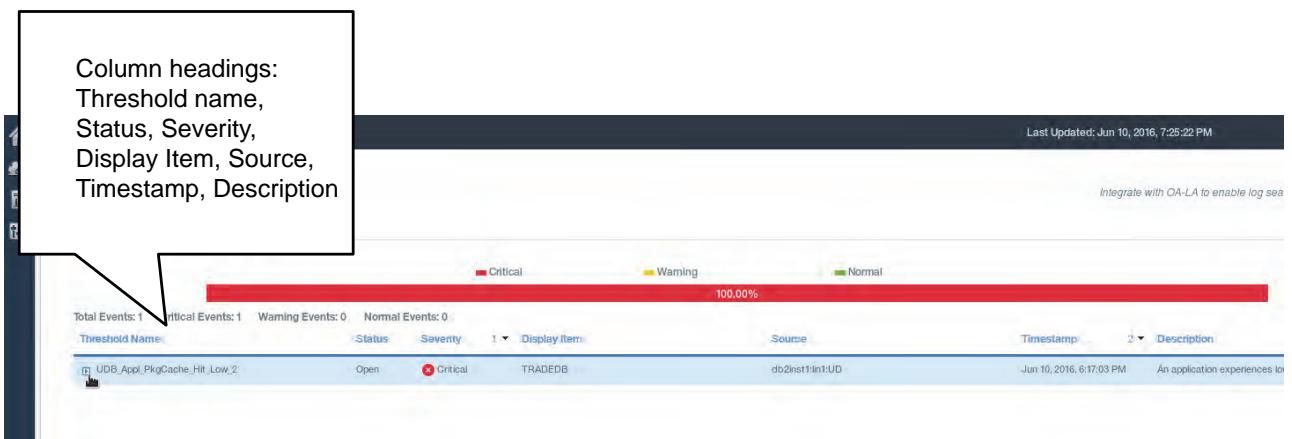


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### Investigating an event

The red bar on the Event Severity Summary shows that there is at least one critical event for this application.

## Event Status widget



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### Event Status widget

The list of events is displayed in the Event Status widget.

## Event Detail window

The screenshot shows the Application Dashboard for the DayTrader application. The 'Events' tab is selected. A summary bar at the top indicates Total Events: 1, Critical Events: 1, Warning Events: 0, and Normal Events: 0. Below this, a table lists a single event row:

Threshold Name	Status	Severity
UDB_App_PkgCache_Hit_Low_2	Open	Critical

A callout box points from the 'Event Detail shows:' list to the event row in the table. Another callout box points from the 'Event Detail shows:' list to the expanded event details below.

Below the table, detailed information for the selected event is shown:

Node	db2inst1:em:UD
Threshold ID	UDB_App_PkgCache_Hit_Low_2
Global Timestamp	Jun 10, 2016, 6:17:06 PM
Type	Sampled
Description	An application experiences low package cache hit ratio. ( Pkg Cache Hit Ratio < 50.00 )
Formula	

Event Detail shows:

- Node (with hyperlink directly to the agent that reported the event)
- Threshold ID
- Global Timestamp
- Type
- Description
- Formula

### Event Detail window

Details for the event that shows the slot values are displayed when an event is selected.

## Applications show the most severe status

The screenshot shows the IBM Operations Manager interface. At the top, there's a dark blue header bar with the title 'Operating System Agents'. Below it is a white panel with two icons: 'Components' (represented by a grid of squares) and 'Events' (represented by a blue flag). A red exclamation mark icon is positioned next to the 'Events' icon. A black arrow points from this red exclamation mark to a callout box on the right. The callout box contains the text: 'Only one status icon (the most severe) is shown with the navigator. There is also a warning event in this case.' Below the navigator, the main interface shows the 'Status Overview' and 'Events' tabs. The 'Events' tab is selected, indicated by a blue underline. On the right, there's a detailed table of events:

Threshold Name	Status	Severity	Details
NT_Services_Automatic_Start	Open	Critical	DB2
NT_Services_Automatic_Start	Open	Critical	IBM
NT_Logical_Disk_Space_Warning	Open	Warning	C:

A legend at the top of the event list indicates that red represents 'Critical' severity.

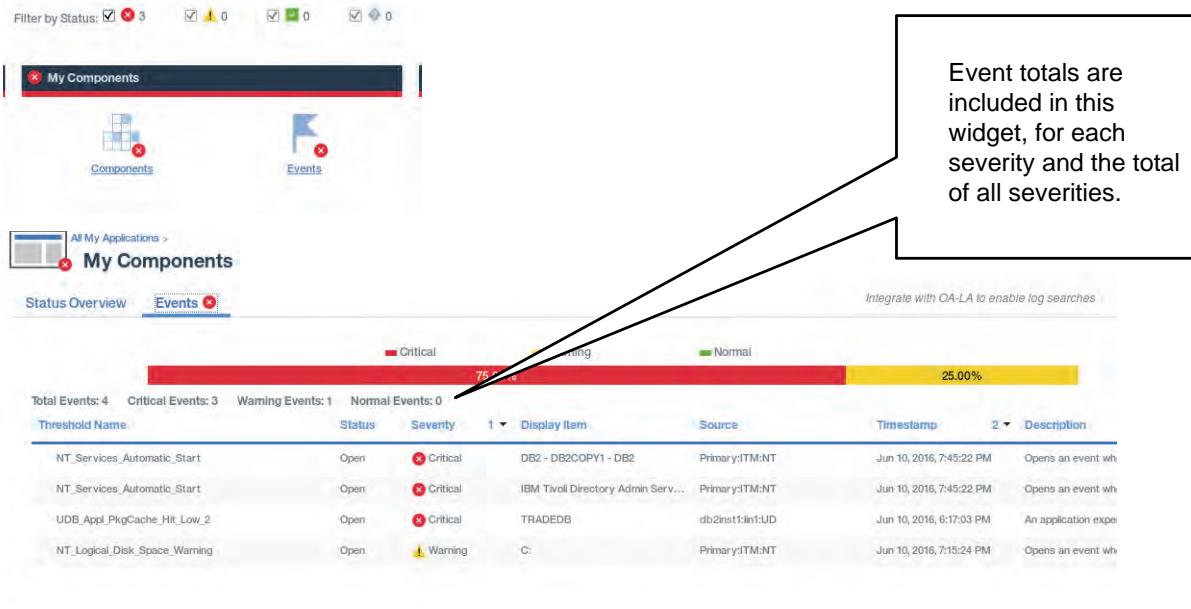
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### Applications show the most severe status

Applications can have multiple events and event statuses at any point in time. However, only the most severe status is displayed for the application.

## All events for all components

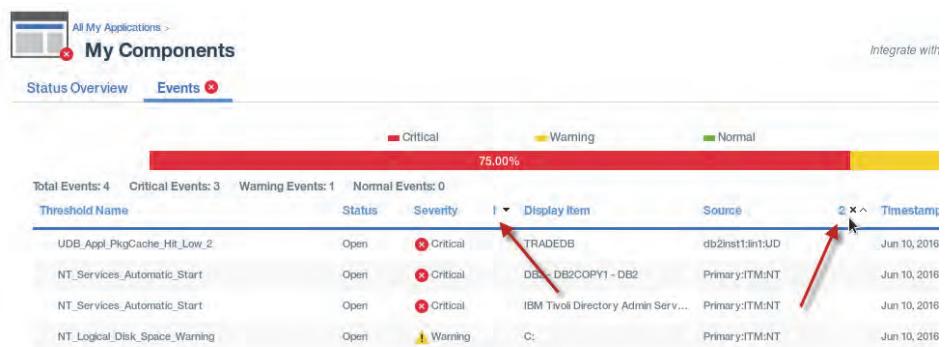


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*All events for all components*

## Using the Event Status widget

- Columns are sortable. Nesting sorts are supported.
- Columns include:
  - Threshold Name
  - Status
  - Severity
  - Display Item
  - Source
  - Timestamp
  - Description



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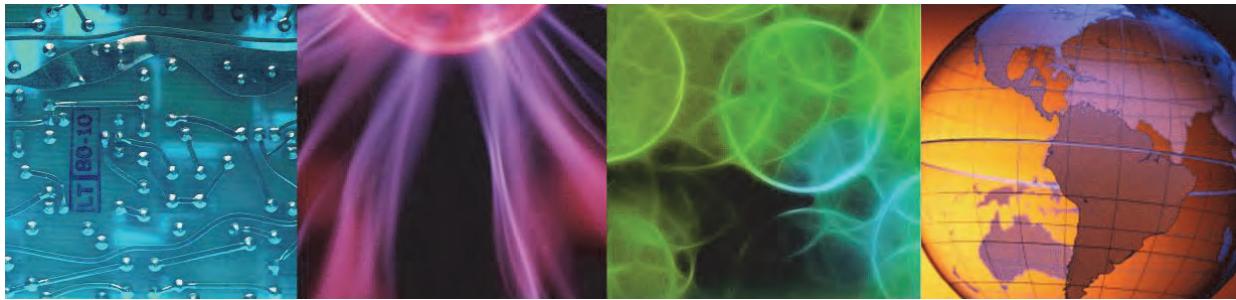
### Using the Event Status widget



## Lesson 2 Threshold Manager



### Lesson 2 Threshold Manager



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In this lesson, you learn how to define thresholds to create events.

## Introduction to thresholds

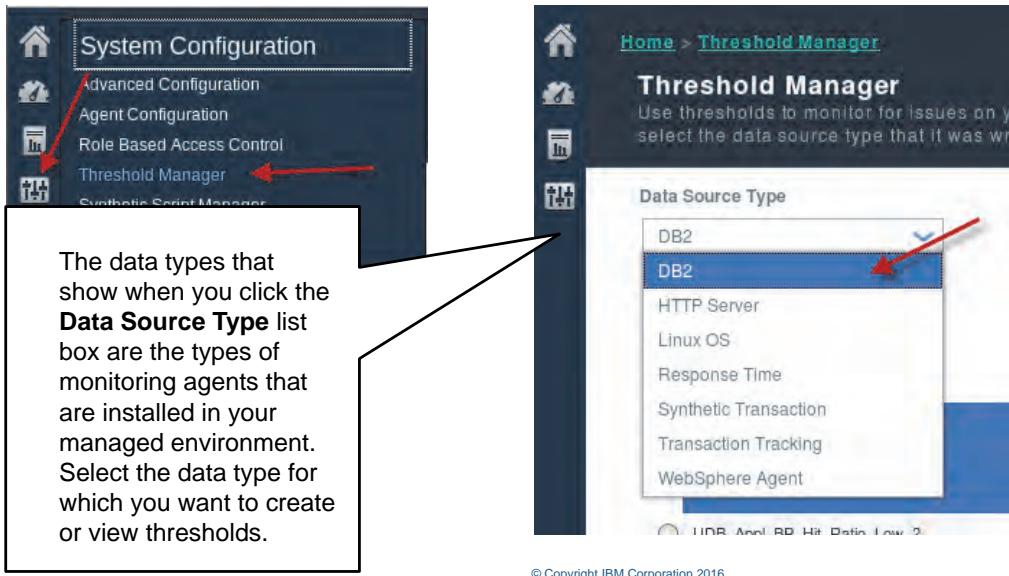
- Use thresholds to monitor for issues on your monitored resources.
- Thresholds compare current attribute values with given values and open an event when the comparison is true.
- To create a threshold, select a data source type from the list and click **New**.
- To edit or delete a threshold, select the data source type that it was written for, select the radio button, and click **Edit** or **Delete**.
- To filter the list, type inside the **Filter** text box.

### *Introduction to thresholds*

The next slides guide you through the process of creating thresholds.

## Selecting the data type

Thresholds sample attributes and compare them with configured values.



### Selecting the data type

Threshold Manager installs with predefined thresholds for monitoring agents. You can create new thresholds and edit existing thresholds.

You use thresholds to compare the sampled value of an attribute with the value set in the threshold.

If the sampled value satisfies the comparison, an event is opened. The event closes automatically when the threshold comparison is no longer true.

You access the Threshold Manager from the **System Configuration** menu.

## Modifying the fields

Field Name	Description
Name	Unique name fewer than 31 characters. Starts with a letter and no blanks.
Description	Optional
Severity	Fatal, Critical, Minor, Warning, Unknown
Interval	Select the time interval for testing the threshold. Allowed values for interval are 000000 (six zeros) for pure-event threshold or at least 000030 (30 seconds) up to 235959 (23 hours, 59 minutes, and 59 seconds) for sampled-event threshold. If you select pure event, the attribute group interval is set to 000000 and value change is not possible.
Required consecutive samples	Specify how many consecutive threshold samples must evaluate to true before an event is generated (1 - 100)
Data set	Select the data that you want to evaluate.

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### Modifying the fields

A threshold can test for one or more conditions in a data set. Click **Add** to define the comparison for a condition. You can add up to nine conditions in Boolean AND (&) comparisons or up to 10 conditions in Boolean OR (|) comparisons. After completing the first condition, select the logical operator before clicking **Add** for the next condition.

## Modifying the fields (continued)

Field Name	Description
Display Item	Optional. For multiple row data sets. Select a display item attribute if you want the threshold to continue evaluating the remaining rows in the data sampling after an event is opened for a row.
Logical operator	This field is applicable only if the threshold has multiple conditions. After defining the first condition in the Conditions table, select AND (&) if the previous condition and the next condition must be met, or select OR ( ) if either of them can be met for the threshold to be breached.
Conditions	The threshold can measure 1 or multiple conditions. Click <b>New</b> to add a condition. Select a condition and click <b>Edit</b> to modify the expression or click <b>Delete</b> to remove the expression. To add more conditions to the formula, select AND (&) or OR ( ) in the <b>Logical operator</b> field, and click <b>New</b> .
Group assignment	Select the check box of the group (or groups) to which the threshold should be assigned.
Execute Command	Optional. The command or script to start when the threshold conditions are true. Supports running the command on the first event, or on every consecutive true interval.

*Modifying the fields (continued)*

## Threshold fields

The screenshot shows the 'Threshold Editor' page with the following fields and their descriptions:

- Name \***: NT\_Logical\_Disk\_Space\_Critical (highlighted by a callout box: "The Name field is required.")
- Description**: Opens an event when the unallocated space on a logical disk drive is less than 10%.
- Severity**: Critical
- Interval (HHMMSS)**: 00 05 00
- Required consecutive samples**: 1
- Data set**: Active Server Pages (selected, highlighted by a callout box: "Provide the severity, interval, and required consecutive samples.")
- Display item**: Disk\_Name
- Logical operator**: And (&)

Callout boxes provide additional context for the 'Name', 'Required consecutive samples', and 'Data set' fields.

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### Threshold fields

1. Give the new threshold a meaningful name. Spaces are not allowed.
2. If necessary, use the Attribute filter field to locate metrics.
3. Configure the available Severity, Interval, and Consecutive Samples parameters.
4. Click to add the condition, and complete the configuration. Click **OK**.

## Threshold fields (continued)

Logical operator: And (&)

Conditions:

- %\_Free**: Comparison: less than or equal to 10
- Disk\_Name**: Comparison: not equal to '\_Total'

Group assignment:

- Available groups**: Resource group description: System group containing all Windows OS resources. Resource group type: System Defined
- Windows OS**

Execute command:

- Show only selected groups
- On first event only
- For every consecutive true interval

Save

Update the condition as necessary.

The resource group can be a custom group or a System Defined Group.

Optionally run a command when the condition is true.

Select Save.

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### Threshold fields (continued)

Click to add the condition and complete the configuration. Click **Save**.

## The resulting event

The screenshot shows the IBM Event Manager interface. At the top, there's a navigation bar with 'All My Applications > My Components > Components >' followed by a 'Windows OS' icon. Below this is a toolbar with 'Status Overview' and 'Events' (which is selected, indicated by a blue underline). A status bar at the bottom shows 'Total Events: 1 Critical Events: 1 Warning Events: 0 Normal Events: 0'. To the right, a callout box contains the text 'The resulting event from the definitions.' A large red arrow points from this callout box down to the event details table.

Threshold Name	Status	Severity
NT_Logical_Disk_Space_Critical	Open	Critical

Below the table, a detailed view of the threshold is shown:

Node	Primary:WIN1:NT
Threshold ID	NT_Logical_Disk_Space_Critical
Global Timestamp	May 10, 2016, 3:09:35 AM
Type	Sampled
Description	Opens an event when the unallocated space on a logical disk drive is less than 10%.
Formula	( % Free <= 99 AND Logical Disk Name != '_Total' )

At the bottom of the interface, there's a copyright notice '© Copyright IBM Corporation 2016' and a page number '20'.

### *The resulting event*

This sampled event determines whether you have less than 99% disk space on a Windows disk drive.

## Special operators that are supported in Edit Conditions

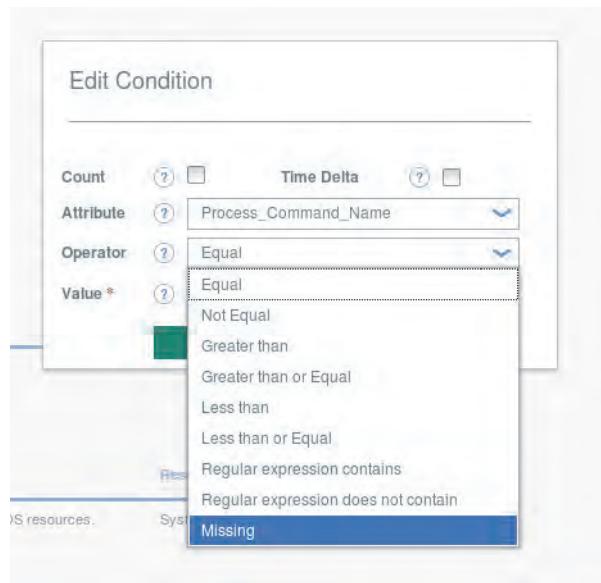
- Standard Boolean Operators:

- Equal
- Not Equal
- Greater than
- Greater than or equal
- Less than
- Less than or equal

- Regular expression

- Equals
- Not equals

- Missing



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### Special operators that are supported in Edit Conditions

The Missing condition is a powerful tool in Application Performance Management for monitoring files and processes.

## Execute command example that uses the Missing comparison

The screenshot shows the configuration of a threshold rule. In the 'Conditions' section, under 'Attribute' and 'Comparison', the 'missing' option is selected for 'Process\_Command\_Name'. In the 'Group assignment' section, the 'Available groups' checkbox is checked, and 'Linux OS' is selected. In the 'Execute command' section, the command '/usr/bin/xclock;' is entered. A callout box points to this command with the text: 'Run this command when the threshold is true.'

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### Execute command example that uses the Missing comparison

The ability to run commands or scripts to solve issues that are discovered is another powerful tool.

## Example of using multiple entries with the Missing operator

The Missing operator supports multiple entries to test in a single condition.

The screenshot shows the 'Threshold Manager' interface. In the top left, there's a configuration pane with 'Display item' set to 'Process\_Command\_Name', 'Logical operator' to 'And (&)', and 'Conditions' section showing a single entry for 'Process\_Command\_Name' with 'Comparison' set to 'missing\_attribute'. A callout box points to this entry with the text: 'The missing operator can check for multiple missing instances of an attribute'. Below this, the 'Group assignment' section shows 'Available groups' checked for 'Linux OS', with 'Resource group description' as 'System group containing all Linux OS resources' and 'Resource group type' as 'System Defined'. On the right, a summary bar indicates 'Total Events: 4 Critical Events: 3 Warning Events: 1 Normal Events: 0'. Below it is a table:

Threshold Name	Status	Severity	Display Item
Linux_Missing_Process	Open	Critical	xcalc
Linux_Missing_Process	Open	Critical	xclock

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*Example of using multiple entries with the Missing operator*

## Display item example

The left screenshot shows the 'Events' tab of the 'Operating System Agents' interface. It displays event counts: Total Events: 4, Critical Events: 3, Warning Events: 1, Normal Events: 0. A legend indicates Critical (red), Warning (yellow), and Normal (green). Below this, a table lists four threshold items:

Threshold Name	Status	Severity	Display Item	Source
Linux_Display_item_Example	Open	Critical	1nt1LZ	
NT_Services_Automatic_Start	Open	Critical	DB2 - DB2COPY1 - DB2	PrimarySTM:N
NT_Services_Automatic_Start	Open	Critical	IBM Tivoli Directory Admin Serv...	PrimarySTM:N
NT_Logical_Disk_Space_Warning	Open	Warning		PrimarySTM:N

The right screenshot shows the same interface but with different event counts: Total Events: 6, Critical Events: 5, Warning Events: 1, Normal Events: 0. The table data is identical to the left screenshot. Below the table, a configuration dialog is open for the 'Disk\_Name' display item. The 'Logical operator' dropdown is set to 'None'. The 'Disk\_Name' dropdown menu is open, showing options: KLZ Custom Scripts, KLZ Custom Scripts Rlm Smp, KLZ Custom Scripts Runtime, KLZ Disk (selected), KLZ Disk IO, and Disk\_Name. The 'Disk\_Name' option is highlighted.

The same threshold, one without Display Item definition and the other with the Disk\_Name attribute provided.

### Display item example

The Display Item feature is useful when an attribute can have multiple values that are returned. Examples include process names that are running on a server or disk drives that are available on a Windows server.

## Adding multiple conditions

The screenshot shows the 'Edit Condition' dialog box and the main configuration interface. In the main interface, under 'Conditions \*', there are two conditions listed:

- Condition 1: Attribute 'System\_Name' with Operator 'Not Equal' and Value 'apm.ibm.edu'.
- Condition 2: Attribute 'Process\_Command\_Name' with Operator 'missing xclock'.

The 'Edit Condition' dialog box is open, showing the configuration for the second condition. It includes fields for 'Count', 'Attribute' (set to 'System\_Name'), 'Operator' (set to 'Not Equal'), and 'Value' (set to 'apm.ibm.edu'). A warning message in the dialog box states: '\*COUNT and \*MISSING functions have to be the last, so new condition will be added before them.' There are 'OK' and 'Cancel' buttons at the bottom of the dialog.

### Adding multiple conditions

The Threshold Manager supports complex Boolean expressions.

## Deleting thresholds

To delete a threshold, choose it from the list, and select **Delete** (the minus sign).

Confirm your selection.

The screenshot shows the 'Threshold Manager' page with a list of thresholds for a 'Linux OS' data source. A red arrow points to the delete icon (minus sign) next to the 'Linux\_Display\_Item\_Example' threshold. A confirmation dialog box is overlaid on the page, asking 'Are you sure you want to delete Linux\_Display\_Item\_Example?' with 'OK' and 'Cancel' buttons.

Name	Description
Linux_BP_SpaceUsedPct_Critical	Monitors all mounted file systems for free space usage percentage. Once usage is higher than 90%, it triggers a critical alert.
Linux_CPU_Utilization_High	The percentage of CPU utilization is higher than 90%.
Linux_CPU_Utilization_High_Warn	The percentage of CPU utilization is higher than 80%.
Linux_Disk_Space_Low	Disk space usage is lower than 10%.
Linux_Display_Item_Example	This threshold is selected. It monitors the display item example.
Linux_Fragmented_File_System	File system fragmentation level is high.
Linux_Mem_Utilization_High_Crit	The memory utilization is higher than 90%.
Linux_Mem_Utilization_High_Warn	The memory utilization is higher than 80% and lower than 90%.

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*Deleting thresholds*

## Thresholds Enablement

- Many agents supply thresholds at installation time.
- You can decide after installation to enable or disable all of these system defined thresholds.
- System Configuration > Advanced Configuration > Thresholds Enablement



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### Thresholds Enablement

This feature provides the ability to quickly enable or disable all product provided thresholds.



# Lesson 3 Resource Group Manager



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In this lesson, you learn how to perform the following tasks:

- Use the Resource Group Manager to organize your managed resources.
- Select which thresholds are evaluated on a resource group.

## Resource Group Manager

- Use the Resource Group Manager to organize your monitored systems into named collections that you can assign to eventing thresholds.
  - Type of monitored resource
  - Geography
  - Application dependency
  - User responsibility
- You can mix different types of monitoring resources in a group.  
Thresholds are distributed to members of the same resource type.
- To create a group, click **New**.
- To edit or delete a group, select the radio button for the group and click **Edit** or **Delete**.
- To filter the list, type inside the **Filter** text box.

## Resource Group Manager (continued)

The screenshot shows the IBM Performance Management console. The main area is titled "Resource Group Manager" with a sub-header: "Use the Resource Group Manager to organize your monitored systems into named collections that can be assigned to event thresholds. Click New. To edit or delete a group, select the radio button for the group and click Edit or Delete." A "New resource group name" input field has a red arrow pointing to it. Below it is a table of existing resource groups:

Resource Group	Description
DB2	System group containing all DB2 resources.
HTTP Server	System group containing all HTTP Server resources.
HTTP Server Agent	This group contains resources of type HTTP Server Agent, but member and do not contain agents displayed in the Performance Management console.
Linux OS	System group containing all Linux OS resources.
Synthetic Events Agent	System group containing all Synthetic Events Agent resources.
Windows OS	System group containing all Windows OS resources.

A callout box with a red arrow points to the "New resource group name" field with the text: "Click the plus sign to create a new resource group."

The left sidebar is titled "System Configuration" and includes the following menu items: Advanced Configuration, Agent Configuration, Role Based Access Control, Threshold Manager, Synthetic Script Manager, and Resource Group Manager, which is highlighted with a red arrow.

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### Resource Group Manager (continued)

Resource groups are named collections that you can assign to event thresholds. You can mix different types of monitoring resources in a group; thresholds are distributed to resources of the same type.

1. Click the menu item to open the Resource Group Manager.
2. Click the plus (+) sign to create a new resource group.

## Creating a resource group

The screenshot shows the 'Creating a resource group' interface. At the top, there are fields for 'Group name' (Linux WAS Servers) and 'Group description' (This resource group is for Linux WAS servers and the software that supports them). Below this is a 'Resource assignment' table.

Available resource	Host name	Type	Source Domain
db2inst1:lin1:UD	lin1	DB2	On Premises
HU:lin1_httpd:HUS	lin1	HTTP Server	On Premises
KTE-GEN-HOSTNAME:TE	apim	Transaction Tracking	On Premises
lin1:HU	lin1	HTTP Server	On Premises

A checkbox labeled 'Show only selected resources' is checked. A 'Filter' button is located at the top right of the table area.

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### Creating a resource group

3. You give the group a name and optional description.
4. Assign resources for your resource assignments from the list of available resources.

## Creating a resource group (continued)

The screenshot shows the 'Resource Group Editor' interface. At the top, there's a header bar with 'Home > Resource Group Manager > Resource Group Editor'. Below it, a sub-header says 'Resource Group Editor' with a note: 'A resource group can include any managed resources in your monitored environment. For resources of the same type, include monitored systems in the Resource assignments or Threshold assignments, type inside the Filter text box.' The main area has two sections: 'Resource assignment' and 'Threshold assignment'.  
**Resource assignment:** A table with columns: Available resource, Host name, Type, and Source Domain. It lists four resources: 'db2inst1inst10' (Host: inst1, Type: DB2, Source Domain: On Premises), 'HTTP\_1\_stopH2' (Host: inst1, Type: HTTP Server, Source Domain: On Premises), 'KTE-GEN-HOSTNAME1' (Host: inst1, Type: Transaction Tracking, Source Domain: On Premises), and 'inst1\_HU' (Host: inst1, Type: HTTP Server, Source Domain: On Premises).  
**Threshold assignment:** A table with columns: Threshold name, Description, Type, and Origin. It lists three thresholds: 'Interaction\_Avail\_Critical' (Description: 'A high percentage of interactions have failed.', Type: Transaction Tracking, Origin: Predefined), 'Interaction\_Avail\_Warning' (Description: 'A moderate percentage of interactions have failed.', Type: Transaction Tracking, Origin: Predefined), and 'Interaction\_Time\_Critical' (Description: 'A high percentage of interactions have a slow fail time.', Type: Transaction Tracking, Origin: Predefined).  
At the bottom right are 'Save' and 'Cancel' buttons.

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### Creating a resource group (continued)

5. Assign thresholds.
6. If a threshold you require for the group does not yet exist, save the resource group and create the new threshold.
7. Return to the Resource Group Manager to add the new threshold and complete the configuration of your resource group.

## Student exercises

---



Perform all of the exercises in the Course Exercises Guide for this unit.

---

## Summary

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You now should be able to perform the following tasks:

- Discuss the use of events in Application Performance Management.
- Describe how thresholds are used to create events.
- Create resource groups to manage the events for different managed systems in your enterprise.



## 5 Integrating IBM Monitoring with other products



### 5 Integrating IBM Monitoring with other products



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This unit covers integrating IBM Monitoring with other products. Specifically, it describes how to integrate the products IBM Tivoli Monitoring, Netcool/OMNIbus, IBM Operations Analytics Log Analysis, and Dashboard Application Services Hub and other products. This unit also describes event notification that uses email and other advanced configuration settings.

## Objectives

---

In this unit, you learn to perform the following tasks:

- Integrate IBM Tivoli Monitoring.
- Integrate Bluemix.
- Integrate Netcool/OMNIbus.
- Integrate IBM Operations Analytics Log Analysis.
- Integrate IBM Operations Analytics Predictive Insights
- Integrate with IBM Alert Management
- Email Event Notification.
- Populate Dashboard Application Services Hub with IBM Monitoring agent data.
- Integrate IBM Control Desk (CO)



# Lesson 1 Integrating IBM Tivoli Monitoring



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In this lesson, you learn how to integrate with IBM Tivoli Monitoring.

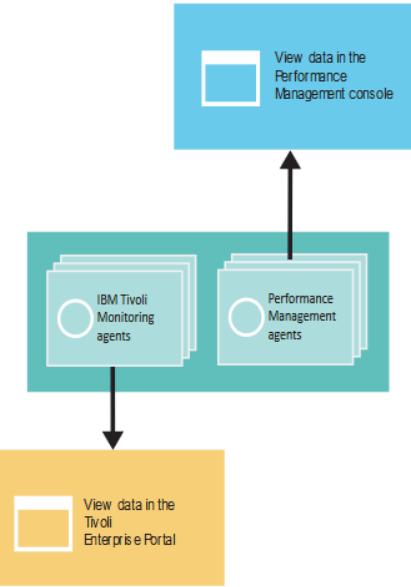
## Overview of IBM Tivoli Monitoring integration

There are three ways that Application Performance Management integrates with IBM Tivoli Monitoring V6:

- Coexistence of IBM Tivoli Monitoring V6 agents on the same operating system as Application Performance Management agents.
- Consolidation of status and events by using the Hybrid Gateway
- Consolidation of historical data in the Tivoli Data Warehouse that allows for long-term historical data to be collected, and reports generated.

## Coexistence of v6 and v7 agents with v8 agents

- You can install IBM Performance Management agents (version 8) on the same computer where IBM Tivoli Monitoring agents (versions 6 or 7) are installed.
- Both agent types cannot be installed in the same directory.
- Most agents can coexist. For a full list, refer to the documentation.



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### Coexistence of v6 and v7 agents with v8 agents

The goal is to provide users with the ability to install both IBM Tivoli Monitoring and Application Performance Management agents on the same system. Areas of conflict are resolved in the implementation, such as file system locations, and registry settings.

If coexisting agents are monitoring the same resources, the following scenarios are not supported:

- Both agents store data in the same IBM Tivoli Data Warehouse. For example, if both agents send data to the same Tivoli Data Warehouse, do not use the version 8 WebSphere MQ agent and the version 6 or 7 WebSphere MQ agent to monitor the same queue manager on your system. This scenario also applies to multiple-instance agents.
- Version 6 or 7 agents are integrated with the Hybrid Gateway to display data from both agents in the Performance Management console. For example, if version 6 or 7 agents are connected to the same Performance Management server through the Hybrid Gateway, do not use the version 8 IBM Integration Bus agent and the version 6 or 7 ITCAM Agent for WebSphere Message Broker to monitor the same broker on your system.

If a Tivoli Monitoring agent, which is integrated with the Hybrid Gateway to display data in the Performance Management console, is monitoring a resource and you want your Performance Management agent to monitor that resource, complete the following steps:

1. Remove the Tivoli Monitoring agent from any applications that include it.
2. Remove the Tivoli Monitoring agent from the Tivoli Monitoring managed system group that Performance Management is configured to use.
3. Wait at least 24 hours and then install the Performance Management agent and add it to an application.

## Hybrid Gateway overview

- Customers need to manage both IBM Tivoli Monitoring 6 On Premises and IBM Performance Management agents. In an environment that includes both IBM Tivoli Monitoring and IBM Performance Management products, you can install the IBM Performance Management Hybrid Gateway to provide a consolidated view of managed systems from both domains.
- The Hybrid Gateway can help customers migrate from IBM Tivoli Monitoring 6 to IBM Performance Management.
- The Hybrid Gateway must be installed in your IBM Tivoli Monitoring environment on a system with Red Hat Enterprise Linux (RHEL) Server 6 Update 2 or higher.
- The Hybrid Gateway can support 1500 - 2000 IBM Tivoli Monitoring on-premises agents.

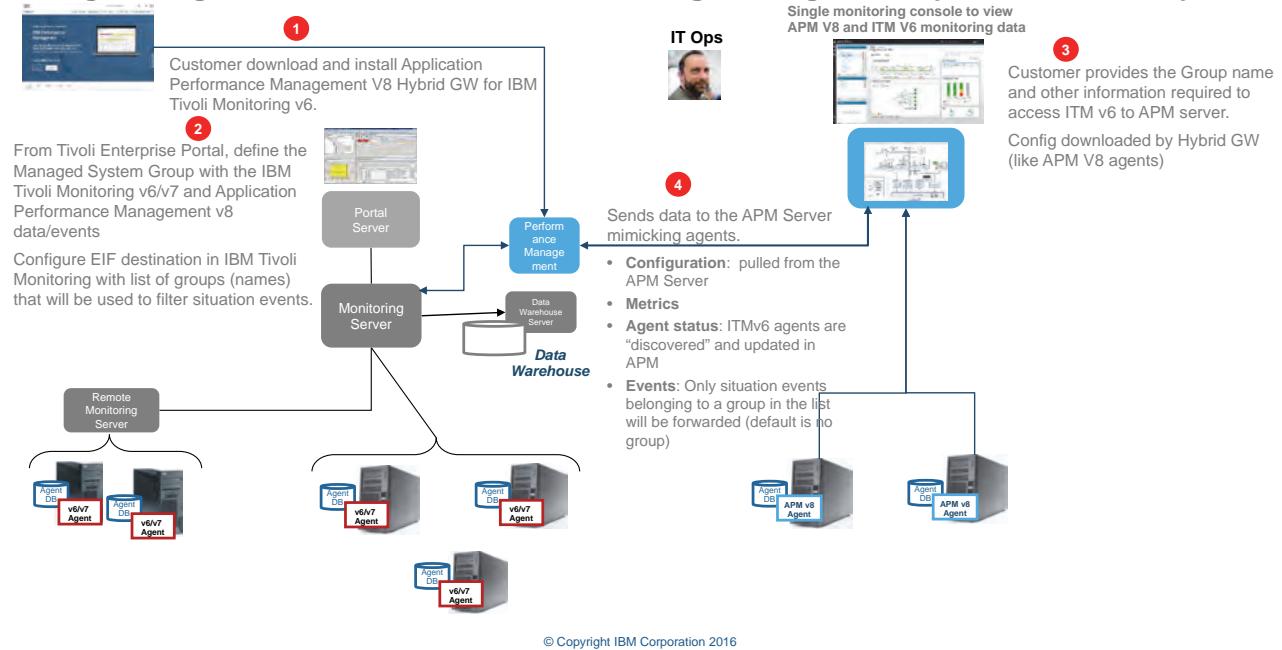
### *Hybrid Gateway overview*

When your monitored environment includes both IBM Tivoli Monitoring and IBM Performance Management products, you can install the IBM Performance Management Hybrid Gateway to get a consolidated view of managed systems from both domains.

When the Performance Management Hybrid Gateway is installed and configured, you can view managed systems from a Tivoli Monitoring domain in the Performance Management console. This gateway must be installed on systems with Red Hat Enterprise Linux Server 6 Update 2 or later.

Therefore, having more than 2000 managed systems can degrade performance and 2000 is the upper limit of the number of Tivoli Monitoring agents that are supported.

## Integrating with IBM Tivoli Monitoring using the Hybrid Gateway



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### Integrating with IBM Tivoli Monitoring using the Hybrid Gateway

This diagram shows the IBM Performance Hybrid Gateway.

The right side of the screen displays an IBM Monitoring environment. Agents are installed, and direct monitoring information into the Application Performance Management user interface (APM UI) which is the Application Dashboard.

On the left side, the IBM Tivoli Monitoring environment is depicted, showing the portal server, monitoring server, monitoring agents, and the portal client. The Hybrid Gateway directs information from the portal server to the environment, where the Application Performance Management UI can display this data.

## IBM Tivoli Monitoring agents and components that are supported by the Hybrid Gateway

Product name	Product Code	Supported Version
ITCAM Agent for WebSphere Applications	KYN	07.20.00
ITCAM Extended Agent for Oracle Database	KRZ	06.31.02.00
ITCAM Agent for DB2	KUD	07.10.00
IBM Tivoli Monitoring: Linux OS Agent	KLZ	v6.2.3: 06.23.01.00 and later v6.3.0: 06.30.01.00 and later
IBM Tivoli Monitoring: Windows OS Agent	KNT	v6.2.3: 06.23.01.00 and later v6.3.0: 06.30.02.00 and later
IBM Tivoli Monitoring: UNIX OS Agent	KUX	v6.2.3: 06.23.01.00 and later v6.3.0: 06.30.02.00 and later
ITCAM Agent for WebSphere MQ Monitoring	KMQ	07.10.01
ITCAM Agent for WebSphere Message Broker	KQI	07.10.01
Tivoli Enterprise Portal Server	KCQ	06.30.05.00

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*IBM Tivoli Monitoring agents and components that are supported by the Hybrid Gateway*

## From IBM Tivoli Monitoring

- Decide which managed systems or components are supported by the Hybrid Gateway.
- From the Object Group Editor, create a managed system group. This group contains the names of the managed systems to see in IBM Monitoring.
- The managed system group name is case-sensitive and is also used by the hybrid gateway configuration.

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*From IBM Tivoli Monitoring*

## From IBM Performance Management

The screenshot shows the 'Advanced Configuration' section of the IBM Performance Management interface. On the left, a sidebar lists various configuration categories: UI Integration, Event Manager, MongoDB Configuration, Agent Central Configuration, Data Mart, **Hybrid Gateway**, Kafka Configuration, Tracking Analytics Service, Agent Subscription Facility, and Thresholds Enablement. The 'Hybrid Gateway' category is selected and highlighted in blue. The main panel is titled 'Parameters' and contains fields for configuring the Hybrid Gateway. The fields include:

Parameter	Value
Managed System Group Name	HybridVMs
Portal Server Host Name	itm.ibm.edu
Portal Server Port	15200
Portal Server Protocol	http
Portal Server User Name	sysadmin
Portal Server User Password	.....
Pass-Through Proxy Host Name	
Pass-Through Proxy Port	0
Pass Through Proxy Protocol	http

A green 'Save' button is located at the bottom right of the form.

- Obtain the Hybrid Gateway agent.
- Install the Hybrid Gateway agent on a system other than the server where the MIN is running.
- From Advanced Configuration, set the parameters for the Hybrid Gateway.
- The Managed System Group Name is the name that is defined in IBM Tivoli Monitoring using the Object Group Editor to contain the server member names.

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From IBM Performance Management

## Viewing hybrid agents in the dashboard

The dashboard displays two views side-by-side:

- ITM - WINDOWSOS View:**
  - Icon: Building with wrench.
  - Section: Status Overview
  - Metrics: Online logical processors (4), Aggregate CPU usage (0.00%), Memory usage (%), Total disk usage (%), Network usage (Pkts/sec), Total real memory (4,095 MB), Total disk space (35.0 GB), Number of processes (95).
- WIN1 - WINDOWSOS View:**
  - Icon: Cloud with wrench.
  - Section: Status Overview
  - Metrics: Online logical processors (5), Aggregate CPU usage (0.00%), Memory usage (%), Total disk usage (%), Network usage (Pkts/sec), Total real memory (4,095 MB), Total disk space (100.0 GB), Number of processes (45).

Both views include a timestamp of 10:46 Aug 19 and a legend for % Busy, % Idle, % Load, and % Free.

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### Viewing hybrid agents in the dashboard

You can view hybrid agents in the Application Performance Management UI application dashboard. In a hybrid environment, you can see information that represents agents from traditional monitoring systems and from IBM Monitoring. In the example, views display one IBM Tivoli Monitoring Windows agent and one IBM Monitoring Windows agent.

Note the icons on the views that represent the Status Overview and the events that are in the upper left corner of each view. The IBM Tivoli Monitoring agent icon is a building with a wrench on it. The IBM Monitoring agent WIN1 icon is a cloud with a wrench on it.

The two examples on the right side of the page indicate how similar the widgets look, whether it is an IBM Tivoli Monitoring agent or an IBM Monitoring agent.

## Benefit of integrating IBM Tivoli Monitoring events

Situation Name	Status	Severity	Display Item	Source	Timestamp
HG{EIF_Sit}	Open	Critical		nc9037034031LZ	2015-10-20
HG{EIF_Sit}	Open	Critical		nc9037034211LZ	2015-10-20

- Customers can now see Situation events that are opened by the IBM Tivoli Monitoring agents that are integrated into APM.

### Benefit of integrating IBM Tivoli Monitoring events

There are no new components that are needed to install in the Advanced Configuration for the Hybrid Gateway. The Hybrid Gateway still requires a Managed System Group Name that corresponds to the IBM Tivoli Monitoring Managed System List name. The Hybrid Gateway also still requires a Tivoli Enterprise Portal Server host name, portal server port, portal server protocol, portal server user name, and any applicable pass-through proxy port and protocol.

The EIF Port in the Hybrid Gateway configuration affects the integration. The Hybrid Gateway listens for events on the same port as the MIN Event Manager. The advanced configuration for the Event Manager port is usually the default port of 9998.

In the Hub Tivoli Enterprise Monitoring Server configuration in IBM Tivoli Monitoring, The Tivoli Event Integration Facility (EIF) must be activated. The location of the Hybrid Gateway and its EIF listener port must be provided. If events are already being emitted to another destination (for example, OMNIbus), further destinations can be defined by using the **tacmd createeventdest** command.

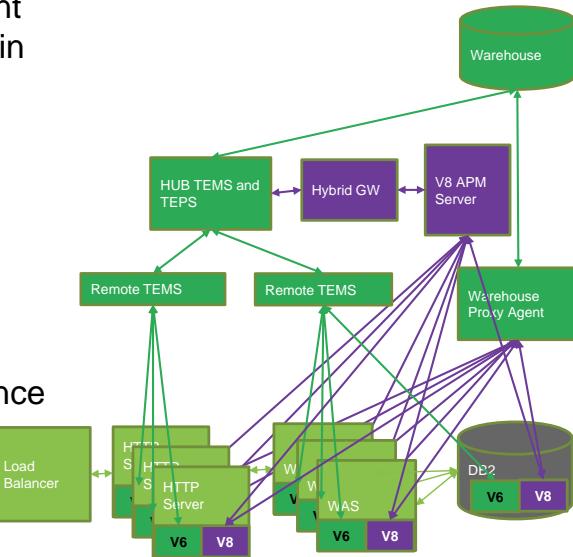
From IBM Tivoli Monitoring in the Situation Editor, edit a situation whose events should be forwarded to Application Performance Management. Perform these tasks on the **EIF** tab:

- Select the **Forward Events to an EIF Receiver** check box.
- Select the new Hybrid Gateway Receiver.
- Repeat for each situation.

The result is that for each situation modified to specify the Hybrid Gateway destination, the Hub Tivoli Enterprise Monitoring Server forwards all events from any IBM Tivoli Monitoring agent to which the situation is distributed.

## Integrating Application Performance Management v8 agents with IBM Tivoli Monitoring v6 Tivoli Data Warehouse

- Starting with IBM Performance Management v8.1.3, customers can store historical data in the IBM Tivoli Monitoring v6 Tivoli Data Warehouse (TDW)
- Only Agents with a corresponding v6/v7 Agent are supported
  - New metrics unique to IPM v8 will not be warehoused
  - Refer to the documentation for a detailed list
- Data is sent from the Application Performance Management v8 Agents to the Warehouse Proxy and then inserted into the TDW
- Allows for enterprise-wide reporting



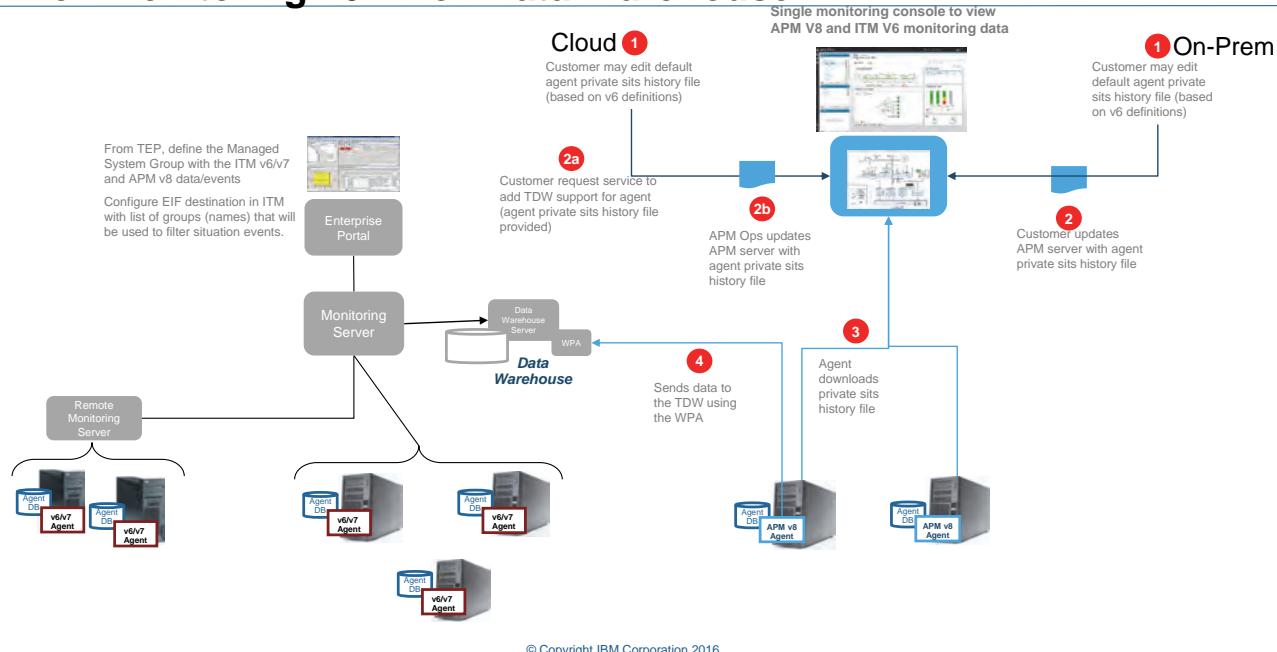
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### Integrating Application Performance Management v8 agents with ITM v6 Tivoli Data Warehouse

Sample history files for agents are available on your Performance Management server. Use the sample file for your agent as the basis for creating the history configuration .xml file on the Performance Management server. The server propagates the configuration to all agents of this type. The history file specifies the Warehouse Proxy agent address, the data sets to collect samples from, the frequency of data collection, and how long to keep the data locally.

## Application Performance Management v8 agent data flow to IBM Tivoli Monitoring v6 Tivoli Data Warehouse



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### Application Performance Management v8 agent data flow to IBM Tivoli Monitoring v6 Tivoli Data Warehouse

This slide depicts the steps and the flow of historical data from Application Performance Management agents into the Tivoli Data Warehouse.

## Configuration overview

- Application Performance Management history configuration is done by agent type (for example, Linux OS, WAS, DB2).
- Requires manual product file editing. GUI editor is not available.
- Configuration to consider:
  - Which history data sets to collect (in pc\_history.xml)
  - WPA connection information to use (in pc\_history.xml)
- Application Performance Management server manages distribution of definitions to Application Performance Management agents.
- Definitions sent to all connected Application Performance Management agents by type (WAS, DB2, and so on).

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Configuration overview

## History configuration file contents

- The history configuration file is written in XML
- Location is on the Performance Management server and varies by product code: /opt/ibm/wlp/usr/servers/min/dropins/CentralConfigurationServer.war/data\_source/pc
- XML details:
  - WAREHOUSE:
    - WPA contact info
    - RPC network protocol
    - Network address
    - Listening port number
  - HISTORY: per table definition to start data collection
  - TABLE: attribute group (data set) name from product ODI file
  - EXPORT: interval (in minutes) for sending data to WPA
  - INTERVAL: interval (in minutes) for data collection
  - RETAIN: Maximum number of hours of short-term history data kept at local agent
- To stop collection: Remove or comment out <HISTORY> entry

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History configuration file contents

## History configuration file and log file

The screenshot shows a code editor window titled "iz\_history.xml" containing XML configuration code for a warehouse. Below the code editor is a separate window showing a log of system messages.

```

<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<PRIVATECONFIGURATION>
<WAREHOUSE LOCATION="ip.pipe:#192.168.1.101[63358]" />
<HISTORY EXPORT="60" INTERVAL="15" RETAIN="6" TABLE="KLZ_CPU"/>
<HISTORY EXPORT="60" INTERVAL="15" RETAIN="6" TABLE="KLZ_DISK"/>
<HISTORY EXPORT="60" INTERVAL="15" RETAIN="6" TABLE="KLZ_VM_STATS"/>
<HISTORY EXPORT="60" INTERVAL="15" RETAIN="6" TABLE="KLZ_NETWORK"/>
<HISTORY EXPORT="60" INTERVAL="15" RETAIN="6" TABLE="KLZ_SYSTEM_STATISTICS"/>
<HISTORY EXPORT="60" INTERVAL="15" RETAIN="6" TABLE="Linux_IP_Address"/>
</PRIVATECONFIGURATION>

```

Log content (highlighted in red boxes):

```

khdevtig.cpp,413,"reportEvent") ReportEvent failed - status = 23
khdxubb.cpp,2935,"checkUTF8ClientEncoding") Database client encoding is not UTF8.
need to set the os environment variable DB2CODEPAGE=1208 for DB2 or
ALGONUL5_LANGUAGE=<NLS_TERRITORY>_1208 for ORACLE
khdrpci.cpp,24,"initRPCone") RPC Listener has been requested.
khdrpci.cpp,349,"initRPCone") Calculated ebase 1918, epval 63358, epLimit 1918
khdrpci.cpp,356,"initRPCone") Trying endpoint 63358, family 34
khdrpci.cpp,140,"CTRPCAddress_sock_Constr") New object contents: name=ip.pipe:#192.168.1.101[63358], socklen=18,
khdrpci.cpp,423,"initRPCone") RPC interface registration successful.
khdrpci.cpp,376,"GetNextSocket") Returning len=18,name=(ip.pipe:#192.168.1.101[63358]),family=34,new handle=2D90B
khdrpcr.cpp,220,"CTRPCRegisterTask") 0 entries found in KHD_WAREHOUSE_TEAMS_LIST, 0 passed the syntax check
khdrpcr.cpp,227,"CTRPCRegisterTask") The default annotation will be used to register the WPA
khdrpcr.cpp,376,"GetNextSocket") Returning len=18,name=(ip.pipe:#192.168.1.101[63358]),family=34,new handle=2D90B
khdrpcr.cpp,62,"register_interface") Registering "candle_warehouse_Proxy": ip.pipe:#192.168.1.101[63358]
kdcdbg.c,168,"KDC0_updateGLB") Preferred GLB @ ip.pipe:#192.168.1.101[1918] already first in list
kdcdbg.c,99,"KDC1_GetBinding") Using LLB at ip.pipe:#192.168.1.101[1918]
kdccgbin.c,118,"KDC6_Bind") Using GLB at ip.pipe:#192.168.1.101[1918]

```

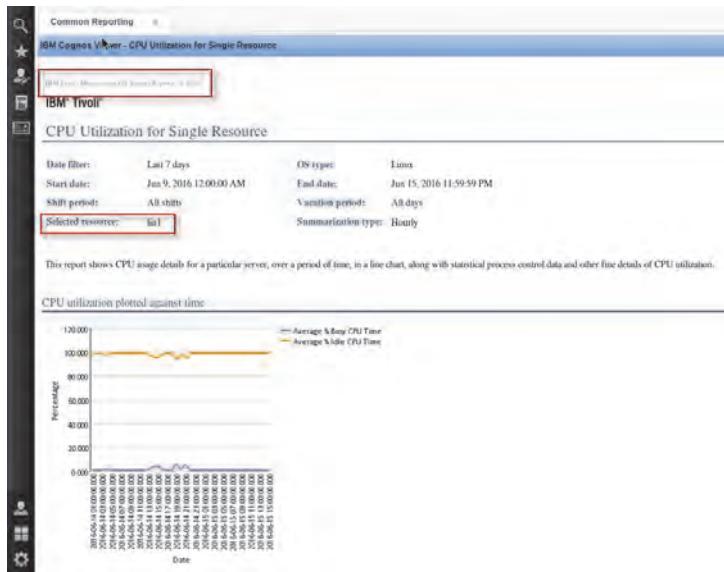
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### History configuration file and log file

This slide shows a sample history configuration file and a log file that shows the location of the warehouse proxy server IP address and port number. These values are used in the history configuration file to identify the target warehouse proxy.

## Tivoli Common Reporting on IBM Monitoring agent example



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### Tivoli Common Reporting on IBM Monitoring agent example

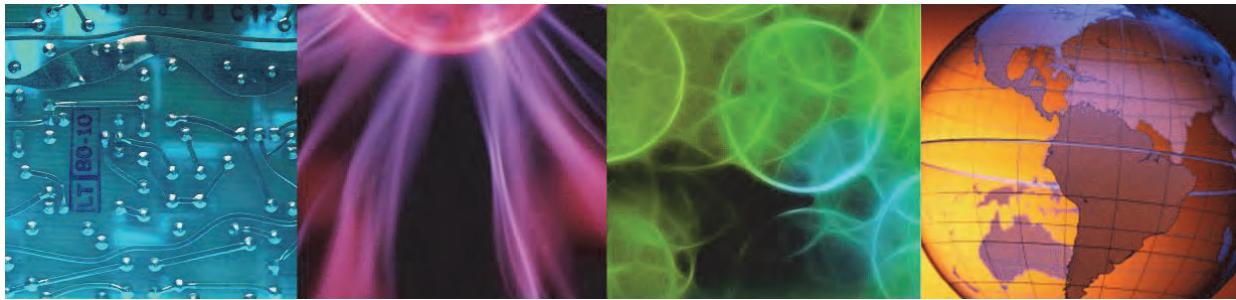
This slide shows a sample report.



## Lesson 2 Bluemix integration



## Lesson 2 Bluemix integration



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In this lesson, you learn how to integrate with IBM Bluemix.

## Bluemix Monitoring and Analytics service overview

- Monitoring and Analytics is a Bluemix service that provides monitoring of Bluemix applications using a backend composed of Application Performance Monitoring (APM) on Cloud and IBM Operations Analytics for Log Analysis servers running in SoftLayer.
- It covers application Availability, Performance, Diagnostics, and Log, as well as alerting on a predefined set of Availability and Performance events.
- It provides full functions for Liberty (java), Node.js, and Ruby on Rails runtimes.
- It only provides Availability for other runtimes.
- When the service is bound to an application, it auto-configures and loads data collectors without further user intervention.
- The service has its own dashboard UI embedded in Bluemix.

## Bluemix Monitoring and Analytics data

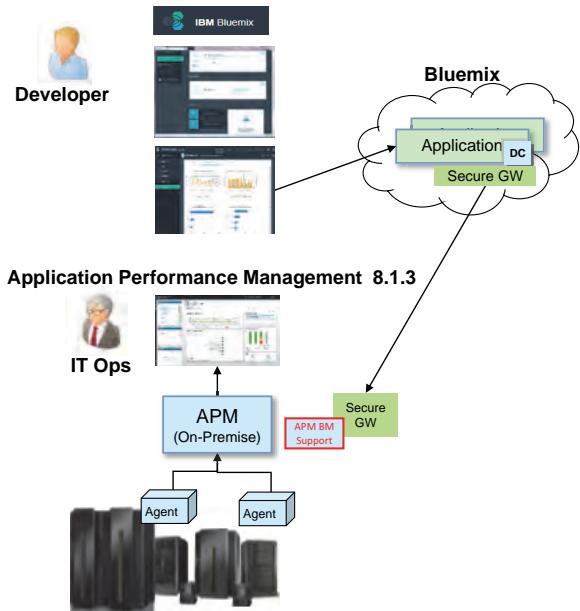


### Bluemix Monitoring and Analytics data

This slide shows examples of Bluemix Monitoring and Analytics data that can be passed to IBM Application Performance Management.

## Hybrid application monitoring: Bluemix Application Performance Management on-premises integration

- Enable the monitoring of the Bluemix application to be fed into the on-premises Application Performance Management server Data fed using IBM Secure Gateway
- Integrates monitoring and deep-dive data Availability Monitoring and Log Analysis are not integrated



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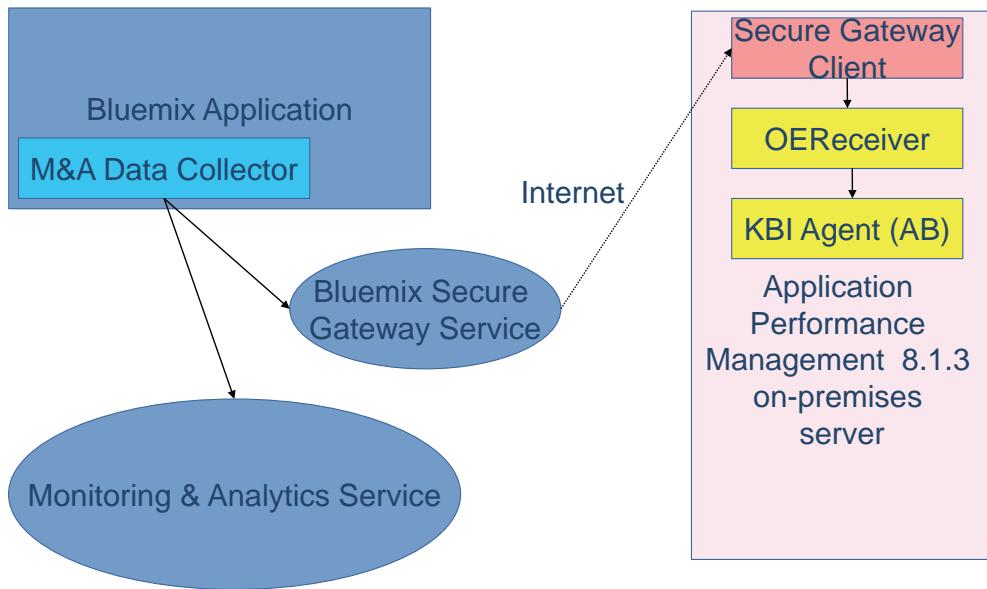
### Hybrid application monitoring: Bluemix Application Performance Management on-premises integration

The Hybrid feature allows a Bluemix application with the Monitoring and Analytics data collector to send its data to an on-premises Application Performance Management server and the Monitoring and Analytics server. This provides only resource and deep dive data, not availability, or log. Availability Monitoring refers to the availability and response time transactional data that is monitored by the Monitoring and Analytics service.

Eventing is provided by situations in the on-premises Application Performance Management server, not by the Monitoring and Analytics mechanism.

Data is passed from the Bluemix application to the on-premises Application Performance Management server using the Bluemix Secure Gateway service that provides an encrypted tunnel allowing data to reach through firewalls.

## Bluemix hybrid architecture



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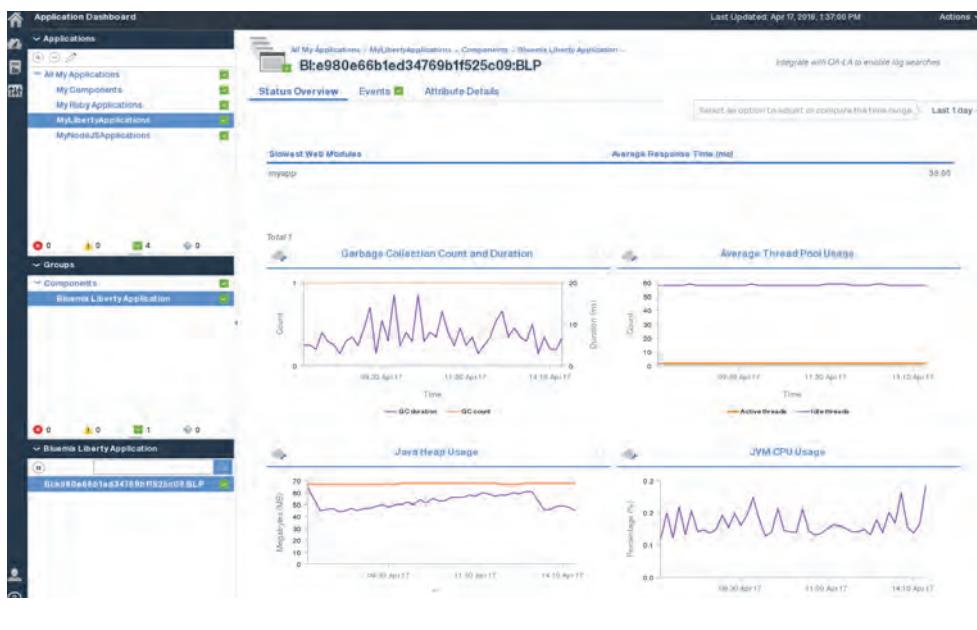
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### Bluemix hybrid architecture

Within the on-premises server, a custom Agent Builder agent (kbiagent) represents the Bluemix applications within Application Performance Management. The kbiagent is installed on the Performance Management server system itself.

The Monitoring and Analytics data collectors in Bluemix will post data using the secure gateway; this data is received by OEReceiver and forwarded to kbiagent, which submits it to the Performance Management in the usual way using ASFREST.

## On-premises example of a Bluemix Liberty application



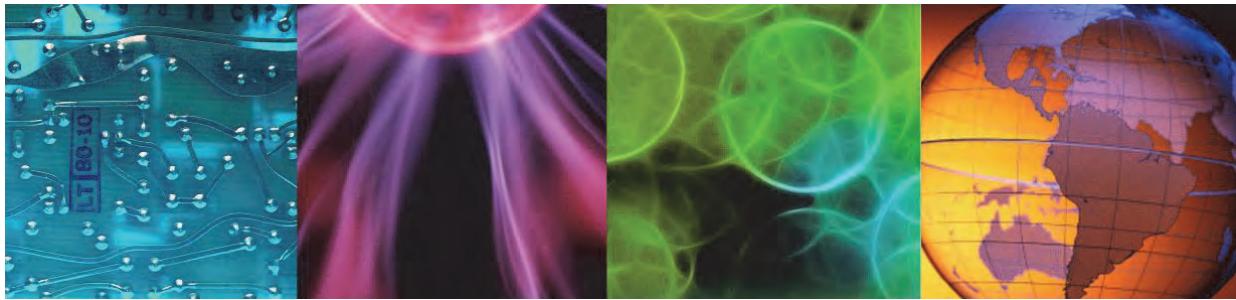
### On-premises example of a Bluemix Liberty application

This slide shows the Bluemix data from a Liberty application from an on-premises Performance Management console.

# Lesson 3 Netcool/OMNIbus integration



## Lesson 3 Netcool/OMNIbus integration



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In this lesson, you learn how to integrate with Netcool/OMNIbus.

## Integration agent for Netcool/OMNibus

- This agent enables the forwarding of alerts, generated in Performance Management on Cloud, to the customer's on-premises OMNIBUS, providing one method for doing event management.
- Configuration is from **Advanced Configuration > Event Manager**:
  - EIF port
  - EIF event targets

Configuration Categories	Parameters
UI Integration	Configuration parameters that control the storage and forwarding of received events.
<b>Event Manager</b>	Event Cache Time: 60 Pure Event Close Time: 24 Master Reset Event: True EIF Port: 9,011 EIF Event Target(s): lin3.ibm.edu
MongoDB Configuration	
Agent Central Configuration	
Data Mart	
Hybrid Gateway	
Kafka Configuration	
Tracking Analytics Service	
Agent Subscription Facility	

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### Integration agent for Netcool/OMNibus

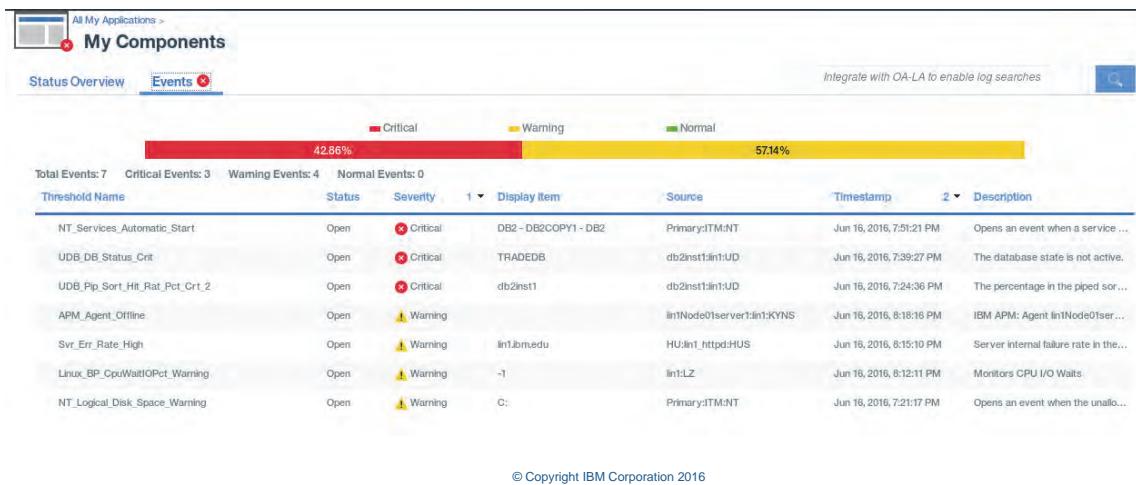
Customers use this feature to integrate their Performance Management alerts with their on-premise alerts, providing one method for event management. This agent takes alerts that are generated in Performance Management and forwards them, over the Internet, to the customer's on-premises OMNIBUS. A customer's cloud-monitored business applications share the same alerting capability as legacy applications.

On-premises OMNIBUS becomes a single alert management system for the Enterprise and Cloud.

## Events in the Application Performance Manager user interface

After you install the integration agent, you can see the events both in the Application Performance Manager UI and the OMNibus Event console.

This screen capture shows how they look in the Application Performance Manager UI.



### Events in the Application Performance Manager user interface

In the Application Performance Management UI, events show in several places. You can see a consolidated view of all your events in the **My Components Event Status** tab.

## Events in Netcool/OMNibus

This screen capture shows how the events look in Netcool/OMNibus.

The screenshot shows the 'Event Viewer' interface from the IBM Dashboard Application Server. The window title is 'IBM Dashboard Appl...'. The URL in the address bar is <https://lin3.ibm.edu:16311/ibm/console/navigation.do?XSS=OCs4myDMyhhmmj1Rj3QnWOU&wpageid=com.ibm.is>. The search bar contains 'Search'. The main pane is titled 'Event Viewer' and shows a table of events. The columns are: Sev, Ack, Node, Alert Group, Summary, Last Occurrence, Count, Type, and ExpireTime. There are 1168 total events. The table includes rows for various nodes like lin3, db2inst1, and Primary:ITM:NT, with details such as 'ALERT: last 5 mins: high number of events sent by: lin3: 1634' and 'ALERT: syslog Probe (Conn ID: 2): sent high number of events: 1637'.

Sev	Ack	Node	Alert Group	Summary	Last Occurrence	Count	Type	ExpireTime
!	No	lin3	TopNodes	ALERT: last 5 mins: high number of events sent by: lin3: 1634	6/16/16 8:24:20 PM	1	Problem	86,430
!	No	lin3.ibm.edu	ProbeStatus	ALERT: syslog Probe (Conn ID: 2): sent high number of events: 1637	6/16/16 8:24:20 PM	1	Problem	86,430
!	No	db2inst1:lin1:UD	ITM_KUD_DB2_Database	UDB_DB_Status_Crit[dbase_status != Active ]	6/16/16 8:22:36 PM	1	ITM Problem	Not Set
!	No	db2inst1:lin1:UD	ITM_KUD_DB2_Database	UDB_DB_Status_Crit[dbase_status != Active ]	6/16/16 8:22:36 PM	2	ITM Problem	Not Set
!	No	lin3.ibm.edu	TopClasses	ALERT: last 5 mins: high number of events for class: Syslog Probe (200): 1343	6/16/16 8:24:20 PM	1	Problem	86,430
!	No	Primary:ITM:NT	ITM_NT_Services	NT_Services_Automatic_Start[Start_Type = Automatic AND Current_State = Stopped ]	6/16/16 8:22:36 PM	1	ITM Problem	Not Set
!	No	db2inst1:lin1:UD	ITM_KUD_DB2_Database	UDB_DB_BP_Hit_Ratio_Low_2[pool_hit_ratio <= 50.00 AND dbase_status != InActive ]	6/16/16 8:22:36 PM	14	ITM Problem	Not Set
!	No	lin3.ibm.edu	DBStatus	ALERT: last 5 mins: alerts.status.inserts/deduplications are high: 960530	6/16/16 8:19:25 PM	1	Problem	86,430
!	No	lin1:LZ	ITM_KLZ_CPU	Linux_BP_Cpu/WaitIOPct_Warning[Wait_IO_CPU > 10.00 AND CPU_ID = -1 ]	6/16/16 8:22:36 PM	7	ITM Problem	Not Set
!	No	lin3.ibm.edu	DBStatus	Last 5 mins alerts.journal (inserts): 0	6/16/16 8:29:20 PM	3	Information	330

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### Events in Netcool/OMNibus

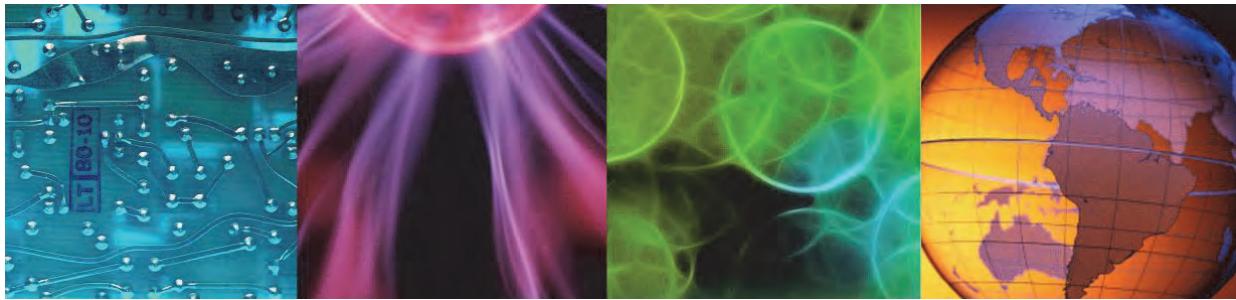
Netcool/OMNibus event viewer shows that the on-premises events pulled down from the Application Performance Management environment. Note that some of the same situations that are shown on the previous slide.



## Lesson 4 Event notification



### Lesson 4 Event notification



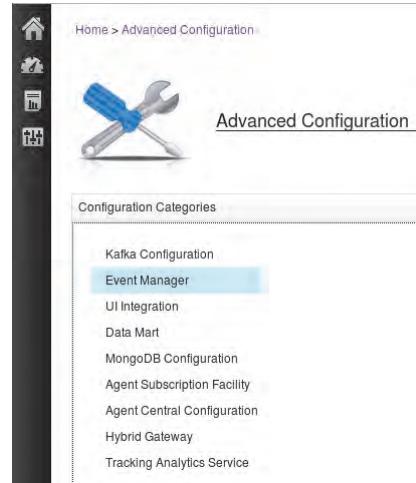
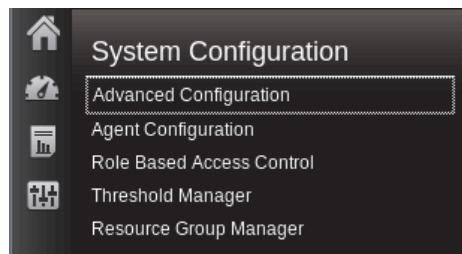
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In this lesson, you learn how to direct event notifications to an email system.

## Event notification overview

- Events that are produced in IBM Monitoring can be sent to email IDs.
- The Advanced Configuration settings are opened.
- Configuration Category > Event Manager** is selected.



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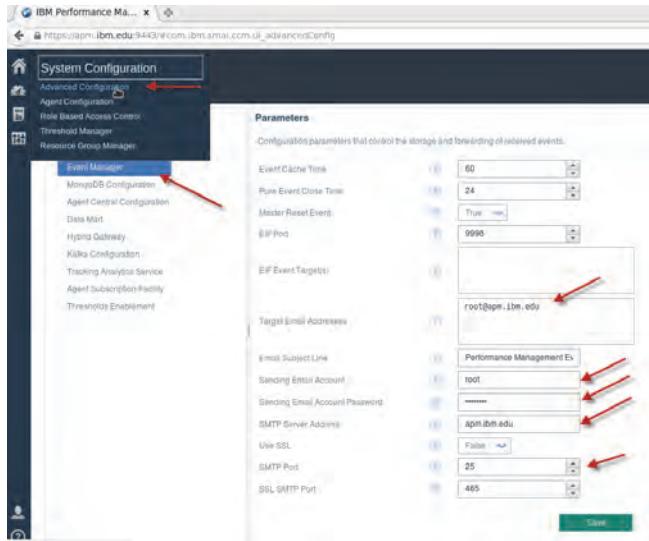
### Event notification overview

You make changes to the Event Manager configuration parameters by using the **System Configuration > Advanced Configuration** menu.

## Event Manager parameter changes for event notification

These parameter changes are made for this course.

- Change **SMTP Server Address** to **apm.ibm.edu**.
- Leave **Email Subject Line** blank because the subject is provided by the Event Manager.
- Change **Target Email Addresses** to **root@apm.ibm.edu**. This address is the location of the mail server and the email ID.
- Change **Sending Email Account Password** to **object00**.



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### Event Manager parameter changes for event notification

Changes are made in this course to four parameters that affect event notification and the mail server that is used. Depending on your mail server, more parameters might also have to be changed.

These fields are all of the Event Manager fields. Not all of these fields apply to event notification. In the Netcool/OMNIbus integration lesson, you see some parameters that apply to that integration:

- **SMTP Server Address** is the fully qualified host name of the SMTP server that is used for sending events as emails, such as smtp.gmail.com.
- **Use SSL** determines whether to use SSL (Secure Socket Layer) as the SMTP transport mechanism. The default is False.
- **SSL SMTP Port** is the port number to use for sending SMTP email by using the SSL protocol. The default is 465.
- **SMTP Port** is the port number to use for sending SMTP email. The default is 25.
- **Pure Event Close Time** determines how long to leave a pure event open before you close it. The default is 24 hours.
- **Sending Email Account** is the email address to use when you are sending an SMTP email event.
- **Email Subject Line** is the text to use in the subject line of the forwarded SMTP event email. The default is Performance Management Event.
- **Target Email Addresses** specifies the email addresses to which events are forwarded. Separate each address with a comma (,), as in ann@ibm.com,jim@ibm.com,owen@ibm.com.

- **Event Cache Time** determines the number of hours that events are retained in the local cache, up to 96 hours. If the event list is long, consider reducing the number of hours that are kept. Or, to see events over a weekend period, increase the number of hours. The default is 24 hours.
- **EIF Port** is the port to use for Event Integration Facility operations. The default is 9998.
- **Sending Email Account Password** is the password that is associated with the sending email account.
- **Master Reset Event** controls whether to send a master reset event to clear previously received sampled events after the monitoring agent is restarted. If you configured email notifications, you also receive an email. The default is TRUE.
- **EIF Event Targets** specifies the list of host names or IP addresses and port numbers to which all received Event Integration Facility events are forwarded. For example, if you are forwarding events to the Netcool/OMNIbus Probe for Tivoli EIF, enter the fully qualified host name or IP address of the computer where the probe is installed. Then, enter the receiver port number. Separate the host name and port number with a colon (:), and separate each host name with a comma (,), such as 9.87.65.111:8989,localhost:9090,myhostname.en.ibm.com. If you do not include a port number, the default EIF port 9998 for the host name is used. IPv6 addresses are not supported for EIF transmission.

## The email in-box

- This example is using a Linux mail server named postfix.
- The rightmost column of the in-box display is the email subject.
- The situation Linux\_BP\_CpuWaitIOPct comes from IBM Monitoring, also seen in the Application Performance Manager console.

```

root@apm:~# mailx
Heirloom Mail version 22.4 7/29/08. Type ? for help.
"/var/spool/mail/root": 39 messages 32 new 38 unread
U 1 Anacron      Wed Sep  3 04:31 18/674 "Anacron job 'cron.daily' on template65.csuite.edu"
U 2 Anacron      Thu Sep  4 03:21 18/674 "Anacron job 'cron.daily' on template65.csuite.edu"
U 3 Anacron      Tue Jun 14 04:41 18/699 "Anacron job 'cron.daily' on apm"
U 4 Anacron      Thu Jun 16 15:48 19/695 "Anacron job 'cron.daily' on apm"
5 root@pm.ibm.edu Thu Jun 16 19:19 56/2203 "Agent Primary:ITM:NT has restarted. on Primary:ITM:NT"
U 6 root@pm.ibm.edu Thu Jun 16 19:19 54/2179 "APM Agent Offline on Primary:ITM:NT"
U 7 root@pm.ibm.edu Thu Jun 16 19:21 86/3917 "NT Logical Disk Space Warning on Primary:ITM:NT"
>N 8 root@pm.ibm.edu Thu Jun 16 19:24 55/2218 "Agent db2inst1:lin1:UD has restarted. on db2inst1:lin1"
N 9 root@pm.ibm.edu Thu Jun 16 19:24 55/2135 "Agent lin1:T5 has restarted. on lin1:T5"
N 10 root@pm.ibm.edu Thu Jun 16 19:24 53/2195 "APM Agent Offline on db2inst1:lin1:UD"
N 11 root@pm.ibm.edu Thu Jun 16 19:24 53/2121 "APM Agent Offline on lin1:T5"
N 12 root@pm.ibm.edu Thu Jun 16 19:24 55/2141 "Agent lin1:LZ has restarted. on lin1:LZ"
N 13 root@pm.ibm.edu Thu Jun 16 19:24 55/2136 "Agent lin1:HU has restarted. on lin1:HU"
N 14 root@pm.ibm.edu Thu Jun 16 19:24 53/2123 "APM Agent Offline on lin1:HU"
N 15 root@pm.ibm.edu Thu Jun 16 19:24 53/2128 "APM Agent Offline on lin1:LZ"
N 16 root@pm.ibm.edu Thu Jun 16 19:24 174/6567 "UDB Inst Status Crit on db2inst1:lin1:UD"
N 17 root@pm.ibm.edu Thu Jun 16 19:24 174/6588 "UDB Pip Sort Hit Rat Pct Crt 2 on db2inst1:lin1:UD"
N 18 root@pm.ibm.edu Thu Jun 16 19:24 212/8098 "UDB DB Status Crit on db2inst1:lin1:UD"
N 19 root@pm.ibm.edu Thu Jun 16 19:25 55/2211 "Agent Primary:lin1:KYNA has restarted. on Primary:lin1"
N 20 root@pm.ibm.edu Thu Jun 16 19:25 53/2207 "APM Agent Offline on Primary:lin1:KYNA"

```

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### The email in-box

This Linux mail server is named postfix. If this server is your mail server, it can require changes in the file **/etc/postfix/main.cf** file to accept email.

Here are some examples of commands that show the mail in-box for the active user:

- mail
- mailx

These commands are also useful:

- list to display all of the available commands.
- d # or d #1-#2 to delete an email or an email range of numbers.
- Enter the number of the email from the in-box.
- d to page downward in the email.
- q or quit to exit the email application.
- x or exit to exit the email.

## Examining an email for IBM Monitoring-related references

The screenshot shows an email from root@apm.ibm.edu to root@apm.ibm.edu with the subject 'NT\_Logical\_Disk\_Space\_Warning on Primary:ITM:'. The message body contains the following text:

```

Message 7
From: root@apm.ibm.edu  Thu, Jun 16 19:21:21 2016
Return-Path: <root@apm.ibm.edu>
X-original-To: root@apm.ibm.edu
Delivered-To: root@apm.ibm.edu
From: root@apm.ibm.edu
To: root@apm.ibm.edu
Subject: NT_Logical_Disk_Space_Warning on Primary:ITM:
Content-Type: text/plain; charset=us-ascii
Date: Thu, Jun 16 19:21:21 +0000 (UTC)
Status: RD

The text below lists the information received from the
identifies the agent that detected the event. The Description
definition and its severity. Below the Description
the threshold event, in their raw form.

Agent IP : 192.168.1.102 (apm.ibm.edu)
Agent IP : 192.168.1.101
Agent : Primary:ITM:NT
Severity : warning
Description: NT_Logical_Disk_Space_Warning[%_Free<
  IN NT Logical Disk
  ManagedSystemName="NT SYSTEM"
  TenantID=SAFF-3FCF-4F10-2000-1CAE-0731-FB00-7E33
  adapter host@itm.ibm.edu
  apm hostname=apm.ibm.edu
  appl_label=A:P:S
  avg_disk_read_per_read=63
  avg_disk_queue_length=10.004
  avg_disk_read_queue_length=9.478
  avg_disk_write_queue_length=2.412
  date=06/16/2016
  disk_bytes_per_sec=168473
  disk_bytes_per_sec_64=168473
  disk_name=C:
  disk_name_long=C:
  disk_name_short=apm
  disk_read_bytes_per_sec=1572941
  disk_read_bytes_per_sec_64=1572941
  disk_reads_per_sec=132
  disk_transfers_per_sec=141
disk transfers per sec=141
disk bytes per sec=1572941
disk write bytes per sec=1411852
disk writes just 1 sec
farnhostname@itm.ibm.edu
farnhostport=10000
hostname@itm.ibm.edu
ident@farnhost:Logical_Disk_Space_WarningPrimary:ITM:NT:ITM logical_disk
interpretation_type=warning
message=Logical_Disk_Space_Warning[%_Free >= 20 AND %_Free <= 30 AND Disk_Free:=Total]
origin=192.168.1.101
pct_disk_read_time=947
pct_disk_write_time=947
pct_disk_write_time24h=947
pct_free=28
pct_reads=947
physical_disk_number=0
server_name=Primary:ITM:NT
severity=WARNING
situation_id=10000
situation_name=Logical_Disk_Space_Warning
situation_origin=Primary:ITM:NT
situation_time=06/16/2016 19:21:17.009
situation_type=warning
source=ITM Agent: Primary Situation
sys_origin=:
sys_situation=Logical_Disk_Space_Warning
time_stamp=14659159711899
time_dif=0
total_size=168473

```

To unsubscribe from these emails log into the Application Performance Management user interface and remove your email address from the list of target email addresses on the Event Manager tab of the Advanced Configuration page.

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### Examining an email for IBM Monitoring-related references

In this email, you can see the following information:

- The sending email account root with the domain added in the **From** field.
- The target email address in the **To** field.
- The subject that was provided by IBM Monitoring, which is the situation name and the agent name.



# Lesson 5 Integrating with IBM Alert Notification



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In this lesson, you learn how to integrate with IBM Alert Notification.

## Integrating IBM IT Alert Notification: Overview (Cloud)

- IBM Alert Notification is a simple notification system that gives IT staff instant notification of alerts for issues in your IT operations environment. Data that is received from agents provides the source of the alerts.
- As a stand-alone package, you can integrate Alert Notification with any on-premises monitoring tool that can implement and start a REST API.
  - Netcool/OMNIbus
  - Netcool/Impact
- When subscribed for Application Performance Management on Cloud, IBM IT Alert Notification is made available automatically.

The screenshot shows the 'Alert Viewer' section of the IBM Agile Operations Management interface. At the top, there are tabs for 'Manage Notification Policies' and 'Alert Viewer'. Below the tabs, there's a search bar and a refresh button. The main area displays a table of alerts with columns for State, ID, What Happened, Severity, Where, When, Alert Source, and Actions. One alert is visible: '13-93add1 NT\_Logical\_Disk\_Space\_Critical(IBM\_Netcool/OMNIbus) Primary(WN1-NT)' with a severity of 'Critical' and a timestamp of '8/15/2016, 7:05:07 PM'. Below the table, there's an 'Alert History' section showing a single entry: 'SYSTEM 8/15/2016, 7:05:09 PM Notification State changed from Unresolved to Notified; Last Notified has been added' by 'quickeasygroup'.

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### Integrating IBM IT Alert Notification: Overview (Cloud)

IBM IT Alert Notification can be integrated with IBM Performance Management on Cloud in a few clicks. The data from the on-premises monitoring agents is the source for the alert data. IBM Performance Management on Cloud can also be integrated with an existing physical on-premises installation of Tivoli Netcool/OMNIbus.

Because IBM IT Alert Notification is provided as a service, IBM installs and manages the required server infrastructure, reducing your time-to-value and offering low-maintenance ownership. IBM IT Alert Notification is offered with IBM Performance Management on Cloud. You can activate IBM IT Alert Notification with your IBM ID and password on IBM Marketplace at <https://www.ibm.com/marketplace/cloud/us/en-us>.

When the Collaborative Operations product is available, an integration with IBM Control Desk becomes available. With this integration, a ticket can be opened as a service request.

After you set up an instance of IBM Performance Management on Cloud and activate IBM IT Alert Notification, you can connect the two services together.

For an IBM Performance Management on Cloud integration, set up a subscription on IBM Service Engage and connect it to your IBM IT Alert Notification. Monitoring agents can be downloaded, and then installed and set up in your monitoring environment. An integration with an on-premises Tivoli Netcool/OMNIbus is also possible.

## IBM IT Alert Notification email example (Cloud)

The situations from Application Performance Management on Cloud can be forwarded to IBM IT Alert Notification to send email notifications. The source for the alert data is from on-premises monitoring agents.

The screenshot shows a web-based alert notification interface. At the top, it displays the alert details: "IBM Alert Notification: Critical. Notification of \*ITM Agent: Private Situation: NT\_Logical\_Disk\_Space\_Critical|ITM\_NT\_Logical\_Disk.C: on Primary WIN1.NT\*". Below this is a "Summary" section with details like "Server: Primary WIN1.NT", "Time: 2016-06-15T23:09:07.000Z", and "Status: Notified". A timestamp "15-23:04" is also present. The main content area is titled "Alert Details" and lists various properties and their values, such as "disk\_read\_bytes\_per\_sec\_64[0]" (Value: 0), "server\_name[0]" (Value: Primary WIN1.NT), and "nt\_logical\_disk\_space\_critical[0]" (Value: C:). The interface includes sections for "Actions", "More Information", "Alerts Overview", "View all my notifications", and "Applications or Services".

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### IBM IT Alert Notification email example (Cloud)

Alerts are received from the alert source. Alerts can be received from IBM Performance Management on Cloud.

Alerts that match the filter conditions in notification policies trigger notifications. Examples of filter conditions include severities, devices, string matching, and so on. As well as the conditions that trigger a notification, notification policies also specify who receives notifications. The recipients can be individual contacts or groups.

## Alert Viewer (Cloud)

Alerts can be acknowledged.

The screenshot shows a web-based alert viewer interface. At the top, there are navigation icons for search and user profile. Below that is a search bar with a magnifying glass icon. The main content area has two sections: 'Alert Source' and 'Actions'. Under 'Alert Source', it says 'ITM Agent: Private Situation'. Under 'Actions', there is a button labeled 'Acknowledge this alert' with a hand cursor icon over it, and a red arrow points to this button. Below these sections is a 'Notified' section containing the email address 'htaylor@us.ibm.com'.

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### Alert Viewer (Cloud)

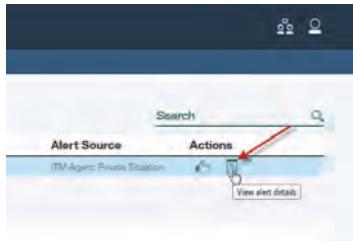
Contacts can click a link in the notification email that acknowledges the alert. This indicates to other contacts that someone is working on that alert. Depending on the settings in the notification policy, an acknowledgment notification can be sent to the contacts. The notification policy can be configured to send a follow-up notification to the contacts that the alert was acknowledged.

Users can log in to IT Alert Notification and action the alert in the Notification Viewer. Actions include keeping a journal of information against the alert, logging tickets, and so on. Mistakenly acknowledged alerts can be unacknowledged.

After the conditions that caused the alert are fixed, the alert can be resolved. This can be done from the Notification Viewer or dashboard. The notification policy can be configured to send another notification to the contacts that the alert was resolved.

## Alert Viewer (continued)

You can view alert details:



A screenshot of the Alert Details interface. The title is 'Alert Details (13-23cd4)'. At the top, there's a search bar and a navigation menu. Below it, a table lists properties and their corresponding values. The table has two columns: 'Property' and 'Value'. The properties listed include: description, disk\_read\_bytes\_per\_sec\_64[0], server\_name[0], disk\_name\_long[0], disk\_write\_bytes\_per\_sec[0], avg\_disk\_read\_queue\_length[0], physical\_disk\_number[0], pct\_disk\_time[0], diskWrites\_per\_sec[0], pct\_disk\_read\_time[0], disk\_write\_bytes\_per\_sec\_64[0], pct\_disk\_write\_time[0], pct\_unused[0], avg\_disk\_queue\_length[0], and timestamp[0]. The value for 'description' is: NT\_Logical\_Disk\_Space\_Critical[%\_Free <= 99 AND ...]

Property	Value
description	NT_Logical_Disk_Space_Critical[%_Free <= 99 AND ...]
disk_read_bytes_per_sec_64[0]	0
server_name[0]	Primary-WIN\NT
disk_name_long[0]	C:
disk_write_bytes_per_sec[0]	0
avg_disk_read_queue_length[0]	0
physical_disk_number[0]	0
pct_disk_time[0]	0
diskWrites_per_sec[0]	0
pct_disk_read_time[0]	0
disk_write_bytes_per_sec_64[0]	0
pct_disk_write_time[0]	0
pct_unused[0]	25
avg_disk_queue_length[0]	0
timestamp[0]	1160815230504452

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*Alert Viewer (continued)*

## Alert Viewer (Continued)

Alerts can be filtered by these characteristics:

- Unnotified
- Notified
- Escalated
- Acknowledged
- Archived
- Status
  - Fatal
  - Critical
  - Major
  - Minor
  - Warning
  - Indeterminate

The screenshot shows the 'Alert Viewer' section of the IBM Agile Operations Management interface. At the top, there are tabs for 'Manage Notification Policies' and 'Alert Viewer'. Below that, there are two buttons: 'All Alerts' (highlighted in green) and 'My Alerts'. The main area is titled 'Alert Viewer' and contains a table with columns 'State', 'ID', and 'What Happened'. One row is visible, showing '13-23od4' and 'NT\_Logical\_Disk\_Space\_Critical|ITM\_NT\_Logi...'. Below this is a section titled 'Alert History' with a table showing changes made by 'SYSTEM' and a user named 'qumcoxxugrog' on different dates. On the left side, there is a vertical toolbar with various icons for filtering and managing alerts.

### Alert Viewer (Continued)

You open the Notification Viewer by clicking the flag icon and selecting **Notification Viewer** from the **Incident** choices. The Notification Viewer is a split-screen widget.

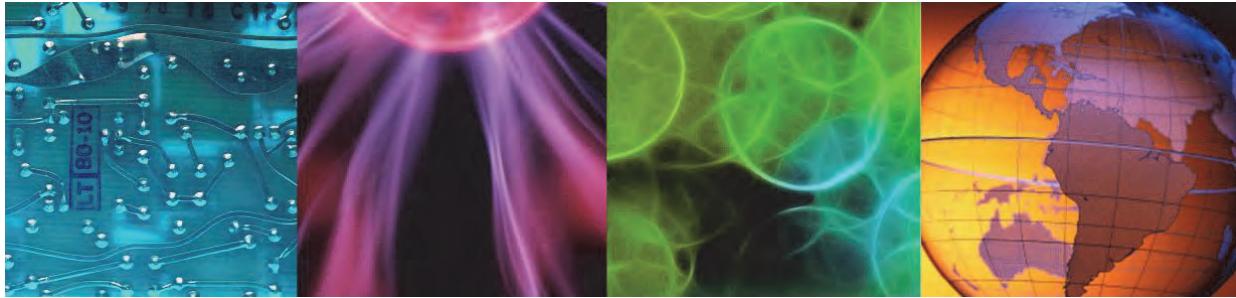
The top half is called Alert Viewer and is the list of alerts. Because of deduplication, each row in the list is a unique alert that. If an alert occurred multiple times, a count is shown. The bottom half is called Journal. When you select an alert, it shows changes that you and other operators made against the alerts and notes that were made.

With IBM IT Event Notification, you can monitor the status of alerts and notifications on-line, action alerts in real time, and track them to resolution. Because the alerts are deduplicated, each row is a unique alert. A count of overall occurrences is shown. You can use the alert severities to prioritize easily. With the notification state, you can track alerts from their receipt by the system through acknowledgment to resolution. You can track changes in the journal. You can use predefined and real-time filters and views to change which alerts you want to see. Alert tracking and housekeeping tools are available at a click.

# Lesson 6 IBM Operations Analytics Log Analysis integration



## Lesson 6 IBM Operations Analytics Log Analysis integration



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In this lesson, you learn how to integrate with the IBM Operations Analytics Log Analysis product.

## Integration overview: IBM Operations Analytics Log Analysis

Integration includes these features:

- Application Performance Manager search  
You enter error information from events into the search field.
- Search starts an on-premises version of IBM Operations Analytics Log Analysis.
- IBM Operations Analytics Log Analysis provides insight by analyzing error patterns in log files. It also helps providing expert advice for errors.

### *Integration overview: IBM Operations Analytics Log Analysis*

You can integrate IBM Performance Management with IBM Operations Analytics Log Analysis to enable searching for error messages from various locations in the customer environment. IBM Operations Analytics Log Analysis supports expert advice, which improves the usability of the messages by indicating what actions to take to address the errors that are detected.

## Integration overview: IBM Operations Analytics Log Analysis

Steps:

1. Confirm you can access IBM Operations Analytics from the browser by opening the following URL:

- `https://<hostname or IP address>:<port number>/Unity`
- Example:  
`https://lin2.ibm.edu:9987/Unity`

2. In the Performance Management Console:

- Click **System Configuration > Advanced Configuration**
- Select the UI Integration Category
- In the **Log Analysis URL** field, enter the web address that is used to start your Log Analysis application.



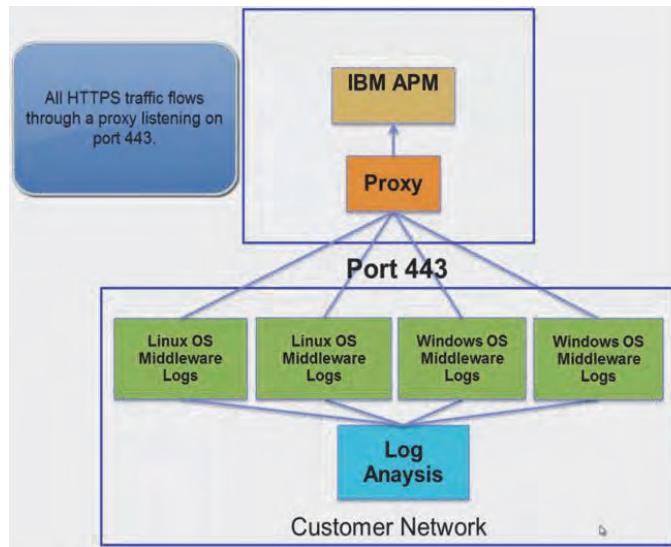
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### Integration overview: IBM Operations Analytics Log Analysis (on premises)

To install this integration, the customer must install IBM Operations Analytics Log Analysis, and verify that it can be started from a browser. A typical login URL is shown in the example.

## Integrating with IBM Operations Analytics Log Analysis



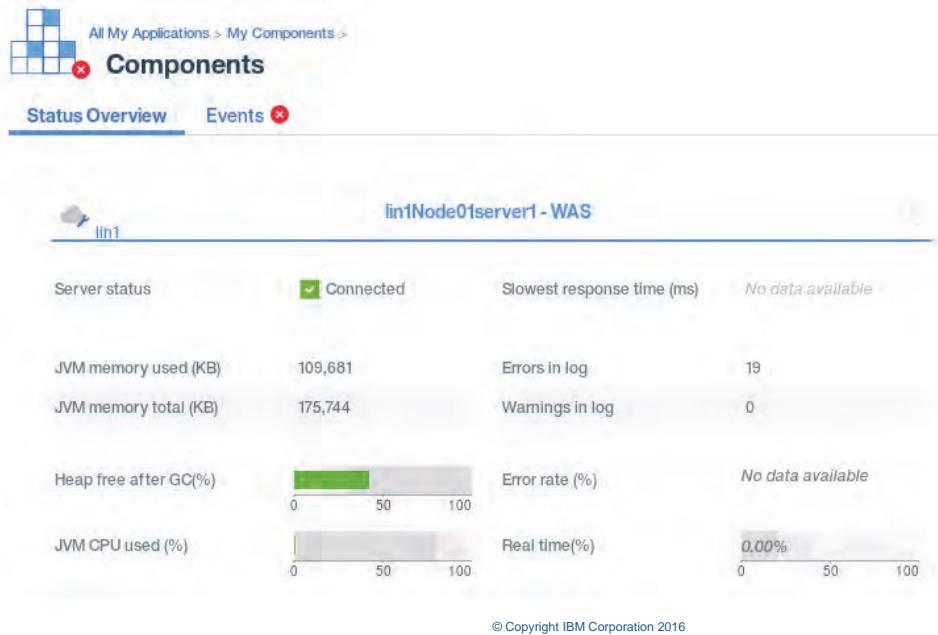
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### Integrating with IBM Operations Analytics Log Analysis

In this diagram, you see a typical configuration. You have the IBM Performance Management running and all traffic communicates through port 443. The IBM Operations Analytics Log Analysis server is running on-premises in the customer environment, and is configured to collect logs from multiple locations in the customer's environment.

## IBM Operations Analytics Log Analysis integration scenario



- There are errors in the log.
- Click anywhere in that screen to open a window with more WebSphere Application Server-related widgets.

### IBM Operations Analytics Log Analysis integration scenario

In this scenario, a WebSphere Application Server in the stock-trading application detected events in the SystemErr.log.

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## IBM Operations Analytics Log Analysis integration scenario (continued)

- Scroll to the Log Messages widget.
- Click inside that widget to display another page and widgets.

The screenshot shows the IBM Operations Analytics interface. At the top, there is a breadcrumb navigation: All My Applications > My Components > Components > WebSphere Application Server > lin1Node01server1:lin1:KYNS. Below the breadcrumb, there are three tabs: Status Overview (selected), Events (with a checked checkbox), and Attribute Details. The main area is titled "Log Messages". It displays two sections: "Errors in log" with a red error icon and the number 12, and "Warnings in log" with a green checkmark icon and the number 0. A question mark icon is located in the top right corner of the main area.

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*IBM Operations Analytics Log Analysis integration scenario (continued)*

## IBM Operations Analytics Log Analysis integration scenario (continued)



- The message log contains an error.
- Moving the mouse over the message text displays the full message. Note the SRVE8094W message.
- Enter the message ID into the search area in the upper-right corner, and click the magnifying glass.

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### IBM Operations Analytics Log Analysis integration scenario (continued)

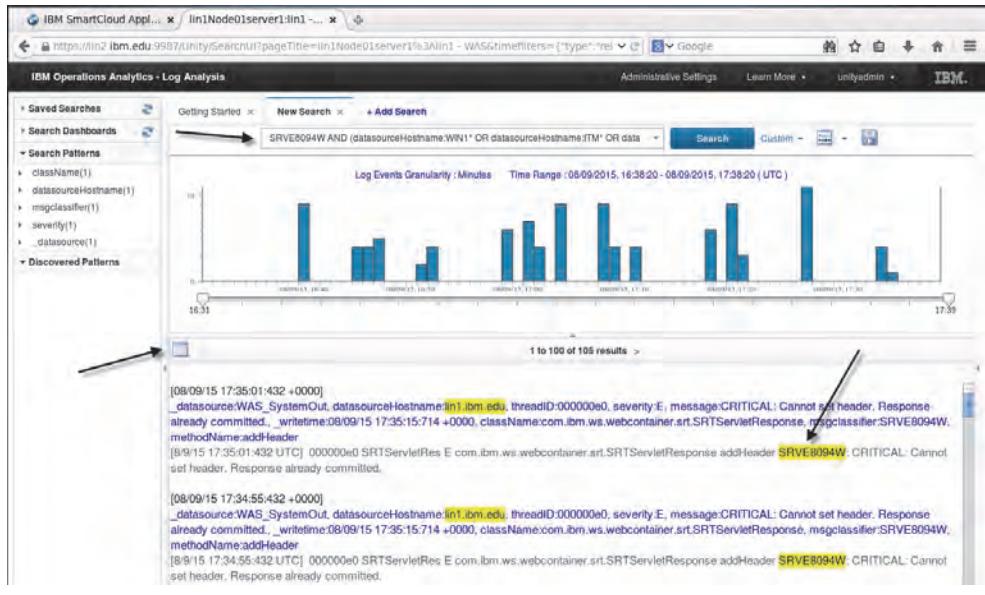
The log contains a critical error that reads in part in the message text: SRVE8094W. Because of the column size, it might not be visible.

Move the mouse pointer over the message to show the entire message. Note the message ID SRVE8094W.

Type the message ID SRVE8094W, into the search box in the upper right to search IBM Operations Analytics Log Analysis for advice.

## IBM Operations Analytics Log Analysis integration scenario (continued)

- Look for the message SRVE8094W in the results window.
- The message is highlighted SRV8094W in the lower part of the window.
- Select Grid View to open a table and parse the log.



### *IBM Operations Analytics Log Analysis integration scenario (continued)*

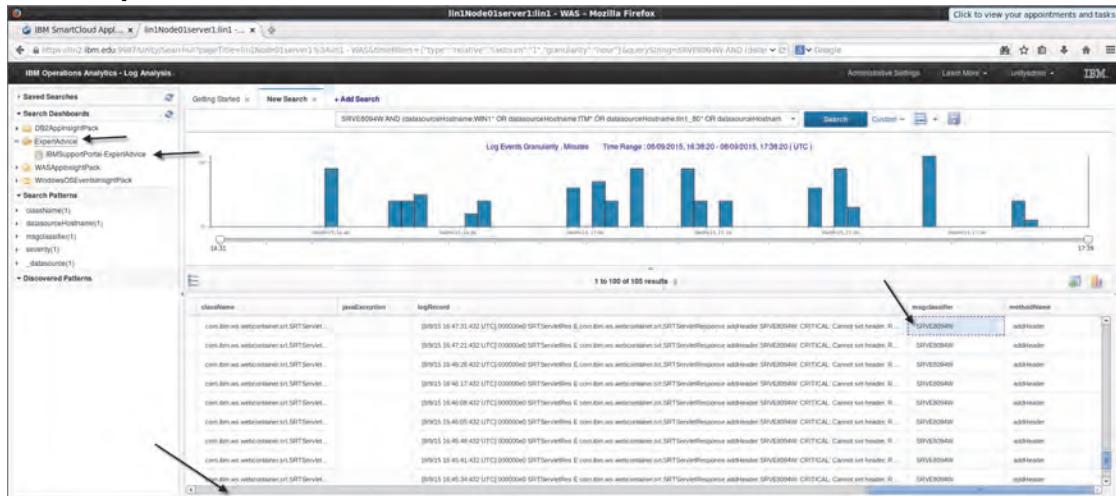
The first time that you search, a login window to the IBM Operations Analytics opens.

Log in with the user name unityadmin and the password object00. This log in starts a search on the IBM Operations Analytics Log Analysis server, looking for this message ID in the stock trading application.

Note the highlighted strings in the messages.

Select Grid View to parse the log.

## **IBM Operations Analytics Log Analysis integration scenario (continued)**



- Scroll the bar to the right.
  - Highlight a msgclassifier cell.
  - Expand Expert Advice.
  - Select IBMSupportedPortal ExpertAdvice.

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*IBM Operations Analytics Log Analysis integration scenario (continued)*

## IBM Operations Analytics Log Analysis integration scenario (continued)

- There are several possible solutions from the Expert Advice for this message ID.
- Scrolling downward, you can see and click the Fix List for WebSphere Application Server 8.5.

The screenshot shows the IBM Operations Analytics - Log Analysis interface. The left sidebar includes sections for Saved Searches, Search Dashboards, Search Patterns, and Discovered Patterns. The main area displays 'Search Results' under 'Expert Advice Search Results'. Three specific messages are listed with arrows pointing to them:

- JR51756: THE SRVE8094W WARNING MESSAGE OCCURS IN THE IBM BPM SERVER LOGS SEVERAL TIMES**  
Process Manager (BPM) server logs show many occurrences of the following warning message from IBM Process Portal: SRVE8094W: WARNING: Cannot set header. Response already committed. Even though no function is lost, these messages can clutter the system ...
- PM86580: SYSTEMOUT.LOG CONTAINS MANY OCCURRENCES OF THE WARNING: SRVE8094W: WARNING: CANNOT SET HEADER. RESPONSE ALREADY COMMITTED**  
SystemOut.log contains many occurrences of the warning: SRVE8094W: WARNING: Cannot set header... Buffer Size to prevent the "WARNING: Cannot set header. Response already committed." message... "WARNING: Cannot set header. Response already committed."...
- PM84636: SYSTEMOUT.LOG CONTAINS MANY OCCURRENCES OF THE WARNING: SRVE8094W: WARNING: CANNOT SET HEADER. RESPONSE ALREADY COMMITTED**  
SystemOut.log contains many occurrences of the warning: SRVE8094W: WARNING: Cannot set header... Buffer Size to prevent the "WARNING: Cannot set header. Response already committed." message... "WARNING: Cannot set header. Response already committed."...

Below the messages, there is a section titled 'Fix list for IBM WebSphere Application Server V8.5' with a detailed product readme.

### IBM Operations Analytics Log Analysis integration scenario (continued)

The remaining steps require an Internet connection to complete. The search locates several solutions for this error message. Because you are running WebSphere 8.5, select the fix list for IBM WebSphere Application Server V8.5.

## IBM Operations Analytics Log Analysis integration scenario (continued)

The screenshot shows a Mozilla Firefox browser window with the title "IBM Fix list for IBM WebSphere Application Server V8.5 - United States - Mozilla Firefox". The address bar shows the URL "www-01.ibm.com/support/docview.wss?uid=swg27036319". The page content is titled "Fix list for IBM WebSphere Application Server V8.5". On the left, there's a sidebar with "Others also viewed..." links and a "Tags" section. The main content area has sections for "Product readme", "Abstract", and "Content". The "Content" section lists fix packs: "Back to all versions", "Fix Pack 8.5.5.6" (which is highlighted with a black arrow), "Fix Pack 8.5.5.5", "Fix Pack 8.5.5.4", and "Fix Pack 8.5.5.3". At the bottom of the page, there's a copyright notice "© Copyright IBM Corporation 2016" and a page number "50".

The WebSphere Fix Pack 8.5.5.6 might solve the problem that you detected.

### IBM Operations Analytics Log Analysis integration scenario (continued)

The WebSphere fix pack 8.5.5.1 should solve the error that you detected.

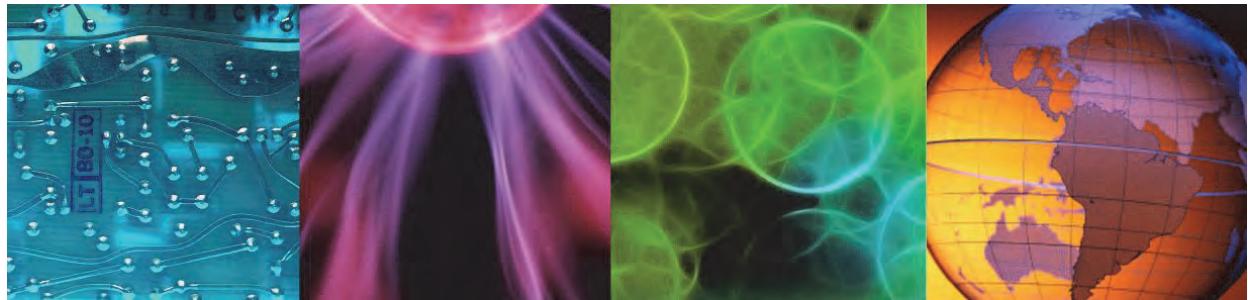
This demonstration shows the value of integrating IBM Performance Management with IBM Operations Analytics Log Analysis. By integrating these two products, you isolated and located the solution to a problem in your environment.

Next, you can view a live demonstration of locating a problem by using Log Analysis.

# Lesson 7 Integrating with IBM Operations Analytics Predictive Insights



## Lesson 7 Integrating with IBM Operations Analytics Predictive Insights



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In this lesson, you learn how Application Performance Management integrates with the IBM Operations Analytics Predictive Insights product.

## Offering overview

### IBM Operations Analytics Predictive Insights

- This component extends the capabilities of IBM Performance Management by providing early detection of service and application issues to help avoid service disruptions and outages that affect your business
- Predictive Insights automatically learns the normal operational behavior of complex infrastructures, such as a cloud, and is designed to identify problems before you know to look for them
- Provides real-time performance analysis for business services
- Analyzes monitoring data to learn the normal behavior of a business service and create a performance model
- Generates an alarm when behavior outside normal behavior is detected (anomaly)

### Predictive Insights User Interface

- Used to perform root cause analysis of an anomaly
- Dynamic view of the anomaly containing all relevant metrics
- Presents a normalized view of metric data for metric comparison and trend identification

#### Offering overview

IBM Operations Analytics Predictive Insights on Cloud provides real-time performance analysis for business services.

Early detection of service and application issues helps you avoid service disruptions and outages that affect your business.

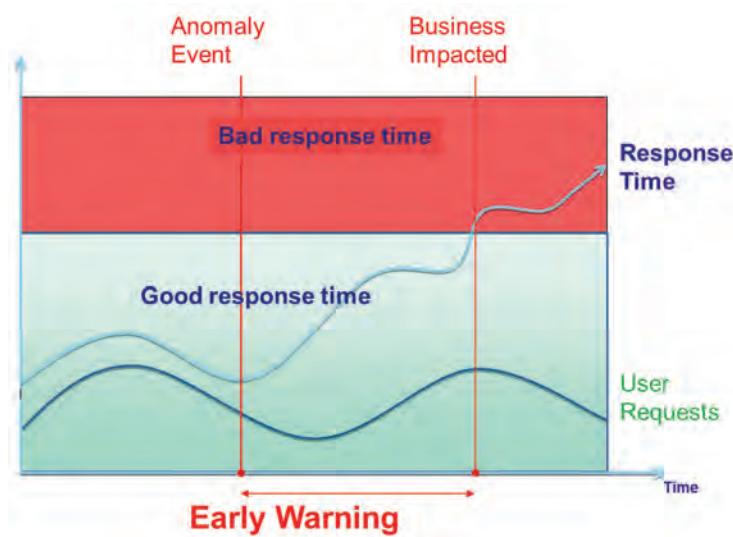
Predictive Insights automatically learns the normal operational behavior of complex infrastructures, such as a cloud, and is designed to identify problems before you know to look for the anomaly.

The Predictive Insights User Interface provides dynamic views of identified anomalies and all relevant metrics. The normalized view supports metric comparison and trend identification.

## Early warning

IBM Operations Analytics Predictive Insights can provide early problem detection to predict application, middleware, or infrastructure problems before they affect service.

The software helps you avoid outages and increase service performance.



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### Early warning

If you want earlier warnings before service problems impact the business, you can no longer set static thresholds on important performance indicators. To get earlier warnings, you need to detect when things are straying away from normal operations. For example, response time should increase and decrease in relation to the number of user requests. However, when response time no longer abides by that trend, operators can get an alarm that can give them time to respond before business is impacted.

## Anomaly events

- Have a Situation Name of *Anomaly Detected*
- Have a Warning status
- Are linked to a resource by the managed system name for the metric that is anomalous
- Provide a description of the anomaly
- Have special icons to indicate anomalies
- Tooltips for these events contain a link to start Predictive Insights in context
- Consolidated when multiple anomalies are detected for the same Managed System Name

## Application Performance Management integrates with IBM Operations Analytics Predictive Insights

The screenshot shows the Application Dashboard interface. On the left, a sidebar lists 'All My Applications' including Credit Card Processing, which is highlighted with a yellow warning icon. Below this is a 'Groups' section. The main area displays a 'Credit Card Processing' application card with a yellow warning icon. It contains icons for 'Components' (blue square), 'Events' (red flag with exclamation mark), and 'Transactions' (blue circular arrow). A red arrow points to the 'Events' icon. To the right is a larger 'Events' card with a blue flag icon and a red arrow pointing to the word 'Events'. At the bottom of the slide, there is a large watermark for 'IBM'.

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*Application Performance Management integrates with IBM Operations Analytics Predictive Insights*

1. Locate and click a problem application in the Application widget.
2. In the All My Applications dashboard, find if any applications show an anomaly. An anomaly is indicated as shown in the slide by a red diamond in the lower corner of a status indicator.
3. Click the **Events** link, as indicated in the slide.

## Event hover help: IBM Operations Analytics Predictive Insights

The screenshot shows the 'Events' tab of the IBM Operations Analytics Predictive Insights interface. It displays a list of events with columns for Threshold Name, Status, Severity, Display Item, Source, Timestamp, and Description. An event titled 'Anomaly Detected' is expanded, showing detailed information about the anomaly. A red arrow points to a blue link labeled 'View anomaly analysis' at the bottom of this expanded section.

Total Events: 2	Critical Events: 0	Warning Events: 2	Normal Events: 0			
Threshold Name	Status	Severity	Display Item	Source	Timestamp	Description
WAS_Response_Time_High	Open	<span style="color: yellow;">!</span> Warning	worklight17Node:worklight17K...	worklight17Node:worklight17K...	May 20, 2016, 4:30:09 PM	Websphere application server ...
Anomaly Detected	Open	<span style="color: yellow;">!</span> Warning	worklight17Node:worklight17K...	worklight17Node:worklight17K...	Feb 12, 2016, 9:45:00 AM	responseTime is Higher than e...

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### Event hover help: IBM Operations Analytics Predictive Insights

1. Review the list of events. The list includes an anomaly, which is associated with the application server.
2. Expand the Anomaly Detected event.
3. Click **View anomaly analysis**.

## Detailed analysis



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### Detailed analysis

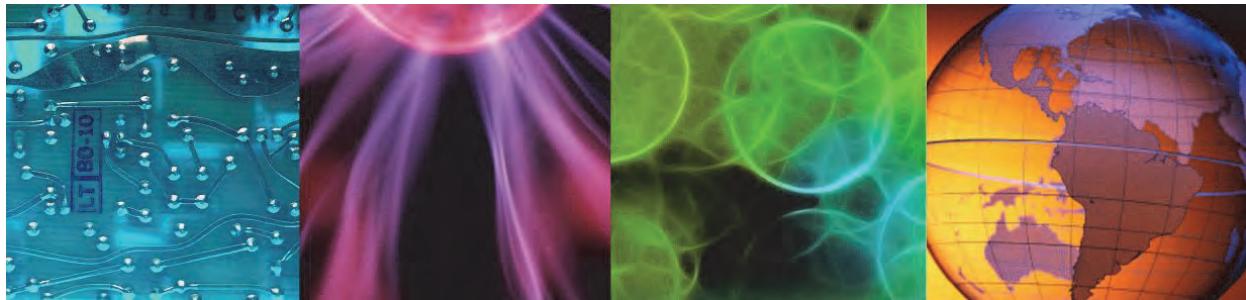
The Predictive Insights interface includes a line graph that tracks the anomalous statistics and a table where you can add other statistics for comparison.

Anomalies are highlighted in red. This level of detail is only available for anomalies.

# Lesson 8 Dashboard Application Services Hub with IBM Performance Management agent data



## Lesson 8 Dashboard Application Services Hub with IBM Performance Management agent data



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In this lesson, you learn how to use IBM Performance Management agent data with Dashboard Application Services Hub.

## Dashboard Application Services Hub

- The Dashboard Application Services Hub integrates with IBM Performance Management.
- IBM Dashboard Application Services Hub provides a single console for administering IBM products and related applications.
- Dashboard Application Services Hub is the user interface for Jazz for Service Management.
- You can integrate these products, for example:
  - IBM Monitoring with DASH to view monitoring agent data
  - Netcool/Impact with DASH to view the Netcool/Impact GUI
  - Netcool/OMNibus with DASH to view the OMNibus alerts
- The IBM Dashboard Application Services Hub provides a set of features to customize the console and build custom dashboards.
- Pages are created that contain widgets, which are used to build charts, gauges, and tables that contain monitoring data.

### *Dashboard Application Services Hub*

You use the Dashboard Application Services Hub to create pages of customized IBM Performance Management agent data.

## Custom dashboards in DASH with IBM Performance Management agent data

- You can query IBM Performance Management agent data from the Dashboard Application Services Hub (DASH). DASH is the Jazz for Service Management user interface.
- Follow these steps to prepare to configure DASH:
  - The IBM Performance Management to DASH connection is done in a similar fashion as the IBM Tivoli Monitoring to DASH connection.
  - The Performance Management dashboard data provider must be up and running before creating the connection.
  - To determine whether the Performance Management dashboard data provider is available, point the web browser on the DASH server to the data provider URL to make sure that it works correctly.
- After configuring DASH to connect to the Performance Management data provider in your environment, you can retrieve data from your Performance Management agents for presentation in DASH custom dashboards.

### Custom dashboards in DASH with IBM Performance Management agent data

With the release of IBM Tivoli Monitoring 6.3, IBM Performance Management 8.1.3, and the IBM Dashboard Application Services Hub 3.1.0.0 (DASH), administrative users can create customized performance monitoring dashboard pages.

Custom monitoring dashboards are available through DASH for users to create their own pages, charts, and tables from the Tivoli Widget Library (TWL).

## Connector from the Jazz server to the data provider server

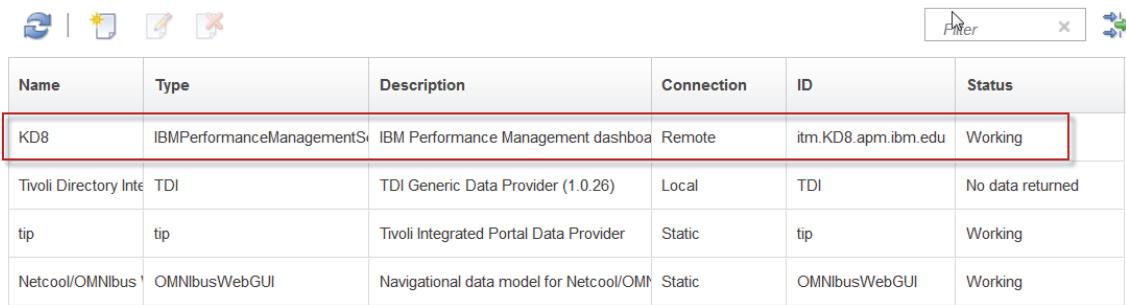
- Add a connection for the server where the Application Performance Manager data provider is running.
- KD8 is the name of the connection, and the status must be Working.

### Connections

?

The connection manager allows you to configure the local and remote connections for this computer. The list below displays all configurable connections.

To create a new remote connection, click on the 'Create new remote provider' icon. To edit an existing connection, either select a connection and click on the 'Edit existing provider' button, or right-click on a connection and select the 'Edit' menu option. To delete a remote connection, either select the connection and click on the 'Delete remote provider' button, or right-click on the connection and select the 'Delete' menu option.



The screenshot shows a software interface titled 'Connections'. At the top, there are four icons: a blue gear (Connections), a yellow star (Create new remote provider), a blue pencil (Edit existing provider), and a red X (Delete remote provider). Below the toolbar is a search bar labeled 'Filter' with a magnifying glass icon. The main area is a table with columns: Name, Type, Description, Connection, ID, and Status. A red box highlights the first row, which contains 'KD8', 'IBMPeformanceManagementS...', 'IBM Performance Management dashbo...', 'Remote', 'itm.KD8.apm.ibm.edu', and 'Working'. Other rows include 'Tivoli Directory Inte...' (TDI, Local, TDI, No data returned), 'tip' (tip, Static, tip, Working), and 'Netcool/OMNibus' (OMNibusWebGUI, Static, OMNibusWebGUI, Working).

Name	Type	Description	Connection	ID	Status
KD8	IBMPeformanceManagementS...	IBM Performance Management dashbo...	Remote	itm.KD8.apm.ibm.edu	Working
Tivoli Directory Inte...	TDI	TDI Generic Data Provider (1.0.26)	Local	TDI	No data returned
tip	tip	Tivoli Integrated Portal Data Provider	Static	tip	Working
Netcool/OMNibus	OMNibusWebGUI	Navigational data model for Netcool/OM...	Static	OMNibusWebGUI	Working

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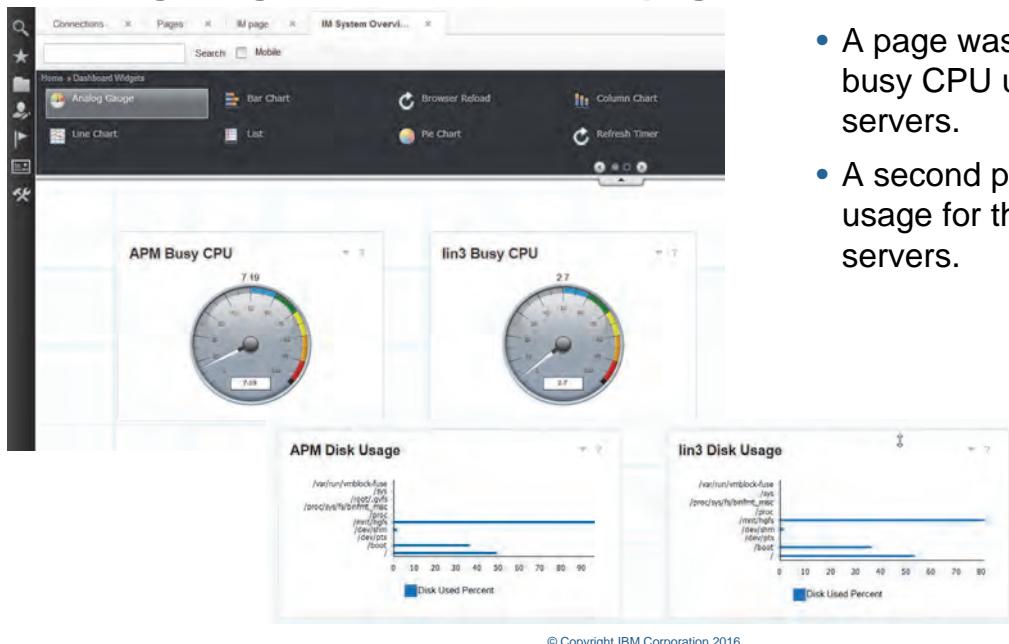
### Connector from the Jazz server to the data provider server

From the Application Performance Management console, click the gear icon to open the Console Settings. By clicking **Connections**, you create a new connection. For the new connection, these items of information are required:

- Protocol
  - Host name
  - Port
- Match the port that is specified when you verified the Performance Management Data Provider.
- User name and password to use on the data provider server.

After searching for this item, the name KD8 is selected for the connection. The example on the slide shows the KD8 connection, which is created for IBM Performance Management.

## Creating widgets on a dashboard page to see monitoring information



- A page was created showing busy CPU usage for two servers.
- A second page shows disk usage for the same two servers.

*Creating widgets on a dashboard page to see monitoring information*

This slide shows parts of two dashboard pages that are created to show data from IBM Performance Management agents. The gauge widgets are used with the KLZ\_CPU data set to show CPU usage on two servers. The bar chart widgets use the KLZ\_Disk data set and show the disk usage by mount point for the same two servers.



# Lesson 9 Integrating with IBM Control Desk



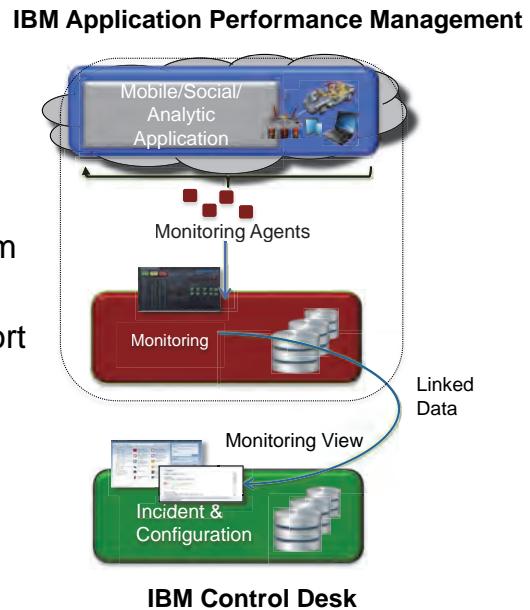
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In this lesson, you learn how Application Performance Management integrates with the IBM Control Desk product.

## Integration with IBM Control Desk (Cloud)

- When IBM Performance Management detects an issue with your application, it can automatically open a service request in IBM Control Desk
- Your specialists can fix problems in your applications before users have time to report them
- Your help desk spends more time solving application issues and less time answering support calls



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### Integration with IBM Control Desk (Cloud)

The integration of IBM Performance Management and IBM Control Desk provides business value by making your help desk more efficient. When IBM Performance Management detects an issue with your application, it can automatically open a service request in IBM Control Desk. Your specialists can then fix problems in your applications before users have time to report them. Your help desk spends more time solving application issues and less time answering support calls.

## Events in the Application Performance Management user interface (Cloud)

After you install and configure the integration agent, you can see the events in the Application Performance Management UI and open service requests in IBM Control Desk.

The screenshot shows the 'Event Status' tab of the 'My Components' section in the IBM Application Performance Management UI. At the top, there's a navigation bar with 'All My Applications >' and a search bar indicating 'No search engines configured'. Below the navigation is a chart titled 'Event Severity Summary (Total:3)' showing the distribution of event severities: 66.67% Normal (green), 33.33% Warning (yellow), and 0 Critical (red). A legend below the chart identifies the colors: green for Normal, yellow for Warning, and red for Critical. The main area displays a table of event details:

Situation Name	Status	Severity	Display Item	Source	Timestamp	Description
Linux_Disk_Space_Low	Open	Critical		central1:LZ	Jun 6, 2014, 4:08:41 PM	Disk free space is low.
Application_RT_High_A	Open	Warning	/downloads/node_app/k...	NJ:njsrh65_3001:NJA	Jun 6, 2014, 4:22:59 PM	Application response tim...
KV1_Host_CPU_Over_C...	Open	Warning	kvmcompute	kvmcompute:central1:V1	Jun 6, 2014, 4:08:50 PM	The CPU of your host is ...

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### *Events in the Application Performance Management user interface (Cloud)*

In the Application Performance Management UI, events show in several places. You can see a consolidated view of all your events on the **My Components Event Status** tab.

## Tickets in IBM Control Desk (Cloud)

This screen capture shows how the service requests look in IBM Control Desk:

The screenshot shows the 'Service Requests' application window in IBM Control Desk (Cloud). The left sidebar contains navigation links like 'Go To Applications', 'Available Queries', 'Common Actions', and 'More Actions'. The main area displays a table of service requests with columns: Service Request, Summary, Reported By, Internal Priority, Priority, Status, Owner, and Owner Group. The table lists five entries, all of which are resolved.

Service Request	Summary	Reported By	Internal Priority	Priority	Status	Owner	Owner Group
1001	APIaaS Event - SID936APIMXGREEN-030.us-na.apm.ibmservice engage.com	APM			CLOSED		
1002	APIaaS Event - SID936APIMXGREEN-030.us-na.apm.ibmservice engage.com				RESOLVED		
1003	APIaaS Event - SID936APIMXGREEN-030.us-na.apm.ibmservice engage.com				RESOLVED		
1004	APIaaS Event - SID936APIMXGREEN-030.us-na.apm.ibmservice engage.com				RESOLVED		
1005	APIaaS Event - SID936APIMXGREEN-030.us-na.apm.ibmservice engage.com				RESOLVED		

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### *Tickets in IBM Control Desk (Cloud)*

After the integration is configured, the events that are in the Application Performance Management UI are also in the IBM Control Desk. This slide shows how the service requests look in IBM Control Desk.

---

## Student exercises



Perform all of the exercises in the Course Exercises Guide for this unit.

### *Student exercises*

---

## Summary

You now should be able to perform the following tasks:

- Integrate IBM Tivoli Monitoring.
- Integrate Bluemix.
- Integrate Netcool/OMNibus.
- Integrate IBM Operations Analytics Log Analysis.
- Integrate IBM Operations Analytics Predictive Insights
- Integrate with IBM Alert Management
- Email Event Notification.
- Populate Dashboard Application Services Hub with IBM Monitoring agent data.
- Integrate IBM Control Desk (CO)

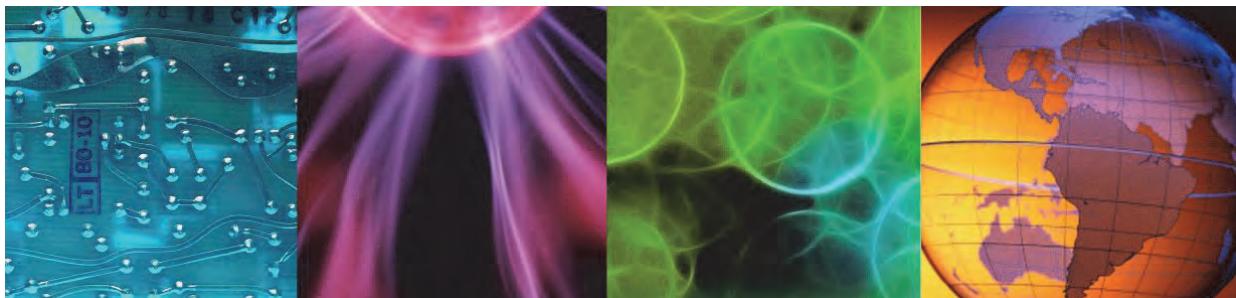
### *Summary*



## 6 Reporting and 7-day comparison



### 6 Reporting and 7-day comparison



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In this unit, you display the historical 7-day comparison and learn how to install and run reports.

## **Objectives**

---

In this unit, you learn to perform the following tasks:

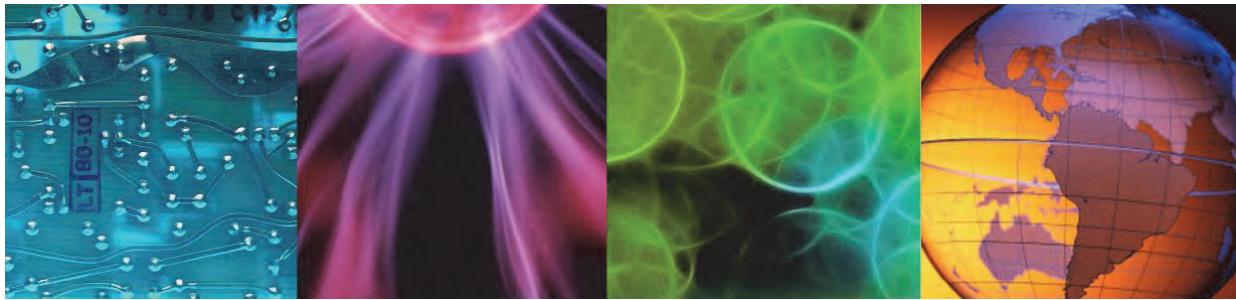
- Produce the historical 7-day comparison.
- Install and run reports.



# Lesson 1 Historical 7-day comparison



## Lesson 1 Historical 7-day comparison



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In this lesson, you learn how to use the historical 7-day comparison.

## Historical 7-day comparison overview

- Historical 7-day comparison compares the time range that is displayed in a line chart with the metrics from a different day, up to one week ago.
- The **Compare to** selection is effective only for the current page.
- All the dashboards in the current application or all applications are affected by the change.
- When you view a comparison, only line charts in the current page are affected. A line for each key performance indicator shows the metrics from the chosen day.
- Unavailable comparison data is indicated by a watermark on the chart: **No Comparison Available**. You might see this label with newer managed resources that have not yet collected at least 1 day of data.
- Any widgets for which no historical data is collected continue to show the most recent values.
- Time range is always based on current time range displayed.
- If a legend does not exist in the original chart, the comparison does not add a legend.

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### Historical 7-day comparison overview

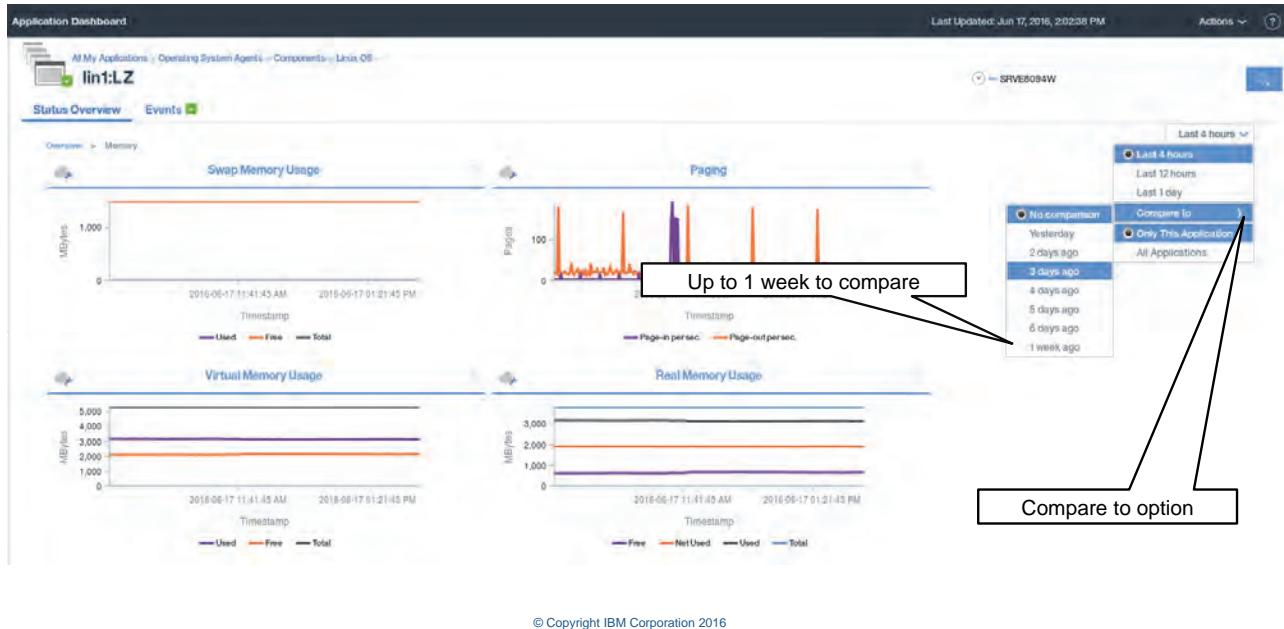
Historical 7-day comparison compares the time range that is displayed in a line chart with the metrics from a different day, up to one week ago. These reports are available with both SaaS and on-premises systems.

A drop-down window provides historical 7-day comparison options. The period for the comparison can be selected from the last 4 hours, last 12 hours, or last 1 day. There is a **Compare to** choice that applies to the current page. For the **Compare to** options, the choices are from yesterday to last week.

When you make historical 7-day comparison choices, the choices affect all of the dashboards in the current application. Only the charts in the page that is viewed are affected. Two distinct lines represent the performance of the current period with a previous day's performance during that same period. Data comparisons can be made from the previous day up to the previous week.

If the data is not available for comparison, a watermark within the graph indicates that.

## Historical 7-day comparison example of making compare selections



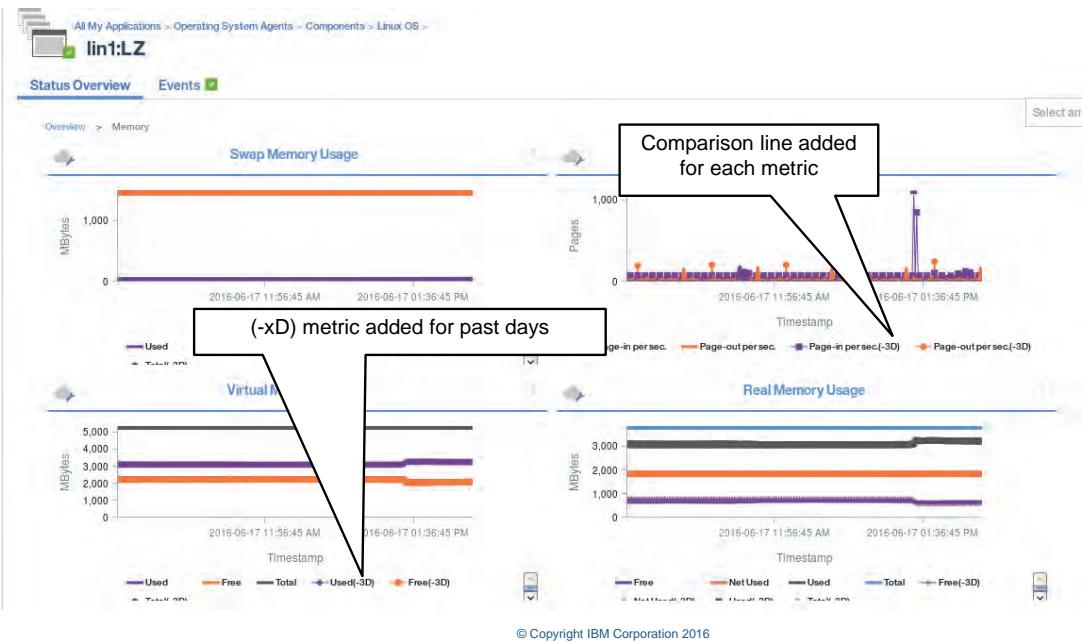
*Historical 7-day comparison example of making compare selections*

The screen capture is an example of reporting memory and paging use from the Status Overview tab and the **Overview > Memory** selection.

The **Status Overview** tab has a drop-down menu. With this menu, you select reports for the last 4 hours, last 12 hours, last 1 day, a toggle for **Only This Application** or **All Applications**, and a new **Compare to** option.

When you select **Compare to**, another drop-down window opens. Here you choose the 7-day selections, where one selection is available for each day of the previous week. You can also select **No comparison**, which avoids comparing with any previous day.

## Historical 7-day comparison example with Memory

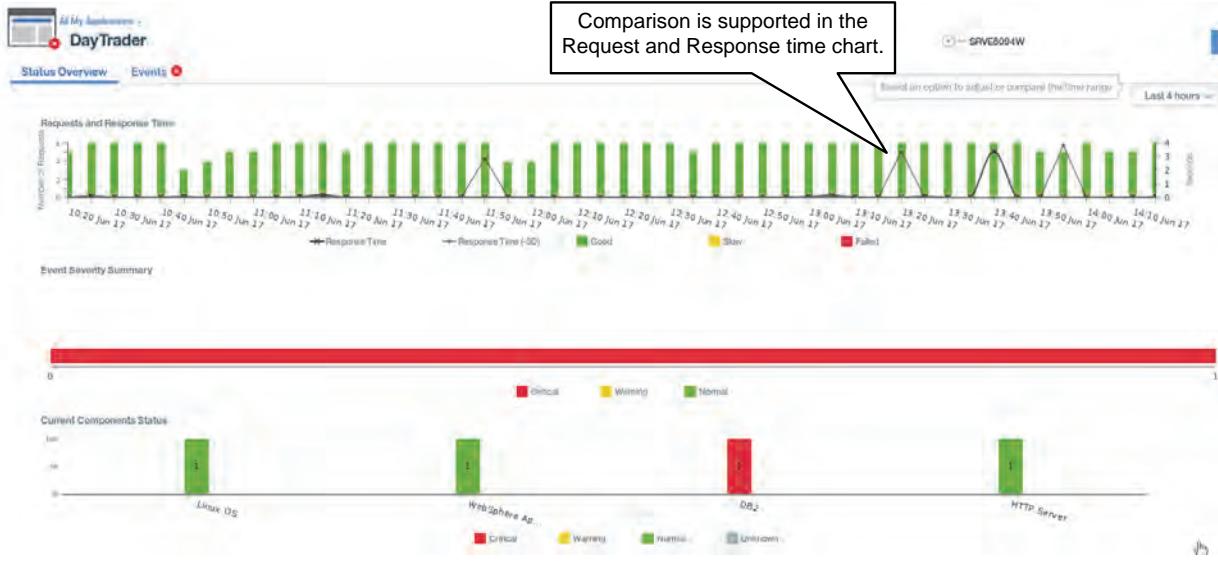


### Historical 7-day comparison example with Memory

This example shows the historical comparison of data from a Linux operating system agent in the Status Overview. You make the historical comparison by selecting the **Last 4 hours** and **3 Days ago**.

In all of these graphs, there are two plots. The solid line plots represent the data from today. The plot lines with a block character also represent the data from 3 days ago at the same time of day. You can tell the difference in the legend by looking for the -3D or minus three days, which represent the value that was selected.

## Historical 7-day comparison example with an application



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### Historical 7-day comparison example with an application

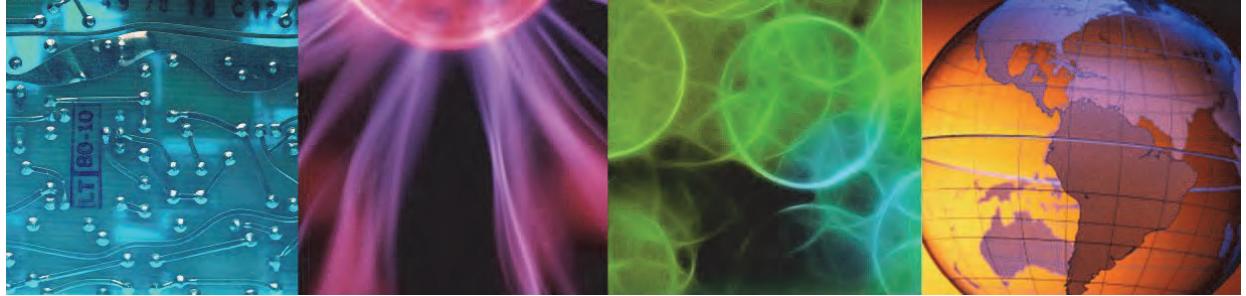
The two charts on this slide represent the Requests and Response Time, Event Severity Summary, and Current Components Status of an application. In the Requests and Response Time plot, there are two distinct plot lines. From the legend in the top chart, the -5D indicates that a day 5 days ago was selected for comparison and is the plot line that has a dot.

Historical comparison is not available for the Event Severity Summary and Current Components Status bar charts.



# Lesson 2 Reporting

## Lesson 2 Reporting



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In this lesson, you learn how to install and use the reporting feature.

## Reporting overview

- Performance Management reports are available for data that is collected by these methods:
  - The Response Time Monitoring Agent (Transaction Tracking must be enabled)
  - The Monitoring Agent for WebSphere Applications
- Performance Management reports are supported on Linux systems only.

For Response Time Monitoring Agent reports.

- In the Application Performance Dashboard menu, click **Reporting > Work with Reports**.
- The Cognos Connections home page opens.

Response Time Monitoring Agent reports

- All My Applications
- Application Performance and Usage
- Compare Application Performance over Two Time Periods
- Compare Performance of Multiple Applications

Monitoring Agent for WebSphere Applications reports

- Application Request Performance
- DB Connection Pools
- EJB Performance
- GC Usage of Application Server
- JVM Usage for Application Server
- Thread Pools
- Web Application Performance
- Application Request Performance for Cluster
- JVM and GC Usage for Cluster
- Top applications with slowest response time across servers

### Reporting overview

The slide lists the available Monitoring Agent for WebSphere® Applications reports and the Response Time Monitoring Agent reports.

Tivoli® Common Reporting 3.1.0.2 is a prerequisite for Response Time agent and WebSphere Applications agent reports. Tivoli Common Reporting is a component of Jazz™ for Service Management.

The following three steps are required to install Performance Management reports:

- Configure an ODBC connection between the Tivoli Common Reporting server and the Performance Management DB2® server.
- Configure the reports installation image. This configuration creates the reports package.
- Install the reports package on the Tivoli Common Reporting server. You can now view reports in the Application Dashboard.

Tivoli Common Reporting 3.1.0.2 is not available for stand-alone installation. You must have Tivoli Common Reporting 3.1.0.1 installed before you upgrade to Tivoli Common Reporting 3.1.0.2.

## Report images are based on the product offering

Download the reports image to your Performance Management server. One of the following reports installation images are available, depending on the product offering:

- ipm\_app\_diagnostics\_reports\_8.1.3.zip
- ipm\_apm\_advanced\_reports\_8.1.3.zip
- ipm\_monitoring\_reports\_8.1.3.zip
- ipm\_apm\_reports\_8.1.3.zip

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*Report images are based on the product offering (on-premises)*

Each of the four IBM Performance Management product offerings has a different report image file.

## Configuring Application Performance Management reports



The screenshot shows a terminal window titled "root@apm:/opt/ibm/ccm". The user runs the command `./configure_reports_images.sh`. The script outputs the path to log files and asks if they want to configure the reports installation image. The user responds "1". It then asks for the path to the reports installation image, which is set to `/downloads/IM813/reports`. The script finds the reports installation image in this path and asks for the password of the APM Administrator, which is provided. It then asks for the APM Server IP address or hostname, accepting the default value `192.168.1.102`. Finally, it confirms that the reports installation image was configured successfully and that the reports packages are available in `/opt/ibm/ccm/depot`.

```
root@apm:~/opt/ibm/ccm
File Edit View Search Terminal Help
[root@apm ccm]# ./configure_reports_images.sh
The log files of reports configuration are located in path: /opt/ibm/ccm/logs.

Do you want to configure the reports installation image [ 1-yes or 2-no; "yes" is default ]? 1
Enter the path you downloaded the reports installation image to: /downloads/IM813/reports/

Reports installation image found in the path "/downloads/IM813/reports".
Enter password of APM Administrator:
Provided password is correct.

The configuration script copies the configured installation image to another directory.
Enter the directory where you want to store the reports configured package or accept the default value [/opt/ibm/ccm/depot]

Enter the APM Server IP address/hostname or accept the default [192.168.1.102]:
The reports installation image was configured successfully. The reports packages are available in "/opt/ibm/ccm/depot":
[root@apm ccm]#
```

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### Configuring Application Performance Management reports

Configure the Application Performance Management reports by entering this command:

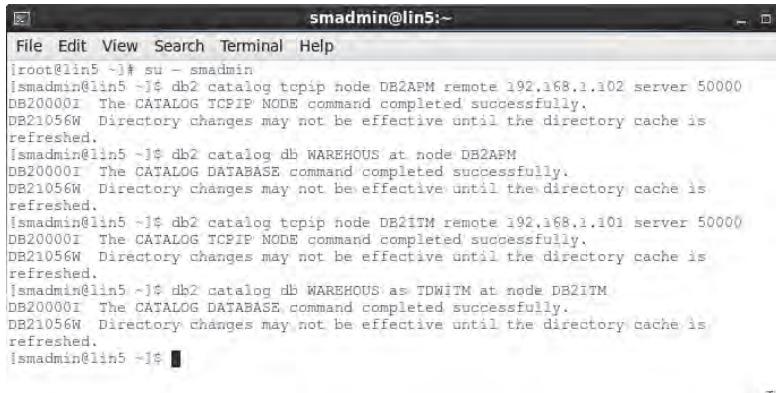
```
./configure_reports_images.sh
```

Respond to the path, password, and host name or address prompts. When complete, the reports packages are placed in the depot in this default location:

**/opt/ibm/com/depot**

## Configuring ODBC connections

- On the Tivoli Common Reporting server, connect to the Performance Management DB2 database by using the DB2 client and catalog a node.
- On the Tivoli Common Reporting server, connect to the Performance Management DB2 database by using the DB2 client and catalog the DB2 warehouse.
- Optionally, if you are planning to run IBM Tivoli Monitoring v6 reports against Performance Management v8 agents, create an ODBC connection to the Tivoli Data Warehouse that is storing the data.



A terminal window titled 'smadmin@lin5:~' showing a series of DB2 catalog commands. The commands include cataloging TCP/IP nodes and databases, and cataloging the DB2 warehouse. The output shows successful completion of each command with messages like 'The CATALOG NODE command completed successfully.' and 'The CATALOG DATABASE command completed successfully.'

```
[root@lin5 ~]# su - smadmin
[smadmin@lin5 ~]$ db2 catalog tcpip node DB2APM remote 192.168.1.102 server 50000
DB20000I The CATALOG TCP/IP NODE command completed successfully.
DB21056W Directory changes may not be effective until the directory cache is refreshed.
[smadmin@lin5 ~]$ db2 catalog db WAREHOUS at node DB2APM
DB20000I The CATALOG DATABASE command completed successfully.
DB21056W Directory changes may not be effective until the directory cache is refreshed.
[smadmin@lin5 ~]$ db2 catalog tcpip node DB2ITM remote 192.168.1.101 server 50000
DB20000I The CATALOG TCP/IP NODE command completed successfully.
DB21056W Directory changes may not be effective until the directory cache is refreshed.
[smadmin@lin5 ~]$ db2 catalog db WAREHOUS as TDWIIM at node DB2ITM
DB20000I The CATALOG DATABASE command completed successfully.
DB21056W Directory changes may not be effective until the directory cache is refreshed.
[smadmin@lin5 ~]$
```

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### Configuring ODBC connections

There are two databases with the name *WAREHOUS*. Use the DB2 alias function to distinguish the two identically named databases.

## Installing Application Performance Management Reports

- Transfer the preconfigured report files from the Performance Management Server and extract the report files.
- Start WebSphere Application Server and Tivoli Common Reporting
- Run installReports.sh from the extracted directory.

```

root@lin5:/downloads/Reports/ipm_monitoring_reports_8.1.3# ./installReports.sh
[root@lin5 ipm_monitoring_reports_8.1.3]# ./installReports.sh
The log files of reports installation are located in path: /tmp/apm_reports_installer.

The following reports are available for installation:
  i) Monitoring Agent for WebSphere Applications Reports

Type the numbers that correspond to the products that you want to install. Type "q" to quit selection.
If you want to enter more than one number, separate the numbers by using space or comma.

Type your selections here (For example: 1,2); 1
Enter the JazzSM installation path or accept the default [/opt/IBM/JazzSM];
JazzSM found in the path "/opt/IBM/JazzSM".
Enter the JazzSM Administrator user or accept the default [smadmin];
Enter the password of JazzSM Administrator;
Provided password is correct.
Enter password of APM Administrator;
Provided password is correct.

./installReports.sh: line 75: : too many arguments
Enter the TCR server IP address/hostname or accept the default []: 192.168.1.108
Creating TDW DataSource for WAREHOUSE database.
Installing report packages,
  i) Monitoring Agent for WebSphere Applications Reports Installed successfully.

Configuring APM server for reporting feature.

Installation completed.
[root@lin5 ipm_monitoring_reports_8.1.3]#

```

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### *Installing Application Performance Management Reports*

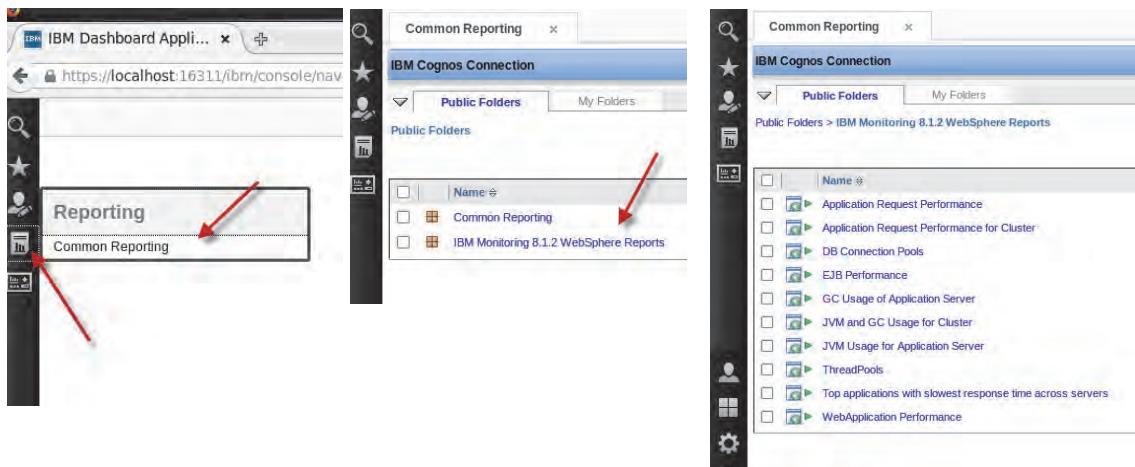
To begin the installation of the reports, enter this command:

```
./installReports.sh
```

Respond to the prompt for the path to the Jazz for Service Management directory or accept the default. Provide the user ID and passwords for the Jazz for Service Management administrator and the APM Administrator. Enter the Tivoli Common Reporting server host name or IP address. The installation of the reports proceeds and completes.

## Running a report from Tivoli Common Reporting

Log in to the Tivoli Common Reporting Server and locate the new reports.



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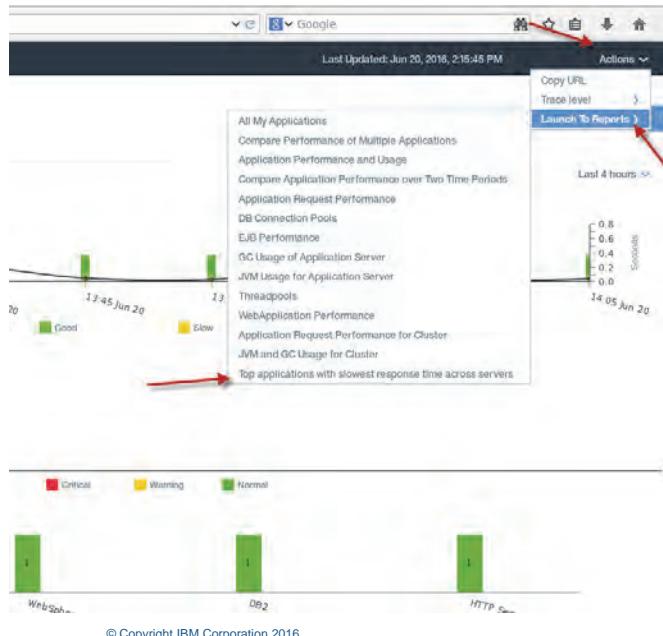
14

### Running a report from Tivoli Common Reporting

Run the report that is installed from the Tivoli Common Reporting server to test the installation.

## Running a report from the Performance Management console

After the reports are installed and configured, you can run the reports from the performance management console.



*Running a report from the Performance Management console*

## Top applications with slowest response time across servers report

Parameter Selection for Top applications with Date Range

Select desired date range for report All

**Start Date:** From: Jun 20, 2016 To: 12 : 00 AM

**End Date:** To: Jun 20, 2016 To: 11 : 59 PM

Summarization selection

Summarization Type: Hourly

Resource selection

Top N: 10

**Start Date:** Jan 1, 1970 12:00:00 AM **End Date:** Jun 20, 2016 11:59:59 PM

**Selected Top N Value:** 10 **Summarization Type:** Hourly

This page is meant to analyze how the applications perform at an aggregated level across all servers.

Top applications with slowest Average Response Time across Servers:

Application Name	Average Response Time(ms)
DefaultApplication	0
ManagementEJB	0
SchedulerCalendars0	0
SchedulerEJB	0
default	0
kalpesh	0
kalpesh_001	0
DefaultSchedulerCalendars0	15.000

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### Top applications with slowest response time across servers report

This example is the “Top applications with slowest response time across servers” report.

## GC Usage of Application Server report



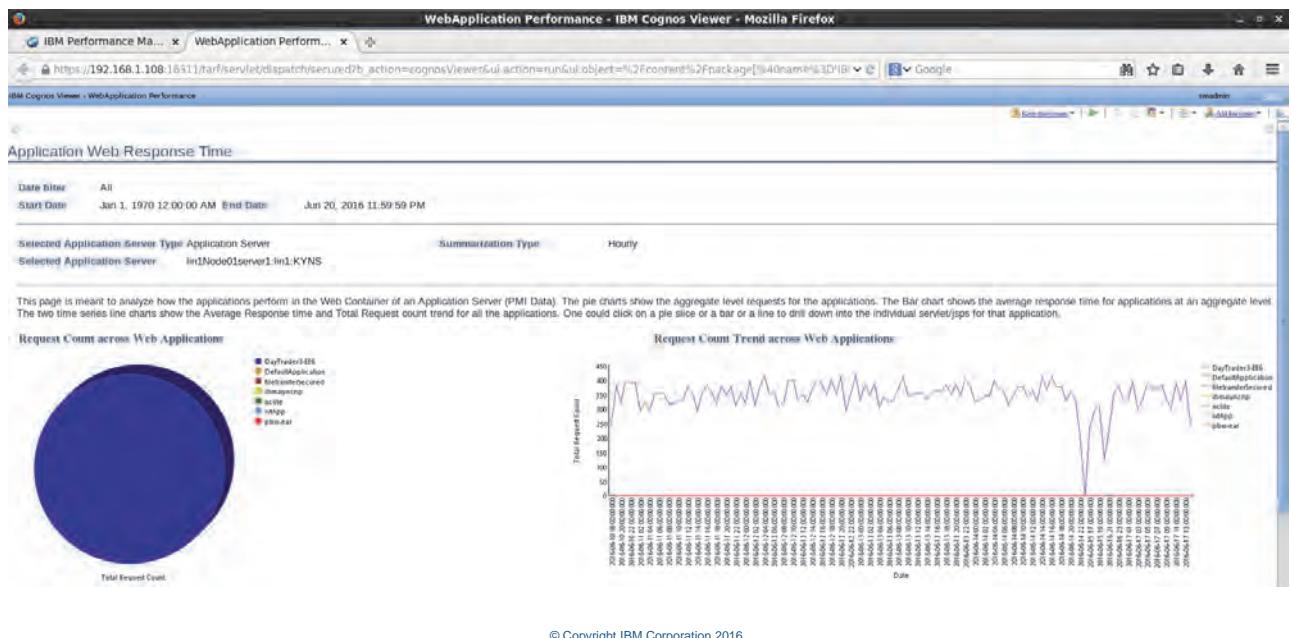
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## GC Usage of Application Server report

This example is the GC Usage of Application Server report.

## Application Web Response Time report



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### Application Web Response Time report

This example is the Application Web Response Time report.

## Thread Pools report

[https://192.168.1.108:16511/ibm/service/api/partner/secured/bi\\_action=crystalViewer&ui.action=run&ui.object=%27Content%27package%2740urn%27&ui.pageName=ThreadPools](https://192.168.1.108:16511/ibm/service/api/partner/secured/bi_action=crystalViewer&ui.action=run&ui.object=%27Content%27package%2740urn%27&ui.pageName=ThreadPools)

Thread Pools

Date/Title: All  
Start Date: Jan 1, 1970 12:00:00 AM End Date: Jun 20, 2016 11:59:59 PM  
Server: Application Server Type: Application Server  
Selected Application Server: IbmNode01Server1:k:1.KYNS  
Commentation Type: Hourly

The report is meant to analyze Thread Pools in an Application Server. The table shows the key statistics for all Thread Pools at an aggregate level. Once a thread pool is selected from the list, the trend chart for that specific thread pool will be displayed.

We are showing data for all Thread Pools.

Thread Pool selected: Thread

Thread Pool Name	Maximum Pool Size (Last 5 Max Average)	Pool Size Average	Pool Size Max (Average)	Active Threads	Average Free Threads	Average Number of Thread Pool Max
WebContainer	50	8	7.55	2	1.00	0.40
SISFAPThreadPool	1	1	1.00	0	0.00	2.00
SISFAPConnectionThreadPool	2	2	1.00	0	0.00	1.00
HAManager thread pool	2	1	0.99	0	0.00	0.99
CRR thread pool	50	1	0.99	0	0.00	0.99
SISFAPInternalThreadPool	41	1	0.98	0	0.00	0.98
AllestThreadPool	5	0	0.00	0	0.00	0.00
Default	20	0	0.00	0	0.03	0.00
Memory Internal Thread Pool	400	0	0.00	0	0.00	0.00
SISFAPInternalThreadPool_50	0	0	0.00	0	0.00	0.00
SISFAPThreadPool	50	0	0.00	0	0.00	0.00
TCPChannelDCS	79	0	0.00	0	0.00	0.00

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### Thread Pools report

This example is the Thread Pools report.

## Student exercises



Perform all of the exercises in the Course Exercises Guide for this unit.

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*Student exercises*

## Summary

You now should be able to perform the following tasks:

- Produce the historical 7-day comparison.
- Install and run reports.

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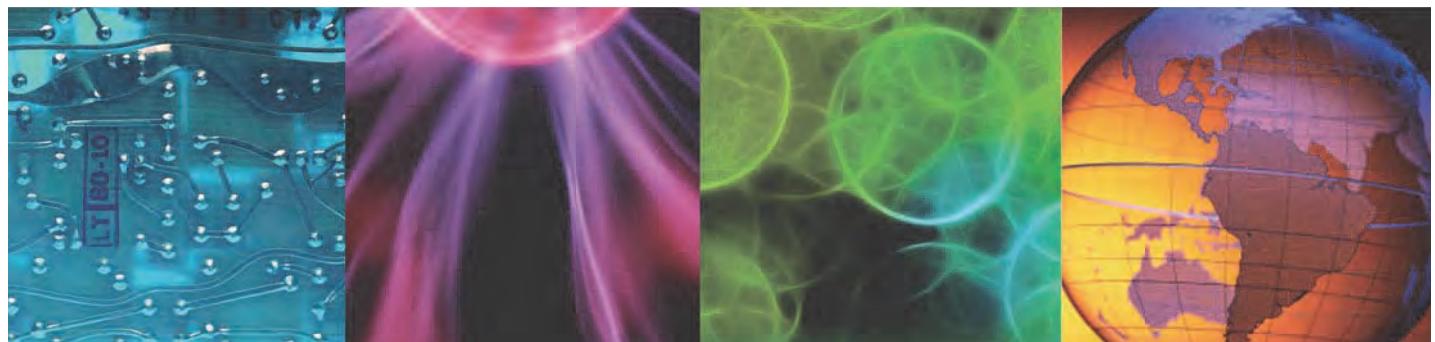
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*Summary*





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