Cisco Information Server Environments KPI

Functional Requirements

Data Virtualization Business Unit Advanced Services

August 2014

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DOCUMENT CONTROL

Version History

Version	Date	Author	Description
1.0	June 2014	Scott Neustein	Initial revision
1.1	June 2014	Scott Neustein	Updated car file names, added SQL Server specific install instructions, and fixed the path for KPI.
1.2	July 2014	Scott Neustein	Created upgrade path, fixed the cache times and the load script times for Performance and updated documentation for clarity, documented how to upgrade from 1.0/1, and documented how to configure the long running queries feature.
1.2.1	August 2014	Scott Neustein	Updated documentation and code for allowing a different schema and/or catalog in MS SQL Server and Oracle
2014.08	August 2014	Scott Neustein	Changed version to reflect all other open sourced projects, added automation for installations that have different Schemas and/or catalogs, and updated documentation.

Related Documents

Document	Date	Author

Data Virtualization Business Unit (DVBU) Products Referenced

DVBU Product Name	Version
Cisco Information Server (CIS)	6.2.x
AS Utilities	2013Q402 or later

Supported Database Platforms

The majority of metrics discussed in the previous sections are generated using custom aggregation procedures. Because CIS does not retain the system metrics data needed to generate KPI data long enough for historical reporting, the KPI module must store this cached data to a dedicated database in order to retain the generated results.

The KPI module only supports the following database platforms at this time as incremental caching targets.

1. Oracle 11g or later
2. SQL Server 2012 or later
3. MySQL 5.0 or later

Support for additional platforms would require customization of the KPI module by a dvbu solutions consultant. Please contact Cisco’s dvbu advanced service group for details.

Prerequisite

Install the latest AS Utilities, from http://githib.com/cisco. This is required for the KPI's to work.

New Installation

Import the KPI components to your CIS instance

You must deploy the KPI components to your CIS instance in order to use the KPI module.

Complete the following steps to deploy the KPI components

1. Sign into Studio and connect to your target CIS instance as a user with administrator privileges.
2. In the repository tree, right click on the "Desktop (username)" folder icon at the top left and select Import. This is done here, as this will also create a database object.
3. Import the file Kpi_for_CIS_*major_minor*.car with the overwrite checkbox enabled. The folder /shared/ASAssets/KPI should appear after the import completes. (This may need to be done twice to resolve impacted items. After import NO objects should be impacted.)

Create and Configure the KPI data source

The KPI module makes use of several custom tables to store logging and metrics data. You must configure a data source connection in order to view KPI data.

1. Create the database
2. Initialize the Composite KPI database
   a. MYSQL:
      i. From the file system where Composite is installed:
      ii. cd to $CIS_HOME/apps/mysql-5_0_72/bin
      iii. mysqladmin --user=root --port=<port#> --password=<password> --host=localhost create COMPOSITE_KPI
      e.g. mysqladmin --user=root --port=9408 --password=admin --host=localhost create COMPOSITE_KPI
   b. ORACLE:
      i. Have the customer DBA create the CIS_KPI schema and provide connection information
   c. SQL SERVER:
      i. Have the customer DBA create the CIS_KPI schema and provide connection information

3. Locate and configure the data source for your KPI database.
    a. If using a MySQL database, configure the data source /shared/ASAssets/KPI/Physical/Metadata/KPI_mysql
    b. If using an Oracle database, configure the data source /shared/ASAssets/KPI/Physical/Metadata/KPI_oracle
    c. If using a SQL Server 2012 database, configure the data source /shared/ASAssets/KPI/Physical/Metadata/KPI_sqlserver

Note: If you are going to be using SQL Server you will need to install the Kpi_SQLServer_for_CIS_*major_minor*.car file the same way at the other car file. You will also need to download, accept Microsoft's Terms of Service, and install the JDBC driver for SQL Server.

Modify Common Values for your installation

The KPI module uses several constant values that are set with in the procedure /shared/ASAssets/KPI/constance/commonValues. You will need to update some of these constants with values for your environment to ensure that KPI functions correctly. Complete the following steps to proceed.

1. Open the procedure /shared/ASAssets/KPI/constance/commonValues and modify the following properties:
    a. defaultDomainName – Provide the domain name of the ldap domain used for authentication
    b. memoryCheckerCommandPath – Provide the absolute path to the shell script FreeMemCommand.sh. Do not change this value if deploying KPI on a windows server.
    c. CpuCheckerCommandPath - Provide the absolute path to the shell script TopCommandGrepCpu.sh. Do not change this value if deploying KPI on a windows server.
    d. dataSourceName – Provide the name of the data source used to store KPI data. Valid values are KPI_mysql, KPI_oracle or KPI_sqlserver.
    e. If your installation has a different schema and/or catalog than the default, then update the appropriate property:
        i. dataSourceSchemaPath_sqlserver
        ii. dataSourceSchemaPath_oracle

Please Note this is the minimum that you need to modify. Other settings may need to be modified; these should be reviewed to ensure that they are correct.

Create or Configure the Composite KPI database tables

The KPI module requires several tables in the KPI data source database in order to store metrics data for reporting. You must create these storage tables using the provided DDL in order for the KPI module to function correctly

1. Create the KPI storage tables
    a. If you choose to create the tables from within Studio, execute the packaged queries under /shared/ASAssets/KP/Physical/Metadata/DDL for your data source. These are numbered for ease of deployment.
    b. If you choose to execute the DDL externally. Copy the DDL from the packaged queries for your database, execute them in your external tool and then introspect the tables under your data source.
2. Reintrospect the KPI data source to confirm that the tables are visible.
    i. *Please note: If you had to change the schema or catalog of the database, then you will need to update the table creation DDL in the packaged queries before they are executed.*
    ii. *Also note that if you changed the schema or catalog, you will need to reintrospect all tables into your data source, and reconfigure view caches and views.*
3. If you have changed the default schema and/or catalog then you MUST do the following:
    a. Make sure the following are set correctly in the /shared/ASAssets/KPI/constants/commonValues sql script.
        i. physicalPhysicalPath (This sould not need to be modified.)
        ii. dataSourceName
        iii. The correct one of these:
            1. dataSourceSchemaPath_mysql
            2. dataSourceSchemaPath_oracle
            3. dataSourceSchemaPath_sqlserver
    b. Then run the following utility: /shared/ASAssets/KPI/Utilities/updatePhysicalSchemaCatalog

        OR

    c. Change the following views manually to the correct data source: /shared/ASAssets/KPI/Physical/Physical/KPI_{*DATABASE*}
    d. Update the SQL that access the newly created tables in your database.

        ALL_USERS
        CACHE_STATUS
        CACHE_TRACKING
        LDAP_PERSON
        CPU_MEMORY_CHECKER
        LOG_DISK
        LOG_EVENTS
        LOG_IO
        LOG_MEMORY
        SYS_CACHES
        SYS_DATASOURCES

SYS_REQUESTS
SYS_SESSIONS
CIS_DATASOURCE_USAGE
CIS_EVENT_LOGS
CIS_REQUEST_LOGS
CIS_REQUESTS_EXPANDED
CIS_RESOURCE_LOGS
CIS_SESSIONS_EXPANDED
CIS_SYSTEM_RESOURCES
CIS_WORKFLOW

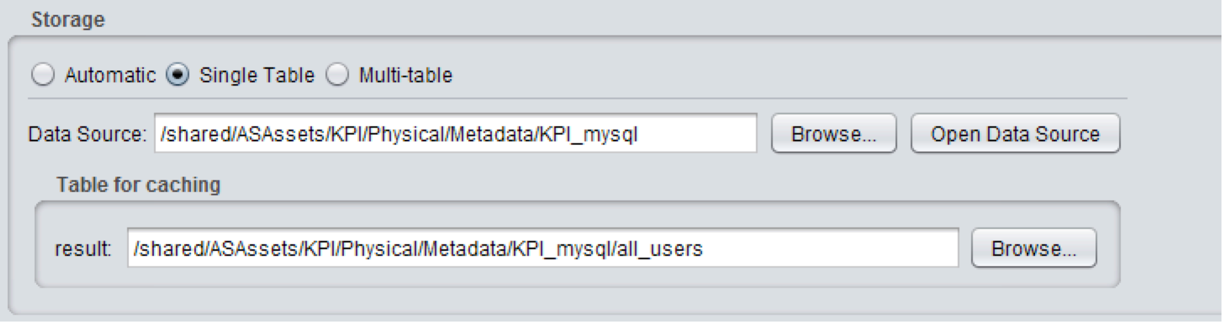
4. If the installation does not use the schema of CIS_KPI for Oracle or the schema and catalog of CIS_KPI.dbo for SQL Server you MUST do the following step.

   Update the KPI system settings the in the directory, /shared/ASAssets/KPI/Physical/Metadata/System

   a. Make sure the following are set correctly in the /shared/ASAssets/KPI/constants/commonValues sql script.
      i. basePath
      ii. dataSourceName
      iii. The correct one of these:
         1. dataSourceSchemaPath_mysql
         2. dataSourceSchemaPath_oracle
         3. dataSourceSchemaPath_sqlserver
   b. Run this utility: /shared/ASAssets/KPI/Utilities/updateCacheDS

   OR

   a. The cache data source should be your database
   b. The results should be the correct table in the database.



Data Source: /shared/ASAssets/KPI/Physical/Metadata/KPI_mysql

result: /shared/ASAssets/KPI/Physical/Metadata/KPI_mysql/all_users

5. Execute the procedure /shared/ASAssets/KPI/Utilities/rebindPhysicalAbstraction to rebind all KPI abstraction layer views to the appropriate data source. Provide the following

input values appropriate to your data source

a. MySql: Rebinding not needed
b. Oracle: oldDatasourceFolderName: KPI_mysql, newDataSourceFolderName: KPI_oracle
c. SQL Server: oldDatasourceFolderName: KPI_mysql, newDataSourceFolderName: KPI_sqlserver

Configure Resource Usage Data Source

Configure the KPI data source /shared/ASAssets/KPI/Physical/Metadata/CIS_Resource_Usage to point to your CIS server's logs directory to allow the KPI module to successfully load resource usage data. DO NOT reintrospect the data source after updating it's configuration settings.

Please note that the following instructions assume that your CIS server is configured to use the default log directory. If you have configured your server to use a different logs directory, you will need to update the data source with the correct path.

1. Update the Root Path property of the data source /shared/ASAssets/KPI/Physical/Metadata/CIS_Resource_Usage to point to <CIS Install Directory>/logs.

Deploy CPU and Memory Checker shell scripts (Linux installs only)

When deploying the KPI module to a CIS instance running on Linux, you must also deploy the shell scripts FreeMemCommand.sh and TopCommandGrepCpu.sh to your CIS server in a location that they can be executed by the user account that CIS is running under. Take note of where the scripts have been deployed, you will need to provide the path to the scripts when configuring the KPI module.

Please note that you do not need to complete this step if deploying the KPI module onto a CIS instance hosted on Windows.

Update an Installation

Import the KPI components to your CIS instance

You must have an already deployed the KPI in your CIS instance in order to use the Upgrade Only KPI module update. This will keep your current data source folder along with the modifications you did the constants folder.

Complete the following steps to deploy the KPI components:

1. Sign into Studio and connect to your target CIS instance as a user with administrator privileges.
2. In the repository tree, right click on the "Desktop (username)" folder icon at the top left and select Import. This is done here, as this will also update the database object.
3. Import the file Kpi_for_CIS_*major_minor*_Upgrade_Only.car with the overwrite checkbox enabled. The folder /shared/ASAssets/KPI should still appear after the import completes.

Configure the KPI data source

The KPI module makes use of several custom tables to store logging and metrics data.

This update will NOT overwrite the existing fully configured data source connection. There is no need to change this configuration at this time.

Update the Composite KPI database tables

The KPI module requires several tables in the KPI data source database in order to store metrics data for reporting. You must update these storage tables using the provided DDL in order for the KPI module to function correctly.

1. Update the KPI storage tables

    a. If you choose to create the tables from within Studio, execute the packaged queries under /shared/ASAssets/KP/Physical/Metadata/DDL for your data source/Post_July_2014_update

    b. If you choose to execute the DDL externally. Copy the DDL from the packaged queries for your database, execute them in your external tool and then introspect the tables under your data source.

2. Reintrospect the KPI data source to confirm that the tables are visible.

    a. The change is for the CPU_ Table, 3 columns are now numeric. The scripts migrate the data.
    b. You will see the table “CPU _old” to see the update was successful.
3. If the installation does not use the default Schema of CIS_KPI or the default catalog in SQL Server of dbo, you need to run the following 2 scripts.
    a. /shared/ASAssets/KPI/Utilities/updatePhysicalSchemaCatalog
    b. /shared/ASAssets/KPI/Utilities/updateCacheDS

Configuration

Update Common Values

The KPI module uses several constant values that are set with in the procedure /shared/ASAssets/KPI/constance/commonValues. You will need to update some of these constants with values for your environment to ensure that KPI functions correctly. Complete the following steps to proceed.

1. Open the procedure /shared/ASAssets/KPI/constance/commonValues and modify the following properties:
    a. defaultDomainName – Provide the domain name of the ldap domain used for authentication
    b. memoryCheckerCommandPath – Provide the absolute path to the shell script FreeMemCommand.sh. Do not change this value if deploying KPI on a windows server.
    c. CpuCheckerCommandPath - Provide the absolute path to the shell script TopCommandGrepCpu.sh. Do not change this value if deploying KPI on a windows server.
    d. dataSourceName – Provide the name of the data source used to store KPI data. Valid values are KPI_mysql, KPI_oracle or KPI_sqlserver.

Configure LDAP data source (if applicable)

The KPI module is designed to retrieve user data from an LDAP directory server in order provide additional detail on which users are making use of a monitored CIS environment. You must configure the LDAP datasource provided with the KPI module to connect to your corporate LDAP directory server.

1. Sign into Cisco Information Server studio with admin rights
2. Configure the LDAP data source

   /shared/ASAssets/KPI/Physical/Metadata/LDAP
3. If necessary, modify the view

   /shared/ASAssets/KPI/Physical/Formatting/requestMonitoring/vLdapPerson

   to correctly map to your LDAP directory structure

Please note that you may need to modify the formatting layer view /shared/ASAssets/KPI/Physical/Formatting/requestMonitoring/vLdapPerson if your LDAP server's structure differs from the base LDAP implementation used by KPI.

Update CIS Logging settings

You will need to enable additional logging functionality on the Composite server in order for the KPI module to collect system metrics needed for reporting.

1. Sign into Composite studio with admin rights
2. Execute the procedure /shared/ASAssets/KPI/Utilities/initializeCISLogs
3. Restart your CIS instance to make sure the settings are applied completely

If the system has a high number of requests, another setting may need to be updated to a higher number.

1. Sign into Composite studio with admin rights
2. Go to Administration → Configuration
3. Navigate to Server > Runtime Processing Information > Requests > Request Purge Period.
4. The default is 5, increase this number to same as the refresh of the incremental cache on sys_requests.

Enable Incremental Caches

The KPI module makes use of incremental caches in order to retain CIS metrics for a longer period than supported by the base CIS logging functionality.

Please note that incremental caches should only be enabled after all other deployment and configuration steps have successfully completed.

1. Create cache indexes (if applicable) by executing the appropriate packaged query for you database under /shared/ASAssets/KPI/Physical/Metadata/DDL
2. Execute the procedure /shared/ASAssets/KPI/Utilities/updateCachedViews with the input value ‘E’ to enable all incremental caches on KPI views.
   Cache and Load Script Configurations

Cache

Caches are run incrementally at regular intervals to get data from the system database and put it in a long-term storage solution.

Depending on your system’s load, you may need to extend the time the requests and sessions are kept in your repository, however these are run every 10 minutes, so you “should” not need to change the systems default configuration. However, if you changed the default configuration this may not work for you and you may need to set the cache to run more frequently.

Name	Cache Type	Frequency
ALL_USERS	Full	Every Hour
CIS_RESOURCE_LOGS	Incremental	Every Hour
CPU_MEMORY_CHECKER	Incremental	Every 15 Minutes
LOG_DISK	Incremental	Every 15 Minutes
LOG_EVENTS	Incremental	Every 10 Minutes
LOG_IO	Incremental	Every 15 Minutes
LOG_MEMORY	Incremental	Every 15 Minutes
SYS_CACHES	Incremental	Every Hour
SYS_DATASOURCES	Incremental	Every 15 Minutes
SYS_REQUESTS	Incremental	Every 10 Minutes
SYS_SESSIONS	Incremental	Every 10 Minutes
Ldap_person (not required)	Full	Once a day

Load Scripts

Load scripts are run by system triggers. They will aggregate and enhance the data that has been incrementally loaded and transform it into more useful data than just the raw data. For example the log_disk, log_io, log_memory and cpu_memorychecker are summarized into 15 minute averages for a better understanding of how the load of your system is effecting performance.

Name	Frequency
initializeCISLogsTrigger	Not enabled by default
tCheckLongRunningRequests	Not enabled by default, but setup for every 10 Minutes
tLoadLogEvents	Once a day @ 3:30 am
tPurgeHistoryData	Not enabled by default
tUpdateDatasourceUsage	Every 6 hours, Midnight, 6am, Noon, 6pm
tUpdateEventRequests	Once a day @ 4:00 am
tUpdateEventSessions	Once a day @ 4:00 am
tUpdateSysRequests	Once a day @ 5:15 am
tUpdateSystemResources	Once a day @ 3:15 am

Long Running Queries

There is a way to monitor long running queries as they are happening. The default configuration for this feature is for the query to run every 10 minutes, and to check for all queries still running after 30 minutes. Note: this will run against the sys_request table in the system database and is not subject to the 24 hour delay.

To make this work, the server will need to have email enabled and some configuration setup.

1. Adminisration → Configuration set up Server/Configuration/Email.
2. In commonValues put valid values in the following:
    a. replyTo
    b. sendTo

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
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