

# webMethods Optimize User's Guide

Version 10.3

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This document applies to webMethods Optimize Version 10.3 and to all subsequent releases.

Specifications contained herein are subject to change and these changes will be reported in subsequent release notes or new editions.

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## About this Guide

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This guide explains how to use webMethods Optimize to analyze system and business processes, monitor resource availability and events, establish thresholds, and respond to alerts.

Note that this guide covers both Optimize for Process and Optimize for Infrastructure. Information that is specific to each version of the product is called out within the chapters as appropriate.

**Important:** Values entered into XML files are case sensitive, so they must be entered exactly as represented in this document.

## Document Conventions

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Convention	Description
<b>Bold</b>	Identifies elements on a screen.
Narrowfont	Identifies service names and locations in the format <i>folder.subfolder.service</i> , APIs, Java classes, methods, properties.
<i>Italic</i>	Identifies:  Variables for which you must supply values specific to your own situation or environment. New terms the first time they occur in the text. References to other documentation sources.
Monospace font	Identifies:  Text you must type in. Messages displayed by the system. Program code.
{ }	Indicates a set of choices from which you must choose one. Type only the information inside the curly braces. Do not type the { } symbols.
	Separates two mutually exclusive choices in a syntax line. Type one of these choices. Do not type the   symbol.

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Convention	Description
[ ]	Indicates one or more options. Type only the information inside the square brackets. Do not type the [ ] symbols.
...	Indicates that you can type multiple options of the same type. Type only the information. Do not type the ellipsis (...).

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You can find documentation on the Software AG Documentation website at "<http://documentation.softwareag.com>". The site requires credentials for Software AG's Product Support site Empower. If you do not have Empower credentials, you must use the TECHcommunity website.

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- Access articles, code samples, demos, and tutorials.

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- Use the online discussion forums, moderated by Software AG professionals, to ask questions, discuss best practices, and learn how other customers are using Software AG technology.
  - Link to external websites that discuss open standards and web technology.

## Data Protection

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Software AG products provide functionality with respect to processing of personal data according to the EU General Data Protection Regulation (GDPR). Where applicable, appropriate steps are documented in the respective administration documentation.



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# 1 Concepts

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This chapter explains the components and concepts behind webMethods Optimize business activity monitoring. It describes the architecture of the Optimize implementation, and the processes by which data is collected and processed in the Optimize application. In addition, it discusses the interaction between Key Performance Indicators (KPIs), operational data, business processes, and rules in analyzing and displaying collected data. Finally, it describes the tasks that system and business users perform and the roles that users can be assigned.

## webMethods Business Activity Monitoring (BAM) Components

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Optimize supports various levels of Business Activity Monitoring (BAM) depending on customer needs. Business activity monitoring enables you to analyze real time business metrics information, including system performance, process metrics, business activity volume and responsiveness, and other key performance indicators (KPIs). Aggregate analytics working in parallel with instance-level data provide information that you can use to eliminate problems, increase efficiency, and take advantage of business opportunities.

Optimize uses data collectors to gather data from business sources and other webMethods components, and this data supports business activity monitoring. Note that Optimize runs within the My webMethods user interface and makes use of much of the standard functionality that is available through this interface.

Two different implementations of Optimize are available to customers: Optimize for Infrastructure and Optimize for Process.

- **Optimize for Infrastructure** enables you to monitor system resources in real time. Resource data consists of data about equipment and applications, such as queue length and whether a managed webMethods component is online or offline. You can monitor individual objects and the overall status of your system. Optimize for Infrastructure contains two components: Infrastructure Data Collector and Optimize. Optimize for Infrastructure uses the Infrastructure Data Collector to collect system data.
- **Optimize for Process** enables you to monitor business processes, activities, and events as well as other business related information. You can track KPIs that relate to operational factors such as margin, revenue, customer satisfaction, and inventory levels. With Optimize you can compare actual performance with rules you establish. If a monitored item goes out of compliance with a rule, Optimize alerts you so that you can address the problem. In addition, you can use Six Sigma to analyze the business processes. Six Sigma is a disciplined methodology for improving business process performance by eliminating defects. Using this methodology, you can measure the number of defects in a process and systematically determine how to eliminate them. Optimize for Process also includes business visualization tools that provide at-a-glance mashups of Optimize monitoring information.

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## Implementation

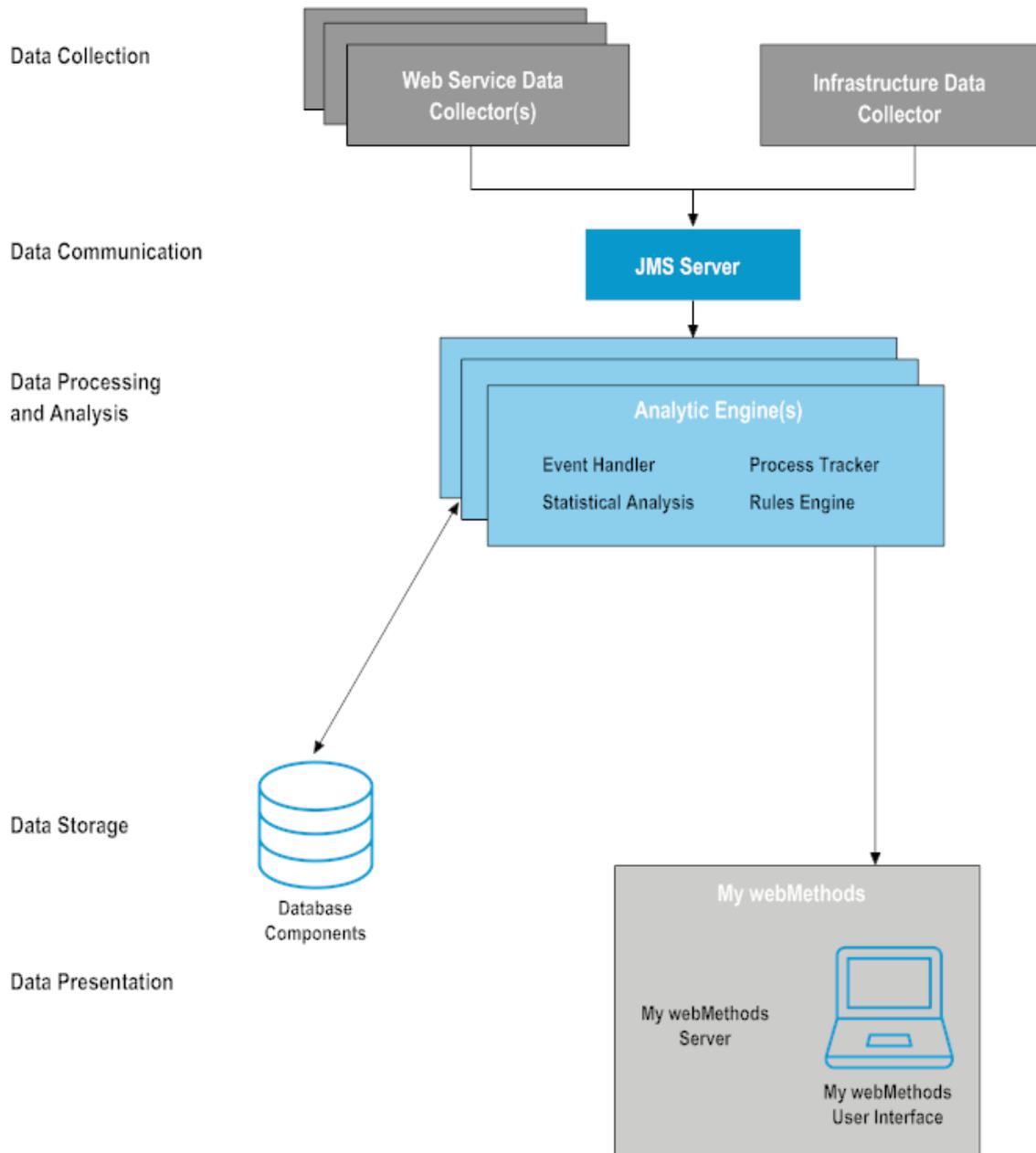
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The following table lists the five main functions that the Optimize implementations perform.

Function	Subcomponent
Data collection	One or more Web Service Data Collectors Infrastructure Data Collector, containing SNMP data collector
Data communication	A JMS Server, usually either Software AG Universal Messaging or webMethods Broker (deprecated)
Data processing and analysis	One or more Analytic Engines
Data storage	Database components
Data presentation	My webMethods user interface

Each subcomponent can reside on its own separate host, or all subcomponents can reside on the same host.

### Typical Optimize Implementation



### Data Collection

Optimize collects data from other webMethods applications, through the Infrastructure Data Collector, or through the Web Service Data Collector(s). For more information about data collection, see [“Data Collection” on page 18](#).

## Data Communication

**Important:** webMethods Broker has been deprecated.

Both Software AG Universal Messaging and webMethods Broker provide a Java Message Service (JMS) communication layer that allows data collected by the Data Collector to be fed into the Optimize Analytic Engine for processing. For more information about Software AG Universal Messaging, see the Terracotta website. For more information about webMethods Broker, see *webMethods Broker Client Java API Programmer's Guide*.

## Data Processing and Analysis

Optimize processes data by way of one or more *Analytic Engines*. The Analytic Engine receives business, system, and process data from the data collection engine, and saves the data in the databases. Optimize analyzes data, saves the analysis in the database, sends information about the status of business and system activity to the My webMethods user interface, and performs other actions when problems occur, such as sending alerts to specified users.

An Analytic Engine contains the following things:

- An *event handler*, which receives business and system data from the Infrastructure and Web Service Data Collectors and from other webMethods products. Business data consists of the underlying data that make up a business process, such as revenue and order number and is specific to Optimize for Process. System data consists of data about equipment or applications, such as queue length and whether a managed component is online or offline. The analytic engine writes this data to the database in a format that business intelligence software can use to generate reports.
- A *process tracker*, which receives business process data from the Web Service Data Collectors and other webMethods products, and tracks the state of executing processes. As a process executes, the process tracker takes measurements about the process instance and its steps, such as wait time and cycle time. This information can be used to track performance of a business process or to alert you when certain conditions exist, such as performance degradation or a failure in process execution.
- An *analysis engine*, which runs algorithms on the data.
- A *rules engine* which compares the data it receives from the Analytic Engine to rules that detect when a process or resource requires user attention.
- A *Web services layer*, which sends the results of the analysis to the My webMethods Server. The My webMethods user interface presents the results, along with icons that indicate that a rule violation has occurred or that Optimize has diagnosed a trend.

## Data Presentation

Optimize presents data by way of the My webMethods user interface. My webMethods enables users to log in to all webMethods components that are incorporated into My webMethods using a single user name and password.

In addition to presenting data, the My webMethods user interface provides access to administrative functions. Using the My webMethods administrative functions, Optimize administrators can create users, groups, and roles; grant access to My webMethods functions using Lightweight Directory Access Protocol (LDAP) or other means; and configure system, business, and business process data. Optimize users can use other functional areas of My webMethods to create rules for comparing data, monitoring business and system data, and tracking business processes.

For more information about the My webMethods user interface, see *Working with My webMethods*.

## Database Components

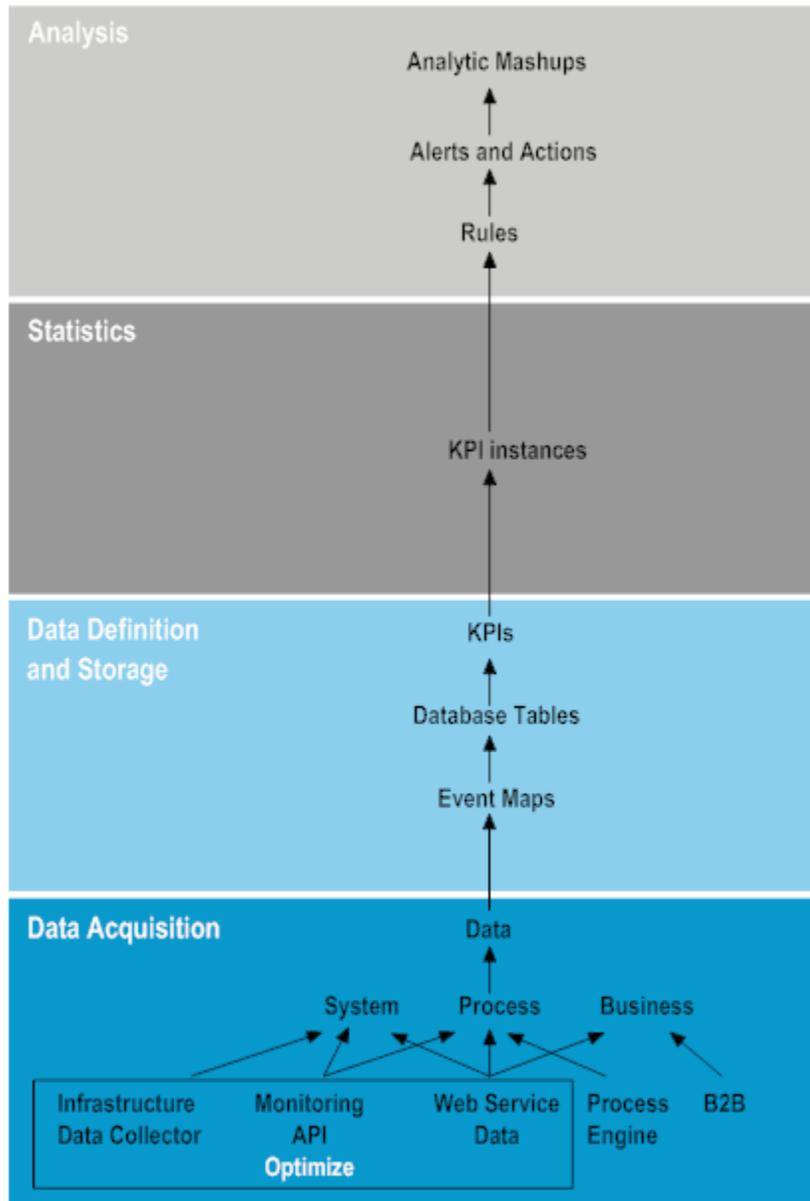
Optimize stores data in relational databases. The Optimize database consists of four components: the Analysis, Process Tracker, Process Audit Log (PAL), and My webMethods Server (MWS) database components. For more information about database components, see Part III, "For Database Administrators," in *Administering webMethods Optimize*.

## Data Collection

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Data collected from many parts of the enterprise infrastructure is fed into the Optimize environment and stored. KPIs that represent information vital to the business are defined and applied to the data. These KPIs are analyzed in real time in order to learn normal behavior and detect abnormal behavior within the environment. Rules are applied to these KPIs and their analyses in order to define conditions that represent problems and opportunities. Violations of these rules can be reported to the appropriate people and automated corrective actions can be taken. Further detail can be provided about a particular violation to determine the true root cause of the situation. Once Optimize has learned enough about the business, it can predict the occurrence of problems and thus allow staff to correct the problems even before they occur. Optimize also allows you to correlate information from disparate parts of the enterprise, such as the system and infrastructure, business processes and business data, and services. In addition, it provides analytic mashups, which are graphical overlays of correlated data such as business process information overlaid with real-time statistics.

Optimize collects data from other webMethods applications, through the Infrastructure Data Collector, or through the Web Service Data Collector. The following diagram illustrates how Optimize collects, defines, stores, and analyzes data.



## Infrastructure Data Collector

The Infrastructure Data Collector is the primary method for collecting infrastructure and SNMP data. The Infrastructure Data Collector uses the Monitoring API to pass operational data and monitoring model data to the Analytic Engine. The Monitoring API is designed as a programmatic interface to the systems monitoring functionality of a business integration platform. It communicates over JMS, utilizing a JMS queue, to provide secure and reliable communications between Optimize and the Infrastructure Data Collector.

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The Infrastructure Data Collector lets you identify webMethods and ETS component resources that you want to monitor and analyze. Using the Infrastructure Data Collector, you can monitor the following:

- **Adabas** When you monitor Adabas, Infrastructure Data Collector can monitor KPI definitions. For more information, see “Monitored KPI Definitions” in *Administering webMethods Optimize*.
- **Adabas SOA Gateway** When you monitor Adabas SOA Gateway, Infrastructure Data Collector can monitor KPI definitions. For more information, see “Monitored KPI Definitions” in *Administering webMethods Optimize*.
- **Apama** When you monitor Apama, Infrastructure Data Collector can monitor KPI definitions. For more information, see “Monitored KPI Definitions” in *Administering webMethods Optimize*.
- **Broker Server** When you monitor a Broker Server, Infrastructure Data Collector automatically monitors related items. Such items include Brokers, Custom Adapter (Broker Clients), and Document Types that are running on the Broker Server.
- **Com-plete** When you monitor Com-plete, Infrastructure Data Collector can monitor KPI definitions. For more information, see “Monitored KPI Definitions” in *Administering webMethods Optimize*.
- **Digital Event Services** When you monitor Digital Event Services, Infrastructure Data Collector can monitor KPI definitions. For more information, see “Monitored KPI Definitions” in *Administering webMethods Optimize*.
- **Event Routing** When you monitor Event Routing, Infrastructure Data Collector can monitor KPI definitions. For more information, see “Monitored KPI Definitions” in *Administering webMethods Optimize*.
- **Integration Server** When you monitor an Integration Server, Infrastructure Data Collector automatically monitors related items as well. Such items include the Integration Server repository and all Integration Server ports; Trading Networks Server, if you have that component installed; packages that are running on the Integration Server; and the connections, polling notifications, and services of adapters that are running on the Integration Server. To lessen the load on Infrastructure Data Collector, you can choose to monitor only certain services on an Integration Server.
- **My webMethods Server** When you monitor My webMethods Server, Infrastructure Data Collector can monitor KPI definitions. For more information, see “Monitored KPI Definitions” in *Administering webMethods Optimize*.
- **Natural** When you monitor Natural, Infrastructure Data Collector can monitor KPI definitions. For more information, see “Monitored KPI Definitions” in *Administering webMethods Optimize*.
- **Natural for Ajax** When you monitor Natural for Ajax, Infrastructure Data Collector can monitor KPI definitions. For more information, see “Monitored KPI Definitions” in *Administering webMethods Optimize*.

- **Presto version 9.9** When you monitor Presto version 9.9, Infrastructure Data Collector can monitor KPI definitions. For more information, see “Monitored KPI Definitions” in *Administering webMethods Optimize*.
- **Terracotta** When you monitor Terracotta, Infrastructure Data Collector can monitor KPI definitions. For more information, see “Monitored KPI Definitions” in *Administering webMethods Optimize*.
- **Software AG MashZone NextGen** When you monitor a MashZone NextGen server, Infrastructure Data Collector can monitor KPI definitions . For more information, see “Monitored KPI Definitions” in *Administering webMethods Optimize*.
- **SNMP agents** Infrastructure Data Collector enables you to specify how often the SNMP data collector discovery and monitoring agents poll SNMP agents for variables and table instances. You can also specify how often the agents attempt to connect to SNMP agents when one or more agents are down.
- **webMethods adapters** Infrastructure Data Collector enables you to monitor adapters installed on Integration Servers. When you start monitoring an Integration Server, Infrastructure Data Collector automatically starts monitoring all adapters that are installed on the Integration Server.
- **webMethods ApplinX** When you monitor ApplinX, Infrastructure Data Collector can monitor KPI definitions. For more information, see “Monitored KPI Definitions” in *Administering webMethods Optimize*.
- **webMethods EntireX** When you monitor EntireX, Infrastructure Data Collector can monitor KPI definitions. For more information, see “Monitored KPI Definitions” in *Administering webMethods Optimize*.
- **Software AG Universal Messaging and Universal Messaging Cluster** When you monitor Universal Messaging and UM Cluster, Infrastructure Data Collector can monitor KPI definitions. For more information, see “Monitored KPI Definitions” in *Administering webMethods Optimize*.

## Web Service Data Collector

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The Web Service Data Collector is installed automatically with Optimize. Web services provide an interface to Optimize through which client programs can send operational data about applications or equipment in your enterprise (such as databases, printers, or disk drives), process data (such as the start and end time of each step in process instances), or business data (such as customers, order quantities, and revenues). Optimize then displays the data in the form of system KPI instances for operational data or business KPI instances for business process data.

**Tip:** You can use Software AG Designer to generate the client program and the SOAP messages for the Web Service Data Collector automatically. For details, see the Software AG Designer help.

Depending on the size of your enterprise, you can distribute the load by deploying Web services to systems that host applications and processes you want to monitor. Web services gather the summarized data and send them to the Analytic Engine, which in turn stores the data in the database and displays it in the My webMethods user interface. In addition, the Analytic Engine runs algorithms on the data to produce a variety of diagnoses. These diagnoses enable Optimize to automatically and continually compare summarized data with a baseline of historical behavior and indicate when types of data are deviating from that baseline.

**Note:** You can provide your own definitions of what types of data are out of compliance by defining rules. For more information about defining rules, see [“Defining Rules” on page 113](#) in this guide.

If you have webMethods Integration Server and Designer, you can build Integration Server services that use Web services to gather data for Optimize. For example, you could do any of the following:

- You can use Integration Server services to gather data about webMethods components. Suppose you are using webMethods Broker (deprecated). You could create an Integration Server service that uses Web services to create system KPI instances for types of data in certain Broker documents, listens for those Broker documents, gets the appropriate field values from the documents, and uses Web services to push the data to the created system KPI instances in Optimize. For more information, see the chapter titled “Configuring and Using the Web Service Data Collector” in *Administering webMethods Optimize*.
- You can use webMethods adapters with Integration Server services to gather data about resources in your enterprise. Suppose your enterprise includes an SAP system and you use the webMethods Adapter for SAP to connect that resource to your webMethods components. You could create an Integration Server service that uses Web services to create system KPI instances for types of data relating to the SAP system, uses the SAP Adapter to query the SAP system for the data at regular intervals, and uses Web services to push the data to the created system KPI instances in Optimize.
- In Optimize for Process, you can use Web services to gather data about business processes in your enterprise. Suppose you want to monitor a business process. You would use Web services to push data about each process instance to Optimize as the process instance executes. Typically, you would push data about the start and end of each step in the process instance and about process run-time events that might indicate that an error or a warning occurred during process execution. You could obtain that data from a log file, from a database, or from the business process code itself.
- Also in Optimize for Process, you can use Web services to gather data about your enterprise's business transactions. If you are monitoring business data, you would use Web services to push data about each transaction instance to Optimize as the instance executes. Typically, you would push data about customers, products, order quantities, and revenue.

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## Key Performance Indicators (KPI)

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You can monitor quantitative business and system data by defining *key performance indicators (KPIs)*. KPIs are quantifiable measurements that reflect the critical success factors of an organization. Optimize uses KPIs to monitor data for exceptions and trends and to help you answer questions such as the following:

- What is the queue length for this operating system?
- How many orders over \$10,000 have completed for this process? (Optimize for Process)
- What is the revenue for the southeast region? (Optimize for Process)

For example, when using Optimize for Process, in an order management process, you might define KPIs for how many orders were received, their dollar amounts, and whether they were processed successfully. You can also define KPIs that compare volume by order channel or cycle time by customer type.

In Optimize, KPIs consist of the following things:

- Dimensions, such as customer, region, dealer, or sales person
- Event maps, which associate business data, such as dimensions, *measures* (measurable and monitorable numeric quantities such as revenue), and transactional attributes, with a particular business process
- KPI definitions, which associate a measure with a *dimension* (a means for breaking out your data into slices), such as revenue by region or queue length by host
- Hierarchies, which determine how dimensions are related. Optimize uses these relationships to aggregate and organize data on My webMethods business process and system monitoring pages.

## KPI Instances and KPIs

You can create a *key performance indicator (KPI)* for each type of data that the Web Service Data Collector collects. Optimize creates and stores data that corresponds to the KPI in a *KPI instance*. For example, for a KPI that tracks Broker client connection state, Optimize creates one KPI instance for each tracked Broker. For more information about the Web Service Data Collector, see “[Web Service Data Collector](#)” on page 21.

When you create a KPI, you can specify a collection interval to summarize the data stored for the KPI instance associated with the KPI. The Analytic Engine runs algorithms on the data to produce a variety of diagnoses. These diagnoses enable Optimize to automatically and continually compare summarized data samples to a baseline of historical behavior and indicate when types of data are deviating from that baseline.

**Note:** You can provide your own definitions of when types of data are out of compliance by defining rules. For more information about defining rules, see [“Defining Rules” on page 113](#).

*System KPI instances* store data about applications, and *business KPI instances* store data about business data and processes. In the My webMethods interface, each type of data that Optimize collects is represented by the KPI instance in which the data is stored.

Each KPI instance performs a specific function for its data, as described in the following table.

KPI instance	Function
Sum	Sums the data points collected over each collection interval. An example for this type of KPI instance is to tally process step errors.
Average	Calculates the average value of the data collected over each collection interval. An example for this type of KPI instance is to track CPU usage.
Last Value	Stores the value of the last data collected in the collection interval. An example for this type of KPI instance is to track the size of a queue.
State	Stores the value of last data collected in each collection interval, where the possible values are 1 (online) or 0 (offline). An example for this type of KPI instance is to track the state of an application.
Max	Stores the maximum value of the data collected in the collection interval.
Min	Stores the minimum value of the data collected in the collection interval.
Count	Counts the number of data points over each collection interval. An example for this type of KPI instance is to count the number of order events.

## Business Processes

Optimize for Process can analyze and display status information for the following two types of business processes:

- *webMethods-executed processes* (processes that are executed and tracked by the webMethods Process Engine).
- *Externally-executed processes* (processes that are not executed and tracked by the webMethods Process Engine). For externally-executed processes, Optimize has no knowledge of the rules and data that determine whether these transitions are valid. Therefore, for these processes, Optimize does not recognize invalid step transitions based on branch or split conditions and does not detect or report errors when such conditions occur.

You can use Software AG Designer to design business process models. For more information about using Software AG Designer to set up business processes and process steps, see the Software AG Designer online help. For more information about setting up and identifying those business processes you want Optimize to monitor, see the chapter titled “Configuring Business Processes” in *Administering webMethods Optimize*.

## Rules

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Optimize evaluates data against *rules* you define. A rule identifies a significant condition under which a process or resource becomes problematic, requires attention, or is of interest. A rule can be configured to alert users or take programmatic action when the condition occurs. Rules can also be configured to send user alerts when the process or resource returns to compliancy. You can define KPI rules and event rules.

When you define a rule, you identify the type of data to which to apply the rule (for example, Broker queue length). By default, Optimize then applies the rule to that type of data on all processes or applications (for example, all Brokers in your entire environment). However, you might want to apply the rule to that type of data for specific processes or applications only (for example, for certain Brokers only). In this case, you create a *rule filter* that identifies only the specific processes or applications. When you define the rule, you associate the rule filter with the rule.

During rule definition, you also identify the users to whom to send alerts when the rule is violated, or you can specify other actions to perform when a rule violation occurs (for example, send an SNMP alert to an SNMP manager or invoke a Web service).

## KPI Rules

*KPI rules* apply to KPIs that were created for business or system data. Optimize evaluates data against a KPI rule over one or more intervals according to the collection interval specified when the KPI was first created.

## Event and Threshold Rules

*Event rules* and *threshold rules* differ from KPI rules in that Optimize evaluates data points against the rule as they are collected (that is, in real time) rather than waiting for a KPI collection interval (that is, an aggregation of data points collected over an interval).

Event and threshold rules generally apply to types of data that require immediate response, such as an application unexpectedly shutting down or CPU usage exceeding unacceptable limits. Optimize maintains state for event rules so that you can track data over multiple intervals, but it does not maintain state for threshold rules. On the other hand, for capturing any individual order with a size greater than a million dollars, a threshold rule would be preferable to an event rule.

For more information on KPI, event, and threshold rules, see [“Defining Rules” on page 113](#).

## Optimize Home Page

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The Optimize for Process Home page enables you to quickly navigate to important Optimize for Process pages. The Optimize for Process Home page is located in My webMethods: **Applications > Monitoring > Business > Optimize for Process**.

The Optimize for Process Home page contains links to frequently used pages related to business processes, KPIs, rules, and problems under the “What would you like to do?” heading. These links are organized under three activity categories: View, Create, and Manage. When you click on a link in any category, the appropriate page is displayed.

In addition, the Home page contains a **More** link under the activity categories. Click the **More** link to access a listing of all Optimize for Process pages.

The **Server** selection box in the upper right corner of the page specifies the server being used and enables you to change the current selection. The currently specified selection applies to all Optimize monitoring pages.

## Users

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Optimize has two types of users: administrators and business analysts. Note that *business analyst* is a type of user that exists only in the context of Optimize for Process.

### Administrators

Administrators perform the following tasks:

- Install Optimize.
- Set up user access.
- Identify the mail server to use to send alerts about problems to users.
- Change interface and communication settings.
- Specify settings for statistical intervals and statistical confidence.
- Define business and system data and identify processes and system objects to monitor.

- Configure data collectors and create rule filters.
- Define rules to use to evaluate collected data.
- Set up logging.
- Maintain KPI instances and the database.

## Business Analysts

A *business analyst* is a type of user that exists only in the context of Optimize for Process. Business analysts perform the following tasks:

- Define rules to use to evaluate collected data.
- Scan for business and system problems.
- View analytic mashups, and rule details to help locate the source of a problem.
- Respond to alerts to resolve a problem.

## Users, Groups, and Roles

Optimize Administrators can use the My webMethods Roles, Groups, and Users pages (**Navigate > Applications > Administration > User Administration**) to create users, groups, and roles. Administrators can also grant access to My webMethods functions using Lightweight Directory Access Protocol (LDAP) or data-level security. For more information on users, groups, and roles, see *Administering My webMethods Server*. For more information on data-level security, see the following sections in *Administering webMethods Optimize*: “Enabling Data-Level Security” and “Granting User Access to KPIs”.



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## 2 Business Visualization Concepts

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This chapter provides a brief description of the following Business Visualization concepts:

- business processes (in Optimize for Process)
- key performance indicators (KPIs)
- data aggregation
- dimensions
- hierarchies
- KPI instances
- trends
- rules
- events (rule violations).

For more information about concepts behind the Optimize business activity components, see [“Concepts” on page 13](#).

## Business Processes

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This topic is specific to Optimize for Process. A *business process* is a series of inter-related business tasks that are performed:

- In a specific order
- Using an associated set of business rules
- By multiple systems, people, and partners

Examples of business processes within a corporation might include preparing for a new employee, handling a purchase order, bringing a product from inception to market, delivering a timely and accurate invoice, or enabling Vendor Managed Inventory.

The business process to prepare for a new employee might include business tasks such as assigning office space for the new employee, enrolling the employee in the internal Human Resources (HR) system, notifying the external partner that handles payroll, and obtaining the necessary office equipment (e.g., computer, phone).

*Business process management* is the ability to define, implement, manage, analyze, and optimize business processes, which includes interactions between:

- Systems within your own corporation (e.g., applications and information stores).
- People in your corporation.
- External business partners.

With business process management in place, the effort to prepare for a new employee can be automated, including the required human interaction. For example, the HR department could initiate the business process by filling out and submitting an online

form. Upon receiving the form, the business process would initiate and automatically update the internal HR system, as well as send a notification to the external partner that handles payroll. Additionally, that same single action by HR could result in the appropriate people and departments being notified about the new employee, so they can ensure that office space is assigned and the necessary office equipment is available by the employee's start date.

An automated business process usually also includes the actions to take should an error or exception occur in the process. For example, if there is no office space available, the Facilities Manager could be notified to determine how to handle that situation.

You can use business process management to monitor and manage each instance of a business process. For example, if you have three new employees starting, you can view details about the business tasks that have been completed for each of the new employees; that is, you can determine whether office equipment has been ordered or whether the payroll provider acknowledged notification for all three employees.

You can have several instances of a business process running at the same time. For example, if you have six new employees starting, you would have six instances of the new employee setup process running.

As business processes run, Optimize tracks KPIs that enable you to improve business process performance.

For information about setting up business processes you want Optimize to monitor, see *Administering webMethods Optimize*.

## Key Performance Indicators

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A *key performance indicator (KPI)* is a measurement of a business activity that is important to the success of an organization. KPIs monitor metrics for quantitative business and system data, such as revenue, volume of orders, queue length, and cycle time. KPIs help answer questions such as the following:

- How many orders over \$10,000 have completed for this process?
- What is the revenue for the Southeast Region?
- What is the total available memory for the Integration Server?

In an order management process, KPIs might monitor how many orders were received, their monetary amounts, and whether they were processed successfully.

To measure business or system data, a KPI specifies:

- A metric, which includes the following:
  - A unit of measure (such as dollars or minutes).
  - A calculation, which determines how to aggregate the data.
- A data collection interval.

Optimize supports nine KPI data collection intervals: 1 minute, 5 minutes, 10 minutes, 15 minutes, 30 minutes, 1 hour, 2 hours, 4 hours, and 8 hours.

Optimize supports five types of calculations.

Calculation	Function
Sum	Sums the data points collected over each collection interval. A possible use for this type of calculation is to tally process step errors.
Delta	Calculates the difference between the last data point collected in the previous collection interval and the last data point collected in the current collection interval. A possible use for this type of calculation is to compare Broker document published counts.  <b>Note:</b> The delta calculation has been deprecated. It is supported in this release, but support will be discontinued in a future release.
Average	Calculates the average value of the data collected over each collection interval. A possible use for this type of calculation is to track CPU usage.
Last Value	Stores the value of the last data collected in the collection interval. A possible use for this type of calculation is to track the size of a queue.
Max	Stores the maximum value of the data collected in the collection interval.
Min	Stores the minimum value of the data collected in the collection interval.
State	Stores the value of the last data collected in each collection interval, where the possible values are 1 (online) or 0 (offline). A possible use for this type of calculation is to track the state of an application.

An *intrinsic KPI* is created by Optimize to monitor business process or system data. For example, Optimize creates KPIs to monitor Instance Count by Process, Cycle Time by Process, and Process Error Count. Optimize also creates KPIs to monitor each error condition. There are hundreds of possible error conditions. For example, if a Step Timeout error occurs, Optimize creates a Step Timeout Error KPI to monitor all occurrences of the error.

A *business or system KPI* enables you to monitor business process or system data. Most of the KPIs discussed in this chapter, such as Revenue by Customer or Integration Server Total Memory, are business or system KPIs.

A *composite KPI* performs a mathematical operation (add, subtract, multiply, or divide) on two other KPIs. For example, if individual KPIs monitor a product's operating costs and revenue, a composite KPI can monitor the product's profit by subtracting the operating cost KPI from the revenue KPI. Both of the individual KPIs must measure their data over the same collection interval (for example, one hour). The composite KPI has a calculation (sum, average, or last value) and a unit of measure.

## Data Aggregation

*Data aggregation* is the process of combining individual data values into summarized data values. To measure the revenue in dollars generated by the order management process, a Total Order Revenue KPI might sum the dollar amounts of orders received during a ten-minute data collection interval. To measure the order cycle time in minutes, an Order Cycle Time KPI might average the time required to process orders over a one-hour data collection interval. To measure available memory, a Total Memory for Integration Server KPI might store the last value in kilobytes of the Integration Server's available memory at the end of each one-minute interval.

Optimize aggregates data for KPIs that calculate sums differently from KPIs that calculate differences, averages, last values, and states. For example, a chart of KPI performance shows four consecutive data points: 5, 8, 7, and 4. You increase the time range until Optimize must aggregate the four data points into one data point. For KPIs that calculate differences, averages, and last values, the aggregated data point is the average of the four individual data points: 6. For KPIs that calculate sums, the aggregated data point is the sum of the four individual data points: 24. (For KPIs that calculate states, the aggregated data point is also the average of the four individual data points, but the values of those individual data points would be 0 or 1.

In addition to aggregating all the data collected during the data collection interval, Optimize must eventually aggregate data from multiple data collection intervals as the time range for data displayed on the **KPI Summary page** or **KPI Instance Detail page** increases.

Depending on the *data display interval*, the time range for the displayed data, a displayed data value may represent one data collection interval or multiple data collection intervals. For more information, see [“KPI Data Display” on page 36](#).

## Dimensions

Measuring a metric like revenue or queue length by itself often does not provide all the information needed to analyze business or system performance. For example, an organization may want to measure:

- Revenue by region and sales person in addition to total order revenue
- Queue length by broker

To facilitate measuring more complex metrics, Optimize uses the concept of *dimensions*. A *dimension* is a category, a way to analyze business or system data by slicing it

into smaller components. Because dimensions are arbitrary and business-specific, organizations must define their own dimensions. Typical examples are:

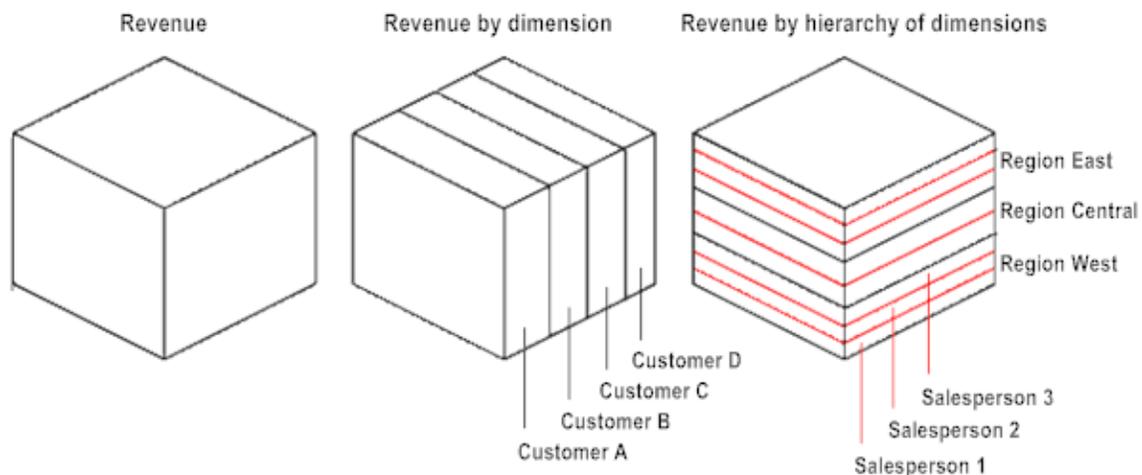
- Customer
- Region and sales person
- Product and manufacturer
- Broker Server and Broker

To understand the concept of a dimension, think of a metric like revenue as a cube. See the “KPIs and Dimensions” figure below.

Now imagine slicing that cube into layers based on customers. The resulting slices enable you to measure revenue by customer.

Another way to slice the cube is by region and sales person. The resulting slices enable you to measure revenue by region and by sales person within each region.

### KPIs and Dimensions



A KPI can measure business or system data by slicing it into dimensions. In the examples above, you might have a Revenue by Customer KPI and a Revenue by Region and Sales Person KPI. For system data, you might have a Queue Length by Broker Server and Broker KPI.

To analyze business or system data by slicing it into multiple dimensions such as region and sales person, you must arrange dimensions within a hierarchy.

A *hierarchy* is an ordered ranking of dimensions. A hierarchy provides additional ways to slice data into smaller components. For example, a sales hierarchy might consist of two dimensions: region and sales person. A queue length hierarchy might also consist of two dimensions: Broker Server and Broker.

Organizations define their own hierarchies of dimensions. For example, one organization might have a product hierarchy in which manufacturer is the main category and product name is a sub-category. Another organization might have

a product hierarchy in which product name is the main category and product manufacturer is the sub-category.

## KPI Instances

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A *KPI instance* is a measurement of one slice of business or system event data.

A Total Order Revenue KPI, which is not sliced by dimensions, has one KPI instance.

A Revenue by Customer KPI, which slices revenue by the customer dimension, has multiple KPI instances. Each KPI instance measures revenue for an individual customer.

A Revenue by Region and Sales Person KPI, which slices revenue by a sales hierarchy with two dimensions (region and sales person), has multiple KPI instances. Each KPI instance measures revenue for an individual sales person within a region.

A Queue Length by Broker Server and Broker KPI, which slices queue length by a broker hierarchy with two dimensions (Broker Server and Broker), also has multiple KPI instances. Each KPI instance measures queue length for an individual broker on a Broker Server.

The **KPI Instance Detail** page displays data for a KPI instance over any time period requested by a user. The default is the most recent four-hour period.

The **KPI Summary page** displays data for up to five KPI instances over any time period requested by a user. The default is the most recent four-hour period.

## Trends

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Optimize performs 16 different types of diagnoses (above normal, below normal, staying in upward trend, staying in downward trend, etc.) on all KPI instances over the KPI's collection interval. You can use this information to watch for trends in performance and to help determine ways to improve business processes and system components that continue to perform outside their normal range.

When Optimize diagnoses a trend, it places a trend icon (for example: ) on the listing for the KPI instance on the KPI Summary page as well as on the KPI Instance Detail page. Place the mouse pointer on a diagnosis trend icon to see a brief description of the trend.

For a complete list of trend icons, see “[Optimize Icons](#)” on page 209.

## Rules

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A *rule* specifies conditions under which a business process or system resource requires user attention, either because a problem has occurred or because an opportunity exists. Optimize supports two types of rules: KPI rules and event rules.

- A *KPI rule* evaluates data over one or more KPI data collection intervals. For example, a Gross Margin Percent Severely Below Normal rule might specify that the gross margin percentage must not go more than one sigma below the average Gross Margin KPI value for three consecutive Gross Margin KPI data collection intervals. A KPI rule takes dimensions into account, tracks its state of compliance, and persists in the database.
- An *event rule* evaluates data as it is collected rather than waiting until the end of a KPI collection interval. Like a KPI rule, an event rule takes dimensions into account, tracks its state of compliance, and persists in the database. In general, event rules evaluate data in situations that require immediate response. For example, an event rule might track whether an application has unexpectedly shut down.

Both types of rules evaluate data provided by KPIs.

Optimize uses a rule icon () to indicate that one or more rules are evaluating the data provided by a KPI. Click the rule icon to select a rule and view its details.

## Events

Optimize displays events and rule violations, based on user-defined rules on the following pages:

- The **KPI Summary** page
- The **KPI Instance Detail** page
- The **Process Analytics** page.

## Rule Violations

Optimize uses a rule violation icon ( or ) to indicate when one or more rules evaluating data provided by a KPI have been violated. Click the rule violation icon to select a rule violation and view details about the rule.

## KPI Data Display

As the time range for KPI data displayed on the **KPI Summary** page or the **KPI Instance Detail** page increases, Optimize must eventually aggregate data from multiple data collection intervals. Optimize aggregates data on each page as described in the Data Aggregation tables on the **KPI Summary** page and the **KPI Instance Detail** page.

**Note:** For KPIs that calculate differences, averages, last values, and states, the data values displayed on each page at a given data display interval will be similar, provided the data values received are similar, since the data values are averaged together over the collection interval. For KPIs that calculate sums, however, the data values displayed on each page at a given display interval

may differ significantly. For example, the display interval (time range) on each page is set at two months. On the **KPI Summary** page, data is aggregated at 12-hour intervals. On the **KPI Instance Detail** page, data is aggregated at one-week intervals. The data values on the **KPI Instance Detail** page are approximately 14 times greater than the data values on the **KPI Summary** page.

## Data Aggregation on KPI Summary Page

The following table describes KPI data aggregation on the **KPI Summary** page.

If the data display interval (time range) is	Optimize aggregates data for KPIs with these data collection intervals	Aggregated data values display at
Less than or equal to 4 hours	None	Data collection intervals
Greater than 4 hours but less than or equal to 12 hours	1 minute	5-minute intervals
Greater than 12 hours but less than or equal to 2 days	1 minute to 10 minutes	15-minute intervals
Greater than 2 days but less than or equal to 1 week	1 minute to 30 minutes	1-hour intervals
Greater than 1 week but less than or equal to 1 month	1 minute to 2 hours	4-hour intervals
Greater than 1 month but less than or equal to 3 months	All	12-hour intervals
Greater than 3 months but less than or equal to 6 months	All	1-day intervals
Greater than 6 months	All	1-week intervals

## Data Aggregation on KPI Instance Detail Page

If the data display interval (time range) is	Optimize aggregates data for KPIs with these data collection intervals	Aggregated data values display at
Less than or equal to 12 hours	None	Data collection intervals
Greater than 12 hours but less than or equal to 2 days	1 minute to 30 minutes	1-hour intervals
Greater than 2 days but less than or equal to 2 weeks	1 minute to 2 hours	4-hour intervals
Greater than 2 weeks but less than or equal to 4 weeks	All	1-day intervals
Greater than 4 weeks	All	1-week intervals

## KPI Historical Average Values

The **KPI Instance Detail** page displays:

- Actual readings. This is the same data that displays on the KPI Summary page. When data aggregation is necessary for display purposes, Optimize aggregates the data on each page using different formulas. For more information, see [“KPI Data Display” on page 36](#) above.
- Historical average values.
- Standard deviations of the actual readings from the historical average values.

Optimize displays historical average values based on a *statistical interval*.

The following table describes how Optimize determines the statistical interval based on the data collection interval and the data display interval.

If the data display interval for actual readings is	And the data collection interval is	Historical average values display at these statistical intervals
Less than or equal to 12 hours	1 minute to 30 minutes	1 hour
	1 hour to 8 hours	No historical average values display
Greater than 12 hours but less than or equal to 2 days	1 minute to 30 minutes	1 hour
	1 hour to 8 hours	No historical average values display
Greater than 2 days but less than or equal to 2 weeks	1 minute to 2 hours	4 hours
	4 hours to 8 hours	No historical average values display
Greater than 2 weeks but less than or equal to 4 weeks	All	1 day
Greater than 4 weeks	1 minute to 30 minutes	No historical average values display
	1 hour to 8 hours	1 week

Optimize plots the historical average value in the middle of each statistical interval. Example #1: the statistical interval is 1 hour. Optimize plots the average historical average value on the half hour. Example #2: the statistical interval is 1 day. Optimize plots the historical average value at 12:00 pm (noon).

Optimize supports three modes of operation for tracking historical average values:

- Weekday and weekend, two different values, one combining the historical average values for each day of the week (Monday through Friday) and another combining the historical average values for each day of the weekend (Saturday and Sunday). This is the default.
- Each day separate, seven different historical average values, one for each day of the week.
- All days the same, one value combining the historical average values for all seven days of the week.

## Setting the Mode of Operation

The number of different historical average values that Optimize computes depends on the mode of operation and the statistical interval.

Mode of operation	1-hour statistical interval	4-hour statistical interval	1-day, 1-week, or 4-week statistical interval
Weekday and weekend	48	12	2
Each day separate	168	42	7
All days the same	24	6	1

### To set the mode of operation for KPI historical average values

- In My webMethods:
  - Navigate > Applications > Administration > System-Wide > Environments > Define Environments.**
  - The Define Environments page is displayed.
- Click the name of the configured environment for which you want to set the mode of operation.
  - The Edit Environment page is displayed.
- Click the **Configure Servers** tab.
- On the **CONFIGURATION** tree, find the Analytic Engine for which you want to set the mode of operation for KPI historical average values, and click **Monitor Behavior Settings** under the name of the Analytic Engine.
- Set the Default Days attribute as follows:
  - `work` (weekday and weekend)
  - `day` (each day separate)
  - `all` (all days the same)

**Note:** The Default Days attribute is case sensitive. Type it exactly as shown above. Do not type any leading or trailing spaces.

## Event Display

Optimize places event flags representing rule violations on the KPI performance chart (which appears on the KPI Summary page and on the Process Analytics page) to indicate that one or more events have occurred.

The following table describes how Optimize assigns events to event flags based on the data display interval.

If the data display interval (time range) is	Event flags display at
Less than or equal to 2 hours	5-minute intervals
Greater than 2 hours but less than or equal to 6 hours	15-minute intervals
Greater than 6 hours but less than or equal to 24 hours	1-hour intervals
Greater than 24 hours but less than or equal to 4 days	4-hour intervals
Greater than 4 days but less than or equal to 24 days	1-day intervals
Greater than 24 days	1-week intervals

For example, the data display interval is four hours. Optimize displays an event flag for every 15-minute interval during which one or more events occurred.

The event flag displays at the start of the interval. For example, the data display interval is the four-hour period from 4:00 pm to 8:00 pm. Five events occurred during the period from 6:00 pm to 6:15 pm. Optimize displays one event flag for those five events. The flag displays at 6:00 pm on the KPI performance chart.

When you change the data display interval as shown in the above table, Optimize reassigns events to event flags.



# 3 Monitoring System Component and Business Process Performance

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## Overview of Monitoring System Component and Business Process Performance

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The system component information in this section applies to both Optimize for Process and Optimize for Infrastructure, while the business process information is specific to Optimize for Process.

A *system component* is any item of information technology (IT) infrastructure equipment in your environment that can be monitored. An *application* is a webMethods program such as Integration Server that runs on a system component in your environment.

You can check the performance of applications and system components by viewing:

- A list of all applications and system components that are out of compliance, on the **Problems** page.
- A summary of all KPI instances associated with applications and IT equipment, on the **Analytics Overview** page.

A *business process model* is an executable process that represents a series of interrelated business tasks that are performed in a specific order by multiple systems, people, and partners. Examples of business processes within a corporation are integrating a new employee, handling a purchase order, developing a product from inception to market, delivering a timely and accurate invoice, enabling vendor-managed inventory, or synchronizing item registries with UCCNET.

Each executable process started from a business process model is referred to as a *process instance*. For more information about business process models and instances, see *webMethods BPM Process Development Help* and *webMethods Monitor User's Guide*.

Using the Optimize components on the **Navigation > Applications > Monitoring** page of My webMethods, you can view following information about your running business processes:

- A summary of business process problems on the **Problems** page.
- The status of processes and process stages at a high level on the **Analytics Overview** page.
- Details about individual process instances on the **Process Instances** page.
- Details about step execution in a process instance on the **Process Instance Detail** page.

Your system administrator can configure your My webMethods System Settings to monitor multiple Integration Servers or multiple Analytic Engines (see “Configuring Optimize to Use Multiple Integration Servers and Analytic Engines” in *Administering webMethods Optimize*). You can select which Integration Servers and Analytic Engines you want to monitor from the **Server** menu in the top right corner of the My webMethods **Monitoring** pages. Only the processes, components, and applications on the selected server are displayed.

**Note:** The default server is set on the System Settings page. If you select a server on another My webMethods page, that server is selected until you select a different server.

## Viewing System Component and Business Process Problems

You can scan for system component and business process problems on the Problems page in My webMethods. The Problems page displays rule violations related to system components and business processes. The page does not show threshold rule violations, because they have a closing date. To display threshold rule violations on the Problems page, you must first specify an Advanced Search date range.

### To view system component and business process problems

1. In My webMethods: **Navigate > Applications > Monitoring > System-Wide > Problems.**

The Problems page lists the system components and business processes that are out of compliance.

The following table describes the information on the **Problems** panel.

Column	Description
<b>Status</b>	Indicates whether the system component or business process is out of compliance or statistically abnormal ▲.
<b>Description</b>	Displays the name of the rule that is violated. Click this text to display the Problem Details page for this problem event. For more information about the Problem Details page, see <a href="#">“Viewing Problem Details” on page 47.</a>
<b>Severity</b>	Indicates if a severity label has been defined for this item. If no severity label has been defined, nothing is displayed.
<b>Related To</b>	Displays the name of the system component and business process to which the problem event is related.
<b>Date/Time</b>	Displays the date and time that the system component and business process violated a rule and went out of compliance.
<b>Detail</b>	Displays rule detail, KPI instance detail, process analytics, Six Sigma, and view detail icons, as appropriate.

2. To narrow the list of problems to a group of components, such as Brokers, click the **Advanced** tab on the **Search** panel and specify your search criteria.

For example, you can narrow the list to show only Brokers residing on a certain server by specifying the broker component type and the host name and port number of that server.

The following table describes how to filter the list by problem type, duration, related problems, users to be notified, rule status, service level agreement (SLA), customer, or severity.

<u>In the Field Name List</u>	<u>In the Operator List</u>	<u>Set This Value</u>
<b>Duration</b>	Greater Than/ Less Than	Select a duration in minutes, hours, or days from the list.
<b>Related To</b>	Contains	Enter any text contained in the <b>Related To</b> field of the problem.
<b>Notification Users</b>	Contains	Enter any text contained in the names of users to be notified of this problem.
<b>Rule Status</b>	Equals	<b>In Compliance</b> or <b>Out of Compliance</b> .
<b>SLA</b>	Equals	<b>With SLA</b> or <b>Without SLA</b> .
<b>Customer</b>	Contains	Type any text contained in the label used to identify the customer associated with the rule.
<b>Severity</b>	Contains	Type any text contained in the label used to identify the severity of the rule.

Click **Add Row** to specify additional set of filter criteria.

- If the **Detail** column contains one or more icons, perform one of the actions that are described in the following table.

<u>If the Detail column contains</u>	<u>Do this</u>
 <b>Rule,</b>	Click to view details about the rule associated with the problem.
 <b>SLA Rule,</b>	For more information about interpreting rule details, see <a href="#">“Defining Rules” on page 113</a> in this guide.
 <b>Rule Violation,</b> or	

If the Detail column contains	Do this
 <b>SLA Rule Violation</b>	
 <b>KPI Detail</b>	<p>Click to view KPI instance information for the associated KPIs.</p> <p>For more information about interpreting KPI instance data, see <a href="#">“Analyzing Information about Key Performance Indicators”</a> on page 163 in this guide.</p>
 <b>Six Sigma</b>	<p>Click to view Six Sigma performance values for the problem associated with the rule, as well as information to help identify the root cause of the rule violation. This applies only to Optimize for Process.</p> <p>For more information about interpreting Six Sigma process improvement details, see <a href="#">“Improving the Long-Term Performance of a Process”</a> on page 93 in this guide.</p>
 <b>View Detail</b>	<p>Click to display the Problem Details page for this problem event.</p> <p>For more information about the Problem Details page, see <a href="#">“Viewing Problem Details”</a> on page 47.</p>

## Viewing Problem Details

The Problem Detail page displays detailed information about a selected problem event. The Problem Detail page consists of the **Problem Information** panel, the **Contributing Events** table, the **Similar Problems** table, and the **KPI Instance Summary** graph.

To view problem details from	Do this
Problems page	<p>In the <b>Problems</b> table, do either of the following:</p> <ul style="list-style-type: none"> <li>■ Click the problem event <b>Description</b>.</li> <li>■ Click  <b>View Detail</b> in the <b>Detail</b> column.</li> </ul>
E-mail alert	Click the Problem Detail hyperlink in the e-mail message.
KPI Instance Detail page	Click a red dot on the KPI instance detail graph.

The **Problem Information** panel contains general information about the problem.

The screenshot shows a 'Problem Information' panel with a blue header. Below the header, there are several fields: 'Description' with the value 'KPI 14 OR KPI 16 CompoundKPI EM1 KPI1 CI1 OR EM1 KPI2 CI1 FIRST', 'Date / Time' with '9/12/2018 6:11:00 AM', 'Related To' with 'Unassociated', 'Severity' (empty), 'Duration' with '127:04:06 Hours', and 'Current Status' with 'Out of Compliance'. There are also two small icons on the right side of the panel.

Field	Description
Description	Name of the rule instance associated with the problem event.
Related To	Name of the system component or business process to which the problem event is related.
Severity	Severity of the problem.
Date/Time	Time when the problem event occurred.
Duration	Time elapsed since this event first occurred.
Status	Status of the rule instance.
(various icons)	Icons that appeared on the Problems page.

## Contributing Events

The **Problem Detail** page displays information about contributing events and helps you determine other factors that might be contributing to a problem event. The information in the **Contributing Events** panel is dynamically generated based on the event map for the returned event and the specific data that is returned.

**Note:** In an Optimize for Infrastructure environment that does not have running business processes, the **Contributing Events** panel is always empty.

## Similar Problems

To help you identify processes, system variables, or other components associated with the problem, the Problem Detail page lists problem events related to the current problem's rule in the **Similar Problems** panel.

The following figure shows an example of the **Similar Problems** panel, and the subsequent table describes the information displayed in this panel.

Similar Problems				
Export Table... 1 - 10 of 49 Items				
Description	Severity	Date/Time	Duration	Detail
<a href="#">KPI 26 OR KPI 28 CompoundKPI EM1 KPI1 CI1 OR EM1 KPI2 CI1 SECOND</a>		9/12/2018 6:11:00 AM	127:04:06 Hours	
<a href="#">KPI 14 OR KPI 20 CompoundKPI EM1 KPI1 CI1 OR EM2 KPI1 CI1 FIRST</a>		9/12/2018 6:11:00 AM	127:04:06 Hours	
<a href="#">KPI 26 OR KPI 32 CompoundKPI EM1 KPI1 CI1 OR EM2 KPI1 CI1 SECOND</a>		9/12/2018 6:11:00 AM	127:04:06 Hours	
<a href="#">KPI 13 AND KPI 15 CompoundKPI EM1 KPI1 CI1 AND EM1 KPI2 CI1 FIRST</a>		9/12/2018 6:10:00 AM	127:05:06 Hours	
<a href="#">KPI 25 AND KPI 27 CompoundKPI EM1 KPI1 CI1 AND EM1 KPI2 CI1 SECOND</a>		9/12/2018 6:10:00 AM	127:05:06 Hours	
<a href="#">KPI 1 AND KPI 5 CompoundKPI EM1 KPI1 CI1 AND EM1 KPI3 CI5 BOTH</a>		9/12/2018 6:10:00 AM	127:05:06 Hours	
<a href="#">KPI 13 AND KPI 17 CompoundKPI EM1 KPI1 CI1 AND EM1 KPI3 CI5 FIRST</a>		9/12/2018 6:10:00 AM	127:05:06 Hours	
<a href="#">KPI 25 AND KPI 29 CompoundKPI EM1 KPI1 CI1 AND EM1 KPI3 CI5 SECOND</a>		9/12/2018 6:10:00 AM	127:05:06 Hours	
<a href="#">KPI 13 AND KPI 19 CompoundKPI EM1 KPI1 CI1 AND EM2 KPI1 CI1 FIRST</a>		9/12/2018 6:10:00 AM	127:05:06 Hours	
<a href="#">KPI 25 AND KPI 31 CompoundKPI EM1 KPI1 CI1 AND EM2 KPI1 CI1 SECOND</a>		9/12/2018 6:10:00 AM	127:05:06 Hours	

« Previous | 1 2 3 4 5 | Next »

The following table provides information about the fields on the **Similar Problems** panel.

Column	Description
Status column	Displays  if the problem event is out of compliance or  if it is statistically abnormal.
<b>Description</b>	Name of the rule instance that is associated with the similar problem. Click the name to view details of the event in a new instance of the Problem Detail screen.
<b>Severity</b>	Optional user-defined characterization of rule violation. You can define the severity on the Add/Edit/Copy Rule page.
<b>Date/Time</b>	Time when the problem occurred.
<b>Duration</b>	Amount of time that has elapsed since the problem event was created.
<b>Detail</b>	Displays one or more of the following icons:
Six Sigma	Click the icon to view Six Sigma performance values for the process associated with the rule, as well as

Column	Description
	information to help identify the cause of the rule violation. This applies only to Optimize for Process.
 Service Level Agreement	Indicates that there is a service level agreement rule violation for a customer. Click to view the Rule Detail page showing the relevant violation.
 Rule Violation	Click to view details about the rule that was violated.
 KPI Detail	Click to view KPI information for the rule violation.
 Problem Detail	Click to view the Problem Detail page for the rule violation.

## KPI Instance Summary Graph for Problem Events

The KPI Instance Summary Graph on the **Problem Detail** page is a KPI summary (detail) graph of each KPI associated with the problem event's rule. This graph centers on the time the event started, and shows multiple KPIs when possible. For events, it displays a scatter graph. For a detailed explanation of KPI Instance Summary graphs, see [“Viewing Details for Rules and Rule Violations” on page 105](#). The default time range of the graph is 2 hours before and 2 hours after the problem occurred.

## Using the Analytics Overview Page

On the Analytics Overview page in the **Monitoring** section of My webMethods, you can:

- view the status of business and system components,
- view information about process steps and step intrinsics,
- view information about stages and stage intrinsics,
- search components based on a variety of criteria.

**Note:** Business process data is specific to Optimize for Process.

By default, information displayed on the Analytics Overview page appears in built-in business and system views, though you can also create custom data views using the Overview Configuration page in My webMethods (**Navigate > Applications > Administration**

> **Analytics > Overview Configuration**). These data views are referred to as configurations. For more information about setting up configurations, see *Administering webMethods Optimize*.

To open the Analytics Overview page in My webMethods navigate to:

**Navigate > Applications > Monitoring > System Wide > Analytics Overview.**

The **Overview Configuration** field that is located at the top right side of the page displays the currently selected configuration. You can use the field to select from the default and custom configurations that exist. If no configuration has been selected for the Analytics Overview page, a message “**No Configurations Found**” is displayed.

The Status column () to the left of each component in the **Analytics Overview** panel indicates its current status. Additional icons beside each component indicate whether that component is a KPI, KPI instance, dimension, process, or a step. If a rule is violated, warning icons are displayed in the **Detail** column, and you can click them to view more information about the violation. The **Detail** column displays a variety of icons to show statistical measurements, rule status, links to KPI details, and six sigma for processes. Other icons provide access to pages containing additional information about trends, rules, and other pertinent issues. You can drill down into each KPI to view the KPI Instance Detail or KPI Summary page.

You can use the four radio buttons at the top of the **Analytics Overview** panel to customize the data view on the page. This capability facilitates viewing data according to your specific needs and is especially useful with data models that entail large and complex data relationships. These buttons and the corresponding views are as follows:

- **Complete Tree:** This view is selected by default and displays all elements of the configuration. The tree is grouped by KPI type and individual KPI instances are further broken down by dimension.
- **Dimension Tree:** This view displays KPI instances grouped by dimension. It facilitates pulling together KPI instances that share common dimension values.
- **KPI Tree:** This view is grouped by KPI instance name and displays only KPI instances without their KPI type and dimension folders. This view is especially useful when KPI instance names include dimensional values. It does not show KPI or dimension nodes.
- **Table View:** This view displays all KPI instances in a tabular format with no hierarchy. The view does not show the folder nodes. You can use the **Export Readings** button to export a .csv file with the data that is displayed in the table, or a .csv file that contains all readings for a specified time interval. For more information, see [“Exporting KPI Readings for a Specified Time Range” on page 59](#).

Regardless of the selected view, the **Analytics Overview** panel shows configuration information.

Column	Description
<b>Status</b>	<p>Indicates whether instances associated with the components are executing normally, have a rule violation, or are statistically abnormal. Status indicators include the following:</p> <ul style="list-style-type: none"> <li> Rule violation</li> <li> Statistical abnormality</li> <li> Normal</li> <li> No data is available</li> </ul> <p>For more information about these status indicators, see “<a href="#">Optimize Icons</a>” on page 209 in this guide.</p>
<b>Components</b>	<p>Lists all monitored business and system components. Click a component name to display the KPI Instance Detail or KPI Summary page for that component. The icon adjacent to each node indicates whether the node is a process, a KPI instance, a KPI, a dimension, a stage, or a step.</p> <ul style="list-style-type: none"> <li> The node is a KPI</li> <li> The node is a KPI instance</li> <li> The node is a dimension of a KPI</li> <li> The node is a process</li> <li> The node is a step in a process</li> <li>The node is a stage</li> <li>The node is a step in a stage</li> </ul> <p>For more information about these icons, see “<a href="#">Optimize Icons</a>” on page 209 in this guide.</p>
<b>Last Reading</b>	<p>Displays the value and unit of measure for the last aggregated data point collected for a KPI instance at the end of the collection interval.</p>
<b>Date/Time</b>	<p>Indicates the date and time of the last reading.</p>
<b>Detail</b>	<p>Displays one or more KPI detail, rule status, Six Sigma, and diagnosis trend icons. For more information about these icons, see “<a href="#">Finding Components that are Out of Compliance</a>” on page 57 and “<a href="#">Optimize Icons</a>” on page 209 in this guide.</p>

## Searching for Components on the Analytics Overview Page

The Analytics Overview page includes four search tabs that enable you to search records based on a variety of criteria. These search tabs are discussed in greater detail in *Working with My webMethods*, and the following descriptions provide specific information for the Analytics Overview search.

The search functionality in the Analytics Overview page allows you to create customized searches to find specific information about processes and components. You must enter your search queries in the **Search** panel. Your search results appear in the **Analytics Overview** panel.

When you first activate the Analytics Overview page, the **Keyword** search tab is active and the **Analytics Overview** panel shows the component tree for the selected configuration. The tree is collapsed by default, and you can click the plus signs (+) adjacent to folders to expand the branches to expose specific components. Click  to expand all branches of the tree.

The **Advanced** search tab includes filters that enable you to locate un-monitored Infrastructure KPIs so that they can be displayed and selected for deletion in Admin Mode.

---

### To search for components on the Analytics Overview page based on specific criteria

1. In My webMethods: **Navigate > Applications > Monitoring > System Wide > Analytics Overview**.
2. To narrow the list of components, click the **Keyword** tab to search by component name, or click the **Advanced** search tab to search by any of the following:
  - To narrow your search to a range of last readings, select a range from the **Last Reading Range** drop-down list, or create your own custom range.
  - To filter the list, in the **Filter** area, select one or more filters from the **Field Name** list. You can filter by process, status, rule, rule status, service level agreement (SLA), customer, or severity. Click **Add Row** to append an additional filter.

The following table lists the filters that are available in the **Filter** area.

In the Field Name List	In the Operator List	Set This Value
<b>Process</b>	Equal To/Not Equal To	<b>Unassociated</b> , or select a process name from the list.
<b>Status</b>	Equal To/Not Equal To	<b>Normal (green)</b> , <b>Statistical Abnormality (yellow)</b> , or <b>Rule Violation (red)</b>
<b>Rules</b>	Equal To	<b>With Rules</b> or <b>Without Rules</b>

<u>In the Field Name List</u>	<u>In the Operator List</u>	<u>Set This Value</u>
<b>Rule Status</b>	Equal To	<b>In Compliance</b> or <b>Out of Compliance</b>
<b>SLA</b>	Equal To	<b>With SLA</b> or <b>Without SLA</b>
<b>Customer</b>	Contains	Enter any text contained in the label used to identify the customer associated with the rule.
<b>Severity</b>	Contains	Enter any text contained in the label used to identify the severity of the rule.

3. Click the **Search**.
4. To save a search, click the **Save** button and enter a name for the search in the Saved Search dialog and then click **OK**. Saved searches are available on the **Saved** tab.
5. To view a saved search, click the **Saved** tab and select the desired search from the **Saved Search** field. Note that the **Saved Search** field is displayed only if saved searches are available.

## Process Intrinsic Data Metrics

This section describes the intrinsic metrics provided on the **Analytics Overview** page for processes, stage sand steps. These KPI instances are included in the built-in business view and can be included with a process in a custom configuration.

The following table describes the intrinsic metrics (accumulated over one-minute intervals) that Optimize monitors for processes.

<b>Process Monitor</b>	<b>Description</b>
Process Error Count	The number of process instances with an error status.
Process Error Count by Error Type	The number of process errors detected for each error type, including processes that timed out before they completed successfully.
Process Timeout Count	The number of times a process timed out before completing successfully.

Process Monitor	Description
Cycle Time by Process	The total time required for a process to run from beginning to end, including the time spent waiting to be processed and the process execution time. This value is an average value.  <b>Note:</b> Process instances in the canceled or suspended state do not contribute to cycle time. If a suspended process resumes and completes successfully, it will contribute to the cycle time less the time spent suspended.
Process Success Count	The number of process instances that completed successfully.
Instance Count by Process	The total number of process instances that started during the interval, regardless of their status.
Canceled	The number of process instances that have been stopped or suspended during the interval.

The following table describes the intrinsic metrics (accumulated over one-minute intervals) that Optimize monitors for process stages.

Process Monitor	Description
Stage Breached Count	The number of stages that were breached during the interval. A breach occurs when a stage rule is violated.
Stage Completed Count	The number of stages that completed successfully during the interval.
Stage Started Count	The number of stages that started during the interval.
Stage Processing Time	The average duration of the stages completed during the interval.

The following table describes the intrinsic metrics (accumulated over one-minute intervals) that Optimize monitors for process steps.

Step Monitor	Description
Processing Time by Step	The amount of time required for a step to execute.
Step Successes	The number of times the step completed successfully.
Error Count by Step	The number of times an error was generated for the step while the process was active. Errors include duplicate processing, timeouts, and steps executed out of sequence.  <b>Note:</b> Out-of-sequence errors do not occur with webMethods BPM processes.
Step Error Count by Error Type	The number of step errors detected for each type of error, displayed by error type.
Step Timeout	The number of times the step timed out before completing successfully.
Instance Count by Step	The number of times the step executed.
Wait Time by Step	The amount of time that the step spent waiting to run, calculated from the end of the previous step to the start of the current step.
Duplicate Step Processing	The number of times that this step executed more than once.
Step Out of Sequence Count	The number of times that this step executed out of sequence. If a step executes (for example, step 2) and a previous step transition has not occurred (step 1 is not complete), the step executing is marked as out of sequence.  <b>Note:</b> Out-of-sequence errors do not occur with webMethods BPM processes.
Step Count	The number of times the step was processed, either successfully or with errors, during the interval. When the step completes,

Step Monitor	Description
	<p>Optimize updates this Step Count along with one or more of the following:</p> <ul style="list-style-type: none"> <li>■ Step Successes, if the step completed successfully.</li> <li>■ Error Count by Step, if errors were generated for the step.</li> <li>■ Duplicate Step Processing, if the step executed more than once.</li> <li>■ Step Timeout Count, if the step timed out before completing.</li> <li>■ Step Out of Sequence Count, for external processes whose steps executed out of sequence.</li> </ul>

The following table describes the intrinsic metrics (accumulated over one-minute intervals) that Optimize monitors for transitions.

Transition Monitor	Description
Error Count by Transition	The number of times an error was generated for the transition while the process was active. Errors include timeouts.

## Finding Components that are Out of Compliance

The Analytics Overview page helps you to quickly identify problem areas and enables you to drill-down to locate specific problem components. The icons in the Status column (🚩) located to the left of components identify problematic components, and icons in the Details column enable you to view more detailed information about the component to identify and resolve specific problems.

Note that in tree views, status icons indicate problems within a branch. The status icon of a parent node reflects the status of its KPI instance children. You must expand the tree and trace a problem through the branches to locate a specific problem as outlined in the following procedure.

### To locate out of compliance or statistically abnormal components

1. In My webMethods: **Navigate > Applications > Monitoring > System Wide > Analytics Overview**.
2. In the **Overview Configuration** drop-down list, select the desired configuration to view in the **Analytics Overview** panel:
  - **Analytic Systems View**
  - **Analytic Business View**
3. In the Analytics Overview window, select the appropriate view for your data.

**Tip:** To view a non-hierarchical list of components, click **Table**. This view contains the same information and icons as the tree view but removes the hierarchical tree structure.

4. If necessary, search for the desired components using the Search functions. Refer to [“Searching for Components on the Analytics Overview Page” on page 53](#) for more information about constructing a search.
5. Scan the Status column for components that are out of compliance. Components that are out of compliance display a red circle (●) in the Status column. A yellow triangle (▲) indicates a component for which there is a statistical abnormality.
6. If branches of the tree are collapsed, you may need to expand the branches to find the specific problem component. Expand (click ⊕) the component you want to explore until you reach the specific component that is out of compliance or has an abnormal diagnosis.

**Tip:** Click ⊕ in the column heading to expand all components in the tree.

7. If the **Detail** column for the component contains one or more icons, perform the corresponding action, as described in the following table.

If the Detail column contains a	Do this
 Diagnosis icon	Rest the mouse pointer on the icon to see a brief description of the statistical diagnosis that Optimize performed on the component. For a more detailed description of each diagnostic icon, see <a href="#">“Optimize Icons” on page 209</a> in this guide.
Rule icon	Rest the mouse pointer on the icon to see the rule type, status, and customer associated with the rule, if any. Click the icon to view details about the rule. <ul style="list-style-type: none"> <li> identifies a rule that has not been violated.</li> <li> identifies a rule that has been violated.</li> <li> identifies an SLA rule that has not been violated.</li> <li> identifies an SLA rule that has been violated.</li> </ul> <ul style="list-style-type: none"> <li>■ If only one rule is associated with the component, Optimize displays the Rule Detail page when you click an icon.</li> <li>■ If more than one rule is associated with the component, Optimize displays the Rule Summary page when you click an icon.</li> </ul>

If the Detail column contains a	Do this
	For more information about interpreting rule details, see <a href="#">“Defining Rules” on page 113</a> in this guide.
 Six Sigma icon	Click the icon to view process improvement information for this component. For more information about interpreting Six Sigma process improvement details, see <a href="#">“Improving the Long-Term Performance of a Process” on page 93</a> in this guide.
 KPI Instance icon	Click the icon to view KPI summary information (if the component has multiple KPI instances) or KPI instance detail information (if the component has only one KPI instance). For more information about interpreting KPI data, see <a href="#">“Analyzing Information about Key Performance Indicators” on page 163</a> in this guide.

- The Analytics Overview page enables you to select KPIs and view an overview of their information on the KPI Summary page. To view KPIs, click the check box in the **Detail** column next to each desired KPI instance, and then click the **View KPI Summary** button. The KPI Summary page is displayed showing relevant information for the selected KPIs.

## Using Admin Mode to Delete KPI Instances

For users with administrative privileges the **Analytics Overview** page displays an icon that activates a different version of the page, known as Admin Mode. This mode enables users to view and select specific KPI instances for deletion. You can also access Admin Mode as a standalone page not linked to the **Analytics Overview** page from the My webMethods menu by clicking **Administration > Data Management > KPI Instance Deletion**.

The standard Analytics Overview search functionality is available in Admin Mode, so you can search and filter KPI instances according to specified criteria. Also, Admin Mode offers the same viewing options as the **Analytics Overview** page.

For more information about deleting KPI instances, see the *Administering webMethods Optimize* PDF publication.

## Exporting KPI Readings for a Specified Time Range

On the Analytics Overview page you can search for KPI readings for a specified time range and export the results to a .csv file.

---

### To export KPI readings for a specified time range

1. In My webMethods: **Navigate > Applications > Monitoring > System Wide > Analytics Overview**.

2. Click the **Advanced** search tab.

For more information about using the **Advanced** search tab, see [“Searching for Components on the Analytics Overview Page” on page 53](#).

3. Select a predefined value from the **Last Reading Range** drop-down list, or specify a user-defined time period using the **Start Date**, **End Date**, **Hour** and **Minute** fields.

4. Click **Search**.

Optimize searches for KPI instances which have last readings in the specified Last Reading Range.

5. In the **Analytics Overview** pane, select the **Table** view.

By default, the table lists up to 200 KPI instances which have last readings in the specified Last Reading Range. To change the maximum number of KPI instances that are displayed in the table, specify a value up to and including 5,000 in the **Max Results** field on the **Options** tab of the **Search** pane and click **Save**.

6. Click **Export Readings**.

The **Export Readings** dialog opens.

7. Select an export option.

To	Do this
Export all KPI readings in the specified Last Reading Range	Select the <b>Export All Readings</b> check box.
Include the auto-generated zero values of the KPI readings in the specified Last Reading Range	Select the <b>Include Zero Readings</b> check box.
Export all KPI readings in the specified Last Reading Range, including the auto-generated zero values of the KPI readings	Select the <b>Export All Readings</b> and the <b>Include Zero Readings</b> check boxes.
Export only the KPI readings that are listed in the Table view of the Analytics Overview pane	Leave the <b>Export All Readings</b> and the <b>Include Zero Readings</b> check boxes unselected.

8. Click **Export**.

Optimize generates a .csv file that lists the KPI readings.

**Note:** The maximum number of KPI readings that Optimize supports for extraction is 2,000,000.

## Viewing the Overall Status of Process Instances

In Optimize for Process, the Process Instances page displays the current status of BAM and BPM processes, and it enables you to search process instances based on a variety of criteria. Note that some information displayed on this page applies to BAM and BPM processes and some is specific to BAM processes.

To view the Process Instances page, navigate the following path in My webMethods:

**Navigate > Applications > Monitoring > Business > Process Instances**

By default, the Process Instances page shows information about all process instances that are updated today. The display is updated whenever you refresh the page or perform a search.

The following table describes the information on the **Process Instances** page.

Column	Description
<b>Last Updated</b>	Displays the date and time that Optimize last updated the process instance (that is, when Optimize last received data).
<b>Start Date/Time</b>	Displays the date and time that the process instance began.
<b>Process Name</b>	Identifies the name of the process.
<b>Version</b>	For a webMethods-executed process, this indicates the version of the process model assigned by Software AG Designer. For an externally executed process, this will display "N/A."
<b>Process Instance ID</b>	Identifies the process instance for each process listed in <b>Process Name</b> .
<i>&lt;Process-specific columns&gt;</i>	For processes that contain custom information, Optimize displays process-specific custom columns when you select a single webMethods process to view. If multiple processes are displayed, the contents of these custom columns are concatenated within the Process Instance ID. For more information about custom columns, see <a href="#">"Dynamically Generated Custom Columns"</a> on page 72.

Column	Description																		
<b>Status</b>	Tracks the progress of the process instance through its execution.																		
	<table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>Started</td> <td>The process has started, but not all steps have completed. A status of ▲ indicates that one or more steps may be executing with errors.</td> </tr> <tr> <td>Stopped</td> <td>The process was canceled.</td> </tr> <tr> <td>Completed</td> <td>Either the process completed successfully (■) or the process completed but one or more steps executed with errors (●).</td> </tr> <tr> <td>Failed</td> <td>Either the process stopped because one or more steps executed with errors or the process is no longer being tracked and is missing information. This status is not applicable to external (BAM-only) processes.</td> </tr> <tr> <td>Failed (Escalated)</td> <td>Parent process takes control of the failed process instance. The parent process receives notification of the failed process instance and continues executing. You cannot resubmit a process instance with this status because the parent process is no longer waiting for a response.</td> </tr> <tr> <td>Suspended</td> <td>Process execution was paused (▲). This status is not applicable to external (BAM-only) processes.</td> </tr> <tr> <td>Resumed</td> <td>The process was suspended and has been resumed. This status is not applicable to external (BAM-only) processes.</td> </tr> <tr> <td>Resubmitted</td> <td>The process was resubmitted after it failed. This status is not applicable to external (BAM-only) processes.</td> </tr> </tbody> </table>	Value	Meaning	Started	The process has started, but not all steps have completed. A status of ▲ indicates that one or more steps may be executing with errors.	Stopped	The process was canceled.	Completed	Either the process completed successfully (■) or the process completed but one or more steps executed with errors (●).	Failed	Either the process stopped because one or more steps executed with errors or the process is no longer being tracked and is missing information. This status is not applicable to external (BAM-only) processes.	Failed (Escalated)	Parent process takes control of the failed process instance. The parent process receives notification of the failed process instance and continues executing. You cannot resubmit a process instance with this status because the parent process is no longer waiting for a response.	Suspended	Process execution was paused (▲). This status is not applicable to external (BAM-only) processes.	Resumed	The process was suspended and has been resumed. This status is not applicable to external (BAM-only) processes.	Resubmitted	The process was resubmitted after it failed. This status is not applicable to external (BAM-only) processes.
Value	Meaning																		
Started	The process has started, but not all steps have completed. A status of ▲ indicates that one or more steps may be executing with errors.																		
Stopped	The process was canceled.																		
Completed	Either the process completed successfully (■) or the process completed but one or more steps executed with errors (●).																		
Failed	Either the process stopped because one or more steps executed with errors or the process is no longer being tracked and is missing information. This status is not applicable to external (BAM-only) processes.																		
Failed (Escalated)	Parent process takes control of the failed process instance. The parent process receives notification of the failed process instance and continues executing. You cannot resubmit a process instance with this status because the parent process is no longer waiting for a response.																		
Suspended	Process execution was paused (▲). This status is not applicable to external (BAM-only) processes.																		
Resumed	The process was suspended and has been resumed. This status is not applicable to external (BAM-only) processes.																		
Resubmitted	The process was resubmitted after it failed. This status is not applicable to external (BAM-only) processes.																		

Column	Description
	<p>Revised</p> <p>Indicates that a running process instance has been updated to a new process model version during execution. When a process version is updated, the status of the running process instance is automatically changed to Revised regardless of its previous status.</p>
<b>Duration</b>	<p>Length of time a process instance was active. Duration is calculated based on the status of the process instance:</p> <ul style="list-style-type: none"> <li>■ <b>Active.</b> Length of time the process instance has been executing. <b>Duration</b> is calculated by subtracting the start time of the process instance from the current system time.</li> <li>■ <b>Inactive.</b> Length of time the process instance was active. <b>Duration</b> is calculated by subtracting the start time of the process instance from the time the process instance became inactive.</li> <li>■ <b>Timed out or stopped.</b> Length of time the process instance was active. <b>Duration</b> is calculated by subtracting the start time of the process instance from the time the cancel or timeout action occurred.</li> </ul> <p><b>Note:</b> For steps that execute in parallel, <b>Duration</b> does not include the overlapping execution time.</p>
<b>Detail</b>	<p>Displays icons to view more details about the steps in the process instance and the KPI instances associated with the process instance. Click the Instance Detail icon  to display the Process Instance Detail page. For more information about these details, see <a href="#">“Viewing Details for a Process Instance” on page 73</a>. Click the KPI Summary icon  to display the KPI Summary page and operational metrics associated with the process instance. Note that this functionality is available only for external (BAM only) or analysis enabled webMethods(BPM) processes. For more information about KPI instances, see <a href="#">“Analyzing Information about Key Performance Indicators” on page 163</a> in this guide.</p>

The Process Instances page contains the same four search tabs (**Keyword**, **Advanced**, **Saved**, **Options**) that appear on the Business Processes page and other search-enabled pages throughout My webMethods. These tabs enable you to search for process instances using a variety of criteria and to control the number of process instances displayed. Refer to [“Using the Analytics Overview Page” on page 50](#) in this guide for more information or to *Working with My webMethods*.

For more information about resubmitting processes, see [“Resubmitting Processes from a Step and Optionally Editing Pipeline Information”](#) on page 68.

When you first access the Process Instances page, the **Keyword** tab is active and the page shows *only those process instances that have been started today*.

- To refresh the display of process instances, click the **Search** button, or to view instances containing a specific word, type the desired word into the **Keyword** field and click the **Search** button. If no process instances have been started in the current day, no results are returned. To search for older process instances, click the **Advanced** tab. For more information, see [“Searching for Process Instances”](#) on page 64.
- To save a search, click the **Save** button and enter a name for the search in the Saved Search dialog box and then click **OK**. The search is now available on the **Saved** tab.
- To view a saved search, click the **Saved** tab and select the desired search from the **Saved Search** field. Note that the **Saved Search** drop-down list appears only if there are saved searches available.
- By default, the maximum number of process instances displayed on the Process Instances panel is controlled by the **Max Results** field on the **Options** tab. The default setting in this field is 200, and you can change the setting by entering any number up to and including 5,000. To override the setting in the **Max Results** field, click the **No Maximum** check box on the **Options** tab. If you select this check box, the page will display available results up to the 5,000 item limit.
- To export the search results, click the **Export Table** button in the Process Instances window.

## Searching for Process Instances

To view instances for other time ranges or for other criteria, refer to the following procedure that describes how to use the **Advanced** search tab.

### To use the Advanced tab to search for process instances

1. In My webMethods: **Navigate > Applications > Monitoring > Business > Process Instances**.
2. Click the **Advanced** tab on the Process Instances **Search** panel.
3. In the **Process** drop-down list, select a process whose instances you want to view.

The following table describes how to use the **Advanced** search tab to view a specific set of process instances.

To	Do this
View only the process instances	For an easily defined time period, such as <b>This month</b> or <b>Last month</b> , select from the predefined time ranges in the <b>Date Range</b> drop-down list.

To	Do this
within a date and time range	<p>If none of the predefined time ranges fit your search, complete the <b>Start Date</b>, <b>End Date</b>, and <b>Time</b> fields. If you specify <b>Start Date</b> and <b>End Date</b> fields, the <b>Date Range</b> drop-down list changes to <b>Custom</b>. The <b>Hour</b> and <b>Minute</b> time fields are optional and default to 12:00 am (midnight) and 11:59 pm.</p> <p>Optionally, use the <b>Filter By</b> drop-down list to specify whether you want to view process instances that <i>started</i> within the specified date/time range or that were <i>last updated</i> within the specified date/time range. The default in the <b>Filter By</b> field is <b>Date Last Updated</b>.</p>
View only the process instances with a specific status	From the <b>Status</b> list, select the status you want to search for. You can multi-select statuses from this drop-down list by holding down the CTRL key while clicking. For example, you can view all process instances that have not completed (started, failed, suspended).
Specify the logic you want applied to the defined terms	In the <b>Search Condition</b> drop-down list, click <b>AND</b> or <b>OR</b> to specify how you want the search terms to be handled logically.

- When you are finished specifying your search criteria, click **Search**.

## About Resubmitting Process Instances and Process Steps

You can use the resubmit feature to repair and re-execute process instances that have failed, or to re-execute completed process instances. Note that only webMethods-executed processes can be resubmitted.

A key component of the resubmit feature is the ability to edit the pipeline associated with a step within the process instance prior to the resubmit operation. This is useful for modifying pipeline data that could be causing the failure.

You resubmit a process instance by resubmitting a step within that process instance. The resubmittal procedure varies depending on the status of the steps within the process:

- A process instance with a “Completed” status may be resubmitted from any step in the instance, provided you have first enabled the step for resubmission before the process instance began executing.
- A process instance with a “Failed” status may be resubmitted from any process instance step that has failed. A failed step is automatically enabled for resubmission, and the pipeline at the point of failure is automatically logged by the Process Engine and made available for resubmittal. No manual configuration is needed. Process

instances with Failed (Escalated) status cannot be resubmitted as the parent process is no longer waiting for a response.

## Requirements for Submitting Process Instances

The following requirements apply to resubmitting completed or failed processes:

- Only webMethods-executed processes can be resubmitted. You must have a BPM or a BPM and BAM server environment selected in the **Server** list at the top of the Process Instances page.
- For a completed process, the step from which you want to resubmit the process instance must be enabled for resubmission before the process instance began executing. For more information about resubmit enabling, see [“Enabling and Disabling a Step for Resubmission” on page 66](#).
- The logging level for the process model from which the instance was started must be set to a level that will log the input pipelines for those steps. Logging levels can be set in Designer, for more information see the *webMethods BPM Process Development Help*, and can also be adjusted in My webMethods. For more information, see the PDF publication *webMethods Monitor User’s Guide*.
- You must have privileges to resubmit process instances and any referenced processes that it may call. For more information, see the PDF publication *Administering webMethods Optimize*.
- An Integration Server must be available. The resubmit buttons and their associated table check boxes are displayed only when this is the case.
- You have appropriate Integration Server ACL settings to resubmit the process instances to a remote Integration Server in a non-clustered environment. If not:
  1. Create an ACL using Integration Server Administrator. Go to the **Security > Access Control Lists** page and create a new ACL to specify which user groups can access the remote server.
  2. Go to the **Settings > Remote Servers > Create Alias** page, select the ACL created in the previous step from the **Execute ACL** list, and create a remote server alias.

When the Integration Servers are clustered, the process instance is resubmitted to the Integration Server configured for your BPM and BAM or BPM only environment.

## Enabling and Disabling a Step for Resubmission

A process instance with a “Completed” status may be resubmitted from any step in the instance, provided you have first enabled the step for resubmission before the process instance began executing. This setting has no effect on process instances that are currently running or that have already stopped running.

In addition to enabling steps for resubmission as described below, you can also enable steps for resubmission in Software AG Designer. For more information about enabling and disabling steps for resubmission in Designer, see *webMethods BPM Process Development Help*.

**Note:** If you want to be able to resubmit process instances at certain steps, you must set the process model logging level to a level that will log the input pipelines for those steps.

### To enable or disable a step for resubmission

1. In My webMethods: **Navigate > Applications > Administration > Business > Business Processes**.
2. On the **Business Processes** page, search for the process model that contains the steps you want to enable.
3. In the search results, locate the process model you want to work with and click **Edit**.
4. On the **Edit Process** page, click the **Step Settings** tab, and then do either of the following:
  - Select the corresponding check box for a step you want to enable for resubmission.
  - Clear the corresponding check box for a step to disable resubmission capability.

**Note:** When a step is enabled for resubmission, the pipeline data for that step is saved. Extensive use of resubmittal enablement (for example, enabling all steps for all process models for resubmittal) may result in a reduction in performance.

5. Click **Save**.

## Resubmittal Behavior in the Run Time

The behavior that occurs when you click the **Resubmit** button depends on the status of the process instance itself.

For a process instance in "Failed" status, resubmitting a failed step in the instance:

- Marks the process instance as "Resubmitted"
- Executes that step with the available pipeline.
- Leaves the instance iteration of the process instance unchanged.
- Increments the step iteration of the resubmitted step from its previous iteration.
- Executes the remainder of the process instance from the point of resubmission.

For a process instance in "Completed" status, resubmitting a step in the instance:

- Creates a completely new iteration of the process instance.
- Increments the process instance iteration.
- Executes the remainder of the process instance from the point of resubmission.

## Resubmitting Processes from a Step and Optionally Editing Pipeline Information

### To resubmit a step in a process instance and optionally edit pipeline information

1. In My webMethods: **Navigate > Applications > Monitoring > Business > Process Instances**.
2. Search for the process instance you want to resubmit.
3. In the search results, locate the process instance that you want to resubmit and click  **Detail**.

**Note:** If your process instance has failed in multiple places, it may be necessary to resubmit multiple steps to get the instance running correctly. If this is the case, repeat the resubmit procedures for each step that requires resubmission.

4. On the Step Summary window of the Process Instance Detail page, locate the step that you want to resubmit and click  **Detail**.

**Note:** At this point, you can view or save the step pipeline data in XML format for additional analysis. Click **Save Pipeline To File**, and then click **Open** to view the file or click **Save** to save the file, then click **OK**.

5. To edit the input pipeline for a step on the Process Step Detail page:
  - a. In the Step Information window, click **Edit Pipeline**.

**Important:** After you update the pipeline, the changes you make are available *only* while you are still on the Process Step Detail page. If you leave this page, the changes you make are not saved. If you want to edit the pipeline before resubmitting, you must make your edits and then *immediately* resubmit the process step.

**Note:** The pipeline for the original iteration of the step is left unchanged. The updated pipeline is logged with the new iteration of the step.

- b. On the Edit Step page, for each field value you want to change:
    - a. Click the hyperlinked field value that you want to change. If the value of a field is not displayed with an active hyperlink, you cannot change that field value.
    - b. Specify a new value for the field.
    - c. Click **OK**.
    - d. After you modify all the fields you want to change, click **Save**. Monitor returns to the Process Step Detail page.
6. Click **Resubmit**.

## Example Resubmittal Use Cases

The following use cases demonstrate the most common scenarios for resubmitting a process instance.

### ***Unhandled Exception***

One of the most common use cases for resubmission is when a step in a process fails and there is no exception handler for that step, referred to as an *unhandled exception*. If an unhandled exception occurs, both the step and process instance are marked as "Failed" in Monitor and the pipeline for the failed step is saved at the point of failure.

The process instance continues to execute if there other tracks in the process that were executing prior to the failure, until the instance reaches a logical stopping point.

You can then locate the failed instance and step, edit the pipeline, and resubmit the failed step. The process instance will then continue executing from the point of the unhandled exception to its logical conclusion using the modified pipeline values.

### ***Handled Exceptions***

In this case, the process model implementation includes an exception handler. For example, you can model a boundary error event that transitions to an error handler sequence flow in the event of step failure at run-time. This is considered a *handled exception*.

The resubmit feature can still be used to resubmit failed steps in this case. However, this is not a common pattern, as the purpose of the exception handler is to execute whatever logical behavior is needed to prevent the failure of the process instance in the event of a step failure.

In other words, if your exception handler is designed properly and working as expected, you would not normally need to resubmit the process instance. If you have to resubmit failed steps in process instances with an exception handler, you are advised to modify your exception handling logic to correctly process the source of the failure.

### ***Steps Enabled for Resubmission***

Resubmission is not limited to steps that have failed. For example, you might want to resubmit a successfully completed step that is situated earlier in the process flow than the actual failed step to repair a failed process instance. Editing the pipeline at this previous, successfully completed step might be necessary to enable the failed step to complete successfully.

This is supported only if the completed step you want to resubmit was previously enabled for resubmission. You must enable the step for resubmission prior to the execution of the process instance. To enable a step for resubmission, see [“Enabling and Disabling a Step for Resubmission” on page 66](#).

### **Resubmitting Completed Processes**

A less common but supported pattern is the resubmission of a successfully completed process instance. Note that a successfully completed process can still contain a failed step, if the process model also contains an exception handler step that was able to complete the process successfully. In this case, you can resubmit either the failed step or any other step that is enabled for resubmission. A totally new instance of the process is started and execution begins from the point of resubmission. Depending on the process model, it may be necessary to resubmit multiple steps to complete the process.

### **Obtaining EDA Event Information about Process Stages**

A process stage is a logical grouping of one or more process steps accompanied by a rule of some sort, such as a threshold for execution duration. Usually, the stage represents an important role from a business perspective, and it is an object of interest for business process analysts. A stage can be defined in any process model using the Process Development perspective for Software AG Designer. After the process model is uploaded for analysis, the webMethods Process Tracker component picks up the process model and its stage definitions from the Process Audit database.

Whenever an event for process or step execution that marks the beginning of a stage is received, Process Tracker produces a `ProcessStageInstanceChange` event for the given stage, reporting that the stage status is “running”, and begins to evaluate the rule associated with this stage. If the rule is violated, Process Tracker produces another `ProcessStageInstanceChange` event, reporting the current stage status and the time when the rule was breached. When a process stage is completed, Process Tracker produces another `ProcessStageInstanceChange` event, reporting that the stage status is now “complete”. It also produces the `ProcessStageInstanceDuration` event which contains the actual stage execution duration.

When a process instance containing stages is completed or canceled, Process Tracker changes the status for all running stage instances to “incomplete”, then evaluates the rules associated with those stage instances. If the rules are violated, Process Tracker sends `ProcessStageInstanceChange` events reporting that the stage instance status is “incomplete” and the time when the rule was breached.

The following table describes the EDA event types that Process Tracker produces.

Event Type	Description
Process Stage Instance Change	Events of this type are produced by Process Tracker every time it detects that the process execution passes through a point that has been defined as the beginning or the end of a stage, and reports the change in state for the respective process stage. It also contains the breach time in case the rule associated with a stage instance has been breached.

Event Type	Description
Process Stage Instance Duration	Events of this type are produced by Process Tracker every time it detects that a stage has completed. The events contain the actual stage duration.

For event schema definitions and other information about working with EDA event types and processes, see the *webMethods BPM Process Development Help*.

The following table lists the process stage intrinsic KPIs.

Process Stage KPI	Description
Breach Count by Stage	Counts the number of stages for which an associated rule has been breached. The KPI instance names conform to this template: "Breach Count by Process \$Process.ProcessName Stage \$Stage.StageName". For example: "Breach Count by Process PricingProcess Stage ValidatePricing". The aggregation interval is one minute, and if there are no breached stage instances during the aggregation interval, a zero value is added.
Instance Count by Stage	Counts the stage instances generated by Process Tracker. The KPI instance name conforms to this template: "Instance Count by Process \$Process.ProcessName Stage \$Stage.StageName". For example: "Instance Count by Stage PricingProcess Stage ValidatePricing". The aggregation interval is one minute.
Complete Count by Stage	Counts the completed stage instances generated by Process Tracker. The KPI instance name conforms to this template: "Complete Count by Process \$Process.ProcessName Stage \$Stage.StageName". For example: "Complete Count by Process PricingProcess Stage ValidatePricing". These KPI instances are populated only when the stage ending milestone is processed by the Process Tracker. The aggregation interval is one minute, and no zero values are added if there are no stage instances finished during the aggregation interval.
Incomplete Count by Stage	Counts the incompleting stage instances generated by Process Tracker. The KPI instance name conforms to this template: "Incomplete Count by Process \$Process.ProcessName Stage \$Stage.StageName". For example: "Incomplete Count by Process PricingProcess Stage ValidatePricing". These KPI instances are populated when the process instance is complete before a stage ending milestone is processed by Process Tracker. The aggregation interval is one minute, and no zero values are added

Process Stage KPI	Description
	if there are no stage instances finished during the aggregation interval.
Process Time by Stage	Measures the average execution time of the stage instances generated by Process Tracker. The KPI instance names conform to this template: "Processing Time by Process \$Process.ProcessName Stage \$Stage.StageName". These KPI instances are populated only when the stage ending milestone is processed by the Process Tracker. Process Tracker contains an early stage breach detection mechanism that keeps track of the actual time passed from the beginning of the stage instance and sets the state to Breached if the actual time exceeds the time specified as a stage breach condition. Stage instances marked as Breached by the early stage breach detection mechanism will not be a part of this measurement, because their actual execution time is still unknown (the ending milestone has not been received yet). The aggregation interval is one minute, and no zero values are added if there are no stage instances finished during the aggregation interval.

## Dynamically Generated Custom Columns

Optimize displays the following standard set of information, with a set of standard column headings, for each process instance:

Standard Column Headings

	LAST UPDATED	START DATE / TIME	PROCESS NAME	VERSION	PROCESS INSTANCE ID	STATUS	DURATION	DETAIL
<input type="checkbox"/>	2005-10-27 15:16:27	2005-10-27 15:30:39	CarBPM04	507acf10473711da935992f9dedcd7		Started	n/a	
<input type="checkbox"/>	2005-10-27 15:15:52	2005-10-27 15:16:57	CarBPM04	3c5aadd0473711da9345992f9dedcd7		Started	5d 21:36:49.300	
<input type="checkbox"/>	2005-10-21 15:44:24	2005-10-21 15:44:24	CarBPM04	3ab66d70420411da8096cc2265c794df		Started	11d 21:9:21.631	

For processes that contain custom fields, Optimize can also display custom column headings to display custom information that has been added to the process.

Custom Column Headings

LAST UPDATED	START DATE / TIME	PROCESS NAME	TYPE	UNIQUE ID	STATUS	DURATION	DETAIL
2005-11-01 09:25:30	2005-10-31 12:21:30	orderProcessor_Bam			Started	1d 23:24:59.273	
2005-11-01 09:20:20	2005-10-31 12:16:20	orderProcessor_Bam			Started	1d 23:30:9.273	
2005-10-31 12:28:50	2005-10-31 12:19:00	orderProcessor_Bam	orderProcessor_Bam	rangeID_143 IterationID_3 dateKey_10/31/2005 13:14:00.000	Started	1d 23:27:29.320	
2005-10-31 12:28:50	2005-10-31 12:19:00	orderProcessor_Bam	orderProcessor_Bam	rangeID_45 IterationID_3 dateKey_10/31/2005 13:14:00.000	Started	1d 23:27:29.320	
2005-10-31 12:28:50	2005-10-31 12:19:00	orderProcessor_Bam	orderProcessor_Bam	rangeID_147 IterationID_3 dateKey_10/31/2005 13:14:00.000	Started	1d 23:27:29.320	
2005-10-31 12:28:50	2005-10-31 12:19:00	orderProcessor_Bam	orderProcessor_Bam	rangeID_138 IterationID_3 dateKey_10/31/2005 13:14:00.000	Started	1d 23:27:29.320	
2005-10-31 12:28:50	2005-10-31 12:19:00	orderProcessor_Bam	orderProcessor_Bam	rangeID_42 IterationID_3 dateKey_10/31/2005 13:14:00.000	Started	1d 23:27:29.320	

If instances from multiple processes are displayed, the custom headings may need to be concatenated and displayed within the standard **Process Instance ID** column.

Concatenated Column Headings

PROCESS NAME	PROCESS INSTANCE ID	STATUS	DURATION
CarBPM04	9b5933104be111da96e1f7a0a2d37c2e	Completed	0d 0:0:2.984
orderProcessor_Bam	type=orderProcessor_Bam&unique_id=rangeID_11 IterationID_1 dateKey_11/02/2005 13:42:00.000	Started	0d 0:4:0.322
orderProcessor_Bam	type=orderProcessor_Bam&unique_id=rangeID_182 IterationID_1 dateKey_11/02/2005 13:42:00.000	Started	0d 0:4:0.322
orderProcessor_Bam	type=orderProcessor_Bam&unique_id=rangeID_109 IterationID_1 dateKey_11/02/2005 13:42:00.000	Started	0d 0:4:0.322
orderProcessor_Bam	type=orderProcessor_Bam&unique_id=rangeID_225 IterationID_1 dateKey_11/02/2005 13:42:00.000	Started	0d 0:4:0.322

## Viewing Details for a Process Instance

You can view details for a specific process instance, and you can move backward and forward through detailed process-instance screens without having to return each time to the **Process Instances** page. You also can view details for the steps within a specific process instance, and edit pipeline or global data for a process instance step. Note that this information is specific to Optimize for Process.

## Viewing Process Instance Details

To view details for a process instance

1. In My webMethods: **Navigate > Applications > Monitoring > Business > Process Instances**.
2. Search for the process you want to work with.
3. Click the Instance Detail icon (🔍) that appears in the **Detail** column in the **Process Instances** panel on the Process Instances page.

Optimize displays the **Process Instance Detail** page, which displays the most important information about a process instance. It offers the following buttons:

- **Previous** and **Next**. These buttons enable you to move through the process instances listed in the search results without having to return to the Process Instances page.
- **Refresh**. Updates the page with the most recent process data available.
- **Close**. Closes the **Process Instance Detail** page and returns to the **Process Instances** page.

The **Process Instance Detail** page contains the information listed in the following tables.

The following table provides information about the **Process Instance Information** panel.

Field	Description
<b>Process</b>	Displays the name of the business process associated with the selected process instance.
<b>Model Version</b>	For a webMethods-executed process, this indicates the version of the process model assigned by Software AG Designer. For an externally executed process, this will display "N/A."
<b>Start Date/Time</b>	Indicates the date and time that the selected process instance started.
<b>Last Updated</b>	Indicates the date and time that Optimize last updated the selected process instance.
<b>Instance ID</b>	Displays the unique identifier for the process instance. If a process instance ID consists of multiple parts (such as order numbers from two or more different order systems), Optimize creates one row for each part of the process instance ID.
<i>&lt;Process-specific columns&gt;</i>	For processes that contain custom information, Optimize displays process-specific custom columns when you select a single webMethods process to view. If multiple processes are displayed, the contents of these custom columns are concatenated within the Process Instance ID. For more information about custom columns, see <a href="#">"Dynamically Generated Custom Columns" on page 72</a> .
<b>Parent Instance ID</b>	Unique identifier for the parent process instance, if applicable. Provided only for instances that have been started by other instances.

Field	Description
<b>Instance Iteration</b>	Indicates the number of times the process instance was submitted.
<b>Status</b>	Indicates the status of the process instance, as described in <a href="#">“Using the Analytics Overview Page” on page 50</a> in this guide.
<b>Duration</b>	<p>For active process instances (those with a status of Started, Resumed, or Resubmitted), duration represents the length of time that this process instance has been executing, calculated by subtracting the start time of the process from the current system time.</p> <p>For inactive process instances (those with a status of Stopped, Completed, Failed, or Suspended), duration represents the length of time that the process instance was active, calculated by subtracting the start time of the process from the time the process became inactive.</p> <p>For process instances that have timed out (status of either Stopped or Completed) or have been canceled (status of Stopped), duration represents the length of time that the process instance was active, calculated by subtracting the start time of the process from the time the cancel or timeout action occurred.</p> <p><b>Note:</b> For process instance steps that execute in parallel, this Duration value does not include the overlapping execution time.</p>
<b>Buttons:</b>	<p>These buttons are available only when a process instance is running (that is, does not have a status of Completed).</p> <ul style="list-style-type: none"> <li>■ <b>Update.</b> Available when a process instance is running and a new version of the source process model has been enabled. This updates the running instance so that it uses the newly enabled model version for the rest of the process.</li> <li>■ <b>Suspend/Resume.</b> Click to suspend or resume a process instance.</li> <li>■ <b>Stop.</b> Click to stop the process instance.</li> </ul>

The following table provides information about the **Process Stage Timeline** panel.

## Process Stage Timeline Information

The Process Stage Timeline panel displays a graphical presentation of stage activity and status over time. webMethods Optimize for Process must be installed to be able to view stage timeline information.

**Note:** When a process contains no stages, or if webMethods Optimize for Process is not installed, this window is collapsed to show only the title bar. It cannot be expanded.

**Note:** Process stage logging does not occur instantaneously. This can result in a delay of up to five minutes between stage instance changes and the stage status displayed in the Stage Timeline window. For example, when viewing a recently executed process instance, stages may initially appear as not yet started. Click the **Refresh** button on the Process Instance Detail page to update the Stage Timeline window. For more information, see “About Process Generation and Stage Status Display” in the Building and Uploading chapter of *webMethods BPM Process Development Help*.

By default, stages of all statuses are displayed, as indicated by the stage status display check boxes:

 **Completed**   **Running**   **Incomplete**   **Not Started**

You can filter the list of displayed stages by clearing a stage status check box, which removes stages of that status from the display. Select a check box to display stages of that status. The stage list provides the following information:

**Note:** Click on a column name to activate the sort controls for that column.

The following table provides information about the columns of the **Process Instance Information** panel.

Column	Description
<b>Status</b>	The current status of the stage: Completed, Running, Incomplete, or Not Started.
<b>Name</b>	The name assigned to the stage.
<b>Cycle Time</b>	Cycle time is based on the status of the stage: <ul style="list-style-type: none"> <li>■ <b>Completed.</b> The length of time it took for the stage to run from start to completion.</li> <li>■ <b>Running.</b> The length of time since the stage began executing.</li> </ul>

Column	Description
	<ul style="list-style-type: none"> <li>■ <b>Incomplete.</b> The length of time it took for the stage to run from start to the time it stopped running for any reason other than completion (for example, step failure or process suspended).</li> </ul> <div style="background-color: #f0f0f0; padding: 10px; margin: 10px 0;"> <p><b>Note:</b> A stage will have incomplete status:</p> <ul style="list-style-type: none"> <li>■ if it is still running when the process terminates for any reason. This can happen with normal process execution if the process instance took a split branch that does not terminate.</li> <li>■ if the End Milestone of a stage is defined as the start or end of a step which is part of a subprocess.</li> </ul> </div> <ul style="list-style-type: none"> <li>■ <b>Not Started.</b> No cycle time is displayed.</li> </ul>

<b>Deviation</b>	<p>Deviation is calculated only when the stage is breached. A value of +/- 0 indicates no deviation. A stage that has breached its defined condition is indicated by an alarm icon .</p> <p>The deviation time is calculated by comparing the Cycle Time to the Condition expression defined for the stage. If the condition specifies &lt;, then the stage is breached when the cycle time exceeds the specified time period. If the condition specifies &gt;, then the stage is breached when the cycle time is less than the specified time period. For example:</p> <ul style="list-style-type: none"> <li>■ If the Condition expression is "&lt; 2 seconds" and the stage completes in 3 seconds, the deviation is 1 second, and the stage is breached.</li> <li>■ If the Condition expression is "&gt; 2 hours" and the stage completes in 1 hour and 30 minutes, the deviation is -30 minutes, and the stage is breached.</li> </ul>
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You can obtain additional stage information as follows:

- Hover the cursor over any row in the stage list, or over the colored bar for a stage in chart area to view the stage name and description as well as the following:
  - **Status:** The current status of the stage.
  - **Start Milestone:** The point in the process where the stage starts.
  - **End Milestone:** The point in the process where the stage ends.
  - **SLA Condition:** The expected execution time specified in the stage's Condition expression.
  - **Stop Tracking On Breach:** Indicates if this option is selected (Yes or No).

- Clicking any row in the stage list does all of the following:
  - Displays the stage's start milestone  and stage end milestone  in the Process Diagram window. Only one stage can be displayed in the Process Diagram at any time. Click another row to display the milestones for another stage.
 

If you have selected the Stop Tracking On Breach check box for a stage and that stage experiences a breach, all stage tracking ceases and any remaining stages in the process are marked as Incomplete. In this case, it is possible for the steps within the stage to be shown as Complete in the process diagram, while the stage that contains them is shown as Incomplete. This is expected behavior.
  - Filters the Step Summary list to display only those steps that executed within the stage's cycle time. Steps that are in a different path from the stage's start and end milestone steps will also be included if the step's execution time falls within the stage cycle time.
  - Filters the Logged Fields list to display only those logged fields that belong to a step in the filtered Step Summary list.
 

Click **Clear Selection** in the Process Stage Timeline window to remove the milestone icons and display all process steps in the Step Summary window and all logged fields in the Logged Fields window.
- To set the time resolution for the chart, select from Year, Month, Week, Day, Hour, or Minute in the **Time Unit** list.

The Process diagram depicts the progression of steps in the process. If the process is a webMethods-executed process, status icons appear on the steps in the diagram.

The following table provides more information about the status icons for webMethods-executed processes.

Icon	Description
	The step is running.
	The step has completed.
	The step has failed.
	The step is waiting (for example, to receive an external document).

In addition, you can display milestones for an individual stage by selecting the stage in the list portion of the Process Stage Timeline window. See "Process Stage Timeline", above, for more information. The following right-click options are available for process diagrams on the Process Diagram panel.

- **Fit to screen** - Resizes and re-centers the diagram based on the screen size.
- **Hide transition labels** - Hides description and expression text on all transition lines in the diagram.
- **Show transition descriptions** - Shows all applicable description text created in Designer for all transitions on the diagram.
- **Show transition expressions** - Shows applicable transition expressions created in Designer for all transitions on the diagram.

**Note:** External (BAM-only) processes can have only one status: “The step has Completed.” No other statuses listed here are displayed for these processes.

The Step Summary panel displays information about the execution of the steps within the process instance.

**Note:** The list of steps can be filtered by stage by selecting the stage in the list portion of the Process Stage Timeline panel. See “Process Stage Timeline”, above, for more information. Click **Clear Selection** in the Process Stage Timeline panel to display all process steps in the Step Summary panel.

The following table provides information about the panel.

Column	Description
<Status Icons>	 The step started successfully.  The step has started and may include errors.  The step completed with errors.
<b>Step Name</b>	Displays the name of the step.
<b>Start Date/Time</b>	Indicates the date and time that the step began executing.
<b>Last Updated</b>	Indicates the date and time that the step stopped executing.
<b>Instance Iteration</b>	For webMethods-executed processes or workflows, identifies the number of times the process or workflow executed, including re-submissions. For externally executed processes, this value will always be 1.
<b>Step Iteration</b>	Displays the number of times the step executed.
<b>Loop Iteration</b>	Applies only to steps that can be configured for standard looping, such as a subprocess step or a call activity step. A step executes

Column	Description																		
	<p>a loop iteration only when a loop condition is configured for the step and that condition has been met.</p> <p><b>Note:</b> A step can loop two or more times until the loop condition is no longer met. A separate row exists for each loop iteration. Any time the step iteration increments, the loop iteration count is reset and begins again with 1.</p>																		
<b>Status</b>	Displays the status of the step.																		
	<table border="1"> <thead> <tr> <th data-bbox="505 653 737 699">Value</th> <th data-bbox="737 653 1406 699">Meaning</th> </tr> </thead> <tbody> <tr> <td data-bbox="505 699 737 835">Started</td> <td data-bbox="737 699 1406 835">The step has started. The step may be executing with errors.</td> </tr> <tr> <td data-bbox="505 835 737 951">Stopped</td> <td data-bbox="737 835 1406 951">The step was canceled. This status is not applicable to BAM-only processes.</td> </tr> <tr> <td data-bbox="505 951 737 1066">Completed</td> <td data-bbox="737 951 1406 1066">Either the step completed successfully or the step completed but it executed with errors.</td> </tr> <tr> <td data-bbox="505 1066 737 1287">Failed</td> <td data-bbox="737 1066 1406 1287">Either the step stopped because it executed with errors or the step is no longer being tracked and is missing information. This status is not applicable to BAM-only processes.</td> </tr> <tr> <td data-bbox="505 1287 737 1507">Expired</td> <td data-bbox="737 1287 1406 1507">The time specified for the step in the process model for an event to occur expired before the event was satisfied. For example, the time set for a join condition expired before a document required by the join condition arrived.</td> </tr> <tr> <td data-bbox="505 1507 737 1623">Retries Exceeded</td> <td data-bbox="737 1507 1406 1623">An attempt was made to execute the step more times than is specified.</td> </tr> <tr> <td data-bbox="505 1623 737 1738">Unsatisfied Join</td> <td data-bbox="737 1623 1406 1738">A join definition for the step has not been satisfied. That is, some incoming transitions have not arrived.</td> </tr> <tr> <td data-bbox="505 1738 737 1862">Waiting</td> <td data-bbox="737 1738 1406 1862">Step is waiting for an event to occur (for example, the step might be waiting for a document to arrive).</td> </tr> </tbody> </table>	Value	Meaning	Started	The step has started. The step may be executing with errors.	Stopped	The step was canceled. This status is not applicable to BAM-only processes.	Completed	Either the step completed successfully or the step completed but it executed with errors.	Failed	Either the step stopped because it executed with errors or the step is no longer being tracked and is missing information. This status is not applicable to BAM-only processes.	Expired	The time specified for the step in the process model for an event to occur expired before the event was satisfied. For example, the time set for a join condition expired before a document required by the join condition arrived.	Retries Exceeded	An attempt was made to execute the step more times than is specified.	Unsatisfied Join	A join definition for the step has not been satisfied. That is, some incoming transitions have not arrived.	Waiting	Step is waiting for an event to occur (for example, the step might be waiting for a document to arrive).
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Started	The step has started. The step may be executing with errors.																		
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Unsatisfied Join	A join definition for the step has not been satisfied. That is, some incoming transitions have not arrived.																		
Waiting	Step is waiting for an event to occur (for example, the step might be waiting for a document to arrive).																		

Column	Description
	Interrupted      The step has been interrupted by an interrupting boundary event.
<b>Duration</b>	<p>For active steps (those with a status of Started), duration represents the length of time that this step has been executing, calculated by subtracting the start time of the step from the current system time.</p> <p>For inactive steps (those with a status of Stopped, Completed, or Failed), duration represents the length of time that the step was active, calculated by subtracting the start time of the step from the time the step became inactive.</p> <p>For steps that have timed out (status of either Stopped or Completed) or have been canceled (status of Stopped), duration represents the length of time that the step was active, calculated by subtracting the start time of the step from the time the cancel or timeout action occurred.</p>
<b>Referenced Processes</b>	webMethods-referenced process or BPMN callable process that was executed at run time for this step.
<b>Detail</b>	Displays the KPI Detail icon and the Step Detail icon. Click either icon to view more details about the step execution.

The **Control Actions** panel appears only when a control action (suspend, resume, resubmit, or stop) has been performed on a webMethods-executed process. This panel is available only for BPM processes.

The following table provides information about the **Control Actions** panel.

Column	Description
<b>Date/Time</b>	Displays the date and time that the control action was performed.
<b>Action</b>	Identifies the action taken on the process instance (suspend, resume, resubmit, or stop).
<b>Instance Iteration</b>	Displays the process iteration upon which the control action was taken.
<b>Step Name</b>	Displays the name of the step, if applicable.

Column	Description
Step Iteration	Displays the step iteration upon which the control action was taken.
Server ID	Identifies the server on which the process instance executed.
User	Identifies the user associated with the control action.

The **Activity Messages** panel appears only when a webMethods-executed process executed a service that logged user-defined messages. This panel is available only for BPM processes.

The following table provides information about the **Activity Messages** panel.

Column	Description								
Date/Time	Displays the date and time that the activity message was logged.								
Step Name	Displays the name of the step.								
Entry Type	Displays the type of message.								
	<table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>Message</td> <td>The message is informational and no action is needed.</td> </tr> <tr> <td>Warning</td> <td>The process can complete successfully even if the circumstance causing the warning is not addressed.</td> </tr> <tr> <td>Error</td> <td>The process cannot complete successfully until the circumstance causing the error is resolved.</td> </tr> </tbody> </table>	Value	Meaning	Message	The message is informational and no action is needed.	Warning	The process can complete successfully even if the circumstance causing the warning is not addressed.	Error	The process cannot complete successfully until the circumstance causing the error is resolved.
Value	Meaning								
Message	The message is informational and no action is needed.								
Warning	The process can complete successfully even if the circumstance causing the warning is not addressed.								
Error	The process cannot complete successfully until the circumstance causing the error is resolved.								
Brief Message	Displays a shortened version of the message.								
Full Message	Displays the full version of the message.								

The **Logged Fields** panel appears only when the process has logged run-time values for certain input, output, and global data document fields. For more information about custom logged fields, see the *webMethods BPM Process Development Help*.

The following table provides information about the **Logged Fields** panel.

Column	Description
<b>Date/Time</b>	Displays the date and time that the custom field was logged.
<b>Step Name</b>	Displays the name of the step.
<b>Instance Iteration</b>	For webMethods-executed processes or workflows, identifies the number of times that the process or workflow executed, including re-submissions. For externally executed processes, this value will always be 1.
<b>Step Iteration</b>	Displays the step iteration that was executing when the custom field was logged.
<b>Loop Iteration</b>	Applies only to steps that can be configured for standard looping, such as a subprocess step or a call activity step. A step executes a loop iteration only when a loop condition is configured for the step and that condition has been met. <div style="background-color: #f0f0f0; padding: 5px; margin-top: 10px;"> <p><b>Note:</b> A step can loop two or more times until the loop condition is no longer met. A separate row exists for each loop iteration. Any time the step iteration increments, the loop iteration count is reset and begins again with 1.</p> </div>
<b>Input/Output</b>	Indicates whether the logged field was defined to log from the step input pipeline or the step output pipeline.
<b>Field Name</b>	Displays the name of the custom logged field.
<b>Field Value</b>	Displays the value of the custom logged field.

The **Process Errors** panel displays information about process errors and step errors, sorted by time. Note that some fields are specific to either BAM or BPM processes.

The following table provides information about the **Process Errors** panel.

Column	Description
<b>Date/Time</b>	Indicates the date and time that the error occurred.
<b>Error</b>	This column is empty for BPM processes. For BAM processes, it displays the name the user gave to the standardized or custom error types for the applicable process instance. See the

Column	Description
	“Configuring Business Processes” chapter in <i>Administering webMethods Optimize</i> for more information about errors.
<b>Error Message</b>	<p>For BAM process instances, error messages provide the following details based on the category of the error type:</p> <ul style="list-style-type: none"> <li>■ For Standardized error types, error messages display details regarding the cause of the error (for timeouts, the time that was expired; for dimension-based timeouts, the dimension instance is listed).</li> <li>■ For Custom error types, error messages display the error text included in the execution error received from the Monitor API.</li> <li>■ For System error types, error messages display a detailed message regarding the internal system error that occurred. In some cases, a stack trace is included. This error message matches a similar error message logged to the Analytic Engine's error log file.</li> </ul>
<b>Message Detail</b>	This field is applicable only to BPM processes. It provides additional run-time error text and, where applicable, a stack trace with details about the error.
<b>Service Name</b>	Displays the name of the webMethods service that was invoked when the error occurred. This column appears only when a webMethods service is associated with the error. This field is applicable only to BPM processes.
<b>Step Iteration</b>	<p>Number of times the step was executed as a result of:</p> <ul style="list-style-type: none"> <li>■ A transition drawn to this step downstream step that causes the step to execute multiple times during a single process execution.</li> <li>■ The process was resubmitted, causing the step to execute again.</li> </ul>
<b>Step Name</b>	Displays the name of the step that was executing when errors occurred and lists all related errors. This field is empty for errors at a process level, such as a process timeout.
<b>Server ID</b>	Identifies the server on which the error occurred. This column appears only if a specific server is associated with the error. This field is applicable only to BPM processes.

4. If you want to see more details about the execution of a particular step, click the Step Detail icon (🔑) next to that step in the **Step Summary** panel and continue to “[Process Instance Step Details](#)” on page 85.

- If you want to resubmit a step, see [“About Resubmitting Process Instances and Process Steps”](#) on page 65 and [“Resubmitting Processes from a Step and Optionally Editing Pipeline Information”](#) on page 68.

## Process Instance Step Details

### To view details for a process instance step

- In My webMethods: **Navigate > Applications > Monitoring > Business > Process Instances**.
- Search for the process you want to work with, and in the search results in the Process Instances window, click the Detail icon (🔍) for the process instance to open the Process Instance Detail page.

**Note:** The 🔍 icon is not available for rows representing a subprocess or call activity loop iteration, as there is no additional information available.

- Click the Step Detail icon (🔍) to the right of a step in the **Step Summary** window.

Optimize displays the **Process Step Detail** page which provides additional information about the step.

The following table describes the information that is displayed in the **Step Information** panel.

Column	Description
<b>Step Name</b>	Displays the name of the step.
<b>Start Date/Time</b>	Displays the date and time that the step began executing.
<b>Last Updated</b>	Indicates the date and time that Optimize last updated the step.
<b>Instance Iteration</b>	Number of times the process instance executed, including resubmissions. For externally executed processes, this value is always 1.
<b>Step Iteration</b>	Displays the number of times the step executed.
<b>Loop Iteration</b>	Applies only to steps that can be configured for standard looping, such as a subprocess step or a call activity step. A step executes a loop iteration only when a loop condition is configured for the step and that condition has been met.

**Note:** A step can loop two or more times until the loop condition is no longer met. A separate row exists for each loop

Column	Description
	iteration. Any time the step iteration increments, the loop iteration count is reset and begins again with 1.
<b>Status</b>	Displays the status of the step. Values for this field are the same as the <b>Status</b> values on the Process Instance Detail page described earlier in this section.
<b>Duration</b>	Displays the amount of time that the step took to execute, from the beginning of the step to the end of the step.
<b>Server Type</b>	For webMethods-executed processes, identifies whether the server is an Integration Server or a Task Engine. For externally executed processes, this row reads <b>External</b> .
<b>Server ID</b>	For webMethods-executed processes, identifies the server on which the step executed. This row does not appear for externally executed processes.
<b>Invoked Service</b>	For webMethods-executed processes, identifies the service that the step executed, if the step is a Flow step. This row does not appear for non-service steps or externally executed processes.
<b>Task Detail</b>	For task steps in a webMethods-executed processes, identifies the task that the step executed. This row does not appear for non-task steps or for externally executed processes.

The following table describes the information that is displayed in the **Step History** panel.

Column	Description
<b>Date/Time</b>	Displays the date and time recorded for the particular status.
<b>Status</b>	Displays each status logged for the step.
<b>User</b>	For webMethods-executed processes that involve webMethodsTask Engine for user interaction, identifies the user associated with this step status. For externally executed processes, this column is empty.
<b>Role</b>	For webMethods-executed processes that involve webMethods Task Engine for user interaction, displays the role associated with

Column	Description
	this step status. For externally executed processes, this column is empty.

The following table describes the information that is displayed in the **Control Actions** window.

Column	Description
<b>Date/Time</b>	Displays the date and time that the control action was performed.
<b>Action</b>	Identifies the control action taken on the step (suspend, resume, resubmit, or stop).
<b>User</b>	Displays the user associated with the specific control action performed on this step.
<b>Server ID</b>	Identifies the server on which the step executed.

**Note:** The **Control Actions** window appears only when control actions (that is, suspend, resume, resubmit, or stop) have been performed on a step within a webMethods-executed process.

The following table describes the information that is displayed in the **Activity Messages** window.

Column	Description
<b>Date/Time</b>	Displays the date and time that the activity message was logged.
<b>Entry Type</b>	Displays the type of message.
<b>Warning</b>	The message is informational and no action is needed.
<b>Warning</b>	The step can complete successfully even if the circumstance causing the warning is not addressed.
<b>Error</b>	The step cannot complete successfully until the circumstance causing the error is resolved.
<b>Brief Message</b>	Displays a shortened version of the message.

Column	Description
Full Message	Displays the full version of the message.

**Note:** The **Activity Messages** window appears only when a webMethods-executed process step ran a service that logged user-defined messages.

The following table describes the information that is displayed in the **Logged Fields** window.

Column	Description
Date/Time	Displays the date and time that the custom field was logged.
Field Name	Displays the name of the custom logged field.
Field Value	Displays the value of the custom logged field.

**Note:** The **Logged Fields** window appears only when the process step logged run-time values for certain input, output, and global data document fields. For more information about custom logged fields, see *webMethods Monitor User's Guide*.

The **Step Errors** window displays step errors (either standardized or customized) that have been defined by a user.

The following table describes the information that is displayed in the **Step Errors** window.

Column	Description
Date/Time	Displays the date and time that the error occurred.
Error Type	Indicates the type of error that occurred. For BAM processes, it displays the name the user gave to the standardized or custom error types for the applicable process instance. See the "Configuring Business Processes" chapter in <i>Administering webMethods Optimize</i> for more information about errors.
Error Message	For BAM process instances, error messages provide the following details based on the category of the error type: <ul style="list-style-type: none"> <li>For Standardized error types, error messages display details regarding the cause of the error (for timeouts, the time that was expired; for dimension-based timeouts, the dimension instance is listed).</li> </ul>

Column	Description
	<ul style="list-style-type: none"> <li>■ For Custom error types, error messages display the error text included in the execution error received from the Monitor API.</li> <li>■ For System error types, error messages display a detailed message regarding the internal system error that occurred. In some cases, a stack trace is included. This error message matches a similar error message logged to the Analytic Engine's error log file.</li> </ul>

4. On the **Process Step Detail** page, perform any of the actions for BPM processes, as described in the following table.

To	Do this on the Step Information panel
Edit pipeline data for this step	<p>Click <b>Edit Pipeline</b>. For more information, see <a href="#">“Resubmitting Processes from a Step and Optionally Editing Pipeline Information”</a> on page 68.</p> <p><b>Note:</b> This button is available only for logged webMethods-executed processes that have completed, failed, or stopped.</p>
Resubmit this step	<p>Click <b>Resubmit</b>. For more information, see <a href="#">“Resubmitting Processes from a Step and Optionally Editing Pipeline Information”</a> on page 68.</p> <p><b>Note:</b> This button is available only for logged processes that have completed, failed, or stopped.</p>

## About Subprocess Detailed Information

When you create a process model on the Software AG Designer Process Development perspective, you can add one or more subprocesses to the model. In addition, you can add a subprocess to a subprocess, nesting as many levels as you need. You can view detailed information for subprocess steps in the Step Summary area, just like any other step. When a subprocess is configured for standard looping, looping information is also available.

**Note:** Do not confuse a subprocess step with a webMethods-referenced process step or a BPMN call activity step. Referenced processes and BPMN callable processes execute another process model, with the process model name shown in the **Referenced Process** column of the Step Summary area.

To view the steps within a subprocess, see [“Viewing Steps Within a Subprocess”](#) on page 90.

## Viewing Steps Within a Subprocess

Each subprocess typically contains one or more steps. When a subprocess is configured for standard looping, looping information is also available.

### To view the steps within a subprocess

1. In My webMethods: **Navigate > Applications > Monitoring > Business > Process Instances**.
  2. Display detailed information for the process instance that contains the subprocess you want to work with, as described in [“Viewing Process Instance Details” on page 73](#).
  3. In the Step Summary area, locate the subprocess you want to view and click the expansion icon  next to the subprocess name. Monitor displays the steps within the subprocess in the table.
    - If the subprocess is not configured for looping, a table entry is available for each step in the process.
    - If the subprocess is a BPMN subprocess configured for standard looping, each loop iteration of the subprocess is shown as a separate table entry. Click the expansion icon  next to the subprocess iteration to see the step summary information for each step in the process during that loop iteration.
- Note:** Any time the parent subprocess step iteration increments, the loop iteration count is reset and begins again with 1.
4. Subprocess that contain any child subprocesses also display an expansion icon. Continue expanding the subprocesses until you locate the step you want to view.

**Tip:** To expand and contract all subprocess instances in the table, click the expansion icon next to the **Step Name** column title.

**Note:** This expandable/collapsible display is not available for deprecated webMethods subprocesses. In this case, all step entries are available at the top level of the table only.

## About Subprocess and Call Activity Duration Time

The Step Summary area contains a **Duration** column, which displays the length of time that the step took to execute. This value represents the time to execute for the activity:

- For a subprocess, this is the time to execute all of the steps in the subprocess.
- For a call activity, this is the time to execute the callable process.

Therefore, it would seem logical that the duration time of the subprocess or call activity would equal the sum of the durations of all the steps in the subprocess, or the duration of the callable process.

However, the duration may actually be greater than the sum of its internal objects. This is because the subprocess or call activity duration also includes communication time, as well as time taken by minor transport delays caused by network latency.

In addition, when the *WaitForSubprocess* value in the service `pub.prt.SubprocessModel` is set to `false` for a dynamic reference process, the call activity step in the parent is shown as ended as soon as the child instance is started. Therefore, the duration for that step iteration in the parent is initially very short. After the child instance completes, the duration value changes to the actual duration of the child instance. Monitor computes the duration from the start record to whatever the last record is for a step.

In cases where you use the dynamic reference process method to initiate multiple instances of a child model, the duration value represents the *duration of the longest of the child instances that were run*, and not the sum of all the durations of all the children.

## Viewing a Call Activity Step

A call activity step starts an instance of another process model that exists outside of the current process and, if desired, incorporates the results of that referenced process into the pipeline of the current process. When a call activity is configured for standard looping, looping information is also available.

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### To view the results of a call activity

1. In My webMethods: **Navigate > Applications > Monitoring > Business > Process Instances**.
2. Display detailed information for the process instance that contains the subprocess you want to work with, as described in [“Viewing Process Instance Details” on page 73](#).
3. In the Step Summary area, locate the call activity for which to view details.
  - If the call activity is not configured for looping, a table entry is displayed with the step summary information for the call activity.
  - If the call activity is configured for standard looping, each loop iteration of the call activity is displayed as a separate table entry. Click the expansion icon  next to the call activity iteration to see the step summary information for each referenced process during that loop iteration.

**Note:** Any time the call activity step iteration increments, the loop iteration count is reset and begins again with 1.

4. You can view the details of the referenced process (and from there, the summary information for the steps within it) in either of two ways:
  - In the Step Summary window, click the link in the **Referenced Subprocess** column.
  - In the Process Diagram window, click the + icon located within the referenced process step.

Click the **Close** button in the **Process Details** page for the referenced process to return to the parent process.

## Viewing Process Metrics

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You can view metrics for a specific process using the Process Dashboards. You can view data about the activity, alarms, and cycle time of the selected process, as well as similar information about its process stages.

### Viewing Metrics for a Process

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#### To view metrics for a process

1. In webMethods Business Console, select **Analytics**.
2. Select the process you want to work with from the drop-down list.

The process metrics, such as process activity, process alarms, process cycle time, stage alarms, and stage cycle times are displayed.

**Note:** For more information about webMethods Business Console, see *Working with webMethods Business Console*. For more information about the Business Process Dashboards, see *Working with Business Process Dashboards*.

# 4 Improving the Long-Term Performance of a Process

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## Overview

The material in this section relates to business processes and is specific to Optimize for Process.

Use the **Six Sigma Summary** page (available from **Navigate > Applications > Monitoring** in My webMethods) to see which critical processes or components are unstable, to identify the cause of a process problem, and to determine where to focus efforts to achieve the greatest process improvement. The **Six Sigma Summary** page uses Six Sigma metrics to quantify how a process is performing, and presents that information as a series of graphs.

When creating a rule, you can specify that it contributes to Six Sigma metrics. For more information, see [“Creating a Rule” on page 116](#).

If your system administrator has configured your My webMethods System Settings to monitor multiple Integration Servers and/or multiple Analytic Engines (see [“Configuring Optimize to Use Multiple Integration Servers and Analytic Engines” in \*Administering webMethods Optimize\*](#)), you can select which Integration Servers and Analytic Engines you want to monitor from the **Server** menu that appears in the top right corner of the Six Sigma page. Only Six Sigma metrics for the selected server will be displayed.

**Note:** The default server is set on the **System Settings** page. If you previously selected a server at another My webMethods page, that server will remain selected until you select a different server.

## What is Six Sigma?

The Six Sigma methodology is a disciplined approach for improving business performance. It is a measure of quality that strives for near perfection in the execution of a process. To achieve Six Sigma quality, a process must produce no more than 3.4 defects per million opportunities. An *opportunity* is defined as a chance for non-conformance with (that is, not meeting) the required specifications. This means a key process must be nearly flawless in its execution to achieve Six Sigma quality.

The following table describes the key concepts that the Six Sigma methodology involves.

Concept	Meaning
Defect	A failure to meet a business rule (that is, a rule violation).
Process Capability	A sigma value or percentage that reflects the number of times the process was measured without defects divided by the total number of times it was measured. The process sigma graph

Concept	Meaning
	on the Six Sigma Summary page shows current and historical process capability.
Variation	The stability of a process. A stable process is one with minimal variation. The process sigma graph on the Six Sigma Summary page shows current and historical variations in process performance, as well as trends. A process with little variation and a high sigma value on this graph indicates a stable process.
Critical to Quality	Attributes identified to be most important to the customer. The Pareto charts on the Six Sigma Summary page identify six areas that are critical to the success of a business process.
The Pareto Principle (also known as the 80:20 rule)	A principle that states the majority of defects (80 percent) are caused by a few (20 percent) vital components. The Pareto charts on the Six Sigma Summary page highlight this principle by identifying the components that are responsible for most of the rule violations.
Root Cause	The underlying cause of a defect. Addressing the root cause rather than its symptoms will prevent defects from recurring.

## Understanding the Six Sigma Summary Page

The **Six Sigma Summary** page consists of three sections: the **Filter** tab, the **Business Process Sigma** tab, and the **Two-Week Business Process Sigma** tab.

### Filter Tab

Use the **Filter** tab to limit the data displayed on this page to show only that which occurred during the specified date range. By default, the current date is used as the end date, and the start date is two weeks before the end date. Use the **Start Date** and **End Date** calendar icons to change the date range of the displayed data.

### Business Process Sigma Tab

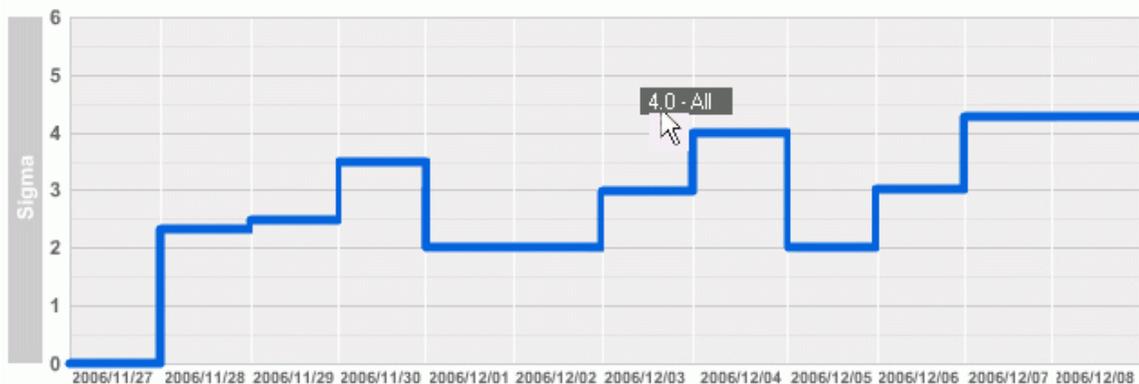
The graph on the **Business Process Sigma** tab shows the Six Sigma value the process achieved for each day. This value represents the percentage of readings that did not violate a rule.

The following table lists the percentages that the sigma scale represents.

Sigma	% Of Readings Without Violations
1 $\sigma$	31.0000
2 $\sigma$	69.6186
3 $\sigma$	93.1489
4 $\sigma$	99.3722
5 $\sigma$	99.9766
6 $\sigma$	99.9996

For example, in the following process sigma graph, the sigma value is 0.79, indicating that fewer than 31 percent of the readings taken for all processes on December 5 did not violate a rule.

### Business Process Sigma graph



## Two-Week Business Process Sigma Tab

The **Two-Week Business Process Sigma** tab located below the **Business Process Sigma** tab displays Pareto charts indicating the importance of different items in contributing to rule violations. Optimize groups contributing factors on each chart and lists them from highest contributor on the left to the lowest on the right.

Optimize displays Pareto charts for each of the groups of contributing factors.

The following table describes the groups of contributing factors.

Group	Meaning
Business Process	Indicates which business processes had the greatest number of violations.
Rule	Indicates which rules had the greatest number of violations.
Infrastructure	Indicates which hardware was associated with the greatest number of violations.
KPI	Indicates which KPI was associated with the greatest number of violations.
Day of Week	Indicates the day on which the greatest number of violations occurred.
Time of Day	Indicates the hour in which the greatest number of violations occurred.

The Pareto charts use the following conventions:

- Number of times out of compliance: Each gray bar on the charts represents a business process, rule, KPI, infrastructure component, day of week, or time of day. The vertical axis to the left of the chart indicates the number of times that items within that group violated a rule.
- Percent contribution to rule violations: The orange line on each chart shows the rule violations for the relevant item, expressed as a cumulative percentage. For example, in the Business Process chart, if the first process caused 65 percent of the rule violations, the orange line shows 65 percent above the first bar. If the second process caused 25 percent of the rule violations, the orange line shows 90 percent above the second bar (65 percent plus 25 percent).

The Pareto charts on this page show how important each component is in contributing to rule violations. Contributing factors are grouped together and listed from highest number of contributors on the left, and lowest on the right. This allows you to gauge the improvement of your business processes over the course of time, and ensure that you are continuing to improve the quality of those processes.

Roll your mouse over the bars and lines on the chart to view their details. Where there is no data available, a gray graph with the text No Data is displayed.

The Two Week Business Process Sigma shows your rate of problems over the course of the last two weeks.

The following table lists how the problem rate corresponds to a Sigma value.

Problem Rate	Sigma
1 rule violation in 1,000,000 evaluations	6
1 rule violation in 100,000 evaluations	5
1 rule violation in 10,000 evaluations	4
1 rule violation in 1,000 evaluations	3
1 rule violation in 100 evaluations	2
1 rule violation in 10 evaluations	1

## Viewing Six Sigma Information about a Process

### To view Six Sigma information about a process

1. View Six Sigma information about a rule violation for a single process or all monitored processes.

The following table describes the actions you should perform to view Six Sigma information about a rule violation for a single process or all monitored processes.

To view Six Sigma information about	Do this
A rule violation for a single process	Click the Six Sigma icon (  ) beside the rule on the Problems page.
All monitored processes	In My webMethods: <b>Navigate &gt; Applications &gt; Monitoring &gt; System-Wide &gt; Six Sigma Summary</b>  For more information, see <a href="#">“Understanding the Six Sigma Summary Page”</a> on page 95.

2. To view more details about a business process or step:
  - a. In My webMethods:

**Navigate > Applications > Monitoring > System-wide > Analytics Overview**

- b. Scan the **Status** column for processes, subprocesses, or metrics that are out of compliance or statistically abnormal.
  - c. To view KPI instance information about a process, subprocess, or metric, click the KPI Summary icon () in the **Detail** column.
3. View sigma information on the **Business Process Sigma** graph by doing the following:
  - a. In the **Filter** tab, select the reporting period for which you want sigma information, and click the **Go** button.
  - b. Rest the mouse pointer on the point where the sigma value intersects the date to view the exact process sigma value and the sigma expressed as a percent. Note whether the sigma is at the desired level, trending up, trending down, or flat.

If the sigma is trending down, look at the Pareto charts on the **Business Process Sigma** tab to determine which group seems to be having the most impact.
4. View information on the Pareto charts by doing the following:
  - a. Rest the mouse pointer on a green bar within a chart to see which business process, rule, KPI, piece of equipment, IT infrastructure component, day of week, or time of day the bar represents.
  - b. View details for the contributor as described earlier in this chapter and in [“Monitoring System Component and Business Process Performance” on page 43](#) and [“Viewing Information About Rules” on page 101](#) to see what changes might need to be made to a process or system configuration to improve their future performance.



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# 5 Viewing Information About Rules

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Optimize evaluates data collected against *rules* that you define. A rule specifies conditions under which a process or resource becomes problematic and requires user or programmatic attention.

When a rule has been created for an item, Optimize displays the  or  icon next to the item. When an item goes out of compliance, Optimize displays the  or  icon to indicate a rule was violated. And when a rule has been disabled, Optimize displays the  or  icon. These icons are displayed on several Optimize pages.

You can click these icons to view real-time and historical details about the rule, such as the expression used to create the rule, the date and time a violation occurred, the rules and KPI instances associated with the rule, and the users who will be notified of a rule violation. You can use the Rule Audit page to view auditing information about rules, including complete information about who resolved an out-of-compliance rule, when a rule was enabled or disabled, and so on.

If your system administrator has configured your My webMethods System Settings to monitor multiple Integration Servers and/or multiple Analytic Engines (see “Configuring Optimize to Use Multiple Integration Servers and Analytic Engines” in *Administering webMethods Optimize*), you can select which Integration Servers and Analytic Engines you want to monitor from the **Server** menu that appears in the top right corner of these pages. Only the rule information for the selected server is displayed.

**Note:** The default server is set on the System Settings page. For each My webMethods user, the server the user was last working with on any My webMethods page will remain the selected server for that user until that user selects a different server.

## Viewing the Rule List

The **Rule List** page displays a listing of all the rules defined for your system.

### To display the rule list

1. Navigate the following path in My webMethods:

**Navigate > Applications > Administration > Analytics > Rules > Rule List**

Optimize displays the **Rule List** page with the names of all rules defined for your system. This page contains the following buttons that enable you to work with rules:

- **Create Rule** - Activates the **Create Rule** page which enables you to create a new rule. For more information on creating rules, see “[Creating a Rule](#)” on [page 116](#).
- **Delete** - Deletes the selected rule or rules from the system.
- **Enable** - Enables the selected rule or rules on the system.
- **Disable** - Disables the selected rule or rules on the system.

The following table describes the information that is displayed on the **Rule List** page.

Column	Description
<b>Rule Name</b>	Name specified for the rule. Click the name to display the Edit Rule page for this rule.
<b>Type</b>	Type of rule: <b>KPI</b> or <b>Event</b> . See <a href="#">“Types of Rules” on page 114</a> for details.
<b>Sticky</b>	<p><b>Yes</b> = rule is “sticky” (stays in violation until it is manually resolved).</p> <p><b>No</b> = rule is not sticky.</p>
<b>Severity</b>	Severity level specified for the rule. See <a href="#">“Setting Rule Attributes” on page 118</a> for details.
<b>Status</b>	<p>Current state of the rule:</p> <ul style="list-style-type: none"> <li> <b>Rule Violation</b>(plus Customer Name, if specified)</li> <li> <b>Rule - No Violation</b>(plus Customer Name, if specified)</li> <li> <b>SLA Rule - No Violation</b>(plus Customer Name, if specified)</li> <li> <b>SLA Rule Violation</b>(plus Customer Name, if specified)</li> <li> <b>Rule Disabled</b></li> <li> <b>SLA Rule Disabled</b></li> </ul>
<b>Enabled</b>	<p>Whether the rule definition is enabled:</p> <ul style="list-style-type: none"> <li> <b>Enabled</b> (click to disable this rule)</li> <li> <b>Disabled</b> (click to enable this rule)</li> </ul>
<b>Actions</b>	<p>Click to perform one of the following actions:</p> <ul style="list-style-type: none"> <li> <b>View Rule Instances.</b> Activates the Rule Instances page. See <a href="#">“Viewing Rule Instances” on page 104</a> for details.</li> <li> <b>Generate Rule Violations.</b> Initiates rule back population for the corresponding rule, which generates historical rule violations. See <a href="#">“Managing Rules from the Rule List Page” on page 149</a> for details.</li> <li> <b>Copy Rule.</b> Makes a copy of the rule to save you time in creating a new rule.</li> </ul>

Column	Description
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**Edit Rule.** Activates the rule on the Edit Rule page.

- Refine the rule list by searching for a keyword in the rule name, or click the **Advanced** tab in the **Search** panel to take advantage of more search criteria.

To narrow the results list by action, user alert, service-level agreement (SLA), expression, customer, rule type, or status, select one or more of the options in the **Filter** area of the **Advanced** tab in the **Search** panel.

The following table describes the options in the **Filter** area of the **Advanced** tab in the **Search** panel.

Field Name	Operator	Value
<b>Action</b>	Equals	<b>SNMP Action, Event Action, or Web Service Action</b>
<b>User Alert</b>	Contains	From the drop-down list, choose the users who receive alerts on the rules you want to list.
<b>SLA</b>	Equals	<b>No or Yes</b>
<b>Expression</b>	Contains	Type any value contained in the rule expression.
<b>Customer</b>	Contains	Type any value contained in the rule's customer entry.
<b>Rule Type</b>	Equals	<b>Event, KPI, or Threshold</b>
<b>Status</b>	Equals	<b>In Compliance or Out of Compliance</b>

Note that you can also specify the search condition as either **OR** or **AND**.

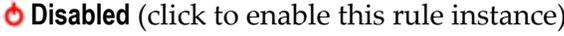
## Viewing Rule Instances

### To view rule instances

- At the **Rule List** page, click  **View Rule Instances**.

The **Rule Instances** page is displayed. The name of the base rule is displayed at the top of the **Rule Instances** page, and the Rule Instances table displays information about all instances of the rule.

The following table describes the information in the Rule Instances table.

Column	Description
Instance Name	Name of the rule instance. Click the name to display the <b>Rule Detail</b> page for this rule instance.
Status	Current state of the rule:  <b>Rule Violation</b>  <b>Rule - No Violation</b>  <b>Rule - Disabled</b>  <b>SLA Rule - No Violation, or</b>  <b>SLA Rule Violation</b>
Enabled	Whether the rule instance is enabled:  <b>Enabled</b> (click to disable this rule instance)  <b>Disabled</b> (click to enable this rule instance) Click  to enable all, or  to disable all.
Detail	Click  <b>Rule Instance Detail</b> to display the Rule Detail page for this rule instance.

## Viewing Details for Rules and Rule Violations

Use the **Rule Detail** page to view information about the rule instance of a rule that has been violated. You can also edit rules from this page when applicable.

### To view details for a rule violation

- Access the **Rule Detail** page in one of the following ways:
  - By clicking , , , or  next to an item on a page that contains these icons.  
 If more than one rule is associated with the item, Optimize displays the **Rule Summary** page containing a list of the rules associated with the item. Click a rule to display the **Rule Detail** page.

- By clicking the name of the rule in the **Rule Instances** page (accessible from the **Rule List** or **Edit Rule** page).
2. Use the information on the **Rule Detail** page to analyze the rule that has been violated.

The following table describes the information on the **Rule Detail** page.

Panel	Description
<b>Rule Information</b>	<p>Displays the name of the rule, a short description of the rule, the rule's severity and status (that is, whether the rule was violated), and the date and time since the rule has been in that status.</p> <p>In addition, an Edit icon is displayed to allow users to edit the rule. Also, a <b>Resolve</b> button is displayed for sticky rules that enables you to change the status of the rule from violated to in compliance.</p>
<b>Attributes</b>	<p>Provides the following information about the rule:</p> <ul style="list-style-type: none"> <li>■ <b>Rule Type</b> - Indicates whether the rule is a KPI, Event, or Threshold rule.</li> <li>■ <b>Enabled</b> - Indicates whether the rule is enabled at this time.</li> <li>■ <b>Sticky</b> - Indicates whether the rule is sticky, which means that the rule remains in violation even when the data that triggered the violation goes back into compliance until you manually resolve the rule issue or edit the rule's sticky setting.</li> <li>■ <b>Contributes to Six Sigma</b> - Indicates whether or not the rule contributes to the Six Sigma reports. For more information about Six Sigma reports, see <a href="#">"Improving the Long-Term Performance of a Process"</a> on page 93 in this guide.</li> <li>■ <b>SLA</b> - Indicates whether a service-level agreement is associated with this rule (<b>Yes</b> or <b>No</b>).</li> <li>■ <b>Customer</b> - Identifies the customer, if any, associated with this rule.</li> </ul>
<b>Alert and Action Settings</b>	<p>Provides the following information regarding user alert and programmatic actions related to rules:</p> <ul style="list-style-type: none"> <li>■ <b>Reminder Interval</b> - Defines the time interval at which alerts are sent while the rule is out of compliance.</li> </ul>

Panel	Description
	<ul style="list-style-type: none"> <li>■ <b>Send when back in compliance</b> - Indicates whether alerts and actions are fired when the rule comes back into compliance following violation.</li> </ul>
<b>Rule Expression</b>	Displays the expression used to evaluate the rule.
<b>Recent Rule Violations</b>	Displays a chronological list of the last three rule violations, including the date and time the violation occurred and the criteria Optimize used to evaluate the KPI instance reading.
<b>KPI Instance Summary</b>	<p>Displays a graph for each KPI instance included in the rule that shows readings taken during the past four hours for each KPI instance associated with the rule. Hovering over points on the graphs displays actual values at those points; click  <b>Detail</b> to display the KPI Instance Detail page for an instance.</p> <p>See <a href="#">“Analyzing Information about Key Performance Indicators” on page 163</a> in this guide for more information about the KPI Instance Summary graphs.</p> <p>For each KPI instance, this panel also displays icons that indicate if Optimize performed a diagnosis on the KPI instance and if the KPI instance is contributing to a rule violation.</p> <p>Each graph also identifies the KPI instance ID and type, the unit of measure used for the KPI instance, the value of the last data sample the KPI instance collected, the date and time the last reading was taken, and the time zone in which the time is represented.</p>
<b>KPI Instance Summary graph key (only shown when the rule type is KPI or Event)</b>	<p><b>Actual Reading:</b> The point is the aggregated reading for the particular KPI interval.</p> <p><b>Average Reading:</b> The point is graphed based on the historical mean of the calculated baseline data of the KPI instance for the particular KPI interval.</p> <p><b>Standard Deviation:</b> Represents the upper and lower boundary range of readings, spanning between one standard deviation above the mean and one standard deviation below the mean for the particular interval.</p> <p><b>Rule Violation:</b> Indicates the point at which the rule was first in violation.</p> <p><b>Note:</b> Data points for <b>Average Reading</b> and <b>Standard Deviation</b> both rely on the calculated baseline data of the KPI instance. The baselines are calculated for time intervals</p>

Panel	Description
	based on the interval of the KPI instance, and depending on configuration, can be tracked per day of week, per workday/weekend, and without reference to the day. For shorter-term KPI instances, readings are made hourly.
<b>Alerts</b>	Lists the users to be notified when this rule is violated and the e-mail address that Optimize uses to send the alert. This section also indicates whether the alert is enabled for a particular user (that is, whether or not the user will receive alerts when the rule is violated). The value of the <b>GROUPED</b> column indicates whether the users who receive the alert will be grouped into a single email alert.
<b>Actions</b>	Lists the SNMP alert, Web service actions, and event actions associated with this rule and indicates whether the action is currently enabled or disabled.

3. Perform any of the actions that are described in the following table.

If you want to	Do this
Reset a sticky rule (that is, change its status from violated to in compliance.)	Click <b>Resolve</b> in the <b>Rule Information</b> area.  <b>Note:</b> The <b>Resolve</b> button is available only when the rule is a sticky rule that has been violated.
View a history of violations for this rule	Click <b>View History</b> in the <b>Recent Rule Violations</b> area. For more information about historical rule information, see <a href="#">“Viewing a History of Rule Violations”</a> on page 109 below.
View the numeric value of a reading on the KPI Instance Summary graph	Rest the mouse pointer on one of the points on the graph.
View details for a KPI instance	Click  in the KPI Instance Summary panel to display the KPI Instance Detail page. For more information about KPI instance details, see <a href="#">“Analyzing Information about Key Performance Indicators”</a> on page 163 in this guide.

**If you want to**

Interpret the meaning of the diagnosis icon (such as ) in the graph

Edit details for a rule.

**Do this**

Rest the mouse pointer on the icon to see a brief description of the diagnosis that Optimize performed on the item. For a more detailed description, see “[Optimize Icons](#)” on page 209 in this guide.

Click  on the Rule Information panel to activate the Rule edit page and edit the rule.

## Viewing a History of Rule Violations

After you view details about a rule violation on the **Rule Detail** page, you can view the history of that rule to see how many times the rule was violated during a specified time period. You can use this information to help you determine patterns in the occurrence of rule violations and whether you can make improvements to reduce the number of violations in the future.

### To view a history of rule violations

1. On the **Recent Rule Violations** panel on the **Rule Detail** page, click **View History**.

Optimize displays the **Rule History** page.

Panel	Description
<b>Rule Information</b>	Displays the name of the rule, a short description of the rule, the rule's status (that is, whether the rule was violated), and the date and time since the rule has been in that status.
<b>Histogram for Rule</b>	Displays a histogram depicting the number of times the rule was violated each day within the last 90 days.
<b>Filter</b>	Sets the date and time range for the <b>Rule Violations for Date Range</b> display. Allows you to specify the start and end times for display.
<b>Rule Violations for Date Range</b>	Displays the date and time the rule violation occurred for the selected date and time range specified in the <b>Filter</b> panel. Also displays the number of continuous intervals the rule has been in violation. If there is a break in the collection of violations, such as a Analytic Engine shutdown, then the table will show separate violations. This section contains multiple rows if a

Panel	Description
	rule was violated more than once within the specified date range.

- Perform one of the possible actions.

If you want to	Do this
Display details about the rule violations for a particular day	Rest the mouse pointer over the bar corresponding to that day in the histogram.
Show historical data for a different date range	In the <b>Filter</b> panel, complete the <b>Start Date</b> , <b>End Date</b> , and <b>Time</b> boxes and then click <b>Go</b> .
Show historical data for a specific day in the histogram	Click any bar on the histogram. The <b>Rule Violations for Date Range</b> panel is re-displayed with the data for that day.

## Viewing Rule Audit Information

The **Rule Audit** page provides complete auditing details for every rule-related change in your system. If more than one server (more than one Analytic Engine) is configured for your system, the **Rule Audit** page shows auditing details only for the currently selected server. You can change the selected server using the **Server** drop-down menu that appears in the top-right corner of the page. (If you do not see a **Server** drop-down menu, only one server is configured for your system.)

### To view rule audit details

- In My webMethods navigate to **Navigate > Applications > Administration > Analytics > Rules > Rule Audit**.

The following table describes the information on the **Rule Audit** page.

Column	Description
<b>Audit Date/Time</b>	The date and time that the rule-related change occurred.
<b>User</b>	The full name (first name, last name) of the My webMethods user who made the change.
<b>Name</b>	The name of the rule or the rule filter.

Column	Description
<b>Field</b>	The field of the rule or the rule filter that was affected by the change, such as Severity, Description (of the rule or rule filter), or Enablement (whether the rule was enabled).
<b>From</b>	The value of a specific rule field <i>before</i> a rule-related change occurred. The designation <b>(Added)</b> displays in this column whenever a rule or rule filter is added to the system.
<b>To</b>	The value of a specific rule field <i>after</i> a rule-related change occurred. For rule expressions that appear truncated in this column, you can get a pop-up window that shows the full expression by resting the mouse pointer on the truncated rule expression. The designation <b>(Removed)</b> displays in this column whenever a rule or rule filter is deleted.
<b>Detail</b>	Click  to display the <b>Rule Audit Detail</b> page, where you can see details about the specific rule change.

**Note:** You can use the table Properties setting to customize the table's displayed columns and appearance.

- You can narrow the list of audit details by doing a keyword search. Keyword input is searched in the following four fields on the **Rule Audit** page: **Name**, **Field**, **From**, and **To**. For example, if you want to specify a value for the data in a field, that information is captured in the **To** and **From** fields.
- You can click the **Advanced** tab in the **Search** panel to refine your search even further. You can search for audit information using several predefined date ranges or a custom date range. You also can search on any rule-related field and/or by user name. Note that you can specify the search condition as **OR** or **AND**.



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# 6 Defining Rules

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## Overview

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A *rule* identifies a significant condition under which a process or resource becomes problematic or requires attention. You can apply a rule to a process or to a type of data. A rule can be configured to alert users or take programmatic action when the condition occurs. Rules can also be configured to send user alerts when the process or resource returns to compliance.

Each rule contains a logical expression. Optimize enables you to create a simple rule expression to test a single condition, or a complex expression that tests two or more conditions. Optimize evaluates the expression to determine if it is true or false. If an expression evaluates to true, Optimize can be configured to send an e-mail alert and/or invoke a Web service or Event or SNMP action. Optimize identifies rule violations in various My webMethods locations, such as the Problem Report and Analytics Overview pages.

To create a rule, you must do the following:

- Name the rule and assign attributes to it.
- Build the expressions that make up the rule.
- Specify the users to notify or other actions to take when the data satisfies the rule expressions.

While you are building the rule expression, Optimize displays the KPI or Event data selections for which you can write rules in My webMethods (**Navigate > Applications > Administration > Analytics > Rules**).

Note that Optimize enables you to edit active rules, but you must exercise great caution when using this feature. If you change fundamental aspects of a rule, such as the rule type or expression, all historical data (including rule violations) related to that rule are deleted. This functionality can, however, work to your advantage if you need to refine a rule definition to better reflect your business environment, because Optimize enables you to re-generate historical rule violations for updated rule definitions.

## Preset Rules

Optimize for Infrastructure offers a set of preset rules for object failure notification, Brokers, Broker Servers, Integration Servers, enterprise adapters, and Trading Networks that accommodate best practices for these components. The preset rules are loaded as part of the installation of Optimize for Infrastructure. You can view details about the rules, including the expression used to create them, on the Optimize **Add/Edit/Copy Rule** page (see [“Managing Rules” on page 149](#)).

## Types of Rules

You can create three types of rules: KPI rules, event rules, and threshold rules.

*KPI rules* evaluate a KPI's aggregated data at the KPI's collection interval. For example, suppose you create a KPI that sums order amounts on a 5 minute interval. You could then create a rule that sends an alert when the summed order amount exceeds a certain value. For more information about creating KPIs, see *Administering webMethods Optimize*.

*Event rules* evaluate data points as they are collected rather than waiting for a KPI collection interval. Optimize maintains state for event rules so that you can track data over multiple event intervals (for example, you can define a rule that alerts you when a webMethods Broker is down for three event intervals).

*Threshold rules* evaluate a single collected data point when it is collected (for example, queue size greater than 1000 or order amount less than \$500). Optimize does not maintain state for threshold rules.

KPI and Event rules differ from threshold rules in that they maintain a state. When activated, they stay in violation until their expression condition returns to compliance. These expression conditions can combine attributes from multiple KPIs and event types. Note that Event rules don't actually operate on a KPI, but they are artificially tied to a KPI in a definition. This doesn't affect rule functionality, however.

Threshold rules, on the other hand, do not maintain state and cannot use multiple event types in their expression. A threshold rule operates on a single event identified by an event map, whereas KPI and event rules operate on one or many KPIs. Threshold rules are activated whenever the threshold condition defined by the rule expression is violated. The sticky function is not available for threshold rules because they do not maintain state. In addition, threshold rules do not distinguish between event data dimensions. Finally, one or more of the expression arguments in a threshold rule can be an event with transaction attributes.

## Types of Rule Expressions

You can select one of the following three expression types when you create a logical expression for a rule:

- A simple rule expression
- A date-time rule expression
- A compound rule expression

### Simple Rule Expressions

A simple rule expression compares two operands through the use of a comparator. The comparator defines the relationship of the two operands (for example, equal to, greater than) and returns a true or false result. For example, you could create the following simple rule expressions to determine if data is out of compliance:

- The KPI aggregated order amount is greater than two standard deviations above normal for the collection interval.
- A Broker queue length is greater than 100.

- An adapter queue size has been trending up for 5 or more intervals.

## Date-Time Rule Expressions

A date-time rule expression evaluates date or time values. For example, you could create date-time expressions that determine if the day is a Monday, or if the day is a workday, or if the time is after 5:00 PM. Date-time expressions are commonly used within a compound rule to qualify the date or time in conjunction with a data comparison, such as "consumed memory greater than 300 MB and the day is a workday".

## Compound Rule Expressions

A compound rule expression is an expression that combines two nested expressions that are made up of any combination of simple, date-time, or compound rule expressions. You create compound rule expressions using Boolean operators. For example, you could create an expression specifying that if the number of orders processed is less than or equal to 100 AND more than two errors occurred during the processing, the process is out of compliance. In Optimize for Infrastructure, a Date-Time Expression is mostly likely used within a compound rule expression: for example, "Broker queue size is greater than 100" AND "Broker queue size reading time is after 5:00 p.m."

## Custom Rule Filters

When you define the rule's expressions, you identify the type of data to which to apply the rule. You can select a rule filter to limit the data to which the rule applies. For example, if your rule refers to Broker queue length, without a rule filter the rule will apply to all Brokers on all Broker Servers. To limit the scope of the rule to specific Brokers, you would specify a rule filter.

## Creating a Rule

The **Add/Edit/Copy Rule** page enables you to create a rule. There are five sections on this page in which you can define various characteristics of a rule. Note that because of the complexities inherent in creating a rule, you must configure a rule expression before you can create a naming template for a rule.

Alternatively, Optimize enables you to create instant rules from the **KPI Instance Detail** page. These rules can be applied a selected KPI instance or to all instances of a KPI.

---

### To create a rule

1. In My webMethods:
  - Navigate > Applications > Administration > Analytics > Rules > Rule List**
  - Optimize displays the **Rule List** page.
2. Click **Create Rule**. Optimize displays the **Add/Edit/Copy Rule** page.

3. In the **Rule Information** panel, type the name and description to use for the rule in the **Rule Name** and **Description** boxes. You can use any combination of characters and numbers. The rule name must be unique.
4. If you want to specify text indicating the severity of this rule, type it in the **Severity** text box. Text entered here appears on the **Problem Report** page and the **Analytics Overview** page, where you can search and sort based on the severity values, and any alerts or actions generated when this rule goes out of compliance can be configured to display the severity text. The Severity field can contain up to 20 characters and numbers.
5. Set attributes for the rule by following the steps in [“Setting Rule Attributes” on page 118](#) below.
6. Build the rule's expression by following the steps in [“Creating Rule Expressions” on page 122](#).
7. If you want to specify a naming template for instances of this rule, enter the name in the **Naming Template** field. Naming templates are only applicable for KPI and Event rules.

A naming template is used to generate a derived name for each rule instance. By default, a rule instance name is composed of the base rule name plus the KPI hierarchy descriptions for each KPI used in the rule. This can lead to a lengthy display name or a name that may not suit your purposes. For example, the default rule name:

```
AE Consumed Memory GT 30mb AnalyticEngine.LogicalServerName.Optimize
Analytic Engine.InternalMonitorQualifier.Name.Virtual Machine Stats.
```

consists of a base rule name (AE Consumed Memory GT 30mb) and two KPI hierarchy descriptions (AnalyticEngine.LogicalServerName.Optimize Analytic Engine and InternalMonitorQualifier.Name.Virtual Machine Stats) arranged in this syntax:

```
<base-rule-name> <hierarchy-desc1>.<hierarchy-descr2>.<dimensional-value>
```

If the **Naming Template** field is empty, all instances of the rule use the default rule name. When a naming template is specified, all rule instance names use the specified template to generate a name.

The naming template can contain any descriptive text in combination with one or more dimension variables. Variables should be used to make the template distinctive for each rule instance. The syntax for using variables in a template is:

```
$DimensionName .AttributeName
```

where the *DimensionName* and *AttributeName* pairing identify a dimensional value used by the KPI. Multiple pairs can be used, each separated by a space or other character. For example, the following template:

```
AE Consumed Mem GT 30 - $InternalMonitorQualifier.Name
```

would result in the following distinctive displayed name:

```
AE Consumed Mem GT 30 - Virtual Machine Stats
```

---

The dimension variables that can be used in a template depend on the KPI evaluated by the rule. The Rule Editor provides tools to insert dimension variables and to view a sample of the instance derived name. To use these tools, you must first choose the KPI in the rule's expression. To determine what variables you can use, do the following:

- a. Type the desired descriptive text into the **Naming Template** field.
  - b. Place the cursor at a point where you want to add a dimension variable, and click the Arrow icon to open a drop down list of available dimension variables.
  - c. Select the desired variable to add it to the cursor position in the **Naming Template** field.
  - d. Repeat the preceding two steps as desired to add additional variables to the derived name that you are creating.
8. On the **Alerts** tab, identify the users to alert when the rule is violated by following the steps in [“Specifying Alert Recipients” on page 148](#).
  9. On the **Actions** tab, identify the actions to take when the rule is violated by following the steps in [“Specifying Alert Recipients” on page 148](#).

The **Rule Instances** panel shows the number of instances of the rule, the number of instances out of compliance, and the number of instances enabled. This information is relevant only after the rule is created. If you are creating a new rule, jump to the final step in this sequence.

10. On the **Rule Instances** panel, click **View Instances** to display the **Rule Instances** page. See [“Viewing Information About Rules” on page 101](#) in this guide for details.
11. Click **Save** on the **Add/Edit/Copy Rule** page to save your changes.

## Setting Rule Attributes

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The Attributes panel on the **Add/Edit/Copy Rule** page enables you to specify attributes for a rule.

---

### To set attributes for a rule

In the **Attributes** panel, do the following:

1. From the **Rule Type** list, select one of the rule types.

**Important:** If you change the rule type for an existing rule, Optimize erases the rule expression. Also, if you change either the rule type or the rule expression itself, Optimize removes all previous rule instances and violations, and creates new rule instances for the rule to match the KPI instances in the revised rule expression.

Rule Type	Description
<b>KPI</b>	Evaluates one or more KPIs at the KPI's collection interval. For more information about creating KPIs, see <i>Administering webMethods Optimize</i> .
<b>Event</b>	Evaluates data points as they are collected rather than waiting for a KPI collection interval.
<b>Threshold</b>	Evaluates a single collected data point at the time of collection.

See “Types of Rules” on page 114 for a complete description of these rule types.

- If you want the rule to be enabled when you save it, select the **Enabled** check box. If you want the rule to be disabled when you save it, clear the check box.
- If you want to make the rule sticky, select the **Sticky** check box. A sticky rule does not acknowledge that a violated rule's data has come back into compliance until the rule is manually resolved as described in “Viewing Information About Rules” on page 101 in this guide. You can make a rule sticky to signal a serious violation that requires user attention to remedy the situation. For example, if you create a rule to detect that a Broker Server is offline, defining the rule as sticky causes the alert to occur once and the rule to remain in violation until the rule is resolved by clicking **Resolve** on the **Rule Detail** page.

**Important:** If a sticky rule is violated again before being resolved, Optimize cannot detect those violations.

- If you want this rule to contribute to the Six Sigma rule violation data displayed on the Improve page, select the **Contributes to Six Sigma** check box.
- To specify that this rule is associated with a Service Level Agreement (SLA), select **SLA**. You can search for SLA rules on the **Problems** and **System Overview** pages so that you can easily find problems and resources related to your SLA-specific rules.
- Optionally specify the name of the customer associated with this rule (particularly useful if this is an SLA rule) in the **Customer** text box. You can also search for Customer on the **Problems** and **System Overview** pages so that you can easily find problems and resources related to your customer-specific rules.
- If you want any specified alerts generated for this rule to be repeated, specify the number of minutes between alerts in the **Reminder Interval** text box.
- If you want to be notified when this rule comes back into compliance after being in violation, select **Send alerts/actions when back in compliance**.

**Tip:** You can sort rules by severity in the tables on the **Problem Report** and **Analytics Overview** pages. To ensure that rules with severity text sort appropriately, consider beginning the severity text string either with

a number that indicates the level of severity or with an identical text string followed by a severity number. For example, you could use a severity text-string sequence such as 1 High, 2 Medium, 3 Low, and so on. Alternatively, you could use a severity text-string sequence such as Severity 1, Severity 2, Severity 3, and so on.

## Creating an Instant Rule

The instant rule feature enables you to quickly create a KPI or event rule and apply it to a specific KPI instance or to all instances of a KPI. You create instant rules using the **Create Rule** page which is accessible from the **KPI Instance Detail** page.

Note that the following procedure assumes that you are already working from the KPI Instance Detail page. See [“Using the KPI Instance Detail Page” on page 178](#) for more information about the KPI Instance Detail page.

### To create an instant rule

1. On the **KPI Instance Detail** page click  in the upper right corner and select **Create Rule**. The **Create Rule** page is displayed.
2. Complete the fields on the **Create Rule** page.

The following table describes the fields on the **Create Rule** page.

Field	Description
<b>Name</b>	Descriptive name for the rule you are creating.
<b>Apply To</b>	Click the appropriate check box to indicate whether you want this rule to apply to the selected KPI instance only or to all KPI instances.
<b>Send Alert To</b>	Enables you to specify a user who will receive an alert message if the rule is violated. This field is unavailable if the currently logged in user hasn't specified an e-mail address in the user settings.
<b>Action</b>	Enables you to specify a system action to invoke automatically if the rule is violated.
<b>Execute On</b>	Enables you to specify whether the rule should fire on a KPI interval (KPI-Aggregation Interval) or on an actual event (Event-Every Event Occurrence).

<u>Field</u>	<u>Description</u>								
<b>Expression Type</b>	<p>Enables you to specify the type of expression to be used with this rule. The actual expression is defined in the <b>Condition</b> field below. The Expression Type options are as follows:</p> <ul style="list-style-type: none"> <li>■ <b>Reading Value:</b> Enables you to create a rule violation condition statement based on a user-selected comparator and value.</li> <li>■ <b>Normality:</b> Enables you to create a rule violation condition statement based on values being one or two standard deviations above or below the mean value.</li> <li>■ <b>Trending:</b> Enables you to create a rule violation condition statement based on a value that is trending up or down for a specified duration.</li> </ul>								
<b>Condition</b>	<p>This field enables you to formulate the expression that determines the specific conditions under which a rule will fire....</p> <table border="1"> <thead> <tr> <th><u>For expression type</u></th> <th><u>Complete these fields</u></th> </tr> </thead> <tbody> <tr> <td><b>Reading Value</b></td> <td>Choose a comparison operator from the <b>Comparison</b> drop-down list and specify a value in the <b>Value</b> field.</td> </tr> <tr> <td><b>Normality</b></td> <td>Choose the appropriate radio button.</td> </tr> <tr> <td><b>Trending</b></td> <td>Choose either <b>Trends Up</b> or <b>Trends Down</b> and specify a whole integer of intervals in the <b>Duration</b> field.</td> </tr> </tbody> </table>	<u>For expression type</u>	<u>Complete these fields</u>	<b>Reading Value</b>	Choose a comparison operator from the <b>Comparison</b> drop-down list and specify a value in the <b>Value</b> field.	<b>Normality</b>	Choose the appropriate radio button.	<b>Trending</b>	Choose either <b>Trends Up</b> or <b>Trends Down</b> and specify a whole integer of intervals in the <b>Duration</b> field.
<u>For expression type</u>	<u>Complete these fields</u>								
<b>Reading Value</b>	Choose a comparison operator from the <b>Comparison</b> drop-down list and specify a value in the <b>Value</b> field.								
<b>Normality</b>	Choose the appropriate radio button.								
<b>Trending</b>	Choose either <b>Trends Up</b> or <b>Trends Down</b> and specify a whole integer of intervals in the <b>Duration</b> field.								
<b>Generate historical rule violations (may take some time to process)</b>	<p>Click this check box if you want the system to go through all legacy data and generate historical rule violations as appropriate.</p> <div style="background-color: #f0f0f0; padding: 10px;"> <p><b>Caution:</b> If you elect to generate historical rule violations, be aware that the process will likely consume significant system resources for some time. Be sure to plan accordingly.</p> </div>								

3. Click **Save** to save the rule configuration as specified.

## Creating Rule Expressions

Rule expressions determine how a rule evaluates. You build expressions by selecting a rule evaluation interval, selecting a rule filter to limit the data to which the rule applies, and the expression components.

### To create a rule expression

1. After you have selected a rule type, click **Edit** in the **Rule Expression** panel of the **Add/Edit/Copy Rule** page. Optimize displays the **Edit Rule Expression** page.

2. Select a rule evaluation interval. In the **Intervals Before True** box of the **Rule Expression** panel, type the number of consecutive intervals for which the rule must evaluate to true before Optimize will consider the rule to be violated. For example, if you are writing a rule to detect when a queue length is trending toward being too large, you might specify that Optimize should not consider the rule violated unless the queue length trends upwards for five intervals.

**Note:** The “interval” evaluated in this case varies depending on whether the rule is an event rule, a threshold rule, or a KPI rule. If this is an event or threshold rule, the “interval” represents each event occurrence. If this is a KPI rule, the “interval” represents the KPI collection interval. Intervals for threshold rules are not adjustable. Also, note that consecutive intervals functionality is not suitable for rules based on process standardized errors.

3. Select a rule filter from the **Rule Filter** list. Rule filters are not available for threshold rules. If you have not yet created any rule filters, click the **Add Filter** button and follow the instructions in [“Creating a Rule Filter” on page 153](#).
  - To apply the rule to all KPI instances or events, click **None** in the **Rule Filter** list.

- To apply the rule to certain KPI instances or events only, click the appropriate rule filter that identifies those processes or system objects.
  - To create a new rule filter, click **Add Filter**. For more information, see [“Creating a Rule Filter” on page 153](#).
  - To edit the selected rule filter, click **Edit Filter**. For more information, see [“Editing a Rule Filter” on page 155](#).
4. Create a simple rule expression, a date-time rule expression, or a compound rule expression as described in one of the following sections:
    - [“Creating a Simple Rule Expression” on page 123](#) below
    - [“Creating a Date-Time Rule Expression” on page 135](#)
    - [“Creating a Compound Rule Expression” on page 146](#)

## Creating a Simple Rule Expression

A simple rule expression consists of two operands and a single logical comparator. For example, to detect a queue size greater than 1000, you would specify a queue size attribute as the first operand. Then you would specify the number 1000 as the second operand. Finally, you would select “greater than” as the comparator.

The following task sections provide detailed steps for creating various types of simple rule expressions. The first task is a high-level view of the overall process for creating a simple rule expression, and the subsequent tasks go into more detail about how to define the different operands available when creating a simple rule expression.

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### To create a simple rule expression (high-level overview)

1. In the **Expression** list in the **Rule Expression** panel, click **Simple Expression**.
2. Define the first operand of the two operands that you want to compare in the simple rule expression. In the first **Operand** list, begin by selecting one of the operand types. Note that the available operands are determined by the Rule Type that you selected in the **Attributes** panel.

The following table describes the operand types and the corresponding rule types.

<u>Operand Type</u>	<u>Available for Rule Type</u>	<u>Description</u>
KPI Value	KPI	<p>The operand is an attribute of a type of KPI instance, as follows:</p> <ul style="list-style-type: none"> <li>■ A data value, such as the last summarized data sample collected.</li> <li>■ A statistical value, such as the mean of a sampling interval.</li> </ul>

<u>Operand Type</u>	<u>Available for Rule Type</u>	<u>Description</u>
		<ul style="list-style-type: none"> <li>■ A diagnosis value, such as the last data point is greater than the previous data point (that is, data points are trending up).</li> </ul>
<b>Event Value</b>	Event	The operand is an attribute of a type of KPI instance. Real-time value of an event flowing into a KPI instance.
<b>Event Text</b>	Event	The operand is a KPI value that may be compared to a text operand.
<b>Math</b>	KPI	Use this operand to perform a mathematical operation on the operand, such as add, subtract, multiply, or divide, using a value that you specify.
<b>Threshold Value</b>	Threshold	The operand is an attribute of an event map. Examples: Dollar amount of a single order. Person who approves a purchase.

For details on how to define the first operand in a simple rule expression, see one of the following group of tasks:

- [“Defining KPI Value as the First Operand” on page 124](#)
  - [“Defining Math as the First Operand” on page 130](#)
  - [“Defining Event Text or Event Value as the First Operand” on page 132](#)
3. In the **Comparator** list, select the logical comparator (such as **Equal To**) to compare the two operands of the simple rule expression (also referred to as a Boolean expression).
  4. Define the second operand of the two operands that you want to compare.  
For more information on how to define the second operand in a simple rule expression, see one of the following tasks:
    - [“Defining KPI Value as the First Operand” on page 124](#)
    - [“Defining Math as the First Operand” on page 130](#)
  5. Click **Save** to save the simple rule expression.

## Defining KPI Value as the First Operand

The specific steps for defining each of the two operands in a simple rule expression depend on your choice of operand types. The operand type determines the fields that appear in the **Rule Expression** panel on the Edit Rule Expression page. A specific set of

fields is associated with each operand type, and whenever you change an operand type, the displayed fields change automatically. If you choose the **KPI Value** operand type for the first operand in a simple rule expression, Optimize displays the fields shown in the following figure and described in the subsequent task.

The screenshot shows the 'Rule Expression' panel with the following configuration:

- Expression: Simple Expression
- Operand: KPI Value
- Category: < Select >
- KPI: < Select >
- Value: Reading Value
- Comparator: EQUAL TO
- Operand: Number
- Value: 0

The following task assumes that you have already chosen **KPI Value** as the first operand in the **Rule Expression** panel on the Edit Rule Expression page.

#### To define KPI Value as the first operand in a simple rule expression

1. In the **Category** list (in the **Rule Expression** panel on the Edit Rule Expression page), click the category of the KPI or KPI instance whose value you want to compare.

In addition to values supplied by categories that your system administrator created, the list could include the options described in the following table.

Category	Description
Analytic Engine	Provides data about the Analytic Engines, such as JVM memory consumed and thread count.
Intrinsic Process Metrics	Provides generic data about your processes as identified on the Problems page. For example, process cycle time (how long an instance takes to run) and step count (how many steps have completed successfully).
Additional options that might appear in the <b>Category</b> list:	<ul style="list-style-type: none"> <li>■ GarbageCollectionType</li> <li>■ PersistenceQualifier</li> <li>■ Queue</li> </ul>

**Note:** When creating a rule against the intrinsic process metrics Cycle Time by Process or Process Time against a Reading Value, the unit of measure is in milliseconds.

Category	Description
	<ul style="list-style-type: none"> <li>■ Router</li> <li>■ Webservice</li> <li>■ Process names</li> </ul>

- Once you have chosen a category, the **KPI** list displays the names of all KPIs in the category you selected. Click the KPI whose value you want to compare.
- In the **Value** list, click the value to use for the first operand of your simple rule expression. For a KPI Value operand, you can choose from the following three types of values: reading values, statistical values, or diagnosis values.

The following table describes the Data values.

#### Data Values

Value	Description	If chosen, second operand must be
Reading Value	Collected data value.	<b>Number</b> <b>Math</b> <b>KPI Value</b> (numeric)
Reading Maximum	Highest event value within a given collection interval for a KPI instance. This value type should not be used with Composite KPIs.	<b>Number</b> <b>Math</b> <b>KPI Value</b> (numeric)
Reading Minimum	Lowest event value within a given collection interval for a KPI instance. This value type should not be used with Composite KPIs.	<b>Number</b> <b>Math</b> <b>KPI Value</b> (numeric)
Reading Date	Date the KPI reading was collected (based on the time zone of the Analytic Engine).	<b>Time</b> <b>KPI Value</b> (date)
Reading Time	Time that the KPI reading occurred (based on the time zone of the Analytic Engine).	<b>Number</b> expressed using 24-hour clock <b>KPI Value</b> (time)

### Data Values

<b>Value</b>	<b>Description</b>	<b>If chosen, second operand must be</b>
Reading Day	Day of the week that the KPI reading occurred (based on the time zone of the Analytic Engine).	<b>Time</b> <b>KPI Value</b> (day)
Reading Trend Up	KPI reading value or event value is higher than the previously collected value.	Number of consecutive KPI intervals.
Reading Trend Down	KPI reading value or event value is lower than the previously collected value.	Number of consecutive KPI intervals.

The following table describes the Statistical values.

### Statistical Values

The values described in this table represent statistical information about Optimize data.

<b>Value</b>	<b>Description</b>	<b>If chosen, second operand must be...</b>
Statistic Mean	Historical mean for the KPI instance and the statistical interval.	<b>Number</b> <b>Math</b> <b>KPI Value</b> (numeric)
Statistic Maximum	Maximum historical value for the KPI instance and the statistical interval.	<b>Number</b> <b>Math</b> <b>KPI Value</b> (numeric)
Statistic Minimum	Minimum historical value for the KPI instance and the statistical interval.	<b>Number</b> <b>Math</b> <b>KPI Value</b> (numeric)
Statistic Stdev	Standard deviation for the KPI instance and the statistical interval.	<b>Number</b> <b>Math</b>

## Statistical Values

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		<b>KPI Value</b> (numeric)
Statistic Confidence	An expression, represented by a percentage value between 0 and 1, of the confidence that readings are within one standard deviation of the statistical mean.	<b>Number</b> <b>Math</b> <b>KPI Value</b> (numeric)

The following table describes the Diagnosis values.

## Diagnosis Values

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The diagnosis values are based on trends that Optimize tracks automatically. Some diagnosis values evaluate against the number of consecutive KPI intervals or Event occurrences. For example, the expression `Diagnosis Trending Up >= 3` would evaluate to "true" if the KPI reading value (or Event value) increased for 3 or more consecutive intervals. Note that interval based expressions (like all other expressions) also use the expression's `Intervals Before True` setting to determine the number of intervals before firing a rule by combining the interval values (`expressionIntervals + intervalsBeforeTrue - 1`). For example, the expression `Diagnosis Trending Up >= 3` with `Intervals Before True` set to "4" would evaluate to "true" if the KPI reading value (or Event value) increased for 6 or more consecutive intervals." This is because `intervalsBeforeTrue = 1` when the `expressionIntervals = 3`, `intervalsBeforeTrue = 2` when the `expressionIntervals = 4`, `intervalsBeforeTrue = 3` when the `expressionIntervals = 5`, and `intervalsBeforeTrue = 4` when the `expressionIntervals = 6` (when the rule fires).

<u>Value</u>	<u>Description</u>	<u>If chosen, second operand must be...</u>
Diagnosis Trend Up	KPI reading value or event value is higher than the previously collected value.	Number of consecutive KPI intervals.
Diagnosis Trend Down	KPI reading value or event value is lower than the previously collected value.	Number of consecutive KPI intervals.
Diagnosis Above Normal	KPI reading value is higher than the statistical mean plus the number of standard deviations specified in the	Number of consecutive KPI intervals.

## Diagnosis Values

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	<p>rule expression. For example, if you have a rule using Diagnosis Above Normal with a value of 2, this part of the rule is satisfied when the reading value is more than two standard deviations above the statistical mean.</p>	
Diagnosis Below Normal	<p>KPI reading value is lower than the statistical mean plus the number of standard deviations specified in the rule expression. For example, if you have a rule using Diagnosis Below Normal with a value of 2, this part of the rule is satisfied when the reading value is more than two standard deviations below the statistical mean.</p>	<p>Number of consecutive KPI intervals.</p>
Diagnosis Slope Above Normal	<p>Rate of change between the last and previous KPI readings plus the number of standard deviations specified in the rule expression. For example, if you have a rule using Diagnosis Slope Above Normal with a value of 2, this part of the rule is satisfied when the reading value is more than two standard deviations above the statistical mean.</p>	<p><b>Number</b> <b>Math</b> <b>KPI Value</b> (numeric)</p>
Diagnosis Slope Below Normal	<p>Rate of change between the last and previous KPI readings is below normal, plus the number of standard deviations specified in the rule expression. For example, if you have a rule using Diagnosis Slope Below Normal with a value of 2, this part of the rule is satisfied when the reading value is more</p>	<p><b>Number</b> <b>Math</b> <b>KPI Value</b> (numeric)</p>

## Diagnosis Values

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	than two standard deviations below the statistical mean.	
Diagnosis Above Mean	This is a count based value that is used in a rule expression with a specified number of standard deviations. It compares the number of successive readings above the historical mean to the average number of readings above the historical mean plus one standard deviation.	Ignored.
Diagnosis Below Mean	This is a count based value that is used in a rule expression with a specified number of standard deviations. It compares the number of successive readings below the historical mean to the average number of readings below the historical mean plus one standard deviation.	Ignored.

- In the **Comparator** list, click the logical comparator (such as **Equal To**) to compare the two operands in the simple rule expression (also known as a Boolean expression).
- In the second **Operand** list, select an appropriate operand and complete the remaining fields to finish defining the simple rule expression. If you select **Number** as the second operand, then in the related **Value** field, you would type the numeric constant that you want to compare to the first operand. If your first operand is of type **KPI Value**, for example, the unit of measure of your numeric constant must be the same as the unit of measure used by the selected KPI (shown to the right of the KPI's Value selection). For example, if the unit of measure used by the selected KPI is megabytes, Optimize interprets the literal in megabytes.
- Click **Save** to save the simple rule expression.

## Defining Math as the First Operand

The specific steps for defining each of the two operands in a simple rule expression depend on your choice of operand types. The operand type determines the fields that appear in the **Rule Expression** panel on the Edit Rule Expression page. Each operand type has a specific set of fields associated with it, and whenever you change an operand type, the displayed fields change automatically. If you choose the **Math** operand type for

the first operand in a simple rule expression, Optimize displays the fields shown in the following figure and described in the subsequent task.

Expression	Expression:	Simple Expression
First Operand	Operand:	Math
Operator	Operator:	Add
Sub-operand 1	Operand:	Number
	Value:	0
Sub-operand 2	Operand:	Number
	Value:	0
	Comparator:	EQUAL TO
Second Operand	Operand:	Number
	Value:	0

Notice that when you choose **Math** as the first operand type, the first operand is composed of an operator and two subordinate operands. The following task assumes that you have already chosen **Math** as the first operand type in the **Rule Expression** panel on the Edit Rule Expression page.

#### To define Math as the first operand type in a simple rule expression

- In the **Operator** list (in the **Rule Expression** panel on the Edit Rule Expression page), indicate which of the following arithmetical functions you want to perform on the two subordinate operands of the **Math** operand type:
  - **Add** ([sub-operand 1] + [sub-operand 2])
  - **Subtract** ([sub-operand 1] - [sub-operand 2])
  - **Multiply** ([sub-operand 1] x [sub-operand 2])
  - **Divide** ([sub-operand 1] ÷ [sub-operand 2])
- Specify each of the two subordinate operands and complete the remaining fields for each sub-operand.

**Important:** At least one of the operands *must* be a KPI value.

**Note:** You can nest operands by selecting **KPI Value** or **Math** instead of **Number** as the operand type for subordinate operands.

- In the **Comparator** list, click the logical comparator (such as **Equal To**) to compare the two “primary” operands in the simple rule expression (also known as a Boolean expression).

- In the second **Operand** list, select an appropriate operand and complete the remaining fields to finish defining the simple rule expression. If you select **Number** as the second operand, then in the related **Value** field, you would type the numeric constant that you want to compare to the first operand. If your first operand is of type **KPI Value**, for example, the unit of measure of your numeric constant must be the same as the unit of measure used by the selected KPI (shown to the right of the KPI's Value selection). For example, if the unit of measure used by the selected KPI is megabytes, Optimize interprets the literal in megabytes.
- Click **Save** to save the simple rule expression.

## Defining Event Text or Event Value as the First Operand

The two **Operand** options **Event Text** and **Event Value** are available only for Event rule types. The specific steps for defining each of the two operands in a simple rule expression depend on your choice of operand types. The operand type determines the fields that appear in the **Rule Expression** panel on the Edit Rule Expression page. A specific set of fields is associated with each operand type, and whenever you change an operand type, the displayed fields change automatically. If you choose either **Event Text** or **Event Value** as the operand type for the first operand in a simple rule expression, Optimize displays the fields shown in the following figure and described in the subsequent task.

The screenshot shows the 'Rule Expression' panel with the following configuration:

- Expression: Simple Expression
- Operand: Event Value
- Category: < Select >
- KPI: < Select >
- Value: Reading Value
- Comparator: EQUAL TO
- Operand: Number
- Value: 0

The following task assumes that you have already chosen either **Event Text** or **Event Value** as the first operand type in the **Rule Expression** panel on the Edit Rule Expression page.

### To define Event Text or Event Value as the first operand in a simple rule expression

- In the **Category** list (in the **Rule Expression** panel on the Edit Rule Expression page), click the category of the event you want to compare.

In addition to values supplied by categories that your system administrator created, the list could include the options that are described in the following table.

Category	Description
Analytic Engine	Provides data about the Analytic Engines, such as JVM memory consumed and thread count.
Intrinsic Process Metrics	Provides generic data about your processes as identified on the Problems page. For example, process cycle time (how long an instance takes to run) and step count (how many steps have completed successfully).  <b>Note:</b> When creating a rule against the intrinsic process metrics Cycle Time by Process or Process Time against a Reading Value, the unit of measure is in milliseconds.
Additional options that might appear in the <b>Category</b> list:	<ul style="list-style-type: none"> <li>■ GarbageCollectionType</li> <li>■ PersistenceQualifier</li> <li>■ Queue</li> <li>■ Router</li> <li>■ WebService</li> <li>■ Process names</li> </ul>

On the Edit Rule Expression page, the options for Event rule types are the same as the options for KPI rule types, with the following two exceptions:

- If you choose **Event Text** as the first operand, the second operand must be either **Text** or **Event Text**.
  - If you choose **Event Value** as the first operand, the second operand must be either **Number** or **Event Value**.
2. In the **Comparator** list, click the logical comparator (such as **Equal To**) to compare the two operands in the simple rule expression (also known as a Boolean expression).
  3. In the second **Operand** list, select an appropriate operand to complete the expression. If you select **Number** as the second operand, then in the related **Value** field, you would type the numeric constant that you want to compare to the first operand. If your first operand is of type **KPI Value**, for example, the unit of measure of your numeric constant must be the same as the unit of measure used by the selected KPI (shown to the right of the KPI's Value selection). For example, if the unit of measure used by the selected KPI is megabytes, Optimize interprets the literal in megabytes.
  4. Click **Save** to save the rule expression.

## Creating a Threshold Value Rule Expression

Threshold value rule expressions are available only for Threshold expression types. The following procedure demonstrates how to create a threshold value rule expression in a simple rule expression.

### To create a threshold value rule expression

1. Type a name for the rule expression in the **Rule Name** field in the **Rule Information** panel.
2. Click the Down arrow to the right of the **Rule Type** field and select **Threshold**.
3. In the **Expression** list of the **Rule Expression** panel, click **Simple Expression**.
4. Choose **Threshold Value** as the first operand. The second operand must be either **Number** or **Threshold Value**.
5. Click the box to the right of the **Event** field to display a pop up containing a list of events. In the **Event** list, Optimize displays a list of available event maps. This list contains both system-defined and user-defined event maps. Your system administrator sets up user-defined event maps (see “Configuring KPIs” in *Administering webMethods Optimize*). The following table describes some of the system-defined event maps listed.

Event Map	Description
<b>AnalyticEngineHealth</b>	Describes the system health of the Analytic Engine.
<b>OptimizeError</b>	Indicates whenever an Optimize error occurs.
<b>Performance Metrics</b>	Describes the set of intrinsic values collected for performance data.
<b>Process Metrics</b>	Describes the set of intrinsic values collected for process data, such as cycle time, or instance or error count.
<b>Process Performance Metrics</b>	Describes the set of intrinsic values collected for process performance data.
<b>QueryMetrics</b>	Describes the set of intrinsic values collected for query data.
<b>QueueMetrics</b>	Describes the set of intrinsic values collected for queue data.

Event Map	Description
<b>Step Metrics</b>	Describes the set of intrinsic values collected for step data, such as cycle time, or instance or error count.
<b>WebServiceMetrics</b>	Describes the set of intrinsic values collected for the Web service DCA.

6. In the **Comparator** list, click the logical comparator (such as **Equal To**) to compare the two operands in the simple rule expression (also known as a Boolean expression).
7. Choose the second operand in the lower **Operand** field. The second operand must be either **Number** or **Threshold Value**.
  - a. If you choose **Threshold Value** as the second operand, an **Event** field is displayed for this operand, and you must choose the event for it as you did for the first operand.
  - b. If you choose **Number** as the second operand, you need only supply a value in the **Value** field for the operand.
8. Click **Save** to save the rule expression.

## Creating a Date-Time Rule Expression

A Date-Time rule expression compares two time-related operands for a KPI or Event rule. A Date-Time expression can be a simple expression or, more typically, it can be an element of a compound rule expression. Note that like other rule expressions, Date-Time expressions are subject to logical restrictions based on operand selections, so you should familiarize yourself with operand functionality and consider what factors you are trying to evaluate before attempting to construct an expression. Also, refer to [“Creating Rule Expressions” on page 122](#) in this chapter for general information about working with the rule expression editor before attempting to create a Date-Time expression.

For a Date-Time expression, the first operand can be either a KPI Value or Time value; the second operand can be values discussed in [“Creating Rule Expressions” on page 122](#) of this chapter as applicable for Date-Time expressions. Note that if the Date-Time expression is the main component of an expression, at least one of the operands must be a KPI value. This is not required if the Date-Time rule expression is a member of a compound rule expression (for example: a rule that fires when a KPI value represents total sales greater than \$1M AND day-of-week is Monday).

While the Rule Expression editor enables you to create a standalone Date-Time expression, such an expression rarely makes sense in a real world business environment. More typically, a Date-Time expression is used as a component of a simple expression or as an embedded expression within a compound rule expression. The examples in the following section of this chapter illustrate some of these typical usage patterns.

There are five basic types of Date-Time expressions you can create that make sense in most business environments.

- **Day of Week:** This type of expression evaluates whether an event or KPI reading occurs before, during, or after a particular day of the week.
- **Time of Day:** This type of expression evaluates whether an event or KPI reading occurs before or after a particular time of the day.
- **Month:** This type of expression evaluates whether an event or KPI reading occurs before, during, or after a particular month.
- **Simple expressions that use reading day:** This somewhat special expression is a simple expression that uses a Date-Time component (reading day) to evaluate an event.
- **Reading Day expression structured as a Date-Time expression.**

The following table provides a reference for choosing the appropriate symbol for a Time operand when creating a Date-Time expression.

<b>Symbol</b>	<b>Value</b>
Day of Week	Current day of the week as a number, where SUNDAY = 1 and SATURDAY = 7
Month	Current month as a number where JANUARY = 1 and DECEMBER = 12
Sunday	Literal value = 1
Monday	Literal value = 2
Tuesday	Literal value = 3
Wednesday	Literal value = 4
Thursday	Literal value = 5
Friday	Literal value = 6
Saturday	Literal value = 7
Workday	Literal value can be 2, 3, 4, 5, or 6
Weekend	Literal value can be 1 or 7
January	Literal value = 1

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<b>Symbol</b>	<b>Value</b>
February	Literal value = 2
March	Literal value = 3
April	Literal value = 4
May	Literal value = 5
June	Literal value = 6
July	Literal value = 7
August	Literal value = 8
September	Literal value = 9
October	Literal value = 10
November	Literal value = 11
December	Literal value = 12

The following procedure describes how to create a basic Date-Time expression. Note that when creating a Date-Time expression, you cannot really consider each operand independently; instead, you must think about logically relate to each other. For instance, if your first operand is Time, and you need to specify a value, the same value must apply to both operands. Note also that this procedure is primarily for instructional purposes; in most cases, a simple, standalone Date-Time expression will have very limited real world applicability.

The examples that follow illustrate more practical Date-Time expressions that relate to real world scenarios.

---

#### **To create a date-time rule expression**

1. In the **Expression** list of the **Rule Expression** panel, click **Date-Time Expression**. Optimize displays the rule expression fields shown in the following figure.

<b>Expression:</b>	▶ Date-Time Expression ▼
<b>Operand:</b>	▶ Time ▼
<b>Symbol:</b>	▶ TIME OF DAY ▼
<b>Date-Time:</b>	▶ BEFORE ▼
<b>Operand:</b>	▶ Number ▼
<b>Value:</b>	▶ 0

2. In the first **Operand** list, select **KPI Value** or **Time**. The available fields below the first **Operand** field change based on your selection as described below.
  - If you select KPI Value as the first operand, you must select the appropriate category and specific name for the KPI in the **Category** and **KPI** fields that appear. Refer to [“Defining KPI Value as the First Operand” on page 124](#) of this chapter for more information about KPI operands. In most cases for Date-Time expressions, you will select one of the following: "Reading Day", "Reading Time", "Reading Date" or "Reading Value" (although Reading Value should represent some date/time value). The second operand selection should logically correspond with the first operand. For example, if "Reading Day" is the first operand, the second operand should be a day of the week equate to a day of the week symbol - "Reading Day" AT "WORKDAY".
  - If you select Time as the first operand, you must select the appropriate unit from the **Symbol** field: TIME OF DAY, DAY OF WEEK or MONTH. When you select the second operand, it must logically correspond to the Time selection. For example, if the first operand is Reading Day, the second operand should be a day of the week that equates to a day of the week symbol, i.e.: “Reading Day” AT “WORKDAY”. See the table preceding this procedure for information about the various time measures you can select.
3. In the **Symbol** list, click the date-related or time-related measure that you want to compare to the second operand.

The following table describes the time measures.

<b>Time Measure</b>	<b>Description</b>
DAY OF WEEK	The current day of the week represented as an integer where SUNDAY = 1 and SATURDAY = 7.
TIME OF DAY	The current time represented as hours and minutes “hhmm”.
MONTH	The current month represented as an integer where JANUARY = 1 and DECEMBER = 12.

4. In the **Date-Time** list, click the time-related comparator to compare the two operands (**Before**, **At**, or **After**).
  5. In the second **Operand** list, select one of the following options (remember that this operand must logically correspond to the value of first operand):
    - **KPI Value:** If you select KPI Value as the second operand, you must select the appropriate category and specific name for the KPI in the **Category** and **KPI** fields. Refer to [“Defining KPI Value as the First Operand” on page 124](#) of this chapter for more information about KPI operands.
    - **Number:** In the **Value** text box, enter a numeric value to compare to the first operand.
    - **Time:** Select an appropriate symbol to correspond to the first operand. Refer to the information in [“Creating a Simple Rule Expression” on page 123](#) and to the table preceding this procedure for information about the various time measures you can select.
    - **Math:** Construct a mathematical operation that resolves to a number which corresponds to the value of the first operand.
- Important:** Express all dates and times based on the time zone at the location of the Analytic Engine.
6. When you are finished working with your expression, click **Save** to save the rule expression.

## Date-Time Expression Examples

The following examples illustrate some potential typical usage scenarios for Date-Time expressions, based on the different types of Date-Time expressions that can be created (Day of Week, Time of Day, Month, etc.). Note that the specific selections and values in these examples are probably not applicable to any specific environment, but these can be adjusted as needed to fit real world scenarios.

### Day of Week Example

The following example, represented by the image of the rule expression editor that follows, shows a typical Day of Week Date-Time expression. This rule fires when Analytic Engine memory consumption exceeds 300 MB and the day of the week is prior to Tuesday. This example uses a compound expression to combine a Simple KPI expression with a Date-Time expression that specifies a day of the week. Note that the second operand of the Date-Time expression could alternatively use the Number operand with a value of 2 to represent Tuesday.

Rule Expression	
Intervals Before True:	<input type="text" value="1"/>
Rule Filter:	None <input type="button" value="Add Filter..."/> <input type="button" value="Edit Filter..."/>
Expression:	Compound Expression
Expression:	Simple Expression
Operand:	KPI Value
Category:	AnalyticEngine ...
KPI:	Consumed Memory by Analytic Engine
Value:	Reading Value UOM = megabytes
Comparator:	GREATER THAN
Operand:	Number
Value:	<input type="text" value="300"/>
Boolean:	AND
Expression:	Date-Time Expression
Operand:	Time
Symbol:	TIME OF DAY
Date-Time:	BEFORE
Operand:	Time
Symbol:	TUESDAY

## Time of Day Example

The following example illustrates a typical Date-Time expression using Time of Day. The rule is set to fire when the Analytic Engine memory consumption exceeds 300 MB, the reading day is a Tuesday and the time is after 4:45 AM. This example uses two compound expressions to combine a Simple KPI expression with two Date-Time expressions, one to specify a day of the week and another to specify the time of the day.

Rule Expression	
Intervals Before True:	<input type="text" value="1"/>
Rule Filter:	<input type="text"/> <input type="button" value="..."/> <input type="button" value="Add Filter..."/> <input type="button" value="Edit Filter..."/>
Expression:	▶ Compound Expression
Expression:	▶ Simple Expression
Operand:	▶ KPI Value
Category:	▶ AnalyticEngine
KPI:	▶ Consumed Memory by Analytic Engine
Value:	▶ Reading Value UOM = megabytes
Comparator:	▶ GREATER THAN
Operand:	▶ Number
Value:	<input type="text" value="300"/>
Boolean:	▶ AND
Expression:	▶ Compound Expression
Expression:	▶ Date-Time Expression
Operand:	▶ Time
Symbol:	▶ DAY OF WEEK
Date-Time:	▶ BEFORE
Operand:	▶ Time
Symbol:	▶ THURSDAY
Boolean:	▶ AND
Expression:	▶ Date-Time Expression
Operand:	▶ Time
Symbol:	▶ TIME OF DAY
Date-Time:	▶ AFTER
Operand:	▶ Number
Value:	<input type="text" value="0329"/>

## Month Example

The following example shows a Date-Time expression that uses Month. The rule is set to fire when the Broker Server disk space is less than 3000 MB and the month is before April. This example uses a compound expression to combine a Simple KPI expression with a Date-Time expression that specifies a month. Note that the second operand of the Date-Time expression could be represented as a Number with a value of "4" for April.

Rule Expression	
Intervals Before True:	<input type="text" value="1"/>
Rule Filter:	None <input type="button" value="Add Filter..."/> <input type="button" value="Edit Filter..."/>
Expression:	Compound Expression
Expression:	Simple Expression
Operand:	KPI Value
Category:	BrokerServer
KPI:	ServerStats.isDiskSpaceLow by Broker Server
Value:	Reading Value UOM = boolean
Comparator:	EQUAL TO
Operand:	Number
Value:	1000
Boolean:	AND
Expression:	Date-Time Expression
Operand:	Time
Symbol:	MONTH
Date-Time:	BEFORE
Operand:	Time
Symbol:	AUGUST

## Reading Day Example

The following example shows a Reading Day Date-Time expression. Reading Day can be used in either a Simple expression or a Date-Time expression. If used in a Date-Time expression, the Reading Day is the day when the rule evaluation occurred. If used in a Simple expression (which is tied to either an event or KPI reading), the Reading Day is the day when the event or KPI Reading occurred. When processing rules in real-time, there is no difference between the two usages; however when performing rule re-generation, the Date-Time expression usage will not evaluate as expected since the evaluation day would be the current day rather than the day when the event or KPI reading day occurred.

Reading Day can be compared to either a Time selection, such as Monday or WorkDay, or a number literal that matches the day of the week. The example that follows shows a compound expression that uses a simple KPI Value expression and an embedded Date-Time Reading Day expression. The rule fires when the KPI value is greater than 300 MB and the Reading Day is a workday and the time of day is before 5:29 AM.

Rule Expression	
Intervals Before True:	<input type="text" value="1"/>
Rule Filter:	None <input type="button" value="Add Filter..."/> <input type="button" value="Edit Filter..."/>
Expression:	Compound Expression
Expression:	Simple Expression
Operand:	KPI Value
Category:	AnalyticEngine ...
KPI:	Consumed Memory by Analytic Engine
Value:	Reading Value UOM = megabytes
Comparator:	GREATER THAN
Operand:	Number
Value:	<input type="text" value="300"/>
Boolean:	AND
Expression:	Compound Expression
Expression:	Date-Time Expression
Operand:	KPI Value
Category:	AnalyticEngine ...
KPI:	Consumed Memory by Analytic Engine
Value:	Reading Day
Date-Time:	AT
Operand:	Time
Symbol:	WORKDAY
Boolean:	AND
Expression:	Date-Time Expression
Operand:	Time
Symbol:	TIME OF DAY
Date-Time:	BEFORE
Operand:	Number
Value:	<input type="text" value="0529"/>

## Compound Rule Expressions

A compound rule expression is created by combining two or more rule expressions. These expressions can be simple expressions, Date-Time expressions or another compound expression. The two rule expressions are joined by a Boolean operator (AND, OR, or XOR). There are a number of important considerations to be aware of when creating compound rule expressions to ensure that they return relevant and coherent results. In addition, it is important for users to understand how compound rules are evaluated so that they can be constructed in a manner to avoid unexpected or irrational results.

## Hierarchy Matching in Compound Rule Expressions

You can create a compound rule using a single event map or multiple event maps. In either case, however, in order for the rule to instantiate, the KPIs upon which the rule is defined must have common dimensional hierarchies, starting with the top-most dimension. Dimension hierarchies must match in dimension, attribute, and hierarchy order. KPIs that use the same hierarchy will always match. The Rule Expression editor provides validation to ensure that matching KPIs are selected.

The following table describes the case of matching hierarchies.

<u>Hierarchy A</u>	<u>Hierarchy B</u>
Dimension "host" Attribute "name"	Dimension "host" Attribute "name"
Dimension "host" Attribute "name"	

The following two tables describe the case when hierarchies do not match.

<u>Hierarchy A</u>	<u>Hierarchy B</u>
Dimension "host" Attribute "name"	
Dimension "port" Attribute "number"	Dimension "port" Attribute "number"

<u>Hierarchy A</u>	<u>Hierarchy B</u>
Dimension "host" Attribute "name"	Dimension "host" Attribute "ipaddr"

The following examples provide additional information about how hierarchies work in compound rule expressions.

### Compound Rule Expression Example 1:

- KPI #1 dimension hierarchy: Customer
- KPI #2 dimension hierarchy: Customer

Resulting rule instances: Those with common values for customer used to instantiate both KPI#1 and KPI #2. A rule instance will not be created if customer Lucent exists for only one of the KPIs. Event data for customer Lucent must be sent in for both KPIs in order for a rule instance to be created.

---

**Compound Rule Expression Example 2**

- KPI #1 dimension hierarchy: Region, State, County
- KPI #2 dimension hierarchy: Region

Resulting rule instances: Those with common values for region used to instantiate both KPI#1 and KPI #2.

---

**Compound Rule Expression Example 3:**

- KPI #1 dimension hierarchy: Region, State, County
- KPI #2 dimension hierarchy: Region, State, City

Resulting rule instances: None, because County and City do not match.

---

**Compound Rule Expression Example 4:**

- KPI #2 dimension hierarchy: State, County, Region
- KPI #1 dimension hierarchy: Region, State, County

Resulting rule instances: None, because State does not match Region.

---

## How Compound Rules Are Evaluated

A compound rule may be created as a threshold, event, or KPI rule type. However, irrespective of rule type, a compound rule is evaluated, to determine whether it is true or false, only when all of the sub-expressions have non-null data. This data may be new values/events/readings for the most recent collection interval or stored data from a previous collection interval if no data is collected for the current interval. After a compound rule is successfully evaluated, the sub-expressions are reset and the compound expression again waits for all sub-expressions to receive new data. In addition, compound rules only retain the last sub-expression data readings; whenever a reading is received, all previous readings are discarded.

The following example illustrates how all compound rules are evaluated. In this example, the compound rule is configured to fire when the value for KPI #1 is greater than 50 and the value for KPI #2 is greater than 500. The KPI collection interval for KPI #1 is 1-minute and the KPI collection interval for KPI #2 is 1-hour.

The following table demonstrates the calculation of the KPI readings.

	<u>KPI #1</u>	<u>KPI #2</u>
	50	N/A
10:55 AM	80	N/A
10:56 AM	60	N/A

	<u>KPI #1</u>	<u>KPI #2</u>
10:57 AM	30	N/A
10:58 AM	20	N/A
10:59 AM	null	N/A
11:00 AM	null	555

In this example, the compound rule would be evaluated at 11:00 AM, since this is when both sub-expression KPIs have non-null readings. This evaluation would occur based on a reading of 20 from 10:58 AM for KPI #1, and a reading of 555 at 11:00 AM for KPI #2. Please note that although KPI #1 had two readings greater than 50 prior to 11:00 AM, the compound rule would not fire at 11:00 AM, because only the last readings are retained for evaluation. Therefore the rule would evaluate at 11:00 AM as false.

As the preceding example illustrates, the KPI collection interval is not considered when a compound rule is evaluated. The evaluation of the compound rule simply occurs whenever both sub-expression readings can be evaluated. In the preceding example, the evaluation of the compound rule occurs at 11:00 AM; however, if there is no reading for KPI #2 until 12:00 noon, 8:00 PM, the next day, or even three days or three weeks later, the rule will not be evaluated until that time. Additionally, the last KPI reading for each KPI is used in the evaluation. In other words, the reading value of 30 is used for KPI #1 in the example above, over-riding all reading values prior to when the reading occurs for KPI #2.

After a compound rule is evaluated, the sub-expressions are reset and again wait for new readings. Therefore, KPI #1 will continue to receive new on minutes readings, but the compound expression will not be evaluated until KPI #2 receives a new reading at the next hour.

Given the considerations involving compound rules, the recommended scenario for using them is to ensure that all of the sub-expressions comprising the compound rule are evaluated regularly and frequently. In the case of compound KPI rules, a common KPI collection interval for all sub-expressions, where each KPI is evaluated for every collection interval, would provide the most intuitive results.

## Creating a Compound Rule Expression

### To create a compound rule expression

1. In the **Expression** list in the **Rule Expression** panel, click **Compound Expression**.

Optimize displays the fields shown in the following figure.

Expression:	Compound Expression
Expression:	Simple Expression
Operand:	KPI Value
Category:	RuleAutomation
KPI:	Compound1 - EM1 KPI1 CI1
Value:	Reading Value UOM = EM1 KPI1 CI1
Comparator:	GREATER THAN
Operand:	Number
Value:	1000
Boolean:	OR
Expression:	Simple Expression
Operand:	KPI Value
Category:	RuleAutomation
KPI:	Compound2 - EM2 KPI2 CI5
Value:	Reading Value UOM = EM2 KPI2 CI5
Comparator:	GREATER THAN
Operand:	Number
Value:	1000

- In the first *indented* **Expression** list and the related fields, create the first rule expression using the instructions in [“Creating a Simple Rule Expression” on page 123](#) and [“Creating a Date-Time Rule Expression” on page 135](#).
- In the **Boolean** list, select the comparator you want to use to join the two expressions.

The following table describes when the rule evaluates to true depending on the comparator that you select.

Comparator	Rule evaluates to true when
AND	Both expression 1 and expression 2 are true.
OR	Expression 1 is true, expression 2 is true, or both expressions are true.
XOR	Expression 1 is true but expression 2 is false, or expression 2 is true and expression 1 is false.

- In the second *indented* **Expression** list and the related fields, create the second rule expression using the instructions in [“Creating a Simple Rule Expression” on page 123](#) and [“Creating a Date-Time Rule Expression” on page 135](#).

5. Click **Save** to save the rule expression.

## Rule Alerts

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When a rule violation occurs, or when a rule returns to compliance, you can arrange to notify one or more specified users, or to invoke a Web service or SNMP action. Rule alerts can take the form of e-mail messages, or you can specify SNMP or Web service alert actions.

## Specifying Alert Recipients

---

### To specify users to receive e-mail alerts about rule violations

1. In the **Alerts** portlet of the Add/Edit/Copy Rule page, click **Add Alert**.

**Important:** If no users are defined in My webMethods, the **Add Alert** button is not available and a message “No available users” appears. For more information about adding users in My webMethods, see *Working with My webMethods*.

A new role is added to the **Alerts** table.

2. Use the **Name** drop-down list to select the user to receive an alert when the rule goes out of compliance.
3. If you want to start sending alerts to the user as soon as a rule violation occurs, select the **Enabled** check box. If you do not want to start sending alerts to the user at this time, clear the check box.
4. If you want to send additional alerts to other users, or send an alert to the same user using a different method, repeat the previous steps.
5. If you want each user to see the other users who receive the email alert, select **Group Users**.

**Note:** When you select **Group Users**, the individual **Enabled** settings are disabled.

All users who receive the email alert are listed on the To: row of the email.

## Specifying Alert Actions

In addition to sending alerts to specified users when a rule violation occurs, you can also specify SNMP alerts or Web service actions. For example, you can have Optimize send an SNMP alert when the rule is violated.

---

### To specify additional actions to take when rule violations occur

1. In the **Actions** tab of the **Add/Edit/Copy Rule** page, click **Add Action**. Optimize adds a new row to the **Actions** table.

**Note:** If actions have not been defined within Optimize, the message “No actions configured in the system” appears in the **Actions** tab. Actions are created and configured by the Optimize administrator. For more information, see *Administering webMethods Optimize*.

2. From the **Action Name** list, select the SNMP or Web service action to take when the rule is violated.
3. If you want to take this action as soon as a rule violation occurs, select the **Enabled** check box. If you do not want to take this action at this time, clear the check box.
4. To delete an action, click the check box in front of the name and click **Delete**.
5. Click **Save** to add the actions to the rule.

## Managing Rules

---

You can manage rules from the **Rule List** page, the **Add/Edit/Copy Rule** page, and the **Rule Instances** page.

### Managing Rules from the Rule List Page

The following table describes how you can use the **Rule List** page to manage both rules that you have created as well as pre-defined rules that come with Optimize.

If you want to	Do this
Search for rules by rule name or description or by other search criteria	Use the Search bar. You can search using any of the following search criteria: rule type, rule status, rule expression text, alert user's name, action type, SLA, customer, or severity. For more information about using the Search bar, see <i>Working with My webMethods</i> .
Manage rule instances from the Rule List page	Click  <b>View Rule Instances</b> in the <b>Actions</b> column to display the Rule Instances page. See <a href="#">“Managing Rule Instances from the Add/Edit/Copy Rule Page” on page 151</a> for instructions.
Enable a rule or a rule instance	Click  <b>Disabled</b> in the <b>Enabled</b> column for the rule. The icon changes to  <b>Enabled</b> . You can enable all rules at

If you want to	Do this
	<p>once by clicking  and choosing <b>Select All</b> from the displayed menu and then clicking the <b>Enable</b> button.</p> <p><b>Note:</b> Changing the enable status of a rule does not always alter the enable setting of its rule instances. For example, if a rule instance has been enabled, disabling the rule will disable the rule instance, but will not change the rule instance's setting. Hence, when the rule is re-enabled, the rule instance setting will prevent the rule instance from being enabled.</p>
<p>Disable a rule or a rule instance</p>	<p>Click  <b>Enabled</b> in the <b>Enabled</b> column for the rule. The icon changes to . You can disable all rules at once by clicking  and choosing <b>Select All</b> from the displayed menu and then clicking the <b>Disable</b> button.</p> <p><b>Note:</b> If you disable a rule that has a current violation against it, Optimize resets the rule so that it is no longer in violation.</p>
<p>View attribute settings for rules</p>	<p>Note the information displayed in the <b>Type</b> and <b>Sticky</b> columns. You can also determine whether a rule violation has occurred by the icon displayed in the <b>Status</b> column. See <a href="#">“Viewing the Rule List” on page 102</a> for more information.</p>
<p>Edit a rule</p>	<p>Click the edit icon () in the <b>Action</b> column for the rule.</p> <p><b>Caution:</b> If you edit a rule definition, all rule instances associated with that rule are deleted from the system.</p> <p>If you edit a rule, you can populate the system with updated historical information based on your edit using the  icon as described below.</p>
<p>Generate Rule Violations</p>	<p>Click the  icon to generate historical rule violations for a rule. If you have edited a rule, when you click this button, Optimize reevaluates all historical system data and generates rule violations according to the revised rule definition. This process is known as rule back population.</p>

If you want to	Do this
	<p><b>Note:</b> Rule back population does not work for rules defined on standard deviation.</p>
Copy a rule	Click the copy icon (  ) in the <b>Action</b> column for the rule. The copied rule name is appended with <code>-COPY</code> .
Delete a rule	<p>Select the check box to the left of the rule and then click Delete.</p> <p><b>Important:</b> Deleting a rule removes all current and historical rule instances associated with that rule.</p>
Export the list of rules to a *.csv (comma separated value) file	Click <b>Export Table</b> . For more information about exporting table data, see <i>Working with My webMethods</i> .

## Managing Rule Instances from the Add/Edit/Copy Rule Page

From the Add/Edit/Copy Rule page, you can display the Rule Instance page by clicking **View Instances** in the Rule Instances tab. From the Rule Instances page, you can enable or disable individual rule instances, which directs Optimize to start or stop reporting rule violations against that instance.

### To enable or disable individual rule instances

- In the **Rule Instances** tab on the Add/Edit/Copy Rule page, click **View Instances**.
- On the Rule Instances page, select a rule instance and do one of the following:
  - Enable a disabled rule instance by clicking  **Disabled**. The icon changes to  **Enabled**.
  - Disable an enabled rule instance by clicking  **Enabled**. The icon changes to  **Disabled**.
  - If you disable a rule instance that has a current violation against it, Optimize clears this rule instance's violation state.
  - Enable all rule instances by clicking .
  - Disable all rule instances by clicking .

## Managing Rule Filters

When you define a KPI or event rule, you must identify the KPIs that gather the type of data to which you want to apply the rule (for example, Broker queue length). By default, Optimize applies the rule to all instances of the KPI (for example, all Brokers in your entire environment). However, you might want to apply the rule only to the KPI instances for specific dimensionality (for example, for specific Brokers). In this case, you create a *rule filter* that identifies the specific KPI dimensions to associate with a rule.

You can also edit and make changes to rule filters and delete ones you no longer need.

## Viewing Rule Filters

To view existing rule filters

1. In My webMethods:

**Navigate > Applications > Administration > Analytics > Rules > Rule Filters**

Optimize displays the **Rule Filters** page.

The screenshot shows the 'Rule Filters' page. At the top, there is a search bar with the text 'Keywords:' and buttons for 'Search' and 'Save'. Below the search bar, there is a table of rule filters. The table has columns for 'Filter Name', 'Description', and 'Edit'. The table lists 25 items, including 'A\_Monitors Only', 'A\_Monitors Plus', 'BAMCompany 1-10-1 Only', and various 'brancher-step' timeout filters. The table is currently showing 1 to 20 of 25 items.

Filter Name	Description	Edit
<input type="checkbox"/> A_Monitors Only	A_Monitors Only	<a href="#">Edit</a>
<input type="checkbox"/> A_Monitors Plus	A_Monitors Plus	<a href="#">Edit</a>
<input type="checkbox"/> BAMCompany 1-10-1 Only	BAMCompany 1-10-1 Only	<a href="#">Edit</a>
<input type="checkbox"/> brancher-step 0 timeout	brancher-step 0 timeout	<a href="#">Edit</a>
<input type="checkbox"/> brancher-step 1 timeout	brancher-step 1 timeout	<a href="#">Edit</a>
<input type="checkbox"/> brancher-step 2 timeout	brancher-step 2 timeout	<a href="#">Edit</a>
<input type="checkbox"/> brancher-step 3 timeout	brancher-step 3 timeout	<a href="#">Edit</a>
<input type="checkbox"/> brancher-step 4 timeout	brancher-step 4 timeout	<a href="#">Edit</a>
<input type="checkbox"/> brancher-step 5 timeout	brancher-step 5 timeout	<a href="#">Edit</a>
<input type="checkbox"/> brancher-step 6 timeout	brancher-step 6 timeout	<a href="#">Edit</a>
<input type="checkbox"/> brancher-step 7 timeout	brancher-step 7 timeout	<a href="#">Edit</a>
<input type="checkbox"/> brancher-step 8 timeout	brancher-step 8 timeout	<a href="#">Edit</a>
<input type="checkbox"/> brancher-step 9 timeout	brancher-step 9 timeout	<a href="#">Edit</a>
<input type="checkbox"/> Event Trending Down Filter >= 5 intervals	Event Trending Down Filter >= 5 intervals	<a href="#">Edit</a>
<input type="checkbox"/> F_Missing Only	F_Missing Only	<a href="#">Edit</a>
<input type="checkbox"/> KPI Trending Up Filter = 3 intervals	KPI Trending Up Filter = 3 intervals	<a href="#">Edit</a>
<input type="checkbox"/> orderProcessor_Bam 具體父 deadline-dim-match-不 dead..	orderProcessor_Bam 具體父 deadline-dim-match-不 deadline+cancel	<a href="#">Edit</a>
<input type="checkbox"/> orderProcessor_Bam 具體父 deadline-dim-match-不 dead..	orderProcessor_Bam 具體父 deadline-dim-match-不 deadline does not cancel	<a href="#">Edit</a>
<input type="checkbox"/> orderProcessor_Bam 具體父 deadline-dim-match-不 negt..	orderProcessor_Bam 具體父 deadline-dim-match-不 negt deadline d-not cancel	<a href="#">Edit</a>
<input type="checkbox"/> OTC_Bus2-Process Timeout	OTC_Bus2-Process Timeout	<a href="#">Edit</a>

2. If necessary, enter a search keyword and click **Go**.

## Creating a Rule Filter

The **Add Rule Filter** page enables you to create new rule filters for rules. In addition, it contains the Filter Dimensions panel which enables you to add new dimensions and dimension instances.

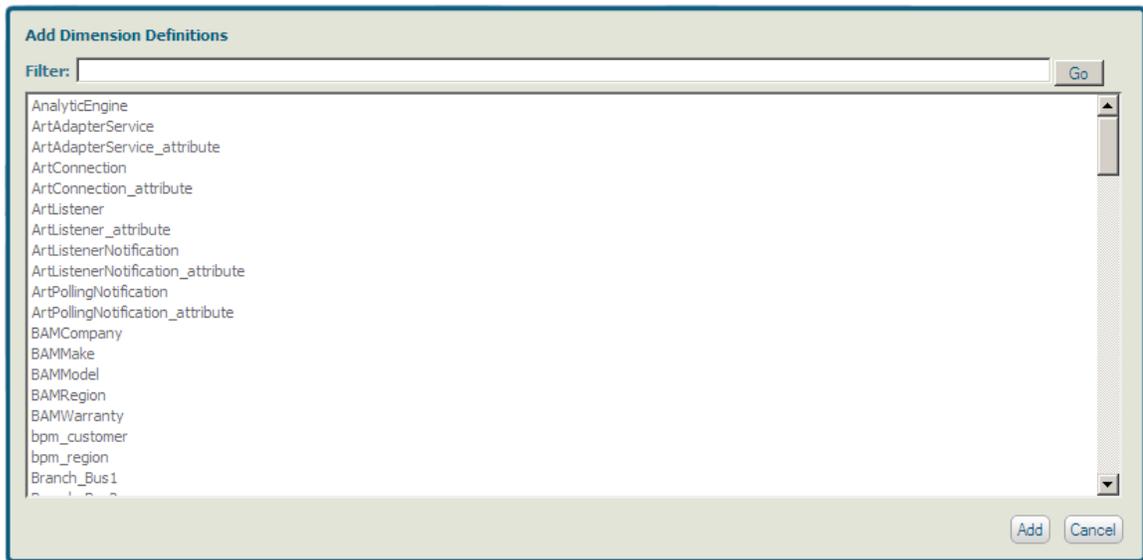
**Note:** A dimension must be part of the hierarchy specified in a KPI to be used in a rule filter for that KPI.

### To create a rule filter

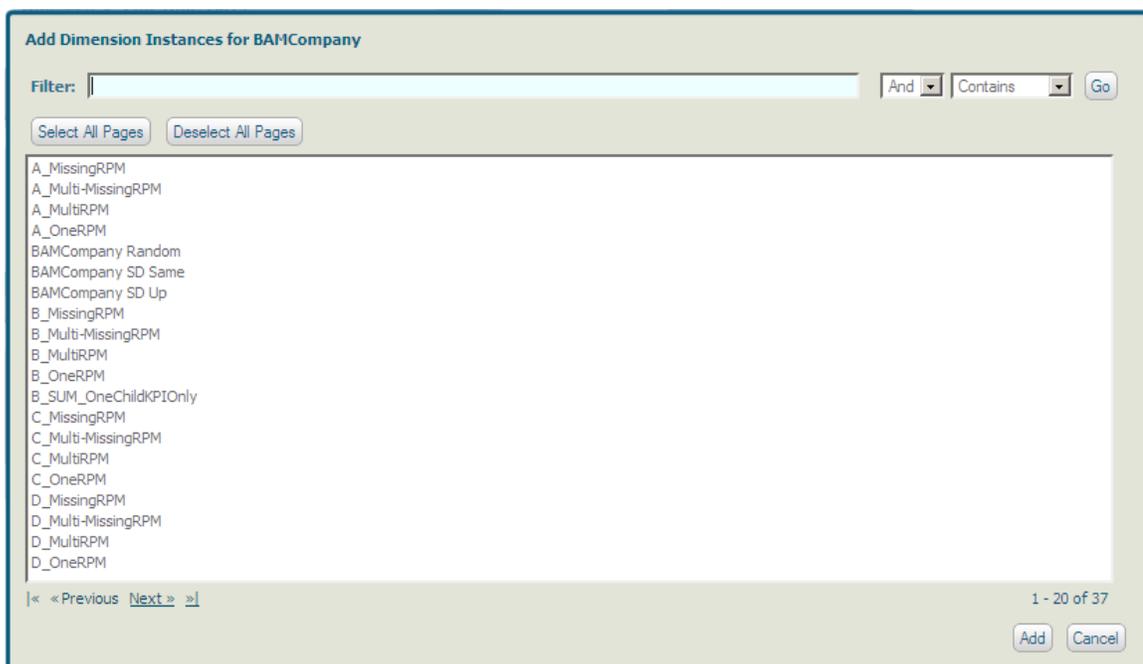
1. Do either of the following:
  - On the **Rule Filters** page, click **Add Filter**.
  - On the **Edit Rule Expression** page, click **Add Filter** in the Rule Expression panel.

Optimize displays the **Add Rule Filter** page.

2. Type a unique name for the rule filter in the **Filter Name** field.
3. Type a brief description of the filter in the **Description** field.
4. Click **Add Dimension Definitions** to choose the dimensions to which the rule filter applies.



5. Select one or more dimension definitions from the **Add Dimension Definitions** dialog (SHIFT + click to select multiple contiguous definitions; CTRL + click to select multiple definitions that are not contiguous), and click **Add**. The **Add Dimension Definitions** dialog closes and the selected dimension definition(s) are added to the **Dimension Definitions** panel in the **Add Rule Filter** page.
6. To add specific dimension instances contained within a dimension definition, click the name of the dimension definition, or click **Edit** beside the dimension definition, in the **Dimension Definitions** panel on the **Add Rule Filter** page. The **Add Dimension Instances** dialog is displayed, and you can click on dimension instances to select them. A dimension definition requires that at least one dimension instance is selected.



7. Do one or more of the following in the Add Dimension Instances dialog:
  - Click the **Select All Pages** button to select all dimensions, across all pages, in the dimension definition. If you want to select all dimensions on the displayed page, press CTRL + A.
  - Click the **Deselect All Pages** to deselect all dimensions, across all pages, in the dimension definition.
  - The **Add Dimension Instances** dialog includes a standard keyword search feature that enables you to locate dimensions. Use the **Filter** field to enter your basic search criteria. The filter also includes options to use and/or and contains/not contains clauses with respect to the filter's keyword entry. After you have configured your search criteria, click **Go** to execute a search.
8. Click **Add** to save changes to the dimension definition and close the **Add Dimension Instances** dialog, or click **Cancel** to close without saving.
9. If you want to delete one or more dimension definitions or dimension instances that you have added, select the check box before the items in the **Dimension Definitions** panel on the **Add Rule Filter** page and click **Delete**.
10. Click **Save** to save the rule filter and return to the Rule Filters page.

## Editing a Rule Filter

You can edit an existing rule filter to refine or enhance it. Changes to a rule filter may affect other rules associated with the filter.

**Note:** Changes to an existing rule filter that is currently in use will purge the system of all related rule instances and their violations.

### To edit a rule filter

1. In My webMethods:
  - Navigate > Applications > Administration > Analytics > Rules > Rule Filters**
2. Click the name of the rule filter, or click **Edit** in the **Edit** column.
  - Optimize displays the Add/Edit Rule Filter page.
3. Edit the details of the rule filter.

The following table describes the actions that you can perform on the **Rule Filter Information** panel.

<u>If you want to</u>	<u>Do this</u>
Rename the rule filter.	Select the name of the rule filter in the <b>Filter Name</b> field and type a new name, or modify the existing name.

If you want to	Do this
Change the rule filter description	Select the description in the <b>Description</b> field and type a new description, or modify the existing description.

The following table describes the actions that you can perform on the **Dimension Definitions** panel.

If you want to	Do this
Remove a dimension definition from the rule filter.	Select the check box beside the dimension definition name and click <b>Delete</b> .
Add, remove, or search for dimensions in a dimension definition associated with the rule filter.	<p>Perform the following:</p> <ol style="list-style-type: none"> <li data-bbox="521 928 1364 1033">In the <b>Dimension Definitions</b> list, click the dimension definition name or click <b>Edit</b> beside the dimension definition name to activate the Add Dimension Instances dialog.</li> <li data-bbox="521 1054 1364 1516">Do one or more of the following on the Add Dimension Instances dialog: <ul style="list-style-type: none"> <li data-bbox="570 1138 1364 1264">■ Click the <b>Select All Pages</b> button to include all dimensions, across all pages, in the dimension definition. If you want to select all dimensions on the displayed page, press CTRL + A.</li> <li data-bbox="570 1285 1364 1358">■ Click the <b>Deselect All Pages</b> to exclude all dimensions, across all pages, in the dimension definition.</li> <li data-bbox="570 1379 1364 1516">■ The Add Dimension Instances dialog includes a standard keyword search feature that enables you to locate dimensions. See <a href="#">“Creating a Rule Filter” on page 153</a> for more information on using this search function.</li> </ul> </li> <li data-bbox="521 1537 1364 1631">Click <b>Add</b> to save changes to the dimension definition and close the Add Dimension Instances dialog, or click <b>Cancel</b> to close without saving.</li> </ol> <p>The dimension definition is updated with the specified dimensions, and the Add/Edit Rule Filters page is displayed.</p>

- Click **Save** to save the rule filter with your changes and return to the Rule Filters page or the Edit Rule Expression page, or click **Cancel** to close the Add/Edit Rule Filter page without saving.

## Deleting a Rule Filter

Deleting a rule filter removes it from the Optimize system.

---

### To delete a rule filter

1. In My webMethods  
**Navigate > Applications > Administration > Analytics > Rules > Rule Filters**
2. In the **Rule Filters** panel, select the check box to the left of the rule filter you want to delete and then click **Delete**.

## Applying Rule Filters to Rules

You apply rule filters to rules by selecting them from the **Rule Filter** list on the **Edit Rule Expression** page (see [“Creating Rule Expressions”](#) on page 122).



# 7 Responding to Problem Alerts

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- Responding to an E-mail Alert ..... 161
- Responding to Pager or Mobile Phone Text Message Alerts ..... 162

When an item goes out of compliance, Optimize notifies you of the problem in the My webMethods user interface. Depending on your user profile, you can also be notified of problems by way of e-mail or SNMP alerts. If you subscribe to a pager or mobile phone service that supports text messaging to an e-mail address, you can also receive e-mail alerts on these devices. Your pager or mobile phone will display as much of the body of the e-mail as your service will allow. The following are examples of e-mail alerts.

#### Problem alert for an event rule in Optimize

```

From: ae0@test_cluster
Sent: Tuesday, November 07, 2006 10:47 PM
To: dkrukov@webmethods.com
Subject: EVENT_Error_Count_by_Process_and_Error_Type
Process.ProcessName.orderProcessorBam.ProcessError.ErrorType.
custom process event4.
-----
Rule Details:
  Name:          EVENT_Error_Count_by_Process_and_Error_Type
  Instance name: EVENT_Error_Count_by_Process_and_Error_Type
Process.ProcessName.orderProcessorBam.ProcessError.ErrorType.
custom process event4.
  Description:   EVENT_Error_Count_by_Process
                 and_Error_Type_descr
  Status:        In compliance
  Severity:      Sev 1
  Definition:    (Intrinsic Process Metrics/Error Count
                 by Process and Error Type/
                 Reading_Value) = (1)
  Evaluation:    1.0 compare.equalTo 1.0
  URL:
http://franklin:8080/webm.apps.mon.sys.rule.detail?wmp1=webm.apps.mon.sys.rule.detail.info.portlet&wmp1.ruleId=171
  Rule type:     Event
  SLA:           Yes
  Customer:      SLA Customer
-----
Diagnosis Details:
  Start date:    2006-11-07 21:47:03.504 PST
  End date:      unknown
  Violation count: 1
  Violation id: 12850
-----
Event Details for KPI: Process Metrics
Monitor dimensions:
  Process: orderProcessorBam
  ProcessError: custom process event4
Attributes:
  Process: orderProcessorBam
  Process Error Count: 1.0
  ProcessInstanceDatabaseId: 1362074
  Process Error Type: custom process event4
Number of Processes: 1
Process info:
  Name:         orderProcessorBam
  Id:           orderId=355&customer=CompanyZ
  URL:
http://franklin:8080/webm.apps.mon.biz.process.instance.bamdetail?wmp1=webm.apps.mon.biz.process.instance.bamdetail.info&wmp1.modelId=orderProcessorBam&wmp1.deployVersion=5&wmp1.instanceId=1362074&wmp1.modelType=3
-----

```

## Problem alert for a KPI rule in Optimize

```

From: ae0@test_cluster
Sent: Tuesday, November 07, 2006 10:48 PM
To: dkrukov@webmethods.com
Subject: KPI_Error_Count_by_Process
Process.ProcessName.orderProcessorBam.
-----
Rule Details:
Name:          KPI_Error_Count_by_Process
Instance name: KPI_Error_Count_by_Process Process.ProcessName.
               orderProcessorBam.
Description:   KPI_Error_Count_by_Process_descr
Status:        In compliance
Severity:      Sev 1
Definition:    (Intrinsic Process Metrics/Error Count by
               Process/Reading_Value) > (1)
Evaluation:    compare.greaterThan 1.0
URL:
http://franklin:8080/webm.apps.mon.sys.rule.detail?wmp1=webm.apps.mon.
sys.rule.detail.info.portlet&wmp1.ruleId=167
Rule type:     KPI
SLA:           Yes
Customer:      SLA Customer
-----
Diagnosis Details:
Start date:    2006-11-07 21:47:00.0 PST
End date:      unknown
Violation count: 1
Violation id:  12867
-----
Event Details for KPI: Error Count by Process
Monitor dimensions:
  Process: orderProcessorBam
Attributes:
  ProcessInstanceDatabaseId: 1362074
  ProcessInstanceDatabaseId: 1362074
  ProcessInstanceDatabaseId: 1362074
Number of Processes: 1
Process info:
  Name:        orderProcessorBam
  Id:          orderId=355&customer=CompanyZ
  URL:
http://franklin:8080/webm.apps.mon.biz.process.instance.bamdetail?
wmp1=webm.apps.mon.biz.process.instance.bamdetail.info&wmp1.modelId=
orderProcessorBam&wmp1.deployVersion=5&wmp1.

```

## Responding to an E-mail Alert

### To respond to an e-mail alert

1. Open the e-mail in your e-mail client.
2. To view details about the rule violation, click the link in the **Rule Details** section of the e-mail.

## Responding to Pager or Mobile Phone Text Message Alerts

---

### To respond to a pager or mobile phone text message alert

1. Log on to My webMethods.
2. To view details about a rule violation, click the link in the **View Rules** section of the e-mail.
3. To view details about a business process or system component that has gone out of compliance, click the link in the **View Process** section of the e-mail. For more information about interpreting these details, see [“Monitoring System Component and Business Process Performance”](#) on page 43.

# 8 Analyzing Information about Key Performance Indicators

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## Analyzing Information about Key Performance Indicators

---

You can analyze summary information about key performance indicators (KPIs) and detailed information about individual instances of KPIs.

Use the **KPI Summary** page to view actionable data in order to solve problems and take advantage of opportunities. On this page, you can analyze the performance of KPIs and compare the performance of up to five instances of KPIs on one graph. You can analyze historical performance. You can examine *events* such as rule violations as you analyze and compare KPIs. Based on this analysis, you can improve your business processes. For example, you can analyze order processing to identify and eliminate obstacles.

Use the **KPI Instance Detail** page to analyze data for a single instance of a KPI. In addition to the actual or aggregated data for a selected time range, the **KPI Instance Detail** page provides the historical mean value and standard deviation for all data points reported to date.

## Performance Comparisons

---

On the **KPI Summary** page, you can compare the performance of up to five instances of KPIs on one graph.

Example #1: you want to investigate revenue by customer for three regions, East, Central, and West, and compare them to the total revenue for all three regions. You can compare the instances of the KPI for revenue from each customer region and the instance of the KPI that sums the revenue from all three regions. Using information available on that page, you can analyze revenue by region and examine associated events such as rule violations.

Example #2: you want to investigate the relationship between order volume, order errors, and order cycle time. You can compare the instances of the KPIs for order volume, order errors, and order cycle time.

Example #3: you want to correlate operational events for your webMethods integrations to the servers and network they are running on. You can compare instances of KPIs for IS Service Average Service Request Time to the server CPU utilization on the server the IS Services are running on.

Example #4: you want to correlate your webMethods integrations to the infrastructure they are running on. You can compare the instances of the KPIs for Number of Successfully Completed IS Service Requests on a specific IS, the Number of Documents Published of a specific Document Type, and Number of Events Published on a specific Broker.

To view the scale values for a KPI instance, click the KPI instance's performance line or the KPI instance name in the legend.

## Historical Analyses

---

You can analyze the historical performance of a KPI over any time range for which you have historical data, and you can compare the historical data for up to five instances of KPIs on one graph.

You can specify any time range. For example, you can analyze historical data for all of 2005, or you can analyze historical data for 4 hours on 8/12/05.

Example: while investigating the relationship between order volume, order errors, and order cycle time, you observe that more errors occur within 24 hours of a holiday. You analyze the historical performance of the order errors KPI within 24 hours of the same holiday in previous years and within 24 hours of different holidays in the same year. Based on your analysis, you discover that more errors occur within 24 hours of all holidays. You then examine instances of the Revenue by Region KPI and discover that the revenue for the central region decreases significantly within 24 hours of holidays. By analyzing instances of the order process with errors, you link the increase in errors to the central region. Now you can manually investigate pre- and post-holiday order processing differences between the central region and the other regions.

## Scale and Units on the KPI Summary Page

---

The KPI performance chart scales each KPI instance over the maximum time range containing data for the KPI instance so that the highest data point is near the top of the graph and the lowest data point is near the bottom of the graph.

### Time Axis

The KPI performance chart always displays scale values and units appropriate to the selected time range along the chart's  $x$  axis.

### Data Axis

Because Optimize can display instances of KPIs associated with different types of data such as monetary values, bytes, percentages, and time on the same KPI performance chart, scale values and units do not display along the  $y$  axis. To display scale values for an instance of a KPI, click its performance line or its name in the legend below the performance chart. The units of measure for each KPI performance line display in the legend.

**Note:** If all the KPI instances on a performance chart share the same type of data, scale values still do not display. You must click the KPI instance's performance line or its name in the legend to see its scale values. Although the KPI instances share the same units, the scale values may differ. For example, one KPI instance's performance may have a high point of 45 bytes and a low

point of 12 bytes. The KPI instance's scale values might range from 10 to 50. Another KPI instance's performance may have a high point of 153 bytes and a low point of 86 bytes. That KPI instance's scale values might range from 80 to 160.

## Data Formats on the KPI Instance Detail Page

---

The **KPI Instance Detail** page can be displayed using two different data formats: graphical and tabular.

- The graphical-format page displays a performance graph showing data points for the KPI instance over a specified time range.
- The tabular-format page displays a table with all of the data points plotted within the specified time range and with any associated transaction data.

Both page-display formats include information about the KPI instance, the historical data for the time of the last reading, and the readings in the last time period.

## Error Messages for Monitored Components

---

Optimize displays error messages for system components monitored by the Infrastructure Data Collector in tabular format on the **KPI Instance Detail** page. See [“Viewing KPI Instance Details in Tabular Format” on page 184](#). For more information about system components monitored by the Infrastructure Data Collector, see *Administering webMethods Optimize*.

## Understanding the KPI Summary Page

---

The **KPI Summary** page consists of two sections: the **KPIs** panel and the **KPI Performance** panel.

Optimize automatically refreshes the information on the **KPIs** panel every two minutes. Optimize does not automatically refresh the information on the **KPI Performance** panel.

## KPI Summary page

Business Data > KPI Summary

**KPIs**

KPI Filter:  Search Condition: **AND**

Max Results Enforced (200) -- Please filter

<input type="checkbox"/>		KPI Name	Related To	KPI Type	Interval	Last Reading	Date/Time	Rule	Detail
<input checked="" type="checkbox"/>		x01->000001 Fact 010 for x001	test process	Gauge	5 Minutes	0.40 (avg)	7/29/2011 4:20 PM		
<input checked="" type="checkbox"/>		x01->000001 Fact 010 for x002	test process	Gauge	5 Minutes	0.52 (avg)	7/29/2011 4:20 PM		
<input checked="" type="checkbox"/>		x01->000002 Fact 010 for x001	test process	Gauge	5 Minutes	0.38 (avg)	7/29/2011 4:20 PM		
<input type="checkbox"/>		x01->000002 Fact 010 for x003	test process	Gauge	5 Minutes	0.62 (avg)	7/29/2011 4:20 PM		
<input type="checkbox"/>		x01->000003 Fact 010 for x001	test process	Gauge	5 Minutes	0.57 (avg)	7/29/2011 4:20 PM		
<input type="checkbox"/>		x01->000003 Fact 010 for x003	test process	Gauge	5 Minutes	0.67 (avg)	7/29/2011 4:20 PM		
<input type="checkbox"/>		x01->000004 Fact 010 for x001	test process	Gauge	5 Minutes	0.40 (avg)	7/29/2011 4:20 PM		
<input type="checkbox"/>		x01->000004 Fact 010 for x004	test process	Gauge	5 Minutes	0.98 (avg)	7/29/2011 4:20 PM		
<input type="checkbox"/>		x01->000005 Fact 010 for x001	test process	Gauge	5 Minutes	0.56 (avg)	7/29/2011 4:20 PM		
<input type="checkbox"/>		x01->000005 Fact 010 for x004	test process	Gauge	5 Minutes	0.80 (avg)	7/29/2011 4:20 PM		

< Previous | 1 2 3 4 5 6 7 8 9 ... 20 | Next >

**KPI Performance**

No Events for 7/29/2011 12:25 PM to 7/29/2011 4:25 PM

RANGE: 1hr 4hr 8hr 12hr 1d 1wk 2wk 1mo 3mo max      12:25 pm Jul 29, 2011 -- 04:25 pm Jul 29, 2011

— x01->000001 Fact 010 for x001 | Gauge | 5 Mir | 0.40 (avg) | 04:20 pm Jul 29, 2011

— x01->000001 Fact 010 for x002 | Gauge | 5 Mir | 0.52 (avg) | 04:20 pm Jul 29, 2011

— x01->000002 Fact 010 for x001 | Gauge | 5 Mir | --- | ---

## KPIs Panel

The following table describes the information that the KPIs panel contains.

Column	Description
Check box <input checked="" type="checkbox"/>	Selects an instance of a KPI for display on the KPI performance chart. A maximum of five KPI instances can be selected. As soon as you select a KPI instance, it displays on the KPI performance chart. Click the check box icon to sort the list by selected KPIs.
Status    column	<p> Performance is normal.</p> <p> A statistical abnormality has occurred.</p> <p> A rule violation has occurred.</p>

Column	Description																
<b>KPI NAME</b>	Displays the name of the KPI instance.																
<b>Related To</b>	Displays the name of the process or event to which the KPI is related.																
<b>KPI type</b>	Displays the KPI type according to the following list: <table border="1"> <thead> <tr> <th>Type</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><b>Sum</b></td> <td>Sums the data points collected over each collection interval.</td> </tr> <tr> <td><b>Average</b></td> <td>Calculates the average value of the data collected over each collection interval.</td> </tr> <tr> <td><b>Last Value</b></td> <td>Stores the value of the last data collected in the collection interval.</td> </tr> <tr> <td><b>State</b></td> <td>Stores the value of last data collected in each collection interval, where the possible values are 1 (online) or 0 (offline).</td> </tr> <tr> <td><b>Max</b></td> <td>Stores the maximum value of the data collected in the collection interval.</td> </tr> <tr> <td><b>Min</b></td> <td>Stores the minimum value of the data collected in the collection interval.</td> </tr> <tr> <td><b>Count</b></td> <td>Counts the number of data points over each collection interval.</td> </tr> </tbody> </table>	Type	Description	<b>Sum</b>	Sums the data points collected over each collection interval.	<b>Average</b>	Calculates the average value of the data collected over each collection interval.	<b>Last Value</b>	Stores the value of the last data collected in the collection interval.	<b>State</b>	Stores the value of last data collected in each collection interval, where the possible values are 1 (online) or 0 (offline).	<b>Max</b>	Stores the maximum value of the data collected in the collection interval.	<b>Min</b>	Stores the minimum value of the data collected in the collection interval.	<b>Count</b>	Counts the number of data points over each collection interval.
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<b>Count</b>	Counts the number of data points over each collection interval.																
<b>interval</b>	Displays the KPI's data collection interval: 1 minute, 5 minutes, 10 minutes, 15 minutes, 30 minutes, 1 hour, 2 hours, 4 hours, or 8 hours.																
<b>LAST READING</b>	Displays the KPI instance's last reading followed by the unit of measure.																

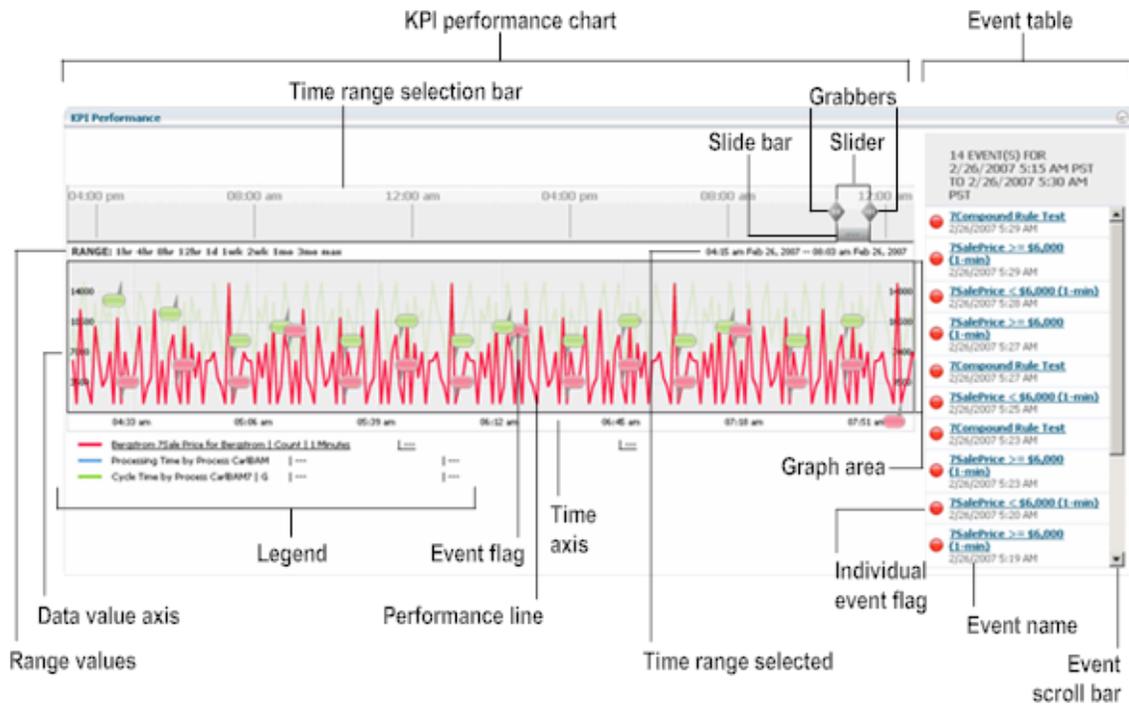
Column	Description				
DATE/TIME	Indicates the date and time of the last reading.				
RULE	Displays one of the following: <table border="1"> <tbody> <tr> <td> Rule</td> <td>One or more rules are evaluating data provided by the KPI. No rule violations have occurred.</td> </tr> <tr> <td> Rule violation</td> <td>One or more rules are evaluating data provided by the KPI. At least one rule violation has occurred.</td> </tr> </tbody> </table>	 Rule	One or more rules are evaluating data provided by the KPI. No rule violations have occurred.	 Rule violation	One or more rules are evaluating data provided by the KPI. At least one rule violation has occurred.
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DETAIL	Displays one or more of the following: <table border="1"> <tbody> <tr> <td></td> <td>Displays the KPI Instance Detail page. For more information, see <a href="#">“Viewing KPI Instance Details in Graphical Format”</a> on page 178.</td> </tr> </tbody> </table>		Displays the KPI Instance Detail page. For more information, see <a href="#">“Viewing KPI Instance Details in Graphical Format”</a> on page 178.		
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## KPI Performance Panel

The KPI Performance panel contains the following information:

- KPI performance chart.
- Event table.

## KPI Performance panel



The following two tables describe the components shown on the illustration of the KPI performance panel.

## KPI Performance Chart

Component	Description
Time range selection bar	Displays a time range that comprises all historical data for the selected KPI instances up to the current date and time. The units are appropriate for the time range (hours, days, months, etc.).
Slider	Selects the time range displayed in the graph area. The time period shown within the slider displays in the graph area.
Slide bar	Moving the slide bar changes the data shown in the graph area but does not change the length of the time period. For example, if you are displaying four hours of data, moving the slide bar lets you select another four-hour time period.

**Note:** You can also change the data shown in the graph area by positioning the mouse pointer anywhere in the graph area and dragging.

Component	Description
Grabbers	<p>The diamond-shaped grabbers on each side of the slider let you grab the sides of the slider and drag them to change the time range of the data shown in the graph area. For example, if you use the grabbers to expand the slider from four hours to two days, two days of data display in the graph area.</p>
<b>RANGE</b> values	<p>Clicking one of the ten <b>RANGE</b> values below the date selection bar changes the range of the data shown in the graph area and within the slider. The values are: 1 hour, 4 hours, 8 hours, 12 hours, 1 day, 1 week, 2 weeks, 1 month, 3 months, and max (the maximum time range).</p> <p>Each <b>RANGE</b> value displays the most recent data, regardless of the currently selected time range. For example, you are displaying data for a previous month and you click the 1 day <b>RANGE</b> value. The data for the most recent 24-hour period displays.</p>
Time range selected	<p>Displays the time range for the data shown in the graph area.</p>
Performance line	<p>The graph area displays a performance line for each selected KPI instance.</p> <p>If you move the mouse pointer horizontally across the graph area, the data point nearest the mouse pointer displays as a square on each KPI instance's performance line and the value of the data point displays beside the name of each KPI instance in the legend below the performance chart.</p> <p>If you select a KPI instance by clicking its performance line in the graph area or its name in the legend:</p> <ul style="list-style-type: none"> <li>■ The data scale values for the KPI instance display on the left and right sides of the graph area.</li> <li>■ The KPI instance's name, data value, and date/time in the legend are underlined.</li> <li>■ The events associated with the KPI instance display on the Event list. The events associated with the other KPI instances are removed from the Event list. For more information, see <a href="#">“Event Table” on page 173</a>.</li> </ul> <p>To un-select a KPI, click its performance line or name in the legend or click anywhere in the graph area.</p>

Component	Description
 event flag	<p>The graph area displays one or more event flags on the performance line of each KPI instance with events (rule violations). The event flags are the same color as the performance line to which they are attached.</p> <p>Each event flag covers a time period based on the time range shown in the graph area. If the time range in the graph area increases, the time period covered by each event flag also increases. When you change the time range in the graph area, you change the time period covered by the event flags. As the time range changes, events may move from one event flag to another. For more information, see <a href="#">“Event Display” on page 41</a>.</p> <p>If you click an event flag, the description of each event represented by the event flag as well as the date and time when each event occurred display on the Event list. For more information, see <a href="#">“Event Table” on page 173</a>.</p>
Time axis	<p>Displays time scale values for the selected time range.</p> <div style="background-color: #f0f0f0; padding: 10px; border: 1px solid #ccc;"> <p><b>Note:</b> To determine the display interval for data values shown in the graph area, check the times of two consecutive data values. For more information about display intervals, see <a href="#">“KPI Data Display” on page 36</a>.</p> </div>
Data value axis	<p>If you click a KPI instance's performance line, or click the KPI instance name in the legend, the data scale values for the selected KPI instance display along the data value axis on both sides of the graph area. For more information, see <a href="#">“Scale and Units on the KPI Summary Page” on page 165</a>.</p>
Legend	<p>Displays the names of the KPI instances shown in the graph area in the order they were selected.</p> <p>Beside the name of each KPI instance, the currently selected data point's value, unit of measure, and date/time are displayed.</p> <p>You select the current data points for the KPI instances with the mouse pointer. As you move the mouse pointer within the graph area, Optimize selects each KPI instance's data point at the mouse pointer's position along the time axis.</p> <p>When KPI instances are first displayed in the graph area and also when no data value is selected, the legend shows the names of the KPI instances without any values, units of measure, or times.</p>

## Event Table

The Event table contains events and rule violations that have occurred over the selected time range for the KPI instances displayed in the graph area. See the [“KPI Performance Panel”](#) illustration.

Until you click an event flag or performance line in the graph area, the Event table displays up to ten of the most recent events.

When you click a KPI instance's performance line, the Event table displays all the events for that KPI instance. The most recent events are shown first.

When you click an event flag on a KPI instance's performance line, or click the KPI instance name in the legend, the Event table displays all the events associated with that event flag. The most recent events are shown first. For more information about event flags displayed on the KPI performance chart, see [“KPI Performance Chart”](#) on page 170.

Component	Description
 Individual event flag	The KPI indicator for an individual event in the Event table. This indicator matches the color of the associated event flag and KPI performance line in the graph area.
Event name, date, and time	The name of the event (rule violation) as well as the date and time when the event occurred. If you click the name, the Problem Detail page is displayed.
Event scroll bar	When more than ten events are associated with a selected event flag, a scroll bar displays along the right side of the Event table. Move the scroll bar slider to display additional events.

## Using the KPI Summary Page

You can display a graph that shows activity for up to five KPI instances for a selected business process or system component.

### Displaying the KPI Summary Page

#### To display the KPI Summary page

1. Open the KPI Summary page by performing one of the actions that are described in the following table.

To display the page from	Do this
Analytics Overview page	<ol style="list-style-type: none"> <li>In My webMethods select: <b>Navigate &gt; Applications &gt; Monitoring &gt; System-Wide &gt; Analytics Overview.</b></li> <li>Click  beside a process component.</li> </ol>
Problems page	<ol style="list-style-type: none"> <li>In My webMethods: <b>Navigate &gt; Applications &gt; Monitoring &gt; System-Wide &gt; Problems.</b></li> <li>Click  beside a problem.</li> </ol>
Problem Detail page	Click  beside a contributing instance.
Process Instances page	<ol style="list-style-type: none"> <li>In My webMethods: <b>Navigate &gt; Applications &gt; Monitoring &gt; Business &gt; Process Instances.</b></li> <li>Click  beside a process instance.</li> </ol>
Process Instance Detail page	Click  beside a process instance.
Rule Detail page	If information about two or more KPI instances displays in the <b>KPI Instance Summary</b> panel, click <b>Compare.</b>

The KPI Summary page displays a list of all KPI instances associated with the selected item. Until you select KPI instances, the KPI performance chart is blank. For more information about the KPI Summary page, see [“Understanding the KPI Summary Page” on page 166.](#)

**Tip:** The process or system component you select determines which KPIs display on the KPIs panel. To see all the instances of a KPI, select it on the Analytics Overview page. To see all KPI instances related to a step in a business process, select the step on the Analytics Overview page. If you want to see all KPI instances related to a server, select the server on the Analytics Overview page. Don't select a process or system component with many KPIs. If you do, you must navigate through the list, and response time will be slow.

## Selecting KPIs and Their Instances for Comparison

You can select a KPI and compare the performance of its instances (up to a maximum of five) over a specified time period. You can also select up to five instances of different KPIs and compare their performance over a specified time period.

### To select KPI instances for comparison

1. Select up to five KPI instances for display in the KPI performance chart by clicking the check box beside the name of the KPI instance.

The KPI performance chart displays a performance line for each selected KPI instance. By default, the graph covers the most recent four hours of data.

Until you click an event flag, performance line in the graph area, or instance name in the legend, the Event list contains up to ten of the most recent events (rule violations).

2. Perform any of the actions that are listed in the following table.

If you want to	Do this
Specify a time period for the KPI performance chart.	Go to <a href="#">“Specifying the Comparison Period” on page 175</a> below.
View details about a KPI instance.	Click  . For more information, see <a href="#">“Using the KPI Instance Detail Page” on page 178</a> .
View details about one or more rules.	Click  . For more information about interpreting rule details, see <a href="#">“Viewing Information About Rules” on page 101</a> .
View details about one or more rules that have been violated.	Click  . For more information about interpreting rule violations, see <a href="#">“Viewing Information About Rules” on page 101</a> .

## Specifying the Comparison Period

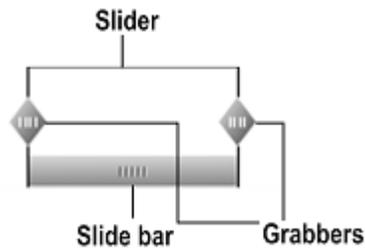
You can compare KPI instances using standard time ranges or any time range that you specify.

To specify	Do this
A standard time range.	<p>Click a <b>RANGE</b> value at the top of the KPI performance chart: 1 hour, 4 hours, 8 hours, 12 hours, 1 day, 1 week, 2 weeks, 1 month, 3 months, or Max (the maximum time range).</p> <p>The slider adjusts to cover the time range you specified.</p> <p>Each <b>RANGE</b> value displays the most recent data, regardless of the currently selected time range. For example, you are displaying data for a previous month and you click the</p>

To specify	Do this
	1 day <b>RANGE</b> value. The data for the most recent 24-hour period displays.

A non-standard time range.

Expand or shrink the slider by moving one or both of its grabbers.



As you move the grabbers, the display of the time range changes in the upper right corner of the KPI performance chart.

The time scale and units on the time axis of the graph area change after you select a standard time range or adjust the grabbers.

**Note:** For information about how Optimize aggregates data when the time range changes, see [“Data Aggregation” on page 33](#).

To select data for the comparison	Do this
Using the slide bar.	Move the slide bar along the time range selection bar.
Using the mouse pointer.	Position the mouse pointer anywhere in the graph area and drag to move the graph.
Using the mouse wheel.	If your mouse is equipped with a mouse wheel, you can move the viewing period forward or back one time range at a time.

## Viewing Data Points and Events for KPIs

You can view data points and analyze events for KPIs throughout the comparison period.

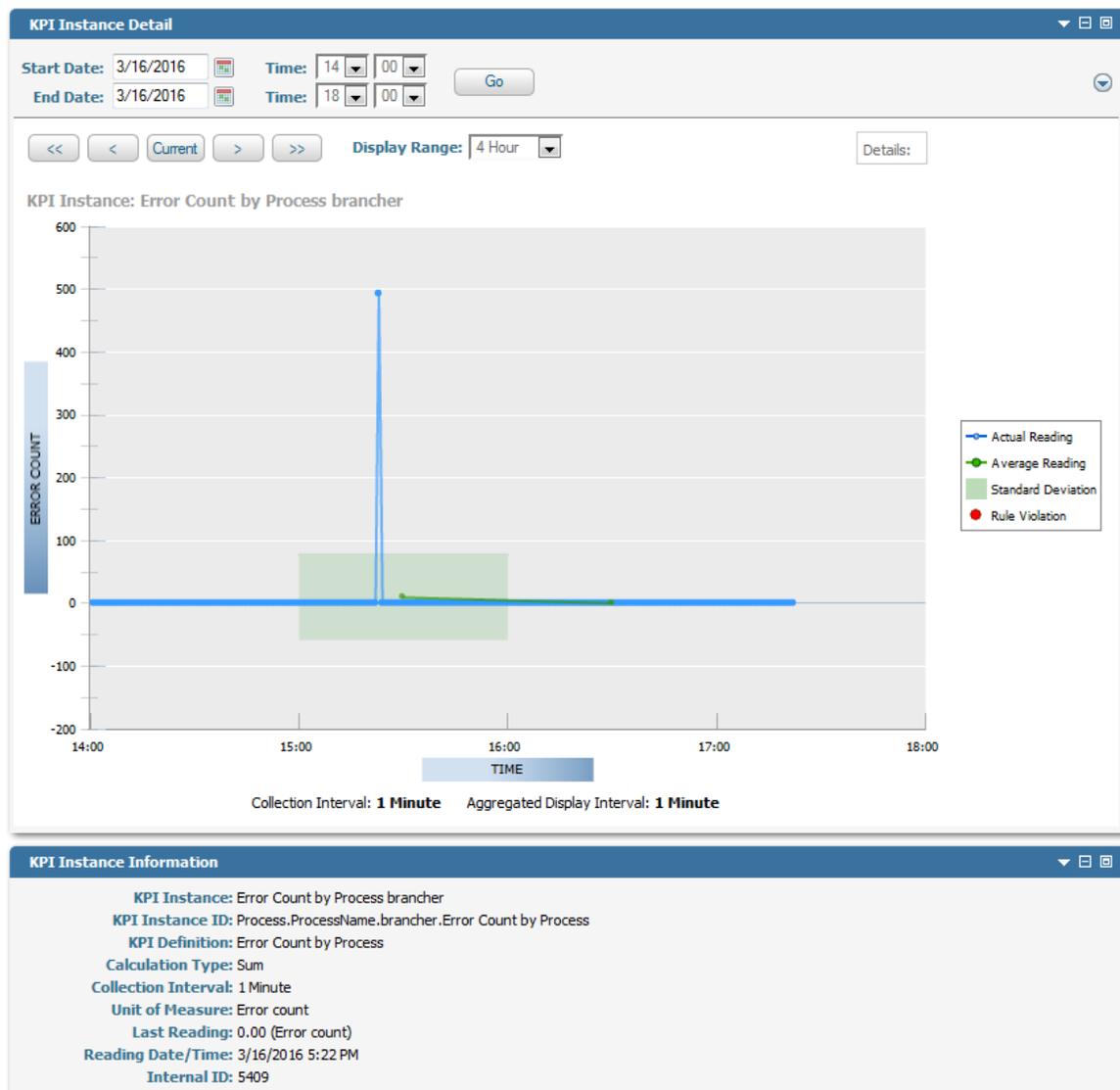
**Note:** To identify whether an event is a rule violation, view basic information about the event. If this information is not sufficient to identify it, view detail information.

If you want to	Do this
View data points for the KPI instances displayed in the graph area.	<p>Move the mouse pointer horizontally across the graph area.</p> <p>For each displayed KPI instance, the data point nearest the mouse pointer displays as a square on the performance line and the value of the data point displays beside the name of the KPI instance in the legend below the performance chart. The data point's unit of measure and date/time are also displayed.</p> <p><b>Note:</b> Values are rounded off to two decimal places.</p>
View the data scale for a KPI instance's performance line.	<p>Click the KPI instance's performance line or the name of the KPI instance on the legend.</p> <p>The data scale displays along the left and right sides of the graph area.</p> <p>The data scale may vary for each KPI instance displayed in the graph area.</p>
View events associated with a KPI instance on the performance chart.	<p>Click the KPI instance's performance line or the name of the KPI instance on the legend.</p> <p>All events associated with the KPI instance are displayed on the Event list. The events associated with the other KPI instances are removed from the Event list.</p>
View events associated with an event flag on the performance chart.	<p>Click the event flag on the performance chart.</p> <p>The description of each event represented by the event flag as well as the date and time when each event occurred are displayed on the Event list.</p>
View detail information about an event.	<p>Click the event's name or KPI indicator on the Event list.</p> <p>The Rule Detail page appears. For more information about interpreting rule details, see <a href="#">“Viewing Information About Rules” on page 101</a>.</p>

## Using the KPI Instance Detail Page

You can display detailed information about a KPI instance in graphical or tabular format. Also, you can create instant rules from a **KPI Instance Detail** page.

### Viewing KPI Instance Details in Graphical Format



The example above shows a graph of a KPI instance for the brancher process, which is an arbitrary example of a business process. Error Count by Process is an intrinsic KPI instance that gives you the number of errors in a process. This KPI instance collects data at one-minute intervals. The graph covers a four-hour time period and it displays the data points (blue dots) at one-minute intervals. The average reading values (green dots)

for the KPI instance display at one-hour intervals. The green shaded area depicts the standard deviation for the one hour interval.

### To view KPI instance details in graphical format

1. Open the **KPI Instance Detail** page.

The following table describes how to open the **KPI Instance Detail** page.

To display the page from	Do this
KPI Summary page	Click  .
Rule Detail page	Click  in the graph.

The KPI Instance Detail panel displays a graph with data points for a selected time range (by default this range is the most recent four hours). The panel includes labels that identify the data collection interval and the aggregated display interval.

The KPI Instance Detail page consists of three panels of information: **KPI Instance Information**, **Historical Data for Last Reading in Displayed Time Range**, and **Readings in Displayed Time Range**.

The following table describes the components of **KPI Instance Detail** panel.

Component	Description
<b>Actual Reading</b>	The data points on the performance line for the KPI instance. For information about how KPIs calculate data points, see <a href="#">“Key Performance Indicators” on page 31</a> .
<b>Average Reading</b>	The historical average values for this KPI instance across all historical readings in the statistical interval. These values are based on the mode of operation for KPI historical values. For more information, see <a href="#">“KPI Historical Average Values” on page 38</a> .
<b>Standard Deviation</b>	The standard deviation across all historical readings in the statistical interval. These readings are based on the mode of operation for KPI historical values. For more information, see <a href="#">“KPI Historical Average Values” on page 38</a> .
<b>Rule Violation</b>	Red dots (if any) indicate that rule violations occurred at the data point.

<b>Component</b>	<b>Description</b>
<b>Collection Interval</b>	The KPI instance's data collection interval: 1 minute, 5 minutes, 10 minutes, 15 minutes, 30 minutes, 1 hour, 2 hours, 4 hours, or 8 hours.
<b>Aggregated Display Interval</b>	The interval between the data points for the actual reading displayed in the graph area. For more information, see <a href="#">“Data Aggregation on KPI Instance Detail Page”</a> on page 38.
<b>KPI Instance Notes</b>	When icons appear, they indicate statistical abnormalities, rule violations, etc. For more information about these icons, see <a href="#">“Optimize Icons”</a> on page 209.
<b>KPI Instance</b>	The name of the KPI instance.
<b>KPI Instance ID</b>	Identifier for the KPI instance.
<b>Calculation Type</b>	The KPI's calculation type: sum, average, last value, min, max, state, or count. For a description of these calculation types, see <a href="#">“Key Performance Indicators”</a> on page 31.
<b>Collection Interval</b>	The KPI's data collection interval. The minimum collection interval is one minute. The maximum is eight hours.
<b>Unit of Measure</b>	The KPI's unit of measure (for example, steps or seconds).
<b>Last Reading</b>	<p>The value of the most recent aggregated data point collected for the KPI instance within the selected time period.</p> <p>Optimize displays aggregated data collection points only for completed display intervals. For example, the aggregated display interval is five minutes. Optimize does not display the aggregated data point for the five-minute display interval until the interval ends.</p>
<b>Reading Date/Time</b>	Date and time when the most recent data point was calculated, within the selected time period.
<b>Internal ID</b>	Unique identifier of the KPI instance used in the database.

The following table describes the rows of the **Historical Data for Last Reading in Displayed Time Range** panel.

Row	Description
<b>Mean</b>	For the selected time period, historical average values for the KPI instance across all historical readings in the statistical interval. These values are based on the mode of operation for KPI historical values. Value is for the most recent mean data point within the selected time period. For more information, see <a href="#">“KPI Historical Average Values” on page 38</a> .
<b>Standard Deviation</b>	For the selected time period, historical standard deviation across all historical readings in the statistical interval. These are values for the most recent standard deviation data point within the selected time period. These values are based on the mode of operation for KPI historical values. For more information, see <a href="#">“KPI Historical Average Values” on page 38</a> . (Not available if confidence is below threshold.)
<b>Statistical Confidence</b>	One minus the statistical significance. The larger this value is, the more likely that the difference between the last reading and the mean is due to chance.

The following table describes the rows of the **Readings in Displayed Time Range** panel.

Row	Description
<b>Number of Readings</b>	Total number of data points calculated in the selected time range.
<b>Mean</b>	Mean value of data points calculated in the selected time range.
<b>Minimum</b>	Data point with the lowest value in the selected time range.
<b>Maximum</b>	Data point with the highest value in the selected time range.

2. If you want to change the time range for which KPI instance details are displayed, do one of the following:
  - To select a specific time range, complete the **Start Date**, **End Date**, and **Time** boxes and then click **Go**.
  - To select a predefined time range, select the desired range from the **Display Range** list. The displayed time range will end with the currently displayed end time.
  - To shift the currently displayed time range backward or forward by half of the current time range, click **<** or **>** respectively.

- To shift the currently displayed time range backward or forward by the entire current time range, click << or >> respectively.
- To shift the currently displayed time range so that it ends at the current time, click the **Current** button. The time range is maintained.

**Tip:** The collection interval and the aggregated display interval are displayed below the KPI instance graph in the KPI Instance Detail panel.

3. Perform any of the actions that are listed in the following table.

<u>If you want to</u>	<u>Do this</u>
View a value for a point on the graph.	Rest the mouse pointer on the point.  <b>Note:</b> Values are rounded off to two decimal places. For greater accuracy, view the data points in tabular format.
Create a rule	Click  in the upper right corner and select <b>Create Rule</b> . A dialog appears enabling you to create a new rule against the KPI or the KPI Instance. For more information about creating rules, see <a href="#">“Creating an Instant Rule” on page 120</a> .
Generate a MashZone query for the currently displayed KPI instance information.	Click  in the upper right corner and select <b>Generate MashZone Query</b> . The generated query string, containing data for the selected KPI instance, appears in a dialog. Select the <b>Generate MashZone Query for all KPI instances</b> option to obtain a query string with data for all KPI instances of the selected KPI.  <b>Note:</b> The information contained in the query string can be copied and then pasted into the MashZone application, where the data presentation can be further processed. For more information about working with Software AG MashZone, see the MashZone online help.
Display the value of the data plotted on the graph, in tabular format.	Click  in the upper right corner and select <b>View Data</b> . For more information about KPI instance details in this format, see <a href="#">“Viewing KPI Instance Details in Tabular Format” on page 184</a> below.

<b>If you want to</b>	<b>Do this</b>
View information about the diagnosis performed on the item.	Rest the mouse pointer on the diagnosis trend (such as  ) to see a brief description of the diagnosis that Optimize performed on the item. For a more detailed description, see “ <a href="#">Optimize Icons</a> ” on page 209.
View details about a rule.	Click  <b>Rule - No Violation</b> or  <b>SLA Rule - No Violation</b> . For more information about interpreting rule details, see “ <a href="#">Viewing Information About Rules</a> ” on page 101.
View details about a rule violation.	Click  <b>Rule Violation</b> , or  <b>SLA Rule Violation</b> . Position the mouse pointer over the rule violation icon to display rule instance information. For more information about interpreting rule details, see “ <a href="#">Viewing Information About Rules</a> ” on page 101.
	<b>Tip:</b> For rule violations, you can also view rule details by clicking a red circle on the graph.

## Viewing KPI Instance Details in Tabular Format

### KPI Instance Detail data page

The screenshot displays the 'KPI Instance Detail' page. At the top, there are navigation tabs: 'Monitoring', 'System-Wide', 'Business', 'Process Analytics', 'Business Overview', and 'Process Instances'. The 'Business Overview' tab is selected. Below the navigation is a 'KPI Instance Detail' window with a 'Close' button. The window contains a search area with 'Start Date' (11/2/2007), 'End Date' (11/2/2007), 'Time' (11:00 to 15:00), 'Max Results' (2000), and 'No Maximum' checkbox. There are 'Go' buttons and a 'View Detail...' button. Below the search area is an 'Export Table...' button and a count '1 - 10 of 70 Items'. The main content is a table with columns 'LAST UPDATED', '%', and 'PROCESSORTIME'. The table contains 10 rows of data. At the bottom of the table is a pagination control: '< Previous | 1 2 3 4 5 6 7 | Next >'. Below the table are three expandable sections: 'KPI Instance Information', 'Historical Data for Last Reading in Display Range', and 'Readings in Display Range'. The 'KPI Instance Information' section shows: Monitor ID: hostname.hostname.k2.processor time; Monitor Type: Last Value; Collection Interval: 5 Minute; Unit of Measure: %; Last Reading: 1.00%; Reading Date/Time: 11/2/2007 2:00 PM; Internal ID: 108. The 'Historical Data for Last Reading in Display Range' section shows: Statistical Confidence: 0.7460832131654194 (Threshold: 0.8). The 'Readings in Display Range' section shows: Number of Readings: 35; Mean: 1.54%; Minimum: 0.00%; Maximum: 13.00%. A 'Close' button is located at the bottom right of the window.

LAST UPDATED	%	PROCESSORTIME
11/2/2007 2:00:00.000 PM	1.00%	
11/2/2007 1:59:04.866 PM		1.0
11/2/2007 1:50:00.000 PM	2.00%	
11/2/2007 1:49:04.967 PM		2.0
11/2/2007 1:45:00.000 PM	1.00%	
11/2/2007 1:44:04.513 PM		1.0
11/2/2007 1:40:00.000 PM	0.00%	
11/2/2007 1:39:04.108 PM		0.0
11/2/2007 1:35:00.000 PM	2.00%	
11/2/2007 1:34:04.617 PM		2.0

**KPI Instance Information**

Monitor ID: hostname.hostname.k2.processor time  
 Monitor Type: Last Value  
 Collection Interval: 5 Minute  
 Unit of Measure: %  
 Last Reading: 1.00%  
 Reading Date/Time: 11/2/2007 2:00 PM  
 Internal ID: 108

**Historical Data for Last Reading in Display Range**

Statistical Confidence: 0.7460832131654194 (Threshold: 0.8)

**Readings in Display Range**

Number of Readings: 35  
 Mean: 1.54%  
 Minimum: 0.00%  
 Maximum: 13.00%

The example above shows processor times for the system component that has the KPI Instance ID of `hostname.hostname.k2.processor time`.

### To view KPI instance details in tabular format

1. On the KPI Instance Detail graph page, click  in the upper right corner and select **View Data**.

The KPI Instance Detail panel displays data for the KPI instance in tabular format. Each row of the table represents either:

- A data point plotted within the selected time range on the KPI Instance Detail Graph page.
- Associated transaction data (if any).

Three panels of information also display: **KPI Instance Information**, **Historical Data for Time of Last Reading**, and **Readings in Last Time Period**.

The following table describes the columns of the **KPI Instance Detail** panel.

<u>Column</u>	<u>Description</u>
<b>LAST UPDATED</b>	The date and time when the data for the KPI instance was collected or data for the associated transaction (if any) was recorded.  The data displays in reverse chronological order (starting with the most recent data).
<b>Data value (formatted)</b>	The data value collected for the KPI instance.  The column heading specifies the unit of measure.
<b>Name of transaction data (if any)</b>	Zero or more columns of transaction data attached to the business or system data monitored by the KPI (for example, order number and required ship date).

**Note:** In Optimize for Process, because aggregated business data is retained for a longer period of time than non-aggregated business data by default, you might notice some discrepancies in the data displayed in the KPI Instance Detail panel. Use the graphical display format instead, or adjust the Business Days to Retain and Aggregated Days to Retain data purge parameters (see “Configuring Data Purge” in *Administering webMethods Optimize*), to avoid these discrepancies.

Below the table, the page also contains the **KPI Instance Information**, **Historical Data for Time of Last Reading**, and **Readings in Last Time Period** panels as described in “[Viewing KPI Instance Details in Graphical Format](#)” on page 178.

2. If you want to change the time range for which KPI instance details are reported, complete the **Start Date**, **End Date**, and **Time** boxes and then click **Go**.
3. Perform any of the actions that are listed in the following table.

If you want to	Do this
Export the data in the table to a comma-delimited text file	Click <b>Export Table</b> . For more information about exporting table data, see <i>Working with My webMethods</i> .
	<p><b>Note:</b>The export includes both formatted data and raw unformatted data. The raw data is provided to enhance external analysis of the data.</p>
View details about the process instance (if any) that generated data associated with the KPI	Click the process instance ID. For more information about process instance details, see <a href="#">“Monitoring System Component and Business Process Performance”</a> on page 43.
View KPI instance details in graphical format	Click <b>View Detail</b> . For more information about KPI instance details in this format, see <a href="#">“Viewing KPI Instance Details in Graphical Format”</a> on page 178.

## Creating Rules from the KPI Instance Detail Page

The KPI Instance Detail page enables you to quickly create rules from a KPI instance on the KPI Instance Detail page. This type of rule is sometimes referred to as an instant rule. You can create rules regardless of whether a KPI instance already has rules. Remember that only users who are authorized to access the Rule List page can create rules as described in the following steps. For detailed information about rules, see [“Defining Rules”](#) on page 113.

### To create a rule from a KPI instance

1. On the KPI Instance Detail page (either graphical format or tabular format), click  in the upper right corner and select **Create Rule**.  
The Create Rule page is displayed.
2. Type a name for the rule in the **Name** field.
3. Click the appropriate check box adjacent to the **Apply To** heading to indicate whether to apply the rule to all instances of this KPI or only to this instance.
4. If you want Optimize to send an alert to a designated user if the rule violates, select that user in the **Send Alert To** field.

**Note:** The **Send Alert To** field is unavailable if the currently logged in user hasn't specified an e-mail address in the user settings.

5. If you want the rule to send a Web service action or an SNMP action, choose the appropriate action from the **Action** drop-down list.
6. In the **Execute On** field, select the appropriate check box to indicate whether to execute this rule on an aggregation interval (a KPI rule) or on every event (an event rule).
7. Make the appropriate selections using the radio buttons beside the **Expression Type** heading. The selection you make here works with the fields under the **Condition** heading that follows and enables you to specify the type of expression to be used with this rule. The Expression Type options are as follows:
  - **Reading Value:** Enables you to create a rule violation condition statement based on a user-selected comparator and value.
  - **Normality:** Enables you to create a rule violation condition statement based on values being one or two standard deviations above or below the mean value.
  - **Trending:** Enables you to create a rule violation condition statement based on a value that is trending up or down for a specified duration.
8. Complete the fields under the **Condition** heading to formulate the expression that determines the specific conditions under which the rule will fire. The fields available vary based on the selections you made under the **Expression Type** heading.

<u>For expression type</u>	<u>Complete these fields</u>
<b>Reading Value</b>	Choose a comparison operator from the <b>Comparison</b> drop-down list and specify a value in the <b>Value</b> field. The unit of measurement for the value of the KPI instance is determined when the event map is created.
<b>Normality</b>	Choose the appropriate radio button.
<b>Trending</b>	Choose either <b>Trends Up</b> or <b>Trends Down</b> and specify a whole integer of intervals in the <b>Duration</b> field.

**Note:** The **Normality** expression type is available only for aggregation-interval (KPI) rules.

9. To back-populate historical data for this rule, check **Generate historical rule violations**.
10. Click **Save** to create the rule.



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# 9 Process Analytics

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## Overview

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The **Process Analytics** page (**Monitoring > Business > Process Analytics**) helps Optimize for Process users to analyze business process activity over the current or previous day using a variety of techniques. This page provides at a glance metrics on process and step volume, cycle time, and rule violations. In addition it enables you to view details about the specific process instances or rule violations related to the general metrics information. This page also displays a process model diagram for the selected process model, and enables you to drill down to view metrics for individual steps within the model. Using the panels on this page, you can quickly assess the state of relevant processes and drill down to explore and develop solutions for relevant problems.

Initially, two panels are displayed on the **Process Analytics** page. The upper panel is the **Process Metrics** panel, and it displays process metric readings under the following headings: **Volume**, **Cycle Time**, **Rule Violations**. These readings represent critical metrics for the system during the applicable time period. The lower panel is the **Process Diagram** panel, and it displays a diagram of the currently selected process model. This diagram shows each step of the process models as well as the transition lines between each step. You can click on a step to view metric details for that step. The default view shows the standard process model, but the panel contains radio buttons that enable you to change the view to show critical path for the process diagram and animated swarm lines that represent path volume flowing through the diagram.

A third panel, the **Metrics Detail** panel, shows process instance or rule violation information when you click a selection from a **Volume**, **Cycle Time**, or **Rule Violations** metrics pop up. This panel can also display step error information if you click a step in the process model diagram.

All information on the **Process Analytics** page applies for the currently selected process model over the relevant time period, as configured in the browser's time zone. The currently selected process is displayed in the **Select a Process** field. If you select a different process model, the **Process Analytics** page displays the selected model for the duration of your current My webMethods session.

You can customize the time period that is applied to the currently selected process model on the **Process Analytics** page by using the **Date Range** drop-down list and the  icon. Either select a time range from the predefined time ranges in the **Date Range** drop-down list, or specify values in the Start Date, End Date, and Time fields to define your own time range. When you specify a start and end date, and time, the **Date Range** drop-down list changes to Custom.

To refresh the page with the latest data from the Analytic Engine, click the **Refresh** button. You can also set an automatic refresh to the **Process Analytics** page by selecting one of the values from the **Refresh Rate** drop-down list. When you set an automatic refresh, the page refreshes periodically with the selected rate. If you click **Refresh** while the **Refresh Rate** is set to a value, different from **None**, this will refresh the contents of the **Process Analytics** page and reset the automatic refresh timer. The automatic refresh timer will also reset if you change the selected process model or date range.

## Process Metrics Panel

The Process Metrics panel is displayed in the upper part of the **Process Analytics** page and shows important metrics under the following headings: **Volume**, **Cycle Time**, and **Rule Violations**. Under each heading, this panel displays a large number and a small number within a box, as well as a horizontal line or an arrow. The large numbers represent the applicable process metrics for the current time period, beginning at 12:00 AM for the current day and ending at the current time; while the small numbers represent metrics for the previous time range starting at 12:00 AM and ending at the same time of day as the current time range. Using these two numbers, you can compare performance for the current day to performance for the previous day. Lines or arrows to the left of the large numbers indicate the trending change for each metric from midnight through the current time today. Lines indicate a steady state, while arrows up or down indicate an increase or decrease of the metric value.

The time ranges on this panel, and the entire **Process Analytics** page, are static until the user refreshes the page by using the page's Refresh button, by selecting a new process or by navigating away from the page.

The following table describes the **Process Metrics** panel metrics.

Metric	Description
Volume	The total number of process instances that were active during the applicable time range.
Cycle Time	The total time it took for a process to run from beginning to end. This value is the average for all process instances that completed during the applicable time range.  <b>Note:</b> Process instances in the canceled or suspended state do not contribute to cycle time. If a suspended process resumes and completes successfully, it will contribute to the cycle time less the time spent suspended.
Rule Violations	The total number of rule violations that occurred for the specified process during the applicable time range. This includes all violations related to the process including step and transition violations.

The **Process Metrics** panel enables you to view detailed information about the displayed metrics. If you click a current or previous **Volume**, **Cycle Time**, or **Rule Violation** metric reading, a pop up menu appears that shows a breakdown of the metric and enables you to select a particular aspect of it for which to view details. When you click one of the pop-up selections, a new detail panel is displayed below the **Process Metrics** panel

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containing the relevant detail information. The contents of this panel vary depending on your selection.

### Volume

All	Displays the total number of process instances for which there was activity during the applicable time range.
Started	Displays all process instances that started during the applicable time range.
In Progress	Displays the total number of process instances that were active but not completed during the applicable time range.
Completed	Displays all process instances that completed during the applicable time range.

### Cycle Time

Average	Displays the average cycle time for all process instances completed during the applicable time range.
Maximum	Displays the maximum cycle time for all process instances within the applicable time range.
Minimum	Displays the minimum cycle time for all process instances within the applicable time range.

### Rule Violations

All Violations	Displays all rule violations that occurred during the applicable time range.
Open Violations	Displays all rule violations that are currently open at the end of the applicable time range.

## Process Diagram Panel

The lower part of the **Process Analytics** page includes the **Process Diagram** panel that displays the process diagram for the selected process. By default the **Process Diagram** panel shows information for the first process in the list of available models for your system. You can select a different model by clicking the drop down for the **Select a Process** field at the top of the **Process Analytics** page.

For more information about working with process model diagrams, see [“Understanding Business Process Models” on page 200](#).

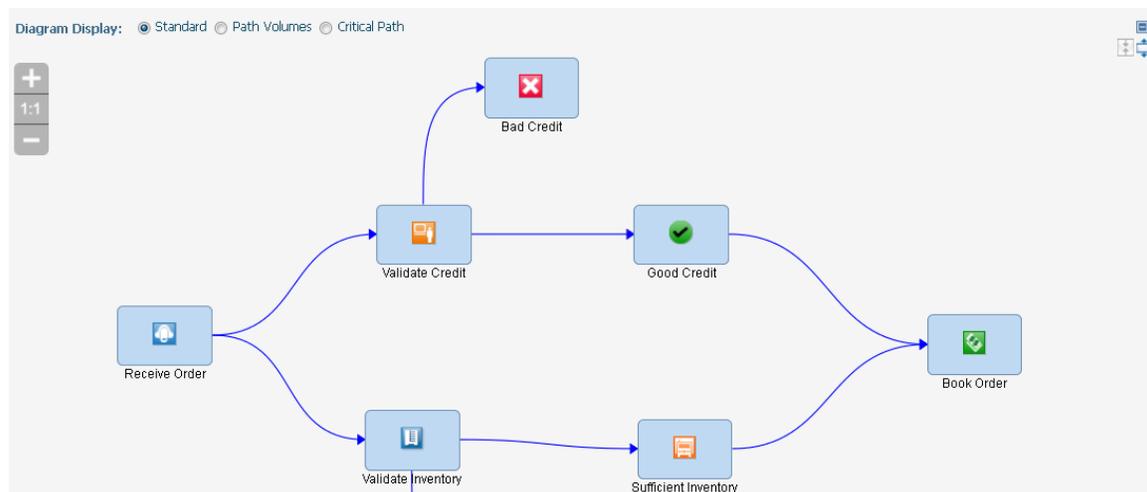
## Working with the Process Diagram

The Process Diagram panel displays a visual representation of the currently selected process model. This diagram shows all elements of the process as well as the various paths that interconnect the process model steps.

There are three display options for the Process Diagram: **Standard**, **Path Volumes**, and **Critical Path**. These options are explained below:

- **Standard** - This option shows all elements of the selected model as well as all available paths through the model components.
- **Path volumes** - This option displays animation, known as swarm lines, that indicates the relative volume between steps. A color gradient is used to identify higher or lower volumes. Volumes are calculated over the applicable time range.
- **Critical Path** - This option highlights the critical path through the specified process model in yellow. The critical path is path most frequently traversed. It is calculated over the applicable time range.

### Process Diagram panel



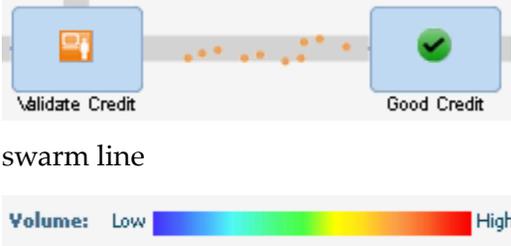
Click the step to display the step metrics in a new version of the Process Metrics panel.  
Click the diagram background to dismiss the step metrics data.

The following table describes the elements of the **Process Diagram** panel.

Component	Description
Zoom control	Adjusts the size of the process diagram.
Plus (+) button	
Minus (-) button	
1:1 button	
	<p>Zooms in to view details of the process. Each click enlarges the size of the process diagram 20 percent.</p> <p>Zooms out to view a larger portion of the process. Each click reduces the size of the process diagram by 20 percent.</p> <p>Returns the default size of the process diagram.</p> <p><b>Note:</b> The scroll wheel on the mouse also zooms in and out.</p> <p><b>Note:</b> The process diagram height that you configure is stored for the current user.</p>
Diagram area	<p>Displays a diagram of the whole business process or a portion of the business process.</p> <p>For information about the components of the business process shown in the diagram area, see <a href="#">“Understanding Business Process Models” on page 200</a>.</p> <p>For information about the view-specific components of the business process shown in the diagram area, see the following table.</p>

The Process Model diagram provides visual information about a business process model, as described in the following table.

Annotation	Description
 <p>selected step</p>	Indicates that the step is selected.

Annotation	Description
 container minimize	Minimizes a subprocess container. For more information, see <a href="#">“Containers” on page 202</a> .
 container icon	Represents a subprocess container that has been minimized. Double-click the icon to expand the container. <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p><b>Note</b>For nested containers, minimizing a container also minimizes all containers nested in it.</p> </div>
 Referenced process	Represents a referenced process. For more information, see <a href="#">“Referenced Process” on page 203</a> .
 swarm line  swarm line colors	Indicates the volume of the process instances that are executed between the business process steps. The color of the swarm line dots indicates the relative volume of process instances. Use the swarm line colors for volume reference.

## Metrics Detail Panel

The Metrics Detail panel is displayed when you select a Process or Step Metrics Panel pop-up menu option. The Metrics Detail panel shows relevant process instances or rule violations in a tabular format that varies according to the selected step metric. Also, the Metrics Detail panel displays step information for a process model step if you click on a step in the Process Model diagram.

### Viewing Volume or Cycle Time Details in the Metrics Detail Panel

The following table describes the information that is displayed for all **Volume** and **Cycle Time** pop-up menu Process and Step metric detail selections.

Column	Description								
<b>LAST UPDATED</b>	Displays the date and time that Optimize last updated the process instance (that is, when Optimize last received data).								
<b>START DATE/TIME</b>	Displays the date and time when the process instance began. The process instances are sorted by <b>DATE/TIME</b> in descending order when displaying process instance volumes and average cycle time details. When displaying cycle times minimum or maximum details, the table is sorted by cycle time, ascending or descending respectively.								
<b>PROCESS INSTANCE ID</b>	Identifies the process instance.								
<b>TRACKING STATUS</b>	Indicates the most recent execution status of the process instance. One of the following values displays: <table border="1"> <thead> <tr> <th>Value</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>Started</td> <td>The process has started, but not all steps have completed.</td> </tr> <tr> <td>Stopped</td> <td>The process was canceled.</td> </tr> <tr> <td>Completed</td> <td>Either the process completed successfully, or the process completed but one or more steps executed with errors.</td> </tr> </tbody> </table> <p>The previous three statuses apply to both webMethods-executed processes and externally-executed processes.</p>	Value	Meaning	Started	The process has started, but not all steps have completed.	Stopped	The process was canceled.	Completed	Either the process completed successfully, or the process completed but one or more steps executed with errors.
Value	Meaning								
Started	The process has started, but not all steps have completed.								
Stopped	The process was canceled.								
Completed	Either the process completed successfully, or the process completed but one or more steps executed with errors.								
<b>CYCLE TIME</b>	The total time required for a process to run from beginning to end, including the time spent waiting to be processed and the process execution time. <p><b>Note:</b> Process instances in the canceled or suspended state do not contribute to cycle time. If a suspended process resumes and completes successfully, it will contribute to the cycle time less the time spent suspended.</p>								

Column	Description
DETAIL	Click  to display the Process Instance Detail page. For more information, see <a href="#">“Monitoring System Component and Business Process Performance”</a> on page 43.

**Note:** The order and specific information displayed varies according to your selection from the pop-up menus. Note that the **Display Process Instances** radio buttons above the table enable you to select whether the table displays All, Started, In Progress or Completed process instances.

## Viewing Rule Violation Details in the Metrics Detail Panel

The following table describes the information that is displayed for all Process and Step Metrics panel Rule Violation pop-up menu selections.

Column	Description						
 <b>Status column</b>	Displays  if the rule violation has been resolved. Displays  if the rule is in violation  if it is statistically abnormal.						
<b>DATE/TIME</b>	Displays the date and time when the rule violation occurred. The rule violations are sorted by <b>DATE/TIME</b> in descending order (most recent to earliest).						
<b>RULE VIOLATION</b>	Displays the name of the rule instance that triggered the violation.						
<b>SEVERITY</b>	Optional user-defined characterization of rule violation. Severity is defined on the Add/Edit/Copy Rule page.						
<b>DETAIL</b>	<table border="1"> <tbody> <tr> <td></td> <td>Indicates a rule that was previously out of compliance but is now currently in compliance.</td> </tr> <tr> <td></td> <td>Click to view details about the rule that was violated.</td> </tr> <tr> <td></td> <td>Indicates an SLA rule that was previously out</td> </tr> </tbody> </table>		Indicates a rule that was previously out of compliance but is now currently in compliance.		Click to view details about the rule that was violated.		Indicates an SLA rule that was previously out
	Indicates a rule that was previously out of compliance but is now currently in compliance.						
	Click to view details about the rule that was violated.						
	Indicates an SLA rule that was previously out						

Column	Description
	of compliance but is now currently in compliance.
	Indicates an SLA rule that has been violated.
	Click to view KPI information for the rule violation. For more information about interpreting KPI data, see <a href="#">“Analyzing Information about Key Performance Indicators”</a> on page 163 in this guide.
	Click to display the Rule Detail page. For more information, see <a href="#">“Monitoring System Component and Business Process Performance”</a> on page 43.

The **Display** radio buttons above the Rule Violations for Process table enable you to select whether the table displays All Violations (both those that are resolved and those that are unresolved) or only Open Violations (those that are currently unresolved).

## Viewing Step Information from the Process Diagram Panel

When you click a step in the process diagram, a **Step Metrics** panel is displayed, showing **Volume**, **Cycle Time**, and **Rule Violation** information for that step.

This panel is similar to the **Process Metrics** panel in that it shows large and small numbers that correspond to metrics for the current and previous day. If you click on one of these numbers, pop-ups with detail options are displayed just as for the **Process Metrics** panel.

### Volume

All	Displays the total number of step instances for which there was activity during the applicable time range.
-----	--

Started	Displays all step instances that started during the applicable time range.
In Progress	Displays the total number of step instances that were active but not completed during the applicable time range.
Completed	Displays all step instances that completed during the applicable time range.

### Cycle Time

Average	Displays the average cycle time for all step instances completed during the applicable time range.
Maximum	Displays the maximum cycle time for all step instances within the applicable time range.
Minimum	Displays the minimum cycle time for all step instances within the applicable time range.

### Rule Violations

All Violations	Displays all rule violations that occurred on the selected step during the applicable time range.
Open Violations	Displays all rule violations that are currently open for the step at the end of the applicable time range.

When you select one of these Step Metrics Detail options, the **Metrics Detail** panel is displayed, in the same manner as how it is displayed for Process Metrics Detail options. For information about the **Volume** and **Cycle Time** step detail information, refer to [“Viewing Volume or Cycle Time Details in the Metrics Detail Panel” on page 195](#) in this chapter. For information about **Rule Violations** step detail information, refer to [“Viewing Rule Violation Details in the Metrics Detail Panel” on page 197](#) in this chapter.

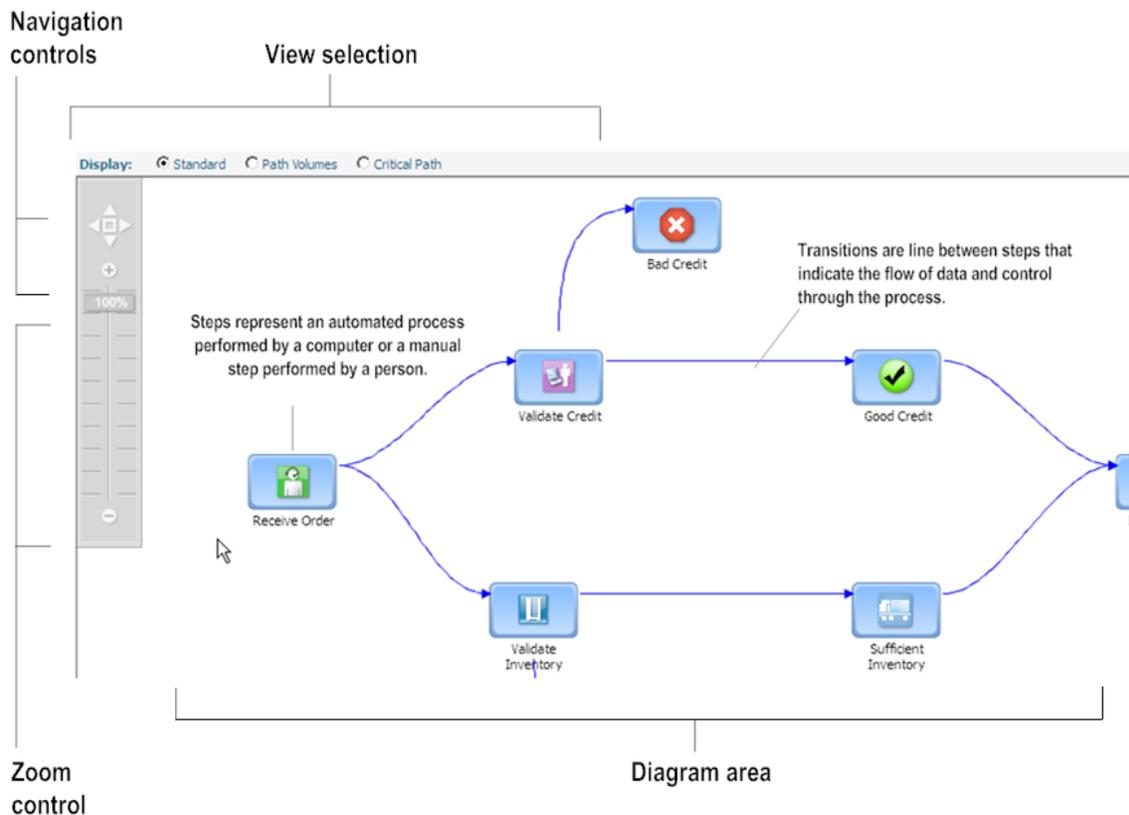
## The Step Instance Detail Panel

If you click one of the pop-up detail selections, the **Step Instance Detail** panel is opened.

## Understanding Business Process Models

The Process Analytics page displays a visual overview diagram or *model* of an entire business process. Business process models are created in Software AG Designer. The following figure shows a sample business process model on the Process Analytics page.

### Sample business process model



A business process model consists of:

- Steps
- Transitions
- Pools (optional)
- Swimlanes (optional)
- Subprocesses (optional)
- Containers (optional)
- Referenced processes (optional)

The following right-click options are available in the Process Model diagram area of all Process Analytics pages.

- **Fit to screen** - Resizes and re-centers the diagram based on the screen size.
- **Hide transition labels** - Hides description and expression text on all transition lines in the diagram.
- **Show transition descriptions** - Shows all applicable description text created in Designer for all transitions on the diagram.
- **Show transition expressions** - Shows applicable transition expressions created in Designer for all transitions on the diagram.
- **Truncate transition expressions/descriptions label** - Shortens description and expression text on all transition lines in the diagram.
- **Expand transition expressions/descriptions label** - Expands description and expression text on all transition lines in the diagram to their full length.

## Steps

A *step* is the basic unit of work in a business process. A step can represent an automated process, a manual step performed by a person, or a visual aid that identifies a task that an external organization performs. Steps can also depict a service that executes if an error or timeout occurs in the process.

## Transitions

A *transition* shows the flow of data and control from one step to another. There are two basic types of transitions:

- A *control flow* moves data directly from one step to another through the execution of an automated process. A solid line indicates a control flow.
- A *message flow* sends a message from one step to another, for example, from a step in an internal process to a step in an external process. A dotted line indicates a message flow.

## Pools

A *pool* is a set of associated steps in a business process. A pool of steps represents either an internal process or an external process. Each process model can have one internal pool and any number of external pools. A pool might represent the steps in a departmental process. For example, there might be an accounting pool and a human resources pool. Pools are represented by shaded rectangles in the process model.

## Swimlanes

A *swimlane* is a set of associated steps within a pool. Swimlanes are represented by backgrounds of different colors within a pool.

## Subprocesses

A *subprocess* is a process within another process. The subprocess is treated like a step within the process that contains it. The subprocess cannot run on its own; it runs as part of the process that contains it.

The steps in a subprocess may be automated or manual, and the subprocess may *loop* or repeat multiple times until specified conditions are met.

## Containers

A *container* holds the set of steps that comprise a subprocess.

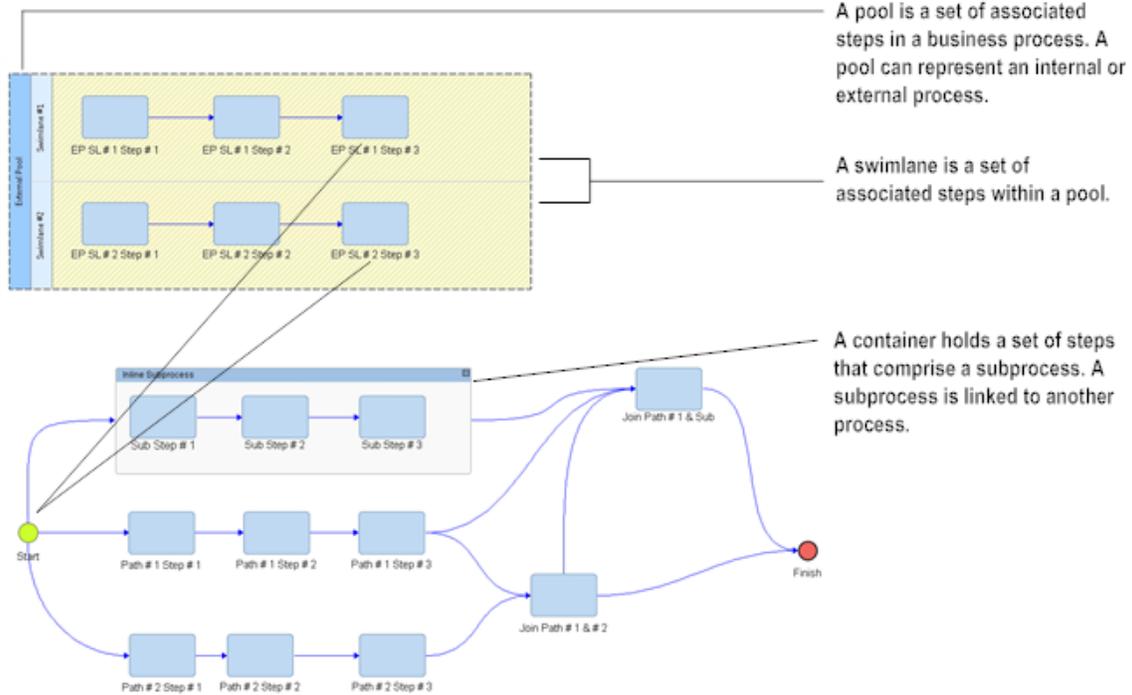
A container can be minimized to display as an icon within the process, and the container icon can be expanded to re-display the subprocess within the container.

Subprocess containers can be nested one within another.

A control flow transition cannot cross the boundaries of a container. It can connect to the container as a whole but not to a step within the container.

A message flow transition, which sends a message, can cross the boundaries of a container and connect to a step within the container.

## Pools, swimlanes, and containers



## Referenced Process

A *referenced process* is a separate process that displays as a step within another process. Unlike a subprocess, a referenced process is self-contained. It can run on its own.

On the **Process Analytics** page, a referenced process displays as an icon. Unlike a subprocess container, a referenced process cannot be expanded on the **Process Analytics** page. To display the referenced process on the **Process Analytics** page, select the referenced subprocess from the "Select a Process" drop down list.



# 10 Diagnostics

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## Viewing Diagnostic Information

The Diagnostics page provides a report of information to assist in troubleshooting issues with event maps, dimensions, hierarchies, KPIs, and rules.

### To view diagnostic information

1. In My webMethods:

**Navigate > Applications > Administration > Analytics > Diagnostics**

Optimize displays the **Diagnostics** page with a report of diagnostic information.

The screenshot shows the 'MY WEBMETHODS' interface. The 'Diagnostics' page is active, displaying a table of diagnostic issues. The table has three columns: TYPE, ITEM, and ISSUE. The table lists various dimension definitions that have not persisted any data in their respective tables.

TYPE	ITEM	ISSUE
DimensionDefNoData	AAA3EditDimension	Dimension definition AAA3EditDimension has not persisted any data in its dimension table, BAM_DIM_AAA3EDI_V1.
DimensionDefNoData	AdabasCaching	Dimension definition AdabasCaching has not persisted any data in its dimension table, BAM_DIM_ADABASC_V1.
DimensionDefNoData	AdabasCollector	Dimension definition AdabasCollector has not persisted any data in its dimension table, BAM_DIM_ADABASC_V11.
DimensionDefNoData	AdabasDeltaSave	Dimension definition AdabasDeltaSave has not persisted any data in its dimension table, BAM_DIM_ADABASD_V1.
DimensionDefNoData	AdabasEventRep	Dimension definition AdabasEventRep has not persisted any data in its dimension table, BAM_DIM_ADABASE_V1.
DimensionDefNoData	AdabasEventRepDest	Dimension definition AdabasEventRepDest has not persisted any data in its dimension table, BAM_DIM_ADABASE_V11.
DimensionDefNoData	AdabasEventRepInQueue	Dimension definition AdabasEventRepInQueue has not persisted any data in its dimension table, BAM_DIM_ADABASE_V12.
DimensionDefNoData	AdabasEventRepSubscr	Dimension definition AdabasEventRepSubscr has not persisted any data in its dimension table, BAM_DIM_ADABASE_V13.
DimensionDefNoData	AdabasFastpath	Dimension definition AdabasFastpath has not persisted any data in its dimension table, BAM_DIM_ADABASF_V1.
DimensionDefNoData	AdabasFastpathDatabase	Dimension definition AdabasFastpathDatabase has not persisted any data in its dimension table, BAM_DIM_ADABASF_V11.
DimensionDefNoData	AdabasOSServer	Dimension definition AdabasOSServer has not persisted any data in its dimension table, BAM_DIM_ADABASO_V1.
DimensionDefNoData	AdabasReview	Dimension definition AdabasReview has not persisted any data in its dimension table, BAM_DIM_ADABASR_V1.
DimensionDefNoData	AdabasSAFSecurity	Dimension definition AdabasSAFSecurity has not persisted any data in its dimension table, BAM_DIM_ADABASS_V14.
DimensionDefNoData	AdabasServer	Dimension definition AdabasServer has not persisted any data in its dimension table, BAM_DIM_ADABASS_V15.
DimensionDefNoData	AdabasSOAGateway	Dimension definition AdabasSOAGateway has not persisted any data in its dimension table, BAM_DIM_ADABASS_V1.
DimensionDefNoData	AdabasSOAGatewayOperation	Dimension definition AdabasSOAGatewayOperation has not persisted any data in its dimension table, BAM_DIM_ADABASS_V11.
DimensionDefNoData	AdabasTransactionManager	Dimension definition AdabasTransactionManager has not persisted any data in its dimension table, BAM_DIM_ADABAST_V1.
DimensionDefNoData	ApplInApplication	Dimension definition ApplInApplication has not persisted any data in its dimension table, BAM_DIM_APPLINX_V1.
DimensionDefNoData	ApplInServer	Dimension definition ApplInServer has not persisted any data in its dimension table, BAM_DIM_APPLINX_V11.

2. View the information on the **Diagnostics** page.

The following table describes the information on the **Diagnostics** page.

Column	Description
<b>TYPE</b>	This column lists the area of the system that is connected to the issue. The listed area can be an event map, a dimension, a measure, a dimension hierarchy, a KPI, or a rule.
<b>ITEM</b>	This column lists the measure name or the dimension name connected to the issue.

<b>Column</b>	<b>Description</b>
<b>ISSUE</b>	This column describes the issue.

As indicated by the up or down triangle beside each column head, you can sort issues by each column. Once you have sorted a column, the other two columns show either a **(2)** or a **(3)**, indicating that column is either the secondary sort key or the tertiary sort key, respectively.



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# A Optimize Icons

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## About Optimize Icons

Optimize displays summary and detailed information about business process and system status in tabular and graphical format. Optimize uses icons to visually indicate status and whether more information is available for an item. Remember that all icons related to business processes are specific to Optimize for Process.

Optimize icons include the following types:

- **Status icons**, which indicate whether a business process or system component is in compliance, out of compliance, or statistically abnormal. For process instances, they indicate whether the process step executed successfully or with errors. For example,  next to the name of a system component indicates that the component is out of compliance.
- **Rule icons**, which indicate that a rule exists for the item and whether the rule was violated. For example,  indicates that a rule violation exists. You can click this icon to view details about the rule.
- **Monitor, or KPI, icon** () , which indicates that one or more KPIs (monitors) are associated with the item.
- **Process Analytics icon** () , which indicates that process analytics information is available for an item.
- **Six Sigma icon** () , which indicates that Six Sigma error related information is available for an item.
- **Diagnosis trend icons**, which indicate that Optimize made a trending diagnosis for the item. For example,  indicates that data samples remain in an upward trend.
- **Business process and system tree icons**, which indicate whether a tree node is a monitor, a process, or a step and let you expand or collapse nodes beneath a business process or system tree. For example:

This category also includes an icon that indicates whether Six Sigma process improvement information is available for a process. See [“Six Sigma Icon” on page 213](#). Note that business process icons are specific to Optimize for Process.

Some Optimize pages contain graphs that plot data points over a period of time. You can rest the mouse pointer on any data point to view the numeric value of that reading.

## Status Icons

For business processes, KPIs, applications, and equipment components, status icons identify whether these items are in compliance, out of compliance, or statistically abnormal. For process instances, these icons identify whether process steps are executing normally or with errors.

The icons appear to the left of a tracked item.

Icon	Meaning for rule compliance and statistical diagnosis	Meaning for process status
	The item is in compliance (normal status) and is statistically normal. The item has not violated a rule.	The step executed normally.
	The item is out of compliance and has violated a rule.	An error occurred during the execution of a process step.  On the Process Instances page, you can rest the mouse pointer on this icon to see a list of all errors that occurred for the process.
	The item is statistically abnormal.	A warning occurred during the execution of a process step.  On the Process Instances page, you can rest the mouse pointer on this icon to see a list of all warnings that occurred for the process.
	No data is available.	No data is available.  On the Process Instances page, this icon indicates that the step has not yet executed.

## Rule Icons

Rule icons indicate whether a rule exists for a monitored item and whether the rule has been violated. You can view details about the rule by clicking the icon. If there is a customer associated with the rule, the customer name displays when you position the mouse pointer over the icon.

Icon	Meaning
	One or more rules are associated with this item.  If more than one rule is associated with this item, clicking this icon displays the Rule Summary page identifying all of the rules associated with this item.

Icon	Meaning
	If only one rule is associated with this item, clicking this icon displays the Rule Detail page containing details about the rule.
	<p>A rule violation exists for one or more rules associated with this item.</p> <p>If more than one rule is associated with this item, clicking this icon displays the Rule Summary page identifying the rules associated with this item.</p> <p>If only one rule is associated with this item, clicking this icon displays the Rule Detail page containing details about the rule violation.</p>
	One or more rules associated with this item has been disabled.

## SLA Rule Icons

SLA Rule icons identify rules that are related to Service Level Agreements, and they have a distinct appearance so that they can be easily distinguished from other rule icons. If there is a customer associated with the rule, the customer name displays when you position the mouse pointer over the icon.

Icon	Meaning
	<p>One or more SLA rules are associated with this item.</p> <p>If more than one rule is associated with this item, clicking this icon displays the Rule Summary page identifying all of the rules associated with this item.</p> <p>If only one rule is associated with this item, clicking this icon displays the Rule Detail page containing details about the rule.</p>
	<p>A rule violation exists for one or more rules associated with this item.</p> <p>If more than one rule is associated with this item, clicking this icon displays the Rule Summary page identifying the rules associated with this item.</p> <p>If only one rule is associated with this item, clicking this icon displays the Rule Detail page containing details about the rule violation.</p>
	One or more SLA rules associated with this item has been disabled.

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## Monitor/KPI Icon

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The Monitor/KPI icon indicates that KPI summary or KPI instance detail information is available for an item.

Icon	Meaning
	<p>Monitor, or KPI, information is available for this item. Click the icon to display this information.</p> <p>If more than one monitor (KPI) is associated with this item, the KPI Summary page displays containing a summary of all monitors (KPIs).</p> <p>If only one monitor is associated with this item, KPI instance detail information is available. Click the icon to display the KPI Instance Detail page containing this information.</p>

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## Process Analytics Icon

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The Process Analytics icon indicates that process analytics information is available for an item.

Icon	Meaning
	<p>Process Analytics information is available for this item. Click the icon to display the Process Analytics page for the process.</p>

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## Six Sigma Icon

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The Six Sigma icon indicates that detail information is available for an item.

Icon	Meaning
	<p>Six Sigma information is available for this item. Click the icon to display this information on the Improve (Six Sigma) page.</p>

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## Diagnosis Trend Icons

Optimize performs a diagnosis on all monitors associated with a KPI, according to the collection interval specified when the KPI was created. You can use this information to watch for trends in performance and to help determine ways to improve processes and system components that continue to perform outside of their normal range.

You can rest the mouse pointer on these icons on any Optimize page to display a short description.

Icon	Description	Meaning
	Staying Above Mean	Last summarized data sample collected is between one and three standard deviations above the historical mean for the current statistical interval.
	Above Normal	Last summarized data sample collected is between one and three standard deviations above normal for the current statistical interval.
	Slope Above Normal	Rate of change between the last and previous summarized data samples collected is between one and three standard deviations above normal for the current statistical interval.
	Staying in Upward Trend	Last data point or summarized data sample collected represents an upward trend.
	Staying Below Mean	Last summarized data sample collected is between one and three standard deviations below the historical mean for the current statistical interval.
	Below Normal	Last summarized data sample collected is between one and three standard deviations below normal for the current statistical interval.
	Slope Below Normal	Rate of change between the last and previous summarized data samples collected is between one and three standard deviations below normal for the current statistical interval.

Icon	Description	Meaning
	Staying in Downward Trend	Last data point or summarized data sample collected represents a downward trend.

## Analytics Overview Icons

Analytics Overview icons appear on the Analytics Overview page to expand or collapse tree nodes and to indicate whether a node is a KPI, a process, or a step.

Icon	Meaning
	Expand (show) nodes beneath the tree.
	Collapse (hide) nodes beneath the tree.
	The node is a KPI
	The node is a KPI instance.
	The node is a dimension of a KPI.
	The node is a tracked process instance.
	The node is an process instance.
	The node is a step in a process.
	On the Problems page, this icon indicates that Six Sigma process improvement information is available for a process. Click the icon to view this information.
	Detailed information is available for a process instance or process step. Click the icon to display a list of process instances associated with an item that is out of compliance.



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# B Glossary

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**alert**

1. A notification triggered by a rule violation. Rule violation alerts can take the form of e-mail messages, or you can specify SNMP alert actions or Web service alert actions.
2. In an Oracle database environment, a notification triggered when the Oracle purge operation completes or encounters an error.

**analysis engine**

An Analytic Engine component that runs algorithms on business, system, and process data.

**Analytic Engine**

An Optimize core function that handles the following tasks:

- Receives business, system, and process data from Infrastructure Data Collector.
- Analyzes the data.
- Saves the data and the analysis in the database.
- Sends information about the status of business and system activity to the My webMethods user interface.
- Performs other actions when problems occur, such as sending alerts to specified users.

**API**

Application programming interface.

**application**

A webMethods program such as Integration Server running on a system component in your environment.

**asset**

A container object with connection data. Previously called an object.

**BAM**

Business Activity Monitoring. BAM allows you to analyze real-time information about the performance of your business, including the volume of business activity and its responsiveness, serious errors that may have occurred, and other KPIs. Using this actionable data, you can eliminate problems and take advantage of business opportunities.

**BAM-only process**

See externally-executed process.

**base rule**

A rule. The term *base rule* is used to distinguish a rule from a rule instance.

**BPEL**

Business Process Execution Language.

**BPM**

Business Process Management.

**BPM-only process**

See webMethods-executed process.

**Broker (deprecated)**

1. An entity that resides on a Broker Server (deprecated). When a client connects to a Broker Server (deprecated), the client specifies the Broker (deprecated) with which it wants to interact.
2. See webMethods Broker (deprecated).

**Broker Server (deprecated)**

The run-time component of webMethods Broker (deprecated) with which publishers and subscribers interact. It performs the communication-related work of receiving client requests, dispatching requests to the requested resource, and returning responses to clients.

**business data**

Data that make up a business process, such as revenue and order number.

**business KPI**

A KPI created by a user to monitor business process data. For example, users can create business KPIs to monitor Revenue by Customer. A business KPI differs from an intrinsic KPI, which is created by Optimize.

**business process**

A series of interrelated business tasks that are performed in a specific order, using an associated set of business rules; and by multiple systems, people, and partners. Examples of business processes within a corporation might include the following procedures:

- Preparing for a new employee.
- Handling a purchase order.
- Bringing a product from inception to market.
- Delivering a timely and accurate invoice.
- Enabling Vendor Managed Inventory.

You can monitor two types of processes from My webMethods: a webMethods-executed process or an externally-executed process.

**business process management**

The ability to define, implement, manage, analyze, and optimize business processes, which includes interactions between systems within your own corporation (e.g., applications and information stores), people in your corporation, and external business partners.

**business process tree**

A listing of business process components with branches and nodes that are displayed on the Analytics Overview page in Optimize.

**Business Visualization**

A set of Optimize analysis functions that present business data as images. Business Visualization provides users with actionable data by highlighting patterns and trends in business processes and key performance indicators (KPIs).

**calculation type**

One of the following five methods for data aggregation: sum, average, count, last value, min, max, and state.

**CDC**

Common Database Configuration. Platform containing the webMethods database components.

**CCS**

Central Configuration System. See Central Configurator.

**Central Configurator**

A webMethods tool that provides a graphical user interface for configuration, enabling you to configure your installation in a central location without manually editing configuration files.

**composite KPI**

A KPI that performs a mathematical operation (add, subtract, multiply, or divide) on two other KPIs. For example, if individual KPIs monitor a product's operating costs and revenue, a composite KPI can monitor the product's profit by subtracting the operating cost KPI from the revenue KPI.

**container**

A set of steps that comprise a subprocess within a business process. Subprocess containers can be nested one within another.

**control flow**

A transition that moves data directly from one step to another through the execution of an automated business process.

**custom error**

An error that originates in an external system. Examples of custom errors include application failure and database failure when the application or database is external to the system. A custom error can occur at either the process or step level.

**data aggregation**

The process of combining individual data values into summarized data values. To measure the revenue in dollars generated by the order management process, a Total Order Revenue KPI might sum the dollar amounts of orders received during a ten-minute data collection interval.

**data collection interval**

A time interval during which Optimize collects data for a KPI.

**database component**

A grouping of database objects deployed as a single or set of database SQL scripts. It is the lowest-level grouping of a set of scripts. A database component is defined by a database component definition file.

**database component definition**

An XML file that defines all the information related to a specific database component. Each database component has one and only one XML file.

**database connection pool**

A collection of pre-established connections to a database. A database connection pool avoids the overhead involved in making a new database connection every time an application or server requires access to the database.

**DCA**

Data collection agent.

**DCC**

Database Component Configurator. A Java program used to install database components found in the Common Database Configuration (CDC) platform by executing SQL commands over a JDBC connection. This includes creation, removal, and migration of database components. This program replaces the Database Component Installer (DCI).

**DCI**

Database Component Installer. This program has been replaced by the DCC (Database Component Configurator).

**defect**

A failure to meet a business rule (that is, a rule violation).

**derived name**

A user-defined name applied to all instances of a rule. If a derived name is specified in the Rule Information settings for the rule, all instance names will be derived from this name. Use variables in the derived name definition to keep all instances of the rule from having the same name.

**destination step**

A destination step relates to wait-time standardized error types. For a complete description, see wait-time standardized error type.

**dimension**

A category, or a way to analyze business data or system data by slicing the data into smaller components. Organizations define their own dimensions. Typical examples of dimensions are customer, region and sales person, product and manufacturer, and Broker Server and Broker.

**dimension hierarchy (formerly KPI hierarchy)**

See hierarchy.

**discovery**

A collection of instructions used by the Infrastructure Data Collector to discover assets.

**display interval**

The displayed aggregation interval used on KPI Instance graphs. Data is aggregated to the display interval to accommodate larger time frames on the graph.

**environment**

A grouping of webMethods product components that share common configuration settings. A default Optimize environment contains the following logical servers:

- An Analytic Engine
- A Web Service Data Collector
- A webMethods Broker (deprecated) or Universal Messaging
- A My webMethods Server

You can use Central Configurator to set up and configure an environment.

**event**

1. A simple structure containing a set of data attributes.
2. In Business Visualization, a rule violation.

**event handler**

An Analytic Engine component that receives business data and system data from the Web Service Data Collectors and other webMethods products. The Analytic Engine writes this data to the database in a format that business intelligence software can use to generate reports.

**event map**

The knowledge of what each attribute in an event (definition 1) means. An event map associates business data, such as dimensions, with a particular business process.

**event rule**

A rule that evaluates data as it is collected rather than waiting until the end of a KPI data collection interval. An event rule takes dimensions into account, tracks its state of compliance, and persists in the database. In general, event rules evaluate data in situations that require immediate response. For example, an event rule might track whether an application has unexpectedly shut down.

**externally-executed process**

A business process that is modeled and monitored using webMethods-provided tools; however, the process is executed by an external application. Compare to webMethods-executed process.

**global data**

No longer applicable. Global data was deprecated in Optimize version 7.1.2.

**hierarchy**

In Optimize, an ordered ranking of dimensions. A hierarchy provides additional ways to slice data into smaller components. For example, a sales hierarchy might consist of the two dimensions of region and salesperson. As another example, a queue-length hierarchy might consist of the two dimensions of Broker Server and Broker.

**infrastructure**

A set of system components (Integration Server, Broker, SNMP agents).

**Infrastructure Data Collector**

A BAM component that monitors the system and operational data associated with webMethods run-time components, such as Integration Servers, Broker Servers, Brokers, and adapters, and reports the status of these components on Optimize for Infrastructure or other external tools.

**Integration Server**

See webMethods Integration Server.

**intrinsic KPI**

A KPI created by Optimize to monitor business process or system data. For example, Optimize creates KPIs to monitor Instance Count by Process, Cycle Time by Process, and Process Error Count.

**KPI**

Key performance indicator. A measurement of a business activity that is important to the success of an organization. KPIs monitor metrics, quantitative business and system data, such as revenue, volume of orders, queue length, and cycle time. KPIs help answer questions such as, "How many orders over \$10,000 are stuck in this process?" A KPI defines a way to aggregate event (definition 1) data.

**Note:** In Optimize, KPIs (more specifically, KPI instances) are sometimes referred to as "monitors."

**KPI definition**

The characteristics of a KPI, as distinct from a KPI instance.

**KPI instance**

A measurement of one slice of business data or system data. A Total Order Revenue KPI, which is not sliced by dimensions, has one KPI instance. A Revenue by Customer KPI, which slices revenue by the customer dimension, has multiple KPI instances. With a Revenue by Customer KPI, each KPI instance measures revenue for an individual customer. A Revenue by Region and Sales Person KPI, which slices revenue by a sales hierarchy with two dimensions (region and sales person), has multiple KPI instances.

For the Revenue by Region and Sales Person KPI, each KPI instance measures revenue for an individual sales person within a specific region.

**KPI rule**

A rule that evaluates data over one or more KPI data collection intervals. For example, a Gross Margin Percent Severely Below Normal rule might specify that the gross margin percentage must not go more than one sigma below the average Gross Margin KPI value for three consecutive Gross Margin KPI collection intervals. A KPI rule takes dimensions into account, tracks its state of compliance, and persists in the database.

**LDAP**

Lightweight Directory Access Protocol. An Internet protocol for accessing information directories containing names, phone numbers, addresses, etc. It allows client programs to query LDAP directory servers about entries using their attributes.

**logical server**

A representation of a webMethods product component. Each logical server contains subcomponents that can be configured using the Central Configurator tool. During the environment configuration process, each logical server is mapped to one or more physical servers.

**mashup**

A Web application that integrates content from multiple sources into a seamless user experience.

**measure (formerly fact)**

A metric with a set of attributes including a unit of measure and a calculation type.

**message flow**

A transition that sends a message from one step to another. For example, a message flow might send a message from a step in an internal business process to a step in an external business process.

**model**

A visual overview diagram of an entire business process. Business process models are created in Software AG Designer or other external tools.

**monitor**

1. A KPI instance.
2. The mechanism Optimize uses to store data for a KPI instance.

**Monitor**

See webMethods Monitor.

**monitor repository**

The total number of monitors and the current queue size of the Analytic Engine. A large queue size might indicate that the Analytic Engine is attempting to process too much data.

**monitored component**

A system component monitored by Infrastructure Data Collector.

**monitoring API**

An interface to Optimize that provides a standardized means for loading monitor, process, and metadata into Optimize's Analytic Engine within the webMethods product suite.

**My webMethods**

A Web-based monitoring and administration user interface for managing all products in a webMethods integration environment. When you log in to My webMethods, you are logging in to all webMethods products that are incorporated into My webMethods.

**My webMethods Server**

The core set of components and services required to host the Web interface for webMethods products including Optimize. Formerly known as Portal.

**Optimize**

See webMethods Optimize.

**Optimize for Infrastructure**

A BAM component that enables you to access the resource information collected by Infrastructure Data Collector. You use Optimize for Infrastructure to monitor the status of individual managed objects as well as the overall status of your system.

**Optimize for Process**

A BAM component that monitors business processes, in addition to managed objects and system status, by tracking KPIs that relate to operational factors such as margin, revenue, customer satisfaction, and inventory levels. Optimize for Process enables you to use Six Sigma on your business processes. Optimize for Process measures the number of defects in a process and helps you systematically determine how to eliminate them. Optimize for Process includes Business Visualization tools that provide at-a-glance mashups of Optimize monitoring information.

**Pareto principle**

A principle that states that the majority of defects (80 percent) are caused by a few (20 percent) vital components.

**pipeline data**

Data available only within a given process, rather than retrieved from or sent to external sources. Specifically, pipeline data is all information (documents and other data types) that is available to any given step because that data was introduced upstream in the process.

**pool**

1. A set of associated steps in a business process. A pool of steps represents either an internal process or an external process.
2. See database connection pool.

**portlet**

Interchangeable user interface components that are managed and displayed in a Web portal. Portlets produce fragments of markup code that are aggregated into a portal page. Typically a portal page is displayed as a collection of non-overlapping portlet

windows, where each portlet window displays a portlet. Hence, a portlet (or collection of portlets) resembles a Web-based application that is hosted in a portal.

**Process Analytics**

An Optimize function that helps users analyze information about the performance of business processes and rules.

**process error**

An error that originates within a business process and applies to the process as a whole. Examples of process errors include processes that timed out before they completed successfully as well as processes that completed with errors.

**process event**

An event that specifies what should happen when an external process encounters a particular situation. For example, if a process contains a manual review step and the system determines that the data it receives in that step is corrupt, a process event might cause Optimize to stop analyzing the process.

**process instance**

An execution of a business process. In an order process, each order that goes through the steps in the process is a process instance.

**Process Tracker**

An Analytic Engine component that receives business process data from the Web Service Data Collectors and other webMethods products, and tracks the state of executing processes. As a process executes, the Process Tracker takes measurements about the process instance and its steps, such as wait time and cycle time. This information can be used to track performance of a business process or to alert you when certain conditions exist, such as performance degradation or a failure in process execution.

**referenced subprocess**

A separate subprocesses that displays as a step within its parent process but is not part its workflow.

**reminder interval**

The number of minutes between alerts. If you want alerts specified for a rule to be repeated, specify this interval in the Attributes settings for the rule.

**rule**

A condition or set of conditions you apply to a process or to a type of data. You can create a rule to notify you when a process or resource becomes problematic and requires user attention. You can also create a rule to notify you when a business opportunity exists. Optimize supports the following two types of rules: KPI rules, event rules, and threshold rules.

**rule evaluation interval**

The number of consecutive intervals for which a rule must evaluate to true before Optimize will consider the rule to be violated. For example, if you are writing a rule to detect when a queue length is trending toward being too large, you might specify that Optimize should not consider the rule violated unless the queue length trends upward for five intervals.

**rule expression**

A logical expression contained in a rule. A simple expression tests a single condition; a complex expression tests two or more conditions. Optimize evaluates the expression to determine whether it is true or false. If the expression evaluates to true, Optimize generates a rule violation.

**rule filter**

A filter that identifies specific processes, dimensions, or system objects that a rule should monitor.

**rule instance**

An occurrence of a rule. For example, a rule specifies that revenue by region requires attention when the revenue drops below \$10,000 over a 12-hour period. One instance of that rule occurs during the process of monitoring revenue for a specific region at each 12-hour period.

**rule violation**

A rule instance that meets the conditions specified by a rule. Under these conditions, a business process or system resource requires user attention, either because a problem has occurred or because an opportunity exists.

**rules engine**

An Analytic Engine component that compares the data it receives from the Analytic Engine to rules that detect when a process or resource requires user attention.

**severity**

A user-defined text field associated with a rule. If text is entered into this field, that text appears with the rule in the rule list, and any alerts generated for that rule can be configured to display the severity text.

**Six Sigma**

A disciplined methodology for improving business process performance by eliminating defects.

**SLA**

Service Level Agreement. An agreement between two parties on the level of service to be provided.

**SNMP**

Simple Network Management Protocol. A protocol for monitoring and controlling network devices. It has nearly universal use in TCP/IP networks.

**SNMP alert**

A user-configured SNMP message sent to a defined SNMP manager upon a rule violation.

**SNMP data collector**

A component of Infrastructure Data Collector specifically configured to collect operational data from defined SNMP Agents.

**SOAP**

Simple Object Access Protocol.

**source step**

A source step relates to wait-time standardized error types.

**SQL**

Structured Query Language. A database query language that interfaces with relational databases.

**Standardized error**

User-defined process error tracked by Optimize. Standardized errors use built-in error conditions that can be configured in the Add Standardized Error page error builder.

**statistical interval**

The time range for historical average KPI values.

**step**

The basic unit of work in a business process. A step can represent an automated process, a manual step performed by a person, or a visual aid that identifies a task that an external organization performs.

**Step Absolute Wait Time**

See wait-time standardized error type.

**step error**

An error that applies to a step within a business process. Examples of step errors include duplicate step processing, step timeouts, and steps executed out of sequence.

**Step Relative Wait Time**

See wait-time standardized error type.

**sticky rule**

A rule that when violated does not return to compliance until the rule is manually resolved. You can make a rule sticky to signal a serious violation that requires user attention to remedy the situation. For example, if you create a rule to detect that a Broker Server is offline, defining the rule as sticky causes the alert to occur once and the rule to remain in violation until the server is restarted and the rule is resolved.

**subprocess**

A process within another business process. The steps within a subprocess are often grouped within a container. The subprocess is treated like a step within the process that contains it.

**swarm line**

A transition that shows the relative volume of process instances traveling down a path in a business process. The number of dots in the swarm line indicates the relative volume moving along the transition.

**swimlane**

A set of associated steps within a pool.

**system component**

Any item of information technology (IT) infrastructure equipment in your environment that can be monitored.

**system data**

Data about equipment or applications, such as queue length and whether a managed component is online or offline.

**system error**

Built-in error that is automatically associated with a process by Process Tracker.

**system KPI**

A KPI created by a user to monitor system data. For example, users can create system KPIs to monitor Integration Server Total Memory. A system KPI differs from an intrinsic KPI, which is created by Optimize.

**system tree**

A listing of system components with branches and nodes that is displayed on the Analytics Overview page in Optimize.

**threshold rule**

A rule that evaluates data as it is collected (for example, queue size greater than 1000 or order amount less than \$500). A threshold rule does not take dimensions into account, does not track its state of compliance, and does not persist in the database. A threshold rule is like a trigger that produces an alert.

**transition**

The flow of data and control from one step to another in a business process. The two basic types of transitions are control flow and message flow.

**transaction**

(In an event map) An attribute that you do not want to measure but would like to store in the database to use in a rule expression or to associate with a fact that arrives with the same event.

**trend**

In Optimize, one of 16 different types of diagnoses (above normal, below normal, staying in upward trend, staying in downward trend, etc.) on all KPI instances over the KPI's data collection interval. You can use this information to watch for trends in performance and to help determine ways to improve business processes and system components that continue to perform outside their normal range.

**wait-time standardized error type**

Wait-time error types are intended for configuring errors related to the time that elapses leading to the start of a specified step in a process instance (the destination step). Wait-time error types are always applied to the destination step. The two available wait-time error types are Step Relative Wait Time and Step Absolute Wait Time. A Step Relative Wait Time error type relates to the time that elapses between the completion of one step in a process instance (the source step) and the start of a subsequent, specified step in that same process instance (the destination step). A Step Absolute Wait Time error type relates to the time that elapses between the beginning of a process instance and the start of a specified step in that process instance.

**Web services**

Self-contained applications that exchange data over the Web or another network and are based on open standards such as SOAP, TCP/IP, HTTP, Java, and XML.

**Web Service Data Collector**

Also referred to as WSDC. An interface to Optimize through which client programs can send any of the following information:

- Process and operational data about applications or IT equipment in your enterprise, such as databases, printers, or disk drives.
- Process data, such as the start and end time of each step in process instances.
- Business data, such as customers, order quantities, and revenues.

**Web services layer**

An Analytic Engine component that sends the results of the analysis to the My webMethods Server. The My webMethods user interface presents the results, along with icons that indicate that a rule violation has occurred or that Optimize has diagnosed a trend.

**webMethods Broker (deprecated)**

The deprecated “message backbone” product in a webMethods integration environment. Broker (deprecated) facilitates asynchronous, message-based communication using the publish-and-subscribe model.

**webMethods Integration Server**

The central run-time product in a webMethods integration environment. Integration Server provides an environment for the orderly, efficient, and secure execution of business processes and services.

**webMethods Monitor**

An administrative tool used to examine instances of running or completed business processes, services, integrations, and documents. Monitor allows you to view data about business processes, services, and documents that other webMethods products have previously logged.

**webMethods Optimize**

The Business Activity Monitoring (BAM) product in a webMethods integration environment. Optimize facilitates real-time insight into key business process and system resource activities, and provides actionable information that enables business users to make informed decisions, quickly address problems, and enhance business operations through continuous process improvement.

**webMethods-executed process**

A business process that is modeled, executed, and monitored using webMethods-provided tools. Compare to externally-executed process.

**WSDC**

See Web Service Data Collector.

**XML**

Extensible Markup Language. A flexible markup language for structuring, storing, and sending information.