CA Application Performance Management

API Reference Guide

Release 9.1.1

CA Technologies Product References

This document references the following CA Technologies products and features:

- CA Application Performance Management (CA APM)
- CA Application Performance Management ChangeDetector (CA APM ChangeDetector)
- CA Application Performance Management ErrorDetector (CA APM ErrorDetector)
- CA Application Performance Management for CA Database Performance (CA APM for CA Database Performance)
- CA Application Performance Management for CA SiteMinder (CA APM for CA SiteMinder)
- CA Application Performance Management for CA SiteMinder Application Server Agents (CA APM for CA SiteMinder Application Server Agents)
- CA Application Performance Management for CA SYSVIEW® (CA APM for CA SYSVIEW)
- CA Application Performance Management for IBM CICS Transaction Gateway (CA APM for IBM CICS Transaction Gateway)
- CA Application Performance Management for IBM WebSphere Application Server (CA APM for IBM WebSphere Application Server)
- CA Application Performance Management for IBM WebSphere Distributed Environments (CA APM for IBM WebSphere Distributed Environments)
- CA Application Performance Management for IBM WebSphere MQ (CA APM for IBM WebSphere MQ)
- CA Application Performance Management for IBM WebSphere Portal (CA APM for IBM WebSphere Portal)
- CA Application Performance Management for IBM WebSphere Process Server (CA APM for IBM WebSphere Process Server)
- CA Application Performance Management for IBM z/OS® (CA APM for IBM z/OS)
- CA Application Performance Management for Microsoft SharePoint (CA APM for Microsoft SharePoint)
- CA Application Performance Management for Oracle Databases (CA APM for Oracle Databases)
- CA Application Performance Management for Oracle Service Bus (CA APM for Oracle Service Bus)
- CA Application Performance Management for Oracle WebLogic Portal (CA APM for Oracle WebLogic Portal)

- CA Application Performance Management for Oracle WebLogic Server (CA APM for Oracle WebLogic Server)

- CA Application Performance Management for SOA (CA APM for SOA)

- CA Application Performance Management for TIBCO BusinessWorks (CA APM for TIBCO BusinessWorks)

- CA Application Performance Management for TIBCO Enterprise Message Service (CA APM for TIBCO Enterprise Message Service)

- CA Application Performance Management for Web Servers (CA APM for Web Servers)

- CA Application Performance Management for webMethods Broker (CA APM for webMethods Broker)

- CA Application Performance Management for webMethods Integration Server (CA APM for webMethods Integration Server)

- CA Application Performance Management Integration for CA CMDB (CA APM Integration for CA CMDB)

- CA Application Performance Management Integration for CA NSM (CA APM Integration for CA NSM)

- CA Application Performance Management LeakHunter (CA APM LeakHunter)

- CA Application Performance Management Transaction Generator (CA APMTG)

- CA Customer Experience Manager (CA CEM)

- CA Embedded Entitlements Manager (CA EEM)

- CA eHealth® Performance Manager (CA eHealth)

- CA Insight™ Database Performance Monitor for DB2 for z/OS

- CA Introscope® (CA Introscope)

- CA SiteMinder®

- CA Spectrum® Infrastructure Manager (CA Spectrum)

- CA SYSVIEW® Performance Management (CA SYSVIEW)

Contact CA Technologies

Contact CA Support

For your convenience, CA Technologies provides one site where you can access the information you need for your Home Office, Small Business, and Enterprise CA Technologies products. At http://ca.com/support, you can access the following:

- Online and telephone contact information for technical assistance and customer services
- Information about user communities and forums
- Product and documentation downloads
- CA Support policies and guidelines
- Other helpful resources appropriate for your product

Providing Feedback About Product Documentation

If you have comments or questions about CA Technologies product documentation, you can send a message to techpubs@ca.com.

If you would like to provide feedback about CA Technologies product documentation, complete our short customer survey, which is available on the CA Support website at http://ca.com/docs.

Product Documentation

CA APM documentation includes information for CA APM, CA Introscope, CA CEM, and CA APM extensions and integrations.

You can view and search all the titles in the CA APM documentation set from the CA APM bookshelf on the CA Support Online (CSO) website.

The following list shows the documentation specific to CA APM.

- *CA APM Release Notes* — Release summary information for CA APM.

  Note: In previous releases, this document was titled *CA APM ReadMe.*

- *CA APM Readme* — Important last-minute release information for CA APM; available on the CA APM software download site or CA Support site.

  Note: In previous releases, this document was titled *CA APM Known Issues.*

- *CA APM Installation and Upgrade Guide* — Installation requirements; installing CA APM, including installing CA Introscope, Enterprise Manager, APM database, Workstation, WebView, CA CEM, TIM; upgrading from previous releases.

- *CA APM Overview Guide* — A broad overview of CA APM components and architecture. Explains terms and concepts used in a CA APM deployment.

- *CA APM Configuration and Administration Guide* — Combines configuration and administration information for CA Introscope and for CA CEM. CA Introscope and CA CEM properties are documented in the appendix.

- *CA APM Security Guide* — Choosing and configuring CA APM, CA Introscope, and CA CEM security solutions. Includes information about Embedded Entitlements Manager.

- *CA APM Sizing and Performance Guide* — Sizing, tuning, and capacity planning for your CA APM deployment and components.

- *CA APM Transaction Definition Guide* — Transaction definition processes and procedures for CA APM; describes the necessary steps to record, define, and verify customer transactions.

The following list shows the documentation specific to CA Introscope. CA APM documentation is also pertinent for CA Introscope.

- *CA APM Java Agent Implementation Guide* — Installation, configuration, and use of the CA APM Java Agent.

- *CA APM .NET Agent Implementation Guide* — Installation, configuration, and use of the CA APM .NET Agent.

- *CA APM Environment Performance Agent Implementation Guide* — Implementing Environment Performance Agent (EPAgent) with CA Introscope to monitor system information, including process availability, disk statistics, web application server and web server logs, Solaris KStat and HTTP service availability. The guide provides instructions for installing, configuring, and using EPAgent.

- *CA APM Workstation User Guide* — Using CA Introscope dashboards, Investigator tree and application triage map, Transaction Tracer, and reporting. Includes CA Introscope metrics overview and descriptions.

- *CA APM WebView User Guide* — Using WebView to view CA Introscope data in dashboards and the Investigator.

- *CA APM ChangeDetector User Guide* — Using CA APM ChangeDetector to monitor and report changes in application files and configuration.

- *CA APM Transaction Generator Implementation Guide* — Using the CA APM Transaction Generator (CA APMTG) to monitor the availability, health, and performance of web sites and web services from the perspective of a user attempting to access web sites. How to use the CA APMTG Agent to generate synthetic transactions that you can monitor using CA APM.

The following list shows the documentation specific to extensions and integrations.

- *CA APM API Reference Guide* — Contains data and components managed within CA APM that is exposed to consumers with an application programming interface (API).

- *CA APM Catalyst Connector Guide* — Installing and using the Catalyst Connector for CA APM.

- *CA APM for CA SiteMinder SNMP Collector Guide* — Installing and configuring CA APM for CA SiteMinder SNMP Collector. Understanding the associated metrics.

- *CA APM for CA SiteMinder Applications Server Agents Guide* — Installing, configuring, and using CA APM for CA SiteMinder Applications Server Agents.

- *CA APM for IBM CICS Transaction Gateway Guide* — Installing, configuring, and using CA APM for IBM CICS Transaction Gateway.

- *CA APM for IBM WebSphere Application Server for Distributed Environments Guide* — Installing, configuring, and using CA APM for IBM WebSphere Distributed Environments.

- *CA APM for IBM WebSphere Application Server for z/OS Guide* — Installing, configuring, and using CA APM for IBM WebSphere for z/OS.

- *CA APM for IBM WebSphere MQ Guide* — Using CA Introscope to view metrics from IBM WebSphere MQ.

- *CA APM for IBM WebSphere Portal Guide* — Installing, configuring, and using CA APM for IBM WebSphere Portal.

- *CA APM for IBM z/OS Guide* — Installing, configuring, and using CA APM for IBM z/OS.

- *CA APM for Microsoft SharePoint Guide* — Installing and configuring CA APM for Microsoft SharePoint to monitor your SharePoint components during development, QA, staging, and production.

- *CA APM for Oracle Databases Guide* — Installing, configuring, and using CA APM for Oracle Databases.

- *CA APM for Oracle WebLogic Portal Guide* — Installing, configuring, and using CA APM for Oracle WebLogic Portal.

- *CA APM for Oracle WebLogic Server Guide* — Installing, configuring, and using CA APM for Oracle WebLogic Server.

- *CA APM for SOA Implementation Guide* — Installation and configuration information for using CA APM for SOA and SOA platform extensions with CA Introscope.

- *CA APM for Web Servers Guide* — Installing, configuring, and using CA APM for Web Servers.

- *CA APM Integration for CA CMDB Guide* — Installing, configuring, and using CA APM for CA CMDB.

- *CA APM Integration for CA Infrastructure Management Guide* — Installing, configuring, and using CA APM for CA Infrastructure Management.

- *CA APM Integration for CA NSM Guide* — Installing, configuring, and using CA APM for CA NSM.

- *CA Cross-Enterprise Application Performance Management Integration Guide* — Installing, configuring, and using the SYSVIEW Agent extension, which allows you to manage application performance of distributed applications accessing mainframe back ends and trace transactions from distributed applications to mainframe CICS transactions. Allows you to monitor the health metrics of critical mainframe components.

- *CA Introscope SAP NetWeaver Conversion Guide* — Using CA APM for SAP NetWeaver.

- *CA Introscope WebView User Guide for SAP* — This guide is for SAP WebView users.

Note: In some product documentation, screenshots contain a logo or other reference to 'Wily', which CA Technologies has replaced with 'APM.' Ignore 'Wily' logos, as they have been removed in the current APM Workstation. References to 'Wily' in diagrams refer to CA Introscope.

Understanding Directory and File Name Conventions

This guide uses the following conventions in file names and directory paths:

Convention	Refers to
<Agent_Home>	The top-level directory where the CA Introscope agent is installed. This directory is typically named *wily*.
<APM_Db_Home>	The top-level directory where the APM database is installed, when referring to Database-only installations.
<AppServer_Home>	The top-level directory where your application server is installed. This directory is often the same as *<Agent_Home>*.
<EM_Home>	The top-level directory where the Enterprise Manager is installed.
<ProductName_Home>	The installation directory of a third-party product or type of application. For example, it is the installation directory of the application server if you are using WebLogic.
<version>	Version-specific identifier included in file names or displayed in the user interface. For example, the following file name: com.wily.introscope.soa.dependencymap_<version>.jar represents a version-specific file name, such as: com.wily.introscope.soa.dependencymap_9.1.0.jar
<File_Name><VersionNumber><Operating System or other identifier>.FileType	A file name that includes specific identifying information. For example, if you extract files from a tar package for CA APM ChangeDetector 9.1.0.0 on a UNIX operating system, then download this file: ChangeDetector9.1.0.0unix.tar But, view it in this guide as follows: ChangeDetector*<VersionNumber>*.unix.tar

Convention	Refers to
Forward slash (/) path separators	The path separator used in directory names on your operating environment.
	The forward slash (/) is used on UNIX platforms and in examples throughout this guide, but use the separator appropriate for your operating system.
Dollar sign ($) environment variables	The environment variable notation used on your operating system.
	The dollar sign ($) is used in UNIX environments and in examples throughout this guide, but you use the character appropriate to your environment.

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Chapter 1: Introduction

This section contains the following topics:

About This Guide

This document provides information about the data and components managed within CA APM that are exposed to users with an application programming interface (API).

The CA APM consists of the following set of web services APIs:

- CA APM Transaction Model Web Services API (see page 14)

- CA Introscope Web Services API (see page 14)

- CA CEM Web Services API (see page 15)

Intended Audience

The following users are the intended audience for this guide:

- Developers and CA APM administrators

- CA Technologies or third-party developers, professional services, or presales engineers

Each of the CA APM web services APIs provide developers and CA APM administrators with the ability to extend their application management solutions. They can retrieve relevant information from CA APM and can integrate data into third-party or custom solutions.

A basic familiarity with software development, web services, and CA APM Model is required to use the CA APM Transaction Model APIs.

CA APM Transaction Model Web Services API

CA APM Transaction Model SDK web service API exposes the CA APM Model to consumers outside of CA APM. The CA APM Transaction Model consists of a unified schema and data model that serves as the foundation for CA APM. The CA APM Transaction Model SDK provides programmatic access to the CA APM Model information using an API. The CA APM Model captures the relationships between business services, transactions, and their logical application structure, such as servlets, web services, and JDBC calls.

The CA APM Transaction Model API can retrieve the behavioral (business services, business transactions) and structural topology of a transaction with the interdependencies of their components. The API also provides web services for obtaining detailed attributes for each managed object that is stored within the transaction model.

The CA APM Transaction Model web services and CA APM database are installed as part of the default Enterprise Manager Installation.

CA Introscope Web Services API

The CA Introscope web services API provides programmatic access to alerts and performance metrics stored within CA APM for use with external applications. The CA Introscope web services API provides the following:

- Polling web service which exposes:
    - Alerts
    - Metrics data
    - Metrics list
    - Enterprise Manager Lifecycle events
- Subscription web service providing the capability to subscribe to specific topics for:
    - Alerts using the Alerts Subscription web service and
    - Enterprise Manager Lifecycle using the Lifecycle Subscription web service.
- Dashboards displaying availability and configuration information for management modules, agents and alert definitions.
- Lifecycle event handling mechanism.
- Security handling.

CA CEM Web Services API

The CA CEM web services API provides a mechanism to access CA CEM data using standard SOAP web services in the programming language of your choice. The CA CEM web services API allows you to:

■ Export CA CEM data and use it in external reporting systems, or for integration with third-party solutions.

■ Access critical configuration, defect, and incident information for monitored business services and business transactions.

Note: As of the CA APM 9.0 release, "business process" in CA CEM changed to "business service" and "application" in CA CEM changed to "business application." To maintain backward compatibility, the CA CEM web services API has not been changed to reflect the new terminology.

CA CEM web services API is secure and requires the web service client to specify CA CEM credentials to call the API.

Chapter 2: CA APM Transaction Model APIs

This chapter describes the concept of the CA APM Transaction Model and possible usage of the CA APM Model.

This section contains the following topics:

CA APM Transaction Model

The CA APM Transaction Model consists of a schema and data model.

Data schema

The CA APM Transaction Model consists of two main parts:

The Behavioral Model

The *behavioral* model for Business Services and Business Transactions is defined through a process named *Transaction Recording.* The user turns on the recording feature within CA APM and asks the end user to describe the "behavior" while executing a series of transactions that are tied to one another. For example, Login, Order, and Logout. CA APM records these transactions and later allows the user to bundle the recorded Business Transactions into a list named as *Business Service*. CA APM also allows for the process of recording to be automated without explicit user interaction by using predefined templates on how to aggregate Business Transactions and bundle them into Business Services.

The Structural Model

The CA APM agent retrieves the *structural* model for Transaction Context, Transaction Segment, and Software Component automatically. The structural model depicts how different applications, components interact with one another and with external systems.

Trading Business Service Example

Figure 1 shows the summary of a recorded and defined Trading Business Service. This summary view is the default view within CA APM 9.1.0 product and designed with a Level 1 Application Triager in mind. The user does not know much about Java, EJBs, MQ or web services, and how to hide the smallest building blocks (Software Components) away from the user. While hidden, Software Components are crucial to the actual creation of the diagram; are used to generate the dependencies and then zoomed out one level up.
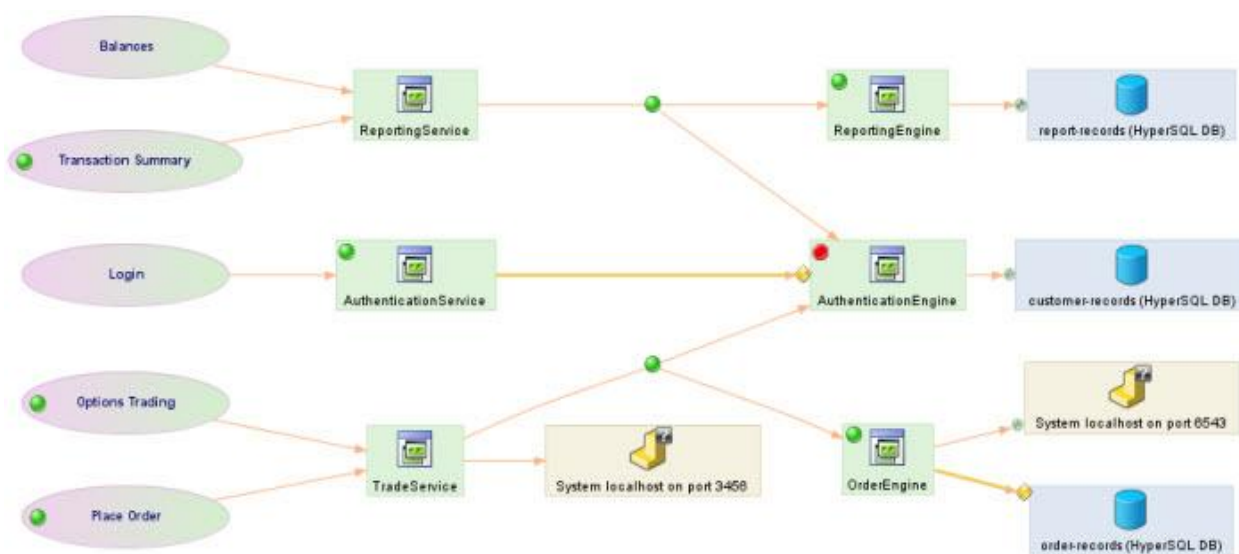
Figure 1. Trading Business Service Summary

In the figure 1, you can see all available Business Transactions that belong to the Trading Business Service: Balances, Transaction Summary, Login, Options Trading, and Place Order. In addition, you can see several Applications: Reporting Service, Authentication Service, Trade Service, Order Engine, Reporting Engine and Authentication Engine internally are named as "Frontends".

In addition, the figure also displays several "Backend" systems: They are various systems that cannot have an agent on them, but detect them anyway and help the Triager to make informed choices. CA APM also detects several database instances.

All these backend systems are represented as Software Components of various types (Database and web service). The Business Service: Customer Records, Order Records, and Report Records use three different database instances.

In this particular case you can see the red dot on top of Authentication Engine. The dot indicates a detected problem which can be either an alert or performance degradation. The Triager passes this problem to the Level 2 Application Support person responsible for the Authentication Engine.

Trading Business Service Details

The detailed view of the Trading Business Service allows a Level 2 Application Support person to look one level deeper and see more Software Components and how they interact with one another.
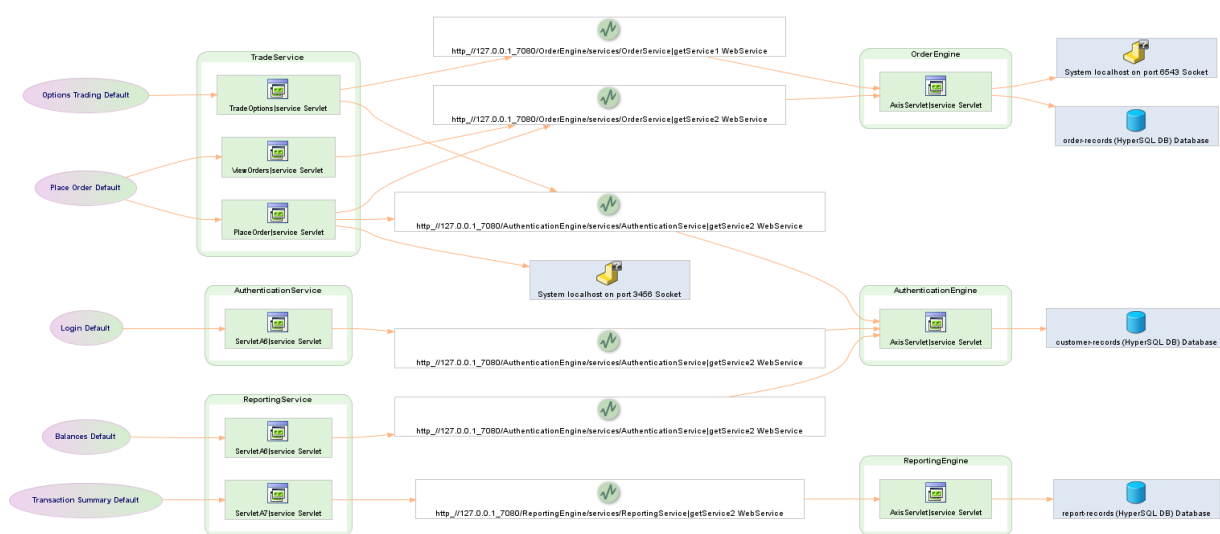
Figure 2: Trading Business Service Details

The Trade Service Application has three entry points from different Servlets. These servlets, through web service clients launch a number of web services with producers hosted on various Applications such as Order Engine and Reporting Engine.

Both the summary and the detailed view display the logical representation of all Software Components. In addition, physical representations are also available in CA APM. For example, if the Logical Reporting Engine web service is clustered across two different physical servers. The representation is for both Physical Software Components and the Logical equivalent.

Polling Web Services Supported

The Polling web services are accessible by using WSDL files for the CA APM Transaction Model SDK.

This API is for users who are developing client applications to access any transactional or structural information from the CA APM Model. The WSDL files are typed representations of the structural and behavioral model data currently available.

Note: Any APIs containing "current" in the operation name basically returns values for the object available within the last 24 hours from the current time.

APM Config Service

WSDL URL:

http://<host>:<port>/apm-web-services/services/ApmConfigService?wsdl

Operations:

The APM Configuration Service exposes all Enterprise Manager Configuration-related operations. The information exposed is obtained from the CA Introscope installation.

Operation	Input	Output	Description
getEMProperties	None	Object of type DEMProperties containing configuration information of the Enterprise Manager	Get a list of Enterprise Manager configuration properties
isEMRunning	None	Type boolean returning if the Enterprise Manager is running or not	Check if Enterprise Manager is running
isEMaMOM	None	Type boolean returning if the Enterprise Manager is a MOM or not.	Check if Enterprise Manager is a Manager of Managers for the Enterprise Manager cluster
getTessSecureURL	None	Type string containing the Tess URL	Retrieve the secure URL for Customer Experience interface

Operation	Input	Output	Description
getTessUnsecure URL	None	Type string containing the Tess URL	Retrieve the unsecure URL for Customer Experience interface
getListOfVirtualA gent	None	Array of type DAlertSnapshot containing information about these virtual agents.	Obtains a list of virtual agents that are reporting to given EM/MOM.
getTessAgent	None	Array of type DAgentSnapshot containing information about the TESS agent that is reporting Btstats metrics.	Obtains the TESS agent that is reporting to a given EM/MOM.

Agent Service

WSDL URL:

http://<host>:<port>/apm-web-services/services/AgentService?wsdl

Operations:

The agent service exposes all Agent-related operations that are available in the CA APM Model. The information exposed is obtained from the CA Introscope installation.

Operation	Input	Output	Description
getAgentById	agentId (type: long)	Object of type DAgentSnapshot containing information about the Agent.	Obtains an Agent object with all attributes, if the ID of an agent is provided.
getCurrentAgents	None	Array of type DAgentSnapshot	Obtains all the agents that have been added to the CA APM Model in the last 24 hours.
getAllAgents	None	Array of type DAgentSnapshot	Obtains all the agents that exist in the CA APM Model.

Operation	Input	Output	Description
getAllAgentsByDate	startDateTime (type:dateTime) endDateTime(type: dateTime)	Array of type DAgentSnapshot	Obtains all the agents that exist in the CA APM Model between the dates specified.
getCurrentAgentsByFQHostName	hostname (type: String)	Array of type DAgentSnapshot	Obtains all agents that are added to the CA APM Model in the last 24 hours that matches the fully qualified host name in the apm_agent table.
getAllAgentsByFQHostName	hostname (type: String)	Array of type DAgentSnapshot	Obtains all agents that exist in the CA APM Model that matches the fully qualified host name that is in the apm_agent table.
getAllAgentsByFQHostNameAndDate	hostname (type: String) startDateTime (type:dateTime) endDateTime(type: dateTime)	Array of type DAgentSnapshot	Obtains all agents that exist in the CA APM model between the dates specified that matches the fully qualified host name in the apm_agent table.
getCurrentAgentsByOwner	ownerId (type: long)	Array of type DAgentSnapshot	Obtains all the agents associated with an Owner that have been added to the CA APM Model in the last 24 hours.
getAllAgentsByOwner	ownerId (type: long)	Array of type DAgentSnapshot	Obtains all the agents associated with an Owner that exists in the CA APM Model.

Operation	Input	Output	Description
getAllAgentsByOwnerAndDate	ownerId (type: long)	Array of type DAgentSnapshot	Obtains all the agents associated with an Owner that exists in the CA APM Model within the specified period.

Alert Service

WSDL URL:

http://<host>:<port>/apm-web-services/services/AlertsService?wsdl

Operations:

The alert service exposes the initial state of all alerts.

Operation	Input	Output	Description
getStateOfLegacyAlerts	None	Array of type DAlertSnapshot	Obtains the initial state of all Alerts. Returns only metrics- based CA Introscope Alerts that are selected for SNMP Alert Action trap configuration
getStateOfTriageMapAlerts	None	Array of type DAgentSnapshot	Obtains the initial state of all Alerts. Returns only metrics- based CA Introscope Alerts and the ones that are selected through "Broadcast to Catalyst" checkbox in the Triage Map

Business Service

WSDL URL:

http://<host>:<port>/apm-web-services/services/BusSvcService?wsdl

Operations:

This service exposes all Business Service-related operations. The information exposed is primarily obtained from CA CEM though some correlation is also done with information in the CA APM Model.

Operation	Input	Output	Description
getAllBusinessServices	None	Array of type DBusinessSvcSnapshot	Retrieve the list of all Business Services defined in CA APM
getAllBusinessServicesByVertexId	vertexId (type: long)	Array of type DBusinessSvcSnapshot	Retrieve the list of all Business Services related to a specific Vertex
getAllBusinessServicesByOwnerId	ownerId (type: long)	Array of type DBusinessSvcSnapshot	Retrieve the list of all Business Services related to a specific Owner
getBusinessServiceByBTId	busTransId (type: long)	Type DBusinessSvcSnapshot	Retrieve the Business Service related to a specific Business Transaction
getBusinessServiceByTransId	transId (type: long)	Type DBusinessSvcSnapshot	Retrieve the Business Service related to a specific Transaction
getBusinessServiceById	busSvcId (type: long)	Type DBusinessSvcSnapshot	Retrieve detailed information about a Business Service by Business Service ID
getBusinessServiceByName	busSvcName (type: string)	Type DBusinessSvcSnapshot	Retrieve detailed information about a Business Service by Business Service name
getAllBusinessServicesUpdated	None	Array of type DBusSvcSnapshot	Retrieve all the Business Services that are updated.
getAllBusinessServicesDeleted	None	Array of type DBusSvcSnapshot	Retrieve all the Business Services that are deleted.

Business Transaction Service

WSDL URL:

http://<host>:<port>/apm-web-services/services/BusTransService?wsdl

Operations:

This service exposes all Transaction-related operations. The information exposed is primarily obtained from CA CEM though some correlation is also done with information in the CA APM Model.

Operation	Input	Output	Description
getAllBusinessTrans	None	Array of type DBusTransactionSnapshot	Retrieve Business Transaction details.
getBusinessTransById	busTransId (type: long)	Array of type DBusTransactionSnapshot	Retrieve the list of all Business Transactions related to specific Transaction ID.
getBusinessTransByTransId	TransId (type: long)	Array of type DBusTransactionSnapshot	Retrieve the list of all Business Transactions related to a specific Transaction ID.
getBusinessTransByBSId	busSvcId (type: long)	Array of type DBusTransactionSnapshot	Retrieve the list of all Business Transactions related to a specific Business Service ID.
getBusinessTransactionsByOwner	ownerId (type: long)	Array of type DBusTransactionSnapshot	Retrieve the list of all Transactions related to a specific Owner
getBusinessTransactionsByVertex	vertexId (type: long)	Array of type DBusTransactionSnapshot	Retrieve the list of all Transactions related to a specific Vertex
getAllBusinessTransactionsUpdated	None	Array of type DBusTransactionSnapshot	Retrieve the list of all Business Transactions that are updated.

Operation	Input	Output	Description
getAllBusinessTransactionsDeleted	None	Array of type DBusTransactionSnapshot	Retrieve the list of all Business Transactions that are deleted.

Edge Service

WSDL URL:

http://<host>:<port>/apm-web-services/services/EdgeService?wsdl

Operations:

This service exposes all Edge related operations that is available with information in the CA APM Model. Only unique edges with the latest flow are returned by the queries.

Operation	Input	Output	Description
getEdgeById	edgeId (type: long)	Type DEdgeSnapshot	Retrieve Edge details by Edge ID
getAllCurrentEdgesByOwner	ownerId (type: long)	Array of type DEdgeSnapshot	Retrieve the list of all current Edges by Owner
getAllEdgesByOwner	ownerId (type: long)	Array of type DEdgeSnapshot	Retrieve the list of all, current and historical edges by Owner
getAllEdgesByOwnerAndDate	ownerId (type: long) startDateTime (type:dateTime) endDateTime(type: dateTime)	Array of type DEdgeSnapshot	Retrieve the list of all Edges by the Owner within a specified date range
getAllCurrentEdgesByTrans	transId (type: long)	Array of type DEdgeSnapshot	Retrieve the list of all Current Edges by Transaction ID
getAllEdgesByTrans	transId (type: long)	Array of type DEdgeSnapshot	Retrieve the list of all Edges by Transaction ID

Operation	Input	Output	Description
getAllEdgesByTransAndDate	transId (type: long) startDateTime (type:dateTime) endDateTime(type: dateTime)	Array of type DEdgeSnapshot	Retrieve the list of all Edges by the Transaction ID within a specified date range
getAllCurrentEdgesByVertex	vertexId (type: long)	Array of type DEdgeSnapshot	Retrieve the list of all Current Edges for a particular Vertex
getAllEdgesByVertex	vertexId (type: long)	Array of type DEdgeSnapshot	Retrieve the list of all Edges for a particular Vertex
getAllEdgesByVertexAndDate	vertexId (type: long)startDateTime (type:dateTime)endDateTime(type: dateTime)	Array of type DEdgeSnapshot	Retrieve the list of all Edges for a particular Vertex within a specified date range
getAllCurrentEdgesByHeadVertex	headVertexId (type: long)	Array of type DEdgeSnapshot	Retrieve the list of all current Edges related to the Head Vertex
getAllEdgesByHeadVertex	headVertexId (type: long)	Array of type DEdgeSnapshot	Retrieve the list of all Edges related to the Head Vertex
getAllEdgesByHeadVertexAndDate	headVertexId (type: long)startDateTime (type:dateTime)endDateTime(type: dateTime)	Array of type DEdgeSnapshot	Retrieve the list of Edges related to the Head Vertex within a specified date range
getAllCurrentEdgesByTailVertex	tailVertexId (type: long)	Array of type DEdgeSnapshot	Retrieve the list of all current Edges related to the Tail Vertex
getAllEdgesByTailVertex	tailVertexId (type: long)	Array of type DEdgeSnapshot	Retrieve the list of all Edges related to the Tail Vertex
getAllEdgesByTailVertexAndDate	tailVertexId (type: long)startDateTime (type:dateTime) endDateTime(type: dateTime)	Array of type DEdgeSnapshot	Retrieve the list of Edges related to the Tail Vertex within a specified date range

Operation	Input	Output	Description
getAllCurrentEdges ByHeadOwner	ownerId (type: long)	Array of type DEdgeSnapshot	Obtains all the unique edges associated with the Head Owner that have been added to the CA APM Model in the last 24 hours.
getAllEdgesByHead Owner	ownerId (type: long)	Array of type DEdgeSnapshot	Obtains all the unique edges associated with the Head Owner in the CA APM Model.
getAllEdgesByHead OwnerAndDate	ownerId (type: long) startDateTime (type:dateTime) endDateTime(type: dateTime)	Array of type DEdgeSnapshot	Obtains all the unique edges associated with the Head Owner in the CA APM Model within the specified period.
getAllCurrentEdges ByTailOwner	ownerId (type: long)	Array of type DEdgeSnapshot	Obtains all the unique edges associated with the Tail Owner that have been added to the CA APM Model in the last 24 hours.
getAllEdgesByTailO wner	ownerId (type: long)	Array of type DEdgeSnapshot	Obtains all the unique edges associated with the Tail Owner in the CA APM Model.
getAllEdgesByTailO wnerAndDate	ownerId (type: long) startDateTime (type:dateTime) endDateTime(type: dateTime)	Array of type DEdgeSnapshot	Obtains all the unique edges associated with the Tail Owner in the CA APM Model within the specified period.

Operation	Input	Output	Description
getObsoleteEdges	startTime (type: dateTime) endTime (type: dateTime) **Note**: startTime can be null.	Array of type DEdgeSnapshot	Obtains all the Edges that are considered to be obsolete as per the Obsolete rule.

Note: Only unique edges indicating the latest flow will be returned by the queries.

Incidents Service

WSDL URL:

> http://<host>:<port>/apm-web-services/services/IncidentsService?wsdl

Operations:

The Incidents service exposes CA CEM incidents to external parties.

Operation	Input	Output	Description
getOpenIncidents	None	DIncidentsResponse	Returns all CA CEM incidents that are open
getIncidentsModifiedAfter	Date dt	DIncidentsResponse	Returns all CA CEM incidents which have been opened, updated, or closed since the specified time.

Note: The dt parameter must be not null DateTime value.

The number of incident ids returned by these operations is limited by the introscope.enterprisemanager.ws.max.incidents property.

introscope.enterprisemanager.ws.max.incidents property

Description

> Limits number of incidents which are received from the Enterprise Manager.

Default value:

> 500

Where does this property live (path/filename):

<EM_Home>/IntroscopeEnterpriseManager.properties

Metrics Service

WSDL URL:

http://<host>:<port>/apm-web-services/services/MetricsService?wsdl

Operations:

This service exposes all Metric Path and metrics-related operations.

Operation	Input	Output	Description
getMetricPathsByVertex	vertexId (type: long)	Array of type DMetricPathSnapshot	Retrieve the list of metric paths related to a specific Vertex
getMetrics	vertexId (type: long) metricPathPrefix(type: string) startTime(type: dateTime) endTime(type:endTime) frequency(type: int)	Array of type DTimesliceGrouped MetricsSnapshot	Retrieve the metrics for a specific Vertex

Note: This operation will be used by anyone who wants to find out the metrics related to an entity. Metrics/Metric Path as an entity will not be exposed by the SDK directly.

Owner Service

WSDL URL:

http://<host>:<port>/apm-web-services/services/OwnerService?wsdl

Operations:

This service exposes all Owner-related operations that are available with information in the CA APM Model.

Operation	Input	Output	Description
getAllOwnerTypes	None	Array of type string	Retrieve all available types of Owners
getOwnerById	ownerId (type:long)	TypeDOwnerSnapshot	Retrieve Owner details by Owner ID
getAllOwners	None	Array of Type DOwnerSnapshot	Retrieve the list of all Owners
getAllOwnersByDate	startDateTime (type:dateTime) endDateTime(type: dateTime)	Array of Type DOwnerSnapshot	Retrieve the list of all Owners within the specified time range
getCurrentOwners	None	Array of Type DOwnerSnapshot	Retrieve the list of all current Owners
getOwnersByType	ownerType (type: string)	Array of Type DOwnerSnapshot	Retrieve all Owners of specific type
getCurrentOwnersByType	ownerType (type: string)	Array of Type DOwnerSnapshot	Retrieve the list of current Owners of specific type
getOwnersByTypeAndDate	ownerType (type: string) startDateTime (type:dateTime) endDateTime(type: dateTime)	Array of Type DOwnerSnapshot	Retrieve the list of Owners of specific type within specified time range
getAllOwnersByTransId	transId (type: long)	Array of Type DOwnerSnapshot	Retrieve the list of all Owners related to a specific Transaction ID
getCurrentOwnersByTransId	transId (type: long)	Array of Type DOwnerSnapshot	Retrieve the list of current Owners related to a specific Transaction ID
getAllOwnersByTransIdAndDate	transId (type: long) startDateTime (type:dateTime) endDateTime(type: dateTime)	Array of Type DOwnerSnapshot	Retrieve the list of Owners related to a specific Transaction ID within the specified time range

Operation	Input	Output	Description
getCurrentOwnersByBTId	busTransId (type: long)	Array of type DOwnerSnapshot	Obtains all the owners associated with the Business Transaction Id that have been added to the CA APM Model in the last 24 hours.
getAllOwnersByBTId	busTransId (type: long)	Array of type DOwnerSnapshot	Obtains all the owners associated with the Business Transaction Id that are there in the CA APM Model.
getAllOwnersByBTIdAndDate	busTransId (type: long) startDateTime (type:dateTime) endDateTime(type: dateTime)	Array of type DOwnerSnapshot	Obtains all the owners associated with the Business Transaction Id that have been added to the CA APM Model in the specified time period.
getCurrentApplicationsByBTId	busTransId (type: long)	Array of type DOwnerSnapshot	Obtains all the Applications (Front-ends) associated with the Business Transaction Id that have been added to the CA APM Model in the last 24 hours.
getAllApplicationsByBTId	busTransId (type: long)	Array of type DOwnerSnapshot	Obtains all the Applications (Front-ends) associated with the Business Transaction Id that are there in the CA APM Model.

Operation	Input	Output	Description
getAllApplicationsByBTIdAndDate	busTransId (type: long) startDateTime (type:dateTime) endDateTime(type: dateTime)	Array of type DOwnerSnapshot	Obtains all the Applications (Front-ends) associated with the Business Transaction Id that have been added to the CA APM Model in the specified time period.
getObsoleteOwners	startTime (type: dateTime) endTime (type: dateTime) **Note**: startTime can be null.	Array of type DOwnerSnapshot	Retrieve all the Owners that are considered to be obsolete as per the Obsolete rule

Vertex Service

WSDL URL:

http://<host>:<port>/apm-web-services/services/VertexService?wsdl

Operations:

This service exposes all Vertex-related operations are available with information in the CA APM Model.

Operation	Input	Output	Description
getAllVertexTypes	None	Array of Type DVertexSnapshot	Retrieve the list of all defined Vertex types
getVertexById	vertexId (type: long)	Type DVertexSnapshot	Retrieve Vertex details by Vertex ID
getAllVerticesByTypeId	vertexTypeId(type: long)	Array of Type DVertexSnapshot	Retrieve the list of all Vertices of specific type
getCurrentVerticesByTypeId	vertexTypeId(type: long)	Array of Type DVertexSnapshot	Retrieve the list of current Vertices of specific type, by type ID

Operation	Input	Output	Description
getAllVerticesByTypeId AndDate	vertexTypeId(type: long) startDateTime (type:dateTime) endDateTime(type: dateTime)	Array of Type DVertexSnapshot	Retrieve the list of Vertices of specific type within the specified time range
getAllVerticesByTypeN ame	vertexType(type: String)	Array of Type DVertexSnapshot	Retrieve the list of all Vertices of specific type, by type name
getCurrentVerticesByT ypeName	vertexType(type: String)	Array of Type DVertexSnapshot	Retrieve the list of current Vertices of specific type, by type name
getAllVerticesByTypeN ameAndDate	vertexType(type: String) startDateTime (type:dateTime) endDateTime(type: dateTime)	Array of Type DVertexSnapshot	Retrieve the list of Vertices of specific type, by type name within the time range
getVerticesByHostNam eAndType	hostname (type:String) vertexTypeId(type: long)	Array of Type DVertexSnapshot	Retrieve the list of Vertices that exist on a specific host, specified by Vertex type
getCurrentVerticesByH ostNameAndType	hostname (type:String) vertexTypeId(type: long)	Array of Type DVertexSnapshot	Retrieve the list of current Vertices that exist on a specific host, specified by Vertex type
getVerticesByHostNam eAndTypeAndDate	hostname (type:String) vertexTypeId(type: long) startDateTime (type:dateTime) endDateTime(type: dateTime)	Array of Type DVertexSnapshot	Retrieve the list of Vertices that exist on a specific host, specified by Vertex type and bound by date range
getAllChildVerticesByP arentId	parentId(type: long)	Array of Type DVertexSnapshot	Retrieve all child Vertices related to a parent Vertex

Operation	Input	Output	Description
getCurrentChildVerticesByParentId	parentId(type: long)	Array of Type DVertexSnapshot	Retrieve current child Vertices related to a parent Vertex
getAllChildVerticesByParentIdAndDate	parentId(type: long) startDateTime (type:dateTime)	Array of Type DVertexSnapshot	Retrieve the list of child Vertices related to a parent Vertex by specified time range
getObsoleteVertices	startTime (type: dateTime) endTime (type: dateTime) **Note**: startTime can be null.	Array of type DVertexSnapshot	Retrieve all the Vertices that are considered to be obsolete as per the Obsolete rule.

Transaction Service

WSDL URL:

http://<host>:<port>/apm-web-services/services/TransactionService?wsdl

Operations:

This service exposes all Transaction-related operations. The information exposed is primarily obtained from CA CEM though some correlation is also done with information in the CA APM Model.

Operation	Input	Output	Description
getTransactionById	transId (type: long)	Type DTransactionSnapshot	Retrieve Transaction details based on Transaction ID
getTransactionsByBS	busSvcId (type: long)	Array of type DTransactionSnapshot	Retrieve the list of all Transactions related to specific Business Service
getTransactionsByBT	busTransId (type: long)	Array of type DTransactionSnapshot	Retrieve the list of all Transactions related to specific Business Transaction

Operation	Input	Output	Description
getTransactionsByOwner	ownerId (type: long)	Array of type DTransactionSnapshot	Retrieve the list of all Transactions related to specific Owner
getTransactionsByVertex	vertexId (type: long)	Array of type DTransactionSnapshot	Retrieve the list of all Transactions related to specific Vertex

Security Impact

The CA APM security model is used for accessing the web services. The web services to Enterprise Manager communication uses the CA Introscope username and password for any user present in the Wily realm for purposes of authenticating to the Enterprise Manager.

Chapter 3: CA Introscope Web Services API

This chapter provides information about and describes how to configure and use the CA Introscope web services.

- Information about Polling and Subscription web services.

- Functionality developed in the pub-sub framework using Apache Muse.

- Prerequisites and configuration information for CA APM web services and alerts on Enterprise Manager.

Note: CA APM web services only expose CA Introscope related data.

This section contains the following topics:

CA Introscope Web Services API Framework

An upgrade to CA APM 9.1.0 removes any CA APM SDK/API files that were previously deployed for web services integration with other CA applications. For more information, see the section on "Non-upgraded files" in the *CA APM Install and Upgrade Guide.*

Important! The integration of the formerly separate CA Introscope web services SDK with CA APM is available in the Enterprise Manager. Customers with CA APM already have the CA APM web services plug-in (com.wily.apm.webservices_9.1.0.jar) and the Introscope Alerts Extension (com.wily.introscope.alerts.extension_9.1.0.jar). These plug-ins are deployed to the Enterprise Manager automatically.

Polling Web Services

Polling web services allows a user to query the Enterprise Manager on demand by making available the services described in the sections. The polling web service supports Virtual Agents too. The following sections detail the functionalities exposed from the polling web service.

Alerts Polling Web Service

The Alerts Polling web service allows the user to obtain inventory-related information for management modules, agents, and alert definitions available within a given Enterprise Manager installation and Enterprise Manager configuration. The inventory information also returns the previous and status of that particular inventory which is a numeric value. Thus, the following states are assigned the corresponding numeric values:

State	Numeric Value
No data	0
OK	1
Caution	2
Danger	3

The user can create any number of management modules on an Enterprise Manager. Each management module comprises of a grouping of Alert Definitions. Each alert definition can map to one or more metrics. They can be in the context of one or more or all agents in the Enterprise Manager. The alert definition has:

■ Thresholds to define warning and critical states

■ Actions to trigger when state transitions happen

■ Rules on when to trigger actions

The following model is exposed from the CA Introscope web services:

```
Introscope Enterprise Manager
    Management Module - 1
            Agent - 1
                    Alert - 1
                    Alert - 4
            ...
                    Alert - m
            Agent - 2
                    Alert - 2
                    Alert - 4
                    Alert - 5
                    ...
                    Alert - n
    Management Module - 2
            Agent - 1
            Agent - 3
```

Within a given Management Module, not all alerts are applicable for all agents. As shown in the example for "Management Module - 1".

For Management Modules to display in the alerts inventory published by the alerts web services and the alerts dashboards, meet the following conditions:

■ Management modules must have alert definitions defined.

■ Alert definitions must be associated with metrics published by a non-custom agent

■ The metric associated with the alert definition for the given agent must have data to report.

Alerts Polling Web Service WSDL

WSDL URL

http://<host>:<port>/introscope-web-services/services/AlertPollingService?wsdl

Namespace

com.wily.introscope.server.webservicesapi.alerts

Location

http://<host>:<port>/introscope-web-services/services/AlertPollingService

Operations

The following operations are used by this web service:

Operation	Input	Output
getAgentSnapshot	getAgentSnapshotRequest manModuleName type string agentIdentifier type string	getAgentSnapshotResponse getAgentSnapshotReturn type DMgmtModuleAgentSnapshot ■ agentCurrStatus type int ■ agentDashboardURL - nullable; type string ■ agentIdentifier - nullable; type string ■ agentName - nullable; type string ■ agentPrevStatus type int ■ hostName - nullable; type string ■ manModuleName - nullable; type string ■ processName - nullable; type string ■ timeOfStatusChange type long

Operation	Input	Output
getAgentSnapshots	getAgentSnapshotsRequest manModuleName type string	getAgentSnapshotsReturn type array of type DMgmtModuleAgentSnapshot ■ agentCurrStatus type int ■ agentDashboardURL - nullable; type string ■ agentIdentifier - nullable; type string ■ agentName - nullable; type string ■ agentPrevStatus type int ■ hostName - nullable; type string ■ manModuleName - nullable; type string ■ processName - nullable; type string ■ timeOfStatusChange type long

Operation	Input	Output
getAlertSnapshot	getAlertSnapshotRequest manModuleName type string agentIdentifier type string alertDefName type string	getAlertSnapshotResponse getAlertSnapshotReturn type DMgmtModuleAlertDefnSnapshot ■ active type boolean ■ agentIdentifier - nullable; type string ■ alertDashboardURL - nullable; type string ■ alertDefnCurrStatus type int ■ alertDefnPrevStatus type int ■ alertIdentifier - nullable; type string ■ criticalThresholdValue type int ■ manModuleName - nullable; type string ■ timeOfStatusChange type long ■ warningThresholdValue type int

Operation	Input	Output
getAlertSnapshots	getAlertSnapshotsRequest manModuleName type string agentIdentifier type string	getAlertSnapshotsResponse getAlertSnapshotsReturn type array of type DMgmtModuleAlertDefnSnapshot ■ active type boolean ■ agentIdentifier - nullable; type string ■ alertDashboardURL - nullable; type string ■ alertDefnCurrStatus type int ■ alertDefnPrevStatus type int ■ alertIdentifier - nullable; type string ■ criticalThresholdValue type int ■ manModuleName - nullable; type string ■ timeOfStatusChange type long ■ warningThresholdValue type int

Operation	Input	Output
getAllAlertsSnapshot	getAllAlertsSnapshotRequest	getAllAlertsSnapshotResponse getAllAlertsSnapshotReturn type array of type DAllAlertsSnapshot ■ alertCurrStatus type int ■ alertName - nullable; type string ■ alertPrevStatus type int ■ alertStatusChanged type boolean ■ manModuleName - nullable; type string ■ simpleAlert type boolean ■ thresholdValue type int
getAllAlertsSnapshotForManagementModule	getAllAlertsSnapshotForManagementModuleRequest managementModule type string	getAllAlertsSnapshotForManagementModuleResponse getAllAlertsSnapshotForManagementModuleReturn type array of type DAllAlertsSnapshot ■ alertCurrStatus type int ■ alertName - nullable; type string ■ alertPrevStatus type int ■ alertStatusChanged type boolean ■ manModuleName - nullable; type string ■ simpleAlert type boolean ■ thresholdValue type int

Operation	Input	Output
getAllFilteredIscopeManagmentModules	getAllFilteredIscopeManagmentModulesRequest	getAllFilteredIscopeManagmentModulesResponse getAllFilteredIscopeManagmentModulesReturn type array of type ManagementModuleBean ■ manModuleName - nullable; type string
getAllIscopeManagmentModules	getAllIscopeManagmentModulesRequest	getAllIscopeManagmentModulesResponse getAllIscopeManagmentModulesReturn type array of type ManagementModuleBean ■ manModuleName - nullable; type string
getEMConfig	getEMConfigRequest	getEMConfigResponse getEMConfigReturn type DEMConfig ■ emDashboardURL - nullable; type string ■ emHostName - nullable; type string ■ emIpAddress - nullable; type string ■ emLaunchTime type long ■ emWebServerPort type int

Operation	Input	Output
getManagedModules	getManagedModulesRequest	getManagedModulesResponse getManagedModulesReturn type array of type DMgmtModuleSnapshot ■ manModCurrStatus type int ■ manModDashboardURL - nullable; type string ■ manModPrevStatus type int ■ manModuleName - nullable; type string ■ timeOfStatusChange type long
getManagementModule	getManagementModuleRequest manModuleName type string	getManagementModuleResponse getManagementModuleReturn type DMgmtModuleSnapshot ■ manModCurrStatus type int ■ manModDashboardURL - nullable; type string ■ manModPrevStatus type int ■ manModuleName - nullable; type string ■ timeOfStatusChange type long

Fault

IntroscopeWebServicesException

Metrics Data Web Service

The Metrics Data web service allows the user to obtain statistics data for specified metrics from the Enterprise Manager.

Metrics in CA Introscope are specified as a combination of the agent name, process name, and host name. The unique agent name consists three parts separated by the | (pipe) character. For example:

```
Machine1|Weblogic|WeblogicAgent
```

Metric names are hierarchical and separated by the | (pipe) character. The last part of the metric name is separated with a colon (:). For example:

```
EJB|Session|FooBean:Average Response Time (ms)
```

To specify a metric to query statistics, you specify both the agent name and the metric name. You can do either of the following:

- Query statistics for an individual metric by specifying the exact agent name and metric name

- Query statistics for multiple metrics in one call by specifying a regular expression for the agent name or metric name.

CA Introscope supports standard Perl regular expression syntax.

Note: Keep in mind that the more generic your regular expressions are, the more metric statistics are returned by the Enterprise Manager. That can cause OutOfMemory errors both on your Enterprise Manager and on your web services client. Such large queries can also cause significant slowdown on the Enterprise Manager. To avoid these situations, Enterprise Manager clamps the maximum number of metrics that are matched for one web service query. The default is 10,000, and it can be configured on the Enterprise Manager.

Specifying Data Granularity

You can query statistics at different granularity levels. The minimum granularity provided by CA Introscope is 15 seconds. Specify this by using the "dataFrequency" parameter. The value of the "dataFrequency" parameter must be in multiples of 15 seconds.

The queries return one record for each "timeslice" in your specified time range. For example, if you specify a time range of 2 hours and a data frequency of 1 hour, two timeslices and two records are returned. If you specify a time range of 2 hours and a data frequency of 1 minute, 120 timeslices and 120 records are returned.

Note: Data granularity in queries effect the performance. For example, a query for two weeks of data for 1000 metrics at 15 second data frequency is likely to cause OutOfMemory errors on both the Enterprise Manager and your web services client. Such large queries can also cause significant slowdown on the Enterprise Manager. For queries that ask for data for a large time range, a granularity of one hour is recommended.

Metrics Data Web Service WSDL Definition

WSDL URL

http://<host>:<port>/introscope-web-services/services/MetricsDataService?wsdl

Operations

The following operations are usedf by this web service:

Operation: getLiveMetricData

Input

getLiveMetricDataRequest

agentRegex type string

metricPrefix type string

Output

getLiveMetricDataResponse

getLiveMetricDataReturn type array of type DTimeslicedResultSetMetricData

- metricData - nullable; type ArrayOfMetricData - array of type MetricData

  agentName - nullable; type string

  metricName - nullable; type string

  metricType type int

  metricValue - nullable; type string

- timesliceEndTime - nullable; type dateTime

- timesliceStartTime - nullable; type dateTime

Operation: getMetricData

Input

getMetricDataRequest

agentRegex type string

metricRegex type string

startTime type dateTime

endTime type dateTime

dataFrequency type int

Output

- getMetricDataResponse

- getMetricDataReturn type array of type TimesliceGroupedMetricData

- metricData - nullable; type ArrayOfMetricData - array of type MetricData

  agentName - nullable; type string

  metricName - nullable; type string

  metricType type int

  metricValue - nullable; type string

- timesliceEndTime - nullable; type dateTime

- timesliceStartTime - nullable; type dateTime

Operation: getTopNMetricData

Input

getTopNMetricDataRequest

agentRegex type string

metricRegex type string

startTime type dateTime

endTime type dateTime

dataFrequency type int

topNCount type int

decreasingOrder type boolean

Output

getTopNMetricDataResponse

getTopNMetricDataReturn type array of type TimesliceGroupedMetricData

- metricData - nullable; type ArrayOfMetricData - array of type MetricData

  agentName - nullable; type string

  metricName - nullable; type string

  metricType type int

  metricValue - nullable; type string

- timesliceEndTime - nullable; type dateTime

- timesliceStartTime - nullable; type dateTime

Fault

IntroscopeWebServicesException

Metrics List Web Service

The Metrics List web service allows the user methods to list agents, metrics paths and metrics available in the Enterprise Manager.

Metrics in CA Introscope are specified as a combination of agent name, process name, and host name. The unique agent name consists three parts separated by the | (pipe) character. For example:
`Machine1|Weblogic|WeblogicAgent`

Metric names are hierarchical and separated by the | (pipe) character. The last part of the metric name is separated with a colon (:). For example:

`EJB|Session|FooBean:Average Response Time (ms)`

A metric path is a non-leaf node in the metric hierarchy tree. For example, consider the following metric tree segment.

```
<pre>
   EJB
       Session
       TradingBean
Average Response Time (ms)
Responses Per Interval
AccountBean
Average Response Time (ms)
Responses Per Interval
</pre>
```

The metric paths in this segment would be: "", "EJB", "EJB|Session", "EJB|Session|TradingBean" and "EJB|Session|AccountBean".

Metrics List Web Service WSDL

WSDL URL

http://<host>:<port>/introscope-web-services/services/MetricsListService?wsdl

Operations

The following operations are used by this web service:

Operation	Input	Output
listAgents	listAgentsRequest agentRegex type string	listAgentsResponse listAgentsReturn type array of type string
listMetricPaths	listMetricPathsRequest agentRegex type string metricPrefix type string recursive type boolean	listMetricPathsResponse listMetricPathsReturn type array of type MetricPath ■ agentName - nullable; type string ■ metricPath - nullable; type string

Operation	Input	Output
listMetrics	listMetricsRequest agentRegex type string metricRegex type string	listMetricsResponse listMetricsReturn type array of type Metric ■ agentName - nullable; type string ■ metricName - nullable; type string
listMetricsForMetricPath	listMetricsForMetricPathRequest agentRegex type string metricPath type string	listMetricsForMetricPathResponse listMetricsForMetricPathReturn type ArrayOfMetric - array of type Metric ■ agentName - nullable; type string ■ metricName - nullable; type string
getDomainsForAgent	agentRegex type string	getDomainsForAgentResponse type array of strings

Fault

IntroscopeWebServicesException

Enterprise Manager Lifecycle Service

This web service provides methods to get start and shutdown notifications from the Enterprise Manager.

Enterprise Manager Lifecycle Web Service WSDL

WSDL URL

http://<host>:<port>/introscope-web-services/services/EmLifecycleService?wsdl

Operations

The following operation is used by this web service:

Operation	Input	Output
emAvailable	emAvailableRequest	emAvailableResponse
		emAvailableReturn type DEMConfig
		▪ emDashboardURL - nullable; type string
		▪ emHostName - nullable; type string
		▪ emIpAddress - nullable; type string
		▪ emLaunchTime type long
		▪ emWebServerPort type int

Fault

IntroscopeWebServicesException

Subscription Web Service

Subscription web services provide the capability to subscribe to specific topics for:

▪ Alerts using the Alerts Subscription web service and

▪ Enterprise Manager Lifecycle using the Lifecycle Subscription web service.

Note: You can download the Subscription web service sample code from the CA APM software download site.

Alerts Subscription Web Service

The Alerts Subscription web service allows:

▪ Client connections to subscribe to notifications of various actions that take place on the Enterprise Manager

▪ Subscriptions to be temporarily suspended and later resumed.

Notifications are published under seven different topics, each with a specific set of messages that can be published.

The available topics and messages are described here.

Note: Future references to "notifications" refer to the notifications discussed in this section.

In the sections, whenever any status updates happen, a numeric value is returned for the status. Thus, the following states are assigned the corresponding numeric values:

State	Numeric Value
No data	0
OK	1
Caution	2
Danger	3

Alert Subscription Web Service Events

This section lists the events you can use the subscription web service to subscribe to.

Management Module added/removed from the Inventory

Topic

ManModInventoryUpdate

Available messages

IntroscopeManModAdded

This message is sent when a management module has been added to the inventory.

IntroscopeManModRemoved

This message is sent when a management module has been removed from the inventory.

Agent added/removed from the Inventory

Topic

AgentInManModInventoryUpdate

Available messages

IntroscopeAgentAddedToManMod

This message is sent when an agent has been added to an existing management module.

IntroscopeAgentRemovedFromManMod

This message is sent when agent has been removed from an existing management module.

Alert Definition added/removed from the Inventory

Topic

AlertDefnInManModInventoryUpdate

Available messages

IntroscopeAlertDefnAddedToManMod

This message is sent when an alert definition is added to an existing management module.

IntroscopeAlertDefnRemovedFromManMod

This message is sent when an alert definition is deleted from an existing management module.

Update of status for a Management Module

Topic

ManModStatusUpdate

Available message

IntroscopeManModStatusUpdated

This message is sent when the rolled up status of a Management Module that includes the status of all the agents within that Management module is changed.

Update of status for an agent

Topic

AgentInManModStatusUpdate

Available message

IntroscopeAgentStatusUpdatedInManMod

This message is sent when there is a change in the rolled up status of an agent due to changes in Alert Definitions for that agent.

Update of status for an Alert Definition

> **Topic**
>
> > AlertDefnInManModStatusUpdate
>
> **Available message**
>
> > IntroscopeAlertDefnStatusUpdatedInManMod
> >
> > > This message type is sent when the status of an alert definition has changed because of threshold violations for that Alert Definition.

Alert message for alert notification

> **Topic**
>
> > AlertMessagesTriggered
>
> **Available message**
>
> > IntroscopeAlertMessagesTriggered
> >
> > > This message is sent when an alert notification is triggered for a particular metric from the Enterprise manager.

Lifecycle Subscription Web Service

The Enterprise Manager Lifecycle Subscription web service allows connections to the Enterprise Manager to subscribe to notifications that are published as lifecycle events on the Enterprise Manager. Allows subscriptions to be temporarily suspended and later resumed.

Notifications are published under a single topic with a specific set of messages it can publish.

The topic and message types are described.

Note: In these sections, references to "notifications" refer to the Topic being discussed.

Lifecycle Subscription Web Service Events

Enterprise Manager running/going down

Topic

> EMLifecycle

Available messages

IntroscopeEMAvailable

This message is sent periodically (every 60 seconds) to indicate that the Enterprise Manager is still running.

IntroscopeEMDown

This message is sent when the Enterprise Manager is about to go down.

Security Mechanism

CA APM web services use the following security mechanism:

CA APM web services use the CA Introscope username and password for a user present in the CA APM realm for purposes of authentication.

Configuration and Validation for Web Services

The following configurations must be performed on Enterprise Manager (version 9.1.0) to facilitate the availability of all web services on. Once completed, the user can use the web services with the configured Enterprise Manager.

Configure the Alerts Extension

Follow the steps to configure the Introscope Alerts Extension on the Enterprise Manager.

The com.wily.introscope.alerts.extension plug-in is part of the base Enterprise Manager installation and resides on the Enterprise Manager in the following location:

```
product\enterprisemanager\plugins\com.wily.introscope.alerts.extension_9.1.0.
jar
```

1. On the Enterprise Manager, navigate to the <INTROSCOPE_HOME>/config directory and edit the IntroscopeEnterpriseManager.properties file.

   a. Add the following property:

   ```
   introscope.alerts.extension.managementmodules.enable
   ```

   This property allows you to list the Management Modules which you want the Alerts Extension to run on. The values are comma-separated. If this property is left blank or the value of "ALL" is entered, then the Alerts extension monitors all Management modules.

Examples:

To filter alerts for only "SOA Performance Management" and "Sample" management modules, enter:

`introscope.alerts.extension.managementmodules.enable = SOA Performance Management, Sample`

To filter alerts for all management modules, enter:

`introscope.alerts.extension.managementmodules.enable=ALL`

Note: Use the Introscope Management Module Editor to verify that you enter the names of the Management Modules correctly. The names are always not the same as the jar file names of the Management Modules.

Set the property value to "NONE" or remove the property from the "IntroscopeEnterpriseManager.properties" file to disable the Alert Extension running on any Management Modules.

b. Add the following property:
    `introscope.alerts.extension.inventory.updatecheckintervalsecs`

    This property sets the frequency of the Alerts Extension inventory check. Values are in seconds.

    If this property is left blank, then the inventory check occurs at a default interval of every 60 seconds. The default value to avoid any performance issues and capture alert status changes happen only within that period. However, if you want to capture all alert state changes that have happened for a period less than 60 seconds. Configure this property to a minimum of 15 seconds, which is the minimum property value for the inventory check. If a user enters value less than 15 seconds, then it defaults to 15 seconds.

    Note: If agents get added or removed or if Management Module changes are saved during this interval, then an internal inventory check for Agents or Management Modules is performed. The inventory is updated before the alert status changes are processed and there is no separate configurable property.

    Example:

    For the inventory check to happen every 120 seconds, enter the following:
    `introscope.alerts.extension.inventory.updatecheckintervalsecs=120`

    Note: Restart the Enterprise Manager for changes to the IntroscopeEnterpriseManager.properties file to take effect.

Configure the Web Application

The CA APM web services web application is installed on the Enterprise Manager, when the Enterprise Manager is installed or it is part of the com.wily.apm.webservices plug-in that resides in the following folder:
`<EM_Home>\enterprisemanager\plugins\com.wily.apm.webservices_9.1.0.jar`

Note: The IntroscopeEnterpriseManager.properties file has the following property:
`introscope.enterprisemanager.ipaddress`

The property for binding all Enterprise Manager communication channels (including the embedded web server) to a specific local IP address. When not configured, the Enterprise Manager accepts incoming connections on all local addresses (the wildcard address).

If the Enterprise Manager binds to the loopback address when starting up, then the Enterprise Manager IP address is displayed on the dashboards. Verify that the correct IP address is displayed on the dashboards and the Enterprise Manager has bound to the correct IP address when it started.

Validate CA Introscope Web Services Availability

CA Introscope provides the CA APM web services APIs so you can use third-party applications to use CA Introscope as a source for alerts and metrics.

When installing the Enterprise Manager, the installer automatically installs the following files for CA APM web services APIs in the
<EM_Home>\product\enterprisemanager\plugins directory:
`com.wily.introscope.alerts.extension_<version>.jar`
`com.wily.apm.webservices_<version>.jar`
`com.wily.apm.tess_<version>.jar`

To learn what is available with these web services, view the web services description language (WSDL) files.

The following CA Introscope web services are available, when you start the Enterprise Manager:

http://<host>:<port>/introscope-web-services/services/AlertPollingService?wsdl

http://<host>:<port>/introscope-web-services/services/MetricsDataService?wsdl

http://<host>:<port>/introscope-web-services/services/MetricsListService?wsdl

http://<host>:<port>/introscope-web-services/services/EmLifecycleService?wsdl

In these URLs, replace <host> with the hostname of the Introscope Enterprise Manager Installation. The <port> with the port number where the Introscope Enterprise Manager Web Server is running. 8081 is the default port that the web server in an Introscope Enterprise Manager installation listens on. If the port number in your installation is different, replace this value. To verify your port number, open the IntroscopeEnterpriseManager.properties file on the Enterprise Manager installation at the location <EM_Home>/config and find the introscope.enterprisemanager.webserver.port property.

You can launch these URLs from a browser to view the corresponding WSDLs for web services. After you enter valid username and password credentials in the authentication dialog, the browser displays the WSDL.

The wily realm is used for the authentication dialog and the Introscope role is supported for these web services.

Dashboards

The web services provide access to the dashboards that are available for configuration and status information for the:

- CA Introscope Management Modules

- CA Introscope agents

- CA Introscope alert definitions

Note: In the sections, replace the host name and port number in each of the dashboard URLs with the actual host and port number of the computer where the introscope-web-services service is running.

View Dashboard

CA Introscope view dashboard displays information about the Enterprise Manager and a list of the management modules currently deployed.

The CA Introscope view dashboard can be launched by issuing the following command:
`http://<host>:<port>/introscope-web-services/dashboards/alerts/IscopeView.jsp`

This view does not require any parameters.

The CA Introscope view dashboard displays a list of the management modules and some of their properties. A link is available to each individual management module for further details.

Management Module Dashboard

The management module dashboard displays information about the management modules and a list of available agents associated with that management module.

The management module dashboard can be launched by issuing the following command:
`http://<host>:<port>/introscope-web-services/dashboards/alerts/MadModView.jsp?managementModule=Actual+Management+Module+Name`

This view requires one parameter:

managementModule

> Set to the name of a management module.

The management module dashboard displays a list of agents and some of their properties. A link is available to each individual agent for further details.

Agent Dashboard

The agent dashboard displays information about the agents associated to a particular management module and a list of the alert definitions available for that agent.

The agent dashboard can be launched by issuing the following command:
`http://<host>:<port>/introscope-web-services/dashboards/alerts/AgentView.jsp?managementModule=Actual+Management+Module+Name&agentIdentifier=host|process|agentname`

This view requires two parameters:

managementModule

> Set it to the name of the management module associated with an agent.

agentIdentifier

> Set it to the identifier of the agent about which information is being retrieved. The agent identifier consists of three parts: the hostname, the process and the name of the agent. The agent identifier is constructed as follows: `hostname|process|agentname`.

The agent dashboard displays a list of the alert definitions and some of their properties. A link is available to each individual alert definition for further details.

Alert Definition Dashboard

The alert definition dashboard displays information about a particular alert definition and the metrics that belong to the metric grouping associated with the alert definition.

The alert definition dashboard can be launched by issuing the following command: `http://<host>:<port>/introscope-web-services/dashboards/alerts/AlertDefView.jsp?&managementModule=Actual+Management+Module&agentIdentifier=host|process|agentName&alertId=Actual+Alert+Id`

This view requires the following parameters:

managementModule

> Set it to the name of the management module to which the agent belongs.

agentIdentifier

> Set it to the identifier of the agent about which information is being retrieved. The agent identifier consists of three parts: the hostname, the process and the name of the agent. The agent identifier is constructed as follows: `hostname|process|agentname`

alertId

> Set it to the name of the alert whose properties are being retrieved.

Supportability Metrics for Web Services

Supportability metrics give you information about the CA APM infrastructure. This section describes several metrics which help you monitor the performance and overhead of web services and alerts.

Web Services Metrics

This section describes supportability metrics for the polling and subscription web services and the CA Introscope web services layer.

Polling and Subscription Web Services Metrics

The CA Introscope web services also publish supportability metrics for the Polling and Subscription web services that are accessed with a client.

These metrics are published as Custom metrics in the CA Introscope Investigator under the Custom Agent for the Enterprise Manager.

The following metrics are published:

Polling web services:

> **Path:**
>
>> SuperDomain| Custom Metric Host.* | Custom Metric Process.* | Custom Metric Agent.*|Enterprise Manager|WebService|Polling|<ServiceName>
>
> **Metrics:**
>
>> - Average Response Time (ms)
>> - Responses Per Interval

Subscription web services:

> **Path:**
>
>> SuperDomain| Custom Metric Host.* | Custom Metric Process.* | Custom Metric Agent.*|Enterprise Manager|WebService|Subscription|<TopicName>:
>
> **Metric:**
>
>> Messages Per Interval

Web Services Layer Metrics

Supportability metrics for the thread in the CA Introscope web services layer are also published.

The metrics published for the threads on the Enterprise Manager:

- Alerts Messages Drainer
- WebServices Consumer Availability Checker

Path:

> SuperDomain| Custom Metric Host.* | Custom Metric Process.* | Custom Metric Agent.*|Enterprise Manager|Internal|Threads|<ThreadName>

Metrics:

- Blocked Count
- Blocked Time (ms)
- CPU Time (ms)
- User Time (ms)
- Wait Count
- Wait Time (ms)

Alert Thread Metrics

A web service also uses supportability metrics for threads in the alerts extension in CA Introscope.

The metrics published for the thread on the CA Introscope Enterprise Manager:

Alerts Inventory Cache Updater

This path lists the following metrics under the thread name:
SuperDomain| Custom Metric Host.* | Custom Metric Process.* | Custom Metric Agent.*|Enterprise Manager|Internal|Threads|<ThreadName>:

- Blocked Count

- Blocked Time (ms)

- CPU Time (ms)

- User Time (ms)

- Wait Count

- Wait Time (ms)

Logging for Alert Extension and Web Services

To distinguish and be able to run the alerts extension and the web services in debug mode, add these lines to the *<EM_Home>/config/IntroscopeEnterpriseManager.properties* file:
```
log4j.logger.Manager.IscopeAlertsExtension=DEBUG, alertslogfile
log4j.logger.Manager.IntroscopeWebServices=DEBUG, webserviceslogfile
log4j.appender.alertslogfile.File=logs/IntroscopeAlerts.log
log4j.appender.webserviceslogfile.File=logs/IntroscopeWebServices.log
log4j.appender.alertslogfile=com.wily.org.apache.log4j.RollingFileAppender
log4j.appender.alertslogfile.layout=com.wily.org.apache.log4j.PatternLayout
log4j.appender.alertslogfile.layout.ConversionPattern=%d{M/dd/yy hh:mm:ss a z}
[%-3p] [%c] %m%n
log4j.appender.alertslogfile.MaxBackupIndex=4
log4j.appender.alertslogfile.MaxFileSize=200MB
log4j.appender.webserviceslogfile=com.wily.org.apache.log4j.RollingFileAppender
log4j.appender.webserviceslogfile.layout=com.wily.org.apache.log4j.PatternLayout
log4j.appender.webserviceslogfile.layout.ConversionPattern=%d{M/dd/yy hh:mm:ss a
z} [%-3p] [%c] %m%n
log4j.appender.webserviceslogfile.MaxBackupIndex=4
log4j.appender.webserviceslogfile.MaxFileSize=200MB
```

Chapter 4: CA CEM Web Services API

This section contains the following topics:

CA CEM Web Services API Framework

The CA CEM web services API provide the ability to retrieve CA CEM data. You can use the CA CEM web services API to:

- Develop your own programs to retrieve CA CEM data.

- Use the CA CEM data export tool, which uses the CA CEM web services API, to retrieve CA CEM data.

- Use the Export Data tab in the CA CEM console to export the CA CEM data.

For more information, see the Export CA CEM Data section in the *CA APM Configuration and Administration Guide*.

CA CEM related data is exposed through the web services that are part of the com.wily.apm.tess plug-in.

You can use the CA CEM data export tool to export the defects, incidents, and statistics data. The CA CEM data export tool uses the following CA CEM APIs to export CA CEM data:

IConfigurationDataOutService—Configuration data objects by:

- Business services (business processes)

- Business transactions

- User groups

- Users

IEventsDataOutService—Defects and incidents by:

- Business service (business process)

- Defect ID

- Incident ID

- Type (for example, slow time)

- User

- User group

- Time

IStatisticsDataOutService—Business service and business transaction statistics by:

- Percentile

- User group

The CA CEM web services APIs contain Javadoc documentation that describes the method summaries and usage details for developers. You can find the Javadoc in the "docs" directory with all web service stub files.

More information:

Validate CA CEM Web Services Availability

The following CA CEM web services APIs are available, when you start the Enterprise Manager:

- Open the following WSDLs in a web browser to expose the CA CEM web services:

  http://<host>:<port>/wily/cem/webservices/ConfigurationDataOutService?wsdl

  http://<host>:<port>/wily/cem/webservices/BizImpactDataOutService?wsdl

  http://<host>:<port>/wily/cem/webservices/EventsDataOutService?wsdl

  http://<host>:<port>/wily/cem/webservices/StatisticsDataOutService?wsdl

  Replace *<host>* and *<port>* with the hostname of the CA CEM computer and port number where the CA CEM server is running.

- When you are prompted, enter the valid username and password in the authentication dialog.

  If local realm authorization is used, then an administrator user or a user that belongs to a defined system or configuration administrator group can access web services. Group membership is defined in users.xml. For more details about security, see the *CA APM Security Guide*.

  If CA Embedded Entitlements Manager authorization is used, any user who has the "Allow" permission to the "WebService" resource class has access to web services. Typically, it is administrator users. Group membership is not relevant in CA Embedded Entitlements Manager authorization. For further details, consult the CA Embedded Entitlements Manager documentation.

  After you are logged in, the browser displays the WSDL.

Appendix A: CA CEM Data Export Tool

This section contains the following topics:

Overview

The CA CEM data export tool uses the CA CEM web services API to retrieve business statistics, defects, and incidents data from CA CEM. You can import the resulting comma-separated value (CSV) data into a spreadsheet or a reporting tool such as Microsoft Excel, SAP Business Objects, SAS, and Crystal Reports. The data includes historical SLA reporting metrics.

CA CEM Web Services SDK Components

Download the CEMWebServicesSDK.zip from CA APM software download site.

Note: You can build the CEMExportTool.jar by downloading the CEMWebServicesSDK.zip or download the CEMExportTool.zip which contains this jar from CA APM software download site.

The SDK is used only when you want to customize the CA CEM data export tool with the following components:

- The docs directory containing Javadoc for the CA CEM web service APIs and all pregenerated web service stub files.

   The Javadoc documentation describes CA CEM web services method summaries and usage details for developers.

- The samples directory provides the examples for using the CA CEM web service APIs with Java.

  The code sample is the CA CEM data export command line tool that uses CA CEM web service API to export data from CA CEM to CSV files. The samples directory contains:

  - The lib directory under c:\...\samples\CEMExportTool\ with all the Apache Axis library jars and all pregenerated stub files for CA CEM web services APIs.

  - The build.xml (Ant build script) and CEMExportTool.mf (manifest) files are available under c:\...\samples\CEMExportTool\ directory and can be used to build the CA CEM data export tool.

    Note: To write Java web service client code, add all jar files in the lib directory class path and run the web services stubs.

- Apache Ant Java build tool mapped to the c:\...\samples\CEMExportTool directory.

  Note: You can download this tool from http://ant.apache.org/ and verify that the Ant script is in your execution path.

- Java SDK 1.6 update 21 or higher.

Build CA CEM Data Export Tool

This section describes the steps to build the CA CEM data export tool that uses CA CEM web services APIs.

Follow these steps:

1. In the command line prompt, type *CD c:\...\samples\CEMExportTool* and click Enter.

2. Type the following command:

   ```
   ant jar
   ```

   The Apache Ant build script is executed. This script compiles the CEMExportTool source code and generates CEMExportTool.jar file in the same directory.

   The CA CEM data export tool uses the CEMExportTool.jar to export CA CEM data.

   Note: Run Apache Ant script only once when you build the CEMExportTool.jar file for the first time.

More information:

Prerequisites

The following software is required to run the CA CEM data export tool:

- CA APM 9.1

- Java SDK 1.6 update 21 or higher

- CEMExportTool.jar

Run the CA CEM Data Export Tool

You can run a command by entering the command number and the command-specific parameters to export CA CEM defects, incidents, and statistics data. Verify that Java.exe is in the same directory; else specify the directory path where the Java executable file is available.

Follow these steps:

1. In the command line prompt, type *CD c:\...\CEMExportTool* and click Enter.

2. Run the CEMExportTool.jar by typing the following command:

   ```
   java -jar CEMExportTool.jar -host hostname -username username -password password
   -port webservices port -command command-number -output output-file
   command-specific-parameters
   ```

   -hostname

   Specifies the CA CEM hostname.

   -username

   Specifies the CA CEM username.

   -password

   Specifies the password associated with the CA CEM username.

   -port

   Specifies the CA CEM web services port number.

   -command number

   Specifies the CA CEM data export tool command number. 50 commands are possible.

   -output filename

   Specifies the file name where CA CEM data is exported in the CSV format.

   -command specific parameters

   Specifies the CA CEM data export tool command-specific parameters.

   These parameters are specific to the command number used.

The CEMExportTool.jar file executes and generates an output file in a .CSV format.

CA CEM Data Export Tool Commands and Parameters

The CA CEM data export tool commands are categorized as defects, statistics, and incidents data commands.

Note: As of the CA CEM 9.0 release, "business process" in CA CEM changed to "business service" and "application" in CA CEM changed to "business application." To maintain backward compatibility, the CA CEM web services API has not been changed to reflect the new terminology.

Defects Command Parameters and Syntax

The following parameters are used to export the defects data:

-command

Specifies the command number.

-output

Specifies the output file name and path where you want to save it.

-appname

Specifies the business application name.

-bpname

Specifies the business service name.

-btname

Specifies the business transaction name.

-start

Specifies the start date and time.

-end

Specifies the end date and time.

Note: If the start and end date are not on the same day, the hour in the start and end date is set to 00:00:00 and 23:59:59.

-usergroup

Specifies the CA CEM user group name.

-defect type

Specifies the defect type. Enter a numeric value for the following defect types:

1. Slow time

2. Fast time

3. High throughput

4. Low throughput

5. Large size

6. Small size

7. HTTP status code

8. Missing transaction or component

9. Content error

   Note: The Content error defect type lets you specify content string value to export in the defects data.

10. Missing response

11. Partial response

-meta keys

(Optional) Specifies the meta keys to retrieve as part of the defect data. Meta keys are the HTTP requests and HTTP responses.

Note: The meta keys are case-sensitive. A semicolon (;) is used to separate the multiple meta keys.

-includecomptiminginfo

(Optional) Specifies to include the component breakdown timing information for a defective business transaction.

-lastxminutes

Specifies the number of minutes within which the defects are recorded.

-lastndefects

Specifies the number of defects that are recorded most recently.

-contentvalue

Specifies the content string value to export in the content error defect.

Example: Export Defects Data

The command syntax for defects data is as follows:

```
java -jar CEMExportTool.jar -host cembox -username username -password password -port
8081 -command 12 -output data.csv -start "1/01/2010 00:00:00" -end "3/15/2010
23:59:00" -usergroup "North America Users"
```

Defects Data Commands

The defects data commands are used to report defects in the specified time range, last N defects, or defects in last X minutes.

Defects data commands and parameters:

Command Number	Command Description	Command Specific Parameters
10	Get Defects for a specified Business Process in a time range.	-start -end -bpname (optional)-metakeys (optional)-includecomptiminginfo.
11	Get Defects for a specified Business Transaction in a time range.	-start -end -btname (optional) metakeys (optional)-includecomptiminginfo.
12	Get Defects for a specified CA CEM User Group in a time range.	-start -end -usergroup (optional)-metakeys (optional)-includecomptiminginfo.

Command Number	Command Description	Command Specific Parameters
13	Get Defects for a specified Defect type in a time range.	-start -end -dtype (optional)-metakeys (optional)-includecomptiminginfo.
14	Get Defects for a specified Business Service, Business Transaction and User Group and Defect Type in a time range.	-start -end -bpname -btname -usergroup -dtype (optional)-metakeys (optional)-includecomptiminginfo.
36	Get Defects for a specified Application in a time range.	-start -end -appname (optional)-metakeys (optional)-includecomptiminginfo.
37	Get Defects that happened in the last X minutes in the system.	-lastxminutes (optional)-metakeys (optional)-includecomptiminginfo.
38	Get Defects that happened in the last X minutes for a specified Application.	-lastxminutes -appname (optional)-metakeys (optional)-includecomptiminginfo.
39	Get Defects that happened in the last X minutes for a specified Business Service.	-lastxminutes -bpname (optional)-metakeys (optional)-includecomptiminginf.

Command Number	Command Description	Command Specific Parameters
40	Get Defects that happened in the last X minutes for a specified Business Transaction.	-lastxminutes -btname (optional)-metakeys (optional)-includecomptiminginfo.
41	Get the last N defects in the system.	-lastndefects (optional)-metakeys (optional)-includecomptiminginfo.
42	Get the last N defects for a specified Application.	-lastndefects -appname (optional)-metakeys (optional)-includecomptiminginfo.
43	Get the last N defects for a specified Business Service.	-lastndefects -bpname (optional)-metakeys (optional)-includecomptiminginfo.
44	Get the last N defects for a specified Business Transaction.	-lastndefects -btname (optional)-metakeys (optional)-includecomptiminginfo.
45	Get the content error defects with a value for a specified business service in a time range.	-contentvalue -start -end -bpname (optional)-metakeys.
46	Get the content error defects with a value for a specified business application in a time range.	-contentvalue -start -end -appname (optional)-metakeys.

Command Number	Command Description	Command Specific Parameters
47	Get the content error defects with a value for a specified business transaction in a time range.	-contentvalue -start -end -btname (optional)-metakeys.
48	Get the content error defects with a value that happened in the last X minutes for a specified business service.	-contentvalue -lastxminutes -bpname (optional)-metakeys.
49	Get the content error defects with a value that happened in the last X minutes for a specified business.	-contentvalue -lastxminutes -appname (optional)-metakeys.
50	Get the content error defects with a value that happened in the last X minutes for a specified business.	-contentvalue -lastxminutes -btname (optional)-metakeys.

Statistics Command Parameters and Syntax

The following parameters are used to export the business statistics data:

-command

Specifies the command number.

-output

Specifies the output file name and path where you want to save it.

-appname

Specifies the business application name.

-bpname

Specifies the business service name.

-btname

Specifies the business transaction name.

-start

Specifies the start date and time.

-end

Specifies the end date and time.

Note: If the start and end date are not on the same day, the hour in the start and end date is set to 00:00:00 and 23:59:59.

-usergroup

Specifies the CA CEM user group name.

-user

Specifies the username.

-pthroughput

(Optional) Specifies the percentile of a transaction throughput.

Example: pthroughput

The following is an example of multiple pthroughput percentiles in a statistics data command:

```
pthroughput = 25; 50; 75.
```

Note:

■   A semicolon (;) is used to separate multiple percentiles.

■   If "-pthroughput all" is specified, then all the percentiles from 5 through 95 incremented by 5 percent are included.

■   The default percentile value used for transaction throughput is 50 percent.

-psize

(Optional) Specifies the percentile of a transaction size.

Example: psize

The following is an example of multiple psize percentiles in a statistics data command:

```
psize = 25; 50; 75.
```

Note:

■   A semicolon (;) is used to separate multiple percentiles.

■   If "-psize all" is specified, then all the percentiles from 5 through 95 incremented by 5 percent are included.

■   The default percentile value used for transaction size is 50 percent.

-ptime

(Optional) Specifies the percentile of a transaction time.

Example: ptime

The following is an example of multiple ptime percentiles in a statistics data command:

```
ptime = 25; 50; 75.
```

Note:

■ A semicolon (;) is used to separate multiple percentiles.

■ If "-ptime all" is specified, then all the percentiles from 5 through 95 incremented by 5 percent are included.

■ The default percentile value used for transaction time is 50 percent.

-interval

Specifies the interval for the nonaggregated statistics data. The valid values are:

1. Hourly

2. Daily

3. Weekly

4. Monthly.

Default: Hourly.

Example: Export Statistics Data

The command syntax for statistics data is as follows:

```
java -jar CEMExportTool.jar -host cembox -username username -password password -port
8081 -command 7 -output data.csv -interval 3 -start "1/01/2010 00:00:00" -end
"3/15/2010 23:59:00" -bpname "StockTrading" -usergroup "North America Users"
```

Statistics Data Commands

The statistics data commands are used to generate business statistics data reports.

Statistics data commands and parameters:

Command Number	Command Description	Command Specific Parameters
1	Get all business service statistics data in a time range.	-interval -start -end (optional)-pthroughput (optional)-psize (optional)-ptime
2	Get all business transaction statistics data in a time range.	-interval -start -end (optional)-pthroughput (optional)-psize (optional)-ptime.
3	Get business service statistics data for a specified business service in a time range.	-interval -start -end -bpname (optional)-pthroughput (optional)-psize (optional)-ptime
4	Get business transaction statistics data for a specified business transaction in a time range.	-interval -start -end -btname (optional)-pthroughput (optional)-psize (optional)-ptime

Command Number	Command Description	Command Specific Parameters
5	Get business service statistics data for a specified user group in a time range.	-interval -start -end -usergroup (optional)-pthroughput (optional)-psize (optional)-ptime.
6	Get business transaction statistics data for a specified user group in a time range.	-interval -start -end -usergroup (optional)-pthroughput (optional)-psize (optional)-ptime
7	Get business service statistics data for a specified business service and user group in a time range.	-interval -start -end -bpname -usergroup (optional)-pthroughput (optional)-psize (optional)-ptime
8	Get business transaction statistics data for a specified business transaction and user group in a time range.	-interval -start -end -btname -usergroup (optional)-pthroughput (optional)-psize (optional)-ptime

Command Number	Command Description	Command Specific Parameters
9	Get business transaction statistics data for a specified business service, business transaction and user group in a time range.	-interval -start -end -btname -bpname -usergroup (optional)-pthroughput (optional)-psize (optional)-ptime
16	Get business service statistics data for a specified business application in a time range.	-interval -start -end -appname (optional)-pthroughput (optional)-psize (optional)-ptime
17	Get business transaction statistics data for a specified business application in a time range.	-interval -start -end -appname (optional)-pthroughput (optional)-psize (optional)-ptime
18	Get business service statistics data for a specified business application and user group in a time range.	-interval -start -end -appname -usergroup (optional)-pthroughput (optional)-psize (optional)-ptime

Command Number	Command Description	Command Specific Parameters
19	Get business transaction statistics data for a specified business application and user group in a time range.	-interval -start -end -appname -usergroup (optional)-pthroughput (optional)-psize (optional)-ptime
21	Get aggregated business service statistics data for all the business services in a time range. This command returns one row of data per business service for the given time range.	-start -end (optional)-pthroughput (optional)-psize (optional)-ptime
22	Get aggregated business transaction statistics data for all the business transactions in a time range. This command returns one row of data per business transaction for the given time range.	-start -end (optional)-pthroughput (optional)-psize (optional)-ptime
23	Get aggregated business service statistics data for a specified business service in a time range. This command returns only one row of data for the specified business service in the given time range.	-start -end -bpname (optional)-pthroughput (optional)-psize (optional)-ptime
24	Get aggregated business transaction statistics data for a specified business transaction in a time range. This command returns only one row of data for the specified business transaction in the given time range.	-start -end -btname (optional)-pthroughput (optional)-psize (optional)-ptime

Command Number	Command Description	Command Specific Parameters
25	Get aggregated business service statistics data for a specified user group in a time range. This command returns one row of data per business service in the specified user group for the given time range.	-start -end -usergroup (optional)-pthroughput (optional)-psize (optional)-ptime
26	Get aggregated business transaction statistics data for a specified user group in a time range. This command returns one row of data per business transaction in the specified user group for the given time range.	-start -end -usergroup (optional)-pthroughput (optional)-psize (optional)-ptime
27	Get aggregated business service statistics data for a specified business service and user group in a time range. This command returns only one row of data for the specified the business service in the specified user group for the given time range.	-start -end -bpname -usergroup (optional)-pthroughput (optional)-psize (optional)-ptime
28	Get aggregated business transaction statistics data for a specified business transaction and user group in a time range. This command returns only one row of data for the specified business transaction in the specified user group for the given time range.	-interval -start -end -btname -usergroup (optional)-pthroughput (optional)-psize (optional)-ptime
29	Get aggregated business transaction statistics data for a specified business service, business transaction and user group in a time range. This command returns a row of data for the specified business transaction in the specified business service and user group for the given time range.	-start -end btname -bpname -usergroup (optional)-pthroughput (optional)-psize (optional)-ptime

Command Number	Command Description	Command Specific Parameters
30	Get aggregated business service statistics data for a specified business application in a time range. This command returns one row of data per business service in the specified business application for the given time range.	-start -end -appname (optional)-pthroughput (optional)-psize (optional)-ptime
31	Get aggregated business transaction statistics data for a specified business application in a time range. This command returns one row of data per business transaction in the specified business application for the given time range.	-start -end -appname (optional)-pthroughput (optional)-psize (optional)-ptime
32	Get aggregated business service statistics data for a specified business application and user group in a time range. This command returns one row of data per business service in the specified business application and user group for the given time range.	-start -end -appname -usergroup (optional)-pthroughput (optional)-psize (optional)-ptime
33	Get aggregated business transaction statistics data for a specified business application and user group in a time range. This command returns one row of data per business transaction in the specified business application and user group for the given time range.	-start -end -appname -usergroup (optional)-pthroughput (optional)-psize (optional)-ptime
34	Get aggregated business service statistics data for a specified user in a time range. This command returns one row of data per business service for the specified user for the given time range.	-start -end -user (optional)-pthroughput (optional)-psize (optional)-ptime

Command Number	Command Description	Command Specific Parameters
35	Get aggregated business transaction statistics data for a specified user in a time range. This command returns one row of data per business transaction for the specified user for the given time range.	-start -end -user (optional)-pthroughput (optional)-psize (optional)-ptime

Incidents Command Parameters and Syntax

The following parameters are used to export the incidents data:

-command

Specifies the command number.

-output

Specifies the output file name.

-start

Specifies the start date and time.

-end

Specifies the end date and time.

-incidentid

Specifies the ID of the incident.

Example: Export Incidents Data

The command syntax for incidents data is as follows:

```
java -jar CEMExportTool.jar -host cembox -username username -password password -port
8081 -command 15 -output data.csv -start "1/01/2010 00:00:00" -end "3/15/2010
23:59:00"
```

Incidents Data Commands

The incidents data commands are used to generate incidents report or close an incident.

The following table lists the incidents data commands and parameters:

Command Number	Command Description	Command Specific Parameters
15	Get Incidents in a time range.	-start -end
20	Close a specified Incident with optional comments. **Note**: Only an incident in an Open status can be closed and there is no output file for this command.	-incidentid (optional)-comments

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