



**Hewlett Packard**  
Enterprise

# Application Performance Management

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## Getting Started Guide

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# Introducing This Guide

This guide provides a high-level overview of the HPE Application Performance Management (APM) platform, and a workflow for setting up the APM end-to-end solution. It also provides details on key APM components and concepts, and on how the APM components complement each other, and end-to-end scenarios. Every topic in the guide points you to where you can find more information in the APM Help.

APM administrators and implementers should read this guide before beginning the planning and installation of the APM platform, to get an overview of the APM solution and its implementation.

Other APM guides referred to in this document are available from the Home page in the APM Help, or from each specific APM component. You can also access the documentation in the [HPE Software Support Web site](#).

# Part 1: Introduction to APM

# Chapter 1: Introducing APM

The HPE Application Performance Management (APM) portfolio provides a set of integrated, management-layer solutions, each employing a different combination of HPE products and applications. The APM portfolio enables the integration of application, system, network, and business transaction monitoring, helping you to manage application performance and address issues before they impact customers; and connecting dynamic cloud and virtualized services to underlying infrastructure, to provide better visibility into services.

The APM portfolio enables effective problem-solving by the various IT teams and personas in your organization, and across the different systems, network tiers, and software layers in your IT architecture.

The APM portfolio includes the following solutions:

- ["Application Performance Management" below](#)
- ["Operations Analytics" on the next page](#)
- ["Introducing APM" above](#)

## Application Performance Management

APM's Application Performance Management (APM) solution provides 24x7 application, service, and infrastructure monitoring, which enables you to manage your applications from an end-user perspective, realize the business impact of performance and availability issues, and diagnose application problems.

Data arriving from APM monitoring components such as SiteScope, Business Process Monitor, Real User Monitor, and Diagnostics, as well as data arriving via integrations with other HPE and third-party products, automatically populate the Run-time Service Model (RTSM), defining CIs and their relationships. In addition, you can synchronize topology between a Configuration Management System (CMS) and the RTSM, enabling topology-based integration flows with other HPE or third-party centers.

APM uses the RTSM data to relate infrastructure components, business transactions, and applications to the business services and service level agreements (SLAs) they support. APM provides a unified dashboard, Service Health, for managing IT operations to meet your business objectives, enabling you to view key business process and system indicators in real time, from an end-user, business-level, and service-level perspective. Service Health also indicates when there is an anomaly on a CI, detected by Service Health Analyzer, enabling an operator to deal with a potential problem before the full impact is felt by the business.

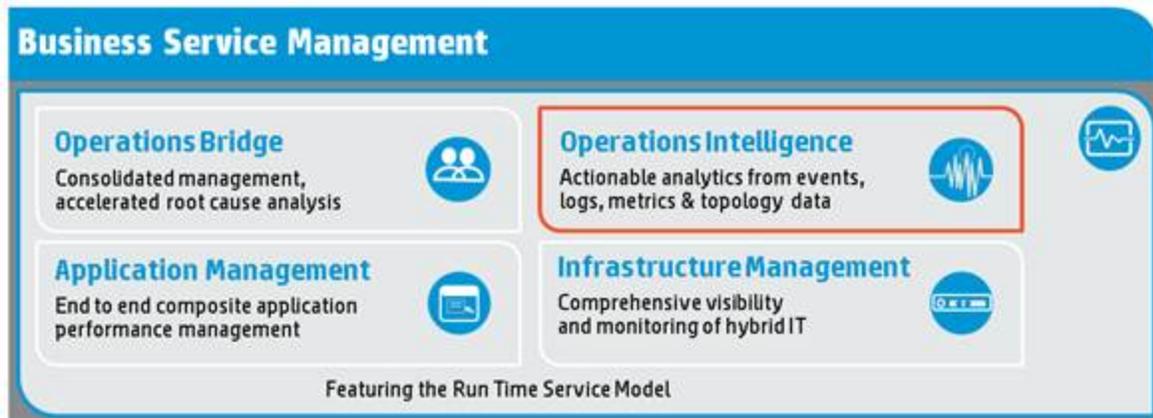
In addition, the Service Level Management application enables you to manage your SLAs and ensure that application performance and availability meet service level goals.

The APM solution also supports Web, J2EE, .NET, SAP, and Siebel performance management, and includes alerting, diagnostics, periodic health checks, capacity management capabilities, and trend analysis.

APM's End User Management software plays an important part in APM, by proactively monitoring application performance and availability from the end-user perspective, so that you can fix issues before customers experience problems. Real-time user information filtered to your development and QA teams can help reduce MTTR, improve service-level performance and availability, and decrease application downtime.

# Operations Analytics

In the age of virtualization and cloud services, IT organizations can no longer know and control all the technologies in their environment; they need analytics to predict the occurrence of known problems and identify unknown issues before they occur. HPE Operational Analytics combines Application Performance Management and ArcSight Logger to deliver actionable intelligence about service health by automating the correlation and analysis of consolidated data—including machine data, logs, topologies, and performance statistics. By making it possible to collect, store and analyze operational data, HPE Operational Analytics lets you automatically correlate problems with their causes.



HPE Operations Analytics (OpsA) is a "Big Data" analytics solution targeted at IT operational use cases. HPE Operations Analytics is a standalone solution, which brings together metrics, topology and log data to help you:

- **Prepare.** OpsA collects, indexes and stores all IT operational data before problems arise.
- **Predict.** Harness the power of predictive analytics to uncover trends before they become problems.
- **Pinpoint.** OpsA delivers capability to rapidly identify root cause of IT outages.

For more details, see

<https://saas.hpe.com/en-us/software/operations-analytics-operations-analysis>

# Chapter 2: Overview of the APM Solution

HPE Application Performance Management (APM) provides a suite of monitoring products that offer a comprehensive methodology for monitoring and measuring IT services from a business perspective. APM tools enable you to identify problems, understand their business impact, and prioritize the triage and remediation process. APM thus enables your IT organization to optimize the performance and availability of applications in production, and proactively resolve problems when they arise, thus assisting your organization to deliver more effective business results with lower IT costs.

APM contains an integrated set of applications for real-time performance and availability monitoring, providing capabilities that include Service Level Management, End User Management, System Availability Management, and custom reporting and alerting. These applications combine top-down, user experience management with bottom-up insight into infrastructure availability and performance, by linking infrastructure to business processes, transactions, and the end-user experience. APM is based on a common foundation of shared workflow, administration and reporting services, shared assets, and expertise.

This unified top-down and bottom-up methodology enables APM to provide consolidated and automated service operations management for your business, reducing MTTR and helping you to more effectively honor your SLAs.



APM's consolidated service operations approach is driven by the following processes:

- ["Detect" below](#)
- ["Consolidate" on the next page](#)
- ["Prioritize" on the next page](#)
- ["Isolate" on the next page](#)
- ["Diagnose" on page 13](#)
- ["Repair" on page 13](#)

## Detect

APM detects problems before they impact the business. APM monitoring tools discover, detect, monitor, and measure across the IT environment, sending alerts and metrics back to the APM applications. You configure the monitoring requirements and thresholds for the measurements to define what is a problem.

In order to create a model of what your IT environment looks like, APM is able to discover your IT environment automatically, using monitoring tools, and using discovery techniques provided by Discovery and Dependency Mapping. APM then helps you model your business processes and services, using the

management tools provided in the Run-time Service Model (RTSM) Administration application; these tools map the complex and dynamic dependencies between applications and their supporting infrastructure.

The APM solution monitoring options include:

- ["Business Process Monitor \(BPM\)" on page 14](#)
- ["Diagnostics" on page 14](#)
- ["Real User Monitor \(RUM\)" on page 16](#)
- ["SiteScope" on page 17](#)
- ["APM Solution Components" on page 14](#)

## Consolidate

APM consolidates topology and performance and availability metrics from across domains and monitoring systems into the APM management centers, enabling service health management for IT operations. Metrics from third-party integrations can be included in this "single pane of glass" approach.

The core component for this consolidated operations approach is the embedded CMDB, the Run-time Service Model (RTSM). The RTSM defines the relationships between the infrastructure components, IT services, applications, and corresponding business services, and provides a topological configuration item (CI) storage repository that is used throughout APM.

## Prioritize

APM prioritizes issues based on their business impact, and whether the associated CI is included in an SLA, enabling IT to focus on those issues first. This prioritization is achieved using the comprehensive dependency map created in the RTSM, which gives visibility into the impact of issues on business services, and on how real users are being impacted by issues.

In addition, Service Level Management capabilities allow you to compare actual application availability and performance with business goals, so that you can see the remaining time until SLAs are breached, and to prioritize problem resolution based on service level compliance.

You can define role-defined dashboards in MyBSM that track KPIs specific to a high-priority business service, to help deliver the relevant information to the right people.

## Isolate

APM provides processes to help isolate the root cause of problems, speeding up resolution time. A problem can occur at any stage of the user experience; it could be infrastructure or network related, an application issue, a transaction implementation issue, a security issue, and so forth. To manage this, APM tracks transactions in an end-to-end manner, regardless of the technologies used to complete them. The RTSM then provides a unified service health view of the relationships and dependencies between the CIs that represent your business services and IT infrastructure.

This combination provides a complete and up-to-date picture of the managed environment, and enables the impact analysis needed to quickly isolate the problem. In the Service Health application, you can identify the impacted CI, and drill down to the domain APM applications such as End User Management and System Availability Management to determine the root cause.

The IT teams can identify and understand the root causes of technical issues, and the impact on customers and the overall business. IT is able to trace the problem back to the physical infrastructure or virtual application environment, or trace an issue back to third-party cloud service providers.

## Diagnose

The APM platform includes tools to help diagnose anomalies across the IT environment and pinpoint bottlenecks, and provides solutions for different IT teams. For example:

On the applications side, Diagnostics can drill down into the application server stack, and peer into the tiers of an application as they relate to individual infrastructure components, providing both historical context and application-specific details at the time of the issue.

## Repair

APM provides integrated run book automation (RBA) through an out-of-the-box integration with HPE Operations Orchestration. This enables an isolation flow to collect additional information on the problem, and the running of automated script actions to try and remedy the problem. APM can also integrate with other run book automation tools.

# Chapter 3: APM Solution Components

APM includes the following tools and solution components:

- "Business Process Monitor (BPM)" below
- "Diagnostics" below
- "Universal Discovery (UD)" on the next page
- "End User Management (EUM)" on the next page
- "MyBSM" on page 16
- "Real User Monitor (RUM)" on page 16
- "Run-time Service Model (RTSM)" on page 16
- "Service Health" on page 17
- "Service Level Management (SLM)" on page 17
- "SiteScope" on page 17
- "System Availability Management (SAM)" on page 18
- "System Health" on page 18
- "User Reports" on page 19

## Business Process Monitor (BPM)

BPM is an APM data collector that emulates end-users by running the transactions included in a business transaction flow or application, from various locations. By collecting synthetic-monitoring performance and availability data from various points throughout your infrastructure, as well as from external locations, BPM enables you to identify performance problems in real time.

BPM should be used to gather data during inactive hours of the users, so you will be able to detect problems before a real user encounters them. In addition, BPM is the basic monitor for building SLAs, because it has the same transaction monitored at the same time intervals.

The defined transactions automatically create corresponding CIs in the RTSM. When APM receives samples for the monitored transactions, they are used to calculate status for the BPM CIs. You use the End User Management reports and other APM applications to view and analyze the data, in order to monitor the performance of your business applications and infrastructure.

For more details, see [Getting Started with BPM - Best Practices in the HPE Software Support site](https://softwaresupport.hpe.com) (<https://softwaresupport.hpe.com>) and the Business Process Monitor Administrator's Guide.

## Diagnostics

HPE Diagnostics is a composite application-monitoring, triage, and diagnostics solution that provides integrated monitored topology, metrics for APM. It uses collectors and agents to collect data across multiple technology platforms, including JAVA, .NET, Oracle and SQL Server databases, SAP environments, and virtualized environments. This data, which is displayed in the Diagnostics application in APM, enables you to monitor and diagnose performance problems in your application infrastructure, and identify critical bottlenecks.

The functionality provided by the Diagnostics integration with APM includes:

- Send metrics data to APM; the data is used to determine status for system and software KPIs and fine-grained HIs, and enables you to track the availability and performance status of business applications monitored by Diagnostics, and reduce the MTTR of problems.
- Aggregate transaction monitoring, with Diagnostics providing backend-view data for business transactions generated by other APM applications, such as BPM. You can generate high level reports in APM about the performance of business transactions that are monitored by Diagnostics.
- Drill down to Diagnostics data from specific APM configuration items and reports.
- View the application infrastructure information from Diagnostics in the context of a business application or business transaction.

For more details, see "Diagnostics and Application Performance Management" in the Diagnostics User's Guide, part of the HPE Diagnostics documentation set.

## Universal Discovery (UD)

UD uses the Discovery process to collect information about your IT infrastructure resources and their interdependencies. Discovery discovers resources such as applications, databases, network devices, servers, and so on. Each discovered IT resource is delivered to, and stored in, the RTSM, where the resource is represented as a managed CI.

Discovery is an ongoing, automatic process that continuously detects changes that occur in the IT infrastructure and updates the RTSM accordingly. You must install the Data Flow Probe component (supplied with APM) to run the Discovery jobs, but you do not need to install any agents on the devices to be discovered.

Following installation, CIs are created for the Data Flow Probe network, host, and host IP. These CIs act as triggers that activate a Discovery job. Every time a job is activated, the job discovers more CIs, which in turn are used as triggers for other jobs. This process continues until the entire IT infrastructure is discovered and mapped.

You manage the Discovery process and the Data Flow Probe from the Data Flow Management (DFM) component in RTSM Administration. In addition, DFM enables you to use the Data Flow Probe to synchronize the topology between RTSM and external data sources (without the need for a UD license).

For more details, see "Data Flow Management Overview" in the Data Flow Management Guide.

## End User Management (EUM)

EUM is a centralized solution for configuring and managing the applications and associated entities you want monitored by the end-user data collectors—Business Process Monitor (BPM) and Real User Monitor (RUM).

By using both BPM and RUM to monitor the same applications and associated entities, you can obtain an overall picture about your applications from both a real user (RUM) and synthetic user (BPM) perspective.

You can view the collected data in End User Management reports and in Service Health.

For more details, see End User Management Administration Overview in the APM Application Administration Guide.

## MyBSM

MyBSM is a customizable Web 2.0 user environment for working with APM. In MyBSM, you can create role-based workspaces (dashboards) for different types of users such as operations users, and senior management. The MyBSM workspace provides smooth interactions between different APM applications and reports.

Each page includes components based on APM applications and reports, that are of interest to specific users or groups of users. For each page, you can define the layout of components on the page, and their interaction with other components.

For more details, see MyBSM Overview in the APM User Guide.

## Real User Monitor (RUM)

RUM is an APM data collector that monitors both user- and system-initiated network traffic between client machines and servers, and between servers, collecting network, server performance, and availability data in real-time.

RUM provides information on:

- End users from all locations, providing end-user experience.
- Application-related network performance.
- Application backend protocols.

This data enables you to pinpoint the cause of delays and quantify the business impact of detected performance issues related to end users.

For more details, see Real User Monitor Administration in the APM Application Administration Guide.

## Run-time Service Model (RTSM)

The RTSM is APM's embedded, customized CMDB. It acts as the central repository for configuration information that is collected and updated from the various APM data collection processes: APM data collectors, the Discovery process, and third-party data collectors and tools. The RTSM defines the relationships among infrastructure components, IT services, applications, and corresponding business services.

The RTSM stores and handles information on the services, their components, and configuration items (CIs), as well as details about the CI attributes, history, and relationships. The RTSM also contains the object repositories used to define CIs and KPIs, which are used throughout APM.

The RTSM supports federation with the HPE CMS solution (an external configuration management system working with an HPE Universal CMDB), and with third-party CMDB solutions. Consequently, it can easily be leveraged in use cases outside APM.

For more details, see "RTSM Overview" in the RTSM Administration Guide.

## Service Health

APM includes two applications for managing the service health of your business processes: Service Health and CI Status.

The Service Health application dashboards provide a central location to view and analyze performance data collected by APM data collectors and stored in the APM database. The collected and aggregated data is used by the Health Indicators (HIs) and Key Performance Indicators (KPIs) to provide quantifiable measurements that help you monitor how well your business is achieving objectives.

The KPIs and HIs provide real-time assessment of the present state of your business and processes, enable you to track critical performance variables over time, and help you assess the business impact of problems in the system.

At the top level, Service Health provides an integrated view of critical applications and business processes; from there, you can drill down to the underlying IT infrastructure associated with these critical business processes. This drilldown view can be laid out in any number of ways, such as by data centers, by technology clusters, by geographical locations, and so on.

For more details, see [Service Health Overview](#) in the APM User Guide.

The CI Status application enables you to analyze the performance data using reports, which display information on KPI statuses over time, and CI status alerts. For details, see [CI Status Reports](#) in the APM User Guide.

The Service Health Administration tool services both of these applications, enabling you to customize how APM calculates KPIs and HIs.

## Service Level Management (SLM)

The SLM application provides a service level management capability within APM:

SLM determines compliance with your Service Level Agreements (SLAs) by measuring your business applications. You can define business service entities (Business Service and Infrastructure Service CIs) that represent the service offerings in your service catalog, and map measurements for service-related processes and network components to each service CI. The service CIs are added to your SLAs. You can also add CIs representing service-related processes and components, directly to your SLAs.

The data produced by the service-related measurements helps you determine whether the availability and performance requirements of users and infrastructure are being met. SLM calculates key performance indicator (KPI) and health indicator (HI) values from the received availability and performance data, and compares them with required service level objectives. The results are displayed in a dashboard and in reports which show you how well actual service levels compare with your goals.

For more details, see [Service Level Management Overview](#) in the APM User Guide.

## SiteScope

SiteScope is an APM data collector providing a Web-based, agentless monitoring solution. SiteScope monitors the availability and performance of distributed IT infrastructures—for example, servers, operating systems, network devices, services, and applications.

SiteScope has the following features:

- Provides individually configurable monitors for reporting key performance data on a wide range of components in the network environment.
- Provides alerting and reporting capabilities, along with a dashboard for a real-time picture of the monitored environments. It can also be used to create baselines and schedule specific thresholds based on a time period or date.
- Provides integrated monitored topology and metrics for APM, and provides RTSM based-views for the monitored systems and services.
- Enables checking or enforcing your monitoring policies using SiteScope templates.
- Enables managing multiple SiteScope instances through SAM Administration in APM, and easy distribution of monitoring between different SiteScope servers.

For more details, see "Introduction to SiteScope" in the HPE SiteScope Deployment Guide, part of the SiteScope Documentation Library.

## System Availability Management (SAM)

SAM Administration is a centralized solution for accessing SiteScopes from within APM. It enables you to register, configure and maintain your SiteScope servers. You can configure and manage multiple SiteScopes from within SAM Administration.

You can configure SiteScope monitors, alerts, and reports and make any other configuration changes for the SiteScope. All the configuration changes that are done from SAM Administration are reflected in the SiteScope itself.

The SAM application utilizes data collected by SiteScope and enables you to:

- Monitor system availability across the entire enterprise infrastructure from a centralized, real-time perspective.
- Apply a business perspective to system management view data at the application level rather than viewing numerous low-level system metrics.
- View information about events collected from external applications or software and SiteScope events.

For more details, see System Availability Management Overview in the APM User Guide.

## System Health

The System Health component uses SiteScope monitors to enable monitoring of the servers, databases, and data collectors that make up your APM system.

You use System Health to:

- Measure system performance and monitor areas of the databases that influence performance.
- Display problematic areas for the servers, databases, and data collectors.
- Perform operations on your environment, such as moving and configuring backup services, and starting and stopping APM processes.
- View log files and other status information on specific components in a variety of formats.

For more details, see the System Health Guide.

## User Reports

The User Reports application provides two main areas of functionality:

- **Report Manager.** This is a central location where you can manage selected reports from throughout APM. In Report Manager, you can create customized reports, such as Custom Reports, Trend Reports, and Service Reports, containing user-defined data and formatting. These reports can help you focus on specific aspects of your organization's application and infrastructure performance.

In Report Manager, you can also define schedules for the automatic generation of reports, to be sent to specified recipients at set times. These can be customized reports defined in the User Reports application, or reports from other APM applications saved as favorites.

For more details, see [Using Report Manager to Manage Reports](#) in the APM User Guide.

- **Custom Query Builder.** This is a Web interface that assists in creating queries to the profile database. The queries are used to run reports, or can be used together with third-party tools or proprietary tools to extract data from the profile database.

For more details, see [Building a Custom Query Using Custom Query Builder](#) in the APM User Guide.

# Chapter 4: Modeling Components

APM includes the following modeling components:

- ["Configuration Items \(CIs\)" below](#)
- ["IT Universe Model" below](#)
- ["TQL Queries" on the next page](#)

## Configuration Items (CIs)

A configuration item (CI) is a component stored in the RTSM that represents a physical, virtual, or logical entity in your IT environment. For example, CIs can represent lines of business, applications, provided services, network hardware, users, and so on. A CI can also be a logical container for a hierarchy of CIs.

Information about each CI is recorded in a configuration record within the RTSM, which is maintained throughout the CI's lifecycle. The RTSM also contains the Configuration Item Type (CIT) model, a repository for the CIT and relationship templates used to create the CIs, CI relationships, and associated attributes.

For more details, see "Configuration Items (CI)" in the RTSM Administration Guide.

The link between two CIs is defined by the relationship between them. Relationships represent the dependencies and connections between the entities in your IT environment. For details, see "CI Type Relationships" in the Modeling Guide.

The CIs and the relationships stored in the RTSM typically include:

- **Business assets, business services, processes, and activities.** These include services that a business provides to another business (or one organization provides to another within a business) and that an IT organization provides to support business services or IT operations. A business service typically has an associated end user or customer, a business application, and an SLA. Examples include payment processing, backup and recovery, and self-service help desk.
- **Application, services, and their core components.** These support a business activity, which is seen as a whole and is known by a specific name. This group also includes infrastructure services that support business services and processes. Examples include voice and network, database, backup and restore, desktop, and Windows administration services.
- **Software.** This includes individual installations of software elements. These are executables that are deployed on a logical system.
- **Infrastructure.** This includes logical systems such as virtualization and clustering, and physical systems such as storage devices, network devices, and servers.
- **Facilities.** This includes locations, sites, buildings, rooms, racks, and so on.

## IT Universe Model

The RTSM houses a map of all the technology components associated with any service your business runs or utilizes. The components are represented by configuration items (CIs), mapped to each other by their interdependencies (called relationships), and together they form a service model of the IT universe in which your business functions. This model is referred to in APM as the IT Universe model.

Having a defined IT Universe model of your organization enables you to see what applications are being monitored, and to determine which other CIs are impacted by problems—for example, whether a service suffered outages due to a problem with its database server.

The IT Universe model can be very large, containing millions of CIs. To facilitate their management, and focus on specific IT areas, you work with the CIs in "views." Views are a subset of the overall components in the IT Universe, and contain topologies of CIs that meet the requirements for a logical grouping, defined in the templates (based on TQL Queries, below) for the views.

In the APM applications you select a specific view to focus on, enabling you to monitor the status of the KPIs attached to the CIs. This enables you to manage the specific area of your business that is represented by the CIs and relationships in the view.

APM supplies out-of-the-box views for the IT Universe, or you can define your own views, to display specific information relevant for your organization's business needs. For more details, see "Modeling Studio Overview" in the Modeling Guide.

## TQL Queries

Topology Query Language is a language and tool that extends the standard SQL language, discovering, organizing, and managing the IT infrastructure data, and enabling you to draw conceptual relationships between CIs to represent their actual interdependencies.

The TQL queries stored in the RTSM help structure the way that CIs are organized and managed in the RTSM, creating the IT Universe model. The TQL also constantly checks for changes that impact the IT Universe model structure.

A TQL query builds a business service model that acts as a template for view content. You can create your own TQL queries to retrieve the specific business service data that you need from the RTSM, and to display the data in views.

For information on TQL queries, see "Topology Query Language (TQL) Overview" in the Modeling Guide.

# Chapter 5: Measurement Components

APM includes the following measurement components:

- ["Health Indicators \(HIs\)" below](#)
- ["Key Performance Indicators \(KPIs\)" below](#)
- ["Measurement Management" on the next page](#)

## Health Indicators (HIs)

Data collectors such as RUM, SiteScope, and so forth, send metric samples to the APM servers, containing information about your monitored applications and business services. Each sample is mapped in APM to its relevant health indicator (HI), and the metric in the sample is used to set the HI's status.

HIs provide fine-grained measurements on the CIs that represent your monitored applications and business services. Some HIs provide business metrics such as backlog and volume, while others monitor specific aspects of performance and availability such as CPU load or disk space.

Metric data sources contribute to an HI's status and value. Some data collectors send samples containing metrics to APM (for example, response time = 6 milliseconds). A sample is translated to HI status as follows:

- **Metric-based HIs.** Metric-based HIs apply calculation rules to the samples generated by the data collectors, to create a calculated HI value. For example, if a data collector collects several response time samples over a 15 minute period, Service Health calculates the average response time and sets the HI's status (for example: Minor) and value (for example: 11 ms).

After an HI's status is set, the key performance indicator (KPI) that is associated with the HI is calculated based on the KPI's definitions.

For details, see Health Indicators and KPIs in the APM User Guide.

## Key Performance Indicators (KPIs)

In the Service Health application, you can monitor status for your CIs using key performance indicators (KPIs). KPIs are high-level indicators of a CI's performance and availability. Each KPI represents an aspect of domain health such as System Performance, System Availability, Application Performance, Application Availability, and so on.

KPIs are calculated using statuses of health indicators (HIs), KPIs, or a combination of both. For example, you can specify a business rule that sets the severity of a KPI on a CI to the worst status of all the HIs assigned to that CI.

The resulting measurement for the KPI is translated into a color-coded status indicator displayed in Service Health, where the color represents a more desirable or less desirable condition for the KPI. A KPI's severity can be normal, warning, minor, major, or critical.

KPIs and HIs are also used to calculate SLA performance within Service Level Management.

You can define a KPI to only use specific HIs that are of interest to you.

For details, see Health Indicators and KPIs in the APM User Guide.

## Measurement Management

- **KPI and HI assignments.** When a new CI is added to your monitored system, the assignment mechanism automatically assigns the appropriate KPIs and HIs to the CI. For details about modifying KPI and HI assignments, see [Customizing KPI and HI Assignments](#) in the [APM Application Administration Guide](#).
- **Configuring indicator and rule templates.** You can view and modify the templates used to define KPIs, HIs, ETIs, and business rules, using the indicator repositories available from Service Health and SLM. The business rules associated with HIs and KPIs define how the HIs and KPIs are calculated. Some business rules are based on sample data, and are used to calculate HIs. Other rules calculate KPIs based on the status or value of HIs and of other KPIs. For details, see [Repositories Overview](#) in the [APM Application Administration Guide](#).

# Chapter 6: APM End-to-End Workflow

This workflow provides an overview of the major tasks required to set up Application Performance Management (APM). It is designed as a step-by-step guide for installing and configuring all the APM components. For more information on APM platform capabilities, see ["Overview of the APM Solution" on page 11](#).

This chapter includes:

- ["Step 1. Plan the APM Deployment" below](#)
- ["Step 2. Deploy Databases and Servers" on the next page](#)
- ["Step 3. Set Up Data Sources" on the next page](#)
- ["Step 4. Integrate with Other Products" on page 27](#)
- ["Step 5. Create and Enrich Data Model" on page 29](#)
- ["Step 6. Configure APM Applications" on page 31](#)
- ["Step 7. Monitor Business Status" on page 34](#)

## Step 1. Plan the APM Deployment

**Tip:** The following is a high-level workflow. For detailed instructions on planning your APM deployment, see ["Part 2: Preparing to Install APM" on page 53](#).

Before you install APM, you should plan your APM deployment and order the relevant hardware and licenses.

- Plan your deployment by determining your individual requirements, including addressing the following topics:
- Calculate hardware requirements
- Choose server deployment
- Determine number of machines
- Choose operating system
- Determine database setup and disk space requirements
- Determine disaster recovery options
- Determine network requirements
- Choose web server

**Note:** If you are upgrading from a previous version, refer to the HPE Application Performance Management Upgrade Guide for detailed workflows.

## Step 2. Deploy Databases and Servers

### APM Deployment

Deploy the APM databases and servers as specified in the APM Installation Guide. This includes the following main steps:

1. **Prepare hardware.** All APM servers and database servers must meet the system requirements for installation.
2. **Install APM on the servers.** Install APM using the installation, post-installation, and configuration wizards.
3. **Run the Setup and Database Configuration Utility.** This configures your APM database servers.
4. **Enable servers and log on.** Enable the servers to allow user access and log on for the first time.
5. **Perform post-installation tasks.** A number of additional settings are required after installation, such as reserving specific ports and disabling your firewall on certain directories.
6. **Register additional licenses.** The main license is registered during the installation wizard, however certain component licenses (for example, HPE Diagnostics) require you to manually register additional licenses using the License Manager.

### System Health Deployment

The System Health component monitors the servers, databases, and data collectors that make up your APM system. If you are going to use System Health, deploy System Health on a standalone machine with access to APM, so that System Health continues to run if APM servers are down.

For details, see "How to Deploy System Health" in the System Health Guide.

Note that System Health can also be deployed on any APM Gateway server; this should be done only if a standalone machine is not available.

To learn more about System Health, see ["System Health" on page 18](#).

## Step 3. Set Up Data Sources

Install the following HPE components (if they are not already installed) and configure them to monitor your business and communicate with APM.

This section includes:

- ["Business Process Monitor" on the next page](#)
- ["Real User Monitor" on the next page](#)
- ["SiteScope" on the next page](#)
- ["Diagnostics" on page 27](#)
- ["Data Flow Probe" on page 27](#)

## Business Process Monitor

Business Process Monitor (BPM) emulates end users by running the transactions included in a business transaction flow or application from various locations.

These transactions are contained within HPE Virtual User Generator scripts, which are later stored in the APM database for consumption and usage by the BPM monitors. If you own HPE Software load testing tools like HPE LoadRunner or HPE Performance Center, you can consider reusing some of the scripts made for these tools for initial use in your BPM monitors.

To learn more about BPM, see ["Business Process Monitor \(BPM\)" on page 14](#).

1. **Record scripts.** Record scripts using either HPE Virtual User Generator or HPE QuickTest Professional. For details, see the HPE Virtual User Generator User's Guide or the HPE QuickTest Professional User Guide.
2. **Install BPM instances.** Install required number of BPM instances on host machines. For details, see the Business Process Monitor Deployment Guide.
3. **Install a script recording tool.** Install either HPE Virtual User Generator or HPE QuickTest Professional. For details, see "Supported Recording Tools" in the Business Process Monitor Administrator's Guide.
4. **Configure BPM data collection.** Define BPM entities (applications, business transaction flows, and transactions) to monitor the business processes in your IT environment. For details, see "How to Set up Business Process Monitors" in the APM Application Administration Guide.

## Real User Monitor

Real User Monitor (RUM) monitors both user- and system- initiated network traffic between client machines and servers, and between servers. RUM passively collects network and server performance and availability data in real time.

To learn more about RUM, see ["Real User Monitor \(RUM\)" on page 16](#).

1. **Install RUM engines.** Install RUM engines on host machines. For details, see "Installing the HPE Real User Monitor Engine" in the the Real User Monitor Administration Guide.
2. **Install RUM probes.** Install RUM probes on host machines to listen to network traffic. For details, see "Installing the HPE Real User Monitor Probe" in the the Real User Monitor Administration Guide.
3. **Configure RUM data collection.** Define the applications and associated entities (business transaction flows, transactions, actions, and so forth) that you want Real User Monitor to monitor. For details, see "How to Discover and Define Real User Monitor Applications" in the APM Application Administration Guide.

## SiteScope

SiteScope monitors collect key performance measurements and report topology on a wide range of back- and front-end infrastructure components.

To learn more about SiteScope, see ["SiteScope" on page 17](#).

1. **Install SiteScope.** Install SiteScope on one or more server machines. For details, see the "Installing SiteScope" part of the HPE SiteScope Deployment Guide.

2. **Connect SiteScope to APM.** Set up communication between SiteScope and APM. For details, see "Connect SiteScope to an APM Server" in the Using SiteScope Guide.
3. **Configure SiteScope data collection.** Create SiteScope groups and subgroups to organize the monitors to be deployed, and then create monitors in these groups.

For details on configuring SiteScope to report metrics to APM, see "HPE Integration Settings" in the Using SiteScope Guide.

## Diagnostics

HPE Diagnostics monitors performance and availability of your enterprise applications and BPM transactions, providing visibility across your enterprise's application infrastructure.

To learn more about HPE Diagnostics, see "[Diagnostics](#)" on page 14.

1. Install HPE Diagnostics. Install the HPE Diagnostics servers, Java and .NET agents, and remote monitoring collectors. For details, see the Diagnostics Server Installation and Administration Guide (supplied with the HPE Diagnostics software).
2. Configure HPE Diagnostics data collection. For Java agents, instrument the application servers; for .NET agents, instrument the application domains for monitoring; for collectors, define the specific instances on the remote systems to be monitored. You then configure the agent and collector data collection settings for your environment. For details, see the Diagnostics Server Installation and Administration Guide.
3. Connect HPE Diagnostics with APM. Register and set up communication between HPE Diagnostics and APM. For details, see the APM - Diagnostics Integration Guide in the [HPE Software Support site](https://softwaresupport.hpe.com/) (<https://softwaresupport.hpe.com/>).

## Data Flow Probe

The Data Flow Probe is required to run the Discovery process, which discovers the IT resources and components on your network, and saves them as CIs and relationships in the Run-time Service Model (RTSM). The Probe is also required for topology synchronization between the RTSM and other data sources, such as a CMS.

To learn more, see "[Universal Discovery \(UD\)](#)" on page 15.

1. **Install the Data Flow Probe.** Install the Data Flow Probe on a server machine. For details, see "Installing the Data Flow Probe on Windows" or "Installing the Data Flow Probe on Linux" in the Data Flow Probe Installation Guide.
2. **Configure Discovery data collection.** Launch the Data Flow Probe and activate Discovery jobs. For details, see "Get Started with the Data Flow Probe" in the Data Flow Management Guide.

## Step 4. Integrate with Other Products

APM integrates with additional HPE and third-party products. It uses these products and applications as data sources and brings in their topologies, metrics.

This section lists some of the more common integrations. For more information about supported integrations, see Integrating with Other Applications - Overview in the APM Application Administration Guide.

You can find detailed information about supported APM integrations in the [HPESW Solution and Integration Portal](https://softwaresupport.hpe.com/km/KM01702731) (<https://softwaresupport.hpe.com/km/KM01702731>).

Instructions on setting up specific integrations can be found in the [HPE Software Support site](https://softwaresupport.hpe.com) (<https://softwaresupport.hpe.com>).

This section includes:

- ["CMS/UCMDB" below](#)
- ["HPE Service Manager" below](#)
- ["HPE Operations Orchestration" on the next page](#)

## CMS/UCMDB

You can integrate the APM Run-time Service Model (RTSM) with a standalone HPE Configuration Management System (CMS). The integration synchronizes CIs and relations between the central HPE Universal Cmdb and the RTSM in APM, while retaining the original UCMDB global IDs.

For details, see "Perform Initial Synchronization" in the Data Flow Management Guide, and the HPE RTSM Best Practices Guide.

To learn more about RTSM, see Run-time Service Model (RTSM).

## HPE Service Manager

HPE Service Manager enables a lifecycle approach to IT service management, providing incident management, problem management, change, configuration and release management (CCRM), and knowledge management services.

The bi-directional integration of APM with Service Manager can impact the following components of APM (the actual functionality depends on how you configure the integration):

- **RTSM.** The relevant topology for Service Manager incidents is added to the RTSM.
- **Service Health.** The integration enables the following functionality:
  - View incident metrics in Service Health, such as number of open tickets, based on Service Manager incident data collected by SiteScope EMS monitors.
  - View information on planned changes and incident details received from Service Manager, in the 360° View page in Service Health. This is done by federating the incidents and planned changes data from Service Manager.
  - Drill down from Service Health CIs to the relevant incident in the HPE Service Manager software.
  - Drill down from the HPE Service Manager software to the Service Health Business Impact report.
- **Service Level Management.** In the Service Level Management application, you can create SLAs based on Service Manager incidents, and view incident data metrics, such as mean time to repair and mean time between failures.
- **Alerts.** Alerts triggered in APM can automatically open incidents in HPE Service Manager.

For more details on the integration of APM with HPE Service Manager, see the APM - Service Manager Integration Guide in the [HPE Software Support site](https://softwaresupport.hpe.com/) (<https://softwaresupport.hpe.com/>).

## HPE Operations Orchestration

The integration of APM with HPE Operations Orchestration (OO) utilizes the OO capabilities for building investigation tools or service remediation scripts. These capabilities enable an operator to validate a problem, investigate it, or automatically correct it.

APM provides a number of predefined mappings between CIs and OO run books. This mapping and the integration procedure enable you to automatically or manually launch OO run books from the Service Health, and Service Health Analyzer applications.

For details about the integration with HPE Operations Orchestration, see the APM - Operations Orchestration Integration Guide in the [HPE Software Support site](https://softwaresupport.hpe.com/) (<https://softwaresupport.hpe.com/>).

## Step 5. Create and Enrich Data Model

After setting up your data collection environment, the data sent to APM populates an extensive set of application infrastructure, Web service, and business transaction CIs in the RTSM, and provides information on relationships between the CIs. Using common data models, APM automatically creates a data model (the IT Universe Model) representing the overall monitored IT environment.

You can customize the data model implementation according to your business needs, as described in the following topics.

This section includes:

- ["Create Business Model" below](#)
- ["Customize Views and Performance Indicators" on the next page](#)
- ["Manage Downtime" on the next page](#)
- ["Define Custom Locations" on the next page](#)
- ["Extend the Data Model" on the next page](#)

## Create Business Model

You can manually define logical business CIs to represent your business entities, such as Business Service or Line of Business.

- You map the business CIs to a topology of CIs that represent the underlying processes and infrastructure supporting the business entity. The business CIs are added to your business views, so that the views display information organized according to your organization's business needs. You can manually create CIs and relationships that represent logical and physical elements of the business using IT Universe Manager in RTSM Administration. For details, see "Working with CIs" in the Modeling Guide.
- You define service CIs (Business Service and Infrastructure Service) that represent the services provided by, or consumed by, your organization, such as project management services, or directory services. These CIs are used as the basis of your model, and also to build service level agreements, and can be defined from the Service Level Management application (in addition to defining them within the RTSM Administration application). For details, see How to Define a Service for an SLA – Use-Case Scenario in the APM Application Administration Guide.

**Tip:** If you have a CMS system with a central UCMDB, it is recommended that you create and model the Business Service CIs in the CMS, and then synchronize them into APM.

## Customize Views and Performance Indicators

APM provides out-of-the-box business views containing CIs, and performance indicators (KPIs and HIs) to monitor and manage the status of your IT infrastructure and business processes. You can define customized views and performance indicators to provide the specific monitoring information required by your organization's APM users.

- **Define views:** There are two types of views: global views in RTSM and local impact views.
  - For details on creating global views in RTSM, see "Modeling Studio Overview" in the Modeling Guide.
  - For details on creating local impact views, see Creating Global Views and Local Impact Views (LIVs) with View Builder in the APM Application Administration Guide.

When creating any type of view, you can use the impact perspective to see the application and its underlying transactions and infrastructure.

- **Define KPIs and HIs:** For details, see Configuring KPIs and HIs - Overview in the APM Application Administration Guide. For an overview of working with KPIs and HIs, see How to Customize Calculations in Service Health in the APM Application Administration Guide.

## Manage Downtime

Downtime in your IT environment, or scheduled maintenance and other events, can skew CI data. You can exclude these periods of time from the indicator performance calculations for your applications and infrastructure.

You configure downtime for CIs in Downtime Management in Platform Administration. For details, see How to Create and Manage Downtimes in the APM Platform Administration Guide.

## Define Custom Locations

Define geographical and logical location CIs to attach to other CIs. These locations can be used to organize and filter CIs by location. Each location can be assigned ranges of IP addresses that have been designated for use by devices in a certain geographical area.

Create the locations to monitor using Location Manager in Platform Administration. For details, see Location Manager in the APM Platform Administration Guide.

## Extend the Data Model

APM provides you with various ways to extend the data model repositories and components stored in the RTSM, and to customize the out-of-the-box RTSM modeling structures:

- **Enrich the topology.** You can integrate RTSM with other data sources to enrich the topological data in the RTSM. The data source can be another RTSM instance, another HPE product such as HPE Service Manager (integrated through a CMS), or a third-party product.  
For details, see "Integrating Multiple CMDBs" in the Data Flow Management Guide, and the HPE RTSM Best Practices Guide.
- **Create TQLs.** You can create TQL queries to retrieve business service data from the RTSM, and to display the data in views.

For details, see "Define a TQL Query" in the Modeling Guide.

- **Define enrichment rules.** You can use the Enrichment Manager to define enrichment rules that add CIs, CI attributes, and relationships to the RTSM. Enrichment query nodes and relationships are created within a TQL query context, and the received data is used to insert new information, that cannot be discovered automatically by the Discovery process, into the RTSM.

For details, see "Define an Enrichment Rule – Scenario" in the Modeling Guide.

- **Create CITs and relationships.** You can use the CI Type Manager to create new CI types, and new relationships between CIs in the RTSM, to match your business needs.

**Note:** You should carry out a planning phase before you actually create new CITs and relationships, as they are likely to impact the rest of your data model.

For details, see "Create a CI Type" and "Create a Relationship Type" in the Modeling Guide.

- **Manage packages.** Packages are used to discover specific IT assets and CI types. You can use the Package Manager to edit packages, or create custom packages, if the factory packages do not contain the resources you need for the tools you develop or if you want to export resources from one system to another.

For details, see "Create a Custom Package" in the RTSM Administration Guide.

To learn more, see "[Run-time Service Model \(RTSM\)](#)" on page 16 and "[Modeling Components](#)" on page 20.

## Step 6. Configure APM Applications

Configure how APM manages and displays the incoming data in the different APM applications.

This section includes:

- "[Set User Permissions](#)" below
- "[Define Alerts](#)" on the next page
- "[Configure Service Health](#)" on the next page
- "[Define MyBSM Workspaces](#)" on the next page
- "[Define Service Level Agreements](#)" on page 33
- "[Configure End User Management](#)" on page 33
- "[Configure System Availability Management](#)" on page 33
- "[Configure System Health](#)" on page 34
- "[Define Customized Reports and Report Scheduling](#)" on page 34

### Set User Permissions

In User Management in Platform Administration, you can define permissions and recipients:

1. **Define user permissions.** To restrict the scope of user access to defined areas, create users and user groups, and assign permissions for your application's views and pages, according to the type of user. For details, see How to Configure Users and Permissions — Use-Case Scenario in the APM Platform Administration Guide.
2. **Create recipients of alerts or reports.** You can create the recipients of emails, pager, or SMS messages triggered by alerts, or scheduled reports, while creating the users. You can also create

recipients separately and assign them to users later. For details, see Recipient Management in the APM Platform Administration Guide.

## Define Alerts

You define triggers for alerts in various APM components, to proactively inform defined recipients when predefined performance limits are breached:

- **Application alerts.** There are two types of application alerts: CI Status alerts for high level information, and End User Management (EUM) alerts for low level of information.
  - **CI Status alerts** are triggered by a change in status of the relevant KPI, calculated in Service Health. For details, see How to Create a CI Status Alert Scheme and Attach it to a CI in the APM Application Administration Guide.
  - **EUM alerts** can be triggered based on Business Process Monitor and Real User Monitor data, including synthetic transactions and real user transactions, and the events on application servers. For details, see How to Create EUM Alert Schemes in the APM Application Administration Guide.
- **Service level agreement (SLA) alerts** are configured in Service Level Management Administration. The SLA alerts are triggered by the relevant change in SLA status. For details, see How to Define an SLA Alert Scheme in the APM Application Administration Guide.
- **SiteScope alerts** are triggered by an event or change of status in some element or system in your infrastructure. An alert definition contains settings that tell SiteScope what monitors can trigger the alert, what condition to watch for, and what information to send to recipients. For details, see "How to Configure an Alert" in the Using SiteScope Guide in the SiteScope Help.

## Configure Service Health

You can customize the way APM calculates information in Service Health. This customization can be done on different levels:

- Within the repositories you can modify the templates or building blocks of Service Health calculation.
- Within assignment administration, you can modify the automatic KPI and HI assignments and propagations.
- Within a specific view, you can modify KPI and HI settings on one or more CI instances.

For details, see How to Customize Calculations in Service Health in the APM Application Administration Guide.

**Note:** To learn more about Service Health, see ["Service Health" on page 17](#).

## Define MyBSM Workspaces

In MyBSM, you can create role-based workspaces for different types of users, such as operations users, and senior management. Workspaces provide smooth interaction between different APM applications and reports.

MyBSM contains out-of-the-box pages from different APM applications; you can also create pages to suit your needs.

For each page, you can:

- Select from a list of components that are of interest to the specific users or user groups. Components include available reports, views, diagrams, graphs, summaries, and other types of data displays.
- Define the layout of components on the page, and their interaction with other components.
- Organize pages and components by categories.

For details on how to set up MyBSM, see [How to Set Up the MyBSM Workspace](#) in the APM User Guide.

**Note:** To learn more about MyBSM, see ["MyBSM" on page 16](#).

## Define Service Level Agreements

In Service Level Management (SLM) administration, you can define services and service level agreements (SLAs):

**Tip:** If you have a CMS system with a central UCMDB, it is recommended that you create and model your Business Service CIs in the CMS, and then synchronize them into the RTSM for consumption in the SLM module.

1. **Define your organization's business services.** Define the services provided by, or consumed by, your organization, that represent the service offerings in your service catalog; for example, project management services, application development for departmental applications, Web development services, email services, backup services, and so forth. For details, see [How to Define a Service for an SLA – Use-Case Scenario](#) in the APM Application Administration Guide.
2. **Create your application-related SLAs.** Create and manage SLAs, OLAs (operational level agreements), and UCs (underpinning contracts) that represent contracts entered into by your organization or department with service providers and customers. For details, see [How to Use SLM to Monitor Your Service Agreements](#) in the APM Application Administration Guide.

To learn more about Service Level Management, see ["Service Level Management \(SLM\)" on page 17](#).

## Configure End User Management

In End User Management Administration, configure the applications, business transaction flows, and transactions for monitoring by Business Process Monitor, Real User Monitor, or both.

For details, see [How to Set up Business Process Monitors](#) and [How to Install Real User Monitor Components](#) in the APM Application Administration Guide.

**Note:** To learn more about End User Management, see ["End User Management \(EUM\)" on page 15](#).

## Configure System Availability Management

In System Availability Management Administration, you can access and manage SiteScopes from within APM:

1. **Add SiteScopes.** You can register and configure one or more SiteScopes. For details, see [Configuring the Connection](#) in the APM Application Administration Guide.
2. **Manage multiple SiteScopes.** You can configure SiteScope monitors, alerts, and reports and make any other configuration changes for the SiteScope. All the configuration changes that are done from System Availability Management Administration are reflected in the SiteScope itself. For details, see [How to](#)

Manage Multiple SiteScopes in System Availability Management in the APM Application Administration Guide.

**Note:** To learn more about System Availability Management, see "[System Availability Management \(SAM\)](#)" on page 18.

## Configure System Health

If you are using System Health to monitor your APM environment, there are a number of things you can configure. These include configuring the server's remote connection, and configuring backup servers from one Data Processing Server to another if the server machine is not functioning properly or requires downtime.

For details, see "Setting Up System Health" and "Configuring a Backup Server" in the System Health Guide.

## Define Customized Reports and Report Scheduling

In the User Reports application, you can:

- **Define customized reports for your organization's requirements.** Use the Report Manager to define Custom Reports, Trend Reports, and Service Reports, to focus on the data you are most interested in tracking. For details, see How to Create and Manage User Reports Using Report Manager in the APM User Guide.
- **Send scheduled reports to recipients.** Use the Report Manager to set schedules for sending automatically generated reports to specified recipients. For details, see Scheduling Reports in the APM User Guide.
- **Create queries to the profile database.** Use Custom Query Builder to assist you in creating queries to run reports. For details, see How to Create a Custom Query in the APM User Guide.

**Note:** To learn more about User Reports, see "[User Reports](#)" on page 19.

## Step 7. Monitor Business Status

View the incoming data and monitor the business status in the different APM applications.

This section includes:

- "[Monitor Customized Role-Based Workspaces](#)" on the next page
- "[Monitor Application Status](#)" on the next page
- "[Monitor Service Level Agreements](#)" on the next page
- "[Monitor End User Experience](#)" on the next page
- "[Monitor System Infrastructure](#)" on page 36
- "[Monitor APM System Health](#)" on page 36
- "[Monitor User Reports](#)" on page 36
- "[Monitor Diagnostics Data](#)" on page 36
- "[Monitor Anomalies](#)" on page 37

## Monitor Customized Role-Based Workspaces

MyBSM displays role-based workspaces that are of interest to specific users or groups of users, such as operations users, and senior management. The MyBSM workspace enables you to view:

- Out-of-the-box pages from different APM applications. For details on the predefined pages, see [Predefined Pages](#) in the APM User Guide.
- Customized pages containing APM components and external components relevant to your business tasks. For details on the different applications components that can be added to MyBSM pages, see [Available Components](#) in the APM User Guide.

**Note:** To learn more about MyBSM, see ["MyBSM" on page 16](#).

## Monitor Application Status

Service Health provides an integrated view of critical applications and business processes; from there, you can drill down to the underlying IT infrastructure associated with these critical business processes.

- You can use Service Health directly as a stand-alone application (select [Application > Service Health](#)). For details, see [Monitoring your Environment with Service Health](#) in the APM User Guide.
- You can combine Service Health components with components from other applications. These components can interact with one another, so that if for example you select a CI in a Service Health component, information on this CI can be displayed in a component from another application, such as [End User Management](#). For details, see [How to Open Pages and Components in Service Health](#) in the APM User Guide.

**Note:** To learn more about Service Health, see ["Service Health" on page 17](#).

## Monitor Service Level Agreements

You monitor your service level agreements in the Service Level Management application. The Service Level Management reports show you how well actual service levels compare with your objectives.

- Use the reports to determine whether the availability and performance requirements of users and infrastructure are being met, by checking service level agreement (SLA) compliance.
- You can also get an early warning of potential problems by generating a forecast status, to determine if current service levels may lead to a future breach of the SLA. For details, see [How to View SLA and Outage Reports](#) in the APM User Guide.

**Note:** To learn more about Service Level Management, see ["Service Level Management \(SLM\)" on page 17](#).

## Monitor End User Experience

You use the End User Management application to view and analyze reports based on performance data collected by the end-user data collectors. The End User Management reports enable you to proactively monitor network and application performance and availability in real time, from the end-user perspective. For details, see [End User Management Reports Overview](#) in the APM User Guide.

**Note:** To learn more about End User Management, see "[End User Management \(EUM\)](#)" on page 15.

## Monitor System Infrastructure

System Availability Management utilizes data collected by SiteScope, and enables you to monitor the health and status of the entire system infrastructure from a centralized, real-time perspective in:

- **System Availability Management Reports.** View reports and analyze performance data collected by the SiteScope data collector and stored in the APM database. For details, see SAM Reports in the APM User Guide.
- **Event Logs.** View information about events collected by SiteScope (generated alerts and status changes in some element or system in your infrastructure), as well as events collected from external applications or software by enterprise management systems using SiteScope. For details, see How to View the Event Log in the APM User Guide.

**Note:** To learn more about System Availability Management, see "[System Availability Management \(SAM\)](#)" on page 18.

## Monitor APM System Health

You can use the System Health component to monitor the health of the servers, databases, and data collectors that make up APMapm system. System Health enables you to detect problematic areas, perform various operations, and view status information on your APM environment. For details, see "Monitoring System Health" in the System Health Guide.

**Note:** To learn more about System Health, see "[System Health](#)" on page 18.

## Monitor User Reports

Use the Report Manager in the User Reports application to view and manage selected reports, including customized reports containing user-defined data.

For details about the Report Manager, see User Reports Overview in the APM User Guide.

**Note:** To learn more about custom reports, see "[User Reports](#)" on page 19.

## Monitor Diagnostics Data

Use the HPE Diagnostics integration to:

- **View HPE Diagnostics in APM.** You can see the performance status of applications monitored by HPE Diagnostics from your APM console (select Application > Service Health, and select the Diagnostics View in Model Explorer).
- **Access HPE Diagnostics from APM.** Drill down directly to Diagnostics data from APM CIs and reports for detailed performance analysis.

For details, see the HPE Diagnostics online help or the section on "Integrations" in the Diagnostics User's Guide (supplied with the HPE Diagnostics software).

**Note:** To learn more about HPE Diagnostics, see ["Diagnostics" on page 14](#).

## Monitor Anomalies

You can investigate the anomalies using the Topology views and the Metrics view. You use these views to investigate the root cause of an anomaly, and solve potential business performance and systems issues before they escalate.

For details, see [Investigating with the Topology View](#) and [Investigating with Metrics View](#) in the APM User Guide.

# Chapter 7: Quick Start Examples

This section shows how you can quickly set up different areas in APM to achieve fast results.

This chapter includes:

- "Quick Start - General" below
- "Quick Start - Service Health" on the next page
- "Quick Start - SLM" on page 41
- "Quick Start – SiteScope" on page 44

**Note:** For more detailed information on setting up Real User Monitor, refer to the Getting Started With RUM - Best Practices document, available at the HPE Software Support site (<https://softwaresupport.hpe.com/>).

## Quick Start - General

First-time users of APM are often overwhelmed by the numerous ways in which you can use APM to monitor your environment. The following section provides some suggestions on a few areas in APM where many users choose to focus their attention; this is of course not a comprehensive list, but is intended more as a starting point that you may find useful.

### End User Management:

After setting up End User Management, we suggest that you use the **End User Monitors view** to monitor your environment. The End User Monitors view is the default view in EUM Administration. The view displays only the applications (and their related CIs) that are actually configured for BPM or RUM. For details, see End User Monitors View in the APM Application Administration Guide.

You may want to look at the following pages:

- **360 by BPM.** This page displays online application status, together with status over time of transactions and related locations, from synthetic user perspectives. For details, see How to Troubleshoot Problems Using the 360 by BPM Page in the APM User Guide.
- **360 by RUM.** Displays online application status, together with status of the application tiers, transactions, and related locations, from real user perspectives. For details, see How to Troubleshoot Problems Using the 360 by RUM Page in the APM User Guide.

From BSM version 9.22, for each alert in BPM or RUM there is a direct link to the relevant report providing details on the root cause of the alert.

### SiteScope

After setting up SiteScope, we suggest you look at the following pages:

- **SiteScope Multi-View Page.** If you are working with SiteScope 11.22 and later, this page enables you to create a Watch List of important SiteScope profiles. You can then select a profile and view its details in the SiteScope Multi-View component. For details, see "SiteScope Multi-View" in the Using SiteScope Guide.
- **Top View** page, focused on the **System Infrastructure** view. For details, see Top View in the APM User Guide.
- Create a page with a **View Selector** and **Cross-Performance Report**. This report displays data from

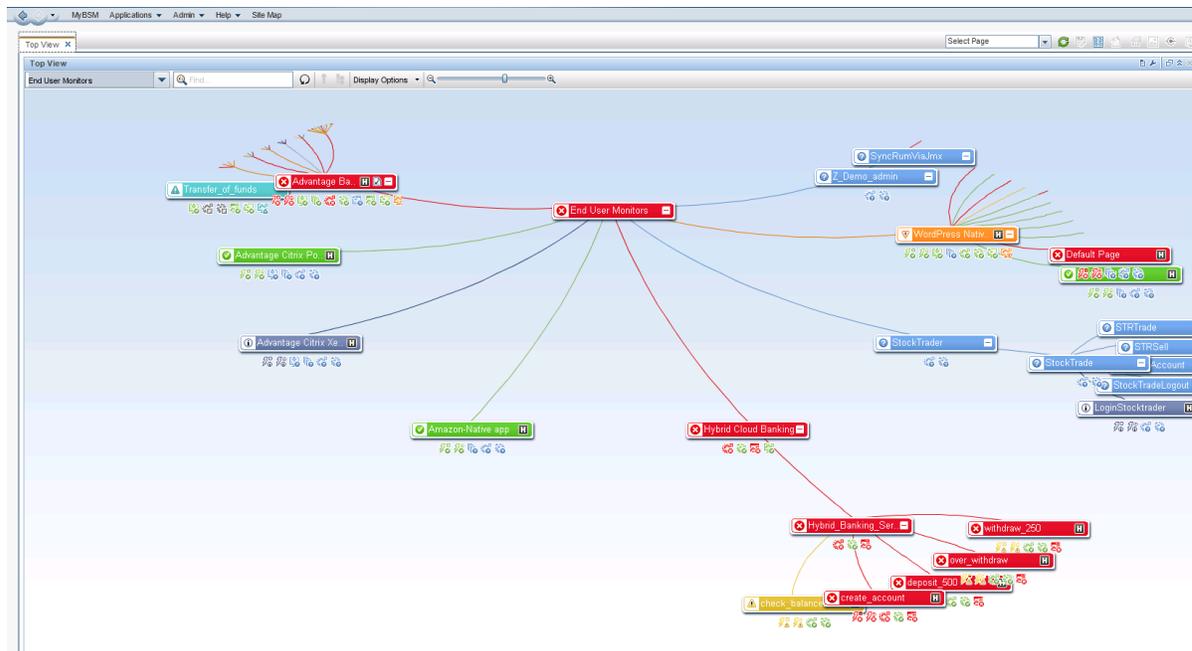
SiteScope servers, filtered by monitored servers, monitor types, and measurements. For details, see Cross-Performance Report in the APM User Guide.

## Quick Start - Service Health

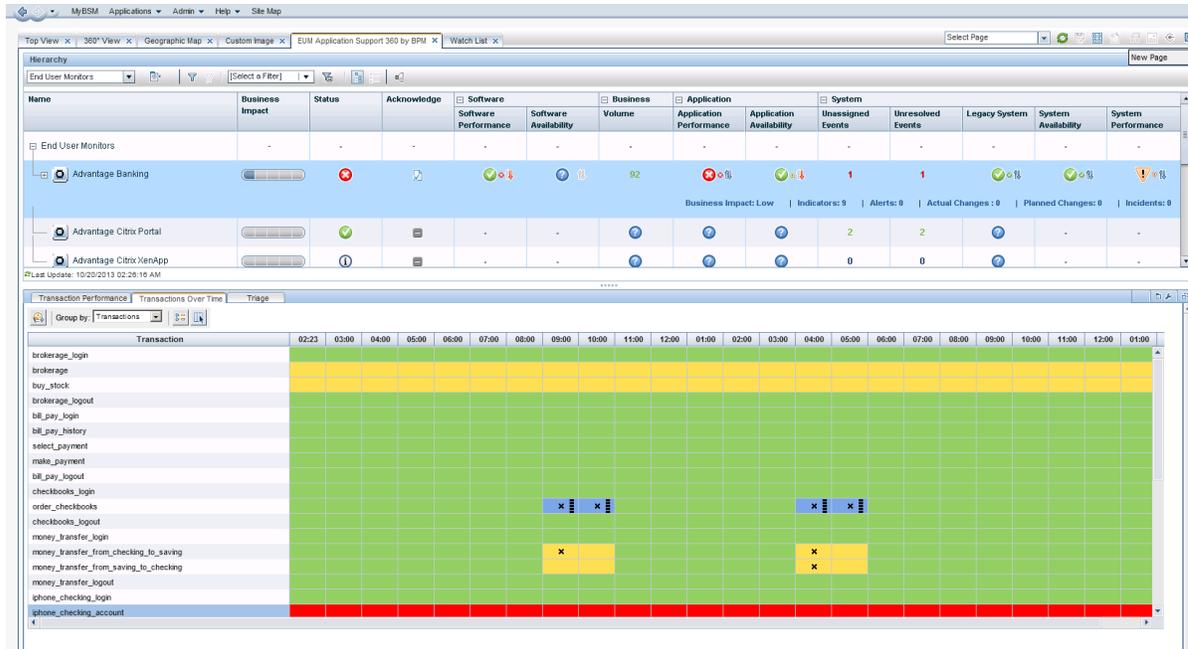
The Service Health application provides a convenient entry point into APM, giving you an integrated view of critical applications and business processes. From there, you can drill down to the underlying IT infrastructure associated with these critical business processes. This drilldown view can be laid out in any number of ways, such as by data centers, by technology clusters, by geographical locations, and so on. For more details, see Service Health Overview in the APM User Guide.

The following example provides a quick glance at what Service Health can offer you; it is important to note that this is not comprehensive, and only serves as a brief introduction to how you can quickly utilize APM using the Service Health application.

1. The APM administrator has set up monitors on various hosts, and a NOC user is monitoring these using the Service Health Top View page. Top View provides us with a high-level view of the monitored environment, enabling us to focus at a glance on problematic areas. To use Top View, we first select a view in the upper left corner. We select the End User Monitors view because the applications are monitored by EUM (BPM and RUM):

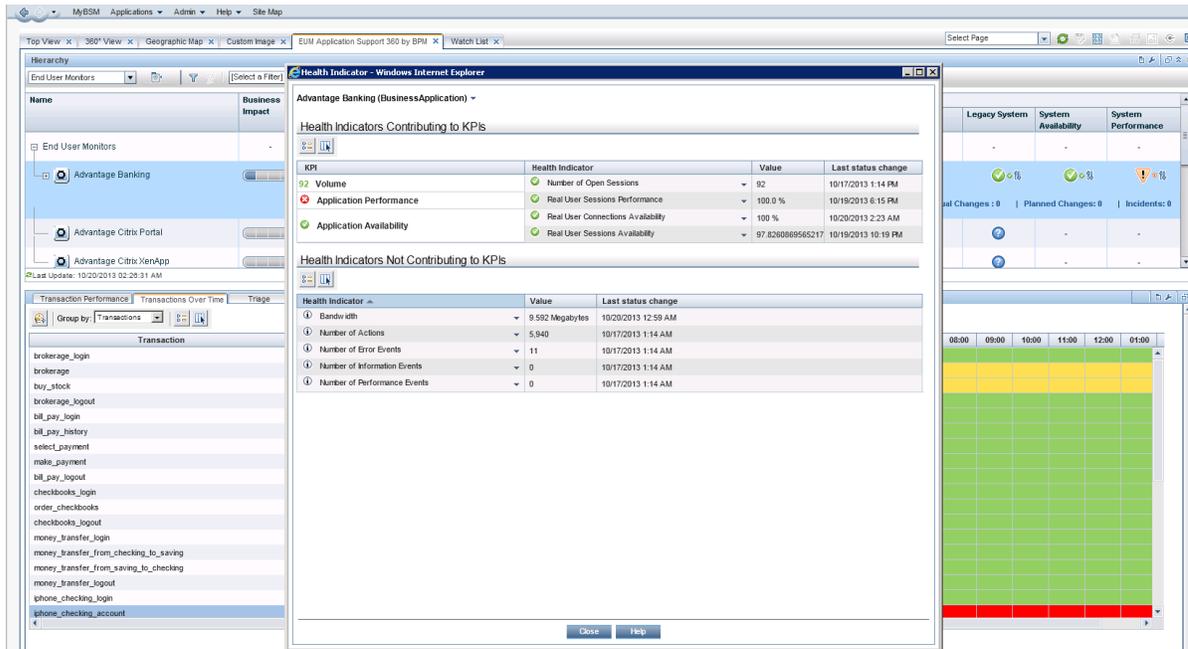


2. In the upper left area, we see there is a problem in the Advantage Banking application. To further explore the problem, we open the 360 by BPM page, which displays online application status, together with status over time of transactions and related locations, from synthetic user perspectives:

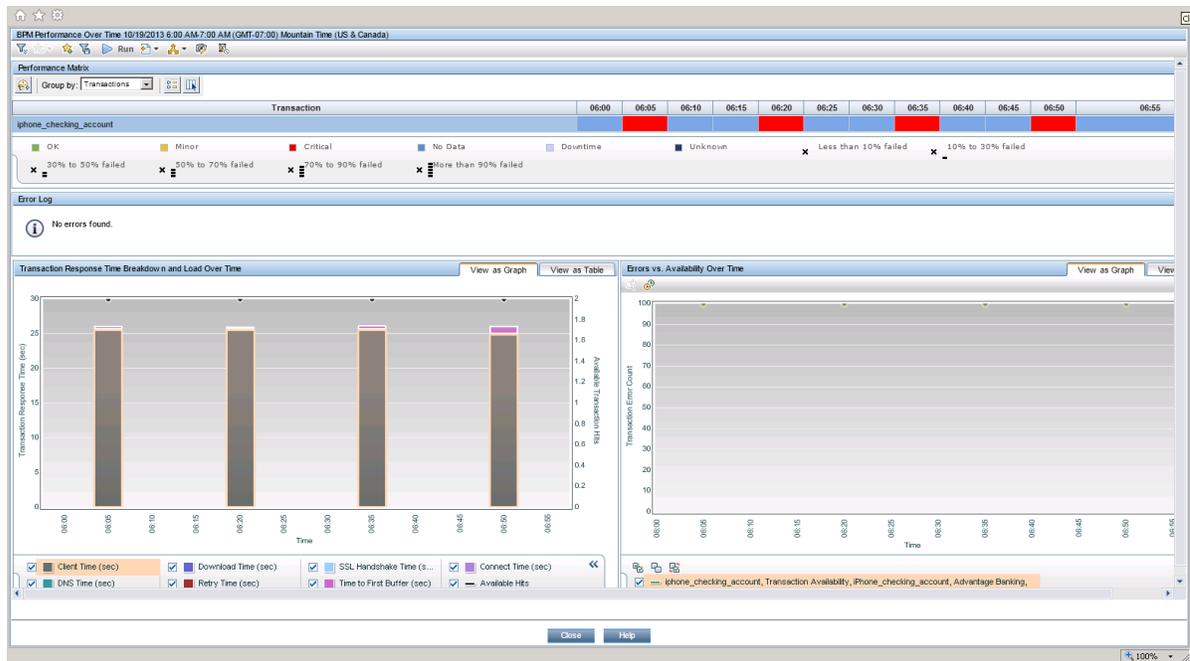


The upper section of this page contains the Hierarchy component, which shows the application hierarchy, and the status of each CI's KPIs. The lower section shows transaction performance over time, giving us an indication of the history of a problem. We see that the `iphone_checking_account` transaction is problematic.

- To get more details about the root cause, we click the Indicators link for the Advantage Banking application, opening the Health Indicators component. This component shows the granular measurements which contribute to the KPI's statuses:



- To get more details on the problematic transaction, we double-click the row in the Transactions Over Time pane. This drills down to the BPM Performance Over Time report for the specific transaction:



Now that we have information on the root cause we can progress to solving the problem.

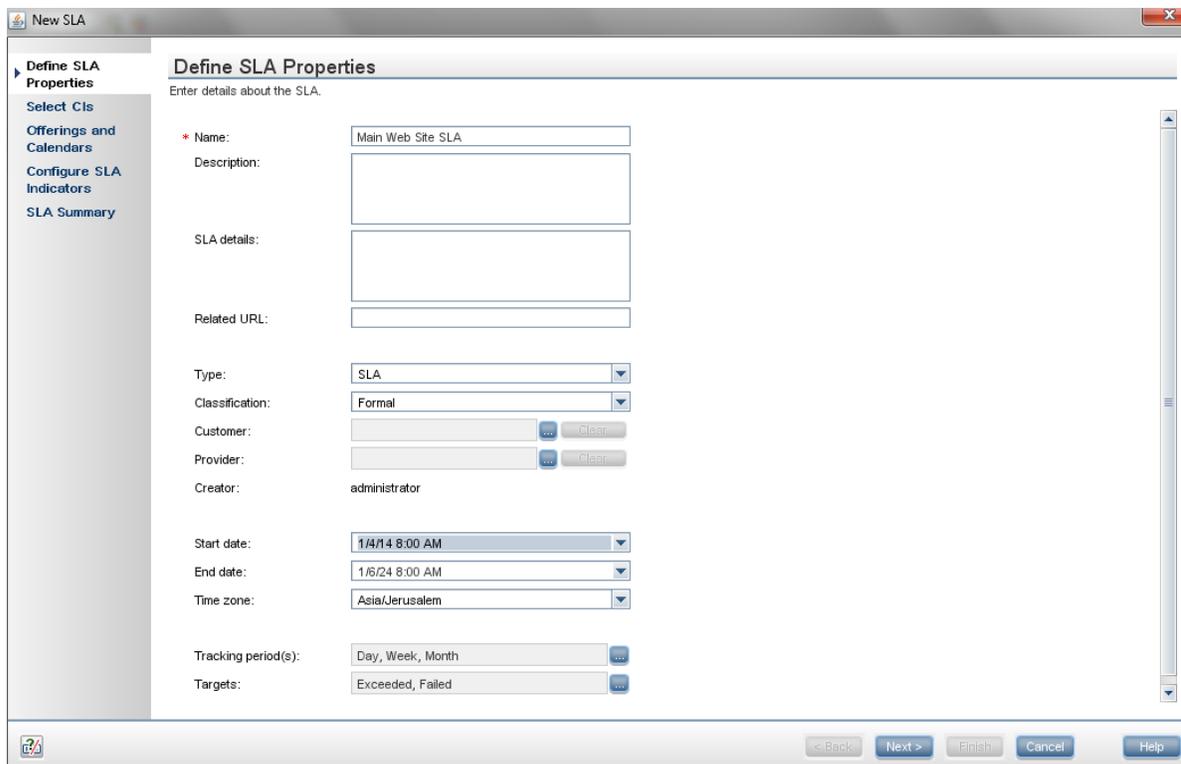
## Quick Start - SLM

Service Level Management (SLM) enables you to proactively manage service level agreements from a business perspective. It provides reporting that lets you measure and monitor application service levels against business objectives. Service Level Management allows you to define realistic, quantifiable service-level objectives and track performance. Reports are generated that display the performance of these services in a way that shows the business that IT is meeting its obligations. For details, see Service Level Management Overview in the APM Application Administration Guide.

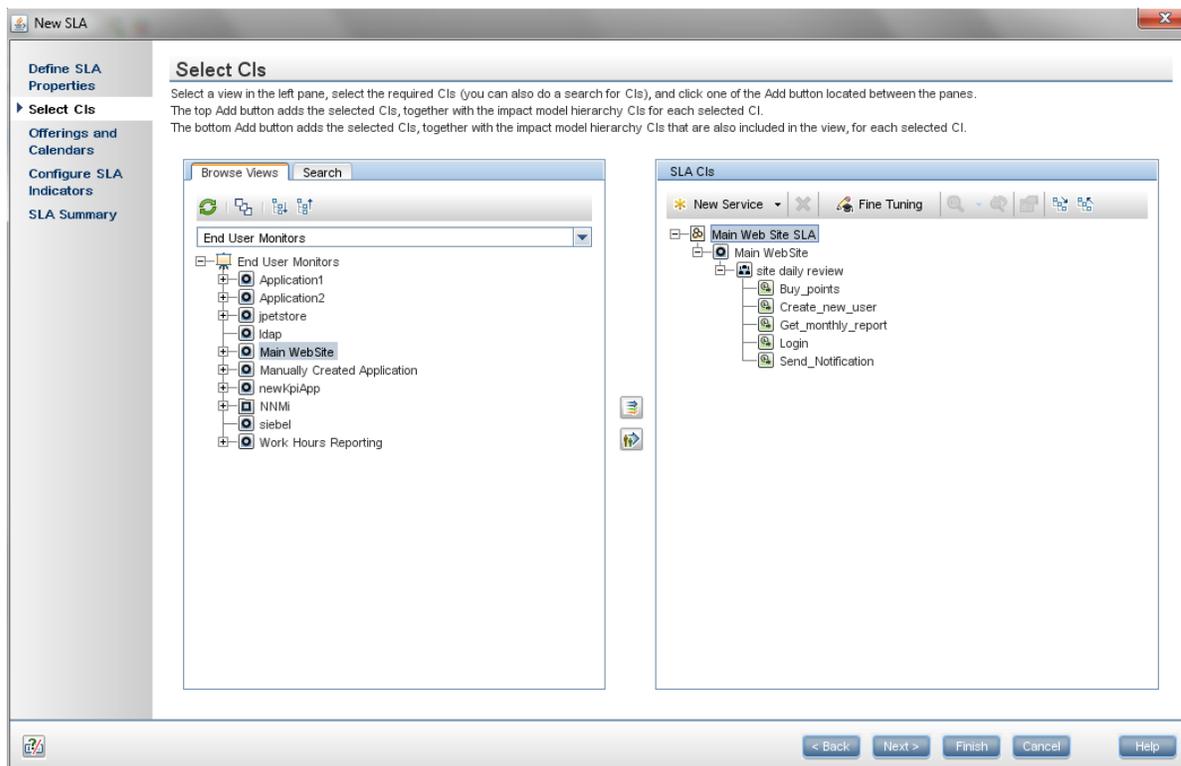
SLM receives availability and performance data, aggregates them, and calculates values that it compares with the required service level objectives. The results are displayed in reports within the SLM application.

The following example shows how you can quickly set up an SLA; note that this is not comprehensive, and only serves as a brief introduction to how you can quickly implement SLM in your APM environment. In this example, the APM administrator has already set up application monitoring by Business Process Monitor (BPM) to monitor a web site. We will use default SLM settings to quickly create an SLA, and monitor compliance with this SLA.

1. In SLM administration, we click **New SLA** on the Agreement Managers page to open the New SLA Wizard.
2. In the **Define SLA Properties** page, we name our SLA. The only other setting we change on this page is the SLA start date, which we define as two days ago. This enables us to see data in SLM reports as soon as we finish creating the SLA, rather than waiting a few days for data to be collected.



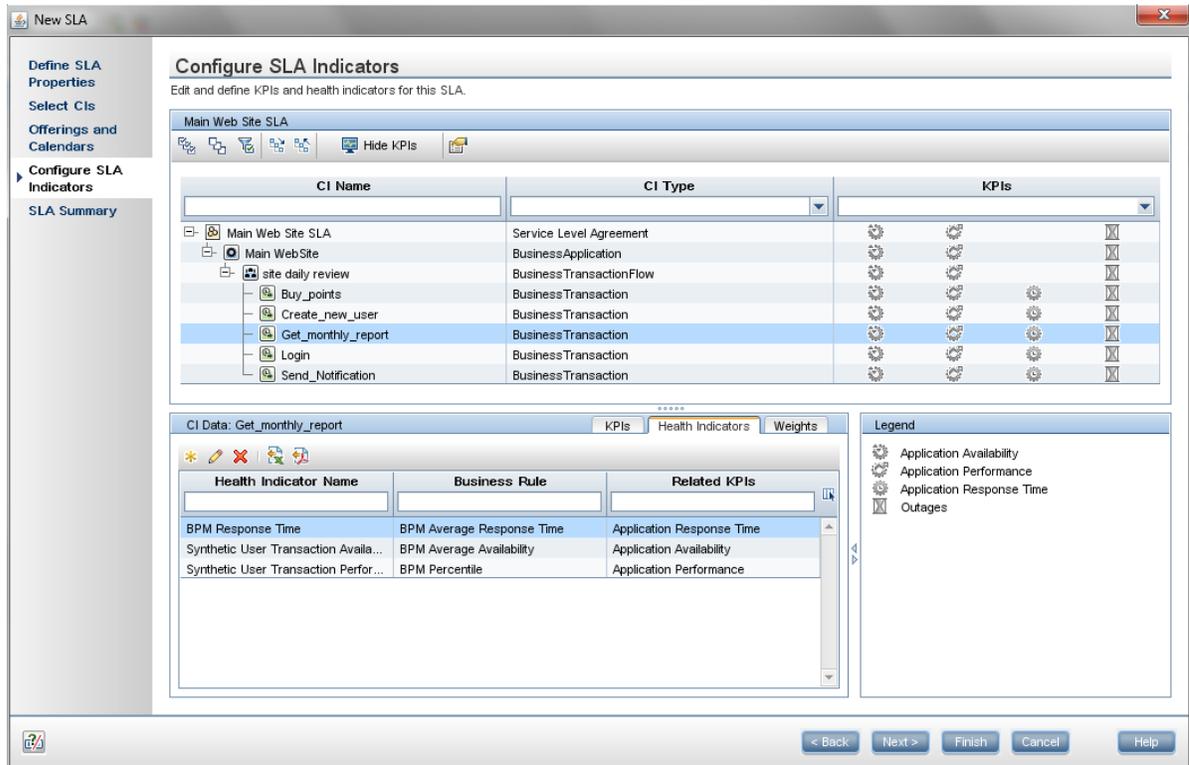
3. In the **Select CIs** page, we add the CIs that represent the application monitored by BPM. We selected the **End User Monitors** out-of-the-box view since it contains our business application which has been configured for BPM monitoring.



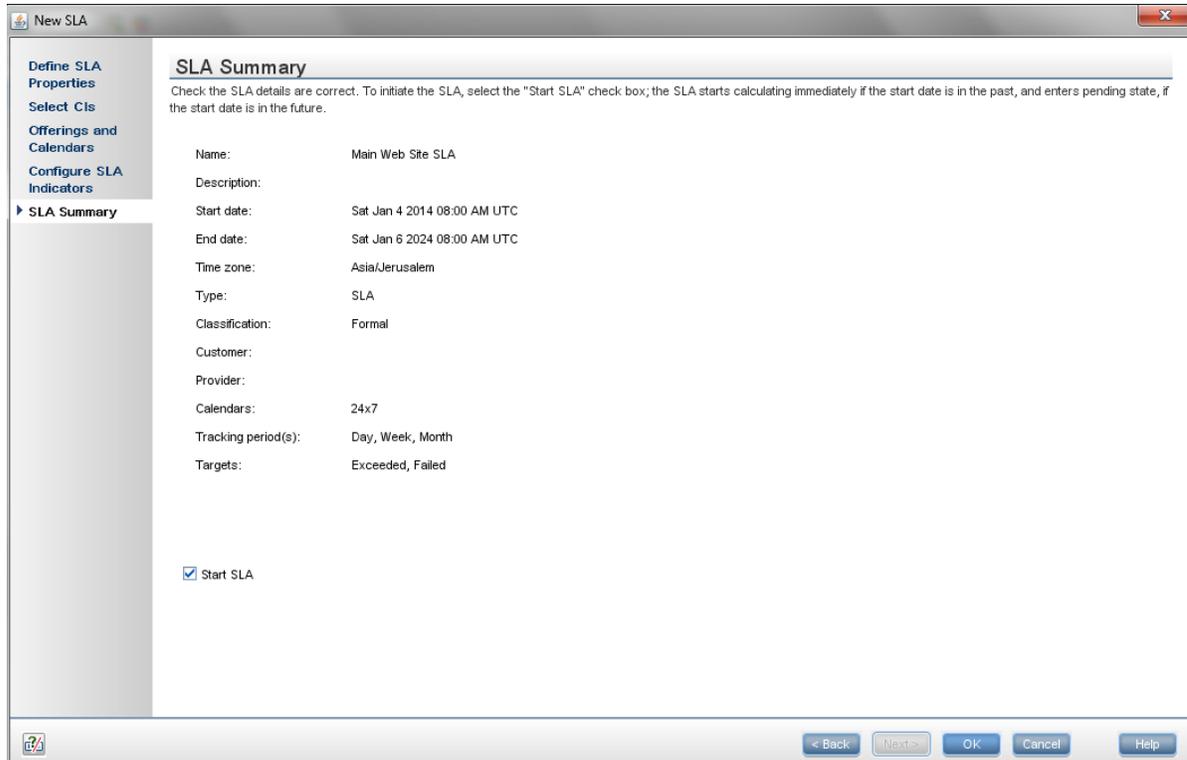
At this point our SLA is defined with the default settings. If we do not need to view offerings or calendars, or SLA indicators, we can click **Finish** to move directly to the **SLA Summary** page.

4. In the **Offerings and Calendars** page, we can view the redefined offering packages to be applied to the CIs in the SLA and the calendars that define the periods for which SLM performs data calculations. After viewing the offerings and calendars, we can click **Finish** to move directly to the **SLA Summary** page.
5. In the **Configure SLA Indicators** page, we can view the default indicators that are defined by the indicator assignments (KPIs and HIs) and offering level (Objectives). This robust interface enables us to apply any business rule to on any raw data. We can define new KPIs and health indicators, or edit the existing ones. We can also configure CI weights to be used in indicator calculations. Note that you can view or modify indicators by selecting a CI in the upper pane, and editing its indicator settings in the lower pane.

After viewing the SLA indicators, click **Finish** to move to the **SLA Summary** page.



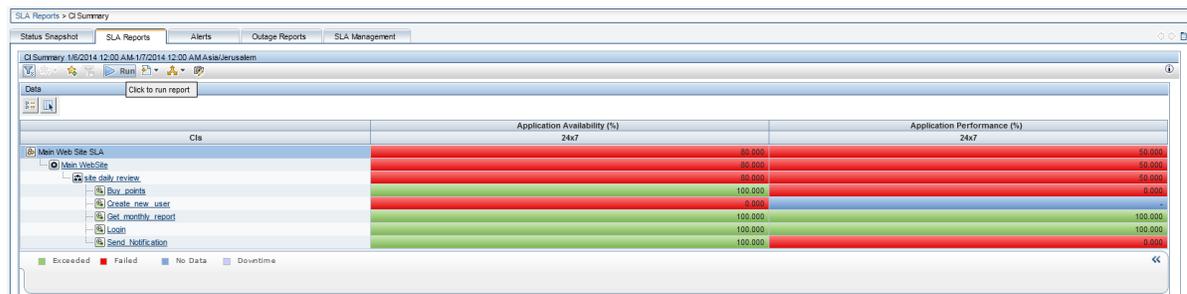
6. The **SLA Summary** page shows the SLA we have just defined.



- APM then takes a few minutes to calculate the SLA. When calculation is complete, we can view details on the SLA's status in the SLM application. Service Level Management reports shows how well actual service levels compare with our business goals. The reports provide a bird's eye view of the whole system, and enable us to get an early warning of potential problems, before SLA violations occur.

We can use SLA reports to explore our SLA status. The **Status Snapshot** shows a summary of the SLA's status. More detailed information on the SLA's CIs and KPIs can be found in **SLA Reports > CI Summary**.

We run the report on our SLA for all KPIs, during the last week. The following is an example that displays the newly created SLA measuring performance and availability for the last week.



## Quick Start - SiteScope

SiteScope is an agentless monitoring solution designed to help you ensure the availability and performance of distributed IT infrastructure and applications. SiteScope continually monitors IT components through a web-based architecture that does not require installing data collection agents on your production systems.

This example is designed to lead you through the process of creating a basic monitoring structure in SiteScope, and seeing how data collected by SiteScope monitors can be used in APM. APM receives data about end-users, business processes, and systems and uses the data in reports and analysis.

In this example you will learn:

- How to deploy the SiteScope Windows template example to monitor CPU utilization and memory resource usage in your environment.
- How metrics data collected by these SiteScope monitors is used in various applications in APM.

**Note:** This example describes how to set up a basic monitoring structure using the SiteScope template example. For a comprehensive guide on working with SiteScope, refer to the Using SiteScope Guide (available on the [HPE Software Support site](#)).

## How do I Configure SiteScope to be Used as a Data Collector for APM?

When configured as a data collector for APM, the metrics and topology data collected by SiteScope monitors can be passed on to APM for analysis and for use in reports.

APM includes a System Availability Management (SAM) Administration page, that enables you to manage SiteScope monitor configurations for one or more SiteScope servers through a central console.

### 1. Download and install SiteScope

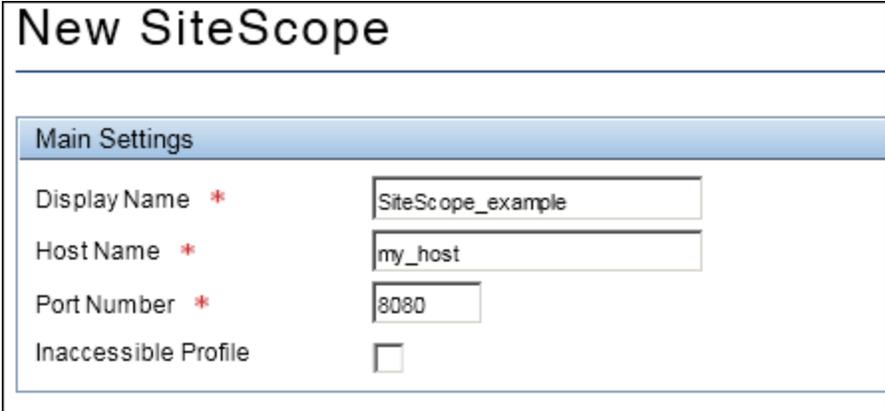
In APM, navigate to **Admin > Platform > Setup and Maintenance**, and click **Downloads**. Download and save the SiteScope installation files (for Windows or Solaris) to a local or network drive.

Install SiteScope on machines designated to run the SiteScope data collector. You can run multiple SiteScopes from multiple platforms. For more information, see the HPE SiteScope Deployment Guide.

**Note:** This guide assumes that SiteScope has been fully installed and configured, and that you are a user with authenticated access to the remote server. For more information, contact your SiteScope administrator.

### 2. Connect the installed SiteScope with APM

In APM, navigate to **Admin > System Availability Management**, and add the SiteScope to SAM Administration.



| Main Settings        |                          |
|----------------------|--------------------------|
| Display Name *       | SiteScope_example        |
| Host Name *          | my_host                  |
| Port Number *        | 8080                     |
| Inaccessible Profile | <input type="checkbox"/> |

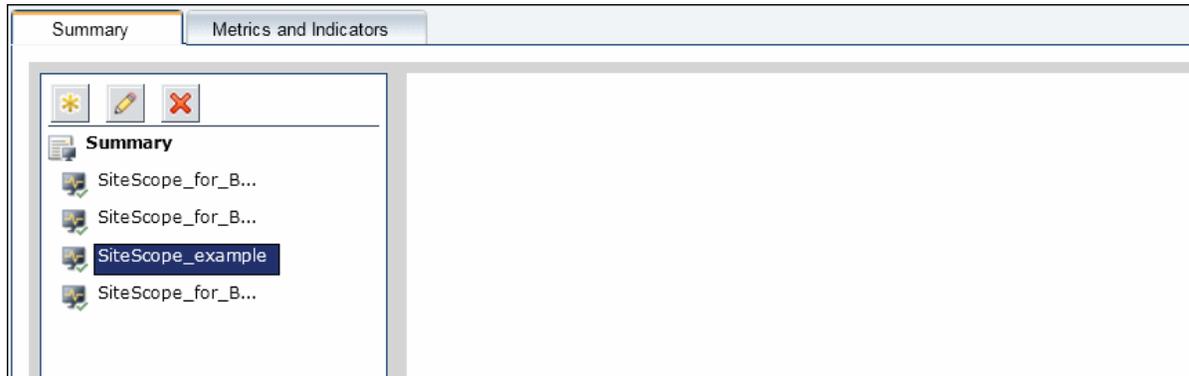
After activating the APM integration, SiteScope data flows to APM.

Now that you have configured SiteScope to communicate with APM, you can create a monitoring structure in SiteScope.

## How do I Create a Monitoring Structure in SiteScope?

### 1. Access SiteScope

In the System Availability Management Administration page in APM (**Admin > System Availability Management**), select the SiteScope server in the left pane.



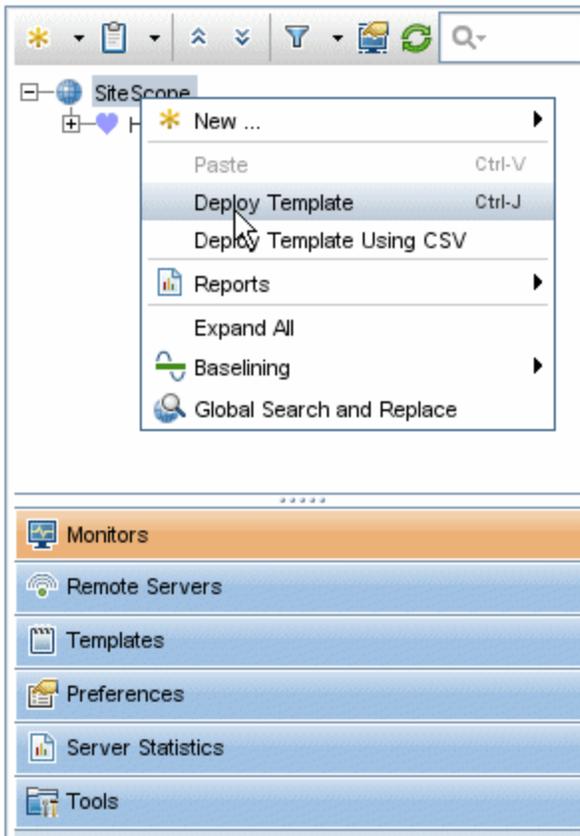
When you select a SiteScope in the tree, the right pane displays that SiteScope's Dashboard and you can perform any function within the SiteScope.

**Tip:** You can also access SiteScope directly by entering the SiteScope address in a Web browser. The default address is: **http://<server name>:8080/SiteScope**.

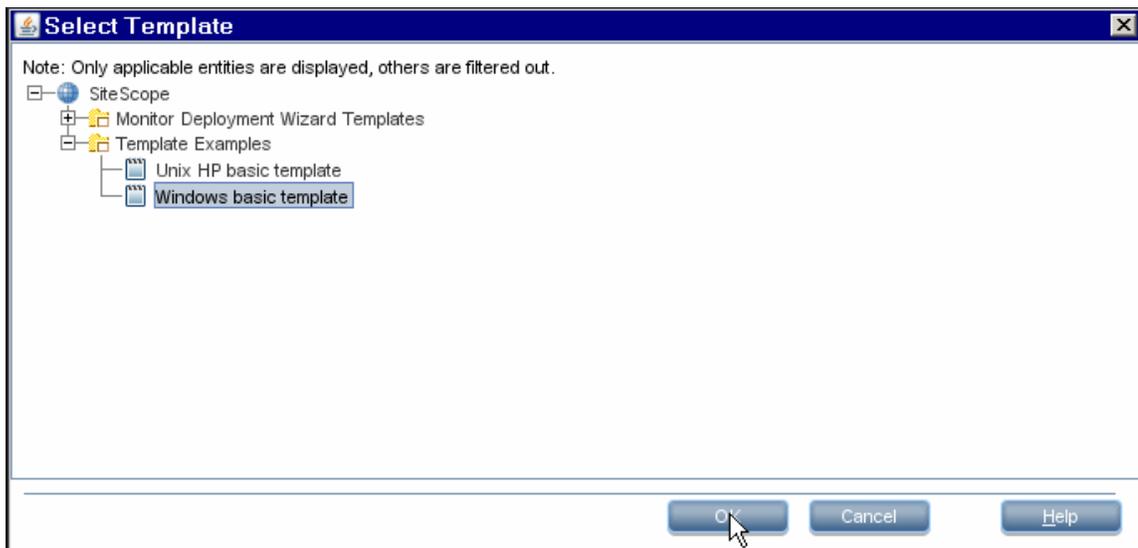
### 2. Deploy the Windows template example

Templates are used to standardize a set of monitor types and configurations into a single structure. This structure can be repeatedly deployed and updated through a single-operation.

- a. In the SiteScope monitor tree, right-click the **SiteScope** root folder, and select **Deploy Template**.



- b. In the Select Template dialog box, select **Windows basic template** from the **Template Examples** container and click **OK**.

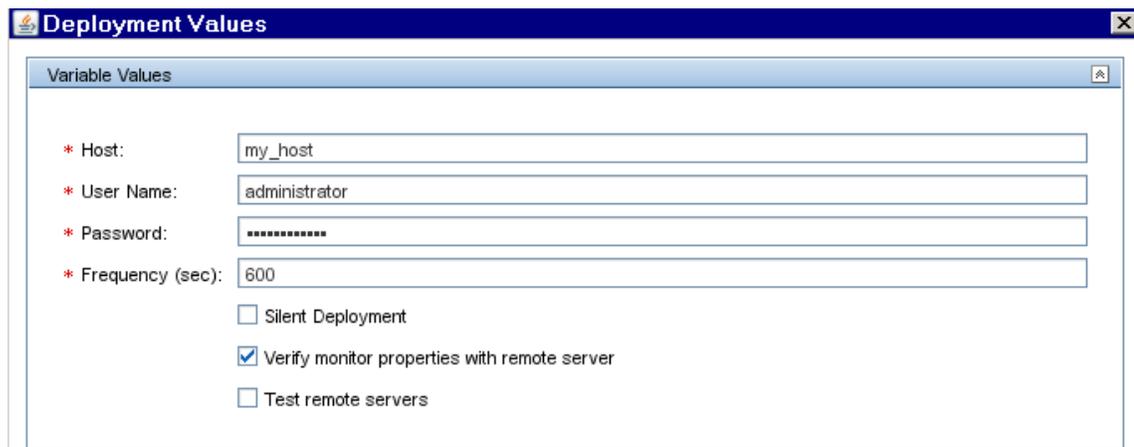


- c. In the Deployment Values dialog box, enter the required variable values in the entry boxes displayed. The entry boxes correspond to the template variables used in the template objects.

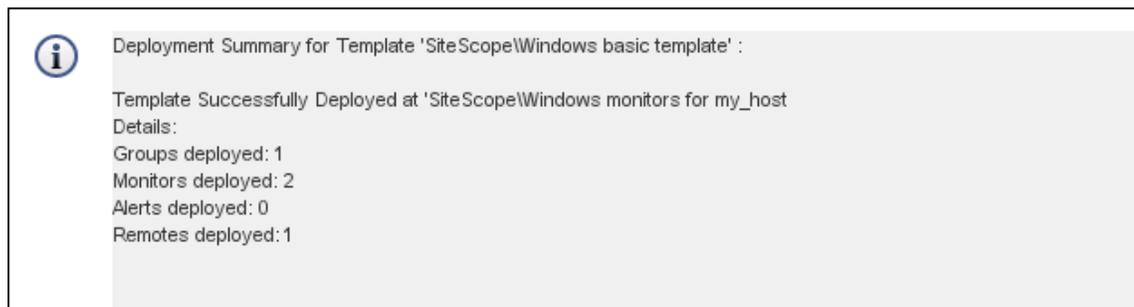
**Host:** Name or IP address of the remote server that should be monitored by SiteScope.

**User Name:** Login name to access the target server.

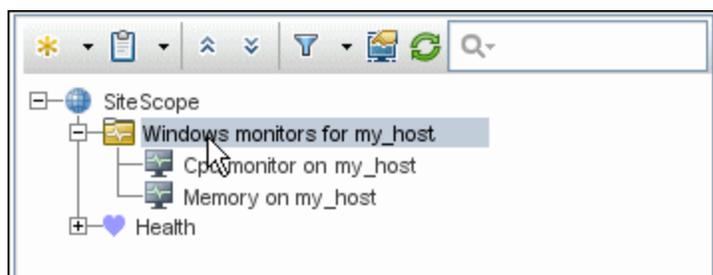
**Password:** Password to access the target server.



- d. A summary of the template deployment is displayed.

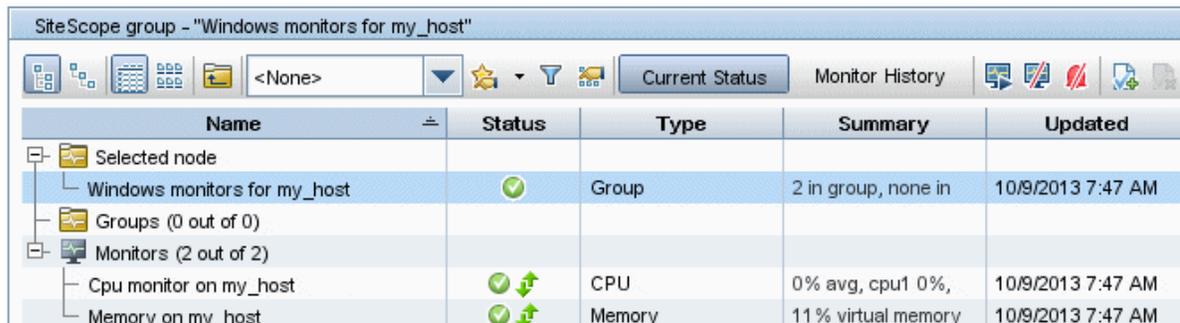


If the deployment is successful, the template objects are added to the monitor tree and the monitors are scheduled to run.



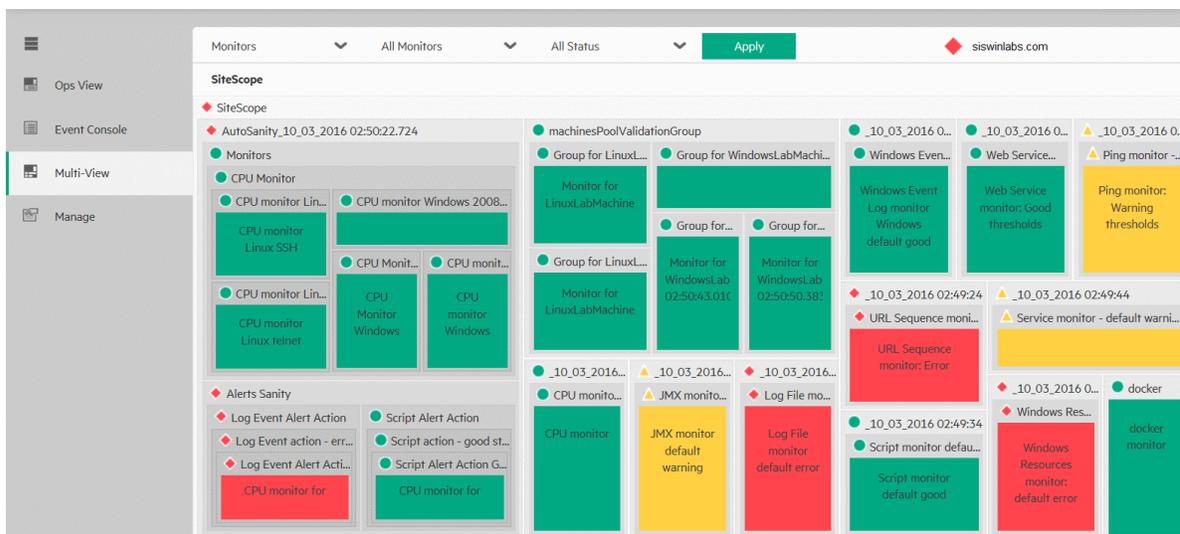
### 3. View monitoring data in SiteScope

You can view current performance data for the CPU and Memory monitors in the SiteScope Dashboard. The Dashboard displays availability, status and metrics information for these monitors.



| Name                         | Status | Type   | Summary             | Updated           |
|------------------------------|--------|--------|---------------------|-------------------|
| Selected node                |        |        |                     |                   |
| Windows monitors for my_host | ✓      | Group  | 2 in group, none in | 10/9/2013 7:47 AM |
| Groups (0 out of 0)          |        |        |                     |                   |
| Monitors (2 out of 2)        |        |        |                     |                   |
| Cpu monitor on my_host       | ✓ ↑    | CPU    | 0% avg, cpu1 0%,    | 10/9/2013 7:47 AM |
| Memory on my_host            | ✓ ↑    | Memory | 11 % virtual memory | 10/9/2013 7:47 AM |

You can also view performance data in SiteScope's Multi-View. It fully utilizes the screen to display the near-real time status of all groups and monitors without losing the hierarchical relationship between the data. Groups and monitors are color-coded to provide quick, at-a-glance information on performance status. Objects can be grouped in various different ways to fit the perspective of different personas.



## How do I View Monitoring Data in APM?

After you have configured SiteScope to communicate with APM and you have created a monitoring structure in SiteScope, you can run the monitor.

**Note:** By default, SiteScope sends all monitor data to APM for each time that the monitor runs. If necessary, you can change this setting (to disable reporting, report monitor status only, or report monitor status and metrics with thresholds) in the SiteScope monitor properties (**HPE Integration Settings > APM Integration Data and Topology Settings**).

After the monitor run has finished, you can view the results in the following APM applications:

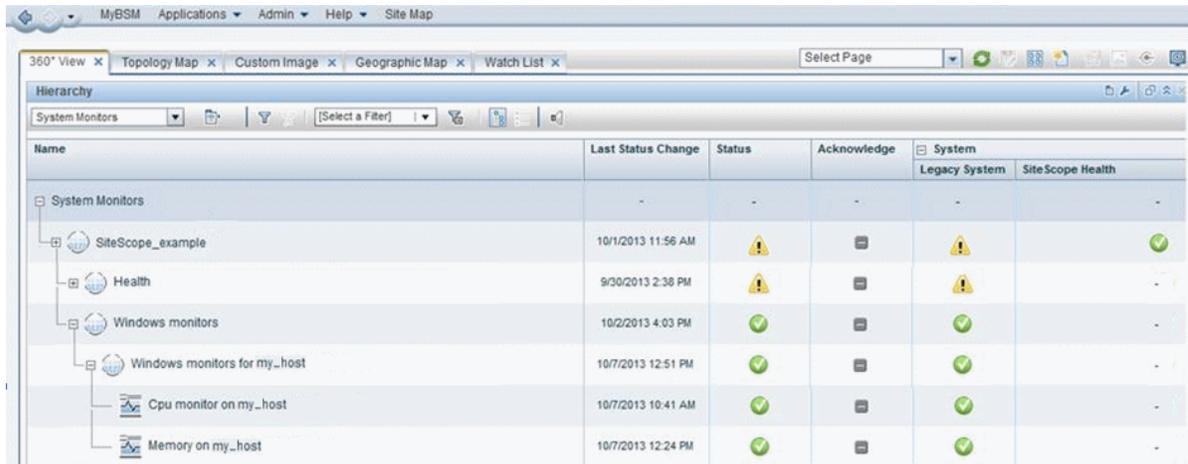
- **Service Health.** You can see the statuses corresponding to metric samples reported by SiteScope monitors in the System Monitors view and System Hardware Monitoring view.

- **System Availability Management Reports.** You can use the SiteScope Over Time reports to view and analyze infrastructure machine-related data collected by SiteScope. You can cross-reference this data with transaction performance problems, such as slow transaction response times and failed transactions, to understand the root cause of application performance issues. In the different reports, specify a filter for the data that you want to be displayed in the graphs.

**1. Check Service Health:**

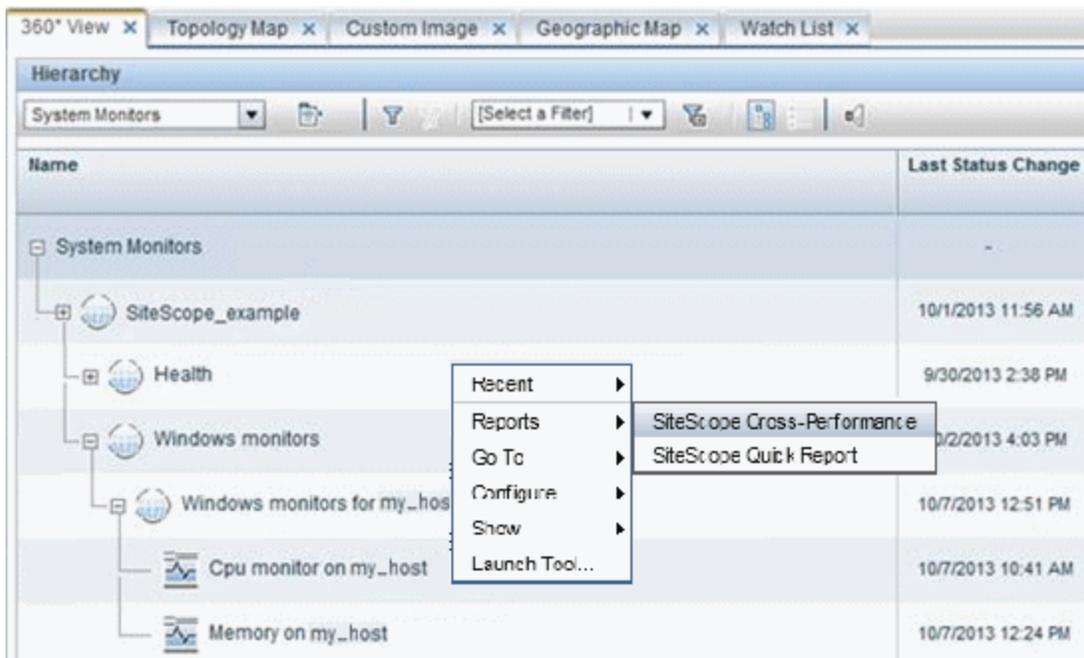
In APM, navigate to **Applications > Service Health > 360° View**.

In the drop down list, select **System Monitors** to view each monitor and its status.

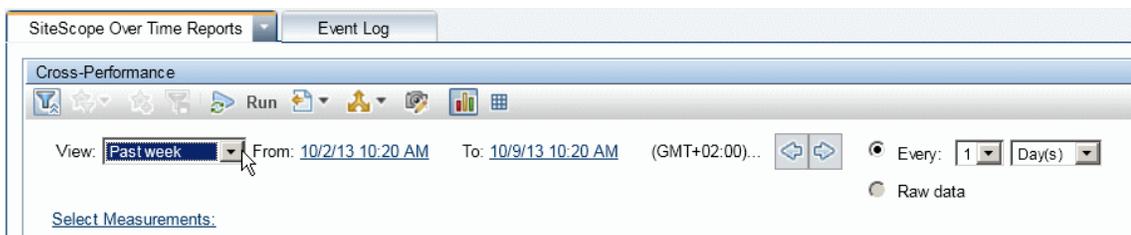


**2. View System Availability Management Reports:**

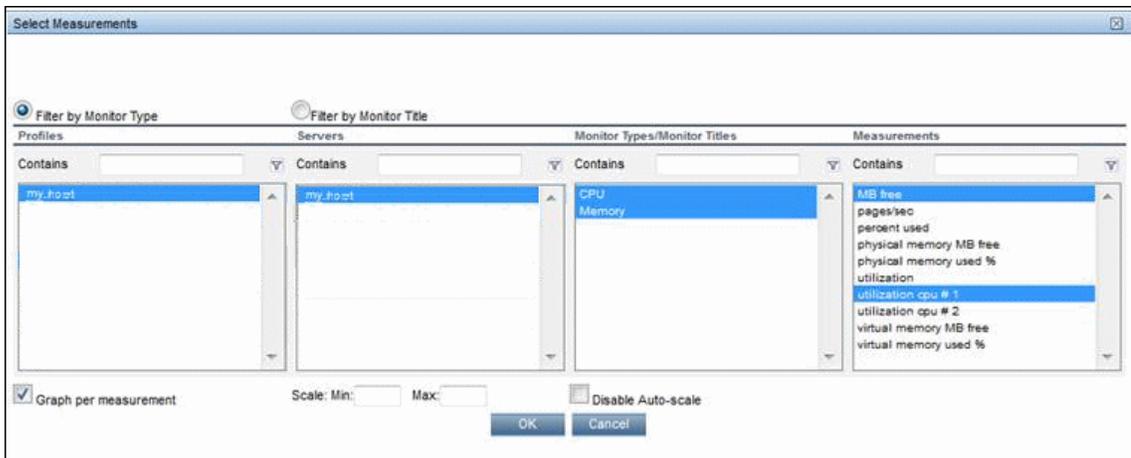
- You can access the System Availability Management Cross-Performance Report from 360° View in Service Health. Right-click the CI, and select **Reports > SiteScope Cross-Performance**.



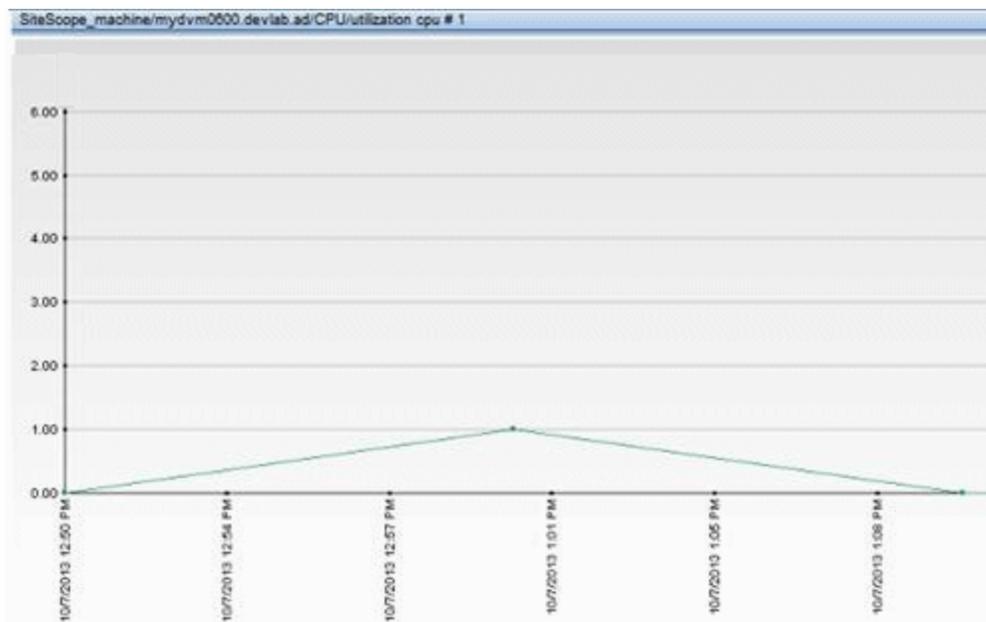
- Select the time period and the granularity with which you want to run the report, for example, Past Week. The granularity determines how many measurement samples are displayed in the report per time interval.

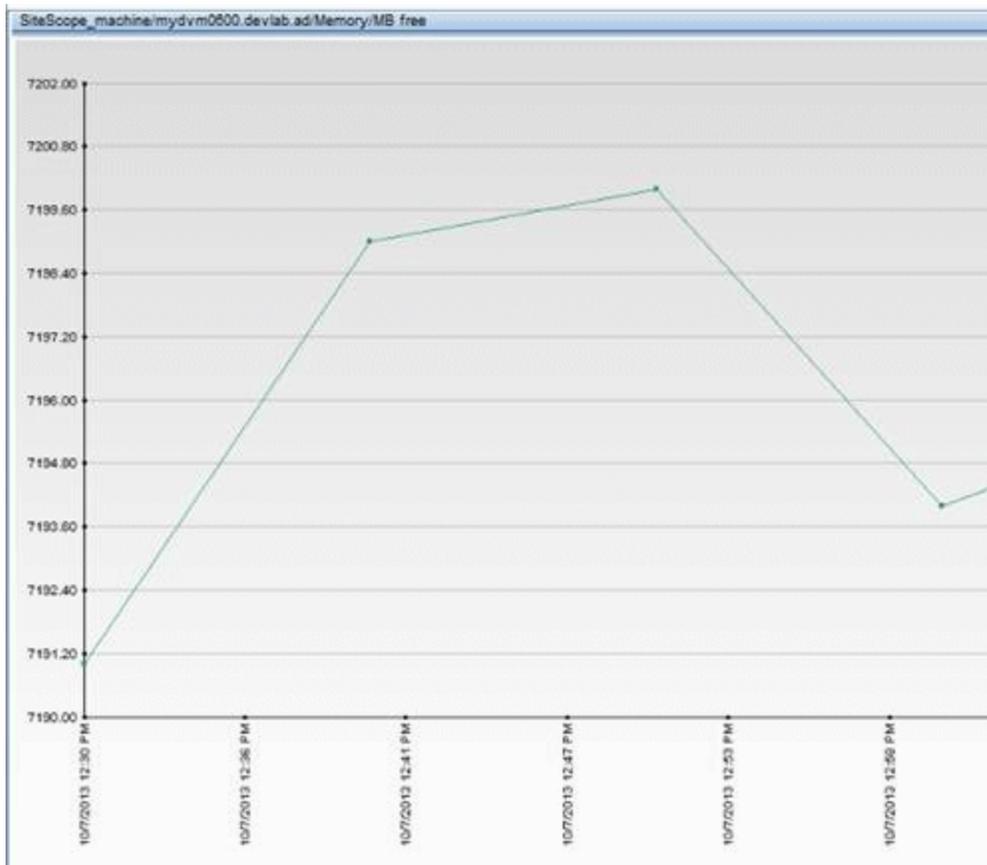


- c. Click the **Select Measurements** link to choose the measurements you want the Cross-Performance report to monitor.



- d. Click **Generate** to create the report. The filter area of the page closes and the report opens displaying data from the SiteScope server filtered by monitored servers, monitor types, and measurements.





### Where Do I Go From Here?

For more information on SiteScope, see the SiteScope documentation on the [HPE Software Support site](#) or visit the HPE SiteScope Product page (<http://www.hpe.com/software/sitescope>).

For more information on System Availability Management, see the Using System Availability Management section of the APM Application Administration Guide on the [HPE Software Support site](#).

# Part 2: Preparing to Install APM

# Chapter 8: Deployment Planning

This chapter includes:

- ["Deployment Planning Checklist" below](#)
- ["Deployment Planning Considerations" on the next page](#)
- ["Using the Capacity Calculator" on page 57](#)

## Deployment Planning Checklist

Deploying HPE Application Performance Management (APM) in an enterprise network environment is a process that requires resource planning, system architecture design, and a well-planned deployment strategy. The checklist below describes some of the basic issues that should be considered prior to installation. HPE Software Professional Services offers consulting services to assist customers with APM strategy, planning and deployment. For information, contact an HPE representative.

Use this checklist to review the basic issues that your organization should consider when planning the APM deployment.

| ✓ | Step  |
|---|---|
|   | Analyze the IT processes and organizational structure and culture that can affect, or be affected by, the deployment.   |
|   | Map the customer environment.   |
|   | Analyze the organization's goals and identify the key IT-enabled business processes to achieve these goals.   |
|   | Identify the target users (those with a vested interest in the business processes), for example, executives, LOB managers, marketing managers, customer support personnel, support engineers, and so forth. |
|   | Align the project with current performance management practices.  |
|   | Map the architecture of the monitored infrastructure, including identifying the processes, systems, system resources, and other infrastructure elements to monitor in each of the applications.             |
|   | Define the project deliverables, including setting expectations regarding measurements, features, the deployment scope, and maturity levels.  |
|   | Identify the appropriate HPE Application Performance Management functionality.  |
|   | Build a deployment roadmap.   |
|   | Define success criteria for the project.  |
|   | Define performance and availability objectives for each monitored business process.   |
|   | Define measurement types to be supported at each deployment stage.  |

| ✓ | Step   |
|---|--|
|   | Form HPE Application Performance Management administration and operations team(s).   |
|   | Plan the practical aspects of the deployment, including system architecture and capacity planning using the capacity calculator; and database environment and security considerations, and so forth. |

## Deployment Planning Considerations

This section provides different information that may be useful while planning an APM deployment. This section contains:

- ["How to determine the hardware requirements that will satisfy the expected capacity?" below](#)
- ["How to determine which deployment type to choose \(One-machine or distributed\)?" below](#)
- ["How many APM machines do I need?" below](#)
- ["Should I deploy APM on virtual machines?" on the next page](#)
- ["What specific hardware should I purchase?" on the next page](#)
- ["How to choose your operating system? \(Windows/Linux\)" on the next page](#)
- ["How much disk space is required for the database schemas?" on the next page](#)
- ["Do I need a CMS, or is RTSM enough for my needs?" on the next page](#)
- ["Which web server to choose?" on the next page](#)
- ["What disaster recovery aspects should I consider?" on the next page](#)
- ["What network aspects should I consider?" on page 57](#)

### How to determine the hardware requirements that will satisfy the expected capacity?

Use the APM 9 Deployments and Capacity Calculator for planning the APM deployment. The calculator determines the required hardware profile per deployment type. When using the calculator, consider expected growth in the near future. For details, see ["Using the Capacity Calculator" on page 57](#).

### How to determine which deployment type to choose (One-machine or distributed)?

APM can be installed either as a one-machine deployment or as a distributed deployment (Gateway and Data Processing Servers installed on separate machines). To choose the deployment type, consider the following:

- The hardware required for each type as reflected in the Deployments and Capacity Calculator results. For large capacities, the one-machine deployment might require a machine with a very large RAM that will not be recommended/supported by your IT.
- One-machine deployment is more economic in terms of resources since many of the common components are deployed only once.
- In terms of best practices - both are recommended and supported.

### How many APM machines do I need?

- The basic APM deployment consists of either one one-machine installation, or one Gateway (GW) installation and one Data Processing (DPS) installation.

- To increase availability and reliability of APM, it is recommended to deploy at least one additional one-machine installation/GW+DPS installation pair. For more information, see "[Benefits of a Multi-Server Deployment](#)" on page 66.
- To scale the number of APM concurrent users you can add additional Gateway machines (or additional one-machine installations).
- Do not inflate your APM deployment by adding more machines than required. The number of TCP resources consumed per machine is correlated to the number of APM machines in the deployment and is limited.

### **Should I deploy APM on virtual machines?**

APM (GW and DPS installations, either as one-machine or as a distributed installation) can be deployed on virtual machines. For more information, see "HPE Application Performance Management on Virtual Platforms" in the APM System Requirements and Support Matrixes, available in the [HPE Software Support site](https://softwaresupport.hpe.com/) (<https://softwaresupport.hpe.com/>).

If you plan to run a database server containing APM databases on a virtual machine, check with your database vendor for their support policies and performance implications.

### **What specific hardware should I purchase?**

APM requires specific hardware profiles, but does not require specific brand.

### **How to choose your operating system? (Windows/Linux)**

- If you are migrating from a previous version of APM, see the APM 9.1x Upgrade Guide for information about which migration paths are supported.
- Both operating systems are recommended and supported. For specific information regarding supported versions, see APM System Requirements and Support Matrixes, available in the [HPE Software Support site](https://softwaresupport.hpe.com/) (<https://softwaresupport.hpe.com/>).

### **How much disk space is required for the database schemas?**

The required disk space for APM schemas is influenced by many variables. For more information about the main considerations, see the APM Database Guide.

### **Do I need a CMS, or is RTSM enough for my needs?**

RTSM is designed to support APM operational use cases only. For topology-based integrations between APM and other HPE centers, it is recommended to install a central CMDB instance that will serve as the CMS instead of integrating directly with the RTSM instance. For more information, see the RTSM Best Practices Guide.

### **Which web server to choose?**

APM supports both Microsoft IIS and Apache web servers. The Apache web server is bundled within the APM installation, while the Microsoft IIS web server must be installed separately prior to APM installation. In terms of best practices, both are recommended and supported.

### **What disaster recovery aspects should I consider?**

You can setup an additional APM deployment that will act as a Disaster Recovery System. Such a deployment can be added at any given time on demand and does not have to be considered when planning your primary environment. For more information, see "Disaster Recovery" in the APM Installation Guide.

## What network aspects should I consider?

It is recommended that all APM Servers are installed on the same network segment.

If APM servers are installed on multiple network segments, it is highly recommended that the number of hops and the latency between the servers be minimal. Network-induced latency may cause adverse effects to the APM application and can result in performance and stability issues. We recommend that the network latency should be no more than 5 milliseconds, regardless of the number of hops.

Placing firewalls between APM servers is not supported. If a firewall is active on any APM server machine (GW or DPS), a channel must be left open to allow traffic between the APM machines (GW and DPS).

## Using the Capacity Calculator

The capacity calculator Excel spreadsheet should be used to determine the scope and size of your APM deployment. You input the information regarding the scope of your deployment in terms of numbers of applications running, users, and expected data. The capacity calculator calculates the configuration of your deployment and the hardware requirements of each machine in the APM deployment. This information can be uploaded automatically while running the Setup and Database Configuration utility or the Upgrade Wizard which are run after installing or upgrading APM.

**Note:** In a Linux environment, the capacity calculator Excel spreadsheet can be opened and edited using the Calc spreadsheet application of OpenOffice.org.

The capacity calculator Excel file includes the following sheets:

- **Deployment Calculator:** Use the Capacity Questionnaire to determine what applications and capacities you require. The results are displayed in the Output tables. Alternatively, you can use the Certified Deployments worksheet.
- **Certified Deployments.** You can use the one of the pre-defined certified deployments in the Certified Deployment worksheet that most closely resembles your needs. These certified deployments can be used as templates and can be modified to suit your needs.
- **Detailed Capacities.** Gives detailed data regarding the numbers used to calculate capacity levels of **Small, Medium, Large, and Extra Large** for each APM application, users, metric data, and model size.
- **Level Override.** This sheet should be used only by very experienced APM administrators. It enables the option to override the capacity levels calculated in the capacity calculator.

### To use the capacity calculator:

1. Locate the Excel sheet named **APM\_9\_Deployment\_and\_Capacities.xls** in your installation media. You can download the latest version from the HPE Software Support site (<https://softwaresupport.hpe.com/>). Search the web site for the term "capacity calculator".
2. In the **Deployment Calculator** sheet **Capacity Questionnaire** columns:
  - Select which applications you are running by selecting **Yes** or **No** as appropriate in the cells next to the name of each application.
  - Enter the required data for each application that you are running and for the number of **Logged in Users**.

You can hover over each cell to read a tooltip description of the information required for each application.

3. After you enter your data, the **Output** tables on the right of the **Deployment Calculation** sheet automatically update to give you the required information regarding your deployment.
  - The **Output - Application/Level** table on the top right indicates the scope of your deployment, giving you sizing information. This includes users, size of your model, size of your expected metrics data, application status (on or off), and sizing for each application.
  - The **Output - Machine Requirements** table in the lower right indicates, for each installation type (one machine or distributed), the required memory in gigabytes and the number of CPU cores for each server installation.

Decide which Deployment Type (one machine or distributed) is applicable to your deployment.

4. Save the Excel file in a location that is accessible to the servers where you are installing APM.

You can now prepare the hardware environment and install APM based on these recommendations.

**To apply the capacity calculator data during installation:**

When running the Setup and Database Configuration utility in the Server Deployment page, browse to the location where you saved the Capacity Calculator with your data. Upload the file, and the data from the Excel sheet automatically updates the fields in the wizard.

For details on using the utility, see "Setup and Database Configuration Utility" in the APM Installation Guide.

## Using the Capacity Calculator After Installation

After you have APM installed, you may want to make changes to your deployment. You can add applications, change the number of logged in users or any of the other numbers related to running applications. You can edit your capacity calculator and determine if the scope of your deployment has changed.

You can upload the data from the updated capacity calculator's Excel file directly into the Server Deployment page in Platform Administration. This page enables you to update the information that you entered in the Server Deployment page while running the Setup and Database Configuration utility without having to run the wizard.

If you do not have the appropriate license for an application, the application does not appear in the list of available applications in the Server Deployment page, either during installation or in the Platform Admin page. You can add licenses for applications after APM is deployed in the License Management page in Platform Administration. After you add a license, you must go to the Server Deployment page to enable the application.

For details on updating a deployment, see "How to Update Your APM Licenses, Applications, or Deployment Scope" in Platform Administration. For any changes to take effect while updating a deployment, you must restart APM.

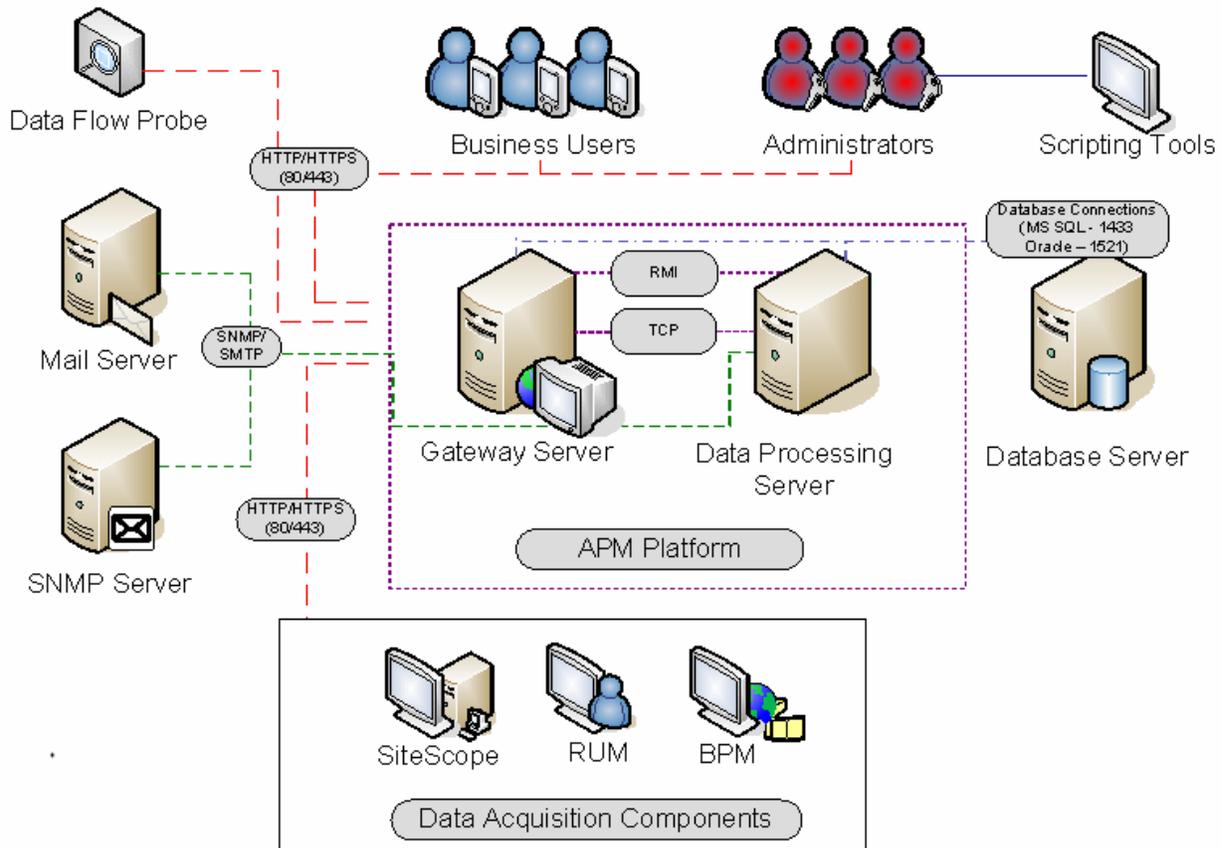
# Chapter 9: Understanding the Platform and Components

This chapter includes:

- "Platform Architecture Diagram" below
- "APM Servers" on the next page
- "APM Database Server" on page 61
- "APM Data Sources" on page 62
- "Additional Proprietary Components" on page 63
- "Third-Party Components" on page 63
- "Bus Communication Among APM Components" on page 64

## Platform Architecture Diagram

The diagram below illustrates the general APM platform architecture and the communication protocols used among the components.



## APM Servers

The APM platform consists of proprietary servers and components, data sources, scripting tools, and third-party servers, such as database and mail servers, that you set up in the enterprise network environment. This chapter provides an overview of the APM platform and components.

APM is powered by a set of servers that are responsible for running the applications, facilitating system management, data handling, reporting, and alerting. You install the following APM servers on one or more Microsoft Windows or Linux machines in your enterprise network environment:

- **APM Gateway Server.** Responsible for running APM applications, producing reports, operating the administration areas, receiving data samples from the data collectors and distributing this data to the relevant APM components, and supporting the bus. To work with APM, the Gateway server machine must run a Web server.
- **APM Data Processing Server.** Responsible for aggregating data, running the Business Logic Engine, and controlling the RTSM service.

You can install the APM servers according to a number of different deployment strategies. Distributed deployments, in which multiple server machines are installed, can benefit from various high availability and load balancing options. For details on the recommended deployment strategies, see "[Deployment Configurations](#)" on page 65. For details on high availability and load balancing options, see "[Load Balancing and High Availability](#)" on page 65.

## Notes and Best Practices for Server Deployment

Note the following when deploying APM servers:

- Access to the APM server machine must be available, either through HTTP or HTTPS, from any standard Internet or intranet connection.
- The APM servers should be on dedicated machines and should not run other applications.
- APM servers should not be installed on machines on which other HPE products are installed.
- Installing APM servers together with most other HPE products on the same physical machine may result in port conflicts, performance issues, or other unexpected behavior. The coexistence of APM servers with HPE SiteScope has been tested and is supported.
- Open JDK is copied onto the machine during server installation as part of the APM installation.
- If APM servers are installed on multiple network segments, it is highly recommended that the number of hops and the latency between the servers be minimal. Network-induced latency may cause adverse affects to the APM application and can result in performance and stability issues. We recommend the network latency should be no more than 5 ms, regardless of the number of hops. For more information, contact HPE Software Support.
- All APM servers, as well as the database servers, must be installed in the same time zone, with the same daylight savings time configuration, and be set to the same time.
- If your APM database server is using an SQL Server platform, make sure the Compatibility Level database setting is set to reflect the version of SQL that you are using in each of the 9.2x/9.30 database schemas. For example if you are using SQL SERVER 2005, the compatibility level should be 90.
- APM does not support setting the time zone to half hour time zones relative to GMT, for example, GMT+6:30 Indian. This may cause problems during data aggregation, which is performed on the hour.

## Web Servers

To work with APM, the Gateway server(s) must run a Web server. In Linux environments, you must use the Apache HTTP Server. In Windows environments, you can select between:

- Microsoft Internet Information Server (IIS). If you plan to run APM on IIS, you should install the IIS prior to APM installation. During APM server installation, the IIS settings are automatically configured to work with APM.

### Note:

- When using the IIS Web Server, APM only supports the IIS default application pool.
- If you are installing on Windows 2008 and using IIS 7, you must create the appropriate roles for the IIS. For details, see "Working with the Web Server" in the APM Installation Guide.
- **Apache HTTP Server.** A version of the Apache HTTP server is installed during APM server installation. It has been adapted by HPE for APM. If you plan to use APM with the Apache HTTP Server, you select the Apache HTTP Server during installation.

For information on setting up the Web server to work with APM, see "Working with the Web Server" in the APM Installation Guide.

## APM Database Server

APM requires the following types of databases/user schemas, which you set up on either Microsoft SQL Server or Oracle Server:

- **Management database.** For storage of system-wide and management-related metadata for the APM environment.
- **RTSM.** For storage of configuration information as configuration items (CIs) that is gathered from the various APM and third-party applications and tools, or created/configured by APM users. This information is used when building APM views.
- **Profile database(s).** For storage of raw and aggregated measurement data obtained from the APM data collectors. Only one profile database is required, but more can be installed if necessary.
- **Analytics Database(s).** For storage of analytic metrics raw and aggregated data. Each Microsoft SQL Server database or Oracle user schema can host up to 1,000,000 metrics. You can create up to five SQL Server databases or Oracle user schemas. You can create Analytics databases manually or by using the Manage Analytics Database page, accessible from **Admin > Platform > Setup and Maintenance**.

Part of the process of deploying APM servers requires connecting to these databases. If you are installing APM for the first time, you can manually create these databases directly on the database server(s) before server installation, or you can allow APM to create the databases for you, using the Setup and Database Configuration utility.

For detailed information on deploying the database servers in your system for use with APM, and creating the databases/user schemas manually, see the APM Database Guide.

The procedure for setting database parameters is described in "Server Deployment and Setting Database Parameters" in the APM Installation Guide.

**Note:** If you need to verify the integrity of the databases, you can run the database schema verification.

For details, see Appendix D, "Database Schema Verification" in the APM Database Guide.

## APM Data Sources

APM data sources are responsible for collecting performance and availability data from various points throughout the infrastructure, as well as from external locations, and feeding it into a central repository. The data is used to monitor and analyze the performance of business applications and IT infrastructure and alert staff to performance and threshold breaches. Some data collectors can also report the topology that they are monitoring to APM.

## Data Collectors

Data collectors are installed and administered separately. Downloading and running data collectors require separate licensing. Each data collector can be downloaded from the APM Downloads page, accessed from Platform Administration (**Admin > Platform > Setup and Maintenance > Downloads**). For details, see "Downloads Overview" in Platform Administration.

You can install the following data collectors on machines in your enterprise network environment or at remote locations:

- **Business Process Monitor (BPM)**. Emulates the end-user experience by running transactions (virtual business processes) and collecting availability and response time data.
- **SiteScope**. Collects key performance measurements and reports topology on a wide range of back-end infrastructure components, including Web, application, database, and firewall servers.
- **Real User Monitor (RUM)**. Measures the end-user experience of real users from a network/server perspective by monitoring real user traffic and collecting network and server performance data in real time.

**Note:** HPE Diagnostics is licensed and installed separately and can act as a data collector for APM.

After the data collectors are installed and configured, you further define their settings in End User Management Administration (**Admin > End User Management**) and System Availability Management Administration (**Admin > System Availability Management**). End User Management Administration enables you to centrally manage your monitoring environment for Business Process Monitor and Real User Monitor. System Availability Management enables you to access hosted instances of SiteScope.

You can deploy monitors, configure alert schemes, and manage and organize your monitor environment all from within the APM platform.

## Data from HPE Software Applications and Integrations

APM has the ability to integrate with BTO products, with applications that are part of APM, and with external applications.

These integrations enable the flow of data from application to application as well as from the applications to APM, depending on the applications. You can drill down from APM to some of the relevant applications.

The primary integrations with APM are as follows:

- APM - Service Manager
- APM - SiteScope
- APM - Operations Orchestration (OO)

- APM - Diagnostics

You can find detailed information about supported integrations in the APM section of the Integrations tab, in the [HPESW Solution and Integration Portal](#).

## Additional Proprietary Components

APM administrators deploy the Discovery Probe to enable the Discovery process, which aids in modeling the IT world. In addition, administrators use HPE scripting tools to create the scripts that are used by Business Process Monitor to collect data for monitored applications.

### Data Flow Probe

The Data Flow Probe enables you to collect data about your IT infrastructure resources and their interdependencies. This process discovers resources such as applications, databases, network devices, servers, and so on. The Data Flow Probe is the main component responsible for receiving discovery tasks from the server, dispatching them to the IT components, and sending the results back to the RTSM through the server. For details on the discovery process and Data Flow Probe deployment, see [Data Flow Management](#).

### Scripting Tools

APM scripting tools enable you to record the end-user actions that represent the key business transactions whose performance you want to monitor using Business Process Monitor. You save the transactions in recorded scripts. The table below describes the scripting tools that are available. For additional information on Business Process Monitor scripting tools, including script recording tips, see [VuGen Recording Tips](#) in the [APM Application Administration Guide](#).

### HPE Virtual User Generator (VuGen)

Enables you to record scripts for a large variety of protocols. This is the recommended tool for recording Business Process Monitor scripts. You download VuGen from the [Downloads](#) page, accessed from the [Setup and Maintenance](#) tab in Platform Administration. For details on using VuGen, see the [HPE Virtual User Generator](#) documentation. For information on using HPE LoadRunner scripts in APM, contact HPE Software Support.

### QuickTest Professional (for use with Windows-based Business Process Monitor only)

Enables you to record scripts for Web-based applications that include Java applets and ActiveX. For details on using QuickTest Professional, refer to the documentation installed with the product.

## Third-Party Components

- **Database Server.** APM requires connection to a database server. The database server is used to store:
  - System-wide and management-related data, which includes administrative settings and customer-configured information
  - Profile data, which includes data collector settings and collected metrics

- Configuration item (CI) data, which includes the CIs used to model your IT infrastructure and the relationships between them.

For more information on using database servers in APM, see the APM Database Guide.

- **Mail Server.** The mail server is used to send alerts and scheduled reports to designated recipients.
- **SNMP Server.** A connection to an SNMP server may be implemented to receive SNMP traps sent by the HPE Application Performance Management alerting mechanism.
- **SiteScope Integration Monitors.** APM supports integration of data from third-party systems via SiteScope Integration Monitors, and to third-party systems, using APM APIs. For more information on SiteScope Integration Monitors, see the Integration Monitors section in Using SiteScope in the SiteScope Help.

## Bus Communication Among APM Components

A bus is a virtual communications channel between APM servers.

The following functionality is provided by the Bus:

- **High availability for communication between the Gateway and Data Processing servers.**

The bus uses a JMS-based messaging system for communication between the servers. A broker process on each server receives and delivers messages between the servers. Bus clustering allows multiple brokers to detect dropped server connections and to reconnect without data loss.
- **Transfer of monitoring data.**

Data collectors send raw monitoring data via HTTP/HTTPS protocol to the Gateway Server. The Gateway Server formats the raw data and sends it to the Data Processing Server via the Bus. In the event that the Online BLE is experiencing downtime, the bus preserves the data until the Online BLE is again operational, thus guaranteeing that the Alert Engine has all of the data to perform its calculations on. Service Health uses the online BLE to listen to the Bus, and Service Level Management uses the offline BLE to listen to the Bus. Both applications display the formatted data to the user.
- **Transfer of alerts.**

Each Data Processing Server can generate alerts as a result of the data aggregation process. These alerts are sent through the bus to the Alerts Engine and on to the user's e-mail, pager, or SMS.

# Chapter 10: Deployment Configurations

This chapter includes:

- ["Best Practices" below](#)
- ["One-Machine Deployment" below](#)
- ["Distributed Deployment" below](#)
- ["Load Balancing and High Availability" below](#)
- ["APM Starter Deployment" on page 67](#)

## Best Practices

We recommend installing APM behind a load balancer or reverse proxy. This enables additional security options and can simplify disaster recovery and upgrade procedures.

It is highly recommended to use the capacity calculator to determine the scope of your deployment and the required hardware profile of each machine in your installation. For details, see ["Using the Capacity Calculator" on page 57](#).

## One-Machine Deployment

A one-machine deployment has the Gateway Server and Data Processing Server installed on the same machine.

A one-machine deployment can be used for many installations scenarios as long as the machine has the required hardware to handle the capacity.

To choose a one-machine deployment, select the **Typical** setup type in the APM installation wizard.

## Distributed Deployment

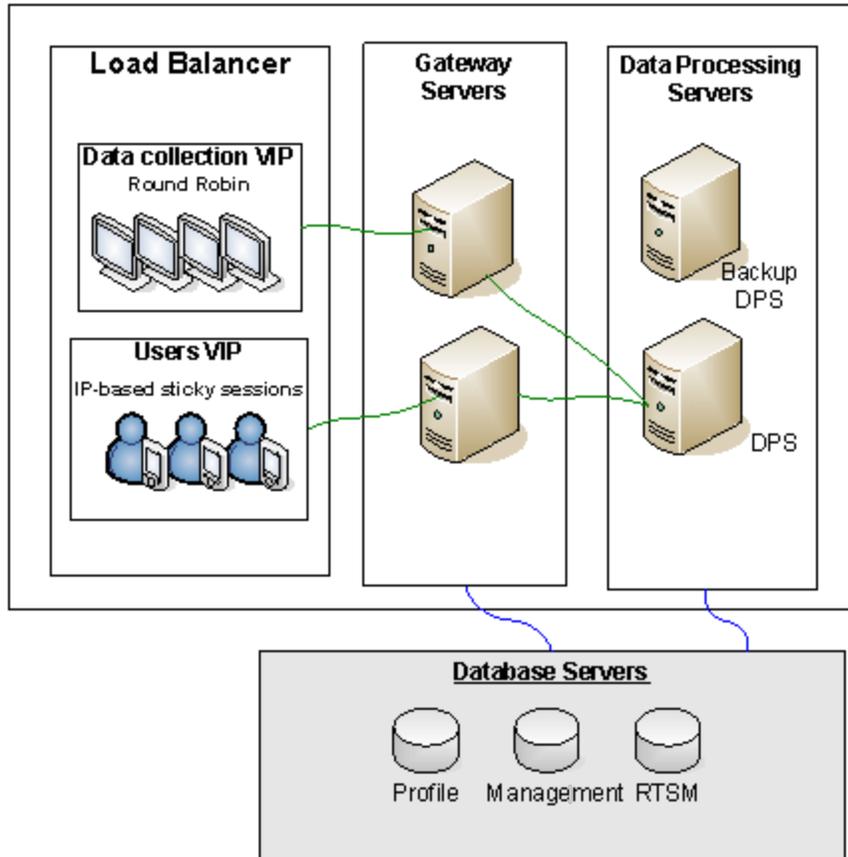
A distributed deployment is when one instance of a Gateway Server is installed on one machine and the Data Processing Server is installed on a second machine.

To set up a distributed deployment, specify the server type you want to install on each machine while running the installation wizard. You can install these servers in any order.

## Load Balancing and High Availability

Load balancing and high availability can be implemented in one-machine or distributed deployments. You configure load balancing by adding an additional Gateway Server and high availability by adding a backup Data Processing Server.

The diagram below illustrates load balancing and high availability for a distributed deployment but the same configuration can be used if the Gateway Server and the Data Processing Server have been installed on one machine.



**Note:** Data Processing Servers can run concurrently with additional Data Processing Servers as long as the same service is not being run concurrently on more than one machine.

## Benefits of a Multi-Server Deployment

Deploying multiple servers for APM for either a one-machine deployment or a distributed deployment gives you the following benefits:

- Provides scaling solutions for your APM system.
- Multiple Gateway Servers can be placed behind a load balancer to divide load and improve system performance. For details on load balancing, see "Load Balancing for the Gateway Server" in the APM Installation Guide.
- Backup machines for the APM servers allow high availability options to be used to improve system availability and reliability. For details on high availability, see "High Availability" in the APM Installation Guide.

## Deploying Multiple Servers

When deploying multiple APM servers, you must perform the following steps:

- At the end of the server installation process, use the Setup and Database Configuration utility to establish connectivity between the server and the databases. You must specify the same database and connection parameters for each APM server (whether the servers are at the same location or geographically separated). For details on using the Setup and Database Configuration utility, see the APM Installation Guide.

- After installing APM servers, point APM data collectors (Business Process Monitor, SiteScope, Real User Monitor) to the server or load balancer with which they must communicate to perform their work. For details, see "Configuring HPE Application Performance Management Data Collectors in a Distributed Environment" in the APM Installation Guide.
- Ensure that the Gateway servers are accessible from any standard Internet or intranet connection, either through HTTP or HTTPS.
- Ensure that each server has a user account with administrative rights to the database servers.
- Create a common temporary directory to hold the temporary images created by the Gateway Servers when generating scheduled reports. For details, see "How to Modify the Location and Expiration of Temporary Image Files" in Platform Administration.

## Notes and Limitations

If APM servers, including the database servers, are installed on multiple network segments, it is highly recommended to minimize the number of hops and the latency between the servers. Network-induced latency may adversely affect the APM application and can result in performance and stability issues. We recommend the network latency should be no more than 5 milliseconds, regardless of the number of hops. For more information, contact HPE Software Support.

Because APM uses Remote Method Invocation (RMI) calls between servers, placing firewalls between APM servers is not supported.

# APM Starter Deployment

The APM Starter deployment allows you to access the core functionality of APM while using the minimum hardware. This can later be ramped up to increase performance and capacity.

APM Starter includes the following APM components: APM one-machine server, RTSM, SiteScope and BPM deployed on the same virtual machine. More components and applications can be included at a later date. For details, speak to HPE Software Support.

**Note:** If you anticipate that you will require greater capacity or performance within less than a year, we recommend that you plan the deployment according to these requirements and not use the APM Starter deployment.

## Installation Notes

Installing an APM starter deployment is similar to most APM installations and follows the main installation workflow. For details, see the APM Installation Guide. However, there are some differences:

- When installing the data collectors, install BPM first.
- When installing SiteScope, change the port to 8090.

## System Capacity

The APM Starter deployment was tested to measure operating capacity. This section demonstrates the results of these tests.

### Machine Details

|                  |         |
|------------------|---------|
| Operating System | Windows |
|------------------|---------|

|           |                    |
|-----------|--------------------|
| CPU cores | 4                  |
| Memory    | 16 GB              |
| Database  | MS SQL 2008 EE SP2 |

### Capacity

| Product Area  | Item                                      | Item Type  | Capacity |
|---------------|---|------------|----------|
| RTSM Capacity | CIs and relationships                     | Model      | 10000    |
|               | Active TQLs                               | Model      | 150      |
| Users         | Logged In Users                           | Users      | 25       |
|               | Service Health Users                      | Users      | 10       |
|               | Defined Users                             | Users      | 150      |
| SLM           | SLAs                                      | SLM        | 10       |
|               | Total CIs                                 | SLM        | 2000     |
| BPM           | Applications                              | MetricData | 20       |
|               | Transactions                              | MetricData | 100      |
|               | Locations                                 | MetricData | 5        |
|               | Trx-Loc Combinations                      | MetricData | 150      |
|               | Max EPS                                   | MetricData | 1        |
| SiteScope     | Monitors                                  | SAM        | 1000     |
|               | Measurements                              | SAM        | 4000     |
|               | Monitored CIs (Hosts + Software Elements) | SAM        | 150      |
|               | Max EPS                                   | SAM        | 50       |

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