Tivoli Application Dependency Discovery Manager
Version 7 Release 2.1

Installation Guide
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Version 7 Release 2.1

Installation Guide

IBM
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About this information

The purpose of this PDF document is to provide the related topics from the information center in a printable format.

The IBM Tivoli Application Dependency Discovery Manager Troubleshooting Guide and the troubleshooting topics in the information center include information on the following items:

- How to identify the source of a software problem
- How to gather diagnostic information, and what information to gather
- Where to get fixes
- Which knowledge bases to search
- How to contact IBM® Support

Conventions used in this information

This information describes the conventions that are used in the IBM Tivoli Application Dependency Discovery Manager (TADDM) documentation for denoting operating system-dependent variables and paths and for denoting the COLLATION_HOME directory. It also indicates the location of the collation.properties file, which is referenced throughout the TADDM documentation, including in the messages.

Operating system-dependent variables and paths

This information uses the UNIX convention for specifying environment variables and for directory notation.

When using the Windows command line, replace $variable with %variable% for environment variables, and replace each forward slash (/) with a backslash (\) in directory paths.

If you are using the bash shell on a Windows system, you can use the UNIX conventions.

COLLATION_HOME directory

The COLLATION_HOME directory is the directory where TADDM is installed plus the dist subdirectory.

On operating systems such as AIX® or Linux, the default location for installing TADDM is the /opt/IBM/taddm directory. Therefore, in this case, the $COLLATION_HOME directory is /opt/IBM/taddm/dist.

On Windows operating systems, the default location for installing TADDM is the c:\IBM\taddm directory. Therefore, in this case, the %COLLATION_HOME% directory is c:\IBM\taddm\dist.
Location of collation.properties file

The collation.properties file contains TADDM server properties and includes comments about each of the properties. It is located in the $COLLATION_HOME/etc directory.

Terms and definitions

This information contains the terms and definitions for important concepts in the IBM Tivoli Application Dependency Discovery Manager (TADDM).

asynchronous discovery
In TADDM, the running of a discovery script on a target system to discover systems that cannot be accessed directly by the TADDM server. Because this discovery is performed manually, and separately from a typical credentialed discovery, it is called “asynchronous”.

business application
One or more computer programs or software components that provide functionality in direct support of a specific business process or processes.

business service
A group of diverse but interdependent applications and other system resources that interact to accomplish specific business functions.

CI
See configuration item.

collection
In TADDM, a group of configuration items.

configuration item (CI)
A component of IT infrastructure that is under the control of configuration management and is therefore subject to formal change control. Each CI in the TADDM database has a persistent object and change history associated with it. Examples of a CI are an operating system, an L2 interface, and a database buffer pool size.

credentialed discovery
TADDM sensor scanning that discovers detailed information about the following items:
• Each operating system in the runtime environment. This scanning is also known as Level 2 discovery, and it requires operating system credentials.
• The application infrastructure, deployed software components, physical servers, network devices, virtual systems, and host data that are used in the runtime environment. This scanning is also known as Level 3 discovery, and it requires both operating system credentials and application credentials.

credential-less discovery
TADDM sensor scanning that discovers basic information about the active computer systems in the runtime environment. This scanning is also known as Level 1 discovery, and it requires no credentials.

Data Management Portal
The TADDM web-based user interface for viewing and manipulating the data in a TADDM database. This user interface is applicable to a domain server deployment, to a synchronization server deployment, and to each storage server in a streaming server deployment. The user interface is very
similar in all deployments, although in a synchronization server deployment, it has a few additional functions for adding and synchronizing domains.

**discover worker thread**
In TADDM, a thread that runs sensors.

**Discovery Management Console**
The TADDM client user interface for managing discoveries. This console is also known as the Product Console. It is applicable to a domain server deployment and to discovery servers in a streaming server deployment. The function of the console is the same in both of these deployments.

**discovery server**
A TADDM server that runs sensors in a streaming server deployment but does not have its own database.

**domain**
In TADDM, a logical subset of the infrastructure of a company or other organization. Domains can delineate organizational, functional, or geographical boundaries.

**domain server**
A TADDM server that runs sensors in a domain server deployment and has its own database.

**domain server deployment**
A TADDM deployment with one domain server. A domain server deployment can be part of a synchronization server deployment.

In a domain server deployment, the following TADDM server property must be set to the following value:

```java
com.collation.cmdbmode=domain
```

**launch in context**
The concept of moving seamlessly from one Tivoli® product UI to another Tivoli product UI (either in a different console or in the same console or portal interface) with single sign-on and with the target UI in position at the proper point for users to continue with their task.

**multitenancy**
In TADDM, the use by a service provider or IT vendor of one TADDM installation to discover multiple customer environments. Also, the service provider or IT vendor can see the data from all customer environments, but within each customer environment, only the data that is specific to the respective customer can be displayed in the user interface or viewed in reports within that customer environment.

**Product Console**
See *Discovery Management Console*.

**script-based discovery**
In TADDM, the use, in a credentialed discovery, of the same sensor scripts that sensors provide in support of asynchronous discovery.

**SE**
See *server equivalent*.

**server equivalent (SE)**
A representative unit of IT infrastructure, defined as a computer system (with standard configurations, operating systems, network interfaces, and storage interfaces) with installed server software (such as a database, a web server, or an application server). The concept of a server equivalent also
includes the network, storage, and other subsystems that provide services to the optimal functioning of the server. A server equivalent depends on the operating system:

<table>
<thead>
<tr>
<th>Operating system</th>
<th>Approximate number of CIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td>500</td>
</tr>
<tr>
<td>AIX</td>
<td>1000</td>
</tr>
<tr>
<td>Solaris</td>
<td>1000</td>
</tr>
<tr>
<td>Linux</td>
<td>1000</td>
</tr>
<tr>
<td>HP-UX</td>
<td>500</td>
</tr>
<tr>
<td>Network devices</td>
<td>1000</td>
</tr>
</tbody>
</table>

**storage server**
A TADDM server that processes discovery data that is received from the discovery servers and stores it in the TADDM database. The primary storage server both coordinates the discovery servers and all other storage servers and serves as a storage server. All storage servers that are not the primary are called secondary storage servers.

**streaming server deployment**
A TADDM deployment with a primary storage server and at least one discovery server. This type of deployment can also include one or more optional secondary storage servers. The primary storage server and secondary storage servers share a database. The discovery servers have no database.

In this type of deployment, discovery data flows in parallel from multiple discovery servers to the TADDM database.

In a streaming server deployment, the following TADDM server property must be set to one of the following values:
- `com.collation.taddm.mode=DiscoveryServer`
- `com.collation.taddm.mode=StorageServer`

For all servers except for the primary storage server, the following properties (for the host name and port number of the primary storage server) must also be set:
- `com.collation.PrimaryStorageServer.host`
- `com.collation.PrimaryStorageServer.port`

If the `com.collation.taddm.mode` property is set, the `com.collation.cmdbmode` property must not be set or must be commented out.

**synchronization server**
A TADDM server that synchronizes discovery data from all domain servers in the enterprise and has its own database. This server does not discover data directly.

**synchronization server deployment**
A TADDM deployment with a synchronization server and two or more domain server deployments, each of which has its own local database.

In this type of deployment, the synchronization server copies discovery data from multiple domain servers one domain at a time in a batched synchronization process.
In a synchronization server deployment, the following TADDM server property must be set to the following value:

```
com.collation.cmdbmode=enterprise
```

This type of deployment is obsolete. Therefore, in a new TADDM deployment where more than one server is needed, use the streaming server deployment. A synchronization server can be converted to become a primary storage server for a streaming server deployment. For more information, see Converting from a synchronization server deployment to a streaming server deployment.

**TADDM database**

In TADDM, the database where configuration data, dependencies, and change history are stored.

Each TADDM server, except for discovery servers and secondary storage servers, has its own database. Discovery servers have no database. Storage servers share the database of the primary storage server.

**TADDM server**

A generic term that can represent any of the following terms:
- domain server in a domain server deployment
- synchronization server in a synchronization server deployment
- discovery server in a streaming server deployment
- storage server (including the primary storage server) in a streaming server deployment

**target system**

In the TADDM discovery process, the system to be discovered.
Installing

Three ways of deploying TADDM

You can deploy the IBM Tivoli Application Dependency Discovery Manager (TADDM) in a domain server deployment, a synchronization server deployment, or a streaming server deployment. The TADDM servers are different depending on the type of deployment you choose.

Table 1 indicates the TADDM servers and associated databases that are present according to which deployment type you choose.

The synchronization server deployment is obsolete. Therefore, in a new TADDM deployment, use either a domain server deployment or a streaming server deployment. If more than one server is needed, use the streaming server deployment. A synchronization server can be converted to become a primary storage server for a streaming server deployment. For more information, see Converting from a synchronization server deployment to a streaming server deployment.

Table 2 on page 2 indicates the user interfaces that are associated with each TADDM server.

The following definitions describe the user interfaces in more detail:

Data Management Portal
The TADDM web-based user interface for viewing and manipulating the data in a TADDM database. This user interface is applicable to a domain server deployment, to a synchronization server deployment, and to each storage server in a streaming server deployment. The user interface is very similar in all deployments, although in a synchronization server deployment, it has a few additional functions for adding and synchronizing domains.

Discovery Management Console
The TADDM client user interface for managing discoveries. This console is also known as the Product Console. It is applicable to a domain server deployment and to discovery servers in a streaming server deployment. The function of the console is the same in both of these deployments.

Table 1. Servers and associated databases in each deployment type

<table>
<thead>
<tr>
<th>Deployment type</th>
<th>Servers</th>
<th>Associated databases</th>
</tr>
</thead>
<tbody>
<tr>
<td>domain server deployment</td>
<td>one domain server</td>
<td>The domain server has its own database.</td>
</tr>
<tr>
<td>synchronization server deployment</td>
<td>one synchronization server</td>
<td>A synchronization server deployment also requires one or more domain server deployments, each of which has a domain server.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The synchronization server has its own database.</td>
</tr>
</tbody>
</table>
Table 1. Servers and associated databases in each deployment type (continued)

<table>
<thead>
<tr>
<th>Deployment type</th>
<th>Servers</th>
<th>Associated databases</th>
</tr>
</thead>
<tbody>
<tr>
<td>streaming server deployment</td>
<td>at least one discovery server</td>
<td>A discovery server does not have a database.</td>
</tr>
<tr>
<td></td>
<td>primary storage server</td>
<td>The primary storage server has its own database.</td>
</tr>
<tr>
<td></td>
<td>one or more optional secondary storage servers</td>
<td>The secondary storage servers share the database of the primary storage server.</td>
</tr>
</tbody>
</table>

Table 2. Servers and associated user interfaces in each deployment type

<table>
<thead>
<tr>
<th>Deployment type</th>
<th>Servers</th>
<th>Associated user interfaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>domain server deployment</td>
<td>one domain server</td>
<td>Data Management Portal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Discovery Management Console</td>
</tr>
<tr>
<td>synchronization server deployment</td>
<td>one synchronization server</td>
<td>Data Management Portal</td>
</tr>
<tr>
<td></td>
<td>A synchronization server deployment also requires one or more domain server deployments, each of which has a domain server.</td>
<td>Data Management Portal</td>
</tr>
<tr>
<td>streaming server deployment</td>
<td>at least one discovery server</td>
<td>Discovery Management Console</td>
</tr>
<tr>
<td></td>
<td>primary storage server</td>
<td>Data Management Portal</td>
</tr>
<tr>
<td></td>
<td>one or more optional secondary storage servers</td>
<td>Data Management Portal</td>
</tr>
</tbody>
</table>

**Domain server deployment**

A domain is a logical subset of the infrastructure of a company or other organization. Domains can delineate organizational, functional, or geographical boundaries. The domain server runs sensors that discover data about only the respective domain.

**domain server**

A TADDM server that runs sensors in a domain server deployment and has its own database.

**domain server deployment**

A TADDM deployment with one domain server. A domain server deployment can be part of a synchronization server deployment.

In a domain server deployment, the following TADDM server property must be set to the following value:

com.collation.cmdbmode=domain

Figure 1 on page 3 illustrates the domain server deployment.
The synchronization server is used in large enterprise environments, and it unifies the data from individual IBM Tivoli Application Dependency Discovery Manager (TADDM) domains.

**synchronization server**

A TADDM server that synchronizes discovery data from all domain servers in the enterprise and has its own database. This server does not discover data directly.

**synchronization server deployment**

A TADDM deployment with a synchronization server and two or more domain server deployments, each of which has its own local database.

In this type of deployment, the synchronization server copies discovery data from multiple domain servers one domain at a time in a batched synchronization process.

In a synchronization server deployment, the following TADDM server property must be set to the following value:

```
com.collation.cmdbmode=enterprise
```

This type of deployment is obsolete. Therefore, in a new TADDM deployment where more than one server is needed, use the streaming server deployment. A synchronization server can be converted to become a primary storage server for a streaming server deployment. For more information, see the Converting from a synchronization server deployment to a streaming server deployment section.

Figure 2 on page 4 illustrates the synchronization server deployment.
Streaming server deployment

If your deployment requires more than one server, you realize the following benefits from using a streaming server deployment rather than a synchronization server deployment (which is obsolete): greater availability of data, cost savings, and elimination of merging problems when consolidating data.

During discovery, data flows in parallel (or streams) from multiple discovery servers to the primary storage server, where the data is processed and stored in the database. Only the primary storage server has a database. Discovery servers are used only for running sensors and therefore do not have a database.

This type of deployment therefore provides the following benefits:

**Greater availability of data**
In a streaming server deployment, data is available as soon as it is discovered.

In contrast, in a synchronization server deployment, the data for a specific domain is unavailable until the synchronization occurs, and data is also unavailable during the synchronization.

**Cost savings**
A streaming server deployment requires less hardware and resources.

**Elimination of merging problems when consolidating data**
In a streaming server deployment, data streams directly to the primary storage server, which prevents the following issues that can occur in a synchronization server deployment:

- Complicated merging scenarios
- Problems that occur if domains overlap
The primary storage server is the coordinator of the storage server pool, which is a cluster of storage servers. Each secondary storage server registers with the primary storage server, and each discovery server is notified when a secondary storage server is added to, or removed from, the storage server pool.

If a discovery server has problems when trying to contact a specific secondary storage server, it tries to contact a different secondary storage server, and it continues this process until it succeeds. When a new storage server joins the storage server pool, the discovery server is notified by the primary storage server. The discovery server then contacts the new storage server.

In a streaming server deployment, you use the Data Management Portal (web-based user interface) to view discovery, topology, reporting, and analytical information. You use the Discovery Management Console (client user interface) to perform discovery-related activities, such as the following activities:

- Starting a discovery
- Showing the progress of a discovery
- Managing discovery scopes
- Managing discovery profiles
- Managing access list information

**discovery server**
A TADDM server that runs sensors in a streaming server deployment but does not have its own database.

**storage server**
A TADDM server that processes discovery data that is received from the discovery servers and stores it in the TADDM database. The primary storage server both coordinates the discovery servers and all other storage servers and serves as a storage server. All storage servers that are not the primary are called secondary storage servers.

**streaming server deployment**
A TADDM deployment with a primary storage server and at least one discovery server. This type of deployment can also include one or more optional secondary storage servers. The primary storage server and secondary storage servers share a database. The discovery servers have no database.

In this type of deployment, discovery data flows in parallel from multiple discovery servers to the TADDM database.

In a streaming server deployment, the following TADDM server property must be set to one of the following values:

- `com.collation.taddm.mode=DiscoveryServer`
- `com.collation.taddm.mode=StorageServer`

For all servers except for the primary storage server, the following properties (for the host name and port number of the primary storage server) must also be set:

- `com.collation.PrimaryStorageServer.host`
- `com.collation.PrimaryStorageServer.port`

If the `com.collation.taddm.mode` property is set, the `com.collation.cmdbmode` property must not be set or must be commented out.
Figure 3 is a simple illustration of a streaming server deployment that shows the information flow from the discovery servers to the storage server and its database. Figure 4 provides more detail. It shows the information flow from the discovery servers, each with a Discovery Management Console, to the storage server pool, which includes multiple storage servers and one primary storage server. Each storage server has a Data Management Portal, and all storage servers share one database.

In a deployment with multiple storage servers, you might want to have some storage servers dedicated solely to workload handling for the user interface, reporting, and integration. To do this, set the value of the following TADDM server property to true in the $COLLATION_HOME/etc/collation.properties file:

```java
com.collation.AlwaysBusyStorageServer=true
```

If this value is true, the server does not participate in the pool of storage servers that handle the discovery workload and can therefore provide a more superior user experience.

Planning for installation

Before installing TADDM, you must decide which type of TADDM deployment you want to use. Each type has different requirements and a different installation process. You must also plan for the number of servers, the types of server, and the type and location of the database.
If you plan to use TADDM with the IBM Tivoli Change and Configuration Management Database (CCMDB), refer to the planning and installing information for CCMDB.

**TADDM server requirements**

A TADDM deployment might require several types of servers, depending on the type of deployment you want to use.

**Number of servers**

The number of servers that you need depends on the estimated number of items that must be discovered. You can base your estimate on either of the following two units:

- **configuration item (CI)**
  A component of IT infrastructure that is under the control of configuration management and is therefore subject to formal change control. Each CI in the TADDM database has a persistent object and change history associated with it. Examples of a CI are an operating system, an L2 interface, and a database buffer pool size.

- **server equivalent (SE)**
  A representative unit of IT infrastructure, defined as a computer system (with standard configurations, operating systems, network interfaces, and storage interfaces) with installed server software (such as a database, a web server, or an application server). The concept of a server equivalent also includes the network, storage, and other subsystems that provide services to the optimal functioning of the server. A server equivalent depends on the operating system:

<table>
<thead>
<tr>
<th>Operating system</th>
<th>Approximate number of CIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td>500</td>
</tr>
<tr>
<td>AIX</td>
<td>1000</td>
</tr>
<tr>
<td>Solaris</td>
<td>1000</td>
</tr>
<tr>
<td>Linux</td>
<td>1000</td>
</tr>
<tr>
<td>HP-UX</td>
<td>500</td>
</tr>
<tr>
<td>Network devices</td>
<td>1000</td>
</tr>
</tbody>
</table>

**Types of servers**

**Domain servers**

TADDM domain servers discover and track the configuration items (CIs) in your environment. A domain server is part of a stand-alone domain server deployment or a synchronization server deployment.

Each domain server, and its associated database, should be limited to approximately 10,000 SEs (or 2,000,000 CIs). If your environment is larger than this, use multiple servers. You can also improve performance by limiting each server to a few sources and types of discovered data. For example, you might want one server to discover a single type of managed software system regardless of location, rather than organizing the servers according to geography.
Note: The synchronization server deployment type is obsolete. If you need to install a new deployment with multiple servers, use a streaming server deployment.

Discovery servers
Discovery servers discover and track the configuration items (CIs) in your environment. A discovery server is part of a streaming server deployment.

Each discovery server should be limited to approximately 10,000 SEs (or 2,000,000 CIs). If your environment is larger than this, use multiple discovery servers. You can also improve performance by limiting each server to a few sources and types of discovered data. For example, you might want one server to discover a single type of managed software system regardless of location, rather than organizing the servers according to geography.

Storage servers
Storage servers process the discovery data from discovery servers. A storage server is part of a streaming server deployment.

A streaming server deployment has at least one storage server, called the primary storage server; there might also be additional storage servers, depending upon the size of the environment and the number of items that need to be discovered.

If you are not sure how many storage servers you need, you can deploy TADDM with only one storage server and then add more storage servers as needed to improve performance.

Database servers
The TADDM database stores the discovered information about configuration items and their relationships, represented using the Tivoli Common Data Model. Each TADDM domain server or primary storage server has a corresponding database; in a synchronization server deployment, the synchronization server also has a database.

For testing or evaluation purposes, you can install the TADDM database on the same system as the domain server, synchronization server, or primary storage server. However, in production environments, a separate database server is recommended.

Anchors
If any of the components you need to discover are separated from the TADDM domain server or discovery server by firewalls, you must configure one or more anchors.

To discover components, each TADDM server must communicate with other computer hosts and network devices. If a firewall prevents direct access to certain hosts or devices, you can configure an anchor. An anchor is a TADDM server running on a system that has direct access to the hosts or devices behind the firewall and acts as a proxy to assist in the discovery process.

You do not need to configure anchors during the installation process, but you must include anchors in your installation plan and verify the system requirements for candidate systems. After the installation, you can use the Discovery Management Console to configure hosts to serve as anchors on your network.
Windows gateways

If your network contains Windows systems, you must specify a Windows system to serve as a gateway server to discover information about the Windows systems that are running in your environment. This gateway server should be in the same firewall zone as the discovered Windows hosts, and must have SSH access from the server. All Windows gateways must be running a supported version of Bitvise WinSSHD, the Cygwin SSH daemon, or Remotely Anywhere. For more information, see the TADDM Administrator's Guide.

You do not need to configure Windows gateways during the installation process, but you must include gateways in your installation plan and verify the system requirements for candidate systems. After the installation, you can use the Discovery Management Console to configure hosts to serve as Windows gateways on your network.

An anchor and a gateway can run on the same Windows system.

Hardware sizing for a synchronization or domain server deployment

These guidelines can help you determine the quantity and specification of servers that you need to meet your discovery requirements in a synchronization or domain server deployment.

TADDM server hardware requirements:

Use this information to estimate the processor, memory, and disk space requirements for the TADDM servers in a synchronization or domain server deployment.

These guidelines are the minimum specifications for hardware sizing. Several factors, including the number of users, can affect server use.

Use the following general guidelines:

- Use a fast multiprocessor system for the TADDM servers.
- Using a small number of faster processors is generally a better solution than using a large number of slower processors. For example, a 4-way 3.6 GHz Intel implementation is preferable to an 8-way 2.0 GHz Intel implementation.
- DB2® and Oracle databases that TADDM uses are configured to take advantage of multiple processors and parallel operations.

Note: Running a TADDM server on virtualized hardware can cause performance problems.

These guidelines assume that the TADDM server and the database server are on separate systems. You can install a TADDM server with a local database, but this is not recommended for production environments.

The following table indicates how to determine the server hardware requirements for your environment, based on the number of server equivalents (SEs) to be discovered.
### Table 3. TADDM server hardware requirements

<table>
<thead>
<tr>
<th>Server type</th>
<th>Processors</th>
<th>Processor speed</th>
<th>Memory</th>
<th>Disk space</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domain server with &lt; 2000 SEs</td>
<td>2</td>
<td>2 GHz minimum, 3 GHz recommended</td>
<td>4 GB</td>
<td>• 7 GB for product installation</td>
</tr>
<tr>
<td>Domain server with 2000 – 10,000 SEs</td>
<td>4</td>
<td>2 GHz minimum, 3 GHz recommended</td>
<td>8 GB</td>
<td>• 50 GB additional space (for DLA books, log and trace files, and other data)</td>
</tr>
<tr>
<td>Synchronization server with &gt; 10,000 SEs</td>
<td>4</td>
<td>2 GHz minimum, 3 GHz recommended</td>
<td>8 GB</td>
<td></td>
</tr>
<tr>
<td>Anchor</td>
<td>2</td>
<td>1 GHz</td>
<td>2 GB</td>
<td>5 GB</td>
</tr>
<tr>
<td>Windows gateway</td>
<td>2</td>
<td>2 GHz</td>
<td>2 GB</td>
<td>2 GB</td>
</tr>
</tbody>
</table>

**Notes:**

- For a synchronization server deployment, 64-bit hardware is required because 32-bit systems have significant scalability limitations.
- For a domain server deployment, 64-bit hardware is required for any domain server that manages more than 2000 servers or 2 million CIs. On 32-bit Windows servers, the 4-Gigabyte Tuning feature must be enabled. (For more information, see [http://msdn.microsoft.com/en-us/library/bb613473(VS.85).aspx](http://msdn.microsoft.com/en-us/library/bb613473(VS.85).aspx).)
- For an anchor server, when exchanging data you must use Secure Shell (SSH) version 2 protocol.

**Database server hardware requirements:**

The processor, memory, and disk space requirements for TADDM database servers are based on the size of your deployment (small, medium, or large).

These guidelines assume that the TADDM database is installed on a separate system. You can install TADDM with a local database, but this is not recommended for production environments. Database performance is also affected by the speed of input/output operations.
### Table 4. TADDM server hardware requirements

<table>
<thead>
<tr>
<th>Deployment type</th>
<th>Processors</th>
<th>Processor speed</th>
<th>Memory</th>
<th>Disk space</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small (&lt; 2000 SEs)</td>
<td>1</td>
<td>2 GHz minimum, 3 GHz recommended</td>
<td>3 GB</td>
<td>• At least 2 physical drives (3 or more recommended).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Initial disk space of 160 MB (required for creating the TADDM schema).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Disk space for discovery data. Use either of these formulas to estimate disk space requirement (assuming Level 3 discovery):</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Cls \times 7000 \text{ bytes}</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- SEs \times 5,600,000 \text{ bytes}</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>where Cls is the number of configuration items, and SEs is the number of server equivalents.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Additional disk space for ongoing growth. Plan for 10% growth weekly.</td>
</tr>
<tr>
<td>Large (2000 – 10,000 SEs)</td>
<td>2</td>
<td>2 GHz minimum, 3 GHz recommended</td>
<td>4 GB</td>
<td></td>
</tr>
<tr>
<td>Enterprise (&gt; 10,000 SEs)</td>
<td>4</td>
<td>2 GHz minimum, 3 GHz recommended</td>
<td>6 GB</td>
<td></td>
</tr>
</tbody>
</table>

**Hardware sizing for a streaming server deployment**

These guidelines can help you determine the quantity and specification of servers that you need to meet your discovery requirements in a streaming server deployment. These guidelines do not apply to an environment where TADDM is running on the Linux for System z® operating system.

These guidelines are the minimum specifications for hardware sizing. Several factors, including the number of users, can affect server use.

The size of a deployment is defined in terms of the number of server equivalents (SEs).

- Small deployment: Less than 2,000 SEs
- Large deployment: 2,000 - 10,000 SEs
- Enterprise deployment: More than 10,000 SEs

Use the following general guidelines:

- Use a fast multiprocessor system for the TADDM servers.
- Using a small number of faster processors is generally a better solution than using a large number of slower processors. For example, a 4-way 3.6 GHz Intel implementation is preferable to an 8-way 2.0 GHz Intel implementation.
- DB2 and Oracle databases that TADDM uses are configured to take advantage of multiple processors and parallel operations.
- For a streaming server deployment, which is a single database system, run the database on a dedicated database server.
These guidelines assume that the TADDM server and the database server are on separate systems.

The following options are examples of how you can scale your TADDM environment as needed:

- Horizontally, by increasing the size, capacity, or both, of an individual component. For example, to run more discovery worker threads on a single discovery server, you might want to increase the number of processors from two to four.
- Vertically, by adding additional components to your deployment. For example, if you have a data center in the USA, Europe, and Japan, you might want to place a discovery server at each location.

**Disk space**

To ensure that sufficient space is available for the TADDM installation and logging information, disk space requirements are provided. Alternatively, you can use the supplied formulas to estimate disk space requirements, paying particular attention to considerations such as growth, TADDM logging, and database logging.

**Memory size**

A discover worker thread is a thread that runs sensors. For a streaming server deployment, 64-bit hardware is required for all storage servers and discovery servers that use more than 24 concurrent discover worker threads. This also implies a 64-bit operating system and Java™ virtual machine. For large and enterprise deployments, a 64-bit version of the database software is required also.

**Processor speed**

The following table outlines the baseline processor types by platform.

<table>
<thead>
<tr>
<th>Platform</th>
<th>Baseline processor type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel</td>
<td>Xeon</td>
</tr>
<tr>
<td>pSeries</td>
<td>Power6</td>
</tr>
<tr>
<td>Sun</td>
<td>Sparc</td>
</tr>
</tbody>
</table>

You can compare other processor types by using industry standard benchmark data that is available from The Standard Performance Evaluation Corporation (SPEC) at [http://www.spec.org/](http://www.spec.org/).

**Primary storage server:**

The hardware specifications for the primary storage server depend on the platform and deployment size.

The primary storage server handles topology builds, data presentation requests, and manages the storage server pool. You must have one primary storage server for each TADDM deployment. You can add additional capacity by deploying secondary storage servers.
**Processor speed**

The following table lists the minimum processor speed that is required for a primary storage server, depending on platform and deployment size. Faster processors improve performance.

*Table 6. Processor speed*

<table>
<thead>
<tr>
<th>Platform</th>
<th>Minimum processor speed for small deployments</th>
<th>Minimum processor speed for large and enterprise deployments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel</td>
<td>2.5 GHz</td>
<td>3 GHz</td>
</tr>
<tr>
<td>pSeries</td>
<td>2.3 GHz</td>
<td>3 GHz</td>
</tr>
<tr>
<td>Sparc</td>
<td>2.5 GHz</td>
<td>3 GHz</td>
</tr>
</tbody>
</table>

**Processor quantity**

The following table lists the minimum processor quantity that is required for a primary storage server, depending on deployment size.

*Table 7. Processor quantity*

<table>
<thead>
<tr>
<th>Deployment size</th>
<th>Number of processors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>2</td>
</tr>
<tr>
<td>Large</td>
<td>4</td>
</tr>
<tr>
<td>Enterprise</td>
<td>4</td>
</tr>
</tbody>
</table>

**Memory size**

The following table lists the minimum memory amount that is required for a primary storage server, depending on deployment size.

*Table 8. Memory*

<table>
<thead>
<tr>
<th>Deployment size</th>
<th>Minimum memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>4 GB</td>
</tr>
<tr>
<td>Large</td>
<td>8 GB</td>
</tr>
<tr>
<td>Enterprise</td>
<td>8 GB or more</td>
</tr>
</tbody>
</table>

**Disk space**

A minimum of 50 GB is needed in addition to what is required for the TADDM product installation. This additional disk space is used to store items such as DLA books, additional logging, and tracing information.

**Secondary storage server:**

The hardware specifications for the secondary storage server depend on the platform and deployment size.

You can add additional secondary storage servers at any time without reconfiguring the discovery servers.
Typically, secondary storage servers are used only in streaming server deployments, but you can, in certain situations, configure secondary storage servers for use in a synchronization server deployment. For example, you can start up and use multiple secondary storage servers to run several bulk loads at an off-peak time to meet elapsed load time requirements. These additional secondary storage servers are used only for this purpose and shut down when not in use.

**Processor speed**

The following table lists the minimum processor speed that is required for a secondary storage server, depending on the platform and deployment size.

<table>
<thead>
<tr>
<th>Table 9. Processor speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platform</td>
</tr>
<tr>
<td>Intel</td>
</tr>
<tr>
<td>pSeries</td>
</tr>
<tr>
<td>Sparc</td>
</tr>
</tbody>
</table>

**Processor quantity**

The following table lists the minimum processor quantity that is required for a secondary storage server, depending on deployment size.

<table>
<thead>
<tr>
<th>Table 10. Processor quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deployment size</td>
</tr>
<tr>
<td>Small</td>
</tr>
<tr>
<td>Large</td>
</tr>
<tr>
<td>Enterprise</td>
</tr>
</tbody>
</table>

**Memory size**

The following table lists the minimum memory that is required for a secondary storage server, depending on deployment size.

<table>
<thead>
<tr>
<th>Table 11. Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deployment size</td>
</tr>
<tr>
<td>Small</td>
</tr>
<tr>
<td>Large</td>
</tr>
<tr>
<td>Enterprise</td>
</tr>
</tbody>
</table>

**Disk space**

A minimum of 50 GB is needed in addition to what is required for the TADDM product installation. This additional disk space is used to store items such as DLA books, additional logging, and tracing information.
Discovery server:

The hardware specifications for the discovery server depend on the platform and deployment size.

**Processor speed**

The following table lists the minimum processor speed that is required for a discovery server, depending on the platform and deployment size.

*Table 12. Processor speed*

<table>
<thead>
<tr>
<th>Platform</th>
<th>Minimum processor speed for small deployments</th>
<th>Minimum processor speed for large and enterprise deployments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel</td>
<td>2.5 GHz</td>
<td>3 GHz</td>
</tr>
<tr>
<td>pSeries</td>
<td>2.3 GHz</td>
<td>3 GHz</td>
</tr>
<tr>
<td>Sparc</td>
<td>2.5 GHz</td>
<td>3 GHz</td>
</tr>
</tbody>
</table>

**Processor quantity**

The following table lists the minimum processor quantity that is required for a discovery server, depending on deployment size.

*Table 13. Processor quantity*

<table>
<thead>
<tr>
<th>Deployment size</th>
<th>Number of processors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>2</td>
</tr>
<tr>
<td>Large</td>
<td>4</td>
</tr>
<tr>
<td>Enterprise</td>
<td>4</td>
</tr>
</tbody>
</table>

**Memory size**

The following table lists the minimum memory that is required for a discovery server, depending on deployment size.

*Table 14. Memory*

<table>
<thead>
<tr>
<th>Deployment size</th>
<th>Minimum memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>4 GB</td>
</tr>
<tr>
<td>Large</td>
<td>8 GB</td>
</tr>
<tr>
<td>Enterprise</td>
<td>8 GB</td>
</tr>
</tbody>
</table>

**Disk space**

A minimum of 50 GB is needed in addition to what is required for the TADDM product installation. This additional disk space is used to store items such as DLA books, additional logging, and tracing information.

Database server:

The hardware specifications for the database server depend on the platform and deployment size.
Processor speed

The following table lists the minimum processor speed that is required for a database server, depending on the platform and deployment size.

Table 15. Processor speed

<table>
<thead>
<tr>
<th>Platform</th>
<th>Minimum processor speed for small deployments</th>
<th>Minimum processor speed for large and enterprise deployments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel</td>
<td>2.5 GHz</td>
<td>3 GHz</td>
</tr>
<tr>
<td>pSeries</td>
<td>2.3 GHz</td>
<td>3 GHz</td>
</tr>
<tr>
<td>Sparc</td>
<td>2.5 GHz</td>
<td>3 GHz</td>
</tr>
</tbody>
</table>

Processor quantity

The following table lists the minimum processor quantity that is required for a database server, depending on deployment size.

Table 16. Processor quantity

<table>
<thead>
<tr>
<th>Deployment size</th>
<th>Number of processors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>2</td>
</tr>
<tr>
<td>Large</td>
<td>4</td>
</tr>
<tr>
<td>Enterprise</td>
<td>4</td>
</tr>
</tbody>
</table>

Add a processor for each additional 10,000 SEs over 10,000, up to a total of 12.

Memory size

The following table lists the minimum memory that is required for a database server, depending on deployment size.

Table 17. Memory

<table>
<thead>
<tr>
<th>Deployment size</th>
<th>Minimum memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>4 GB</td>
</tr>
<tr>
<td>Large</td>
<td>8 GB</td>
</tr>
<tr>
<td>Enterprise</td>
<td>8 GB or more</td>
</tr>
</tbody>
</table>

Add 2 GB of memory for each additional 20,000 SEs over 20,000.

Disk space

The following components require database disk space:

- System catalog
- Tables
- Indexes
- Logs
- Temporary space, for sorts and joins, for example
- Backup space
Disk space and disk drive requirements for a database server are not a function of only disk capacity. The following table lists some general guidance about disk drive layout on the database server.

<table>
<thead>
<tr>
<th>Deployment size</th>
<th>Number of disk drives (RAID) or disk arms (SAN) required for the TADDM database tables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
</tr>
<tr>
<td>Small</td>
<td>2</td>
</tr>
<tr>
<td>Large</td>
<td>6</td>
</tr>
<tr>
<td>Enterprise</td>
<td>8</td>
</tr>
</tbody>
</table>

Place database logs on separate disk drives (RAID) or disk arms (SAN) from the TADDM database tables. Database logs are required for large and enterprise deployments.

**Initial amount of disk space required for TADDM database**

To estimate the initial amount disk space that is required for your TADDM database implementation, complete the following steps. These estimates are based on Level 3 discovery data. Depending on the breadth and depth of data in your environment, the disk space requirements can change.

1. Use the `ci_no` variable to represent the number of CIs.
2. Use the `se_no` variable to represent the number of SEs.
3. Use the `ci_rds` variable to represent the amount of raw disk space for CIs without any additional disk space for growth. Allow 4000 bytes per CI.
   \[
   ci_rds = ci_no \times 4000
   \]
4. Use the `se_rds` variable to represent the amount of raw disk space for SEs without any additional disk space for growth. An SE consists of approximately 800 CIs. Allow 800,000 bytes per SE.
   \[
   se_rds = se_no \times 3,200,000
   \]
5. Use the `tds` variable to represent the total disk space, including some additional disk space for growth. Use one of the following formulas:
   - \[
   tds = ci_rds \times 1.75
   \]
   - \[
   tds = se_rds \times 1.75
   \]
   This calculation includes additional disk space for temporary space and more.
6. Use the `chs` variable to represent the change history disk space. The change history disk space is the amount of space by which the database grows weekly, over and above the initial disk allocation, depending on the frequency of discovery.
   \[
   chs = tds \times 1.1
   \]
   This calculation allows for an increase of 10%.

The space requirements increase if additional data is discovered or loaded or if you use the TADDM version management feature.

The following example of a disk space calculation, based on CIs, is for a large deployment:

1. \[ ci_no = 4,400,000 \]
2. \[ ci_rds = ci_no \times 4,000 = 17,600,000,000 \]
3. $tds = ci_{rds} \times 1.75 = 30,800,000,000$
4. $chs = tds \times 1.1 = 33,880,000,000$

The following example of a disk space calculation, based on SEs, is for a large deployment:
1. $se_{no} = 5,500$
2. $se_{rds} = se_{no} \times 3,200,000 = 17,600,000,000$
3. $tds = se_{rds} \times 1.75 = 30,800,000,000$
4. $chs = tds \times 1.1 = 33,880,000,000$

**Hardware scaling guidelines:**

You can use the sample configurations as a guideline for selecting the components for your TADDM implementation.

The guidelines assume that you are running Level 3 discoveries. To optimize discovery throughput, the storage servers should be 100% in use. If they are not, additional discovery servers can be added or the `dwcount` value can be increased on the existing discovery servers, if they have spare capacity. If a storage server has spare capacity, you can increase the `topopumpcount` value. When the storage servers are 100% in use, to increase throughput, increase the number of storage servers.

If UI performance becomes poor when running data load operations (for example, sensor discovery or bulk load), you can dedicate storage servers to UI, API, or report operations. If you want discovery servers to use other storage servers, instead of a particular storage server when persisting results, you can set the following property value to `true` on that storage server:

```properties
com.collation.AlwaysBusyStorageServer=true
```

Typically, you set this property value to `true` on the primary storage server or any other storage server dedicated to UI, API, or report operations.

**Discovery storage rates:**

You can use the discovery storage rates that are listed to help you determine the number of components that are required to meet your objectives for discovery.

In a synchronization server deployment, storage to the database is typically the main bottleneck. In a streaming server deployment, any bottleneck in discovery throughput has moved to the sensors that are waiting for the data to be stored.

The following table lists typical discovery storage rates.

**Table 19. Typical discovery rates**

<table>
<thead>
<tr>
<th>Number of storage servers</th>
<th>Number of imports (discovery servers)</th>
<th>CI rate per second</th>
<th>Percent improvement</th>
<th>Number of threads used for persisting discovery results in the database (topopumpcount)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>144</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>246</td>
<td>101.83</td>
<td>16</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>280</td>
<td>33.91</td>
<td>16</td>
</tr>
</tbody>
</table>
The number of imports that is listed is the number of discovery servers that are able to send enough data to the storage servers so that they are not waiting on sensor results, which means that they are storing at their maximum rate. As the number of storage servers increases, there is an increase in the CI storage rate.

**Discovery sensor rates:**

You can use the discovery sensor rates that are listed to help estimate your discovery server configuration, based on your discovery requirements.

The information in this topic was gathered when discovery testing with 96 discovery worker threads (\(dwcount\)) running on the discovery servers. This value is three times higher than the default of 32. Higher \(dwcount\) values can be used, increasing the number of sensors that are running concurrently and the amount of data being stored.

The information uses the average sensor time per server, which can vary widely depending on which sensors run, and the breadth and depth of the objects being discovered.

The total sensor elapsed time is calculated in the following way: (Number of servers/\(dwcount\)) \(\times\) average sensor time per server

The following table lists typical discovery sensor rates.

*Table 20. Typical discovery sensor rates*

<table>
<thead>
<tr>
<th>Number of servers</th>
<th>Average sensor time per server (in minutes)</th>
<th>Number of discovery worker threads ((dwcount))</th>
<th>Total sensor elapsed time (in minutes)</th>
<th>Total sensor elapsed time (in hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,000</td>
<td>30</td>
<td>32</td>
<td>4,688</td>
<td>78</td>
</tr>
<tr>
<td>5,000</td>
<td>30</td>
<td>64</td>
<td>2,344</td>
<td>39</td>
</tr>
<tr>
<td>5,000</td>
<td>30</td>
<td>96</td>
<td>1,563</td>
<td>26</td>
</tr>
<tr>
<td>10,000</td>
<td>30</td>
<td>32</td>
<td>9,375</td>
<td>156</td>
</tr>
<tr>
<td>10,000</td>
<td>30</td>
<td>64</td>
<td>4,688</td>
<td>78</td>
</tr>
<tr>
<td>10,000</td>
<td>30</td>
<td>96</td>
<td>3,125</td>
<td>52</td>
</tr>
</tbody>
</table>

**Discovered target resources utilization footprint:**

The TADDM discovery process uses minimal system and network resources. Based on lab-based benchmarks, TADDM typically uses less than 10% of CPU utilization, and less than 1% of operating memory (on discovered hosts) during Level 3 discovery.

**Note:** Discovered target resource utilization footprint (on discovered hosts) might vary depending on the application type, or its configuration, or both.

The following figures show the CPU utilization and operating memory consumption during Level 3 discovery of WebLogic servers.
Server configurations:

You can use the server configuration guidelines to help estimate the number of storage and discovery servers that you need, depending on the size of your deployment.

Based on your discovery requirements, the number of servers you that you need might differ from the numbers that are listed.

Small deployment
- One primary storage server
- One discovery storage server

Large deployment
- One primary storage server
- One secondary storage server
- Two discovery servers
  Depending on the geographic location of target computers (one per data center), discovery elapsed time requirements, and so on, more or fewer discovery servers might be required.

Enterprise deployment
- One primary storage server
- Two secondary storage servers
- Three discovery servers
  Depending on the geographic location of target computers (one per data center), discovery elapsed time requirements, and so on, more or fewer discovery servers might be required.
Sample scenarios:

You can use the typical discovery sensor rates to help determine how many discovery servers that you need to meet your discovery requirements.

Increase the thread count value, \( \text{dwcount} \), until you get memory, processor usage, or both, constrained on your discovery server. Then, scale your discovery servers as appropriate.

Estimating the number of discovery servers that are required is difficult for the following reasons:

- It is not always known in advance how many sensors will run on each server.
- The time taken for a sensor to complete can vary widely based on the configuration of the target server.

When monitoring discovery through the UI, consider the following general rules:

- If the number of sensors that are running is much greater than the \( \text{dwcount} \) value, TADDM is waiting to store data. TADDM waiting to store data is an indication that you might need to increase the capacity of your storage servers, that is, add another secondary storage server.
- If the number of sensors running is about the same as the \( \text{dwcount} \) value, TADDM is waiting for sensors to run. TADDM waiting for sensors to run is an indication that you might need to increase the capacity of your discovery servers, that is, add another discovery server, increase the \( \text{dwcount} \) value, and so on.

When using a streaming server deployment, you can easily add or remove secondary storage servers, discovery servers, or both, as your needs change or your environment grows.

Sizing example

The discovery storage rates are theoretical maximum rates. While the maximum rate might be reached for some time during a long discovery, in most cases the storage rate is less. For this scenario, a 50% rate is assumed.

The number of SEs to be discovered is 60,000 and there is a requirement for the discovery to complete within one day.

Using one storage server, it would take 1.93 days to discover and store the results of 60,000 SEs, not meeting the requirement. The following table displays the calculations for the example using one storage server.

Table 21. Example using one storage server

<table>
<thead>
<tr>
<th></th>
<th>CIs</th>
<th>SEs</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week</td>
<td>43,545,600</td>
<td>217,728</td>
<td>0.28</td>
</tr>
<tr>
<td>Day</td>
<td>6,220,800</td>
<td>31,104</td>
<td>1.93</td>
</tr>
<tr>
<td>Hour</td>
<td>259,200</td>
<td>1,296</td>
<td>46</td>
</tr>
<tr>
<td>Minute</td>
<td>4,320</td>
<td>22</td>
<td>2,778</td>
</tr>
<tr>
<td>Second</td>
<td>72</td>
<td>0.4</td>
<td>166,667</td>
</tr>
</tbody>
</table>
Using one primary storage server and two secondary servers, it would take 1.00 days to discover and store the results of 60,000 SEs, meeting the requirement. The following table displays the calculations for the example using two storage servers.

Table 22. Example using two storage servers

<table>
<thead>
<tr>
<th></th>
<th>Cls</th>
<th>SEs</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week</td>
<td>84,672,000</td>
<td>423,360</td>
<td>0.1</td>
</tr>
<tr>
<td>Day</td>
<td>12,096,000</td>
<td>60,480</td>
<td>1.0</td>
</tr>
<tr>
<td>Hour</td>
<td>504,000</td>
<td>2,520</td>
<td>24</td>
</tr>
<tr>
<td>Minute</td>
<td>8,400</td>
<td>42</td>
<td>1,429</td>
</tr>
<tr>
<td>Second</td>
<td>140</td>
<td>0.7</td>
<td>85,714</td>
</tr>
</tbody>
</table>

Using the discovery sensor rates from the previous example, the following table shows the number of discovery servers that are required for sensor processing to meet the one day requirement.

Table 23. Example for discovery servers

<table>
<thead>
<tr>
<th>Number of servers</th>
<th>Average sensor time per server (in minutes)</th>
<th>dcount</th>
<th>Total sensor elapsed time (in minutes)</th>
<th>Total sensor elapsed time (in hours)</th>
<th>Number of discovery servers needed per hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>60,000</td>
<td>30</td>
<td>32</td>
<td>56,250</td>
<td>938</td>
<td>39.06</td>
</tr>
<tr>
<td>60,000</td>
<td>30</td>
<td>64</td>
<td>28,125</td>
<td>469</td>
<td>19.53</td>
</tr>
<tr>
<td>60,000</td>
<td>30</td>
<td>96</td>
<td>18,750</td>
<td>313</td>
<td>13.02</td>
</tr>
</tbody>
</table>

The total sensor elapsed time is calculated in the following way: (Number of servers/dcount) x average sensor time per server

This example is for illustrative purposes and assumes Level 3 discovery. The actual number of discovery servers can vary based on the actual average time per sensor.

**Windows gateways**

You can use the guidelines for Windows gateways to configure the Windows gateways in your TADDM environment.

Sufficient capacity for any Windows gateway server is an important component in the overall configuration of your TADDM discovery environment. Windows gateway processing is processor intensive and can become a bottleneck to overall discovery throughput when sufficient capacity is not available. The following guidelines can be used to configure your Windows gateways:

- Gateways can be configured as a shared pool for multiple discovery servers. This method ensures that all of the gateway servers can be used while discovery is running on any of the discovery servers.
- Monitoring the processor usage on the Windows gateway servers to determine if sufficient capacity is available. You can use Windows Task Manager or any other tool available that monitors processor usage. If the processor usage on any of the Windows gateway servers runs at 100% use for long periods of time, there is insufficient processor capacity on that gateway. Running at 100% use indicates that some of the TADDM sensors running through this gateway are waiting for available processor resources to do their work. This delay negatively affects the total elapsed time for the sensor to complete.
Different guidelines apply for queue lengths on multiprocessor systems. For busy systems (those having processor use in the 80 - 90 % range) that use thread scheduling, the queue length should range from 1 - 3 threads per processor. For example, on a four-processor system, the expected range of processor queue length on a system with high processor activity is 4 - 12. On systems with lower processor use, the processor queue length is typically 0 or 1.

Processor queue length, can be an indication that there is insufficient capacity on that gateway. Address this situation by completing one or more of the following actions:
- Add additional processors to the gateway server.
  Large and enterprise deployments should have a minimum of two processors.
- Use gateway servers with faster processors, for example processors with a speed of 2.0 GHz - 3.0 GHz.
  Large and enterprise deployments should have at least a 3.0 GHz processor.
- Add additional gateway servers to the pool.

Typically, users have 70 - 80% of their total distributed servers running the Windows operating system. Using this information, you can determine the number of Windows gateways needed, depending on the deployment size.
- For small deployments: Two Windows gateways
- For large deployments: Four Windows gateways
- For enterprise deployments: Four Windows gateways

These categories are based on the total number of Windows servers being discovered, not the total number of servers in the environment.

You might have to add more gateways if you are not meeting your discovery throughput requirements. If all of your gateway servers are running at full capacity, and you have tried to address the problem by adding additional processors or using gateway servers with faster processors, then the next step is to add an additional gateway server.

**Required software**

All Windows gateways must be running a supported version of Bitvise WinSSHD, Cygwin SSH daemon, or Remotely Anywhere.

The following is the list of supported versions of the software:
- Bitvise: WinSSHD 4.06 through 4.28 and 5.09, or later.
- For Cygwin, you must install the following packages:
  - From the admin category: cygrunsrv (version 1.17–1 or later).
  - From the net category: opensshd (version 4.6p 1–1 or later).
- Remotely Anywhere: 9.x

**Restriction:** For Windows Server 2012, only Bitvise 5.59 or later is supported. Cygwin and Remotely Anywhere are not supported.

For more information about availability, installation and configuration of the above software, see [Configuring for discovery of Windows systems](#)
Running Windows gateways on virtual machines

You can run Windows gateways on virtual machines (VMs). The guidelines in the previous section are based on dedicated physical resources. For example, an enterprise-sized deployment requiring four gateways can use one of the following configurations:

- An 8-way physical server into four 2-way VMs, with each VM used as one of the four gateways. This configuration is acceptable.
- An 8-way physical server into eight 2-way VMs, with four of the VMs being used by TADDM as gateways, and the other four VMs used for some other, non-TADDM usage.

This server is over allocated, that is, eight physical processors and 16 virtual processors. This configuration might be acceptable if the four TADDM VMs are the only VMs running when a TADDM discovery is running.

This configuration is probably not acceptable if all eight VMs are running while a TADDM discovery is running. Because the physical processor resources are over allocated, the processor resources that are required by TADDM are not available.

When using VMs for Windows gateways, any monitoring of the gateways for capacity must be done on the physical server. Performance information you see on the VM is not reliable or accurate.

TADDM server software requirements

Each TADDM server must be running a supported operating system and Java virtual machine (JVM). These servers might include domain servers, discovery servers, storage servers, synchronization servers, anchors, and Windows gateways.

**Important:** Be sure to read the following important information before installing the TADDM server:

- You must install the latest patches and updates from the operating system vendor before installing the TADDM server.
- The server *hosts* file must include the IP address and host name of the local system. The hosts file is in one of the following locations:
  - Windows systems: `c:\Windows\system32\drivers\etc\hosts`
  - Linux and UNIX systems: `/etc/hosts`

Specify both the fully qualified host name and the short name of the server. The format of a hosts file entry is as follows:

```
ip_address hostname [hostname_2 ... hostname_n] [#comment]
```

The fully qualified host name must occur before the short name in the hosts file.

Alternatively, you can configure the host name resolution order for your system to use DNS resolution before checking the hosts file. For more information about how to configure the host name resolution order, see the documentation for your operating system.

- The TADDM server supports only the IBM Java Runtime Environment (JRE).
- The user ID under which the TADDM server runs must have read, write, and execute permissions for its installation directory and contents, and for the temporary directory of the system. By default, the installation directory is `/opt/IBM/taddm` on Linux and UNIX systems, or `c:\ibm\taddm` on Windows systems. Typically, the temp directory is `%TEMP%` on a Windows system and `/tmp` on Linux and UNIX systems.
• On UNIX systems, the user ID under which the TADDM server runs must have an open file limit of at least 8192 files. You can set the open file limit using the `ulimit` command.

• On UNIX systems, the user ID under which the TADDM server runs must have a limit of at least 4096 processes for the maximum number of processes running per user. You can set the limit of the number of running processes using the `ulimit` command.

• On Linux and UNIX systems, the TADDM server user ID must also have root execution permission for the `nmap` command. For detailed information about Nmap and the Stack Scan sensor, see the “Stack Scan sensor” topic in the TADDM Sensor Reference.

• On supported AIX operating systems, you must have the unzip extraction utility available in the `/usr/bin` or `/usr/local/bin` directory. If not installed, you must install the extraction utility into one of those directories before beginning the TADDM server installation.

• `lsof` is required on AIX operating systems. Download it from the AIX Web Download Pack Programs website.

• AIX requires GNU tar version 1.14 or later.

• The TADDM server uses a 64-bit JVM automatically on a 64-bit system. A 64-bit JVM is supported on AIX, Solaris, Windows, Linux, and Linux on System z operating systems. The installation process uses Java 5.0 JRE 32-bit. To run a 32-bit Java GUI on 64-bit hardware with a Linux operating system, you need the following 32-bit shared library files:
  - `libdl.so.2`
  - `libpthread.so.0`
  - `libstdc++.so.5`
  - `libXmu.so.6`
  - `libXt.so.6`
  - `libX11.so.6`
  - `libm.so.6`
  - `libXtst.so.6`
  - `libXp.so.6`
  - `libXc.so.6`
  - `lib/ld.so.1`
  - `libXext.so.6`
  - `libSM.so.6`
  - `libICE.so.6`
  - `libXau.so.6`
  - `libXdmcp.so.6`
  - `libXft.so.2`

To install the shared library files, use the following command:

```
yum install library
```

The following example shows how to use the command to install the `libXft.so.2` library:

```
yum install libXft.so.2
```

• Discovered systems might be running operating systems and applications that are no longer supported by their vendors. While every effort is made to fix
issues encountered on these targets of a discovery, you might have to reproduce
the problem on a vendor-supported operating system or application, and use the
vendor’s support.

The following table provides details about operating systems that are supported
for TADDM servers. Operating system requirements for anchor servers are the
same as the requirements for TADDM servers. Operating system requirements for
gateway servers are the same as Windows operating system requirements for
TADDM servers.

**Note:** For the most current information about supported operating systems, refer
to the IBM Software Product Compatibility Reports at [http://pic.dhe.ibm.com/
infocenter/prodguid/v1r0/clarity/index.html](http://pic.dhe.ibm.com/infocenter/prodguid/v1r0/clarity/index.html).

**Table 24. Supported operating systems for TADDM servers**

<table>
<thead>
<tr>
<th>Operating system and supported release</th>
<th>Support details</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIX 6.1</td>
<td>Only 64-bit AIX is supported.</td>
</tr>
<tr>
<td>AIX 7.1</td>
<td></td>
</tr>
<tr>
<td>Red Hat Enterprise Linux 4 x86</td>
<td>Some problems might occur on updates earlier than Red Hat Enterprise Linux, Update 6 (for example, out of memory conditions and ClassNotFound exceptions). If you encounter these problems, upgrade to Update 6.</td>
</tr>
<tr>
<td>Red Hat Enterprise Linux 4 x86_64</td>
<td>The Security-Enhanced Linux (SELinux) security system must be disabled. You can disable SELinux by specifying SELINUX=disabled in the /etc/sysconfig/selinux configuration file. (Restart your system after modifying the file.) On 64-bit Linux systems, the libstdc++.so.5 library is required.</td>
</tr>
<tr>
<td>Red Hat Enterprise Linux 4 for System z with Update 3</td>
<td>The Security-Enhanced Linux (SELinux) security system must be disabled. You can disable SELinux by specifying SELINUX=disabled in the /etc/sysconfig/selinux configuration file. (Restart your system after modifying the file.) On 64-bit Linux systems, the libstdc++.so.5 library is required.</td>
</tr>
<tr>
<td>Red Hat Enterprise Linux 5 x86</td>
<td>The libXp-1.0.0-8.i386.rpm package must also be installed. (This package is available from the Server directory on disk 2 of the Red Hat Enterprise Linux 5.0 distribution media.) On 64-bit Linux systems, the libstdc++.so.5 library is required.</td>
</tr>
<tr>
<td>Red Hat Enterprise Linux 5 x86_64</td>
<td>On 64-bit Linux systems, the libstdc++.so.5 library is required.</td>
</tr>
<tr>
<td>Red Hat Enterprise Linux 5 for System z</td>
<td>On 64-bit Linux systems, the libstdc++.so.5 library is required.</td>
</tr>
<tr>
<td>Red Hat Enterprise Linux 6 x86</td>
<td>The libXp-1.0.0-8.i386.rpm package must also be installed. (This package is available from the Server directory on disk 2 of the Red Hat Enterprise Linux 6.0 distribution media.) On 64-bit Linux systems, the libstdc++.so.5 library is required.</td>
</tr>
<tr>
<td>Red Hat Enterprise Linux 6 x86_64</td>
<td>On 64-bit Linux systems, the libstdc++.so.5 library is required.</td>
</tr>
<tr>
<td>Red Hat Enterprise Linux 6 for System z</td>
<td>On 64-bit Linux systems, the libstdc++.so.5 library is required.</td>
</tr>
<tr>
<td>Solaris 10 SPARC</td>
<td>SUSE Fix Pack 1 is also required.</td>
</tr>
<tr>
<td>SUSE Linux Enterprise Server 10 x86</td>
<td>On 64-bit Linux systems, the libstdc++.so.5 library is required.</td>
</tr>
<tr>
<td>Operating system and supported release</td>
<td>Support details</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>SUSE Linux Enterprise Server 10 x86_64</td>
<td>On 64-bit Linux systems, the libstdc++.so.5 library is required.</td>
</tr>
<tr>
<td>SUSE Linux Enterprise Server 10 for System z</td>
<td></td>
</tr>
<tr>
<td>SUSE Linux Enterprise Server 11 x86</td>
<td></td>
</tr>
<tr>
<td>SUSE Linux Enterprise Server 11 x86_64</td>
<td></td>
</tr>
<tr>
<td>SUSE Linux Enterprise Server 11 for System z</td>
<td>Requires Microsoft Service Pack 2.</td>
</tr>
<tr>
<td>Microsoft Windows Server 2008 R2</td>
<td></td>
</tr>
<tr>
<td>Microsoft Windows Server 2012</td>
<td></td>
</tr>
</tbody>
</table>

**Database server software requirements**

Each TADDM domain database server must be running a supported relational database.

For testing or demonstration purposes, you can install the TADDM database on the same system as the domain server, synchronization server, or primary storage server. For a streaming server deployment, you must install the database before installing the TADDM server. For a domain server deployment or synchronization deployment, the installer can optionally install a local DB2® database as part of the TADDM installation process, or create the required tables using an existing local DB2® installation. (To use a local Oracle database, you must install the database before installing the TADDM server.)

In a production environment, you must install a supported database on a separate system before installing the TADDM server. Any of the following database software can support a TADDM database:

<table>
<thead>
<tr>
<th>Supported database</th>
<th>Support details</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM DB2 for z/OS® Version 9.1</td>
<td></td>
</tr>
<tr>
<td>IBM DB2 Version 9.5</td>
<td>Fix Pack 5 or later required</td>
</tr>
<tr>
<td>IBM DB2 Version 9.7</td>
<td>Fix Pack 3 or later required</td>
</tr>
<tr>
<td>IBM DB2 Version 10.1</td>
<td>Fix Pack 4 or later required</td>
</tr>
</tbody>
</table>
| Oracle 10g | • The JDBC driver file ojdbc14.jar is required.  
• The Oracle Real Application Clusters option is not supported |
| Oracle 11g | • The JDBC driver file ojdbc5.jar is required.  
• The Oracle Real Application Clusters option is not supported |

**Restriction:** You must install the correct Oracle JDBC drivers. If you fail to update the drivers, you might encounter various problems with TADDM 7.2.1.
Note: For the most current information about supported operating systems, refer to the support matrix at [http://www.ibm.com/software/sysmgmt/products/support/Tivoli_Supported_Platforms.html](http://www.ibm.com/software/sysmgmt/products/support/Tivoli_Supported_Platforms.html).

For optimal performance, install the following database components on separate physical devices or disk arms:
- Database tables and indexes (use four or more physical devices or disk arms)
- Database logs
- Database temporary space

If you are using DB2 on a Linux system, and you plan to create the TADDM database and tables during the installation process, make sure the SHMMAX and SHMALL shared memory kernel parameters meet the required minimum values before you install TADDM. For more information, refer to the DB2 documentation at [http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp](http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp).

For information on configuring, monitoring, and tuning your database, see the Relational Database Design and Performance Tuning for DB2 Database Servers white paper that at [http://www.ibm.com/software/brandcatalog/ismlibrary/](http://www.ibm.com/software/brandcatalog/ismlibrary/) Many of the concepts in the white paper are applicable to the Oracle database manager.

### Client requirements

The Discovery Management Console and the Data Management Portal are accessed by using a web browser.

To run the Discovery Management Console, a client system must meet the following hardware requirements:
- Processor: 2.0 GHz or faster
- Memory: 512 MB – 1 GB of RAM available to TADDM, depending on the number of discovered configuration items

For more information about configuring the minimum and maximum memory settings, refer to the TADDM Administrator’s Guide.

The following browsers are supported for the Discovery Management Console and the Data Management Portal:
- Windows systems:
  - Microsoft Internet Explorer 8
  - Microsoft Internet Explorer 7
  - Mozilla Firefox 3.5
  - Mozilla Firefox 3.6
- Linux, Solaris, and Linux on System z systems:
  - Mozilla Firefox 3.5
  - Mozilla Firefox 3.6
- AIX systems:
  - Mozilla Firefox 3.5
  - Mozilla Firefox 3.6

Notes:
- If you are using Microsoft Internet Explorer 7, you can avoid performance issues by increasing the limit on the number of concurrent downloads. For more information, see [http://support.microsoft.com/kb/282402](http://support.microsoft.com/kb/282402).
If you are using Microsoft Internet Explorer 8, you must configure Internet Explorer 8 to use Internet Explorer 7 compatibility mode. When you use this method, Internet Explorer 8 must display your Discovery Management Console and Data Management Portal in the exact same manner that Internet Explorer 7 displays these interfaces. However, if an issue arises that does not occur in Internet Explorer 7, it might be necessary to use Internet Explorer 7 to resolve the issue.

Tivoli Common Reporting version 2.1 does not support Firefox version 3.5. If you are using Tivoli Common Reporting 2.1 to generate TADDM reports, you must use Firefox version 3.6 or later. For more information, refer to the Tivoli Common Reporting documentation.

The default system fonts and font sizes can be required to ensure correct layout and functionality.

In addition to a supported web browser, the Discovery Management Console also requires either the IBM or Sun Java Runtime Environment (JRE), version 5.0 or version 6.0, on each client system.

To determine if you have the correct version of the Java platform, enter the following command at a DOS command prompt or a UNIX or Linux console window:

```
java -version
```

If the output indicates you are running either Java HotSpot (Sun) or the IBM JRE, version 5.0 or 6.0, then all prerequisites are met.

Note: On Red Hat Enterprise Linux 5 Japanese, some version 5.0 JREs have font problems. Ensure the JRE 5.0 build level is pxi32dev-20070201 (SR4) or later for the Discovery Management Console.

For more information about the prerequisites for starting the Discovery Management Console, including how to install the required JRE, refer to the TADDM User’s Guide.

Planning for security

Before installing, decide which user registry configuration you want to use for TADDM security. During the installation process, you must specify which user registry is used to authenticate TADDM users.

TADDM uses many forms of security, including user authentication and user authorization. User authentication ensures that a TADDM user is who the user claims to be. User authorization ensures that a TADDM user can manipulate TADDM objects and perform TADDM operations that the user is permitted to access.

The following table identifies the ways TADDM ensures that data that is collected during the discovery process is secure:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credentials required for user of API access</td>
<td>Eliminates unauthorized access to information or control</td>
</tr>
<tr>
<td>Logging of user activity</td>
<td>Enables security audits</td>
</tr>
<tr>
<td>Utilize SSH for host access</td>
<td>Authenticated and secures discovery activity</td>
</tr>
</tbody>
</table>
Authentication

TADDM supports three types of user repositories that can be used to authenticate TADDM users: a TADDM file-based repository, LDAP repositories, and the federated repositories functions of IBM WebSphere® Application Server. You can select the type of user registry that you want to use during the installation process. These types of registries are mutually exclusive.

**TADDM file-based repository**

The TADDM file-based repository is used for small proof-of-concept installations or environments where TADDM product integration that uses a single sign-on (SSO) is not required. The TADDM file-based repository requires that all users and groups (including passwords) are created, managed, and maintained within TADDM. To configure TADDM to use the file-based repository, select this repository during the TADDM installation.

**LDAP registry**

If your environment has a central LDAP registry, you can use this repository to authenticate TADDM users. TADDM supports LDAP authentication by using the following products:

- IBM Tivoli Directory Server Version 6.0, Version 6.2 or later
- Microsoft Active Directory 2008 R2

**Note:** However, if single sign-on is required, you must configure TADDM to use WebSphere federated repositories as the user registry.

**WebSphere federated repositories**

The WebSphere federated repositories feature is a flexible meta-repository within WebSphere that supports multiple types of repositories, including Microsoft Active Directory. If you use other Tivoli products in your environment, including IBM Tivoli CCMD (IBM SmartCloud Control Desk (SCCD)), or Tivoli Business Service Manager (TBSM), you can configure TADDM to use WebSphere federated repositories. To see supported versions of the products, go to the [Supported versions](#) section.

This configuration enables single sign-on (SSO) between Tivoli applications by using WebSphere Lightweight Third-Party Authentication (LTPA) tokens. For example, configuring TADDM for the same WebSphere federated repositories used by IBM Tivoli CCMD supports SSO for launch in context between IBM Tivoli CCMD and TADDM.

**Planning for the future**

If you cannot use the federated repositories functionality of IBM WebSphere Application Server, but you plan to install IBM Tivoli CCMD in the future, it is easier for you to move to federated repositories if you choose the LDAP user registry instead of the file-based user registry. If you use an LDAP user registry, you do not have to re-create your users when moving to federated repositories.
Authorization

TADDM supports two types of authorization: run time and data-level. These types of authorization are based on TADDM roles which are groups of permissions. The Data Management Portal manages the assignment of roles to users. This feature is not available through the Discovery Management Console. The following table shows the three core TADDM roles (administrator, operator, and supervisor) and their permissions.

<table>
<thead>
<tr>
<th>Roles</th>
<th>Permissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator</td>
<td>Read, Update, Admin, Discover</td>
</tr>
<tr>
<td>Operator</td>
<td>Read</td>
</tr>
<tr>
<td>Supervisor</td>
<td>Read, Update, Discover</td>
</tr>
</tbody>
</table>

Runtime authorization

When using TADDM runtime authorization, the user interface (UI) and application programming interface (API) check specific TADDM permissions to prevent or authorize access to TADDM capabilities. The following list shows examples of runtime authorization:

- The Admin permission is checked before a user administering users, groups, and roles through the Data Management Portal.
- The Discover permission is checked before a user initiating TADDM discoveries or manually creating TADDM components in the Discovery Management Console.

Runtime authorization is always in effect and cannot be disabled.

Data-level authorization

When using TADDM data-level security, named groups of TADDM objects (access collections) are created to define groups of objects that are managed by particular users. Users are assigned a role and access collections of objects with which to interact. One virtual access collection, DefaultAccessCollection, represents access to all objects. The TADDM-specific permissions (Read, Update) are used with access collections so that a user can view and modify objects (contained by the access collections) that the user can access. You can set up access collections, roles, and users in the Discovery Management Console after you complete the installation process.

Data-level authorization is disabled by default and can be enabled by setting com.collation.security.enabledatalevelsecurity to true in the $COLLATION_HOME/etc/collation.properties file.

Multitenancy

TADDM can host multiple organizations or customers, allowing users to access the data that belongs to their organizations. Large companies and service providers might prefer multitenancy capabilities. TADDM supports multitenancy through the creation of access collections along organizational or customer lines.

For example, organization A’s objects are grouped into access collections (A, B, and C). Organization B’s objects are also grouped into access collections (D, E, and F).
User #1 has administrator access (Read, Update, Admin, and Discover) for access collections (A, B, and C). User #2 has administrator access (Read, Update, Admin, and Discover) for access collections (D, E, and F). Therefore, each user can view the details of and modify the objects to which the user can access.

The TADDM user interface supports data-level security. If data-level security is enabled, a user can view details only about objects that are in access collections to which the user has access.

When planning for TADDM security, there are limitations:

- Because all TADDM administrators have Admin permission, each administrator is able to administer all TADDM users, including users that are associated with a particular organization. TADDM does not have a hierarchy of administrators.
- Data-level security does not apply to scope sets. Therefore, any user with the Discovery permission can see all scope sets, including those sets associated with other organizations or customers.
- Some TADDM reports might show objects to which users do not have access. TADDM reports generated by using the Business Intelligence and Reporting Tools (BIRT) system, access the TADDM database directly and do not support data-level security.

**Planning for single sign-on with IBM Tivoli CCMDB**

You can install TADDM to use the federated repositories function of IBM WebSphere Application Server to authenticate TADDM users. Use federated repositories to take advantage of the user and group management capabilities that it provides and to enable single sign-on (SSO) between Tivoli applications.

To see supported versions of the products, go to the Supported versions section.

To use single sign-on, the IBM Tivoli Change and Configuration Management Database (IBM Tivoli CCMDB) and TADDM systems must be members of the same DNS domain that is configured in the WebSphere Application Server for single sign-on. Furthermore, the Authentication Service application (authsvc_ctges enterprise application) must be running on the CCMDB WebSphere Application Server in order to log in to TADDM, if TADDM is configured to use federated repositories. These functions are installed and configured as part of the IBM Tivoli CCMDB installation. For more information, see IBM Tivoli CCMDB Planning and Installation Guide.

If you have WebSphere Application Server configured to use a stand-alone LDAP user registry, change the configuration to use federated repositories. To make this change, set up a subtree of the LDAP repository that combines all of the existing LDAP parameters into a single federated repository realm.

**Configuration of single sign-on between TADDM and IBM Tivoli CCMDB**

When configuring TADDM to use WebSphere federated repositories, there are some configuration considerations:

- When specifying the WebSphere port, use the bootstrap port of the WebSphere instance. The bootstrap port is used for incoming EJB communications with the WebSphere Application Server.
  
  For WebSphere Application Server and bundled version of WebSphere Application Server, this port is 2809.
For WebSphere Application Server Network Deployment, which IBM Tivoli CCMDB uses, this port is 9809.

- To implement single sign-on between IBM Tivoli CCMDB and TADDM, the two systems must be members of the same DNS single sign-on domain configured in WebSphere.

The instructions to configure the WebSphere single sign-on domain are found in the WebSphere 6.1 online documentation, in the section titled *Implementing single sign-on to minimize Web user authentications.*

**Planning for self-monitoring**

Before you install and deploy the self-monitoring tool, locate the server name for the IBM Tivoli Monitoring server.

The server name is the only item of information that you need to know before installing and deploying self-monitoring. If you do not know the server name, contact your network administrator for this information.

When you know the server name for the IBM Tivoli Monitoring server you can deploy the self-monitoring agent, point to the IBM Tivoli Monitoring server, and view information in the Tivoli Enterprise Portal.

The self-monitoring tool is supported only on TADDM synchronization server deployment. Monitoring of multiple TADDM servers is not supported.

The self-monitoring tool cannot be installed on the Windows operating systems supported by TADDM. The self-monitoring tool can be installed on all other Linux, Solaris, AIX, and Linux for System z operating systems that are supported by TADDM.

**Planning worksheet for synchronization server deployment installation**

These tables list the settings that you must know when installing TADDM for a synchronization server deployment.

Do not use port 9530, 9531, 4160, 10339 or 9436 when specifying the TADDM server port values during the installation. In a domain server deployment, you must not use these ports when specifying the Enterprise server port values.

**Table 28. Common installation settings**

<table>
<thead>
<tr>
<th>Setting</th>
<th>Default</th>
<th>Your value</th>
</tr>
</thead>
</table>
| Install directory for TADDM | • Linux, Solaris, AIX, and Linux on System z operating systems: /opt/IBM/taddm  
   • Windows operating systems: c:\IBM\taddm |                                                                            |
| Non-root user ID      | • Linux, Solaris, AIX, and Linux on System z operating systems: user      
   name for the person running the TADDM installation process  
   • Windows operating systems: user name for the person running the TADDM installation process |                                                                            |
Table 28. Common installation settings (continued)

<table>
<thead>
<tr>
<th>Setting</th>
<th>Default</th>
<th>Your value</th>
</tr>
</thead>
</table>
| DB2 instance user ID           | • Linux, Solaris, AIX, and Linux on System z operating systems: db2inst1  
                                 | • Windows operating systems: db2admin |            |
| DB2 instance password          |                                              |            |
| DB2 database server port       | 50000                                        |            |
| Archive DB2 user ID            | archuser                                     |            |
| Archive DB2 user ID password   |                                              |            |

Table 29. Additional settings for a custom installation. The port numbers and server details in this table are used by the synchronization server.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Default</th>
<th>Your value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security manager port for interactions with the synchronization server</td>
<td>9540</td>
<td></td>
</tr>
<tr>
<td>Topology manager port for interactions with the synchronization server</td>
<td>9550</td>
<td></td>
</tr>
<tr>
<td>API server port for interactions with the synchronization server</td>
<td>9570</td>
<td></td>
</tr>
<tr>
<td>Change manager port for interactions with the synchronization server</td>
<td>9560</td>
<td></td>
</tr>
<tr>
<td>Report server port for interactions with the synchronization server</td>
<td>9580</td>
<td></td>
</tr>
<tr>
<td>IBM Tivoli CCMDB server host name (for launch-in-context function)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IBM Tivoli CCMDB server port (for launch-in-context function)</td>
<td>9530</td>
<td></td>
</tr>
<tr>
<td>TADDM server host name</td>
<td>default</td>
<td></td>
</tr>
<tr>
<td>Discovery manager server mode (local or distributed)</td>
<td>Local</td>
<td></td>
</tr>
<tr>
<td>Start TADDM server after reboot (check box)</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Start TADDM server after installation (check box)</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Database type</td>
<td>DB2</td>
<td></td>
</tr>
<tr>
<td>Database server host name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Database server port</td>
<td>50000</td>
<td></td>
</tr>
<tr>
<td>Database name</td>
<td>taddm</td>
<td></td>
</tr>
<tr>
<td>Node name for DB2 client</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Create database during installation (check box)</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>
Table 30. Additional port values. In general, change these port numbers only if you have already assigned the default port numbers, or if you have policies regarding port number usage. You must know these port numbers if you install IBM Tivoli Change and Configuration (IBM Tivoli CCMDB).

<table>
<thead>
<tr>
<th>Setting</th>
<th>Default</th>
<th>Your value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web server port</td>
<td>9430</td>
<td></td>
</tr>
<tr>
<td>SSL web server port</td>
<td>9431</td>
<td></td>
</tr>
<tr>
<td>GUI server port</td>
<td>9435</td>
<td></td>
</tr>
<tr>
<td>GUI system SSL port</td>
<td>9434</td>
<td></td>
</tr>
<tr>
<td>JNDI port</td>
<td>9432</td>
<td></td>
</tr>
<tr>
<td>RMI port</td>
<td>9433</td>
<td></td>
</tr>
<tr>
<td>Topology manager port</td>
<td>5636</td>
<td></td>
</tr>
<tr>
<td>Topology builder port</td>
<td>5637</td>
<td></td>
</tr>
<tr>
<td>RMID port</td>
<td>1098</td>
<td></td>
</tr>
</tbody>
</table>

Table 31. Settings for Oracle database. Complete this table only if you are using an Oracle domain database.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Default</th>
<th>Your value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle database system ID</td>
<td>orcl</td>
<td></td>
</tr>
<tr>
<td>Oracle host name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oracle database port</td>
<td>1521</td>
<td></td>
</tr>
<tr>
<td>Oracle user ID</td>
<td>taddmuser</td>
<td></td>
</tr>
<tr>
<td>Oracle password</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oracle additional (archive) user ID</td>
<td>archuser</td>
<td></td>
</tr>
<tr>
<td>Oracle additional (archive) password</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oracle system user ID (required only if the installer is creating the Oracle database users)</td>
<td>sys</td>
<td></td>
</tr>
<tr>
<td>Oracle system password (required only if the installer is creating the Oracle database users)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oracle connect as role (required only if the installer is creating the Oracle database users)</td>
<td>sysdba</td>
<td></td>
</tr>
<tr>
<td>Oracle home directory (required only if the installer is creating the Oracle database users)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 32. Ports used by the PingSensor and PortSensor to make connections. These ports must be open for discovery to work.

<table>
<thead>
<tr>
<th>Port name</th>
<th>Port number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CiscoWorks</td>
<td>1741</td>
</tr>
<tr>
<td>DNS</td>
<td>53</td>
</tr>
<tr>
<td>LDAP</td>
<td>389</td>
</tr>
<tr>
<td>SSH</td>
<td>22</td>
</tr>
<tr>
<td>WBEM</td>
<td>5988</td>
</tr>
<tr>
<td>WMI</td>
<td>135</td>
</tr>
</tbody>
</table>
Default port for synchronization server

The default synchronization server ports are defined in the following file:

- Linux, and UNIX: `$COLLATION_HOME/external/gigaspaces-4.1/policy/reggie.config`
- Windows: `%COLLATION_HOME%\external\gigaspaces-4.1\policy\reggie.config`

If a different port is needed because of a firewall or a conflict with another application, the port can be changed. For the change to be effective, you must restart the synchronization server.

Note: Changing the port from the default value is not recommended except when required by your firewall configuration or by a known conflict with another application. Using a port other than the default can cause problems with some TADDM services.

If you block or unblock the ports through the firewall while TADDM is operational, you must restart TADDM.

If communications are blocked, and then unblocked between an active domain and TADDM database, restart TADDM. Without a restart, the software does not connect.

The following example is a sample `reggie.config` file that uses 19435 for the default port:

```java
import net.jini.jeri.tcp.TcpServerEndpoint;
import net.jini.jeri.BasicJeriExporter;
import net.jini.jeri.BasicILFactory;

com.sun.jini.reggie {
    /* to change the Lookup Groups, see container-name-server.xml file */
    initialMemberGroups = new String[] { "$INITIAL_LOOKUP_GROUP" };
    persistenceDirectory = "${REGGIE_LOG_FILE}";

    serverExporter = new BasicJeriExporter(
        TcpServerEndpoint.getInstance(19435),
        BasicILFactory()
    );
}
```

In the sample, the 19435 value is the fixed port that must be added to the firewall rules between the synchronization server and the domain server.

Planning worksheet for streaming server deployment installation

You must make a number of settings to TADDM for a streaming server deployment

Do not use port 10339 or 9436 as TADDM server port values during the installation.
### Table 33. Common installation settings

<table>
<thead>
<tr>
<th>Setting</th>
<th>Default</th>
<th>Your value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Install directory for TADDM</td>
<td>- Linux, Solaris, AIX, and Linux on System z operating systems: /opt/IBM/taddm&lt;br&gt;- Windows operating systems: c:\ibm\taddm</td>
<td></td>
</tr>
<tr>
<td>Non-root user ID</td>
<td>- Linux, Solaris, AIX, and Linux on System z operating systems: taddmusr&lt;br&gt;- Windows operating systems: <em>username</em> for the person running the TADDM installation process</td>
<td></td>
</tr>
<tr>
<td>DB2 instance user ID</td>
<td>- Linux, Solaris, AIX, and Linux on System z operating systems: db2inst1&lt;br&gt;- Windows operating systems: db2admin</td>
<td></td>
</tr>
<tr>
<td>DB2 instance password</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DB2 database server port</td>
<td>50000</td>
<td></td>
</tr>
<tr>
<td>Archive DB2 user ID</td>
<td>archuser</td>
<td></td>
</tr>
<tr>
<td>Archive DB2 user ID password</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 34. Discovery server port values

<table>
<thead>
<tr>
<th>Setting</th>
<th>Default</th>
<th>Your value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary storage server host name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary storage server web server port</td>
<td>9430</td>
<td></td>
</tr>
<tr>
<td>Primary storage server administrator user ID</td>
<td>administrator</td>
<td></td>
</tr>
<tr>
<td>Primary storage server administrator password</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GUI-Server communication port for communication with Java Product Console</td>
<td>9435</td>
<td></td>
</tr>
<tr>
<td>GUI-Server SSL port for secure communication with Java Product Console</td>
<td>9434</td>
<td></td>
</tr>
</tbody>
</table>

### Table 35. Port values for primary storage server

<table>
<thead>
<tr>
<th>Setting</th>
<th>Default</th>
<th>Your value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security Manager port for TADDM internal use</td>
<td>9540</td>
<td></td>
</tr>
<tr>
<td>Topology Manager port for TADDM internal use</td>
<td>9550</td>
<td></td>
</tr>
<tr>
<td>IBM® Tivoli® CCMDB server host name (for launch-in-context function)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setting</td>
<td>Default</td>
<td>Your value</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>---------</td>
<td>------------</td>
</tr>
<tr>
<td>IBM Tivoli CCMDB server port (for launch-in-context function)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 36. Port values for secondary storage server

<table>
<thead>
<tr>
<th>Setting</th>
<th>Default</th>
<th>Your value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topology Manager port for TADDM internal use</td>
<td>9550</td>
<td></td>
</tr>
<tr>
<td>Primary storage server host name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary storage server web server port</td>
<td>9430</td>
<td></td>
</tr>
<tr>
<td>Primary storage server administrator user ID</td>
<td>administrator</td>
<td></td>
</tr>
<tr>
<td>Primary storage server administrator password</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 37. Settings for Oracle database. Complete this table only if you are using an Oracle domain database.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Default</th>
<th>Your value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle database system ID</td>
<td>orcl</td>
<td></td>
</tr>
<tr>
<td>Oracle host name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oracle database port</td>
<td>1521</td>
<td></td>
</tr>
<tr>
<td>Oracle user ID</td>
<td>taddmuser</td>
<td></td>
</tr>
<tr>
<td>Oracle password</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oracle additional (archive) user ID</td>
<td>archuser</td>
<td></td>
</tr>
<tr>
<td>Oracle additional (archive) password</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oracle system user ID (required only if the installer is creating the Oracle database users)</td>
<td>sys</td>
<td></td>
</tr>
<tr>
<td>Oracle system password (required only if the installer is creating the Oracle database users)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oracle connect as role (required only if the installer is creating the Oracle database users)</td>
<td>sysdba</td>
<td></td>
</tr>
<tr>
<td>Oracle home directory (required only if the installer is creating the Oracle database users)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 38. Ports used by the PingSensor and PortSensor to make connections. These ports must be open for discovery to work.

<table>
<thead>
<tr>
<th>Port name</th>
<th>Port number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CiscoWorks</td>
<td>1741</td>
</tr>
<tr>
<td>DNS</td>
<td>53</td>
</tr>
<tr>
<td>LDAP</td>
<td>389</td>
</tr>
<tr>
<td>SSH</td>
<td>22</td>
</tr>
<tr>
<td>WBEM</td>
<td>5988</td>
</tr>
</tbody>
</table>
Table 38. Ports used by the PingSensor and PortSensor to make connections (continued). These ports must be open for discovery to work.

<table>
<thead>
<tr>
<th>Port name</th>
<th>Port number</th>
</tr>
</thead>
<tbody>
<tr>
<td>WMI</td>
<td>135</td>
</tr>
</tbody>
</table>

**JERI port for storage and discovery servers**

The port that is used for the Java Extensible Remote Invocation (JERI) is defined in the following file:

- Linux, and UNIX: \$COLLATION_HOME/external/gigaspaces-4.1/policy/reggie.config
- Windows: %COLLATION_HOME%\external\gigaspaces-4.1\policy\reggie.config

If a different port is needed because of a firewall or a conflict with another application, the port can be changed. For the change to be effective, you must restart the storage server.

Changing the port from the default value is not recommended except when required by your firewall configuration or by a known conflict with another application. Using a port other than the default can cause problems with some TADDM services.

If communications are blocked, and then unblocked between an active domain and TADDM database, restart TADDM. Without a restart, the software does not connect.

The following example is a sample reggie.config file that uses 19435 for the JERI port:

```java
import net.jini.jeri.tcp.TcpServerEndpoint;
import net.jini.jeri.BasicJeriExporter;
import net.jini.jeri.BasicILFactory;

com.sun.jini.reggie {
    /* to change the Lookup Groups, see container-name-server.xml file */
    initialMemberGroups = new String[] { "$INITIAL_LOOKUP_GROUP" };
    persistenceDirectory = "$(REGGIE_LOG_FILE)";

    serverExporter = new BasicJeriExporter(  
        TcpServerEndpoint.getInstance(19435),
        net.BasicILFactory()
    );
}
```

In the sample, 19435 is the fixed port that must be added to the firewall rules between the storage server and the discovery server.

**Installing TADDM**

Follow these steps to install TADDM.

**About this task**

You can access the product software from DVD or from IBM Passport Advantage®.
Configuring the remote database server

Before installing the TADDM server for a production environment, configure the database server on a remote system.

Preparing a DB2 database

Before installing TADDM with a remote DB2 database, you must prepare the database.

Before you begin

You must install the DB2 database software on the database server.

Make sure your database server meets all of the hardware and software requirements for a TADDM database server. For more information, see “Planning for installation” on page 6.

Procedure

To prepare a DB2 database, complete the following steps:

1. Optional: If you want to use a new DB2 instance for the TADDM database, use the db2icrt command to create the DB2 instance.
   Typically, the primary DB2 database user ID is the instance owner (db2inst1 on Linux and UNIX systems, or db2admin on Windows systems). This database user ID is created during the DB2 installation. If you want to use the existing DB2 instance for the TADDM database, skip this step.
   Refer to the DB2 documentation for more information about the db2icrt command.

2. Use the user-account management facilities of your operating system to create the secondary database user ID (the archiver user, typically archuser) and add it to the DB2 group of the DB2 instance owner. (To have permission to access the database, the secondary database user ID must be in the same DB2 group as the DB2 instance owner.) Add the secondary database user ID to one of the following groups:
   • Windows systems: DB2ADMNS
   • Linux and UNIX systems: db2grp1, db2adm1

3. From the product DVD, copy the following file to the system where the DB2 database is installed:
   • For Linux, and UNIX systems: support/bin/make_db2_db.sh
   • For Windows systems: support\bin\make_db2_db.bat

4. Use one of the following procedures to run the make_db2_db script on the system where the DB2 database is installed:
   • For Linux and UNIX operating systems:
     a. Log in as the DB2 database instance owner. Use the db2inst1 ID.
     b. Run the following command: make_db2_db.sh taddm
   • For Windows operating systems:
     a. Open the DB2CMD command prompt.
     b. Run the following command: make_db2_db.bat taddm

Preparing a DB2 for z/OS database

Before installing the TADDM server, prepare the DB2 for z/OS database.
Before you begin

You must first install the DB2 for z/OS software on the database server.

Procedure

To prepare a DB2 for z/OS database, complete the following steps:

1. In your DB2 for z/OS configuration, modify the following parameters. (Note that bufferpool names might be different from the names listed here.)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>U Lock for RR/RS</td>
<td>YES</td>
</tr>
<tr>
<td>Skip Uncommitted Inserts</td>
<td>YES</td>
</tr>
<tr>
<td>Evaluate Uncommitted</td>
<td>YES</td>
</tr>
<tr>
<td>Number of Locks per User</td>
<td>60,000</td>
</tr>
<tr>
<td>Resource Timeout</td>
<td>150 seconds</td>
</tr>
<tr>
<td>Idle Thread Timeout</td>
<td>0 (disabled)</td>
</tr>
<tr>
<td>RID POOL SIZE</td>
<td>0</td>
</tr>
<tr>
<td>Deadlock Detection</td>
<td>DEADLOK='2,1'</td>
</tr>
<tr>
<td>BP32K bufferpool size</td>
<td>1500</td>
</tr>
<tr>
<td>BP8K0 bufferpool size</td>
<td>12,000</td>
</tr>
<tr>
<td>BP2 bufferpool size</td>
<td>90,000</td>
</tr>
</tbody>
</table>

2. On the system where the DB2 for z/OS server is installed, create a primary DB2 database user ID (for example, dbuser) and a secondary DB2 database user ID (for example, archuser). For more information, refer to the DB2 for z/OS documentation.

3. From the system where you plan to install the TADDM server, install and verify the JDBC connection to the remote DB2 for z/OS database. You can use the DB2 Control Center to connect to the database. The JDBC URL to connect to is:

```
jdbc:db2://hostname:port/database_ssid_name
```

Depending upon the application you use to connect to the database, you might need to install additional license .jar files on the client system to support connecting to DB2 for z/OS. In addition, if you are using DB2 Control Center, you must also configure the required stored procedures and define the corresponding Workload Manager (WLM) on the z/OS system.

To install the IBM DB2 Driver for JDBC:

a. On the DB2 for z/OS system, enable the distributed data facility (DDF) and TCP/IP support.

b. On the DB2 for z/OS system, customize and run the DSNTIJMS job to enable the stored procedures and define the tables required by the driver.

c. Create the WLM address space startup procedure for the IBM DB2 Driver for JDBC stored procedures.

• For more information, refer to the DB2 for z/OS documentation.

4. Optional: If you are reinstalling TADDM after previously encountering a problem during installation, remove any existing TADDM database and tablespaces. Use the following SQL statements.
DROP TABLESPACE CMDBA.CMDBA4K;
DROP TABLESPACE CMDBB.CMDBB4K;
DROP TABLESPACE CMDBA.CA4K;
DROP TABLESPACE CMDBB.CB4K;
DROP TABLESPACE CMDBA.PA4K;
DROP TABLESPACE CMDBB.PB4K;
DROP TABLESPACE CMDBA.CMDBA8K;
DROP TABLESPACE CMDBB.CMDBB8K;
DROP TABLESPACE CMDBA.CMDBA32K;
DROP TABLESPACE CMDBB.CMDBB32K;
DROP DATABASE CMDBA;
DROP DATABASE CMDBB;
DROP PROCEDURE updateJoinKey0;
DROP PROCEDURE updateJoinKey;

**Note:** If the existing TADDM database and tablespaces use names that are different from those in this example, modify the names accordingly.

5. Create the DB2 database and tablespaces for TADDM. The TADDM database uses the SYSDEFLT storage group. The following SQL statements show examples of DB2 storage definitions on z/OS for the TADDM tablespaces. The values in these SQL statements should be adjusted according to the requirements of your environment. In particular, before running these statements, you must adjust the PRIQTY and SECQTY values as appropriate for your environment; the values you choose will affect database size. The following tables show example values and the resulting storage requirements:

**Table 39. Tablespace storage requirements, example 1**

<table>
<thead>
<tr>
<th>Statement</th>
<th>PRIQTY</th>
<th>SECQTY</th>
<th>Required storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>CREATE TABLESPACE</td>
<td>500</td>
<td>1000</td>
<td>12 volumes × 1.6 GB = 19 GB</td>
</tr>
<tr>
<td>CREATE INDEX</td>
<td>200</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>CREATE TABLESPACE (for LOB objects)</td>
<td></td>
<td></td>
<td>Automatically configured for each LOB column</td>
</tr>
</tbody>
</table>

**Table 40. Tablespace storage requirements, example 2**

<table>
<thead>
<tr>
<th>Statement</th>
<th>PRIQTY</th>
<th>SECQTY</th>
<th>Required storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>CREATE TABLESPACE</td>
<td>1000</td>
<td>2000</td>
<td>20 volumes × 1.6 GB = 32 GB</td>
</tr>
<tr>
<td>CREATE INDEX</td>
<td>1000</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td>CREATE TABLESPACE (for LOB objects)</td>
<td></td>
<td></td>
<td>Automatically configured for each LOB column</td>
</tr>
</tbody>
</table>

**Note:** Each tablespace name used in this step must be configured in the db2zos.xml file. If you use tablespace names that are different from the default names in this example, you must modify db2zos.xml after installation. Tablespace names on DB2 for z/OS are limited to 8 characters in length.

CREATE DATABASE CMDBA STOGROUP SYSDEFLT BUFFERPOOL BP32K CCSID UNICODE;
CREATE DATABASE CMDBB STOGROUP SYSDEFLT BUFFERPOOL BP32K CCSID UNICODE;
CREATE TABLESPACE CMDBA4K IN CMDBA USING STOGROUP SYSDEFLT PRIQTY 1000 SECQTY 2000 ERASE YES CLOSE YES LOCKSIZE ROW LOCKMAX 0 BUFFERPOOL BP2 SEGSIZE 4;
CREATE TABLESPACE CMDBB4K IN CMDBB USING STOGROUP SYSDEFLT PRIQTY 1000 SECQTY 2000 ERASE YES CLOSE YES LOCKSIZE ROW LOCKMAX 0 BUFFERPOOL BP2 SEGSIZE 4;
CREATE TABLESPACE CA4K IN CMDBA USING STOGROUP SYSDEFLT PRIQTY 1000 SECQTY 2000 ERASE YES CLOSE YES LOCKSIZE ROW LOCKMAX 0 BUFFERPOOL BP2 SEGSIZE 4;
CREATE TABLESPACE CB4K IN CMDBB USING STOGROUP SYSDEFLT PRIQTY 1000 SECQTY 2000 ERASE YES CLOSE YES LOCKSIZE ROW LOCKMAX 0 BUFFERPOOL BP2 SEGSIZE 4;
PRIQTY 1000 SECQTY 2000 ERASE YES CLOSE YES LOCKSIZE ROW
LOCKMAX 0 BUFFERPOOL BP2 SEGSIZE 4;
CREATE TABLESPACE PA4K IN CMDBA USING STOGROUP SYSDEFLT
PRIQTY 1000 SECQTY 2000 ERASE YES CLOSE YES LOCKSIZE ROW
LOCKMAX 0 BUFFERPOOL BP2 SEGSIZE 4;
CREATE TABLESPACE PB4K IN CMDBB USING STOGROUP SYSDEFLT
PRIQTY 1000 SECQTY 2000 ERASE YES CLOSE YES LOCKSIZE ROW
LOCKMAX 0 BUFFERPOOL BP2 SEGSIZE 4;
CREATE TABLESPACE CMDBA8K IN CMDBA USING STOGROUP SYSDEFLT
PRIQTY 1000 SECQTY 2000 ERASE YES CLOSE YES LOCKSIZE ROW
LOCKMAX 0 BUFFERPOOL BP8K0 SEGSIZE 4;
CREATE TABLESPACE CMDBB8K IN CMDBB USING STOGROUP SYSDEFLT
PRIQTY 1000 SECQTY 2000 ERASE YES CLOSE YES LOCKSIZE ROW
LOCKMAX 0 BUFFERPOOL BP8K0 SEGSIZE 4;
CREATE TABLESPACE CMDBA32K IN CMDBA USING STOGROUP SYSDEFLT
PRIQTY 1000 SECQTY 2000 ERASE YES CLOSE YES LOCKSIZE ROW
LOCKMAX 0 BUFFERPOOL BP32K SEGSIZE 4;
CREATE TABLESPACE CMDBB32K IN CMDBB USING STOGROUP SYSDEFLT
PRIQTY 1000 SECQTY 2000 ERASE YES CLOSE YES LOCKSIZE ROW
LOCKMAX 0 BUFFERPOOL BP32K SEGSIZE 4;

6. Grant the required database access to TADDM users:

GRANT DBADM ON DATABASE CMDBA TO DB_USER;
GRANT DBADM ON DATABASE CMDBB TO DB_USER;
GRANT USE OF BUFFERPOOL BP32K TO DB_USER WITH GRANT OPTION;
GRANT PACKADM ON COLLECTION * TO DB_USER;
GRANT BINDADD TO DB_USER;
GRANT SELECT ON SYSIBM.SYSCHECKS TO DB_USER;
GRANT SELECT ON SYSIBM.SYSCHECKS2 TO DB_USER;
GRANT SELECT ON SYSIBM.SYSFOREIGNKEYS TO DB_USER;
GRANT SELECT ON SYSIBM.SYSINDEXES TO DB_USER;
GRANT SELECT ON SYSIBM.SYSINDEXPART TO DB_USER;
GRANT SELECT ON SYSIBM.SYSKEYCOLUSE TO DB_USER;
GRANT SELECT ON SYSIBM.SYSKEYS TO DB_USER;
GRANT SELECT ON SYSIBM.SYSROUTINES TO DB_USER;
GRANT SELECT ON SYSIBM.SYSSEQUENCES TO DB_USER;
GRANT SELECT ON SYSIBM.SYSSYNONYMS TO DB_USER;
GRANT SELECT ON SYSIBM.SYSTABLES TO DB_USER;
GRANT SELECT ON SYSIBM.SYSTABLESPACE TO DB_USER;
GRANT SELECT ON SYSIBM.SYSTRIGGERS TO DB_USER;
GRANT SELECT ON SYSIBM.SYSVIEWS TO DB_USER;

GRANT DBADM ON DATABASE CMDBA TO ARCHIVE_USER;
GRANT DBADM ON DATABASE CMDBB TO ARCHIVE_USER;
GRANT USE OF BUFFERPOOL BP32K TO ARCHIVE_USER WITH GRANT OPTION;
GRANT PACKADM ON COLLECTION * TO ARCHIVE_USER;
GRANT BINDADD TO ARCHIVE_USER;
GRANT SELECT ON SYSIBM.SYSCHECKS TO ARCHIVE_USER;
GRANT SELECT ON SYSIBM.SYSCHECKS2 TO ARCHIVE_USER;
GRANT SELECT ON SYSIBM.SYSINDEXES TO ARCHIVE_USER;
GRANT SELECT ON SYSIBM.SYSINDEXPART TO ARCHIVE_USER;
GRANT SELECT ON SYSIBM.SYSKEYCOLUSE TO ARCHIVE_USER;
GRANT SELECT ON SYSIBM.SYSKEYS TO ARCHIVE_USER;
GRANT SELECT ON SYSIBM.SYSROUTINES TO ARCHIVE_USER;
GRANT SELECT ON SYSIBM.SYSSEQUENCES TO ARCHIVE_USER;
GRANT SELECT ON SYSIBM.SYSSYNONYMS TO ARCHIVE_USER;
GRANT SELECT ON SYSIBM.SYSTABLES TO ARCHIVE_USER;
GRANT SELECT ON SYSIBM.SYSTABLESPACE TO ARCHIVE_USER;
GRANT SELECT ON SYSIBM.SYSTRIGGERS TO ARCHIVE_USER;
GRANT SELECT ON SYSIBM.SYSVIEWS TO ARCHIVE_USER;
where DB_USER is the primary DB2 database user ID, and ARCHIVE_USER is the secondary DB2 database user ID.

**Note:** Depending on the system configuration, you might need to grant access to additional system resources required by the DB_USER and ARCHIVE_USER user IDs.

## Preparing an Oracle database

Before installing TADDM with a remote Oracle database, you must first prepare the database by creating the Oracle user IDs required by the TADDM server.

### Before you begin

You must first install the Oracle software on the database server.

### Notes

- When creating the Oracle database, select the Unicode character set (AL32UTF8) in the **Database Character Set** field. Otherwise, data that is in languages other than English might not display correctly. If you see the Oracle message **OALL8 is in inconsistent state**, TADDM cannot access some of the national language-specific text in your database. Re-create your database with the correct character set.
- For Oracle RAC, complete the following steps for one of its nodes. Select the locally running SID as script parameter.

### Procedure

To prepare an Oracle database, complete the following steps:

1. From the product DVD, copy the following file to the system where the Oracle database is installed:
   - Linux and UNIX systems: `support/bin/make_ora_user.sh`
   - Windows systems: `support\bin\make_ora_user.bat`

2. Complete one of the following procedures to run the `make_ora_user` script on the system where the Oracle database is installed:
   - Linux and UNIX systems:
     a. Log in as the Oracle user or the user that was used to install the Oracle database (typically `oracle`).
     b. Run the following command:
        ```
        make_ora_user.sh sid cmdb_usr cmdb_pwd archive_usr archive_pwd
        ```
        - *sid* Oracle System Identification Database
        - *cmdb_usr* Primary Oracle user ID
        - *cmdb_pwd* Primary Oracle user password
        - *archive_usr* Secondary (archive) user ID
        - *archive_pwd* Secondary (archive) user password
   - Windows systems:
     a. At a command prompt, run the following command:
        ```
        make_ora_user.bat sid cmdb_usr cmdb_pwd archive_usr archive_pwd
        ```
Configuring for the Context Menu Service and Data Integration Service

If you want to use the Context Menu Service (CMS) and Data Integration Service (DIS) to enable cross-product launch points, you can connect to an existing DIS database used by other Tivoli or IBM products, or if one does not already exist, configure the TADDM database for CMS and DIS.

CMS and DIS support flexible cross-product launch points by storing information about available launch points in a database. By using this approach, a product can provide a launch capability for any other product that has registered launch points in the database, without having to implement product-specific launch functions. TADDM can use CMS and DIS to register TADDM launch points for use by other products such as CCMDB.

You can configure CMS and DIS in either one of the following two ways:

- Configure TADDM to connect to an existing CMS/DIS database already used by other Tivoli or IBM products.
- Configure the TADDM database for CMS and DIS. In this situation, other Tivoli or IBM products in the enterprise using CMS and DIS can connect to this CMS/DIS database.

You must not set up more than one CMS/DIS database within a Tivoli enterprise.

About this task

You can optionally specify that the CMS/DIS configuration be completed automatically during the TADDM installation process. Follow these steps if you need to manually configure the CMS/DIS database after installation.

Note: To avoid delays in registering configuration items in the database, install the CMS/DIS database on a server that is geographically close to the TADDM database server.

Preparing a DB2 database for the Context Menu Service and Data Integration Service

Follow these steps to manually configure a DB2 database for the Context Menu Service (CMS) and Data Integration Service (DIS).

Before you begin

You must install the DB2 database software on the database server.
About this task

You can optionally specify that the CMS and DIS configuration be completed automatically during the TADDM installation process. Follow these steps if you did not use this option and need to manually configure the database after installation.

Procedure

To prepare a DB2 database for CMS and DIS:

1. Optional: If you want to use a new DB2 instance for the TADDM database, use the `db2icrt` command to create the DB2 instance.
   
   Typically, the primary DB2 database user ID is the instance owner (db2inst1 on Linux and UNIX systems, or db2admin on Windows systems). This database user ID is created during the DB2 installation. If you want to use the existing DB2 instance for the TADDM database, skip this step.
   
   Refer to the DB2 documentation for more information about the `db2icrt` command.

2. From the product DVD, copy the `support/cmsdis/cmsdis.zip` file to the system where the DB2 database is installed.

3. Use one of the following procedures to run the `make_db2_cms_dis` script on the system where the DB2 database is installed:
   
   - For Linux and UNIX systems:
     a. Log in as the DB2 database instance owner. Use the db2inst1 ID.
     b. Extract the contents of the `cmsdis.zip` file.
     c. Navigate to the `cmsdis` directory.
     d. At a command prompt, run the following command:
       
       ```
       make_db2_cms_dis.sh -d db_name db_user db_password
       ```
       
       where:
       
       - `db_name`
         The database name. The database name for CMS and DIS must be different from the TADDM database name.
       
       - `db_user`
         The database instance user ID.
       
       - `db_password`
         The password for the database instance user ID.
     
   - For Windows systems:
     a. Open the DB2CMD command prompt.
     b. Extract the contents of the `cmsdis.zip` file.
     c. Navigate to the `cmsdis` directory.
     d. At a command prompt, run the following command:
       
       ```
       make_db2_cms_dis.bat -d db_name db_user db_password
       ```
       
       where:
       
       - `db_name`
         The database name. The database name for CMS and DIS must be different from the TADDM database name.
db_user
The database instance user ID.

db_password
The password for the database instance user ID.

Check the standard output for any errors resulting from the make_db2_cms_dis
script.

4. Set the following configuration parameters in the $COLLATION_HOME/etc/
collation.properties file:
   com.ibm.cdb.DisCmsIntegration.enabled=true
   com.ibm.cdb.DisCmsIntegration.dbUser=db2_instance_userid
   com.ibm.cdb.DisCmsIntegration.dbPassword=db2_instance_password
   com.ibm.cdb.DisCmsIntegration.dbUrl=jdbc:db2://db2Hostname:db2_port/db2_name
   com.ibm.cdb.DisCmsIntegration.dbDriver=com.ibm.db2.jcc.DB2Driver

where:

   db2_instance_userid
   The user ID of the DB2 instance owner.

db2_instance_password
   The password for the DB2 instance owner user ID.

db2_hostname
   The host name of the DB2 server.

db2_port
   The DB2 port on the server.

db2_name
   The DB2 instance name.

Preparing an Oracle database for the Context Menu Service and
Data Integration Service

Follow these steps to manually configure an Oracle database for the Context Menu
Service (CMS) and Data Integration Service (DIS).

Before you begin

You must install the Oracle database software on the database server, and the
sqlplus command must be available.

Note: When creating the Oracle database, select the Unicode character set
(AL32UTF8) in the Database Character Set field. Otherwise, data that is in
languages other than English might not display correctly. If you see the Oracle
message OALL8 is in inconsistent state, TADDM cannot access some of the
national language-specific text in your database. Re-create your database with the
correct character set.

About this task

You can optionally specify that the CMS and DIS configuration automatically
complete during the TADDM installation process. Follow these steps if you did not
use this option and have to manually configure the database after installation.

Procedure

To prepare an Oracle database for CMS and DIS:
1. From the product DVD, copy the `support/cmsdis/cmsdis.zip` file to the system where the Oracle database is installed.

2. Use one of the following procedures to run the `make_oracle_cms_dis` script on the system where the Oracle database is installed:
   - For Linux and UNIX systems:
     a. Log in as the Oracle user, or the user that was used to install the Oracle database (typically `oracle`).
     b. Extract the contents of the `cmsdis.zip` file.
     c. Go to the `cmsdis` directory.
     d. At a command prompt, run the following command:
        ```bash
        make_oracle_cms_dis.sh -d sid cmsdis_usr cmsdis_pwd
        ```
        where:
        - `sid` is the Oracle system ID.
        - `cmsdis_usr` is the Oracle user ID. This user ID must be different from the Oracle user ID used for TADDM.
        - `cmsdis_pwd` is the password for the Oracle user ID.
   - For Windows systems:
     a. Extract the contents of the `cmsdis.zip` file.
     b. Go to the `cmsdis` directory.
     c. At a command prompt, run the following command:
        ```bat
        make_oracle_cms_dis.bat -d sid cmsdis_usr cmsdis_pwd
        ```
        where:
        - `sid` is the Oracle system ID.
        - `cmsdis_usr` is the Oracle user ID. This user ID must be different from the Oracle user ID used for TADDM.
        - `cmsdis_pwd` is the password for the Oracle user ID.

   Check the standard output for any errors resulting from the `make_oracle_cms_dis` script.

3. Set the following configuration parameters in the `$COLLATION_HOME/etc/collation.properties` file:
   ```properties
   com.ibm.cdb.DisCmsIntegration.enabled=true
   com.ibm.cdb.DisCmsIntegration.dbUser=oracle_cmsdis_user
   com.ibm.cdb.DisCmsIntegration.dbPassword=oracle_cmsdis_password
   com.ibm.cdb.DisCmsIntegration.dbUrl=jdbc:oracle:thin:@oracle_hostname:oracle_port:oracle_sid
   com.ibm.cdb.DisCmsIntegration.dbDriver=oracle.jdbc.driver.OracleDriver
   ```
   where:
   - `oracle_cmsdis_user` is the Oracle user ID for CMS and DIS.
Installing TADDM servers

You can use any one of several methods to install TADDM servers.

About this task

There are several different TADDM servers you might need to install, depending on the type of deployment you want to use:

Table 41. TADDM deployment types and servers

<table>
<thead>
<tr>
<th>Deployment type</th>
<th>Servers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domain server deployment</td>
<td>• 1 domain server</td>
</tr>
<tr>
<td>Synchronization server deployment (obsolete)</td>
<td>• 2 or more domain servers</td>
</tr>
<tr>
<td></td>
<td>• 1 synchronization server</td>
</tr>
<tr>
<td>Streaming server deployment</td>
<td>• 1 primary storage server</td>
</tr>
<tr>
<td></td>
<td>• 1 or more discovery servers</td>
</tr>
<tr>
<td></td>
<td>• 1 or more optional secondary storage</td>
</tr>
<tr>
<td></td>
<td>servers</td>
</tr>
</tbody>
</table>

You can use any of several methods to install TADDM servers.

Installing TADDM servers using the installation wizard

Use the installation wizard to install a TADDM server by specifying options in a graphical user interface that guides you through the installation process step by step.

Installing a domain server using the installation wizard:

Follow these steps to install a domain server using the installation wizard. You can use a domain server in a stand-alone domain server deployment, or as part of a synchronization server deployment.

Note: The synchronization server deployment type is obsolete. In a new TADDM deployment where more than one server is needed, use the streaming server deployment.

Before you begin

You must be logged in to an account with administrator privileges to install the TADDM server. Complete all prerequisite steps, including any required database configuration, before starting the installation process.
If you are installing the TADDM server on Microsoft Windows Server 2008, you must temporarily turn off User Account Control (UAC) before starting the installation process. For more information, see [http://technet.microsoft.com/en-us/library/cc709691(WS.10).aspx#BKMK_S3](http://technet.microsoft.com/en-us/library/cc709691(WS.10).aspx#BKMK_S3)

About this task

There are two basic types of domain server installation:

- **Simple installation** installs the domain server with default options, using a local DB2 database (which you can optionally install during the server installation). This type of installation is suitable for testing but is not intended for production environments.

- **Advanced installation** installs the domain server using a remote DB2, DB2 for z/OS, or Oracle database, and with installation options that you can customize for your environment. Use advanced installation for production environments.

The installation wizard prompts you to select either simple or advanced installation. If you select simple installation, some steps in the installation procedure do not apply.

Notes

- If you are installing on a dual-stack system that supports both the IPv4 and IPv6 protocols, make sure any numeric IP addresses you specify during the installation process are IPv4 addresses.

- For Oracle RAC database, you can only select Advanced installation. TADDM installer does not support RAC configuration directly. You can only install TADDM with one RAC node configuration, and then update JDBC connection string in the `collation.properties` file after the installation. See "Configuring Oracle RAC after installation" on page 79.

Procedure

To install the domain server using the installation wizard:

1. Insert the TADDM disk 1 installation DVD for your supported operating system into the DVD drive.

2. Start the installation wizard using one of the following methods:
   - Run the wizard from the IBM Tivoli CCMD launchpad. You can start the launchpad using the appropriate command for your operating system:
     - On Windows systems, run `launchpad.exe`. (This command runs automatically on systems where the Windows autorun feature is enabled.)
     - On Linux and UNIX systems, run the `launchpad.sh` command from the root directory. For example, use the following command:
       
       ```
       ./media/cdrecorder/launchpad.sh
       ```
     
     Do not run the launchpad command from the mounted DVD directory, because you might need to swap disks during the installation process.
   - At a command prompt, go to the DVD drive and run the appropriate command for your operating system:
     - For AIX operating systems, `setupAix.bin`
     - For Linux operating systems, `setupLinux.bin`
     - For Linux on System z operating systems, `setupZLinux.bin`
     - For Solaris operating systems, `setupSolarisSparc.bin`
For Windows operating systems, **setupWin.bat**

**Restriction:** When you run the TADDM installation wizard `setupWin.bat` on Windows operating systems, select the **Run as administrator** option. Otherwise, the installation will fail.

**Note:** If an error message is displayed that there is insufficient disk space in the temp directory, run the installation again and specify a different temp directory. Use the option `-t temp` (for example, `setupLinux.bin -t /mytempdir`).

3. Select the language to use for your installation. Click **OK**.

4. On the Introduction page, click **Next**.

5. Read and accept the terms of the software license agreement and click **Next**.

6. Specify the location where you want to install the server. Make sure that the path you specify contains only ASCII characters, and does not contain any spaces. Non-ASCII characters or spaces in the path can cause installation problems and problems starting the server.

After you specify the server location, click **Next**.

7. Specify the user ID you want to use to run the server.
   - On Windows operating systems, the user must belong to the Administrators group. If the user does not exist or is not part of the Administrators group, select the check box to create the user or add the user to the Administrators group. The user ID must be a local user account.
   - On Linux and UNIX operating systems, the user ID you specify must be non-root.

After you have specified the user ID, click **Next**.

**Note:** If the user ID you are using to run the installer is not an administrator or root, this page is not displayed.

8. On the TADDM Deployment Option page, select **Domain server deployment**. Click **Next**.

9. Select the installation type (**Simple** or **Advanced**):
   - To install the server with default options and a local DB2 database, select **Simple**. This type of installation is suitable for testing but is not intended for production environments. If the DB2 database software is not already installed on your system, you can optionally select **Install DB2 database on the system** to include the DB2 software as part of a simple installation.
   - To install the server for a production environment with a remote DB2, DB2 for z/OS, or Oracle database, select **Advanced**. With advanced installation, you can customize the installation options.

After you select the installation type, click **Next**.

**Note:** If you chose a simple installation, skip to step 11 on page 52.

10. Specify advanced server options and the database type:
   a. On the Server Ports page, specify the server port information. Click **Next**.
   b. On the Enterprise Server Ports page, specify the enterprise server port information. Click **Next**.
   c. On the Additional Server Information page, specify the following options:
      - The RMI server host name. If the server resides on the same system as IBM Tivoli CCMDB, accept the default value. If the server resides on a different system, type the numeric IP address (not the host name) of the server.
• The platform binaries to install. If you configure the binaries later, the binaries are pushed to the remote gateway or anchor. If you are not sure which platform binaries you want to install, select All.

• Server startup options.

Click Next.


e. If you are installing on a Linux or UNIX system, specify whether you want to install the Tivoli Netcool® Performance Flow Analyzer server as part of the domain server installation. (The Tivoli Netcool Performance Flow Analyzer Server Information page is displayed only on Linux and UNIX systems.) If you select Install Tivoli Netcool Performance Flow Analyzer Server, you must also specify the server port in the Port field. The Tivoli Netcool Performance Flow Analyzer server is installed on the same system as the domain server. On Linux and UNIX systems, the server is installed in the /opt/aurora directory.

If you do not install the Tivoli Netcool Performance Flow Analyzer server during the TADDM installation, you can install it at a later time, on either the local system or a remote system. For more information, see "Installing the Tivoli Netcool Performance Flow Analyzer server" on page 74.

Note: The Tivoli Netcool Performance Flow Analyzer package that is shipped with TADDM is not the full product version of Tivoli Netcool Performance Flow Analyzer.

f. Select the database type (DB2, DB2 z/OS, or Oracle). Click Next.

g. If you are using an Oracle database, specify the path to the Oracle JDBC driver and click Next. Verify that the Oracle JDBC driver you are using is the same version as the Oracle server. If the Oracle JDBC driver file is not present on the local system, you can copy it from the JDBC directory on the Oracle server (for example, $ORACLE_HOME/jdbc/lib). For more information, contact your database administrator.

11. On the Database Information page, specify the TCP/IP host name or numeric IP address, listening port, database name, and user information for the database. If you are using the simple installation process with an existing local installation of DB2, select Create the database during install unless the required TADDM database and tables already exist. Click Next.

Note: If you are using the simple installation process, skip to step 17 on page 54 after you complete this step.

See "Configuring the remote database server" on page 40 for information about user account requirements.

12. Optional: If you want to configure the Context Menu Service and Data Integration Service during the installation process, select the Configure Context Menu Service (CMS) / Data Integration Service (DIS) check box. (If you do not select this option during the installation process, you can manually configure the Context Menu Service and Data Integration Service after installing. For more information, see "Configuring for the Context Menu Service and Data Integration Service" on page 45.)

If you are not configuring the Context Menu Service and Data Integration Service, skip to 14 on page 53.
13. Optional: If you are configuring the Context Menu Service and Data Integration Service, specify the required database information.

Note: To avoid delays in registering configuration items in the database, install the CMS/DIS database on a server that is geographically close to the TADDM database server.

If you are using a DB2 database, follow these steps:

a. Specify the database server, port, database name, and user information for the database. The database name must be different from the TADDM database name.

b. Select Create the database during install unless the required database and tables already exist. (If you select Create the database during install and the database already exists, the installer deletes the existing database and creates the new one.)

Note: The Create the database during install check box is available only if the DB2 database is on the local system and the user ID running the installation process has root or administrator privileges.

Click Next.

If you are using an Oracle database, follow these steps:

a. Specify the database server, port, system ID, and Oracle user information for the database. The Oracle user for the Context Menu Service and Data Integration Service must be different from the Oracle user for the domain server.

b. Select Create the user during install unless the required user already exists. (If you select Create the user during install and the user already exists, the installer deletes the existing user and creates the new one.)

Note: The Create the user during install check box is available only if the user ID running the installation process has root or administrator privileges.

Click Next.

c. If you selected the Create the user check box, specify the Oracle database administrator information and the Oracle home directory. This information is used to create the Context Menu Service and Data Integration Service Oracle user during the installation process.

Click Next.

14. Select the user registry option:

- To use a file-based registry, select File-based user registry. No additional configuration information is required for this option.
- To use a Lightweight Directory Access Protocol (LDAP) user registry, select LDAP user registry.
- To use a WebSphere Federated Repositories registry, select WebSphere Federated Repositories.

Click Next.

15. If you selected an LDAP user registry, additional pages prompt you for LDAP server and configuration information:

a. Specify the LDAP server and user information. Click Next.

b. Specify the LDAP configuration parameters (or accept the defaults values). Click Next.
16. If you selected a WebSphere Federated Repositories registry, specify the WebSphere Federated Repositories server and user information.

   Note: User IDs and passwords are case sensitive. Make sure you use the correct case.
   Click Next.

17. Review the pre-installation summary. After you verify that the information is correct, click Next to start the installation process.

18. If you are installing the DB2 software as part of a simple installation, follow the instructions to install DB2:

   Important: If you are installing a Linux, Solaris, or AIX system, make sure you navigate to the root directory and unmount the optical drive before changing disks.
   a. Insert TADDM disk 2 or specify the DB2 installation image directory. Click Next.
   b. Insert TADDM disk 1 or specify image directory. Click Next.

19. When prompted, insert TADDM disk 3 into the DVD drive. Specify the image directory. Click Next.

20. After the installation finishes, click Done to close the installation wizard.

Results

This installation can be a lengthy process, depending on the number and type of components you are installing. While the installation process is running, you can monitor progress by viewing changes to the installation log. The log also contains information that can help you troubleshoot problems that occur during installation. Log files can be found in the installLogs subdirectory of the installation directory.

What to do next

On Microsoft Windows Server 2008 systems, remember to turn User Account Control (UAC) on after you have finished the installation. For more information, see http://technet.microsoft.com/en-us/library/cc709691(WS.10).aspx#BKMK_S3

Installing a synchronization server using the installation wizard:

Follow these steps to install a synchronization server for a TADDM synchronization server deployment.

Note: The synchronization server deployment type is obsolete. In a new TADDM deployment where more than one server is needed, use the streaming server deployment.

Before you begin

You must be logged in to an account with administrator privileges to install the TADDM server. Complete all prerequisite steps, including any required database configuration, before starting the installation process.

If you are installing the TADDM server on Microsoft Windows Server 2008, you must temporarily turn off User Account Control (UAC) before starting the installation process. For more information, see http://technet.microsoft.com/en-us/library/cc709691(WS.10).aspx#BKMK_S3
About this task

The installation wizard guides you through the installation process. Depending on the selections you make in the wizard, some steps in the installation procedure might not apply.

Note: If you are installing on a dual-stack system that supports both the IPv4 and IPv6 protocols, make sure any numeric IP addresses you specify during the installation process are IPv4 addresses.

Procedure

To install the synchronization server using the installation wizard:

1. Insert the TADDM Disk 1 installation DVD for your supported operating system into the DVD drive.
2. Start the installation wizard using one of the following methods:
   • Run the wizard from the IBM Tivoli CCMDB launchpad. You can start the launchpad using the appropriate command for your operating system:
     – On Windows systems, run `launchpad.exe`. (This command runs automatically on systems where the Windows autorun feature is enabled.)
     – On Linux and UNIX systems, run the `launchpad.sh` command from the root directory. For example, use the following command:
       `/media/cdrecorder/launchpad.sh`
     Do not run the launchpad command from the mounted DVD directory, because you might need to swap disks during the installation process.
   • At a command prompt, go to the DVD drive and run the appropriate command for your operating system:
     – For AIX operating systems, `setupAix.bin`
     – For Linux operating systems, `setupLinux.bin`
     – For Linux on System z operating systems, `setupZLinux.bin`
     – For Solaris operating systems, `setupSolarisSparc.bin`
     – For Windows operating systems, `setupWin.bat`

   Restriction: When you run the TADDM installation wizard `setupWin.bat` on Windows operating systems, select the Run as administrator option. Otherwise, the installation will fail.

   Note: If an error message is displayed that there is insufficient disk space in the temp directory, run the installation again and specify a different temp directory. Use the option `-t temp` (for example, `setupLinux.bin -t /mytempdir`).
3. Select the language to use for your installation. Click OK.
5. Read and accept the terms of the software license agreement and click Next.
6. Specify the location where you want to install the server. Make sure the path you specify contains only ASCII characters, and does not contain any spaces. Non-ASCII characters or spaces in the path can cause installation problems and problems starting the server.
   After you specify the server location, click Next.
7. Specify the user ID you want to use to run the server.
• On Windows operating systems, the user must belong to the Administrators group. If the user does not exist or is not part of the Administrators group, select the check box to create the user or add the user to the Administrators group. The user ID must be a local user account.

• On Linux and UNIX operating systems, the user ID you specify must be non-root.

After you have specified the user ID, click Next.

**Note:** If the user ID you are using to run the installer is not an administrator or root, this page is not displayed.

8. On the TADDM Deployment Option page, select **Synchronization server deployment**. Click Next.


10. On the Additional Server Information page, specify the following options:

   • The RMI server host name. If the server resides on the same system as IBM Tivoli CCMDB, accept the default value. If the server resides on a different system, type the numeric IP address (not the host name) of the server.

   • The platform binaries to install. If you configure the binaries later, the binaries are pushed to the remote gateway or anchor. If you are not sure which platform binaries you want to install, select **All**.

   • Server startup options.

Click Next.


12. If you are installing on a Linux or UNIX system, specify whether you want to install the Tivoli Netcool Performance Flow Analyzer server as part of the domain server installation. (The Tivoli Netcool Performance Flow Analyzer Server Information page is displayed only on Linux and UNIX systems.)

   If you select **Install Tivoli Netcool Performance Flow Analyzer Server**, you must also specify the server port in the **Port** field. The Tivoli Netcool Performance Flow Analyzer server is installed on the same system as the domain server. On Linux and UNIX systems, the server is installed in the `/opt/aurora` directory.

   If you do not install the Tivoli Netcool Performance Flow Analyzer server during the TADDM installation, you can install it at a later time, on either the local system or a remote system. For more information, see "Installing the Tivoli Netcool Performance Flow Analyzer server" on page 74.

   **Note:** The Tivoli Netcool Performance Flow Analyzer package that is shipped with TADDM is not the full product version of Tivoli Netcool Performance Flow Analyzer.

13. Select the database type (**DB2**, **DB2 z/OS**, or **Oracle**). Click Next.

14. If you are using an Oracle database, specify the path to the Oracle JDBC driver and click Next. Verify that the Oracle JDBC driver you are using is the same version as the Oracle server. If the Oracle JDBC driver file is not present on the local system, you can copy it from the JDBC directory on the Oracle server (for example, `$ORACLE_HOME/jdbc/lib`). For more information, contact your database administrator.

15. On the Database Information page, specify the TCP/IP host name or numeric IP address, listening port, database name, and user information for the database. If you are using the simple installation process with an existing local...
installation of DB2, select **Create the database during install** unless the required TADDM database and tables already exist.

Click **Next**.

See “Configuring the remote database server” on page 40 for information about user account requirements.

16. Optional: If you want to configure the Context Menu Service and Data Integration Service during the installation process, select the **Configure Context Menu Service (CMS) / Data Integration Service (DIS)** check box. (If you do not select this option during the installation process, you can manually configure the Context Menu Service and Data Integration Service after installing. For more information, see “Configuring for the Context Menu Service and Data Integration Service” on page 45.)

If you are not configuring the Context Menu Service and Data Integration Service, skip to 18.

17. Optional: If you are configuring the Context Menu Service and Data Integration Service, specify the required database information.

**Note:** To avoid delays in registering configuration items in the database, install the CMS/DIS database on a server that is geographically close to the TADDM database server.

If you are using a DB2 database, follow these steps:

a. Specify the database server, port, database name, and user information for the database. The database name must be different from the TADDM database name.

b. Select **Create the database during install** unless the required database and tables already exist. (If you select **Create the database during install** and the database already exists, the installer deletes the existing database and creates the new one.)

**Note:** The **Create the database during install** check box is available only if the DB2 database is on the local system and the user ID running the installation process has root or administrator privileges.

Click **Next**.

If you are using an Oracle database, follow these steps:

a. Specify the database server, port, system ID, and Oracle user information for the database. The Oracle user for the Context Menu Service and Data Integration Service must be different from the Oracle user for the domain server.

b. Select **Create the user during install** unless the required user already exists. (If you select **Create the user during install** and the user already exists, the installer deletes the existing user and creates the new one.)

**Note:** The **Create the user during install** check box is available only if the user ID running the installation process has root or administrator privileges.

Click **Next**.

c. If you selected the **Create the user** check box, specify the Oracle database administrator information and the Oracle home directory. This information is used to create the Context Menu Service and Data Integration Service Oracle user during the installation process.

Click **Next**.

18. Select the user registry option:
To use a file-based registry, select **File-based user registry**. No additional configuration information is required for this option.

To use a Lightweight Directory Access Protocol (LDAP) user registry, select **LDAP user registry**.

To use a WebSphere Federated Repositories registry, select **WebSphere Federated Repositories**.

Click **Next**.

19. If you selected an LDAP user registry, additional pages prompt you for LDAP server and configuration information:
   a. Specify the LDAP server and user information. Click **Next**.
   b. Specify the LDAP configuration parameters (or accept the defaults values). Click **Next**.

20. If you selected a WebSphere Federated Repositories registry, specify the WebSphere Federated Repositories server and user information.

   **Note**: User IDs and passwords are case sensitive. Make sure you use the correct case.

   Click **Next**.

21. Review the pre-installation summary. After you verify that the information is correct, click **Next** to start the installation process.

22. If you are installing the DB2 software as part of a simple installation, follow the instructions to install DB2:

   **Important**: If you are installing a Linux, Solaris, or AIX system, make sure you navigate to the root directory and unmount the optical drive before changing disks.
   a. Insert TADDM disk 2 or specify the DB2 installation image directory. Click **Next**.
   b. Insert TADDM disk 1 or specify image directory. Click **Next**.

23. When prompted, insert TADDM disk 3 into the DVD drive. Specify the image directory. Click **Next**.

24. After the installation finishes, click **Done** to close the installation wizard.

**Results**

This installation can be a lengthy process, depending on the number and type of components you are installing. While the installation process is running, you can monitor progress by viewing changes to the installation log. The log also contains information that can help you troubleshoot problems that occur during installation. Log files can be found in the **installLogs** subdirectory of the installation directory.

**What to do next**

On Microsoft Windows Server 2008 systems, remember to turn User Account Control (UAC) on after you have finished the installation. For more information, see [http://technet.microsoft.com/en-us/library/cc709691(WS.10).aspx#BKMK_S3](http://technet.microsoft.com/en-us/library/cc709691(WS.10).aspx#BKMK_S3)

**Installing the primary storage server using the installation wizard:**

Follow these steps to install the primary storage server using the installation wizard. The primary storage server is required for a streaming server deployment.
Before you begin

You must be logged in to an account with administrator privileges to install TADDM. Complete all prerequisite steps, including any required database configuration, before starting the installation process.


About this task

A storage server processes discovery data and stores it in a local or remote DB2, DB2 for z/OS, or Oracle database. A streaming server deployment requires at least one storage server (the primary storage server). Install the primary storage server before installing any discovery servers.

**Note:** For Oracle RAC database, you can only select Advanced installation. TADDM installer does not support RAC configuration directly. You can only install TADDM with one RAC node configuration, and then update JDBC connection string in the collation.properties file after the installation. See “Configuring Oracle RAC after installation” on page 79.

Procedure

To install the primary storage server using the installation wizard:

1. Insert the TADDM Disk 1 installation DVD for your supported operating system into the DVD drive.
2. At a command prompt, go to the DVD drive and run the appropriate command for your operating system:
   - For AIX operating systems, `setupAix.bin`
   - For Linux operating systems, `setupLinux.bin`
   - For Linux on System z operating systems, `setupZLinux.bin`
   - For Solaris operating systems, `setupSolarisSparc.bin`
   - For Windows operating systems, `setupWin.bat`

   **Restriction:** When you run the TADDM installation wizard `setupWin.bat` on Windows operating systems, select the **Run as administrator** option. Otherwise, the installation will fail.

3. Select the language to use for your installation. Click **OK**.
4. On the Introduction page, click **Next**.
5. Read and accept the terms of the software license agreement and click **Next**.
6. Specify the location where you want to install the server. Make sure the path you specify contains only ASCII characters, and does not contain any spaces. Non-ASCII characters or spaces in the path can cause installation problems and problems starting the server.
   After you specify the server location, click **Next**.
7. Specify the user ID you want to use to run the server.
On Windows operating systems, the user must belong to the Administrators group. If the user does not exist or is not part of the Administrators group, select the check box to create the user or add the user to the Administrators group. The user ID must be a local user account.

On Linux and UNIX operating systems, the user ID you specify must be non-root.

After you specify the server location, click Next.

8. On the TADDM Deployment Option page, select Streaming server deployment. Click Next.

9. When prompted for the type of server you want to install, select Primary Storage Server.


11. On the Additional Server Information page, specify the following options:
   - The server numeric IP address, if you are not using DNS to resolve the server name. (Otherwise, accept the default value.)
   - Server startup options.

   Click Next.


13. Select the database type (DB2, DB2 z/OS, or Oracle). Click Next.

14. If you are using an Oracle database, specify the path to the Oracle JDBC driver and click Next. Verify that the Oracle JDBC driver you are using is the same version as the Oracle server. If the Oracle JDBC driver file is not present on the local system, you can copy it from the JDBC directory on the Oracle server (for example, $ORACLE_HOME/jdbc/lib). For more information, contact your database administrator.

   Note: If you are using a DB2 or DB2 for z/OS database, skip this step.

15. On the Database Information page, specify the TCP/IP host name or numeric IP address, listening port, database name, and user information for the database. To use an existing local installation of DB2, select Create the database during install unless the required TADDM database and tables already exist.

   Click Next.

   See "Configuring the remote database server" on page 40 for information about user account requirements.

16. If you want to configure the Context Menu Service and Data Integration Service during the installation process, select the Configure Context Menu Service (CMS) / Data Integration Service (DIS) check box. (If you do not select this option during the installation process, you can manually configure the Context Menu Service and Data Integration Service after installing. For more information, see "Configuring for the Context Menu Service and Data Integration Service" on page 45.

17. Optional: If you are configuring the Context Menu Service and Data Integration Service, specify the required database information.

   Note: To avoid delays in registering configuration items in the database, install the CMS/DIS database on a server that is geographically close to the TADDM database server. If you are using a DB2 database, follow these steps:
a. Specify the database server, port, database name, and user information for
the database. The database name must be different from the TADDM
database name.

b. Select **Create the database during install** unless the required database and
tables already exist. (If you select **Create the database during install** and
the database already exists, the installer deletes the existing database and
creates the new one.)

**Note:** The **Create the database during install** check box is available only
if the DB2 database is on the local system and the user ID running the
installation process has root or administrator privileges.

Click **Next**.

If you are using an Oracle database, follow these steps:

a. Specify the database server, port, system ID, and Oracle user information
for the database. The Oracle user for the Context Menu Service and Data
Integration Service must be different from the Oracle user for the domain
server.

b. Select **Create the user during install** unless the required user already
exists. (If you select **Create the user during install** and the user already
exists, the installer deletes the existing user and creates the new one.)

**Note:** The **Create the user during install** check box is available only if the
user ID running the installation process has root or administrator privileges.

Click **Next**.

c. If you selected the **Create the user** check box, specify the Oracle database
administrator information and the Oracle home directory. This information
is used to create the Context Menu Service and Data Integration Service
Oracle user during the installation process.

Click **Next**.

18. Select the user registry option:

- To use a file-based registry, select **File-based user registry**. No additional
  configuration information is required for this option.
- To use a Lightweight Directory Access Protocol (LDAP) user registry, select
  **LDAP user registry**.
- To use a WebSphere Federated Repositories registry, select **WebSphere
  Federated Repositories**.

Click **Next**.

19. If you selected an LDAP user registry, additional pages prompt you for LDAP
server and configuration information:

a. Specify the LDAP server and user information. Click **Next**.

b. Specify the LDAP configuration parameters (or accept the defaults values).
Click **Next**.

20. If you selected a WebSphere Federated Repositories registry, specify the
WebSphere Federated Repositories server and user information.

**Note:** User IDs and passwords are case sensitive. Make sure you use the
correct case.

Click **Next**.

21. Review the pre-installation summary. After you verify that the information is
correct, click **Next** to start the installation process.
22. When prompted, insert TADDM disk 3 into the DVD drive. Specify the image directory. Click Next.

23. After the installation finishes, click Done to close the installation wizard.

Results

This installation can be a lengthy process, depending on the number and type of components you are installing. While the installation process is running, you can monitor the progress by viewing changes to the installation log. The log also contains information that can help you troubleshoot problems that occur during installation. Log files can be found in the installLogs subdirectory of the installation directory.

What to do next

On Microsoft Windows Server 2008 systems, remember to turn User Account Control (UAC) on after you have finished the installation. For more information, see [http://technet.microsoft.com/en-us/library/cc709691(WS.10).aspx#BKMK_S3](http://technet.microsoft.com/en-us/library/cc709691(WS.10).aspx#BKMK_S3)

Installing a secondary storage server using the installation wizard:

Follow these steps to install a secondary storage server using the installation wizard. A secondary storage server is an optional part of a streaming server deployment.

Before you begin

You must be logged in to an account with administrator privileges to install TADDM. Complete all prerequisite steps, including any required database configuration, before starting the installation process.

If you are installing the TADDM server on Microsoft Windows Server 2008, you must temporarily turn off User Account Control (UAC) before starting the installation process. For more information, see [http://technet.microsoft.com/en-us/library/cc709691(WS.10).aspx#BKMK_S3](http://technet.microsoft.com/en-us/library/cc709691(WS.10).aspx#BKMK_S3)

The primary storage server must be installed before you can install a secondary storage server. Do not start the secondary storage server unless the server is the same version as the primary storage server. All TADDM servers in a streaming server deployment must have the same version and release.

The primary storage server must resolve the fully qualified domain name (FQDN) for each secondary storage server and discovery server. You can configure the host name resolution order for your system to use DNS resolution. Alternatively, you can edit the /etc/hosts file in the primary storage server. Include the IP address and host name for each discovered secondary storage server and discovery server to this file.

About this task

A storage server processes discovery data and stores it in a local or remote DB2, DB2 for z/OS, or Oracle database. A streaming server deployment requires at least one storage server (the primary storage server). Depending on your environment, you might also need one or more secondary storage servers. A secondary storage server automatically uses the database information specified for the primary storage server.
Procedure

To install a secondary storage server using the installation wizard:

1. Insert the TADDM Disk 1 installation DVD for your supported operating system into the DVD drive.

2. At a command prompt, go to the DVD drive and run the appropriate command for your operating system:
   - For AIX operating systems, `setupAix.bin`
   - For Linux operating systems, `setupLinux.bin`
   - For Linux on System z operating systems, `setupZLinux.bin`
   - For Solaris operating systems, `setupSolarisSparc.bin`
   - For Windows operating systems, `setupWin.bat`

   **Restriction:** When you run the TADDM installation wizard `setupWin.bat` on Windows operating systems, select the **Run as administrator** option. Otherwise, the installation will fail.

Note: If an error message is displayed that there is insufficient disk space in the temp directory, run the installation again and specify a different temp directory. Use the option `-t temp` (for example, `setupLinux.bin -t /mytempdir`).

3. Select the language to use for your installation. Click **OK**.

4. On the Introduction page, click **Next**.

5. Read and accept the terms of the software license agreement and click **Next**.

6. Specify the location where you want to install the server. Make sure that the path you specify contains only ASCII characters, and does not contain any spaces. Non-ASCII characters or spaces in the path can cause installation problems and problems starting the server.
   After you specify the server location, click **Next**.

7. Specify the user ID you want to use to run the server.
   - On Windows operating systems, the user must belong to the Administrators group. If the user does not exist or is not part of the Administrators group, select the check box to create the user or add the user to the Administrators group. The user ID must be a local user account.
   - On Linux and UNIX operating systems, the user ID you specify must be non-root.
   After you specify the server location, click **Next**.

8. On the TADDM Deployment Option page, select **Streaming server deployment**. Click **Next**.

9. When prompted for the type of server you want to install, select **Secondary Storage Server**.

10. On the Server Ports page, specify the server port information. Click **Next**.

11. Specify the host name and port information for the primary storage server.
    Also specify the primary storage server user ID and password (specify the user account you use to log in to the Discovery Management Console). The default user ID is `administrator`, and the default password is `collation`.

    **Note:** The primary storage server must be already installed and running.

12. On the Additional Server Information page, specify the following options:
    - The server numeric IP address, if you are not using DNS to resolve the server name. (Otherwise, accept the default value.)
• Server startup options.

Note: If the version you are installing is not the same version as the primary storage server, clear the Start the server after installation check box. Click Next.

13. Review the pre-installation summary. After you verify that the information is correct, click Next to start the installation process.

14. When prompted, insert TADDM disk 3 into the DVD drive. Specify the image directory. Click Next.

15. After the installation finishes, click Done to close the installation wizard.

Results

This installation can be a lengthy process, depending on the number and type of components you are installing. While the installation process is running, you can monitor the progress by viewing changes to the installation log. The log also contains information that can help you troubleshoot problems that occur during installation. Log files can be found in the installLogs subdirectory of the installation directory.

What to do next

On Microsoft Windows Server 2008 systems, remember to turn on User Account Control (UAC) after you have finished the installation. For more information, see http://technet.microsoft.com/en-us/library/cc709691(WS.10).aspx#BKMK_S3

Installing a discovery server using the installation wizard:

Follow these steps to install a discovery server using the installation wizard. At least one discovery server is required for a streaming server deployment.

Before you begin

You must be logged in to an account with administrator privileges to install TADDM. Complete all prerequisite steps, including any required database configuration, before starting the installation process.

If you are installing the TADDM server on Microsoft Windows Server 2008, you must temporarily turn off User Account Control (UAC) before starting the installation process. For more information, see http://technet.microsoft.com/en-us/library/cc709691(WS.10).aspx#BKMK_S3

Before installing a discovery server, you must install the primary storage server. Do not start the discovery server unless the server is the same version as the primary storage server. All TADDM servers in a streaming server deployment must have the same version and release.

The primary storage server must resolve the fully qualified domain name (FQDN) for each secondary storage server and discovery server. You can configure the host name resolution order for your system to use DNS resolution. Alternatively, you can edit the /etc/hosts file in the primary storage server. Include the IP address and host name for each discovered secondary storage server and discovery server to this file.
About this task

A discovery runs sensors in a streaming server deployment. The number of discovery servers you need depends upon the number of items that need to be discovered. A discovery server does not have its own database; discovered data flows from the discovery server to a storage server.

Procedure

To install a discovery server using the installation wizard, complete the following steps:

1. Insert the TADDM Disk 1 installation DVD for your supported operating system into the DVD drive.
2. At a command prompt, go to the DVD drive and run the appropriate command for your operating system:
   - For AIX operating systems, `setupAix.bin`
   - For Linux operating systems, `setupLinux.bin`
   - For Linux on System z operating systems, `setupZLinux.bin`
   - For Solaris operating systems, `setupSolarisSparc.bin`
   - For Windows operating systems, `setupWin.bat`

   **Restriction:** When you run the TADDM installation wizard `setupWin.bat` on Windows operating systems, select the **Run as administrator** option. Otherwise, the installation will fail.

   **Note:** If an error message is displayed that there is insufficient disk space in the temp directory, run the installation again and specify a different temp directory. Use the option `-t temp` (for example, `setupLinux.bin -t /mytempdir`).

3. Select the language to use for your installation. Click **OK**.
4. On the Introduction page, click **Next**.
5. Read and accept the terms of the software license agreement and click **Next**.
6. Specify the location where you want to install the server. Make sure the path you specify contains only ASCII characters, and does not contain any spaces. Non-ASCII characters or spaces in the path can cause installation problems and problems starting the server.
   After you specify the server location, click **Next**.
7. Specify the user ID you want to use to run the server.
   - On Windows operating systems, the user must belong to the Administrators group. If the user does not exist or is not part of the Administrators group, select the check box to create the user or add the user to the Administrators group. The user ID must be a local user account.
   - On Linux and UNIX operating systems, the user ID you specify must be non-root.
   After you have specified the user ID, click **Next**.
8. On the TADDM Deployment Option page, select **Streaming server deployment**. Click **Next**.
9. When prompted for the type of server you want to install, select **Discovery Server**.
10. On the Server Ports page, specify the server port information. Click **Next**.
11. Specify the host name and port information for the primary storage server. Also specify the primary storage server user ID and password (specify the
user account you use to log in to the Discovery Management Console). The default user ID is administrator, and the default password is collation.

Note: The primary storage server must be already installed and running.

12. On the Additional Server Information page, specify the following options:
   - The server numeric IP address, if you are not using DNS to resolve the server name. (Otherwise, accept the default value.)
   - Server startup options.

   Note: If the version you are installing is not the same version as the primary storage server, clear the Start the server after installation check box.

   Click Next.

13. Review the pre-installation summary. After you verify that the information is correct, click Next to start the installation process.

14. When prompted, insert TADDM disk 3 into the DVD drive. Specify the image directory. Click Next.

15. After the installation finishes, click Done to close the installation wizard.

Results

This installation can be a lengthy process, depending on the number and type of components you are installing. While the installation process is running, you can monitor the progress by viewing changes to the installation log. The log also contains information that can help you troubleshoot problems that occur during installation.

On Linux and UNIX systems, message log files can be found in the following directory: install_dir/installLogs.

On Windows systems, message log files can be found in the following directory: install_dir\installLogs.

What to do next

On Microsoft Windows Server 2008 systems, remember to turn User Account Control (UAC) on after you have finished the installation. For more information, see http://technet.microsoft.com/en-us/library/cc709691(WS.10).aspx#BKMK_S3.

Installing the TADDM server at a console

You can run the installer in console mode to install a TADDM server using an interactive text-mode interface.

Procedure

To run a console mode installation of the server, complete the following steps:

1. Insert the TADDM installation DVD for your supported operating system into the CD drive.

2. Open a command prompt, navigate to the CD drive, and enter one of the following commands:
   - For AIX operating systems, setupAix.bin -i console
   - For Linux operating systems, setupLinux.bin -i console
   - For Linux on System z operating systems, setupZLinux.bin -i console
   - For Solaris operating systems, setupSolarisSparc.bin -i console
For Windows operating systems, `setupWin.bat -i console`

**Restriction:** When you run the TADDM installation wizard `setupWin.bat` on Windows operating systems, select the **Run as administrator** option. Otherwise, the installation will fail.

You might have to wait a few minutes for files to decompress before the installation process begins.

**Note:** If an error message is displayed that there is insufficient disk space in the temp directory, run the installation again and specify a different temp directory. Use the option `-t temp`, for example, `setupLinux.bin -i console -t /mytempdir`.

3. Follow the prompts in the console window to complete the installation. The console installation process follows the same steps as the wizard installation process. For more information about the information you must specify during installation, refer to the wizard installation instructions for the server type you are installing (see "Installing TADDM servers using the installation wizard" on page 49).

**Results**

This installation can be a lengthy process, depending on the number and type of components that you are installing. While the installation process is running, you can monitor the progress by viewing changes to the installation log. The log also contains information that can help you troubleshoot problems that occur during installation. Log files can be found in the `installLogs` subdirectory of the installation directory.

**Silently installing the TADDM server**

You can run the installer in silent mode to install a TADDM server with no user interaction.

**About this task**

**Restriction:** Silent installation is not supported if a firewall exists between IBM Tivoli CCMDB and TADDM resources.

**Restriction:** Silent installation does not support DVD disk switching. Copy the contents of the TADDM installation disks to a local directory before running the silent installation.

**Restriction:** When you run the TADDM installation wizard `setupWin.bat` on Windows operating systems, select the **Run as administrator** option. Otherwise, the installation will fail.

**Procedure**

1. Go to the server and use one of the following procedures:
   - For Linux, Solaris, AIX, and Linux on System z operating systems, use either root or non-root user ID to log in.
   - For the Windows operating systems, use a Windows logon ID with Administrator authority.
2. To generate a response file, complete one of the following options.

   **Important:** The response file must be saved in the UTF-8 encoding without the BOM so that the installer reads it properly. If the response file is in the UTF-8
encoding with the BOM or uses Unicode or Unicode Big Endian encoding, the installer is unable to read the file properly.

**Important:** If you are installing on a dual-stack system that supports both the IPv4 and IPv6 protocols, make sure that any numeric IP addresses you specify in the response file are IPv4 addresses.

- Run the installation wizard with the record option, ensuring that the folder that is to contain the response file already exists. As you proceed through the pages of the installation wizard, your answers are captured and the response file is generated.

When you complete the installation, the response file (for example, install.rsp) is available in the tmp directory.

When recording the response file, password information is not saved. Before installing TADDM in silent mode, you must manually edit the response file and ensure the appropriate database passwords are included.

- For Linux operating systems:
  ```bash
  setupLinux.bin -r /tmp/install.rsp
  ```
- For Solaris operating systems:
  ```bash
  setupSolarisSparc.bin -r /tmp/install.rsp
  ```
- For AIX operating systems:
  ```bash
  setupAix.bin -r /tmp/install.rsp
  ```
- For Linux on System z operating systems:
  ```bash
  setupZLinux.bin -r /tmp/install.rsp
  ```
- For Windows operating systems:
  ```bash
  setupWin.bat -r c:\temp\install.rsp
  ```

- If you do not want to generate a response file by recording input values to a response file, you can create a response file to use for the silent installation. To create a response file, run the following command for your operating system, ensuring that the folder that is to contain the response file already exists:

  - For Linux operating systems:
    ```bash
    setupLinux.bin -g /tmp/install.rsp
    ```
  - For Solaris operating systems:
    ```bash
    setupSolarisSparc.bin -g /tmp/install.rsp
    ```
  - For AIX operating systems:
    ```bash
    setupAix.bin -g /tmp/install.rsp
    ```
  - For Linux on System z operating systems:
    ```bash
    setupZLinux.bin -g /tmp/install.rsp
    ```
  - For Windows operating systems:
    ```bash
    setupWin.bat -g c:\temp\install.rsp
    ```

    You must edit the template response file, install.rsp, with the appropriate values before you can use it. The template response file includes instructions for each value.

    Sample response files are provided in the support/samples directory.

    You can use any text editor to edit the response file.

3. Run the silent installation using the response file:

   - For Linux operating systems:
     ```bash
     setupLinux.bin -i silent -f /tmp/install.rsp
     ```
   - For Solaris operating systems:
setupSolarisSparc.bin -i silent -f /tmp/install.rsp

- For AIX operating systems:
  setupAix.bin -i silent -f /tmp/install.rsp

- For Linux on System z operating systems:
  setupZLinux.bin -i silent -f /tmp/install.rsp

- For Windows operating systems:
  setupWin.bat -i silent -f c:\temp\install.rsp

Note: If an error message is displayed that there is insufficient disk space in
the temp directory, run the installation again and specify a different temp
directory. Use the option -t temp, for example, setupLinux.bin -i silent -f
/tmp/install.rsp -t /mytempdir.

Results

This installation can be a lengthy process, depending on the number and type of
components that you are installing. While the installation process is running, you
can monitor the progress by viewing changes to the installation log. The log also
contains information that can help you troubleshoot problems that occur during
installation. Log files can be found in the installLogs subdirectory of the
installation directory.

Verifying the TADDM server installation

After you finish installing the TADDM server, you can use the checkinstall script
to verify the results of the installation.

Procedure

This script verifies the required TADDM user IDs and passwords, as well as the
connection to the domain database.

1. Go to the $COLLATION_HOME/support/install directory.
2. Run the checkinstall script for your operating system:
   - Windows systems: checkinstall.bat
   - Linux and UNIX systems: checkinstall.sh
3. Review the resulting messages to identify any problems with the installation.
   The following example shows the results for a successful installation:

   Run-as user:taddmuser
   DB User:db2admin
   Archive DB User:archuser
   DB type:db2
   DB url:jdbc:db2://localhost:50000/cmdb

   CHECKED AND PASSED:
   /opt/IBM/taddm1234/dist/external/jdk [ok]
   /opt/IBM/taddm1234/dist/lib [ok]
   /opt/IBM/taddm1234/dist/deploy-tomcat [ok]
   /opt/IBM/taddm1234/dist/etc/collation.properties [ok]
   db2admin jdbc:db2://localhost:50000/cmdb [ok]
   archuser jdbc:db2://localhost:50000/cmdb [ok]
   taddmuser [ok]

   EXCEPTIONS RAISED:

   ERROR LIST:

   Basic TADDM installation check: Passed
If your installation does not pass the installation check, review the EXCEPTIONS RAISED and ERROR LIST sections to identify the problems that need to be corrected.

**Installing the self-monitoring tool**

You can optionally install the self-monitoring tool to gather information related to the availability, performance, infrastructure, and health of systems using TADDM in a synchronization server deployment.

**About this task**

The tool also provides information about configuration items. You can monitor only the systems, or the systems and other resources in the environment.

IBM Tivoli Monitoring Express®, used by the self-monitoring tool, provides information about the TADDM performance. To gather performance data for the IBM Tivoli Change and Configuration Management Database (CCMDB), monitor the Java process that is being used by the WebSphere Portal Server. This process is usually installed in the `/opt/IBM/WPS/java/jre/bin/java` directory.

When using the self-monitoring tool, one of the terms that you need to know is *process attribute*. A process attribute for a situation can start a reflex action. Total memory used is an example of a process attribute.

To access the information reported by the monitoring tools, use the Tivoli Enterprise Portal. Within the Tivoli Enterprise Portal, there are workspaces that provide various types of data. The workspaces usually display information using tables and charts. For more information about workspaces used by the self-monitoring tool, refer to the TADDM Administrator’s Guide: Using the self-monitoring tool. For more information about the workspaces for the operating system agent, or any other supporting agent, refer to User’s Guides: Monitoring Agent for Linux OS User’s Guide: Workspaces reference at [http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/index.jsp?topic=](http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/index.jsp?topic=)

You can install the self-monitoring tool using either wizard installation or silent installation. Console installation is not available for the self-monitoring tool.

**Prerequisites for installing the self-monitoring tool**

Before installing the self-monitoring tool, you must install IBM Tivoli Monitoring software and TADDM.

The following prerequisites must be met before installing the self-monitoring tool:

- You must be using a TADDM synchronization server deployment. The self-monitoring tool is not supported in streaming server deployment.
- The IBM Tivoli Enterprise Monitoring Server for IBM Tivoli Monitoring Express version 6.1 or later must be installed on a network-connected host to which the operating system agent and the Universal Agent are connected.
- The IBM Tivoli Monitoring operating system agent must be installed and running on the TADDM system.
- The IBM Tivoli Monitoring Universal Agent must be installed and running on the TADDM system.
- TADDM must be installed.
On Red Hat Enterprise Linux 5.1 systems, you must install the libXmu and libXp libraries before installing the self-monitoring tool. Use the RPM Package Manager to install these packages.


**Installing the self-monitoring tool using the installation wizard**

You can use the installation wizard to install the self-monitoring tool.

**About this task**

Note: The self-monitoring tool cannot be installed on the Windows operating systems supported by TADDM. The self-monitoring tool can be installed on all other Linux, Solaris, AIX, and Linux for System z operating system supported by TADDM.

You install the self-monitoring tool by running an executable binary file from a command line.

**Procedure**

To install the self-monitoring tool using the installation wizard, complete the following steps:

1. On the system where TADDM is installed, navigate to the `$COLLATION_HOME/itmconfig` directory.
2. Run the corresponding executable binary file for your operating system as the root user:

   ```
   installer_binary -i gui
   ```

   Note: The `-i gui` parameter is required for wizard installation. Console installation is not supported for the self-monitoring tool.
3. Follow the instructions in the wizard to complete the installation.

**Silently installing the self-monitoring tool**

You can use a response file to silently install the self-monitoring tool.

**About this task**

Note: The self-monitoring tool cannot be installed on the Windows operating systems supported by TADDM. The self-monitoring tool can be installed on all other Linux, Solaris, AIX, and Linux for System z operating system supported by TADDM.

**Procedure**

To silently install the self-monitoring tool, complete the following steps:

1. Create a response file specifying the installation options you want to use.

   Note: You must ensure that the folder that is to contain the specified response file already exists.
Important: The response file must be saved in the UTF-8 encoding without the BOM so that the installer reads it properly. If the response file is in the UTF-8 encoding with the BOM or uses Unicode or Unicode Big Endian encoding, the installer is unable to read the file properly.

There are several ways to create a response file:

- Record a response file based on the options you select during a wizard installation. To record a response file, start the installation wizard with the \(-r\) parameter, specifying the path and file name of the response file to create. For example, the following command starts the installer for a Linux system, recording the response file /tmp/response_file.rsp:

```
./cfgSelfMonitoringLinux.bin -r /tmp/response_file.rsp
```

- Generate a template response file, which you must then customize with appropriate values. To generate a template response file, run the installer command in wizard mode with the \(-\text{DgenerateInstallTemplate}\) parameter, specifying the path name of the response file template to create. For example, the following command uses the Linux installer to create a template response file:

```
./cfgSelfMonitoringLinux.bin -i gui -DgenerateInstallTemplate=/tmp/response_file.rsp
```

Make sure your environment supports running the installer in wizard mode. The installer for the self-monitoring tool does not support console mode, so the template response file generation fails if the installer is unable to run in wizard mode.

- Modify the sample response file. The sample response file is installed with TADDM as \$COLLATION_HOME/itmconfig/support/samples/sample_ssmi_install.rsp.

2. Go to the \$COLLATION_HOME/itmconfig directory.

3. While logged on as the root user, run the appropriate executable binary file for your operating system, specifying silent installation and the path and file name of the response file to use. Use the following syntax:

```
installer_binary -i silent -f path_and_file_name
```

For example, the following command starts a silent installation on a Linux system, using the values in the response file /tmp/response_file.rsp:

```
./cfgSelfMonitoringLinux.bin -i silent -f /tmp/response_file.rsp
```

Results

After a successful installation, log files are stored in the \$COLLATION_HOME/itmconfig/installLogs directory. If the installation is not successful, check for log files in the \$TEMP/ssmi directory.

Installing IBM Tivoli Monitoring workspaces and situations for TADDM

You use a program to install the IBM Tivoli Monitoring workspaces and situations for TADDM.

Before you begin

To complete these steps, you must be logged in with a user ID that has write access to the IBM Tivoli Monitoring installation directory.
Procedure

To install IBM Tivoli Monitoring workspaces and situations for TADDM, complete the following steps:

1. Locate the CD with the installation process for TADDM. Take this CD to the server that is hosting the Tivoli Enterprise Monitoring Server for IBM Tivoli Monitoring, version 6.1 or later.

2. On the CD, go to the following directory: `itm-selfmon-support`. This directory contains all of the files that are required to install the IBM Tivoli Monitoring workspaces and situations for TADDM.

The `itm-selfmon-support/SolutionInstaller` directory contains the program (a launchable executable file for each platform supported by IBM Tivoli Monitoring) to install the workspaces and situations.

3. Run the installation file. The installation process prompts you for the location of the IBM Tivoli Monitoring installation directory, `ITM_INSTALL_DIRECTORY`. This location is usually in the `/opt/IBM/ITM` directory for supported Linux, AIX, Solaris, and Linux for System z operating systems. The installation process also prompts you for the location of the solution. The solution is stored in the `$BASEDIR/itm-selfmon-support/CD_ROOT` directory.

4. Enter the location of the solution and click Next. The next set of windows provides fields with defaults specified.

5. Accept the defaults by clicking Next.

6. If you are prompted for hub Tivoli Enterprise Monitoring Server information, specify the administrative user ID, password, and host name for the hub Tivoli Enterprise Monitoring Server.

   **Note:** This page appears only if the Tivoli Enterprise Monitoring Server is connected to a hub Tivoli Enterprise Monitoring Server.

7. Click Finish in the last window.

8. Take the CD with the installation process for TADDM to the server that is hosting the Tivoli Enterprise Portal Server for IBM Tivoli Monitoring, version 6.1 or later.

9. On the CD, go to the following directory: `itm-selfmon-support`. This directory contains all of the files that are required to install the IBM Tivoli Monitoring workspaces and situations for TADDM.

The `itm-selfmon-support/SolutionInstaller` directory contains the program (a launchable executable file for each platform supported by IBM Tivoli Monitoring) to install the workspaces and situations.

10. Run the installation file. The installation process prompts you for the location of the IBM Tivoli Monitoring installation directory, `ITM_INSTALL_DIRECTORY`. This location is usually the `/opt/IBM/ITM` directory for supported Linux, AIX, Solaris, and Linux for System z operating systems. The installation process also prompts you for the location of the solution. The solution is stored in the `$BASEDIR/itm-selfmon-support/CD_ROOT` directory.

   **Note:** The option to install to the Tivoli Enterprise Monitoring Server depot is not supported.

11. Enter the location of the solution and click Next. The next set of windows provides fields with defaults specified.

12. Accept the defaults by clicking Next.

13. Click Finish on the last window.
Troubleshooting the self-monitoring tool installation

This information covers common problems that occur with the installation of the self-monitoring tool in the IBM Tivoli Application Dependency Discovery Manager (TADDM).

Self-monitoring installer cannot locate any IBM Tivoli Monitoring components on the computer

Problem

The installation program for the self-monitoring tool cannot locate any IBM Tivoli Monitoring components on the computer because an incorrect value is entered in the installable media field, which is labeled Enter the location where your installable media is located.

Solution

To resolve this, go to the installation program window with the installable media field, and browse to the `itm-selfmon-support/CD_ROOT` directory that is included with the installation program. The installable components window should now be populated.

The text-based console mode installer for the self-monitoring tool runs rather than the graphical installer

Problem

The text-based console mode installation program for the self-monitoring tool runs rather than the graphical installation program. The following message is shown:

Graphical installers are not supported by the VM.
The console mode will be used instead.

Solution

This problem occurs when you run the installation program from a telnet or ssh session without exporting the display to a suitable X Windows server. To resolve the problem, set the $DISPLAY variable to a valid X Windows server address and screen index.

Installing the Tivoli Netcool Performance Flow Analyzer server

To use the NetFlow sensor, you must install the Tivoli Netcool Performance Flow Analyzer server that is shipped with TADDM because that version contains the configuration that is required by the NetFlow sensor. However, note that the Tivoli Netcool Performance Flow Analyzer Version 4.1 package that is shipped with TADDM is not the full product version of Tivoli Netcool Performance Flow Analyzer.

Before you begin

The Tivoli Netcool Performance Flow Analyzer server collects information from network devices that support protocols and tools such as NetFlow, Internet Protocol Flow Information Export (IPFIX), jFlow, cflowd, and NetStream. The NetFlow sensor uses this data to create additional network connections among computer systems.

For detailed information about the NetFlow sensor, see the TADDM Sensor Reference.

The Tivoli Netcool Performance Flow Analyzer server is not supported on Windows or Linux on System z systems.
You must disable the Security-Enhanced Linux (SELinux) security system. To do this, specify SELINUX=disabled in the /etc/sysconfig/selinux configuration file. Restart your system after you update the file.

**About this task**

As part of the TADDM server installation process, you can optionally install the Tivoli Netcool Performance Flow Analyzer on the same system.

**Procedure**

To install the Tivoli Netcool Performance Flow Analyzer server at a later time, or to install it on a remote server, follow these steps:

1. On the system where you want to install the Tivoli Netcool Performance Flow Analyzer server, log in with a user ID that has root privileges.
2. On the TADDM installation DVD or installation image, go to the tnpfa directory.
3. Run the appropriate installer:
   - Linux systems: setupTNPFALinux.bin
   - Solaris systems: setupTNPFASolaris.bin
   - AIX systems: setupTNPFAix.bin
4. Follow the instructions in the wizard to complete the installation.

**Note:** On Linux and UNIX systems, the Tivoli Netcool Performance Flow Analyzer server is always installed in the /opt/aurora directory.

**What to do next**

You must configure your routers and switches to send NetFlow data to the Tivoli Netcool Performance Flow Analyzer server by using UDP port 2055. For details, refer to the documentation for your routers and switches. For more information, see the following links:


To start the Tivoli Netcool Performance Flow Analyzer server, use the command tnpfa start. To stop the server, use the command tnpfa stop.

Reports required by the NetFlow sensor are stored in the /var/lib/aurora/sites/taddm directory.

### Post-installation configuration

After you complete the installation process, you must complete some configuration tasks before using TADDM.

**Post-installation DB2 for z/OS configuration**

If you are using a DB2 for z/OS domain database, these steps are required to complete the database setup and optimize performance. If you are using a database other than DB2 for z/OS, these steps are not necessary.
About this task

Completing DB2 for z/OS setup

After installing the TADDM server with a remote DB2 for z/OS database, follow these configuration steps to complete the setup of the database.

Procedure

To complete the setup of the database, complete the following steps:

1. Using an ASCII text editor, open the $COLLATION_HOME/etc/collation.properties file and verify that the following line exists (and that it is not commented out):

   com.collation.db.type=db2zos

2. If your database uses tablespace names that are different from those shown in “Preparing a DB2 for z/OS database” on page 40, use an ASCII text editor to modify the corresponding parameters in the $COLLATION_HOME/etc/db2zos.xml configuration file, specifying the correct names.

3. Install the DB2 for z/OS Universal JDBC driver. Enter the following Java command on one line, depending on the operating system:

   On UNIX systems
   
   java -cp $COLLATION_HOME/lib/jdbc/db2jcc.jar:
   $COLLATION_HOME/lib/jdbc/db2jcc_license_cisuz.jar:
   $COLLATION_HOME/lib/jdbc/db2jcc_license_cu.jar com.ibm.db2.jcc.DB2Binder
   -url jdbc:db2://hostname:port/SSID -user userid -password password
   -action ADD -size 15 -blocking ALL

   On Windows systems
   
   java -cp %COLLATION_HOME%\lib\jdbc\db2jcc.jar;
   %COLLATION_HOME%\lib\jdbc\db2jcc_license_cisuz.jar;
   %COLLATION_HOME%\lib\jdbc\db2jcc_license_cu.jar com.ibm.db2.jcc.DB2Binder
   -url jdbc:db2://hostname:port/SSID -user userid -password password
   -action ADD -size 15 -blocking ALL

   where:

   hostname
   The TCP/IP host name of the DB2 for z/OS server

   port
   The TCP/IP port of the DB2 for z/OS server.

   SSID
   The DB2 subsystem ID.

   userid
   The DB2 primary user ID

   password
   The password for the DB2 primary user ID

4. Verify that the DB2 for z/OS database is running.

5. Start the TADDM server. To start the server, go to the $COLLATION_HOME/bin directory and run the control start command. (For more information about starting the server, refer to the Administrator’s Guide.)

   While starting up for the first time, the TADDM server creates all of the required TADDM tables and LOB tablespaces.

6. Stop the TADDM server. To stop the server, go to the $COLLATION_HOME/bin directory and run the control stop command. (For more information about stopping the server, refer to the Administrator’s Guide.)

7. Configure the LOB tablespaces in the TADDM database to disable lock escalation and set the lock mode to ROW. The names of these tablespaces are automatically generated for each LOB column and are different for each
installation, so this configuration step must be taken after installation. Use the following SQL statements to make these changes.

**Note:** (This example assumes that the TADDM databases are named **CMDBA** and **CMDBB**. If you specified different database names, modify the SQL statements accordingly.)

```sql
select 'ALTER TABLESPACE '||DBNAME||'.'||NAME||'
  locksize LOB lockmax Gt' from sysibm.systablespace
where type='O' and DBNAME IN ('CMDBA', 'CMDBB');
```

```sql
select 'ALTER TABLESPACE '||DBNAME||'.'||NAME||'
  locksize ROW lockmax Gt' from sysibm.systablespace
where type='G' and DBNAME IN ('CMDBA', 'CMDBB');
```

8. Restart DB2.
9. Restart the TADDM server.

**Optimizing DB2 for z/OS performance**
Perform these database maintenance steps to avoid performance issues with a DB2 for z/OS database.

**Procedure**

1. Use the Discovery Management Console to run a discovery. This method populates the domain database with data.
2. Stop the TADDM server.
3. Generate and run the RUNSTATS control statement for each new database. The following example assumes that the databases are named **CMDBA** and **CMDBB**:

   ```sql
   SELECT DISTINCT 'RUNSTATS TABLESPACE '||DBNAME||'.'||TSNAME||'
       INDEX(ALL) SHRLEVEL REFERENCE' FROM SYSIBM.SYSTABLES
   WHERE DBNAME IN ('CMDBA', 'CMDBB') ORDER BY 1;
   ```

4. Immediately after RUNSTATS is complete, generate and run the UPDATE control statement for each new database. Run the following statements only from a DB2 command-line window for the schemas corresponding to both the primary user ID and the archive user ID:

   ```sql
   select 'UPDATE SYSIBM.SYSINDEXES SET FIRSTKEYCARDF=FULLKEYCARDF WHERE'
       ||chr(10)||'
     NAME ='''||CAST(RTRIM(name) AS VARCHAR(40))'||'''
     ||chr(10)||'
     AND CREATOR ='''||CAST(RTRIM(creator) AS VARCHAR(40))'||'''
     ||chr(10)||'
     AND TBNAME ='''||CAST(RTRIM(tbname) AS VARCHAR(40))'||'''
     ||chr(10)||'
     AND TBCREATOR ='''||CAST(RTRIM(tbcreator) AS VARCHAR(40))'||''';'
   from sysibm.sysindexes a
   where tbcreator = 'SYSADM'
   AND NAME IN
   (SELECT IXNAME FROM SYSIBM.SYSKEYS B
   WHERE A.CREATOR = B.IXCREATOR
   AND A.NAME = B.IXNAME
   AND COLNAME = 'PK__JDOIDX');
   ```

   ```sql
   select 'UPDATE SYSIBM.SYSCOLUMNS SET COLCARDF=(SELECT FULLKEYCARDF FROM'
       ||chr(10)||' SYSIBM.SYSINDEXES WHERE||chr(10)||'
     NAME ='''||CAST(RTRIM(name) AS VARCHAR(40))'||'''
     ||chr(10)||'
     AND CREATOR ='''||CAST(RTRIM(creator) AS VARCHAR(40))'||'''
     ||chr(10)||'
     AND TBNAME ='''||CAST(RTRIM(tbname) AS VARCHAR(40))'||'''
     ||chr(10)||'
     AND TBCREATOR ='''||CAST(RTRIM(tbcreator) AS VARCHAR(40))'||''';'
   from sysibm.sysindexes a
   where tbcreator = 'SYSADM'
   AND NAME IN
   (SELECT IXNAME FROM SYSIBM.SYSKEYS B
   WHERE A.CREATOR = B.IXCREATOR
   AND A.NAME = B.IXNAME
   AND COLNAME = 'PK__JDOIDX');
   ```
where SYSADM is the schema name corresponding to the primary or archive user ID. Then run the resulting UPDATE SYSIBM.SYSINDEXES and UPDATE SYSIBM.SYSCOLUMNS statements for each schema.

5. Regularly monitor the size of the TADDM database tables, and adjust their storage attributes if necessary. In particular, monitor the size of the following database tables, which can become very large:
   - CHANGE_HISTORY_TABLE
   - CMDB_GUID_ALIAS
   - PERSOBJ
   - RELATION
   - SFTCMP
   - MEDACDEV
   - WINSVC
   - MSSOBJLINK
   - BINDADDR
   - OPSYS
   - OPERATINGSYSENTS_FD67DE48X
   - COMPsys
   - COMPOSITE
   - MSSOBJLINK_REL
   - SOFTMODL
   - RUNTIMEPROCESSJDO_PORTS_X
   - COMPUTERSYSTICES_E032D816X
   - APPSRVR
   - IPINTRFC
   - ORCLINITV
   - RUNTIMEPROCEORTS_13B7EE75X
   - IPROUTE
   - IPADDR

   Use ALTER statements to modify the PRIQTY and SECQTY attributes according to the needs of your environment. If appropriate, consider moving tables to separate tablespaces.

6. Use the REBIND command on the following packages with the KEEP_DYNAMIC(YES) option:
   - SYSLH200
   - SYSLH201
   - SYSLH202
Configuring Oracle RAC after installation

If you use Oracle RAC as TADDM primary storage server or TADDM domain database, these steps are required to complete the database setup. TADDM installer does not directly support Oracle RAC configuration.

About this task

Complete the following steps before you install TADDM secondary storage server so that RAC configuration is automatically loaded to TADDM secondary storage server. If TADDM secondary storage server is already installed, you must configure the server the way you configure Oracle RAC in the collation.properties file.

Procedure

1. Stop TADDM primary storage server or TADDM domain database.
2. Go to the $COLLATION_HOME/etc/ directory and edit the collation.properties file. Replace the RAC node configuration, which is used for installation purpose and contains all available nodes with the new configuration as shown in the examples. Examples:

   - RAC node configuration, which is used for installation purpose.
     
     ```
     #com.collation.db.url=jdbc:oracle:thin:@<node1_ip>:<node1_port>:<node1_sid>
     com.collation.db.url=jdbc:oracle:thin:@10.10.10.1:1521:RAC1
     #com.collation.db.archive.url=jdbc:oracle:thin:@<node1_ip>:<node1_port>:<node1_sid>
     com.collation.db.archive.url=jdbc:oracle:thin:@10.10.10.1:1521:RAC1
     ```

   - Oracle RAC configuration. In this example, two nodes are used, but the number of nodes can be increased if needed.
     
     ```
     jdbc:oracle:thin:@(DESCRIPTION=(LOAD_BALANCE=on)
     (ADDRESS=(PROTOCOL=TCP)(HOST=node1) (PORT=1521))
     (ADDRESS=(PROTOCOL=TCP)(HOST=node2) (PORT=1521))
     (CONNECT_DATA=(SERVICE_NAME=service)))
     ```

   The jdbc url must be formatted inline and included for both com.collation.db.url and com.collation.db.archive.url.

   ```
   #com.collation.db.url=jdbc:oracle:thin:@(DESCRIPTION=(LOAD_BALANCE=on)
   (ADDRESS=(PROTOCOL=TCP)(HOST=node1_ip)(PORT=node1_port))(ADDRESS=(PROTOCOL=TCP)
   (HOST=node2_ip)(PORT=node2_port))(CONNECT_DATA=(SERVICE_NAME=rac_service)))
   com.collation.db.url=jdbc:oracle:thin:@(DESCRIPTION=(LOAD_BALANCE=on)
   (ADDRESS=(PROTOCOL=TCP)(HOST=10.10.10.1)(PORT=1521))(ADDRESS=(PROTOCOL=TCP)
   (HOST=10.10.10.2)(PORT=1521))(CONNECT_DATA=(SERVICE_NAME=rac_service)))
   #com.collation.db.archive.url=jdbc:oracle:thin:@(DESCRIPTION=(LOAD_BALANCE=on)
   (ADDRESS=(PROTOCOL=TCP)(HOST=node1_ip)(PORT=node1_port))(ADDRESS=(PROTOCOL=TCP)
   (HOST=node2_ip)(PORT=node2_port))(CONNECT_DATA=(SERVICE_NAME=rac_service)))
   com.collation.db.archive.url=jdbc:oracle:thin:@(DESCRIPTION=(LOAD_BALANCE=on)
   (ADDRESS=(PROTOCOL=TCP)(HOST=10.10.10.1)(PORT=1521))(ADDRESS=(PROTOCOL=TCP)
   (HOST=10.10.10.2)(PORT=1521))(CONNECT_DATA=(SERVICE_NAME=rac_service)))
   ```

Checking the server status

After installing TADDM, you can check the status of the server.

Procedure

To verify that all services are started, complete the following steps:
1. Go to the installation directory of the TADDM server:
   - For Linux, and UNIX systems: $COLLATION_HOME/bin
   - For Windows systems: %COLLATION_HOME%\bin
2. Enter one of the following commands:
For Linux and UNIX systems: 
`./control status`

For Windows systems: 
`control status`

If TADDM is running on a domain server, the following output is displayed:

```
Discover: Started
GigaSpaces: Started
DbInit: Started
Tomcat: Started
Topology: Started
DiscoverAdmin: Started
Proxy: Started
EventsCore: Started
```

TADDM: Running

If TADDM is running on a synchronization server, the following output is displayed:

```
DbInit: Started
GigaSpaces: Started
Tomcat: Started
EcmdbCore: Started
```

TADDM: Running

If TADDM is running on a storage server, the following output is displayed:

```
GigaSpaces: Started
DbInit: Started
Tomcat: Started
StorageService: Started
```

TADDM: Running

If TADDM is running on a discovery server, the following output is displayed:

```
Discover: Started
GigaSpaces: Started
Tomcat: Started
DiscoveryService: Started
```

TADDM: Running

**Configuring clients for secure access**

You can configure TADDM client systems to use Secure Sockets Layer (SSL) connections for accessing the Discovery Management Console and the Administrator Console.

**About this task**

**Note:** If you have a TADDM enterprise environment which spans multiple domains requiring SSL, you cannot launch a domain Discovery Management Console that requires SSL from the Data Management Portal running on the synchronization server. To avoid this problem, do not configure SSL for domains that are leaf nodes of a synchronization server.

**Configuring secure access to the Discovery Management Console**

To configure secure access to the Discovery Management Console using SSL security, you must download and record the location of the truststore on the client system.
Procedure

To configure secure access to the Discovery Management Console, complete the following steps:

1. In a web browser on the client system, open the TADDM launch page by entering the hostname and port of the TADDM server. The default URL is as follows:
   \[http://hostname:9430\]
   
   where \(hostname\) is the TCP/IP hostname or numeric IP address of the system where the TADDM server is installed.

2. On the TADDM launch page, click **Show SSL Options**.
3. Click **Download Trust Store**.
4. Click **Save**. Make sure you record the location where you save the file.
5. In the text field next to **Download Trust Store**, type the path to the directory where you saved the truststore file. Do not include the file name.

What to do next

After you download the truststore, client systems can establish secure connections to the Discovery Management Console. To establish a secure session, click **Establish a secure (SSL) session** on the login window.

Configuring secure access to the Administrator Console

You can establish a secure session with the Administrator Console by specifying an HTTPS connection.

Procedure

To configure secure access to the Administrator Console, complete the following steps:

No special configuration is required for secure access to the Administrator Console. However, client systems should be configured to specify the HTTPS protocol and secure port when connecting to the TADDM console. The default URL for HTTPS access is as follows:

\[https://hostname:9431\]

where \(hostname\) is the TCP/IP hostname or numeric IP address of the system where the TADDM server is installed. Make sure any bookmarks on the client system are configured to specify HTTPS.

Note: On client systems, the web browser might report security warnings. These warnings can sometimes be prevented by specifying the host name as a fully qualified domain name (for example, host.example.com).

You can ignore warnings about the following issues when attempting to access the Administrator Console:

- The certificate issuer (localhost) is not recognized as being trusted.
- The **Issued to** field of the security certificate does not match the URL entered in the browser.
In addition, the client browser must be configured to use Transport Layer Security (TLS) 1.0. You must also follow the steps required for accepting the TADDM server security certificate. For more information, refer to the documentation for your browser.

**Clearing the Java Web Start cache**

After you install the server, you might have to clear the Java Web Start cache on each client system where you log in to the Discovery Management Console.

**Procedure**

To clear the Java Web Start cache, complete the following steps:

1. Go to the directory where the Java runtime environment is installed.
2. Change to the \jre\bin directory.
3. Double-click javaws.exe.
   a. In the Java Application Cache Viewer window, click Edit > Preferences.
   b. In the Java Control panel, under the Temporary Internet Files section, click Delete Files, select all check boxes, and click OK.
   c. Click OK.

**Clearing the Microsoft Internet Explorer browser cache**

After you upgrade a TADDM synchronization server from one TADDM release to another, you might have to clear your browser cache for the Data Management Portal to display correctly.

**Procedure**

To clear your browser cache, use the appropriate method for your browser.

- To clear the Microsoft Internet Explorer cache:
  1. Click Tools > Internet options > General.
  2. In the Temporary Internet files section click Delete files.
  3. In the Delete files window, select Delete all offline content.
  4. Click OK.
  5. Close the Microsoft Internet Explorer browser before logging back on to the Data Management Portal.

- To clear the Mozilla Firefox cache:
  1. Click Tools > Clear Recent History.
  2. In the Time range to clear field, select Everything.
  3. In the Details list, make sure Cache is selected.
  4. Click Clear Now.

**Upgrading TADDM**

Before upgrading IBM Tivoli Application Dependency Discovery Manager (TADDM), ensure that your environment meets the requirements for each TADDM component, including the hardware, operating system, and software prerequisites.

**Before you begin**

For more information about hardware, operating system, and software prerequisites, see “Planning for installation” on page 6.
During the upgrade new objects are created that results in the creation of new database tables. The size of the database can typically increase by up to a factor of four. The increase varies depending on the number and type of objects in the database. So, you might need to increase the size of database table spaces to ensure that there is enough free space available for a successful upgrade. Work with your database administrator to make any necessary changes during the upgrade.

Table 42 indicates the type of deployment that you have after you upgrade, depending on your original TADDM installation.

<table>
<thead>
<tr>
<th>TADDM installation before upgrade</th>
<th>TADDM deployment type after upgrade</th>
</tr>
</thead>
<tbody>
<tr>
<td>one domain server</td>
<td>domain server deployment</td>
</tr>
<tr>
<td>Enterprise Domain Server and two or more domain servers</td>
<td>synchronization server deployment</td>
</tr>
</tbody>
</table>

Notes:
1. After the upgrade, any Enterprise Domain Server is a synchronization server, and domain servers are still domain servers.
2. After the upgrade, if you have a synchronization server deployment but you want to use a streaming server deployment, you can manually convert the servers. For information about how to do this, see Converting from a synchronization server deployment to a streaming server deployment in the TADDM Wiki at http://www.ibm.com/developerworks/wikis/display/tivoliaddm/Home.

Performing prerequisite tasks

Before upgrading the TADDM server, you must complete these prerequisite tasks.

Procedure
1. Ensure that the names of any existing business applications, business services, or collections (now called groups) do not contain single or double quotation marks.

2. Ensure that the primary and secondary database users have the authority to run the LOAD command in DB2. The LOAD command enhances the performance of DB2. The primary and secondary database users must have the following authorities:
   - For DB2 9.5: SYSADM, DBADM, and LOAD authorities.
   - For DB2 9.7: DATAACCESS authority, LOAD or DBADM authority.

To grant the DBADM and LOAD authorities for the user, complete the following steps:
   a. Connect to the TADDM database with instance owner.
   b. Run the following command:
      
      ```
      db2 grant dbadm, load on database to user user
      
      Replace user with the name of your user.
      ```

3. Create a backup of the database. To create a backup of a DB2 database, complete the following steps:
   a. Stop the TADDM server.
   b. Use one of the following procedures:
      - For Linux, Solaris, AIX, and Linux on System z operating systems, log in as the DB2 database instance owner. For example, you could use the db2inst1 ID.
For Windows operating systems, open the DB2CMD command prompt.
c. Run the following command:
   
   \texttt{db2 backup database cmdb}

   Replace \texttt{cmdb} with the name of your database.

If you use an Oracle or DB2 for z/OS database, refer to the database software documentation for instructions about how to back up the database.

4. If you created any custom database views or triggers, drop them. Any views that you do not drop are automatically dropped during the migration process. If you do not drop the triggers, the upgrade process cannot complete successfully.

5. Create a backup of the \$\texttt{COLLATION\_HOME} directory (which includes databases).

6. On Linux operating systems, run the following command to verify that the libstdc++ compatibility package is installed:
   
   \texttt{rpm -a -q | grep compat-libstdc++-33}

   If this package is not installed, run the following command to install the package:
   
   \texttt{yum install compat-libstdc++-33}

7. If the TADDM server is running, stop the server. Use one of the following procedures to ensure that all TADDM server Java processes are stopped:
   - For Linux, Solaris, AIX, and Linux on System z operating systems, complete the following steps:
     a. Go to the \$\texttt{COLLATION\_HOME/bin} directory.
     b. Enter the following command:
        
        \texttt{./control stop}
     c. If all of the Java processes do not stop after entering the \texttt{./control stop} command and waiting for an appropriate amount of time for the processes to shut down, use the process ID information provided by the \texttt{ps} command to identify and stop the running Java processes that are related to TADDM:
        
        \texttt{ps -ef | grep java}
   - For Windows operating systems, use the Windows Task Manager to ensure that all TADDM server Java processes are stopped.

8. If you are using a DB2 database, make sure intrapartition parallelism is not enabled on the database server. You can verify this by checking the status of the \texttt{intra\_parallel} configuration parameter at a DB2 command prompt:
   
   \texttt{db2 get dbm cfg | grep INTRA\_PARALLEL}

   \textbf{Note:} On Linux and UNIX systems, you must be logged in as the DB2 database instance owner.

   If the \texttt{intra\_parallel} parameter is set to \texttt{YES}, run the following command:
   
   \texttt{db2 update dbm cfg using INTRA\_PARALLEL NO}

   If you modify the \texttt{intra\_parallel} parameter, you must then restart the DB2 server before continuing with the upgrade process.

9. The minimum values for the database log configuration parameters are as follows:
   - Log file size (4KB) (\texttt{LOGFILSIZ}) = 4096
   - Number of primary log files (\texttt{LOGPRIMARY}) = 12
   - Number of secondary log files (\texttt{LOGSECOND}) = 40

   Use the following commands to access the configuration parameters:
db2 connect to cmdb
db2 get db cfg |grep LOG

To set the parameters to the required values, if they are incorrect, use the following commands:
db2 update db cfg using LOGFILSIZ 4096
db2 update db cfg using LOGPRIMARY 12
db2 update db cfg using LOGSECOND 40

10. Create a complete backup of the server files. Depending on the operating system, compress the entire directory. For Linux, Solaris, AIX, and Linux on System z operating systems, you want to compress the /opt/IBM/taddm directory. For Windows operating systems, you want to compress the C:\ibm\taddm directory.

11. Optional: Save copies of any configuration files you have customized. These files might include the following:
   - $COLLATION_HOME/deploy-tomcat/ROOT/WEB-INF/cmdb-context.xml (for domain server)
   - $COLLATION_HOME/deploy-tomcat/ROOT/WEB-INF/ecmdb-context.xml (for synchronization server)
   - $COLLATION_HOME/etc/sync/*
   - $COLLATION_HOME/etc/detail/screenscontent.xml
   - $COLLATION_HOME/etc/detail/screenlayout.xml
   - $COLLATION_HOME/etc/templates
   - $COLLATION_HOME/etc/osgi
   - Custom BIRT reports

12. If you are using an Oracle database, make sure that the UNDO_RETENTION parameter is set to an appropriate value based on the size of the database. Refer to the Oracle documentation for information about how to calculate the appropriate value. Also, use the following commands to adjust the open cursors parameter:
   - Use the following command to set the open cursors parameter to a minimum value of 1000:
     SQL> ALTER SYSTEM SET OPEN_CURSORS=1000 SCOPE=BOTH;
   - Use the following command to see the current value of the parameter:
     SQL> SHOW PARAMETER OPEN_CURSORS;

13. Run the premigration tool.
   a. Insert the TADDM disk 1 installation DVD for your supported operating system into the DVD drive.
   b. Navigate to the support/bin directory.
   c. Open the premigration_tool_readme.txt file.
   d. Use the instructions in the premigration_tool_readme.txt file to run the premigration tool.

### Upgrading the TADDM server

Before beginning the upgrade, verify that your system is running a supported operating system and that all hardware and software requirements are met.

### About this task

Depending on the type of TADDM deployment that you are using, upgrade the associated TADDM servers in the order that is described in [Table 43 on page 86](#).
Table 43. Order in which to upgrade the TADDM servers

<table>
<thead>
<tr>
<th>Deployment type</th>
<th>Order in which to upgrade the associated TADDM servers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synchronization server deployment</td>
<td>1. Upgrade the synchronization server.</td>
</tr>
<tr>
<td></td>
<td>2. Upgrade the domain servers. You must upgrade a domain server and all leaf nodes at the same time.</td>
</tr>
<tr>
<td>Streaming server deployment</td>
<td>1. Upgrade the primary storage server.</td>
</tr>
<tr>
<td></td>
<td>2. After the successful upgrade of the primary storage server, upgrade the remaining TADDM servers in this order:</td>
</tr>
<tr>
<td></td>
<td>a. Upgrade any secondary storage servers.</td>
</tr>
<tr>
<td></td>
<td>b. Upgrade the discovery servers.</td>
</tr>
<tr>
<td></td>
<td>c. Start secondary storage servers and discovery servers. By default, they are not started after the upgrade.</td>
</tr>
</tbody>
</table>

All TADDM servers in a streaming server deployment must be upgraded together so that they have the same version and release. Do not start the secondary storage server or the discovery server unless the server is the same version as the primary storage server.

If you are installing on a dual-stack system that supports both the IPv4 and IPv6 protocols, ensure that any numeric IP addresses that you specify during the installation process are IPv4 addresses.

Upgrading the data model requires significant data processing. Depending on the size of the discovered data and your system configuration, the upgrade process might take several hours.

Procedure

To upgrade a TADDM server, complete the following steps:

1. For each TADDM server that you plan to upgrade, complete the prerequisite tasks, which include stopping all TADDM servers.
2. Insert the TADDM disk 1 installation DVD and change to the TADDM directory.
3. Use one of the following commands to run the upgrade process:
   - For AIX operating systems, `setupAIX.bin`
   - For Linux operating systems, `setupLinux.bin`
   - For Linux for System z operating systems, `setupZLinux.bin`
   - For Solaris operating systems, `setupSolarisSparc.bin`
   - For Windows operating systems, `setupWin.bat`

   **Restriction:** When you run the TADDM installation wizard `setupWin.bat` on Windows systems, select the **Run as administrator** option.

   In addition, you can run the upgrade process in console mode, by using the `-i console` parameter.
4. Click the **I accept both the IBM and the non-IBM terms.** check box and click **Next.**
5. When prompted to do so, type the name of the TADDM installation directory. The existing installation is checked to ensure that it is eligible to be upgraded.
6. Click Next.

7. On Windows systems, specify the user ID and password for the user account you want to use to run the TADDM server Windows service. The specified user must belong to the Administrators group.

Click Next.

8. Optional: If you want to configure the Context Menu Service and Data Integration Service during the upgrade process, select the Configure Context Menu Service (CMS) / Data Integration Service (DIS) check box. (If you do not select this option during the upgrade process, you can manually configure the Context Menu Service and Data Integration Service after upgrading. For more information, see "Configuring for the Context Menu Service and Data Integration Service" on page 45.)

Note: The Context Menu Service and Data Integration Service configuration options do not appear during the upgrade process if these services are already installed and configured. Instead, the upgrade process migrates the existing configurations from the $COLLATION_HOME/solutions/disintegration/collation.properties file to the $COLLATION_HOME/etc/collation.properties file.

If you are not configuring the Context Menu Service and Data Integration Service, skip to [10 on page 88]

9. Optional: If you are configuring the Context Menu Service and Data Integration Service, specify the required database information. If you are using a DB2 database, follow these steps:

   a. Specify the database server, port, database name, and user information for the database. The database name must be different from the TADDM server database name.

   b. Select Create the database during install unless the required database and tables already exist. (If you select Create the database during install and the database already exists, the installer deletes the existing database and creates the new one.)

   Note: The Create the database during install check box is available only if the DB2 database is on the local system and the user ID running the upgrade process has root or administrator privileges.

   Click Next.

If you are using an Oracle database, follow these steps:

   a. Specify the database server, port, system ID, and Oracle user information for the database. The Oracle user for the Context Menu Service and Data Integration Service must be different from the Oracle user for the TADDM server.

   b. Select Create the database during install unless the required database and tables already exist. (If you select Create the database during install and the database already exists, the installer deletes the existing database and creates the new one.)

   Note: The Create the database during install check box is available only if the user ID running the upgrade process has root or administrator privileges.

   Click Next.

   c. If you selected the Create the user check box, specify the Oracle database administrator information and the Oracle home directory. This information
is used to create the Context Menu Service and Data Integration Service
Oracle user during the upgrade process.
Click **Next**.

10. Review the summary information and click **Install**.

**Important:** At the beginning of an upgrade from TADDM 7.2.0.x to 7.2.1 Fix Pack 4, the premigration and verify-data tools are run to check for any corrupted relationships or duplicates in the database. If any duplicates are found, the following message is displayed:

CTJTI0269E There are configuration item duplicates in the TADDM database. Upgrade to TADDM 7.2.1.4 and use the verify-data tool to repair.
Run the command as follows: verify-data tool -v dup -a repair

The message is only a warning and you can continue the upgrade. After you complete it, run the verify-data tool as described in the message.

11. Insert TADDM disk 3 in DVD drive when prompted. Specify the image directory and click **Next**.

12. After the upgrade process is complete, a page, indicating the status of the upgrade, is displayed. Click **Finish** to close the upgrade program.

**Important:** During installation, the TADDM server is automatically started to perform several database migration steps. If the existing database contains a large number of configuration items, this startup process can take several hours, which can cause the installer to exit with one of the following messages:

- CTJTI0203E (The GUID migration fails because the Tivoli Application Dependency Discovery Manager Server did not start within a specified time.).
- CTJTI0191E (The GUID migration fails. See the following log file: log_file. After correcting the problem, run the installation process to resume the upgrade process. Contact Support if unable to resolve the error, a database restore may be required in the event a code fix is necessary.).

If you are monitoring the system, you might see that the Proxy service remains in startup mode for several hours as the view information is reprocessed.

If this happens, wait for the server startup to complete, and then restart the installer process to complete migration; the installer automatically resumes at the point where the failure occurred.

13. If the TADDM database is an Oracle database running in an enterprise environment, for all domains that were upgraded, run the `purge recyclebin` command using SQL*Plus.

14. If you have saved backup copies of any configuration files before upgrading, merge the contents of the backup copies with the contents of the new files installed as part of the upgrade. See the topic “Performing prerequisite tasks”, optional step: “Save copies of any configuration files you have customized” for details about files that can have backup copies.

If an error occurs during the upgrade, correct the problem and restart the TADDM installation process. The installation process resumes the upgrade process. It is not necessary to repeat any steps that were successfully completed.
Log files are created and stored in the `installLogs` directory during the upgrade.
The main log files include "7.2.1" in their filenames.
The DB upgrade log file can be found in `${COLLATION_HOME}/log/migration.log` directory.

15. On each client that uses the Discovery Management Console, clear the Java Web Start cache.
   To clear the Java Web Start cache, complete the following steps:
   a. Go to the \jre\bin subdirectory of the IBM Java SDK directory.
   b. Double-click the `javaws.exe`.
      1) In the Java Application Cache Viewer window, select **Edit > Preferences**
      2) In the Java Control Panel window, from the Temporary Internet Files section, click **Delete Files**. Select all **Delete the temporary files** check boxes and click **OK**.
      3) Click **OK** to exit the Java Control Panel window.

   If experiencing problem when accessing the Data Management Portal, for example, the screen appears blank clear the browser cache.

16. If integrating TADDM with Tivoli Business Service Manager, IBM Tivoli CCMDB, or any software products copy the necessary client jar files to those installations.

17. When migration is complete, update the database statistics using the `RUNSTATS` command for a DB2 database and `DBMS_STATS` command for an Oracle database. See the “DB2 database tuning” topic, in administering TADDM in the TADDM information center or the TADDM Administrator’s Guide. If you use an Oracle database, see the Oracle documentation for instructions about how to run the `DBMS_STATS` command.

18. Optional: If you automatically configured the Context Menu Service and Data Integration Service as part of the installation, and you have previously made any changes to the configuration files for these services, you might need to manually apply these changes to the upgraded configuration files. Check the previous configuration files for customized values:
   - `${COLLATION_HOME}/solutions/disintegration/etc/cmsdis/classtype-detailsPanel.list`
   - `${COLLATION_HOME}/solutions/disintegration/etc/cmsdis/classtype-changehistory.list`

   Any changes you made in these files must now be applied to the new configuration files:
   - `${COLLATION_HOME}/etc/cmsdis/classtype-detailsPanel.list`
   - `${COLLATION_HOME}/etc/cmsdis/classtype-changehistory.list`

19. Restart the server.

**What to do next**
   - If you have customized discovery profiles, compare them to the new profiles to determine whether any new sensors must be added. The upgrade process does not modify customized profiles.
   - After completing and verifying the upgrade, check the TADDM support web site and install any available maintenance fixes.
   - TADDM uses file-based authentication for the administrator account, even when using VMM (Virtual Member Manager) or LDAP (Lightweight Directory Access
Protocol) User Registry. As part of the upgrade process, the password for the
default administrator account is set to `collation`. You can change this password
after restarting TADDM. If you do not change this password, you must update
the configuration of any products that integrate with TADDM, such as IBM
Tivoli Business Service Manager, to reflect the new password for the
administrator account.

- After the upgrade completes, the user must run database statistics. For
  information about how to run database statistics, see the “Database tuning”
  section in the TADDM Administrator’s Guide.
- If TADDM and IBM Tivoli Monitoring environment integration is installed on
  the TADDM server, you must uninstall and reinstall the IBM Tivoli Monitoring
  workspaces and situations for TADDM.

Silently upgrading the TADDM server
If a firewall does not exist between the IBM Tivoli Change and Configuration
Management Database (IBM Tivoli CCMDB) and TADDM resources, you can use a
response file to silently upgrade the TADDM server.

Procedure

To run a silent upgrade of the server, complete the following steps:
1. Create an upgrade response file, for example `upgrade.rsp`. Include the following
   keys in the upgrade response file:
   - LICENSE_ACCEPTED=true
   - USER_INSTALL_DIR=/opt/IBM/taddm
   - UPGRADE=true
   - RUN_AS_USER=run_as_user (Windows systems only)
   - RUN_AS_USER_PASSWORD=run_as_user_password (Windows systems only)
   - TADDM_DISC3_INSTALL_DIR=/mnt/DVD-disc3-dir

   You can use any text editor to create and edit the response file.
   Sample response files are provided in the support/samples directory.
2. Use one of the following commands to run the silent upgrade from the
   response file:
   - Linux systems (not including Linux on System z):
     `setupLinux.bin -i silent -f /tmp/upgrade.rsp`
   - Linux on System z systems:
     `setupZLinux.bin -i silent -f /tmp/upgrade.rsp`
   - Solaris systems:
     `setupSolarisSparc.bin -i silent -f /tmp/upgrade.rsp`
   - AIX systems:
     `setupAix.bin -i silent -f /tmp/upgrade.rsp`
   - Windows systems:
     `setupWin.bat -i silent -f c:\temp\upgrade.rsp`

Restriction: When you run the TADDM installation wizard `setupWin.bat` on
Windows systems, select the Run as administrator option.
A silent upgrade can be a lengthy process, depending on the number and type
of components that you are upgrading. During the upgrade process, you can
monitor the progress by viewing changes to the upgrade log.
3. To navigate to the directory containing the log files, use one of the following procedures:
   - For Linux, Solaris, AIX, and Linux on System z operating systems, in a terminal window, change to the log file directory: `cd install_dir/installLogs`
   - For Windows operating systems, at a command prompt, change to the log file directory: `cd install_dir\installLogs`

4. Use the `tail` command to watch messages as they are written to the logs. Use this format:
   `tail -f taddm_taddm_version_install_msg.log`

To exit the `tail` program, press Ctrl+C.

**Important:** During installation, the TADDM server is automatically started to perform several database migration steps. If the existing database contains many configuration items, this startup process can take several hours, which can cause the installer to exit with one of the following messages:

- CTJTI0203E (The GUID migration fails because the Tivoli Application Dependency Discovery Manager Server did not start within a specified time).
- CTJTI0191E (The GUID migration fails. See the following log file: log_file. After correcting the problem, run the installation process to resume the upgrade process. Contact Support if unable to resolve the error, a database restore may be required in the event a code fix is necessary).

If you are monitoring the system, you might see that the Proxy service remains in startup mode for several hours as the view information is reprocessed.

If this happens, wait for the server startup to complete, and then restart the installer process to complete migration; the installer automatically resumes at the point where the failure occurred.

5. If the TADDM database is an Oracle database running in an enterprise environment, for all domains that were upgraded, run the `purge recyclebin` command using SQL*Plus.

6. Choose the appropriate method to ensure that new database schema changes take effect and are saved:
   - If the file exists, delete it. Perform a full synchronization to synchronize the new database schema changes.
   - If the file does not exist, a popup message is displayed when performing a full synchronization. Click OK to ensure that implicit relationships are not deleted.

7. If you saved backup copies of any configuration files before upgrading, merge the contents of the backup copies with the contents of the new files installed as part of the upgrade. Complete this step before starting the server.

8. Restart the server.

**Upgrading the database manually**

You can upgrade the database manually if the TADDM server is at the current version, but the database is still at the previous version.
About this task

Typically, the database is automatically upgraded during the TADDM upgrade process. However, in some situations you might need to upgrade the database manually (for example, if a problem during the upgrade process caused the database upgrade to fail).

Procedure

To manually upgrade the database, complete the following steps:

1. If the TADDM server is running, stop the TADDM server.
2. Reorganize the database. For a DB2 database, follow these steps:
   a. Log in as the DB2 database instance owner.
   b. Run the following command:
      ```
      db2 reorgchk update statistics on table all > reorg.out
      ```
   c. In the reorg.out file, look in the reorg column for entries that are marked with a wildcard character. The wildcard character is an asterisk (*). For each line with a wildcard character, run the following command:
      ```
      db2 reorg table tablename
      db2 terminate
      ```
      If you use an Oracle or DB2 for z/OS database, refer to the database software documentation for instructions about how to update database statistics.
3. If you are using a DB2 database, make sure intrapartition parallelism is not enabled on the database server. You can verify this by checking the status of the `intra_parallel` configuration parameter at a DB2 command prompt:
   ```
   db2 get dbm cfg | grep INTRA_PARALLEL
   ```
   **Note:** On Linux and UNIX systems, you must be logged in as the DB2 database instance owner.
   If the `intra_parallel` parameter is set to YES, run the following command:
   ```
   db2 update dbm cfg using INTRA_PARALLEL NO
   ```
   If you modify the `intra_parallel` parameter, you must then restart the DB2 server before continuing with the upgrade process.
4. If you are using a DB2 database, change the `applheapsz` configuration parameter to at least 1536. Log in as the DB2 database instance owner on the DB2 server and run the following command:
   ```
   db2 update db cfg for cmdb using applheapsz 1536
   ```
5. Go to the `$COLLATION_HOME/bin` directory.
6. Use one of the following procedures to upgrade the database:
   - Linux and UNIX systems:
     ```
     migration.sh -s -bv 7.2.1
     ```
   - Windows systems:
     ```
     migration.bat -s -bv 7.2.1
     ```
7. Verify that no errors occurred by checking the `$COLLATION_HOME/log/` migration.log log file. If an error occurred, fix the problem and run the migration script again. If no errors occurred, go to the next step.
8. Start the TADDM server. Wait for the server to start. The server status must be running before you do the next step.
9. Use one of the following procedures to migrate GUID by class:
   - Linux and UNIX systems:
migration.sh -gc -bv 7.2.1
- **Windows systems:**
migration.bat -gc -bv 7.2.1

10. Use one of the following commands to migrate GUID by ID:
- **Linux and UNIX systems:**
migration.sh -gi
- **Windows systems:**
migration.bat -gi

11. Verify that no errors occurred by checking the $COLLATION_HOME/log/migration.log. If an error occurred, fix the problem and run the script again. If no errors occurred, go to the next step.

12. For a domain server database upgrade, use one of the following commands to migrate templates:
- **Linux and UNIX systems:**
migration.sh -t -bv 7.2.1
- **Windows systems:**
migration.bat -t -bv 7.2.1

**Note:** This step is not required for synchronization server database upgrades.

13. Verify that no errors occurred by checking the $COLLATION_HOME/log/migration.log log file. If an error occurred, fix the problem and run the script again.

14. Upgrade the sensor configurations by completing the following steps:
   a. Run the following command, according to the operating system:
      - **For Linux and UNIX systems:**
migration.sh -sc
      - **For Windows systems:**
migration.bat -sc
   b. Check the $COLLATION_HOME/log/migration.log file to verify that no errors occurred. If any errors occurred, see the log files in the $COLLATION_HOME/log/migration/722 directory for more detailed information, including information about how to resolve the errors.

15. Run the following command, according to the operating system, to change the upgrade status to COMPLETED, which enables the TADDM processes to operate:
   - **For Linux and UNIX systems:**
migration.sh -e
   - **For Windows systems:**
migration.bat -e

### Converting a 32-bit TADDM deployment to 64-bit

Follow these steps if you want to upgrade the operating system of your TADDM server from a 32-bit edition to a 64-bit edition while preserving your existing TADDM data.

#### About this task

Upgrading an operating system from a 32-bit edition to a 64-bit edition typically requires a "clean" installation and reinstallation of all applications. However, if you reinstall TADDM from the product DVD, the new installation is unable to access the TADDM database from a previous installation.
To avoid this problem, you can preserve your existing TADDM directory structure and then convert it to a 64-bit deployment after upgrading your operating system.

**Procedure**

1. Make a backup copy of the 32-bit TADDM installation directory and all of its subdirectories. The default installation directory is as follows:
   - Linux and UNIX systems: /opt/IBM/taddm
   - Windows systems: c:\IBM\taddm
   This directory structure includes your entire TADDM server installation.

2. Upgrade the operating system to the 64-bit edition. If possible, preserve the existing file system during the installation.

3. If necessary, restore the 32-bit TADDM directory structure from the backup copy. If you were able to preserve the file system during the operating system upgrade, this step is not necessary.

   **Note:** On AIX, Solaris, and Linux for System z systems, no further conversion is necessary. For Windows and Linux systems, continue with the next step.

4. On Linux and UNIX systems, log on as a non-root user (such as the TADDM user you specified during TADDM installation).

5. Navigate to the $COLLATION_HOME/external/jdk directory.

6. Extract the files in the appropriate archive to the $COLLATION_HOME/external directory:
   - Linux and UNIX systems: jdk-1.5.0-Linux-x86_64.zip
   - Windows systems: jdk-1.5.0-Windows-i386-64.zip
   This step creates a new 64-bit JDK subdirectory:
   - Linux and UNIX systems: $COLLATION_HOME/external/jdk-1.5.0-Linux-x86_64
   - Windows systems: %COLLATION_HOME%\external\jdk-1.5.0-Windows-i386-64

7. Copy the following files to the appropriate locations:

<table>
<thead>
<tr>
<th>File</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>$COLLATION_HOME/lib/websphere/6.1/orb.properties</td>
<td>$COLLATION_HOME/external/64bit_jdk_dir/jre/lib</td>
</tr>
<tr>
<td>$COLLATION_HOME/lib/websphere/6.1/iwsorbutil.jar</td>
<td>$COLLATION_HOME/external/64bit_jdk_dir/jre/lib/ext</td>
</tr>
</tbody>
</table>

where 64bit_jdk_dir is the new 64-bit JDK subdirectory created in the previous step.

**Rolling back the upgrade**

The procedure for rolling back an upgrade differs depending on the operating system of the TADDM server.

**Rolling back the upgrade on a Windows system**

Follow these steps to roll back a server upgrade on a Windows system.

**About this task**

**Note:** These instructions assume the default installation location. If you used a different location when installing and upgrading your server, substitute that path for the paths specified in this task.
Procedure

To roll back a server upgrade on a Windows system, complete the following steps:

1. Stop the server. To stop the server, make sure you are logged in with the user ID that was specified as the owner of the installation when the software was installed. Go to the %COLLATION_HOME%\bin directory. Enter the following command:

   stopserver.bat

   **Note:** On a Windows Server 2008 system, you must run the `stopserver.bat` command with administrator privileges. Use either of these methods:
   - Right-click the Command Prompt icon and then click **Run as administrator**
     to open a command prompt window with administrator privileges. You can then run the `stopserver.bat` command from this command prompt.
   - Use the Windows `runas` command at any command prompt, as in the following example:
     `runas /user:taddm_admin "stopserver.bat"`
     For more information about the `runas` command, refer to the Windows Server 2008 command help.

2. Use the Windows Task Manager to ensure that all TADDM server Java processes are stopped.

3. Restore the server files, using the backup copies you created before the upgrade:
   a. Go to the `c:\ibm\` directory.
   b. Rename the current installation directory to `c:\ibm\cmdb.bak`.
   c. Extract the backup files. For example, use the following command:

      ```
      unzip cmdb.zip
      ```

4. Restore the database. To restore a DB2 database, follow these steps:
   a. Log in as the DB2 database instance owner (for example, `db2inst1`).
   b. Run the following command:

      ```
      db2 restore database cmdb
      ```
      
      where `cmdb` is the name of your database.

      To restore an Oracle or DB2 for z/OS database, refer to the database software documentation for instructions.

5. Start the TADDM server.

What to do next

After the rollback process is complete, you might have one or more directories with the following prefix: `_uninst`. When the directories are empty, you can delete the directories with the `_uninst` prefix. If you have more than one directory with the `_uninst` prefix, the directory with the largest number is the directory that is used for the rollback process.

Rolling back the upgrade on a Linux or UNIX system

Follow these steps to roll back a server upgrade on a Linux or UNIX system.
About this task

Note: These instructions assume the default installation location. If you used a different location when installing and upgrading your server, substitute that path for the paths specified in this task.

Procedure

To roll back a server upgrade on a Linux or UNIX system, complete the following steps:

1. Stop the server. To stop the server, log in with the user ID that was specified as the owner of the installation when the software was installed. Go to the $COLLATION_HOME/bin directory. Enter the following command:
   ```bash
   ./control stop
   ```

2. If all of the Java processes do not stop after you enter the `./control stop` command and wait an appropriate amount of time for the processes to shut down, use the process ID information that is provided by the `ps` command to identify and stop the running Java processes related to TADDM:
   ```bash
   ps -ef | grep java
   ```

3. Delete the TADDM installation directory. The default location is /opt/IBM/taddm.

4. Restore the server files, using the backup you created before the upgrade.
   a. Go to the /opt/IBM directory.
   b. Rename the current installation directory to cmdb.bak.
   c. Extract the backup files. For example, use the following command:
      ```bash
      tar -xvf cmdb.tar
      ```

5. Use the following command to change file ownership to non-root (run as user):
   ```bash
   chown non-root_user_ID: non-root_user_group collation_home
   ```
   For example, `chown cmdbuser : cmdbgrp /opt/ibm/taddm/dist`

6. Restore the database. To restore a DB2 database, follow these steps:
   a. Log in as the DB2 database instance owner (for example, `db2inst1`).
   b. Run the following command:
      ```bash
      db2 restore database cmdb
      ```
      where `cmdb` is the name of your database.
      To restore an Oracle or DB2 for z/OS database, refer to the database software documentation for instructions.

7. Start the TADDM server.

Uninstalling TADDM

Follow these instructions to uninstall a TADDM server or other components.

Uninstalling a TADDM server

The uninstallation process is the same for all types of TADDM server. You can uninstall the server using the uninstallation wizard, console uninstallation, or silent uninstallation.

Uninstalling a TADDM server in wizard or console mode

You can uninstall the TADDM server interactively using the uninstallation wizard or console mode.
Before you begin

**Important:** The TADDM installation program generates a unique server key for each installation. If you uninstall and reinstall TADDM, you cannot reconnect to a preexisting domain database that was encrypted for a previous TADDM installation. To ensure that you can recover from file system failures or other problems that necessitate restoring the TADDM file system, regularly back up your TADDM installation.

Before you start the uninstallation processes, back up the server.

When you run the uninstallation process from a Windows computer, use a Windows logon ID with Administrator authority.

When you run the uninstallation process from a Linux, Solaris, AIX, or Linux for System z operating system, use the same type of ID, either root or non-root user ID, that you used to complete the installation process.

If you do not know what ID was used to complete the installation process, look at the owner of the `taddm` directory. This ID was used for the installation process. Use this type of ID to complete the uninstallation process.

**Procedure**

To uninstall the server, complete the following steps:

1. Optional: If you are uninstalling a synchronization server, you must first delete the domain from the synchronization server:
   a. Log in to the Data Management Portal running on the synchronization server using the Administrator account.
   b. In the Domain Summary pane, select the domain to delete.
   c. Click **Delete**.
   d. When prompted, click **Yes** to confirm that you want to delete the selected domain.

   **Note:** Deleting a domain can take a long time to complete. The domain is deleted from your enterprise and removed from the Domain Summary table.

2. Close all browser windows.

3. Use one of the following procedures to stop the server:
   - For Linux, Solaris, AIX, and Linux on System z operating systems, run the following command:
     
     ```bash
     $COLLATION_HOME/bin/control stop
     ```
   - For Windows operating systems, run the following command:
     
     ```bat
     %COLLATION_HOME%\bin\stopserver.bat
     ```

   **Note:** On a Windows Server 2008 system, you must run the `stopserver.bat` command with administrator privileges. Use either of these methods:
   - Right-click the Command Prompt icon and then click **Run as administrator** to open a command prompt window with administrator privileges. You can then run the `stopserver.bat` command from this command prompt.
   - Use the Windows `runas` command at any command prompt, as in the following example:
runas /user:taddm_admin "stopserver.bat"

For more information about the runas command, refer to the Windows Server 2008 command help.

Before continuing, verify that all TADDM processes have stopped. You can do this by using the ps command on Linux and UNIX systems, or Task Manager on Windows systems.

4. Run one of the following uninstallation commands:
   • For Linux, Solaris, AIX, and Linux on System z operating systems:
     `TADDM_install_dir/_uninstall/uninstall [-i console]`
     where `TADDM_install_dir` is the directory where you installed TADDM (the default installation directory on Linux and UNIX systems is `/opt/IBM/taddm`).
   • For Windows operating systems:
     `TADDM_install_dir\_uninstall\uninstall.exe [-i console]`
     where `TADDM_install_dir` is the directory where you installed TADDM (the default installation directory on Windows systems is `c:\ibm\taddm`). Specify the `-i console` option to run the uninstallation in console mode.

After the uninstallation process is complete, a summary window is displayed. A message also states that the uninstallation process is complete.

5. Click Finish to exit the uninstallation process.

What to do next

After the uninstallation process is complete, log files and a few additional files remain in the directory. For Windows operating systems, you might have one or more directories with the following prefix: _uninstall. When the directories are empty, you can delete the directories with the _uninstall prefix. If you have more than one directory with the _uninstall prefix, the directory with the largest number is the directory used for the uninstallation process.

Silently uninstalling a TADDM server

To silently uninstall a TADDM server, you must first create an uninstallation response file.

About this task

Note: Silent uninstallation is not supported if a firewall exists between IBM Tivoli CCMDB and TADDM resources.

Procedure

To run a silent uninstall of the server using a response file, complete the following steps:
1. Create an uninstall response file containing the following values, with a text editor:
   ```
   REMOVE_ALL_FILES=true
   Valid values are true or false.
   DROP_DB2_DB=true
   Valid values are true or false
   UNINSTALL_DB2=true
   Valid values are true or false
   ```
A sample uninstall response file is provided in the sample folder.

- For Linux, Solaris, AIX, and Linux on System z operating systems:
  support/samples/
- For Windows operating systems: support\samples\

2. Run one of the following uninstall commands:
   - For Linux, Solaris, AIX, and Linux on System z operating systems:
     TADDM_installDir/_uninstall/uninstall –i silent –f /tmp/uninstall.rsp
   - For Windows operating systems:
     TADDM_installDir\_uninstall\uninstall.exe –i silent –f \tmp\uninstall.rsp

   In the preceding examples, the uninstall response file created is named uninstall.rsp.

**What to do next**

You can also run the uninstall from the command line:

- For Linux, Solaris, AIX, and Linux on System z operating systems:
  TADDM_installDir/_uninstall/uninstall –i silent DREMOVE_ALL_FILES=true –DDROP_DB2_DB=true –DUNINSTALL_DB2=true
- For Windows operating systems:
  TADDM_installDir\_uninstall\uninstall.exe –i silent DREMOVE_ALL_FILES=true –DDROP_DB2_DB=true –DUNINSTALL_DB2=true

**Uninstalling the self-monitoring tool**

You can uninstall the self-monitoring tool using either the uninstallation wizard or silent uninstallation.

**Note:** Console uninstallation is not available for the self-monitoring tool.

**Uninstalling the self-monitoring tool in wizard mode**

A wizard guides you through the uninstallation process for the self-monitoring tool.

**Procedure**

To uninstall the self-monitoring tool, complete the following steps:

1. Go to the $COLLATION_HOME/itmconfig/_uninstall directory.
2. While logged on as the root user, run the uninstall command.
3. Follow the instructions in the wizard to complete the uninstallation.

**Results**

By default, the uninstaller runs in the same mode that was used for installation.

For example, if the installer was run in silent mode, the uninstall command with no parameters runs the uninstaller in silent mode. To force a wizard uninstallation, use the command uninstall -i gui.

**Silently uninstalling the self-monitoring tool**

You can use silent uninstallation to uninstall the self-monitoring tool without user interaction.
Procedure

To silently uninstall the self-monitoring tool, complete the following steps:
1. Go to the $COLLATION_HOME/itmconfig/_uninstall directory.
2. While logged on as the root user, run the `uninstall` command, specifying silent installation. Use the following syntax:
   `uninstall -i silent`

Results

Note: If you do not specify the `-i` parameter, the uninstaller runs by default in the same mode that was used for installation. For example, if the installer was run in silent mode, the `uninstall` command with no parameters runs the uninstaller in silent mode.

Uninstalling the Tivoli Netcool Performance Flow Analyzer server

As part of the TADDM server uninstallation process, you can optionally uninstall the Tivoli Netcool Performance Flow Analyzer on the same system.

Procedure

To uninstall the Tivoli Netcool Performance Flow Analyzer server separately, or to uninstall it on a remote server, complete the following steps:
1. On the system where the Tivoli Netcool Performance Flow Analyzer server is installed, log in with a user ID that has root privileges.
2. Go to the `_uninstall` subdirectory of the Tivoli Netcool Performance Flow Analyzer installation directory.
3. Run the uninstallation command:
   `aurora deinstall`
4. Follow the instructions in the wizard to complete the uninstallation.

Uninstalling IBM Tivoli Monitoring workspaces and situations for TADDM

After you uninstall the self-monitoring tool, you must uninstall IBM Tivoli Monitoring workspaces and situations for TADDM to complete the uninstallation process.

Procedure

To uninstall workspaces and situations for TADDM, complete the following steps:
1. Uninstall the self-monitoring tool.
2. Stop the IBM Tivoli Monitoring Universal Agent that is running on the server for TADDM:
   a. Log in to the host system for TADDM as root.
   b. Run the following command:
      `ITM_INSTALL_DIRECTORY/bin/itmcmd agent stop um`
3. Go to the Tivoli Enterprise Portal.
4. Remove the Universal Agent from the TADDM server. For more information about removing the agent, go to the Tivoli Monitoring User’s Guide, part of the IBM Tivoli Monitoring, Information Center.
You can completely remove this system from the IBM Tivoli Monitoring environment by removing all other agents installed. If you require the Universal Agent remove it now and reinstall after completing the remaining steps.

5. Open the situation editor and expand the Universal Data Provider.
6. Delete all situations with names that begin with “CMDB”.
7. Delete all workspaces with names that begin with “Application Dependency”. For more information about workspaces, go to the IBM Tivoli Monitoring Information Center.
8. In the IBM Tivoli Monitoring file system, delete the following files:
   - `ITM_INSTALL_DIRECTORY\cms\KUM_CMDBWICMS.LVL`
   - `ITM_INSTALL_DIRECTORY\cms\SQLLIB\kum_cmdb.sql`
   - `ITM_INSTALL_DIRECTORY\cms\SQLLIB\kum_cmdb_del.sql`
   - `ITM_INSTALL_DIRECTORY\CNPS\KUM_CMDBWICNS.LVL`
   - `ITM_INSTALL_DIRECTORY\CNPS\SQLLIB\kum_cmdb_kcj.sql`
   - `ITM_INSTALL_DIRECTORY\CNPS\SQLLIB\kum_cmdb_pres.sql`
   - `ITM_INSTALL_DIRECTORY\installITM\KUM_CMDBWICMS.VER`
   - `ITM_INSTALL_DIRECTORY\installITM\KUM_CMDBWICNS.VER`

Troubleshooting installation problems

This information covers common problems that occur with installing or uninstalling IBM Tivoli Application Dependency Discovery Manager (TADDM).

In a test environment, you can use the TADDM installer to create a remote TADDM DB2 database using DB2 client

Problem
If you do not have the DB2 client installed on the TADDM server when creating a remote TADDM DB2 database, you receive an error message that states that the db2cmd.exe file is not found.

You receive the following error message after the DB2 installation panel:
"db2cmd.exe" was not found.

Solution
In a production environment, do not install the TADDM server and the DB2 database on the same system. Install TADDM and the DB2 database on separate systems. On the system used for the DB2 database, manually run the scripts to create the database.

In a test environment, if you use the DB2 client to create the remote TADDM DB2 database, complete the following steps:
1. Install the DB2 client. See the DB2 documentation for instructions.
2. Install the appropriate DB2 fix pack. See the DB2 documentation for instructions.
3. Catalog the database node. See the DB2 documentation for instructions.
4. Create the local DB2 instance ID. The user ID must be the same as the user ID on the DB2 server. See the DB2 documentation for instructions.
5. Create the archuser user ID. The user ID must be the same as the user ID on the DB2 server. See the DB2 documentation for instructions.
Alternately, in test and production environments, you can create a remote TADDM DB2 database by using a script, `make_db2_db`, provided with the TADDM installation program. It is not required that you use the script that is provided with the TADDM installation program. This script is an example of a script that can be used. If used, the script creates a properly configured database for TADDM. You can use a different script that conforms to standards for your environment.

If you use the `make_db2_db` script, the existing database or users in your DB2 database are deleted when the `make_db2_db` script runs.

1. From the product DVD, copy the following file to the system where the DB2 database is installed:
   - For Linux, Solaris, AIX, and Linux on System z operating systems, `support/bin/make_db2_db.sh`
   - For Windows operating systems, `support\bin\make_db2_db.bat`

2. Use one of the following procedures to run the `make_db2_db` script on the system where the DB2 database is installed:
   - For Linux, Solaris, AIX, and Linux on System z operating systems, complete these steps:
     a. Log in as the DB2 instance owner. For example, you can use the `db2inst1` ID.
     b. Run the following command: `make_db2_db.sh cmdb`
   - For Windows operating systems, complete these steps:
     a. Open the DB2CMD command prompt.
     b. Run the following command: `make_db2_db.bat cmdb`

The DB2 client is used only for database creation during installation. After installation, the TADDM server does not use the DB2 client.

**SUSE Linux for System z operating system has memory problem**

**Problem**

When uninstalling TADDM on a computer with SUSE Linux for the IBM System z operating system, SUSE Linux runs out of memory.

The computer where TADDM is installed with SUSE Linux for the System z operating system must have 4 - 8 GB of memory. This problem occurs if the computer has less than 4 GB of memory.

**Solution**

Before you uninstall the TADDM server, stop the server. If you do not stop the server, the system might run out of memory during the uninstall process, which means the uninstall process never completes in an orderly way. In this case, complete the following steps:

1. Stop the uninstall process.
2. Run the following command to stop all Java processes:
   ```
   ps -ef | grep java
   ```
3. Run the following command, where `pid` is the process ID that is displayed as a result of running the preceding command:
   ```
   kill pid
   ```
4. Uninstall the TADDM server.
TADDM installed on system with an Internet connection that is incorrectly configured

Problem
The TADDM installation process was successful, but the installation process was performed on a system where the Internet connection is incorrectly configured. The discovery process does not find any configuration items.

The Internet connection is fixed and a new IP address is assigned. During this process, all users of the system must redefine their user ID and password. TADDM fails with a DBInit Fails error.

Solution
The password for both database users (the primary and archive users) must be reset and manually tested before TADDM restarts successfully.

TADDM installation fails on a computer that is using a remote mounted CD/DVD on System z operating system

Problem
When you attempt to install TADDM on a computer that is using a remote mounted CD/DVD on System z operating system, the installer GUI does not appear and the installation does not start.

Solution
1. Copy the entire TADDM install image contents of the installer DVD on System z to the local drive of the computer on which you are trying to install TADDM.
2. From the local directory where you copied the files, run the following script:
   setupZLinux.bin

Password verification fails on a 64-bit Windows system even when the user ID and password are correct

Problem
When you attempt to install TADDM on a 64-bit Windows system, the installer is unable to successfully verify your password on the Runtime User Information page of the installation wizard, even if the user ID and password are correct.

Solution
This problem can occur on a 64-bit Windows system if the name of the %temp% directory includes non-ASCII characters. Because the default %temp% directory is based on the user that is currently logged on, this can happen if your user ID includes non-ASCII characters (for example, Russian characters).

To avoid the problem, use either of the following workarounds:

- Reset the temp environment variable so that it refers to a directory whose name includes only ASCII characters. For example, use this command to use the c:\temp directory:
  set TEMP=c:\temp

  Note: Make sure that the directory you specify exists.
- Set the FORCE_OEM_CHARSET environment variable to specify the active code page. For example, if the active code page is 852, run the following command:
  set FORCE_OEM_CHARSET=852
You can determine the active code page by running the `chcp` command.

After using either of these workarounds, run the TADDM installation wizard (`setupWin.bat`) from the same command-line session.

**Restriction:** When you run the TADDM installation wizard `setupWin.bat` on Windows operating systems, select the **Run as administrator** option. Otherwise, the installation will fail.

**TADDM installation fails on a 64-bit Windows system because of missing files**

**Problem**
When you attempt to install TADDM on a 64-bit Windows system, the installation fails, and error messages in the logs indicate that required installation files could not be found (for example, `install.vbs`).

**Solution**
This problem can occur on a 64-bit Windows system if the name of the `%temp%` directory includes non-ASCII characters. For more information, see “Password verification fails on a 64-bit Windows system even when the user ID and password are correct” on page 103.

**You cannot see part of the installation wizard window**

**Problem**
If you are using a low screen resolution such as 640x480 pixels, you might not see part of the installation wizard window, including some of the control buttons.

**Solution**
If possible, change the screen resolution to a minimum of 1024x768, and then run the installation wizard again.

If you cannot change the screen resolution, run the TADDM installation in console mode by using the `-i console` option. For more information, see “Installing the TADDM server at a console” on page 66.

**The Tivoli Netcool Performance Flow Analyzer installer fails to start**

**Problem**
If you run the wrong Tivoli Netcool Performance Flow Analyzer installer binary file for your operating system, you might see a misleading message that indicates success even though the installer does not start. For example, if you try to run the Solaris binary file on a Linux system, the following messages is displayed:

```
Launching installer...
./setupTNPFASolaris.bin: line 2432: /tmp/install.dir.17107/Solaris/resource/jre/jre/bin/java: cannot execute binary file
./setupTNPFASolaris.bin: line 2432: /tmp/install.dir.17107/Solaris/resource/jre/jre/bin/java: Success
```

**Solution**
Make sure that you are running the correct installer binary file for your operating system.
Installation fails on a Windows system because of incorrect .vbs file association

Problem
If you try to run the TADDM installer on a Windows system where the file type association for the extension .vbs has been changed from the default value, the installation fails, and the following message is displayed in the taddm_7.2.1_install_msg.log file:

Input Error: There is no script engine for file extension ".vbs"

Solution
Make sure the Windows file type association for the extension .vbs is set to Microsoft Console Based Script Host. For more information about how to set file associations, see the Microsoft Windows documentation.

Installation fails because of an error extracting from common.zip

Problem
Under some circumstances, the installation process on a Windows system fails, and a message in the logs indicates an error extracting files from the common.zip file. This message usually indicates that the file has been locked by another process.

Solution
Restart the Windows system and run the installation process again.

Error when running make_ora_cms_dis script

Problem
Under some circumstances, the make_ora_cms_dis script fails while attempting to configure the database for the Context Menu Service and Data Integration Service. The following error is displayed in the log file:

ERROR at line 1:
ORA-01119: error in creating database file 'DISTSO0.dbf'
ORA-27038: created file already exists
OSD-04010: <create> option specified, file already exists

Solution
Search the database server for the following files (typically found in the $ORACLE_HOME/database directory):
• DISTSO0.dbf
• DISTSO1.dbf

Rename these files (for example, DISTSO0.dbf.old) and then run the make_ora_cms_dis script again.

Installation fails on AIX system with no "/usr/bin -> /bin" directory link

Problem
When running the installer on an AIX system, the installation fails with the following error message:

-bash: ./setupAix.bin: /bin/sh: bad interpreter: No such file or directory

Solution
This error occurs when the AIX system does not have a symbolic link established between files in the /bin directory and the /usr/bin directory that contains the AIX shell.

To correct the problem:
1. Navigate to the root directory.
2. Run the following command:
   
   ```bash
   ln -s /usr/bin/ /bin
   ```

3. Verify the link by running the following command:

   ```bash
   ls -ld /bin
   ```

   If you see the files in the `/usr/bin` directory, the link is established correctly.

4. Run the installer again.

**Missing file message during installation**

**Problem**
During installation on a Solaris system, the following message is displayed:

```
./setupSolarisSparc.bin: !: not found
```

**Solution**
This message can be disregarded. Continue with the installation.

**Installation fails on remote system**

**Problem**
If you start the installer on a remote system by using telnet or SSH, but do not specify the `-i console` option. The installer attempts to use console mode installation but fails.

**Solution**
When starting the installation that uses telnet or SSH, make sure that you explicitly specify console mode installation, as in the following example:

```
setupAix.bin -i console
```

**Installation cannot proceed when using a custom temporary directory in a Linux environment**

**Problem**
If you use a custom temporary directory to install TADDM for example, `setupLinux.bin -t /path/to/custom/tmp`, the installation might not proceed on a Linux system. An error stating that there is not insufficient space (0 bytes free) can be displayed. The installation log has additional information as shown in the following example:

```
(from runCommand(content, envs, filetype)) - null
Caused by: java.lang.NullPointerException
at: com.ibm.cdb.install.ia.utils.Utils.setFileExecutable(Utils.java:2472)
```

**Solution**
Check the option that was used to mount the temporary directory. You cannot use the `noexec` option. This option prevents direct execution of any binary files found in the custom temporary folder. Use the `exec` option to mount the temporary directory before carrying out the installation.

**Installation fails because of the missing files**

**Problem**
When you install TADDM on Windows operating systems, the following errors occur:

- The following message is displayed on the first installation panel:
  
  ```
  CTJTI0017E The following file is not found: \collation\common.zip.
  ```
A message about missing files in log files is displayed shortly after running the installation.

Solution
When you create administrator account manually on Windows operating systems, run the TADDM installation wizard setupWin.bat as administrator. Select the Run as administrator option.

Troubleshooting upgrade problems
This information covers common problems that occur when upgrading the TADDM database.

Schema verification failed during the upgrade
Problem
During a database upgrade, multiple checks are performed to verify the database. For example, the structure of each table, index, and primary key are verified. If problems are identified that cannot be automatically solved, you must manually fix the problem. Check the $COLLATION_HOME/log/migration/TADDM-version/date-time-PrimarySchema.log and $COLLATION_HOME/log/migration/TADDM-version/date-time-SecondarySchema.log files and if a schema verification failed error occurred then you must correct the problem.

Solution
Identify the cause of the problem, check the list of messages before the Schema verification failed error occurred in the $COLLATION_HOME/log/migration/TADDM-version/date-time-DbMessages.log file. You must have access to the TADDM database Data Definition Language (DDL) statements. Create and run the DDL statements to correct the problem. After correcting the problem, restart the upgrade. The database is verified again before continuing with the upgrade.

The following sections describe specific problems and solutions that are identified during the upgrade verification process.

Schema verification failed because the index is missing
Problem
For example, a problem of a missing index occurs when upgrading a DB2 database and TADDM on a Linux system. Check the $COLLATION_HOME/log/migration/TADDM-version/date-time-DbMessages.log file. Use the grep command to search the log file: grep verify_migration date-time-DbMessages.log. The following sample shows a missing index problem in the log file:

solution
mig_verify_migration: Missing index CHANGE_HISTORY_TABLE.CH_WHEN_INDEX on columns: WHEN_CHANGED+HANDLED_BY_STATE_MANAGER+TYPE_OF_EVENT+ACTUAL_CHANGE_TYPE+OBJECT_ID

Solution
To solve the problem, complete the following steps:
1. Enter the following commands to extract the TADDM DDL statements:
   mkdir /tmp/TADDM_DDL
   cp $COLLATION_HOME/sdk/lib/oal-topomgr.jar /tmp/TADDM_DDL/
   cd /tmp/TADDM_DDL/
   $COLLATION_HOME/external/jdk-1.5.0-Linux-i686/bin/jar xf oal-topomgr.jar db2/oracle/
2. Find the DDL statement required to create the missing index:
   grep CH_WHEN_INDEX db2/*
3. Connect to the database by using the correct user ID, the correct user ID is dependent on which schema verification step has failed:
   db2 connect to CMDB USER archuser USING password

4. Run the DDL statement found in step 2 and create the missing index:
   db2 "CREATE INDEX CH_WHEN_INDEX ON CHANGE_HISTORY_TABLE
   (WHEN_CHANGED ASC, HANDLED_BY_STATE_MANAGER ASC, TYPE_OF_EVENT ASC,
   ACTUAL_CHANGE_TYPE ASC, OBJECT_ID ASC)"

5. Optional: If the verification process failed as a result of a problem with the primary schema, then it is almost certain that the same problem exists in the secondary schema. You can check and correct the problem using the same approach in the secondary schema before starting the upgrade. You can also correct the problem later after a verification step fails on the secondary schema.

6. Restart the upgrade. The database is verified again before continuing with the upgrade.

**Schema verification failed because the index definition is wrong**

**Problem**
For example, a problem of a wrong index definition occurs when upgrading a DB2 database and TADDM on a Linux system. Check the $COLLATION_HOME/log/migration/TADDM-version/date-time-
DbMessages.log. Use the grep command to search the log file: grep verify_migration date-time-DbMessages.log. The following sample shows a wrong index definition in the log file:

```
mig_verify_migration: Wrong index definition for FCPORTRoles_x.I_FCPORTRDCF26330
existing: +PK__JDOIDX+PK__ROLES_x+JDOORDERX expected: +PK__JDOIDX+JDOORDERX+PK__ROLES_x
```

**Solution**
To solve the problem, complete the following steps:

1. Enter the following commands to extract the TADDM DDL statements:
   ```
   mkdir /tmp/TADDM_DDL
   cp $COLLATION_HOME/sdk/lib/oal-topomgr.jar /tmp/TADDM_DDL/
   cd /tmp/TADDM_DDL/
   $COLLATION_HOME/external/jdk-1.5.0-Linux-i686/bin/jar xf oal-topomgr.jar db2/oracle/
   ```

2. Find the DDL statement required to create the index which contains the wrong definition:
   ```
grep FCPORTRDCF26330 db2/*
```

3. Connect to the database by using the correct user ID, the correct user ID is dependent on which schema verification step has failed:
   `db2 connect to CMDB USER archuser USING password`

4. Drop the existing index:
   ```
db2 "DROP INDEX I_FCPORTRDCF26330"
```

5. Run the DDL statement found in step 2 and create the index:
   ```
db2 "CREATE INDEX I_FCPORTRDCF26330 ON FCPORTRRoles_x
   (PK__JDOIDX, JDOORDERX ASC, PK__ROLES_x ASC)"
```

6. Optional: If the verification process failed as a result of a problem with the primary schema, then it is almost certain that the same problem exists in the secondary schema. You can check and correct the problem using the same approach in the secondary schema before starting the upgrade. You can also correct the problem later after a verification step fails on the secondary schema.

7. Restart the upgrade. The database is verified again before continuing with the upgrade.
Schema verification failed because the index definition is wrong (mixed)

Problem
For example, a problem of a wrong index definition (mixed) occurs when upgrading a DB2 database and TADDM on a Linux system. Check the $COLLATION_HOME/log/migration/TADDM-version/date-time-DbMessages.log. Use the grep command to search the log file: grep verify_migration date-time-DbMessages.log. The following sample shows a wrong index definition in the log file:

```
mig_verify_migration: Wrong index definition for HIRDBUNIT.HIRDBUNITPEA483236 existing: +PK__DICTIONARYSERVER_X expected: +PK__PARENTHIRDBUNIT_X
mig_verify_migration: Wrong index definition for HIRDBUNIT.HIRDBUNITDF7FAE72C existing: +PK__PARENTHIRDBUNIT_X expected: +PK__DICTIONARYSERVER_X
```

Solution
To solve the problem, complete the following steps:

1. Connect to the database by using the correct user ID, the correct user ID is dependent on which schema verification step has failed:
   ```
   db2 connect to CMDB USER archuser USING password
   ```

2. The PK__PARENTHIRDBUNIT_X and PK__DICTIONARYSERVER_X entries are indexed but you must rename the indexes. Create and run statements to rename the indexes:
   ```
   db2 "RENAME INDEX HIRDBUNITPEA483236 TO TEMPINDEXNAME"
   db2 "RENAME INDEX HIRDBUNITDF7FAE72C TO HIRDBUNITPEA483236"
   db2 "RENAME INDEX TEMPINDEXNAME TO HIRDBUNITDF7FAE72C"
   ```

3. Optional: If the verification process failed as a result of a problem with the primary schema, then it is almost certain that the same problem exists in the secondary schema. You can check and correct the problem using the same approach in the secondary schema before starting the upgrade. You can also correct the problem later after a verification step fails on the secondary schema.

4. Restart the upgrade. The database is verified again before continuing with the upgrade.

Schema verification failed because the primary key definition is missing or wrong

Problem
For example, a problem with a missing or wrong primary key occurs when upgrading a DB2 database and TADDM on a Linux system. Check the $COLLATION_HOME/log/migration/TADDM-version/date-time-DbMessages.log. Use the grep command to search the log file: grep verify_migration date-time-DbMessages.log. The following sample shows a missing primary key in the log file:

```
mig_verify_migration: Missing primary key DISCRUN.DISCRUN_PK
mig_verify_migration: Missing column PK_X in primary key DISCRUN.DISCRUN_PK
```

Solution
To solve the problem, complete the following steps:

1. Enter the following commands to extract the TADDM DDL statements:
   ```
   mkdir /tmp/TADDM_DDL
   cp $COLLATION_HOME/sdk/lib/oal-topomgr.jar /tmp/TADDM_DDL/
   cd /tmp/TADDM_DDL/
   $COLLATION_HOME/external/jdk-1.5.0-Linux-i686/bin/jar xf oal-topomgr.jar db2/oracle
   ```

2. Find the DDL statement required to create the primary key which contains the missing or wrong definition:
   ```
   grep DISCRUN_PK db2/*
   ```
3. Connect to the database by using the correct user ID, the correct user ID is dependent on which schema verification step has failed:
   db2 connect to CMDB USER archuser USING password
4. Drop the existing primary key:
   db2 "ALTER TABLE DISCRUN DROP PRIMARY KEY"
5. Run the DDL statement found in step 2 and create the primary key:
   db2 "ALTER TABLE DISCRUN ADD CONSTRAINT DISCRUN_PK PRIMARY KEY (PK_X)"
6. Optional: If the verification process failed as a result of a problem with the primary schema, then it is almost certain that the same problem exists in the secondary schema. You can check and correct the problem using the same approach in the secondary schema before starting the upgrade. You can also correct the problem later after a verification step fails on the secondary schema.
7. Restart the upgrade. The database is verified again before continuing with the upgrade.

**Batch Element Error**

**Problem**
DB2 SQL Error: SQLCODE=-803, SQLSTATE=23505, SQLERRMC=1;user.ALIASES, DRIVER=3.62.56

**Solution**
This error can be ignored. The error indicates that an object cannot have aliases updated nor inserted for the class. These objects are typically orphans and get deleted automatically with cleanup agents or by running verify-data.sh/bat

on completion of the migration.

**DB2 SQL error: SQLCODE: -964, SQLSTATE: 57011, SQLERRMC: null**

**Problem**
During a database migration, the following error occurs:
DB2 SQL error: SQLCODE: -964, SQLSTATE: 57011, SQLERRMC: null

**Solution**
This error means that the transaction log size is too small. The size of LOGPRIMARY must be increased.

Use the following steps to increase the size of LOGPRIMARY:
- Run db2 get db cfg for dbname | grep LOGP
- Multiply the result by at least 3.
- Run db2 update db cfg for dbname using LOGPRIMARY=newvalue.
- Rerun the upgrade.
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