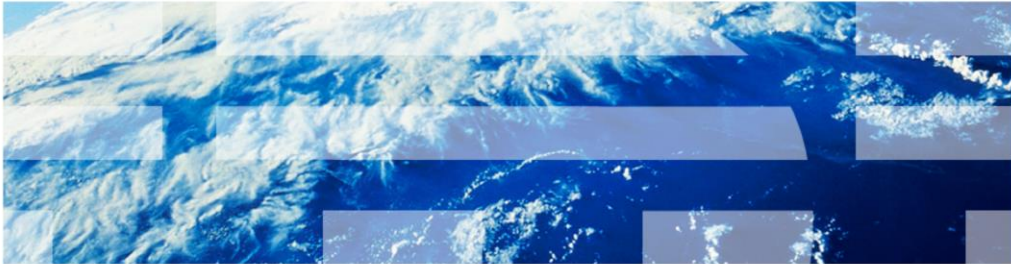


Tivoli Business Service Manager V6.1

Failover



Tivoli® Business Service Manager V6.1, Failover.

Objectives

After completing this module, you can explain these items:

- Overview of the failover process
- Failover architecture
- Preparing to install for failover
- Failover in normal operation
- Failover in failover
- Automatic failover
- Failover configuration
- Preparing a configuration file for failover
- An Fo_config template example
- Starting the servers in a failover environment
- Documenter page, which provides failover status

After completing this module, you will be able to explain each of the items listed here.

Overview of the failover process

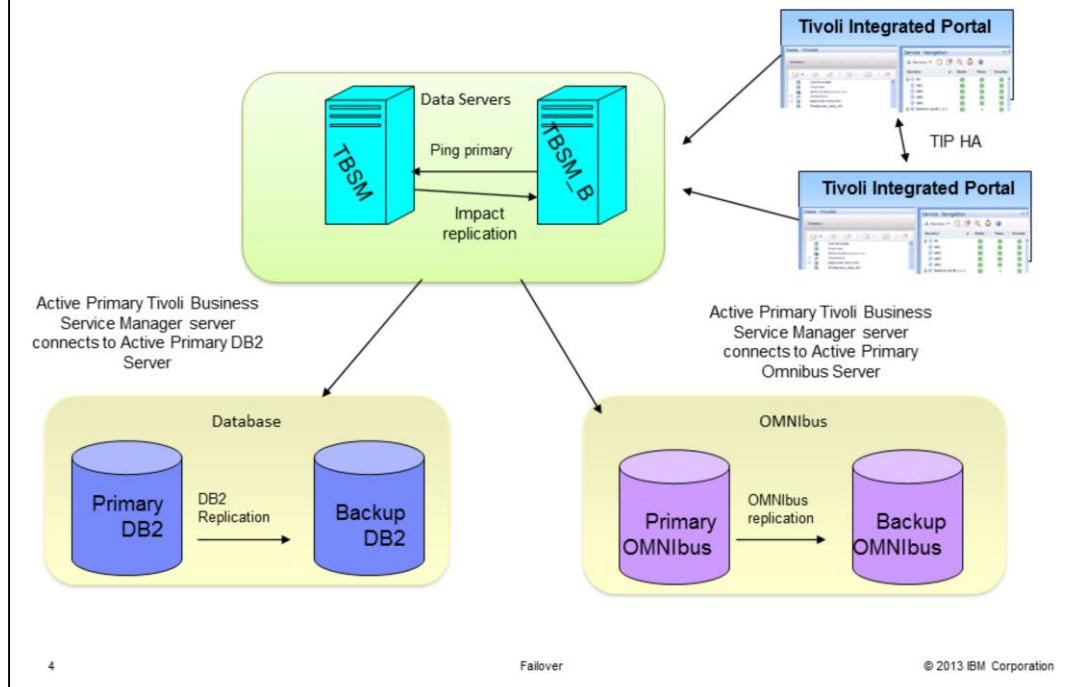
- A failover environment contains a primary server and backup data server
- The ObjectServer and data server can be on the same or on different computers
- The backup data server does not perform any operational processing when the primary server is functional
- For Tivoli Business Service Manager Support Failback, set this property to true:
DATA_PrimaryConfigureFailback=true property is in the
fo_config.props file

A failover environment contains a primary and backup data server, and optionally a primary and backup OMNIbus ObjectServer. The ObjectServer and Data server can be on the same or on different computers. If the primary host fails or the network connection between the primary and backup servers is lost, the backup server takes over the processes of the primary server. Tivoli Business Service Manager Data server failover provides support for Tivoli Business Service Manager event and status processing if a hardware or software failure affects this capability.

The backup data server does not perform any operational processing when the primary server is functional. Therefore, the backup server does not provide a load-balancing function. If the primary server fails within a short time, the backup server connects to the database and resynchronizes its status from events. The dashboard servers detect that the primary data server is no longer available and connects to the backup server. If the primary server resumes while the backup server is running as the primary, the original primary server assumes the role of backup server.

You can configure the system so that when the backup server is running as primary and the default primary starts again, the default primary takes over as the primary Tivoli Business Service Manager server. The default backup transitions into the backup role. This behavior is called failback. To enable this behavior, set the DATA_PrimaryConfigureFailback to true in the fo_config.props file. Otherwise, the default primary becomes the backup if it starts when the default backup server is running as primary.

Failover architecture



The main components of Tivoli Business Service Manager are data servers and dashboard servers. There can be two data servers if you have failover configured, a primary and a backup. Of course, the primary is the active Tivoli Business Service Manager server and the backup is in standby until the primary stops. You can also have database failover through DB2® HADR (High Availability Disaster Recovery). The database configuration is done internally to DB2 so that the primary Tivoli Business Service Manager data server connects to the primary DB2 server. OMNibus also has a High Availability capability, with primary and backup OMNibus servers. The Tivoli Business Service Manager Server connects to the primary OMNibus server if OMNibus failover is configured. You are not looking at this configuration in detail during this module.

Tivoli Integrated Portal also has high availability. Several Tivoli Integrated Portal servers participate in high availability, share a configuration, and are all active at the same time. You can set up a load balancer to balance the sessions among the Tivoli Integrated Portal servers. You are not looking at this in any detail in this module. From a Tivoli Business Service Manager failover perspective, the main parts are the Dashboard, Data, and OMNibus. The points beyond that are not significant in a failover setup. From a Tivoli Business Service Manager perspective, the failover configuration is mainly around setting up the correct communications pieces so that Tivoli Business Service Manager communicates directly to DB2, Tivoli Integrated Portal, and OMNibus.

Preparing to install for failover (1 of 2)

- Ensure proper OS and network configuration
- Verify that your DNS configuration and `/etc/hosts` files on all servers are such that all machines can communicate with each other by using host names
- Verify that the host name command resolves to the actual IP address, not localhost (127.0.0.1)
- Review firewall and OS settings to ensure that server communication is not blocked

The primary and backup server must run the same version and release of Tivoli Business Service Manager and same operating system

Example: You cannot use a Tivoli Business Service Manager 4.2 backup server with a Tivoli Business Service Manager 6.1 primary server

You can use the preinstallation checklist as a guide, if you plan to configure failover after you install. First, verify that your DNS configuration files, `etc/hosts` files, or both, on all servers can communicate with each other using host names. Verify that a reference to the current host name uses the actual IP address and not the loopback address 127.0.0.1. On many systems, you can ping `<yourhost name>` and examine the IP address that is displayed as the command runs.

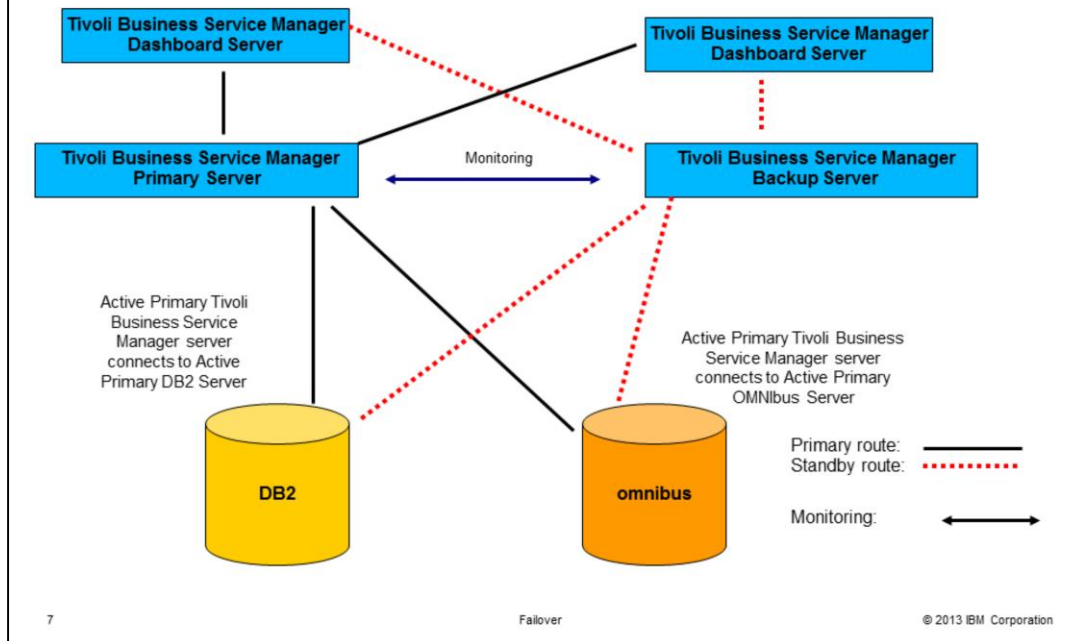
Review any operating system and firewall settings to prevent blocking communication among servers. The primary and backup server must be running the same version and release of Tivoli Business Service Manager and the same operating system. For example, you cannot use a Tivoli Business Service Manager 4.2 backup server with a Tivoli Business Service Manager 6.1 primary server.

Preparing to install for failover (2 of 2)

- Use the same user ID (non-root on UNIX®) to install Tivoli Business Service Manager on the primary and backup server
- The primary and backup Tivoli Business Service Manager installation must use the same authentication method, either LDAP or OMNibus
 - The file-based authentication method is not supported for failover configurations
 - To make this choice, you must choose **Advanced Install**
- If you change any of the default port values during installation, use the same values for both installations

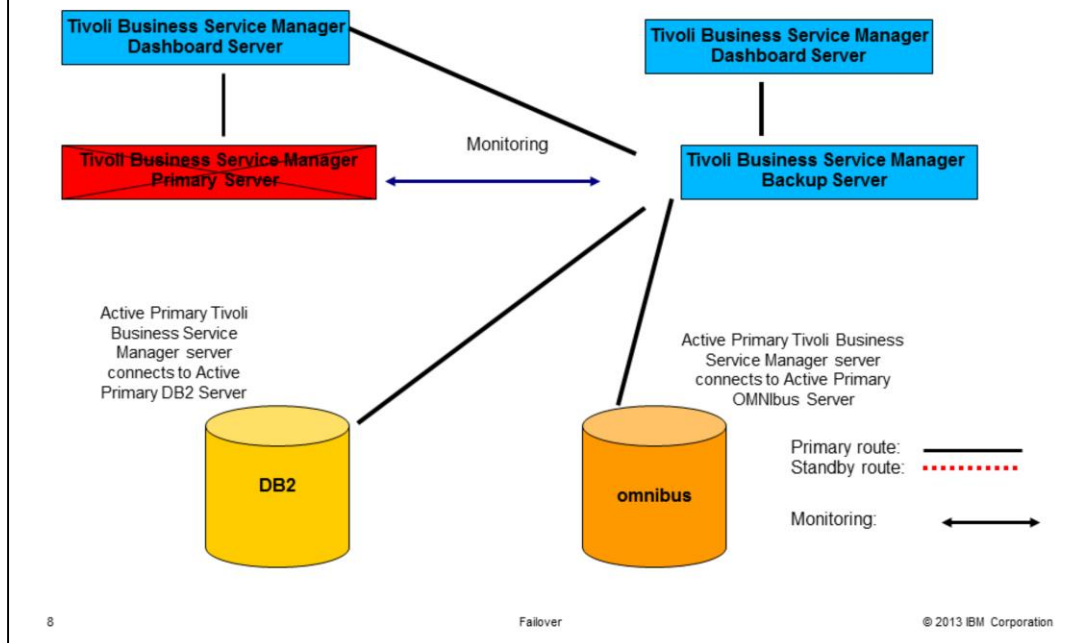
When you install a Data server as a backup server, you must indicate this choice during the installation by selecting a check box. Use the same non-root user ID to install Tivoli Business Service Manager on the primary and backup server to ensure that the user ID and password are the same for both machines. On Windows®, choose the same user ID and password when prompted for the account. The primary and backup Tivoli Business Service Manager installation must use the same authentication method, either LDAP or OMNibus. The file-based authentication method is not supported for failover configurations. You must select **Advanced Installation** to choose the authentication method. If you change any of the default port values during installation, use the same values for both installations.

Failover in normal operation



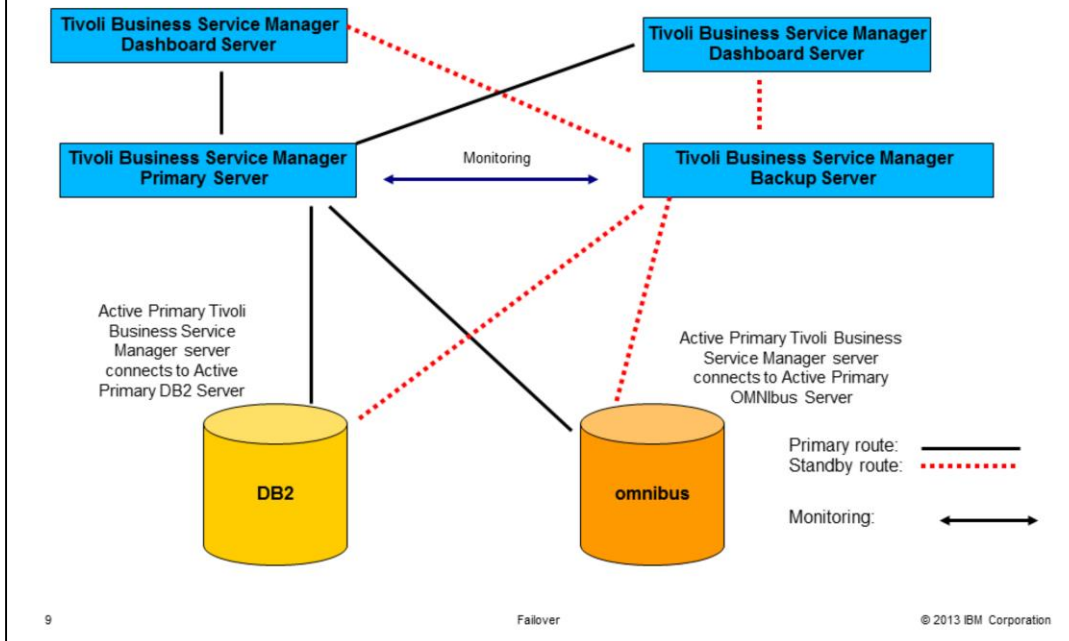
In a failover environment, the primary data server is actively processing events and can have one or more dashboard servers connected. The backup server monitors the primary server to ensure that it is available. Each dashboard server tries to connect to the primary first, and then to the backup server.

Failover in failover



If the primary data server goes down, the backup data server assumes the role of primary server. When the original primary comes back up, if failback is not configured, it assumes the role of the backup. Another case to consider is if the primary data server did not go down, but there is connectivity loss between the primary and backup. In this case, the backup becomes the primary. When connectivity is restored, the backup (running as primary) receives information that the original primary is now also running as primary. The backup returns to the backup role, so that only one primary is active. The dashboard server connects to whichever server is running as primary.

Automatic failback



If failback is configured, then when the original primary server comes back up, it assumes the role of the primary. The original backup, which is currently acting as the primary, returns to the backup role.

Failover configuration

- You must specify a designated backup server at installation time
- You cannot install a dashboard server at the same time as a backup data server (must install that later, if wanted)

Installation of IBM Tivoli Business Service Manager

Data Server Information

Preparation
▷ Decisions
▷ Configuration
▷ Pre-Installation Summary
▷ Installing...
▷ Install Complete

Provide the following information for the Data Server

Communication Port
17542

Impact Server Command Line Port
2001

Impact Server DB Port
5436

If failover will be set up and this data server will be the backup server, select the following checkbox

Note: When you designate this data server as a backup server, it is only the first step in the data server failover-configuration process. To finish the failover configuration, you need to run the fo_config script after you complete the installation. Do not install a dashboard server to connect with this data server until the failover procedure has been completed on this machine. See the Configuring post installation: Configuring failover and Load Balancing section of the TBSM Installation guide for instructions on configuring a failover environment.

Designated backup server

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You must specify the backup server when you install Tivoli Business Service Manager, by selecting the Designated backup server check box. You must run the fo_config script against the primary and secondary servers after the installation. You cannot install a dashboard server when you install a backup data server. After the installation is complete, you can use the same installation wizard to install a dashboard server.

Preparing a configuration file for failover

You create the **fo_config.props** file by using the **fo_config** script
The **fo_config** script generates a template file

- Run this command from any Tivoli Business Service Manager Data or Dashboard:
`server$TBSM_HOME/bin/fo_config template`

The script generates this file:

`$TBSM_HOME/bin/fo_config.YYYYMMDDHHMMSS.props`
where YYYYMMDDHHMMSS is a time stamp

You can rename this file to a more convenient name

- Copy **fo_config** file to all the Data servers and Dashboard servers that are part of the failover configuration

To configure the Data servers for failover, you must create a configuration file that contains information that is specific to your environment. You create the `fo_config.props` file by using the `fo_config` script. To prepare a failover configuration file, perform these steps:

- Run the `fo_config` script that is provided to generate a template that you can then edit to create the final configuration file. This file makes the configuration changes to the Data and Dashboard servers that enable Data server failover. This script generates a file named `$TBSM_HOME/bin/fo_config.YYYYMMDDHHMMSS.props`, where YYYYMMDDHHMMSS is a time stamp. You can rename this file to a more convenient name. Using a text editor, modify the file as needed for your environment.

After the `fo_config` properties file has all the appropriate values, copy this file to all the Data servers and Dashboard servers that are part of the failover configuration. If you used the default values during installation, these are the only parameters that you need to modify. If you did not use the default values during installation, then you must modify the other parameters.

Fo_config template example (1 of 3)

```
DATA_PrimaryDataServerHostname=nc136080
DATA_PrimaryDataServerHTTPPort=17310
DATA_PrimaryDB2Hostname=Zara.tivlab.staines.ibm.com
DATA_PrimaryDB2Port=50000
DATA_PrimaryObjectServerPort=4100
DATA_PrimaryObjectServerName=NCOMS
ConfigureNameServer=true
DATA_PrimaryConfigureFailback=false
```

In these examples of the Fo_config template file, all the comments have been removed to make it less verbose. The parameters that are set in the fo_config.props file are as follows:

- The first field is the Hostname of the primary data server.
- The next field is the HTTPPort for primary data server. The default is 17310.
- The next parameter is a new field that is required for the primary DB2HOSTNAME. If the DB2server exists on a different machine than the data server host, you have a separate entry for the DB2hostname.
- DB2 Port of primary database is a value in TBSM_TBSMDatabase.ds in the installdirectory/tbsm/etc/ directory.
- Port of the primary ObjectServer.
- Name of the primary ObjectServer.
- ConfigureNameServer=true. By default the fo_config script configures the nameserver configuration with the host or port of the primary server and backup server if failover is configured.
- DATA_PrimaryConfigureFailback=false . To enable this behavior, set this property to true. Otherwise, the default primary assumes the backup role if it starts when the default backup server is running as primary.

Fo_config template example (2 of 3)

DATA_BackupMillisecondsTillStartAsStandalone=300000

DATA_BackupDataServerHostname=nc136081

DATA_BackupDataServerHTTPPort=17310

DATA_BackupDB2Hostname=

DATA_BackupDB2Port=50000

DATA_BackupObjectServerHostname=

DATA_BackupObjectServerPort=4100

DATA_BackupObjectServerName=NCOMS_BKUP

- DATA_BackupMillisecondsTillStartAsStandalone. If there is a backup server, and it is started before the primary server is started, by default it waits 300 seconds until assuming the role as the primary. You can configure the duration with this property.
- DATA_BackupDataServerHostname is the host name of the backup Data server. This parameter is optional. If this parameter is not specified, the system is configured as a stand-alone Data server, if it was previously configured as part of a failover pair.
- DATA_BackupDataServerHTTPPort. You only configure HTTP port of the backup Data server if DB2 is in replication. HADR is configured for DB2.
- DB2Hostname
- DB2Port. DB2 port of backup DB2 server is optional. Only configure this property if DB2 is in failover.
- BackupObjectServerHostname
- BackupObjectServerPort. This value is typically the same value as the value of DATA_PrimaryObjectServerPort.
- BackupObjectServerName. This value must be different from the value of DATA_PrimaryObjectServerName.

Fo_config template example (3 of 3)

```
UseObjectServerFailback=false  
  
DATA_Bi-DirectionalGatewayName=NCO_GATE  
  
DATA_Bi-DirectionalGatewayPort=4300  
  
DASH_PrimaryDataServerHostname=nc136080  
  
DASH_PrimaryDataServerRMIPort=17542  
  
DASH_PrimaryDataServerHTTPPort=17310  
  
DASH_BackupDataServerHostname=nc136081  
  
DASH_BackupDataServerRMIPort=17542  
  
DASH_BackupDataServerHTTPPort=17310
```

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Failover

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- UseObjectServerFailback. If the ObjectServer is configured for failback, then set this property to true. Tivoli Business Service Manager can connect to the primary ObjectServer if the primary ObjectServer comes back up, instead of continuing to use the backup ObjectServer.
- Name of the bi-directional gateway.
- Port of the bi-directional gateway.
- Host name of the primary Data server.
- RMI port of the primary Data server.
- HTTP port of the primary Data server. This value must be the same as the value of DATA_PrimaryDataServerHTTPPort.
- Host name of the backup Data server. This parameter is optional. If this parameter is not specified, the Dashboard server is configured to communicate with a stand-alone Data server.
- RMI port of the backup Data server.
- HTTP port of the backup Data server. This value must be the same as the value for DATA_BackupDataServerHTTPPort.

Starting the servers in a failover environment (1 of 2)

Starting Tivoli Business Service Manager Failover configuration

- Start a primary Server before you start the corresponding backup server
- Start these processes:
 - Primary ObjectServer
 - Backup ObjectServer
 - Backup OMNibus gateway
 - Primary Data server
 - Backup Data server
 - One of more Dashboard servers

To start all the Tivoli Business Service Manager processes at one time on UNIX, run the **\$TBSM_HOME/bin/tbsm_suite.sh** start command

To start Tivoli Business Service Manager in a failover configuration, you must start a primary server before you start the corresponding backup server. You must start the processes in this order. A backup server stops if it cannot contact the primary server when it is initially started. Likewise, the OMNibus gateway might stop if it cannot connect to the primary ObjectServer when it is initially started.

On a UNIX machine, you can start all the Tivoli Business Service Manager processes at one time by issuing the start command shown here.

Starting the servers in a failover environment (2 of 2)

Starting individual Tivoli Business Service Manager services on Windows

- To start the primary ObjectServer:
net start NCOObjectServer
- To start the backup ObjectServer:
net start NCOObjectServer
- To start the OMNibus gateway (on the backup computer if a backup OMNibus is configured):
net start "NCOObjectServerGatewayBi"
- To start the primary Data server:
net start "IBMWAS70Service - TBSMProfile_Port_17310"
- To start the backup Data server:
net start "IBMWAS70Service - TBSMProfile_Port_17310"
- To start one or more Dashboard servers:
net start "IBMWAS70Service - V2.2_TIPProfile_Port_16310"

To start individual Tivoli Business Service Manager services on Windows, issue one or more of the commands shown on this slide.

Documenter page provides failover status

The screenshot shows the Configuration Documenter interface for TBSM. It includes a navigation bar with 'Cluster Status' and 'Server Status' tabs. The main content area is divided into two sections: 'Cluster Status for TBSMCLUSTER' and 'Server Status'.

Cluster Status for TBSMCLUSTER

Primary Server	Host
TBSM (Current Instance)	nc136080
Secondary Server	Host
TBSM_B	nc136081

Server Status

Memory Status	Current Usage (in MB)	Max Limit (in MB)
Heap Memory Utilization	256	1200

Service Name	Number of Events in Queue	Event Source
OMNIBusEventReader	0	Primary Source of defaultobjectserver at nc136080:4100 as user root
TBSMOMNIBusEventReader	0	Primary Source of ObjectServer_DS at nc136080:4100 as user root
TransactionFetcher	0	Primary Source of TBSMComponentRegistry at isaacg.tivlab.raleigh.ibm.com:50000 as user db2inst2
EventProcessor	0	OMNIBusEventReader

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You can use the Configuration Documenter to view the detailed information about the system components. You can access the Documenter page under the Troubleshooting folder in your Tivoli Integrated Portal navigation. You can see which service is currently active. In this case, the TBSM Current Instance is the default active primary server, and TBSM_B is the secondary backup server. You can also see whether OMNIBus is in failover.

In the Cluster Status section, you can see the name and the host where primary and secondary servers are running. You can also see which server is currently the primary one.

In the Server Status section, you can see information about the running services and the memory status for the server.

For ObjectServer event readers, such as TBSMOMNIBusEventReader, the documenter shows which OMNIBus server it is currently connected to. If OMNIBus is in failover configuration, you know which of the pair Tivoli Business Service Manager is currently reading from.

Summary

Now that you have completed this module, you can explain the following items:

- Overview of the failover process
- Failover architecture
- Preparing to install for failover
- Failover in normal operation
- Failover in failover
- Automatic failover
- Failover configuration
- Preparing a configuration file for failover
- An Fo_config template example
- Starting the servers in a failover environment
- Documenter page, which provides failover status

Now that you have completed this module, you can explain each of the items shown on this slide.

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