Measurements made by eG Agents

Type	Details	Measurements
Operating Systems	**Solaris 7.0 or higher, Red Hat Linux 6.0, AIX 4.3.3 or 5.x or 6.1 or 7, HP-UX 11, Free BSD 5.4, Tru64 5.1, Windows Vista, Windows 2008, Windows 7, Windows 8, Windows 10, Windows 2012, Windows 2016,Windows 2019**	• System CPU and memory statistics such as CPU utilization, run queue length, blocked processes, swap memory in use, and available free memory; • Disk statistics including percentage utilization of partitions, read and write rates on each physical disk, percentage busy, request queue length; • Network traffic statistics including packet rate to and from the different network interfaces, bandwidth in and out of each of the interfaces (Windows only); • TCP statistics such as incoming and outgoing connection rate, current connections, connection drop rate, etc.;
	Operating systems that support the HOST Resources MIB	• Monitoring of devices accessible via the server, which include the current status of a device and the number of errors encountered by the device; • Monitoring of storage areas on the server, including tracking the storage area size, used space, and percentage utilization, etc.; • System monitoring to determine the users currently logged in to the server and the total number of processes that are running; Tracking CPU usage on the server; • Process monitoring including tracking whether a specific process is running or not and its memory utilization; • TCP connection monitoring including number of currently established connections, failed connections, retransmission rate for segments, etc.;
	AS400	• Current workload indicators such as the number of jobs executing on the server; • Metrics revealing the message processing ability of the server, which include, the number of messages in queue; • Statistics that indicate the health of the storage subsystem, such as, the capacity of the auxiliary storage space and the percentage of space used, the amount of storage spaced used by temporary objects and permanent objects, etc.; • User activity related metrics, such as, the number of users who have currently signed on, the number of user jobs that were temporarily suspended, the number of disconnected jobs, etc.; • Measures indicating the count of jobs for each job type, the number of jobs that are currently active, the number threads utilized to perform the jobs that match specific monitoring pattern and CPU and memory utilization levels for performing the jobs that specific pattern; • Key statistics revealing the number of spool files that are in critical, warning and hold status; • Metrics revealing the number of messages that required reply from the system/user;

Operating Systems	**Novell Netware**	• Monitoring of system memory available and usage, and utilization of memory by individual NLMs; • Tracking of the Netware file system accesses (read and write rates), as well as monitoring all the volumes on the server to determine percentage utilization of the volume and the amount of freeable space on the volume; • Tracking the Netware system processor usage and interrupt rates;
Web Servers	**Apache, iPlanet/SunONE, Microsoft IIS, and Oracle HTTP web servers**	• Server availability and response time monitoring from an external location HTTP/HTTPS protocol emulation; • Web server statistics including internal measures of connection and request rates handled by the server, percentage of errored responses, percentage aborts, etc. for the entire server; Reporting of similar metrics for web sites hosted on the server as well; • Monitoring server processing times for individual transactions using eG's web adapter capability- – offering metrics such as request and connection rate for individual web transactions, response time monitoring per transaction, percentage aborts for individual transactions; • Emulation of multi-step web service interactions using the eG client emulator to offer availability and response time statistics for each step of the service interaction;
	Sun Java Web Server 7	• Metrics revealing bottlenecks in connection requests, such as, the number of connections in queue, the number of connections dropped from the queue, the duration for which connections were enqueued, etc.; • Metrics indicating whether/not the DNS cache has been enabled, and if so, how is it been utilized; • Metrics measuring the file cache usage, such as, the number of cache hits/misses, the number of cache content hits/misses, the number of entries in cache, the cache heap size, whether the file cache is enabled/disabled, etc.; • Metrics revealing quality of the HTTP service on each virtual server, such as, the rate of HTTP requests to the virtual server, the number of errors that were logged, the data received and transmitted by the virtual server, the number and type of responses, etc.; • Metrics revealing the health of the web server instance, such as, the duration for which the instance was running, the rate of requests to the web server instance, the number of errors logged by the instance, the average response time of all virtual servers in instance during the last 5 minutes, the data received/transmitted by the instance, etc.; • Metrics indicating the uptime and session activity on each web application on the web server, which include, the number of JSPs loaded/reloaded on to each application, the number of active sessions, number of rejected sessions, the average lifetime of expired sessions, etc.;

Web Servers		
		• Metrics revealing how the JVM manages memory resources, such as, the heap memory size, the time taken for garbage collection, the number of times garbage collection occurred, the number of classes loaded/unloaded from JVM, etc.; • Metrics that indicate issues with keep-alive connections to the web server instance, such as, the number of successful requests from a keep-alive connection, the number of keep-alive connections that were flushed and refused, the number of keep-alive connection timeouts, etc.; • Metrics measuring thread pool usage, such as, the number of threads in pool, the number of requests queued, the number of idle threads in pool, etc.; • Metrics revealing bottlenecks in connection requests, such as, the number of connections in queue, the number of connections dropped from the queue, the duration for which connections were enqueued, etc.;
	Nginx Servers	• Metrics revealing the total number of connections, active connections, connections handled by the server etc.; • Measures indicating the total number of requests handled, the number of request header reads, total number of write responses, total number of waiting connections, average number of requests handled etc;
	WebToB	• Metrics reporting the availability of the server and the number of times that the server was restarted abnormally; • Key statistics revealing the number of requests processed by the server, the number requests that were waiting in the queue and the number of requests returned when the queue has reached its maximum size; • Service-related statistics such as status of the service, the maximum number of requests handled by the service and the average response time for a request, are reported; • Measures revealing the number of connections established to the server from the clients, the number HTTP handlers configured, the number of client connections waiting for requests and ready to process the requests and the number of connections in the queue.;
	Oracle HTTP Server 12C	**OHS Applications** • Metrics revealing the number of times applications requests are handled/declined and time taken to handle to those requests; **OHS Server** • Metrics revealing the number of active connections available in the server, number of requests, POST requests, GET requests and errors handled by the server; • Metrics indicating the time period that the server has been up and whether the server has been rebooted or not; • Metrics revealing the number of recent errors occurred in the server;

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Web Servers		**OHS Service** • Metrics indicating the percentage of requests that were successfully serviced by the web server during the last measurement period; • Metrics revealing the percentage of responses in the last measurement period with a status code in the range of 300-399, 400-499 and 500-600; • Metrics revealing the number of HTTP requests handled by this Server and time taken to respond to HTTP requests;
Middleware Application Servers	**iPlanet Application Server**	• Server usage in terms of request rate, percentage of threads utilized, data transfer and reception rate; • Server performance as measured by average response time;
	WebLogic Application server	• Server usage and performance measurements including throughput, percentage of heap space in use, number of requests queued; • JDBC connection pool usage in terms of percentage of connections used, and percentage of connections pending per pool; • Statistics pertaining to the EJB components such as transaction commit and rollback rates, timeouts during access to individual components, access queue lengths, etc.
	Cold Fusion Application server	• Database measures including database access rate and average response time for database access; • Server workload measures such as request rate, data transmission and reception rate, queue length, request time out rate, and average response time;
	SilverStream Application server	• Statistics such as the utilization of the server, percentage of threads associated with the client connections, the percentage of idle threads, memory usage, etc.; • Server workload measures such as request rate, response time, transmission rate, the number of sessions, etc.;
	WebSphere Application Server	• Internal measures of server availability and memory usage; • Metrics indicating cache usage such as the number of cache hits, misses, etc. • Measures that help determine the sizing needs of the JVM heap, such as the percentage of JVM memory utilized, the free memory, the number of GC executions on the heap, etc.; • Comprehensive monitoring of thread and connection pools including measurement of pool utilization, wait counts per pool, average wait time for each pool, and creation and destruction rates per pool; • Measurements of individual EJB components such as the rate of instantiations, average creation time and response time per EJB component, etc.; • Metrics associated with global and local transactions such as the number of transactions begun at the server, number of concurrently active transactions, average duration of the transactions, etc.;

Middleware Application Servers	JBoss Server	• Measures JVM heap performance related to used & accessible memory in JVM Heap; • Monitors thread pool usage, connection pool usage, and alerts when pool usage levels reach threshold limits; • Monitors Servlet executions, so the most popular servlets can be chosen for further optimization; Also tracks EJB pools and the activation/destruction of the beans;
	JBoss AS/EAP servers	• Measures such as the incoming requests processed, time taken for processing the requests, errors encountered etc, relating to each JBoss connector; • Measures such as the active connections, available connections, connections destroyed, connections created, time taken for connection creation etc can be obtained by extensively monitoring the JBoss datasource apart from obtaining metrics relating to the connection pool;
	JEUS	• Measures relating to the prepared statements of the data source such as the prepared statement cache access size, number of times the cache was accessed etc., • Critical metrics relating to the EJBs such as the number of times the EJB has been invoked, bean instances that is available in the pool etc., • Measures revealing the size of the MQ Queues and the type of messages processed by the queue etc., • Measures revealing the messages in the MQ topic, the message processing rate, subscribers count for the topic etc., • Metrics revealing the requests processing capability of each servlet deployed in the JBoss AS 7; • The transaction processing capability of the Jboss AS 7 and the numerical statistics pertaining to each type of transaction; • Measures such as the active connections, available connections, connections destroyed, connections created, time taken for connection creation etc., can be obtained by extensively monitoring the JBoss XA-data source apart from obtaining metrics relating to the connection pool; • Measures relating to the prepared statements of the XA-data source such as the prepared statement cache access size, number of times the cache was accessed etc., • Metrics indicating whether/not the JEUS server is running and whether the server needs to be restarted now or not;

Middleware Application Servers		• Key metrics revealing the number of sessions that are currently active on the server, the number of requests that were processed successfully/failed, and the average time taken to process the requests; • Statistics revealing the number of connections that were created and used on the server, the number of connections that are available to use on the server, how long the connections were waiting? how long the connections were in use? and the number of connections that were destroyed; • Stateful/Stateless Session Bean related metrics such as the count of various method calls, and the number of Active ejb objects and Active ejb beans are revealed; • Measures indicating the number of consumers accessing the queues, the rate at which the messages were processed/delivered/expired from the queues, and the number of messages that are pending in the queues; • Thread pools related metrics such as size of the thread pool, the number of pools that are currently active, the number of tasks processed in the server and the time take to execute the threads; • Statistics revealing the consumption status of the topics, the number of consumers accessing the topics, the rate at which the messages were processed/delivered/expired from the topics, and the number of messages that are pending in the topics.
	JRun Application Server	• Measures pertaining to the thread pool usage of all the server instances of a JRun server such as the percentage of threads utilized, threads queued etc.; • Thread processing metrics such as the waiting time of a request for processing, processing time of the server and a request, the data reception and transfer rate of the server, etc.; • Performance statistics related to the JVM of all instances of a JRun server, such as the memory used by the server, free memory, number of active sessions in the server and the server memory

Middleware Application Servers	Borland Enterprise Server (BES)	• Key runtime statistics pertaining to a BES management agent, such as the amount of memory available to and consumed by the agent, the current number of active threads in the agent, etc.; • Partition-specific statistics such as the memory available to and consumed by the partition, the current number of active threads in the partition, etc.; • Performance statistics related to the BES EJB container, which includes the time spent in performing CMP related activities such as executing SQL queries and updates, the time spent in receiving and serving a TCP request, in dispatching methods to various objects, time spent in the ORB, etc.; • Important statistics measuring the time taken for performing JDBC1 and JDBC2 related activities, such as the time spent by the data sources in acquiring a pool connection, in registering a transaction resource in transaction service, etc.; • Measurements related to the time spent in activating and passivating a stateful session bean; • Transaction-specific statistics such as the time spent in beginning, committing, and rolling back transactions
	Sun Java System Application Server	• Overall health of the virtual server in terms of rate of requests to the web server, data reception and transfer rate, etc.; • Metrics related to JDBC connection pools such as the number of threads awaiting the database connection, the number of failed connection attempts, etc.; • Transaction related measures including the number of transactions that are completed, rolled back, and in-progress; • EJB caching and pool related metrics, which include the number of beans in a pool, the number of times user requests found and failed to find a bean, etc.
	Orion Server	• Measures pertaining to the JVM running on an Orion server which includes the active thread count, the total memory capacity of the JVM, and the unused memory in the JVM
	Tomcat Server	• Reports JVM details specific to loading /unloading of classes, checks thread pool usage, alerts on deadlocks or excessive non-daemon threads that could be impacting the server's performance. • Monitoring the GC (Garbage Collection) process, reports on memory usage patterns in the JVM. • Measures the workload to the Tomcat connector. • Measures JSP engine performance and reports on usage and execution of JSPs and servlets.

Middleware Application Servers	**Oracle 9i/10G Application Server**	• Overall JVM performance in terms of JVM availability, current active threads in the JVM, the high and low watermarks of heap usage, etc.; • JDBC-connection related metrics such as the number of threads creating connections, time taken for connection creation, etc.; • Transaction related metrics such as the number of active transactions, transaction commits, and rollbacks; • Web module-specific metrics such as the number of threads handling requests, the number of completed requests, request processing time, etc.; • JSP related metrics including the number of active requests for the JSP, request processing time, etc.; • Servlet related metrics such as the number of threads servicing the servlet, the number of completed requests, request processing time, etc.
	Oracle Forms Server (Windows)	• Key metrics reporting the memory and CPU usage of the server; • Metrics related to user sessions such as the number of active and idle sessions, session duration etc.; • Measures that report server responsiveness such as the rate of requests received, response time of the Forms server and the database server, etc.; • General statistics pertaining to database users that includes such as the rate of requests received from a user, response time of the Forms server and the database server, memory and CPU utilized by the user
	Glassfish Monitoring	• Key measures of the processing ability of the applications deployed on the server, such as, the number of requests to the server per application, the processing time of requests per application, etc.; • Session related metrics, such as, the number of active sessions, the number of activated and passivated sessions, expired sessions, rejected sessions, etc., • Thread pool usage metrics such as, the number of core threads in each pool, the number of busy threads, the maximum number of threads allowed per pool, the percentage usage of threads per pool, etc. • Metrics pertaining to transactions, such as the transaction state and the number of active/committed/rolled back transactions; • Connection pool usage metrics, which include, the number of free and used connections per pool, the waiting time of connections, potential connection leaks, the length of the queue of waiting connections, failed connections, etc.; • Statistics indicating the processing ability of servlets/servlet groups, which include, the number of requests processed by a servlet/servlet group, the average processing time of requests, the count of servlet errors, etc.; • Metrics revealing how well the EJB cache has been utilized, which include, the number of cache hits/misses, the cache hit ratio, etc.;

Middleware Application Servers		
		• Metrics providing method-level performance insights, such as, the number of successful/error-ridden invocations of a method, method execution time, etc.; • EJB pool related metrics, such as, the count of beans in a pool, the number of threads waiting for a free bean in a pool, the count of beans created/destroyed in a pool, etc.; • Measures revealing the level of activity on stateful and stateless session bean containers, such as, the number of times create, ready, and remove method calls were invoked on these containers.
	Domino Application Server	• Statistics measuring the health of the web server component of the Domino application server, such as, the load on the server in terms of requests to the server, the data received by it, and the count of current connections to it; • Replicator related metrics such as, the number of successful and failed replications, the number of pending replications, etc. • Statistics pertaining to the Domino database such as number of databases in cache, the percentage of pages cached, the maximum capacity of the server cache; • Memory usage metrics, which include the total memory allocation, the shared memory allocation, etc.; • Important metrics pertaining to the network traffic, that includes, the data receipt and transfer rates, etc.
	Tuxedo Domain Server	• Measures indicating the availability and response time of a Tuxedo application; • Domain usage statistics such as the percentage of servers in the domain that have been utilized, etc.; • Queue-related measures including the queue state, servers associated with the queue, etc.; • Site and server related measures, such as the site state, server state, the number of current logins, bridge state, transaction commit rate, etc. • Connections that are currently open on the server; • Bulletin Board related statistics such as the servers registered on the bulletin board, services, interfaces and queues available in the domain, etc,

Middleware Application Servers	WildFly JBoss	- Measures such as the incoming requests processed, time taken for processing the requests, errors encountered etc, relating to each connector; - Measures such as the active connections, available connections, connections destroyed, connections created, time taken for connection creation etc can be obtained by extensively monitoring the datasource apart from obtaining metrics relating to the connection pool; - Measures relating to the prepared statements of the datasource such as the prepared statement cache access size, number of times the cache was accessed etc., - Critical metrics relating to the EJBs such as the number of times the EJB has been invoked, bean instances that is available in the pool etc., - Measures revealing the size of the MQ Queues and the type of messages processed by the queue etc., - Measures revealing the messages in the MQ topic, the message processing rate, subscribers count for the topic etc., - Metrics revealing the requests processing capability of each servlet deployed in the WildFly; - The transaction processing capability of the WildFly and the numerical statistics pertaining to each type of transaction; - Measures such as the active connections, available connections, connections destroyed, connections created, time taken for connection creation etc., can be obtained by extensively monitoring the XA-datasource apart from obtaining metrics relating to the connection pool; - Measures relating to the prepared statements of the XA-datasource such as the prepared statement cache access size, number of times the cache was accessed etc.,
	Progress OpenEdge Server	- Metrics indicating the current state of the server; - Metrics revealing the errors encountered during read and write operations; - Metrics revealing the number of read/write operations performed on the server; - Key metrics revealing the number of sessions that are currently active/idle in server. - Key metrics revealing the number of agents deployed in the server;

Database Servers	Oracle database	**Oracle Processes**
		• Monitoring the server CPU usage, memory usage and tracking the number of running processes in oracle server;
		• Metrics revealing the number of client processes running in oracle server, CPU usage by client processes and memory usage for client processes;
		• Statistics revealing the average response time taken for querying and transaction;
		• Metrics revealing the instance availability and uptime of the instance;
		Oracle Server
		• Metrics indicating the response time of the database server and connection availability;
		• Metrics measuring the rate of data transmission and reception between server to client;
		• Time related metrics such as connection time, query execution time and response time to a user query;
		• Metrics indicating the number of sessions/processes allocated and currently active on database server;
		• Measures indicating the configuration limit and utilization limit of the sessions/processes and percentage of sessions/processes configured on database server;
		• Key metrics indicating Data Guard related details such as whether /not Data Guard is enabled and current role of Data Guard on the database;
		• Metrics revealing the open mode status of the database and whether /not the role of a database has switched;
		• Metrics indicating the current status and applied mode on achieved redo log destination;
		• Metrics indicating the number of log sequences received, applied and could not be transmitted to each archive redo log destination and current status of redo logs to each archive redo log destination;
		• Metrics indicating the number of information events, warning events, error events and critical events that were generated during the last execution of the test;

Database Servers		**Oracle Service Layer** • Metrics revealing the total number of connections currently established/active/Inactive/Blocked/Cached/Killed/Snipped; • Metrics revealing the count of Active /Inactive /Snipped/ Blocked/ Killed/ Cached sessions; • Metrics revealing the count of Long/Short/Full table scans; • Metrics revealing the count of Invalid and Modified objects for a specific User account; • Metrics revealing the count of User commits and rollbacks; • Metrics revealing the number of default parameters; • Metrics revealing the count of wait times, failed jobs and broken jobs; • Metrics revealing the number of deferred transactions and expired users; • Metrics revealing the listener log size, status and uptime; • Metrics revealing the count of Logical reads. physical reads, physical writes, User calls, Pares and Block changes;
	Oracle RAC	• External metrics indicating the availability and responsiveness of the cluster; • Measures revealing the session load on the cluster; • Key metrics pertaining to the number of sessions that are waiting for a redo log write confirmation after a commit; • MTTR related statistics, which include, the target and estimated MTTR, target and actual number of redo blocks, etc.; • Metrics related to wait events, such as, the number of events of type log file parallel write, Db file parallel write, log file sync, and Db file sequential read that occurred on the cluster, the number and nature of wait events that occurred per session module, the number and nature of session wait events, etc.;
	Rocket UniVerse Database Server	• Measures revealing the total number of sessions, percentage of sessions used by the user, and number of interactive and background processes initiated by the user. • Metrics related to number of active group locks and active file/record locks. • Metrics revealing undo tablespace usage such as, the number of sessions accessing the undo tablespace and their usage duration; top sessions to the undo tablespace in terms of duration of usage are also revealed; • Locking activity related metrics, which include, number and duration of transaction locks; • Tablespace usage metrics, which include, the size of tables per tablespace, index size, partition size, used space, free space, etc. • Key metrics related to the queries executing on the undo tablespace, such as, the query duration, time taken for undo retention, etc.;

Database Servers	DB2 UDB	• Instance level measures such as the percentage of agents waiting, percentage of piped sorts, the number of registered agents; • Statistics revealing how effectively the agent pool was utilized, which includes, the percentage of agents that were directly assigned from the pool for servicing requests, the number of agents stolen from an application, etc.; • Key metrics of database health including lock activity, buffer pool hit ratio, catalog cache hit ratio, read and write rates, rollback rate, transaction rate, average sort time, percentage of sorts overflowing, heap space used by each sort, SQL activity, etc.; • Lock activity related measures such as the number of locks currently held by all applications on the database, the rate of lock waits, the duration of lock waits, the number of deadlocks, etc.; • Buffer pool usage metrics, such as, the percentage of pages, data pages, and index pages readily served by the pool, the percentage of times dirty pages and victim pages were cleaned from the database, etc. • External measures such as the availability and response time of the database server
	Sybase Adaptive Database	• Overall health of the server in terms of availability and response time; • Key metrics of database health including lock activity, the number of network bytes received and sent, cache utilization and cache hit ratio (of both the data cache and procedure cache), the rate of reads and writes performed on a device, space usage of the SQL databases, transaction related metrics, etc.
	DB2 DPF	• Metrics revealing how effectively the agent pool has been utilized, such as, the total number of agents in pool, the number of idle agents, percentage of pool agents used for servicing requests, etc. • Metrics revealing the database manager's health, which include, the rate at which sorts requested heaps post threshold, the rate of piped sort requests and rejects, etc. • Locking related metrics, such as, the number of locks held, escalated, timedout, the number and duration of locks waits, etc. • Buffer pool usage metrics, which include, the hit ratio, prefetch ratio, catalog cache hit ratio, package cache hit ratio, etc. • Sorting related metrics. which include, the sort heap space allocated to each partition, sort heap space used, average sort time, etc. • Statistics measuring the level of I/O activity on the partitions, such as, direct read rate, direct write rate, etc. • Key metrics pertaining to the transactions executing on each partition, such as, rate of transactions, commit rate, and rollback rate

Database Servers	**Microsoft SQL**	• External monitoring of server availability and response time for a typical query; • Key metrics of SQL server health including various caching hit ratios, page read and write rates, pending transactions, locking rates and wait time, memory usage of various components such as optimizer, locking subsystem, usage of the server's buffer memory, space usage of the SQL databases, etc.; • Monitoring of the server CPU usage, tracking number of running processes in the SQL server, and analysis of what queries the running processes are executing
	MySQL	• External measures of availability and responsiveness; • Rate of data transmission and reception by the server, number of active, aborted, failed connections, rate of queries handled by the server, and rate of slow queries, rate of commits and rollbacks, locking activity including number of locks and the percentage of lock waits
	My SQL Cluster	**MySQL Cache** • Metrics revealing the Write Key buffer hit rate/ Read Key buffer hit rate, amount of buffer used and amount of current buffer available; • Metrics revealing the number of cluster queries that are registered with the cache, added to the cache, and deleted from the cache; • Metrics revealing the amount of free memory in the query cache, number of free memory blocks in the query cache, number of queries that were not cached and number of times the cache was accessed during the last measurement period; • Metrics revealing the number of physical reads of a key block from the disk and number of key read requests received by the cache; • Metrics indicating the key blocks in the key cache that have been modified, but have not been flushed to the disk; • Metrics revealing the InnoDB Engine Statistics such as the total memory allocated, total size of the free memory, size of used memory and amount of dictionary memory/additional memory allocated; • Metrics revealing the maximum size of memory, total page size, Dirty page size, Misc page size, Latched page size and Flushed page size; • Metrics revealing the rate at which InnoDB pages are created/read and written; • Metrics revealing the count of InnoDB lock waits, lock time and current locks; **MySQL Net** • Metrics revealing the rate of data being transmitted by the server in response to client requests in the cluster; • Metrics revealing the rate of data received by the server from clients during the last measurement period; • Metrics revealing the count of active connections, aborted connections and failed connections available in the cluster;

Database Servers		**MySQL Server**

MySQL Server

- Metrics revealing the number of threads in the thread cache, number of threads newly created to handle new connections available in the cluster, number of threads that are currently active in the cluster, number of delayed insert handler threads in a cluster and number of slow launch threads available in the cluster;

- Metrics revealing the count of slow queries and Handler keys;

- Metrics revealing the MySQL cluster resources such as the number of tables that were opened, number of implicit temporary tables that were created on the disk, while executing statements and number of implicit temporary tables that were created in the memory created while executing statements during the last measurement period;

- MySQL Cluster activity related details such as rate at which rows are written with INSERT DELAYED, rate at errors occurred in the rows written with INSERT DELAYED, rate at which requests to update/insert/delete a row in a table were received and rate at which FLUSH commands were executed;

- Statistics revealing the InnoDB throughput details such as count of Key reads, Key writes, Random reads and Sequential reads;

MySQL Service

- Metrics indicating whether the MySQL service is available or not;

- Metrics revealing the count of Primary and Secondary nodes;

- Metrics revealing the state of cluster members;

- My SQL Cluster node related measures such as node availability state, node response time, DB connection availability, DB connection response time, query processor availability and query execution time;

- Metrics revealing the MySQL Cluster Database size and growth rate;

- MySQL Cluster User Processes related measures such as the count of active processes/ inactive processes and idle processes of a user are revealed;

- Metrics revealing the count of Long running queries;

- Metrics revealing the Network availability related measures such as the server availability, time taken to connect to the database server, number of records, time taken to respond by the server, time taken to execute a query, database connection status and query processor status;

- Metrics revealing the Cluster locks related details such as the count of lock waits and table lock waits;

- Metrics revealing rate at which ranges/rows were sorted.;

- Metrics revealing the rate at which sorting was performed by scanning the table and merging the algorithms have occurred;

- Metrics revealing the number of User commits and User rollbacks have occurred;

Database Servers	SQL Azure	• Metrics reporting the availability of the database server and connections, and response time for a typical query. • Measures pertaining to memory such as how much memory used for processing for the query plan? how much memory consumed by the queries waiting in the queue? and how long the queries were waiting for memory? etc. are reported; • High-availability related metrics such as current status of the replication process, the mode at which the database is currently in and the amount of time that the replication process lags, are reported. • Statistics revealing useful measures on the root blocker processes on the database server; • Key metrics indicating the maximum number of physical/logical reads consumed for executing the SQL procedure/query per second and the maximum time spent for executing the SQL procedure/query; • Measures reporting the CPU and memory utilization and percentage of concurrent sessions on the database service tier; • The count of active and idle sessions on the database server is also revealed. SQL procedure; • Key measures revealing the time spent by the database server waiting for events of various wait types and helps identify the wait types with wait events that have remained active for a long time.
	Maria Database	• External measures of availability and responsiveness; • Rate of data transmission and reception by the server, number of active, aborted, failed connections, rate of queries handled by the server, and rate of slow queries, rate of commits and rollbacks, locking activity including number of locks and the percentage of lock waits • Numerical statistics revealing the type of errors encountered by the database server; • User specific statistics revealing the count of active, idle, inactive processes utilized by each user;

Database Servers	**PostgreSQL**	- Statistics revealing table I/O, such as, the rate at which heap blocks and index blocks of a table are read, the percentage of heap blocks and index blocks of a table read from buffer cache, etc.; - Statistics revealing index I/O, such as, the rate at which index blocks are read, the percentage of index blocks read from buffer cache; - The size of each tablespace on a PostgreSQL database; - Metrics measuring background I/O, such as, the number of checkpoint requests received, the number of buffers released for re-use from the buffer cache, etc. - Database usage related metrics, such as, the current database size, the percentage of requests to database serviced by cache, the rate of inserts, deletes, updates, rollbacks on database, etc.; - Metrics measuring the rate of index scans, the rate at which rows are read/fetched from each index, etc.; - Statistics on table usage, which include, the number of sequential scans and index scans initiated on a table, the number of times the table was scanned, the rate of inserts, updates, deletes on the table, etc.; - User related metrics, such as the number of connections established by a user on the server, the number of active, waiting, idle connections per user, etc.; - Metrics revealing the availability of availability zones and the default region; - Metrics reporting the number of locks currently held on the server; - Metrics revealing the availability and responsiveness of the server; - Metrics revealing the number and details of the long running queries on the server;
	Progress Database	- Measures revealing the total number of sessions of each user and the rate at which the sessions are created by the user; - Measures such as the availability of the database and the connection, the time taken by the database and the database connection to respond to the user queries, whether the query is executed successfully or not and the number of records that were fetched from the database; - Metrics relating to the rate at which after-image writes are performed by the after-image writer, the total number of the buffer busy waits, etc.; - Metrics revealing the rate at which before-image writes are performed by the before-image writer, the before-image writes hit ratio, the total number of the buffer busy waits, etc.; - Statistics indicating the rate at which the read and write operations were performed on each data file, the rate at which the buffered read and write operations were performed on the data file, the rate at which the unbuffered read and write operations were performed on each data file, etc.; - Critical metrics revealing the number of index entries that were newly created and were deleted per second, the rate at which the index entries were scanned, the number of block splits that were created in the database while adding new index entries, etc.;

Database Servers		• Measures such as the rate at which each user accessed the database, the number of before-image and after-image read operations performed by each user per second, and the number of before-image and after-image write operations performed by each user per second; • Metrics reporting the number of client requests received per second for performing the read and write operations on the database, the rate at which the read and write operations performed on the database and percentage of the data blocks that is readily available in the memory without doing disk I/O; • Buffer related measures such as the total number of buffers in the cache, the number of buffers that are currently in use and are modified, the percentage of the used buffers and modified buffers, the number of buffers in the checkpoint queue, etc; • Measures revealing the number of user sessions and the rate at which the number of sessions were created; • Metris revealing the rate at which the spin latch was created, the average time taken by the spin latch, etc; • Measures relating to the lock such as the number of exclusive locks acquired by the user per second, the number of shred locks that were released per second, etc;
	Informix Dynamic Server	• External measures of availability and response time; • Session related metrics such as the number of current and blocked sessions; transaction related metrics such as the commit and roll back rates; efficiency metrics like rate of sequential scans, disk sorts, etc.; lock activity monitoring including tracking the number of lock requests, waits, timeouts, and deadlocks; space monitoring for each database

Database Servers	**Intersystems Cache**	• Reports buffer pool usage metrics such as the current buffer size, the number of interactive and batch buffers currently available, etc.; • Measures the availability and responsive of the server; • Reports critical database performance indicators such as lines executed; routine loads, new global references, new global sets, new global kills, logical database block reads, physical database global read and write, new database journal entries, write update status, etc.; • Reports the current number of resource seizes. • Monitors the users to the database instance, the database and routine caching activities performed by the database instance, license usage of the database instance, errors (if any) that have been logged, etc.; • Monitors the caching and data management functions performed by the ECP application server; • Reports statistics that reveal whether critical application and system processes are running or not; • Measures the health of the locking activity by reporting the number of locks currently held; • Monitors the Cache console log to reveal the number of warnings, and severe/fatal errors encountered by the Cache database
	SAP HANA	• Measures revealing the space usage statistics of the disk volume such as the total size, unused size, percentage of free space currently available, percentage growth in space usage; • Measures revealing the percentage of CPU usage of the database server; the CPU time spent in system level processing, user level processing; percentage of time the CPU of the database server was idle etc., • Memory related metrics such as the total physical memory, the free physical memory, physical memory that is currently used by the database server; total swap memory, used swap memory, swap memory that is currently used by the database server etc., • Space related metrics for each service in the volume such as the used space, percentage of space that is currently used, rate at which the volume file has grown etc., • Measures revealing the total size of each cache, numerical statistics revealing the requests or transactions available for retrieval from the cache, the inserts, invalidate requests etc.,

Database Servers	Tibero	- Overall health of the database server in terms of availability and response time; - Statistics related to connections such as the number of connections in ready state, number of connections that are currently active on the server, number of connections assigned to users, number of connections that are currently releasing the resources, number of connections through which the rolling back transactions were performed, etc.; - Current status and mode of the datafiles, the rate at which the reads/writes performed in the datafiles and the time taken to perform the IO operations on the datafiles are monitored; - Amount of PGA memory that is currently in use and the percentage of PGA memory utilized by the users are revealed; - Measures revealing the heavy contention for the rollback segments, if any; - Key measure indicating the number of times that the full table scan was performed on the database instance; - Measures indicating the number of expensive SQL statements and the time taken to execute the expensive statements etc., - Measures indicating the uptime of the database, the workload on each service port of the database, the numerical statistics relating to the compilations performed, the records updated, the rolled back transactions through each port etc., - Measures revealing the number of open transactions of each type and the maximum time taken for a transaction to execute; number of blocked transactions of each type; - Measures revealing the availability and responsiveness of the database server; - Metrics revealing the number of open connections, idle connections running connections etc for each user of the database server; - Measures revealing the active status of each service of the database server; the uptime; average time taken by each service to respond to requests from clients; number of threads for each service etc.; - Metrics related to the CPU usage of each service; memory usage statistics such as available memory, memory that is available for use etc.,
	Mongo Database	- Metrics revealing the availability and response time of the Mongo database server, the availability and response time of the collections and documents available on the database server, etc.; - Measures reporting the total number of connections that can be established from the Mongo database server, the number of connections that are available to use and the percentage of connections utilized in the database server; - Metrics reveal storage size, index size, the amount of space utilized, average size of the object, total number of extents available across the collections, etc.; - Measures indicating the number of large collections available in the database server and the size of those large collections;

Database Servers		• Metrics revealing the availability and response time of the Mongo database server, the availability and response time of the collections and documents available on the database server, etc.; • Measures reporting the total number of connections that can be established from the Mongo database server, the number of connections that are available to use and the percentage of connections utilized in the database server; • Metrics reveal storage size, index size, the amount of space utilized, average size of the object, total number of extents available across the collections, etc.; • Measures indicating the number of large collections available in the database server and the size of those large collections; • Key metrics revealing the rate at which the read locks and write locks were occurred during the last measurement period, the number of insert, query, update, delete, getMore and command operations received by the database server, maximum time taken to execute the received operations, etc.; • Metrics revealing the rate at which the requests were serviced on the database server and the rate at which the data was transmitted from and received by the database server during the last measurement period; • Measures indicating the number of read lock waits and write lock waits held in the queue; • Key statistics reveal number of times the flush operations performed to remove writes on the disk, average time taken for each flush operation, and time taken for last flush operation; • Journaling Statistics such as the number of transactions written to the journal, the amount of data written into the journal, the compression ration of the data written to the journal, etc.; • Memory related details such as total memory allocated to the Mongo database, the amount of memory allocated to the journal, the amount of heap memory utilized on the Mongo database server, the number of page faults occurred on the disk; • Key metrics revealing the rate at which the regular asserts, warning asserts, message asserts, user asserts and rollover asserts occurred on the Mongo database server; • Statistics indicating the rate at which the getMore, command, insert, delete, update, query, read and write operations were received in the database server during the last measurement period and the number of active client connections that perform read and write operations on the database server; • Measures indicating the replication lag, the amount of space allocated to the Oplog, the amount of space utilized in the Oplog, etc; • Metrics revealing whether the replications nodes are running or not, the current state of the replication nodes, the heartbeat time received from the replication node, etc.;

Database Servers		
		• Cache related measures such as the percentage of cache size utilized from the total size allocated to the cache, the amount of data that is currently available in cache, the amount of space utilized by the dirty cache, the number of pages evicted from the cache, etc.; • Measures reveling the number cursors that are currently opened for the clients, the number of cursors that are timed out during the last measurement period, and the number of cursors for which the timeout feature is disabled; • Statistics revealing the number of read and write tickets created by the WiredTiger storage engine, the number of read and write tickets that are currently in use, the number of read and write tickets that are available for use, etc.; • Log file related metrics indicating the total number of messages logged in, the count of fatal and warning messages in the log file, the size of log file and the growth rate of the log file; • Metrics revealing the rate at which the locks were occurred in the database server, the average time taken for acquiring the locks, etc.; • Reporting the number of transactions that were initiated, committed and rolled back during the last measurement period, etc.
	Cassandra Database	**Cassandra Server Layer** • Metrics revealing the details of prepared statements such as number of prepared statements executed/evicted from cache during last measurement period; • Key metrics indicating the Hinted Handoff status; • Metrics revealing the job-related details such as jobs health, total number of jobs launched on the tower; number of jobs that are completed successfully, number of jobs that failed on the tower; • Metrics revealing the number of project sync failures and inventory syn failures; • Measures revealing the number of hosts and groups failed during launching the jobs using each job template; • Measures revealing the number of hosts and groups associated with each job template; • Metrics revealing the number of bloom filter false positives that were detected on key space; • Measures revealing the average time taken by each key space to read/ write and respond to a range of requests; • Metrics revealing the memory table related details such as column count, switch count, data size and on/off heap size; • Measures revealing the latency related information such as read latency, write latency and range latency; • Measures revealing the current status and amount of data handled by the node;

Database Servers		• Measures revealing the Cassandra request related details such as unavailable requests, timed-out requests and failed requests; • Measures revealing the current size of the log file, fatal errors and warning messages that were logged in the log file and growth rate of the logged file; **Cassandra Memory Layer** • Metrics indicating the size of the buffer pool and count of service requests that were not serviced by the buffer pool; • Measures indicating the cache related information such as percentage of space utilized by cache, cache hit rate and hit ratio; • Measures indicating the delays in flushing writes to disk due to overgrowth of the commit logs such as commit log growth rate/size/segment, waiting time and pending time; • Metrics revealing the Potential disk space crunch due to irregularities in the compaction process such as compacted size, number of completed/pending and total transactions; **Cassandra Service Layer** • Metrics revealing the sever availability, connection response time, query response time, connection availability, query availability and no of records fetched from the database; • Metrics revealing the number of queries that are executed on the database node beyond the configured time; • Metrics indicating the rate at which messages of each type to be dropped from the target database node; • Metrics indicating the rate at which large messages/small messages/gossip messages were completely transferred to each node from the target database node; • Metrics indicating the rate at which large messages/small messages/gossip messages were dropped during transfer to each node from the target database node; • Metrics revealing the rate at which the messages were timed out during transfer to each node; • Metrics revealing the node related details such current status, nodes joined in cluster, nodes available in cluster and nodes; • Metrics revealing the running state of gossip protocol and native protocol; • Metrics revealing the number of task that were active in each thread pool. Metrics revealing the rate at which tasks were completed/pending/blocked per second in each thread pool.

Database Servers	Microsoft SQL Integration Server	**MS SQL Integration Service** • Metrics revealing the count of BLOB files and number of BLOB files read/written; • Metrics revealing the amount of buffer memory available, amount of buffer memory allocated, and amount of buffer memory used; • Metrics revealing the amount of flat buffer memory available, amount of flat buffer memory allocated, and amount of flat buffer memory used; • Metrics revealing the amount of private buffer memory available, amount of private buffer memory allocated, and amount of private buffer memory used; • Metrics revealing the count of rows read/written; • Metrics revealing the count of Simultaneous SSIS packages running; • Metrics revealing the count and duration of component; • Metrics revealing the count and duration of package; • Metrics revealing the count of error messages, warning messages, task failed messages and unknown messages; • Metrics revealing the count of total packages available and count of packages that are Created/ Running/ Cancelled/ Succeeded/ Stopping/ Completed/ Unexpectedly Ended/ Pending and Failed;
	Microsoft SQL Report Server	**MS SQL Report Service** • Metrics revealing the count of Login attempts/successful logins/login failure and Active Connections; • Metrics revealing the count of request processing rate, current requests, failed requests, requests that are disconnected/rejected and count of tasks that are available in queue; • Metrics revealing the count of HTTP errors that have occurred; • Metrics revealing the count of Active sessions, New sessions and count of existing report requests; • Metrics revealing the data retrieval time of reports such as time taken for data retrieval process, data rendering process and processing time of data; • Metrics revealing the duration of reports; • Metrics revealing the network related details such as SQL server availability, Database connection availability, Query processor availability, total response time, number of records fetched and query execution time

| Database Servers | | **MS SQL Report Server**

• Metrics revealing the amount of data sent and received on the server;

• Metrics revealing the count of threads that were rejected;

• Metrics revealing the count of successful reports/cancelled reports/Parameter Error reports/Timed out expired reports/Internal-Error reports/Rendering Error reports and Running Reports;

MS SQL Report Mem Structures

• Metrics revealing the cache related details such as cache hits, cache misses and cache flushes;

• Metrics revealing the count of memory cache hits and memory cache misses;

• Metrics revealing the amount of pressure handled by the memory, memory shrink size and memory shrink notifications; |
| | Hadoop | **Hadoop Data Node**

• Metrics revealing the operational status and time taken by the Data Node to send Block Report, Incremental Block Report and Cache Report ;

• Metrics revealing the number of times the Data is read or written from Data Node,

• Metrics revealing the number of times the data is read/written into Local Clients and Remote Clients;

• Metrics revealing the rate at which the block was removed, cached, Un Cached and verified

• Metrics revealing the count of heartbeat sent by Data Node to Name Node and rate which heartbeat occurs;

• Metrics revealing the rate at which block read write operations have occurred in Data Node;

Hadoop Name Node

• Statistics revealing the count of corrupt blocks, missing blocks, allocated blocks and blocks scheduled for replication and deletion;

• Metrics revealing FS-Image Edit logs related details such as time for downloading image, uploading image and editing image;

• Metrics revealing the Name Node related details such as total size of the Name Node, amount of space utilized and available for use and amount of cache, files, loads and stale nodes available;

• Metrics revealing the count of Journal transactions occurred in the Name Node and time taken to complete a journal transaction;

• Metrics revealing the number of Retry Cache hits available/cleared and updated in the Name Node;

• Metrics revealing the RPC related details such as RPC call rate, processing time taken by RPC, Authentication success and failure rate, Authorization success and Failure rate and number of open connections; |

Database Servers		• Snapshot operations related details such as number of snapshot operations that were created, deleted, and renamed, number of operations allowed and disallowed; • Metrics revealing whether the Name Node has been rebooted, time period that the Name Node has been up and status of the Name Node ; **Hadoop Node Managers** • Metrics revealing the count of launched containers, failed containers, killed containers, running containers and allocated containers; • Metrics revealing the time taken to launch the container, allocated and available memory, available vcores and allocated vcores, bad local directories and good local directories; • Metrics revealing the health status and count of Total node managers, active node managers, unhealthy node managers, lost node managers, rebooted node managers and decommissioned node managers; **Hadoop Resource Manager** • Metrics revealing the RPC related details such as RPC call rate, processing time taken by RPC, Authentication success and failure rate, Authorization success and Failure rate and number of open connections; • Metrics revealing whether the Resource Manager has been rebooted and time period that the Resource Manager has been up; **Hadoop Server** • Jobs related details such as count of submitted Jobs, completed Jobs, failed Jobs, killed Jobs, pending Jobs and running Jobs are reported; • Metrics revealing the details of Jobs running between 60 to 300 minutes, Jobs running between 300 to 1400 minutes, and Jobs running more than 1400 minutes; • Metrics revealing the Error related details such as number of Bad id type, Connections type, wrong length type, wrong map type, IO error type and wrong reduce type errors have occurred; **Hadoop Service** • Metrics revealing the Kerberos Login related details such as the number of successful and failed logins;

Database Servers	**Microsoft SQL Server Analysis Services(SSAS)**	**MS SQL Analysis Database** • Metrics revealing the size of memory and write rate of temporary file; • Metrics revealing the amount of partition and memory available for the server; • Metrics revealing the rate at which index rows are created; **MS SQL Memory** • Cache related metrics such as the count of cache entries, amount of memory used, direct hit ratio and miss ratio; • Metrics revealing the rate at which cache was looked up/missed/evicted for serving read requests; • Cache related metrics such as the count of cache entries, amount of memory used, direct hit ratio and miss ratio; • Metrics revealing the rate at which cache was looked up/missed/evicted for serving read requests; • Metrics revealing the count of client and user connections; • Metrics revealing the rate at which client/user connections was successful and unsuccessful; • Metrics revealing the count of Lock waits, Latch waits, deadlocks and current locks available; • Metrics revealing the count of Evaluation nodes and Bulk-Mode evaluation nodes; • Metrics revealing the count of Evaluation node/Bulk-Mode evaluation node cache hits/misses and its ratio; • Metrics revealing the amount of memory allocated to file store with its read/write and fault rate; • Metrics revealing the size of in-memory aggregation map/Dimension property. Dimension String file; • Metrics revealing the amount of memory available in the server; • Metrics revealing the hard/low/high memory limit; • Metrics revealing the amount of shrinkable/non-shrinkable cleaner memory; • Metrics revealing the amount of memory available in 64KB page pool, 64KB/8 KB lookaside list; **MS SQL Analysis Service** • Metrics revealing the number of client connections/user sessions established. • Metrics revealing the count of connection requests/success and failures; • Metrics revealing the number of idle threads in the processing thread pool dedicated to non-I/O jobs, number of non-I/O jobs in the queue of the processing thread pool and number of threads running non-I/O jobs in the processing thread pool; • Metrics revealing the number of idle/busy threads in the query thread pool;

Database Servers		
		• Metrics revealing the number of jobs in the queue of the query thread pool;
		• Metrics revealing the count of rows read/written from relational databases;
		• Metrics revealing the rate at which rate of rows read/written into database;
		• Metrics revealing the count of rows converted during processing.
		• Metrics revealing the rate at which bytes are sent from the server to clients;
		• Metrics revealing the rate of aggregation lookups and aggregation hits happened on the server;
		• Metrics revealing the rate of calculation/dimension/persistent cache hits and lookups and network round trips;
		• Metrics revealing the number of logical read operations using the Data file;
	Apache CouchDB	**COUCHDB DATABASE** • Metrics revealing the growth rate and size of CouchDB; • Metrics revealing the percentage of database used and free space available for use in CouchDB; • Metrics revealing the amount and percentage of disk space available; • Metrics revealing the read rate, write rate and purge rate of the database; **COUCHDB MEMORY** • Metrics revealing the count of authentication cache hits and misses; • Metrics revealing the cache hit rate/miss rate and recovery rate of Design document; • Metrics revealing the Shared Cache hit/misses/eviction rate; **COUCHDB SERVICE** • Metrics revealing the rate at which HTTP copy/delete/get/head/post/put request happens; • Metrics revealing the different types of response rate that occurs in CouchDB; • Metrics revealing the rate at which bulk request/HTTP request and Purge request occur; • Metrics revealing the View Index and Temporary Index request rate; • Metrics revealing the number of replications and document write failures that had occurred in CouchDB; • Metrics revealing the count of total/successful and failure checkpoints available in CouchDB; **COUCHDB SERVER** • Metrics revealing the number of compactions, number of long running compactions and maximum compaction time taken by the CouchDB; • Metrics revealing the number of indexers and long running indexers available in CouchDB;

Database Servers		- Metrics revealing the number of attempts taken by the CouchDB to read beyond the end of DB file and Set limit; - Metrics revealing the count of total/successful and failed read repairs that happened in CouchDB; - Metrics revealing the count of total log messages that occurred in CouchDB; - Metrics revealing the individual count of alert/critical/warning/info/error/debug/emergency and notice messages that occurred in CouchDB; - Metrics revealing the file size and growth rate of CouchDB;

Access Applications	Citrix Web Interface	• Key statistics revealing the health of the interactions between the web interface, XML service, and IMA service, which include availability of the Citrix XML service, the time taken to establish a TCP connection to the Citrix XML service, the total time taken for a user to login to the Citrix web interface and enumerate all the applications, etc.
	Citrix StoreFront	• Metrics revealing the rate at which resources were accessed from the store, how well the ICA protocol and RADE process is utilized in accessing the store, time taken to access the resources using RADE process etc., • Key metrics indicating the rate at which users are authenticated based on their language preference, average time taken for such authentication, how well the password change requests are processed for the users? And the time taken to change the passwords etc., • Metrics revealing how well the authentication store stores the user requests, how well the user requests are deleted after the service has been serviced etc., • Metrics related to Citrix Dazzle such as the rate of image response received for the resources accessed, rate at which the resources were accessed, arte at which cache calls were updated upon user requests etc., • Measures revealing the user subscription details such as the rate at which user subscriptions were added, enabled removed etc from the store, the rate at which user subscriptions were updated etc., • Metrics revealing the rate at which the users accessing through the Citrix Self-service plugin are authenticated to access the controller and the average time taken for access;
	Citrix NetScaler LB	• Metrics revealing the extent to which CPU and memory resources were utilized by the NetScaler device • Network traffic related statistics indicating the amount of data/the number of packets transmitted and received over every VLAN configured on the device, and the packet loss ratio

Access Applications	**Citrix Access Gateway**	• Key metrics related to the processing ability of the Citrix Access Gateway, which includes, the number of context requests pending processing, the rate at which the gateway performs commits, updates, deletes, etc., the rate at which data streams were read/written, etc. • Statistics pertaining to session management, such as, session cache hits and misses
	Citrix XenApp Server	• ICA protocol level monitoring of Citrix server availability and response time; • True client emulation by recording and playback of user transactions to measure each step of the user transaction – including login time, time for checking all published applications, time for accessing each published application, etc.; • Application resource usage metrics, such as the number of instances of each application currently executing, and the CPU and memory utilization of the application, so as to allow administrators to determine the most resource intensive applications; • User related statistics such as the number of users currently logged in, their CPU and memory utilization, as well as reporting on what processes the user is currently executing; • Session related statistics that provide the number of active and inactive sessions, and the login times for each session; • MetaFrame XP-specific performance metrics indicating the rate of application enumeration and resolution, the rate at which data has been read from and written into the IMA data store, availability of the data store, etc.; • Monitoring at the Citrix farm level to determine the number of pool licenses that are in use, assigned pool licenses, etc.; • Comparison of application load and license usage for each application across each of the servers in a farm; • Monitoring of the license usage of the products of the Citrix MetaFrame Access Suite • TCP and ICA connection availability of each TCP port and its responsiveness; • Application resource usage metrics, such as the number of instances of each application currently executing, and the CPU and memory utilization of the application, so as to allow administrators to determine the most resource intensive applications; • User related statistics such as the number of users currently logged in, their CPU and memory utilization, as well as reporting on what processes the user is currently executing; number of times the sessions were disconnected; users who reconnected soon after a disconnect, average client latency of each user., • Session related statistics that provide the number of active and inactive sessions, connected and disconnected sessions, number of total sessions and the login times for each session;

Access Applications	**Citrix XenDesktop Director**	• Key metrics revealing the numerical statistics of desktop OS machines in each delivery group configured in a site such as the total machines, machines in maintenance mode, powered off machines, assigned machines etc; • Statistics revealing the number of machines of each type that are currently in the state of failure; • Metrics revealing the session load on each server OS machine, the resource usage of each machine and the current state of each machine; • Metrics revealing the user connections to each delivery group, average time taken for users to access the desktops/applications delivered by each group, number of logins that are slow etc; • Session related statistics that provide the number of active and inactive sessions, and the login times for each session to each delivery group in a site, status of sessions to each delivery group, etc; • User connections related metrics such as the failure of connections due to client-side problems, connection failure due to configuration errors, machine failures, number of new connections, login duration of each user, user authentication time, real time login details of each user etc;
	Citrix NetScaler VPX/MPX	• External metrics of availability and responsiveness of the device; • Metrics revealing the overall health of core hardware components of the NetScaler device, such as, the current voltage and temperature of CPU cores, the speed of CPU fans and system fans, the temperature of CPU cores, the current voltage output of various power supply units, the current state of power supply units, etc.; • Metrics revealing the CPU usage per processor and for the NetScaler device as a whole; • Disk space usage metrics, such as, the total capacity per disk partition, the amount of used and free space, and the percent disk space usage per partition; • Memory usage metrics revealing the percent memory used globally by the device and the per feature memory usage; • Metrics revealing the current state of each network interface configured on the device, the link state of the interfaces, link uptime/downtime, data/packets received/transmitted over the interfaces, packets dropped by each interface, error packets received/transmitted by each interface, etc.; • Metrics measuring load imposed by RNAT sessions, such as, the number of active sessions, the amount of data transmitted/received, etc.; • Statistics monitoring VLAN traffic, which include, data/packets received/transmitted per VLAN, count of packets dropped by each VLAN, etc.; • Measures indicating how well the device handles IP, HTTP, ICMP, TCP, and UDP load;

| Access Applications | | • Key metrics revealing the device's DNS query handling capability, such as, the number of queries received and answered, the number of times the cache was flushed, the count of queries for which records were not found, number of queries in invalid query format, the number of responses in invalid format, the number of DNS requests refused, etc.;

• SSL acceleration related metrics, such as, number of SSL crypto cards present in the device, the number of SSL cards that are UP, the status of the SSL engine, the number of SSL/SSL v2/SSL v3 transactions performed on the device, the count of Front-End and Back-End SSL sessions, etc.;

• Application firewall related metrics, such as, amount of data received/transmitted by the firewall, the number of aborts, redirects, start URL and deny URL security check violations, etc.;

• Measures pertaining to the High Availability configuration of NetScaler, which include, whether the NetScaler appliance is HA-enabled or not, the current state of the HA node, the number of heartbeat packets received and sent, the number of times command propagation timed out, the number of synchronization failures, etc.;

• Load-balancing virtual server related metrics, such as, the current state of each virtual server, the number of client and server connections to each server, the data/packet traffic on each server, etc.;

• Metrics indicating the current state of and data/packet traffic handled by each authentication virtual server;

• Statistics that reporting anomalies in transmission of log messages to the SYSLOG server, such as, the total number of log messages generated, number of logs sent and not sent to the syslog server, the count of NAT allocation failures, NSB allocation failures, NAT lookup failures, etc.;

• Service-related metrics, such as, the current state of the virtual server bound to each service, the number of server and client connections to each service, the current load on the service, etc.;

• VPN session related metrics, such as, the number of VPN login requests received, the number of times the VPN login page failed, the number of DNS and WINS queries resolved by the VPN sessions, etc. |
| | **Sun Ray Server** | • Measures that indicate whether every Sun Ray client is able to connect to the Sun Ray server;

• Session related statistics revealing the number and type of sessions on the server;

• Metrics that shed light on the current status of critical device services on the server; |

Access Applications	**Citrix NetScaler Web Insight**	• Measures revealing the number of requests and total amount of data received by each web server, etc.; • Metrics indicating the number of requests and total amount of data received by each web application, elapsed time between the end of an enquiry and the beginning of a response from the web application, average latency caused by the server and client networks, etc.; • Measures revealing the number of requests and total amount of data received by the appliance; the number of requests and total amount of data received by the appliance using the HTTP request method etc.; • Measure indicating the elapsed time, from when the browser starts to receive the first byte of a response of specific type until either all page content has been rendered or the page load action has timed out. • Measures revealing the number of requests received from clients running specific operating system, the number of requests and amount of data received from each type of client etc.; • Key statistics mentioning the render time and load time of each URL, number of requests received for this URL etc.; • Metrics revealing the number of requests received from each client, latency caused by the client-side network etc.;
	Microsoft Terminal Server	• Monitoring of the server's TCP port for availability and response time; • Tracking of the server's CPU and memory usage; Monitoring of specific applications deployed on the server to determine which applications are running, which are the most resource intensive applications, and who is using these applications; • Session related metrics to determine how many concurrent sessions are there – currently and at peak times; • In-depth analysis of the applications invoked/used by individual users.
	Citrix Cloud Connector	• Measures revealing the availability and responsiveness of the Citrix cloud Connector Service; • Measures revealing the time taken to process an XML transaction by the Citrix Broker Service, the rate at which XML transactions were received by the Citrix Broker Service, the count of XML transactions processed concurrently by the service; • High Availability Service-related metrics such as the database connectivity, the rate of database transactions, the database transaction errors, etc.; • Registration related statistics such as soft registrations, hard registrations, expired registrations, rate of registrations; • Metrics revealing the rate of failed launches and expired launches while monitoring the High Availability Service; etc.,

Access Applications	**Citrix NetScaler SDX**	• Measures indicating availability of the SDX appliance on the network, how quickly the appliance responds to requests and whether the appliance was restarted recently; • Statistics pointing to the interface that is down and the interface that is handling more traffic than others; • Key metrics indicating the VPX instance that is inaccessible and also listing the reasons for it, for example - is it because the VPX instance is down, or is it because the VM hosting the instance is not running; • Measures revealing the CPU utilization level, the VPX instances that are hogging the CPU resources and the specific CPU cores that are utilized more; • Metrics pointing to the size of memory and storage resources of the appliance, the VPX instances that utilize the memory abnormally and the storage repository that is running out of free space; • Statistics indicating the utilization of physical disk, the count of SSL chips available to use on the appliance and the VPX instances that are consuming too many SSL chips for processing SSL traffic; • Measures reporting the throughput of the appliance and the VPX instance that is consuming unusually high bandwidth;
	Citrix Session Recording Server	**Citrix Session Recording Service Layer** • Metrics revealing the total number of files available in the recording folder; • Key metrics indicating the Hinted Handoff status; • Metrics revealing the average/maximum file size of the recording folder; • Metrics revealing the total size of the recording folder; • Metrics revealing the number of session recordings that are currently being received by session recording server; • Metrics revealing the rate at which the message bytes were processed by the Storage Manager; • Metrics revealing the rate at which the message were received;
License Servers	**Citrix License Server**	• License usage metrics such as the number of licenses installed on the server, the number and percentage of licenses utilized, etc.
	Terminal Services Licensing Server	• License usage metrics such as the number of licenses installed on the server, the number and percentage of licenses utilized, etc.

Directory Servers	Netscape Directory	- Key metrics revealing the performance of the caching activity of the server, which includes the cache hit ratio, rate of page reads and writes, etc.; - Metrics on entry caches such as the cache hit ratio; - External measures of availability, responsiveness, TCP connectivity, etc.
	Active Directory	- Overall health of the Active Directory in terms of schema cache hit ratio, the number of pending requests, the rate of write operations on the directory store, etc.; - Key metrics pertaining to the replication activity like the number of replication updates happening on the current domain controller, the number of changes applied to the object properties through inbound replications, etc.
	Sun Java System Directory Server	- Database cache usage related statistics, such as, the percentage of requests to the server serviced by the database cache, file cache, and entry cache; - Availability and responsiveness of the server; - Metrics revealing load on the server, such as the current number of connections to the server, the number of connections handled by the server, the operations completed and outstanding operations on the server;
	eDirectory Server	- Monitors the block and entry caches of eDirectory with respect to database entry current size, database entry items cached, database block items cached, entry cache hit ratio etc. - Provides statistics on the accesses, operations and errors of each application protocol interface of a directory server with respect to unauthorized/invalid requests, read requests, add entry requests, remove entry requests, no of chaining, no of error requests, Replication updates In and Out, incoming and outgoing traffic etc.
	Active Directory Federation (AD FS)	**ADFS Service** - Metrics revealing the count of Additional Authentications available for the server, number of device authentications available, number of Artifact Resolution requests available, number of certificate authentications available, number of external Authentications and External lockouts available ; - Metrics revealing the count of Federation metadata requests, MSIS HTTP token requests, OAuth authorization/token requests, Passive requests, password changed requests, Password change Failed/Successful requests and SAML-P token requests; - Metrics revealing SSO related details such as the number of SSO authentication failures that had occurred, SSO authentications that had granted and token requests; - Metrics revealing the count of User/Password authentication failures, User/Password authentications, Windows integrated authentications, WS-Fed token requests and WS-Trust token requests; - Metrics revealing the status, availability and response time; of the service;

Authentication/Policy Servers	SiteMinder Policy Server	- Key statistics indicating the availability of the server, and the total time taken to perform authorization and authentication checks; - Statistics related to the administrator logins to the server, such as the number and percent of admin rejects, etc.; - User authentication related metrics, which include the number of authentication attempts, accepts, rejects, etc.; - Performance metrics associated with authorizations, which include the number of authorization accepts, rejects, etc.
	SiteMinder OneView Monitor	- Critical statistics pertaining to every step of the request authorization cycle, which include the number of login attempts and failed logins, the number of validation attempts and failures, the number of authorization attempts and failures, etc.; - The SiteMinder Agent Cache related metrics, such as the percentage of resource cache and session cache hits; - Key performance data pertaining to the SiteMinder Policy server, which include the number of open connections on the server, number of authentication and authorization requests accepted and rejected by the server, etc.
	Radius	- External measures of availability and response time; - Monitoring of critical Radius processes
	Citrix Secure Gateway (CSG)	- Statistics related to connections between ICA client and the CSG, such as the number of active HTTP and ICA connections, failed connections, etc.; - Key statistics that measure to and fro traffic between the ICA client and the CSG, which includes rate of data received and sent by the CSG; - Metrics that measure validations performed by the Secure Ticketing Authority such as the rate of failed validations and the number of successful validations
	Microsoft Radius Servers	- Measures such as the rate of accounting requests received and responded to, the rate of duplicate accounting requests, etc., revealing how well the server performs accounting; - Key metrics indicating the health of the authorization and authentication functions performed by the server, such as, the rate at which access requests were accepted, challenged, and rejected, the rate of duplicate access requests was received by the server, etc.;

Authentication/Policy Servers	**Microsoft DFS**	• Key metrics revealing the number of referral requests to the namespace, number of requests processed, requests that failed, request processing rate etc.; • Statistics revealing the bandwidth saved during replication of each folder, number of files that were moved to the conflict and deleted folder, number of conflict files and deleted files, number of staging files that were generated, number of staging files cleaned up, deleted space in use etc.; • Metrics revealing the length of the API queue, the throughput and bandwidth savings of each replication connection, the number and type of API requests; request processing rate for each type, database lookups and commits performed by each volume hosting the replication folders etc.;
	Microsoft RAS Servers	• Port-specific performance metrics, which include, the rate at which bytes/frames were transmitted and received, the rate of errors, the number of remote access connections, etc.; • Performance statistics related to the telephone-communication on a computer, which include, the number of telephone lines serviced by the computer, the rate of outgoing/incoming calls, etc.
	Citrix Secure Ticketing Authority (STA)	• Important metrics indicating the status of tickets such as the rate of receipt of validated and failed data requests, the rate of receipt of validated and failed ticket requests, the rate of ticket timeouts, etc.
	Citrix Federated Authentication Service	**Citrix FAS Service** • Metrics indicating whether the Authorization Definitions is in session or not ; • Metrics revealing the MS Certificate Authority Details whether the MS Certificate is accessible or not and whether the MS Certificate is set to default or not.; • Metrics revealing the Authorization Certificates status; • Metrics revealing the FAS Servers related measures such as whether the server is in maintenance mode or not, number of users accessing the FAS server, number of unique users accessing the FAS servers and the number of expired users accessing this server; • Metrics revealing the users related details such as number of users who own this certificate, total users possessing this certificate, number of expired users and total amount of expired users available; • Metrics revealing the count of active sessions, certificate signing requests, private key operations performed, and time taken to access this requests; • Metrics revealing the server load related details such as whether the server is in high/medium/low load;

Authentication/Policy Servers	Microsoft Certificate Authority Server	**CAS_SERVICE** • Metrics revealing the count of SSL certificates that got expired and SSL certificates that are going to get expired; • Metrics revealing the count of active connections; • Certificate request related measures such as count of certificate requests processed, count of certificates that are issued/pending and failed state, time taken to process the certificate request; • Metrics revealing the time taken to process certificate request, time taken to sign a cryptography, time taken for retrieving the request, time taken to process policy module and time taken to process certificate challenges and responses; • RPC user related measures such as user availability, response time and admin availability are reported;

Infrastructure Services	**DNS**	• External measure of availability of the server and response time
	Windows DNS	• External measure of availability of the server and response time; • Important measures specific to a DNS server running on windows, such as the rate of requests and responses to queries, the rate of recursive query successes and failures, etc.
	FTP	• External measures of availability and response time for GET and PUT operations
Network Devices	**Network switch/router (any MIB-II compliant device) – including 3Com/Cisco/HP/BayStack switches/hubs**	• Network connectivity and response time monitoring, bandwidth usage on all incoming and outgoing links of the network switch/router
	Cisco ASA	• CPU usage measures revealing the percentage of time during the last 5 seconds, 1 minute and 5 minute the device was using the CPU; • Statistics reporting total amount of memory available for the memory pool, number of bytes from the pool that are currently used by the applications on the managed device and percentage of unused memory in the pool; • Key metric revealing number of sessions that are currently active on the Cisco ASA device and number of users who have active remote access sessions; • Measures indicating number of IPsec Phase-1 and Phase-2 IKE Tunnels that are currently active, number of packets received and sent by all IPsec Phase-1 and Phase-2 IKE tunnels and number of packets that were dropped by all IPsec Phase-1 and Phase-2 IKE tunnels while sending and receiving data;
	Cisco Routers	• Network connectivity and latency monitoring; • Bandwidth usage on all incoming and outgoing links; tracking of CRC errors, collisions, load factor, reliability of each of the interfaces of the router; • CPU, memory, buffer utilization on the router; • Hardware monitoring including temperature, voltage, etc.;
	Cisco Catalyst Switch	• Performance Statistics pertaining to a Cisco Catalyst switch, such as the rate at which data is transmitted and received by the corresponding interface of the switch, and the percentage of bandwidth utilized by that interface
	Local Director	• Monitoring of virtual and real server workloads in terms of connection and data rates
	Network Printers	• Toner capacity, paper availability, toner availability, paper flow, the number of pages printed, and printer availability; • Measures indicating the status of covers/doors, input trays and output bins

Network Devices	Check Point Firewall-1	• Overall availability and responsiveness of the firewall; • Usage statistics including packet processing rate, percentage of rejected and dropped packets, etc.
	Cisco VPN Concentrator	• Fan related metrics such as the speed and status of the individual fans; • Statistics monitoring the temperature of different hardware components such as temperature of the CPU and the cage, etc.; • Measures indicating the level of CPU, session, and throughput utilization
	HP Router	• Key metrics revealing the CPU and memory utilization; • Metrics revealing the configured power and the actual power of the target HP Router; • Tunnel related statistics such as the number of active tunnels, amount of data transmitted and received through the tunnels, number of packets transmitted and received through the tunnels etc.; • The current voltage on each voltage test point of the managed router;
	Cisco Nexus Switch	• The percentage of time during the last minute/during the last 5 minutes the device was using the CPU; • The current state of each fan sensor and the speed of each fan; • The memory utilization of each memory module; • The current state of each sensor of the power supply units; • The current state of each voltage sensor; • The size of the RAM and NVRAM; • The utilization percentage of NVRAM; • The current operational status of each fan; • The availability of all network interfaces; • Metrics revealing the data transmission to and from each network interface and also error related statistics of each network interface;
	Palo Alto Firewall	• The availability of the firewall and the network connectivity of the firewall; • The high availability status of the firewall and the mode of high availability configuration; • Sessions related measures such as total number of sessions that are currently active and the number of active TCP/UDP/SSL Proxy sessions; • Key metrics revealing number of tunnels that are active when GlobalProtect Subscription is enabled and the utilization of the GlobalProtect gateways; • Measures indicating the number of sessions that are active on each virtual system and the percentage of sessions that are utilized on each virtual system;

Network Devices	**Blue Coat ProxySG**	• Metrics indicating the total number of client HTTP connections made by the Blue Coat ProxySG appliance, the number of active client and server connections, and the number of idle client and server connections; • Measures revealing the rate at which the HTTP requests were received from the client, the rate at which the number of HTTP hits were processed by the client, the number of HTTP errors, the service time taken by the appliance to process the HTTP hits, the HTTP partial hits and HTTP misses, etc.; • Key metrics providing the details on the total number of unencrypted and encrypted ICAP scanning transactions performed between the appliance and the ICAP server, the number of encrypted and unencrypted requests transferred between the appliance and the ICAP server, the number of successful and failed ICAP transactions, etc.; • Measures indicating the resource availability status and the resource utilization of the appliance; • Statistics revealing the CPU utilization of the appliance, the total amount of memory allocated to the appliance, the amount of memory utilization of the appliance, the amount of memory available for use and the percentage of memory utilization of the appliance; • Temperature sensor related metrics such as the current status and temperature of each sensor; • Voltage sensor related metrics such as the current status and voltage reading of each sensor; • Fan sensor related metrics such as the current status and speed of each sensor; • Measure reveals the current operational status of each disk available in the appliance;
	Cisco PIX Firewall	• Buffer usage metrics such as the maximum blocks that were allocated, the number currently available etc.; • Measures indicating status of a hardware unit; • Connection related metrics, which includes the number of open, closing, and half-open connections.
	Dell Switch M-Series	• Metrics indicating CPU and Memory utilization of the stack units in the switch; • Hardware related measures such as the current operational status of the fan and the current state of the power supply, and the current temperature reading of the stack unit; • Measures revealing the current switch status of the stack unit; • Key metric revealing the port related details such as the administrative state and operational state of each port on the switch, and strength of the power signals received and transmitted through each port.

Network Devices	Juniper SA Device	• Key host-level statistics such as the percentage of disk space, CPU, memory, and swap space utilized on the IVE system; • Critical performance metrics such as a measure of the log file growth on the IVE system, the number of concurrent users on the system, the number of file/web/applet/terminal hits on the system, etc.
	3COM Core Builder Switch	• Key metrics pertaining to each of the network interfaces supported by the switch, such as, availability of the interface, the traffic handled by the interface, its speed, etc.
	Juniper DX Device	• Key host-level statistics such as the percentage of disk space, CPU, memory, and swap space utilized on the IVE system; • Critical performance metrics such as a measure of the log file growth on the IVE system, the number of concurrent users on the system, the number of file/web/applet/terminal hits on the system, etc. • Metrics reporting the level of HTTP traffic on the device, and HTTP errors encountered by the device
	Juniper EX Switch	• Metrics revealing the CPU utilization, current temperature, uptime of each hardware component; • Memory related metrics such as the total memory allocated to each hardware component, buffer memory and heap memory utilization of each hardware component; • Metrics revealing the number of times the temperature failure, fan failure and power supply failure events were triggered; • The current mode of the routing engine can be ascertained;
	OpenVPN Access Servers	• Measures revealing the total number of active users connected the server and the user related statistics such as the data transmission and reception, active session duration of each user etc.; • Statistics revealing the total number of licenses available for the server, the number of licenses used and the number of licenses available for use;
	QNAP NAS Systems	• Disk related measures such as the current state of the disk, capacity of the disk and the current temperature of the disk; • Metrics revealing the current state of each disk volume and the space utilization metrics of each disk volume such as the total volume, volume available for use, volume already used etc.; • Current speed of the fan; • System related metrics such as the current CPU utilization, temperature etc.; memory related metrics of the system such as the total memory, available memory, etc.; • The Uptime and reboot details of the system;

Network Devices	Data Domain	• Hardware related measures such as the status of each fan, fan speed, status of the disks, disk capacity and measures related to disk I/O, size of the NVRAM and errors encountered by the NVRAM, battery status etc., • Metrics revealing the current status of each Power module and sensors, overall CPU utilization and disk I/O of the storage system etc., • Key metrics revealing the current status of the file system service, the space utilization of each file in the storage system, size of each file prior to and after compression, compression ratio of each file etc.,
	Big-IP/F5 Load Balancer	• Measures key system performance metrics for any system that supports the Net-SNMP agent, and checks for the availability and used memory of a system using the Net-SNMP agent; • Reports the status of incoming and outgoing traffic through all the virtual servers/addresses that have been configured on the load balancer; • Reports the status of and the traffic on each of the virtual IP addresses configured on the BIG-IP load balancer; • Monitors the status of and the traffic on each of the virtual servers configured on the BIG-IP load balancer
	Brocade SAN Switches	• Metrics indicating the current status (whether online or offline) of the fabric switch, and the status (whether online/offline/faulty/unknown/testing) of the links of the ports on the switch; • Key statistics revealing the health of sensors, such as, the number of sensors in the normal/unknown/faulty state; • Metrics indicating the status of the ports on the fabric switch;
	FortiGate Firewall	• Usage statistics indicating how well the firewall uses the CPU, memory, and disk resources; • Statistics measuring the load on the firewall in terms of the number of sessions to the firewall, the network and data traffic processed by the firewall; • Firewall efficiency indicators such as the number of attacks and viruses that were detected by the firewall during the last 20 hours
	Alcatel Switch	• Overall health statistics pertaining to the switch such as, input utilization, I/O utilization, CPU, memory utilization, etc.; • Usage statistics of each of the modules of the switch such as, input utilization, I/O utilization, CPU, memory utilization, etc.; • Metrics revealing the status and usage of ports on the switch.

Network Devices	Forefront TMG	• Measures relating to the content cache of the firewall such as the rate at which the data is retrieved from the disk allocated for content caching; the rate at which the I/O operations failed, how well the URLs are stored and retrieved from the disk drive; etc., • Metrics revealing the efficiency of the firewall such as the number of scanned messages, the number of infected messages that were blocked, the number of spam messages etc., • Metrics revealing the number of packets that were backlogged, dropped, allowed etc., by the firewall, etc., • Metrics revealing the number of connection objects that were waiting for a TCP connection, number of active sessions, SIP registrations, number of active SIP sessions, TCP and UDP connections, the data transmission and reception rate through the firewall, number of worker threads etc., • Measures indicating the number of active H.323 calls and the rate at which the calls were handled; • Measures revealing the number of connections that were active, connecting, listening through the SOCKS protocol, • Metrics revealing the data transfer between the web proxy clients and servers such as the number of HTTP/HTTPS requests, rate at which data is sent from the computes protected by the firewall, number of outgoing and incoming connections etc.,
	Coyote Point Equalizer	• External metrics of availability and responsiveness of the equalizer; • Cluster related statistics, such as, the load on each cluster, the total number of connections handled by each cluster, the rate at which servers in each cluster were accessed, etc.; • Metrics revealing the number and nature of connections to the equalizer; • Statistics related to cluster servers, such as, the load on each server in each cluster, the responsiveness of each cluster server, the idle time of each server cluster, etc.
	Citrix Branch Repeater	• Measures revealing the uptime and the percentage of CPU used by the branch repeater; • Metrics revealing the data transmission and packet transmission for each application link, the numerical statistics of the dropped data and packets during transmission as well as reception due to QoS threshold settings; • Measures indicating the load on the branch repeater, the effectiveness of the repeater is reported by the amount of data and connections it has accelerated, the compression rate of the accelerated date etc., • Measures indicating the number of active connections, metrics revealing the accelerated traffic to and from each ICA application, the ratio of data transmission and reception for each ICA application etc., • Metrics revealing the level of traffic sent and received by each configured service class, the packets dropped when QoS thresholds are violated by each service class, etc., • Metrics revealing the volume of traffic handled by each WAN and LAN link and the packets dropped over the links due to QoS threshold violation etc., • Measures revealing the traffic accelerated by each user-configured traffic – shaping policy and the rate of traffic acceleration and the packet loss due to each traffic shaping policy etc.,

Network Devices	**Cisco SAN Switch**	• The status of the fan tray, the power supply units, and the sensors; • Metrics such as the operational mode and operational state of each WWN of the fiber channel port, the link failures experienced by each WWN, etc.; • The operational status of each VSAN on the fiber channel switch; • Overall health statistics pertaining to the switch such as, input utilization, I/O utilization, CPU, memory utilization, etc.;
	Cisco CSS	• Metrics revealing the current status and usage of the destination services configured for every service group, which include, the current destination service status, the number of time user requests to the service group load balanced to the service, etc.; • Metrics revealing the status and usage of each service group, such as, the current status of the groups, the number of connections established through the groups, etc. • Statistics related to the load generated by applications connecting to the CSS, such as, the number of application packets received and transmitted, the current session state, etc.; • Measures that reveal owner activity on the device, such as, the number of times the owner accessed the CSS with content requests, the number of owner requests dropped, etc.; • Key metrics pertaining to the status and usage of the content providing services, such as, the current state of each service, the total data sent through each service, the average service load, the service status, etc.; • Service-related statistics such as, the number of times each service served owner requests, the status of each content service, etc.; • Metrics revealing the state and usage of content rules; • Metrics indicating the current state of each IP interface on the CSS, and the types of interfaces associated with each VLAN circuit configured on CSS; • Overall health statistics pertaining to the switch such as, input utilization, I/O utilization, CPU, memory utilization, etc.; • The current status of each redundant link on the CSS.
	SonicWall Firewall	• Measures indicating the active connections on the firewall and the maximum connections that can be handled by the firewall; • Measures revealing the reception/transmission of fragmented packets through each VPN tunnel, amount of data and packets encrypted/decrypted by each VPN tunnel; • Measures revealing the current CPU utilization and memory utilization of the firewall;
	Generic SAN Switch	• The current status of the sensors on the switch, the connection units on the switch, etc.; • Port-related statistics, such as the load on each port on the SAN switch, the current operational state and health of each port, the port speed, the errors captured on every port, etc.,

Network Devices	**Coyote Load Balancer**	• Metrics revealing the total connections, active connections, total transactions of each server, amount of data received/transmitted through the server, number of HTTP responses compressed by the server; • Metrics revealing the current state, failover state and failover mode of each peer; • Measures indicating the total connections, active connections, total transactions of each server, amount of data received/transmitted through each HTTP cluster and HTTPS cluster, number of HTTP responses compressed by the HTTP cluster and HTTPS cluster, etc.; • Measures indicating the total connections, active connections, total transactions of each server, amount of data received/transmitted through the L4 cluster; • Measures indicating the total connections, active connections, total transactions of each server, amount of data received/transmitted through the L4 cluster; • Measures indicating the total connections, active connections, total transactions of each server, amount of data received/transmitted through each server pool; • Metrics revealing the current state and subnet state of each VLAN;
	F5 Big-IP Local Traffic Manager	• Metrics indicating the temperature and fan speed of the CPU supported by the local traffic manager; • Metrics indicating how the traffic manager utilizes each disk partition; • Chassis fan related metrics such as the current status and speed of the fan; • The current status of each pool and virtual server configured on the traffic manager • The connections, data and packet transmission/reception through each virtual server; • The maximum number of connections that were established on each virtual server; • The availability of each node; • The activity status of each load balancing pool if the pool is available; • The connections, data and packet transmission/reception through each pool and pool member; • The maximum number of connections that were established on each pool and pool member; • The data and packet transmission/reception from the client and server on the Traffic Management Module; • The client and server related connections on the Traffic Management Module etc., The connections, data and packet transmission/reception through each virtual server; • The maximum number of connections that were established on each virtual server;

Network Devices	WatchGuard Firewall	- Measure revealing the current CPU utilization of the firewall at periodic intervals; - Measures indicating the total connections, active connections and the connections that were dropped by the firewall; - Measures revealing the data and packet transmission/reception through the firewall; - For each firewall policy, measures such as the connections, data transmission/reception, packet traffic and packets discarded due to errors is reported; - For each VPN pair, measures such as the IPSEC traffic, packet traffic, packets discarded due to errors is reported; - Data traffic, packet traffic, packets discarded due to errors etc., are reported for each VPN tunnel; - Measures revealing the Data traffic through various protocols such as Encapsulating Security Payload (ESP), Authentication Header, IP Payload Compression protocol (IpComp) of each security association; - Measures revealing various errors during packet transmission for each security association etc.,
	A10 Application Delivery Controller	- Measure revealing the percentage of CPU resources utilized; the current state of each power supply unit; - Measures indicating the total capacity of the disks, amount and percentage of space utilized from the total capacity of the disks and free space available in the disks; - Memory related metrics such as total amount of the memory configured, amount and percentage of memory space and the amount of memory space that is available for use; - For each real server/virtual server, metrics revealing the current health, rate at which data and packets were transmitted from and received by each real server/virtual server, number of active connections, percentage of connection used by each real server, number of persistent connections, L7 requests processing rate etc.; - For each port of the real server/virtual server, key metrics revealing the current the rate at which data and packets were transmitted/received through each port, number of active connections, maximum number of connections that were established through each port of the real server, number of persistent connections etc.; - For each service group/service group member, key metrics revealing the current health/state, rate at which data and packets were transmitted /received, percentage of active connections that were established, the rate at which the connections were established, maximum number of connections that were established through each port of the virtual server, number of persistent connections, etc.

Network Devices	**Array Application Delivery Controller**	• Utilization levels of the CPU of the Array Application Delivery Controller are measured; • Measures indicating the current status of the fans and power supplies available in the target delivery controller; • Metrics revealing the space utilization of the disks on the target delivery controller; • Key statistics indicating health of the real and virtual servers associated with the application delivery controller and how well the client traffic was processed by the real and virtual servers and the server that handles the maximum traffic; • Statistics revealing the number of connections established to the delivery controller and the number of requests processed by the target delivery controller; • Measures indicating the number of SSL connections that were open, accepted and requested to the virtual host, the number of SSL sessions that were resumed and yet to be resumed and the number of SSL connections that were missed on the virtual host; • Measures reporting the amount of data transmitted out and received after compression, the rate at which the bytes were transmitted/received and compression ratio; • Cache statistics such as number of GET, HEAD and PURGE requests received by the cache and the percentage of requests that were successfully retrieved from the cache; • Key measures indicating size and limit of different types of data structure items available on the target delivery controller and, for each type, the number of data structure items that are available for use on the delivery controller;
	HP Switch	• CPU measures such as the current CPU utilization and the maximum percentage of CPU utilization by the HP switch; • Measures indicating total amount of memory allocated for the switch, the amount of memory that is currently utilized and is available for use and the percentage of memory utilized by the switch; • Key measure indicating the percentage of CPU utilized by each process; • Current temperature of the switch is also reported; • Metrics revealing the number of users who are currently active on the target HP switch and the users who were blocked on the switch;

Network Devices	CheckPoint Smart Appliance	• Disk measures such as total space allocated for each disk, space that is currently available for use, and amount and percentage of space that is currently in use. • Measures indicating speed at which each fan operates and whether/not the sensor of the fan is out of range. • Metrics revealing the current status of each power supply unit, the current voltage of each element and whether/not the LED corresponding to the element is out of range, the current temperature of the hardware unit. etc. • CPU related metrics such as percentage of CPU utilization and CPU utilized for system level and user level processing. • Memory related measures such as total memory of the appliance, amount and percentage of memory utilized by the appliance and amount of memory that is currently available for use in the appliance. • Measures indicating percentage of CPU utilized by each virtual system, the number of connections that are currently active on the virtual system and the maximum number of connections made to the virtual system.
	3Com Switch	• CPU measures such as the current CPU utilization and the maximum percentage of CPU utilization by the 3Com switch; • Measures indicating total amount of memory allocated for the switch, the amount of memory that is currently utilized and is available for use and the percentage of memory utilized by the switch; • Key measures indicating the current operational status of the switch and the percentage of CPU utilized by each process performed on the switch; • Current temperature of the switch is also reported; • Metrics revealing the number of users who are currently active on the target 3Com switch and the users who were blocked on the switch;
	Dell EMC S Switch	• Metrics indicating the utilization levels of CPU and memory of the switch; • Status of the hardware components such as fans, power supply units are revealed. Statistics revealing the speed of the fans in the fan tray; • Measures revealing the current temperature of the switch and the current voltage status of the switch; • Metrics relating to the stack unit such as current status, type and uptime and the total time during which the stack unit has been up since the last reboot.
	Dell N Series Switch	• Measures indicating the utilization levels of CPU and memory of the switch; • Statistics revealing the current status of the hardware components such as fan, power supply and temperature of the switch. • Metrics relating to the stack unit such as current status and uptime and the total time during which the stack unit has been up since the last reboot.

Network Devices	**Radware Alteon Load Balancers**	• Metrics revealing the CPU utilization level of the load balancer at different time stamps; • Memory related metrics such as total memory allocation, the amount of memory that is currently utilized by the load balancer and the amount of memory that is free to use; • Status of the hardware components such as fans, power supply and temperature of the load balancer; • Key metrics revealing the high availability, throughput and SSL capacity usage of the load balancer; • Session related statistics pertaining to the real server and virtual server are reported; • Service group related metrics such as current status, number of sessions that are currently active and the transmit rate; • Metrics revealing the number of real servers in normal, down and disabled states;
	Peplink WAN Router	• Measures indicating the percentage of CPU utilized by the router. • Metrics revealing the percentage of memory utilized by the router. • Measures indicating the device reboot time and uptime. • Measures indicating the current state of each VPN profile connected to the router via WAN connection. • Measures indicating the current status of each access point connected to the router. • Measures indicating the current status of each WAN connection to the target router. • Statistics revealing the data/packets that are transmitted/received through each WAN connection.
	Cisco Wireless Accesspoint	• Measures revealing the total number of new users and the number of users who are currently logged in and logged out of the device; • Metrics revealing the current status of each radio interface and the WLAN and channel utilization levels; • Statistics revealing data and packet transfer rates of each user, the number of packets and the amount of data dropped during transmission, and the number of TS violate packets; • Measures indicating the number of info, debug, notice, warning, error, critical, alert and emergency events occurred on the device; • Measures reporting the status of each virtual access point and • Key measure revealing data transmission of the workgroup in the upstream and downstream access point device; • Metrics indicating whether/not the email alert feature is enabled on the device, and the count of email alerts that were successfully sent and were failed;

Network Devices	Riverbed Steelhead	**Steelhead Services** • Metrics revealing the current health and service status of this device; • Metrics revealing the current temperature of this device; • Metrics revealing the time at which the service was started for optimization; • Metrics revealing the count of connection related metrics such as number of optimized connections/ passthrough connections/half opened connections/ half closed connections/ Established and total connections; • Metrics revealing the current status of the process that are running on the device; • Metrics revealing the total number of times the process has crashed or exited unexpectedly; **Steelhead Statistics** • Metrics revealing the amount of aggregated data which has received/transmitted through device over WAN to LAN; • Metrics revealing the amount of aggregated data which has received/transmitted through device over LAN to WAN; • Metrics revealing the amount of data that has been passed through device over WAN to LAN and vice-versa; • Metrics revealing the total amount of data transmitted without optimization; • Metrics revealing the amount of data which that has been received through application port over WAN to LAN; • Metrics revealing the amount of data which that has been transmitted through application port over WAN to LAN; • Metrics revealing the number of hits/misses measured on the data store per second during last measurement period; • Metrics revealing the percentage of disk utilized for the data store operations; **Flow Statistics** • Metrics revealing the amount of traffic generated from the source across timeline; • Metrics revealing the amount of traffic received on destination configured on steelhead device; • Metrics indicating the amount of data transmission flows on top talkers; • Metrics revealing the amount of traffic generated on specified application port;

Network Devices	**Blue Coat PacketShapper Load Balancer**	**Partition Details** • Metrics revealing the count of low order data and high order data; • Metrics revealing the Retransmitted/Dropped Late/Dropped Scheduler order data; • Metrics revealing the details such as count of non-compressed data and data received before and after compression; • Metrics revealing the count of packets that are available and retransmitted; • Measures revealing the count of TCP packets, ,scheduler dropped packets and late drop packets; • Metrics revealing the count of Frames, CIR Failure and low bandwidth failure; • Metrics revealing the TCP connection related details such as number of TCP connections available, number of connections exited/refused/ignored/aborted and denied; **Class Details** • Metrics revealing the count of low order data and high order data; • Metrics revealing the Retransmitted/Dropped Late/Dropped Scheduler order data; • Metrics revealing the count of TCP packets that are available and retransmitted; • Metrics revealing the count of issues that had occurred due to CIR Failure, Client flood attack, Server flood attack, HTTP client-side error and HTTP server-side error; • Metrics revealing the TCP connection related details such as number of TCP connections available, number of connections exited/refused/ignored/aborted and denied; **Link Details** • Metrics revealing the count of transmitted data, received data, compressed data and retransmitted data; • Metrics revealing the packet related details such as total count of packets available, number of TCP/retransmitted/transmitted packets available, number of transmitted/received packets that have dropped, number of transmitted/received packets that have dropped due to hardware error/no buffer; • Metrics revealing the TCP connection related details such as number of TCP connections available, number of connections exited/refused/ignored/aborted and denied;

Network Devices	**Cisco SG switch**	**Operating System** • CPU related metrics such as CPU enabled status, percentage of CPU utilized during the last 1 second/1 minute/5 minutes are reported; • Metrics revealing the current status of the fan.; • Metrics indicating the current state of this temperature sensor.; • Metrics indicating the current status of the power supply unit; • Metrics revealing the safeguard engine related details such as whether/not engine is enabled and current state of the engine; • Metrics revealing the PoE PSE port related details such as PSE port status, PSE current voltage, PSE output status and PSE output voltage;
	D-Link DGS Switch	**Operating System** • CPU related metrics such as CPU enabled status, percentage of CPU utilized during the last 1 second/1 minute/5 minutes are reported; • Metrics revealing the flash memory related details such as amount of flash memory allocated, amount of memory used, amount of flash memory available for use and percentage of flash memory used; • Metrics revealing the current status of Fan1/Fan2/Fan3/Fan4/Fan5 of this fan tray in this stack unit.; • Metrics indicating the current state of this temperature sensor.; • Metrics indicating the current status of the power supply unit; • Metrics revealing the safeguard engine related details such as whether/not engine is enabled and current state of the engine;
	Dell Force10 switch	**Operating System** • CPU related metrics such as CPU enabled status, percentage of CPU utilized during the last 5 second/1 minute/5 minutes are reported; • Metrics revealing the current status of the fan.; • Metrics revealing the amount of memory utilized by the switch; • Metrics indicating the current status of the power supply unit; • Metrics revealing the current status and temperature of the stack unit; • Metrics revealing the count of fan trays and power supply units available in stack unit;
	Juniper MX Router	**Router Service** • Metrics revealing the current status of the BGP peer.; • Metrics indicating the number of messages received by this BGP peer.; • Metrics indicating the number of messages transmitted through this BGP neighbor; • Metrics indicating the time delay measured as result of this RPM probe type;

Network Devices	F5 Access Policy Manager (F5 BIG-IP APM)	**APM Services** • Metrics revealing the connection-related metrics such as total number of connections available, number of connections that are currently in use, number of raw data received and transmitted, and number of compressed data received and transmitted ; • Metrics revealing the Global connection related details such as total number of global connections available, number of global connections that are currently in use, number of raw data received and transmitted using global connections, and number of compressed data received and transmitted using global connections; • Metrics revealing the Profile access related details such as number of sessions that are currently active/Pending/Established, number of sessions terminated by Admins/Error/User logouts and number of sessions allowed/denied by ACL; • Metrics revealing the APM User related details such as number of F5 connections accessed by the user, amount of data received and transmitted by the user, number of packets received and transmitted by the user and count of citrix sessions accessed by the user; • Metrics revealing the count of total, new and logged out citrix sessions that occurred; • Metrics revealing the count of total, new and logged out session details for other F5 Sessions; **F5 Server** • Metrics revealing the F5 system related details such as the number of Active connections/Server connections and Client connections available in the system; • Metrics revealing the rate at which service operation has done, packets were transferred, Http requests were made, and SSL transactions were done; • Metrics revealing the rate which data is transmitted and received and rate at which packets were transmitted and received; • Metrics revealing the Traffic related details such as the number of bytes transmitted and received by the client, number of packets transmitted and received by the client and number of connections established by the client; • Metrics revealing the details such as number of data transmitted/received from the serve, number of packets transmitted/received from the server and number of connections that are currently established from the server; • Metrics revealing the amount of CPU used, amount of memory used, amount of memory available for use and number of packets dropped;

Network Devices		
		TM Server • Metrics revealing the Virtual Server-related details such as the status of the server, number of data transmitted and received, number of packets received and transmitted, number of active connections available, maximum number of connections available for this server, number of requests processed by the server, and number of connections established to the server; **TM Service** • Connection pool related metrics such as status of the pool, number of active connections available in the Pool, total count of connections available in the Pool, amount of data transmitted/ received in Pool, number of packets transmitted/received in Pool, Pool member activity status and Pool member availability status;
	Brocade FastIron Switch	**Operating System** • Metrics revealing the amount of CPU used by the switch ; • Metrics revealing the operational state of the Fan and Power Supply unit; • Metrics revealing the current temperature of the CPU; • Metrics revealing the memory-related details such as amount of memory allocated, amount of memory available for use and percentage of memory used by the memory module;
	Maipu Router	**Operating System** • Metrics revealing the current status, priority and current option used by this task; • Metrics revealing the percentage of CPU utilized by this task.; • Metrics revealing the total size of stack memory utilized, amount of stack memory utilized, amount of stack memory that is available for use and percentage of stack memory utilized by this task ;
	McAfee Email Gateway	**Hardware Management** • Metrics revealing the state of various hardware devices such as Temperature Sensor, Voltage sensor, Power supply sensor, cooling sensor, etc.; • Metrics revealing the health state UPS, Bridge mode and Disk; **System Management** • Metrics revealing the amount of CPU used by the server; • Metrics revealing whether the appliance has been rebooted or not, time period that the system has been up since the last time this test ran and the total time that the server has been up since its last reboot; • Metrics revealing the partitions related details such as amount of disk space available, amount of disk space used, and amount of disk space available for use; • Metrics revealing the partitions related details such as the number of total files available, amount of used filed available and number of files available for use;

Network Devices

System Service

- Metrics revealing the health state of services such as the AV data health state, SPAM health state, Anti relay health state, SMTP health state, POP3 health state, CMA process health state, GTI message reputation service, GTI feedback service, GTI file reputation, RBL check, Local LDAP, Remote LDAP and ASE;

- Metrics revealing the Webmail client health state, Event handler process health state, SMTP retryer protocol health state, SPAM updater process health state, Postgre process health state and RMD merge Process health state;

Detections

- Metrics revealing the issues detected when connection initiated by the remote system and local system such as count of sender checks, denied sender, SPF, BATV checks and RBL match;

- Metrics revealing the detection related information for inbound and outbound such as the recipient based detections, anti-relay based detections, detections due to greylist, detections due to content, LDAP permit recipient based detections, directory harvest based detections and detections due to GTI message reputation/ sender id/ DKIM check/ SPAM/ PHISH / mail filtering/ mail size filtering and file filtering and count of total inbound detections detected;

- Metrics revealing the detection related information for inbound and outbound such as the Packers detected by AV engine, Pups detected by AV engine, detections due to DLP checks/ mail URL reputations/ mail URL reputations DOS;

- Metrics revealing the SMTP proxy related details such as count of total SMTP connections established, number of SMTP retry attempts and number of connections blocked and data transmitted through proxy;

Inbound Summary

- Metrics revealing the details for Inbound block related details such as the number of total inbound messages blocked, number of blocks that occurred due to sender checks, sender denial checks, RBL checks, BATV checks, SPF checks, PUPS, Packers, Virus and threshold;

- Metrics revealing the details such as the recipient based detections, anti-relay based detections, detections due to greylist, detections due to content, LDAP permit recipient based detections, directory harvest based detections and detections due to GTI message reputation/ sender id/ DKIM check/ SPAM/ PHISH / mail filtering/ mail size filtering and file filtering and count of total inbound detections detected;

- Metrics revealing the detection related information for inbound such as the Packers detected by AV engine, Pups detected by AV engine, detections due to DLP checks/ mail URL reputations/ mail URL reputations DOS;

- Metrics revealing the delivery related details such as Total Inbound Emails delivered, Total plain mails delivered, Total encrypted mails delivered, total TLS encrypted emails delivered, Total TLS secure web encrypted push/pull/dual emails delivered;

Network Devices		• Metrics revealing the count of total TLS S/MIME encrypted emails delivered, total TLS PGP encrypted emails delivered, total TLS encrypted emails delivered through TLS and total secure web push/pull/dual encrypted plain emails delivered, Total secure web S/MIME encrypted plain emails delivered and total secure web PGP encrypted plain emails delivered;

Outbound Summary

- Metrics revealing the details for Outbound block related details such as the number of total inbound messages blocked, number of blocks that occurred due to sender checks, sender denial checks, RBL checks, BATV checks, SPF checks, PUPS, Packers, Virus and threshold;

- Metrics revealing the details such as the recipient based detections, anti-relay based detections, detections due to greylist, detections due to content, LDAP permit recipient based detections, directory harvest based detections and detections due to GTI message reputation/ sender id/ DKIM check/ SPAM/ PHISH / mail filtering/ mail size filtering and file filtering and count of total inbound detections detected;

- Metrics revealing the detection related information for outbound such as the Packers detected by AV engine, Pups detected by AV engine, detections due to DLP checks/ mail URL reputations/ mail URL reputations DOS;

- Metrics revealing the delivery related details such as Total Outbound Emails delivered, Total plain mails delivered, Total encrypted mails delivered, total TLS encrypted emails delivered, Total TLS secure web encrypted push/pull/dual emails delivered;

- Metrics revealing the count of total TLS S/MIME encrypted emails delivered, total TLS PGP encrypted emails delivered, total TLS encrypted emails delivered through TLS and total secure web push/pull/dual encrypted plain emails delivered, Total secure web S/MIME encrypted plain emails delivered and total secure web PGP encrypted plain emails delivered;

POP3

- Metrics revealing the issues that are detected during Post Office Protocol access such as the count of SPAM, Phish, Unsafe URL and Safe URL;

- Metrics revealing the count of Virus, Packers and PUPs detected by AV engine;

Summary

- Metrics revealing the count of quarantined email messages that are available/Queued/Released;

- Metrics revealing the state of Email messages such as available/ Blocked/Released/Bounced/Queued/Quarantined and Delivered;

- Metrics revealing the SMTP Detections related measures such as count of Total/Inbound and Outbound detections made; |

Network Devices	Mule ESB	**Mule Server** • Metrics revealing whether the server was able to respond successfully to the query made by the test.; • The response code returned by the server for the simulated request; • Metrics revealing the size of the content returned by the server; • Metrics revealing the time taken by the server to respond to the requests it receives; • Metrics revealing whether the server was successful in executing the request made to it.; • Metrics revealing the time for establishing a TCP connection to the web server host; • Measures indicating whether the test managed to establish a TCP connection to the server; • Metrics revealing the time taken by the server to respond to the requests it receives;
	JetNexus Load Balancer	**Jet Nexus Statistics** • Metrics revealing the amount of CPU, Memory and Disk used by the appliance.; • Metrics revealing the amount of data received and transmitted, amount of compressed data received and transmitted using system; • Metrics revealing the amount of data transmitted and received using Real Server and Virtual Server; • Metrics revealing the count of total connections and current connections; • Metrics revealing the status of Real Server and Virtual Server.; • Metrics revealing the total clients and amount of pool used by the Real Server; • Measures revealing the amount of data cached and compressed by the Virtual Server; • Metrics revealing number of hits occurred and total number of clients available in Virtual Server and Real Server;
	Synology NAS	**Synology Storage** • Metrics revealing the current status of the volume available in the system; • Metrics revealing the rate at which data was read from/written into this device.; • Metrics revealing the number of times data was read/written into this device; • Metrics revealing the read and write throughput, number of FDS opened concurrently and bandwidth utilized for receiving and transmitting a copy job; • Metrics revealing the percentage of space usage on each disk;

Network Devices	**Fortinet Sandbox**	**Fortinet Host** • Metrics revealing the CPU usage related details such as the amount of physical CPU used, and amount of CPU used on excluding nice process; • Metrics revealing the memory usage related details such as amount of memory allocated, amount of memory used, amount of memory available for use and percentage of memory used; • Metrics revealing the disk usage metrics such as Available space, use space, free space and percentage of space available for use on the disk; • Metrics revealing the number of trap messages sent; **Network** • Metrics relating to the uptime of the Sandbox such as whether the Sandbox was rebooted or not, the time for which the Sandbox has been up since the last reboot, etc. **Fortinet Job Statistics** • Statistics revealing the job-related details such as the count of pending office files/android files/web files/ user-defined files and non-sandbox files; • Metrics revealing the count of pending URL jobs/ processing jobs and job assignment;
	InfiniBand Switch	**InfiniBand Fabric** • Metrics revealing the operational status and Element Manager availability of Fabric elements; • Metrics revealing the count of pending URL jobs/ processing jobs and job assignment; **InfiniBand Ports** • Metrics revealing the SMA Port related details such as Link state, Physical state and speed of Active link; • Metrics revealing the PMA Extended Port related details such as the amount of data transmitted/received, and number of packets transmitted/received; • Metrics revealing the number of Unicast packets received/transmitted and amount of multicast packets received/transmitted; • Metrics revealing the PMA port related details such as the count of symbol/received errors and count of successful/failed link error recovery; • Metrics revealing the count of bad packets at the receiver end, count of discarded inbound packets and count of inbound packets; • Statistics revealing the Subnet Manager related details such as the amount of packers received/transmitted, count of requests and responses received/transmitted, count of unknown received packets, count of ignored packets, count of outstanding packets and count of onwire packets available.

Messaging Servers	**MSMQ**	• Monitoring server performance through key metrics like incoming and outgoing message rates, error messages seen by the server, current sessions being handled, etc. • Queue statistics, such as, the outstanding message queue length, and the journal queue length
	WebSphere MQ Series	• Monitoring the availability of the messaging service and the individual queue managers; • Statistics pertaining to the local queues including the current depth, percentage utilization of the queue, details of which messages are in the queue and for how long, etc.; • Measures that indicate channel availability and volume of data handled by each channel
	Fiorano MQ	• Server statistics such as the number of active and idle threads, the rate of receipt of messages from and publication of messages to topics, the rate at which messages are received from and pushed to the queues on the server, memory statistics including the amount of memory utilized and the available memory; • Queue-specific statistics such as the number of messages in the queue awaiting delivery, and the number of undeleted messages in the queue; • Topic related measures such as the number of durable subscribers on the topic, and the number of undelivered messages to such subscribers.
	Tibco EMS Server	• Metrics that indicate the current mode of operation of the server; • Metrics revealing the load on the server in terms of the number and type of topics, and the number and type of queues on the server; • Metrics that report the percentage of connections to the server that are in use, and the number of producers, consumers, sessions, and durables on the server; • Metrics revealing the number and size of pending messages on the server, the free and used message memory, etc. • Metrics related to each queue on the server, such as, the number and size of pending messages to a queue, whether the queue is a static or dynamic queue, etc. • Metrics related to each topic on the server, such as, the number and size of pending messages to a topic, whether the topic is a static or dynamic topic, etc. • Metrics that reveal the level of user activity on the server, such as, the number of sessions and connections to a user, etc.

Measurements made by eG Agents

Messaging Servers	**Microsoft Skype for Business / Lync**	• Key metrics that reveal the address book accesses, the speed of these accesses etc., statistics revealing the message processing ability of the server, • Metrics that capture the failed messages and when the failure occurred – during message validation? in the message queue or when written to the database? • Metrics revealing the quality of the AV Conferencing experience, metrics revealing the processing of the call park requests; • Statistics revealing the number of users/clients connected to the server, the current load on the server, the number of dropped conferences and unfinished tasks; • Metrics revealing the number of requests queued for processing by the database and the time spent by the requests in the queue; • Key metrics that detect the client and server authentication failures as well as DNS failures; • The current state and draining state of the Application Sharing Conference unit, the Data MCU unit and the Instant Messaging Multipoint Control unit; • Key metrics revealing the number of RDP connections that failed and the conferences handled by the Application Sharing Conference unit; • The number of whiteboards and conferences that were active on the Data MCU; • The number of add user and add conference responses that failed; the number of SIP connections and the that failed and the connections that were currently active; • Key metrics revealing the number of replication requests received by the replication service and the time taken by the service to process the requests; • The number of times user provisioning and publish calls failed; • Key metrics revealing the number of stored procedure calls executed by the user service; the number of unique users connected to the servers based on each client version; • Statistics revealing the users for whom voice call is enabled, the users who are currently connected to the server; the number of times the HTTPS connections failed etc.;
	Microsoft Exchange 5.5	• Caching related statistics such as the number of requests fulfilled by the Exchange Directory cache; • Database usage statistics, which include the number of requests fulfilled by the buffer pool, the percentage of tables opened using the cached information, etc.; • Metrics pertaining to the POP3 and IMAP protocols that include the number of current IMAP and POP3 connections, and respective outstanding requests; • General statistics including the number of incoming and outgoing messages from the mail server, the number of messages awaiting final delivery, etc.

Messaging Servers	RabbitMQ Cluster/Rabbit MQ Node	• Key measures indicating the total number of cluster nodes, count of nodes that are currently running and the number of nodes that are stopped; • Metrics revealing the current status and uptime of the cluster nodes, utilization levels of file descriptors, socket descriptors, Erlang process and memory of the nodes, the rate at which the messages were read from or written to the message store, bandwidth utilized for performing read and write operations on the node, average time taken to perform the read and write operations and time taken to seek and sync data on the node; • Measures indicating the number of client and application connections established to the target cluster and the rate at which the bytes were transmitted/received through the client/application connection; • Measures that indicate the rate at which the messages were prefetched, acknowledged, unacknowledged, unconfirmed and uncommitted via each channel; • Statistics pertaining to the queues including the number of running and idle queues, count of the messages that are to be auto/consumer acknowledged, delivered, published and retuned on the queue, etc.; • Key measures indicating the rate at which the garbage collection operations were performed on each cluster node, the amount of data reclaimed by the garbage collector and the number of context switch operations performed per second on each node; • Measures indicating the number of virtual hosts, exchanges, queues and channels that are currently available for users, the number of messages that are to be delivered, published, acknowledged, auto/consumer-acknowledged, etc.; • Statistics revealing the type and feature of exchanges on the node and the number of messages that were published in/out using the exchange on the node.;
	Mosquitto MQTT	• Metrics revealing the details of the server such as Uptime and Reboot status; • Statistics revealing the client related details such as total number of clients available, number clients connected, disconnected and expired and maximum number of clients allowed; • Metrics revealing the count of subscriptions, published data/messages related details;

Messaging Servers	**ActiveMQ Server**	**Apache ActiveMQ Server** • Queue-specific statistics such as the number of messages in the queue awaiting delivery, Queue size, number of Producers available, number of Consumers available, number of Dequeue/Enqueue/Inflight count, DLQ count and the number of expired messages in the queue; • Topic related measures such as the number of durable subscribers on the topic, Queue size, number of Producers available, number of Consumers available, number of Dequeue/Enqueue/Inflight count, DLQ count, amount of memory assigned to the topic, amount of memory used and memory usage status; • Metrics revealing the MQ server status related details such as number of warnings available, total number of connections and number of connections that are currently in use; • Broker related measures such as the total number of producers/consumers/messages available in the server, current dequeue/enqueue count, count of queue producers/consumers who are currently accessing it and number of topic producers/topic subscribers available; • Metrics revealing the durable topic subscribers and inactive topic subscribers and amount of store, memory and temporary memory used;

Mail Servers	**Microsoft Exchange 2000/2003**	• Extensive server statistics including the number of logons that have failed, connection and transmission rates, authentication failure rates, etc.; • Key message delivery statistics such as the number of messages in the local and remote queues, current number of inbound SMTP connections, number of messages entering the retry queue, average number of retries per outbound message, local and remote message delivery times, etc.; • MTA related statistics, such as, the message processing rate of the MTA, the number of threads in use by the MTA, the number of outstanding messages in the work queue, etc.; • Metrics related to the mail scanning and virus processing sub-system, which includes, the number of requests pending virus scanning, the rate at which messages were scanned, the number of files and messages that were cleaned and quarantined, etc.; • Measures monitoring the performance of RPC activities, such as, the number of attempted RPC calls, the number of RPC failures and successes, the RPC success ratio, RPC latency-related metrics, etc.; • Mailbox usage metrics such as, the mailbox size, quota size, and percentage of mailbox space currently used.
	Microsoft Exchange 2007/2010	• External metrics revealing the availability of the server to send and receive mails, and its responsiveness; • Metrics indicating the overall request processing ability of the server, such as, the rate at which the server processes requests, and the speed at which requests are processed; • Metrics revealing the health of the ActiveSync engine, such as, the time taken by the engine to process requests, the number of requests in queue, the number of pending ping commands, the number of busy/idle worker threads, etc.; • Metrics revealing the health of the Availability service, such as, the request servicing rate, the rate of mailbox hits/misses, etc.; • Metrics related to the Outlook Web Access protocol, such as, the speed of the web access, the time taken for a search to complete, the number of failed web access requests, etc.; • Metrics related to the RPC activity on the server, such as, the rate of RPC successes and failures, the RPC success ratio, the rate of high latency RPC attempts, the fast RPC ratio, etc.; • Metrics monitoring the health of the Exchange database, such as, the database cache hit and table cache hit ratios, the rate of log records waiting to be added to the log buffer, and the rate of log threads waiting for their data to be written to the log buffer; • Metrics indicates the mount status of the Exchange mailbox; • Key statistics pertaining to the health of the mailbox store and public store, such as, the time taken by the mailbox store to deliver a message to local recipients, the count of messages in queue, the rate of messages delivered, the size of the receive queue, etc.;

Mail Servers		• Usage metrics related to the virtual memory of the Exchange store, such as, the size of the largest free block of virtual memory, the number of free blocks of virtual memory, etc.;
		• Metrics related to the Search Indexing engine, such as, the number of mailboxes left to crawl, the number of documents to be indexed, the number of documents that failed during indexing, the time taken for document indexing, etc.;
		• Metrics that shed light on issues related to the Mailbox assistant, such as, the number of events awaiting processing by the assistants, delay between polling and event creation, the time taken by the assistant for event processing, .etc.;
		• Metrics related to the mailboxes in a storage group, which include, the number of users who are currently reaching their mailbox quota, the number of users who have reached their storage quota, etc.;
		• Queue related statistics, such as, the number of messages currently in queue;
		• Metrics measuring the effectiveness of the Recipient Filter Agent, such as, the number of recipients rejected by recipient validation and by block list;
		• Statistics related to the Sender ID agent, such as, the rate at which messages of various types are validated;
		• Metrics indicating the health of the SMTP Receive Connectors, such as, the number of messages received by the server, the messages refused owing to size, etc.;
		• Metrics indicating the health of the store drivers, such as, the number of failed and successful deliveries, the rate of inbound message delivery attempts, etc.;
		• Metrics tracking the connection filtering agent's activities, such as, the number of connections to IP block list providers, IP allow list providers, IP block list, and IP allow list;
	Microsoft Exchange 2013/2016/2019	• Metrics that reveal the level of efficiency of the content filter agent's operations, such as, the number of messages at spam control level 0-9, the number of messages quarantined, the number of messages deleted, etc.;
		• Metrics that report the number of senders blocked by the Sender reputation agent owing to various reasons;
		• Metrics that reveal the level of traffic handled by the SMTP send connectors, such as, the rate at which messages were sent by the connectors, data transferred per connection, etc.;
		• Metrics indicating the LDAP read rate, LDAP read time, LDAP search rate and time, timeout errors. Outstanding requests etc., for each client process communicating with the Active Directory server;
		• Key metrics indicating the authentication requests, latencies and rejections for every configured authentication method;
		• Metrics revealing the count of the items in the mailbox, size of the mailbox, quarantined status of the mailbox, various metrics pertaining to the quota configuration of the mailbox, accessibility of the mailbox etc.,
		• Key metrics pertaining to the databases of the exchange server such as the database size, mount status, mailboxes in the database etc. can be ascertained;

- Metrics indicating the quality check on the indexing process such as the count of documents that skipped indexing, documents that failed indexing etc.;

- Metrics related to the Search Indexing engine, such as, the number of mailboxes left to crawl, the number of documents to be indexed, the number of documents that failed during indexing, the time taken for document indexing, etc.;

- Metrics monitoring the mailbox databases and reports the type of replication set, health of the database copies, log files that are pending to be copied, disk capacity of the database etc.,

- Metrics related to the current status of the mail flow, time taken for mail delivery, key metrics revealing the user experience with POP3 service such as the number of SSL connections, command processing rate, LDAP latency POP3 connections that are currently open etc.;

- Key metrics revealing the replication health of the Exchange server, current status of the Exchange search on the mailbox, search time, etc.;

- Statistics relating to the ESE databases such as the database cache size, database cache hit ratio, database read and write latencies, page compression ratio in the cache of the database, database cache size, read/write operation latency in the cache, database sessions in use etc.;

- Key statistics pertaining to the health of the exchange store such as the load on the database, the processing ability of the database, overall health of the database, the number of mailboxes that are quarantined in the database, number of active mailboxes, database maintenance rate, mailbox maintenance rate, message property promotion rate of the database, etc.;

- Key metrics revealing the client types/protocols communicating with the Exchange store such as the RPC request load, operational load, log file load processing time, growth, etc.,

- Key metrics pertaining to the anti-malware scan engines such as the errors in the engine, number of malware items, scan time per item etc.;

- Statistics revealing the maximum time a component took to process email messages, key metrics pertaining to the delivery SMTP receive connectors/SMTP send connectors such as the incoming load on the connector, the rate at which each connector processed the load, and the count of mails rejected by the connector etc.;

- Metrics that shed light on issues related to the Mailbox assistant, such as, the number of events awaiting processing by the assistants, delay between polling and event creation, the time taken by the assistant for event processing, etc.;

- Metrics related to the submissions made by the mailbox transport submission service such as the failed rate, successful submissions rate, permanent failed submissions, failures encountered by store driver submission agents, the time taken by the submission component to process messages for various latencies etc.,

Mail Servers	• Statistics revealing the maximum time a component took to process email messages, key metrics pertaining to the submission SMTP send connectors such as the throughput of the connector, errors encountered by the connector;
	• Metrics revealing the errors encountered by the classification scan engine, time taken by the engine to load and scan the content etc.;
	• for various latencies, number of messages of each priority in various exchange transport queues, the processing rate of messages of every priority in the queue etc.,
	• Statistics pertaining to the current state of the queue, messages in the queue, rate at which messages are sent/received etc.;
	• Statistics pertaining to the number and size of messages pertaining to each key event type handled by the exchange server, number of messages deferred due to errors in the transport rule evaluation, the maximum time taken by each transport component to process messages for various latencies etc.,
	• Key metrics indicating the load on the SMTP receive connector/SMTP send connector, messages rejected by the connector, errors encountered by the send connectors etc.,
	• Metrics revealing the maximum time taken for end to end email message flow
	• Key metrics indicating the time taken by the Client Access server to process the requests to each proxy enabled service, the length of the HTTP service request queues, rate at which the requests are rejected, the cache utilization of the proxy enabled services etc.,
	• Metrics revealing the maximum time taken by the Frontend transport connector took to proxy emails at various latencies, key metrics indicating the load on the Frontend SMTP receive connector/SMTP send connector, messages rejected by the connector, errors encountered by the send connectors etc.,
	• Metrics revealing the size of the mailbox folder and its sub folders, number of items in the folder and its sub folders etc.,
	• Statistics revealing the availability of the Exchange mail server and performance of the servers, metrics tracking the synchronization and ping requests to the ActiveSync servers, the incoming and outgoing proxy requests through the ActiveSync servers etc.,
	• Statistics revealing the requests for Outlook WebApp Services and instant messaging services, time taken to service such requests, number of requests that failed, unique users in the Outlook WebApp etc.,
	• Key statistics pertaining to the RPC connection attempts to the server over HTTP, connection failures, RPC packet rate etc.,
	• Metrics revealing the number of users currently connected to the Exchange server over RPC/HTTP, incoming/outgoing bandwidth of the RPC/HTTP requests, number of connections made to the Exchange server instance through the RPC/HTTP etc.,
	• Statistics revealing the inbound calls to the Unified Messaging Call router service, number of inbound calls received and rejected, the overall health and performance of the Unified Messaging Call router service;

Mail Servers	**Instant Messenger of the Exchange 2000 Server**	• Performance metrics related to messenger such as the count of users currently online, the number of messages in queue, the rate of request failure, the rate of response failure, the requests receive rate, the requests sent rate, etc.
	Oracle Communications Messaging Server	• Performance statistics related to the server's HTTP, IMAP, and POP3 services, such as the number of active connections and sessions to the server, the rate of successful logins and failed ones, etc.; • External measures indicating the availability and responsiveness of the TCP ports of the messaging server's LDAP, IMAP, and POP3 services; • Measures of the database lock behavior, such as the rate of lock requests, releases, and deadlocks, and transaction metrics such as the rate of transaction begins, commits, rollbacks, etc.; • Message Traffic related metrics such as the number of messages delivered, rejected, etc.; • User-specific statistics such as the number of user accounts present, the disk space consumption of the messages in the user accounts, etc.
	Lotus Domino	• Statistics pertaining to the Domino database such as number of databases in cache, the percentage of pages cached, the maximum capacity of the server cache; • Memory usage metrics, which include the total memory allocation, the shared memory allocation, etc.; • Statistics related to the services of the Domino mail server such as the message receipt rate, percentage of undelivered messages, etc.; • Important metrics pertaining to the network traffic, that includes, the data receipt and transfer rates, etc.
	Novell Groupwise	• Tracking the availability and responsiveness of all of the Groupwise server components including the Groupwise Internet Agent, Message Transfer Agent (MTA), Post Office Agent (POA), and Web Access Agent; • Performance metrics such as rate of data/messages sent and received, number of messages in each of the server queues (routing queue, post office queue, gateway queue), etc.; • SMTP service-related metrics including the number of send and receive threads available, rate of message transmission and reception, etc.; • POP3, LDAP, and IMAP service-related measures such as the number of sessions active, etc.; • Client connection related measures that include request rate, pending request count for POP3 access; • Local queue related metrics such as the number of messages in the routing queue, post office and gateway queues, etc.

Mail Servers	Qmail	• Statistics revealing the availability and down time (if any) of the services on a Qmail MTA; • Queue related metrics such as the total number of messages in the queue, the queue size, etc.; • Key metrics pertaining to the delivery performance of the server such as the number and rate of delivery attempts that were made, the number and rate that was successful, etc.; • Message related statistics, which include the number of messages transferred, bounced, thrown away etc.
	Ironport AsyncOS Mail	• Overall health statistics revealing the CPU utilization, Disk I/O utilization, Power supply status, fan speed and current temperature of the server; • Queue related metrics such as the used percent of total queue capacity and the available queue space details. • Key metrics pertaining to the DNS statistics of the server such as the outstanding DNS requests and the pending DNS requests; • Mail and socket related metrics, which include the open socket count and mail thread count.
	Postfix	• Metrics revealing the total size of the deferred queue and the number of messages that were in the queue during different time slots; • Hold queue related measures such as the total size of the queue and the number of messages that were in the queue during different time slots; • Messages relating to the Mail Drop queues such as the total size of the queue and the number of messages that were in the queue during different time slots; • Active queue related issues such as the total size of the queue and the number of messages that were in the queue during different time slots;
	BlackBerry Server	• Metrics related to the BlackBerry MDS Services component of BlackBerry MDS, which includes, the number of connections to handheld devices and number of push server connections initiated by MDS, the data traffic to and from handheld devices, the number of packets refused, invalid packets, failed connections, truncated connections, successful connections, etc. • Metrics revealing how well the BlackBerry server handles messages sent and received from handheld devices, such as, the number of messages processed, the number awaiting delivery, the number of messages that expired or were undelivered, etc. • SRP connection related metrics revealing whether the BlackBerry server/BlackBerry Dispatcher is connected with the SRP host or not, the number of times reconnection attempts failed, the duration for which the connection with the SRP host was lost, etc.; • Statistics that indicate the license usage by users to the BlackBerry server, such as, the number of installed, used, and free licenses;

Mail Servers		• Metrics that bring to light the efficiency of the BlackBerry Messaging Agent, such as, the response time for operations, number of failed connection attempts to the mail server, etc. • Measures that indicate whether WER (Wireless Email Reconciliation) is enabled on the BlackBerry server or not, whether the handheld device is in the cradle or not, whether a user account is enabled or not, etc.; • Measures of the user activity on the BlackBerry server, which include, the number of messages processed, the number awaiting delivery, the number of messages that expired or were undelivered, per user;
Microsoft Windows Applications	**BizTalk**	• Key metrics at EVERY stage of server processing including document submission and reception rates, encode/decode rates, the rate at which the documents are being mapped, the rate at which the documents in the work queue are being parsed, etc.
	DHCP	• Performance statistics pertaining to a DHCP Server, that includes, packet processing time, length of the internal message queue, rate of receiving and acknowledging requests, etc.; • Utilization measures including the number of IP addresses in use and the number of free IP addresses in the target network
	WINS	• Measures indicating the total number of queries received by the WINS server, rate of failed queries, release requests received, release failures, etc.
	Print Server	• Measures related to print queues such as the number of jobs, job service rate, number of errored jobs, etc. of a print queue
	Transaction Server	• Monitoring of CPU and memory usage of the server as well as statistics on packages installed and those that are running; • Transaction related metrics such as number of aborted and committed transactions
	Proxy Server	• Measures such as the availability and response time of the server, the TCP connection availability, etc.; • Measures related to the WinSock service including the active sessions for the service, the number of live worker threads etc.; • Health of the Web Proxy service in terms of the number of active sessions to the web proxy service, the time taken by the service to service a request, etc.; • Caching related metrics that include, the refresh rate of the URL cache, the cache size, etc.
	ISA Proxy Server	• Health of the firewall protection to the server in terms of the number of active TCP and UDP connections to the server, read and write rates, etc.; • Caching related metrics that include, the commit rate of the URLs, the space utilized by the disk and memory caches, etc.; • Measures related to the Web Proxy service such as the percentage of successful client requests to the server, the time taken for processing requests, requests rejected

Microsoft Windows Applications	**Domain Controller**	• Measures that indicate the availability and response time for domain authentications; • Various session related statistics like, rate of logons to the server, number of errored logons, the number of active, normally terminated, and timed out sessions etc.
	Event Logs	• Statistical information about the events generated by various applications, windows services and drivers in the system, which includes the number of application error events, application information error events, warnings, system error events, etc.
	COM+ Applications	• Metrics that reveal the health of the COM+ applications on the COM+ server, such as the CPU and memory usage of the application, the number of threads running in the application, etc.; • Component-specific measures, which include the number of objects being invoked, the average duration of method calls, the number of completed and failed calls, etc.; • Transaction related metrics, which include the number of active, aborted, and committed transactions, the average response time to a user request, etc.
	ASP.NET	• Worker process related measures, which include the number of applications currently running, requests handled, requests rejected, request execution time, worker processes currently running, etc.; • Statistics related to the managed locks and threads used by an application, which include the number of currently managed thread objects, the number of native operating system threads, rate at which threads attempt to acquire locks, etc.; • Measures that assess the memory allocation activity of the server, such as the heap memory usage, time spent on garbage collection, etc.; • Metrics that reveal the performance of the ASP.NET application/application domain cache like the cache hit ratio, total entries in the cache, etc.; • Measures indicating how well the appdomain handles requests, such as the number of requests currently executing, the number of successful requests, requests that timed out, etc.
	Microsoft System Management Server (SMS)	• Metrics related to the health of the Data Discovery Manager, which include, the number of data records processed and those that are in queue; • Key measures of the health of the SMS Memory Queue, such as, the number of objects added or removed from the queue; • Software Metering related metrics, such as, the number of software metering usage files processed by the Software Metering Processor, the count of bad usage files processed, etc.; • Key statistics that indicate the report processing ability of the hardware and software inventory managers, which include, the number of reports processed and the rate at which they were processed; • Metrics revealing how efficiently the SMS Policy manager services requests, such as, the rate at which requests are received by the GetPolicy component, and the number of requests that were served from the cache;

Microsoft Windows Applications	**File Server**	• Key metrics that track open file connections to the host such as the number of files locked at the host, and the number of users having open files on the host; • Session related statistics, which include the number of files opened over the network and number of users with open sessions
	Microsoft SharePoint	• Metrics that reveal the processing ability of the archival plugin component, such as, the number of documents that are actively using the first queue of the plugin, the number of documents actively using the second queue of the plugin, the number of documents which currently returned errors from the plugin, the number of blocked documents, etc.; • Metrics related to the document conversion process, such as, the rate of email message processing, the number of pending document conversions, etc.; • Statistics that reveal the health of the Excel calculation service, such as, the rate of requests with errors, the average processing time for a request, the Excel calculation service workbook cache size, etc.; • Measures that track the number and rate of requests to the Excel Web Services component; • Metrics revealing the efficiency of the Search feature offered by SharePoint, such as, the number of queries to the content index that currently failed, the number of queries that succeeded, the number of documents filtered, etc.; • Metrics revealing the effectiveness of the SharePoint publishing cache, such as, the cache hit ratio and the number of items removed from the cache; • Measures that reveal the content processing ability of the gatherer, which include, the rate of document additions, the rate of documents with errors, the number of times access to a document has been retried, the number of unprocessed documents in the gatherer, etc.
	Microsoft Active Dynamix	• Metrics revealing data and session load, such as, the total number of sessions and the number of active sessions, the total number of client requests, the rate at which client requests were processed, bytes sent and received by server, etc.; • Metrics related to .NET business connectors, such as, the number of ,NET business connector sessions, the number and type of session related exceptions, the number of sessions allocated, disposed, etc.

Microsoft Windows Applications	**Microsoft Dynamics NAV**	• Metrics revealing the number of client sessions to each NAV server instance, the time taken for server operations, the number of open connections to each server instance, number of rows in all temporary tables for each server instance; the percentage of requests made by each instance that were serviced by the calculated fields cache, SQL command cache, etc.; • Key metrics monitoring the call and transaction load on each instance of the NAV service such as the number of pending calls, failed calls, aborted transactions, etc.;
	Microsoft Dynamics CRM 2011	• Measures revealing the authentication statistics of the server such as the number of unsuccessful authentication requests per minute, number of authentication requests that were processed, number of authentication requests that were processed/failed while processed using the active directory authentication credentials, number of authentication requests that were processed/failed while processed using the authentication credentials of the Microsoft account, number of authentication requests that were processed/failed using claim based authentication etc., • Critical metrics revealing the email messages passing through the Email router such as the number of corrupted incoming email messages, incoming email messages that failed during delivery, incoming email messages that were not delivered successfully, the number of times the email router service configuration was refreshed, the number of times the service provider could not be loaded/ failed to load during execution etc., • Metrics revealing the total number of cache flush requests that were successfully received for the locator service, the cache flush requests that were unsuccessful etc., • Numerical statistics dealing with the router requests such as the router requests that timed out, router requests made through faulted channels, requests received by the router, requests to the AppFabric that timed out. • Metrics related to the Sandbox host such as the total CPU percentage used by all the worker processes, memory used by all the worker processes, number of handled used by the worker processes, the organizations on which the worker processes are active, rate at which the incoming custom workflow activities are executed, SDK request related statistics such as the rate of outgoing SDK requests, percentage of SDK requests that failed, response time etc., • Critical measures related to the Microsoft Dynamics CRM Web service such as the number of requests received by the Microsoft Dynamics CRM web service, percentage of requests that failed, total number of metadata requests received by the Microsoft Dynamics CRM web service, percentage of metadata requests that failed, total number of rendering requests etc.,

Microsoft Windows Applications	Fast Search for SharePoint 2010	• Measures related to each crawl collection, such as, the number of websites or web links that are currently crawled, the rate at which the documents are currently downloaded, the average size of the documents downloaded, the number of documents downloaded that are currently stored in the Web Crawler store, etc.; • Measures revealing the load on each query dispatcher, which include, the number of queries that are currently active on the query dispatcher since the last index set change, the number of queries that have been dispatched since the last index set change, etc.; • Metrics that measure the load on each indexer partition, such as, the number of active items on every indexer partition, the number of items that are indexed per second, the current state of a partition, etc.; • Metrics revealing indexer health, such as, the total number of feed operations processed by each indexer, the total number of feed operations processed by an indexer, the current load on the API queue of the indexer, etc.; • Key measures of the processing ability of the Query & Results server, such as, revealing the rate at which the system queries and user queries failed, the number of queries handled by this QR Server per second, etc.; • Metrics revealing the root-cause of slowdowns in search queries, such as, the elapsed time between acknowledgement of a batch submission and the receipt of a final success or failure callback, the time taken from item initialization to completion of indexing, the time that elapsed between placing an item in a batch and its submission, the count of batches that are ready for submission, the ones that are submitted, items that are currently processed, etc.; • Measures revealing the current status of each document processor;
	Windows Clusters	• Metrics revealing the current status of the resource groups managed by the cluster service, such as, the number of groups that are offline/online/partially online; • Key metrics that report the status of the nodes in the cluster, which include, the number of nodes that are active, the number that is down, and the number that is paused; • The number of network interfaces in the cluster that are currently running and those that are currently down; • The number of network interfaces in the cluster that are currently running and those that are currently down; • The number of cluster resources that are online/offline, the number of cluster networks that are up/down, etc.;

Storage and Backup Applications/Devices	**NetApp Filers**	• Key metrics pertaining to the NetApp filer hardware such as failed number of fans, failed power points, etc.; • Statistics indicating the utilization of system resources such as the percentage of time for which the CPU was busy, the rate of data received and sent etc.; • Performance statistics pertaining to the filer's disk drives such as the number of active, broken, and spare disks, etc.; • Measurements pertaining to the filer's file system such as the disk space utilized and free, etc.; • Statistics related to the RPC, NFS, and CIFS protocols such as the rate of calls received and rejected by the RPC, NFS, and CIFS layers respectively, etc.
	NetApp Netcache	• HTTP, FTP, NNTP request related measures such as the rate of requests, rate of request hits, misses, response time for requests, etc. for each protocol; • Measures related to streaming requests such as the rate of streaming requests, rate of request hits, misses, response time for requests, etc.
	NFS (Solaris only)	• Server statistics related to RPC calls such as the total number of calls received, the number that was bad, etc.; • Client Statistics related to RPC calls such as the total number of calls received, the number that was bad, etc.; • The availability and access times of network file systems remotely mounted by a client
	Symantec Backup Server	• Performance metrics pertaining to the server such as the number of active jobs, failed jobs, successful jobs and the size of data backed up; • Key metrics such as the percentage of jobs that were aborted, corrupted, skipped, etc.; • Metrics revealing the size of the VMware Virtual Machines that have been backed up, the number of virtual machines that have been backed up and the percentage of data backed up per virtual machine etc.
	Veeam Backup Server	• Metrics revealing the current status of the jobs executing on the Veeam backup server and the time taken for execution; • Metrics revealing the current state of each job and the size of each job;

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Storage and Backup Applications/Devices	**Unitrends Backup**	• Measures indicating whether the Archiving process is successful or not, the total size of the archiving directory and the total number of archives done for each client; • Measures indicating whether the backup process is successful or not and the size of the files that were backed up and the number of backups taken in each backup type; • Metrics revealing the total amount of backup space allocated to each directory, the amount of space that is currently in use and is available to use in each directory, etc.; • CPU utilization and memory utilization of the backup server; • Key metrics revealing the health of the fan sensors on the server, like, the current fan speed, and the fan sensor status; • Measures indicating the health of the temperature sensors on the server, like, the current temperature, and the temperature sensor status; • Measures indicating the health of the voltage sensors on the server, like, the current voltage, and the voltage sensor status.
	HPE StoreOnce Backup System	**HPE StoreOnce Server** • Metrics revealing the status and health level of the Catalyst service; • Metrics revealing the Virtual Tape Library related details such as the status, health level, replication health level, number of user data stored before deduplication and data stored after deduplication; • Metrics revealing the number of drives, cartridges and Online drives available in Virtual Tape Library; • Metrics revealing the read and write throughput, number of FDS opened concurrently and bandwidth utilized for receiving and transmitting a copy job; • Metrics revealing the Replication level, Replication status, and amount of data received and transmitted for replication process; • Metrics revealing the NAS Shares status, Housekeeping status, system status, overall health status of the system, capacity of the system and amount space available for use;

| Storage and Backup Applications/Devices | NetBackup Server | **NetBackup**
• Metrics revealing the count of files that has been backed up, size of the file that is used for backup, number of client files that are on hold and total number of backup jobs that has been completed during last measurement period.
• Metrics revealing the count of Full media, Suspended media, Frozen media, Imported media, Active media, Non-active media, WORM media and Encrypted media available on the media server;
• Metrics revealing the total number of tasks available for execution;
• Metrics revealing the total number of errors that occurred during backup process; |
| | Commvault Backup | **Commvault Backup Services**
• Metrics revealing the number of jobs that are currently running/ waiting to run/pending on the server;
• Metrics revealing the number of jobs that were submitted, but were held before they could begin running on the backup server;
• Metrics revealing the count of total job performed by each job type;
• Metrics revealing the count of active clients and inactive clients;
• Metrics revealing the number of jobs that are backed up, restored and managed by admin. |

SAP Applications	**SAP ABAP System**	**ABAP Users** • Metrics revealing the count of multiple users who have logged in and count of active/logon sessions that occurred.; • Metrics revealing the response time and Dialog activity of the users and count of users who have logged in.; • Metrics revealing the SAP System status; **Gateway Performance** • Metrics revealing the Central Services Process Status detail such as elapsed time, display status and process status; • Statistics revealing the OData Services related details such as the time taken to response to the request, size of the request, time taken by the backend to retrieve data, rate at which request./response/entry were made and rate at which mobile/tablet/desktops requests were made; • Metrics revealing the rate at which read property operations/read feed operations/ read entry operations/ metadata operations/ functional operations/ document operations/ batch operations have occurred; • Metrics revealing the OData User related details such as the time taken to response to the request, size of the request, time taken by the backend to retrieve data, rate at which request./response/entry were made and rate at which mobile/tablet/desktops requests were made; • Metrics revealing the rate at which read property operations/read feed operations/ read entry operations/ metadata operations/ functional operations/ document operations/ batch operations have occurred; • Metrics revealing the front-end error log details such as the count of errors and rate at which error had occurred; • Metrics revealing the application log details such as the count of total logs, total messages, cancel logs, error logs, warning logs, information logs and success logs; • Metrics also reveling the count of error messages, warning messages, success messages, information messages, important messages and medium messages; **Gateway Service** • Metrics revealing whether the Gateway Service is active or not; • Metrics revealing the count of processible units, executable units, tRFC unit details and qRFC unit details; • Metrics revealing the details derived during runtime health check up such as the count of Inbound/Outbound schedulers running, Destinations with insufficient resources, Unreachable/Locked destinations, Protocol conversion errors and other errors; • Metrics revealing the back-end error log details such as the count of errors and rate at which error had occurred;

SAP Applications		**SAP Basis** • Metrics revealing the SAP WAS Enqueue Replication details such as whether the process is enabled/active and whether the HA polling interface is configured or not ; **SAP Work Processes** • Metrics revealing the Application Server availability; • Metrics revealing the count of application servers that are reachable; • Metrics revealing the amount of load balanced and number of unique servers available; • Metrics revealing the response time and wait time of the update process; • Metrics revealing the frontend wait time and number of spools used; • Metrics revealing the count of process that are created, processes that are running/waiting and processes that are in Priv-mode; • Metrics revealing the count of Extended memory and Heap memory used; **SAP Gateway** • IDoc Statistics such as Idocs with recent unprocessed interface errors and Idocs with recent unprocessed external system or application errors; • Metrics indicating whether/not this RFC destination is reachable; **SAP Service** • Metrics revealing the Outbound Email messages such as the count of total messages, warning messages, error messages, information messages, initializing messages and transmitting messages and the rate at which these messages were processed;
	SAP AGate Servers	• Key component-level metrics such as the percentage utilization of user sessions and worker, the hit rate of the component, etc.; • Important access related statistics such as the number of times the AGate component was successfully accessed; • Error statistics such as the number of errors that occurred in the AGate component during the last measurement period; • Measures revealing the number of web accesses serviced by an AGate instance

	SAP BOBI	- Metrics revealing the current health, status and thread usage of the Dashboard Cache Server; metrics revealing the request processing capability of the Dashboard Cache Server; - Metrics revealing the current health, state and thread usage of the File Repository server; metrics revealing the request processing capability of the File Repository server; - Statistics revealing the current health, state and thread usage of the Adaptive Job server; metrics revealing whether the Job server is able to send documents to various designated destinations; number of jobs received for processing by the job server and the number of jobs that failed; - Statistics revealing the health, state and the processing ability of the Adaptive Processing Server; - Statistics related to the JVM health and the correctness of the configuration of the critical Adaptive Processing Server services; - Metrics revealing the status of the connection server; running state of the connection server; number of server threads that are currently servicing requests; - Statistics revealing the current health and running status of the Crystal Reports Server; usage of the server threads; metrics revealing the rate at which the server processes the requests; - Key metrics revealing the current health and running status of the Dashboards processing server; usage of the server threads; metrics revealing the request processing capability of the Dashboard processing server; - Statistics revealing the current health, status and request processing ability of the Report Application server; - Metrics revealing the current health, status of the Web Intelligence server; tracks the load on the server cache through its size; tracks client calls made to and sessions created on the Web Intelligence server; - Logs related to the core server types such as the Central Management server, Adaptive Processing server, Adaptive Job server etc.; - Metrics revealing the requests received by and the connections to the semantic layer; availability and processing ability of the Central management server; metrics revealing whether the CMS has a healthy connection to the ADS; the count of the jobs that failed and are waiting in the CMS; metrics related to the connections established by the CMS and the utilization of these connections; - Metrics revealing the number and type of sessions that are currently active on the CMS; license utilization of the CMS etc.; - Statistics revealing the availability and thread pool size of the Event server; - Status of the Web Application Container server; tracks Multi-Dimensional Analysis Service sessions and reports the number of OLAP data requests received;

SAP Applications		• Metrics related to the availability of the Platform Search service; status of the indexing mechanism; document indexing rate etc.; • Statistics revealing the availability of the Data Federation Service; the load in the service, the query load on the data federation query engine etc.; • Metrics revealing the current health of the monitored node, execution time of each probe, current state of each service running on the node, utilization of each service operating in the monitored node etc.;
	SAP Web Application Server	• Measures relating to the Configuration Manager's interactions with the database, such as the rate of database lock exceptions, the percentage of cache reads, etc.; • Key statistics pertaining to application and system threads, which include thread pool usage, the number of tasks waiting to be executed, etc.; • Performance metrics revealing how well client connections are managed, which includes the current connection pool size, the number of unrecognizable connections, etc.; • Pool manager related measures, such as the memory allocated to the pool manager, and percentage of memory utilized; • Measures revealing the availability and responsiveness of the P4 connection to the server; • Key statistics pertaining to how well the EJB container service manages the enterprise bean instances, which include the number of bean creations/removals, the number of bean passivations and activations, etc.; • Session oriented performance measures, which include the number of failed logon attempts, the number of invalid, logged off, and timed out sessions, etc.; • Transaction related statistics, such as the number of rolled back transactions, suspended transactions, etc.
	SAP Web Dispatcher	• Key statistics indicating the current state, number of connections and maximum time taken to establish the connection. • Measures revealing the rate at which the requests are processed by the thread and status of the thread. • Threads related measures such as total number of threads created from the thread pool, ratio of the total number of threads created to the maximum thread setting, number of currently open connections, etc. • Metrics revealing current load on the destination, current number of HTTP and HTTPS connections, stateless and stateful requests to the destination, and average time taken by a request and recent response time for a ping request to the destination. • Measures revealing number and percentage of expired or invalidated entries in the cache.

SAP Applications	Max DB	• Basic measures of availability and responsiveness of the database;
		• Memory usage statistics such as the percentage of memory in data area that is utilized;
		• Locking related metrics, which include, the rate of deadlocks and collisions, the number of requests awaiting locks, etc.;
		• Usage metrics pertaining to the log queue, such as, the maximum number of transactions written to the queue, the log queue overflows, etc.;
		• Performance metrics pertaining to the SAP live Cache, which include, the memory in use, the number of attempts to acquire a spinlock, the rate of errors, etc.;
		• The hit rate of the data cache and the database session cache;
		• I/O buffer cache-specific metrics, such as, the current size of the cache, the percentage of the cache used by the data cache and the converter, the free space in the cache, etc.
		• Transaction related statistics, which include, the rate of transaction commits and rollbacks, the rate at which SQL commands were executed and parsed, etc.
		• Metrics revealing the type of queries that are executed on the database, and the number of active sessions to the database;
	SAP BODS	**BODS Data Services** • Metrics revealing the AL Designer logs related details such as count of messages that are marked as high and Highest importance are available, count of errors, asserts, flows and new messages that are available; • Metrics revealing the number of rows processed, number of buffers used, and amount of CPU used; • Job related metrics such as the number of succeeded jobs available, number of erroneous jobs available, number of jobs that are running, number of recovered jobs available and elapsed time taken by a job; **BODS Services** • Metrics revealing the status of the Repository and Web Service; • Metrics revealing the count of core services, Enterprise information management services and Promotion management services available;

SAP Applications	SAP Business One	**SAP B1 Server** • Metrics revealing the DI API Log and Business Log related details such as count of total messages available, count of errors, critical errors, audit fails, audit success, note messages, protective messages, logged always messages, full information messages and trace messages that are available; • Metrics revealing the rate at which warning, error, critical error and audit fail messages occurs; • Metrics revealing the number of executions, maximum/average response time of the step; • Metrics revealing the count of In-progress instances, Cancelled instances, Error instances and completed instances; that are available in server; **SAP B1 Workload** • Metrics revealing the message log related details such as count of success messages, failed messages, filtered messages and messages that are in processing state; • Metrics revealing the rate at which message processing and failure occurs; • Event related metrics such as number of events occurred , number of events that are succeeded, failed and filtered; **SAP B1 User** • Metrics revealing the User related details such as the count of total sessions, new sessions, logged out sessions and login fails that have occurred;
	SAP Business Warehouse Instance	**BW Service** • Metrics revealing the number of times a process has been executed, total number of process completed, number of current and total process, number of records and data packages currently available and current execution status; • Query related statistics such as number of sessions, number of steps, number of executions, number of records selected, number of records transported, and time taken to respond the to the request; • Metrics revealing the OLAP time related details such as OLAP cache time, OLAP Authorization time, OLAP Input help time and OLAP services time; • Metrics revealing the time taken for reading the data, time taken to select a data, time taken a read a text and User exit time; **BW Reports** • Metrics revealing the Open Hub Destination Requests related details such as; number of requests available, number of error requests available, number of lines read and rate at which destination requests and error requests are processed; • Metrics revealing the Template related details such as number of steps taken to execute the template, number of times the template has been executed, number of times the template has been loaded, time taken to report/render a web item, number of queries executed for the template, and time taken for closing the template;

SAP Applications		• Workbook related metrics such as number of sessions and steps taken by the workbook, time taken to respond/load and generate workbook and time taken to Read/Serialize/DE Serialize/Render and Transfer a workbook;
	SAP ABAP Instance	**SAP Basis** • Metrics revealing the rate of Enqueue operations (logical data locks) coming from another instance to the central instance.; • Metrics revealing the percentage length of the wait queue for the enqueue service, percentage of owner IDs in the lock table that are currently utilized, percentage of lock arguments in the lock table that are currently utilized, and number of errors encountered by the enqueue work process.; • Metrics revealing the number of locks, number of entries, buffer storage space and percentage of database queries that were met from the buffer; • Metrics revealing the total size of heap and extended memory related details; • Metrics revealing the percentage of space utilized by paging and Roll area; • Metrics revealing the amount of free space utilized by database tablespaces; **SAP Work Processes** • Spool system related metrics such as the number of spool work processes available, number of pages available in Pool requests queue, number of group spool requests and group spool processes available, number of spool requests created or with errors and number of output problems/errors encountered by the output requests • Metrics revealing the different modes of work processes such as Free/Hold/Running/ Stopped/PRIV Mode; • Metrics revealing the number of background work processes running on an application server; • Metrics revealing the number of jobs that are waiting for free background processes for their execution, number of free background work processes/Class A background work processes in the entire system; • Metrics revealing the Dialog Activity related details such as the number of dialog work process, number of dialog steps per minute and number of users who are logged in; • Metrics revealing the Buffer cache hit ratio, Library cache hit ratio and Redo LOG buffer entries; • Metrics revealing whether the SAP logon group is load-balanced or not; • Metrics revealing whether an SAP ABAP Instance is currently available for communicating with an SAP Message server; • Metrics revealing the number of application servers that are currently communicating with the SAP Message server; • Metrics revealing number of primary indices/secondary indices/ tables/views that were affected while performing this type of database consistency check; • Metrics revealing the total number of updates created, total number of stopped updates, error updates and new updates;

		SAP Workload
		• Metrics revealing the current and previous status of this job execution and total time taken to execute this job;
		• Metrics revealing the count of Active jobs/Ready jobs/Long Running jobs/New jobs/Aborted or Cancelled jobs and Finished jobs;
		• Metrics revealing the details of Active Task and Active Transactions;
		SAP Gateway
		• Metrics revealing the number of new Idocs, number of Idocs with recent unprocessed interface errors and number of Idocs with recent unprocessed external system or application errors;
		• Queue related metrics such as the number of queue entries, number of queues, number of Blocked queues, number of SYSFAIL queues, number of CPICERR queues, number of queues that are in waiting state, number of queues that have been running for long time;
SAP Applications		• Gateway related metrics such as the number of gateway clients who are currently connected to the SAP server, number of gateway connections currently utilized, and percentage utilized by admin entries, remote gateway and gateway work processes;
		• RFC Connections related metrics such as the count of communication errors, execution errors and errors with no server resources in Outbound RFC calls and number of Inbound RFC calls;
		• Metrics indicating whether/not this RFC destination is reachable;
		• Transactional RFC calls related details such as the number of calls recorded/executed and mailed, number of tRFC calls that occurred in CPICERR and SYSFAIL state;
		• Metrics indicating whether/not the ICM is running;
		• Metrics revealing the ICM related details such as the count of newly Created threads, Free threads, number of requests waiting for free ICM threads, number of connections that are opened and utilized and number of inactive ICM services available;
		SAP Service
		• Metrics indicating the number of batch input sessions that are created, number of batch input sessions with errors and batch input sessions running in background;
		• Event linkages related metrics such as the number of total linkages, number of active linkages, number of inactive linkages and number of error linkages available;
		• Metrics revealing the total number of ABAP short dumps that have occurred and total number of error messages present in SAP ABAP's sub-system;
		• Dialog service-related details such as the time taken to respond for a dialog step, network transfer time taken by the dialog step, GUI callback time, Dialog process time, Load generation time and database response time for dialog step;

SAP Applications		• Metrics indicating whether the SAP server is available or not, time taken for the SAP client to connect to the SAP server and time taken by the server to execute a command;
		• Metrics revealing the number of users logged on to various client activities of the SAP ABAP server.
		• Metrics indicating the number of messages of the configured patterns that were added to the SAP ABAP instance logs when the test was last executed.
		• Metrics revealing the Syslog file related details such as the count of Transaction problems, warnings, Dump messages, AS problems, memory messages, error messages and total issues available in the file;
		• TemSe related metrics such as rate at which this Temse object was created, rate at which this Temse object was created due to Spool requests and background jobs and rate at which data was copied to the Temse area of this Temse object during the last measurement period;
		• Transport requests related details such as the total number of requests that were created, succeeded and partially succeeded during last measurement period
		• Alerts related measures such as the total number of alerts that have occurred, number of red. Yellow, green, active, completed and auto completed alerts are reported;
		• Metrics revealing the total number of Performance attributes available for this monitor, number of errors or critical status messages that have been issued for this monitor, number of warning messages that have been issued for this monitor and number of successful events for this monitor;
		SAP Users
		• Metrics revealing the rate of steps executed for this user's transactions in the last measurement period, percentage of CPU resources utilized by this user's transactions, maximum PRIV Mode Heap memory/ extended memory used by transactions of this user, total response time per transaction of this user within the last measure period, average time taken for round trip communication steps between client and server in between a transaction of this user;
		• Metrics revealing the average response time of a transaction of this user at the server end, average time taken to process a transaction of this user, average time that the transactions of this user spent waiting for a free work process at the dispatcher. and number of active transaction invocations/new invocations that have been performed by this user;
		• Metrics revealing the count of active and new users, successful logouts and internal /external sessions for this user;
		• Metrics revealing the number of users who are currently logged in to SAP ABAP multiple times, total number of sessions of all users who are currently logged into the SAP system multiple times and number of sessions actively used by all users who have logged into the SAP ABAP server multiple times;

SAP Applications	**SAP Hybris**	**SAP Hybris Cache** • Metrics revealing the number of current entries, maximum entries and percentage of entries available; • Hybris Main Cache related metrics such as number of cache entries available, access/hit rate, hit/miss percentage and rate at which entries are added/removed in cache; • Hybris Query Region Cache related metrics such as Cache Entries, Cache Fill ratio, maximum entries and rate at which fetch/hits/misses happens; • Metrics realign he Hybris Entity Region Cache related metrics such as number of cache entries available and number of maximum entries allowed; • Metrics also revealing the fetch/miss rate and cache fill ratio of Entity Region Cache with Eviction count and Invalidation count; **SAP Hybris Connection** • Data sources related metrics such as the status of the data source, rate at which connections are made, number of open/used connections available, count of maximum number of connections that are allowed to be in open state, percentage of open/used connections with average waiting time taken by the connections; **SAP Hybris Service** • Metrics revealing the count of Cron jobs that are running; **SAP Hybris Task Engine** • Metrics revealing the Task Engine Database related details such as Table conditions and Table Tasks; • Metrics revealing the Execution hit rate, lock time and execution time taken by the Task Engine; • Pooling Queue related metrics such as Pooling time, number of Queue Entries/ Pooling Queue entries available and pooling buffer entries; • Pooling schedular metrics such as the time taken to schedule the task engine, time taken to copy/count the tasks and time taken to activate/deactivate worker;

Corillian's Voyager	**Voyager Transaction Processor (TP)**	• Statistics pertaining to the authentication database and the TP database such as the database pool size, the rate at which requests were serviced/enqueued, the average transaction response time etc.; • Measures that monitor the requests to the TP such as the total number of requests processed by the TP, the average response time of the TP, etc.; • Statistics revealing the health of the authentication service such as the rate of database calls, the number of authentication API calls, database API calls, identity API calls, pin vault API calls that are currently in progress, etc.; • Metrics relating to the TP sessions such as the total number of Voyager sessions on the TP, the sessions that have timed out, etc.; • Performance statistics pertaining to the host server such as the number of transactions inside a host server, the transaction processing time of the host server, etc.; • VLB-related metrics which include the number of requests executing on the VLB, the number of requests processed by the VLB, the request execution time, etc.
	Voyager User Interface	• Measures such as the number of executions, the transaction processing time, the rate of incoming/outgoing data, etc.
Virtualization Software	**VMware® vSphere/ESX Server**	• A single eG agent performs a patent-pending 'In-N-Out' monitoring to extract the percentage of physical CPU, memory, disk, storage, and network resources used by the ESX host, the percentage of physical resources used by each of the guest operating systems executing on the host, and the percentage of 'allocated' resources used up by each of the guests. • Reports on status of every guest in terms of the number of guests powered on and off, added and removed guests, etc.; for 'virtual desktops', the number of guests with and without users is also reported; • Storage LUN related metrics such as the rate at which read and write commands were issued, total capacity of each LUN, amount of space used in each LUN, amount of space reserved for each LUN, whether the LUN is SSD or non-SSD, etc.; • Metrics specific to 'virtual desktops', such as, the number of new logins to the desktop, the number of sessions logging out, etc.
	Microsoft Virtual Server	• A single eG agent on the base operating system reports the percentage of physical resources (CPU, memory, disk space, etc.) consumed by the virtual host, and polls each of the guests to determine the fraction of physical resources used up by every guest. • Monitors the event logs on each guest to trap application/system errors and warnings • Reports metrics indicating the status of guests – i.e., whether powered on or not; in-out movement of guests can also be tracked using metrics such as the number of guests that were added/removed during the last measure period

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Virtualization Software	**Solaris Zones**	• A single eG agent on the base Solaris host reports the percentage of physical resources (CPU, memory, disk space, etc.) consumed by the virtual host, and polls each of the zones to determine the fraction of physical resources used up by every zone. • Reports metrics indicating the status of zones – i.e., how many are registered, installed, running, etc.; in-out movement of zones can also be tracked using metrics such as the number of zones that were added/removed during the last measure period • Monitors the uptime of every zone configured on a Solaris virtual host
	Solaris LDoms	• A single eG agent on the primary domain reports the percentage of physical CPU/memory resources allocated to the primary domain and other logical domains, the percentage of physical CPU/memory resources utilized by the primary domain and the Solaris host as a whole, and also the percentage of allocated resources consumed by the primary domain. • Reports metrics indicating the status of the logical domains – i.e., how many are registered, active, inactive, in bind/unbind state, etc.; in-out movement of domains can also be tracked using metrics such as the number of domains that were added/removed during the last measure period ; • Provides an "outside view" that reveals the percentage of physical CPU/memory resources utilized by each logical domain; • Provides an "inside view" that reveals how well each domain consumes the allocated CPU/memory/disk resources, the network and TCP traffic to and from every logical domain, and the uptime statistics per domain;
	Citrix XenServers	• A single eG agent on the control domain reports the percentage of physical CPU resources used up by the control domain and each of the processors that the XenServer host supports, the total disk capacity and usage of each volume group of the host, the physical memory consumed by the control domain, the network traffic to and from the host, etc.; • Reports metrics indicating the status of the guests – i.e., how many are registered, running, halted, suspended, etc.; in-out movement of guests can also be tracked using metrics such as the number of guests that were added/removed by XenMotion; • Provides an "outside view" that reveals the percentage of physical CPU/memory resources utilized by each guest; • Provides an "inside view" that reveals how well each guest utilizes the allocated CPU/memory/disk resources, the network and TCP traffic to and from every guest, and the uptime statistics per guest;

Virtualization Software	**Citrix Provisioning Servers**	• Measures revealing the availability of the License server and the database server used by the Citrix PVS; • Key metrics revealing the composition of a PVS farm, such as the number of sites, servers, stores, and farm views in the farm; • Status of the Citrix PVS; • Site-specific statistics reporting the number of active/inactive servers, devices and vDisks in each site; • vDisk related metrics, which include, the status and size of each vDisk, whether the vDisk is currently locked or not, etc.; • Statistics pertaining to device collections, such as, the number of active/inactive devices in each collection, etc.
	VDI in a Box / VMware / XenServer / Hyper-V	• License related statistics such as the licenses of each type that are currently installed, number of licenses currently in use, the available licenses and the usage statistics of each license type etc., • Metrics revealing the current status and type of the server, RAM size, CPU cores etc., desktop related statistics such as the number of desktops used, desktops that are prestarted etc., space usage statistics such as the total space, free space available in the logical storage of the server etc.,
	KVM Servers	• Key metrics revealing the number of processes executing on the server, their CPU and memory utilization; Availability and responsiveness of the configured TCP ports on the server; • Template related statistics such as the desktops created from each template, desktops that are currently in use, desktops that are currently in broken state; etc., • Status of the user's desktop sessions • Status of the image, image distribution across the servers of the grid, number of templates that are currently using the image, is the HDX protocol enabled? is the desktop agent installed etc., can be determined • Key metrics revealing the status of the template, refresh policy configured for the desktops, RAM allocation and virtual cores allocation to the desktops, maximum number of desktops that can be generated from the template and the desktops that are already started and are ready for login etc. • Measures relating to the virtual components such as the sockets, threads, cores, virtual CPUs etc., • Measures relating to the physical memory allocation of the KVM server host; • Measures revealing the status of each storage pool in the KVM server and the space utilization of each storage pool; • Measures revealing the type of each storage volume and the space utilization of each storage volume; • The current status of the virtual network;

Virtualization Software		
		• Measures relating to the resource utilization of each of the virtual machine hosted on the server, overall status of the virtual machines etc.;
		• Measures relating to the data/file processing during live migration of the VM;
		• Apart from the above measures, the eG agent collects a host of metrics pertaining to individual virtual guests such as the resource utilization of each virtual machine, TCP traffic, network loading etc.,
	Citrix XenMobile MDM	• The current status of the Citrix XenMobile MDM
		• License utilization details of the Citrix XenMobile MDM such as the total licenses used, licenses held by the XenMobile MDM, number of days by which the license will expire etc.;
		• Key statistics indicating the status of the scheduled jobs such as the jobs that are currently running, cancelled jobs, recent jobs that failed, jobs that ran recently etc.;
		• Thread related statistics such as the maximum number of threads the server can spawn, the threads that are currently in use, the waiting threads, the queue length, threads that were cancelled etc.;
	Citrix XenMobile	• Key statistics mentioning the number and names of the devices that are using hosting blacklisted applications, devices that are hosting applications that are not suggested, devices that are missing the installation of suggested applications etc.;
		• Numerical statistics revealing the full wipes, pending full wipes, corporate wipes completed, device locks completed, tracks completed etc.;
		• The current load on the server, the count of the devices currently connected to the server, resume requested devices etc.;
		• Operating system related statistics such as the devices that are currently managed/unmanaged, devices that are currently active/inactive, devices that have violated one/more policies etc.;
		• Key statistics revealing the status of the devices connecting to the corporate network such as the currently managed/unmanaged devices, active/inactive devices etc.;
		• Package related statistics such as the pending deployments, successful deployments, failed deployments etc.;
		• Memory details of the Citrix XenMobile such as the memory allocated to each memory pool at startup stage, upper limit usage of initially allocated memory, amount of memory that is currently utilized by each memory pool, amount of committed memory, maximum amount of memory used for memory management by each memory pool, etc.;
		• JVM threads related statistics such as total number of threads (including daemon and non-daemon threads), highest number of live threads since XenMobile JVM started, number of threads in different states such as runnable, blocked and timed waiting states, etc.;

Virtualization Software		• Metrics revealing number of times the collections were loaded to, fetched from, recreated in the Hibernate Cache etc.;
		• Measures indicating number of times the entities were loaded to, fetched from, inserted into the Hibernate Cache etc.;
		• Statistics shed light on the number of queries that were successfully retrieved from the queries cache, average time taken to execute the queries in the queries cache, number of queries executed from the queries cache etc.;
		• The number of cacheable entities/collections that were successfully retrieved from the second level cache, number of cacheable entities/collections stored in the memory of the second level cache, total size of cacheable entities etc.;
		• Key measures mentioning total number of JDBC connections requested by the sessions, number of sessions that were opened/closed, the time taken to execute the slowest recorded query etc.;
		• Key statistics mentioning maximum amount of memory allocated for JVM, amount of memory that is currently in use, time taken by the garbage collector for collecting unused memory etc.;
		• SSL certificate related details such as the current status (whether valid/invalid) and how long this certificate will remain valid;
		• Measures revealing current status of each cluster task performed in the XenMobile and time duration elapsed since the cluster task was last updated;
		• Current status of each cluster node in the XenMobile cluster and the total number of connections made to each cluster node;
		• Statistics indicating number of successful, pending and failed deployments of each device policy and each delivery group in the XenMobile environment;
		• The current workload imposed by actions on the XenMobile;
		• Number of devices that are currently in session state;
		• Measures shed light on the number of messages received for each action, number of messages received owing to cancellation of this action, etc.;
		• Metrics indicating total number of users currently connected to the XenMobile server, percentage of users who logged in recently etc.;
		• License usage metrics such as the number of licenses of each product category that are currently in use, the number and percentage of licenses utilized, etc.
		• Measures indicating connection status of the user with the XenMobile, time taken to connect to XenMobile and authenticate user login, etc.
		• Measure revealing the total number of connections made to each cluster node in the XenMobile;
		• XenMobile threads related statistics such as the maximum number of threads the server can spawn, the threads that are currently in use, the waiting threads, the queue length, threads that were cancelled etc.;
		• Statistics revealing that how many times each operation succeeded and failed;
		• Current status of each connection established to XenMobile;

Virtualization Software		• Key statistics indicating the number of jobs that keep repeating, total number of jobs that were scheduled, the jobs that are currently running, cancelled jobs, recent jobs that failed, jobs that ran recently etc.;
		• Key measures mentioning the number of jail broken devices, number of devices that are newly enrolled, number of non-compliant devices, number of devices of this type that are owned by the company and the employees, number of devices that are managed/unmanaged by the server, etc.;
	Citrix Sharefile	• The availability of the control plane, time taken to connect to the control plane, authentication status, time taken for authentication etc.;
		• The availability and access time of each storage zone configured on ShareFile, the number, names and types of the storage zones;
		• License utilization details of the ShareFile such as the number of employee licenses, used licenses, usage etc.;
		• Key metrics revealing the storage space utilization of the ShareFile;
		• Statistics revealing the devices that are currently active on the ShareFile account, load on the ShareFile, wiped devices, locked devices etc.;
		• Metrics revealing the number of files and folders in the ShareFile account, size of the folder, active folders, least used folders etc.;
		• Key metrics revealing the status of uploads, downloads and deletes performed using ShareFile, time taken to upload/download/delete the file etc.;
	Citrix AppController	• Key metrics that capture the expiry date of all the active SSL certificates, metrics that help in computing the validity of the active certificates etc.;
		• Measures revealing whether a user can connect to the AppController, time taken to connect, status of user authentication during login, time taken to authenticate user logins, time taken to login etc.;
		• Key metrics revealing the user operations that succeeded and failed;
		• Numerical statistics revealing the key usage policies enforced on applications of each type; numerical statistics revealing the successful and failed application launches;
		• Metrics revealing the number of user sessions in the AppController, the number of users who logged in recently, the sessions that logged out and the sessions that failed;
		• Key metrics revealing the number of sessions that are open for each user, the number of successful and failed application launches for each user;
		• Numerical statistics revealing the devices that are connected to the AppController, devices that are locked and devices that are erased;
		• Measures revealing the number of users currently logged in through each received connecting to the AppController, number of users from the internal network who logged into the AppController through this receiver, number of users who logged into the AppController through an external network.

Virtualization Software	Microsoft Hyper-V	• Metrics revealing the memory usage of the Hyper-V host; • Metrics revealing the logical processor usage such as, the percentage of time guest code and the hypervisor ran on each processor, percentage of processor idle time, the percentage of time each processor was used, the number of virtual processor to logical processor context switches, the rate at which each logical processor is processing hardware interrupts, etc. • Key metrics revealing how well the root partition manages the host's physical resources, which includes, the number of address spaces in the TLB of the partition, the number of virtual processors in the root partition, the number of pages currently deposited into the root partition, the number of page tables that are currently present in the virtual TLB of the root partition, the rate of flushes of the entire TLB etc. • Metrics revealing virtual processor usage of the parent partition, such as, the percentage of time the virtual processor of the parent partition spent in executing guest code and in executing hypervisor operations, the percentage of time the virtual processor was in use, the rate at which CPUID, emulated, HLT instructions were completed, the rate of small and large TLB fills, etc.; • Metrics measuring the health of the hypervisor, which includes, the number of virtual processors supported by the hypervisor, the number of partitions managed by the hypervisor, the number of bootstrap and deposited pages in the hypervisor, etc. • Statistics indicating how Hyper-V utilizes its network adapters, switches, and ports, such as, the rate of broadcast packets sent/received, rate of data sent/received, etc. • Reports metrics indicating the status of the guests – i.e., which VMs are powered-on/off.; in-out movement of guests can also be tracked using metrics such as the number of guests that were added/removed; • Provides an "outside view" that reveals the percentage of physical CPU/memory/disk resources utilized by each guest; • Provides an "inside view" that reveals how well each guest utilizes the allocated CPU/memory/disk resources, the network and TCP traffic to and from every guest, and the uptime statistics per guest; • A specialized 'Hyper-V VDI' model that reveals the users logged into the virtual desktops on the Hyper-V server, and the resource usage of each user; the total number of currently open sessions across the virtual desktops, the percentage of new logins to the desktops, the number of sessions that logged out, etc.

Virtualization Software	**AIX LPARs on IBM pSeries Server**	• Metrics revealing the overall physical CPU usage by all AIX LPARs, such as, the number of installed processing units on the IBM pSeries server, the number of free processing units on the server, the number and percentage of used processing units, the percentage of physical processors consumed by AIX LPARs, the number of dedicated and shared processors, etc. • Metrics measuring the I/O activity on each physical adapter on the Virtual I/O server, such as, number of data transfers handled by each adapter, the amount of data received and sent by each adapter, etc. • Metrics indicating the composition of volume groups on a Virtual I/O server and how the volume groups are utilized, such as, the status of each volume group, the number of logical and physical volumes in each volume group, the number of volumes that are currently active in each group, the number of allocated and unallocated partitions in each group, etc. • Metrics that alert you to space crunches in storage pools, which include, total storage pool size, allocated pool size, percent usage of space in storage pool, percent free space in storage pool, etc. • Reports metrics indicating the status of the AIX LPARs – i.e., which LPARs are powered-on/off.; in-out movement of AIX LPARs can also be tracked using metrics such as the number of LPARs that were added/removed; • Provides an "outside view" that reveals the percentage of physical CPU/memory utilized by each AIX LPAR; • Provides an "inside view" that reveals how well each AIX LPAR utilizes the allocated CPU/memory resources, the network and TCP traffic to and from every AIX LPAR, and the uptime statistics per LPAR;
	VMware vCenter	• Metrics revealing the availability and responsiveness of vCenter; • Session statistics that indicate the current session load on Virtual Center, sessions that logged out suddenly, new logins to Virtual Center, etc.; • Key metrics that measure how effectively Virtual Center managers ESX server licenses, which include, the number of licenses installed, the number and percentage of licenses utilized, etc.; • Statistics that indicate the current configuration of ESX server clusters managed by Virtual Center, and the CPU/memory resources used by each cluster; • The resources available to every resource pool under each ESX cluster managed by Virtual Center, and the extent to which the resource pool utilized the available resources;

Virtualization Software	RHEV Hypervisor	- Measures indicating the hypervisor status, physical CPUs available to the hypervisor, etc. - Metrics revealing the memory usage of the hypervisor host, such as, the used physical memory, percentage of free physical memory, swap memory usage, memory over commitment, etc. - Physical CPU usage related metrics, such as, the percentage of user CPU, system CPU, and idle CPU utilization; - Metrics revealing network health, which include, the current status of each network interface, the traffic on and errors experienced by each network interface, etc. - Metrics revealing how efficient the virtual network is, which include, the rate of data transmitted and received over the network, and the errors encountered in the process; - Outside-view metrics revealing how each VM uses the physical resources of the host, such as, power-on state of each VM, the virtual CPUs allocated to and utilized by VMs, physical memory consumption, disk throughput, network bandwidth consumed by VMs, etc. - VM status-related metrics such as the number of registered, powered-on, powered-off, suspended, orphaned VMs, etc. - Inside-view metrics revealing how each VM uses the allocated resources;
	RHEV Manager	- Errors/warning events captured by the RHEV manager log; - Storage domain related metrics, such as, the number of VMs using a storage domain, the capacity of and space used on a storage domain, storage domain availability, etc. - Metrics revealing the number of information, error, and warning events that occurred on the manager; - Logical network related metrics, such as, the current status, bandwidth used, and errors experienced by logical networks; - Cluster related metrics, which include, the Physical CPU available to cluster, the physical CPU usage of VMs in cluster, physical memory usage of VMs in cluster, total physical hosts in cluster, powered-on/powered-off hosts in cluster, VMs in cluster, etc. - Datacenter related metrics, such as, the current status of a datacenter, the disk capacity, free space in datacenter, clusters, servers, VMs in datacenter, etc.

Virtualization Software		
	HMC Server	• Metrics relating to Resource Monitoring and Control (RMC) tasks and HMC tasks; each indicating the total number of tasks, number of running tasks, number of sleeping tasks, number of stopped tasks and the number of zombie tasks; • Processor metrics that include CPU utilization, percent of used system CPU, percent of idle CPU, percent of IO Waits and the total number of zombie HMC tasks; • Reports metrics that indicate the number of pSeries severs that are managed in the HMC server and the number of LPARs that are available in the managed pSeries server; • Metrics relating to the Web logins and the terminal logins; each indicating the number of current sessions, new sessions, percent of new sessions and the number of disconnected sessions from the server; • Metrics relating to the uptime of the servers such as rebooted, measure indicating the time period during which the system has been up since the last measurement and the total time during which the server has been up since the last reboot.
	Oracle VirtualBox	• Metrics revealing host health, such as, the total physical memory, physical memory usage, free physical memory on the host, CPU usage of the host, percent CPU usage on user, system-level, and idle processing, etc. • Statistics revealing the health of VMs operating on VirtualBox, such as, the powered-on state of a VM, the RAM, video memory, and balloon memory configuration of a desktop, RAM usage, CPU usage, etc.; • Session related metrics, such as, current sessions, percentage of new logs, sessions logging out, etc.; • Metrics revealing VM status, such as, the number of registered, running, not running, added, removed guests; • Inside-view metrics of every desktop, which include, the user who is currently connected to a desktop, the time and duration of connection, and how the user utilized the resources allocated to every

Virtualization Software	**Oracle VDI Broker**	- Status of the RDP Broker service; - Number and nature of errors/warnings logged in the Oracle broker's log file; - Metrics revealing the administrative, operational, and availability state of the broker; - Current state and resource usage of the Oracle VDI manager; - Desktop provider related metrics, which include, the current state of the desktop provider, number of pools and datacenters managed by the desktop provider, the percentage of provider's desktops assigned to users, the percent CPU, memory, and storage usage of provider's desktops, etc.; - Metrics revealing the administrative, operational, and availability state of the broker; - Pool related measures, such as, the assignment status of pools, the type of desktops assigned to each pool, total desktops in pool, the number of running, powered off, unknown, suspended desktops in pool, etc.; - Desktop related metrics, which include, the number of desktops managed by the broker, the number of running, powered off, unknown, suspended desktops, etc.; - Per desktop metrics, which indicate, the machine and desktop state of a desktop, the amount of RAM, disk capacity, and video memory allocated to a desktop, etc.
	Oracle VM Manager	- Key metrics revealing the count and details of the critical information, error and warning events that are generated on the Oracle VM Manager; - Numerical statistics that reveal the jobs that started, completed, failed, succeeded etc.; the average time taken to complete the jobs; the number of jobs that were outstanding in the job queue etc.; - The current state of the Oracle VM Manager; the availability of the web interface and the time taken to connect to the web interface; - Key metrics revealing the number of registered Oracle VM servers in each pool, the number of servers that are currently running, number of servers that are not running and those that are in maintenance mode, the number of VMs in each pool and the VMs that are currently running etc.; - The total capacity and space utilization related metrics for each file system of the Oracle VM Manager; metrics revealing whether the file system was shared or not; - The total capacity and space utilization related metrics for each SAN storage used by the Oracle VM Manager etc.;

Virtualization Software	Oracle VM Server	• Key metrics revealing the physical CPU usage of the Oracle VM server such as the number of processors, number of cores per socket etc.; the speed at which the processors have been configured to run; • Numerical statistics revealing the processors assigned to the control domain; the CPU utilization and memory utilization of the control domain; • Key metrics revealing the physical memory utilization of the VMs and the total amount of physical memory on the host; • The total capacity and space utilization related metrics for each file system on the Oracle VM Server; metrics revealing whether the file system was shared or not; • The total capacity and space utilization related metrics for each SAN storage used by the Oracle VM Server etc.; • Key metrics revealing the CPU time utilization of the control domain, run queue length, swap memory of the control domain etc.; • Metrics revealing the space utilization of each disk partition of the control domain; the input/output utilization of each physical disk etc.; • The current status of the Oracle VM Server, metrics revealing whether the server is in maintenance mode, the availability of the web interface and the time taken to connect to the web interface; • The current state of each VM on the Oracle VM Server, numerical statistics of the physical server's resources that each VM on the Oracle VM server is taking up; • Numerical statistics revealing the VMs that are registered, powered on, added and removed; • Provides an "inside view" that reveals how well each VM utilizes the allocated CPU/memory/disk resources, the network and TCP traffic to and from every VM, and the uptime statistics per VM etc.;
	VMware vCenter Cluster	• Metrics revealing the availability and responsiveness of vCenter cluster; • Session statistics that indicate the current session load on vCenter cluster, sessions that logged out suddenly, new logins to cCenter cluster, etc.; • Key metrics that measure how effectively the cluster managers ESX server licenses, which include, the number of licenses installed, the number and percentage of licenses utilized, etc.; • Statistics that indicate the current configuration of ESX server clusters managed by the vCenter cluster, and the CPU/memory resources used by each ESX cluster; • The resources available to every resource pool under each ESX cluster managed by the vCenter cluster, and the extent to which the resource pool utilized the available resources;

Virtualization Software	Docker	- Metrics indicating whether/not the Docker service is installed, loaded or running currently. - Measures revealing percentage of data space and Metadata space utilization; - Key metrics disclosing the numerical statistics of various events that occur in the Docker. - Docker image related metrics such as total number of images, number of images that are mapped/unmapped to the containers and disk space utilized by the mapped/unmapped images. - Measures indicating the disk space utilization of each image, number of containers created from each image, number of containers (created from each image) that are running currently, amount and percentage of memory utilized by the containers that were created by each image etc.; - Metrics that shed light on the Docker containers such as total number of containers, the current status (whether/not running) of the containers, number of containers that are newly added to or removed from the Docker server, memory utilization of the containers etc.; - Key measures revealing the uptime of each container, packets transmission, the rate at which data is transmitted from each container, incoming and outgoing traffic, CPU utilization of each container, etc.; - Statistics indicating average network delay during packet transmission, packet loss and availability network connection;
	Nutanix Acropolis	- Key measures indicating the number of times the read requests served from each cache, the real memory consumed by the data in the cache, the amount of memory saved due to deduplication, the logical SSD memory used to cache data without deduplication, etc.; - Measures revealing the current status, type and mode of each physical disk, whether the data in the disk is migrated or not, the total capacity of the disk, the amount of the disk that is currently in use and is still unused, the total number of I/O operations that are currently performed on the disk, the time taken for processing the I/O requests, and bandwidth used by the disk when processing I/O requests; - Metrics reveal the average time taken by the storage to process read and write I/O requests, the bandwidth utilized for processing the read and write I/O requests, the number of read and write operations that are currently performed on the storage, the total capacity of the storage, the amount of storage space that is still unused in the SSDs and directly attached SATA HDDs, etc.; - System related measures such as number of CPU cores and CPU sockets on the host, the total capacity of the host across all the CPU cores, total memory capacity, the current size of the oplog, etc.;

Virtualization Software		• Measures revealing the logon and logoff duration for each user, size of each user's profile when it is retrieved from the user's store at logon, the number of locally copied files that are synchronized during logon and log off and categorized by the file size of 1KB and the file size ranging from 1KB to 10KB, 100KB to 10MB, 1MB to 5MB and 5MB and above, etc.; • Metrics indicating the current state of the virtual machine, whether the VM is the controller VM or not, the number of sessions that are currently active on the virtual machine, percentage of virtual and physical CPU resources used by the VM, the amount of data received and transmitted by the VM, etc.; • Statistics revealing the number of VMs that are currently powered on, the number of powered off VMs on the hypervisor, the number of suspended VMs, the number of powered on guests that are currently logged in with users, the number of that are newly added to and newly removed from the Nutanix Acropolis; • Measures reporting the number of sessions that are currently active across all the guests, the number of new logins, the percentage of current sessions that logged in and the number of sessions that logged out.
	Nutanix Prism	• Measures indicating the replication factor of each container, the replication factor setting for the Oplog, whether on-disk deduplication and erasure coding are enabled or not, the number of VMs that are attached to the container, maximum capacity configured for the container, etc.; • Metrics revealing the availability of the prism, the time taken by the Prism service to respond to HTTP requests and the response code returned by the emulated HTTP request; • Storage pool related metrics such as the number of disks pooled in the storage pool, the amount of space in the cluster that is available to the storage pool, the total amount of logical storage space used, the amount of actual usage of storage (i.e., usage after compression and deduplication), etc.; • Measures indicating whether the cluster is deployed on the cloud or not, whether shadow clones are enabled for the cluster or not, whether/not the lockdown mode has been enabled for the cluster, the number of hypervisors, the average time taken by the physical disks to process read and write I/O requests, the total storage capacity, etc.; • Statistics revealing the total number of VMs in each cluster, the number of VMs in the cluster that are currently powered on and are currently powered off, and number of controller VMs in the cluster; • Metrics reporting the amount of data read from and written to the cluster in response to the read and write I/O requests, total memory capacity of the cluster, the amount of memory that is utilized and is unused in the cluster;

Virtualization Software	**VMware Apps Volume**	• Measures indicating number of warning messages, number of error messages, number of information messages, number of active requests and number of delayed jobs that were generated for this event type; • Metrics indicating the total number of datastores available in the storage group, amount of space allocated to each storage group, amount of space utilized and amount of space available for use in each storage group; • Measures indicating the VMware App Volumes Manager availability, response time and response codes returned by HTTP/ HTTPS requests; • Measures indicating the current status of the appstack, number of users accessing the appstack, number of users attached to the appstack, and number of applications running in appstack; • Measures indicating the number of appstacks placed in the datastore and the number of writable volumes available in the datastore. • Metrics indicating the amount of space that is allocated to the datastore, the amount of space available for use on the data store and percentage of space utilized by datastore; • Measures indicating the total number of appstacks available in the VMware App Volumes manager, number of appstacks attached to the logged user and number of writable volumes attached to the VMware App Volume Manager. • Measures indicating the license validity, total number of user licenses allocated, total number of concurrent user licenses that are currently in use, total number of server licenses that are currently in use and total number of desktop licenses that are allocated; • Metrics related to the storage groups such as total number of datastores available in each storage group, total amount of space allocated for each storage group and percentage of space utilized by the storage group are reported.
	VMWare Virtual Desktop Manager (VDM)	• Key metrics revealing the health of the network connection to the VirtualCenter, and the availability of the VirtualCenter; • Statistics revealing if any error entries have been logged in the ADAM event logs; • Metrics indicating the health of the Tomcat JVM, such as, the memory usage of the JVM, the free memory on the JVM, the total number of daemon and live threads on the JVM, the JVM uptime, etc.

Virtualization Software	**Kubernetes**	**Kube Application Services Layer** • Metrics revealing the type and age of the service; • Metrics revealing the number of pods that this service targets; • Metrics revealing the current status of the service; **Kube Workloads Layer** • Metrics revealing the Daemon Set details such as age, number of nodes that are currently scheduled/mis scheduled for running on the Daemon Set; • Metrics indicating the state and age of the deployment; • Statistics revealing the deployment related information such as whether/not a deployment can be paused/in progress/available; • Metrics revealing the number of non-terminated pod replicas that are updated/targeted by the deployment; • Metrics revealing the count of available/unavailable/ready pods/hash collisions created by the deployment; • Metrics revealing the age of the autoscaler and also it indicates whether/not this autoscaler is enabled and is able to calculate the desired scales; • Metrics revealing the minimum/maximum/desired/current replicas that can be managed by this autoscaler; • Metrics revealing the count of completed/failed jobs in the namespace; • Statistics revealing the number of pods that are created/failed/succeeded in the namespace; • Metrics revealing the number of active cron jobs; • Key metrics revealing the status and age of the Pod; • Statistics revealing the Pod related details such as Termination Grace Period, Quality of Service, Restart Policy, total containers, total volumes mounted and init containers of the Pod; • Metrics revealing the state of the containers such as running/terminated/waiting; • Metrics revealing the CPU related information such as CPU limits, CPU capacity, CPU requests, CPU usage and Containers in this Pod for which CPU limits/CPU requests are not set; • Metrics revealing the memory related information such as Memory limits, Memory capacity, Memory requests, Memory usage and Containers in this Pod for which Memory limits/ Memory requests are not set;

Virtualization Software		**Kube Cluster** • Metrics revealing the status and type of node; • Metrics revealing whether/not this node is unscheduled/ correctly configured or not; • Metrics revealing the count of master nodes/worker nodes; • Metrics revealing the total number of nodes in the cluster; • Metrics revealing the number of nodes that are added/removed from the cluster during last measurement period; • Metrics revealing the number of nodes in the cluster that are running/not running/ unknown presently; • Metrics revealing the number of Pods in the cluster that are in Running state/Pending state/Success state/Failed state/Unknown state. • Metrics revealing the current status of this namespace, age of the namespace, number of pods/services available in the namespace; • Metrics revealing details like maximum memory limits, default memory limits, maximum memory requests, default memory requests for a container; • Metrics revealing the persistent volume related details such as current status, age, access mode and storage capacity. **Kube Control Pane Layer** • Metrics indicating the server availability; • Metrics revealing the etcd related details such as ratio of cache hits to misses and time taken to add/retrieve objects to etcd cache; • Metrics revealing the event related information such as number of nodes registered, number of pods that were terminated, number of nodes that were gracefully removed/drained; • Statistics revealing the number of nodes that were ready/not ready/schedulable/deleted/terminated during last measurement period; • Metrics revealing the number of times the CIDR Not Available/CIDR Assignment Failed events occurred; • Metrics indicating the number of times the Kubelet Starting event/Kubelet Setup Failed event has occurred; • Metrics revealing the details of events configured for pods, Volumes, Deployments, Containers and Load balancer;

Virtualization Software	Proxmox Hypervisor	**Operating System** • Node specific statistics such as status of the node, total memory available, amount of memory used, amount of memory available for use, amount of memory utilized, time period that the node has been up, and amount of CPU utilized; • Storage related measures such as total memory available for use, amount of free memory available for use, amount of memory used, percentage of memory utilized; • Metrics revealing the Storage status such as whether the Storage is active/ enabled or shared; **Virtual Guests** • Metrics revealing the VM details such as status of the VM, total memory/free memory available in VM; • Metrics revealing the total time that the VM has been up since its last reboot, percentage of disk utilized, rate of disk writes, rate of disk reads etc., of each physical disk on the VM and total disk throughput; • Metrics revealing the total network operations performed on this device and amount of network data received/transmitted; • Login related measures such as the number of current sessions, new logins, and session logouts; • Metrics revealing the virtual machines related measures such as the number of registered VMs, number of running VMs, number of VMs that are paused, added and removed;
	Proxmox Cluster	**Proxmox Node** • Metrics revealing the Node status such as amount of memory allocated for node, amount of memory used by the node, amount of memory available for use, amount of CPU used and uptime of the node; **Proxmox Infrastructure** • Cluster storage related measures such as total memory available for use, amount of free memory available for use, amount of memory used, percentage of memory utilized; • Metrics revealing the cluster Storage status such as whether the Storage is active/ enabled or shared; • Metrics revealing the status of the cluster; • Metrics revealing the count of total nodes available, online/offline nodes available, running/stopped VMS available , total users available and total groups available; • Metrics revealing the cluster log related details such as the number of information, warning and error messages that occurred; • Metrics revealing the count of successful tasks and failed tasks;

Virtualization Software	**Quality Virtual Desktop**	• Metrics revealing the current state of the server node and the blocked status of the server node, the number of virtual desktops in the node, successful/failed authentications, HTTP requests handled, metrics related to NX protocol attempts etc.;
		• Numerical statistics revealing the total hosts, powered on hosts, powered off hosts, starting hosts blocked hosts in the node cluster, disk images available in the server node etc.;
		• Desktop related statistics in the server node such as the registered desktops, powered on desktops, starting desktops, powered off desktops, desktops with users logged in, desktops without users etc.;
		• Key metrics relating to the currently active user sessions, new user logins, sessions that were logged out etc.;
		• Metrics revealing the total memory of the operating system flavor, overlay enabled status of the Operating system flavor, network availability, network delay of the server etc.;
		• A host of inside view metrics such as the percent of time the disk was busy processing requests, average time taken for reading the data from the disk, throughput of the virtual disk., total capacity of the disk, percentage of space utilized by the disk, physical memory utilization of the disk, incoming and outgoing traffic through each virtual desktop, CPU and memory usage of each virtual guest, TCP connections of the virtual desktop, TCP protocol traffic to and from each guest, latencies seen by users connecting to a virtual desktop, uptime of each virtual desktop etc.;
	Leostream connection broker	• External metrics revealing the availability and responsiveness of the connection broker and its web server component;
		• Metrics indicating whether the internal and external databases of the connection broker are available or not, and if so, how quickly they respond to requests;
		• Measures revealing the current status of the centers from which the connection brokers gather environment information;
		• Job queue related measures such as, the number of waiting jobs in queue, the number of finished, aborted, cancelled jobs, additions to the queue in the current measurement period in terms of new waiting, finished, in progress, aborted, and cancelled jobs;
		• Statistics reporting whether the SunRay servers with which the connection broker is interacting is alive or not;
		• Metrics indicating the number of registered desktops on the connection broker, the number assigned to users, the number of desktops assigned but unused, the number of free desktops, etc.

Virtualization Software	**VMware Horizon Connection Server**	• Metrics revealing the status of the connection broker; • Metrics that track license usage, such as, the number of days to the expiry whether/not the local mode license is enabled, etc.; • Connectivity related metrics that report whether/not the View Manager is able to connect to vCenter, whether/not the View server is able to connect to the Events Database, whether/not each virtual desktop (in a group) is available over the network, etc.; • Reports connectivity between the vCenter and the View manager; also indicates the connectivity of this server with the events database, Active Directory; • Usage metrics per desktop pool, such as, the total number of desktops, the number of active/inactive desktops, percentage of inactive desktops, etc. • Metrics revealing the number of broker events, admin events, transfer events and agent events recorded in the events database; • Key measures revealing the number of errors recorded during the desktop pool launch and provisioning events; • Monitoring the ThinApp repositories for availability; • Measures reporting the ThinApp applications that were frequently accessed and the installation type in which the applications were assigned to the desktops; • Metrics revealing the number of replications that were performed successfully and failed during the last measurement period;
	VMware Horizon Pod	• Metrics reporting the number of VMware Horizon Connection Server instances that were enabled and disabled on the cloud pod. • Measures indicating the current status of each application and total number of RDS hosts using each application. • Metrics indicating the percentage of desktops that were actively used in each desktop pool. • Measures indicating the current status of each application pool. • Measures indicating the number of RDS hosts and application pools that are available in each RDS farm. • Measures indicating the total number of users, total number of remote sessions, total number of registered desktops and the source of desktop pool. • Key metrics revealing the count of desktops in different states such as Agent unreachable, provisioned, etc. • Measures indicating whether each desktop pool is enabled or disabled and reporting whether any users or groups have been entitled to access each desktop pool or not. • Statistics revealing the number of entitled users, number of remote sessions, total desktops registered, startup desktops and maintenance desktops in the pool. • Measures indicating the current status of the RDS Hosts, number of sessions that were initiated on the desktops/applications on each RDS host using PCoIP, Blast and RDP protocols.

Virtualization Software	**VMware Horizon Security Server**	• Measure that reports the availability of the VMware Horizon Connection Server when accessed remotely via the VMware Horizon Security Server; • Measure indicating the desktops provisioned by the VMware Horizon Connection Server when accessed remotely via the VMware Horizon Security Server; • Metric indicating the number of view sessions were initiated through the VMware Horizon Security server;
	VMware Horizon View Composer	• Key metrics revealing the number of fatal errors that were logged in the composer log file during the last measurement period.
	VMware Horizon View RDS	• Metrics revealing the availability of the VMware view RDS connection and the time taken by the server to respond to a request; metrics revealing whether the user login process was successful, and the time taken for a login; • Metrics revealing the activity of redirector component of the Microsoft windows operating system and metrics revealing the status of the file serving as seen by a file server's client; the status of logons from client sessions to the VMware RDS server; • Key measures revealing the time taken for user login and profile loading process; the number of times the user profile was loaded; the number of times the profile loading for each user was successful and the number of times the profile loading failed etc.; • Metrics revealing the number of instances of the published application executing on the server, the memory and CPU utilization of each published application; • The status of the listener port, performance statistics relating to the VMware RDS server user sessions, metrics revealing the resource utilization of each user on the RDS server etc.; • Statistics revealing the number of disconnected VMware RDS server sessions, the new logins to the VMware RDS server etc.;
	VMware Identity Manager	• Measures indicating availability of the HTTP/HTTPS protocol and time taken to establish the connection;

Connection Brokers	**Citrix Delivery Controller 3/4**	• Metrics revealing the health of the IMA- interactions between a DDC and other servers in the farm, which include, the number of active IMA connections, the rate at which data was received and sent by DDC; • Metrics revealing the health of the Citrix XenApp technology on which the DDC has been built, which include, the rate of application enumerations; the rate of application resolutions, whether a connection to the datastore is available or not, the rate of data written to and read from datastores and dynamic stores. • Metrics indicating the availability of the servers hosting virtual desktops in desktop groups; • Metrics indicating the errors recently captured by the DDC logs; • Metrics revealing the availability and responsiveness of the DDC; • Metrics revealing the status of virtual desktops in farms and desktop groups, such as, the number of desktops that are powered on/off, the number of desktops that have been assigned to users, the number of desktops in use, the number of desktops that are idle, etc.; • Metrics reporting the composition of a DDC farm, which include, the number of DDCs in the farm, the number of desktop groups in the farm, the number of desktop groups that are available/unavailable; • Metrics revealing whether the virtual desktop agent is available or not on each of the virtual desktops managed by DDC; • Metrics indicating whether the virtual desktops are available over the network or not;
	Citrix Delivery Controller 5	• Metrics revealing the connection status between the XenDesktop broker and each server hosting the virtual desktops; • Metrics reporting the current status of each controller and the number of desktops registered with each of them; • Metrics indicating the health of the interactions between the Citrix Broker Service, AD Identity service, Configuration server, Machine Creation service, Machine Identity service, and the database, such as, the database availability, the time taken for database transactions, transaction errors, etc.; • Key metrics related to the desktops available per catalog, such as, the allocation type of desktops, the number of desktops assigned/not assigned to users, the number of desktops not in groups, type of catalog, etc. • Metrics revealing the availability of the License server, database server, etc.; • Desktop group related metrics, which include, whether the desktop group is available/not, the total number of desktops in each group, the available desktops, disconnected desktops, etc.;

Connection Brokers		- Metrics tracking the disconnected sessions to virtual desktops, such as, the total number of disconnected sessions, new disconnects, etc.; - Metrics tracking the number of sessions accessing applications published on each virtual desktop; - Whether the virtual desktop agent is available/not per desktop; - Metrics providing status updates on virtual desktops, such as, the current desktop state, whether desktop is available over the network or not, etc.
	Citrix Delivery Controller (v7)	- Metrics revealing the status of the connection between the broker and the hosting server, whether the connection between the broker and hosting server is in maintenance mode, whether machine creation service is used to create provisioned machines etc., - Site level details such as the availability of the license server, response time of the license server, active sessions on the site, brokers in the site, etc., - Broker level details such as the state of the broker, machines registered with the broker, status of the services such as the broker service, AD Identity service etc., on each broker, connectivity between each service and the database, health of the transaction performed by each service on the database etc., - For both Site and individual brokers, delivery groups related metrics such as the availability of the delivery group, total number of machines in each group, the available machines, used machines, disconnected machines, machines on which error was detected etc., - For both Site and individual brokers, catalog level metrics such as the number of machines, user assigned machines, registered machines, unregistered machines, total user sessions, established sessions etc., allocation type of the machines, machines available to users from each catalog to delivery groups, total machines in catalog etc., - Application level statistics such as whether the application is enabled or not, visibility of the application, number of currently running instances of each application, priority level set for resource usage of each application etc., - For both Site and individual brokers, session related metrics such as the total sessions, active sessions, connected sessions, sessions in Unknown state etc., - For both Site and individual brokers, metrics revealing the total logins and logouts for each protocol type, currently active sessions etc.; - Measures revealing the current status of each AppDisk and number of application packages available in each AppDisk; - Zone related details such as the current status of the primary zone and number of controllers, delivery groups and machine catalogs available in the zone; - Key statistics revealing the count of delivery controller license warning events, broker service license critical events, broker service license information events broker service license warning and site license error;

Connection Brokers	**Citrix Cloud Delivery Controller**	• Metrics revealing the status of the broker service and the configuration service; • Key statistics revealing the state of each controller and the count of registered machines in each controller; • Zone related details such as the current status of the primary zone and number of controllers, delivery groups and machine catalogs available in the zone; • Site level details such as the availability of the license server, response time of the license server, active sessions on the site, brokers in the site, etc., • Metrics revealing the connectivity and responsiveness of the delivery controller through Citrix XMLAccess; • Machine catalog level metrics such as the number of machines in catalog, machines used in delivery groups, machines available for delivery groups, machines used in delivery groups etc.; • Load Evaluator Index for CPU, disk, session, memory of the delivery controller; • Key metrics revealing the numerical statistics of desktop OS machines in each delivery group configured in a site such as the total machines, machines in maintenance mode, powered off machines, assigned machines, registered machines, error related statistics pertaining to the desktop machines etc.; • Application related statistics such as the count of instances of each application running on the desktops of the delivery controller, the CPU priority level of each application, whether each application is enabled or not, whether each application is visible to the users or not; • Session related statistics through each protocol on the Desktop OS Machines such as such as the count of total sessions, active sessions, desktop sessions, hidden sessions, mobile sessions; the count of application launched through each protocol etc.;
	Citrix Director	• Metrics revealing the status of the desktop OS machines in each delivery group configured in a site; • Statistics relating to the number of machines of each type that are currently in a state of failure; current state of each Server OS machine, resource utilization of each machine and the session load on each machine; • Metrics revealing the user connections to each delivery group, time taken for users to access the desktops/applications delivered by each group etc.; • Metrics revealing the user session related statistics of each delivery group in a site, the number of user connections to each delivery group in a site, the connection failures etc.; • Numerical statistics revealing the users who are connected to the machines/applications in each delivery group in a site, login duration of each user to access the desktops/applications, number of times each user has logged on etc.;

Connection Brokers	**Citrix XA/XD Site 7.x**	- Key metrics revealing the status of the connection between the XenDesktop broker and each server hosting the machine, - Metrics revealing the non-availability of the license server on the site, responsiveness of the license server inactive brokers and the session overload on the site; - Key metrics revealing the current status of each delivery controller configured within a site and the number of machines registered with each controller; - Statistics revealing the health of each controller service on the target controller, status of desktop OS machines in each delivery group configured in a site, statistics relating to the number of machines of each type that are currently in a state of failure; - Metrics revealing the session load, resource utilization and current state of each Server OS machine; - Catalog related statistics such as the catalog type, the type of desktops allocated to each catalog, the availability, usage and assignment of desktops within a catalog etc.; - Numerical statistics revealing the users who are connected to the machines/applications in each delivery group in a site, login duration of each user to access the desktops/applications, number of times each user has logged on etc.; - Metrics revealing the user session related statistics of each delivery group in a site, the number of user connections to each delivery group in a site, the connection failures etc.;
	Citrix WEM Broker	- Measures indicating the availability of license server and the response time taken by the license server. - Measures indicating the number of error events that were generated and logged in the event logs. - Metrics indicating the number of warning messages, verbose messages, critical events that were generated and logged in the event logs. - Measures indicating the availability, connection time and response time of the database server.

Hardware Monitoring	**Sun, HP, Dell, IBM hardware monitoring**	• Integrates with Dell Open Manage and HP/Compaq Insight Agents • Measures hardware status indicators such as overall system status, chassis status, power supply, voltage, amperage status, etc.; • Measures of the thermal status of the hardware including the current temperature, and the temperature status; • Key metrics revealing the health of the cooling units/fans on the server, like, the current fan speed, and the fan status; • Status of the power supply units
Siebel Enterprise	**Siebel Web Server**	• Application access related metrics such as, the number of times an application was accessed and for how long; • Session activity on the web server measured by the number of current sessions to the server, the session duration, anonymous sessions removed/requested/returned, server response time, request time, etc.; • Metrics revealing the lock behavior, which includes, the number and duration of user-initiated and anonymous locks
	Siebel Application Server	• Metrics indicating the health of the object managers, such as, the current state of the object manager, and whether the object manager has reached its maximum tasks limit or not; • Statistics revealing component health, including, the CPU time used up by components, the response time of the components, errors encountered by a component, etc.
	Siebel Gateway	• Reports the errors logged in the gateway error logs; • Indicates whether the Gateway Name Server is available or not.
UPS Monitoring	**APC UPS**	• Statistics revealing the health of the UPS batteries, which include, the current status (whether battery is low or normal) of the UPS batteries, the count of defective external batteries (if any), the power and voltage levels handled by the batteries, battery usage levels, whether the battery needs to be replaced, etc. • Key metrics such as the UPS status, power and voltage I/O, etc.

UPS Monitoring	**Generic UPS**	• Metrics revealing battery health, such as, the battery discharge time, battery runtime left, battery charge remaining, current battery status, etc.; • Metrics that measure the quality of input and output lines, such as, the number of input lines utilized by UPS, the number of bad input lines to the UPS, the number of output lines utilized by UPS, etc.; • Statistics revealing the voltage, current, and power inputs to the UPS via the input lines; • Statistics revealing the voltage, current, and power output from the UPS via the output lines;
	XUps	• Metrics revealing battery health, such as, the battery runtime left, battery charge remaining, current battery status, etc.; • Metrics reporting the utility line frequency, the number of times input was out of tolerance, source of input and output power, output load, etc.; • The input voltage, input current, output voltage, output current, etc.
	Delta UPS	• Statistics revealing the health of the UPS batteries, including the current status of the UPS batteries, the power, temperature and voltage levels handled by the batteries, the battery usage levels and whether the battery needs to be replaced etc., • Key metrics revealing the number of low battery traps recorded, fuse failure events, power failure events, temperature failure events, overall failure events etc, • Statistics revealing the voltage current and frequency inputs to the UPS via the input lines and the output lines; • Key metrics revealing the UPS power capacity i.e., the load through each output line;
SAN Storage Devices	**Hitachi AMS**	• Statistics revealing the health of each drive on the device, such as, the speed at which each drive processes read/write requests, etc. • Statistics revealing the load on each drive on the device, such as, the rate of I/O operations on the drive, the rate of read and write operations to the drive, the transfer rate of read/write commands per drive, etc. • Metrics indicating the control status of each port type on the device; • Key metrics that shed light on the load on enabled ports, such as, the rate of I/O operations on each port, the rate of read and write operations per port, etc. • Metrics that indicate the current mode of operation of the server; • Metrics measuring the extent of usage of each processor supported by the device; • Metrics revealing how effectively each cache on the device has been utilized, such as, the percentage of writes that are pending to every cache, the percentage usage of each cache's clean, middle, physical queues, etc.

SAN Storage Devices		
		• Metrics that point to the LUN on the storage device with the maximum throughput, such as, the rate of read/write commands executed on each LUN, the percentage of read and write requests that were served by this LUN, etc. • Metrics indicating the overloaded RAID groups on the device, such as, the rate of read/write commands executed on each RAID group, the percentage of read and write requests that were served by this RAID group, etc.
	Clariion SAN	• Statistics revealing the status, I/O operations and overall health of the storage processor, such as, status, percent utilization of storage processor, the speed at which each processor processes read/write requests, etc. • Cache related metrics indicating the read/write hit ratios, the percentage dirty cache pages and the percentage dirty cache pages owned; • Metrics that point to the LUN on the storage device with the maximum throughput, such as, the rate of read/write commands executed on each LUN, the percentage of read and write requests that were served by this LUN, etc. • Statistics revealing the status, I/O operations and overall health of the disk, such as, LUNs count, percent disk utilization, Hard read/write errors, Soft read/write errors, read/write requests, etc. • Statistics revealing the status, and overall health of the storage processor port, such as, status of link and port, the rate of read/write commands executed on each storage processor port, the number of data read/write commands made through this storage processor port etc. • Metrics relating to the hardware status of the Disk Array enclosure such as the state of the Fans, Power state for each fan and the LCC state pertaining to each fan.
	NexentaStor	• Key metrics revealing how well each volume is capable of processing I/O requests; the current status of each volume and the metrics revealing the space utilization of each volume; • Metrics revealing the physical memory utilization of the NexentaStor appliance; • Users currently connected to the NexentaStor appliance;
	EMC VNX Storage	• Measures revealing the space usage statistics of the File system such as the available space, total space, used space, percentage of space utilized etc., • Metrics that point to the LUN on the storage system with the maximum throughput, such as, the rate of read/write commands executed on each LUN, the percentage of read and write requests that were served by this LUN, etc., • Metrics revealing the I/O operations that are performed using the NFS protocol, the number of active threads in the NFS server etc., • Statistics revealing the I/O operations that are performed using the CIFS protocol, the number of protocol connections and the number of files opened using the CIFS protocol etc.

SAN Storage Devices		• Metrics revealing the performance of the Data Movers by analyzing the number of running threads, joined threads, blocked threads etc., the idle/busy stat of the CPU, the available RAM size of the Data Mover etc., • Metrics revealing the status of the statmon service, the connections that are availed and the percentage of connections that are used after the start of the statmon service etc., • Metrics revealing the status of the Storage Port, the link state and the SFP state of the Storage Port. • Statistics revealing the status, I/O operations, throughput and overall health of the storage processor, such as, status, percent utilization of storage processor, the rate at which each processor processes read/write requests, etc., • Cache related metrics indicating the size of the read/write cache, the state of the read/write cache, the size of the free memory, the number of dirty cache pages and the cache pages owned, the physical memory of the storage processors etc., • Statistics revealing the status, I/O operations and overall health of the disk, such as, LUNs count, percent disk utilization, Hard read/write errors, Soft read/write errors, read/write requests, etc., • Metrics relating to the hardware status of the Disk Array enclosure such as the state of the Fans, Power state for each fan and the LCC state pertaining to each fan. • Statistics revealing the network traffic in each network interface such as the I/O errors, packets/data transmitted and received etc.,
	HP P2000 SAN	• Measures revealing the status and health of the vdisk; • Metrics revealing the I/O activity per vdisk, the rate at which read/write operations were performed, the rate at which data was read and written from the vdisk etc., • Key metrics revealing the health and I/O activity per volume, the rate at which the read/write operations were performed, the rate at which data was read/written from the volume, the number of times the flush from the cache is/is not a full stripe • Key metrics of the controller such as the percent of time the CPU of controllers were processing requests, the I/O activity performed on each controller, the rate at which data is transmitted, the rate at which data is serviced through read/write cache etc., • Measures reporting the status and health of the expander port and host port of the controller; • Metrics reporting the status, health and the failover status of the controller to the partner controller; • Metrics revealing the I/O activity performed through each host port; • Key metrics revealing the status, health and LED status of the disk; The I/O activity per disk , the rate at which data is transmitted etc., • Hardware related measures such as the status of the expander, the SES elements of the expander and the sensors;

SAN Storage Devices	Dell EqualLogic	- External measures of the availability and responsiveness of the storage device; - Measures revealing the number of disks and controllers inside the chassis that is to be monitored; - Hardware related metrics such as the speed and status of fans, the overall status of the hardware, the status of power supply units and temperature sensors, etc.; - Key metrics pertaining to the space usage in the device, such as, total storage space, the space used, etc. - Metrics revealing the errors and I/O activity per disk, such as disk state, disk size, number of disk errors, and the rate of bytes read/written; - Metrics reporting the size and mode of the cache; - Key space usage metrics pertaining to the storage pool, such as, the total space in the pool, the used space, reserved space, free space etc.; - Metrics tracking iSCSI connections to the device, which include, the number of current connections, read/write latencies, rate of data transmissions/receptions, etc.; - Metrics revealing controller health, such as, the status of the controller, the controller batteries, the temperature of processor and chipset, etc.; - Critical metrics pertaining to the space usage in member arrays, which include, the total space in each array, the used space, etc.
	Hitachi USP	- Metrics revealing the current status of batteries used by each RAID store on the Hitachi USP storage device; - Metrics that report the current status of the cache, controller, drive, fan, processor, power supply unit, shared memory used by each RAID store on the device; - Metrics revealing the I/O activity for all the host bus adapters connected to each storage unit port, such as, the rate of I/O operations on each port, the responsiveness of the port to read-write requests, etc. - Metrics revealing disk processor, channel processor, and DRS processor usage; - Metrics revealing the I/O activity for all the host bus adapters connected to each storage unit port, such as, the rate of I/O operations on each port, the responsiveness of the port to read-write requests, etc. - Measure indicating the percentage if data waiting to be written to the cache; - Metrics revealing the I/O activity for all the host bus adapters connected to each storage unit port, such as, the rate of I/O operations on each port, the responsiveness of the port to read-write requests, etc. - The percentage usage of the Cache switch to cache memory access path; - Metrics revealing the I/O activity for all the host bus adapters connected to each storage unit port, such as, the rate of I/O operations on each port, the responsiveness of the port to read-write requests, etc.

SAN Storage Devices		• Metrics measuring the I/O activity on each logical volume, parity group, and LUN on the storage device such as, the rate of I/O operations on the component, the rate of data transfers on the component, the responsiveness of the component to I/O requests, etc.
	Hitachi VSP	• The availability of the storage device over the network; • The current status of critical hardware components such as the battery, cache, controller, drive, fan, processor, power supply and shared memory; • Metrics revealing the I/O operations rate on each logical volume, the responsiveness of each volume to requests, percentage of data written to each logical volume, percentage of read requests served by each logical volume etc; • Metrics revealing the I/O operations rate on each LUN, the responsiveness of each LUN to requests, percentage of data written to each LUN, percentage of read requests served by each LUN etc.; • Key metrics revealing the I/O operation rate of each port, the responsiveness of each port and the data traffic through each port; • The utilization of the channels, disk and DRR processors; • Do the caches have adequate memory space for storing data written to them, or are too many writes pending to the cache? • The utilization of the cache memory to cache switch access paths;
	Hitachi VSP Gx00 Series	• The availability of the storage device over the network; • The current status of critical hardware components such as the battery, cache, controller, drive, fan, processor, power supply and shared memory; • Metrics revealing the I/O operations rate on each logical volume, the responsiveness of each volume to requests, percentage of data written to each logical volume, percentage of read requests served by each logical volume etc.; • Metrics revealing the I/O operations rate on each LUN, the responsiveness of each LUN to requests, percentage of data written to each LUN, percentage of read requests served by each LUN etc.; • Key metrics revealing the I/O operation rate of each port, the responsiveness of each port and the data traffic through each port; • The utilization of the channels, disk and DRR processors; • Do the caches have adequate memory space for storing data written to them, or are too many writes pending to the cache? • The utilization of the cache memory to cache switch access paths;

SAN Storage Devices	**HP EVA StorageWorks**	• Metrics revealing the current status of the temperature sensors, communication buses, EMUs, fans, modules, and power supply units within an array enclosure;
		• Metrics reporting the current status of each fan and power supply unit that is supported by the array controller;
		• Metrics revealing the I/O activity for all the host bus adapters connected to each storage unit port, such as, the rate of I/O operations on each port, the responsiveness of the port to read-write requests, etc.
		• Status and space usage related metrics pertaining to each disk group on the storage device;
		• Metrics revealing the level of traffic on each physical disk group, such as, the rate of read and write requests each group, the rate of data reads and writes to each group, etc.
		• Metrics revealing the I/O activity for all the host bus adapters connected to each storage unit port, such as, the rate of I/O operations on each port, the responsiveness of the port to read-write requests, etc.
		• The current state, formatting capacity, media accessibility, rate of disk read requests, rate of disk reads etc., of each physical disk on the device;
		• Metrics revealing how well the LUN cache services requests to each LUN group, such as, the rate of read and write requests to cache, time taken for reading from and writing to the cache, the time taken for reading from and writing to the physical disk, etc.
		• Metrics indicating the current operational state of each LUN on the storage device, and the current state of the read cache, write cache, and mirror cache of each LUN;
		• General health metrics such as the current operational state of the device ports on the controller, whether the device ports are up/down, the number and type of errors experienced by the device ports, the current health and operational state of the fibre channel ports, etc.
		• Traffic related metrics, such as, the rate at which the device received requests and transferred data;
		• The current operational state of the EVA system, and the space usage by the system;
		• Metrics revealing problem situations such as, cache battery failures, bad caches, bad mirror connections, bad mirror ports, controller failures, abnormal controller temperature, excessive CPU usage by controller, etc.
		• Metrics that report the current condition and operational state of the host ports on the controller, the operational state of the external hosts connecting to the LUNs, the number of outstanding requests from external hosts, and the number of busy responses sent to the hosts, etc.;
		• Metrics measuring the ability of the host ports to handle load, such as, the rate of read and write requests received by the host ports, the time taken by host ports for servicing read and write requests, etc.

SAN Storage Devices	**IBM DS RAID Storage**	• Metrics indicating the current status of the storage array and the space usage on the array; • Metrics reporting the number and nature of errors experienced by the drive channels; • Metrics indicating the current status of the drive channels and the drive channel links; • Traffic related metrics pertaining to the LUNs, such as, the number of I/O operations currently executing on the LUNs, the percentage of read and write operations, the cache hit percentage, etc. • Metrics revealing the current status of the logical drives; • Metrics revealing the status and extent of traffic on the controllers, which include, such as, the current status of the controllers, the number of I/O operations currently executing on the LUNs, the percentage of read and write operations, the cache hit percentage, etc. • Metrics revealing the current status of the batteries, the fan canisters, the SFP transceivers, the temperature sensors, power supply units, fans in the array enclosure; • Metrics indicating the current status of drive ports, host ports, and drives
	IBM DS8000 Storage system	• Metrics revealing the current health and operational status of each disk and the capacity of each disk; • Metrics revealing the current health and operational status of each LUN, the I/O operations performed on each LUN such as the rate of read operations, write operations, percentage of read hits and write hits etc.; • Metrics revealing the current health and operational status of each FC port and the I/O activity on each FC port; • Key metrics revealing the current health and operational status of each rank and the metric related to the space utilization of each rank; metrics revealing the I/O processing on each rank; • Statistics revealing the current health and operational status of each array and the metrics revealing the space utilization of each array;
	NetApp USD	• Measures that intercept SNMP traps and report error events that affect disk health, hardware failures, fatal errors that could cause system shutdown, warning events, etc. • Status measures revealing the overall status of the NetApp Unified Storage system, the status of the AutoSupport feature, etc.; • Measures revealing when and how many Consistency Points were triggered, such as, the total number of CPs, number of CPs that occurred due to a full NVRAM log, etc.

SAN Storage Devices		• Metrics revealing the percentage of time the CPU of the device was busy, the NVRAM DMA wait time, whether/not sufficient spare disks are available, etc.
		• Disk usage metrics, such as, the RAID state of each disk, the total physical capacity of every disk, percentage of used space in each disk, read/write latencies per disk, etc.
		• Metrics focusing on the performance of Aggregates, which include, the state of each aggregate, mirror state of an aggregate, the size of each aggregate, the percent usage of an aggregate, etc.
		• RAID group usage measures, such as, number of prefailed disks per group, the total size of a group, the percent usage of a group, the percentage of media and parity scrubbing in a group, etc.
		• Measures revealing the health of every Host Bus Adapter, such as, the current state of an HBA, whether/not this HBA is in standby mode, the queue depth of an HBA, total CRC errors, count of discarded frames and link breaks, etc.
		• Key metrics related to current and potential hardware failures, which include, the current hardware temperature, the number of failed fans/power supplies, the current battery status, etc.
		• Statistics related to block I/O protocols, such as, the availability status of each protocol service, the rate of I/O operations and I/O latencies experienced by each protocol, etc.
		• CIFS related metrics, such as, the status of CIFS, the rate of read and write operations performed by CIFS, the latencies experienced by CIFS, etc.
		• Usage metrics pertaining to the WAFL buffer cache, such as, the rate of name cache, directory find, buffer hash, inode cache, and buffer cache hits and misses, the number of available buffers, blocks read from and written to the cache, etc.;
		• Metrics revealing IGroup configuration mismatches, such as, the count of igroups with invalid OS type, invalid user-partner settings, mismatched use-partner OS type setting, invalid ALUA setting, etc.
		• Measures revealing initiator status per iGroup, which include, the count of initiators with mismatching ALUA setting, OS type, VSA setting, and LUN mapping;
		• LUN related metrics, such as, whether a LUN is online/offline, the space usage per LUN, the I/O operations and latencies per LUN

SAN Storage Devices	**HP 3PAR Storage**	• Key metrics revealing the current health and operational state of each cage, metrics revealing the I /O operations performed such as the rate of read operations, write operations, percentage of read hits and write hits etc; • Hardware related metrics such as the current state and health of each fan, running condition of each fan, health and operation states of each CPU; the current health and operational state of each power supply unit; • Metrics that reveal the current health and operational states of each controller and also points to the rate and percentage of read and write operations performed by each controller; • Statistics revealing the health and operational status of each disk, the speed at which each disk processes read/write requests, etc. • Key metrics that shed light on the load on enabled ports, such as the rate of I/O operations on each port, the rate of read and write operations per port etc.;
	Dell Compellent	• Statistics revealing the health and operational status of each disk on the storage center, the speed at which each disk processes read/write requests, etc. • Statistics revealing the rate of I/O operations on the storage array, the rate of read and write operations to the storage array, the transfer rate of read/write commands per storage array, etc. • Key metrics that shed light on the load on enabled ports, such as, the rate of I/O operations on each port, the rate of read and write operations per port, etc. • Metrics measuring the extent of usage of each controller in the storage center in terms of its read and write requests processing capabilities and also reveal operational and health state of each controller in the storage center; • LUN related statistics such as the current health, the rate of read/write commands executed on each LUN, the percentage of read and write requests that were served by this LUN, average time taken by each LUN to process I/O requests and number of requests performed by each LUN.
	EMC XtremIO	• Statistics revealing the current state of each X-Brick, the number of SSDs and BBUs available in each X-Brick. • Metrics that reveal the usage of CPU and state of each X-Env • Statistics revealing the health and state of each SSD, space utilization, rate of I/O operations, bandwidth utilized by each SSD for performing read and write operations, the rate of read and write operations performed in each SSD, etc. • Key metrics that shed light on bandwidth utilization of each data protection group, rate of I/O operations on each data protection group, the read latency per data protection group, etc. • Metrics revealing startup time, health and connection state of the cluster, SSD space utilization by each cluster, rate of read and write operations, average read and write size, bandwidth utilized by each cluster, etc; • Key metrics that shed light on health and current state of each target port, the rate of I/O operations on each target port, the rate of read and write operations per target port, etc;

SAN Storage Devices		• Metrics revealing number of LUN mappings to each volume, snapshots created by each volume, space utilized by each volume, etc. • Measures indicating bandwidth utilization of each volume folder, rate of I/O operations on each volume folder, average read and write size of each volume folder, etc.; • Statistics such as the space utilization of snapshots, number of volumes created using each snapshot, bandwidth utilized for performing read and write operations, rate of read and write operations of each snapshot, etc.; • Metrics that point to the initiators with the maximum throughput, such as, the rate of read/write commands executed on each initiator, the number of read and write requests that were served by each initiator, bandwidth taken by each initiator to process read and write requests and read and write latency of each initiator. • Number of sub-folders created from each initiator group folder, rate of read/write commands executed on each initiator group folder, bandwidth utilized by each initiator group folder to process read and write requests, etc.; • Measures revealing bandwidth utilization of each initiator group, rate of I/O operations on each initiator group, average read and write size of each initiator group, etc.;
	Nimble Storage	• Measure indicating the number of times the events were triggered when failure of the disks, fans and the storage controller occurs; • Hardware related metrics such as the failure of each power supply unit; temperature failure of the hardware components etc.; • Metrics revealing the read and write latency; the rate at which I/O operations were read/written sequentially/at random; the rate at which data is read from /written sequentially/at random. • For each volume, key metrics that reveal the current state, space utilization and number of iSCSI connections etc.; • Cache related measures such as the rate at which read requests were successfully fulfilled by the read cache; • Disk space utilized by the volumes and snapshots;
	SolidFire	• Key metrics revealing the current status of each user account, the number of volumes owned by each user account, the ratios of compression, de-duplication, and thin provisioning of the volumes mapped per user account and overall efficiency; • Metrics relating to the cluster capacity such as the total size of active block drives and metadata drives, maximum amount of provisionable space available in the volumes, maximum amount of space that was provisioned, amount of space utilized for metadata in snapshots, etc.; • Measure reveals the total number of critical errors occurred in the SolidFire clusters;

SAN Storage Devices		• Statistics indicating the current usage percentage of cluster capacity, the rate of I/O operations on the cluster, the rate of read and write operations to the cluster, the rates at which the data was read from and written to the cluster, the ratios of compression, de-duplication, and thin provisioning of the volumes in the cluster, etc.; • Measures reporting the current status of each drive, number of failed hardware elements in each drive, the current utilization capacity of the drive, the rates at which the data was read from and written to each drive during last measurement period, the percentage of space available for use in each drive, etc.; • Statistics revealing the rate of I/O operations on the storage array, the rate of read and write operations to the storage array, the transfer rate of read/write commands per storage array, etc. • Tracking the paired clusters for the current status and latency of the clusters. • Measure indicates the current status of each interface in a particular cluster node. • Volumes related measures such as total size, client queue depth level, average time taken for performing read and write operations, the rate of read and write operations performed on each volume, etc.; • Statistics revealing the number of volumes owned per volume access group, the number of volumes that were deleted from each volume access group, overall efficiency, ratios of compression, de-duplication, and thin provisioning of the volumes in each volume access group, etc.;
	GemFire	• Measures stating the maximum number of connections that clients could make to each cache server, maximum number of threads that were created in each cache server, average time taken for processing the client requests, the number of GET and PUT requests that were made to each cache server, etc; • Metrics revealing whether the cache server is running or not, the rate at which reads, and writes were performed, CPU usage of each cache server, number of regions and locators available in each cache server, the rate at which data was transmitted from and received by each cache server, etc.; • Statistics reporting the number of JVM pauses detected in each cache database, the number of threads that are currently in use, amount of space allocated to the heap memory, the current size of the heap memory, the count of garbage collections, etc.; • Disk related metrics such as average time taken for flushing the disk in each cache database, the read and write rates on the disk in each cache database and the total amount of space utilized on the disk; • Key measures revealing the total number of cache database members available in each region, read and write rates of the region, total number of buckets for the region, the current size of the buckets, etc.

SAN Storage Devices	**EMC VNXe**	• Metrics indicating the count of critical, warning and error events occurred on the storage system; • Cache related measures such as read and write hits/misses at peak state, average read and write hits/misses, percentage of pages that are available for use on the cache, etc.; • Statistics revealing the health of the iSCSI port, the rate at which read and write IO operations performed via the port at peak times and the read and write bandwidth values at peak times; • Metrics indicating health status, utilization levels, uptime and temperature of the storage processors; • Measures reporting the health of the SAS port, SSDs on the storage system and VMs that use the storage system; • Statistics revealing the health of the Fibre Channel port, the rate at which read and write IO operations performed via the port at times, the read and write bandwidth values at peak times, etc.; • Metrics pertaining to the disks such as health and capacity of the disk, the average/peak rate at which the read and write IO operations performed, the average bandwidth utilized for performing read and write operations, etc.; • Metrics that point to the LUN on the storage system with the maximum throughput, such as, the rate of read/write operation performed on each LUN, the percentage of read and write requests that were served by each LUN, etc., • Metrics revealing the I/O operations that are performed using the NFS protocol, the number of active threads in the NFS server etc., • Statistics revealing the I/O operations that are performed using the CIFS protocol, the number of protocol connections and the number of files opened using the CIFS protocol etc.; • Measures indicating the bandwidth utilized by Ethernet for performing data/packet transmission at peak time.
	Pure Storage	• Key metrics reporting the utilization levels of storage array capacity; • Current status of the array controllers, drives and replicated array connection is also revealed; • Measures indicating the rate at which the read and write operations are performed on the array, the average latency detected while performing read and write operations and average bandwidth utilization during read/write operations; • Host group related measures such as bandwidth used for performing read/write operations, the rate at which the read and write operations were performed and the time taken for performing read/write operations; • Count of the audit, critical and warning messages is revealed; • Measures that point to the rate at which the read and write operations are performed on the host, the average latency detected while performing read and write operations, average bandwidth utilization during read/write operations and depth of the queue;

SAN Storage Devices		• Metrics indicating used and free capacity of storage on the host and volume and snapshot utilization levels on the host; • Statistics revealing the rate at which the read and write operations are performed on the volumes, the average latency detected while performing read and write operations, average bandwidth utilization during read/write operations and depth of the queue;
	EMC Unity	• Metrics indicating the count of critical, warning and error events occurred on the storage system; • Cache related measures such as read and write hits/misses at peak state, average read and write hits/misses, percentage of pages that are available for use on the cache, etc.; • Statistics revealing the health of the iSCSI port, the rate at which read and write IO operations performed via the port at peak times and the read and write bandwidth values at peak times; • Metrics indicating health status, utilization levels, uptime and temperature of the storage processors; • Measures reporting the health of the SAS port, SSDs on the storage system and VMs that use the storage system; • Statistics revealing the health of the Fibre Channel port, the rate at which read and write IO operations performed via the port at times, the read and write bandwidth values at peak times, etc.; • Metrics pertaining to the disks such as health and capacity of the disk, the average/peak rate at which the read and write IO operations performed, the average bandwidth utilized for performing read and write operations, etc.; • Metrics that point to the LUN on the storage system with the maximum throughput, such as, the rate of read/write operation performed on each LUN, the percentage of read and write requests that were served by each LUN, etc., • Metrics revealing the I/O operations that are performed using the NFS protocol, the number of active threads in the NFS server etc., • Statistics revealing the I/O operations that are performed using the CIFS protocol, the number of protocol connections and the number of files opened using the CIFS protocol etc.; • Measures indicating the bandwidth utilized by Ethernet for performing data/packet transmission at peak time.

SAN Storage Devices	**LeftHand SAN Storage**	• CPU and memory utilization levels of the storage system are indicated; • Measures indicating fan speed and temperature of the CPU; • Status of hardware components such as fan, power supply, temperature sensor and voltage sensor of the storage; • Metrics indicating the current status and size of the storage RAID, RAID controller and cache, count of the disks associated with the storage controller, temperature and temperature of the disks; • Storage node related metrics such as current status, space utilization, rate at which the read and write operations were performed, amount of data read/written per second, time taken for performing read/write operations and the number of I/O operations that were pending; • Measure indicating whether/not the storage cluster manager is a failover manager; • Space utilization details of the storage cluster and the volumes on the storage system are reported; • Snapshots related metrics such as space utilization levels, rate at which the read and write operations were performed, amount of data read/written per second, time taken for performing read/write operations and the number of read/write operations that were pending during last measurement period and cache hits of the snapshots; • Key statistics indicating the space utilization levels on the volumes, the number read and write operations performed per second, the rate at which the data was read from/written on the volumes, time taken for performing read/write operations and read cache hits on the volumes;
	IBM Storwize v7000	• Measures indicating the I/O activity on the vDisk and the read/write latencies; the status of the vDisk, capacity, cache status of the vDisk; • Measures relating to the data transmission and reception through each port, the rate at which the commands were initiated to the controllers and commands received through each port, link failures of FC port, numerical statistics of the FC port synchronization failure, signal loss of the FC port, invalid words transmitted through the port and invalid CRC etc., • Measures relating to the data transmission and reception through each node, the latencies for each message excluding and including the time spent in the inbound/outbound queue; • Measures indicating the time for which the CPU of the node canister was busy and the percentage of time the CPU was busy;

SAN Storage Devices		• Metrics indicating the rate at which the sectors were read and written on the vDisk; the rate at which pre stage sectors were initiated by the cache of the vDisk; the rate at which the sectors were written for track writes initiated by the vDisk cache etc., • Measures revealing the status and capacity of the MDisk, I/O activity on the MDisk, the average time taken by the MDisk to respond to read/write requests etc., • Measures revealing the status and capacity of the drive, the I/O activity on the drive, the average time taken by the drive to respond to read/write requests etc., • Hardware related metrics such as the status of the enclosure, the numerical statistics of the total canisters in each enclosure, the online canisters, the power supply units, slots to accommodate drives in the enclosure etc., • Hardware related measures such as the status of each port in the enclosure slot, status indicating whether a drive is present in the enclosure slot; the ID of the drive inserted in the enclosure slot; • Metrics revealing the status of the power supply unit in the control enclosure, status of the canister; health of the battery; the charging status of the battery; current charge of the battery, end of life status of the battery etc.,
	SIOS Datakeeper	**SIOS Services** • Metrics indicating the current mirroring status of this volume; • Metrics indicating the type of mirroring a volume is involved in; • Measures indicating the current resynchronization phase of the volume; • Metrics revealing the time taken for volume resynchronization process. • Metrics indicating the number of bytes allocated for the write queue and number of writes to be mirrored in the write queue; • Metrics indicating the number of network reconnections made while mirroring the volume; • Metrics indicating the number of dirty blocks, number of writes to this volume, number of passes that have been made by this volume; • Metrics indicating the current status of the job, type of mirroring performed by the job and amount of space allocated for this job; • Key metrics indicating the license expiry period;

SAN Storage Devices	Oracle ZFS Storage	**Oracle ZFS Service** • Metrics revealing whether the service status is online or disabled; • Metrics revealing the cluster state of the device; • Metrics revealing the bandwidth details for FC/FTP/SFTP/iSCSI/NDMP; • Metrics revealing the IO operations rate for iSCSI and FC; • Metrics revealing the average/maximum count of NFSV2/NFSV3/NFSV4 operations count; • Metrics revealing the average/maximum network bandwidth utilized by the is device; **Oracle ZFS Cache** • Metrics revealing the ARC related details such as ARC hit ratio, ARC data hits and data misses, ARC metadata hits and metadata misses and prefetched data hits and misses; • Metrics revealing the L2ARC Access related details such as ARC size, Data size, Header size, hits and misses; **Oracle ZFS Pool** • Metrics revealing the pool related details such as pool status, used space, free space and total space; **Oracle ZFS System** • Alert related metrics such as major alert, minor alert and other types of alert are reported; • Metrics revealing the amount of CPU by the user/PID/Mode/Application; • Disk related metrics such as count of read/write operations performed on disk and bandwidth utilized for read/write operations; • Alerts such as minor, major and other are reported for fault logs; • Metrics revealing the memory usage related details such as count of free memory, total memory, kernel memory and cache memory; • Metrics revealing the system log related details such as Errors, warnings, notice and others are reported;

SAN Storage Devices	Dell EMC ECS Storage	**EMC ECS Node** • Metrics revealing the health status of the disk, total size, allocated size, free size and inactive /inactive namespaces; • Disk performance related metrics such as count of erasure encoding reads/writes, consistency checker reads/writes, XOR reads/writes, user reads/writes, Geo reads/writes, and Hardware recovery read/writes; • Metrics revealing the total reads and writes performed in the disk; • Metrics revealing the bandwidth/latency created during transaction read/write; • Metrics revealing the Node NIC workload related details such as total data transferred/utilized, data transmitted/received through NIC and data utilized for transmission and reception; • Metrics revealing the Node process related details such as thread count, and amount of CPU/memory utilized; • Metrics revealing the node health status, number of good/bad/maintenance/offline disks available and amount of CPU/memory utilized; • Metrics also revealing the amount of disk space available, used and reserved; **EMC ECS Service** • Metrics revealing the replication group related details such as the state of the replication group, number of Zones available in this group, amount of replication data sent and received and amount of user data/system metadata and XOR data is in pending state; • Metrics revealing the number of audit log events available; • ECS bucket related metrics such as whether the bucket is in locked state, whether the F5 access is enabled and whether the Stale is allowed; • Metrics revealing the count of active/inactive namespaces; • Metrics revealing the unacknowledged alert related details such as the count of info/warning/ Error/critical and other alerts that have occurred; **EMC ECS Storage Pool** • Metrics revealing whether the Storage Pool and cold storage state; • Metrics also revealing the details such as number of good nodes/bad nodes/ maintenance nodes /offline nodes available in the Storage pool; • Disk related metrics such as number of disks available, number of good/bad/maintenance disks available in the pool; • Metrics revealing the number of Geo copy/Geo cache/ system meta data and User data available in the pool; • Metrics revealing total space available in the pool, amount f disk space allocated, amount of space available for use in the disk, amount of space reserved for use in the disk and percentage of allocated space used;

EMC ECS VDC

- Metrics revealing the ECS Cluster Capacity elated details such as the total size/free size and used size of the cluster;

- VDC Disk related metrics such as number of disks available, number of good/bad/maintenance disks available in the pool;

- Metrics revealing the number of Geo copy/Geo cache/ system meta data and User data available in the pool;

- VDC Disk workload related details such as count of erasure encoding reads/writes, consistency checker reads/writes, XOR reads/writes, user reads/writes, Geo reads/writes, and Hardware recovery read/writes with total reads and writes performed in the disk;

- Metrics revealing the VDC Erasure coding related details such as the total coding/coded data used;

- Metrics revealing the VDC Garbage collection details such as whether the User GC/System GC is enabled, total GC detected and count of pending reclamation, unreclaimable/system reclaimed/user reclaimed;

- Metrics revealing the Geo Replication details such as the count of replication reads/writes and number of user data /system metadata pending;

- Metrics revealing the Node-rebalancing related details such as whether the rebalancing is enabled or not, count of data rebalanced and amount of data pending for rebalancing process;

- Metrics revealing the VDC nodes related details such as whether the node is in active state ?

- Metrics revealing the number of good nodes/bad nodes/ maintenance nodes available;

- Metrics revealing the amount of CPU/memory used and amount of bandwidth transmitted/received by NIC;

- Metrics revealing the recovery rate of VDC;

- Metrics revealing the transaction workload related details such as the amount o read/write transactions that had occurred and amount of bandwidth and latency consumed by read/write transaction;

- Metrics also revealing the count of total requests/successful requests/user error and system error that had occurred while processing a transaction;

SAN Storage Devices	Oracle Primavera	**P6 EPPM**
		• Metrics revealing the Job service- related details such as count of used/maximum memory available for job execution, number of jobs running on the server, number of jobs that re in pending state and number of jobs executed/failed in last hour;
		• Metrics revealing the user session related details such as the count of total sessions, P6 analytics session, API sessions, web service sessions, resource sessions, timesheet sessions, project sessions, portfolio sessions, enterprise reports sessions, team member sessions and team member interface sessions available in EPPM;
		• Metrics revealing the EPPM Quantity related details such as the number of projects/activities/ resources and users created, number of recent project code assignments/recent activity code assignments/recent activity resource assignments that are created wit h number of user defined fields;
		• Metrics revealing the users related details such as the count of total users, P6 analytics users, API users, power client users, web service users, resource users, timesheet users, project users, portfolio users, team member users, profile users and team member interface users that are available in EPPM;
		• Metrics revealing the Connection Pool performance related metric such as average lease time. SQL time, lease wait time taken by the connection;
		• Metrics revealing the count of connections leased/recycled/revoked/succeeded lease request /denied lease request and SQL queries that are available;
	Oracle Exadata Storage Server	**Oracle Data Server**
		• Metrics revealing the cell disk space related details such as the status of the cell disk, total space allocated, free space available for use, amount of space utilized and count of errors that had occurred;
		• Metrics revealing the status of the Exadata Flash cache, number of allocated cell disks, size of Flash cache, size and percentage of usable flash cache and count of unavailable cell disks;
		• Metrics revealing the Flash log related details such as the log status, log size, usable flash log size and count of total/unavailable cell disks;
		• Metrics revealing the Grid disk status and error count that had occurred in Grid disk;
		• Cell system related metrics such as the cell status, fan status, power status, temperature status, cell server status, management server status, restart server status, locator LED status, uptime and amount of battery charge present in disk controller, temperature of cell/disk controller;
		• Metrics also revealing he amount of memory/virtual memory/CPU utilized by cell server and management server;
		• Metrics revealing the status of physical disk and number of LUNs available;

SAN Storage Devices		**Oracle Data Service** • Flash cache related metrics such as the count of flash cache read hits/read misses, count of skipped reads/skipped reads due to heavy load /skipped reads due to large IO request; • Metrics also revealing the count of flash cache write hits/write misses/skipped write/ skipped writes due to heavy load /skipped writes due to large IO request; • Metrics revealing the count read request/ write request hits/ misses due to heavy load or large IO request; • Metrics revealing the amount flash cache used, amount flash cache allocated and amount of flash cache that are usable; • Host interconnects related details such as rate at which data is transmitted/received and retransmitted and count of dropped data during transmission/ RDMA transmission; • Metrics revealing the IO related details such as rate at which small/large blocks were read and written and amount of device utilized by large/small request; • Metrics revealing the amount of data received/transmitted through Infiniband interfaces/Ethernet interfaces; • Metrics revealing the count of Info/warning/critical and other alerts;

Network File Systems	**NFS on Solaris Server**	• Measures revealing the total number of RPC calls received by the server from clients, the number of bad calls, the number of calls with a length shorter than the minimum length requirement of an RPC request, the number of duplicate RPC requests, etc.
	NFS on Solaris Client	• Measures revealing the total number of RPC calls made by the client, the number of bad length calls, the number of calls that timed out, the number of call failures and the reasons for the same, etc. • Availability and access time of remotely mounted NFS file systems;
	NFS on Linux Server	• Measures revealing the total number of RPC calls received from clients to the NFS server, the number of corrupted RPC requests, the number/percentage of RPC call failures, the number/percentage of bad authentication requests, etc.;
	NFS on Linux Client	• Measures revealing the total number of RPC calls received from clients to the NFS server, the total number of retransmitted RPC calls from clients, the total number of times authentication information had to be refreshed, etc.; • Availability and access time of remotely mounted NFS file systems; • Measures indicating the availability and space usage of every NFS mounted directory;
Cloud Technologies	**Amazon EC2 Cloud**	• External metrics of the availability of HTTP/HTTPS connection to the cloud and the responsiveness of the cloud; • Metrics revealing the availability of availability zones, regions, the time taken to access the regions, etc.; • Metrics revealing the availability of instances launched on the cloud and the time taken to access the instances; • Metrics reporting the number of instances on the cloud, the number of powered-on/off, added, removed instances; • Resource usage metrics revealing the percentage of CPU resources utilized by an instance, the network traffic generated by an instance, etc.; • Metrics revealing the uptime of instances; • Metrics capturing the failure of an instance to be powered-on/off in a region and the time taken for the same;

Cloud Technologies	Microsoft Azure	- Key metrics revealing whether the test managed to establish TCP connection with the cloud, whether the DNS server was able to respond successfully to the request made to it, etc., - Connection related metrics revealing number of successful connections to the database instance, number of connections that experienced deadlock on the database instance, number of connections that were throttled on the database instance, etc.; - Measures indicating number of database instances that are currently powered-on and powered-off on the cloud and number of database instances that were added to and removed from the cloud. - Storage related measures reveal the availability of the primary and secondary storage regions on the storage account, amount of ingress and egress data in the storage, etc.; - Key metrics reporting number of anonymous, Shared Access Signature and authentication requests that failed due to authorization errors and network errors. - Metrics revealing deployment status of the cloud service, amount of data from and written to the disk allocated to the cloud service, amount of incoming and outgoing traffic, etc.; - Measures reporting maximum number of disks allocated the virtual machine, amount of memory configured, etc.; - Metrics revealing runtime availability, compute mode and site mode of the website, number of HTTP 2xx , HTTP 3xx, HTTP 401, HTTP 402, HTTP 403, HTTP 404, HTTP 406 and HTTP 4xx encountered by the website, etc.; - Measures indicating number of VMs that were registered, added and removed from the cloud; - Key statistics revealing number of requests that are made, queued and rejected to the cloud service and number of ISAPI extension requests received on the cloud service; - Measures revealing availability of the cloud and time taken by the clod to respond to the client requests; - Metrics reporting maximum number of cores, the storage accounts, cloud services, virtual network sites and local network sites that allocated to the subscription and number of cores, storage accounts, cloud services, virtual network sites and local network sites that are currently utilized in the subscription;

Cloud Technologies	Microsoft Office 365	- Measures that indicate the HTTP/S or network connection availability to the Office 365 Portal and time taken by the portal to respond for the requests are revealed; - Measures that pinpoint the empty or orphaned groups; - Critical measures indicating whether/not the domains in the Office 365 tenant are verified and exposing the unverified domains in the monitored domain; - License related metrics such as the number of licensed users, the number of days by which the licenses will expire, the percentage of license usage, the products that are being used on a trial license, etc.; - Measure that reveals the count of communications posted on the message center; - Statistics indicating the current health of the Office 365 services and the number of service incidents and maintenance events occurring on the services; - Metrics indicating the services that are handling high workload, the type of operations that impose heavy load on the services and the users who are performing such operations; - Measures pinpointing the unlicensed users on the Office 365, the count of users who do not have sign-in rights, and the users who were deleted recently; - Critical measures indicating the availability of the Exchange Online for sending/receiving the emails and how quickly the Exchange online is sending/receiving the emails; - Measures revealing the email delivery failures, the emails that could not be delivered and pending messages; - Measures that pinpoint the sudden increase in number and size of the incoming/outgoing mails, the users who has received maximum number of mails and the users who receive the mails of large size; - Metrics indicating availability of the MAPI connections and the time taken by the MAPI connection to connect to the user mailboxes; - Mailbox related measures such as the number of shared mailboxes, number of mailboxes that were created newly, modified and soft deleted; the count of mailboxes on litigation/in-place hold; - Measures pinpointing the DLP rules violation, malware captured in incoming/outgoing mails and the top receivers and senders of malware, in terms of the number of malware-infected mails sent/received and the malware size; - Measures that reveal the top senders/receivers of spam mails, in terms of the number of spam mails sent/received and the size of spam mails, the datacenter that has the maximum number of mails, etc.; - Metrics indicating the availability and response time of the SharePoint Online; - Measure that reveals the SharePoint sites that took too long to respond to requests; - Statistics indicating the inactive site collections and the sites that were deleted recently;

Cloud Technologies		• Metrics revealing the site collections that have been used by the external users;
		• Measures reporting the file and page operations imposing too much load on SharePoint Online, the synchronization operations that are contributing to the unusual workload, etc.;
		• Failures and latency of file operations are reported;
		• Key measures indicating the health of the SharePoint Online and health check failures;
		• Measures indicating the site collection that is running out of server and/or storage resources and the reason being the resource depletion;
	Salesforce	**Salesforce Service**
		• License related measures such as status of the license, total license available, amount of license used, amount of license available for use and license expiry date;
		• Key statistics indicating the status of the scheduled jobs such as the jobs that are currently running, planned jobs, jobs that are waiting, jobs that are currently blocked, jobs that are deleted, jobs that are paused and contain errors in it, etc.;
		Salesforce Instance
		• Metrics revealing the API access related details such as API connection time, API Connection status and API response time;
		• Metrics revealing the Instance status, number of transactions that occurred, and average speed of the instance;
		• Metrics revealing the Web access related details such as web connection time, web connection status, Authentication status, time taken to authenticate, and time taken for login;
		Salesforce Objects
		• Object related measures such as count of Accounts, Assets, Campaign, Cases, Contacts, Contracts, Opportunities, Organizations, Partners and Quotes that are associated with Salesforce are revealed;
		• System overview related details such as the number of API requests, number of rules defined, number of Apex Triggers used, number of Apex Classes used, amount of code used, amount of Custom Apps used, number of Active force.com sites available and its usage and number of custom tabs available and its usage;
		• Storage related measures such as the number of records available in the storage, amount of storage used, and amount of storage allocated;
		Salesforce Users
		• User related measures such as number of Active/Inactive/New Users available, number of users who are removed, number of active and disconnected sessions available, number failed logons that occurred, number of frozen logons that occurred, number of password locked users and number of users who are currently logged in;

Cloud Technologies	Microsoft Teams	• Metrics revealing the count of teams created/deleted; • Metrics revealing the count addition and removal of Bots/Channel/Tab/Connector from team; • Metrics revealing the Tenant settings modification/Role modifications/Channel settings modifications to the team; • Statistics revealing the count of total streams/good steams/poor streams with its percentage; • Metrics revealing the count of total teams available; • Metrics revealing the details of service status /Connection status of the team; • Metrics revealing the count of Active Team Users/Inactive Team users; • Metrics revealing the details such as number of calls connected/completed/failed; • Metrics revealing the details of Calls such as Call duration, signal level and noise level;
	Microsoft OneDrive for Business	• Metrics revealing the details about storage such as how much storage is used and allocated; • Metrics revealing details of top sites that are consuming too much storage; • Metrics revealing the count of inactive and orphaned sites; • Measures revealing the total number of active/inactive users on the Microsoft OneDrive;
	Microsoft Skype for Business Online	• Metrics revealing the top users who are engaged in Instant Messaging and File Transfers; • Metrics that reveal the level of user activity on the server, such as, the number of sessions and connections to a user, etc.; • Metrics revealing the number of pending activations; • Metrics revealing the overall health status of the Skype for business; • Metrics revealing the top users who are performing video streams;
	Microsoft Azure Partner Center	**Azure Partner Billing** • Metrics revealing the total billing cost for all the services.; • Metrics revealing the various types of cost estimation methods such as the license-based cost, usage-based cost and one-time based cost estimation; • Metrics revealing the count of customers who owns the license and customers who utilizes the license; • Metrics revealing the number of subscriptions and services used; • Metrics revealing the charges calculated based upon usage; • Metrics revealing the count of onetime based customers; • Metrics indicating whether the balance is fulfilled or in pending status;

Cloud Technologies	**Cloud Desktops**	**Inside View of Desktops** • Disk Activity related measures such as the time taken to read/write data into the disk, number of reads/writes happening on a local disk, time taken by the disk to service each transfer request and rate at which the operating system divides I/O requests to the disk into multiple request.; • Metrics revealing the total capacity of a disk partition, amount of space used in a disk partition and amount of free space available for each disk partition of a system; • GPU related metrics such as the percentage of device cooler rate for this GPU of this virtual desktop, current power usage/temperature of this GPU allocated to this virtual desktop, amount of frame buffer memory on-board this GPU that has been used by this virtual desktop and amount of virtual memory of this GPU device of this VM/virtual desktop; • BAR1 related metrics such as the total size of BAR1 memory, amount of used BAR1 memory, amount of unused BAR1 memory and mode using which the GPU resources were delivered to this VMs, etc.; • Metrics revealing the percentage of CPU utilized, percentage of time spent by CPU, length of the queue, number of process blocked for IO, paging and amount of memory used/available for use; • Memory related details such as total physical memory available and amount of memory used / available for use; • Metrics revealing the number of handles opened by various processes running in a target Windows virtual desktop; • PCoIP Session related details such as the rate at which data was sent and received, rate at which Image/Audio/USB data was sent and received, bandwidth used by incoming/outgoing PCoIP packets and percentage of packets transmitted/received by this user that were lost; • Blast Session related details such as Round-Trip time, bandwidth usage, Frame rate and network throughput are revealed; • RemoteFX User Experience related details such as the frame encoding time, frame quality, frames skipped due to insufficient network/client/server resources and count of input/output/source frames utilized by the user, etc.; • Metrics revealing the rate at which segments are transferred and received by the guests; • Metrics revealing the uptime of the VM, number of incoming/outgoing/current connections available in the VM; • Metrics revealing the total idle time and elapsed time of the user during session; • Metrics revealing the incoming and outgoing traffic on network interface and inbound/outbound packets that could not be transmitted because of errors; • Metrics revealing the Page read rate/Page write rate/Page Input rate/Page output rate in VM; • Metrics revealing the current status and real time protection status of the security product;

Cloud Technologies		
		• Metrics revealing the count of new automatic/manual services running;
		• Metrics revealing the Disk alignment status, Personal vDisk status and current usage of a page file;
		• Windows update related details such as count of total /critical /low /moderate /optional updates available, system reboot status and pending update status;
		Outside View of VMs
		• Metrics revealing the number of user sessions that are currently active, new logins and number of sessions logged out from the Windows virtual Desktops;
		• Metrics revealing the number of Windows virtual desktops (on the cloud) that reported metrics during the last hour, number of VMs that are powered-on currently, number of Windows virtual desktops to which users/no user are currently logged in;
	Alibaba Cloud	**Alibaba Billing**
		• Metrics revealing the total amount spent for the service and pending amount that needs to be paid for this month;
		• Metrics revealing the count of total regions/services/instances and pretax cost for the service;
		Alibaba Database
		• Metrics revealing the Alibaba RDS related details such as current status of this DB instance with its type and class;
		• Metrics revealing the modes of this database such as whether the Database is in lock mode or connection mode?
		• Metrics revealing the total memory/capacity of the database, total CPU, used space and space occupied by data files/log files/backups/SQL data;
		• Metrics revealing the maximum count of database/account that can be created;
		• Metrics revealing the maximum IO requests/connections available in the database;
		• Metrics revealing the count of inbound/outbound traffic that had occurred and rate at which I/O requests are created ;
		• Metrics revealing the amount of memory used/available, amount of CPU used, count of connections/IOPS utilized;
		• Metrics revealing the count of connections available for the database and count of active connections to the database;

Cloud Technologies		• Metric revealing the InnoDB Buffer pool related details such as rate at which read operations, DB utilization and dirty blocks had occurred;
		• Metrics revealing the rate at which read, and operations are performed in the database;
		• Metrics revealing, the rate which table rows are read/written/deleted/updated and inserted in the InnoDB;
		• Metrics revealing the rate at which insert statement. Delete statement/delete statement/replace statement/replace select statement are executed in the InnoDB;
		• Metrics revealing the count of temporary tables created, count of fsync writes/log writes physical writes performed;
		• Metrics revealing the read rate and write rate of MyISAM storage Engine to buffer pool;
		• Metrics revealing the read rate and write rate of MyISAM storage Engine to Hard disk;
		• Metrics revealing the buffer utilization/read /write hit rate of MyiSAM storage engine;
		• Metrics revealing the Redis DB related details such as current status of Redis DB, storage capacity of DB, bandwidth available for DB, number of connections available for DB, account status, account type, account privilege, backup status, amount of memory/connection used and amount of memory /connection available for use;
		• Metrics revealing the amount of bandwidth consumed by read/write operations, write/read speed, CPU usage and amount of memory/connections available for use in Redis DB;
		• Metrics revealing the Alibaba SQL related details such as rate at which buffer hits/full table scans/SQL compilations occurs;
		• Metrics revealing the login rate, lock rate, deadlock rate lock wait rate and SQL transaction rate of the SQL server;
		Alibaba ECS
		• Metrics revealing the count of total instances, number of instances that are powered-on/off and number of instances that are added/removed;
		• Metrics revealing the current status, CPU, Memory, bandwidth, memory used by ECS;
		• Metrics revealing the inbound/outbound/internet/intranet bandwidth of ECS;
		• Metrics revealing the internet/intranet traffic received and sent by the ECS;
		• Metrics revealing the count of disk read/write operations and its bandwidth obtained from ECS;
		• Metrics revealing the count of CPU Credit usage and balance details;
		• Metrics revealing the count of Total instance, Powered-on instance and Powered-off instance;

Cloud Technologies		• Metrics revealing the amount of disk size, free memory and used memory available;

- Metrics revealing the amount of disk size, free memory and used memory available;

- Metrics revealing the average system load, total snapshots available and its size and count of CPU pending IO operations;

Alibaba Infrastructure

- HTTP related details such as availability, response time, TCP connection availability/response time, DNS availability, data transfer time, content length and DNS response time are revealed;

- Metrics revealing the SSL certificate related details such as status of the certificate, total certificate available, number of certificate issues and number of certificates expired;

- Metrics revealing the Alibaba regions and Zones related details such as number of regions/ zones available/allocated, and number of Zones that are unavailable;

Alibaba Management

- Metrics revealing the count of Users, Groups, Custom Policies and RAM roles available;

Alibaba Network

- Metrics revealing the VPC related details such as number of VPC connections available, number of Route tables available, number of VSwitch available, number of RDS instance/ECS instance/ SLB instance/NAT Gateway and security group available;

- Metrics revealing the SLB related details such as the current status of SLB, count of Healthy backend/faulty backend ECS instances available, amount of inbound/outbound traffic that had occurred, number of incoming/outgoing packets available, number of active/inactive /concurrent connections available;

- Metrics also revealing the status codes, response time, count of dropped inbound/outbound traffic, dropped incoming/.outgoing packets and count of dropped connection of the SLB;

- Metrics revealing the CDN related details such as CDN type, count of access requests, byte hit rate, percentage of 4xx/5xx status codes, downstream traffic and indicates whether the SSL is enabled or not?

Alibaba Storage

- Metrics revealing the current health status of the volume, count of deleted instance/deleted snapshot, count of auto snapshot and its policies thar are enabled, disk size , count of attached instances and encryption status of the disk are informed;

Others	Java Applications	- Metrics reporting the number of classes loaded/unloaded from memory; - JVM garbage collection related metrics, such as, the number of garbage collections started, the percentage of time the JVM spent on garbage collection, etc.; - Metrics indicating the status of JVM threads, such as, the number of runnable, blocked, waiting, timed waiting, low CPU, medium CPU, high CPU threads, etc.; - Metrics indicating the temperature and fan speed of the CPU supported by the local traffic manager; - Resource usage metrics, such as, the CPU and memory usage of the JVM; - Uptime statistics such as the total uptime of the JVM, the uptime during the last measurement period, etc.
	External TFTP	Metrics indicating availability of the Trivial File Transfer Protocol (TFTP) server and time taken by the server to respond to user requests.
	HP Blade Servers	- Metrics indicating the current condition and composition (whether/not it has server blades, power supply units, temperature sensors, fans, fuses, net connectors) of the blade enclosure; - Fan related metrics such as the current condition of the fan, whether it is available or not, etc.; - Fuse-related metrics such as the current status of each fuse, whether every fuse is available or not, etc.; - Temperature sensor related metrics such as the current condition and temperature of each sensor; - Rack blade related metrics, such as, the current status of each rack blade, the current condition, availability, power output, etc., of each power supply unit on each rack blade; - Power enclosure related metrics, that indicate the current availability, condition, and redundant state of each power enclosure; - The type and current condition of each net connector.

Others	Endeca Search	• Metrics revealing how well the Endeca Navigation engine is able to process search queries, which include, the number of successful search requests, the number of search queries waiting in queue, the average processing time of queries, the time spent in dgraph, etc.
	Bluecoat AntiVirus	• Metrics relating to the scan status such as the number of files that is scanned and the number of files that is detected; • Key metrics relating to the status of resource usage and the percent of resource utilization.
	HP Enterprise Security Key Manager	• The utilization of each CPU on the HP ESKM appliance; • The memory utilization of the appliance; • Metrics indicating the total number of requests processed by the appliance; the number of successful requests and failed requests; • Key measures revealing the number of times power failure event/fan failure event/disk failure event was triggered on the appliance;
	Hitachi Compute Blade	• Key metrics revealing status related metrics of each blade server such as the current health, power supply, maintenance mode, etc; • The current voltage and power consumption of each blade server; • The current status of each LED and the color emitted by each LED that in available in each blade server as well as switch module; • Metrics revealing the current health, power supply, temperature, voltage and power consumption of each chassis; • Key metrics revealing the power status, operating mode and maintenance mode of each management module; • Metrics revealing the current status of each LED, color of each LED available in each fan module, the speed of each fan in each fan module; • The current health status, power status and redundancy status of each fan module; • The current health status and power supply status of each fan module;

| Others | IBM Storwize v7000 | • Measures indicating the I/O activity on the vDisk and the read/write latencies; the status of the vDisk, capacity, cache status of the vDisk;

• Measures relating to the data transmission and reception through each port, the rate at which the commands were initiated to the controllers and commands received through each port, link failures of FC port, numerical statistics of the FC port synchronization failure, signal loss of the FC port, invalid words transmitted through the port and invalid CRC etc.,

• Measures relating to the data transmission and reception through each node, the latencies for each message excluding and including the time spent in the inbound/outbound queue;

• Measures indicating the time for which the CPU of the node canister was busy and the percentage of time the CPU was busy;

• Metrics indicating the rate at which the sectors were read and written on the vDisk; the rate at which pre stage sectors were initiated by the cache of the vDisk; the rate at which the sectors were written for track writes initiated by the vDisk cache etc.,

• Measures revealing the status and capacity of the MDisk, I/O activity on the MDisk, the average time taken by the MDisk to respond to read/write requests etc.,

• Measures revealing the status and capacity of the drive, the I/O activity on the drive, the average time taken by the drive to respond to read/write requests etc.,

• Hardware related metrics such as the status of the enclosure, the numerical statistics of the total canisters in each enclosure, the online canisters, the power supply units, slots to accommodate drives in the enclosure etc.,

• Hardware related measures such as the status of each port in the enclosure slot, status indicating whether a drive is present in the enclosure slot; the ID of the drive inserted in the enclosure slot;

• Metrics revealing the status of the power supply unit in the control enclosure, status of the canister; health of the battery; the charging status of the battery; current charge of the battery, end of life status of the battery etc., |
| | Cisco UCS Manager | • Measures revealing the overall health, operational state, performance state, the power, presence, thermal, and voltage states of core UCS components managed by the Cisco UCS manager such as the I/O modules, fans, chassis, fan modules, backplane ports, fabric ports, etc.;

• Measures revealing the overall health, operational state, performance state, the power, presence, thermal, and voltage states of the fabric interconnect PSUs

• Measures reporting the overall health, operational state, network load on each fabric interconnect Ethernet port;

• Measures reporting the overall health, operational state, network load on each fabric interconnect FC port;

• Availability, operational state, and current configuration of the blade servers in each chassis managed by the Cisco UCS manager;

• Key metrics revealing the current temperature and input current of processors; |

Others		• Useful metrics indicating the power consumption and temperature of the motherboard on every blade server;
		• Metrics revealing the overall health, performance, and load on each NIC managed by the UCS manager;
		• Measures revealing the overall health, operational state, performance state, the power, presence, thermal, and voltage states of the fabric interconnect fans;
		• Key statistics revealing the count of critical, warning, major and minor faults occurred on the UCS manager;
		• Memory that point to the errors encountered by memory at different time stamps.
	Egenera PAN Manager	• Measures revealing the current status of a PAN Domain, total number of pNodes available in the domain, the number of active pNodes, the percentage of pNodes in the domain that are currently in use, etc.
		• Metrics related to PAN OPServers, which include, the current status of each PAN OPServer and the master/slave status of the PAN OPServer;
		• License usage metrics, such as, the number of licences of each type available in the PAN Manager, the number of licenses of each type utilized, etc.;
		• Measure revealing chassis health, such as, the current operating status of a chassis, type of switch available in a chassis, the number of uplink and downlink ports in a chassis, etc.;
		• vSwitch-related metrics, such as, the vSwitch type, uplink status of a vSwitch, link dependency status of a vSwitch, the number of LPANs and pServers attached to a vSwitch, etc.;
		• Statistics that measure pNode performance, such as, the current state of each pNode, the clock speed of the CPU in every pNode, the number of CPU cores available in each pNode, average CPU/memory/blade/hard drive/zone temperature of each pNode, etc.;
		• Statistics revealing pServer performance, such as, the current operating state of each pServer, whether/not the PAN Agent is available on a pServer, the number of primary/failover pNodes per pServer, CPU/memory usage of a pServer, disk I/O of a pServer, network traffic handled by each pServer, etc.;
		• Measures revealing the current status of each LPAN in the PAN Manager, the average percentage of CPU that is currently utilized by an LPAN, the number of pServers available in an LPAN, the number of pServers that are currently booting in an LPAN, etc.;
		• Disk space usage metrics per disk partition per pServer, such as, the total capacity of a disk partition, the amount of available space per partition, the percentage of space usage on each disk partition, etc.
	2X Publishing Agent	• Statistics that measure the CPU and memory usage of applications deployed on the server;
		• Key metrics revealing whether connection to the gateway is available and the time taken to establish the connection;

Others	**2X Terminal Server**	- Redirector related metrics, which include, the rate of data sent and received by the local server from the network, rate of network errors, reads/writes denied, etc. - Metrics tracking user profile size, such as, the current profile size, whether/not the profile exceeds quota, large files in user's profile, etc. - External metrics indicating availability of connection to server port and connection time; - Metrics measuring status of a user's login and the time taken to login; - Metrics revealing the resource usage of applications on the server; - Session related metrics, which include, the number of idle/active/connected sessions to the server, etc. - Metrics revealing latencies in client connections to the server; - Metrics revealing the level of user activity on the server, which include, the current sessions for a particular user on the server, resource usage of the user, errors and bandwidth usage of the user, handles used by the user's processes, etc.
	2X Client Gateway	- Metrics indicating the availability of HTTP/HTTPS connection to the gateway and the time taken to establish the connection; - Statistics that measure the health of the web server on which the gateway operates; - Metrics that capture the errors that occurred on the gateway; - Metrics that track the status of critical Windows services that support the client gateway; - Metrics tracking the usage of critical resources by the gateway processes;
	APP – V Management Server	- Measures revealing the availability and the authentication status of the APP-V Management server; - Measures revealing the availability and response time of the App-V database (generally a Microsoft SQL server), query execution time of the database server, the number of records fetched from the database server, etc.; - Measures revealing critical information relating to the App-V Publishing Admin log such as the information messages, critical messages, warming messages, verbose messages, etc.; - Measures revealing critical information relating to the App-V Publishing Operational log such as the information messages, critical messages, warming messages, verbose messages etc.; - Measures revealing critical information relating to the App-V Client Management Admin log such as the information messages, critical messages, warming messages, verbose messages, etc.;

Others	**App – V Client**	• Measures revealing the performance of different applications executing on the App-V Client; • Measures relating to the App-V Publishing server such as the availability and the response time; • Measures relating to the size of each application, the percentage of application that is currently loading, the usage of the application, etc.; • Measures revealing critical information relating to the App-V Client Admin log such as the information messages, critical messages, warming messages, verbose messages, etc.; • Measures revealing critical information relating to the App-V Client Operational log such as the information messages, critical messages, warming messages, verbose messages etc.; • Measures revealing critical information relating to the App-V Client Virtual Application log such as the information messages, critical messages, warming messages, verbose messages, etc.;
	TeraText ArborText	• Measures revealing the number of rendering jobs that succeeded, failed, and are in queue;
	TeraText Content Server	• External metrics of the availability and responsiveness of the Content Server; • Measures revealing the file count and total size of each database; • Disk cache usage metrics such as, the number and percentage of cache hits and misses, the percentage of disk cache in use, etc.; • The memory usage of the Content Server; • The number and duration of file operations and record change operations; • Measures revealing the time taken by the server to process security requests, • Z39.50 operations, present operations, search operations, sort and merge requests;
	Marathon EverRun PVM	• Metrics that reveal the current operational state, health state, and capacity of each disk partition available to the PVM and each disk partition of the XenServer host on which the PVM executes; • Statistics reporting the current operational and health state of the XenServer master in every XenServer pool; • Ethernet adapter related metrics such as the current operational and health state of each Ethernet adapter of the XenServer host on which the PVM executes and every Ethernet adapter used by the PVM; • Current operational and health state of each PVM

Others	**Double Take**	• Measure revealing the total memory allocated to the server. • Metrics relating to the uptime of the servers such as whether the server was rebooted or not, the time for which the server has been up since the last reboot, etc. • Metrics revealing the amount of time this connection has been active, current state, the number of operations currently in the retransmit queue on the source, the number of operations currently waiting in the acknowledgement queue, etc.; • Metrics relating to the security of the servers such as the number of successful logins, the number of failed logins, the number of login attempts that were successful during the last measurement period, and the number of login attempts that failed during the last measurement period.
	RSA Authentication Manager	• Metrics indicating the total number of authentication requests processed by the appliance, the number of successful requests and failed requests and average time taken by the appliance to process authentication requests and responses; • Measures revealing the number of authentications performed by the appliance, the number of successful authentications and failed authentications, and the number of new pin authentications and next token code authentications; • Metrics revealing the size of the cache, the hit ratio of the cache and the number • of times the cache was flushed; • Key measures indicating the total number of authentication requests that were processed in each data source, the number of success requests and failed requests in each data source, the number of connections that are currently active in each data source, etc.; • The replications state of each replica instance; • Measure reveals the number of sessions that are currently active on the appliance;
	HA Proxy	• The Uptime and reboot details of the proxy server; • Key metrics revealing the count of maximum connections, sockets, memory and pipes allocated to the proxy server, the count of current connections, sockets, memory and pipes utilized by the proxy server, the percentage of connection utilized etc.; • Session related statistics such as the count of maximum sessions, maximum connection rate, current session connection rate, session limit on the proxy server, the session utilization percentage, the count of HTTP requests and responses, average response time, etc.;

Others	**Ruckus Zone Director**	- The CPU utilization of the Ruckus Zone Director; - Memory related metrics such as total amount of the memory allocated, amount and percentage of utilized memory and the amount of memory that is available for use; - Measures revealing the status of the Ethernet, the number of packets transmitted and received through the Ethernet, the amount of data received and transmitted through the Ethernet, etc.; - Key metrics revealing the unauthorized client devices related details such as the radio type, the channel, the rouge type, the encryption mode and the signal strength; - Statistics revealing the total number of access points and the number of authorized devices and the unauthorized devices; - Measures indicating the utilization percentage of the CPU and memory of WLAN; - Metrics revealing the rate at which the number of packets were transmitted from and received by the Zone Director, the rate at which the amount of data were transmitted from and received, etc.; - Key measures revealing the rate at which the number of packets were transmitted and received by each user, the rate at which the amount of data was transmitted from and received, the number of packets that were dropped during transmission and reception of the packets, etc.; - Access point related details such as the total number of radios associated with each access point, the number of authorized devices associated with each access point, the number of multi cast and unicast packets that were transmitted and received, etc.; - Metrics revealing the resource utilization, the power management status of each access point radio, the number of packets transmitted and received, the number of successful authentications, the number of failed authentications, the transmitted power of each radio, etc.;
	Bind DNS Servers	- The count of incoming and outgoing queries from the internal resolver for each type of Resource record; - IPV4 and IPV6 socket related statistics for UDP and TCP protocols such as the count of sockets opened, sockets closed, socket connections established count, the number of bind failures etc.; - Key metrics indicating the number of IPV4 and IPV6 requests; the count of queries for which an authoritative answer was obtained; the count of SERVFAIL and NXDOMAIN errors encountered; the count of queries dropped by the server, the responses received by the server etc., - Internal resolver statistics such as the count of IPV4 and IPV6 queries sent through the internal resolver, the IPV4 and IPV6 responses received by the resolver, the count of queries for which round trip time was measured; the count of each type of errors encountered etc.

Others	**IBM WebSphere Liberty Server**	• Key statistics revealing the connection creation rate, connection count in each connection pool, free connections in each connection pool etc.; • Queue related statistics such as the configured size of each queue, the state of each queue, outstanding I/O requests to each queue etc.; • Thread related statistics such as the count of threads available in each thread pool and the count of active threads in each pool; • Topic related statistics such as the maximum size of each topic, the count of I/O requests to each topic and the status revealing whether or not operations were allowed on each topic; • Key statistics revealing the number of requests to access each servlet, the request rate to each servlet and the response time of each servlet to the requests; • Session related statistics revealing the number of active sessions, invalidated sessions, session creation rate etc. can be identified; • Metrics revealing the state of each application; • Metrics reporting the number of classes loaded/unloaded from memory; • JVM garbage collection related metrics, such as, the number of garbage collections started, the percentage of time the JVM spent on garbage collection, etc.; • Metrics indicating the status of JVM threads, such as, the number of runnable, blocked, waiting, timed waiting, low CPU, medium CPU, high CPU threads, etc.; • Metrics indicating the temperature and fan speed of the CPU supported by the local traffic manager; • Resource usage metrics, such as, the CPU and memory usage of the JVM; • Uptime statistics such as the total uptime of the JVM, the uptime during the last measurement period, etc.
	Atlantis ILIO	• The comparative measures of the disk utilization with/without the Atlantis ILIO server, the total capacity saved in the target environment with the use of Atlantis ILIO server etc., • The I/O activity on the backend storage and the time taken by the Atlantis ILIO server to respond to requests; • The disk space utilized by the NFS datastore; • The read/write offloads by the Atlantis ILIO; • The I/O activity on the NFS datastore; • The NFS thread utilization of the Atlantis ILIO; etc.,
	Horizon Unified Access Gateway	• The availability and responsiveness of each VMware Horizon Connection Server communicating with the target Horizon Access Gateway; • The overall status of the Horizon Access Gateway, session related statistics such as the count of sessions, authenticated sessions, PCoIP sessions, Blast sessions, RDP sessions etc. • The failed and successful logins to the Horizon Access Gateway are also measured.

Others	**Infoblox**	• Metrics revealing the CPU and memory utilization, temperature of the hardware components of the Infoblox system; • The current status of each service running on the Infoblox system, the current status of each physical node, whether the Infoblox system is highly available or not; • Key statistics related to the messages that were transmitted/received through DHCP protocol and DHCP6 protocol; • Statistics revealing the number of DNS referrals in each zone, the responses that were successfully made to the appliance, the queries that failed etc., • Metrics revealing the rate at which queries were processed by the DNS cache, number of queries replied by an authoritative server during the last 5 minutes and last 15 minutes, number of queries replied by the authoritative server after referencing another server in the last 5 minutes and last 15 minutes etc.;
	NetApp Cluster	• Key metrics revealing the percentage of time the CPU was busy performing system-level processing, metrics revealing the health of the hardware components of the NetApp Cluster such as the number of failed fans, power supplies, battery status etc.; • Key metrics revealing the current state of each aggregate, the space utilization related metrics of each aggregate, the I/O activity of each aggregate etc., • Statistics revealing the current state of each disk and the I/O activity of each disk; • Statistics revealing the type of jobs in the job queue and the count of jobs that were successful, running, failed, rescheduled etc., • Key metrics revealing the current state of the node and the I/O activity of each node, • The current state of each Vserver, the availability of the cluster peer, • The current state of each flash cache and current state of each Vserver peer relationship, • The overall health and state of each Fiber Channel Adapter, key metrics revealing the active iSCSI sessions, the processing capability of each session, the login failures, failed tasks and errors encountered by each iSCSI session; • Key metrics revealing the processing ability of each logical interface, the errors encountered during data transmission/reception and the uptime of each logical interface; • Statistics revealing how well data is handled by each FC port and the errors/failures encountered by each FC port; the availability of the FCP service; • Statistics revealing the I/O operation s performed using CICS protocol, the count of Windows/Unix user groups that crossed disk space and file usage quotas set etc.;

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Others		
		• The current state, alignment state of each LUN configured in the NetApp; • Cluster, the space utilization of each LUN and the metrics related to the I/O activity of each LUN; • The current state of each volume, the space utilization related metrics of each volume and the metrics related to the I/O activity of each volume etc.; • The current failover state of each cluster and the partner system;
	Dell PowerEdge VRTX	• Key metrics revealing the current state and health of each amperage probe, the input power of each probe, • Hardware related metrics such as the current state and health of each fan, running condition of each fan, health of each cooling unit and DIMM; the current health of each PCI device; • Hardware related metrics such as the current health of each power supply point, operational state of the power supply unit's sensor, health of each PSU, current health of each processor, battery and the overall health of the Dell PowerEdge VRTX, current health of each slot, current health of each voltage probe and temperature probe etc.; • The current health of each blade server, enclosure and the current status of the enclosure hardware; the current health of each RAID controller, etc. • Statistics revealing the current state of each physical disk and the metrics revealing the space utilization of each physical disk; the current health and operational state of each virtual disk etc.;
	IBM Integration Bus	• Key metrics revealing the current load on the FTP server; • Statistics revealing the number of connections available in the JDBC connection pools and the metrics revealing the utilization of the connections; the timed out JDBC connections; • The number of times the statements were executed successfully for each ODBC DSN and the number of times the statements failed; the number of error prone connections in the ODBC DSN; • The throughput of the messages through the SOAP service; faulty replies sent through the SOAP service; • Key statistics revealing the number of connections handled by the firewall service, the number of open connections on the TCP client node and TCP server node; • Statistics revealing the data and message transmission/reception on each TCP client node and TCP server node; • Metrics revealing the number of requests to the CICS transaction server that were successful and the requests that actually failed; the number of decisions that were processed successfully by the Decision service;

Others		• Key metrics revealing the garbage collection activity on the heap; time taken by the message node to process the input messages; the number of messages processed by each message flow node and the time taken to process the messages; • Statistics revealing the number of messages processed by each message flow and the time taken to process each message in the message flow; • The processing rate of each message in a thread and the number of input messages processed by each thread etc.;
	eG Real user Monitor	• For each website, key metrics revealing the total number of page views that were viewed, Apdex score, average time taken by the pages to load, number of unique users who are currently accessing the web site, percentage of page views with normal user experience, page views that are slow in loading and page views that have encountered JavaScript errors, number of times this web site accessed by the mobile phones, tablets and desktops, time related measures such as average page rendering time, etc. • For each browser, statistics revealing the total number of page views that were viewed, Apdex score, average time taken by the pages to load, number of unique users who are currently accessing the browser, percentage of page views with normal user experience, page views that are slow in loading and page views that have encountered JavaScript errors, number of times the browser was accessed from the mobile phones, tablets and desktops, time related measures such as average DOM ready time, etc.; • Key metrics disclosing the total number of page views that were viewed using each device, Apdex score of each device, average time taken by the pages to load on the device, number of unique users who are currently accessing the device, percentage of page views with normal user experience, page views that are slow in loading and page views that have encountered JavaScript errors for each device, time related measures such as the average DOM processing time, etc. • Monitors the total number of page views of each page type, Apdex score, average time taken by the pages of this type to load completely on the browser, number of unique users who are currently accessing each page type, percentage of page views with normal user experience, page views that are slow in loading and page views that have encountered JavaScript errors for each page type, time related measures such as the average DOM processing time, etc. • Measures revealing total number of page views of each page group, Apdex score of each page group, average time taken by the pages of each group, number of unique users who are currently accessing pages of each group, percentage of page views with normal user experience, page views that are slow in loading and page views that have encountered JavaScript errors for each page group, time related measures such as the average TCP connection time, etc.; • Measures revealing total number of times pages were viewed by users from each region, Apdex score web site/web application based on the experience of users from this region, average time taken by the pages accessed by the users from this region, number of unique users who are currently accessing pages in this region, percentage of page views with normal user experience, the average front end time in this region, number of satisfied, tolerating and frustrated page views viewed by the users from this region, average DOM download time, etc.

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Others		• Metrics shed light on Apdex score of web site/web application based on the experience of users from this country, average time taken by the pages accessed by the users from this country, number of unique users who are currently accessing pages in this country, percentage of page views with normal user experience, the average front end time in this country, number of satisfied, tolerating and frustrated page views viewed by the users from this country, average DOM download time, etc.; • Statistics indicating Apdex score of web site/web application based on the experience of users from each city, average time taken by the pages accessed by the users from each city, number of unique users who are currently accessing pages in the city, percentage of page views with normal user experience, the average front end time in the country, number of satisfied, tolerating and frustrated page views viewed by the users from the city, average DOM download time, etc.;
	eG .NET Business Transaction Monitor	• Measures that point to the total number of transactions performed per second, and the number of healthy, slow, stalled, and failed transactions to the .NET application on IIS web servers.
	eG NetFlow Collector	• Monitoring Netflow records exported by Netflow-enabled devices and reporting key statistics including network traffic handled by the sources, destinations, and application/protocols.
	Atlassian Confluence	• Metrics that point to the number of requests currently being served by Confluence, the number of times the Confluence error page was served, the number of requests served, the average time taken for serving ten requests and the time taken for the database to execute the sample query; • Key statistics revealing the number of email messages queued for dispatch, the number of mail messages in error queue, the number of times the delivery of emails in the error queue was retried, whether/not the error queue is currently flushing and the percentage of mails that have been placed in the error queue; • Measures indicating the number of email messages that the mail server has tried to send, the number of emails successfully sent by the mail server and the number of mails that could not be delivered by the mail server; • Measures indicating whether/not the cache is currently flushing, whether/not Confluence is currently re-indexing, time taken during the last re-indexing, and number of tasks in the index queue;

Others	Elastic Search	- Measures indicating the current health status of the cluster, total number of shards that are currently active on cluster and total number of nodes available in cluster. - Metrics indicating the number of evictions performed in the query cache and field data cache while processing the search queries in each index. - Measures indicating the current size of the query cache and field data cache of the index and time taken for processing the search requests in the index. - Measures indicating the current health and size of each index, number of documents that were newly added and deleted to the index, time taken for performing merge, refresh and flush operations in each index. - Key metrics indicating the total number of primary shards, the number of shards in the relocating/initializing state. - Number of indexes in the normal, warning and critical states is proactively reported;
	Raspberry Pi Devices and Systems	- Metrics revealing the voltage of each hardware component; - Metrics revealing the memory of each hardware component available in that device; - Metrics revealing the temperature of the device; - Metrics revealing the clock frequency of each hardware component.
	Redis	- Metrics revealing the client related details such as client ID, Database, port number, total number of clients connected, number of clients blocked, biggest input buffer size, longest output list, channel subscriptions, pattern subscriptions, query buffer length, output buffer length and output buffer query; - Metrics revealing the cluster details such as cluster state, number of nodes in the cluster, hash slots state and number of nodes added/deleted from the cluster ; - Metrics revealing the CPU related details such as CPU usage, amount of system CPU/User CPU consumed, and total CPU time consumed; - Metrics revealing the server related details such as server connectivity and server ping check; - Metrics revealing the number of successful lookups and failed lookups of keys in database; - Key statistics revealing the number of expired keys/deleted keys, number of connections accepted/rejected by the server, - Metrics indicating the count of total inbound/outbound traffic to the server; - Metrics revealing the count of published/subscribed channels and patterns;

Others	**NVIDIA License Server**	**Operating System** • Metrics revealing the details of database connection status, security status and HTTP Authentication status ; • Metrics revealing the type of licenses available; • Metrics revealing the number of total licenses available, number of licenses used and licenses available for use; • Metrics revealing the count of Overdraft licenses, Reserved licenses and determine whether the overdraft is uncapped or not;
	Node.js	**NodeJS Engine** • Metrics revealing the Event Loop process details such as maximum/minimum/average/lag time taken to complete the Event Loop processes, total amount of time taken for Event Loop process and Event Loop tick count; • Metrics revealing the number of worker processes available in Event Loop; • Metrics revealing the number of errors and number of errors reported by working processes during Event Loop processes; **NodeJS Server** • Metrics revealing the amount of CPU utilized by System and User. • Metrics revealing the Percentage of CPU utilized by worker processes; • Metrics revealing the amount of physical memory available; • Heap related metrics such as maximum heap available, amount of heap memory used, amount of free memory available; • Metrics revealing the GC related details such as time taken for garbage collection, the number of times garbage collection occurred;
	NetScaler Web AppFlow	**Citrix Web Devices** • Metrics revealing the number of requests received, total amount of data received, average latency experienced and report the high watermark of latency on the NetScaler appliance; • Metrics indicating the number of requests and total amount of data received by the NetScaler appliance using this HTTP request method; • Metrics revealing the number of responses and total size of responses of this status sent by this NetScaler appliance; • Metrics revealing the number of requests and total amount of data received from clients running this operating system;

Others		**Citrix Web Applications**
		• Metrics revealing the number of requests to web applications that used this protocol.;
		• Metrics revealing the total amount of data used by this protocol.;
		• Metrics indicating the elapsed time between the end of a request that used this protocol and the beginning of a response from the application.;
		• Metrics indicating the elapsed time, from when the server starts to receive the first byte of a request that used this protocol until the NetScaler appliance receives the first byte to response.;
		• Metrics indicating the high watermark of server/client network latency;
		• Metrics revealing the number of requests and total amount of data received by this web application;
		Citrix Web URLs
		• Metrics revealing the number of requests and total amount of data received by this web URL;
		• Metrics indicating the elapsed time, from when the browser starts to receive the first byte of a response until the user starts to interact with the page.;
		• Metrics indicating the elapsed time, from when the browser starts to receive the first byte of a response until either all page content has been rendered or the page load action has timed out;
		Citrix Web Clients
		• Metrics revealing the number of requests received and total amount of data received from this client.;
		• Metrics revealing the latency caused by the client-side network.;
		• Metrics revealing the high watermark of client network latency.;
		• Metrics revealing the elapsed time, from when the browser starts to receive the first byte of a response until either all page content has been rendered by this client or the page load action has timed out;
		Citrix Web Servers
		• Metrics revealing the number of requests and total amount of data received by this web server.;
		• Metrics indicating the elapsed time, from when the server starts to receive the first byte of a request from the NetScaler appliance until the NetScaler appliance receives the first byte to response;
		• Metrics indicating the average latency caused by the server network;

Others	**Citrix NetScaler HDX Insight**	• License usage metrics such as the number of SSL VPN licenses configured, number/percentage of licenses currently utilized, etc. • Measures that indicate the number of user sessions that are currently active across all virtual desktops, number and percentage of new logins and number of sessions that were logged out. • Metrics revealing average rate at which data is transferred over the ICA sessions, number of unique users and number of sessions. • Key statistics revealing number of desktop sessions currently launched by each user, average latency experienced by each user due to problems with client and server-side networks, screen lag experienced by this user, etc.; • The average latency experienced by each session caused by the NetScaler appliance when ICA traffic flown from server network to client network and vice versa, host delay, etc.; • Key metrics revealing the number of instances/sessions of each application that are currently launched, time taken to launch each application etc.; • Measures such as the rate at which data is transferred over the virtual channel, the total number of unique user sessions handled, and unique applicants launched by the NetScaler appliance etc.; • Metrics that reveal the number of user sessions that are currently active across all XenApp servers, number and percentage of new logins and number of sessions that were logged out. • Metrics revealing the number of applications launched by each user, screen lag experienced by the user while interacting with an application on XenApp, screen lag time of the user smoothed over the client and server-side connections, etc.; • Measures indicating how many times in each session the client and server advertised a zero TCP window, how many times the retransmit timeout got invoked in the session on the client and server-side connections, etc.; • The rate at which data is transferred over the ICA sessions launched from each device type that interacts with the applications/virtual desktops.

DevOps	Ansible Tower	**Ansible Resource Layer** • Metrics revealing the number of hosts that are performing the jobs successfully; • Statistics revealing the number of hosts that are successfully performing the jobs and the number of hosts that failed to perform the jobs; • Metrics revealing the job-related details such as jobs health, total number of jobs launched on the tower; number of jobs that are completed successfully, number of jobs that failed on the tower; • Metrics revealing the number of project sync failures and inventory syn failures; • Measures revealing the number of hosts and groups failed during launching the jobs using each job template; • Measures revealing the number of hosts and groups associated with each job template; **Ansible Access Layer** • Metrics indicating the total number of users in this organization; • Metrics indicating the total number of teams and admin users in this organization; • Metrics indicating the total number of inventories, projects and job templates available in this organization;
	Jenkins	• Metrics revealing the status of each job available on the server. • Performance metrics pertaining to the server such as the number of active jobs, failed jobs and successful jobs; • Key metrics such as the percentage of jobs that were aborted, corrupted, skipped, etc.; • Key metrics revealing the current state of the node and the I/O activity of each node; • Key metrics revealing the clock difference and response time; • Measures revealing the details about memory utilized by each node; • Metrics revealing the job status and elapsed time details;
	Bitbucket	**Bitbucket Repository** • Metrics revealing the number of branches created in the repository ; • Metrics revealing the number of issues that are still unresolved in the repository; • Metrics revealing the number of number of pull requests made to this repository; • Metrics revealing the size of the repository; • Metrics revealing the number of users who can watch the activities performed in this repository; • Metrics revealing the number of forks available in this repository;

DevOps	**Jenkins**	**Jenkins** • Metrics revealing the job-related details such as job status, job stability and job execution time ; • Metrics revealing the number of times the job has failed to execute, time taken for completing a job and time taken by the last job for execution; • Metrics revealing the node status, amount of free space available in node and time taken for response;
	Jira Cloud	**Jira** • Metrics revealing the total number of issues available for the project and the number of opened/unassigned/recently created issues available for the project ; • Metrics revealing the number of issues reported in last 60 minutes, number of issues that are in due for 24 hours and number of issues that are in critical state for the last 30 minutes; • Metrics revealing the Active Sprints state such as the number of projects available in To- do state/InProgress state/Done state; • Metrics revealing the total issues, critical issues and elapsed time of the project; • Metrics revealing the Jira SLAs state such as the number of SLAs that are running/ exceeded/ paused and completed;
	JIRA On-Premise	**Jira** • Metrics revealing the total number of issues available for the project and the number of opened/unassigned/recently created issues available for the project ; • Metrics revealing the number of issues reported in last 60 minutes, number of issues that are in due for 24 hours and number of issues that are in critical state for the last 30 minutes; • Metrics revealing the Active Sprints state such as the number of projects available in To- do state/InProgress state/Done state; • Metrics revealing the total issues, critical issues and elapsed time of the project; • Metrics revealing the Jira SLAs state such as the number of SLAs that are running/ exceeded/ paused and completed; **Jira JMX** • Metrics revealing the Jira Entities related details such as the number of issues occurred for the project, number of users/groups created, number of components available, number of filters/attachments and custom fields available in that project;