Oracle® Enterprise Manager

System Monitoring Plug-in Metric Reference Manual for Non-Oracle Database Management

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Oracle Enterprise Manager System Monitoring Plug-in Metric Reference Manual for Non-Oracle Database Management, Release 12 (12.0)

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Preface

This manual is a compilation of the plug-ins metrics provided in Oracle Enterprise Manager for database management.

Audience

This document is intended for Oracle Enterprise Manager users interested in plug-ins metrics for database management.

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Related Documents

For more information, see the following documents in the Oracle Enterprise Manager 10*g* Release 2 documentation set:

- *Oracle Enterprise Manager System Monitoring Plug-in Installation Guide for Sybase Adaptive Server Enterprise (ASE)*
- *Oracle Enterprise Manager System Monitoring Plug-in Installation Guide for IBM DB2 Database*
- *Oracle Enterprise Manager System Monitoring Plug-in Installation Guide for Microsoft SQL Server*

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

How to Use This Manual

The *System Monitoring Plug-in Metric Reference Manual for Non-Oracle Database Management* lists all the plug-ins metrics for database management that Enterprise Manager monitors. This manual shows all the metric help available online, eliminating the need to have the Grid Control Console up and running.

This preface describes:

- Structure of the Metric Reference Manual
- Background Information on Metrics, Thresholds, and Alerts

Structure of the Metric Reference Manual

This manual contains chapters for the Microsoft SQL Server and the IBM DB2 Database. The metrics in these chapters appear in alphabetical order according to category.

Metric Information

The information for each metric comprises a description and user action if available:

- Description

  Provides an explanation following the metric name. This text defines the metric and, when available, provides additional information pertinent to the metric.

- User Action

  Suggests how to solve the problem causing the alert.

Definitions of Columns in Metric Summary Tables

The Metric Summary table in Enterprise Manager Grid Control is part of the overall metric information. The following table provides descriptions of columns in the Enterprise Manager Metric Summary table.

Column Header	Column Definition
Target Version	Version of the target, for example, 9.0.2.x and 10.1.0.x. The x at the end of a version (for example, 9.0.2.x) represents the subsequent patchsets associated with that release.

Column Header	Column Definition
Server Evaluation Frequency	The rate at which the metric is evaluated to determine whether it has crossed its threshold. For server-generated alerts, the evaluation frequency is determined by Oracle Database internals. For example, if the evaluation frequency is 10 minutes, when the Average File Write Time degrades to the point an alert should trigger, it could be almost 10 minutes before Enterprise Manager receives an indication of the alert. This column is present in the Metric Collection Summary table only for Oracle Database 10*g* metrics.
Collection Schedule	The rate at which the Management Agent collects data. The collection frequency for a metric comes from the Enterprise Manager default collection file for that target type.
Upload Interval	The rate at which the Management Agent moves data to the Management Repository. For example, upload every n^{th} collection. The upload frequency for a metric comes from the Enterprise Manager default collection file for that target type. This column is present in the Metric Collection Summary table only when the Upload Frequency is different from the Collection Frequency.
Comparison Operator	The comparison method Enterprise Manager uses to evaluate the metric value against the threshold values.
Default Warning Threshold	Value that indicates whether a warning alert should be initiated. If the evaluation of the warning threshold value returns a result of TRUE for the specified number of consecutive occurrences defined for the metric, an alert triggers at the warning severity level.
Default Critical Threshold	Value that indicates whether a critical alert should be initiated. If the evaluation of the critical threshold value returns a result of TRUE for the specified number of consecutive occurrences defined for the metric, an alert triggers at the critical severity level.
Consecutive Number of Occurrences Preceding Notification	Consecutive number of times a metric's value reaches either the warning threshold or critical threshold before a notification is sent.
Alert Text	Message indicating why the alert was generated. Words that display between percent signs (%) denote variables. For example, `Disk Utilization for %keyValue% is %value%%` could translate to `Disk Utilization for d0 is 80%`.

Abbreviations and Acronyms

To reduce the page count in this document, the following abbreviations and acronyms are used:

Abbreviation/Acronym	Name
Agent	Oracle Management Agent
Database	Oracle Database
OMS	Oracle Management Service
Repository	Oracle Management Repository

Background Information on Metrics, Thresholds, and Alerts

A metric is a unit of measurement used to determine the health of a target. It is through the use of metrics and associated thresholds that Enterprise Manager sends out alerts notifying you of problems with the target.

Thresholds are boundary values against which monitored metric values are compared. For example, for each disk device associated with the Disk Utilization (%) metric, you can define a different warning and critical threshold. Some of the thresholds are predefined by Oracle; others are not.

After a threshold is reached, an alert is generated. An alert is an indicator signifying that a particular condition has been encountered and is triggered when one of the following conditions is true:

- A threshold is reached.
- An alert has been cleared.
- The availability of a monitored service changes. For example, the availability of an application server changes from up to down.
- A specific condition occurs. For example, an alert is triggered whenever an error message is written to a database alert log file.

Alerts are detected through a polling-based mechanism by checking for the monitored condition from a separate process at regular, predefined intervals.

> **See Also:** See the *Oracle Enterprise Manager Concepts* manual and the Enterprise Manager online help for additional information about metrics, thresholds, and alerts

Editing

Out of the box, Enterprise Manager comes with thresholds for critical metrics. Warning and critical thresholds are used to generate an alert, letting you know of impending problems so that you can address them in a timely manner.

To better suit the monitoring needs of your organization, you can edit the thresholds provided by Enterprise Manager and define new thresholds. When defining thresholds, the key is to choose acceptable values to avoid unnecessary alerts, while still being notified of issues in a timely manner.

You can establish thresholds that will provide pertinent information in a timely manner by defining metric baselines that reflect how your system runs for a normal period of time.

The metrics listed on the Edit Thresholds page are either default metrics provided by Oracle or metrics whose thresholds you can change.

Specifying Multiple Thresholds

The Specifying Multiple Thresholds functionality allows you to define various subsets of data that can have different thresholds. By specifying multiple thresholds, you can refine the data used to trigger alerts, which is one of the key benefits of using Enterprise Manager.

The key in specifying multiple thresholds is to determine how the comparison relates to the metric threshold as a whole. What benefit will be realized by defining a more stringent or lax threshold for that particular device, mount point, and so on?

For example, using the Average Disk I/O Service Time metric, you can define warning and critical thresholds to be applied to all disks (sd0 and sd1), or you can define different warning and critical thresholds for a specific disk (sd0). This allows you to adjust the thresholds for sd0 to be more stringent or lax for that particular disk.

Accessing Metrics Using the Grid Control Console

To access metrics in the Grid Control Console, use the All Metrics page associated with a particular target by doing the following:

1. From the Grid Control Console, choose the target.
2. On the target's home page, click All Metrics in the Related Links section.

3. On the All Metrics page, choose the metric of interest and click Help. The help for that metric appears.

1

Microsoft SQL Server Metrics

This chapter provides descriptions for all Microsoft SQL Server metric categories, and tables list and describe associated metrics for each category. The tables also provide user actions if any of the metrics for a particular category support user actions. Shaded rows represent key columns for a particular category.

1.1 Configuration Metrics

Configuration metrics consist of the following categories:

- SQL Server Configuration
- Registry Setting Configuration
- Database Setting Configuration

1.1.1 SQL Server Configuration Metrics

The metrics in this category represent a SQL Server installation. The metrics contain details of the product and version of the SQL Server instance.

- Table Name — MGMT_EMX_MSSQL_SQLSERVER
- View Name — MGMT_EMX_MSSQL_SQLSERVER_VIEW

Default Collection Interval — Every 24 hours

Table 1–1 SQL Server Configuration Metrics

Metric	Description
Server Name	Name of the SQL Server.
Clustered	Whether the server belongs to a cluster.
Package	Product installed. 0 — Unknown 1 — Office 0 — Unknown 0 — Unknown 0 — Unknown
Product	Installed product.
Version String	Installed version.
Operatingsystem Details	Operating system on which the installation is done.

1.1.2 Registry Setting Configuration Metrics

The metrics in this category contain the installation and run-time parameters of the SQL Server stored in the registry.

- Table Name — MGMT_EMX_MSSQL_REGSETTING
- View Name — MGMT_EMX_MSSQL_REGSETTING_VIEW

Default Collection Interval — Every 24 hours

Table 1–2 Registry Setting Configuration Metrics

Metric	Description
Agent Log File	Path and file name for the Agent log.
Backup Directory	Location of the backup files directory.
Case Sensitive	Comparison method for multi-byte character data is either case-sensitive or not.
Error Log Path	Operating system path and file name to be used for the SQL Server error log.
Master DB Path	The full path and file name of the operating system file containing the master database.
NT Event Logging	Whether the SQL Server uses the Windows NT application log. If TRUE, the SQL Server sends all events to the Windows NT application log and the SQL Server error log. If FALSE, the SQL Server sends events only to the SQL Server error log.
Number of Processors	Number of CPUs available to the SQL Server on the server.
Perf Mon Mode	Operating system path and file name to be used for the SQL Server error log. Windows NT Performance Monitor polling behavior when the monitor is launched. 0 — Continuous 1 — On demand
Registered Organization	Company name supplied by the installer.
Registered Owner	User name supplied by the installer.
Replication Installed	TRUE when components supporting replication are installed.
RPC Encrypt	Whether RPC encryption is enabled.
SNMP	Whether Simple Network Management Protocol (SNMP) is installed on an instance of the SQL Server.
SNMP Current Version	Version of Simple Management Protocol (SNMP) currently installed on an instance of the SQL Server.
Sort Order	Character set used and ordering applied.
SQL Data Root	Default operating system directory implementing storage for SQL Server system user-defined databases.
TCP Port	TCP/IP Sockets Net-Libraries port number on an instance of the SQL Server.

1.1.3 Database Setting Configuration Metrics

The metrics in this category contain the settings for a database. These settings control the access to and the behavior of the database.

- Table Name — MGMT_EMX_MSSQL_DBSETTING
- View Name — MGMT_EMX_MSSQL_DBSETTING_VIEW

Default Collection Interval — Every 24 hours

Table 1–3 Database Setting Configuration Metrics

Metric	Description
Database Name (key column)	Database name.
Offline	Whether the database is online. Also, whether the database is unavailable, or is being made unavailable, for use by authorized users.
Recovery Type	Whether the comparison method for multi-byte character data is case-sensitive or not. Type of recovery model that a database will use: Value — 0 Description — Simple Explanation — The database can be recovered only to the last full database backup or last differential backup. Value — 1 Description — Bulk Logged Explanation — Logging for all SELECT INTO, CREATE INDEX, and bulk loading data operations is minimal and therefore requires less log space. In exchange for better performance and less log space usage, the risk of exposure to loss is greater than with full recovery. Value — 2 Description — Full Explanation — Database backups and transaction log backups provide full recoverability from media failure. All operations are fully logged, including bulk operations such as SELECT INTO, CREATE INDEX, and bulk loading data. Value — 3 Description — Unknown Explanation — The recovery type is not known.
AutoClose	Whether the database is closed and its resources are freed when no user connection accesses the database.
AutoCreateStatistics	Whether the optimizer directs automatic creation of supporting data statistics as required.
AutoShrink	Whether operating system files maintaining table and index data are evaluated for downward resizing when the server periodically checks for unused space.
AutoUpdateStatistics	Whether the optimizer directs the automatic rebuilding of statistics.
CursorCloseOnCommit	Whether cursors are closed when a transaction is completed.
DataSpaceUsage	Amount of space in use and reserved for use of data in megabytes.
IndexSpaceUsage	Amount of space for the index in megabytes.
DB Owner UseOnly	Whether only users with the database ownership privilege can access the database.
SingleUser Mode	Whether only one user can access the database at a given time.
ReadOnly	Whether the database is read-only.
DefaultCursor	Whether cursors declared in a batch are created with local scope.
SelectIntoBulkCopy	Whether non-logged operations are allowed.
TruncateLogOnChekpoint	Whether the SQL Server removes log entries referencing committed transactions when activity on the databases forces a dirty page write.

1.2 Access Methods Metrics

The metrics in this category search through and measure the allocation of SQL Server database objects, such as the number of index searches or number of pages that are allocated to indexes and data.

1.2.1 For Microsoft SQL Server 2000/2005/2008

Default Collection Interval — Every 30 minutes

Table 1–4 Access Methods Metrics

Metric	Description
Access Method Counter Name (key column)	Performance metric name. See Table 1–5.
Access Method Counter Value	Performance metric value.

The Access Method Counter Name key column contains several metrics. Table 1–5 provides a list of these metrics and a description for each.

Table 1–5 Access Method Counter Name Metrics

Metric	Description
Extents Deallocations/sec	Number of extents deallocated per second from database objects used for storing index or data records.
Extents Allocated/sec	Number of extents allocated per second to database objects used for storing index or data records.
Forwarded Records/sec	Number of records per second fetched through forwarded record pointers.
FreeSpace Page Fetches/sec	Number of pages returned per second by free space scans used to satisfy requests to insert record fragments.
FreeSpace Scans/sec	Number of scans per second that were initiated to search for free space in which to insert a new record fragment.
Full Scans/sec	Number of unrestricted full scans per second, which can be either base-table or full-index scans.
Index Searches/sec	Number of index searches per second. These are used to start range scans and single index record fetches and to reposition an index.
Mixed Page Allocations/sec	Number of pages allocated per second from mixed extents. These are used for storing the first eight pages that are allocated to an index or table.
Page Deallocations/sec	Number of pages deallocated per second from database objects used for storing index or data records.
Page Splits/sec	Number of page splits per second that occur because of overflowing index pages.
Pages Allocated/sec	Number of pages allocated per second to database objects used for storing index or data records.
Probe Scans/sec	Number of probe scans per second. These are used to directly find rows in an index or base table.
Range Scans/sec	Number of qualified range scans through indexes per second.
Scan Point Revalidations/sec	Number of times per second that the scan point had to be revalidated to continue the scan.
Skipped Ghosted Records/sec	Number of ghosted records per second skipped during scans.
Table Lock Escalations/sec	Number of times locks on a table were escalated.
Workfiles Created/sec	Number of workfiles created per second.

Table 1–5 (Cont.) Access Method Counter Name Metrics

Metric	Description
Worktables Created/sec	Number of work tables created per second.
Worktables from Cache Base	Denominator ("base") of a fraction that the performance counter Worktables from Cache ratio represents.
Worktables from Cache Ratio	Percentage of work tables created where the initial pages were immediately available in the work table cache.

1.3 Agent Status Metrics

The metrics in this category provide information regarding the current status of the Agent.

Default Collection Interval — Every 5 minutes

Table 1–6 Agent Status Metrics

Metric	Description and User Action
Process ID	Process ID of the Sqlserver Agent process.
Server name	Name of the Sqlserver instance.
Software Home	Path of the Sqlserver process.
Sqlserver Agent Status	Status of the Sqlserver Agent process. When the status is not running, the SQL server Agent must be started.

1.4 Buffer Manager Metrics

The Buffer Manager object provides counters to monitor how Microsoft SQL Server uses:

- Memory to store data pages, internal data structures, and the procedure cache.
- Counters to monitor the physical I/O as the SQL Server reads database pages from, and writes database pages to, the disk.

1.4.1 For Microsoft SQL Server 2000/2005/2008

Default Collection Interval — Every 15 minutes

Table 1–7 Buffer Manager Metrics

Metric	Description
Buffer Manager Counter Name (key column)	Performance metric name. See Table 1–8.
Buffer Manager Counter Value	Performance metric value.

The Buffer Manager Counter Name key column contains several metrics. Table 1–8 provides a list of these metrics and a description for each.

Table 1–8 Buffer Manager Counter Name Metrics

Metric	Description
Buffer Cache Hit Ratio	Percentage of pages found in the buffer cache without having to read from disk. The ratio is the total number of cache hits divided by the total number of cache lookups since the SQL Server was started. After a long period of time, the ratio does not change very much. Because reading from the cache is much less expensive than reading from disk, this ratio should be high. Generally, you can increase the buffer cache hit ratio by increasing the amount of memory available to the SQL Server.
Buffer Cache Hit Ratio Base	Denominator ("base") of a fraction that the performance counter Buffer Cache Hit Ratio represents.
Checkpoint Pages/sec	Number of pages flushed to disk per second by a checkpoint or other operations that cause all dirty pages to be flushed to disk.
Database Pages	Total number of database pages.
Free List Stalls/sec	Number of requests that had to wait for a free page.
Free Pages	Total number of pages on all free lists.
Lazy Writes/sec	Number of buffers written per second by the buffer manager's lazy writer. The lazy writer is a system process that flushes out batches of dirty, aged buffers (buffers that contain changes that must be written back to disk before the buffer can be reused for a different page) and make them available to user processes. The lazy writer eliminates the need to perform frequent checkpoints in order to create available buffers.
Page Lookups/sec	Number of requests to find a page in the buffer pool.
Page Reads/sec	Number of physical database page reads issued per second. This statistic displays the total number of physical page reads across all databases. Because physical I/O is expensive, you may be able to minimize the cost by using a larger data cache, intelligent indexes, more efficient queries, or by changing the database design.
Page Writes/sec	Number of database page writes issued per second. Page writes are generally expensive. Reducing page-write activity is important for optimal tuning. One way to do this is to ensure that you do not run out of free buffers in the free buffer pool. If you do, page writes will occur while waiting for an unused cache buffer to flush.
Procedure Cache Pages	Number of pages used to store compiled queries.
Readahead Pages/sec	Number of pages read in anticipation of use.
Reserved Pages	Number of buffer pool reserved pages.
Stolen Pages	Number of pages used for miscellaneous server purposes (including procedure cache).
Target Pages	Ideal number of pages in the buffer pool.
Total Pages	Number of pages in the buffer pool (includes database, free, and stolen pages).

1.5 Cache Manager Metrics

The Cache Manager object provides counters to monitor how the Microsoft SQL Server uses memory to store objects such as stored procedures, ad hoc and prepared Transact-SQL statements, and triggers. Multiple instances of the Cache Manager object can be monitored at the same time, with each instance representing a different type of plan to monitor.

1.5.1 For Microsoft SQL Server 2000/2005/2008

Default Collection Interval — Every 15 minutes

Table 1–9 Cache Manager Metrics

Metric	Description
Cache Manager Counter Name (key column)	Performance metric name. See Table 1–10.
Cache Manager Instance Name (key column)	Instance for the Cache Manager counter name.
Cache Manager Counter Value	Performance metric value.

The Cache Manager Counter Name key column contains several metrics. Table 1–10 provides a list of these metrics and a description for each.

Table 1–10 Cache Manager Counter Name Metrics

Metric	Description
Cache Hit Ratio	Percentage of pages found in the cache without having to read from disk. The ratio is the total number of cache hits divided by the total number of cache lookups since the SQL Server was started. After a long period of time, the ratio does not change very much. Because reading from the cache is less expensive than reading from disk, this ratio should be high. Generally, you can increase the cache hit ratio by increasing the amount of memory available to the SQL Server.
Cache Hit Ratio Base	Denominator ("base") of a fraction that the performance counter Cache Hit Ratio represents.
Cache Pages	Number of pages used by objects in the cache. After a long period of time, the count does not change very much.
Cache Object Counts	Number of objects found in the cache. After a long period of time, the count does not change very much.
Cache Use Counts/sec	Number of times per second that each type of object in the cache has been used. The higher this value is, the better. After a long period of time, the count does not change very much.

1.6 Database Metrics

The MSSQL_Database class represents a SQL Server database. Each SQL Server installation can contain one or more databases.

Default Collection Interval — Every 15 minutes

Table 1–11 Database Metrics

Metric	Description and User Action
Database Name (key column)	Database name.
Create Date	Time and date the database was created.
Database File Path	Primary location of the database files.
Database Status	Status of the database: 0 — Normal 32 — Loading 192 — Recovering 256 — Suspect 512 — Offline 1024 — Standby 32768 — Emergency Mode

Table 1–11 (Cont.) Database Metrics

Metric	Description and User Action
Database Size (MB)	Total size of the database in megabytes. Allocate more space to the database if this metric decreases beyond the critical threshold.
Database Space Available %	Percentage of space that is available. Allocate more space to the database if this metric decreases beyond the critical threshold.
Space Available (MB)	Unused space in megabytes. Allocate more space to the database if this metric decreases beyond the critical threshold.
Version	Version of Microsoft SQL Server used to create the referenced database.

1.7 Database Backup Metrics

The metrics in this category provide detailed backup information for all databases.

Default Collection Interval — in real time

Table 1–12 Database Backup Metrics

Metric	Description
Backup Set ID (key column)	Unique backup set identification number that identifies the backup set.
Media Set ID (key column)	Unique media set identification number that identifies the media set containing the backup set.
Family Sequence Number (key column)	Position of this media family in the media set.
File Number (key column)	File identification number unique within a database.
Backup Set Name	Name of the backup set. Can be NULL
Backup Set Description	Description of the backup set. Can be NULL.
Username	Name of the user performing the backup operation. Can be NULL.
Start Date	Date and time the backup operation started. Can be NULL.
Finish Date	Date and time the backup operation finished. Can be NULL.
Size of Backup (bytes)	Size of the backup set, in bytes. Can be NULL.
Database Name	Name of the database involved in the backup operation. Can be NULL.
Server Name	Name of the server running the SQL Server backup operation. Can be NULL.
Machine Name	Name of the computer running SQL Server. Can be NULL.
Media Set Name	Name of the media set. Can be NULL.
Media Set Device Name	Physical name of the backup device. Can be NULL.
Physical Block Size (Bytes)	Physical block size used to write the media family. Can be NULL.
File Group Name	Name of the filegroup containing a backed up database file. Can be NULL.
File Group Physical Name	Remainder of the physical (operating system) file name. Can be NULL.
Backup Set Expiration Date	Date and time the backup set expires. Can be NULL.

1.8 Database Job Metrics

The metrics in this category return information about jobs that are used by the SQLServerAgent service to perform automated activities in Microsoft SQL Server.

Default Collection Interval — Every 2 hours

Table 1–13 Database Job Metrics

Metric	Description and User Action
Job ID (key column)	Job identification number.
Computer Used to Send Network Messages	Name of the user or computer used when sending network messages.
Computer Used to Send Pages	Name of the user or computer used when sending a page.
Current Execution Status	0 — Returns only jobs that are not idle or suspended 1 — Executing 2 — Waiting for thread 3 — Between retries 4 — Idle 5 — Suspended 7 — Performing completion actions
Current Execution Steps in the Job	Current job execution step.
Current Retry Attempt	If the job is running and the step has been retried, this is the current retry attempt.
Delete Job Event	Bitmask indicating under what circumstances the job should be deleted when a job completes. Possible values are the same as for notify_level_eventlog.
Description	Description for the job.
Email of Operator	Email name of the operator to notify.
Enabled	Indicates whether the job is enabled to be executed.
ID of Next Run Schedule	Identification number of the next run schedule.
Job Category	The category to which the job belongs.
Job Creation Date	Date the job was created.
Job Modification Date	Date the job was last modified.
Job Owner	The owner of the job.
Job Type	1 — Local job 2 — Multiserver job 0 — Job has no target servers
Job Version Number	Version of the job, which is automatically updated each time the job is modified.
Last Run Date (mm-dd-yyyy)	Date the job last started executing.
Last Run Outcome	Outcome of the job the last time it ran: 0 — Failed 1 — Succeeded 3 — Canceled 5 — Unknown
Last Run Time (hh:mm:ss)	Time the job last started executing.
Name	Name of the job.
Next Run Date (mm-dd-yyyy)	Date the job is next scheduled to run.

Table 1–13 (Cont.) Database Job Metrics

Metric	Description and User Action
Next Run Time (hh:mm:ss)	Time the job is next scheduled to run.
Notify Level Email	Bitmask indicating under what circumstances a notification email should be sent when a job completes. Possible values are the same as for notify_level_eventlog.
Notify Level Event Log	Bitmask indicating under what circumstances a notification event should be logged to the Microsoft Windows NT application log. Possible values are as follows: 0 — Never 1 — When a job succeeds 2 — When the job fails 3 — Whenever the job completes (regardless of the job outcome)
Notify Level Net Send	Bitmask indicating under what circumstances a network message should be sent when a job completes. Possible values are the same as for notify_level_eventlog.
Notify Level Page	Bitmask indicating under what circumstances a page should be sent when a job completes. Possible values are the same as for notify_level_eventlog.
Number of Job Schedules	Number of job schedules the job has.
Number of Job Steps	Number of job steps the job has.
Number of Target Servers	Number of target servers the job has.
Originating Server	Name of the server from which the job originated.
Start Step ID	ID of the step in the job where execution should begin.

1.9 Database Lock Metrics

The metrics in this category report information about locks.

Default Collection Interval — Every 15 minutes

Table 1–14 Database Lock Metrics

Metric	Description
Server Process Identifier (key column)	Server process ID of the current user process.
Database Identifier (key column)	Database identification number requesting a lock.
Object Identifier (key column)	Object identification number of the object requesting a lock.
Index Identifier (key column)	The index identification number.

Table 1–14 (Cont.) Database Lock Metrics

Metric	Description
Mode	Lock mode: Shared (S) Update (U) Exclusive (X) Intent Schema Bulk update (BU) RangeS_S — Shared range, shared resource lock; serializable range scan. RangeS_U — Shared range, update resource lock; serializable update scan. RangeI_N — Insert range, null resource lock. Used to test ranges before inserting a new key into an index. RangeX_X — Exclusive range, exclusive resource lock. Used when updating a key in a range.
Resource	Lock resource that corresponds to the value in `syslockinfo.restext`: RID, KEY, PAG, EXT, TAB, and DB
Lock Request Status	The current status of the lock: GRANT, WAIT, and CNVT
Type	The lock type: ■ RID = Lock on a single row in a table identified by a row identifier (RID). ■ KEY = Lock within an index that protects a range of keys in serializable transactions. ■ PAG = Lock on a data or index page. ■ EXT = Lock on an extent. ■ TAB = Lock on an entire table, including all data and indexes. ■ DB = Lock on a database. ■ FIL = Lock on a database file. ■ APP = Lock on an application-specified resource. ■ MD = Locks on metadata, or catalog information. ■ HBT = Lock on a heap or B-Tree index. This information is incomplete in SQL Server. ■ AU = Lock on an allocation unit. This information is incomplete in SQL Server.

1.10 Database Parameter Metrics

The Databases object in Microsoft SQL Server provides counters to monitor:

- Bulk copy operations.
- Backup and restore throughput.
- Transaction log activities.

Monitoring transactions and the transaction log determine how much user activity is occurring in the database and how full the transaction log is becoming. The amount of user activity can determine the performance of the database and affect log size, locking, and replication. Monitoring low-level log activity to gauge user activity and resource usage can help you identify performance bottlenecks.

Default Collection Interval — Every 24 hours

Table 1–15 Database Parameter Metrics

Metric	Description and User Action
Parameter Name (key column)	Name of the Database Configuration parameter.
Current Value	Current value of the Database Configuration parameter.
Description	Text description of the configuration value.
Dynamic Reconfigure	Whether the parameter can be dynamically reconfigured. If TRUE, a modification to the value is immediately effective. If FALSE, modifications are visible only after the SQL Server service has been stopped and restarted.
ID	Parameter name.
Maximum Value	Upper bound for a configuration value.
Minimum Value	Lower bound for a configuration value.
Running Value	Value for the configuration option (value in `syscurconfigs.value`).

Table 1–16 ID Description Mapping

Metric	Description
101	Recovery interval.
102	Allow updates.
103	User Connections.
106	Locks.
107	Open objects
109	Fill factor.
115	Nested triggers.
117	Remote access.
124	Default language.
125	Language in cache.
502	Max async I/O.
503	Max worker threads.
505	Network packet size.
518	Show advanced option.
542	Remote proc trans.
543	Remote conn timeout.
1110	Time slice.
1123	Default sort order ID.
1124	Unicode local ID.
1125	Unicode comparison style.
1126	Language neutral.
1127	Two-digit year cutoff.
1505	Index create mem.
1514	Spin Counter.
1517	Priority boost.
1519	Remote login timeout.

Table 1–16 (Cont.) ID Description Mapping

Metric	Description
1520	Remote query timeout.
1531	Cursor threshold.
1532	Set working set size.
1533	Resource timeout.
1534	User Options.
1535	Processor affinity mask.
1536	Max text repl size.
1537	Media retention.
1538	Cost threshold for parallelism.
1539	Max degree of parallelism.
1540	Min memory per query.
1541	Query wait.
1542	VLM size.
1543	Min memory.
1544	Max memory.
1545	Query max time.
1546	Lightweight pooling.

1.11 Database Performance Metrics

The Databases object in Microsoft SQL Server provides counters to monitor:

- Bulk copy operations.
- Backup and restore throughput.
- Transaction log activities.

Monitoring transactions and the transaction log determine how much user activity is occurring in the database and how full the transaction log is becoming. The amount of user activity can determine the performance of the database and affect log size, locking, and replication. Monitoring low-level log activity to gauge user activity and resource usage can help you identify performance bottlenecks.

1.11.1 For Microsoft SQL Server 2000/2005/2008

Default Collection Interval — Will upload data when alert raised

Table 1–17 Database Performance Metrics

Metric	Description
Database Performance Counter Name (key column)	Performance metric name. See Table 1–18.
Database Performance Instance Name (key column)	Instance for the Database Performance Counter Name
Database Performance Server Locks Counter Value	Performance metric value.

The Database Performance Counter Name key column contains several metrics. Table 1–18 provides a list of these metrics and a description for each.

Table 1–18 Database Performance Counter Name Metrics

Metric	Description
Active Transactions	Number of active transactions for the database.
Backup/Restore Throughput/sec	Read/write throughput for backup and restore operations of a database per second. For example, you can measure how the performance of the database backup operation changes when more backup devices are used in parallel or when faster devices are used. Throughput of a database backup or restore operation allows you to determine the progress and performance of your backup and restore operations.
Bulk Copy Rows/sec	Number of rows bulk-copied per second.
Bulk Copy Throughput/sec	Amount of data bulk-copied in kilobytes per second.
Data File(s) Size (KB)	Cumulative size (in kilobytes) of all the data files in the database including any automatic growth. Monitoring this counter is useful, for example, for determining the correct size of tempdb.
DBCC Logical Scan Bytes/sec	Number of logical read scan bytes per second for database consistency checker (DBCC) statements.
Log Bytes Flushed/sec	Total number of log bytes flushed.
Log Cache Hit Ratio	Percentage of log cache reads satisfied from the log cache.
Log Cache Reads/sec	Reads performed per second through the log manager cache.
Log File(s) Size	Cumulative size in kilobytes of all the transaction log files in the database.
Log File(s) Used Size (KB)	The cumulative used size of all the log files in the database.
Log Flush Wait Time	Total wait time in milliseconds to flush the log.
Log Flush Waits/sec	Number of commits per second waiting for the log flush.
Log Flushes/sec	Number of log flushes per second.
Log Growths	Total number of times the transaction log for the database has expanded.
Log Shrinks	Total number of times the transaction log for the database has contracted.
Log Truncations	Total number of times the transaction log for the database has truncated.
Percent Log Used	Percentage of space in the log that is in use.
Repl. Pending Xacts	Number of transactions in the transaction log of the publication database marked for replication, but not yet delivered to the distribution database.
Repl. Trans. Rate	Number of transactions per second read out of the transaction log of the publication database and delivered to the distribution database.
Shrink Data Movement Bytes/sec	Amount of data being moved per second by autoshrink operations, DBCC SHRINKDATABASE, or DBCC SHRINKFILE statements.
Transactions/sec	Number of transactions started for the database per second.

1.12 Event Log Entry Metrics

The MSSQL_ErrorLogEntry class represents the entries in a SQL Service error log.

Default Collection Interval — Metric is disabled. Will upload data when alert is raised.

Table 1–19 Database Performance Counter Name Metrics

Metric	Description
Type of Record (key column)	Specifies the type of event. This is an enumerated string
Record Number (key column)	Identifies the event within the Windows logfile (for example, NT Eventlog logfile). This is specific to the logfile and is used together with the logfile name to uniquely identify an instance of this class.
Event Log Entry	Name of Windows logfile (for example, NT Eventlog logfile). This is used together with the RecordNumber to uniquely identify an instance of this class.
Event Code	This property has the value of the lower 16-bits of the EventIdentifier property. It is present to match the value displayed in the NT Event Viewer. Two events from the same source may have the same value for this property but may have different severity and EventIdentifier values
Event Identifier	Identifies the event. This is specific to the source that generated the event log entry, and is used, together with SourceName, to uniquely identify an NT event type.
Date-Time	Date and time of event generation.
Event Severity	Indicates the severity of the event. Two events from the same source may have may have different severity and EventIdentifier values.
Category	Specifies a subcategory for this event. This subcategory is source specific.
User	User name of the logged on user when the event ocurred. If the user name cannot be determined this will be NULL.
Event Message	Event message as it appears in the NT Eventlog. This is a standard message with zero or more insertion strings supplied by the source of the NT event. The insertion strings are inserted into the standard message in a predefined format. If there are no insertion strings or there is a problem inserting the insertion strings, only the standard message will be present in this field.

1.13 General Statistics Metrics

The General Statistics object in Microsoft SQL Server provides counters to monitor general server-wide activity, such as the number of current connections and the number of users connecting and disconnecting per second from computers running an instance of SQL Server. This can be useful when you are working on large online transaction processing (OLTP) systems where many clients connect and disconnect from an instance of SQL Server.

1.13.1 For Microsoft SQL Server 2000/2005/2008

Default Collection Interval — Every 30 minutes

Table 1–20 General Statistics Metrics

Metric	Description
General Statistics Counter Name (key column)	Performance metric name. See Table 1–21.
General Statistics Counter Value	Performance metric value.

The General Statistics Counter Name key column contains several metrics. Table 1–21 provides a list of these metrics and a description for each.

Table 1–21 General Statistics Counter Name Metrics

Metric	Description
Logins/sec	Total number of logins started per second.
Logouts/sec	Total number of logout operations started per second.
User Connections	Number of user connections. Because each user connection consumes some memory, configuring overly high numbers of user connections could affect throughput. User connections should be set to the maximum expected number of concurrent users.

1.14 Integrated Security Setting Metrics

Note: This metric is supported for SQLServer Database 2000 targets but not for SQLServer Database 2005 targets.

The MSSQL_IntegratedSecuritySetting class represents the security settings of a SQL Server installation. This setting affects all login connections to the SQL Server regardless of the login authentication type.

Default Collection Interval — Every 24 hours

Table 1–22 Integrated Security Setting Metrics

Metric	Description and User Action
SettingID (key column)	SQL Server name.
Audit Level	Indicates the current audit level security setting. Possible values are shown below. You can change the value for the desired auditing level. 0 Description — None Explanation — Do not log authentication attempts. 1 Description — Audit Login Success Explanation — Log successful authentication. 2 Description — Audit Login Failure Explanation — Log failed authentication. 3 Description — Audit All Explanation — Log all authentication attempts regardless of success or failure.
Impersonate Client	Indicates the current audit level security setting as shown Security context for non-administrative users executing `xp_cmdshell`. If TRUE, `xp_cmdshell` runs in the security context of the client connection. If FALSE, `xp_cmdshell` runs in the security context of the SQL Server Agent.
Security Mode	Indicates the current security mode. Possible values are shown below. You can change the value for the desired security mode. 0 Description — None Explanation — Do not log authentication attempts. 1 Description — Audit Login Success Explanation — Log successful authentication. 2 Description — Audit Login Failure Explanation — Log failed authentication. 3 Description — Audit All Explanation — Log all authentication attempts regardless of success or failure.

1.15 Last Database Backup Metrics

The metrics in this category provide the last backup information for all databases.

Default Collection Interval — Every 24 hours

Table 1–23 Last Database Backup Metrics

Metric	Description
Database_name (key column)	Name of the database.
Days Since Last Backup	Number of days since the last backup of the database.
Last Backup Date	Date when the last backup of the database was initiated.

1.16 Login Metrics

The MSSQL_Login class represents the login authentication records present in a SQL Server installation.

Default Collection Interval — in real time

Table 1–24 Login Metrics

Metric	Description
Name (key column)	User name.
Type	Login type for the user: 0 — Other NT user authentication 1 — NT group 2 — SQL server authentication

1.17 MSSQL Database File Metrics

The MSSQL_DatabaseFile class is an extension to the CIM_DataFile class. It contains properties that are relevant to an operating system file that is also a file storing SQL Server database data.

Default Collection Interval — Every 30 minutes

Table 1–25 MSSQL Database File Metrics

Metric	Description
Database File Name (key column)	User name.
Database Name (key column)	Name of the database.
FileGroup Name (key column)	Name of the File Group.
Database File Path	Complete path of the database file.
File Growth	Growth increment of the operating system file that stores table, index, or log data. When FileGrowthType is in megabytes, the FileGrowth value represents the number of megabytes of disk space to allocate for incremental file growth. When FileGrowthType is percent, the value represents a percentage and must be in the range from 1 through 100.
File Growth Type	Method of incremental allocation applied when an operating system file is extended. 0 — Megabyte 1 — Percent 99 — Invalid
Maximum Size	Upper limit for the size of an operating system file containing table and index data, or maintaining a database transaction log.
Primary File	Whether the database file is the one that maintains the database-specific system tables. A SQL Server database can have only one primary file.

Table 1–25 (Cont.) MSSQL Database File Metrics

Metric	Description
Space Available in MB	Amount of disk resources, in megabytes, allocated and unused in operating system files.
Database File Space Available (%)	Percentage of space available of the database file.
Size (MB)	Current size of the database file.

1.18 MSSQL File Group Metrics

The MSSQL_FileGroup class represents the groups of operating system files that store a database. A SQL Server filegroup categorizes the operating system files containing data from a single SQL Server database to simplify database administration tasks, such as a backup. A filegroup cannot contain the operating system files of more than one database, though a single database can contain more than one filegroup.

Default Collection Interval — in real time

Table 1–26 MSSQL File Group Metrics

Metric	Description
DatabaseName (key column)	Name of the database.
Filegroup Name (key column)	FileGroup name.
Default	Whether the filegroup is the default filegroup during table or index creation.
Read Only	Whether the filegroup is read only.
Total Size of the File Group (in MB)	Total size of the file group in megabytes.
Type	Filegroup type. A database is created on exactly one filegroup named PRIMARY. This is the primary filegroup. After database creation, you can add a filegroup to the database, called a user-defined file group. 0 — User-defined 8 — On read-only media 16 — Primary

1.19 MSSQL Transaction Log Metrics

Note: This metric is supported for SQLServer Database 2000 targets but not for SQLServer Database 2005 targets.

The MSSQL_TransactionLog class represents the transaction log of a Microsoft SQL Server database. A SQL Server transaction log maintains a record of modifications to the operating system files containing the data of an SQL Server database. The transaction log provides data recovery assistance if a system failure occurs, and a SQL Server database has at least one operating system file that stores transaction log records. A transaction log can be written to more than one operating system file. Each SQL Server database maintains its own transaction log, and the operating system file or files that store log records cannot be shared with another database.

Default Collection Interval — Every 30 minutes

Table 1–27 MSSQL Transaction Log Metrics

Metric	Description
Database Name (key column)	FileGroup name.
Size	Initial size of the database.
Last Backup	Time of the last backup.
Transaction Log Space Available (in MB)	Space available in the database.
Transaction Log Space Available (%)	Percentage of space available in the database.

1.20 Memory Manager Metrics

The Memory Manager object in Microsoft SQL Server provides counters that enable you to monitor overall server memory usage to gauge user activity and resource usage. This can help you identify performance bottlenecks.

1.20.1 For Microsoft SQL Server 2000/2005/2008

Default Collection Interval — Every 15 minutes

Table 1–28 Memory Manager Metrics

Metric	Description
Memory Manager Counter Name (key column)	Performance metric name. See Table 1–29.
Memory Manager Counter Value	Performance metric value.

The Memory Manager Counter Name key column contains several metrics. Table 1–29 provides a list of these metrics and a description for each.

Table 1–29 Memory Manager Counter Name Metrics

Metric	Description
Connection Memory (KB)	Total amount of dynamic memory the server is using for maintaining connections.
Granted Workspace Memory (KB)	Total amount of memory currently granted to executing processes such as hash, sort, bulk copy, and index creation operations.
Lock Memory (KB)	Total amount of dynamic memory the server is using for locks.
Lock Blocks Allocated	Current number of allocated lock blocks. At server startup, the number of allocated lock blocks plus the number of allocated lock owner blocks depends on the SQL Server Locks configuration option. If more lock blocks are needed, the value increases.
Lock Owner Blocks Allocated	Current number of allocated lock owner blocks. At server startup, the number of allocated lock owner blocks plus the number of allocated lock blocks depends on the SQL Server Locks configuration option. If more lock owner blocks are needed, the value increases dynamically.
Lock Blocks	Current number of lock blocks in use on the server (refreshed periodically). A lock block represents an individual locked resource, such as a table, page, or row.
Lock Owner Blocks	Number of lock owner blocks currently in use on the server (refreshed periodically). A lock owner block represents the ownership of a lock on an object by an individual thread. Therefore, if three threads each have a shared (S) lock on a page, there will be three lock owner blocks.

Table 1–29 (Cont.) Memory Manager Counter Name Metrics

Metric	Description
Maximum Workspace Memory (KB)	Maximum amount of memory available for executing processes such as hash, sort, bulk copy, and index creation operations.
Memory Grants Outstanding	Total number of processes per second that have successfully acquired a workspace memory grant.
Memory Grants Pending	Total number of processes per second waiting for a workspace memory grant.
Optimizer Memory (KB)	Total amount of dynamic memory the server is using for query optimization.
SQL Cache Memory (KB)	Total amount of dynamic memory the server is using for the dynamic SQL cache.
Target Server Memory (KB)	Total amount of dynamic memory the server is willing to consume.
Total Server Memory (KB)	The memory allocated to the SQL Server.

1.21 Memory Statistics Metrics

The metrics in this category provide information about various memory-related performance issues.

Default Collection Interval — Every 15 minutes

Table 1–30 Memory Statistics Metrics

Metric	Description and User Action
Average Latch Wait Time (ms)	Average latch wait time in milliseconds for latch requests that had to wait. If this number is high, your server might have resource limitations.
Buffer Cache Hit Ratio (%)	Percentage of pages found in the buffer cache without having to read from disk. The ratio is the total number of cache hits divided by the total number of cache lookups since the SQL Server was started. After a long period of time, the ratio does not change very much. Because reading from the cache is much less expensive than reading from disk, this ratio should be high. Generally, you can increase the buffer cache hit ratio by increasing the amount of memory available to the SQL Server.

Table 1–30 (Cont.) Memory Statistics Metrics

Metric	Description and User Action
Cache Hit Ratio (%)	Percentage of pages found in the cache without needing to read from disk. The ratio is the total number of cache hits divided by the total number of cache lookups since the SQL Server was started. After a long period of time, the ratio does not change very much. Because reading from the cache is less expensive than reading from disk, this ratio should be high. The higher this value is, the better. Generally, you can increase the cache hit ratio by increasing the amount of memory available to the SQL Server.
Log Flush Wait Time (ms)	Log cache is very important, because it rolls back a transaction before it is committed if the circumstances warrant. But after a transaction is complete (and no longer can be rolled back), this log cache is immediately flushed to the physical log file. This is a normal procedure. SELECT queries that do not modify data do not create transactions and do not produce log flushes. Essentially, a log flush occurs when data is written from the log cache to the physical log file. Therefore, a log flush occurs every time a transaction completes, and the number of log flushes that occur are related to the number of transactions performed by the SQL Server. One way to troubleshoot the disk I/O bottleneck is to capture the Log Flushes/sec counter data and see how busy this mechanism is. If the server experiences a lot of transactions, it will also experience a lot of log flushes, so the value you see for this counter can vary from server to server, depending on how busy it is with action-type queries that create transactions. Try to identify situations where the number of log flushes per second seems to be significantly higher than the expected number of transactions that you think should be running on a server.
Total Lock Wait Time (ms)	Total wait time in milliseconds for locks in the last second. If the value is high, your server has high resource contention.

1.22 Processor Metrics

The Win32_Processor class represents a device that is capable of interpreting a sequence of machine instructions on a Win32 computer system. On a multiprocessor machine, one instance of this class exists for each processor.

Default Collection Interval — Every 15 minutes

Table 1–31 Processor Metrics

Metric	Description and User Action
Device (key column)	Device ID for the device.
CPU Status	Status of the CPU.
Load Percentage	Usage of the CPU. If the value increases above the critical threshold, this indicates a possible risk to the processor.

1.23 Response Metrics

This metrics category provide information about the response of the target SQL Server Instance.

Default Collection Interval — Every 5 minutes

Table 1–32 Response Metrics

Metric	Description and User Action
Process ID	Process ID of the SQL Server process.
Server Name	Name of the instance of the SQL Server.
Software Home	Path of the SQL Server process.
SQL Server Status	Status of the SQL Server process. When the status is not Running, the SQL Server must be started.

1.24 SQL Server Locks Metrics

The Locks object in the Microsoft SQL Server provides information about SQL Server locks on individual resource types. Locks are held on SQL Server resources, such as rows read or modified during a transaction, to prevent concurrent use of resources by multiple transactions. For example, if an exclusive (X) lock is held on a row within a table by a transaction, no other transaction can modify that row until the lock is released. Minimizing locks increases concurrency, which can improve performance. Multiple instances of the Locks object can be monitored at the same time, with each instance representing a lock on a resource type.

1.24.1 For Microsoft SQL Server 2000/2005/2008

Default Collection Interval — Every 15 minutes

Table 1–33 SQL Server Locks Metrics

Metric	Description
SQL Server Locks Counter Name (key column)	Performance metric name. See Table 1–34.
SQL Server Locks Instance Name (key column)	Instance for the SQL Server Locks Counter Name.
SQL Server Locks Counter Value	Performance metric value.

The SQL Server Locks Counter Name key column contains several metrics. Table 1–34 provides a list of these metrics and a description for each.

Table 1–34 SQL Server Locks Counter Name Metrics

Metric	Description
Average Wait Time (ms)	Average amount of wait time in milliseconds for each lock request that resulted in a wait.
Average Wait Time Base	Denominator ("base") of a fraction that the performance counter Average Wait Time ratio represents.
Lock Requests/sec	Number of new locks and lock conversions per second requested from the lock manager.
Lock Timeouts/sec	Number of lock requests per second that timed out, including internal requests for NOWAIT locks.

Table 1–34 (Cont.) SQL Server Locks Counter Name Metrics

Metric	Description
Lock Waits/sec	Number of lock requests per second that could not be satisfied immediately and required the caller to wait.
Lock Wait Time (ms)	Total wait time in milliseconds for locks in the last second.
Number of Deadlocks/sec	Number of lock requests per second that resulted in a deadlock.

1.25 SQL Server Process Metrics

The MSSQL_Process class represents SQL Server processes. Note that these are not the same as an operating system's notion of a process. These are the processes identified by the SQL Server and assigned a SQL Server process ID by the SQL Server.

Default Collection Interval — Every 15 minutes

Table 1–35 SQL Server Process Metrics

Metric	Description and User Action
Process Handle (key column)	Process ID.
Blocked Process ID	ID of a process being blocked by the process.
CPU Time (ms)	Cumulative CPU usage time of the process.
Client Name	Name of the client application.
Command	Abbreviated indicator of the current command. When no command is current, it has a value of AWAITING COMMAND.
Creation Date	Time that the process began executing.
Database Name	Database currently being used by the process.
Execution State	Current operating condition of the process. Possible values are as shown: 0 — Unknown 1 — Other 2 — Ready 3 — Running 4 — Blocked 5 — Suspended Blocked 6 — Suspended Ready
Host Name	Name of the client workstation that started the SQL Server process.
Login	Login used by the process to connect to the SQL Server.
Memory Usage (pages)	Number of pages in the procedure cache that are currently allocated to this process. A negative number indicates that the process is freeing memory allocated by another process.
Process State	Whether the process is running or sleeping.

1.26 SQL Server Role Metrics

The MSSQL_Role class represents a database role or a SQL Server role. Roles establish groups of users with similar security attributes. Permissions can be granted by role, simplifying security planning and administration.

Default Collection Interval — Real Time

Table 1–36 SQL Server Role Metrics

Metric	Description
Name	Role name.
Full Name	Descriptive title for the role.

1.27 SQL Statistics Metrics

The SQL Statistics object in the Microsoft SQL Server provides counters to monitor compilation and the type of requests sent to an instance of the SQL Server. Monitoring the number of query compilations and recompilations and the number of batches received by an instance of the SQL Server indicates how quickly the SQL Server is processing user queries and how effectively the query optimizer is processing the queries.

1.27.1 For Microsoft SQL Server 2000/2005/2008

Default Collection Interval — Every 10 minutes

Table 1–37 SQL Statistics Metrics

Metric	Description
SQL Statistics Counter Name (key column)	Performance metric name. See Table 1–38.
SQL Statistics Counter Value (key column)	Performance metric value.

The SQL Statistics Counter Name key column contains several metrics. Table 1–38 provides a list of these metrics and a description for each.

Table 1–38 SQL Statistics Counter Name Metrics

Metric	Description
Auto-Param Attempts/sec	Number of auto-parameterization attempts per second. Total should be the sum of the failed, safe, and unsafe auto-parameterizations. Auto-parameterization occurs when the SQL Server attempts to reuse a cached plan for a previously executed query that is similar as the current query, but not exactly the same. For more information, see "Auto-parameterization" in the Microsoft SQL Server Introduction.
Batch Requests/sec	Number of Transact-SQL command batches received per second. This statistic is affected by all constraints (such as I/O, number of users, cache size, complexity of requests, and so forth). High batch requests mean good throughput. For more information, see "Batch Processing" in the Microsoft SQL Server Introduction.
Safe Auto-Params/sec	Number of safe auto-parameterization attempts per second.
SQL Compilations/sec	Number of SQL compilations per second. Indicates the number of times the compile code path is entered. Includes compiles due to recompiles. After SQL Server user activity is stable, this value should reach a steady state.
SQL Recompilations/sec	Number of SQL recompiles per second. Counts the number of times recompiles are triggered. Generally, the number of recompiles should be low.
Unsafe Auto-Params/sec	Number of unsafe auto-parameterization attempts per second. The table has characteristics that prevent the cached plan from being shared. These are designated as unsafe. The fewer of these that occur the better.

1.28 Server Statistics Metrics

The metrics in this category provide information about various server-related performance issues.

Default Collection Interval — Every 15 minutes

Table 1–39 Server Statistics Metrics

Metric	Description
CPU Busy Ratio	CPU utilization.
CPU ms	CPU busy time in milliseconds.
Errors / sec.	Packet error rate in seconds.
IDLE ms	CPU idle time in milliseconds.
IO ms	IO busy time in milliseconds.
Max Connections	Maximum number of connections.
Open Transactions	Total number of transactions.
Packet Error Ratio	The ratio of erroneous packets received to the number of packets received.
Packets Errors	Number of packet errors.
Packets Received	Number of received packets.
Packets Sent	Number of sent packets.
Reads / sec.	Packet read rate in seconds.
Total Errors	Total number of errors.
Total Reads	Total number of reads.
Total Writes	Total number of writes.
Writes / sec.	Packet write rate in seconds.

1.29 User Metrics

The User object exposes the attributes of a single Microsoft SQL Server database user.

Default Collection Interval — Real Time

Table 1–40 User Metrics

Metric	Description and User Action
DatabaseName (key column)	Name of the database.
Name (key column)	User name.
User Status	The status property is a string indicating the current status of the object. Various operational and non-operational statuses can be defined. Operational statuses are OK, Degraded, and Pred Fail. Pred Fail indicates that an element may be functioning properly but predicting a failure in the near future.
System Object	The SystemObject property indicates whether the object is owned by Microsoft. A value of True indicates that the object implementation is owned by Microsoft.

1.30 Windows Cluster Name Metrics

The metrics in this category provide details about the windows cluster.

1.30.1 For Microsoft SQL Server 2005

Default Collection Interval — Every 30 minutes

Table 1–41 Windows Cluster Name Metrics

Metric	Description
Cluster Name (key column)	Name of the windows cluster.
Cluster Server Name	Name of the cluster server.

1.31 Windows Cluster Nodes Metrics

The metrics in this category provide details about windows cluster nodes.

1.31.1 For Microsoft SQL Server 2005

Default Collection Interval — Every 30 minutes

Table 1–42 Windows Cluster Nodes Metrics

Metric	Description
Node Name (key column)	Name of the windows cluster node.
Cluster Server Name	Name of the cluster server.
Node Status	Status of the windows cluster node.

1.32 Windows Cluster Resources Metrics

The metrics in this category provide details about windows cluster resources.

1.32.1 For Microsoft SQL Server 2005

Default Collection Interval — Every 30 minutes

Table 1–43 Windows Cluster Resources Metrics

Metric	Description
Resource Name (key column)	Name of the windows cluster resource.
Cluster Server Name	Name of the cluster server.
Resource Status	Status of the windows cluster resource.

1.33 Cluster Name and Network Metrics

The metrics in this category provide details about the cluster name and network.

1.33.1 For Microsoft SQL Server 2005

Default Collection Interval — Every 30 minutes

Table 1–44 Cluster Name and Network Metrics

Metric	Description
Cluster Name (key column)	Name of the windows cluster.
Network Used (key column)	Name of the network used.
Cluster Server Name	Name of the cluster server.

1.34 Cluster Resource and Type Metrics

The metrics in this category provide details about the cluster resource and type.

1.34.1 For Microsoft SQL Server 2005

Default Collection Interval — Every 30 minutes

Table 1–45 Cluster Resource and Type Metrics

Metric	Description
Resource Name (key column)	Name of the windows cluster resource.
Resource Type (key column)	Type of the resource.
Cluster Server Name	Name of the cluster server.

1.35 Cluster Resource and Group Metrics

The metrics in this category provide details about the cluster resource and group.

1.35.1 For Microsoft SQL Server 2005

Default Collection Interval — Every 30 minutes

Table 1–46 Cluster Resource and Group Metrics

Metric	Description
Resource (key column)	Name of the cluster resource and group.
Resource Group (key column)	Name of the resource group.
Cluster Server Name	Name of the cluster server.

1.36 Cluster Active Group and Node Metrics

The metrics in this category provide details about the cluster active group and the node.

1.36.1 For Microsoft SQL Server 2005

Default Collection Interval — Every 30 minutes

Table 1–47 Cluster Active Group and Node Metrics

Metric	Description
Active Group (key column)	Name of the active group.
Node (key column)	Name of the node.
Resource Status	Status of the windows cluster resource.

1.37 Cluster Resource Group and Cluster Name Metrics

The metrics in this category provide details about the cluster resource group and cluster name.

1.37.1 For Microsoft SQL Server 2005

Default Collection Interval — Every 30 minutes

Table 1–48 Cluster Resource Group and Cluster Name Metrics

Metric	Description
Resource Group (key column)	Name of the resource group.
Cluster (key column)	Name of the cluster.
Cluster Server Name	Name of the cluster server.

1.38 Cluster Active Resource and Node Metrics

The metrics in this category provide details about the cluster active resource and node.

1.38.1 For Microsoft SQL Server 2005

Default Collection Interval — Every 30 minutes

Table 1–49 Cluster Active Resource and Node Metrics

Metric	Description
Active Resource Name (key column)	Name of the active resource.
Cluster Node (key column)	Name of the cluster node.
Cluster Server Name	Name of the cluster server.

1.39 Cluster Quorom Resource and Cluster Name Metrics

The metrics in this category provide details about the cluster quorom resource and cluster name.

1.39.1 For Microsoft SQL Server 2005

Default Collection Interval — Every 30 minutes

Table 1–50 Cluster Quorom Resource and Cluster Name Metrics

Metric	Description
Quorom Resource Name (key column)	Name of the quorom resource.
Cluster Name (Key Column)	Name of the the cluster.
Cluster Server Name	Name of the cluster server.

1.40 Cluster Resource and Owner Node Name Metrics

The metrics in this category provide details about the cluster resource and owner node.

1.40.1 For Microsoft SQL Server 2005

Default Collection Interval — Every 30 minutes

Table 1–51 Cluster Resource and Owner Node Name Metrics

Metric	Description
Cluster Resource (key column)	Name of the cluster resource.
Owner Node (Key column)	Name of the owner node.
Cluster Server Name	Name of the cluster server.

1.41 Cluster Resource and Cluster Name Metrics

The metrics in this category provide details about the cluster resource and cluster name.

1.41.1 For Microsoft SQL Server 2005

Default Collection Interval — Every 30 minutes

Table 1–52 Cluster Resource and Cluster Name Metrics

Metric	Description
Resource Name (key column)	Name of the resource.
Cluster Name (Key column)	Name of the cluster.
Cluster Server Name	Name of the cluster server.

1.42 Cluster Resource Group and Preferred Node Metrics

The metrics in this category provide details about the cluster resource group and preferred node.

1.42.1 For Microsoft SQL Server 2005

Default Collection Interval — Every 30 minutes

Table 1–53 Cluster Resource Group and Preferred Node Metrics

Metric	Description
Resource Group (key column)	Name of the resource group.
Preferred Node (key column)	Name of the preferred node.
Cluster Server Name	Name of the cluster server.

1.43 Index/Table Fragmentation Metrics

The metrics in this category provide information of the defragment level of Microsoft SQL Server 2005. Currently, this metric is not applicable for Microsoft SQL Server 2000. To retrieve data for this metric, DMV "sys.dm_db_index_physical_stats" is queried for each database (for all objects, indices and partitions). The scan level mode to obtain the statistics is DEFAULT or NULL (i.e., equivalent to LIMITED), which is the fastest mode and scans the smallest number of pages.

Evaluation and Collection Frequency — Every SUN

Table 1–54 Cluster Resource Group and Preferred Node Metrics

Metric	Description
Allocation Unit type Description	Description of the allocation unit type: ▪ IN_ROW_DATA ▪ LOB_DATA ▪ ROW_OVERFLOW_DAT The LOB_DATA allocation unit contains the data that is stored in columns of type text, ntext, image, varchar(max), nvarchar(max), varbinary(max), and xml. For more information, see Data Types (Transact-SQL). The ROW_OVERFLOW_DATA allocation unit contains the data that is stored in columns of type varchar(n), nvarchar(n), varbinary(n), and sql_variant that have been pushed off-row. For more information, see Row-Overflow Data Exceeding 8 KB.
Number of Index levels	1 = Heap, or LOB_DATA or ROW_OVERFLOW_DATA allocation unit.
Current Level of Index	Zero for index leaf levels, heaps, and LOB_DATA or ROW_OVERFLOW_DATA allocation units. Greater than zero for nonleaf index levels. index_level will be the highest at the root level of an index. The nonleaf levels of indexes are only processed when mode = DETAILED.

Table 1–54 (Cont.) Cluster Resource Group and Preferred Node Metrics

Metric	Description
Average Fragmentation in Percent	Logical fragmentation for indexes, or extent fragmentation for heaps in the IN_ROW_DATA allocation unit. The value is measured as a percentage and takes into account multiple files. For definitions of logical and extent fragmentation, see Remarks. Zero for LOB_DATA and ROW_OVERFLOW_DATA allocation units. NULL for heaps when mode = SAMPLED. Upload Frequency - After every sample. Alert Text - Average fragmentation for %indexid% is %avg_fragmentation_in_percent%%% where Database ID is %database_id%, Object ID is %object_id% ,Index ID is %index_ id%,Partition Number is %partition_number% and Index type Description is %index_type_desc%. It has crossed warning (%warning_threshold%%%) or critical (%critical_threshold%%%) threshold. Multiple Thresholds - For this metric you can set different warning and critical threshold values for each unique combination of " Database ID ", " Object ID ", " Index ID ", " Partition Number ", and " Index type Description " objects. If warning or critical threshold values are currently set for any unique combination of " Database ID ", " Object ID ", " Index ID ", " Partition Number ", and " Index type Description " objects, those thresholds can be viewed on the Metric Detail page for this metric. To specify or change warning or critical threshold values for each unique combination of "Database ID", "Object ID", "Index ID", "Partition Number", and "Index type Description" objects, use the Edit Thresholds page.
Number of fragments in the leaf level	Number of fragments in the leaf level of an IN_ROW_DATA allocation unit. For more information about fragments, see Remarks. NULL for nonleaf levels of an index, and LOB_DATA or ROW_OVERFLOW_DATA allocation units. NULL for heaps when mode = SAMPLED.
Average number of pages in one fragment	Average number of pages in one fragment in the leaf level of an IN_ROW_DATA allocation unit. NULL for nonleaf levels of an index, and LOB_DATA or ROW_OVERFLOW_DATA allocation units. NULL for heaps when mode = SAMPLED.
Total number of index or data pages	For an index, the total number of index pages in the current level of the b-tree in the IN_ROW_ DATA allocation unit. For a heap, the total number of data pages in the IN_ROW_DATA allocation unit. For LOB_DATA or ROW_OVERFLOW_DATA allocation units, total number of pages in the allocation unit.
Average(%) of available data storage space used	Average percentage of available data storage space used in all pages. For an index, average applies to the current level of the b-tree in the IN_ROW_DATA allocation unit. For a heap, the average of all data pages in the IN_ROW_DATA allocation unit. For LOB_DATA or ROW_OVERFLOW DATA allocation units, the average of all pages in the allocation unit. NULL when mode = LIMITED. Upload Frequency - After every sample. Alert Text - Average percentage of available data storage space used in all pages for %indexid% is %avg_page_space_used_in_percent%%% where Database ID is %database_id%, Object ID is %object_id% , Partition Number is %partition_number% and Index type Description is %index_type_desc%.It has fallen below warning (%warning_threshold%%%) or critical (%critical_threshold%%%) threshold. Multiple Thresholds - For this metric you can set different warning and critical threshold values for each unique combiation of "Database ID", "Object ID", "Index ID", "Partition Number", and "Index type Description " objects. If warning or critical threshold values are currently set for any unique combination of "Database ID", "Object ID", "Index ID", "Partition Number", and "Index type Description" objects, those thresholds can be viewed on the Metric Detail page for this metric. To specify or change warning or critical threshold values for each unique combination of "Database ID", " Object ID ", " Index ID ", "Partition Number", and "Index type Description" objects, use the Edit Thresholds page.

Table 1–54 (Cont.) Cluster Resource Group and Preferred Node Metrics

Metric	Description
Total number of records	Total number of records. For an index, total number of records applies to the current level of the b-tree in the IN_ROW_DATA allocation unit. For a heap, the total number of records in the IN_ROW_DATA allocation unit. Note: For a heap, the number of records returned from this function might not match the number of rows that are returned by running a SELECT COUNT(*) against the heap. This is because a row may contain multiple records. For example, under some update situations, a single heap row may have a forwarding record and a forwarded record as a result of the update operation. Also, most large LOB rows are split into multiple records in LOB_DATA storage. For LOB_DATA or ROW_OVERFLOW_DATA allocation units, the total number of records in the complete allocation unit. NULL when mode = LIMITED.
Number of ghost records ready for removal	Number of ghost records ready for removal by the ghost cleanup task in the allocation unit. Zero for nonleaf levels of an index in the IN_ROW_DATA allocation unit. NULL when mode = LIMITED.
Number of ghost records retained in an allocation unit	Number of ghost records retained by an outstanding snapshot isolation transaction in an allocation unit. Zero for nonleaf levels of an index in the IN_ROW_DATA allocation unit. NULL when mode = LIMITED.
Minimum record size in bytes	For an index, minimum record size applies to the current level of the b-tree in the IN_ROW_DATA allocation unit. For a heap, the minimum record size in the IN_ROW_DATA allocation unit. For LOB_DATA or ROW_OVERFLOW_DATA allocation units, the minimum record size in the complete allocation unit. NULL when mode = LIMITED.
Maximum record size in bytes	For an index, the maximum record size applies to the current level of the b-tree in the IN_ROW_DATA allocation unit. For a heap, the maximum record size in the IN_ROW_DATA allocation unit. For LOB_DATA or ROW_OVERFLOW_DATA allocation units, the maximum record size in the complete allocation unit. NULL when mode = LIMITED.
Average record size in bytes	For an index, the average record size applies to the current level of the b-tree in the IN_ROW_DATA allocation unit. For a heap, the average record size in the IN_ROW_DATA allocation unit. For LOB_DATA or ROW_OVERFLOW_DATA allocation units, the average record size in the complete allocation unit. NULL when mode = LIMITED.
Number of records in a heap that have forward pointers	Number of records in a heap that have forward pointers to another data location. (This state occurs during an update, when there is not enough room to store the new row in the original location.) NULL for any allocation unit other than the IN_ROW_DATA allocation units for a heap. NULL for heaps when mode = LIMITED.

2

IBM DB2 Database Metrics

This chapter provides descriptions for all IBM DB2 Database metric categories, and tables list and describe associated metrics for each category. The tables also provide user actions if any of the metrics for a particular category support user actions. Shaded rows represent key columns for a particular category.

2.1 Connections

Connections metrics provide the connection details for the database at the Agent level and at the Database Manager level. Connections metrics consist of the following categories:

- Agent Collection Statistics
- Connected Applications Statistics

2.1.1 Agent Connection Statistics Metrics

The metrics in this category return the Agent connection statistics, including the configured values and the current parameter values at the Database Manager snapshot level.

Default Collection Interval — Every 15 minutes

Table 2–1 Agent Connection Statistics Metrics

Metric	Description and User Action
Agent Created Due to Empty Pool	Number of Agents created due to an empty pool.
Agent Creation Rate	Creation rate for Agents in the last interval, which equals: `(agents_created_empty_pool-agents_created_empty_pool)/ __interval` Increase the value of the configuration parameter `agents_created_empty_pool`.
Agent Creation to Assignment Ratio	Creation to assignment ratio, which equals: `(agents_created_empty_pool /agents_from_pool)` Increase the value of the configuration parameter `agents_from_pool`.
Agent Limit	Number of Agents the Database Manager can create.
Agent Waiting Top	Maximum number of Agents that have ever waited.
Agents Assignment Rate	Assignment rate for Agents in the last interval, which equals: `(agents_from_pool-agents_from_pool) /__interval` Increase the value of the configuration parameter `agents_from_pool`.
Agents From Pool	Number of Agents from the pool.
Agents Registered	Number of registered Agents.

Table 2–1 (Cont.) Agent Connection Statistics Metrics

Metric	Description and User Action
Agents Waiting on Token	Number of Agents waiting on a token.
Coordination Agent Limit	Maximum number of coordination Agents the Database Manager can create.
Idle Agents	Number of idle Agents.
Maximum Agents Registered	Maximum number of registered Agents.
Maximum Coordination Agents	Maximum number of coordination Agents the database has created.

2.1.2 Connected Applications Statistics Metrics

The metrics in this category return the current connection information at both the database and Database Manager snapshot level, including the number of active connections.

Default Collection Interval — Every 15 minutes

Table 2–2 Connected Applications Statistics Metrics

Metric	Description
Database Name (key column)	Name of the database
Remote Connections	Current number of connections initiated from remote clients to the instance of the database manager that is being monitored.
Local Connections	Number of local applications currently connected to a database within the database instance being monitored.
Remote Connections in Execution	Number of remote applications currently connected to a database and are currently processing a unit of work within the database manager instance being monitored.
Local Connections in Execution	Number of local applications currently connected to a database that are currently processing a unit of work within the database manager instance being monitored.
Connects Since Database Activation	Number of connections to the database since the first connect, activate, or last reset (coordinator Agents).
Applications Connected Currently	Number of applications currently connected to the database.
Applications Executing in the Database	Number of applications currently connected to the database, and for which the database manager is currently processing a request.

2.2 Database Manager Configuration Information

Database Manager Configuration Information metrics describe a set of Database Manager configuration parameters. These values are of two types: in hard disk and in memory, which is the type presented here. Database Manager Configuration Information metrics consist of the following categories:

- Capacity
- Logging and Recovery
- Connection
- Partitioned Database Environment
- Database Instance

2.2.1 Capacity Metrics

The metrics in this category return the Database Manager capacity configuration parameters that can impact the throughput on your system.

- Table Name — MGMT_EMX_IBMDB2_DBMCAP
- View Name — MGMT_EMX_IBMDB2_DBMCAP_VIEW

Default Collection Interval — Every 24 hours

Table 2–3 Capacity Metrics

Metric	Description
Application Support Layer Size	The application support layer heap represents a communication buffer between the local application and its associated Agent.
Database System Monitor Heap Size	Determines the amount of memory, in pages, to allocate for database monitor data.
Audit Buffer Size	Specifies the size of the buffer used when auditing the database.
Maximum Java Interpreter Heap Size	Determines the maximum size of the heap used by the Java interpreter started to service Java DB2 stored procedures and UDFs.
Maximum Total Files Open	Defines the maximum number of files that can be opened by all Agents and other threads executing in a single database manager instance.
Priority of Agents	Controls the priority the operating system scheduler gives to all Agents and other database manager instance processes and threads.
Maximum Number of Agents	Indicates the maximum number of database manager Agents, whether coordinator Agents or sub-Agents, available at any given time to accept application requests.
Maximum Number of Concurrent Agents	Maximum number of database manager Agents that can concurrently execute a database manager transaction.
Agent Pool Size	Determines the maximum size of the idle Agent pool.
Initial Number of Agents in Pool	Determines the initial number of idle Agents created in the Agentpool at DB2START time.
Sort Heap Threshold	The size of the shared sort memory is statically predetermined at the time of the first connection to a database based on the value of `sheapthreas`.

2.2.2 Connection Metrics

The metrics in this category return the parameters that provide information about using DB2 in a client/server environment.

- Table Name — MGMT_EMX_IBMDB2_DBMCON
- View Name — MGMT_EMX_IBMDB2_DBMCON_VIEW

Default Collection Interval — Every 24 hours

Table 2–4 Connection Metrics

Metric	Description
TCP/IP Service Name	Contains the name of the TCP/IP port that a database server uses to communicate to the client.
Search Discovery Communications Protocols	From an administration server perspective, this metric defines the search discovery managers started when DB2ADMIN starts.

2.2.3 Database Instance Metrics

The metrics in this category return the parameters that provide information about Database Manager instances.

- Table Name — MGMT_EMX_IBMDB2_DBMDBINST
- View Name — MGMT_EMX_IBMDB2_DBMDBINST_VIEW

Default Collection Interval — Every 24 hours

Table 2–5 Database Instance Metrics

Metric	Description
Diagnostic Error Capture Level	Determines the type of diagnostic errors recorded in the `db2diag.log`.
Diagnostic Directory Data Path	Enables you to specify the fully qualified path for DB2 diagnostic information.
Notify Level Raw	Specifies the type of administration notification messages written to the administration notification log.
Default Database System Monitor Switches	Unique metric that enables you to set several switches, each of which are internally represented by a bit of the metric.
Communications Bandwidth	Value calculated for the communications bandwidth in MB per second.
CPU Speed Raw	The CPU speed, in milliseconds per instruction, used by the SQL optimizer to estimate the cost of performing certain operations.
Maximum Number of Concurrently Active Databases	Specifies the number of local databases that can be concurrently active.
System Administration Authority Group Name	Defines the group name with SYSADM authority for the database manager instance.
Notify Level	If `notifylevel_raw` equals: 0 — No messages 1 — Fatal or unrecoverable errors 2 — All Immediate action required messages 3 — All Important information (no immediate action required) Otherwise, All Informational messages.
CPU Speed	CPU speed in MIPs, which equals: `1/(cpuspeed_raw*1000)`

2.2.4 Logging and Recovery Metrics

The metrics in this category save the logging and recovery information. Recovering your environment can be very important to prevent the loss of critical data. A number of parameters are available to help you manage your environment and to ensure that you can adequately recover your data or transactions.

- Table Name — MGMT_EMX_IBMDB2_DBMLOGREC
- View Name — MGMT_EMX_IBMDB2_DBMLOGREC_VIEW

Default Collection Interval — Every 24 hours

Table 2–6 Logging and Recovery Metrics

Metric	Description
Transaction Manager Database Name	Identifies the name of the transaction manager (TM) database for each DB2 instance.
Transaction Resync Interval	Specifies the time interval in seconds for which a transaction manager (TM), resource manager (RM), or sync point manager (SPM) should retry the recovery of any outstanding transactions in doubt found in the TM, RM, or SPM.
Sync Point Manager Name	Identifies the name of the sync point manager (SPM) instance to the database manager.
Sync Point Manager Log File Size	Identifies the sync point manager (SPM) log file size in 4 KB pages.
Sync Point Manager Resync Agent Limit	Identifies the number of Agents that can simultaneously perform resync operations.

2.2.5 Partitioned Database Environment Metrics

The metrics in this category return parameters about parallel operations and partitioned database environments.

- Table Name — MGMT_EMX_IBMDB2_DBMPARENV
- View Name — MGMT_EMX_IBMDB2_DBMPARENV_VIEW

Default Collection Interval — Every 24 hours

Table 2–7 Partitioned Database Environment Metrics

Metric	Description
Connection Elapsed Time	Specifies the number of seconds within which a TCP/IP connection is to be established between two database partition servers.
Number of FCM Buffers	Specifies the number of 4 KB buffers used for internal communications (messages) both among and within database servers.
Node Connection Retries	`max_connretries` specifies the number of connection retries that can be made to a database partition server.
Maximum Time Difference Among Nodes	Each database partition server has its own system clock. This metric specifies the maximum time difference, in minutes, that is permitted among the database partition servers listed in the node configuration file.
Start and Stop Timeout	Applicable only in a partitioned database environment.

2.3 Health Indicators/Alarms

Health Indicators/Alarms metrics return the health information and current values for all the snapshot levels of containers, tablespaces, databases and the Database Manager. Health Indicators/Alarms metrics consist of the following categories:

- Container Health Indicator
- Container Health Information
- Database Health Indicator
- Database Health Information
- Database Collection Health Indicator
- DBM Health Indicator
- DBM Health Information

- Tablespaces Health Indicator
- Tablespaces Health Indicator History

2.3.1 Container Health Indicator Metrics

The metrics in this category return health indicator information for tablespace containers from a health snapshot of tablespaces in a database.

Default Collection Interval — Every 30 minutes

Table 2–8 Container Health Indicator Metrics

Metric	Description and User Action
Container Name	Name of the container.
Health Indicator Alert State	State of the alert. If `alert_state_raw` equals: 1 — Normal 2 — Attention 3 — Warning 4 — Alarm A warning or alarm condition indicates that you should examine the Health Indicator Alert Type.
Health Indicator Alert State Raw	Severity of the alert.
Health Indicator Alert Type	Type of alert. If `alert_state_raw` equals: 3001 — Tablespace Container State 3002 — Tablespace Container Utilization
Health Indicator Identifier	Identifier for the alert.
Health Indicator Timestamp	Time when the alert was generated.
Health Indicator Value	Value for the alert.
Node Number	Node at which the alert was generated.
Snapshot Timestamp	Time when the query was executed.
Additional Information	Additional information present in the Container Health Indicator metrics.

2.3.2 Container Health Information Metrics

The metrics in this category return container information from a health snapshot of a database.

Default Collection Interval — Every 30 minutes

Table 2–9 Container Health Information Metrics

Metric	Description and User Action
Container Name (key column)	Name of the container.
Tablespace Name (key column)	Name of the tablespace to which the container belongs.
Node Number	Node at which the container resides.

Table 2–9 (Cont.) Container Health Information Metrics

Metric	Description and User Action
Rolled Up Alert State	If `alert_state_raw` equals: 1 — Normal 2 — Attention 3 — Warning 4 — Alarm
Rolled Up Alert State Raw	Severity of the alert.
Snapshot Timestamp	Time when the query was executed.

2.3.3 Database Collection Health Indicator Metrics

The metrics in this category return container information from a health snapshot of a database.

Default Collection Interval — Every 30 minutes

Table 2–10 Database Collection Health Indicator Metrics

Metric	Description and User Action
Database Name (key column)	Name of the database.
Health Indicator Detail	Description of the object.
Health Indicator ID	Identifier for the alert.
Health Indicator Object Name	Name of the object.
Health Indicator Object State Detail	Type of alert state. A warning or alarm condition indicates that the Health Indicator Alert Type should be examined.
Health Indicator Object State	Severity of the alert.
Health Indicator Timestamp	Time when the alert was generated.
Snapshot Timestamp	Time when the query was executed.

2.3.4 Database Health Indicator Metrics

The metrics in this category return health indicator information from a health snapshot of a database.

Default Collection Interval — Every 30 minutes

Table 2–11 Database Health Indicator Metrics

Metric	Description and User Action
Database Name (key column)	Name of the database.
Health Indicator Alert State Raw	Severity of the alert.
Health Indicator Alert State	If `alert_state_raw` equals: 1 — Normal 2 — Attention 3 — Warning 4 — Alarm A warning or alarm condition indicates that the Health Indicator Alert Type should be examined.
Health Indicator Alert Type	If `alert_state_raw` equals: 3001 — Tablespace Container State 3002 — Tablespace Container Utilization
Health Indicator ID	Identifier for the alert.
Health Indicator Timestamp	Time when the alert was generated.
Health Indicator Value	Value for the alert.
Snapshot Timestamp	Time when the query was executed.
Additional Information	Additional information present in the Database Health Indicator metrics.

2.3.5 Database Health Information Metrics

The metrics in this category return information from a health snapshot of a database.

Default Collection Interval — Every 30 minutes

Table 2–12 Database Health Information Metrics

Metric	Description and User Action
Database Name (key column)	Name of the database.
Database Path	Physical path of the database.
Database Location	Location of the database. If `db_location_raw` equals: 0 — Local 1 — Remote
Database Location Raw	Location of the database with respect to the DBM.
Health Indicator Alert State	If `alert_state_raw` equals: 1 — Normal 2 — Attention 3 — Warning 4 — Alarm A warning or alarm condition indicates there are one or more alerts on the database.
Health Indicator Alert State Raw	Severity of the alert.
Input Database Alias	Alias name for the database.
Server Platform	Platform where the database is installed.
Snapshot Timestamp	Time when the query was executed.

2.3.6 DBM Health Indicator Metrics

The metrics in this category return health indicator information from a health snapshot of the DB2 Database Manager.

Default Collection Interval — Every 30 minutes

Table 2–13 DBM Health Indicator Metrics

Metric	Description and User Action
Database Name (key column)	Name of the database.
Health Indicator Alert State Raw	Severity of the alert.
Health Indicator Alert Type	If `alert_state_raw` equals: 3001 — Tablespace Container State 3002 — Tablespace Container Utilization
Health Indicator Alert State	If `alert_state_raw` equals: 1 — Normal 2 — Attention 3 — Warning 4 — Alarm A warning or alarm condition indicates that the Health Indicator Alert Type should be examined.
Health Indicator ID	Identifier for the alert.
Health Indicator Timestamp	Time when the alert was generated.
Health Indicator Value	Value for the alert.
Server Instance Name	Host name where DB2 is installed.
Snapshot Timestamp	Time when the query was executed.
Additional Information	Additional information present in the DBM Health Indicator metrics.

2.3.7 DBM Health Information Metrics

The metrics in this category return information from a health snapshot of the DB2 Database Manager.

Default Collection Interval — Every 30 minutes

Table 2–14 DBM Health Information Metrics

Metric	Description and User Action
Server Instance Name (key column)	Host name where DB2 is installed.
Database Start Up Time	Time DB2 was last started.
Database Last Reset Time	Time DB2 was last reset.
Number of Nodes in DB2 Instance	Number of nodes in the DB2 instance.
Rolled Up Alert State Raw	Host name where DB2 is installed.

Table 2–14 (Cont.) DBM Health Information Metrics

Metric	Description and User Action
Rolled Up Alert State	If `alert_state_raw` equals: 1 — Normal 2 — Attention 3 — Warning 4 — Alarm A warning or alarm condition indicates there are one or more alerts on the DBM.
Server Instance Name	Host name where DB2 is installed.
Snapshot Timestamp	Time when the query was executed.

2.3.8 Tablespaces Health Indicator

The metrics in this category return health indicator information for tablespaces from a health snapshot of tablespaces in a database.

Default Collection Interval — Every 30 minutes

Table 2–15 Tablespaces Health Indicator Metrics

Metric	Description and User Action
Tablespace Name (key column)	Name of the tablespace.
Health Indicator Alert State Raw	Severity of the alert.
Health Indicator Alert State	If `alert_state_raw` equals: 1 — Normal 2 — Attention 3 — Warning 4 — Alarm
Health Indicator Alert Type	If `alert_state_raw` equals: 3001 — Tablespace Container State 3002 — Tablespace Container Utilization
Health Indicator ID	Identifier for the alert.
Health Indicator Timestamp	Time when the alert was generated.
Health Indicator Value	Value for the alert.
Snapshot Timestamp	Time when the query was executed.
Additional Information	Additional information present in the Tablespace Health Indicator metrics.

2.3.9 Tablespaces Health Indicator History

The metrics in this category return health indicator information for tablespaces from a health snapshot of tablespaces in a database.

Default Collection Interval — Every 30 minutes

Table 2–16 Tablespaces Health Indicator History Metrics

Metric	Description and User Action
Tablespace Name (key column)	Name of the tablespace.
Rolled Up Alert State Raw	Severity of the alert.
Rolled Up Alert State	If `alert_state_raw` equals: 1 — Normal 2 — Attention 3 — Warning 4 — Alarm
Snapshot Timestamp	Time when the query was executed.

2.4 Monitoring Information

Monitoring Information metrics capture the monitoring information for the database, including general monitoring information, monitored values of the Agent, and monitored values of the database. Monitoring Information metrics consist of the following categories:

- General Information
- Agent Monitoring
- Database Monitoring
- Database Backup

2.4.1 Agent Monitoring Metrics

The metrics in this category return information about Agents from an application snapshot.

Default Collection Interval — Every 15 minutes

Table 2–17 Agent Monitoring Metrics

Metric	Description and User Action
Agent CPU Utilization (%)	Total CPU utilization, which is equal to: `Agent_total_cpu_time-_Agent_total_cpu_time )/1000)/__interval)*100`
Agent Identifier	Unique ID for each Agent.
Agent System CPU Time	Total system time used by DBM for processing by the Agent if it is an application-level snapshot, or by a statement if it is at the statement level.
Agent User CPU Time	Total user time used by DBM for processing by the Agent if it is an application-level snapshot, or by a statement if it is at the statement level.
Application Average Lock Wait Time (ms)	The average waiting time for locks, which equals: `lock_wait_time / lock_wait` If the average lock wait time is high, you should look for applications that hold many locks, or have lock escalations, with a focus on tuning your applications to improve concurrency, if appropriate. If escalations are causing a high average lock wait time, the values of one or both of the locklist and maxlocks configuration parameters may be too low.
Application Commit SQL Statements Rate	Commit SQL statements reading rate, which equals: `commit_sql_stmts - _commit_sql_stmts/ __interval` You can set the desired value for the warning and critical thresholds to monitor any adverse conditions.

Table 2–17 (Cont.) Agent Monitoring Metrics

Metric	Description and User Action
Application Dynamic SQL Statements Rate	Dynamic SQL statements reading rate, which equals: `dynamic_sql_stmts - _dynamic_sql_stmts/ __interval` You can set the desired value for the warning and critical thresholds to monitor any adverse conditions.
Application Failed SQL Statements Rate	Failed SQL statements reading rate, which equals: `failed_sql_stmts - _failed_sql_stmts/ __interval` You can set the desired value for the warning and critical thresholds to monitor any adverse conditions.
Application Identifier	Unique ID for each application.
Application Idle Time	Time spent idle for an application.
Application Name	Name of the application.
Application Rollback SQL Statements Rate	Rollback SQL statements reading rate, which equals: `rollback_sql_stmts - _rollback_sql_stmts/ __interval` You can set the desired value for the warning and critical thresholds to monitor any adverse conditions.
Application Row Reading Rate	Rows reading rate in the last interval, which equals: `rows_read - rows_read)/__interval` You can set the desired value for the warning and critical thresholds to monitor any adverse conditions.
Application Row Writing Rate	Rows writing rate in the last interval, which equals: `rows_written - rows_written)/__interval` You can set the desired value for the warning and critical thresholds to monitor any adverse conditions.
Application Static SQL Statements Rate	Static SQL statements reading rate, which equals: `static_sql_stmts - _static_sql_stmts/ __interval` You can set the desired value for the warning and critical thresholds to monitor any adverse conditions.
Application Priority	Priority of Agents working for this application.
Application Status	Status of the application corresponding to the value of `application_status_raw`.
Authorization ID	Authorization ID of the user who invoked the application being monitored. On a DDCS gateway node, this is the user's authorization ID on the host.
Average Sort Time per Sort	Average sort time per sort for the statement, which equals: `stmt_sorts/total_sort_time`
Client Database Alias	Alias of the database provided by the application to connect to the database.
Client Node Number	`client_nname` in the database manager configuration file at the client node.
Commit SQL Statements	Number of commit SQL statements.
Coordinator Agent Process Identifier	Process ID (UNIX systems) or thread ID (Windows systems) of the coordinator Agent for the application.
Current Agents Waiting on Locks	Number of applications waiting for a lock held by other applications.
Dynamic SQL Statements	Number of dynamic SQL statements.
Exclusive Lock Escalations	Number of exclusive lock escalations.
Execution Elapsed Time	Sum of the host execution times (in milliseconds) for all the statements that were executed for a particular application.

Table 2–17 (Cont.) Agent Monitoring Metrics

Metric	Description and User Action
Execution Identifier	ID that the user specified when logging in to the operating system. This ID is distinct from the Authorization ID, which the user specifies when connecting to the database.
Failed SQL Statements	Number of failed SQL statements.
Host CPU Usage Per Sec (%)	Ratio of CPU time utilized in the last interval, which equals: `elapsed_exec_time_ms - elapsed_exec_time_ms / __interval` You can set the desired value for the warning and critical thresholds to monitor any adverse conditions.
Lock Timeouts	Number of lock timeouts for the application.
Lock Escalations	Number of lock escalations.
Number of Deadlocks	Total number of deadlocks that have occurred.
Number of Lock Waits	Number of times the application waited for locks.
Number of Locks Currently Held	Number of locks currently held by an application.
Number of Rows Read	Total number of rows read.
Number of Rows Written	Total number of rows written.
Number of Sorts	Number of sorts performed by the statement.
Prefetch Wait Time	IO wait time.
Rows Read	Number of rows read.
Rows Written	Number of rows written.
Rollback SQL Statements	Number of rollback SQL statements.
Start Time	Start time of the statement.
Statement Operation	Statement operation value.
Statement System CPU Time	Total system time used by DBM for processing by the Agent/statement.
Statement User CPU Time	Total user time used by DBM for processing by the Agent/statement.
Statement Text	Whole query or the statement executed.
Statement Type	Number of requests to perform a direct write of one or more sectors of data.
Statement User CPU Time	Total user time DBM used for processing by the Agent/statement.
Static SQL Statements	Number of static SQL statements.
Time Waited on Locks	Total time the application waited for locks.
Total Sorts	Total number of sorts.
Total Sort Time (ms)	Total time used for sorting.
Total CPU Time	Total CPU time, which equals: `stmt_usr_cpu_time + stmt_sys_cpu_time`
Total CPU Time Used by Agent	Total CPU time, which equals: `agent_usr_cpu_time + agent_sys_cpu_time`

2.4.2 Database Monitoring Metrics

The metrics in this category return snapshot information from the database and `detail_log` logical data groups.

Default Collection Interval — Every 15 minutes

Table 2–18 Database Monitoring Metrics

Metric	Description
Database Name (key column)	Real name of the database for which information is collected or to which the application is connected. This is the name the database was given when created.
Allocated Database Size (Bytes)	Capacity of the database. (Not available in partitioned databases.)
Application Average Lock Wait Time (ms)	Average waiting time for locks, which equals: `lock_wait_time/lock_wait` High wait for an application can mean that the application is degrading performance.
Commit SQL Statements	Number of applications waiting for a lock on an object in the database. Number of commit SQL statements.
Current Agents Waiting on Locks	Number of applications waiting for a lock on an object in the database.
Database Commit SQL Statements Rate	Commit SQL statement reading rate, which equals: `commit_sql_stmts - _commit_sql_stmts/ __interval` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Database Connection Time	Last time the database was connected.
Database Disconnection Time	Last disconnection time for the database.
Database Dynamic SQL Statements Rate	Dynamic SQL statement reading rate, which equals: `dynamic_sql_stmts - _dynamic_sql_stmts/ __interval` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Database Failed SQL Statements Rate	Failed SQL statement reading rate, which equals: `failed_sql_stmts - _failed_sql_stmts/ __interval` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Database Location	Location of the database. Local — if `db_location_raw` = 0 Remote — if `db_location_raw` = 1
Database Location Raw	Location of the database (local or remote).
Database Path	Physical disk location of the database.
Database Rollback SQL Statements Rate	Rollback SQL statement reading rate, which equals: `rollback_sql_stmts - _rollback_sql_stmts/ __interval` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Database Size	Size of the database in bytes.
Database Space Utilization (%)	Total percentage space utilization in the database, which equals: `(db_size/db_capacity) *100`
Database Static SQL Statements Rate	Static SQL statement reading rate, which equals: `static_sql_stmts - _static_sql_stmts/ __interval` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Database Status	Status of the database.

Table 2–18 (Cont.) Database Monitoring Metrics

Metric	Description
Deadlocks Rate	Rate of deadlocks, which equals: `(deadlocks-_deadlocks)/_interval` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Dynamic SQL Statements	Number of dynamic SQL statements.
Exclusive Lock Escalation Rate	Rate of exclusive lock escalations, which equals: `(x_lock_escals-_x_lock_escals)/__interval` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Exclusive Lock Escalations	Number of exclusive lock escalations.
Failed SQL Statements	Number of failed SQL statements.
Instance ID	Name of the database manager instance for which the snapshot was taken.
Internal Deadlock Rollback Rate	Rate of internal deadlock rollbacks, which equals: `(int_deadlock_rollbacks-_int_deadlock_rollbacks) /__interval` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Lock Escalations	Number of lock timeouts for the application.
Lock Escalation Rate	Rate of lock escalations, which equals: `(lock_escals-_lock_escals)/__interval` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Lock Timeouts	Number of lock escalations.
Locks Timeout Rate	Rate of lock timeouts. The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Number of Current Locks Held	Number of locks currently held by an application.
Number of Currently Active Connections	Total number of active connections in the database.
Number of Currently Connected Applications	Total number of currently connected applications.
Number of Deadlocks	Total number of deadlocks that have occurred.
Number of Internal Rollbacks	Total number of internal deadlock rollbacks.
Number of Lock Waits	Number of times the application waited for locks.
Percentage Applications Waiting on Locks	Ratio of applications waiting on locks, which equals: `(locks_waiting /appls_cur_cons)*100` If a large number of applications are waiting on locks, this indicates a possible performance degradation.
Rollback SQL Statements	Number of rollback SQL statements.
Static SQL Statements	Number of static SQL statements.
Time Waited on Locks	Total time the application waited for locks.
Total Locklist Memory in Use	Total lock list memory in use.

2.4.3 Database Backup Metrics

The metrics in this category provide information regarding the last database backup.

Default Collection Interval — Every 2 hours

Table 2–19 Database Backup Metrics

Metric	Description
Database Name (key column)	Real name of the database for which information is collected or to which the application is connected. This is the name the database was given when created.
Instance ID	Name of the database manager instance for which the snapshot was taken.
Database Last Backup	Last backup of the database.

2.4.4 General Information Metrics

The metrics in this category provide basic information about the status of the databases and some of the important configuration values.

Default Collection Interval — Every 15 minutes

Table 2–20 General Information Metrics

Metric	Description and User Action
DB2 Start Time	Date and time that the database manager was started using the `db2start` command.
DB Status Value	Status of the DB2 instance.
Agents Registered	Number of Agents registered in the DBM instance that is being monitored.
Communication Private Memory	Amount of communication private memory.
Sort Heap Allocated	Amount of memory allocated to sort heap.
Sort Heap Threshold	Maximum number of private memory pages to be used for private sorts, or the maximum number of shared memory pages to be used for shared sorts. If the sort is a private sort, this parameter affects Agent private memory. If the sort is a shared sort, this parameter affects the database shared memory. Each sort has a separate sort heap that is allocated as needed by the Database Manager. This sort heap is the area where data is sorted. If directed by the optimizer, a smaller sort heap than the one specified by this metric is allocated using information provided by the optimizer.
DB2 Status	Status of the DB2 instance. If DB2 status equals: 0 — Active 1 — Quiesce Pending 2 — Quiesced
Sort Heap Utilization	Sort heap utilization, which equals: `sort_heap_allocated / sortheap_threshold *100` Increase the value of the configuration parameter, `sheapthres`.

2.5 Performance

Performance metrics provide information regarding the performance at various snapshot levels. Performance metrics consist of the following categories:

- Memory Manager
- Sort Heap
- Bufferpool Database Performance
- Bufferpool Performance

- Cache Statistics
- Agent Performance
- Log IO Performance
- Non-Buffered IO Activity

2.5.1 Agent Performance Metrics

The metrics in this category provide performance metrics for the Agent at the application snapshot level.

Default Collection Interval — Every 15 minutes

Table 2–21 Agent Performance Metrics

Metric	Description and User Action
Database Name (key column)	Real name of the database for which information is collected or to which the application is connected. This is the name the database was given when created.
Cleans for Steals	Number of times a page cleaner was invoked because a synchronous write was needed during the victim buffer replacement for the database.
Cleans for Threshold	Number of times a page cleaner was invoked because a buffer pool had reached the dirty page threshold criterion for the database.

2.5.2 Bufferpool Database Performance Metrics

The metrics in this category provide performance metrics for all the bufferpools in the database.

Default Collection Interval — Every 15 minutes

Table 2–22 Bufferpool Database Performance Metrics

Metric	Description and User Action
Database Name (key column)	Real name of the database for which information is collected or to which the application is connected. This is the name the database was given when created.
Average Data Write Rate	Pool data write rate, which equals: `(pool_data_writes/pool_write_time)`
Average Index Write Rate	Pool index write rate, which equals: `(pool_index_writes/pool_write_time)`
Average Page Read Rate	The rate equals: `(pool_data_p_reads + pool_index_p_reads )/pool_read_time`
Average Page Write Rate	The rate equals: `(pool_data_writes + pool_index_writes)/pool_write_time`
Database Buffer Pool Hit Ratio (%)	The ratio equals: `(1-((pool_data_p_reads + pool_index_p_reads)/ (pool_index_l_reads + pool_index_l_reads )))*100` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Logical Data Read Rate	The rate equals: `(pool_data_l_reads /pool_read_time)`
Logical Index Read Rate	The rate equals: `(pool_index_l_reads /pool_read_time)`

Table 2–22 (Cont.) Bufferpool Database Performance Metrics

Metric	Description and User Action
Physical Index Read Rate	The rate equals: `(pool_index_p_reads/pool_read_time)`
Physical Index Read Rate	The rate equals: `pool_data_p_reads/pool_read_time`
Pool Logical Data Reads	This count includes accesses to data that is already in the buffer pool when the database manager needs to process the page and read into the buffer pool before the database manager can process the page.
Pool Logical Index Reads	Number of logical read requests to get index pages into the buffer pool.
Pool Physical Data Reads	Number of read requests that required I/O to get data pages into the buffer pool.
Pool Physical Index Reads	Number of physical read requests to get index pages into the buffer pool.
Pool Asynchronous Data Reads	Number of data pages read asynchronously to the buffer pool by prefetchers.
Pool Asynchronous Data Writes	Number of times a buffer pool data page was physically written to disk by either an asynchronous page cleaner or a prefetcher.
Pool Asynchronous Index Reads	Number of index pages read asynchronously to the buffer poll by prefetchers.
Pool Asynchronous Index Writes	Number of times a buffer pool index page was physically written to disk by either an asynchronous page cleaner or a prefetcher.
Pool Asynchronous Read Time	Number of times a buffer pool data page was physically read from disk by an asynchronous page prefetcher.
Pool Asynchronous Write Time (ms)	Number of times a buffer pool index page was physically written to disk by either an asynchronous page cleaner or prefetcher.
Pool Data Writes	Number of times the buffer pool data page was physically written to the disk.
Pool Index Writes	Number of times the buffer pool index page was physically written to the disk.
Pool Logical Data Reads	This count includes accesses to data that is already in the buffer pool when the database manager needs to process the page and read into the buffer pool before the database manager can process the page.
Pool Logical Index Reads	Indicates the number of logical read requests to get index pages into the buffer pool.
Pool Physical Index Reads	Indicates the number of physical read requests to get index pages into the buffer pool.
Pool Physical Data Reads	Number of read requests that required I/O to get data pages into the buffer pool.
Pool Read Time (ms)	Provides the total amount of elapsed time spent processing read requests that caused data or index pages to be physically read from disk to buffer pool.
Pool Write Time (ms)	Total amount of time spent physically writing data or index pages from the buffer pool to disk.
Synchronous Data Read Rate	Total synchronous read rate, which equals: `((pool_read_time-pool_async_read_time == 0) ? 0 :((pool_data_p_reads-pool_async_data_reads )/(pool_read_time-pool_async_read_time)))`

Table 2–22 (Cont.) Bufferpool Database Performance Metrics

Metric	Description and User Action
Synchronous Data Write Rate	Pool data synchronous write rate, which equals: `((pool_data_writes - pool_async_data_writes )/(pool_write_time-pool_async_write_time))`
Synchronous Index Read Rate	Index synchronous read rate, which equals: `(pool_data_p_reads-pool_async_index_reads )/(pool_read_time-pool_async_read_time)`
Synchronous Index Write Rate	Index synchronous write rate, which equals: `((pool_index_writes - pool_async_index_writes )/(pool_write_time-pool_async_write_time))`

2.5.3 Bufferpool Performance Metrics

The metrics in this category provide performance metrics for the individual bufferpools in the database.

Default Collection Interval — Every 15 minutes

Table 2–23 Bufferpool Performance Metrics

Metric	Description and User Action
Buffer Pool Name (key column)	Name of the bufferpool.
Database Buffer Pool Hit Ratio (%)	Buffer pool hit ratio, which equals: `(1-((pool_data_p_reads + pool_index_p_reads)/(pool_index_l_reads + pool_index_l_reads )))*100)` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Database Name	Real name of the database for which information is collected or to which the application is connected. This is the name the database was given when created.
Database Alias	Alias for the database.
Database Path	Physical location of the database.
Pool Asynchronous Data Reads	Number of data pages read asynchronously to the buffer poll by prefetchers.
Pool Asynchronous Data Writes	Number of times a buffer pool data page was physically written to disk by either an asynchronous page cleaner or a prefetcher.
Pool Asynchronous Index Reads	Number of index pages read asynchronously to the buffer poll by prefetchers.
Pool Asynchronous Index Writes	Number of times a buffer pool index page was physically written to disk by either an asynchronous page cleaner or prefetcher.
Pool Asynchronous Read Time (ms)	Number of times a buffer pool data page was physically read from disk by an asynchronous page prefetcher.
Pool Asynchronous Write Time (ms)	Number of times a buffer pool index page was physically written to disk by either an asynchronous page cleaner or prefetcher.
Pool Data Writes	Number of times the buffer pool data page was physically written to the disk.
Pool Index Writes	Number of times the buffer pool index page was physically written to the disk.
Pool Logical Data Reads	This count includes accesses to data that is already in the buffer pool when the database manager needs to process the page and read into the buffer pool before the database manager can process the page.
Pool Logical Index Reads	Indicates the number of logical read requests to put index pages into the buffer pool.

Table 2–23 (Cont.) Bufferpool Performance Metrics

Metric	Description and User Action
Pool Physical Index Reads	Indicates the number of physical read requests to put index pages into the buffer pool.
Pool Physical Data Reads	Number of read requests that required I/O to put data pages into the buffer pool.
Pool Read Time (ms)	Provides the total amount of elapsed time spent processing read requests that caused data or index pages to be physically read from the disk to the buffer pool.
Pool Write Time (ms)	Total amount of time spent physically writing data or index pages from the buffer pool to the disk.

2.5.4 Cache Statistics Metrics

The metrics in this category provide performance information for the package and the catalog cache of the database.

Default Collection Interval — Every 15 minutes

Table 2–24 Cache Statistics Metrics

Metric	Description and User Action
Database Name (key column)	Real name of the database for which information is collected or to which the application is connected. This is the name the database was given when created.
Catalog Cache Hit Ratio (%)	Catalog cache hit ratio, which equals: `1-(cat_cache_inserts /cat_cache_lookups))*100` The hit ratio is a percentage indicating how well the catalog cache is helping to avoid actual accesses to the catalog on disk. A high ratio indicates it is successful in avoiding actual disk I/O accesses.
Catalog Cache Inserts	Number of inserts performed. The hit ratio is 1-(CCI/CCL).
Catalog Cache Lookups	Number of times the catalog cache was referenced to obtain table description information.
Catalog Cache Overflows	Number of times that the catalog cache overflowed the bounds of its allocated memory.
Package Cache Hit Ratio (%)	Package cache hit ratio, which equals: `1-(pkg_cache_inserts /pkg_cache_lookups))*100` The hit ratio is a percentage indicating how well the package cache is helping to avoid reloading packages and sections for static SQL from the system catalogs as well as helping to avoid recompiling dynamic SQL statements. A high ratio indicates it is successful in avoiding these activities.
Package Cache Inserts	Number of inserts performed. The hit ratio is 1-(PCI/PCL).
Package Cache Lookups	Number of times the package cache was referenced to obtain a section or a package.
Package Cache Max Used (Bytes)	Largest size reached by the package cache.
Package Cache Overflows	Number of times that the package cache overflowed the bounds of its allocated memory.

2.5.5 Log I/O Performance Metrics

The metrics in this category provide performance information for the log input and output including the number of reads and writes in the logs.

Default Collection Interval — Every 15 minutes

Table 2–25 Log I/O Performance Metrics

Metric	Description
Database Name (key column)	Real name of the database for which information is collected or to which the application is connected. This is the name the database was given when created.
Cleans Logging Threshold	Number of times a page cleaner was invoked because the logging space used had reached a predefined criterion for the database.
Log Reads	Number of log reads.
Log Writes	Number of log writes.

2.5.6 Memory Manager Metrics

The metrics in this category provide the values of the workspace provided and the locklist set in the database.

Default Collection Interval — Every 15 minutes

Table 2–26 Memory Manager Performance Metrics

Metric	Description
Database Name (key column)	Real name of the database for which information is collected or to which the application is connected. This is the name the database was given when created.
Private Workspace Max Used	Largest size that can be reached by private workspace.
Shared Workspace Max Used	Largest size that can be reached by shared workspace.
Total Locklist Memory in Use	Total amount of lock list memory that is in use.

2.5.7 Sort Heap Metrics

The metrics in this category display the various performance values associated with the sortheap.

Default Collection Interval — Every 15 minutes

Table 2–27 Sort Heap Performance Metrics

Metric	Description and User Action
Database Name (key column)	Real name of the database for which information is collected or to which the application is connected. This is the name the database was given when created.
Active Sorts	Number of sorts in the database that currently have an allocated sort heap.
Average Active Sorts Rate	Rate of active sorts in the last interval, which equals: `(active_sorts-_active_sorts )/__interval` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Average Hash Join Overflow Rate	Rate of hash join overflow in the last interval, which equals: `(hash_join_overflow-_hash_join_overflow) /__interval` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Average Hash Join Rate	Rate of hash joins in the last interval, which equals: `(total_hash_joins-_total_hash_joins )/__interval` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.

Table 2–27 (Cont.) Sort Heap Performance Metrics

Metric	Description and User Action
Average Hash Join Small Overflow Rate	Rate of the small hash join overflow in the last interval, which equals: `(hash_join_small_overflow-_hash_join_small_overflow )/__interval` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Average Hash Loops Rate	Rate of hash loops in the last interval, which equals: `(total_hash_loops-_total_hash_loops)/ __interval` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Average Piped Sorts Rejected Rate	Rate of piped sorts rejection in the last interval, which equals: `((piped_sorts_requested-piped_sorts_accepted)-(_piped_sorts_ requested-_piped_sorts_accepted)) /__interval` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Average Post Threshold Joins Rate	Rate of post threshold joins in the last interval, which equals: `(post_threshold_ hash_joins-_post_threshold _hash_joins)/__interval` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Average Post Threshold Sorts Rate	Rate of post threshold sorts in the last interval, which equals: `(post_threshold_sorts-_post_threshold_sorts ) /__interval` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Average Sort Heap Pages Used	Average sort heap space used, which equals: `(sort_heap_allocated /active_sorts)` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Average Sort Time (ms)	Average time per sort, which equals: `(total_sort_time/total_sorts)` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Average Sorts Overflow Rate	Rate of sort overflow in the last interval, which equals: (sort_overflow-_sort_overflow)/__interval The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Average Sorts Rate	Rate of sorts in the last interval, which equals: `(total_sorts-_total_sorts )/__interval` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Piped Sorts Accepted	Number of piped sorts that have been accepted.
Piped Sorts Requested	Number of piped sorts that have been requested.
Post Threshold Hash Sorts	Total number of times that a hash join heap request was limited due to concurrent use of shared or private sort heap space.
Post Threshold Sorts	Number of sorts that have requested heaps after the sort heap threshold has been exceeded.
Sort Overflows	Total number of sorts than ran out of sort heap and may have required disk space for temporary storage.
Sorts Overflow Rate	Sorts overflow ratio, which equals: `((sort_overflow/total_sorts )*100)` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.

Table 2–27 (Cont.) Sort Heap Performance Metrics

Metric	Description and User Action
Total Hash Join Overflows	Number of times that hash join data exceeded the available sort heap space.
Total Hash Join Small Overflow	Number of times that hash join data exceeded the available sort heap space by less than 10%.
Total Hash Joins	Total number of hash joins executed.
Total Hash Loops	Total number of hash loops executed.
Total Sort Heap Allocated	Total number of allocated pages of sort heap space for all sorts at the level chosen and at the time the snapshot was taken.
Total Sorts	Number of sorts that have been executed.
Total Sort Time (ms)	Time spent in sorts.

2.5.8 Non-Buffered I/O Activity Metrics

The metrics in this category display the various performance values related to the non-buffered I/O activities that do not use the buffer pool.

Default Collection Interval — Every 15 minutes

Table 2–28 Non-Buffered I/O Activity Metrics

Metric	Description
Database Name (key column)	Real name of the database for which information is collected or to which the application is connected. This is the name the database was given when created.
Average Data Read Rate	Direct read rate, which equals: `direct_reads/direct_read_time` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Average Data Write Rate	Direct write rate, which equals: `direct_writes/direct_write_time` The desired value can be set for the warning and critical thresholds to monitor any adverse conditions.
Direct Read Requests	Number of requests to perform a direct read of one of more sectors of data.
Direct Read Time (ms)	Elapsed time in milliseconds required to perform the direct reads.
Direct Reads	Number of read operations that do not use the buffer pool.
Direct Write Requests	Number of requests to perform a direct write of one or more sectors of data.
Direct Write Time (ms)	Elapsed time in milliseconds required to perform the direct writes.
Direct Writes	Number of write operations that do not use the buffer pool.

2.6 Response Metrics

The metrics in this category provide information about the response of the IBM DB2 database in the instance.

Default Collection Interval — Every 5 minutes

Table 2–29 Response Metrics

Metric	Description
Database Name	Name of the database.
DB Status	Status of the database: 0 — Active 1 — Quiesce pending 2 — Quiesced 3 — Roll forward
DB Status Value	Status value of the database.
DB2 Status	Status value of the DB2 instance.
DB2 Status Value	Status of the DB2 instance: 0 — Active 1 — Quiesce pending 2 — Quiesced
Name	Database host name.
Status	Status of the database. The database is up if the status is 0. Otherwise, it is down.

2.7 Storage Information

Storage Information metrics provide information about the storage objects, such as the tablespace and data files. Storage Information metrics consist of the following categories:

- Log Storage
- Tablespace
- Data Files

2.7.1 Data Files Storage Metrics

The metrics in this category provide information about the file properties for the database data storage files.

Default Collection Interval — Every 2 hours

Table 2–30 Tablespace Storage Metrics

Metric	Description
Data File Identifier (key column)	Unique identifier for the data file.
Table Name	Name of the particular table in the database where the file resides.
Table Schema	Schema of the table in which the file resides.
Table Type	Type of table to which the file belongs.
Page Reorganizations	Number of page reorganizations.
Overflow Accesses	Number of overflow accesses.

2.7.2 Log Storage Metrics

The metrics in this category provide information about the log storage properties for the database.

Default Collection Interval — Every 30 minutes

Table 2–31 Log Storage Metrics

Metric	Description and User Action
Database Name (key column)	Real name of the database for which information is collected or to which the application is connected. This is the name the database was given when created.
Allocated Secondary Log Size	Allocated size of the secondary log.
Log Space Utilization	Space utilization of log files.
Total Log Available	Total number of pages available for logging.
Total Log Space Used	Total number of pages used for logging.

2.7.3 Tablespace Storage Metrics

The metrics in this category provide information about the individual tablespace properties for all database tablespaces.

Default Collection Interval — Every 15 minutes

Table 2–32 Tablespace Storage Metrics

Metric	Description
Tablespace Identifier (key column)	Identifier for the tablespace.
Tablespace Name (key column)	Name of the tablespace.
Bufferpool Identifier	Bufferpool identifier for the tablespace.
Extent Size	Extent size for the tablespace.
Number of Containers	Number of containers.
Number of Ranges	Number of ranges.
Page Size	Page size for the tablespace.
Prefetch Size	Prefetch size for the tablespace.
Tablespace Free Pages	Number of pages in a tablespace that will become free if all pending transactions are committed or rolled back, and new space is requested for an object.
Tablespace State	State of the tablespace.
Tablespace Total Pages	Total number of pages in a tablespace.
Tablespace Type	Type of tablespace.
Tablespace Usable Pages	Total number of pages in a tablespace minus overhead pages.
Tablespace Used Pages	Total number of pages currently used (not free) in a tablespace.
Tablespace Utilization (%)	Tablespace utilization in percentage.

2.8 System Configuration Information

System Configuration Information metrics collect the information related to the database software. Each installation of the database software provides an instance to store the data. System Configuration Information metrics consist of the following categories:

- Database System Information
- Product Information
- Partition Information

- Instance Information
- Registry Settings

2.8.1 Database System Information Metrics

The metrics in this category provide information about the various system configuration metrics for the database system, including the name and operating system properties.

- Table Name — MGMT_EMX_IBMDB2_DBSYS
- View Name — MGMT_EMX_IBMDB2_DBSYS_VIEW

Default Collection Interval — Every 24 hours

Table 2–33 Database System Information Metrics

Metric	Description
Server Name	Name of the database server.
OS Name	Name of the operating system.
OS Version	Version of the operating system.
OS Release	Release of the operating system.
Total Number of CPUs	Total number of CPUs for the operating system on which the database is installed.
Total Number of Configured CPUs	Total number of configured CPUs on which the database is installed.
Total Memory (mb)	Amount of memory.

2.8.2 Instance Information Metrics

The metrics in this category return the parameters that provide information about database instances.

- Table Name — MGMT_EMX_IBMDB2_DBINST
- View Name — MGMT_EMX_IBMDB2_DBINST_VIEW

Default Collection Interval — Every 24 hours

Table 2–34 Instance Information Metrics

Metric	Description
Instance Name (key column)	Name of the instance.
Number of DB Partitions	Number of database partitions.
Bit Size of Current Instance	Bit size of the current instance (32 or 64).
Release Number	Internal release number, as returned by the db2level command; 9 for example, 03030106.
Service Level	Service level, as returned by the db2level command; for example, DB2 v8.1.1.80.
Build Level	Build level, as returned by the db2level command; for example, n041021.
Program Temporary Fix	Program temporary fix (PTF) identifier, as returned by the db2level command; for example, U498350.
Fix Pack Number	FixPak number, as returned by the db2level command.

2.8.3 Product Information Metrics

The metrics in this category provide information about the installed IBM DB2 database product.

- Table Name — MGMT_EMX_IBMDB2_DBPRO
- View Name — MGMT_EMX_IBMDB2_DBPRO_VIEW

Default Collection Interval — Every 24 hours

Table 2–35 Product Information Metrics

Metric	Description
Database Path	Installation path of the database.
Product	Installed product.
Version	Version of the installed product.

2.8.4 Partition Information Metrics

The metrics in this category return parameters about parallel operations and partitioned database environments.

- Table Name — MGMT_EMX_IBMDB2_DBPART
- View Name — MGMT_EMX_IBMDB2_DBPART_VIEW

Default Collection Interval — Every 24 hours

Table 2–36 Partition Information Metrics

Metric	Description
Partition Number (key column)	Partition number where the database is installed.
Host Name	Host name of the machine where the db2 database software is installed.
Port Number	TCP/IP port number to communicate with the database.
Switch Name	Name of the switch where the database is connected.

2.8.5 Registry Settings Metrics

The metrics in this category provide information about the various registry parameters for the database.

- Table Name — MGMT_EMX_IBMDB2_DBREGSET
- View Name — MGMT_EMX_IBMDB2_DBREGSET_VIEW

Default Collection Interval — Every 24 hours

Table 2–37 Registry Settings Metrics

Metric	Description
Database Registry Variable (key column)	Name of the DB2 registry variable.
Database Registry Value	Current setting of the DB2 registry variable.
Is Aggregate	Indicates whether or not the DB2 registry variable is an aggregate variable. Possible return values are 0 if it is not an aggregate variable, and 1 if it is an aggregate variable.

Table 2–37 (Cont.) Registry Settings Metrics

Metric	Description
Aggregate Type	Name of the aggregate if the DB2 registry variable is currently getting its value from a configured aggregate. If the registry variable is not being set through an aggregate, or is set through an aggregate but has been overridden, the value of AGGREGATE_ NAME is NULL.
Level Value	Level at which the DB2 registry variable acquires its value. Possible return values and the corresponding levels that they represent are I, G, N, or E.
Level	Values are: Instance — If level1_raw = I Global — If level1_raw = G Database Partition — If level1_raw = N Otherwise, the value is Environment.

2.9 DB2 Diag Log File Monitoring Metrics

The metrics in this category provide information about the IBM DB2 database Diagnostic Log file.

Note: This metric category is supported only for local monitoring, that is, when the IBM DB2 database on a host is monitored by an Oracle Management Agent that is running on the same host.

Default Collection Interval — Every 5 minutes

Table 2–38 DB2 Diag Log File Monitoring Metrics

Metric	Description
Log File Match Count	Nmber of times a pattern was found in the log file.
Server	Name of the server where IBM DB2 is running.
Instance	Name of the IBM DB2 instance.
DB	Name of the IBM DB2 database.
Function	Name of the function present in the last log entry.
Last Occurrence Time Stamp	Time of the last log entry that shares a common function name with other entries that satisfy a particular pattern.
Message	Message present in the log file.

3

Sybase Adaptive Server Enterprise Database Metrics

This chapter provides descriptions for Sybase Adaptive Server Enterprise Database Plug-In metric categories, and tables list and describe associated metrics for each category. The tables also provide user actions if any of the metrics for a particular category support user actions.

This chapter covers the metric categories that appear for all releases of System Monitoring Plug-In for Sybase Adaptive Server Enterprise Database. If you see a release number against a metric name, then it indicates that the metric appears only for that particular release of the plug-in. Otherwise, the metric appears for all releases of the plug-in. For example, if you see **For Release 6**, then it indicates that the metric appears only for System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0).

Note that in Release 9, the metric collection has been disabled for the following metrics:

- Database Indexes
- Database Objects
- Database Thresholds
- Database Transactions

Note that in Release 11, the metric collection has been disabled for the following metrics:

- Database Idexes
- Database Objects
- Database Thresholds
- Database Trasactions
- Database Segments
- Process Objects Information
- Process Statistics
- Process Tracking Details
- Segment Usages
- Running Procedure Statistics
- Wait Class Event Information

- Wait Events Information
- Wait Process Statistics

To enable these metrics, follow these steps:

1. In Enterprise Manager Grid Control, on the plug-in Home page, from the Related Links section, click **Metric and Policy Settings**.
2. On the Metric and Policy Settings page, from the **View** list, select **All metrics**. In the table that lists all the metrics, in the **Collection Schedule** column, you will see **Disabled** mentioned for some metrics.
3. Click **Disabled**. Enterprise Manager Grid Control displays the Edit Collection Settings page.
4. On the Edit Collection Settings page, in the Collection Schedule section, click **Enable** and then **Continue**. Enterprise Manager Grid Control displays the Metric and Policy Settings page with the metric enabled.
5. On the Metric and Policy Settings page, click **OK**.

3.1 Response

This metrics in this category provide information about the response of the target Sybase ASE instance.

Default Collection Interval — Every 5 minutes

Table 3–1 Response Metrics

Metric	Description
Sybase ASE Status	Status of the Sybase ASE instance.
For Release 11 - Server State	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 11 (1.3.1.0.0)** State of the Sybase ASE server

3.2 Databases Instances

The metrics in this category provide information regarding database instances.

Default Collection Interval — Every 30 minutes

Table 3–2 Databases Instances Metrics

Metric	Description
Database Size	Size of the database.

3.3 General Statistics

The metrics in this category provide general statistics.

For this metric, you can set different warning and critical threshold values for each "Number of Transactions" object. If warning or critical threshold values are currently set for any "Number of Transactions" object, those thresholds can be viewed on the Metric Detail page for this metric. To specify or change warning or critical threshold values for each "Number of Transactions" object, use the Edit Thresholds page.

Collection frequency - Every 30 mins

Table 3–3 General Statistics Metrics

Metric	Description and User Action	Upload Frequency	Operator	Alert Text
Number of Active Locks	Number of active locks.	After every sample	>	The total number of active locks are %active_locks%. It has crossed warning (%warning_ threshold%) or critical (%critical_ threshold%) threshold.
Number of Active Page Locks	Number of active page locks.	After every sample	>	The total number of active page locks are %active_page_ locks%. It has crossed warning (%warning_ threshold%) or critical (%critical_ threshold%) threshold.
Number of Active Table Locks	Number of active table locks.	After every sample	>	The total number of active table locks are %active_table_ locks%. It has crossed warning (%warning_ threshold%) or critical (%critical_ threshold%) threshold.
Number of Active Users	Number of active users.	After every sample	>	The total number of active users are %active_users%. It has crossed warning (%warning_ threshold%) or critical (%critical_ threshold%) threshold.
Number of External Transactions	Number of external transactions.	After every sample	>	The total number of external transactions are %extrn_trans%. It has crossed warning (%warning_ threshold%) or critical (%critical_ threshold%) threshold.
Number of Local Transactions	Number of local transactions.	After every sample	>	The total number of local transactions are %local_trans%. It has crossed warning (%warning_ threshold%) or critical (%critical_ threshold%) threshold.

Table 3–3 (Cont.) General Statistics Metrics

Metric	Description and User Action	Upload Frequency	Operator	Alert Text
Number of Servers	Number of servers.	After every sample	>	The total number of servers are %servers%. It has crossed warning (%warning_ threshold%) or critical (%critical_ threshold%) threshold.
Number of Transaction Logs	Number of transaction logs.	After every sample	>	The total number of transaction logs are %trans_logs%. It has crossed warning (%warning_ threshold%) or critical (%critical_ threshold%) threshold.
Number of User Tables	Number of user tables.	After every sample	>	The total number of user tables are %user_tables%. It has crossed warning (%warning_ threshold%) or critical (%critical_ threshold%) threshold.

3.4 Cached Objects Statistics

The metrics in this category provide statistics for all objects and indexes with pages currently in a data cache.

Collection frequency - Every 60 mins

This metrics has been removed in Release 11.

Table 3–4 Cached Objects Statistics Metrics

Metric	Description
Cached Object Size	Number of kilobytes of the cache the object is occupying.
Cache Name	Name of the cache.
DB Name	Name of the database.
Object Name	Name of the object.
Object Type	Object type.
Owner Name	Name of the object owner.
For Release 6 Number of Processes Currently Accessing the Object (per sec) For Release 7 Process Access Rate of the Object (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of processes currently accessing the object. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the processes are currently accessing the object, that is, the number of processes that have started accessing the object since last collection divided by the elapsed time between two collections.

3.5 Cached Procedures Statistics

The metrics in this category provide statistics for all procedures currently stored in the procedure cache.

For every collection, only the top 10 rows sorted on Memory Usage are selected.

Collection frequency - Every 30 mins

Table 3–5 Cached Procedures Statistics Metrics

Metric	Description
Procedure Compiled Date	Date that the procedure was compiled.
DB Name	Name of the database.
Memory Usage (KB)	Number of kilobytes of memory used by the procedure.
Procedure Name	Name of the object.
Procedure Type	The type of procedure (stored procedure, trigger, and so on).
Owner Name	Name of the object owner.

3.6 Cache Pools Statistics

The metrics in this category provide statistics for all pools allocated for all caches.

Collection frequency - Every 60 mins

Table 3–6 Cached Pools Statistics Metrics

Metric	Description
Allocated bytes for pool (Bytes)	Number of bytes that have been allocated for the pool.
For Release 6 Number of buffers in the least recently used portion **For Release 7** Buffers Fetch & Replacement Rate at LRU Portion of Pool (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** The number of buffers that were fetched and replaced in the least recently used portion of the pool since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the buffers were fetched and replaced in the least recently used portion of the pool since last collection, that is, the number of buffers that were fetched and replaced since last collection divided by the elapsed time between two collections.
For Release 6 Number of buffers in the most recently used portion **For Release 7** Buffers fetch & replacement rate at MRU portion of pool(per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** The number of buffers that were fetched and replaced in the most recently used portion of the pool since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the buffers were fetched and replaced in the most recently used portion of the pool since last collection, that is, the number of buffers that were fetched and replaced since last collection divided by the elapsed time between two collections.
For Release 6 Number of pages read into the pool **For Release 7** Page read rate into the pool (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of pages read into the pool since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the pages were read into the pool since last collection, that is, the number of pages read into the pool since last collection divided by the elapsed time between two collections.

Table 3–6 (Cont.) Cached Pools Statistics Metrics

Metric	Description
For Release 6 Number of bytes that are currently being used within the pool	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of bytes that are currently being used within the pool.
For Release 6 Number of buffers that have been read from disk into the pool **For Release 7** Buffers read rate from the disk into the pool (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of buffers that have been read from the disk into the pool since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the buffers were read from the disk into the pool since last collection, that is, the number of buffers that were read from the disk into the pool since last collection divided by the elapsed time between two collections.
For Release 6 Number of dirty buffer retrievals **For Release 7** Dirty buffer retrievals rate from the pool (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of dirty buffer retrievals since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the dirty buffers were retrieved since last collection, that is, the number of dirty buffer retrievals since last collection divided by the elapsed time between two collections.

3.7 Data Cache Statistics

The metrics in this category provide statistics relating to Adaptive Server data caches.

Collection frequency - Every 60 mins

Table 3–7 Data Caches Statistics Metrics

Metric	Description and User Action
Number of Buffer Pools Within the Cache	The number of buffer pools within the cache.
Number of partitions currently configured for the cache	Number of partitions currently configured for the cache.
For Release 6 Cache searches directed to the cache **For Release 7** Cache searches directed to the cache (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of buffers that were fetched and replaced in the most recently used portion of the pool, since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the buffers were fetched and replaced in the most recently used portion of the pool, that is, the number of buffers that were fetched and replaced since last collection divided by the elapsed time between two collections.
Data Cache Hit Ratio (%)	Percentage of Data Cache Hit Ratio.
For Release 6 Number of buffers retrieved from the cache **For Release 7** Buffers retrieval rate from the data cache (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of buffers retrieved from the cache since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the buffers were retrieved from the cache since last collection, that is, the number of buffers retrieved from the cache since last collection divided by the elapsed time between two collections.
Miss Ratio (%)	Percentage Cache Miss Ratio.

Table 3–7 (Cont.) Data Caches Statistics Metrics

Metric	Description and User Action
For Release 6 Number of buffers read into the cache from disk **For Release 7** Buffers read rate from the disk to data cache (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of buffers read into the cache from disk since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the buffers were read into the cache from disk since last collection, that is, the number of buffers read into the cache from disk since last collection divided by the elapsed time between two collections.
For Release 6 Number of buffers written from the cache to disk **For Release 7** Buffers write rate from the data cache to disk (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of buffers written from the cache to disk since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which buffers were written from the cache to disk, that is, the number of buffers written from the cache to disk divided by the elapsed time between two collections.
Is relaxed replacement policy	Whether the cache is using relaxed cache replacement strategy.
For Release 6 Number of dirty buffer retrievals **For Release 7** Dirty buffer retrievals rate from data cache (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of dirty buffer retrievals since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which dirty buffers were retrieved since last collection, that is, the number of dirty buffer retrievals since last collection divided by the elapsed time between two collections.

3.8 Deadlock Statistics

The metrics in this category provide information pertaining to the most recent deadlocks that have occurred in Adaptive Server. You can tune the maximum number of messages returned with deadlock pipe max messages.

Collection frequency - Every 45 mins

Table 3–8 Deadlock Statistics Metrics

Metric	Description and User Action
Application holding the lock	Name of the application holding the lock.
BatchID for the SQL executed by the process holding the lock In **Release 9**, this metric name has changed to: Lock Held Process executed SQL BatchID	Unique batch identifier for the SQL code being executed by the process holding the lock when it was blocked by another process (not when it acquired the lock).
Command being executed that caused the lock to be held	The command being executed that caused the lock to be held.
Context ID for the process holding the lock In **Release 9**, this metric name has changed to: Lock Held Process Context ID	Unique context identifier for the process holding the lock when it was blocked by another process (not when it acquired the lock).

Table 3–8 (Cont.) Deadlock Statistics Metrics

Metric	Description and User Action
Release 8 or lower SPID of the parent process of the process holding the lock	SPID of the parent process of the process holding the lock.
Release 8 or lower KPID of process holding the lock	KPID of process holding the lock.
Line number within the batch of the statement of the process In **Release 9**, this metric name has changed to: Lock Held Process executing Line Number within the batch	Line number within the batch of the statement of the process.
Type of lock being held In **Release 9**, this metric name has changed to: Holding lock type	Type of lock being held.
DBID where the stored procedure that caused the lock to be held resides In **Release 9**, this metric name has changed to: Lock held stored procedure's DBID	DBID where the stored procedure that caused the lock to be held resides.
Object ID of stored procedure holding the lock In **Release 9**, this metric name has changed to: Lock held stored procedure's Object ID	Unique object identifier for the stored procedure that caused the lock to be held, if applicable.
Release 8 or lower SPID of process holding the lock	SPID of process holding the lock.
Transaction in which the lock was acquired In **Release 9**, this metric name has changed to: Transaction holding the lock	The name of the transaction in which the lock was acquired.
User name for whom lock being held In **Release 9**, this metric name has changed to: User holding the lock	Name of the user for whom the lock is being held.
Object DBID	Unique database identifier for database where the object resides.
Object Name	Name of the object.
Page number for which the lock requested In **Release 9**, this metric name has changed to: Lock Requested Page Number	Page number for which the lock requested, if applicable.

Table 3–8 (Cont.) Deadlock Statistics Metrics

Metric	Description and User Action
Deadlock resolved time	Time at which the deadlock was resolved.
Row number for which the lock was requested In **Release 9**, this metric name has changed to: Lock Requested Row Number	Row number for which the lock was requested, if applicable.
Release 8 or lower SPID of the parent process of the process waiting for the lock	SPID of the parent process of the process waiting for the lock.
Release 8 or lower KPID of the process waiting for the lock	KPID of the process waiting for the lock.
Type of lock requested	Type of lock requested.
Release 8 or lower SPID of the process waiting for the lock	SPID of the process waiting for the lock.
Amount of time (ms) the waiting process was blocked In **Release 9**, this metric name has changed to: Blocked Process Waiting Time (ms)	Amount of time in milliseconds that the waiting process was blocked before the deadlock was resolved.
Name of the user for whom the lock is being requested In **Release 9**, this metric name has changed to: User requested/waiting for the lock	Name of the user for whom the lock is being requested.

3.9 Device Statistics

The metrics in this category provide statistical information relating to devices.

Collection Frequency - Every 30 mins.

Table 3–9 Device Statistics Metrics

Metric	Description and User Action
For Release 6 Number of APF device reads from device **For Release 7** APF read rate from the device (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of APF reads from the device since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the APF reads were made from the device since last collection, that is, the number of APF reads from the device since last collection divided by the elapsed time between two collections.
For Release 6 Number of IO requests **For Release 7** I/O request rate to a mirrored device [if mirrored] (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of IO requests since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the IO requests were made since last collection, that is, the number of IO requests since last collection divided by the elapsed time between two collections.
For Release 6 Number of force task waits for IO Syncronization **For Release 7** Forced task waits rate for IO sync. to mirrored device (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of tasks forced to wait for synchronization of an I/O request since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the tasks were forced to wait for synchronization of an I/O request since last collection, that is, the number of tasks forced to wait for synchronization of an I/O request since last collection divided by the elapsed time between two collections.
IO Time (ms)	Total amount of time (in milliseconds) spent waiting for I/O requests to be satisfied since last collection.
For Release 6 Number of reads from device (excluding APF) **For Release 7** Read rate from the device [excluding APF] (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of reads from the device (excluding APF). **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the reads were made from the device since last collection, that is, the number of reads from device since last collection divided by the elapsed time between two collections.
For Release 6 Number of writes to device **For Release 7** Write rate to the device (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of writes to the device since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the writes were made to the device since last collection, that is, the number of writes to the device since last collection divided by the elapsed time between two collections.

3.10 Adaptive Server Engines Statistics

The metrics in this category provide statistics regarding Adaptive Server engines.

Collection Frequency - Every 30 mins.

Table 3–10 Adaptive Server Engines Statistics Metrics

Metric	Description and User Action
Number of CPU that the engine is affinited to	The number of CPUs that the engine affinited to.
For Release 6 Number of handled connections **For Release 7** Engine's connections handle rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of connections handled since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the connections were handled since last collection, that is, the number of connections handled since last collection divided by the elapsed time between two collections.
For Release 6 Number of context switches **For Release 7** Engine's context switch rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of context switches handled since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate of context switches handled since last collection , that is, the number of context switches handled since last collection divided by the elapsed time between two collections.
For Release 6 Total Time Engine Running (seconds)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Total time (in seconds) the engine has been running.
Current KPID	Kernel process identifier for the currently executing process.
For Release 6 \Total time engine has been in idle spin mode (seconds)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Time (in seconds) the engine has been in idle spin mode.
OS Process ID	OS Process ID.
Number of affinited processes to engine	Number of processes that have been affinitied to this engine.
Engine came online (Date)	Date that the engine came online.
Engine Status	Status of the engine (online, offline, and so on).
Engine went offline (Date)	Date that the engine went offline.
For Release 6 Total time engine executing system database services (seconds)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Time (in seconds) the engine has been executing system database services.
Engine CPU (for System DB Services) Utilization %	Engine CPU Utilization (System DB Services).
For Release 6 Total time engine executing user commands (seconds)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Time (in seconds) the engine has been executing user commands.
Engine CPU (for User Commands) Utilization %	Engine CPU Utilization (for User Commands)

3.11 Device Data and IO Log Statistics

The metrics in this category provide device I/O statistics broken down into data and log I/O for normal and temporary databases on each device.

Collection frequency - Every 30 mins

Table 3–11 Device Data and IO Log Statistics Metrics

Metric	Description and User Action	Upload Frequency	Operator	Alert Text
Number of IO Operations	Total number of I/O operations. For this metric, you can set different warning and critical threshold values for each unique combination of "Device Logical Name" and "IO Category" objects. If warning or critical threshold values are currently set for any unique combination of "Device Logical Name" and "IO Category" objects, those thresholds can be viewed on the Metric Detail page for this metric. To specify or change warning or critical threshold values for each unique combination of "Device Logical Name" and "IO Category" objects, use the Edit Thresholds page. See Editing Thresholds for information on accessing the Edit Thresholds page.	After every sample	>	The total number of IO operations are %IOs%. It has crossed warning (%warning_ threshold%) or critical (%critical_ threshold%) threshold.
IO Waiting time (ms)	Amount of time (in milliseconds) spent waiting for I/O requests to be satisfied.	Not defined	Not defined	Not defined

3.12 Adaptive Server Statistics

The metrics in this category provide statistics about the ASE adaptive server.

Collection frequency - Every 30 mins

Table 3–12 Adaptive Server Statistics Metrics

Metric	Description and User Action
For Release 6 Number of logins or attempted logins to SQL Server **For Release 7** Attempted logins (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** The number of logins or attempted logins to the Server since last colletion. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the logins or attempted logins were made to the Server, that is, the number of logins or attempted logins to the Server since last colletion divided by the elapsed time between two collection.
Sybase ASE (Overall) CPU Utilization (%)	Overall CPU Utilization (%) of Sybase ASE.
Sybase ASE (Overall) IO Utilization (%)	Overall IO Utilization (%) of Sybase ASE.
For Release 6 Number of errors detected by SQL Server while reading and writing packets **For Release 7** Detected packet (rcvd/sent) error rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** The number of errors detected by the server while reading and writing packets since last colletion. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the errors were detected by the server while reading and writing packets since last collection, that is, the number of errors detected by the server while reading and writing packets since last colletion divided by the elapsed time between two collection.

Table 3–12 (Cont.) Adaptive Server Statistics Metrics

Metric	Description and User Action
For Release 6 Number of input packets read by SQL Server **For Release 7** Input packets read rate by AS (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** The number of input packets read by the server since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the input packets were read by the server since last collection, that is, the number of input packets read by the server since last collection divided by the elapsed time between two collection.
For Release 6 Number of output packets written by SQL Server **For Release 7** Output packets write rate by AS (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** The number of output packets written by the server since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the output packets were written by the server since last collection, that is, the number of output packets written by the server since last collection divided by the elapsed time between two collection.
For Release 6 Number of connections handled since last collection	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** The number of connections handled since last collection.
For Release 6 Number of errors detected by SQL Server while reading and writing **For Release 7** Detected disk read/write error rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** The number of errors detected by SQL Server while reading and writing since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which errors detected by the server while reading and writing since last collection, that is, the number of errors detected by the server while reading and writing divided by the elapsed time between two collection.
For Release 6 Number of disk reads by SQL Server **For Release 7** Read rate from disk (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** The number of disk reads by the server since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the disk was read by the server since last collection, that is, number of disk reads by the server since last collection divided by the elapsed time between two collection.
For Release 6 Number of disk writes by SQL Server **For Release 7** Write rate to disk (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** The number of disk writes by the server since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the disk was written by the server since last collection, that is, the number of disk writes by the server since last collection divided by the elapsed time between two collection.

3.13 Locks Information

The metrics in this category provide information about a list of all locks that are being held, and those that have been requested, by any process, for every object.

Collection frequency - Every 45 mins

Table 3–13 Locks Information Metrics

Metric	Description and User Action
Lock context	Lock context (bit field). These values are the same as the values for the context column in syslocks.
Lock Level	The type of object for which the lock was requested ('PAGE', 'ROW', and so on).
Lock State	Whether the lock has been granted [Granted, Requested]. The upload frequency is after every sample and the operator is >. Alert text is - The lock state is %LockState%. For this metric, you can set different warning and critical threshold values for each unique combination of "SPID", "KPID", "DBID", "Lock ID", and "Object ID" objects. If warning or critical threshold values are currently set for any unique combination of "SPID", "KPID", "DBID", "Lock ID", and "Object ID" objects, those thresholds can be viewed on the Metric Detail page for this metric. To specify or change warning or critical threshold values for each unique combination of "SPID", "KPID", "DBID", "Lock ID", and "Object ID" objects, use the Edit Thresholds page.
Lock Type	Type of lock ['exclusive table', 'shared page', and so on].
Locked page number	Page that is locked when LockLevel = 'PAGE'.
Parent SPID	Parent process ID.
Locked row number	Locked row numberRow that is locked when LockLevel = 'ROW'.
Lock wait time	The time (in seconds) that the lock request has not been granted..

3.14 Network I/O Statistics

The metrics in this category provide network I/O statistics.

Collection frequency - Every 30 mins

Table 3–14 Network I/O Statistics Metrics

Metric	Description
For Release 6 Number of bytes received **For Release 7** Incoming network IO traffic rate (bytes/sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of bytes received since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the bytes were received since last collection, that is, the number of bytes received since last collection divided by the elapsed time between two collections.

Table 3–14 (Cont.) Network I/O Statistics Metrics

Metric	Description
For Release 6 Number of bytes Sent **For Release 7** Outgoing network IO traffic rate (bytes/sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of bytes sent since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the bytes were sent since last collection, that is, the number of bytes sent since last collection divided by the elapsed time between two collections.
For Release 6 Number of Packets Received **For Release 7** Incoming network IO traffic rate (packets/sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of packets received since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the packets were received since last collection, that is, the number of packets received since last collection divided by the elapsed time between two collections.
For Release 6 Number of Packets Sent **For Release 7** Outgoing network IO traffic rate (packets/sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of packets sent. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the packets were sent since last collection, that is, the number of packets sent since last collection divided by the elapsed time between two collections.

3.15 Open Databases Statistics

The metrics in this category provide state and statistical information pertaining to databases that are currently in use.

Collection frequency - Every 1 hour

Table 3–15 Open Databases Statistics Metrics

Metric	Description
For Release 6 Number of append log semaphore requests **For Release 7** Append log semaphore request rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of semaphore requests when attempting to append to the database transaction log. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the semaphore requests were made since last collection, that is, the number of semaphore requests made since last collection *(when attempting to append to the database transaction log)* divided by the elapsed time between two collections.
For Release 6 Number of append log semaphore waits **For Release 7** Append log semaphore Waits rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of times a task had to wait for the append log semaphore to be granted. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which a task had to wait for the append log semaphore to be granted since last collection, that is, the number of times a task had to wait for the append log semaphore to be granted divided by the elapsed time between two collections.
For Release 7 Append log semaphore Waits (%)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Percentage of tasks that had to wait for the append log semaphore to be granted since last collection.
Is backup in progress	Whether a backup is currently in progress for the database.

Table 3–15 (Cont.) Open Databases Statistics Metrics

Metric	Description
Last backup start time	Date that the last backup started for the database.
Is last backup failed	Whether the last backup of the database failed.
Is transaction log full	Whether the database transaction log is full.

3.16 Open Objects Statistics

The metrics in this category provide statistics for all open objects.

Collection frequency - Every 12 hours

Table 3–16 Open Objects Statistics Metrics

Metric	Description
For Release 6 Number of APF buffers read **For Release 7** APF buffers read (OpenObject) rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of APF buffers read since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the APF buffers were read since last collection, that is, the number of APF buffers read since last collection divided by the elapsed time between two collections.
LastOptSelectDate	Last date.
Last Used Date	Last used date.
For Release 6 Number of lock requests on object **For Release 7** Lock request rate for the object (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of requests for a lock on the object since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the requests were made for a lock on the object since last collection, that is, the number of requests for a lock on the object since last collection divided by the elapsed time between two collections.
For Release 6 Number lock waits **For Release 7** Lock waits rate for the object (per sec)t	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of times a task waited for a lock for the object since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which a task waited for a lock for the object since last collection, that is, the number of times a task waited for a lock for the object since last collection divided by the elapsed time between two collections.
For Release 7 Lock waits % for the object	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Percentage of lock waits.
For Release 6 OptSelectCount **For Release 7** Object selection rate for plan during compilation (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of objects selected for plan during compilation (per sec). **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the objects were selected for plan during compilation.
For Release 6 Total number of buffers read **For Release 7** Buffers read (OpenObject) rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Total number of buffers read since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the buffers were read since last collection, that is, the number of buffers read since last collection divided by the elapsed time between two collections.

Table 3–16 (Cont.) Open Objects Statistics Metrics

Metric	Description
For Release 6 Object Name	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Name of the object.
For Release 6 Number of times the object is accessed For Release 7 Object access rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of times the object was accessed since last collection. The upload frequency is after every sample. The operator is >. Alert text is - The total number of times the object accessed are %Operations%. It has crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold. For this metric, you can set different warning and critical threshold values for each unique combination of "DBID", "Object ID", and "Index ID" objects. If warning or critical threshold values are currently set for any unique combination of "DBID", "Object ID", and "Index ID" objects, those thresholds can be viewed on the Metric Detail page for this metric. To specify or change warning or critical threshold values for each unique combination of "DBID", "Object ID", and "Index ID" objects, use the Edit Thresholds page. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the object was accessed since last collection, that is, the number of times the object was accessed since last collection divided by the elapsed time between two collections.
For Release 6 Total number of pages read **For Release 7** Page read (OpenObject) rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Total number of pages read since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** rate at which the pages were read since last collection, that is, the number of pages read since last collection divided by the elapsed time between two collections.
For Release 6 Total number of pages written to disk **For Release 7** Page write (OpenObject) rate to disk (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Total number of pages written to the disk since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the pages were written to tje disk since last collection, that is, the number of pages written to the disk since last collection divided by the elapsed time between two collections..
For Release 6 Number of buffers read from disk **For Release 7** Buffers read (OpenObject) rate from disk (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Total number of buffers read from the disk since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the buffers were read from the disk since last collection, that is, the number of buffers read from the disk since last collection divided by the elapsed time between two collections.
For Release 6 Number of buffers written to disk **For Release 7** Buffers write (OpenObject) rate to disk (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Total number of buffers written to the disk since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the buffers were written to the disk since last collection, that is, the number of buffers written to the disk since last collection divided by the elapsed time between two collections.
For Release 6 Number of deleted rows **For Release 7** Row deletion (OpenObject) rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of rows deleted since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the rows were deleted since last collection, that is, the number of rows deleted since last collection divided by the elapsed time between two collections.

Table 3–16 (Cont.) Open Objects Statistics Metrics

Metric	Description
For Release 6 Number of inserted rows **For Release 7** Row insertion (OpenObject) rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of rows inserted since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the rows were inserted since the last collection, that is, number of rows inserted divided by the elapsed time between two collections.
For Release 6 Number of updated rows **For Release 7** Row updates (OpenObject) rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of updates. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the rows were updated since last collection, that is, the number of rows updated since last collection divided by the elapsed time between two collections.
For Release 6 Used Count **For Release 7** Object usage rate in plan during execution (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of times the object was used in the plan during compilation since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the object was used in the plan during compilation since last collection, that is, the number of times the object was used in the plan during compilation since last collection divided by the elapsed time between two collections.

3.17 Procedure Cache Statistics

The metrics in this category provide statistics relating to Adaptive Server procedure cache.

Collection frequency - Every 30 mins

Table 3–17 Procedure Cache Statistics Metrics

Metric	Description
Procedure Cache Hit Ratio (%)	Procedure cache hit ratio percentage. The upload frequency is after every sample and the operator is >. Alert text is - Procedure Cache hit ratio is %HitRatio%. It has crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
For Release 6 Number of stored procedures loaded into cache **For Release 7** Stored procedures load rate into procedure cache (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of stored procedures loaded into the cache since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the stored procedures were loaded into the cache since last collection, that is, the number of stored procedures loaded into the cache since last collection divided by the elapsed time between two collections.
Miss Ratio (%)	Procedure Cache Miss Ratio.
For Release 6 Number of stored procedures requested **For Release 7** Stored procedures request rate from procedure cache (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of stored procedures requested since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the stored procedures where requested since last collection, that is, the number of stored procedures required since last collection divided by the elapsed time between two collections.

Table 3–17 (Cont.) Procedure Cache Statistics Metrics

Metric	Description
For Release 6 Number of stalls for a free procedure cache buffer **For Release 7** Procedure cache stalls rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of times a process had to wait for a free procedure cache buffer when installing a stored procedure into the cache. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which a process had to wait for a free procedure cache buffer since last collection, that is, the number of times a process had to wait for a free procedure cache buffer divided by the elapsed time between two collections.
For Release 6 Number of times a procedure normalized **For Release 7** Procedures normalize and write back rate to sysproced's(per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of times a procedure was normalized and the tree written back to sysprocedures since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which a procedure was normalized since last collection, that is, the number of times a procedure was normalized and the tree written back to sysprocedures since last collection divided by the elapsed time between two collections.
For Release 11 Procedure Cache Used Memory(MB)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 11 (1.3.1.0.0)** Memory used in the procedure cache

3.18 Process Statistics

The metrics in this category provide detailed statistics about processes that are currently executing or waiting.

Collection frequency - Every 30 mins

Table 3–18 Process Statistics Metrics

Metric	Description
Application Name	Application name.
Blocking SPID	Session process identifier of the process holding the lock that this process has requested, if waiting for a lock.
Requested Lock ID	Unique lock identifier for the lock that this process has requested, if waiting for a lock.
Command	Category of process or command that the process is currently executing.
DBID	Unique identifier for the database being used by the current process.
DB Name	Name of process for the database being used by the current process.
Process Engine Group Name	Engine group for the process.
Engine Number	Unique identifier of the engine on which the process is executing.
Process Execution Class	Execution class for the process.
FID	The SPID of the parent process, if it exists.
Statement position in SQL batch	Line number of the current statement within the SQL batch.
Login Name	Login user name.
Master Transaction ID	Unique transaction identifier for the current transaction, if in a transaction.
Number of child processes	Number of child processes, if executing a parallel query.
Process Priority	Priority at which the process is executing.

Table 3–18 (Cont.) Process Statistics Metrics

Metric	Description
Elapsed time since connection established (seconds)	Number of seconds since this connection was established.
Process waiting time (seconds)	Amount of time in seconds that the process has been waiting, if the process is currently in a wait state.
Wait Event ID	Unique identifier for the event that the process is waiting for, if the process is currently in a wait state.

3.19 Processes Activity Statistics

The metrics in this category provide detailed statistics about process activity.

Collection frequency - Every 30 mins

Table 3–19 Process Activity Statistics Metrics

Metric	Description
For Release 6 Number of transactions committed by the process **For Release 7** Transaction commit (process) rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of transactions committed by the process since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the transactions were committed by the process since last collection, that is, the number of transactions committed by the process since last collection divided by the elapsed time between two collections.
CPU Usage by process (ms)	CPU time (in milliseconds) used by the process.
For Release 6 Number of pages where data was retrieved using an index **For Release 7** Page retrival rate (per sec) for data using an index	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of pages where data was retrieved using an index since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the data was retrieved using an index since last collection, that is, the nmber of pages where data was retrieved using an index since last collection divided by the elapsed time between two collections.
Number of locks currently held by the process	Number of locks currently held by the process.
For Release 6 Number of buffers read from cache **For Release 7** Buffers read (process) rate from cache (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of buffers read from the cache since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the buffers were read from the cache since last collection, that is, the number of buffers read from the cache since last collection divided by the elapsed time between two collections.
Allocated memory (bytes)	Amount of memory (in bytes) allocated to the process.
For Release 6 Number of pages read **For Release 7** Page read (process) rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of pages read since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the pages were read since last collection, that is, the number of pages read since last collection divided by the elapsed time between two collections.

Table 3–19 (Cont.) Process Activity Statistics Metrics

Metric	Description
For Release 6 Number of pages written **For Release 7** Page write (process) rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of pages written since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the pages were written since last collection, that is, the number of pages written since last collection divided by the elapsed time between two collections.
For Release 6 Number of buffers read from disk **For Release 7** Buffer read (process) rate from disk (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of buffers read from the disk since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the buffers were read from the disk since last collection, that is, the number of buffers read from the disk since last collection divided by the elapsed time between two collections.
For Release 6 Number of buffers written to disk **For Release 7** Buffer write (process) rate to disk (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of buffers written to the disk since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the buffers were written to the disk since last collection, that is, the number of buffers written to the disk since last collection divided by the elapsed time between two collections.
For Release 6 Number of transactions rolled back by the process **For Release 7** Transactions roll-back (process) rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of transactions rolled back by the process since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the transactions were rolled back by the process since last collection, that is, the number of transactions rolled back by the process since last collection divided by the elapsed time between two collections.
Number of pages where data was retrieved without an index	Number of pages where data was retrieved without an index.
For Release 6 Number of temporary table objects accessed **For Release 7** Temporary tables (process) creation/access rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of temporary table objects accessed since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the temporary table objects were accessed since last collection, that is, the number of temporary table objects accessed since last collection divided by the elapsed time between two collections.
For Release 6 Number of transactions started by the process **For Release 7** Transactions start (process) rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of transactions started by the process since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the transactions were started by the process since last collection, that is, the number of transactions started by the process since last collection divided by the elapsed time between two collections.

Table 3–19 (Cont.) Process Activity Statistics Metrics

Metric	Description
For Release 6 Number of bytes written to the user log cache for the process **For Release 7** Write rate (bytes/sec) to the ULC for the process	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of bytes written to the user log cache for the process since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the bytes were written to the user log cache since last collection, that is, the number of bytes written to the user log cache for the process since last collection divided by the elapsed time between two collections.
Current usage (bytes) of the User log cache by the process	The current usage (bytes) of the User log cache by the process.
For Release 6 Total number of times the user log cache was flushed **For Release 7** User Log Cache flush rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Total number of times the user log cache was flushed since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the user log cache was flushed since last collection, that is, number of times the user log cache was flushed since last collection divided by the elapsed time between two collections.
For Release 6 Number of times the user log cache was flushed **For Release 7** User Log Cache flush rate [due to ULC full] (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of times the user log cache was flushed because it was full since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the user log cache was flushed since last collection, that is, the number of times the user log cache was flushed since last collection divided by the elapsed time between two collections.
Maximum ever usage (bytes) of the user log cache	The maximum ever usage (in bytes) of the user log cache by the process.
Waited time by process (ms)	Time (in milliseconds) the process has spent waiting.

3.20 Process Tracking Details

The metrics in this category provide information enabling processes to be tracked to an application, user, client machine, and so on.

Collection frequency - Every 30 mins

Table 3–20 Process Tracking Details Metrics

Metric	Description
Client Host Name	Host name of client
Client application OS PID	OS process identifier of the client application

3.21 Process Network IO Activity

The metrics in this category provide network I/O activity information for each process.

Collection frequency - Every 30 mins

Table 3–21 Network IO Activity Metrics

Metric	Description
For Release 6 Number of bytes received **For Release 7** Incoming network IO traffic (process) rate (bytes/sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of bytes received since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the bytes were received since last collection, that is, the number of bytes received since last collection divided by the elapsed time between two collections.
For Release 6 Number of bytes sent **For Release 7** Outgoing network IO traffic (process) rate (bytes/sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of bytes sent since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the bytes were sent since last collection, that is, the number of bytes sent since last collection divided by the elapsed time between two collections.
Network packet size	Network packet size the session is currently using.
For Release 6 Number of packets received **For Release 7** Incoming network IO traffic (process) rate (packets/sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of packets received since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the packets were received since last collection, that is, the number of packets received since last collection divided by the elapsed time between two collections.
For Release 6 Number of packets sent **For Release 7** Outgoing network IO traffic (process) rate (packets/sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of packets sent since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the packets were sent since last collection, that is, the number of packets sent since last collection divided by the elapsed time between two collections.

3.22 Process Objects Information

The metrics in this category provide statistical information regarding objects that have been accessed by processes.

Collection frequency - Every 30 mins

Table 3–22 Process Objects Information Metrics

Metric	Description
DB Name	Name of the database.
KPID	Kernel process identifier.
For Release 6 Number of buffers read from cache **For Release 7** Buffers read (process object) rate from cache (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of buffers read from the cache since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the buffers were read from the cache since last collection, that is, the number of buffers read from cache since last collection divided by the elapsed time between two collections.
Object Name	Name of the object.
Object Type	Object type.

Table 3–22 (Cont.) Process Objects Information Metrics

Metric	Description
For Release 6 Number of APF buffers read from disk **For Release 7** APF buffers read (process object) rate from disk (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of APF buffers read from the disk since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the APF buffers were read from the disk since last collection, that is, the number of APF buffers read from the disk since last collection divided by the elapsed time between two collections.
For Release 6 Number of buffers read from disk **For Release 7** Buffers read (process object) rate from disk (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of buffers read from the disk since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the buffers were read from the disk since last collection, that is, the number of buffers read from the disk since last collection divided by the elapsed time between two collections.
SPID	Session process identifier.

3.23 Running Procedures Statistics

The metrics in this category provide a list of all procedures that are being executed by processes.

Collection frequency - Every 30 mins

Table 3–23 Running Procedures Statistics Metrics

Metric	Description
Compile date	Compile date of the procedure.
Stack frame	Stack frame of the procedure.
DB Name	Name of the database that contains the procedure.
Memory Usage (KB)	Number of kilobytes of memory used by the procedure.
Procedure Name	Name of the procedure.
Procedure Type	Type of the procedure.
Owner Name	Name of the owner.
Query Plan ID	Unique identifier for the query plan.

3.24 Currently Executing SQL Text Information

The metrics in this category provide the SQL text that is currently being executed.

Table 3–24 Currently Executing SQL Text Information Metrics

Metric	Description
SQL Text	SQL text.

3.25 Currently Executing Queries

The metrics in this category provide information for currently executing statements.

Table 3–25 Currently Executing Queries Metrics

Metric	Description
Procedure stack frame ID	Stack frame of the procedure, if a procedure.
CPU Usage (ms) by Query	Number of milliseconds of CPU used by the statement.
Line number of the statement in SQL batch	Line number of the statement in SQL batch.
Number of buffers read from cache	Number of buffers read from cache.
Procedure Memory Usage (KB)	Number of kilobytes of memory used for execution of the statement.
Network packets size (bytes)	Size (in bytes) of the network packet currently configured for the session.
Number of network packets received by Adaptive Server	Number of network packets received by Adaptive Server.
Number of network packets sent by Adaptive Server	Number of network packets sent by Adaptive Server.
Number of pages modified by the statement	Number of pages modified by the statement.
Number of buffers read from disk	Number of buffers read from disk.
Stored plan ID	Unique identifier for the stored plan for the procedure.
Number of altered plans	The number of plans altered at execution time.
Procedure ID	Unique identifier for the procedure.
Execution start time	Date when the statement began execution.
Total Waited time during execution (ms)	Number of milliseconds the task has waited during execution of the statement.

3.26 Waiting Process Statistics

The metrics in this category provide a server-wide view of where processes are waiting for an event.

Collection Frequency - 30 mins

Table 3–26 Waiting Process Statistics Metrics

Metric	Description
Total number of waits for event	Number of times the process has waited for the event. The upload frequency is after every sample. The operator is >. Alert text is - The total total number of waits for event are %Waits%. It has crossed warning (%warning_threshold%) or critical (%critical_ threshold%) threshold. For this metric, you can set different warning and critical threshold values for each unique combination of "SPID", "KPID", and "Wait Event ID" objects. If warning or critical threshold values are currently set for any unique combination of "SPID", "KPID", and "Wait Event ID" objects, those thresholds can be viewed on the Metric Detail page for this metric. To specify or change warning or critical threshold values for each unique combination of "SPID", "KPID", and "Wait Event ID" objects, use the Edit Thresholds page.
Total waiting time for event (ms)	Amount of time (in milliseconds) that the process has waited for the event.

3.27 Adaptive Server State

The metrics in this category provide information regarding the overall state of Adaptive Server.

Collection Frequency - 30 mins

Table 3–27 Adaptive Server State Metrics

Metric	Description
Checkpoints	Reports whether any checkpoint is currently running.
Number of active inbound connections	Number of active inbound connections.
Monitoring counters clearing date	Date and time the monitor counters were last cleared.
Number days Adaptive Server has been running	Number of days Adaptive Server has been running
Diagnostic Dumps	Reports whether sybmon is performing a shared memory dump
Number of processes waited longer than lock wait threshold	Number of processes that have waited longer than LockWaitThreshold seconds. The upload frequency is after every sample. The operator is >. Alert text is - The total number of processes waited longer than lock wait threshold are %LockWaits%. It has crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Lock wait threshold (seconds)	Time (in seconds) that processes must have waited for locks in order to be reported.
Max Recovery time per database (minutes)	The maximum time (in minutes), per database, that Adaptive Server uses to complete its recovery procedures in case of a system failure. Also, the current Run Value for recovery interval in minutes.
Total number of occured deadlocks	Total number of deadlocks that have occurred. The upload frequency is after every sample. The operator is >. Alert text is - The total total number of occured deadlocks are %NumDeadlocks%. It has crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Adaptive Server started date	Date and time that Adaptive Server was started.

3.28 Recently (Currently Being) Executed SQL Text

The metrics in this category provide the most recent SQL text that has been executed, or is currently being executed. The maximum number of rows returned can be tuned with SQL text pipe max messages.

Collection Frequency - 12 hours

Table 3–28 Recently (Currently Being) Executed SQL Text Metrics

Metric	Description
For Release 7 **SQL Batch ID**	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** **Batch ID of the currently being executed SQL text.**
For Release 7 **SQL Text position in bat**	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** **Position of the currently being executed SQL test.**
For Release 7 **Server UID**	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** **UIS of the server.**
For Release 6 SQL Text	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** SQL Text

3.29 Most Recently Executed Statement Statistics

The metrics in this category provide statistics pertaining to the most recently executed statements. The statements shown could be from the time the information was last collected based on one of the following (whichever is the latest):

- Automatic collection interval set in Grid Control.

- Manual refresh done to collect real-time information during the set collection intervals.
- Query manually run on the monSysStatement MDA table during the set collection interval.

Collection Frequency - 12 hours

Table 3–29 Most Recently Executed Statement Statistics Metrics

Metric	Description
Procedure stack frame ID	Current procedure nesting level when executing the statement.
CPU Usage (ms)	Number of milliseconds of CPU used by the statement.
Execution finish time	Date when the statement finished execution.
Line number of the statement in SQL batch	Line number of the statement in SQL batch.
Number of buffers read from cache	Number of buffers read from cache.
Memory Usage (KB)	Number of kilobytes of memory used for execution of the statement.
Network packet size (bytes)	Size (in bytes) of the network packet currently configured for the session.
Number of network packets received by Adaptive Server	Number of network packets received by Adaptive Server.
Number of network packets sent by Adaptive Server	Number of network packets sent by Adaptive Server.
Number of pages modified by the statement	Number of pages modified by the statement.
Number of buffers read from disk	Number of buffers read from disk.
Stored Plan ID	Unique identifier for the stored plan for the procedure.
Number of alerted plans	The number of plans altered at execution time.
Procedure ID	Unique identifier for the procedure.
Execution start time	Date when the statement began execution.
Total waited time during execution (ms)	Number of milliseconds the task has waited during execution of the statement.

3.30 Waiting Events Statistics

The metrics in this category provide a server-wide view of where processes are waiting for an event.

Collection Frequency - Every 1 hour

Table 3–30 Waiting Events Statistics Metrics

Metric	Description
Total number of task waits	Number of times tasks that have waited for the event.
Amount of waiting time for the event (ms)	Amount of time (in milliseconds) that tasks have spent waiting for the event.

3.31 Server-Wide Worker Threads Statistics

The metrics in this category provide server-wide statistics related to worker threads.

Collection Frequency - Every hour

Table 3–31 Server-Wide Worker Threads Statistics Metrics

Metric	Description
Max number of worker processes ever in use	The maximum number of worker processes that have ever been in use.
Max number of worker processes ever in use	The maximum number of worker processes that have ever been in use.
Max parallel degree	The maximum degree of parallelism that can be used (the current Run Value for max parallel degree) in configuration parameter.
Max scan parallel degree	The maximum degree of parallelism that can be for a scan (the current Run Value for max scan parallel degree) in configuration parameter).
For Release 6 Number of attempted parallel queries **For Release 7** Attempted parallel queries (SysWorkerThread) rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of attempted parallel queries since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the parallel queries were attempted since last collection, that is, the number of attempted parallel queries since last collection divided by the elapsed time between two collections.
For Release 6 Number of altered plans **For Release 7** Altered plans (SysWorkerThread) rate (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of altered plans since last collection. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which altered plans were made since last collection, that is, the number of altered plans since last collection divided by the elapsed time between two collections.
Number of active worker processes	Number of worker processes active. The upload frequency is after every sample. The operator is >. Alert text is - The total number active worker processes are %ThreadsActive%. It has crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Total memory configured for worker processes (Bytes)	The amount of memory configured for use by worker processes.
Max configured worker processes	Configured maximum number of worker processes.
Total memory in use by worker processes (Bytes)	The amount of memory currently in use by worker processes.
Max memory ever used by worker processes (Bytes)	The maximum amount of memory ever used by worker processes.

3.32 Wait Class Event Information

The metrics in this category provide information and textual description for all of the wait classes (for example, waiting for a disk read to complete). All wait events have been grouped into wait classes that classify the type of event that a process is waiting for.

Collection Frequency - Every 720 hours

Table 3–32 Wait Class Event Information Metrics

Metric	Description
Description	Description of the wait event class.

3.33 Wait Events Information

The metrics in this category provide information and textual description for every possible situation where a process is forced to wait within Adaptive Server.

Collection Frequency - Every 720 hours

Table 3–33 Wait Events Information Metrics

Metric	Description
Description	Description of the wait event type.

3.34 Database Usages

The metrics in this category provide information regarding each disk allocation piece assigned to a database. Each database contains a specified number of database (logical) page numbers.

Collection Frequency - Every 1 hour

Table 3–34 Database Usages Metrics

Metric	Description and User Action
Database Space Utilization (%)	Percentage of Database Space Utilization. The upload frequency is after every sample. The operator is >. Alert text is - The database space utilization is %DatabaseSpaceUtilization%. It has crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold. Default Warning Threshold is 80. Default Critical Threshold is 90. For this metric you can set different warning and critical threshold values for each unique combination of "DBID", "Segment Map", and "First Database (logical) Page Number" objects. If warning or critical threshold values are currently set for any unique combination of "DBID", "Segment Map", and "First Database (logical) Page Number" objects, those thresholds can be viewed on the Metric Detail page for this metric. To specify or change warning or critical threshold values for each unique combination of "DBID", "Segment Map", and "First Database (logical) Page Number" objects, use the Edit Thresholds page.
Database Free Space (MB)	Free space not part of an allocated extent.
Database Size (MB)	Number of contiguous database (logical) pages.

3.35 Database Indexes

The metrics in this category provide information about each clustered index, one row for each nonclustered index, one row for each table that has no clustered index, and one row for each table that contains text or image columns.This table also contains one row for each function-based index or index created on a computed column.

Collection Frequency - Every 24 hours

Table 3–35 Database Indexes Metrics

Metric	Description and User Action
Creation date	Creation date.
Character set ID	Character set ID with which the index was created; 0 if there is no character data in the keys.
Index ID	ID of an index, or ID of table to which index belongs.
Number of keys for a clustered index	Number of keys for a clustered index on an allpages-locked table; number of keys, plus 1 for all other indexes. The upload frequency is after every sample. The operator is >. For this metric, you can set different warning and critical threshold values for each "Index/Table Name" object. If warning or critical threshold values are currently set for any "Index/Table Name" object, those thresholds can be viewed on the Metric Detail page for this metric. To specify or change warning or critical threshold values for each "Index/Table Name" object, use the Edit Thresholds page.
Maximum size of a row	Maximum size of a row.
Maximum number of rows per page	Maximum number of rows per page.
Minimum size of a row	Minimum size of a row.

Table 3–35 (Cont.) Database Indexes Metrics

Metric	Description and User Action
For Release 6 Partition Type	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** \1 - range 2 - hash 3 or NULL - [default] round robin 4 - list
Segment number	Number of segment in which object resides.
Sort order ID	Sort order ID with which the index was created; 0 if there is no character data in the keys.

3.36 Database Login Roles

The metrics in this category provide information regarding each instance of a server login possessing a system role. One row is added for each role granted to each login. For example, if a single server user is granted sa_role, sso_role, and oper_role, three rows are added to sysloginroles associated with that user's system user ID (suid). Data from this metric is uploaded only if the severity has reached WARNING state.

Collection Frequency - Every 24 hour

Table 3–36 Database Login Roles Metrics

Metric	Description and User Action
Role Name	Name of the role. The upload frequency is after every sample. The operator is >. Alert text is - User %Name% (with SUID %SUID%) has been granted server role of %RoleName%. For this metric, you can set different warning and critical threshold values for each unique combination of "SUID", "Name", and "Server Role ID" objects. If warning or critical threshold values are currently set for any unique combination of "SUID", "Name", and "Server Role ID" objects, those thresholds can be viewed on the Metric Detail page for this metric. To specify or change warning or critical threshold values for each unique combination of "SUID", "Name", and "Server Role ID" objects, use the Edit Thresholds page.

3.37 Database Logins

The metric in this category provide information regarding each valid Adaptive Server user account.

Data from this metric is uploaded only if the severity has reached WARNING state.

Collection Frequency - Every 5 hours

Table 3–37 Database Logins Metrics

Metric	Description and User Action
CPU and I/O Last Cleared Date	Date totcpu and totio were last cleared.
DB Name	Name of database in which to put user when connection established.
Full Name	Full name of the user.
User Default Language	Default language of the user.
Number of failed login attempts	Number of failed login attempts; reset to 0 by a successful login. The upload frequency is after every sample. The operator is >. Alert text is - The total number of failed login attempts for %SUID% are %LoginCount%. It has crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold. For this metric you can set different warning and critical threshold values for each "SUID" object. If warning or critical threshold values are currently set for any "SUID" object, those thresholds can be viewed on the Metric Detail page for this metric. To specify or change warning or critical threshold values for each "SUID" object, use the Edit Thresholds page.
Login Name	Login name of the user.

Table 3–37 (Cont.) Database Logins Metrics

Metric	Description and User Action
Date the password was last changed	Date the password was last changed.
Login Status	Status of the login account. The upload frequency is after every sample. The operator is >. Alert text is - The login status for %SUID% is %Status%. For this metric you can set different warning and critical threshold values for each "SUID" object. If warning or critical threshold values are currently set for any "SUID" object, those thresholds can be viewed on the Metric Detail page for this metric. To specify or change warning or critical threshold values for each "SUID" object, use the Edit Thresholds page.
CPU Accumulated Time (ticks)	CPU time accumulated by login.
I/O Accumulated Time (ticks)	I/O accumulated by login

3.38 Database Objects

The metrics in this category provide information regarding each table, view, stored procedure, extended stored procedure, log, rule, default, trigger, check constraint, referential constraint, computed column, function-based index key, and (in tempdb only) temporary object, and other forms of compiled objects. It also contains one row for each partition condition ID when object type is N.

Collection Frequency - Every 24 hours

Table 3–38 Database Objects Metrics

Metric	Description and User Action
Stored Procedure ID of a Delete Trigger	Stored procedure ID of a delete trigger if the entry is a table. Table ID if the entry is a trigger.
Stored Procedure ID of a Insert Trigger	Stored procedure ID of a table's insert trigger if the entry is a table.
For Release 6 Object ID	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Object ID.
Object Type	One of the following object types: C – computed column D – default F – SQLJ function L – log N – partition condition P – Transact-SQL or SQLJ procedure PR – prepare objects (created by Dynamic SQL) R – rule RI – referential constraint S – system table TR – trigger U – user table V – view XP – extended stored procedure.
Login Name of user who created the object	Login Name of user who created the object.
Number of changes in the schema	Count of changes in the schema of an object (incremented if a rule or default is added). The upload frequency is after every sample. The operator is >. Alert text is - The total number of changes in the schema are %SchemaCnt%. It has crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold. For this metric, you can set different warning and critical threshold values for each "Object Name" object. If warning or critical threshold values are currently set for any "Object Name" object, those thresholds can be viewed on the Metric Detail page for this metric. To specify or change warning or critical threshold values for each "Object Name" object, use the Edit Thresholds page.
User ID of object owner	User ID of object owner.
Stored Procedure ID of a Update Trigger	Stored procedure ID of an update trigger of a table if the entry is a table.

3.39 Database Segments

The metrics in this category provide information regarding each segment (named collection of disk pieces). In a newly created database, the entries are: segment 0

(system) for system tables; segment 2 (logsegment) for the transaction log; and segment 1 (default) for other objects.

Collection Frequency - Every hour

Table 3–39 Database Segments Metrics

Metric	Description and User Action
For Release 6 Segment Number	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Segment number
Segment Status	Indicates which segment is the default segment. The upload frequency is after every sample. The operator is >. Alert text is - The Segment status is %Status%. For this metric you can set different warning and critical threshold values for each "Segment Name" object. If warning or critical threshold values are currently set for any "Segment Name" object, those thresholds can be viewed on the Metric Detail page for this metric. To specify or change warning or critical threshold values for each "Segment Name" object, use the Edit Thresholds page.

3.40 Database Thresholds

The metrics in this category provide information regarding each threshold defined for the database.

Collection Frequency - Every 12 hours

Table 3–40 Database Thresholds Metrics

Metric	Description and User Action
Size of threshold (logical pages)	Size of threshold in logical pages. The upload frequency is after every sample. The operator is >. The alert text will be "The size of threshold is %FreeSpace%". It has crossed warning (%warning_ threshold%) or critical (%critical_threshold%) threshold". For this metric you can set different warning and critical threshold values for each "Segment" object. If warning or critical threshold values are currently set for any "Segment" object, those thresholds can be viewed on the Metric Detail page for this metric. To specify or change warning or critical threshold values for each "Segment" object, use the Edit Thresholds page.
For Release 6 Process Name **For Release 7** Procedure executed when unused pages count falls below threshold	Name of the procedure that is executed when the number of unused pages on segment falls below free_space.
SUID	The server user ID of the user who added the threshold or modified it most recently.

3.41 Database Transactions

The metrics in this category provide information about Adaptive Server transactions.

Collection Frequency - Every 24 hours

Table 3–41 Database Transactions Metrics

Metric	Description
Connection State	Value indicating the connection state.
Transaction Failover State	Value indicating the transaction failover state.
Lock Owner ID	Lock owner ID.
Length of Transaction Name	Length of transaction name.
Transaction Server Process ID	Server process ID, or 0 if the process is detached.

Table 3–41 (Cont.) Database Transactions Metrics

Metric	Description
Remote Server Name	Name of the remote server.
Transaction State	Value indicating the current state of the transaction.
Transaction Status	Status of the transaction.
Transaction Type	Value indicating the type of transaction.

3.42 Database Users

The metrics in this category provide information regarding each user allowed in the database, and one row for each group or role.

Collection Frequency - Every 24 hours

This metric does not exist for Release 11.

Table 3–42 Database Users Metrics

Metric	Description
For Release 6 Group ID	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Group ID to which this user belongs. If uid = gid, this entry defines a group. Negative values may be used for user IDs (uid). Every suid associated with a group or a role in sysusers is set to -2 (INVALID_SUID).
For Release 6 SUID	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Server user ID.
For Release 6 User Name **For Release 7** User/Group Name	User or group name, unique in this database.

3.43 Most Recent Error Messages

The metrics in this category provide statistics pertaining to the most recent server error messages. The error messages shown could be from the time the information was last collected based on one of the following (whichever is the latest):

- Automatic collection interval set in Grid Control
- Manual refresh done to collect real-time information during the set collection intervals
- Query manually run on the monSysStatement MDA table during the set collection interval
- Data from this metric is uploaded only if the severity has reached WARNING state.

Collection Frequency - Every 1 hour

Table 3–43 Most Recent Error Messages Metrics

Metric	Description
For Release 9 Error Message	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 9 (1.2.1.1.0)** Error message that was displayed.
For Release 9 Error Severity	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 9 (1.2.1.1.0)** Severity of the Error. The upload frequency is after every sample. The operator is >=. The alert text will be " %ErrorMessage%.. For this metric, you can set different warning and critical threshold values for each unique combination of "SPID/KPID/FamilyID", "Engine Number","Error Number" and "Error timestamp" objects. If warning or critical threshold values are currently set for any unique combination of "SPID/KPID/FamilyID", "Engine Number","Error Number" and "Error timestamp" objects, those thresholds can be viewed on the Metric Detail page for this metric. This alert is Stateless alert.
For Release 9 State	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 9 (1.2.1.1.0)** State of the error.

3.44 Segment Usages

The metrics in this category provide details about the segment usages.

By default, this metric is disabled.

For enabling this metric, monitoring user should have permission on each database.

All these metric categories provide the following details:

Table 3–44 Segment Usages Metrics

Metric	Description
Segment Free Space (MB)	Name of the configuration parameter.
Segment Size (MB)	Default value assigned to this parameter.
Segment Space Utilization (%)	Memory used by the parameter.
Segment Used Space (MB)	Most recent value to which the configuration parameter has been set with sp_ configure.

3.45 Top Ten Big Cached Objects

The metrics in this category provide statistics for all objects and indexes with pages currently in a data cache.

Only top 10 rows sorted on size are returned every time this metric is collected.

Collection frequency - Every 60 mins

Table 3–45 Top Ten Big Cached Objects Metrics

Metric	Description
Cached Object Size	Number of kilobytes of the cache the object is occupying.
Cache Name	Name of the cache.
DB Name	Name of the database.
Object Name	Name of the object.

Table 3–45 (Cont.) Top Ten Big Cached Objects Metrics

Metric	Description
Object Type	Type of object.
Owner Name	Name of the object owner.
For Release 6 Number of Processes Currently Accessing the Object (per sec) **For Release 7** Process Access Rate of the Object (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of processes currently accessing the object. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the processes are currently accessing the object, that is, the number of processes that have started accessing the object since last collection divided by the elapsed time between two collections.

3.46 Top Ten Frequently Accessed Cached Objects

The metrics in this category provide statistics for all objects and indexes with pages currently in a data cache.

Only top 10 rows sorted on the frequency of access are returned every time this metric is collected.

Collection frequency - Every 60 mins

Table 3–46 Top Ten Frequently Accessed Cached Objects Metrics

Metric	Description
Cached Object Size	Number of kilobytes of the cache the object is occupying.
Cache Name	Name of the cache.
DB Name	Name of the database.
Object Name	Name of the object.
Object Type	Type of object.
Owner Name	Name of the object owner.
For Release 6 Number of Processes Currently Accessing the Object (per sec) **For Release 7** Process Access Rate of the Object (per sec)	**For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 6 (1.0.1.0.0)** Number of processes currently accessing the object. **For System Monitoring Plug-In for Sybase Adaptive Server Enterprise (ASE) Release 7 (1.1.1.0.0)** Rate at which the processes are currently accessing the object, that is, the number of processes that have started accessing the object since last collection divided by the elapsed time between two collections.

3.47 Configuration Metrics

Configuration metrics consist of the following categories.

3.47.1 Sybase ASE Version Metrics

The metrics in this category provide details about the version of Sybase ASE.

Default Collection Interval — Every 24 hours

Table 3–47 Sybase ASE Version Metrics

Metric	Description
Version	Version of Sybase ASE.

3.47.2 System Listeners Metrics

The metrics in this category provide details about the system listeners.

Default Collection Interval — Every 24 hours

Table 3–48 System Listeners Metrics

Metric	Description
ASE Server Name and Port	Name of the ASE Server and the associated port.
Network Protocol	Network protocol used.

3.47.3 System Databases

The metrics in this category provide details about the databases used.

Default Collection Interval — Every 24 hours

Table 3–49 System Databases Metrics

Metric	Description
Database Name	Name of the database used.
Database Size	Size of the database used.
Owner Name	Name of the owner of the database.
Database ID	Unique ID of the database.
Date of Creation	Date when the database was created.
Status	Current status of the database.

3.47.4 Installed Scripts

The metrics in this category provide details about the installed scripts.

Default Collection Interval — Every 24 hours

Table 3–50 Installed Scripts Metrics

Metric	Description
Script Name	Name of the installed script.
Version	Version of the installed script.
Status	Current status of the script.

3.47.5 Charsets Information

The metrics in this category provide details about the charsets.

Default Collection Interval — Every 24 hours

Table 3–51 Charsets Information Metrics

Metric	Description
Entity Type	Type of charset entity.
ID	Unique ID assigned to the entity.
Charset ID	Unique ID assigned to the charset.
Status	Status of the charset.
Charset Name	Name of the charset.
Description	A brief description of the charset.
Sort File	Name of the associated sort file.

3.47.6 Configuration Parameters

This section is a grouping of the following configuration parameters metric categories:

- Backup/Recovery Configuration Parameters
- Cache Manager Configuration Parameters
- Component Integration Services Configuration Parameters
- Configuration Options Configuration Parameters
- DTM Administration Configuration Parameters
- Diagnostics Configuration Parameters
- Disk I/O Configuration Parameters
- Error Log Configuration Parameters
- Extended Stored Procedure Configuration Parameters
- General Information Configuration Parameters
- Java Services Configuration Parameters
- Languages Configuration Parameters
- Lock Manager Configuration Parameters
- Memory Use Configuration Parameters
- Meta-Data Caches Configuration Parameters
- Monitoring Configuration Parameters
- Network Communication Configuration Parameters
- O/S Resources Configuration Parameters
- Physical Memory Configuration Parameters
- Physical Resources Configuration Parameters
- Processors Configuration Parameters
- Rep Agent Thread Administration Configuration Parameters
- Security Related Configuration Parameters
- SQL Server Administration Configuration Parameters
- Unicode Configuration Parameters
- User Environment Configuration Parameters

The default collection interval for all these metric categories is — Every 24 hours

All these metric categories provide the following details:

Table 3–52 Configuration Parameters Metrics

Metric	Description
Parameter Name	Name of the configuration parameter.
Default Value	Default value assigned to this parameter.
Memory Used	Memory used by the parameter.
Config Value	Most recent value to which the configuration parameter has been set with sp_ configure.
Run Value	Value being used by Adaptive Server. It changes after you modify a parameter's value with sp_configure and, for static parameters, after you restart Adaptive Server.
Unit	Unit of measurement. For example, bytes, number, and so on.
Type	Indicates whether the parameter is dynamic or static. For static The Adaptive Server needs to be restarted if it is a static parameter. and not if it is a dynamic parameter.

3.47.7 Database Instances

The metrics in this category provide details about the database instances.

The default collection interval for all these metric categories is — Every 1 hour

All these metric categories provide the following details:

Table 3–53 Database Instances Metrics

Metric	Description
Data Space Utilization (%)	Name of the configuration parameter.
Free Data Space (MB)	Default value assigned to this parameter.
Free Log Space (MB)	Memory used by the parameter.
Log Space Utilization (%)	Most recent value of the configuration parameter set by sp_configure.
Total Data Space (MB)	Value being used by Sybase Adaptive Server. It changes after you modify a parameter's value with sp_configure and for static parameters, after you restart Sybase Adaptive Server.
Total Log Space (MB)	Unit of measurement. For example, bytes, number, and so on.
Used Data Space(MB)	Indicates whether the parameter is dynamic or static. For static parameters, Sybase Adaptive Server needs to be restarted. For dynamic parameter, it need not be started.
Used Log Space (MB)	

4

Microsoft SQL Server Reports

This chapter provides a list of out-of-box reports available for System Monitoring Plug-In for Microsoft SQL Server.

Table 4–1 Microsoft SQL Server Reports

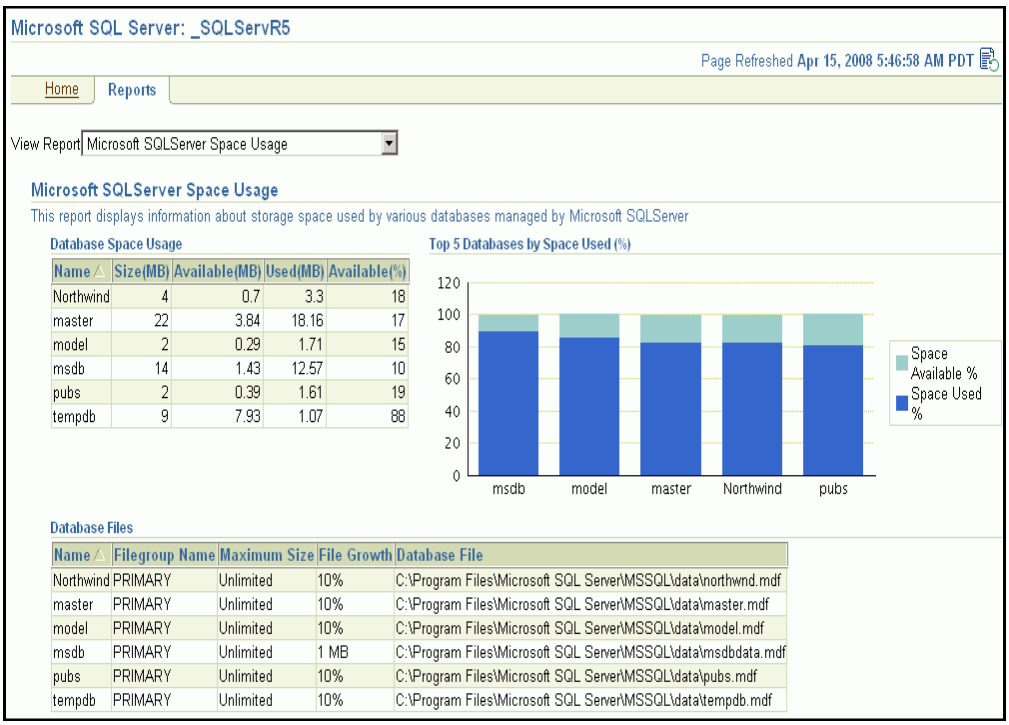
Report Name	Report Elements
Microsoft SQLServer System Configuration	■ Instance Information ■ Registry ■ Security ■ Server Parameters
Microsoft SQLServer System Database Configuration	■ Database ■ Database Settings
Microsoft SQLServer System Memory Statistics	■ Server Statistics ■ Buffer Cache Hit Ratio (%) ■ Cache Hit Ratio (%) ■ Average Latch Wait Time (ms) ■ Total Lock Wait Time (ms)
Microsoft SQLServer System Space Usage	■ Database Space Usage ■ Top 5 Databases by Space Used (%) ■ Database Files
Microsoft SQLServer System Users and Privileges	■ Top 10 User Logins Based on CPU Usage (ms) ■ Server Roles ■ Logins ■ Database Users
Microsoft SQLServer System Performance	■ Host CPU load percentage ■ Top SQL Server Processes by CPU Time ■ Memory Manager ■ Top Server Processes by Memory Usage
Microsoft SQLServer System Process Info and Locks	■ Summary ■ Process States ■ Process Info ■ Process Locks ■ Lock Analysis

Table 4–1 (Cont.) Microsoft SQL Server Reports

Report Name	Report Elements
Microsoft SQLServer System Cache and Buffer	■ Memory Status ■ Buffer Performance ■ Buffer Allocation ■ Cache Performance ■ Memory Allocation ■ Memory Allocation Chart
Microsoft SQLServer System Alert Log and Alert Events	■ Error Logs ■ Event Summary (in current log) ■ Server and Agent Errors ■ Server and Agent Warnings ■ Server Alerts
Microsoft SQLServer System Database Backups and Jobs	■ Database Backups ■ Database Jobs
Microsoft SQLServer System Cluster	■ Cluster Nodes Summary ■ Nodes in Cluster ■ SQL Cluster Nodes Summary ■ Cluster Resources and Activity
Microsoft SQLServer System Statistics	■ Server Statistics ■ Rate of Errors ■ Packet Error Ratio ■ Rate of Reads ■ Rate of Writes ■ Database Statistics ■ Database Statistics Summary ■ Server Statistics

The following shows the Space Usage report available for Microsoft SQL Server:

Figure 4–1 Space Usage Report



5

IBM DB2 Database Reports

This chapter provides a list of out-of-box reports available for System Monitoring Plug-In for IBM DB2 Database.

Table 5–1 IBM DB2 Database Reports

Report Name	Report Elements
IBM DB2 Database System Configuration	■ System Configuration ■ Product Overview ■ Instances ■ Partitions ■ Registry Settings
IBM DB2 Database DB Manager Configuration	■ DB Manager Capacity ■ DB Manager Database Instance ■ DB Manager Log and Recovery ■ DB Manager Partitioned DB Environment ■ DB Manager Connections
IBM DB2 Database DB Disk Storage Statistics	■ Disk Space Utilization ■ Disk Space Utilization Summary ■ Disk Space Utilization Details
IBM DB2 Database Bufferpool and Non-Buffered IO Statistics	■ Bufferpool Activity Summary ■ Non Buffered IO Activity Summary ■ Reads per sec ■ Index Read Rate ■ Index and Data Write Rate ■ Non Buffered IO
IBM DB2 Database Cache Statistics	■ Package Cache Summary ■ Catalog Cache Summary ■ Catalog Cache Overflows ■ Catalog Cache Hit Ratio ■ Package Cache Overflows ■ Package Cache Hit Ratio ■ Catalog Cache Heapfull

Table 5–1 (Cont.) IBM DB2 Database Reports

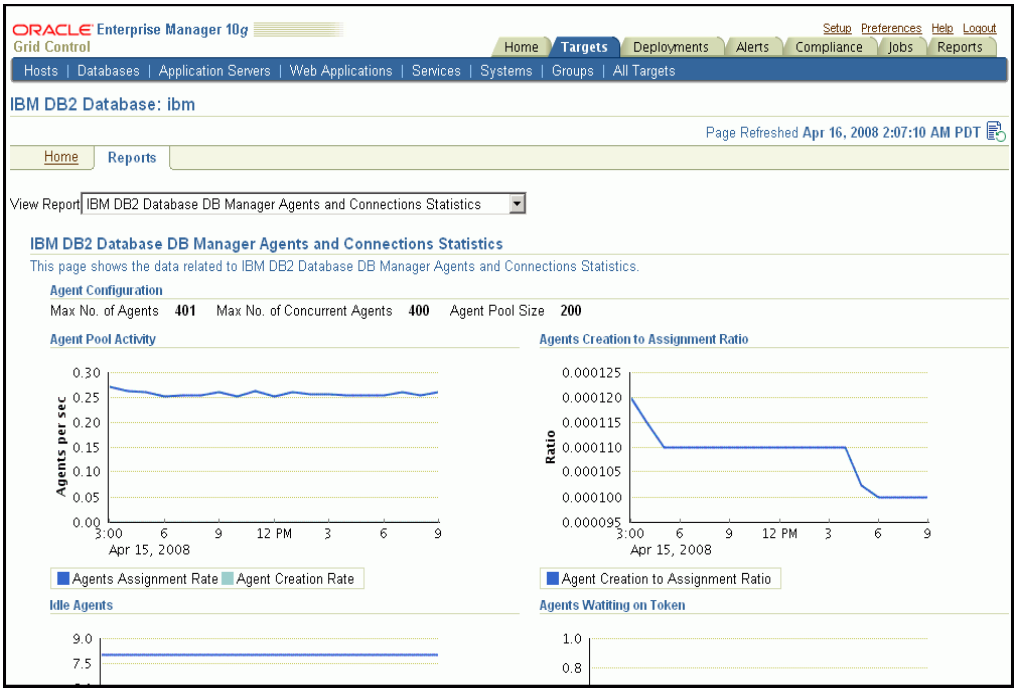
Report Name	Report Elements
IBM DB2 Database Sort Heap and Hash Join Statistics	■ Total Sorts and Hash Joins ■ Active Sorts ■ Active Sorts Summary ■ Average Sort Space Used ■ Average Sort Time Per Sort ■ Sorts Overflow Ratio ■ Hash Join Small Overflows and Overflows ■ Hash Join Small Overflows to Overflows Ratio
IBM DB2 Database DB Manager Sorts Statistics	■ Database Manager Sorts Summary ■ Post Threshold Sorts and Joins ■ Piped Sorts Rejection Rate
IBM DB2 Database Locks Statistics	■ Lock Summary ■ Average Lock Wait Time ■ Locks Held and Waiting ■ Application Escalations and Timeouts ■ Deadlocks and Internal Deadlock Rollbacks
IBM DB2 Database DB Manager Agents and Connections Statistics	■ Agent Configuration ■ Agent Pool Activity ■ Agents Creation to Assignment Ratio ■ Idle Agents ■ Agents Watiting on Token ■ Remote Connections ■ Remote Connections Summary ■ Local Connections ■ Local Connections Summary
IBM DB2 Database Applications Lock Performance	■ Top 10 Applications Based on Average Lock Wait Time (ms) ■ Top 10 Applications Based on Number of Locks Held ■ Top 10 Applications Based on Number of Lock Timeouts
IBM DB2 Database CPU Usage	■ Top 10 Applications Based on Total CPU Usage (ms) ■ Top 10 Applications Based on Total Idle Time (ms)
IBM DB2 Database Applications Row Accesses and Sorts Performance	■ Top 10 Applications Based on Rows Read ■ Top 10 Applications Based on Rows Written ■ Top 10 Applications Based on Time Spent in Sorts (ms)
IBM DB2 Database SQL Statement Performance	■ Top 10 Statements Based on Rows Read ■ Top 10 Statements Based on Rows Written ■ Top 10 Statements Based on Average Sort Time (ms) ■ Top 10 Statements Based on CPU Usage (ms)
IBM DB2 Database DB Health	■ Database Health Information ■ Database Health Indicator ■ Database Collection Health Indicator

Table 5–1 (Cont.) IBM DB2 Database Reports

Report Name	Report Elements
IBM DB2 Database DB Manager Health	▪ Database Manager Health Information ▪ Database Manager Health Indicator
IBM DB2 Database Tablespace Health	▪ Tablespace Health Information ▪ Tablespace Health Indicator
IBM DB2 Database Container Health	▪ Container Health Information ▪ Container Health Indicator
IBM DB2 Database Tablespace Statistics	▪ Top 5 Tablespaces by Space Available (%) ▪ Tablespaces Summary

The following shows the DB Manager Agents and Connections Statistics report available for IBM DB2 Database:

Figure 5–1 IBM DB2 Database DB Manager Agents and Connections Statistics Report



6

Sybase Adaptive Server Enterprise Database Reports

This chapter provides a list of out-of-box reports available for System Monitoring Plug-In for Sybase (ASE) Database.

Table 6–1 Sybase (ASE) Database Reports

Report Name	Report Elements
Sybase ASE Performance Statistics	■ CPU Utilization ■ IO Utilization ■ ASE State Summary ■ ASE State Summary...
Sybase ASE Engines Statistics	■ System CPU (by all Engine's) Utilization ■ User CPU (by all Engine's) Utilization ■ Top 10 Engines by System CPU Utilization ■ Top 10 Engines by User CPU Utilization
Sybase ASE Databases Space Statistics	■ Databases Current Configuration ■ Top 5 Databases by Space Utilization ■ Databases Backup Related Summary
Sybase ASE Device IO Statistics	■ User Data Devices IO Operations Vs Waiting time ■ User Log Devices IO Operations Vs Waiting Time ■ User Data Devices IO Summary ■ User Log Devices IO Summary ■ Tempdb Data Devices IO Operations Vs Waiting Time ■ Tempdb Log Devices IO Operations Vs Waiting Time ■ Tempdb Data Devices IO Summary ■ Tempdb Log Devices IO Summary ■ Device Reads Rate Vs Writes Rate Vs APF Reads Rate ■ Devices Semaphore Requests Rate Vs Waits Rate ■ Device IO Operations Summary

Table 6–1 (Cont.) Sybase (ASE) Database Reports

Report Name	Report Elements
Sybase ASE Data Cache Statistics	■ Data Cache Hit Rate History ■ Data Cache Hit Rates Summary ■ Data Cache Memory Usage ■ Cached Object Accesses by Processes ■ Top 10 Big Objects in Data Cache ■ Top 10 Popular Objects in Data Cache
Sybase ASE Procedure Cache Statistics	■ Procedure Cache Hit Rate History ■ Procedure Cache Memory Usage History ■ Top 10 Objects in Procedure Cache by Memory Usage
Sybase ASE Network IO Monitoring Report	■ Incoming Traffic History ■ Outgoing Traffic History ■ Incoming Packet Traffic History ■ Outgoing Packet Traffic History
Sybase ASE Database Log Statistics	■ Overall Append Log Requests Rate Vs Waits Rate ■ Tempdb Append Log Requests Rate Vs Waits Rate ■ Overall Append Log Waits Percentage ■ Tempdb Append Log Waits Percentage ■ Databases Log Related Summary
Sybase ASE User Statistics	■ Attempted Logins History ■ Top 5 User SQL Statistics Summary ■ Top 3 Users by CPU Time ■ Top 3 Users by DiskIO ■ Top 3 Users by CPU Time - Summary ■ Top 3 Users by DiskIO Time - Summary ■ Top 3 Users by Incoming Network Traffic ■ Top 3 Users by Outgoing Network Traffic ■ Top 3 Users by Incoming Network Traffic - Summary ■ Top 3 Users by Outgoing Network Traffic - Summary
Sybase ASE Process Statistics	■ Top 10 Processes by CPU Time ■ Top 10 Processes by Waiting Time ■ Top 10 Processes by Incoming Network Traffic ■ Top 10 Processes by Outgoing Network Traffic ■ Top 10 Processes by Memory Usage ■ Top 10 Processes by User Log Cache(ULC) Writes ■ Top 10 Processes by Transactions Rate ■ Top 10 Processes by DiskIO Rate
Sybase ASE SQL Statistics	■ Top 3 CPU Intensive SQL Commands ■ Top 3 Disco Intensive SQL Commands ■ Top 3 Memory Intensive SQL Commands ■ Top 3 Long Waited SQL Commands

Table 6–1 (Cont.) Sybase (ASE) Database Reports

Report Name	Report Elements
Sybase ASE Open Objects Statistics	■ Top 5 Hot Objects by Logical Reads ■ Top 5 Hot Objects by Physical Reads ■ Top 5 Hot Objects by APF Reads ■ Top 5 Hot Objects by Page Reads ■ Top 5 Hot Objects by Physical Writes
Sybase ASE Deadlock Statistics	■ Top 10 Processes by Locks Held ■ Deadlock Detail Table
Sybase ASE Worker Threads Statistics	■ Attempted Parallel Queries History ■ Altered Plans History ■ Worker Threads Summary
Sybase ASE Configuration	■ Sybase ASE Version ■ System Listeners ■ Information about Databases ■ Installed Scripts ■ Charsets Information ■ Backup/Recovery Configuration Parameters ■ Cache Manager Configuration Parameters ■ Component Integration Services Configuration Parameters ■ Configuration Options Configuration Parameters ■ DTM Administration Configuration Parameters ■ Diagnostics Configuration Parameters ■ Disk I/O Configuration Parameters ■ Error Log Configuration Parameters ■ Extended Stored Procedure Configuration Parameters ■ General Information Configuration Parameters ■ Java Services Configuration Parameters ■ Languages Configuration Parameters ■ Lock Manager Configuration Parameters ■ Memory Use Configuration Parameters ■ Meta-Data Caches Configuration Parameters ■ Monitoring Configuration Parameters ■ Network Communication Configuration Parameters ■ O/S Resources Configuration Parameters ■ Physical Memory Configuration Parameters ■ Physical Resources Configuration Parameters ■ Processors Configuration Parameters ■ Rep Agent Thread Administration Configuration Parameters ■ Security Related Configuration Parameters ■ SQL Server Administration Configuration Parameters ■ Unicode Configuration Parameters ■ User Environment Configuration Parameters

Table 6–1 (Cont.) Sybase (ASE) Database Reports

Report Name	**Report Elements**
Sybase ASE Error Statistics	■ Errors Production Rate (per hour) ■ Recent Error Messages Summary ■ Recent Error Messages with Severity 10 to 16 ■ Recent Error Messages with Severity 17 to 18 ■ Recent Error Messages with Severity 19 to 26

The following shows the SQL Statistics report available for Sybase Adaptive Server Enterprise Database:

Figure 6–1 SQL Statistics Reports