eG Total Performance Visibility

Monitoring Sybase Adaptive servers

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Table of contents

Table of Figures

1

Introduction

Adaptive Server Enterprise (ASE) is a performance-optimized relational database management system that is ideally suited for online transaction processing (OLTP) and decision support systems (DSS).

Figure 1.1 depicts the components of a typical ASE.

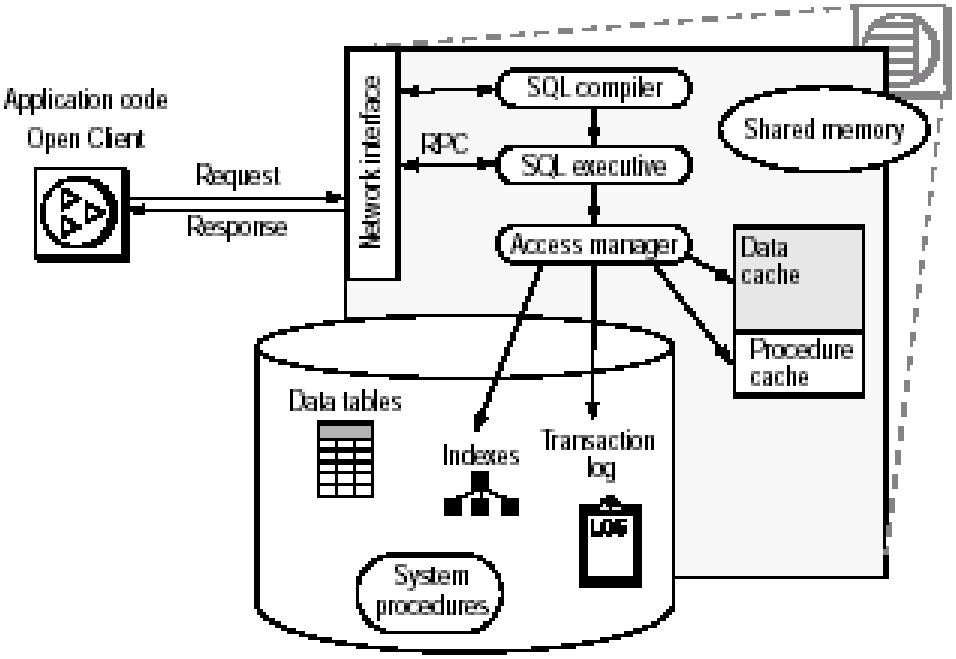


Figure 1.1: Architecture of ASE

The components include Data Tables, Transaction log, System procedures, SQL compiler, SQL Executive, Access manager, Shared Memory, Data Caches, Network Interface etc. A monitor server also comes along with an ASE. The architecture of the monitor server is shown in Figure 1.2. As the communication between the adaptive server and monitor server happens through a shared memory, the monitor server has to reside on the same machine as the adaptive server. The monitor server communicates with the adaptive server and keeps track of all performance monitoring data. It also maintains all the counters.

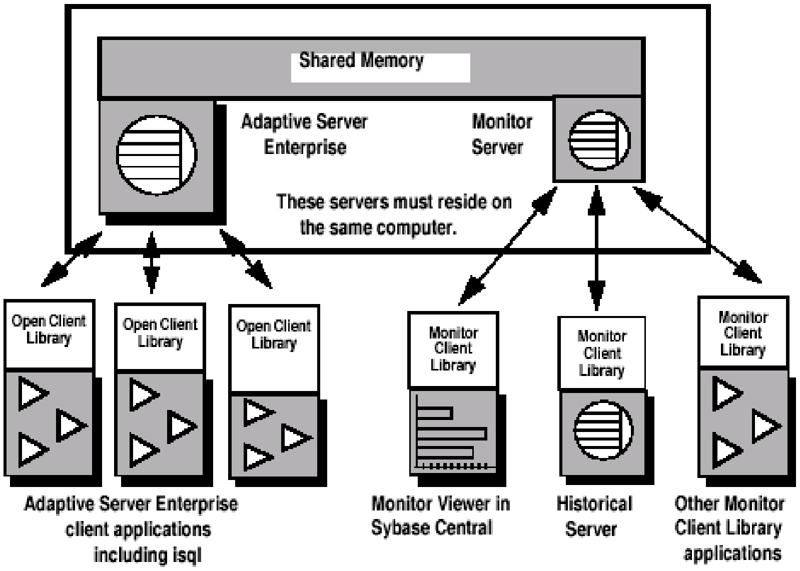

Shared Memory
Adaptive Server Enterprise
Monitor Server
These servers must reside on the same computer.
Open Client Library
Open Client Library
Open Client Library
Monitor Client Library
Monitor Client Library
Monitor Client Library
Adaptive Server Enterprise client applications including isql
Monitor Viewer in Sybase Central
Historical Server
Other Monitor Client Library applications

Figure 1.2: Architecture of the Monitor server

Starting in ASE 12.5.0.3, a new feature called ‘MDA tables’ is available to ASE users. These MDA tables provide access to low-level monitoring information in ASE; since the MDA tables can be accessed with regular SQL select statements, they are much easier to use than products like Monitor Server/Historical Server.

eG Enterprise supports two distinct approaches to monitoring the Sybase ASE - while one approach involves the usage of the Monitor Client Library (see Figure 1.2) for obtaining the metrics of interest, the other mandates the use of the MDA tables installed on the Sybase ASE.

The sections that follow will discuss each of these models in great detail.

2

Configuring a Sybase Adaptive Server Using the Monitor Client Library

In order to extract performance data from a Sybase server using the Monitor Client Library, eG Enterprise provides the Sybase monitoring model. This section discusses how to use the Sybase monitoring model.

2.1 Configuring a Sybase Adaptive Server on Unix

To configure the Sybase Adaptive server for monitoring by an eG agent, you can use either the **setup_agent** command or the **setup_sybase.sh** command. Both these commands are available in the **/opt/egurkha/bin** directory.

The **setup_agent** command is primarily used to configure the eG agent. The Sybase Adaptive server configuration is a part of this process.

To configure the Sybase Adaptive server after configuring the agent, do the following:

1. At the command prompt, move to the **/opt/egurkha/bin** directory and run the **setup_ sybase.sh** command.

2. Upon execution, the command will request for the following inputs:

    - The IP address of the host on which the Sybase server has been installed
    - The port at which the Sybase server listens
    - The password of the Sybase administrative user (who holds the “sa_role” privilege).

    ```
    Please enter the details of the Sybase Adaptive server which is running on this machine.

    IP address: 192.168.10.88
    Port number: 4100
    Password for sa login:
    ```

3. By default, the eG Sybase Monitor extracts the measures of interest by executing stored procedures on the 'master' database on the Sybase server. If, for some reason, you decide not to use the 'master' database, then you can create a special database for this purpose using this setup procedure. To achieve this, first, type **y** when setup prompts you for your confirmation to create a new database.

    ```
    Do you want to create a new database to store eG System Procedures and Tables? [y/n]: y
    ```

4. If you press **y** at step 2, you will be prompted for the new database name:

   ```
   Please enter the new Database name: john
   ```

   After you specify the name of the new database, setup will lead you step 4 where the special database user is to be created.

   On the other hand, if you press **n** at step 2 above, it means that you will be using the default 'master' database. In which case again, you will be lead to step 4 where a new database user is to be created.

5. eG Enterprise requires a special Sybase database user account for monitoring a Sybase server. This user should possess the “sa_role” privilege and the “sybase_ts_role” privilege. Setup will now request your confirmation for creating this user account.

   ```
   To monitor a Sybase Adaptive server, the eG Agent requires a user account with the sa_
   role and sybase_ts_role privilege.
   ```

   ```
   Do you want me to create a user with sa_role and sa_ts_role privilege in the database?
   [y/n]:y
   ```

   Enter **y** to proceed with the new user creation, or **n** if you do not wish to create a new database user.

6. If you enter **y** in step 2, you will be required to provide the following inputs:

   ```
   User: john
   ```

   ```
   Password: ****
   ```

   ```
   Retype Password: ****
   ```

   Specify the name of the new user and his/her password in the space provided. Also, confirm the password by retyping it.

7. Once user creation is successful, the following message will appear:

   ```
   The user has been created successfully in the database.
   ```

   ```
   Please use this user name and password to configure the Sybase related tests using the
   eG Admin UI.
   ```

8. The **/opt/egurkha/lib** directory (in Windows, this will be **<EG_INSTALL_DIR>/lib** directory) in an agent host, consists of a file named **sybmon.sql**. This file comprises of 3 stored procedures, namely: **sp_egmonitor, sp_eglockdetails, sp_egmonitor_dd**. When these procedures are executed on the Sybase server, they enable the Sybase-specific tests to collect the required measures from the server.

   Towards this end, the setup will now perform the following tasks:

   - Pick the three procedures from the **/opt/egurkha/lib** directory
   - Log into the Sybase server using the sa login password provided earlier
   - Install the procedures on the Sybase server

   The following messages indicate the installation attempts:

   ```
   Installing the procedure sp_egmonitor. . .
   ```

   ```
   Granting permissions. .
   ```

```

Installing the procedure sp_eglockdetails. . .
Granting permissions. .

Installing the procedure sp_egmonitor_dd...
Granting permissions. .
```

9. Once all the three procedures are successfully installed, setup will display the following message:

```
Installation has succeeded
```

10. Subsequently, when the Sybase related tests are configured (using the special user's name and password) and executed, the tests in turn, will run the installed procedures on the Sybase server, and collect the necessary statistics.

2.2 Configuring a Sybase Adaptive Server on Windows

In Windows environments, eG provides a special Sybase configuration tool. To execute the tool, follow the menu sequence depicted by Figure 2.1.

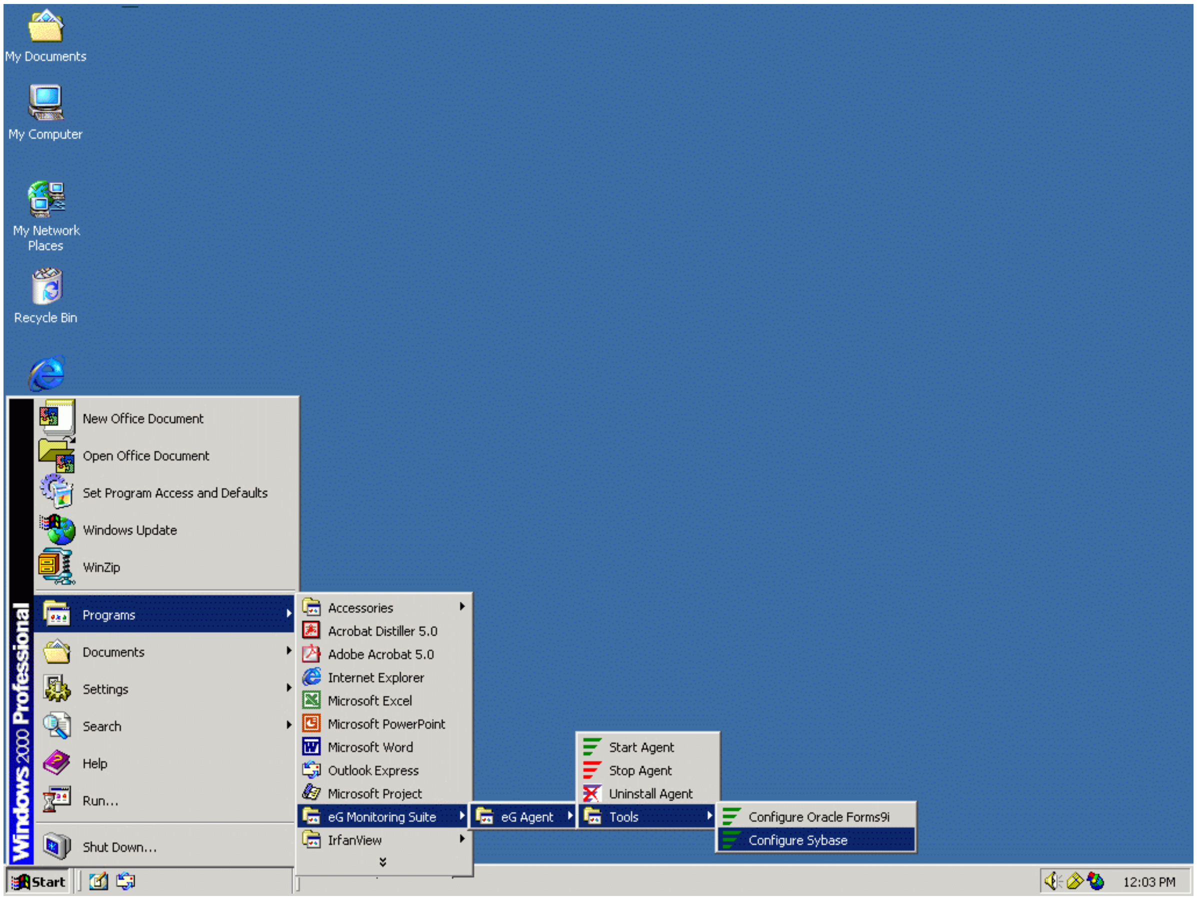


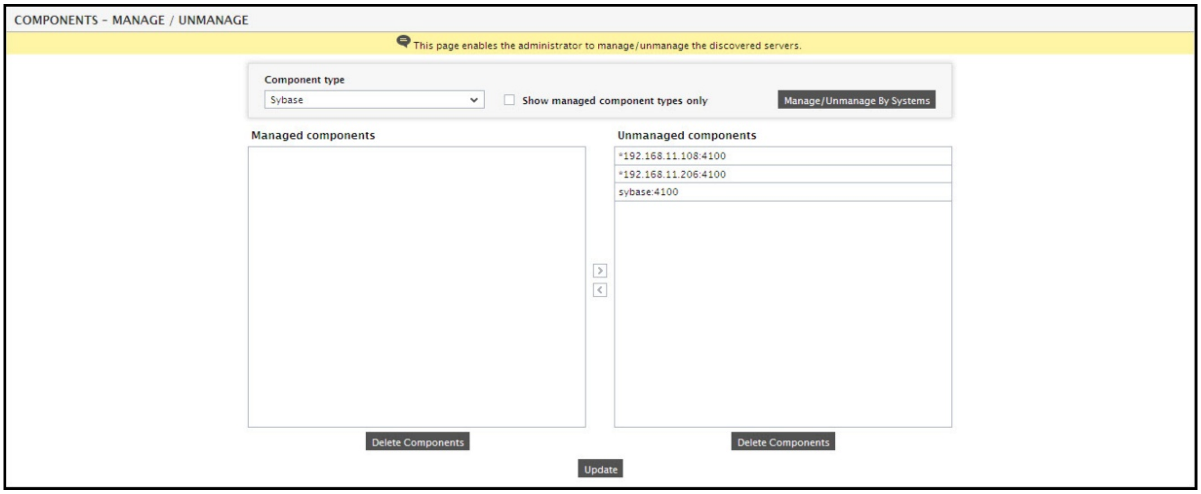
Figure 2.1: Configuring the Sybase Adaptive server

Once the configuration process begins, follow steps 2-9 of Section Section **2.1**.

3

Administering the eG Manager to monitor the Sybase Server

1. Login to the eG administrative interface as an administrator (admin).
2. Check whether the Sybase server has been auto-discovered. If not, run discovery using the **DISCOVERY** page (Infrastructure -> Components -> Discover) or manually add the Sybase server using the **ADD/MODIFY COMPONENTS** page (Infrastructure -> Components -> Add/Modify). The eG Enterprise system automatically manages the manually added components.
3. The discovered components however, need to go through a manual management exercise, using the **COMPONENTS - MANAGE/UNMANAGE** page (Infrastructure -> Components -> Manage/Unmanage). This process is depicted by Figure 3.1 and Figure 3.2 below.



COMPONENTS - MANAGE / UNMANAGE

This page enables the administrator to manage/unmanage the discovered servers.

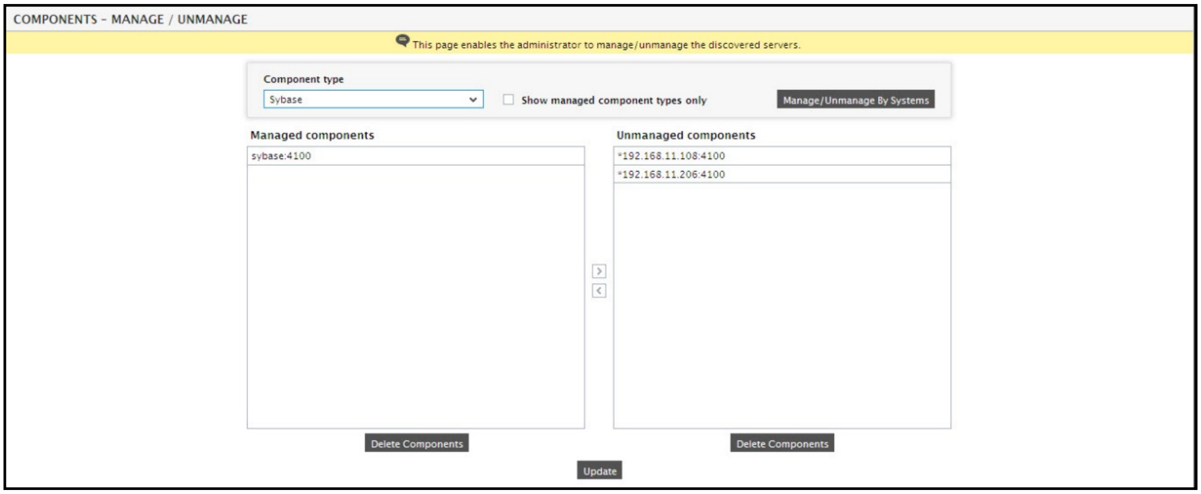
Component type: Sybase

□ Show managed component types only

Managed components

Unmanaged components:
*192.168.11.108:4100
*192.168.11.206:4100
sybase:4100

Figure 3.1: Viewing the list of unmanaged Sybase Adaptive servers



COMPONENTS - MANAGE / UNMANAGE

This page enables the administrator to manage/unmanage the discovered servers.

Component type: Sybase

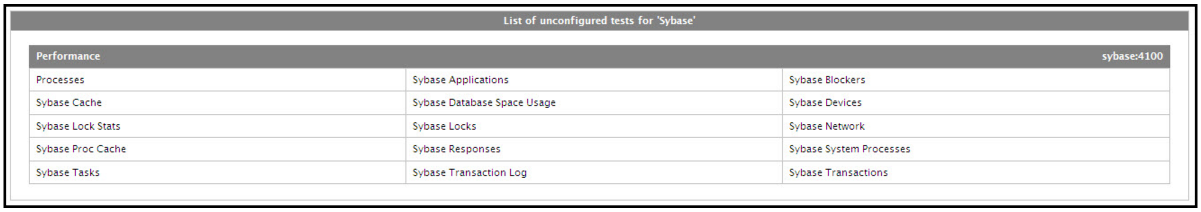
□ Show managed component types only

Managed components: sybase:4100

Unmanaged components: *192.168.11.108:4100, *192.168.11.206:4100

Figure 3.2: Managing a Sybase server

4. Now, if you try to sign out of the user interface, you will be prompted to configure a series of tests for the managed Sybase server (see Figure 3.3).



List of unconfigured tests for 'Sybase'

Performance		sybase:4100
Processes	Sybase Applications	Sybase Blockers
Sybase Cache	Sybase Database Space Usage	Sybase Devices
Sybase Lock Stats	Sybase Locks	Sybase Network
Sybase Proc Cache	Sybase Responses	Sybase System Processes
Sybase Tasks	Sybase Transaction Log	Sybase Transactions

Figure 3.3: A table displaying the List of Unconfigured Tests for the Sybase server

5. Click on **Sybase Responses** test to configure it. To knoe how to configure this test, click here.
6. Finally, sign out of the eG administrative interface.

4

Monitoring Sybase Using the Monitor Client Library

In order to extract performance data from a Sybase server using the Monitor Client Library, eG Enterprise provides the Sybase monitoring model (see Figure 4.1).

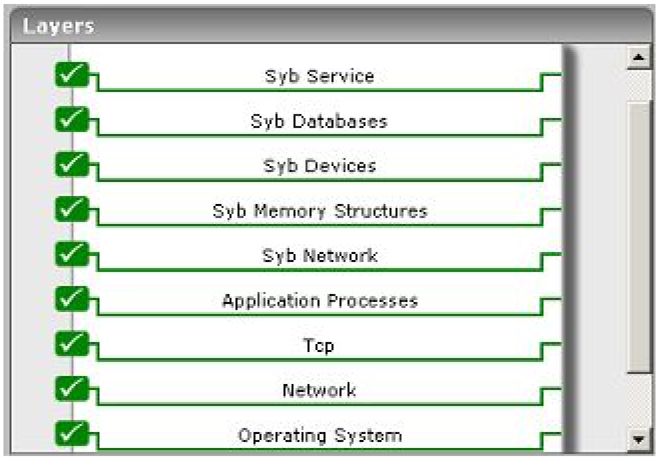


Figure 4.1: Layer model for Sybase Adaptive Server

Every layer of Figure 4.1 is associated with a series of tests, which when executed on the Sybase Adaptive server, extract a wealth of performance metrics from the server. These statistics in turn enable administrators to quickly figure out the following:

- Is the Sybase server available? If so, does it respond to requests quickly?
- Is the Sybase server overloaded?
- Is the I/O activity on the server optimal?
- How many locks are currently active on the database? Have the locks been held for an unusually long time? Do applications have to wait for too long to acquire a lock?
- Are there too many deadlocks on the database?
- Are the Sybase data and procedure caches been effectively utilized?
- Is sufficient space available for all Sybase databases? Should more space be allocated to any specific database?
- Are transactions rolled back frequently?
- Are there too many root blocker processes on the database?
- Which is the busiest program/application executing on the Sybase database in terms of number of open connections to it? Is any application consuming the CPU resources excessively?

The sections to come discuss each of the top 5 layers of Figure 4.1 elaborately, as the remaining layers have been dealt with in the *Monitoring Unix and Windows Servers* document.

4.1 The Syb Network Layer

This layer tracks the health of the network(s) that connect users to the adaptive server. Figure 4.2 depicts the tests mapping to this layer.

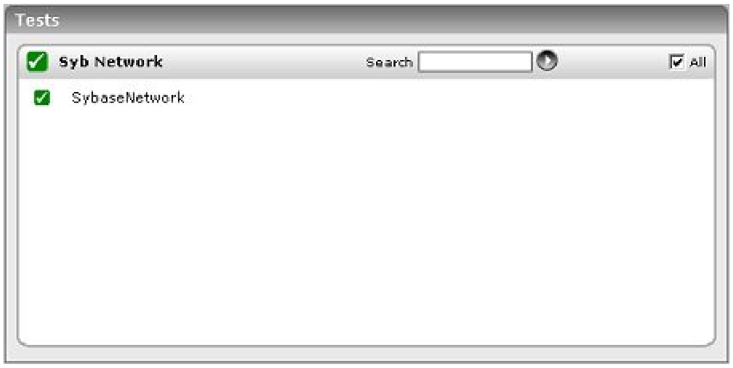


Figure 4.2: Tests mapping to the Syb Network layer

4.1.1 Sybase Network Test

This test, executed by an internal agent, tracks various statistics pertaining to network traffic of the Sybase Adaptive Server.

Target of the test : A Sybase adaptive server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every Sybase server being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – A Sybase user who has the “sa_role” and “sybase_ts_role”.
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.

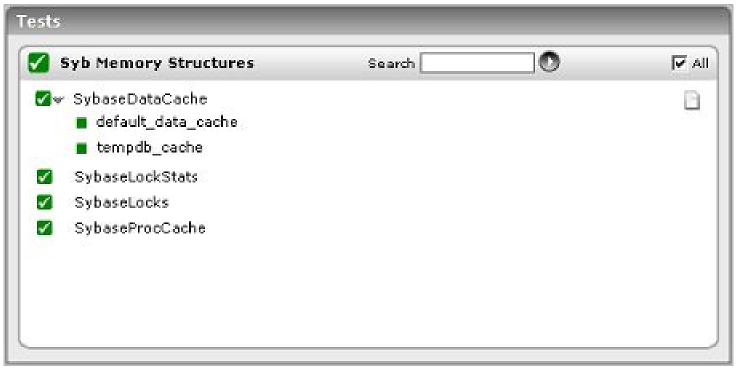
Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
I/O requests:	The total number of packets received and sent per second	Pkts/Sec	
I/O delays:	The percentage of times network I/O was delayed	Percent	A non-zero value over a period of time indicates a problem.
Receive rate:	Reports the rate at which the network bytes are being received.	KBytes/Sec	This measure indicates the amount of data coming to the database server through the network. A high value of this measure indicates higher rate of incoming data to the server. If this measure is considerably high, the value of the default network packet size parameter should be increased.
Send rate:	Reports the rate at which the network bytes are being sent.	KBytes/Sec	This measure indicates the amount of data going out of the database server through the network. A high value of this measure indicates higher rate of outgoing data from the server. If this measure is considerably high, the value of the default network packet size parameter should be increased.
Avg packet size:	The average number of bytes sent per packet	Bytes	If the Adaptive server receives a command that is larger than the packet size, the server waits to begin processing until it receives the full command. Therefore, commands that require more than one packet are slower to execute and take up more I/O resources. If the average bytes per packet is near the default packet size configured for your server, you may want to configure larger packet sizes for some connections. You can configure the network packet size for all

Measurement	Description	Measurement Unit	Interpretation
			connections or allow certain connections to log in using larger packet sizes.

4.2 The Syb Memory Structures Layer

This layer tracks the status of the locks, deadlocks, and database caches. The tests associated with this layer are depicted in Figure 4.3.


Tests

☑ Syb Memory Structures

Search

☑ All

☑ SybaseDataCache
🟩 default_data_cache

🟩 tempdb_cache

☑ SybaseLockStats

☑ SybaseLocks

☑ SybaseProcCache

Figure 4.3: Tests mapping to the Syb Memory Structures layer

4.2.1 Sybase Locks Test

This test, executed by an internal agent, tracks the statistics pertaining to the lock and deadlock traffic of Sybase Adaptive Server. Locking affects the performance of the Sybase adaptive server by limiting the concurrency. An increase in the number of simultaneous users to a server may increase the lock contention thereby decreasing the performance of the server (as one process may have to wait for another process to release its lock, thereby affecting the response time and throughput). Deadlocks cause more severe damage. A deadlock causes one transaction to be aborted and transaction must be restarted by the application. If a deadlock occurs very often, it severely affects the throughput of the application.

Target of the test : A Sybase adaptive server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every Sybase server being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server

3. **PORT** – The port on which the server is listening
4. **USER** – A Sybase user who has the "sa_role".
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **DETAILED DIAGNOSIS** – To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

   The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

   - The eG manager license should allow the detailed diagnosis capability
   - Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Lock requests:	The average number of lock requests per second	Locks/sec	A high value indicates that there is high locking activity in the system and may need close scrutiny for the type of locks being requested. The detailed diagnosis for this measure provides a listing of locks requests for each lock type.
Lock waits:	The average number of times there was lock contention	Waits/sec	A high value of waits can have an adverse impact on application performance. Possible reasons for this behavior could be: • Inadequate number of locks available in the database • Unusually high locking behavior of applications accessing the database • Improper database application design, etc. The detailed diagnosis for this measure provides a listing of waited number of

Measurement	Description	Measurement Unit	Interpretation
			locks for each lock type.
Avg lock wait time:	The average amount of wait time for each lock request that resulted in a wait	Secs	A high value may indicate that there is contention for locks in the system. When the average wait time for locks is high, users may have to wait for their transactions to complete.
Lock timeouts:	The number of times a task was waiting for a lock and the transaction was rolled back due to a session-level or server-level lock timeout	Timeouts/Sec	Lock timeouts can be useful for removing tasks that acquire some locks, and then wait for long periods of time blocking other users. The detailed diagnosis for this measure provides a listing of lock timeouts for each lock type.
Deadlocks:	The average number of deadlocks found in the lock requests	Number	A deadlock may arise due to various situations including bad design of queries and deficient coding practices. A deadlock is a situation where both/all the lock requestors are in a mutual or a multi- way tie. Any deadlocks are detrimental to database application performance. The detailed diagnosis for this measure provides a listing of number of dead locks for each lock type.

4.2.2 Sybase Lock Stats Test

A Sybase server provides data concurrency and integrity between transactions using locking mechanisms. The locking activity of a database server must be monitored carefully because an application holding a specific lock for a long time could cause a number of other transactions relying on the same lock to fail. The SybaseLockStats test monitors the locking activity on a database server instance.

Target of the test : A Sybase adaptive server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every Sybase instance monitored.

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – A Sybase user who has the "sa_role".
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **DETAILED DIAGNOSIS** – To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

   The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

   - The eG manager license should allow the detailed diagnosis capability
   - Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Locks:	Gives the total number of locks that are held.	Number	A high value may indicate one of the following: a. Too many transactions happening b. Locked resources not being released properly c. Locks are being held unnecessarily.
Avg block time due to locks:	Indicates the average time for which a process is blocked	Secs	A high value may indicate one of the following: a. Locked resources not being released properly b. Locks are being held unnecessarily. The detailed diagnosis of this measure,

Measurement	Description	Measurement Unit	Interpretation
			if enabled, provides the complete information (i.e. duration for which the lock was held, the object that was locked, the type of lock held, etc.) pertaining to the locks that are being held currently.

4.2.3 Sybase Cache Test

This test reports the statistics pertaining to the default data cache and for all the named caches configured in a Sybase database server.

Target of the test : A Sybase adaptive server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for the default cache and every named cache being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server.
3. **PORT** – The port on which the server is listening.
4. **USER** – A Sybase user who has the “sa_role”.
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **DETAILED DIAGNOSIS** – To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

   The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

   - The eG manager license should allow the detailed diagnosis capability
   - Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Cache utilization:	The number of searches using this cache as a percentage of searches across all caches.	Percent	Compare this value for each cache to determine if there are caches that are over or under-utilized. If you decide that a cache is not well utilized, you can • Change the cache bindings to balance utilization • Resize the cache to correspond more appropriately to its utilization
Cache hit ratio:	The percentage of times that a required page was found in the data cache.	Percent	A low value indicates that the cache may be too small for the current application load.
Spinlock contention:	The number of times an engine encountered spinlock contention on the cache, and had to wait, as a percentage of the total spinlock requests for that cache.	Percent	If spinlock contention is more than 10%, consider using named caches or adding cache partitions.
Buffers grabbed:	The average number of times that Adaptive Server fetched a buffer from the LRU end of the cache, replacing a database page.	Buffers/Sec	The detailed diagnosis of this measure, if enabled, reports the buffers grabbed for each configured memory pool. If this value is high in some pools and low in other pools, you might want to move space from the less active pool to the more active pool, especially if it can improve the cache-hit ratio.
Dirty buffers grabbed:	The average number of times that fetching a buffer found a dirty page at the LRU end of the cache and had to wait while the buffer was written to disk.	Buffers/Sec	A nonzero value indicates that the wash area of the pool is too small for the throughput in the pool. The detailed diagnosis of this measure, if enabled, reports the dirty buffers grabbed for each configured memory pool.

Measurement	Description	Measurement Unit	Interpretation
Large I/Os denied:	The number of large I/O requests denied as a percentage of the total number of requests made	Percent	Large I/O requests are denied due to the following reasons: • If any page in a buffer already resides in another pool. • When there are no buffers available in the requested pool. • On the first extent of an allocation unit, since it contains the allocation page, which is always read into the 2K pool. If a high percentage of large I/Os were denied, it indicates that the use of the large pools might not be as effective as it could be.
Large I/O effectiveness:	The total number of pages that were used after being brought into cache by large I/O	Percent	A low value indicates that only few of the pages brought into cache are being accessed by queries.

4.2.4 Sybase Proc Cache Test

The SybaseProcCache test reports the procedure cache statistics of a Sybase database server.

Target of the test : A Sybase adaptive server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every Sybase server being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server.
3. **PORT** – The port on which the server is listening.
4. **USER** – A Sybase user who has the “sa_role”.
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Procedure requests:	The number of times stored procedures were executed	Trans/Sec	
Disk reads:	The number of times that stored procedures were read from disk rather than found and copied in the procedure cache	Reads/Sec	If this value is consistently high, increase the procedure cache size.
Cache hit ratio:	Percentage of procedure requests served from cache	Percent	If this value is low, consider increasing procedure cache memory or add more memory to the server.
Procedures created:	The number of procedures created during the sample interval	Procedures/Sec	
Procedures aged out of cache:	The number of times that a procedure aged out of cache	Procedures/Sec	

4.3 The Syb Devices Layer

This layer tracks the health of the devices in a database. Figure 4.4 shows the tests that correspond to this layer.

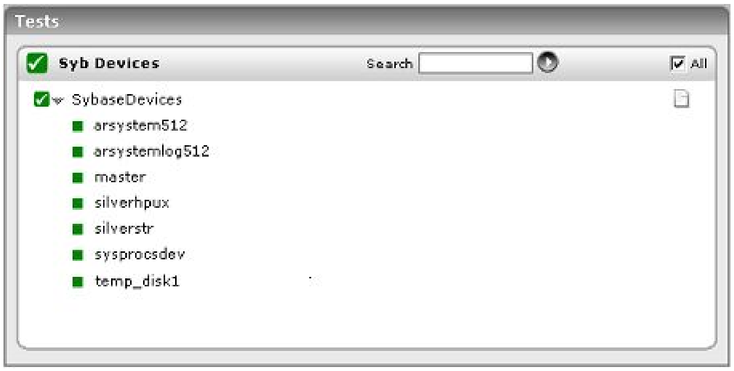


Figure 4.4: Tests mapping to the Syb Devices layer

4.3.1 Sybase Devices Test

This test, executed by an internal agent, tracks statistics pertaining to the devices of the Sybase adaptive server.

Target of the test : A Sybase adaptive server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every Sybase server being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server.
3. **PORT** – The port on which the server is listening.
4. **USER** – A Sybase user who has the "sa_role".
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
I/O requests:	The average number of IO requests for a device	IOs/Sec	
Physical reads:	The average number of reads performed on a device	Reads/Sec	
Physical writes:	The average number of writes performed on a device	Writes/Sec	
I/O errors:	The percentage of times there was an error in IO requests	Percent	
I/O waits:	The percentage of times the semaphore was busy and	Percent	When Adaptive Server needs to perform a disk I/O, it gives the task the

Measurement	Description	Measurement Unit	Interpretation
	the IO operation had to wait for the semaphore to be released		semaphore for that device in order to acquire a block I/O structure. On SMP systems, multiple engines can try to post I/Os to the same device simultaneously. This creates contention for that semaphore, especially if there are hot devices or if the data is not well distributed across devices. A large value could indicate a semaphore contention issue. One solution might be to redistribute the data on the physical devices.

4.4 The Syb Databases Layer

Using the SybaseDatabaseSpaceUsage test associated with it, the **Syb Databases** layer monitors the space usage of ech of the databases on the Sybase Adaptive server, and reports whether any database is experiencing excessive space usage or insufficient space allocation.

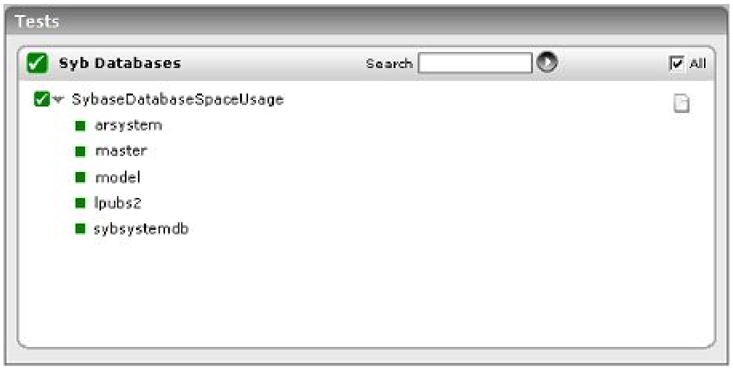


Figure 4.5: The tests associated with the Syb Databases layer

4.4.1 Sybase Database Space Usage Test

This test reports the space usage of all Sybase databases.

Target of the test : A Sybase adaptive server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every database being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server.
3. **PORT** – The port on which the server is listening.
4. **USER** – A Sybase user who has the "sa_role".
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **INCLUDE DB** - Specify a comma-separated list of databases that you wish to monitor in the **INCLUDE DB** text box. By default, this is set to all.
8. **EXCLUDE DB** - Specify a comma-separated list of databases that you wish to exclude from the scope of monitoring in the **EXCLUDE DB** text box. By default, this is set to none.

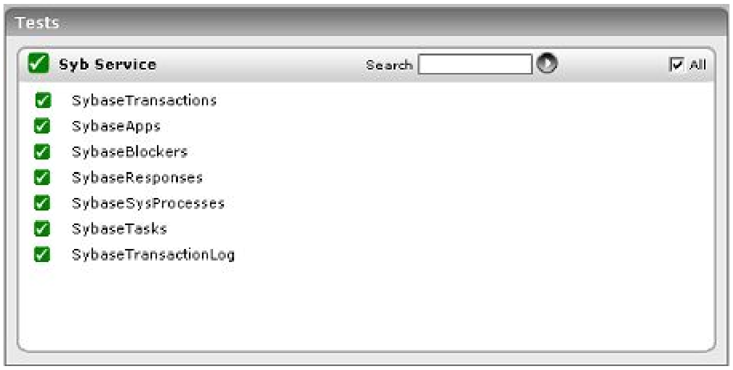
Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Total size:	The space allocated to a database	MB	
Reserved space percent:	The percentage of space reserved for tables and indexes of a database	Percent	If the value of this measure reaches 100%, it indicates that the total space in the database has been completely allocated. New tables/indexes can be added to the database, only if its total size is increased.
Reserved space:	The amount of space allocated to the tables and indexes created on a database	MB	If the value of this measure becomes equal to that of the *Total size* measure, new tables/indexes can no longer be created on the database. To create new tables, you must increase the database size.
Data space:	The amount of space used by data	MB	
Index space:	The amount of space used by indexes	MB	
Unused space:	The amount of free	MB	

Measurement	Description	Measurement Unit	Interpretation
	space available in the database		

4.4.2 The Syb Service Layer

This layer tracks the health of the database server by looking into how the database is responding to the applications. The tests associated with this layer are shown in Figure 4.6.



☑ SybaseTransactions
☑ SybaseApps
☑ SybaseBlockers
☑ SybaseResponses
☑ SybaseSysProcesses
☑ SybaseTasks
☑ SybaseTransactionLog

Figure 4.6: Tests mapping to the Syb Service layer

4.4.3 Sybase System Processes Test

This test reports details about the system processes running in a Sybase database server.

Target of the test : A Sybase adaptive server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every Sybase server being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – A Sybase user who has the “sa_role”.
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **DETAILED DIAGNOSIS** – To make diagnosis more efficient and accurate, the eG Enterprise suite

embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

- The eG manager license should allow the detailed diagnosis capability
- Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Sybase processes:	The total number of Sybase processes	Number	
Background processes:	The total number of background processes run by the Adaptive Server rather than by a user process	Number	The detailed diagnosis of this measure, if enabled, provides the details pertaining to the background processes currently executing.
Running processes:	The total number of running processes	Number	The detailed diagnosis of this measure, if enabled, provides details such as the ID of the running processes, the user executing each of the processes, the database on which every process is executing etc.
Sleeping processes:	The total number of sleeping processes	Number	The detailed diagnosis of this measure, if enabled, provides details such as the ID of the sleeping processes, the user executing each of the processes, the database on which every process is executing, the sleep status, sleep time etc.
Infected processes:	The total number of processes in which the server has detected a	Number	The detailed diagnosis of this measure, if enabled, provides the ID of the

Measurement	Description	Measurement Unit	Interpretation
	serious error condition		infected processes, the user executing each of the processes, and the database on which every process is executing. This information enables the user to isolate the specific queries that are infected. Further analysis of these queries can be performed, in order to figure out the reason for the infection and take adequate measures to prevent it from recurring.
Blocked processes:	If a process attempts to access a resource that is already in use by another process, then such a process will be blocked until such time that the other process releases the resource. This measures indicates the total number of blocked processes.	Number	The detailed diagnosis of this measure, if enabled, reveals information such as the ID of the blocked processes, the user executing each of the processes, the database on which every process is executing, the waiting time of the blocked process, etc.

4.4.4 Sybase Responses Test

This test, executed by an internal agent, tracks the statistics pertaining to the availability and response time of the Sybase adaptive server.

Target of the test : A Sybase adaptive server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every Sybase server being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – A Sybase user who has the “sa_role”.
5. **PASSWORD** – The password corresponding to the above user

6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **QUERY** – By default, this parameter is set to *select * from sysobjects*. The test executes this executes the default query to report the availability and responsiveness of the server. If the user configured for this test does not have the right to execute the default query, then the **QUERY** parameter can be overridden with a query that user has permission to execute.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Sybase server availability:	Indicates if the database instance is responding to requests or not.	Percent	A value of 100 for this measure indicates that the database is responding to a request. On the other hand, a value of 0 denotes that the database is not responding. Availability problems may be caused by a misconfiguration/malfunctioning of the database instance, or because the instance is using an invalid user account. Besides the above, this measure will report that the server is unavailable even if a connection to the database instance is unavailable, or if a query to the database fails. In this case, you can check the values of the DB connection availability and Query processor availability measures to know what is exactly causing the database instance to not respond to requests - is it owing to a connection unavailability? or is it due to a query failure?
Total response time :	Indicates the time taken by the database server to respond to a user query. This is the sum total of the connection time and query execution time.	Secs	A sudden increase in response time is indicative of a potential performance bottleneck on the database server.
DB connection availability:	Indicates whether the database connection is	Percent	If this measure reports the value 100 , it indicates that the database connection is

Measurement	Description	Measurement Unit	Interpretation
	available or not.		unavailable. The value 0 on the other hand indicates that the database connection is unavailable. A connection to the database may be unavailable if the database is down or if the database is listening on a port other than the one configured for it in the eG manager. If the Availability measure reports the value 0, then, you can check the value of this measure to determine whether/not it is due to the unavailability of a connection to the server.
	Query processor availability: Indicates whether the database query is executed successfully or not.	Percent	If this measure reports the value 100, it indicates that the query executed successfully. The value 0 on the other hand indicates that the query failed. In the event that the Availability measure reports the value 0, check the value of this measure to figure out whether the failed query is the reason why that measure reported a server unavailability.
Connection time to database server:	Indicates the time taken by the database connection.	Secs	A high value could indicate a connection bottleneck. Whenever the Response time of the measure soars, you may want to check the value of this measure to determine whether a connection latency is causing the poor responsiveness of the server.
Query execution time:	Indicates the time taken for query execution.	Secs	A high value could indicate that one/more queries to the database are taking too long to execute. Inefficient/badly designed queries to the database often run for long periods. If the value of this measure is higher than that of the Connection time measure, you can be rest assured that long running queries are the ones causing the responsiveness of the server to suffer.

Measurement	Description	Measurement Unit	Interpretation
Records fetched:	Indicates the number of records fetched from the database.	Number	The value 0 indicates that no records are fetched from the database

4.4.5 Sybase System Processes Test

This test reports details about the system processes running in a Sybase database server.

Target of the test : A Sybase adaptive server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every Sybase server being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – A Sybase user who has the “sa_role”.
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **DETAILED DIAGNOSIS** – To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

   The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

   - The eG manager license should allow the detailed diagnosis capability
   - Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Sybase processes:	The total number of Sybase processes	Number	
Background processes:	The total number of background processes run by the Adaptive Server rather than by a user process	Number	The detailed diagnosis of this measure, if enabled, provides the details pertaining to the background processes currently executing.
Running processes:	The total number of running processes	Number	The detailed diagnosis of this measure, if enabled, provides details such as the ID of the running processes, the user executing each of the processes, the database on which every process is executing etc.
Sleeping processes:	The total number of sleeping processes	Number	The detailed diagnosis of this measure, if enabled, provides details such as the ID of the sleeping processes, the user executing each of the processes, the database on which every process is executing, the sleep status, sleep time etc.
Infected processes:	The total number of processes in which the server has detected a serious error condition	Number	The detailed diagnosis of this measure, if enabled, provides the ID of the infected processes, the user executing each of the processes, and the database on which every process is executing. This information enables the user to isolate the specific queries that are infected. Further analysis of these queries can be performed, in order to figure out the reason for the infection and take adequate measures to prevent it from recurring.

Measurement	Description	Measurement Unit	Interpretation
Blocked processes:	If a process attempts to access a resource that is already in use by another process, then such a process will be blocked until such time that the other process releases the resource. This measures indicates the total number of blocked processes.	Number	The detailed diagnosis of this measure, if enabled, reveals information such as the ID of the blocked processes, the user executing each of the processes, the database on which every process is executing, the waiting time of the blocked process, etc.

4.4.6 Sybase Tasks Test

This test reports statistics pertaining to the tasks performed by the Sybase database engine.

Target of the test : A Sybase adaptive server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every Sybase server being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – A Sybase user who has the “sa_role”.
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **DETAILED DIAGNOSIS** – To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

   The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

   - The eG manager license should allow the detailed diagnosis capability
   - Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Connections opened:	The rate at which connections are opened	Conns/Sec	This provides a general understanding of the Adaptive Server environment and the work load during the measure interval.
Task switches:	The rate at which the Adaptive Server switched context from one user task to another	Switches/Sec	The detailed diagnosis of this measure, if enabled, reports the percentage of times the context switch was due to each cause.

4.4.7 Sybase Transaction Log Test

This test reports statistics pertaining to the transaction logs of a Sybase database server.

Target of the test : A Sybase adaptive server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every Sybase server being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – A Sybase user who has the "sa_role".
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **DETAILED DIAGNOSIS** – To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

   The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

   - The eG manager license should allow the detailed diagnosis capability

- Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
ULC log writes:	The rate at which log records per transaction are written into the ULCs	Records/Sec	If this data is unusual, study the Max ULC size measure and look at your application for long-running transactions and for transactions that modify a large number of rows.
Waits for ULC log writes:	The rate at which attempts made to write to ULCs encountered semaphore contention	Waits/Sec	
ULC flushes:	The rate at which user log caches (ULCs) were flushed to a transaction log	Flushes/Sec	The detailed diagnosis for this measure provides the percentage of ULC flushes due to full ULC, end transaction, change of database, system log record and other reasons.
Waits for ULC flushes:	The rate at which attempts made to flush ULC pages to the log encountered log semaphore contention	Waits/Sec	If this value is high, reduce the semaphore contention by: • Increasing the ULC size, if filling user log caches is a frequent cause of user log cache flushes • Reducing log activity through transaction redesign. Aim for more batching with less frequent commits. Be sure to monitor lock contention as part of the transaction redesign. • Reducing the number of multidatabase transactions, since each change of database context requires a log write. • Dividing the database into more than one database so that there are

Measurement	Description	Measurement Unit	Interpretation
			multiple logs. If you choose this solution, divide the database in such a way that multidatabase transactions are minimized.
Max ULC size:	The maximum number of bytes used in any ULCs, across all ULCs. This data can help you determine if ULC size is correctly configured.	KB	If this value is consistently less than the defined value for the user log cache size configuration parameter, reduce the user log cache size to Max ULC size value.
Log allocations:	The rate at which additional pages were allocated to the transaction log	Allocations/Sec	This data is useful for comparing to other data in this test and for tracking the rate of transaction log growth.
Transaction log writes:	The rate at which the Adaptive server wrote a transaction log page to disk	Pages/Sec	
Avg writes per log page:	The average number of times each log page was written to disk	Writes/Page	In high throughput applications, this number should be as low as possible.

4.4.8 Sybase Transactions Test

This test reports the transaction statistics of a Sybase database server.

Target of the test : A Sybase adaptive server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every Sybase server being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – A Sybase user who has the “sa_role”.

5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Committed transactions:	The rate of transaction commits	Trans/Sec	
Rolledback transactions:	The rate of transactions rollbacks	Trans/Sec	Rollbacks are costly operations on the database, and hence, will have to be kept at the minimum.
Inserts:	The rate at which records are inserted into the database	Inserts/Sec	
Updates:	The rate at which records in the database are updated	Updates/Sec	
Deletes:	The rate at which records are deleted from the database	Deletes/Sec	

4.4.9 Sybase Blockers Test

One common problem encountered with databases is blocking. Suppose that process A is modifying data that process B wants to use. Process B will be blocked until process A has completed what it is doing. This is only one type of blocking situation; others exist and are common. What matters to a database administrator is identifying when blocking is a problem and how to deal with it effectively. When blocking is bad enough, users will notice slowdowns and complain about it. With a large number of users, it is common for tens or hundreds of processes to be blocked when slowdowns are noticed. Killing these processes may or may not solve the problem because 10 processes may be blocked by process B, while process B itself is blocked by process A. Issuing 10 kill statements for the processes blocked by B probably will not help, as new processes will simply become blocked by B. Killing process B may or may not help, because then the next process that was blocked by B, which is given execution time, may get blocked by process A and become the process that is blocking the other 9 remaining processes. When you have lots of blocking that is not resolving in a reasonable amount of time you need to identify the root blocker, or the process at the top of the tree of blocked processes. Imagine again that you have 10 processes blocked by process B, and process B is blocked by process A. If A is not blocked by anything, but is itself responsible for lots of blocking (B and the 10 processes waiting on B), then A would be the root blocker. (Think of it as a traffic jam.) Killing A (via kill) is likely to unblock B, and once B completes, the 10 processes waiting on B are also likely to complete successfully. The SybaseBlockers test monitors the number of root blocker processes in a database.

Target of the test : A Sybase adaptive server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every Sybase server being monitored

Configurable parameters for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – A Sybase user who has the “sa_role”.
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **DETAILED DIAGNOSIS** - To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

   The option to selectively enabled/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

   - The eG manager license should allow the detailed diagnosis capability
   - Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Number of root blockers:	Indicates the number of root blocker processes.	Number	Usually, the number of root blocker processes should be low. If this value increases suddenly, this is a cause for concern. Likewise, if a root- blocker process has been blocking other processes for a long time, it is a reason for further investigation. The detailed diagnosis for this test, if enabled,

Measurement	Description	Measurement Unit	Interpretation
			provides details of the root blocker processes - their SPIDs, programs running these processes, and the queries being issued by these processes. It is usually the case that killing any root-blocker process that has been running for a long while will get the database running well again.

4.4.10 Sybase Applications Test

Sometimes the database performs poorly due, not to blocking, but to particularly heavy loads. Often the DBA will determine that the database simply cannot support the work that it is being asked to do and maintain adequate performance. This does not necessarily mean it is time to create more indexes or throw more hardware at the problem. One cannot always assume that periods of high utilization represent legitimate work. There could be problems in the applications that are running, or even problems caused by the user. Maybe the application has a data paging functionality, but the user has opted to receive the entire 100,000 row DataSet every time, even though she/he has applied a sort which gives her the one row she needs first with each query. Regardless, it is important to identify performance issues and eliminate them. This test identifies which program has more connections open to (i.e., processes running in) the Sybase database. Simply looking at the CPU cycles taken up by a process will not indicate which of these processes has been most active recently. For example, the Sybase server internal processes may have been running for days and will probably always show up as the processes that have taken the most CPU time since the database booted up. Hence, it is more helpful to find processes that have used lots of CPU for the majority of the time that they have been connected. This value represents how “expensive” a process is with respect to the Sybase database server. For each program that connects to the database server, this test reports the total CPU cycles for each second that the program is connected to the database. This value, represented by the *CPU cycles rate* measure, is an aggregate of all the CPU cycles consumed by every instance of the program while it is connected to the database server. The *Avg CPU cycles rate* measure represents the *CPU cycles rate* averaged across the number of processes in the database for the program under consideration. The *Avg CPU cycles rate* quantifies how bad a program is compared to the others, by dividing the *CPU cycles rate* by the number of connected instances. A high value for this value would indicate that every instance of the program was CPU-intensive. A lower value would indicate that the program may have some instances that cause performance problems, but also has instances that are mostly idle.

Target of the test : A Sybase adaptive server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every program/application executing on the Sybase server being monitored

Configurable parameters for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – A Sybase user who has the “sa_role”.
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **DETAILED DIAGNOSIS** - To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

   The option to selectively enabled/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

   - The eG manager license should allow the detailed diagnosis capability
   - Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Number of processes:	Indicates the number of database processes associated with a specific program.	Number	A comparison of this value across programs will indicate which program is initiating most connections to the database. Comparison of this value over time can provide indications of potential changes in database activity characteristics of a program.
CPU cycles rate:	Indicates the number of CPU cycles consumed by all processes of a program, per minute of login.	Cycles/Sec	The higher the value, the more CPU resources that the program is taking in the database. The detailed diagnosis for this test provides details of the most expensive queries to the database - i.e., what host is a program running from, who is running it, and what application is running it, which

Measurement	Description	Measurement Unit	Interpretation
			database the program is accessing, etc.
Avg CPU cycles rate:	Indicates the number of CPU cycles consumed by a process of a program, per minute of login.	CyclesRate/Conn	This value is the ratio of the CPU cycles rate to the number of processes for a program.

5

Configuring a Sybase Adaptive Server Using the MDA Tables

Starting Sybase ASE 12.5.3, users have the option of installing MDA tables on the Sybase server for accessing critical performance statistics pertaining to the server. If MDA tables are installed on a Sybase server, then, you can use the Sybase ASE 15 monitoring model offered by eG Enterprise to monitor that Sybase server. This section discusses how to configure, administer, and use the Sybase ASE 15 model.

5.1 Configuring the eG Agent to Monitor the Sybase Adaptive Server Using the MDA Tables

To use the Sybase ASE 15 model, the following pre-requisites need to be fulfilled:

a. MDA tables should be installed on the Sybase server to be monitored;

b. The eG agent should be configured with the user privileges required for monitoring. These privileges may differ across tests. While most tests need to be configured with the privileges of a user who has the "mon_role", the **Sybase Database Space Usage** test and the **Sybase Database Stats** test require the privileges of a user with the "mon_role" and "sa_role", and the **Sybase System Processes** test requires the "mon_role" and "sybase_ts_role". The test-specific documentation will shed more light on this. However, for best results, its recommended that you configure all tests with the credentials of a user with all three roles - "mon_role", "sa_role", and "sybase_ts_role".

c. The following configuration parameters have to be enabled on the target Sybase server:

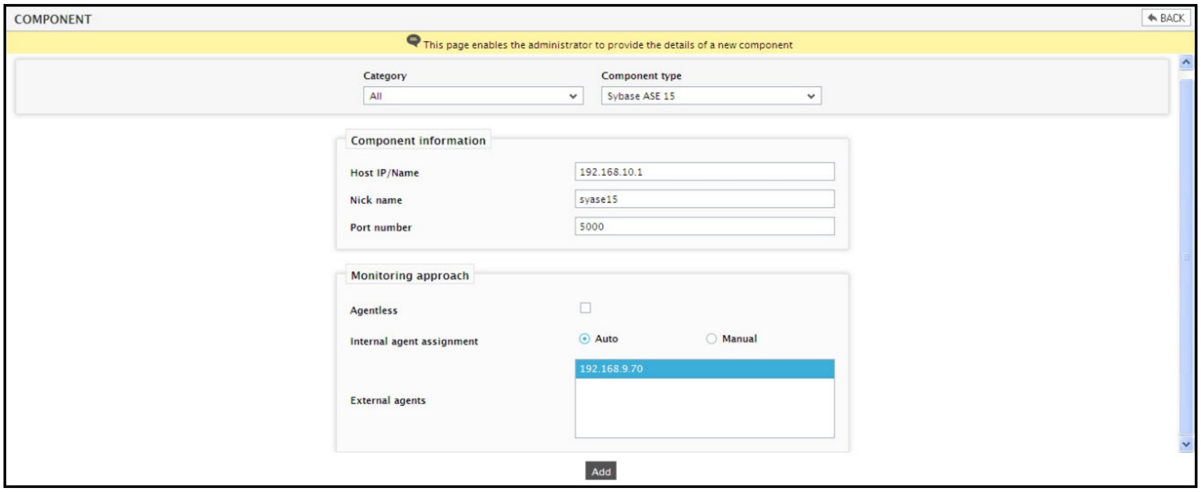
- enable monitoring
- sql text pipe active
- sql text pipe max messages
- statement pipe active
- statement pipe max messages
- errorlog pipe active
- errorlog pipe max messages
- deadlock pipe active
- deadlock pipe max messages
- wait event timing
- process wait events
- object lockwait timing
- SQL back capture

- statement statistics active
- per obect statistics active
- enable stmt cache monitoring
- max SQL text monitored
- performance monitoring option

6

Administering the eG Manager to Monitor the Sybase Adaptive Server Using Sybase ASE 15 Model

1. Login to the administrative interface as an administrator (admin).
2. Specify **Sybase ASE 15** as a new component in the **Component type** list box (see Figure 6.1) that appears in the **COMPONETS** Page. Also, provide the **Host IP** and the **Nickname** for the component that is to be added. Then click on the **Add** button so that the new component will be added.



This page enables the administrator to provide the details of a new component

Category: All

Component type: Sybase ASE 15

Component information

Host IP/Name: 192.168.10.1

Nick name: syase15

Port number: 5000

Monitoring approach

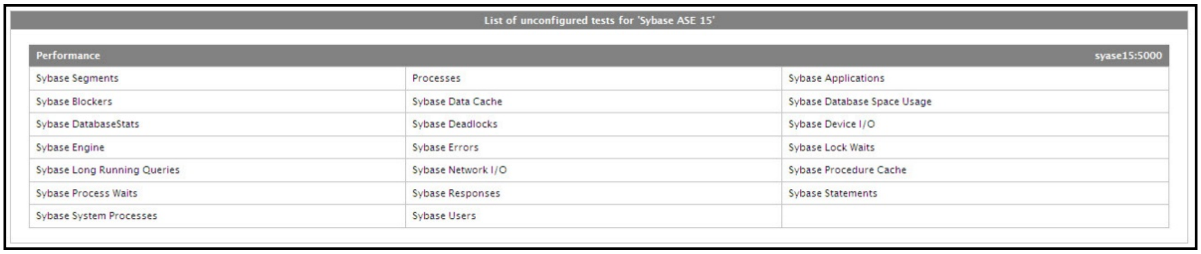
Agentless: □

Internal agent assignment: ● Auto ○ Manual

External agents: 192.168.9.70

Figure 6.1: Adding Sybase ASE component

3. Then proceed to signout of the page. A list of unconfigured tests (see Figure 6.2) for the Sybase ASE 15 component will then appear.



List of unconfigured tests for 'Sybase ASE 15'

Performance		syase15:5000
Sybase Segments	Processes	Sybase Applications
Sybase Blockers	Sybase Data Cache	Sybase Database Space Usage
Sybase DatabaseStats	Sybase Deadlocks	Sybase Device I/O
Sybase Engine	Sybase Errors	Sybase Lock Waits
Sybase Long Running Queries	Sybase Network I/O	Sybase Procedure Cache
Sybase Process Waits	Sybase Responses	Sybase Statements
Sybase System Processes	Sybase Users	

Figure 6.2: A table displaying the List of Unconfigured Tests for the Sybase ASE 15

4. Click on **Sybase Long Running Queries** test to configure it. To know how to configure the test, click here.

5. Finally, click the **Update** button to register the changes and try signing out of the admin interface once again. This time you will be prompted to configure the **Sybase Segments** test, and click on the test name to configure it. To know how to configure the test, click here.
6. Then, click the **Update** button to register the changes and try signing out of the admin interface once again.

7

Monitoring the Sybase Server Using the MDA Tables

Starting Sybase ASE 12.5.3, users have the option of installing MDA tables on the Sybase server for accessing critical performance statistics pertaining to the server. If MDA tables are installed on a Sybase server, then, you can use the *Sybase ASE 15* monitoring model (see Figure 7.1) offered by eG Enterprise to monitor that Sybase server.

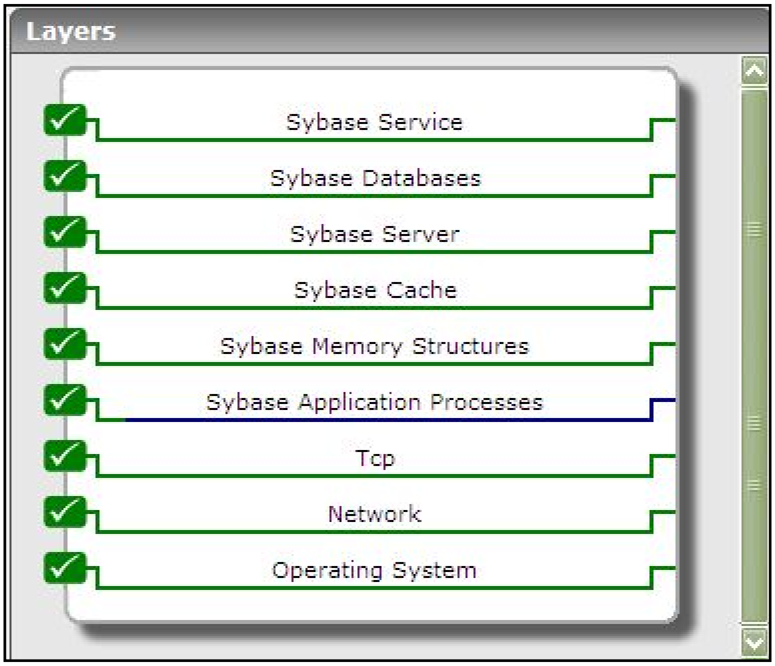


Figure 7.1: The Sybase ASE 15 monitoring model

Once the pre-requisites are fulfilled, then the tests mapped to each layer of Figure 7.1 will periodically run queries on the MDA tables to report a wealth of performance information pertaining to the Sybase server. Using these metrics, administrators can find quick and easy answers to the following performance queries:

- Is the Sybase server available? If so, is it responding quickly to client requests?
- Has the error log captured any errors recently? If so, what are they?
- Did too many wait events occur on the Sybase server during the last measurement period?If so, what type of events are these? How long did these events wait?
- Did any deadlocks occur?
- Are too many locks being held? Which user and process initiated these locks?
- Have locks been held for an unusually long time?

- Are the data and procedure caches being used optimally?
- Have the caches been sized correctly?
- Is the server able to process I/O requests quickly, or are any bottlenecks visible?
- Is the Sybase engine using up CPU excessively?
- Is the traffic to and from the server high?
- Are there any sleeping, blocked, or infected processes on the server? If so, what are they?
- Is any database on the server using memory and space excessively? If so, which one is it?
- Have any queries been running on the server for a very long time? If so, what are the queries?
- How is the user load on the server?
- Have any users initiated sleeping or infected processes on the server? What are these processes?

The sections that follow will discuss each of the first 6 layers of Figure 7.1, elaborately.

7.1 Sybase Application Processes Layer

The tests mapped to this layer proactively alerts administrators to the following:

- Non-availability of the Sybase port;
- Non-availability of the processes that are crucial to the smooth functioning of the Sybase server;
- Excessive resource usage by one/more of these critical processes;
- Errors recently encountered by the server;

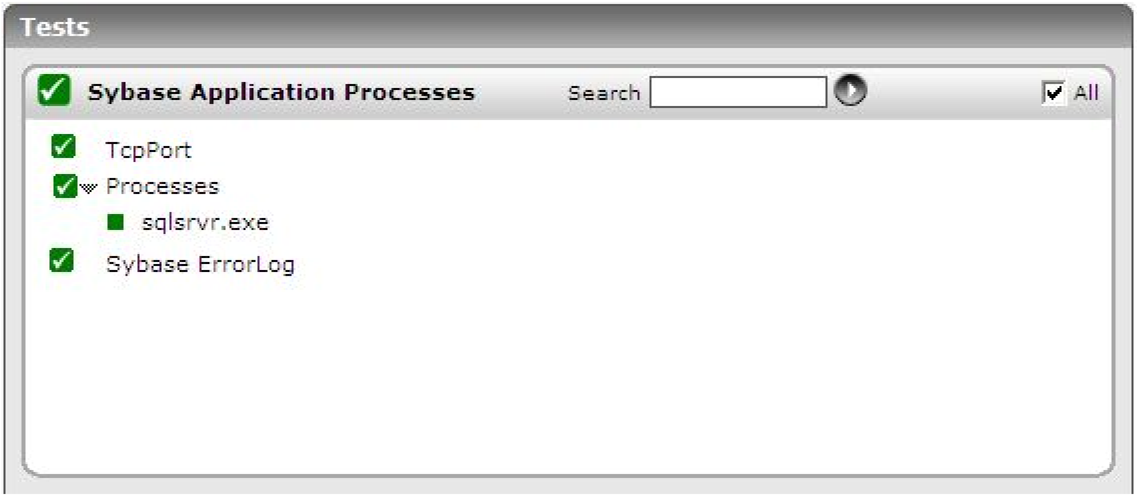


Figure 7.2: The tests mapped to the Sybase Application Processes layer

Since the **Tcp Port** and **Processes** tests have already been deal with in the *Monitoring Unix and Windows Servers* document, the section that will follow will handle the **Sybase ErrorLog** test only.

7.1.1 Sybase Errors Test

This test periodically monitors the Sybase server's error logs to promptly capture the errors that occur on the server and report the number and severity of the errors. For execution, this test requires the enable monitoring, errorlog pipe max messages, and errorlog pipe active configuration parameters to be enabled.

Target of the test : A Sybase adaptive server (ver. 12.5 and above) on which MDA tables have been installed

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every Sybase Server being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – To enable this test to connect to the Sybase server and collect the required metrics, it is enough if you configure the test with the name of a Sybase user who has the "mon_role". However, for best results, it is recommended that you configure all Sybase tests with the credentials of a Sybase user who has the "mon_role", "sa_role', and "sybase_ts_role".
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **DETAILED DIAGNOSIS** – To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

   The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

   - The eG manager license should allow the detailed diagnosis capability
   - Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Error count severity 10-16:	The number of errors with severity codes between 10	Number	Error messages with severity levels 10-16 are generated by problems that are

Measurement	Description	Measurement Unit	Interpretation
	and 16, which occurred on the Sybase server during the last measurement period.		caused by user errors. These problems can always be corrected by the user. To view the list of problems in this category, use the detailed diagnosis of this measure.
Error count severity 17-18 :	The number of errors with severity codes between 17 and 18, which occurred on the Sybase server during the last measurement period.	Number	Error messages with severity level 17 mean that the command has caused Adaptive Server to run out of resources or to exceed some limit set by the System Administrator. You can continue with the work you are doing, although you may not be able to execute a particular command. The Database Owner can correct the level 17 error messages indicating that you have run out of space. Other level 17 error messages should be corrected by the System Administrator. Error messages with severity level 18 indicate some kind of internal software bug. However, the command runs to completion, and the connection to Adaptive Server is maintained. You can continue with the work you are doing, although you may not be able to execute a particular command. An example of a situation that generates severity level 18 is Adaptive Server detecting that a decision about the access path for a particular query has been made without a valid reason. Since problems that generate such messages do not keep users from their work, users tend not to report them. Users should be instructed to inform the System Administrator every time an error message with these severity levels (or higher) occur so that the

Measurement	Description	Measurement Unit	Interpretation
			System Administrator can report them.
Error count severity 19-26:	The number of errors with severity codes between 19 and 26, which occurred on the Sybase server during the last measurement period.	Number	**Level 19**: Adaptive Server fatal error in resource Error messages with severity level 19 indicate that some non- configurable internal limit has been exceeded and that Adaptive Server cannot recover gracefully. You must reconnect to Adaptive Server. **Level 20**: Adaptive Server fatal error in current process Error messages with severity level 20 indicate that Adaptive Server has encountered a bug in a command. The problem has affected only the current process, and it is unlikely that the database itself has been damaged. Run dbcc diagnostics. You must reconnect to Adaptive Server. **Level 21**: Adaptive Server fatal error in database processes Error messages with severity level 21 indicate that Adaptive Server has encountered a bug that affects all the processes in the current database. However, it is unlikely that the database itself has been damaged. Restart Adaptive Server and run the dbcc diagnostics. You must reconnect to Adaptive Server. **Level 22**: Adaptive Server fatal error: Table integrity suspect Error messages with severity level 22 indicate that the table or index specified in the message was previously damaged by a software or hardware

Measurement	Description	Measurement Unit	Interpretation
			problem. The first step is to restart Adaptive Server and run dbcc to determine whether other objects in the database are also damaged. Whatever the report from dbcc may be, it is possible that the problem is in the cache only and not on the disk itself. If so, restarting Adaptive Server will fix the problem. If restarting does not help, then the problem is on the disk as well. Sometimes, the problem can be solved by dropping the object specified in the error message. For example, if the message tells you that Adaptive Server has found a row with length 0 in a nonclustered index, the table owner can drop the index and re-create it. Adaptive Server takes any pages or indexes offline that it finds to be suspect during recovery. Use sp_setsuspect_ granularity to determine whether recovery marks an entire database or only individual pages as suspect. See sp_ setsuspect_ granularity in the Reference Manual for more information. You must reconnect to Adaptive Server. **Level 24**: Hardware error or system table corruption Error messages with severity level 24 reflect some kind of media failure or (in rare cases) the corruption of sysusages. The System Administrator may have to reload the database. It may be necessary to call your hardware vendor. **Level 23**: Fatal error: Database integrity suspect

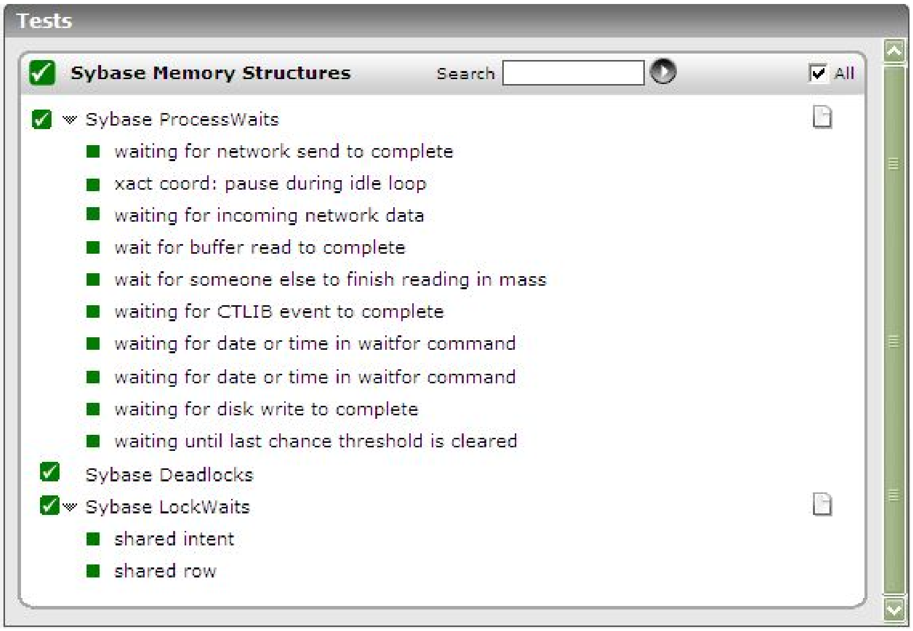
Measurement	Description	Measurement Unit	Interpretation
			Error messages with severity level 23 indicate that the integrity of the entire database is suspect due to previous damage caused by a software or hardware problem. Restart Adaptive Server and run dbcc diagnostics. Even when a level 23 error indicates that the entire database is suspect, the damage may be confined to the cache, and the disk itself may be fine. If so, restarting Adaptive Server with startserver will fix the problem. **Level 25**: Adaptive Server internal error Level 25 errors are not displayed to the user; this level is only used for Adaptive Server internal errors. **Level 26**: Rule error Error messages with severity level 26 reflect that an internal locking or synchronization rule was broken. You must shut down and restart Adaptive Server.
Total error count:	The total number of errors that occurred on the Sybase server during the last measurement period.	Number	Ideally, this value should be 0.

7.2 Sybase Memory Structures Layer

This layer monitors wait events and the locking activity on the database server to identify areas where the server has been wasting resources. Using the tests mapped to this layer, administrators can quickly isolate the following:

- Wait events on which the server has spent the maximum time; who and which process initiated such an event;

- Deadlock situations;
- Locks that have been held for too long a time; who and which process initiated the lock, and which object held the lock for how long.



Tests

☑ Sybase Memory Structures Search ☑ All

☑ Sybase ProcessWaits
- 🟩 waiting for network send to complete
- 🟩 xact coord: pause during idle loop
- 🟩 waiting for incoming network data
- 🟩 wait for buffer read to complete
- 🟩 wait for someone else to finish reading in mass
- 🟩 waiting for CTLIB event to complete
- 🟩 waiting for date or time in waitfor command
- 🟩 waiting for date or time in waitfor command
- 🟩 waiting for disk write to complete
- 🟩 waiting until last chance threshold is cleared

☑ Sybase Deadlocks

☑ Sybase LockWaits
- 🟩 shared intent
- 🟩 shared row

Figure 7.3: The tests associated with the Sybase Memory Structures layer

7.2.1 Sybase Process Waits Test

A wait event occurs when a server process suspends itself, sleeps, and waits for another event to wake it. The Sybase ASE includes unique wait event IDs for each of these wait events.

The test monitors each type of wait events on the Sybase database server and reports key performance statistics pertaining to every event type. For execution, this test requires the enable monitoring and process wait events configuration parameters to be enabled.

Target of the test : A Sybase adaptive server (ver. 12.5 and above) on which MDA tables have been installed

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every wait event type being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – To enable this test to connect to the Sybase server and collect the required metrics, it is enough if you configure the test with the name of a Sybase user who has the “mon_role”. However, for

best results, it is recommended that you configure all Sybase tests with the credentials of a Sybase user who has the “mon_role”, “sa_role’, and “sybase_ts_role”.

5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **DETAILED DIAGNOSIS** – To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

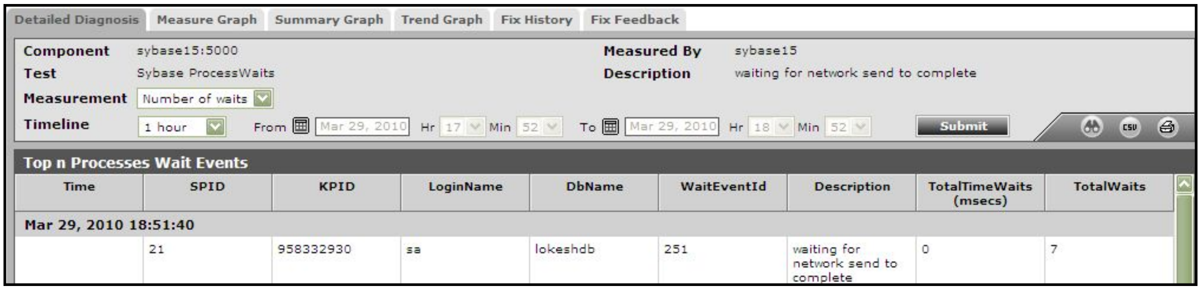
   The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

   - The eG manager license should allow the detailed diagnosis capability
   - Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Number of waits:	The number of events of this wait event type during the last measurement period.	Number	Use the detailed diagnosis of this measure to view the complete details of the wait events and to figure out who and which process initiated the event.
Avg wait time:	The average wait time of events of this type.	MillSeconds	If this measure value is high for a particular event type when the value of the Number of waits measure is low, it could indicate that one/more events of that type have been waiting for a long time. The DBA might have to ensure that such wait events are minimal.

The detailed diagnosis of the Number of waits measure will reveal the description of the wait event, the user and the process that initiated the wait event, the total number of waits, and the total time waited.



Component sybase15:5000

Test Sybase ProcessWaits

Measurement Number of waits

Timeline 1 hour From Mar 29, 2010 Hr 17 Min 52 To Mar 29, 2010 Hr 18 Min 52

Measured By sybase15

Description waiting for network send to complete

Top n Processes Wait Events

Time	SPID	KPID	LoginName	DbName	WaitEventId	Description	TotalTimeWaits (msecs)	TotalWaits
Mar 29, 2010 18:51:40								
	21	958332930	sa	lokeshdb	251	waiting for network send to complete	0	7

Figure 7.4: The detailed diagnosis of the Number of waits measure

7.2.2 Sybase Deadlocks Test

This test monitors the locking activity on the Sybase server, and reports the number of deadlocks. For this test to work, the following configuration parameters need to be enabled on the server:

- enable monitoring
- deadlock pipe max messages
- deadlock pipe active

Target of the test : A Sybase adaptive server (ver. 12.5 and above) on which MDA tables have been installed

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every database being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – To enable this test to connect to the Sybase server and collect the required metrics, it is enough if you configure the test with the name of a Sybase user who has the "mon_role". However, for best results, it is recommended that you configure all Sybase tests with the credentials of a Sybase user who has the "mon_role", "sa_role', and "sybase_ts_role".
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **DETAILED DIAGNOSIS** – To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

   The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

- The eG manager license should allow the detailed diagnosis capability
- Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Number of deadlocks:	The number of deadlocks found in the Sybase Server.	Number	A deadlock may arise due to various situations including bad design of queries and deficient coding practices. A deadlock is a situation where both/all the lock requestors are in a mutual or a multi- way tie. Any deadlocks are detrimental to database application performance. The detailed diagnosis for this measure provides a listing of dead locks for each lock type.

7.2.3 Sybase Lock Waits Test

For every lock type auto-discovered, this test reports the total number of locks currently held, and the average wait time for locks. For execution, this test requires the enable monitoring and wait event timing configuration parameters to be enabled.

Target of the test : A Sybase adaptive server (ver. 12.5 and above) on which MDA tables have been installed

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every lock type being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – To enable this test to connect to the Sybase server and collect the required metrics, it is enough if you configure the test with the name of a Sybase user who has the “mon_role”. However, for best results, it is recommended that you configure all Sybase tests with the credentials of a Sybase user who has the “mon_role”, “sa_role’, and “sybase_ts_role”.
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.

7. **DETAILED DIAGNOSIS** – To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

   The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

   - The eG manager license should allow the detailed diagnosis capability
   - Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

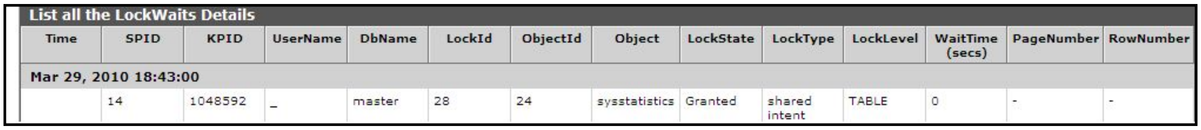
Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Number of locks:	The number of locks of this type that are currently held.	Number	Ideally, both these values should be low. A large number of locks or a high wait time for locks can result in lock contention and can adversely impact server performance. You can use the detailed diagnosis of the Number of locks measure to view the complete lock details and to determine the process and user responsible for the lock. Furthermore, you can use the following locking guidelines to reduce lock contention and speed performance: • Use the lowest level of locking required by each application. Use isolation level 2 or 3 only when necessary. Updates by other transactions may be delayed until a transaction using isolation level 3 releases any of its shared locks at the end of the transaction. Use isolation level 3 only when nonrepeatable reads or phantoms

Measurement	Description	Measurement Unit	Interpretation
			may interfere with your desired results. If only a few queries require level 3, use the holdlock keyword or at isolation serializing clause in those queries instead of using set transaction isolation level 3 for the entire transaction. If most queries in the transaction require level 3, use set transaction isolation level 3, but use noholdlock or at isolation read committed in the remaining queries that can execute at isolation level 1. If you need to perform mass inserts, updates, or deletes on active tables, you can reduce blocking by performing the operation inside a stored procedure using a cursor, with frequent commits. • If your application needs to return a row, provide for user interaction, and then update the row, consider using timestamps and the tsequal function rather than holdlock. • If you are using third-party software, check the locking model in applications carefully for concurrency problems. Also, other tuning efforts can help reduce lock contention. For example, if a process holds locks on a page, and must perform a physical I/O to read an additional page, it holds the lock much longer than it would have if the additional page had already been in cache. Better cache utilization or using large

Measurement	Description	Measurement Unit	Interpretation
			I/O can reduce lock contention in this case. Other tuning efforts that can pay off in reduced lock contention are improved indexing and good distribution of physical I/O across disks. Moreover, you can configure a server-wide lock- wait limit with the configuration parameter lock wait period. This can reduce lock wait time considerably.
Avg wait time sec:	The average wait time of locks of this type.	Secs	

The detailed diagnosis of the Number of locks measure provides the complete lock details including the user and the process that initiated the lock, the object that has been locked, the lock type, the lock level, the lock wait time, and the exact page number and row number that has been locked. This information enables administrators to effectively troubleshoot lock-related issues, accurately identify what caused the lock, and optimize the process code/query so that, the lock is released.



List all the LockWaits Details

Time	SPID	KPID	UserName	DbName	LockId	ObjectId	Object	LockState	LockType	LockLevel	WaitTime (secs)	PageNumber	RowNumber
Mar 29, 2010 18:43:00													
	14	1048592	_	master	28	24	sysstatistics	Granted	shared intent	TABLE	0	-	-

Figure 7.5: The detailed diagnosis of the Number of locks measure

7.2.3.1 Sybase Spinlocks Test

Spinlocks are lightweight synchronization primitives which are used to protect access to shared resources. The spinlocks can only be updated automically when the resource is accessed to perform a user task. The spinlock denies all other tasks access to the resource until the changes are made by the current user task as a result other user tasks are made to wait, this in turn causes spinlock contention. Although, the spinlocks are held for extremely brief durations, they can increase CPU resource utilization and reduce performance of the Sybase server with high transaction rates. Therefore, the spinlocks should be monitored to avoid such excess CPU utilization and performance lag of the Sybase server. The **Sybase Spinlocks** test helps administrators greatly in this exercise.

This test auto-discovers the named spinlocks and reports the percentage of spinlock contention on the resources, CPU cycle spinning activity, and grabs and waits of each spinlock.

Target of the test : A Sybase adaptive server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for each spinlock being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port through which the server communicates. By default, it is 1433.
4. **USER** – To enable the eG agent to connect to the Sybase server and collect the required metrics, specify the credential of the Sybase user who has the “mon_role”.
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Spinlock contention:	Indicates the number of times an engine encountered this spinlock contention on the resource, and had to wait as a percentage of the total spinlock requests for that resource.	Percent	The value of this measure should not exceed 10%. For example, if the spinlock contention is more than 10% in the cache, consider using named caches or adding cache partitions. The number of cache partitions is always a power of 2 such that you can approximately reduce half of the spinlock contention when you increase the number of partitions each time. The detailed diagnosis of this measure, if enabled, provides details such as SpinlockslotID, Ownerpid, Lastownerpid, Spid, login name, Status, etc.
Grabs rate:	Indicates the number of grabs for this spinlock per second.	Grabs/Sec	
Spins rate:	Indicates the number of	Spins/Sec	Ideally, the value of this measure should

Measurement	Description	Measurement Unit	Interpretation
	CPU spins that are made per second to acquire this spinlock.		be low. A signifigance increase in the value indicates high CPU utilization, which results high performance lag.
Waits rate:	Indicates the number of waits that are occured per second for this spinlock.	Waits/Sec	If the value of this measure is consistently high, identify which resource causing waits and fine tune the appropriate SQL queries.

7.3 Sybase Cache Layer

Use the tests associated with this layer to measure the effectiveness of your caches, check for sizing inadequacies, and take relevant optimization steps.

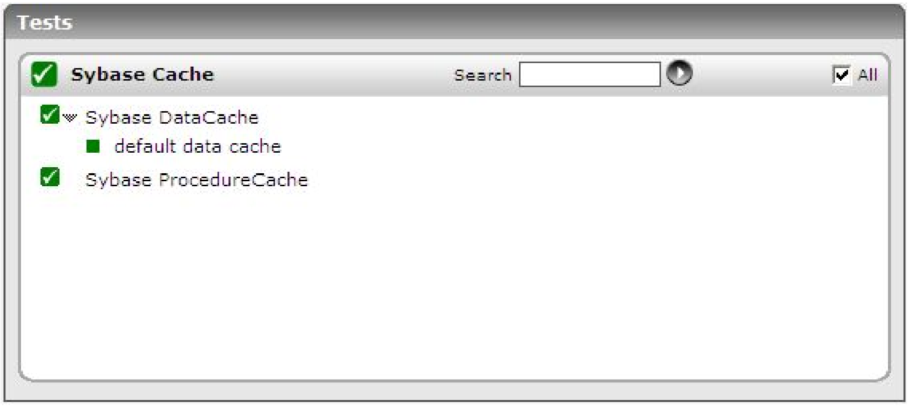


Figure 7.6: The tests associated with the Sybase Cache layer

7.3.1 Sybase Data Cache Test

Data caches in ASE hold the data, index, and log pages currently in use, as well as recently used pages in memory. These caches are critical in providing high levels of system performance as they effectively avoid expensive disk I/O. Inadequately sized data caches can increase the incidence of physical disk accesses, thereby affecting the performance of the Sybase server. Periodic monitoring of the usage of the data cache is essential to determine whether the cache needs to be resized or not.

This test auto-discovers the data caches on the Sybase server, and tracks the usage of each cache. Frequently used objects and objects that occupy the memory are listed in detailed diagnosis. For this test to work, make sure that the enable monitoring parameter is enabled.

Target of the test : A Sybase adaptive server (ver. 12.5 and above) on which MDA tables have been installed

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every database being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – To enable this test to connect to the Sybase server and collect the required metrics, it is enough if you configure the test with the name of a Sybase user who has the "mon_role". However, for best results, it is recommended that you configure all Sybase tests with the credentials of a Sybase user who has the "mon_role", "sa_role', and "sybase_ts_role".
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **DETAILED DIAGNOSIS** – To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

   The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

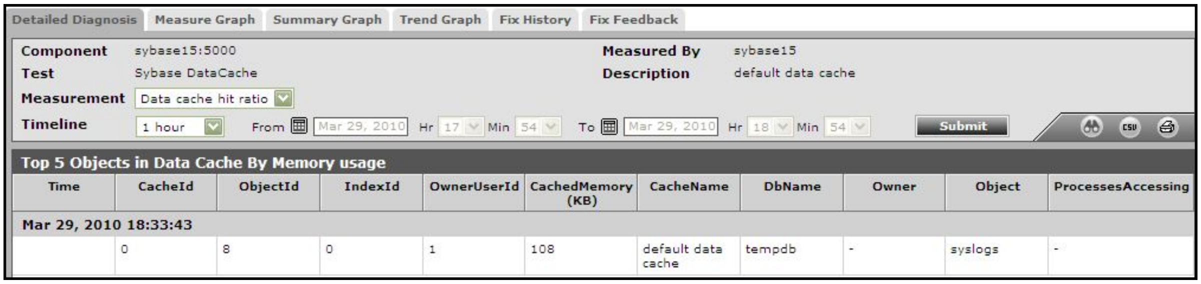
   - The eG manager license should allow the detailed diagnosis capability
   - Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Data cache hit ratio:	The hit ratio of each data cache in the Sybase server.	Pct	If the value of this measure is low, it indicates that too many physical reads are occurring on the Sybase server. If the problem persists, it could result in a serious contention for disk resources, which in turn, can cause the performance of the Sybase server to significantly deteriorate. You might want to consider resizing the data cache to avoid this adversity. The detailed diagnosis for this measure

Measurement	Description	Measurement Unit	Interpretation
			provides a list of objects that occupy the memory in cache, so that we can easily identify the objects that are consuming too much memory, and accordingly initiate corrective actions.
Number of objects:	The number of objects in each cache.	Number	Use the detailed diagnosis of this measure to view the list of objects in cache; this reveals the objects that are frequently accessed by users.

The detailed diagnosis of the Data cache hit ratio measure reveals the objects that are in cache and the memory space occupied by each object. This way, you can quickly identify which objects are occupying the maximum space in the cache, check whether these objects are been used frequently, and if not, remove the objects from the cache, so as to free space.



Component sybase15:5000
Test Sybase DataCache
Measured By sybase15
Description default data cache
Measurement Data cache hit ratio
Timeline 1 hour From Mar 29, 2010 Hr 17 Min 54 To Mar 29, 2010 Hr 18 Min 54

Top 5 Objects in Data Cache By Memory usage

Time	CacheId	ObjectId	IndexId	OwnerUserId	CachedMemory (KB)	CacheName	DbName	Owner	Object	ProcessesAccessing
Mar 29, 2010 18:33:43										
	0	8	0	1	108	default data cache	tempdb	-	syslogs	-

Figure 7.7: The detailed diagnosis of the Data cache hit ratio

7.3.2 Sybase Procedure Cache Test

Adaptive Server maintains an MRU/LRU (most recently used/least recently used) chain of stored procedure query plans. As users execute stored procedures, Adaptive Server looks in the procedure cache for a query plan to use. If a query plan is available, it is placed on the MRU end of the chain, and execution begins. If no plan is in memory, or if all copies are in use, the query tree for the procedure is read from the sysprocedures table. It is then optimized, using the parameters provided to the procedure, and put on the MRU end of the chain, and execution begins. Plans at the LRU end of the page chain that are not in use are aged out of the cache.

The memory allocated for the procedure cache holds the optimized query plans (and occasionally trees) for all batches, including any triggers. If adequate memory is not available to the cache, then cache misses will increase, thereby causing direct accesses to database tables to rise; if this trend continues, then the performance of the database server will suffer.

By periodically monitoring the usage of the procedure cache, administrators can promptly detect insufficient memory allocations to the cache; based on the findings, they can resize the cache to ensure peak performance of the database server.

This test reports whether/not the procedure cache has been utilized optimally. For execution, the test requires the enable monitoring configuration parameter to be enabled.

Target of the test : A Sybase adaptive server (ver. 12.5 and above) on which MDA tables have been installed

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every database being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – To enable this test to connect to the Sybase server and collect the required metrics, it is enough if you configure the test with the name of a Sybase user who has the “mon_role”. However, for best results, it is recommended that you configure all Sybase tests with the credentials of a Sybase user who has the “mon_role”, “sa_role’, and “sybase_ts_role”.
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **DETAILED DIAGNOSIS** – To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

   The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

   - The eG manager license should allow the detailed diagnosis capability
   - Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

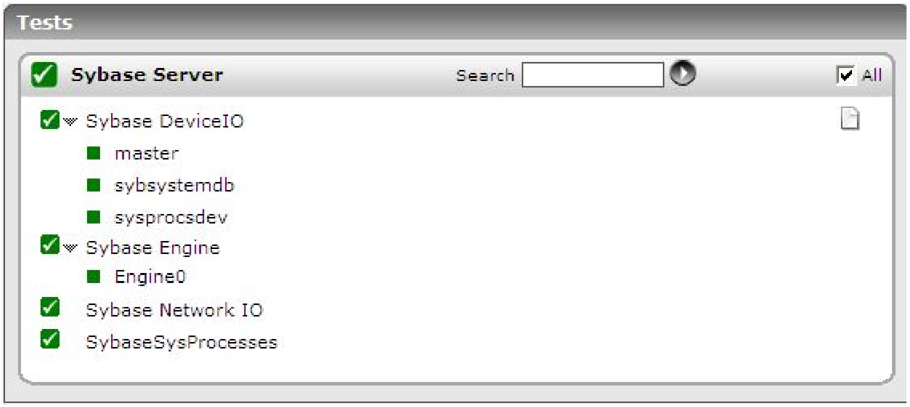
Measurement	Description	Measurement Unit	Interpretation
	Procedure hit ratio: The percentage of time a	Percent	Ideally, the value of this measure should be high. A low value indicates that many

Measurement	Description	Measurement Unit	Interpretation
	stored procedure query plan required by a user was available in the procedure cache.		stored procedure query plan that users required were, more often than not, unavailable in the procedure cache. To ensure that accesses to physical database tables do not increase as a result, check the most accessed procedure and place it in named cache. A low cache hit rate could also indicate a badly sized cache. Use the detailed diagnosis of this test to view the top-5 procedures in the cache in terms of memory usage. If need be, you can resize the cache using the following formula: max # of concurrent users) * (4 + size of largest plan) * 1.25

7.4 Sybase Server Layer

The tests mapped to this layer enable administrators to do the following:

- Detect I/O processing bottlenecks on the Sybase server;
- Ascertain how CPU-efficient the Sybase engine is;
- Monitor the traffic to and from the server so that, network slowdowns can be prompty isolated;
- Monitor the type and count of processes on the Sybase server so that, resource-intensive processes can be identified.



Tests

☑ Sybase Server Search ☑ All

- ☑ Sybase DeviceIO
  - 🟩 master
  - 🟩 sybsystemdb
  - 🟩 sysprocsdev
- ☑ Sybase Engine
  - 🟩 Engine0
- ☑ Sybase Network IO
- ☑ SybaseSysProcesses

Figure 7.8: The tests mapped to the Sybase Server layer

7.4.1 Sybase Device I/O Test

This test monitors the I/O activity on each device on the Sybase server, and proactively alerts administrators to contention for device I/O semaphores. To ensure that this test runs smoothly, enable the enable monitoring configuration parameter on the Sybase server.

Target of the test : A Sybase adaptive server (ver. 12.5 and above) on which MDA tables have been installed

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every device being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server.
3. **PORT** – The port on which the server is listening.
4. **USER** – A Sybase user who has the “sa_role”.
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Reads:	The number of reads that occurred on the device during the last measurement period.	Number	

Measurement	Description	Measurement Unit	Interpretation
APF reads:	Indicates the number of APF reads that occurred on this device during the last measurement period.	Number	Asynchronous prefetch (APF) issues I/O requests for pages before the query needs them so that most pages are in cache by the time query processing needs to access the page. High APF activity can hence improve performance for: • Sequential scans, such as table scans, clustered index scans, and covered nonclustered index scans • Access via nonclustered indexes • Some dbcc checks and update statistics • Recovery
Writes:	Indicates the number of writes that occurred on this device during the last measurement period.	Number	
Request:	The number of requests from this device during the last measurement period.	Number	
IO waits:	The number of I/O requests to this device that were waiting during the last measurement period.	Number	
Total io time:	The time taken to read from or write to this device during the last measurement period.	Msecs	A high value of this measure indicates that the device is taking too much time to process I/O requests. This could be owing to any of the following reasons: • An I/O overload on the device; • Disk fragmentation on the device; • Table fragmentation

Measurement	Description	Measurement Unit	Interpretation
Percentage io granted:	The percentage of IO granted.	Percent	Ideally, this value should be high. When Adaptive Server needs to perform a disk I/O, it gives the task to the semaphore for that device in order to acquire a block I/O structure. On SMP systems, multiple engines can try to post I/Os to the same device simultaneously. This creates contention for that semaphore, especially if there are hot devices or if the data is not well distributed across devices. A low value for this measure indicates that many I/O requests were waiting for the semaphore – in other words, it indicates a contention for the semaphore. One solution might be to redistribute the data on the physical devices.

7.4.2 Sybase Engine Test

This test measures the efficiency of the Sybase engines by monitoring the CPU usage of each engine. You will have to enable the enable monitoring configuration parameter to make this test work.

Target of the test : A Sybase adaptive server (ver. 12.5 and above) on which MDA tables have been installed

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every engine being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – To enable this test to connect to the Sybase server and collect the required metrics, it is enough if you configure the test with the name of a Sybase user who has the “mon_role”. However, for best results, it is recommended that you configure all Sybase tests with the credentials of a Sybase user who has the “mon_role”, “sa_role’, and “sybase_ts_role”.

5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Percentage CPU busy:	The percentage of CPU used by this engine during the last measurement period, for processing queries.	Percent	A high value for this measure indicates excessive utilization of CPU. The CPU utilization may be high because a few queries are consuming a lot of CPU, or because there are too many queries contending for a limited resource. Check the currently running queries to see the exact cause of the problem. If one/more queries appear to be resource-intensive, you might have to fine-tune them to make them resource efficient.
Percentage system busy:	The percentage of CPU used by this engine during the last measurement period, for system- level processing.	Percent	An unusually high value indicates a problem and may be due to too many system- level tasks executing simultaneously.
Percentage user busy:	The percentage of CPU used by this engine during the last measurement period, for processing user requests.	Percent	A high value for this measure indicates that one/more user transactions are consuming too much CPU. You can take the help of the detailed diagnosis information provided by the Avg CPU time measure reported by the Sybase Statement test to identify the user queries that are consuming CPU resources excessively. Once identified, you might have to fine- tune the application that initiated the query.
Percentage idle:	The percentage of time for which the CPU was idle during the last measurement period.	Percent	

7.4.3 Sybase Network I/O Test

This test tracks the incoming and outgoing network traffic on the Sybase server. For execution, this test requires the enable monitoring configuration parameter to be enabled.

Target of the test : A Sybase adaptive server (ver. 12.5 and above) on which MDA tables have been installed

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every server being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – To enable this test to connect to the Sybase server and collect the required metrics, it is enough if you configure the test with the name of a Sybase user who has the "mon_role". However, for best results, it is recommended that you configure all Sybase tests with the credentials of a Sybase user who has the "mon_role", "sa_role', and "sybase_ts_role".
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Total traffic:	The total number of IO packets handled by the server per second.	Packets/sec	
Packets send rate:	The number of packets sent from the Sybase Server per second.	Packets/sec	
Packets received rate:	The number of packets received by the Sybase server per second.	Packets/sec	
Data sent:	The number of bytes sent by the Sybase server per second.	Bytes/Sec	

Measurement	Description	Measurement Unit	Interpretation
Data received:	The number of bytes received by the Sybase server per second.	Bytes/Sec	

7.4.4 Sybase System Processes Test

This test reports details about the system processes running in a Sybase database server.

Target of the test : A Sybase adaptive server (ver. 12.5 and above) on which MDA tables have been installed

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every user being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – To enable this test to connect to the Sybase server and collect the required metrics, it is enough if you configure the test with the name of a Sybase user who has the “mon_role”. However, for best results, it is recommended that you configure all Sybase tests with the credentials of a Sybase user who has the “mon_role”, “sa_role’, and “sybase_ts_role”.
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **DETAILED DIAGNOSIS** – To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

   The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

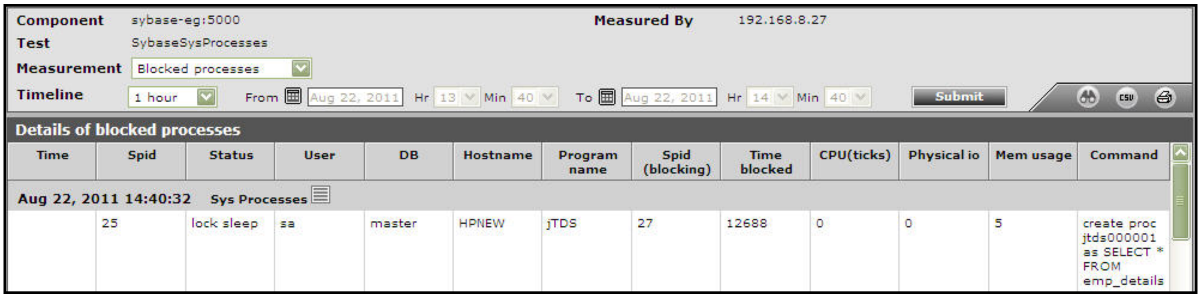
   - The eG manager license should allow the detailed diagnosis capability
   - Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Sybase processes:	The total number of Sybase processes	Number	
Background processes:	The total number of background processes run by the Adaptive Server rather than by a user process	Number	The detailed diagnosis of this measure, if enabled, provides the details pertaining to the background processes currently executing.
Running processes:	The total number of running processes	Number	The detailed diagnosis of this measure, if enabled, provides details such as the ID of the running processes, the user executing each of the processes, the database on which every process is executing etc.
Sleeping processes:	The total number of sleeping processes	Number	The detailed diagnosis of this measure, if enabled, provides details such as the ID of the sleeping processes, the user executing each of the processes, the database on which every process is executing, the sleep status, sleep time etc.
Infected processes:	The total number of processes in which the server has detected a serious error condition	Number	The detailed diagnosis of this measure, if enabled, provides the ID of the infected processes, the user executing each of the processes, and the database on which every process is executing. This information enables the user to isolate the specific queries that are infected. Further analysis of these queries can be performed, in order to figure out the reason for the infection and take adequate measures to prevent it from recurring.

Measurement	Description	Measurement Unit	Interpretation
Blocked processes:	If a process attempts to access a resource that is already in use by another process, then such a process will be blocked until such time that the other process releases the resource. This measures indicates the total number of blocked processes.	Number	The detailed diagnosis of this measure, if enabled, reveals information such as the ID of the blocked processes, the user executing each of the processes, the database on which every process is executing, the waiting time of the blocked process, the command that initiated the block, etc.
Remote processes:	Indicates the number of processes that are processing I/O with a remote server.	Number	The detailed diagnosis of this measure, if enabled, reveals information such as the ID of the remote processes, the user executing each of the processes, the database on which every process is executing, resource usage per process, etc.
Stopped processes:	Indicates the number of processes that have stopped executing.	Number	The detailed diagnosis of this measure, if enabled, reveals information such as the ID of the stopped processes, the user executing each of the processes, the database on which every process is executing, resource usage per process, etc.

The detailed diagnosis of the Blocked processes measure not only reveals the IP of the process that has been blocked, but also provides useful information indicating the resource usage of each blocked process, along with the last query that was executed by the blocked process.



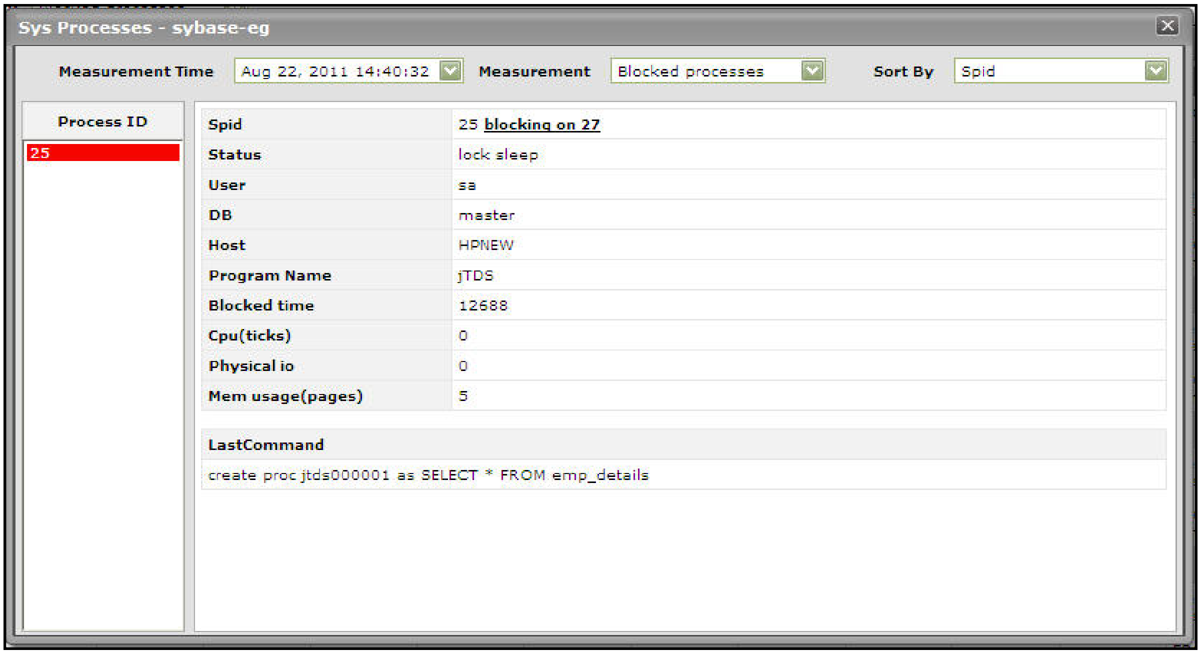
Component sybase-eg:5000 Measured By 192.168.8.27
Test SybaseSysProcesses
Measurement Blocked processes
Timeline 1 hour From Aug 22, 2011 Hr 13 Min 40 To Aug 22, 2011 Hr 14 Min 40

Details of blocked processes

Time	Spid	Status	User	DB	Hostname	Program name	Spid (blocking)	Time blocked	CPU(ticks)	Physical io	Mem usage	Command
Aug 22, 2011 14:40:32 Sys Processes												
	25	lock sleep	sa	master	HPNEW	jTDS	27	12688	0	0	5	create proc jtds000001 as SELECT * FROM emp_details

Figure 7.9: Detailed diagnosis of the Blocked processes reported by the SybaseSysProcesses test

For performing additional diagnosistics on the blocked process, click on the **Sys Processes** icon (▤) in Figure 7.9. Figure 7.10 will then appear, listing the **Process ID** of each blocked process. By default, the **Process ID** will be sorted in the ascending order of the ID itself; to change the sort order, pick a different option from the **Sort By** list. The **Process ID**s will then be listed in the chosen sort order. Selecting a **Process ID** from the list will reveal the following in the right panel of Figure 7.10: the current status of the chosen process, the database on which the process is executing, the duration for which it was blocked, and the CPU, I/O, and memory resources that were consumed by the process. In addition, the **LastCommand** executed by the process will also be displayed.



Sys Processes - sybase-eg

Measurement Time: Aug 22, 2011 14:40:32
Measurement: Blocked processes
Sort By: Spid

Process ID
25

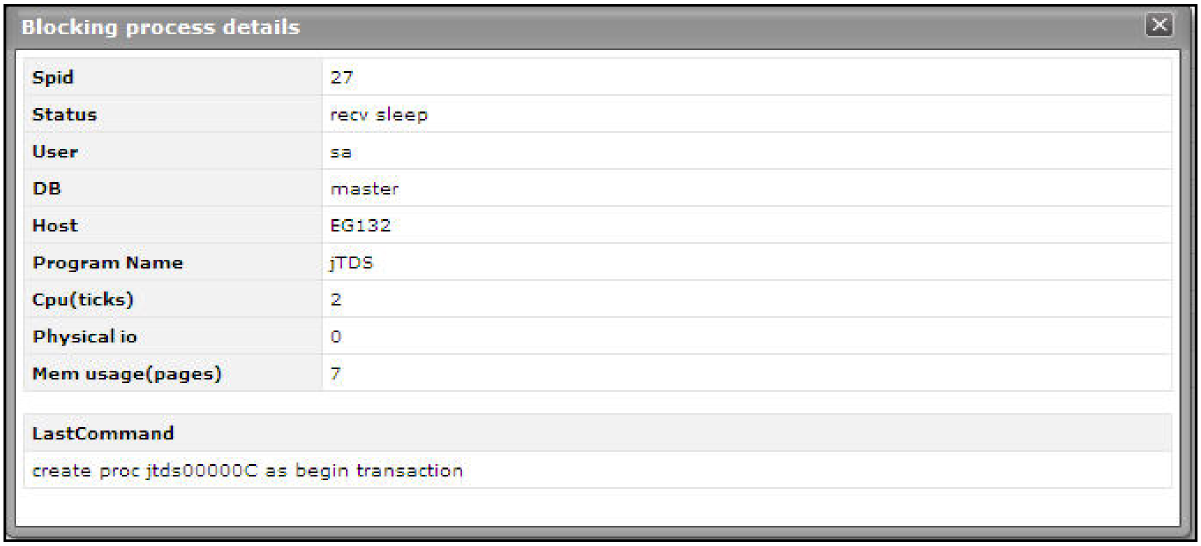
Spid	25 blocking on 27
Status	lock sleep
User	sa
DB	master
Host	HPNEW
Program Name	jTDS
Blocked time	12688
Cpu(ticks)	0
Physical io	0
Mem usage(pages)	5

LastCommand

```
create proc jtds000001 as SELECT * FROM emp_details
```

Figure 7.10: Analyzing blocked processes

Moreover, the **Spid** of the blocked process, as displayed in Figure 7.10, will be accompanied by a link to the ID of the process that is blocking it. Clicking on this link will reveal the complete details of the blocking process (see Figure 7.11), including the command executed by that process.



Blocking process details

Spid	27
Status	recv sleep
User	sa
DB	master
Host	EG132
Program Name	jTDS
Cpu(ticks)	2
Physical io	0
Mem usage(pages)	7

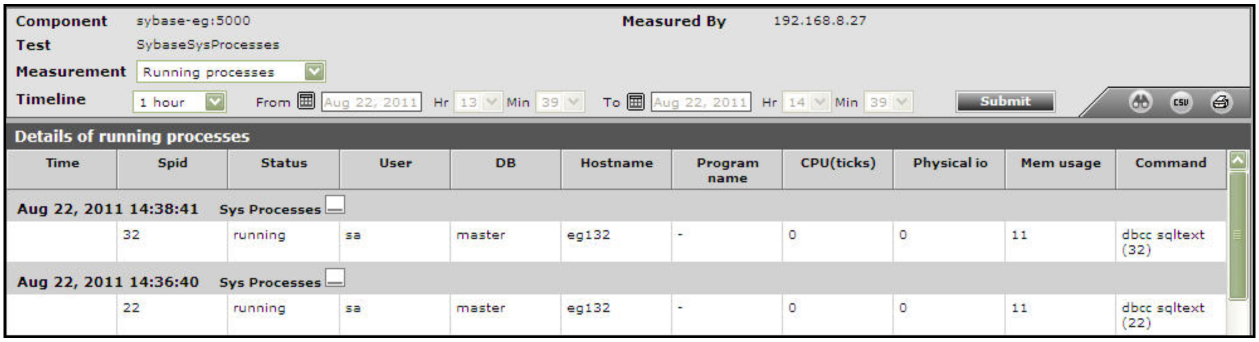
LastCommand

create proc jtds00000C as begin transaction

Figure 7.11: Details of the blocking process

By analyzing the query of the blocking process, you can determine whether deficiencies in query formulation caused this process to block the other process; if so, you can fine-tune the query to remove the block.

View the complete details of running processes by using the detailed diagnosis of the Running processes measure. Besides the process ID and the user who initiated the process, the detailed diagnosis will also reveal the resource usage (CPU, IO, Physical memory) of each process, thus bringing resource-intensive processes to your attention. The last command executed by the process will also be revealed. For further diagnosis, use the **Sys Processes** icon (▤) in Figure 7.13.



Component sybase-eg:5000 Measured By 192.168.8.27

Test SybaseSysProcesses

Measurement Running processes

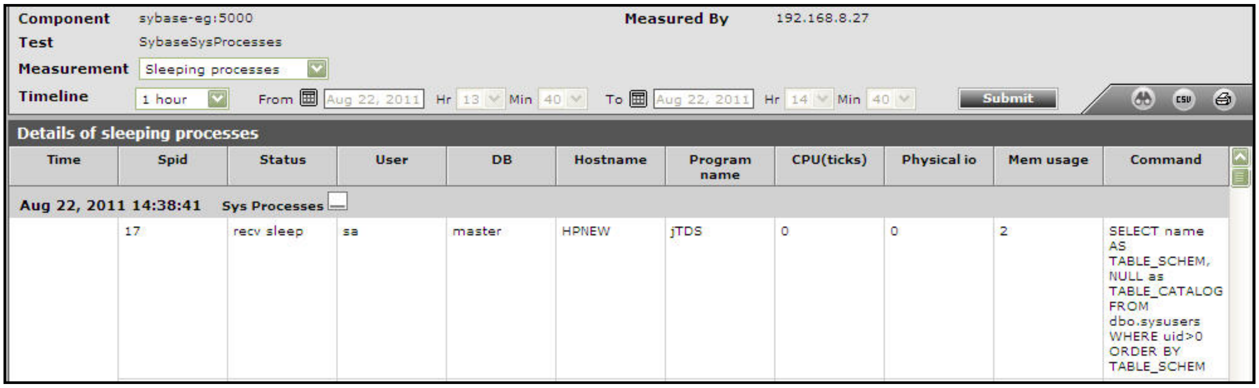
Timeline 1 hour From Aug 22, 2011 Hr 13 Min 39 To Aug 22, 2011 Hr 14 Min 39

Details of running processes

Time	Spid	Status	User	DB	Hostname	Program name	CPU(ticks)	Physical io	Mem usage	Command
Aug 22, 2011 14:38:41 Sys Processes										
	32	running	sa	master	eg132	-	0	0	11	dbcc sqltext (32)
Aug 22, 2011 14:36:40 Sys Processes										
	22	running	sa	master	eg132	-	0	0	11	dbcc sqltext (22)

Figure 7.12: The detailed diagnosis of the Running processes measure reported by the SybaseSysProcesses test

To view the complete details of sleeping processes, use the detailed diagnosis of the Sleeping processes measure. In addition to process ID and user name, the detailed diagnosis also reveals the last command that was executed by the sleeping process, thereby pointing you to queries that may require optimization. For further diagnosis, use the **Sys Processes** icon (▤) in Figure 7.13.



Component sybase-eg:5000 Measured By 192.168.8.27

Test SybaseSysProcesses

Measurement Sleeping processes

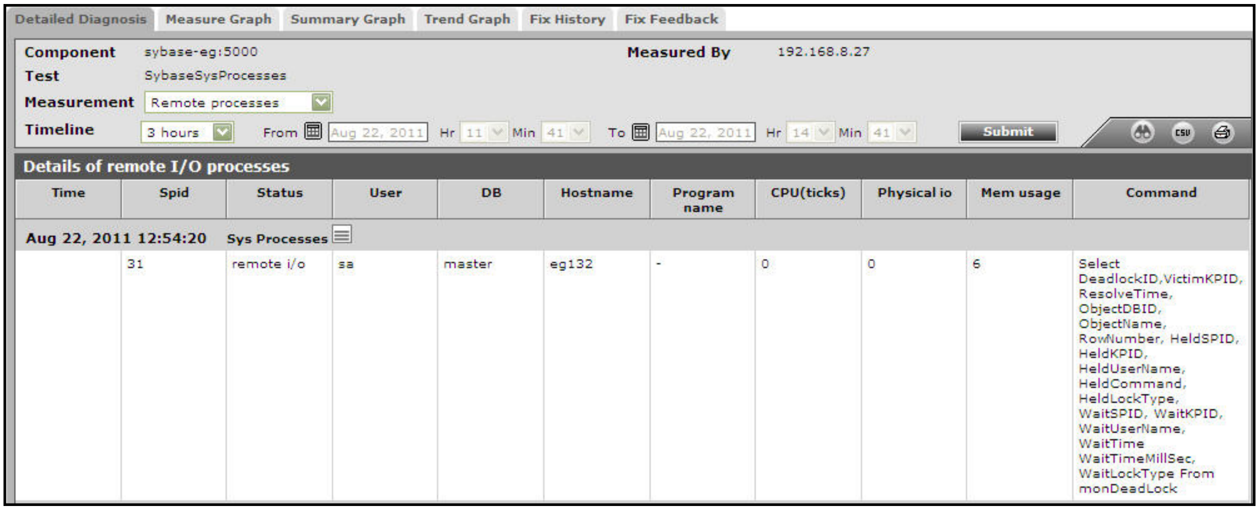
Timeline 1 hour From Aug 22, 2011 Hr 13 Min 40 To Aug 22, 2011 Hr 14 Min 40 Submit

Details of sleeping processes

Time	Spid	Status	User	DB	Hostname	Program name	CPU(ticks)	Physical io	Mem usage	Command
Aug 22, 2011 14:38:41 Sys Processes										
	17	recv sleep	sa	master	HPNEW	jTDS	0	0	2	SELECT name AS TABLE_SCHEM, NULL as TABLE_CATALOG FROM dbo.sysusers WHERE uid>0 ORDER BY TABLE_SCHEM

Figure 7.13: The detailed diagnosis of the Sleeping processes measure reported by the SybaseSysProcesses test

For viewing detailed metrics related to remote processes, use the detailed diagnosis of the Remote processes measure. In addition to process ID and user name, the detailed diagnosis also reveals the last command that was executed by the remote process, thus revealing the nature of interactions between Sybase and the remote server. For further diagnosis, click on the (▤)icon in Figure 7.14.



Component sybase-eg:5000 Measured By 192.168.8.27

Test SybaseSysProcesses

Measurement Remote processes

Timeline 3 hours From Aug 22, 2011 Hr 11 Min 41 To Aug 22, 2011 Hr 14 Min 41 Submit

Details of remote I/O processes

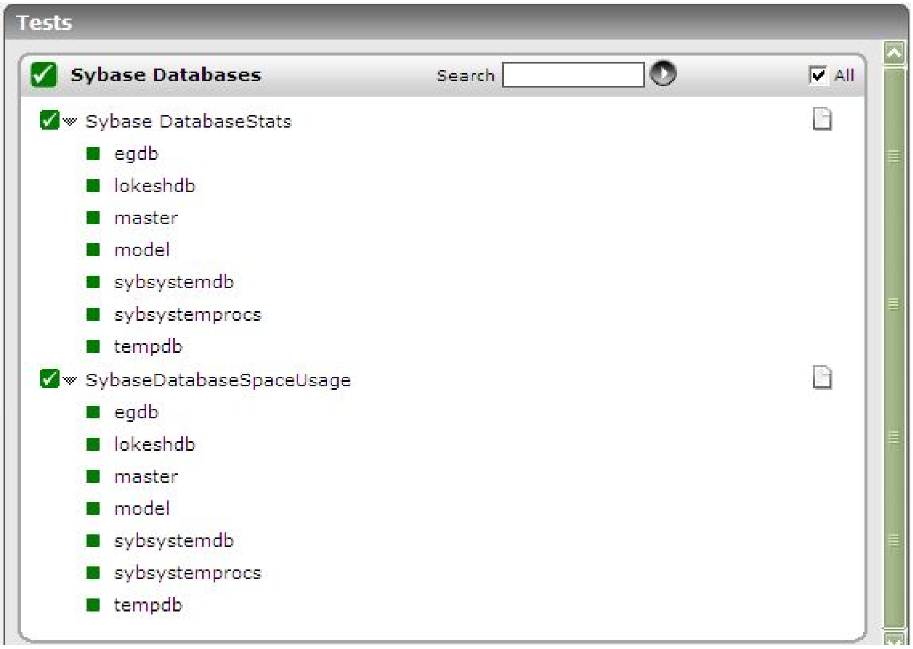
Time	Spid	Status	User	DB	Hostname	Program name	CPU(ticks)	Physical io	Mem usage	Command
Aug 22, 2011 12:54:20 Sys Processes										
	31	remote i/o	sa	master	eg132	-	0	0	6	Select DeadlockID,VictimKPID, ResolveTime, ObjectDBID, ObjectName, RowNumber, HeldSPID, HeldKPID, HeldUserName, HeldCommand, HeldLockType, WaitSPID, WaitKPID, WaitUserName, WaitTime WaitTimeMillSec, WaitLockType From monDeadLock

Figure 7.14: The detailed diagnosis of the Remote processes measure reported by the SybaseSysProcesses test

7.5 Sybase Databases Layer

This layer monitors each of the databases on the Sybase server. Using the tests mapped to this layer, you can promptly identify the following:

- Which database is consuming memory excessively?
- The transaction log on which database has run out of space?
- Which database is left with very little free space?



☑ Sybase Databases

- ☑ Sybase DatabaseStats
  - 🟩 egdb
  - 🟩 lokeshdb
  - 🟩 master
  - 🟩 model
  - 🟩 sybsystemdb
  - 🟩 sybsystemprocs
  - 🟩 tempdb
- ☑ SybaseDatabaseSpaceUsage
  - 🟩 egdb
  - 🟩 lokeshdb
  - 🟩 master
  - 🟩 model
  - 🟩 sybsystemdb
  - 🟩 sybsystemprocs
  - 🟩 tempdb

Figure 7.15: The tests mapped to the Sybase Databases layer

7.5.1 Sybase DatabaseStats Test

This test is used to track the memory usage, backup state, transaction log space requests, and wait statistics of each database. For this test to work, make sure that the enable monitoring parameter is enabled.

Target of the test : A Sybase adaptive server (ver. 12.5 and above) on which MDA tables have been installed

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every database being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – To enable this test to connect to the Sybase server and collect the required metrics, it is enough if you configure the test with the name of a Sybase user who has the “mon_role”. However, for best results, it is recommended that you configure all Sybase tests with the credentials of a Sybase user who has the “mon_role”, “sa_role’, and “sybase_ts_role”.
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **DETAILED DIAGNOSIS** – To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured

to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

- The eG manager license should allow the detailed diagnosis capability
- Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Used memory:	The memory currently used by each database	KB	Ideally, the value of this measure should be low. In the event of a sudden slowdown in the performance of the Sybase server, you might want to compare the memory usage of all databases on the server to identify which database is excessively consuming memory resources.
Last backup state:	Whether the last backup succeeded or failed.	Number	If the value of this measurement is '1', then it indicates that the last backup you attempted or scheduled failed. You would then have to investigate the reasons for the failure and rectify them. If the last backup was successful, then this measure will return the value '0'.
Transaction log state:	The current status of transaction log gets.	Number	If this measurement is '1', it implies that the transaction log of that database has run out of space. When this occurs, you would have to allocate more space for that transaction log file; if not, database performance will suffer.
Append log request:	The number of times the Sybase server placed a request for log space for	Number	

Measurement	Description	Measurement Unit	Interpretation
	that database.		
Append log waits:	The current number of log requests waiting to be processed.	Number	If most of the Append log requests are in waiting – i.e., if the value of this measure is dangerously close to that of the Append log requests measure- it could indicate a processing bottleneck on the server; this is typically caused by insufficient space in the transaction logs. In such a situation, it would be best to allocate more space to the transaction log, so that the request queue length reduces.

7.5.2 Sybase Database Space Usage Test

This test reports the space usage of all Sybase databases, and sheds light on those databases that are running short of space.

Target of the test : A Sybase adaptive server (ver. 12.5 and above) on which MDA tables have been installed

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every database being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – To enable this test to connect to the Sybase server and collect the required metrics, it is enough if you configure the test with the name of a Sybase user who has the “mon_role”. However, for best results, it is recommended that you configure all Sybase tests with the credentials of a Sybase user who has the “mon_role”, “sa_role’, and “sybase_ts_role”.
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **INCLUDE DB** - Specify a comma-separated list of databases that you wish to monitor in the **INCLUDE DB** text box. By default, this is set to all.
8. **EXCLUDE DB** - Specify a comma-separated list of databases that you wish to exclude from the scope

of monitoring in the **EXCLUDE DB** text box. By default, this is set to *none*.

9. **USE STORED PROCEDURE** –By default, this flag is set to **Yes**, indicating that the test uses a stored procedure for collecting space usage metrics. To use this stored procedure, the eG agent requires *sa_ role* privileges. In high security environments, where administrators may not prefer to expose the credential of a user with *sa_role* privilegs to the eG agent, you can configure the eG agent to run a query instead for pulling the required metrics. To enable the eG agent to use this query, set the **USE STORED PROCEDURE** flag to **No**.

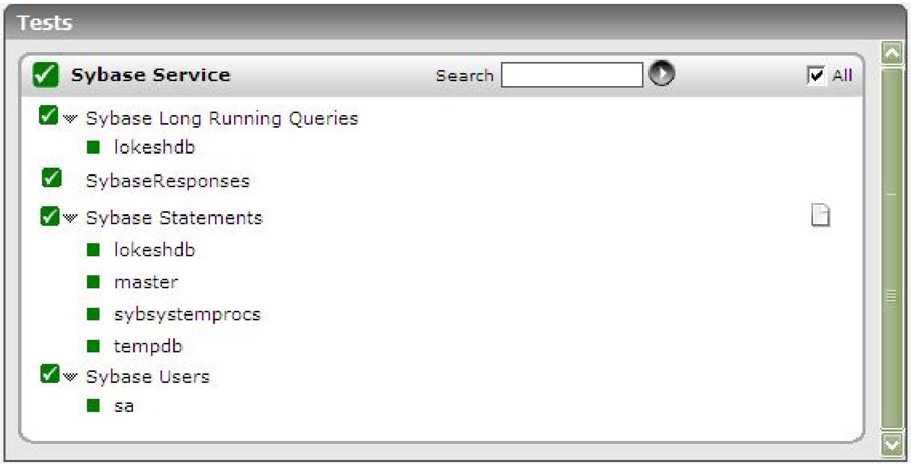
Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Total size:	The space allocated to a database	MB	
Reserved space percent:	The percentage of space reserved for tables and indexes of a database	Percent	If the value of this measure reaches 100%, it indicates that the total space in the database has been completely allocated. New tables/indexes can be added to the database, only if its total size is increased.
Reserved space:	The amount of space allocated to the tables and indexes created on a database	MB	If the value of this measure becomes equal to that of the Total_size measure, new tables/indexes can no longer be created on the database. To create new tables, you must increase the database size.
Data space:	The amount of space used by data	MB	
Index space:	The amount of space used by indexes	MB	
Unused space:	The amount of free space available in the database	MB	

7.6 Sybase Service Layer

The tests mapped to this layer proactively alert administrators to the following:

- Non-availability of the Sybase server;
- Poor responsiveness of the Sybase server;
- Queries that have been running too long a time;
- Resource-intensive transactions to a database on the Sybase server;
- Infected processes and sleeping processes initiated by users to the Sybase server.



Tests

☑ Sybase Service — Search □ — ☑ All

- ☑ Sybase Long Running Queries
  - 🟩 lokeshdb
- ☑ SybaseResponses
- ☑ Sybase Statements
  - 🟩 lokeshdb
  - 🟩 master
  - 🟩 sybsystemprocs
  - 🟩 tempdb
- ☑ Sybase Users
  - 🟩 sa

Figure 7.16: The tests mapped to the Sybase Service Layer

7.6.1 Sybase Long Running Queries Test

This test tracks the currently executing queries on the Sybase database server and determines the number of queries that have been running for a long time. For execution, this test requires the enable monitoring, statement statistics active, and per object statistics active configuration parameters to be enabled.

Target of the test : A Sybase adaptive server (ver. 12.5 and above) on which MDA tables have been installed

Agent deploying the test : An internal agent

Outputs of the test : One set of results for the Sybase server being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – To enable this test to connect to the Sybase server and collect the required metrics, it is enough if you configure the test with the name of a Sybase user who has the "mon_role". However, for best results, it is recommended that you configure all Sybase tests with the credentials of a Sybase user who has the "mon_role", "sa_role', and "sybase_ts_role".
5. **PASSWORD** – The password corresponding to the above user

6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **ELAPSED TIME** - In the **ELAPSED TIME** text box, specify the duration (in seconds) for which a query should have executed for it to be regarded as a long running query. The default value is 5.
8. **DDROWCOUNT** – Specify the number of long running queries for which details will be available in the detailed diagnosis page. By default, this parameter is set to 5. This indicates that even if the total number of long running queries is, say 10, the detailed diagnosis of this test will provide information pertaining to only 5 queries by default. For information related to more number of queries, you should increase the **DDROWCOUNT**.
9. **DETAILED DIAGNOSIS** – To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

   The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

   - The eG manager license should allow the detailed diagnosis capability
   - Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Number of queries:	Indicates the number of queries currently executing on the database server that have been running for more time than the configured **ELAPSED TIME**.	Number	The detailed diagnosis for this measure indicates the exact queries and which user is executing the queries. This information can be very useful in identifying queries that may be candidates for optimization.
Avg elapsed time:	The average time taken by the long running queries to execute.	MSecs	

7.6.2 Sybase Users Test

This test monitors user sessions to the database server, and reports the number and status of processes executed by each user on the server.

Target of the test : A Sybase adaptive server (ver. 12.5 and above) on which MDA tables have been installed

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every user being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – To enable this test to connect to the Sybase server and collect the required metrics, it is enough if you configure the test with the name of a Sybase user who has the “mon_role”. However, for best results, it is recommended that you configure all Sybase tests with the credentials of a Sybase user who has the “mon_role”, “sa_role’, and “sybase_ts_role”.
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **EXCLUDEUSER** - Specify a comma-separated list of user names to be exclude from the monitoring scope of this test in the **EXCLUDEUSER** text box.
8. **DETAILED DIAGNOSIS** – To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option.

   The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:

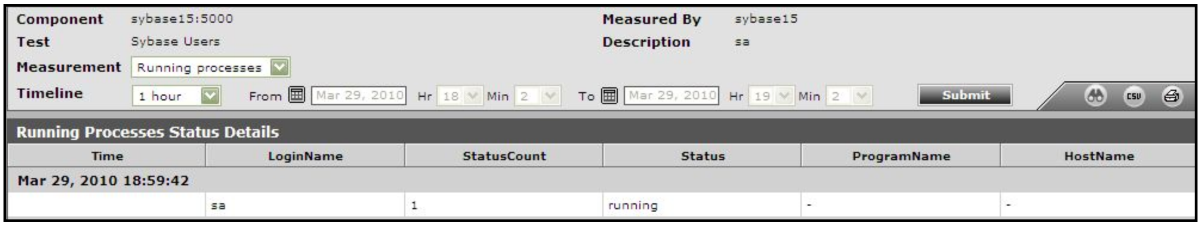
   - The eG manager license should allow the detailed diagnosis capability
   - Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Total processes:	The number of processes initiated by this user on the database server. each username.	Number	
Running processes:		Number	Use the detailed diagnosis of this

Measurement	Description	Measurement Unit	Interpretation
	The number of processes currently running for this user in the database.		measure to view the details of the running processes.
Sleeping processes:	The number of processes initiated by this user that are currently sleeping.	Number	If the value of this measure is very high, it could indicate a memory leak in the application. The administrator should take care to avoid sleeping processes. Use the detailed diagnosis of this measure to view the details of sleeping processes.
Infected processes:	The number of processes initiated by this user that are currently infected.	Number	If the value of this measure is very close to that of the Total processes measure, then further investigation would be required to control the infected processes. Use the detailed diagnosis of this measure to identify these processes and take the necessary corrective action.

Using the detailed diagnosis of the Running processes measure, you can find out which processes are currently running for a particular user.



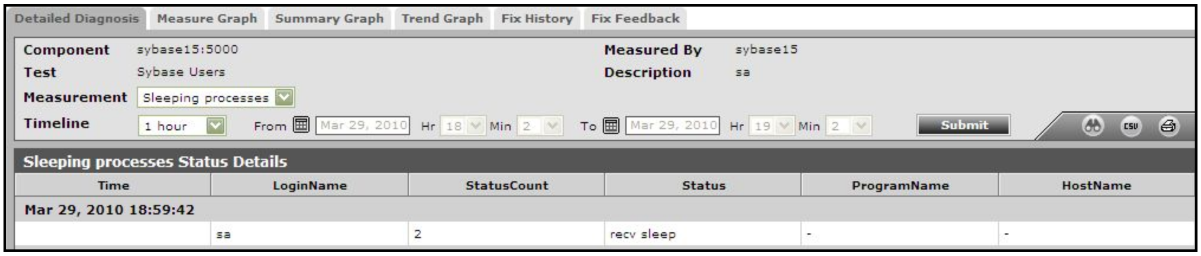
Component sybase15:5000
Test Sybase Users
Measurement Running processes
Timeline 1 hour From Mar 29, 2010 Hr 18 Min 2 To Mar 29, 2010 Hr 19 Min 2
Measured By sybase15
Description sa

Running Processes Status Details

Time	LoginName	StatusCount	Status	ProgramName	HostName
Mar 29, 2010 18:59:42					
	sa	1	running	-	-

Figure 7.17: The detailed diagnosis of the Running processes measure reported by the Sybase Users test

Using the detailed diagnosis of the Sleeping processes measure, you can find out which processes initiated by a particular user are currently sleeping.



Component sybase15:5000
Test Sybase Users
Measured By sybase15
Description sa
Measurement Sleeping processes
Timeline 1 hour From Mar 29, 2010 Hr 18 Min 2 To Mar 29, 2010 Hr 19 Min 2

Sleeping processes Status Details

Time	LoginName	StatusCount	Status	ProgramName	HostName
Mar 29, 2010 18:59:42					
	sa	2	recv sleep	-	-

Figure 7.18: The detailed diagnosis of the Sleeping processes measure reported by the Sybase Users test

7.6.3 Sybase Responses Test

This test, executed by an internal agent, tracks the statistics pertaining to the availability and response time of the Sybase adaptive server.

Target of the test : A Sybase adaptive server (ver. 12.5 and above) on which MDA tables have been installed

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every Sybase server being monitored

Configurable parameter for the test

1. **TEST PERIOD** – How often should the test be executed
2. **HOST** – The IP address of the Sybase server
3. **PORT** – The port on which the server is listening
4. **USER** – To enable this test to connect to the Sybase server and collect the required metrics, it is enough if you configure the test with the name of a Sybase user who has the “mon_role”. However, for best results, it is recommended that you configure all Sybase tests with the credentials of a Sybase user who has the “mon_role”, “sa_role’, and “sybase_ts_role”.
5. **PASSWORD** – The password corresponding to the above user
6. **CONFIRM PASSWORD** – Confirm the **PASSWORD** by retyping it here.
7. **QUERY** – By default, this parameter is set to *select * from sysobjects*. The test executes this executes the default query to report the availability and responsiveness of the server. If the user configured for this test does not have the right to execute the default query, then the **QUERY** parameter can be overridden with a query that user has permission to execute.

Measurements made by the test

Measurement	Descritpion	Measurement Unit	Interpretation
Sybase server availability:	Indicates if the database instance is responding to	Percent	A value of 100 for this measure indicates that the database is responding to a

Measurement	Descritpion	Measurement Unit	Interpretation
	requests or not.		request. On the other hand, a value of 0 denotes that the database is not responding. Availability problems may be caused by a misconfiguration/malfunctioning of the database instance, or because the instance is using an invalid user account. Besides the above, this measure will report that the server is unavailable even if a connection to the database instance is unavailable, or if a query to the database fails. In this case, you can check the values of the DB connection availability and Query processor availability measures to know what is exactly causing the database instance to not respond to requests - is it owing to a connection unavailability? or is it due to a query failure?
Total response time:	Indicates the time taken by the database server to respond to a user query. This is the sum of connection time and query execution time.	Secs	A sudden increase in response time is indicative of a potential performance bottleneck on the database server.
DB connection availability:	Indicates whether the database connection is available or not.	Percent	If this measure reports the value 100 , it indicates that the database connection is available. The value 0 on the other hand indicates that the database connection is unavailable. A connection to the database may be unavailable if the database is down or if the database is listening on a port other than the one configured for it in the eG manager or owing to a poor network link. If the Sybase server availability measure reports the value 0, then, you can check the value of this measure to

Measurement	Descritpion	Measurement Unit	Interpretation
			determine whether/not it is due to the unavailability of a connection to the server.
Query processor availability:	Indicates whether the database query is executed successfully or not.	Percent	If this measure reports the value 100, it indicates that the query executed successfully. The value 0 on the other hand indicates that the query failed. In the event that the Sybase server availability measure reports the value 0, check the value of this measure to figure out whether the failed query is the reason why that measure reported a server unavailability.
Query execution time:	Indicates the time taken for query execution.	Secs	A high value could indicate that one/more queries to the database are taking too long to execute. Inefficient/badly designed queries to the database often run for long periods. If the value of this measure is higher than that of the Connection time measure, you can be rest assured that long running queries are the ones causing the responsiveness of the server to suffer.
Records fetched:	Indicates the number of records fetched from the database.	Number	The value 0 indicates that no records are fetched from the database

8

Conclusion

This document has described in detail the monitoring paradigm used and the measurement capabilities of the eG Enterprise suite of products with respect to **Sybase Adaptive servers**. For details of how to administer and use the eG Enterprise suite of products, refer to the user manuals.

We will be adding new measurement capabilities into the future versions of the eG Enterprise suite. If you can identify new capabilities that you would like us to incorporate in the eG Enterprise suite of products, please contact support@eginnovations.com. We look forward to your support and cooperation. Any feedback regarding this manual or any other aspects of the eG Enterprise suite can be forwarded to feedback@eginnovations.com.