Documentation

Cisco Information Server Environments KPI

Functional Requirements

Data Virtualization Business Unit Professional Services

March 2014

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DOCUMENT CONTROL

Version History

Version	Date	Author	Description
1.0	Oct 2012	Manny Bhatia	Initial revision
1.4	Nov 2012	Matthew Lee	Minor updates to deployment language to clarify steps
1.5	Sept 2013	Matthew Lee	Revised setup and configuration steps for clarification
1.6	Jan 2014	Matthew Lee	Revised document for KPI version 2.0
1.7	March 2014	Matthew Lee	Migrated to Cisco documentation standards

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

INTRODUCTION

This document outlines the installation, configuration and use of the KPI data collection asset for the CIS Information Server (CIS) instance. Following KPI module connects system metrics and usage data to monitoring of resource utilization and system capacity. The KPI module collects the following categories of data

- Resource utilization:
    - Identify most used resources
    - Data throughput at a resource level
    - Minimum, Maximum and average response times when resources are invoked
    - Minimum, Maximum and Average Memory utilization for each execution
- User resource utilization:
    - Organizational hierarchy of LDAP user
    - Number of requests executed by user over time
    - Data throughput for resources and frequency of their usage
- Server resource utilization
    - Memory and CPU Utilization of physical server
    - Overall throughput of data
    - Number of sessions and requests executed on CIS server
- Developer resource utilization
    - Resource ownership (creation/modification) for a developer
    - Reusability/Dependency of resources
    - Identification of orphaned resources.

The above data may be captured from either from CIS servers or network monitoring tools that monitor the CIS Server environment as well as data sources.

Once the data is collected, performance, usage and capacity planning reports may be generated on demand.

AUDIENCE

This document is intended to provide guidance for the following users:

- Architects
- Data professionals
- Operations users
- Project Managers

INSTALLATION & CONFIGURATION

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 supports the following database platforms at this time as incremental caching targets.

- Oracle 11g or later
- SQL Server 2012
- 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 professional service group for details.

Please note that it is strongly recommended that the database chosen to cache KPI data have case sensitivity and ignore trailing space settings that match your CIS server to maximize query pushdowns in order to minimize the amount of additional load the KPI module adds to your CIS environment.

Installing KPI for the first time

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 Cisco Studio and connect to your target CIS instance as a user with administrator privileges.
2. In the repository tree, right click on the folder /shared/ASAssets icon and select Import
3. Import the file Kpi.car with the overwrite checkbox enabled. The folder /shared/ASAssets/KPI should 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. You must configure a data source connection in order to view KPI data.

1. 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

Create or Configure the CIS 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

Create the KPI storage tables

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

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

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

    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.

    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

2. 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

You must 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.

Configuring the KPI Module

Once the KPI module has been deployed, you must configure selected settings on both the CIS server and in your KPI code before metrics can be collected.

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

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 data source 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 CIS server in order

for the KPI module to collect system metrics needed for reporting.

See *Appendix A – Manually Configuring Resource Logging* for information on manually configuring CIS resource log generation for the KPI module.

1. Sign into Cisco Information Server studio with admin rights
2. Execute the procedure /shared/ASAssets/KPI/Utilities/configureCISLogs
3. Restart your CIS instance in order to apply the setting changes
4. Execute the procedure /shared/ASAssets/KPI/Utilities/initializeCISLogs

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 your database under /shared/ASAssets/KPI/Physical/Metadata/DDL

2. Execute the procedure /shared/ASAssets/KPI/Utilities/updateCachedViews with the input value '1' to enable all incremental caches on KPI views.
   Note: this procedure is being deprecated

   Or execute /shared/ASAssets/KPI/Utilites/toggleKPICaches with the input of E to enable or D to disable all caches

Update An Existing Installation

Installations of KPI version 2.x and later can be directly updated by importing the KPI.car file and following the configuration steps above. Previous releases of the KPI module may require a fresh installation of the KPI module.

Please note that importing a new version of the KPI module will overwrite your existing KPI implementation and remove any configurations and custom modifications you have made. We are investigating options for a non-destructive upgrade process as future functionality.

Update the KPI Database

When upgrading a release of KPI 2.x, you may need to apply updates to the incremental cache tables. The table structure is not automatically updated when you import a new car file, so you must complete the upgrade manually. Complete the following steps

1. Execute the scripts located under

   /shared/ASAssets/KPI/Physical/Metadata/DDL/Upgrade for your data source

   a. MySql: N/A

   b. Oracle: N/A

   c. SQL Server: pqCreate_KPI_Tables_sqlServer_kpi_tables_UPDATE1

KPI METRICS CIS RESOURCES

Published Resources

This section outlines the resources that are published under the KPI virtual database to expose metrics data. Resources are organized under catalogs and schemas based upon their functionality.

See the section titled KPI Metrics Resources for descriptions of result sets returned by each resource.

Request Monitor Catalog

Requests Schema

Resource	Resource Type	Description
vDatasourceUsage	Table	details on data sources usage
vGetSystemInformation	Table	cluster and server name
vLdapPerson	Table	details regarding an LDAP user
vLongRunningRequests	Table	details on long running queries
vResourcePerRequest	Table	details on resources used per request
vRequestExpanded	Table	expanded details for executed requests
vResourceUsageCountByUser	Table	details regarding usage of resources by users
vSessionExpanded	Table	expanded details for user sessions
vSystemResources	Table	details on system resource usage
vUserSessionRequests	Table	details on requests generated by each user session

Resource Usage Catalog

Cache Monitor Schema

Resource	Resource Type	Description
vCacheActive	Table	This table returns a list of all the active caches on the CIS server.no matter if the cache is up or down or has a configuration error.
vCacheDisabled	Table	This table returns a list of all disabled caches on the CIS server
vCacheIssues	Table	This table returns a list of all active caches on the CIS server that have an error state such as DOWN, CONFIG ERROR and NOT LOADED
vCacheSchedule	Table	This table returns a list of all active caches on the CIS server ordered by their next scheduled refresh time
vCacheScheduleDependencies	Table	This table returns a list of all active caches on the CIS server ordered by their next schedule refresh time and dependencies upon other cached

		resources

CountAll Schema

Resource	Resource Type	Description
vResourceCountAll_1MON	Table	This table returns list of all resources that have been accessed in the last 1 month period, ordered by the number of times each has been called in descending order
vResourceCountAll_1MON_Published	Table	This table returns list of all published resources that have been accessed in the last 1 month period, ordered by the number of times each has been called in descending order
vResourceCountAll_1YR	Table	This table returns list of all resources that have been accessed in the last 1 year period, ordered by the number of times each has been called in descending order
vResourceCountAll_1YR_Published	Table	This table returns list of all published resources that have been

		accessed in the last 1 year period, ordered by the number of times each has been called in descending order
vResourceCountAll_3MON	Table	This table returns list of all resources that have been accessed in the last 3 month period, ordered by the number of times each has been called in descending order
vResourceCountAll_3MON_Published	Table	This table returns list of all published resources that have been accessed in the last 3 month period, ordered by the number of times each has been called in descending order
vResourceCountAll_6MON	Table	This table returns list of all resources that have been accessed in the last 6 month period, ordered by the number of times each has been called in descending order
vResourceCountAll_6MON_Published	Table	This table returns list of all published

		resources that have been accessed in the last 6 month period, ordered by the number of times each has been called in descending order

CountAllUsers Schema

Resource	Resource Type	Description
vResourceCountAllUsers_1MON	Table	This table returns list of all resources that have been called in the last 1 month period grouped by calling user. Each row includes a count of the number of times that the user has accessed the called resource.
vResourceCountAllUsers_1MON_Published	Table	This table returns list of all published resources that have been called in the last 1 month period grouped by calling user. Each row includes a count of the number of

		times that the user has accessed the called resource.
vResourceCountAllUsers_1YR	Table	This table returns list of all resources that have been called in the last 1 year period grouped by calling user. Each row includes a count of the number of times that the user has accessed the called resource.
vResourceCountAllUsers_1YR_Published	Table	This table returns list of all published resources that have been called in the last 1 year period grouped by calling user. Each row includes a count of the number of times that the user has accessed the called resource.
vResourceCountAllUsers_3MON	Table	This table returns list of all resources that have been called in the last 3 month period

		grouped by calling user. Each row includes a count of the number of times that the user has accessed the called resource.
vResourceCountAllUsers_3MON_Published	Table	This table returns list of all published resources that have been called in the last 3 month period grouped by calling user. Each row includes a count of the number of times that the user has accessed the called resource.
vResourceCountAllUsers_6MON	Table	This table returns list of all resources that have been called in the last 6 month period grouped by calling user. Each row includes a count of the number of times that the user has accessed the called resource.

vResourceCountAllUsers_6MON_Published	Table	This table returns list of all published resources that have been called in the last 6 month period grouped by calling user. Each row includes a count of the number of times that the user has accessed the called resource.

CountByDate Schema

Resource	Resource Type	Description
vResourceCountDate_1MON	Table	This table returns list of all resources that have been called in the last 1 month period grouped by the date the request was executed. Each row includes a count of the number of times that the resource was called on the reported date.
vResourceCountDate_1MON_Published	Table	This table returns list of all published resources that

		have been called in the last 1 month period grouped by the date the request was executed. Each row includes a count of the number of times that the resource was called on the reported date.
vResourceCountDate_1YR	Table	This table returns list of all resources that have been called in the last 1 year period grouped by the date the request was executed. Each row includes a count of the number of times that the resource was called on the reported date.
vResourceCountDate_1YR_Published	Table	This table returns list of all published resources that have been called in the last 1 year period grouped by the date the request was executed. Each row includes a count of the number of times that the resource

		was called on the reported date.
vResourceCountDate_3MON	Table	This table returns list of all resources that have been called in the last 3 month period grouped by the date the request was executed. Each row includes a count of the number of times that the resource was called on the reported date.
vResourceCountDate_3MON_Published	Table	This table returns list of all published resources that have been called in the last 3 month period grouped by the date the request was executed. Each row includes a count of the number of times that the resource was called on the reported date.
vResourceCountDate_3MON	Table	This table returns list of all resources that have been called in the last 3 month period

		grouped by the date the request was executed. Each row includes a count of the number of times that the resource was called on the reported date.
vResourceCountDate_3MON_Published	Table	This table returns list of all published resources that have been called in the last 3 month period grouped by the date the request was executed. Each row includes a count of the number of times that the resource was called on the reported date.

DataCount Schema

Resource	Resource Type	Description
getResourceDataCount	Procedure	This procedure returns a list of the top N most frequently accessed resources for the specified data range. Each row includes a count of the number of

		rows of data each resource contains

NotUsed Schema

Resource	Resource Type	Description
vResourcesNotUsed_1YR_Published	Table	This table returns a list of all published resources present on the CIS server that have not been used in the last 1 year period.

ResourceList Schema

Resource	Resource Type	Description
vResourceListAllPublishedResources	Table	This table returns a list of all published resources present on the CIS server.
vResourceListDistinctPublishedDatabases	Table	This table returns a list of all resources published under a database on the CIS server
vResourceListDistinctPublishedResources	Table	This table returns a list of all distinct resources published under a database on

		the CIS server
vResourceListDistinctPublishedWebServices	Table	This table returns a list of all resources published as a web service operation on the CIS server
vResourceListDistinctResources	Table	This table returns a list of all distinct resources on the CIS server.

ResourceNotUsed Schema

Resource	Resource Type	Description
vResourceNotUsed_1Yr_Published	Table	This table returns a list of all published resources present on the CIS server that have not been used in the past 1 year period

TrendCount Schema

Resource	Resource Type	Description
vResourceTrendCount_1MON	Table	This table returns a list of resources and the number of calls to the resource grouped by resource name

		and date over the last 1 month period. This allows tracking of resource usage trends over time.
vResourceTrendCount_1MON_Published	Table	This table returns a list of published resources and the number of calls to the resource grouped by resource name and date over the last 1 month period. This allows tracking of resource usage trends over time.
vResourceTrendCount_1YR	Table	This table returns a list of resources and the number of calls to the resource grouped by resource name and date over the last 1 year period. This allows tracking of resource usage trends over time.
vResourceTrendCount_1YR_Published	Table	This table returns a list of published

		resources and the number of calls to the resource grouped by resource name and date over the last 1 year period. This allows tracking of resource usage trends over time.
vResourceTrendCount_3MON	Table	This table returns a list of resources and the number of calls to the resource grouped by resource name and date over the last 3 month period. This allows tracking of resource usage trends over time.
vResourceTrendCount_3MON_Published	Table	This table returns a list of published resources and the number of calls to the resource grouped by resource name and date over the last 3 month period. This allows tracking of resource

		usage trends over time.
vResourceTrendCount_6MON	Table	This table returns a list of resources and the number of calls to the resource grouped by resource name and date over the last 6 month period. This allows tracking of resource usage trends over time.
vResourceTrendCount_6MON_Published	Table	This table returns a list of published resources and the number of calls to the resource grouped by resource name and date over the last 6 month period. This allows tracking of resource usage trends over time.

Data Sources

This section outlines the data sources created, populated and used by KPI project.

/shared/ASAssets/KPI/Physical/Metadata/LDAP

The data source LDAP is an LDAP data source that connects to a client's corporate LDAP directory to lookup user information and their relation to client hierarchy. The

data source's URL property should be modified to allow the data source to successfully connect to and query the target LDAP directory server. The LDAP structure organizationalPerson must be introspected under this data source for LDAP integration to function successfully.
It is strongly recommended that this data source should not use the same LDAP account as the CIS server uses to authenticate LDAP users. This may result in the LDAP account being locked if the data source's credentials are not updated when the account's password is changed.

/shared/ASAssets/KPI/Physical/Metadata/CIS_Resource_Usage

CIS_Resource_Usage is a file based data source used to capture resource usage log files created by CIS. Any time a request is executed against CIS resources either from Cisco Information Server studio or an external client, all resources touched by the request are logged in this file. Top level resource used is identified as Node Id = 0 or Parent Id = 0

/shared/ASAssets/KPI/Physical/Metadata/CPUAndMemChecker

CPUAndMemChecker custom java procedure is used to capture system level CPU and Memory usage at the operating system level. On a linux server installation, CPUAndMemChecker invokes two shell scripts (TopCommandGrepCpu.sh and FreeMemCommand.sh) to execute 'top' and 'free' commands to returns CPU percentage, used memory and available memory. Windows installations make use of built in system APIs and do not require external scripts.
The CPUAndMemChecker procedure is invoked by pLoadSystemResources script and inserts the results in CIS_SYSTEM_RESOURCES table of the KPI data source.
The CPUAndMemChecker procedure exposes one procedure that has following parameters:

Parameter Name	Direction	Description
CpuScriptNameOrCommand	IN	Path to TopCommandGrepCpu.sh shell script to return CPU utilization. This property is ignored if executed on a CIS server hosted on Windows example value /dvpmgr/product/CIS_6.2.0/apps/extension/lib/kpi/TopCommandGrepCpu.sh
MemScriptNameOrCommand	IN	Path to FreeMemCommand.sh shell script to return memory utilization. This property is ignored if executed on a CIS server hosted on Windows

		example value /dvpmgr/product/CIS_6.2.0/apps/extension/lib/kpi/FreeMemCommand.sh
CpuUsedPercent	OUT	Average CPU utilization percentage reported by the server's operating system
memoryUsedMb	OUT	Used memory in Megabytes reported by the server's operating system
memoryAvailMb	OUT	Available memory in Megabytes reported by the server's operating system

Metadata - /shared/ASAssets/KPI/Physical/Metadata/KPI_<data source type>

The KPI module provides data source for all currently supported storage database platforms under /shared/ASAssets/KPI/Physical/Metadata.
Currently the KPI module includes the following KPI data sources

- /shared/ASAssets/KPI/Physical/Metadata/KPI_mysql
- /shared/ASAssets/KPI/Physical/Metadata/KPI_oracle
- /shared/ASAssets/KPI/Physical/Metadata/KPI_sqlserver

During deployment the KPI module must be configured to use the data source appropriate for the target KPI database platform. The following instructions refer to this data source at the KPI data source for simplicity
The KPI data source is used to capture

- RAW CIS server metrics captured using incremental caching
- Requests data replicated from SYS_REQUESTS metadata
- Some pre-processed data for final reporting

The following tables have been created in CIS_KPI schema to capture the required data and DDL to generate the tables is attached in Appendix 1

Table Name	Description
ALL_USERS	This table stores user information for all user accounts that have executed queries against the CIS instance. This is an incremental cache target table.
cache_status	This table is used by CIS to manage incremental caches used by the KPI module. Developers should not modify the table or its contents unless explicitly

	instructed by CIS support or AS.
cache_tracking	This table is used by CIS to manage incremental caches used by the KPI module. Developers should not modify the table or its contents unless explicitly instructed by CIS support or AS.
CIS_DATASOURCE_USAGE	This table stores snapshots of data source usage in CIS. The data in this table is loaded using the script pLoadDatasourceUsage
CIS_EVENT_LOGS	This table stores raw events data generated by custom logger. Request, Session and resource data from this table is processed nightly and loaded to reporting tables. Raw data in this table is purged every 7 days.
CIS_REQUEST_LOGS	This table holds raw requests data as replicated from SYS_REQUESTS table. This data is used to augment request data collected by custom logger and finally loaded into CIS_REQUESTS_EXPANDED. This table is purges every 7 days.
CIS_REQUESTS_EXPANDED	This table hold processed request data as a single row for each request. Data is kept for 2 years
CIS_RESOURCE_LOGS	This table holds resource used for each request executed against CIS server. Data is loaded from cis_request_usage.log.<day> files nightly and the table is purged every 2 years.
CIS_SESSIONS_EXPANDED	This table holds process sessions data as a single row for each session. Data is kept for 1 year
CIS_SYSTEM_RESOURCES	This tables stores hourly snapshots of memory, disk and I/O usage captured from SYS_MEMORY, SYS_STORAGE and SYS_IO tables
CIS_WORKFLOW	The CIS_WORKFLOW table manages workflows for processing data.
CPU_MEMORY_CHECKER	This table stores the results of executing the CPUAndMemChecker procedure over time. This is an incremental cache target table
LDAP_PERSON	This LDAP_PERSON table is used to precache LDAP

	user information.
LOG_DISK	This table stores logs of available disk space incrementally cached from the CIS system table LOG_DISK
LOG_EVENTS	This table stores system event logs incrementally cached from the CIS system table LOG_EVENTS
LOG_IO	This table stores IO logs incrementally cached from the CIS system table LOG_IO
LOG_MEMORY	This table stores jvm memory logs incrementally cached from the CIS system table LOG_MEMORY
SYS_CACHES	This table stores a list of all cached resources and their current statuses incrementally cached from the CIS system table SYS_CACHES
SYS_DATASOURCES	This table stores a list of all data sources and their current statuses incrementally cached from the CIS system table SYS_DATASOURCES
SYS_REQUESTS	This table stores a list of all requests run on the CIS server incrementally cached from the system table SYS_REQUESTS
SYS_SESSIONS	This table stores a list of all sessions opened on the CIS server incrementally cached from the system table SYS_SESSIONS

/shared/ASAssets/KPI/Physical/LoadViews

This section details all views and scripts created for KPI project to expose metrics data.

View/Script Name	Description
pRequests	pRequests script queries REQUEST type events from VDL_METRICS.CIS_EVENT_LOGS table and extracts various attributes from EVENT_ATTRIBUTES column. Output of pRequests is a result set as described in /shared/ASAssets/KPI/Constants/CommonValues.RequestRow row type

pSessions	Similar to pRequests, this script queries SESSION type events from VDL_METRICS.CIS_EVENT_LOGS table and extracts SESSION related attributes from EVENT_ATTRIBUTES column. Output of pSessions is a result set as described in /shared/ASAssets/KPI/Constants/CommonValues.SessionRow row type
vCISEventLogs	Displays raw CIS_EVENT_LOGS data.
vCISRequestLogs	Displays raw data from CIS_REQUEST_LOGS table and is used with pRequests script to generate a single request row.
vLogDatasourcesUsage	View to query SYS_DATASOURCE table in CIS and fliters out data sources which are not system, examples or utilities types.
vLogSystemResources	View to capture SYS_MEMORY, SYS_IO and SYS_STORAGE data from CIS metadata tables. The system tables are purged every 15 minutes therefore maximum usage for each of the types is calculated.
vSYSRequests	View to query SYS_REQUEST table.

Formatting Views - /shared/ASAssets/KPI/Physical/Formatting

/CacheMonitoring

vSysCaches	Formatting layer view for the Physical view SYS_CACHES

/DatasourceUsage

vDatasourceUsage	Formatting layer view for the Physical view SYS_DATASOURCES

/RequestMonitoring

xsAllDomainUsers	XSLT Transform to retrieve all users from CIS and LDAP domain

vAllDomainUsers	View to display all users along with their calculated role
vDatasourceUsage	Formatting layer view for the Physical view CIS_DATASOURCE_USAGE
vLdapPerson	Formatting layer view for the Physical view LDAP_PERSON. *View contains a query engine hint to force case insensitive string search.*
vRequestExpanded	Formatting layer view for the Physical view CIS_REQUESTS_EXPANDED
vSessionsExpanded	Formatting layer view for the Physical view CIS_SESSIONS_EXPANDED
vSystemResources	Formatting layer view for the Physical view CIS_SYSTEM_RESOURCES

/ResourceUsage

vResourceUsage	Formatting layer view for the Physical view CIS_RESOURCE_LOGS

Business Views - /shared/ASAssets/KPI/Business

/Business/Cache

getCacheScheduleDependenciesProc	This procedure is used to show both the cache schedule and the dependent and used resources that are also cached resources
vCacheDisabled	This view returns a list of all disabled caches in CIS
vCacheIssues	This view returns a list of all active caches in CIS that have issues such as DOWN, CONFIG ERROR, NOT LOADED, etc
vCacheSchedule	This view returns a list of all active caches in CIS ordered by the next scheduled refresh and resource name
vCachevActive	This view returns a list of all active caches in CIS

/Business/requests

vDatasourceUsage	Business view for physical view vDatasourceUsage
vLdapPerson	
vLongRunningRequests	
vPublishedResourcePerRequest	Detailed view that identifies published data source and resource invoked by a user.
vRequestExpanded	Business view for physical view vRequestExpanded
vRequestsCountsByUser	View identifies published data source and resources invoked by a user and daily counts of the invocation. The view also identifies if resource was cached or not.
vResourceUsageCountByUser	View to identify the resources invoked/used by a user and daily usage count for each resource.
vSessionsExpanded	Business view for physical view vSessionsExpanded
vSystemResources	Business view for physical view vSystemResources
vUserSessionRequests	View to calculate daily totals for number of sessions, requests, session duration request duration, bytes in and out for a user

/Business/resourceCountAll

getCISLogsCountAllByDateRange	This procedure is used to group and count the resources by ResourcePath desc and count desc to show a count across a time period for all resources

/Business/resourceCountAllUsers

getCISLogsCountAllUsersByDateRange	This procedure is used to group and count the resources by ResourcePath desc and count desc to show a count across a time period for all resources. User information for the calling user is included in the results

/Business/resourceCountByDate

getCISLogsCountDateUsersBy	This procedure is used to group and count the

DateRange	resources by date desc, name desc and count desc to show a count across a time period for all resources

/Business/resourceDataCount

getDataCount	This procedure is used to get the row count for the top N used resources as specified by the name filter, date range and exclude filters that are passed into getCisLogsCountAllByDateRange

/Business/resourceList

vAllPublishedResources	This view returns a list of all published resources on the CIS instance except for system tables.
vDistinctPublishedDatabases	This view returns a distinct list of published database resources on the CIS instance
vDistinctPublishedResources	This view returns a distinct list of published database and web service resources on the CIS instance
vDistinctPublishedWebServices	This view returns a distinct list of published web service resources on the CIS instance
vDistinctResources	This view returns a list of distinct resources found in the CIS logs

/Business/resourceNotUsed

getCISLogsResourcesNotUsed ByDateRange	This procedure is used to determine which published resources have not been used within the specified date range.

getCISLogsTrendByDateRange	This procedure is used to group and count resources by name desc, date desc and count desc to show the trend of usage for a resource across a period of time.

Application Views - /shared/ASAssets/KPI/Application

vDatasourceUsage	Mapping layer view for Business layer view vDatasourceUsage

vRequestExpanded	Mapping layer view for Business layer view vRequestExpanded
vSessionsExpanded	Mapping layer view for Business layer view vSessionsExpanded
vSystemResources	Mapping layer view for Business layer view vSystemResources
vPublishedResourcePerRequest	Mapping layer view for Business layer view vPublishedResourcePerRequest.
vRequestsCountsByUser	Mapping layer view for Business layer view vRequestsCountsByUser
vResourceUsageCountByUser	Mapping layer view for Business layer view vResourceUsageCountByUser
vUserSessionRequests	Mapping layer view for Business layer view vUserSessionRequests
vGetSystemInformaton	Wrapper view for utilities/pGetSystemInformation

Load Scripts - /shared/ASAssets/KPI/Physical/LoadScripts

This section lists the load scripts created to load and aggregate raw data into processed KPI metrics.

Script Name	Description
pStartWorkflow	This script is invoked from each of the load scripts and marks the start of a workflow in the CIS_WORKFLOW table. For a given workflow, the script takes workflow name as an input and returns the nexts workflow start and end time.
pEndWorkflow	Like pStartWorkflow script, this script is also called from other load scripts and marks the end of a workflow by updating the CIS_WORKFLOW table when a workflow finishes. This script takes workflow name, workflow start and end times, workflow status and number of rows affected as input and updates the CIS_WORKFLOW table
pPurgeData	This scripts purges old data from VDL_METRICS tables by executing series of DELETE statements. The purge period for each delete is defined within /shared/ASAssets/KPI/constants/commonValues script.
pLoadEventSessions	The pLoadEventSessions queries raw session type data from CIS_EVENT_LOGS table and loads it into the physical CIS_SESSIONS_EXPANDED. This script uses vSessionsRealtime to retrieve previous days session

	events data
pLoadEventRequests	The pLoadEventRequests queries raw requests type data from the system table CIS_EVENT_LOGS and loads it into the physical table CIS_REQUESTS_EXPANDED. This script uses vRequestsRealtime to retrieve previous days requests events data
pLoadRequests	pLoadRequest script replicates the raw data in the system table SYS_REQUEST to CIS_SYS_REQUESTS table. It filters out system and TOP requests
pLoadDatasourcesUsage	This script queries SYS_DATASOURCE table hourly and inserts its snapshot in the physical table CIS_DATASOURCE_USAGE. This script is invoked by the trigger tUpdateDatasourceTrigger
pLoadLogEvents	This procedure loads system event records from the physical KPI table LOG_EVENTS, extracts event information into a format that is compatible with other KPI tables and writes the results to the physical table CIS_EVENT_LOGS
pLoadSystemResources	pLoadSystemResources script queries the system tables SYS_MEMORY, SYS_IO,SYS_STORAGE the CJP CPUAndMemChecker to sample system load metrics. The loaded metrics are inserted into the physical table CIS_SYSTEM_USAGE.

Triggers - /shared/ASAssets/KPI/Physical/Triggers

This section lists all triggers that have been defined to execute various KPI procedures at regular intervals. The default execution frequencies are listed for each trigger.

Trigger Name	Script invoked	Frequency
tPurgeHistoryData	/shared/ASAssets/KPI/Physical/LoadScripts/pPurgeData	Daily
initializeCISLogsTrigger	/shared/ASAssets/KPI/Utilities/initializeCISLogs	Daily
tUpdateDatasourceUsage	/shared/ASAssets/KPI/Physical/LoadScripts/pLoadDatasourcesUsage	Hourly
tUpdateEventRequests	/shared/ASAssets/KPI/Physical/LoadScripts/pLoadEventRequests	Daily
tUpdateEventSessions	/shared/ASAssets/KPI/Physical/LoadScripts/pLoadEventSessions	Daily
tCheckLongRunningRequ	/shared/ASAssets/KPI/Utilities/pCheckLongRunn	10

ests	ingRequests	minutes
tUpdateSysRequests	/shared/ASAssets/KPI/Physical/LoadScripts/pLoadRequests	10 minutes
tUpdateSystemResources	/shared/ASAssets/KPI/Physical/LoadScripts/pLoadSystemResources	15 minutes

Utilities - /shared/ASAssets/KPI/Utilities/

This section lists all of the utility procedures that have been defined for the KPI module. These scripts provide common functionality for both setup and execution of the KPI module.

Utility Name	Description
cachedResources	This procedure is used to manipulate cached resources within a starting folder. This procedure can retrieve, enable, or disable cached resources within a designated folder. It operates recursively.
changeCase	This procedure forces the input text to the requested case if UPPER or LOWER is specified. Otherwise the procedure just returns the input text
configureCISLogs	This procedure is used to dynamically configure the CIS_Resource_Usage data source by getting information from the server and the defaultValues constants file which determine the default values.
constructExcludeWhereClause	This procedure is used to dynamically construct the "exclude path" where clause for the resource path name filter.
constructNameFilterWhereClause	This procedure is used to dynamically construct the where clause for the resource path name filter
GetQueryResponseTime	This procedure executes the passed in query and calculates the average time taken to retrieve the first row of data.
initializeCISLogs	This procedure is used to initialize the CIS_RESOURCE_USAGE data source to dynamically pick-up the resource usage logs that are configured for this CIS instance.

pCheckLongRunningRequests	This procedure queries the view /shared/ASAssets/KPI/Business/requests/vLongRunningRequests to generate a list of long running requests, generates an html table containing each of the requests and emails an address identified by the constants property /shared/ASAssets/KPI/constants/commonValues.sendTo. Email integration must be configured on the CIS server for this to work.
pGetSystemInformation	This script is used to get cluster name and server name from /lib/util/getProperties() built in function. This function is used in load scripts and by custom logger to get server name
rebindPhysicalAbstraction	This procedure is used to rebind all of the resources (Views) in a given starting source folder to a target rebind folder. This procedure is used to rebind all KPI views when configuring a KPI data source or changing the source schema name from the default.
removeSqlFromSysEventAttributes	This procedure extracts the SQL query text from the passed in event attributes string to allow the event attributes to be successfully detolkenized as a comma seperated string without accidentally being split along any commas contained in the SQL
toggleKPICaches	This procedure allows the user to enable or disable all KPI caches in one place.
updateCachedViews	This procedure is used to update the cache configuration data source target depending on which data source type the user chooses to cache results to.

Constants - /shared/ASAssets/KPI/constants

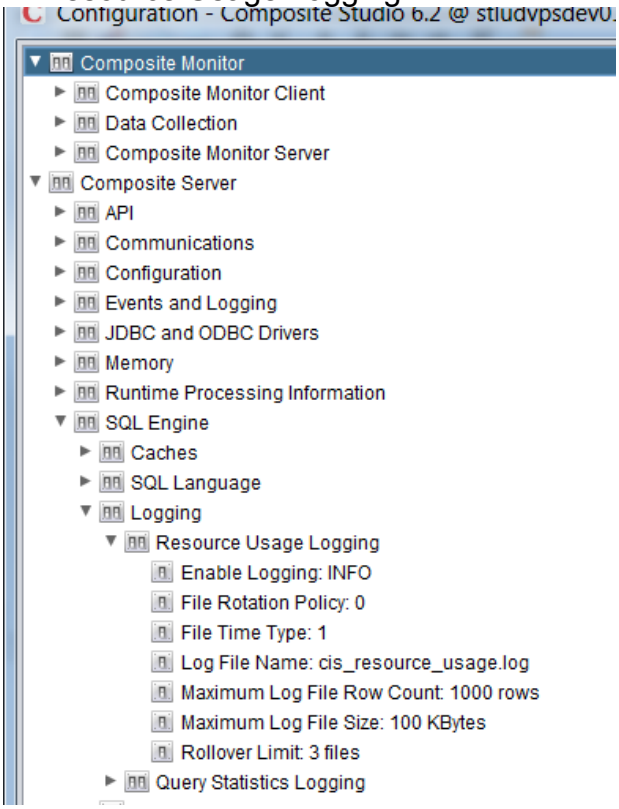
This section lists all of the utility procedures that have been defined for the KPI module. These scripts provide common functionality for both setup and execution of the KPI module.

Utility Name	Description
commonValues	Script to store default purge time values as well as row types used in scripts
getCommonValues	Script returns the value of a named constant defined in

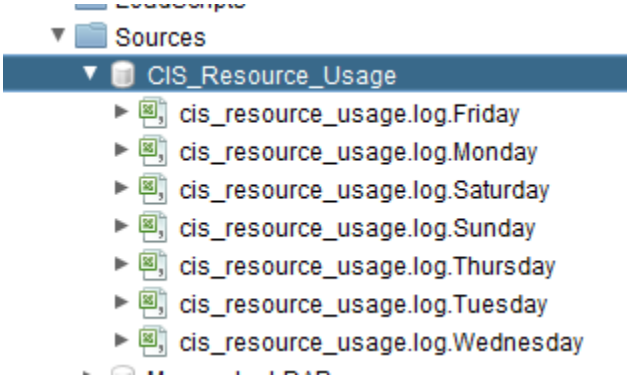
	the commonValues script. This is used by some views and procedures when directly referencing the commonValues script is not possible or practical

APPENDIX A – MANUALLY CONFIGURING RESOURCE LOGGING

The resource usage log generation is enabled in Studio by navigating to Administration → Configuration → CIS Server → SQL Engine → Logging → Resource Usage Logging.



As shown below, one log file per calendar day is created by this logging using the format cis_resource_usage.log.<day of week>. The generated daily files are retained only for one week before they are overwritten, so the KPI module contains scheduled procedures to automatically load the log file's contents to a staging table for long term retention.



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