Sun StorageTek™ Business Analytics Fabric Agent Installation Guide

Release 5.0 SP1

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Introduction to the Fabric Agent

Sun StorageTek Business Analytics provides one unified fabric agent supporting different vendor products and interfaces.

Note: With the acquisition of StorageTek, Sun Microsystems has re-branded and re-named Global Storage Manager (GSM) as Sun StorageTek Analytics, a member of the Enterprise Storage Manager portfolio of software solutions. The functionality of Business Analytics is identical to GSM, only the name has changed.

The products and product interfaces include Brocade as well as the FA-MIB (Fibre Alliance MIB) support for switches and Service Processors that support the FA-MIB (e.g., McData). SWAPI adds zoning and performance support for McData switches. The CIM product interface is used for switches or proxy servers that support the CIM interface. Refer to the *Sun StorageTek Business Analytics Support Matrix* located on the Documentation CD for the latest information on supported SANs/fabric switches as well as their support requirements.

The Fabric Agent reports information about the fabric member switches, hardware and software configuration, port connectivity and performance, as well as zoning. Sun StorageTek Business Analytics 5.0 provides three installation media for the supported server platforms: Windows Local Manager, Solaris Local Manager, and UNIX Agent Installation (HP-UX and AIX).

To upgrade a Fabric Agent or multiple fabric agents, the procedure is to:

1. Uninstall the previous version of the Fabric Agent.

2. Install the current Fabric Agent.

The decision to upgrade an existing Fabric Agent to that in the latest Sun StorageTek Business Analytics software may be performed because:

- The Sun StorageTek Business Analytics Release Notes indicate a problem has been fixed or a new feature added.
- The upgrade is recommended by your Sun representative.

Automatic and Static Agent Registration

Automatic agent registration is a configuration option for agent data collection. In the storability.ini file, automatic agent registration is configured as follows:

- **Local Manager** – Specify the IP address or host name of the Local Manager to be contacted to activate agent registration.
- **Local Manager Registration Port** – Specifies the TCP port number used by the Local Manager for agent auto registration. The default port number is 17146.
- **Enable Auto Registration** – Turns agent auto registration on (default) or off.

To register the Host Agent statically, proceed as follows:
- Enter false in the **Enable Auto Registration** field.
- Modify the Routing Agent static agent configuration to include an entry (port number|<agent IP address/name>)
- Restart the Routing Agent

FABRIC AGENT OBJECTS

Table 1 lists the objects that the unified fabric agent publishes.

Table	Columns
gsa_alerts-3-0	sourceip, priority, alert_id, progname, alert, time, firsttime, refreshedtime, int1, text1, text2.
gsa_agent_version-2-0	ip_address, agent_name, version, compile_time, managed_entities, tz_name, tz, timestamp
gsa_cache_control-2_1	ip_address, port, table_name, cache_age, last_update_request_length, update_request_pending, group_name, group_master,timestamp
gsa_ini_control-2_0	ip_address, port, domain, parameter, value, status, timestamp
gsa_parm_info	ip_address, port, object, parm_name, value_syntax, description, example
gsa-fabric_ports_perf	acom_id, ip_address, switch_wwn, port_wwn, report_interval_sec, sample_interval_sec, cnt_errors, rx_frames_per_sec, tx_frames_per_sec, tx_bytes_per_sec,, rx_bytes_per_sec, tx_peak_bytes_per_sec, rx_peak_bytes_per_sec, timestamp.
gsa-fabric_switch-2_1	ip_address, switch_wwn, switch_name, mgt_ip_address, dev_ip_address, dev_ip_address2, model, role, state, timestamp
gsa_fabric_ports-2_1	ip_address, domain, port, fabric_wwn, switch_wwn, port_wwn, port_state, port_type, att_port_id, att_node_wwn, timestamp
gsa_fabric_zone	ip_address, fabric_wwn, z_type, z_name, member_type, member_name, effective, timestamp.

Table 1 –Fabric Agent Objects

FABRIC AGENT MATRIX

Item	Description
Support Prerequisites	.
Software and Hardware Requirements	Refer to the *Sun StorageTek Business Analytics Support Matrix.*

Brocade Configuration Parameters	`Switch management IP Address or host name`
	`User name`
	`User password`
	
	Use the switch management interface of the switch with the highest firmware revision indicated in the Sun StorageTek Business Analytics Support Matrix.

SWAPI Configuration Parameters	`Switch management IP Address or host name`
	`SWITCH`
	`Port`
	`User name`
	`User password`

Item	Description
FA-MIB Configuration Parameters	IP address or host name SNMP Read Community Port (default port is 161)
Cisco	IP address or host name SNMPv2 Read Community Port Number (default port is 161)
SNIA SMI (CIM)	Provider Switch or Proxy IP address or host name Port (default port is 5988) Provider namespace User name User password
Prerequisites Verification	
Verify Brocade User Name, Password, Switch Management IP Address	telnet <switch_mgt_ip_adress> <user name> <password>
SWAPI-supported Fabric (Refer to *the Sun StorageTek Business Analytics Support Matrix*)	telnet <switch_mgt_ip_adress> <user name> <password>
FA-MIB-supported Fabric (Refer to the *Sun StorageTek Business Analytics Support Matrix*)	bulkall –ip <ip_address> -o <output_filename> a. Open the output file. b. Verify it is not empty. If it is empty, verify with the site administrator that SNMP is enabled on the device.
Cisco IP and *bulkall*	bulkall –ip <ip_address> -i cisco-debug-mib.txt –ver 1 -o <output_filename> Note: Cisco fabric switches support many SNMP MIBs that the Fabric Agent does not use. The StorageTek-supplied *cisco-debug-mib.txt* file limits verification to only MIBs that the agent uses. When you use `bulkall` with this file, you are only verifying the MIBs the Fabric Agent uses. The above example assumes the bulkAll utility and the cisco-debug-mib.txt file are located in the same folder/directory.
Agent Installation	
Windows	• Windows Local Manager Installation CD (InstallShield) • Windows Administrator privileges
Solaris	• Solaris Local Manager Installation CD (package installation) • root user privileges

Item	Description
Best Practices	
Maximum Number of Monitored fabrics/fabric switches (per agent)	StorageTek has no finite limitation on the number of switches. However, if you are collecting from more than 300 ports, you may want to consider deploying another Fabric Agent. Minimally, increase the CONFIG_CACHE_REFRESH_INTERVAL and disable performance collection.
SWAPI and Fabric Under Service Processor Management	SWAPI is NOT supported for a fabric under Service Processor Management.
Restrictions	The Fabric Agent does not currently support using SSL (secure mode) in collection of the information.
Configuration Parameters	**Note**: Some configuration settings only apply to a specific fabric switch product interface.
Local Manager	IP address or host name of the Local Manager that will be contacted for agent auto registration.
Local Manager Port	The TCP port number the Local Manager uses for agent auto registration. The default port number is 17146.
Enable Auto Registration	Turns agent auto registration on (default) or off.
CONFIG_CACHE_REFRESH_INTERVAL	Configuration cache refresh interval in seconds; default value is 1200 seconds.
CMD_EXECUTION_TIMEOUT	Time to wait in seconds for execution of each CLI command, If performance is disabled, StorageTek suggests you do not set this configuration variable. If performance is enabled, the default value of CMD_EXECUTION_TIMEOUT=0.9 of minimal PERF_SAMPLE_INTERVAL, CONFIG_CACHE_REFRESH_INTERVAL.
PERF_REPORT_INTERVAL	Interval at which performance data is expected to be collected (hourly). Default is 3600 seconds.
PERF_SAMPLE_INTERVAL	Optional parameter that specifies the interval in seconds to collect performance data. If not set or set to zero, performance data collection is disabled.

Item	Description
IP_INCLUDE	This is an optional parameters with multiple entries allowed. If provided, this setting specifies which switches to include in reporting based on their IP address or subnet. The format used is the address/netmask convention that is commonly used in networking applications: `IP_INCLUDE = address` (where the address is specific hostname or IP address) Or: `IP_INCLUDE = network/netmask` (where the address belongs to specified network with specified netmask. **Note**: The separator is a forward slash "/") The network is any valid IP address, and the netmask is an integer between 0 and 32 specifying the number of bits to use when comparing the numerical network. If no IP_INCLUDE parameter is specified, the default agent behavior is to include all switches.
IP_EXCLUDE	This is an optional parameters with multiple entries allowed. If provided, this setting specifies which switches to exclude from reporting based on their IP address or subnet with an optional integer netmask. The format is: IP_EXCLUDE = address or IP_EXCLUDE = address/netmask If provided, this parameter specifies which switches to exclude from reporting based on their IP address or subnet. If not specified, the default behavior is not to exclude any switches. **Note**: If two Local Managers have Fabric Agents that can collect on the same fabric, Sun recommends that you use this configuration parameter to choose which Local Manager will collect data from that fabric.

Item	Description
SAVE_FABRIC_DATA_DIR	This is an optional configuration setting and is disabled by default. If set, this should be the full pathname to a directory where intermediate API data files will be created. The Fabric Agent will append intermediate API data to files that are named *saved_ *.txt* in the specified directory for offline debugging.
BRCD_CLI_PATH	This is an optional configuration setting and is disabled by default. When disabled, the agent looks for brcdCLI in the same directory as the agent binary. If set, it specifies the full pathname of an alternate brcdCLI executable, including the executable name (e.g. C:\testdir\brcdCLInew.exe).
FAMIB_CLI_PATH	This is an optional configuration setting and is disabled by default. If set, it specifies a non-standard location of FAMIB CLI.
SWAPI_CLI_PATH	This is an optional configuration setting and is disabled by default. If set, it specifies a non-standard location of SWAPI CLI.
CISCO_CLI_PATH	This is an optional configuration setting and is disabled by default. If set, it specifies a non-standard location of the CISCO CLI.
CIM_CLI_PATH	This is an optional configuration setting and is disabled by default. If set, it specifies a non-standard location of the CIM_CLI_PATH.
FAMIB_OFFLINE_DIR	This is an optional configuration setting and is disabled by default. If set, it specifies a directory in which the agent will look for offline bulkAll output for debugging purposes.
CISCOMIB_OFFLINE_DIR	This is an optional configuration setting and is disabled by default. If set, it specifies a directory in which the agent will look for offline bulkAll output for debugging purposes.
BRCD_IP	IP Address or host name, Brocade User Name, Brocade User Password. One entry is required per fabric; two entries are recommended for redundancy. StorageTek recommends you do not configure more than two entries.

Item	Description
SWAPI_IP	This interface is specified by an IP Address or host name, switch/proxy, port user name, and password. One entry is required per switch supporting SWAPI; two or more entries are recommended for redundancy. **Note**: The Fabric Agent does not communicate with service processors implementing SWAPI in proxy mode.
FAMIB_IP	This interface is specified by IP address or host name, SNMP Read Community, and port specify this interface. The default port is 161.
CISCO_IP	CISCO_IP = ip|SNMPv2 Read community string|SNMP port. This product interface can be used for switches that support Cisco switches over SNMPv2 using the Cisco-specific MIBs. One entry is required per fabric containing a Cisco switch; two or more entries are recommended for redundancy. The agent will automatically discover additional Cisco switches in the fabric. The Fabric Agent requires SNMPv2 to be enabled on each Cisco switch. The read community string is encrypted before it is written to storability.ini file. The Fabric Agent assumes the same read community string is valid for all switches discovered in the same fabric. Currently, the Fabric Agent does not support SNMPv3.
CIM_IP	CIM_IP = provider ip|provider port (5988)|namespace| username|password This product interface can be used for switches that support the CIM interface. One entry is required per SMI provider. This entry support one or several fabrics at the same time, depending on the configuration of the provider. The first field is the IP address of a CIM provider. This may be an individual switch that supports CIM natively, or a CIM proxy reporting on one or more switches. The second field is the CIM provider port, which is TCP port number 5988 by default. The third field, the namespace value, must be obtained from the vendor documentation for the CIM provider. The Username and password must be configured for an account that grants access to the CIM provider.

Table 2 - Fabric Agent Matrix

INSTALLING FABRIC AGENT - WINDOWS

The following section describes how to install and configure the Fabric Agent on a Windows platform.

1. Insert the Sun StorageTek Business Analytics Windows Local Manager CD into the CD-ROM drive.

2. Click **Next** on the **Welcome** menu to continue the installation.

3. Click **Yes** to accept the terms of the software license agreement.

4. Review/modify the **User Name** and **Company Name** and click **Next>**.

5. Check the **Fabric Agent** checkbox on the screen that lists agents for installation.

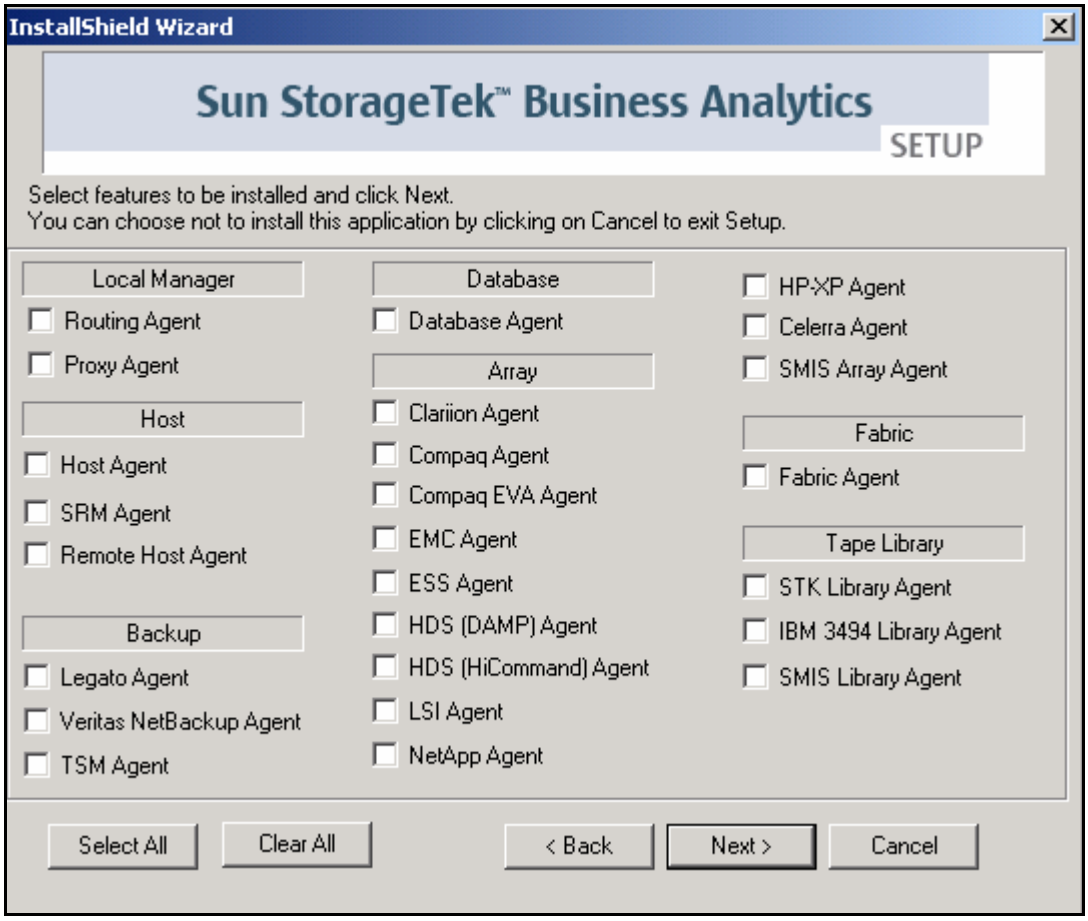

Figure 1 - Agent Selection Dialog

6. Review the settings and click **Next**.

7. Specify whether or not to install the new version of the Configuration Tool.

8. When the Configuration Tool is automatically launched, select **File** -> **Edit** -> **Smart Agent Configuration**.

9. Click the **Fabric Agent** tab and click **Add**. Use the list box to select the fabric product interface (e.g., BRCD_IP) you are configuring.

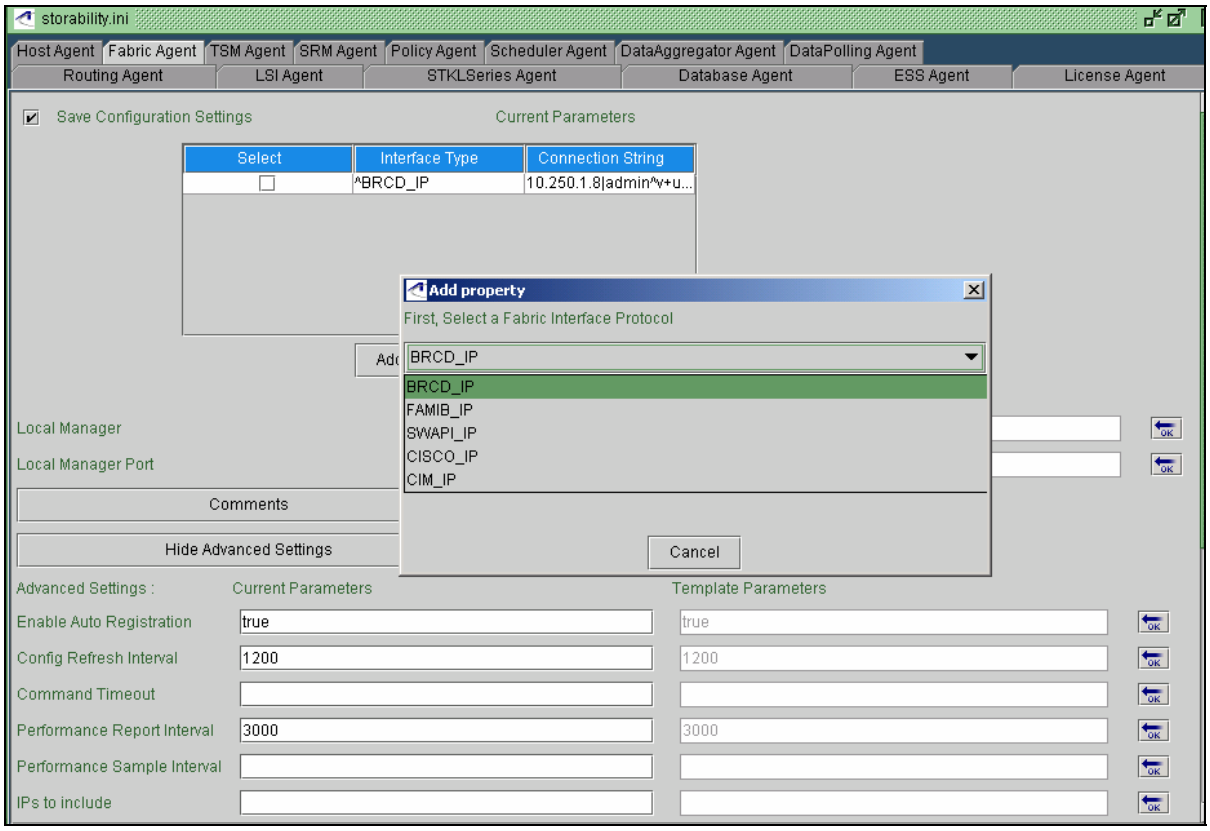

Figure 2 - Fabric Agent Configuration Window

Brocade

User Name – Brocade user name for agent authentication

Password – Brocade user's password for agent authentication

IP Address – Switch management IP address

FA-MIB

IP Address – IP address to access the SNMP MIB.

Community –SNMP read string (default SNMP read community is public).

Port – TCP port number (default port is 161).

SWAPI

IP Address –Switch management interface IP address

User Name – User name used for agent authentication

Password – User's password

CISCO IP

IP Address – IP address to access the Cisco switch.

SNMPv2 Read community string - SNMP read string (default SNMP read community is public).

Port - TCP port number (default port is 161).

CIM IP

Provider IP – Specify one entry per SMI provider. This entry support one or several fabrics at the same time, depending on the configuration of the provider.

Provider Port – Specify the provider port number. The default port number is 5988.

Namespace – Specify the namespace value that must be obtained from the vendor documentation for the CIM provider.

User Name – Specify a user name for an account that grants access to the CIM provider.

Password – Specify a password for the above specified user.

10. Click **Submit** after you have finished configuring the fabric product interfaces.

11. For **Local Manager**, specify the IP address or host name of the Local Manager to be contacted for agent auto registration.

12. For **Local Manager Port**, specify the TCP port number the Local Manager uses for agent auto registration. The default port number is 17146.

13. Click **Show Advanced Settings** and review/modify the following configuration variables:

    - **Enable Auto Registration** – Turns agent auto registration on (default) or off. Default value is true (enabled) but may be set to false to disable agent auto registration.

    - **Config. Cache Interval** – Specifies the configuration cache refresh interval in seconds; default value is 1200.

    - **Connect Timeout** – Specifies the time to wait in seconds for execution of each CLI command, If not set, the fabric agent will wait ninety (90) percent of the Fabric Refresh Interval.

    - **Performance Report Interval -** Specifies the **i**nterval at which performance data is expected to be collected (hourly). Default is 3600 seconds.

    - **Performance Sample Interval –** Is an optional parameter that specifies the interval in seconds to collect performance data. If not set or set to zero, performance data collection is disabled.

- **IPs to Include** - This is an optional parameter with multiple entries allowed. If provided, this setting specifies which switches to include in reporting based on their IP address or subnet.

  The format used is the address/netmask convention that is commonly used in networking applications:

  `IP_INCLUDE = address` (where the address is specific hostname or IP address)

  Or:

  `IP_INCLUDE = network/netmask` (where the address belongs to specified network with specified netmask.

  Note: The separator is a forward slash ("/").

  The network is any valid IP address, and the netmask is an integer between 0 and 32 specifying the number of bits to use when comparing the numerical network. If no IP_INCLUDE parameter is specified, the default agent behavior is to include all switches.

- **IPs to Exclude** - This is an optional parameter with multiple entries allowed. This option is disabled by default.

  If turned on, this setting specifies which switches to exclude from reporting based on their IP address or subnet with an optional integer netmask.

  The format is:

  ```
  IP_EXCLUDE = address
  ```

  Or:

  ```
  IP_EXCLUDE = address/netmask
  ```

  If provided, this parameter specifies which switches to exclude from reporting based on their IP address or subnet. If not specified, the default behavior is not to exclude any switches.

- **BRCD_CLI_PATH** - This is an optional configuration setting and is disabled by default. When disabled, the agent looks for brcdCLI in the same directory as the agent binary. If set, it specifies the full pathname of an alternate brcdCLI executable, including the executable name (e.g. C:\testdir\brcdCLInew.exe).

- **FAMIB_CLI_PATH** - This is an optional configuration setting and is disabled by default. If set, it specifies a non-standard location of FAMIB CLI.

- **SWAPI_CLI_PATH** - This is an optional configuration setting and is disabled by default. If set, it specifies a non-standard location of SWAPI CLI.

- **CISCO_CLI_PATH** - This is an optional configuration setting and is disabled by default. If set, it specifies a non-standard location of the CISCO CLI.

- **CIM_CLI_PATH** - This is an optional configuration setting and is disabled by default. If set, it specifies a non-standard location of the CIM_CLI_PATH.

- **CISCOMIB_OFFLINE_DIR** - This is an optional configuration setting and is disabled by default. If set, it specifies a directory in which the agent will look for offline bulkAll output for debugging purposes.

- **FAMIB_OFFLINE_DIR** - This is an optional configuration setting and is disabled by default. If set, it specifies a directory in which the agent will look for offline bulkAll output for debugging purposes.

14. With "Save Configuration Settings" turned on (check mark), select **File->Save** and confirm saving changes to the storability.ini file.
15. Select **File-> Exit** to close the Configuration Tool.
16. Use the Windows **Services** panel to start the Storability Fabric Agent before you verify agent functionality.

Important Note:

The Fabric Agent will not start if **any** switch is misconfigured in the storability.ini file. That is, the Fabric Agent will not start even though other switches in the storability.ini file are properly configured. In this case, refer to the *Troubleshooting* section of this guide to troubleshoot any misconfigured switches, fix the incorrect configuration parameters, and resave the configuration settings. You may then restart the Fabric Agent.

INSTALLING THE FABRIC AGENT – SOLARIS

The following section describes the installation procedure for installing the Fabric Agent for Brocade, SWAPI, Cisco, or FA-MIB. For the installation procedure for SNIA SMI (CIM), refer to the following *Installing the Fabric Agent and GSMcimfab on Solaris* section.

1. Mount the installation CD on the Solaris server. For example:

```
mount –F hsfs –o ro /dev/dsk/c0t6d0s0 /mnt
```

2. Change directory to the UNIX directory for the Solaris operating system (e.g., Solaris/8).

3. Run the pkgadd command. The main package installation menu for Storability agents is displayed.

```
pkgadd –d .
```

```
root@symmsun01# cd Solaris
root@symmsun01# cd 8
root@symmsun01# pkgadd -d .

The following packages are available:
  1  GSMacsls      Storability GSM STK/ACSLS Library Agent
                   (sparc) prod-4.0.31-qa
  2  GSMbase       Storability GSM base
                   (sparc) prod-4.0.31-qa
  3  GSMclarii     Storability GSM Clariion Agent
                   (sparc) prod-4.0.31-qa
  4  GSMclra       Storability GSM EMC Celerra Agent
                   (sparc) prod-4.0.31-qa
  5  GSMcpq        Storability GSM Compaq StorageWorks Agent
                   (sparc) prod-4.0.31-qa
  6  GSMcpqeva     Storability GSM Compaq EVA Agent
                   (sparc) prod-4.0.31-qa
  7  GSMdb         Storability GSM Database Agent
                   (sparc) prod-4.0.31-qa
  8  GSMemc        Storability GSM EMC Symmetrix Agent
                   (sparc) prod-4.0.31-qa
  9  GSMess        Storability GSM ESS Array Agent
                   (sparc) prod-4.0.31-qa
 10  GSMfabric     Storability GSM Fabric Agent
                   (sparc) prod-4.0.31-qa

... 17 more menu choices to follow;
<RETURN> for more choices, <CTRL-D> to stop display:^D

Select package(s) you wish to process (or 'all' to process
all packages). (default: all) [?,??,q]: 10
```

Figure 3 - Fabric Agent Package Selection

4. Type the package selection number for the Fabric Agent; type 10 and press **Enter** to select installing the **Fabric Agent**.

5. Read the information on the types of switches that the Fabric Agent supports collecting data.

6. Specify whether (y/n) the Fabric Agent will monitor Brocade switches.

```
The Storability Fabric Agent can collect data from the following types
of switches:
  Brocade (Brocade API)
  Cisco   (SNMP)
  McData  (SNMP or SWAPI)

Monitor Brocade switches? [y] [y,n,?] y

Brocade topology configuration:
At least one switch per monitored fabric must be configured, though two
are recommended to provide redundancy.  Enter a blank IP (hit enter) when
done.

Address of Brocade management port? 10.250.1.8
Username for Brocade management? admin
Password for Brocade management?
Confirm password?

Address of Brocade management port?
```

Figure 4 - Brocade Switch Configuration Settings

7. If you specify data will be collected from Brocade switches, enter:

   - **IP Address** – Switch management IP address.
   - **User Name** – Brocade user name for agent authentication
   - **Password** – Brocade user's password for agent authentication

8. Press **Enter** on a blank IP Address line to indicate you have completed entering configuration parameters for Brocade switches and to continue.

9. Specify whether (y/n) the Fabric Agent will collect data from Cisco switches.

10. If you specified the agent will collect data from Cisco switches, enter:

    - **IP Address** – IP address to access the Cisco switch.
    - **SNMPv2 Read community string** - SNMP read string (default SNMP read community is public).
    - **Port** - TCP port number (default port is 161).

11. Press **Enter** on a blank IP Address line to indicate you have completed entering configuration parameters for Cisco switches and to continue.

12. Specify whether (y/n) the Fabric Agent will collect data from FA-MIB fabric product interfaces (e.g., McData).

13. If you specified the agent will collect data from FA-MIB switches like McData, enter:

    IP Address – IP address to access the SNMP MIB.

    Community –SNMP read string (default SNMP read community is public).

    Port – TCP port number (default port is 161).

14. Press **Enter** on a blank line IP address line to indicate you have completed configuring McData (FA-MIB) switches.

15. Specify whether (y/n) the Fabric Agent will collect data from SWAPI fabric product interfaces (e.g., McData).

16. If you specified the agent will collect data from SWAPI fabric product interface (e.g., McData), enter:

    - **IP Address** –Switch management interface IP address
    - **User Name** – User name used for agent authentication
    - **Password** – User's password

17. Press **Enter** on a blank IP address line to indicate you have completed configuring SWAPI (.e.g. McData) switches.

18. Specify whether (y/n) the Fabric Agent will collect performance data. By default, the Fabric Agent does not collect performance data.

Note: Collecting performance data may take a considerable amount of time and agent resources.

19. Type y and press Enter to review/modify the **Advanced Settings**.

```
Modify advanced settings? [n] [y,n,?] y

Automatically restart this agent from agentMonitor? [y] [y,n,?]

Data collection interval? [1200] [?]

Performance sampling interval? [1200] [?]

Performance reporting interval? [3600] [?]

Command execution timeout? [900] [?]

Enable offline data collection? [n] [y,n,?] y

Enable explicit switch IP whitelists? [n] [y,n,?] y
Whitelist base address? [done]

Enable explicit switch IP blacklists? [n] [y,n,?] y
Blacklist base address? [done]

Enable automatic agent registration? [y] [y,n,?] y

Local Manager address for agent registration? [localhost]
```

Figure 5 - Fabric Agent Advanced Settings

- Specify whether (y/n) to have the Fabric Agent restarted by the Agent Monitor if the agent is detected as not running.
- Specify the frequency that the Fabric Agent will collect data. The default interval is 1200 seconds.
- Specify the frequency that the Fabric Agent will collect performance data. The default interval is 3600 seconds.
- Specify how long the Fabric Agent will wait for a command to be executed. The default timeout is 900 seconds.
- Specify whether (y/n) to enable offline data collection for debugging purposes. The default value is offline data collection is disabled.
- Specify whether (y/n) to enable explicit switch IP whitelists. This is an optional parameter with multiple entries allowed. This option is disabled by default.

  If turned on, this setting specifies which switches to include in reporting based on their IP address or subnet.

  The format used is the address/netmask convention that is commonly used in networking applications:

  `IP_INCLUDE = address` (where the address is specific hostname or IP address)

Or:

`IP_INCLUDE = network/netmask` (where the address belongs to specified network with specified netmask.

Note: The separator is a forward slash ("/").

The network is any valid IP address, and the netmask is an integer between 0 and 32 specifying the number of bits to use when comparing the numerical network. If no IP_INCLUDE parameter is specified, the default agent behavior is to include all switches.

- Specify whether (y/n) to enable explicit switch blacklists. The option is disabled by default.

  If turned on, this setting specifies which switches to exclude from reporting based on their IP address or subnet with an optional integer netmask. The format is:

  `IP_EXCLUDE = address`

  Or:

  `IP_EXCLUDE = address/netmask`

  If provided, this parameter specifies which switches to exclude from reporting based on their IP address or subnet. If not specified, the default behavior is not to exclude any switches.

- Specify whether (y/n) agent auto registration is turned on (default) or turned off.

- Specify the IP address or network resolvable host name of the Local Manager that will be contacted for agent auto registration. The default value is local host.

- Specify the TCP port number the Local Manager uses for agent auto registration. The default port number is 17146.

20. Specify (y/n) whether to continue with the installation of the Fabric Agent.

21. Specify (y/n) whether to restart the agents after the installation has completed.

Important Note:

The Fabric Agent will not start if **any** switch is misconfigured in the storability.ini file. That is, the Fabric Agent will not start even though other switches in the storability.ini file are properly configured. In this case, refer to the *Troubleshooting* section of this guide to troubleshoot any misconfigured switches, fix the incorrect configuration parameters, and resave the configuration settings. You may then restart the Fabric Agent.

22. The installation proceeds and returns you to the main package installation menu.

23. Press **Ctrl-D** and **q** to exit to the command line.

INSTALLING THE FABRIC AGENT AND CIMFAB – SOLARIS

The following section describes the installation procedure for installing the Fabric Agent and then the CIM package on Solaris 9.

1. Mount the installation CD on the Solaris server. For example:

```
mount –F hsfs –o ro /dev/dsk/c0t6d0s0 /mnt
```

2. Change directory to the UNIX directory for the Solaris 9 operating system.

3. Run the pkgadd command.

```
pkgadd –d . GSMfabric GSMcimfab
```

4. Read the information on supported vendors and product interfaces. **Note**: The installation instructions for all other supported products and product interfaces are provided in the previous instruction. This section assumes you are installing the CIM-enabled interface (CIMfab).

```
bash-2.05# pkgadd -d . GSMfabric GSMcimfab

Processing package instance <GSMfabric> from </cdrom/cdrom/Unix/Solaris/9>

Storability GSM Fabric Agent
(sparc) prod-4.0.37-qa
Copyright (c) 2002 Storability, Inc
All Rights Reserved

This is licensed software.  By installing this software you agree
to the terms of the license agreement included with the package in
/opt/storability/GSM-license.txt

GSMfabric was built on SunOS 5.9.

The Storability Fabric Agent can collect data from the following types
of switches:
  Brocade (Brocade API)
  Cisco   (SNMP)
  McData  (SNMP or SWAPI)
  CIM-enabled

Monitor Brocade switches? [y] [y,n,?] n
```

Figure 6 - Package Install Menu for GSMfabric and GSMcimfab

5. Specify whether (y/n) data will be collected from Brocade switches.

6. Specify whether (y/n) data will be collected from Cisco switches.

7. Specify whether (y/n) data will be collected from McData (or other FA-MIB) switches using SNMP.

8. Specify whether (y/n) data will be collected from McData switches using SWAPI.

9. At the "Do you intend to install GSMcimfab?" prompt, type **y** and press **Enter**.

```
Monitor Cisco switches? [y] [y,n,?] n

Monitor McData switches (SNMP)? [y] [y,n,?] n

Monitor McData switches (SWAPI)? [y] [y,n,?] n
Monitoring CIM-enabled fabric switches requires the separate GSMcimfab
package also be installed.

Do you intend to install GSMcimfab? [n] [y,n,?] y

Enable fabric performance collection? [n] [y,n,?] y
The 'advanced' settings all have reasonable default values, which most
likely need not be changed.

Modify advanced settings? [n] [y,n,?] y

Automatically restart this agent from agentMonitor? [y] [y,n,?]

Data collection interval? [1200] [?]

Performance sampling interval? [1200] [?]

Performance reporting interval? [3600] [?]
```

Figure 7 - Preparing To Install GSMcimfab

10. Specify whether (y/n) to enable the collection of fabric performance data.
11. Type **y** and press **Enter** to review/modify the Advanced Settings.
12. Specify whether (y/n) to have the Agent Monitor automatically restart the agent if it is detected as not running.
13. Specify the frequency the configuration cache is refreshed. The default value is 1200 seconds. If not set or set to zero, performance data collection is disabled.
14. Specify the frequency the agent collects fabric performance data. The default value is 1200 seconds.
15. Specify the interval for performance data to be collected hourly. The default value is 3600 seconds.

16. Specify the time to wait in seconds for execution of each CLI command.

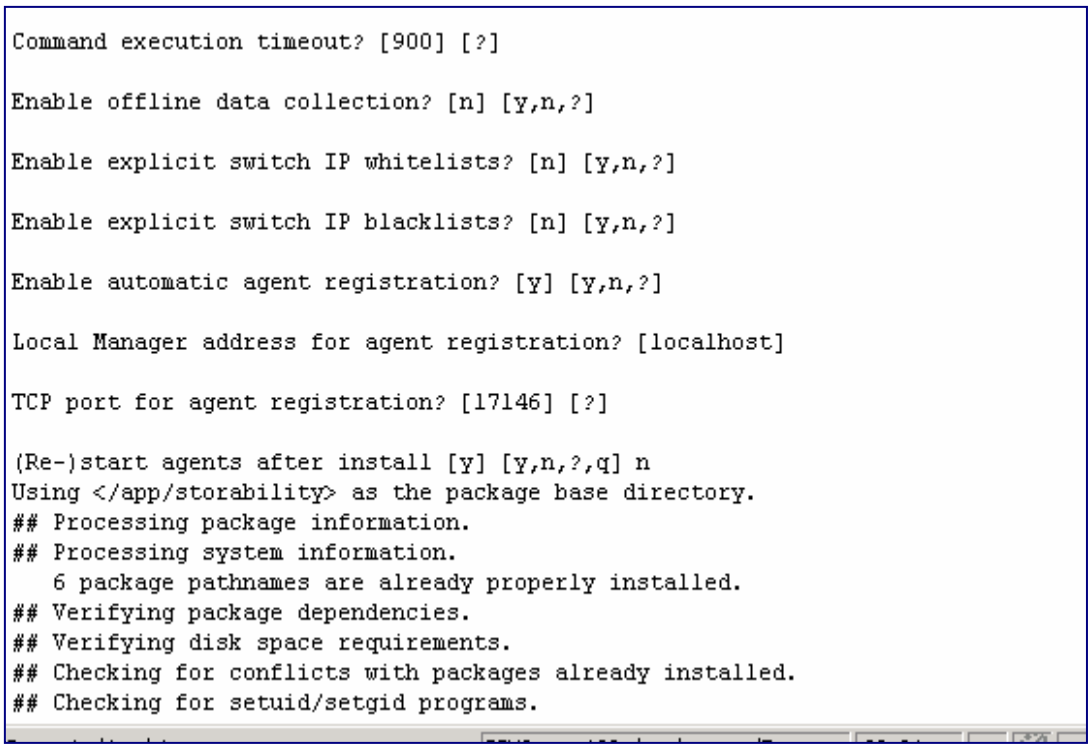

Figure 8 - Specify Fabric Agent Advanced Settings

17. Specify whether (y/n) to enable explicit switch IP whitelists. This is an optional parameter with multiple entries allowed. This option is disabled by default.

18. If turned on, this setting specifies which switches to include in reporting based on their IP address or subnet. The format used is the address/netmask convention that is commonly used in networking applications:

    IP_INCLUDE = address (where the address is specific hostname or IP address)

    Or:

    IP_INCLUDE = network/netmask (where the address belongs to specified network with specified netmask.

    Note: The separator is a forward slash (“/”).

    The network is any valid IP address, and the netmask is an integer between 0 and 32 specifying the number of bits to use when comparing the numerical network. If no IP_INCLUDE parameter is specified, the default agent behavior is to include all switches.

19. Specify whether (y/n) to enable explicit switch blacklists. The option is disabled by default. If turned on, this setting specifies which switches to exclude from reporting based on their IP address or subnet with an optional integer netmask. The format is:

    IP_EXCLUDE = address

    Or:

    IP_EXCLUDE = address/netmask

20. If provided, this parameter specifies which switches to exclude from reporting based on their IP address or subnet. If not specified, the default behavior is not to exclude any switches.

21. Specify whether (y/n) agent auto registration is turned on (default) or turned off.
22. Specify the IP address or network resolvable host name of the Local Manager that will be contacted for agent auto registration. The default value is local host.
23. Specify the TCP port number the Local Manager uses for agent auto registration. The default port number is 17146.
24. Specify whether (y/n) to restart the agents after installation.
25. Specify whether (y/n) to continue with the installation of the Fabric Agent package.
26. If you specify to continue the installation, the installation proceeds and displays a successful installation message when it has completed.

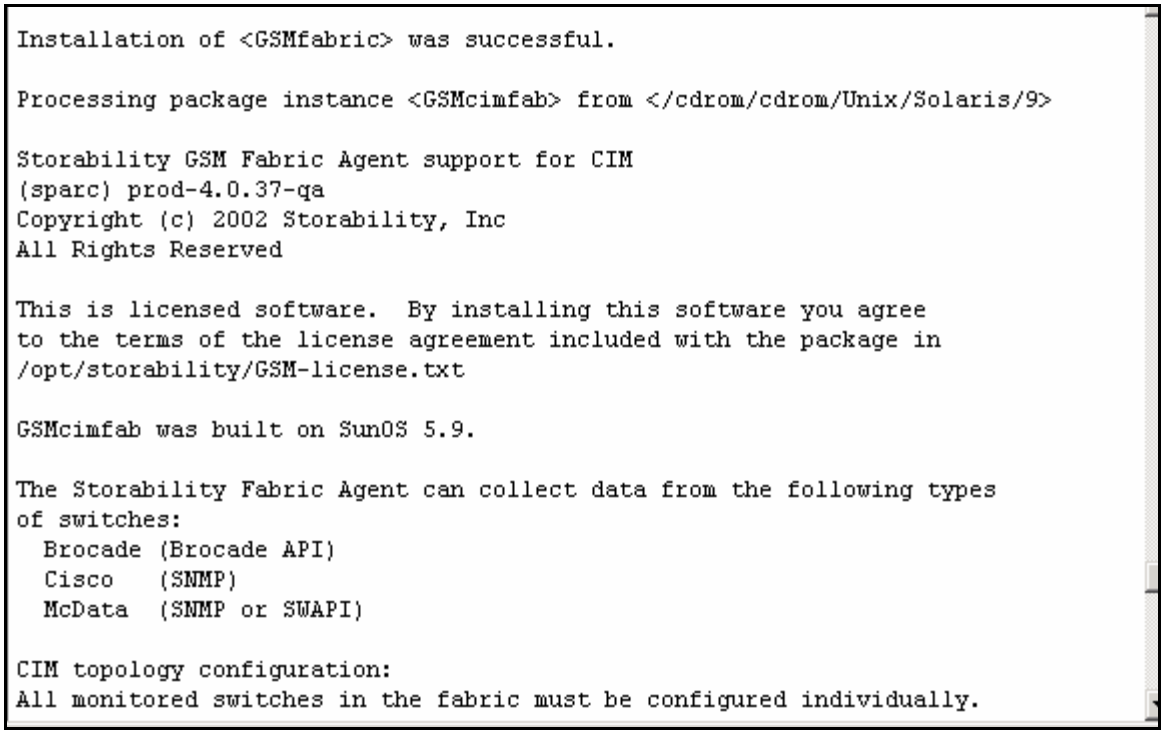

Figure 9 - Fabric Agent Installation Completed

27. Read the information on how to configure CIM topology configuration and how to specify that you have finished configuring CIM-enabled switches.
28. Enter the provider switch or proxy IP address or host name and press Enter.
29. Enter the user name and press Enter.
30. Enter the password for this user and press Enter.
31. Confirm the password.
32. Specify the port number or simply press Enter to accept the default port of 80.
33. Specify the provider namespace and press ENTER.

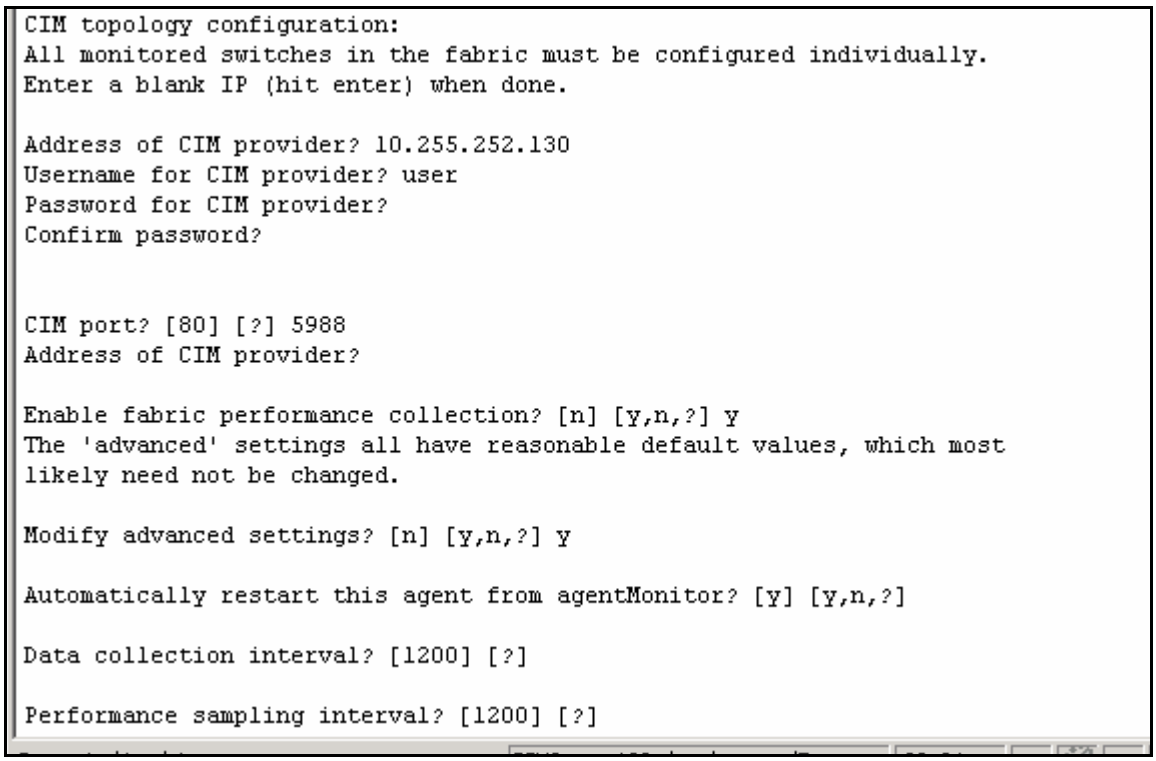

Figure 10 - Specify SNIA SMI (CIM) Configuration Settings

34. Specify whether (y/n) to enable fabric performance data collection.
35. Type **y** and press **Enter** to review/modify the Advanced Settings.
36. Specify whether (y/n) to have the Agent Monitor restart the agent if it is detected as not running.
37. Specify the frequency for the configuration cache to be refreshed. The default value is 1200 seconds.
38. Specify optionally the interval in seconds to collect performance data. The default value is 1200 seconds. If set to zero or not set, performance data collection is disabled.

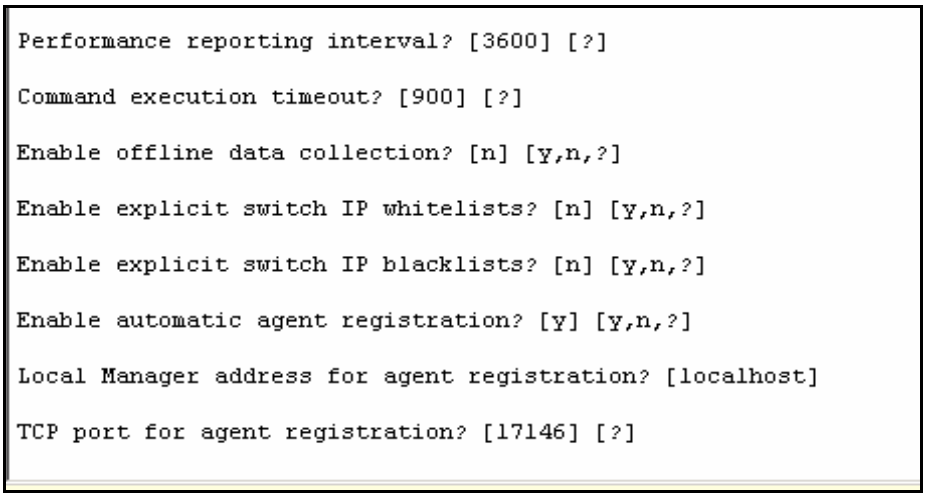

Figure 11 - GSMcimfab Advanced Settings

39. Specify the interval for performance data to be collected hourly. The default value is 3600 seconds.
40. Specify the time to wait in seconds for execution of each CLI command.
41. Specify whether (y/n) to enable explicit switch IP whitelists. This is an optional parameter with multiple entries allowed. This option is disabled by default.
42. If turned on, this setting specifies which switches to include in reporting based on their IP address or subnet. The format used is the address/netmask convention that is commonly used in networking applications:

    IP_INCLUDE = address (where the address is specific hostname or IP address)
    Or:
    IP_INCLUDE = network/netmask (where the address belongs to specified network with specified netmask.

    Note: The separator is a forward slash ("/").

    The network is any valid IP address, and the netmask is an integer between 0 and 32 specifying the number of bits to use when comparing the numerical network. If no IP_INCLUDE parameter is specified, the default agent behavior is to include all switches.
43. Specify whether (y/n) to enable explicit switch blacklists. The option is disabled by default. If turned on, this setting specifies which switches to exclude from reporting based on their IP address or subnet with an optional integer netmask. The format is:

    IP_EXCLUDE = address
    Or:
    IP_EXCLUDE = address/netmask

    If provided, this parameter specifies which switches to exclude from reporting based on their IP address or subnet. If not specified, the default behavior is not to exclude any switches.
44. Specify whether (y/n) agent auto registration is turned on (default) or turned off.
45. Specify the IP address or network resolvable host name of the Local Manager that will be contacted for agent auto registration. The default value is local host.
46. Specify the TCP port number the Local Manager uses for agent auto registration. The default port number is 17146.
47. Specify whether (y/n) to restart the agents after installation.
48. Specify whether (y/n) to continue with the installation of the GSMcimfab package.

Figure 12 - Completing GSMcimfab Installation

49. The package installation completes and returns you to the command line.

VERIFYING THE FABRIC AGENT

This section describes how to use GSMdiag to verify the Fabric Agent. If the collected objects are not complete, proceed to the *Fabric Agent Troubleshooting* section.

1. Use the **GSMDiag** utility to verify agent functionality.
    a. Enter the IP Address or Hostname of the server where the agent is installed, and select the Storability Fabric Agent from the drop down list of service names.
    b. Click the **Get Object List** button and you should receive a list of objects published by the Fabric Agent.
    c. Select the **gsa_fabric_switch** object published by the agent. Verify the correct number of switches is reported.

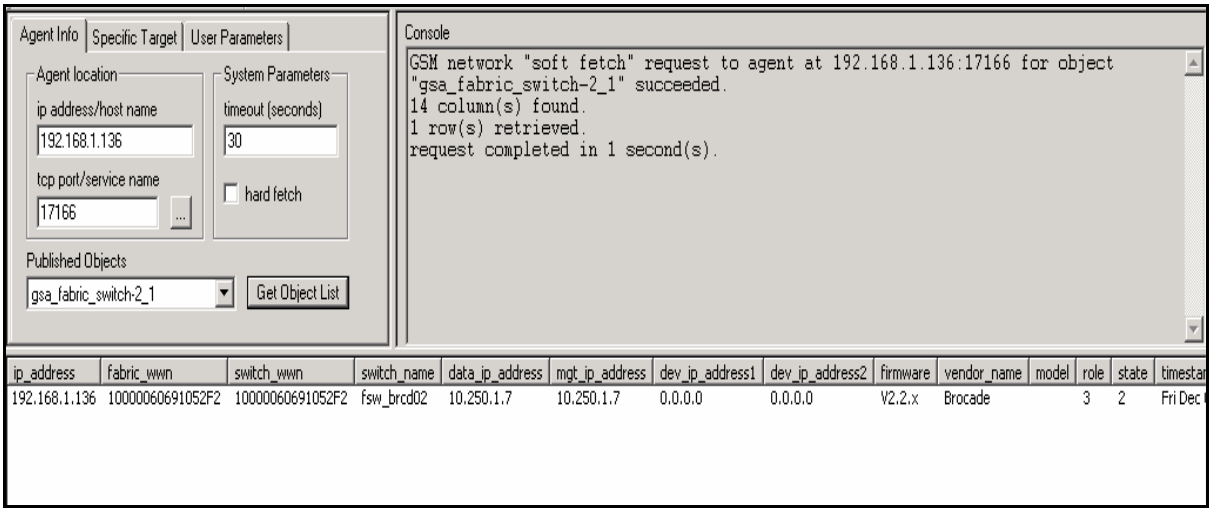

Figure 13 - GSMdiag: gsa_fabric_switch-2_1 Object

    d. Verify all other objects published by the agent.
2. To verify the Fabric Agent has registered successfully with its configured Local Manager:
    a. In the **Agent location** window, enter the IP Address or network resolvable Host Name of the Local Manager in the ip address/host name input box.
    b. Set the port to 17146 (or select the Storability Routing Agent from the drop down list of service names).
    c. Click the **Get Object List** button and you should receive a list of tables published by the Routing Agent.
    d. Select the **gsa_agent_register** object.
    e. Verify this collected object reports the Storability Fabric Agent in the "active_peer" field by IP address and port number.

VERIFYING MANAGEMENT CONSOLE FUNCTIONALITY

The following procedure describes how the Sun StorageTek Business Analytics administrator verifies the Fabric Agent's reports in the Management Console. Refer to the *Administration* chapter to obtain information on the administrative menus you can access from the **Tools** pull down menu, including the **Polling** and **Change Dashboard** menus.

1. Log in to the Management Console as an administrative user (e.g., gsmuser) whose views provide access to the desired assets (e.g., sites).
2. Verify that your customized Home Page includes the **Fabric Utilization Overview** dashboard (or use **Change Dashboard** to assign one).
3. Select **Tools->Data Polling Schedule**.
4. Use the **Collect Now** button to collect the Fabric (collection type) Configuration (Collection Metric) data using a polling schedule that includes the specific site or all sites.
5. Use the **Collect Now** button to collect the Fabric (collection type) Performance (Collection Metric) data using a polling schedule that includes the specific site or all sites.
6. Close the **Data Polling Schedule** window.
7. Verify the **Fabric Utilization Overview** dashboard reports information on the fabrics monitored by the Fabric Agent you are verifying.

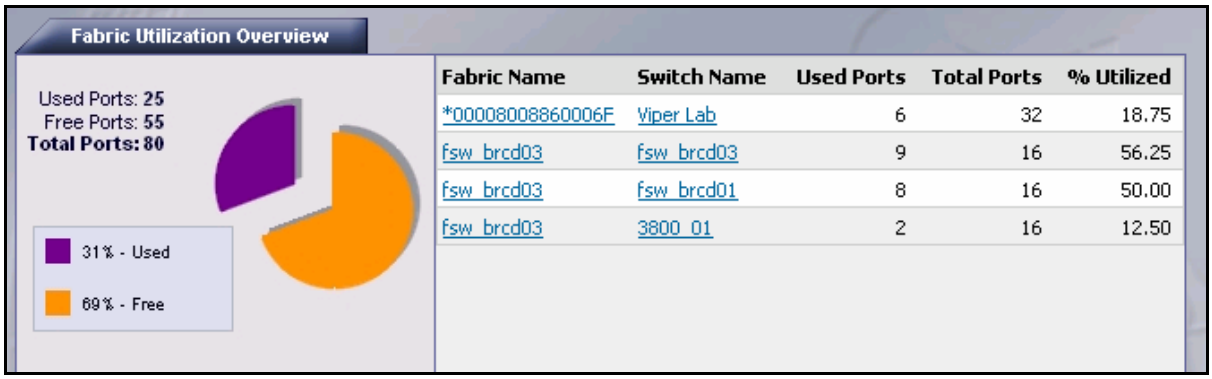

Figure 14 - Fabric Utilization Overview

8. Close the browser session with the Management Console as the above steps complete verifying the Management Console functionality.

FABRIC AGENT TROUBLESHOOTING

1. **Verify system/agent prerequisites** – Refer to *Sun StorageTek Business Analytics Support Matrix* that is located on the Documentation CD to verify the most recent support requirements for the agent.
2. Review the Message Log – Review/collect the Message.log file that can contain information on startup errors, configuration errors, or errors regarding accessing data or parsing output.

   Windows

   - Located by default in: <drive>:\Program Files\Storability\GSM\Agents\Storability Fabric Agent folder.
   - Can enable debug level logging by appending LOG_SEVERITY=Debug to the Fabric Agent section of the storability.ini file (if Storability Support requests it).

Solaris

- Agents' common Message.log file located by default in: /opt/storability/data.
- Can enable debug level logging by appending LOG_SEVERITY=Debug to the Fabric Agent section of the storability.ini file (if Sun Support requests it).

Message Types

- No Information Received – Verify message is logged that the agent started. In addition, look for message that agent stopped.
- Configuration Errors – Look for errors like "cannot create ini instance" or "ini file, storability.ini, is not valid. In this case, go the agent installation directory/folder and verify the storability.ini file is there. If not, re-install the agent.
- Vendor-Specific - "Wrong number of tokens for IP" or cannot extract valid IP address from .."; indicate some type of configuration error. Will cause the agent to stop in most cases. To resolve, delete and redefine the IP-related configuration parameters and then restart the agent.
- Cannot set CacheUpdateInterval – No collection – Indicates the Config. *Cache Interval* setting in the storability.ini is not set with a valid parameter.
- "Cannot get install of some object type" or "some object type is NULL" messages – Most likely indicates there is insufficient memory available on the agent machine.
- "Cannot start CLI: cliName" - Check that the corresponding CLI is located in the installed directory.
- "Timeout: Cannot start CLI: <cliName> during <number> sec. …… " – Check the number and if it is less than one hundred (100), increase the CONFIG_CACHE_INTERVAL or the PERF_SAMPLE_INTERVAL in the storability.ini file. In the unlikely situation the problem cannot be resolved, send the Message log, storability.ini file, and GSMdiag file to Customer Support.
- "Timeout:<Number> was not enough to read the info …" – Increase CONFIG_CACHE_INTERVAL or the PERF_SAMPLE_INTERVAL in the storability.ini file.
- "Error writing …." – Most likely there is not the necessary shared library installed. Check that the required shared libraries exist.
- "Cannot connect ….." or "cannot get some type of info" – Means usually there is an incorrect IP address or user credentials defined in the storability.ini file. If message "cannot connect" for a specific vendor persists, use the tools described in `Table 1 – Fabric Agent Matrix` (e.g., bulkAll) to further troubleshoot the problem.
- Look for messages that specifically describe how to troubleshoot a problem with a particular vendor CLI.
- As a final troubleshooting action, you can run cliname 7 "<exact configuration setting in the storability.ini file for the IP address you are troubleshooting. Ou replace any host name with the IP address and use the decrypted password (if any). The file may contain more information in the error section than in the log and verifies the configuration information. Customer Support may request you send this resulting file with other requested information.

  For example

  ```
  brcdCLI 7 "10.1.1.27|username|password" > <filename>
  ```

3. Use **GSMdiag** to save the output for all the tables if escalating a problem to Sun Technical Support.

a. Run GSMdiag.
b. Enter the **IP Address** or **Hostname** of the server where the agent is installed and set the port number by selecting the Fabric Agent from the drop down list of service names.
c. Click the **Get Object List** button and you should receive a list of tables published by the agent. If unsuccessful, verify the Ethernet connectivity to the server running the agent and that the Array Agent is running.
d. Select the **alerts-3_1** table and examine the **Description** column for each reported alert.
e. Select **File->Save All** and the "This action will network fetch all objects published by the currently specified agent and save the data to a single file." Message appears.
f. Click **OK** and the **Save As** dialog appears.
g. Enter a meaningful file name and click **OK** to initiate the collection.
h. Enter the desired file name and click **OK**.

4. **Verify Local Manager Registration -** The configured Routing Agent's **gsa_agent_register** table should be reviewed if the auto-registration feature is enabled (default). Otherwise, verify the necessary sub agent entry has been added to the Routing Agent's storability.ini file.
5. **Review the Routing Agent Message Log** – Review/collect the Routing Agent Message Log to check for errors related to Ethernet connectivity problems contacting that Array Agent.
6. **Confirm Polling Schedules** – Using the Management Console's **Polling** menu, review/modify the existing Polling Schedules for the Collection Type of Fabric for the specific site (or all sites).
7. **Review Aggregator Message Log** – Open the Aggregator's Message Log in a text editor and validate that the Fabric Tables are being requested and that rows are being inserted into the database.

   The log contains two entries, TID (Transaction ID) and SID (Session ID), which can help you locate (e.g., Find) and view relevant logged entries. For scheduled polling requests, the TID will be equal to the Job ID in the Polling menu. Each SID is a unique identifier for a particular agent data collection session. For on-demand polling requests, the TID is a uniquely generated TID (not the Job ID) and SID, and the TID and SID will be equal to the same integer value.

8. **Check the assurent database** – The assurent database is the data repository for your Sun StorageTek Business Analytics application. For the Fabric Agent, use any MS SQL Query interface, such as osql, to verify rows have been inserted into the fabric-related tables, such as the **gsa_fabric_switch-2_1** table.
9. **Verify Management Console Functionality** – As a final step in the agent troubleshooting procedure, minimally verify the monitored fabric switches now appear in the Fabric Utilization Overview pane or in the Asset Management report for the site.

Upgrade Fabric Agents

To upgrade a Fabric Agent (or multiple fabric agents), the procedure is to:

1. Uninstall the previously installed Fabric Agent.
2. Install the current Fabric Agent that Sun StorageTek Business Analytics provides.

Upgrade Fabric Agent – InstallShield

The procedure to upgrade the Fabric Agent on a Windows server is described as follows:

1. Copy the existing storability.ini file with the multiple Fabric agents' or unified Fabric Agent's configuration settings to a "Backup" directory.
2. Select **Start->Program Files->Storability->Uninstall->Uninstall Local Manager.**
3. The Storability **Uninstall** dialog appears.
4. Click the checkbox for the Fabric Agent, McData Agent, and/or Brocade Agent, as applicable for your installed fabric agents. Keep in mind you must uninstall any previously installed Fabric Agent before you upgrade to the current Fabric Agent.
5. Click **Next>**. The **Question** dialog appears.
6. Click **Yes** to confirm the uninstalling the agent. An uninstalling agent splash box appears as each selected agent is uninstalled.
7. When the InstallShield Wizard Complete dialog box appears, click **Finish**.
8. Install the current Fabric Agent that Sun StorageTek Business Analytics provides.

Upgrade Fabric Agent – Solaris

The procedure to uninstall the Fabric Agent(s) on a Solaris server is described below. As previously described, uninstall any previously installed Fabric Agent **before** you install the current Fabric Agent.

1. Copy the <install_directory>/storability/etc/storability.ini file to a "Backup" directory.

2. Type:

```
pkgrm GSMmcdata   OR:

pkgrm GSMbrocade   OR:

pkgrm GSMfabric
```

   as appropriate for your installed fabric agents.

3. At the "do you want to remove this package" prompt, enter **y** and press **Enter**.

4. At the "do you want to continue the removal of the package?" prompt, type **y** and press **Enter**. The "Removal of GSM <agent name> was successful" message appears.