A Simplified Approach to IBM Tivoli Directory Server V5.2 Replication
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Replication for fun and profit

Replication is a technique used by directory servers to improve performance, availability, and reliability. The replication process keeps the data in multiple directory servers synchronized.

Replication provides three main benefits:
- Redundancy of information - Replicas back up the content of their supplier servers.
- Faster searches - Search requests can be spread among several different servers, instead of a single server. This improves the response time for the request completion.
- Security and content filtering - Replicas can contain subsets of the data in a supplier server.

Overview of replication

This section presents a high-level description of the various types of replication topologies.

Simple replication

The basic relationship in replication is that of a master server and its replica server. The master server can contain a directory or a subtree of a directory. The master is writable, which means it can receive updates from clients for a given subtree. The replica server contains a copy of the directory or a copy of part of the directory of the master server. The replica is read only; it cannot be directly updated by clients. Instead it refers client requests to the master server, which performs the updates and then replicates them to the replica server.

A master server can have several replicas. Each replica can contain a copy of the master’s entire directory, or a subtree of the directory. In the following example Replica 2 contains a copy of the complete directory of the Master Server, Replica 1 and Replica 3 each contain a copy of a subtree of the Master Server's directory.

![Diagram of master-replica replication](image)

*Figure 1. Master-replica replication*

The relationship between two servers can also be described in terms of roles, either supplier or consumer. In the previous example the Master Server is a supplier to each of the replicas. Each replica in turn is a consumer of the Master Server.
Cascading replication

Cascading replication is a topology that has multiple tiers of servers. A master server replicates to a set of read-only (forwarding) servers that in turn replicate to other servers. Such a topology off-loads replication work from the master server. In the example of this type of topology, the master server is a supplier to the two forwarding servers. The forwarding servers serve two roles. They are consumers of the master server and suppliers to the replica servers associated with them. The replica servers are consumers of their respective forwarding servers. For example:

![Diagram of cascading replication]

**Figure 2. Cascading replication**

Peer-to-peer replication

There can be several servers acting as masters for directory information, with each master responsible for updating other master servers and replica servers. This is referred to as peer replication. Peer replication can improve performance, availability, and reliability. Performance is improved by providing a local server to handle updates in a widely distributed network. Availability and reliability are improved by providing a backup master server ready to take over immediately if the primary master fails. Peer master servers replicate all client updates to the replicas and to the other peer masters, but do not replicate updates received from other master servers.

**Note:** There is no entry conflict resolution in peer-to-peer replication.

The following is an example of peer-to-peer replication:

![Diagram of peer-to-peer replication]

**Figure 3. Peer-to-peer replication**
**Gateway replication**

Gateway replication is a more complex adaptation of peer-to-peer replication that extends replication capabilities across networks. The most notable difference is that a gateway server does replicate changes received from other peer servers through the gateway.

A gateway server must be a master server, that is, writable. It acts as a peer server within its own replication site. That is, it can receive and replicate client updates and receive updates from the other peer-master servers within the replication site. It does not replicate the updates received from the other peer-masters to any servers within its own site.

Within the gateway network, the gateway server acts as a two-way forwarding server. In one instance, its peers in its replication site act as the suppliers to the gateway server and the other gateway servers are its consumers. In the other instance the situation is reversed. The other gateway servers act as suppliers to the gateway server and the other servers within its own replication site are the consumers.

Gateway replication uses gateway servers to collect and distribute replication information effectively across a replicating network. The primary benefit of gateway replication is the reduction of network traffic. For example:

![Gateway replication diagram](image)

**Figure 4. Gateway replication**

**Getting started with replication**

**Note:** Before starting to set up your replication topology, make a backup copy of your original ibmslapd.conf file. You can use this backup copy to restore your original configuration if you encounter difficulties with replication.

The following diagram shows a basic master-replica topology:
To define a basic master-replica topology, you must:

1. **Create a master server** and define what it contains. Select the subtree that you want to be replicated and specify the server as the master.
2. Create credentials to be used by the supplier.
3. **Create a replica server**.
4. Export data to the replica.

The following sections explain how to accomplish these tasks.

**Note:** These procedures assume that all servers involved are IBM® Tivoli® Directory Server version 5.2 servers. They also assume that you have installed and can use the Web Administration Tool. See the *IBM Tivoli Directory Server Version 5.2 Installation Guide* for information about installing the Web Administration Tool.

### Creating a master server (replicated subtree)

**Note:** The servers must be running to perform this task.

This task designates an entry as the root of an independently replicated subtree and creates an `ibm-replicasubentry` representing this server as the single master for the subtree. To create a replicated subtree, you must designate the subtree that you want the server to replicate.

1. Use the Web Administration Tool to log on to the master server.
2. Expand the Replication management category in the navigation area of the Web Administration Tool and click **Manage topology**.
3. Click **Add subtree**.
4. Enter the DN of the subtree that you want to replicate or click **Browse** to expand the entries to select the entry that is to be the root of the subtree.

**Note:** If you are not using a suffix, there are other requirements. See the *IBM Tivoli Directory Server Version 5.2 Administration Guide*.

5. The master server referral URL is displayed in the form of an LDAP URL; for example:

```
ldap://<myservername>.<mylocation>.<mycompany>.com
```

**Note:** The master server referral URL is optional. It is used only:

- If the server contains (or will contain) any read-only subtrees.
To define a referral URL that is returned for updates to any read-only subtree on the server.

6. Click OK.
7. The new server is displayed on the Manage topology panel under the heading Replicated subtrees.

Creating credentials
Credentials identify the method and required information, such as a DN and password, that the supplier uses in binding to the consumer.

1. If you have not already do so, use the Web Administration Tool to log on to the master server.
2. Expand the Replication management category in the navigation area of the Web Administration Tool and click Manage credentials.
3. Select cn=replication,cn=IBMpolicies to store the credentials from the list of subtrees.
4. Click Add.
5. Enter the name for the credentials you are creating; for example, mycreds, cn=
is prefilled in the field for you.
6. Select Simple bind as the type of authentication and click Next.
   • Enter the DN that the server uses to bind to the replica; for example, cn=any
     Note: This DN cannot be the same as your server administration DN.
   • Enter the password the server uses when it binds to the replica; for example, secret.
   • Enter the password again to confirm that there are no typographical errors.
   • If you want, enter a brief description of the credentials.
   • Click Finish.

Note: You might want to record the credential’s bind DN and password for future reference. You will need this password when you create the replica agreement.

Creating a replica server

Note: The servers must be running to perform this task.

On the master server:
1. If you have not already do so, use the Web Administration Tool to log on to the master server.
2. Expand the Replication management category in the navigation area of the Web Administration Tool and click Manage topology.
3. Select the subtree that you want to replicate and click Show topology.
4. Click the arrow next to the Replication topology selection to expand the list of supplier servers.
5. Select the supplier server and click Add replica.
6. On the Server tab of the Add replica window:
   • Enter the host name of the replica server. Do not change the default non-SSL port (389).
   • Leave the Enable SSL check box unchecked.
   • Enter the replica name or leave this field blank to use the host name.
• Enter the replica ID. If the server on which you are creating the replica is running, click **Get replica ID** to automatically prefill this field. This is a required field, if the server you are adding is going to be a peer or forwarding server. It is recommended that this be filled in for all IBM Tivoli Directory Server replica servers.

• Enter a description of the replica server.

7. Click the **Additional** tab.
   a. Specify the credentials that the replica uses to communicate with the master.
      1) Click **Select**.
      2) Click the radio button next to *cn=replication,cn=IBMpolicies*.
      3) Click **Show credentials**.
      4) Expand the list of credentials and select *mycreds*.
      5) Click **OK**.
      See “Creating credentials” on page 5 for additional information on agreement credentials.
   b. Keep the **Specify a replication schedule or enter DN (optional)** set to **None**. This sets the default as immediate replication.
   c. Do not deselect any capabilities.
   d. Click **OK** to create the replica. A message is displayed noting that additional actions must be taken.
   e. Click **OK**.

**Copying data to the replica**
To ensure that the servers are synchronized, you must first quiesce the master. This means that the master does not accept any updates from its clients.

1. If you have not already do so, use the Web Administration Tool to log on to the master server.
2. Expand the **Replication management** category in the navigation area of the Web Administration Tool and click **Manage topology**.
3. Select the subtree you have replicated.
4. Click **Quiesce/Unquiesce** to quiesce the subtree.
5. Click **OK**.

You must now export the data from the master to the replica. This is a manual procedure.

On the master server create an LDIF file for the data. To copy all the data contained on the master server, issue the command:

```
db2ldif -o <masterfile.ldif>
```

If you want to copy just the data from a single subtree the command is:

```
db2ldif -o <masterfile.ldif> -s <subtreeDN>
```

**Note:** The four operational attributes, createTimestamp, creatorsName, modifiersName, and modifyTimestamp are exported to the LDIF file unless the -j option is specified.

On the computer where you are creating the replica:
1. Ensure that the suffixes used by the master are defined in the *ibmslapd.conf* file.
2. Stop the replica server.
3. Copy the <masterfile.ldif> file to the replica and issue the command:
   ```
   ldif2db -r no -i <masterfile.ldif>
   ```
   The replication agreements, schedules, credentials (if stored in the replicated subtree) and entry data are loaded on the replica.
4. Start the server.

**Adding the supplier information to the replica**

You need to change the replica's configuration to identify who is authorized to replicate changes to it, and add a referral to a master.
1. Use the Web Administration console to log on as the directory administrator to the computer where you are creating the replica.
2. Expand **Replication management** in the navigation area of the Web Administration Tool and click **Manage replication properties**.
3. Click **Add**.
4. Select a supplier from the **Replicated subtree** drop-down menu or enter the name of the replicated subtree for which you want to configure supplier credentials.
5. Enter the replication bindDN. In this example, cn=any is used.
6. Enter and confirm the credential password. (You previously recorded this for future use.) See “Creating credentials” on page 5.
7. Click **OK**.
8. You must restart the replica for the changes to take effect.

**Starting replication**

The replica is in a suspended state and no replication is occurring. After you have finished setting up your replication topology, on the master you must:
1. If you have not already do so, use the Web Administration Tool to log on to the master server.
2. Expand the **Replication management** category in the navigation area of the Web Administration Tool and click **Manage queues**.
3. Select the new replica.
4. Click **Queue details**.
5. Click **Pending changes**.
6. If there are any pending changes, click **Skip all**. If there are no changes pending click **Cancel**. This prevents duplication of the topology information that was loaded with the <master.ldif> file. If you have created multiple new replicas, repeat steps 1 through 4 for each of the new servers.
7. Click **Manage topology**.
8. Select the subtree you have replicated.
9. Click **Quiesce/Unquiesce** to unquiesce the subtree.
10. Click **OK**. The master now receives updates from its clients and places them in the replication queues.
11. Click **Manage queues**.
12. Select the replica.
13. Click **Suspend/resume** to start receiving replication updates for that server. Repeat steps 10 and 11 for each server that was suspended.

See the *IBM Tivoli Directory Server Version 5.2 Administration Guide* for more detailed information about managing queues.
Going a little faster with replication

Now that you have created the basic master-replica topology, you can expand upon that model.

Creating a master-forwarder-replica topology

To define a master-forwarder-replica topology, you must:

1. Create a master server and a replica server. You have already done this. See "Getting started with replication" on page 3.
2. Create a new replica server for the original replica. See "Creating a replica server" on page 5.
3. Copy data to the replicas. See "Copying data to the replica" on page 6.

Changing the replica to a forwarding server

Note: Before starting to set up your replication topology, make a backup copy of your original ibmslapd.conf file. You can use this backup copy to restore your original configuration if you encounter difficulties with replication.

If you have set up a replication topology (see "Creating a master server (replicated subtree)" on page 4) with a master (server1) and a replica (server2), you can change the role of server2 to that of a forwarding server. To do this you need to create a new replica (server3) under server2.

1. Start all the servers.
2. If you have not already do so, use the Web Administration Tool to log on to the master server (server1).
3. Expand the Replication management category in the navigation area and click Manage topology.
4. Select the subtree that you want to replicate and click Show topology.
5. Click the arrow next to the Replication topology selection to expand the list of supplier servers.
6. Click the arrow next to the server1 selection to expand the list of servers.
7. Select server2 and click Add replica.
8. On the Server tab of the Add replica window:
   • Enter the host name of the replica server (server3). Do not change the default non-SSL port (389).
   • Leave the Enable SSL check box unchecked.
   • Enter the replica name or leave this field blank to use the host name.
   • Enter the replica ID. If the server on which you are creating the replica is running, click Get replica ID to automatically prefill this field. This is a required field, if the server you are adding is going to be a peer or forwarding server. It is recommended that this be filled in for all IBM Tivoli Directory Server replica servers.
   • Enter a description of the replica server.
9. Click the Additional tab.
   a. Specify the credentials that the replica uses to communicate with the master.
      1) Click Select.
      2) Click the radio button next to cn=replication,cn=IBMpolicies.
      3) Click Show credentials.
      4) Expand the list of credentials and select mycreds.
      5) Click OK.
      See "Creating credentials" on page 5 for additional information on agreement credentials.
   b. Keep the Specify a replication schedule or enter DN (optional) set to None. This sets the default as immediate replication.
   c. Do not deselect any capabilities.
   d. Click OK to create the replica. A message is displayed noting that additional actions must be taken.
   e. Click OK.
10. Copy data from server1 to the new replica server3. See "Copying data to the replica" on page 6 for information about how to do that.

   Note: The topology changes are replicated to server2 by the master server1.
11. Add the supplier agreement to server3 that makes server2 a supplier to server3 and server3 a consumer to server2. See "Adding the supplier information to the replica" on page 7 for information about how to do this.

The server roles are represented by icons in the Web Administration Tool. Your topology is now:
   • server1 (master)
     - server2 (forwarder)
     - server3 (replica)

**Speeding along with replication**

**Note:** Before starting to set up your replication topology, make a backup copy of your original ibmslapd.conf file. You can use this backup copy to restore your original configuration if you encounter difficulties with replication.

Now that you have created a replication topology with a forwarding server, the next step is to set up a peer-to-peer replication environment.
Setting up a complex topology with peer replication

Peer replication is a replication topology in which multiple servers are masters. However, unlike a multi-master environment, no conflict resolution is done among peer servers. LDAP servers accept the updates provided by peer servers, and update their own copies of the data. No consideration is given for the order in which the updates are received, or whether multiple updates conflict.

To add additional masters (peers), you first add the server as a read-only replica of the existing masters (see “Creating a replica server” on page 5), initialize the directory data, and then promote the server to be a master.

The replica is in a suspended state and no replication is occurring. After you have finished setting up your replication topology, you must click Manage queues, select the replica, and click Suspend/resume to start replication. See IBM Tivoli Directory Server Version 5.2 Administration Guide for more detailed information about managing queues. The replica now receives updates from the master.

Use peer replication only in environments where the update vectors are well known. Updates to particular objects within the directory must be done only by one peer server. This is intended to prevent the scenario of one server deleting an object, followed by another server modifying the object. This scenario creates the possibility of a peer server receiving a delete command followed by a modify command, which creates a conflict. Setting up a load balancer is one method of resolving data conflict resolution.

A load balancer, such as the IBM WebSphere Edge Server, has a virtual host name that applications use when sending updates the directory. The load balancer is configured to send those updates to only one server. If that server is down, or unavailable because of a network failure, the load balancer sends the updates to the next available peer server until the first server is back on line and available. Refer to your load balancer product documentation for information on how to install and configure the load balancing server.

Using the forwarding topology created in “Changing the replica to a forwarding server” on page 8, you are going to create a peer-forwarder- replica topology consisting of two peer-master servers, two forwarding servers, and four replicas. To create this topology, you must:

1. Create two additional replica servers for the master server. See “Creating a replica server” on page 5.
2. Create two replicas under each of the two newly created replica servers.
3. Promote the original replica to a master.

   Note: The server that you want to promote to a master must be a leaf replica with no subordinate replicas.

4. Copy the data from the master to the new master and replicas. See “Copying data to the replica” on page 6.

Creating the topology:
You can promote a server to be a peer. In this example you are going to start with the forwarding topology created in the previous procedure and create five new replicas and then promote one of them (server5) to be a peer to the master server (server1).
1. Start all the servers.
2. Use the Web Administration Tool to log on to the master (server1).
3. Expand the Replication management category in the navigation area and click Manage topology.
4. Click the arrow next to the Replication topology selection to expand the list of servers.
5. Click the arrow next to the server1 selection to expand the list of servers.
6. Click the arrow next to the server2 selection to expand the list of servers.
7. Click server1 and click Add replica. Create server4. See “Creating a replica server” on page 5 for information about creating replicas, adding credentials and supplier information. Follow the same procedure to create server5. The server roles are represented by icons in the Web Administration Tool. Your topology is now:
   * server1 (master)
     - server2 (forwarder)
       - server3 (replica)
     - server4 (replica)
     - server5 (replica)
9. Click server2 and click Add replica to create server6. See “Creating a replica server” on page 5 for information about creating replicas, adding credentials and supplier information.

10. Click server4 and click Add replica to create server7. See “Creating a replica server” on page 5 for information about creating replicas, adding credentials and supplier information. Follow the same procedure to create server8. Your topology is now:

- server1 (master)
  - server2 (forwarder)
    - server3 (replica)
    - server6 (replica)
  - server4 (forwarder)
    - server7 (replica)
    - server8 (replica)
  - server5 (replica)
11. Select server5 and click **Move**.

**Note:** The server you want to move must be a leaf replica with no subordinate replicas.

12. Select **Replication topology** to promote the replica to a master. Click **Move**.

13. The **Create additional supplier agreements panel** is displayed. Peer replication requires each master to be a supplier and consumer to each of the other masters in the topology and to each of the first level replicas, server2 and server4. Server5 already is a consumer of server1; it now needs to become a supplier to server1, server2, and server4. Ensure that the supplier agreement boxes are checked for:

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Consumer</th>
</tr>
</thead>
<tbody>
<tr>
<td>server5</td>
<td>server1</td>
</tr>
<tr>
<td>server5</td>
<td>server2</td>
</tr>
<tr>
<td>server5</td>
<td>server4</td>
</tr>
</tbody>
</table>

Click **Continue**.

**Note:** In some cases the Select credentials panel will pop up asking for a credential that is located in a place other than cn=replication,cn=localhost. In such situations you must provide a credential object that is located in a place other than cn=replication,cn=localhost. Select the credentials the subtree is going to use from the existing sets of credentials or create new credentials. See ”Creating credentials” on page 5.

14. Click **OK**. Your topology is now:
   - server1 (master)
     - server2 (forwarder)
       - server3 (replica)
       - server6 (replica)
     - server4 (forwarder)
       - server7 (replica)
- server8 (replica)
- server5 (master)
- server1 (master)
- server2 (forwarder)
- server4 (forwarder)

15. Copy data from server1 to all the new servers. See "Copying data to the replica" on page 6 for information about how to do that.

16. Add the supplier information to each new replica. See "Adding the supplier information to the replica" on page 7 for information about how to do that.

17. Start or resume replication. See "Starting replication" on page 7 for information about how to do that.

Racing with replication

Note: A gateway server must be an IBM Tivoli Directory Server version server, or an IBM Directory Server version 5.1 server with a fix pack that supports gateway replication.

Gateway replication uses gateway servers to collect and distribute replication information effectively across a replicating network. The primary benefit of gateway replication is the reduction of network traffic.

Gateway servers must be masters (writable). The following figure illustrates how gateway replication works:
The replicating network in the preceding figure contains four replication sites, each containing a gateway server. A gateway server:

- Collects replication updates from the peer/master servers in the replication site where it resides and sends the updates to all the other gateway servers within the replicating network.
- Collects replication updates from other gateway servers in the replication network and sends those updates to the peers/masters and replicas in the replication site where it resides.

Gateway servers use server IDs and consumer IDs to determine which updates are sent to other gateway servers in the replicating network and which updates are sent to local servers within the replication site.

To set up gateway replication, you must create at least two gateway servers. The creation of a gateway server establishes a replication site. You must then create replication agreements between the gateway and any masters/peers and replicas you want to include in that gateway’s replication site.

Gateway servers must be masters (writable). If you attempt to add the gateway object class, ibm-replicaGateway, to a subentry that is not a master, an error message is returned.

There are two methods for creating a gateway server. You can:

- Create a new gateway server
- Convert an existing peer server to a gateway server

**Note:** It is very important that you assign only one gateway server per replication site.

---

*Figure 11. A replicating network with Gateway servers*

---

![Diagram of a replicating network with Gateway servers](image)
Setting up gateway servers and replication sites:

**Note:** Before starting to set up your replication topology, make a backup copy of your original ibmslapd.conf file. You can use this backup copy to restore your original configuration if you encounter difficulties with replication.

To set up a gateway using the complex topology with peer replication from the previous scenario:

- Convert an existing peer server (peer1) to a Gateway server to create replication site1.
- Create a new gateway server for replication site 2 and agreements with peer1.
- Create the topology for replication site 2 (not illustrated in this example).
- Copy the data from the master to all the machines in the topology.
  1. Use the Web Administration Tool to log on to the master (server1).
  2. Expand the Replication management category in the navigation area and click **Manage topology**.
  3. Select the subtree that you want to replicate and click **Show topology**.
  4. Click the arrow next to the **Replication topology** selection to expand the list of servers.
  5. To convert an existing server to a gateway server, select server1 or its peer server5. For this example use server1.
  6. Click **Edit server**.
  7. Verify that Server is a master is checked and then select Server is a gateway.
  8. Click OK.

  **Note:** If the server you want to use as a gateway is not already a master, it must be a leaf replica with no subordinate replicas that you can first promote to be a master and then designate as a gateway.

  9. To create a new gateway server, select server1 and click **Add replica**.
  10. Create the new replica, server9. See “Creating a replica server” on page 5 for information about creating replicas, adding credentials and supplier information.

![Figure 12. Initial peer-to-peer topology](image)
11. Select server9 and click Move.
12. Select Replication topology to promote the replica to a master. Click Move.
13. The Create additional supplier agreements panel is displayed. Ensure that the supplier agreement boxes are checked for server1 only.

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Consumer</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ server9</td>
<td>server1</td>
</tr>
<tr>
<td>server9</td>
<td>server2</td>
</tr>
<tr>
<td>server9</td>
<td>server4</td>
</tr>
<tr>
<td>server9</td>
<td>server5</td>
</tr>
</tbody>
</table>

Click Continue.

Note: In some cases the Select credentials panel will pop up asking for a credential that is located in a place other than cn=replication,cn=localhost. In such situations you must provide a credential object that is located in a place other than cn=replication,cn=localhost. Select the credentials the subtree is going to use from the existing sets of credentials or create new credentials. See “Creating credentials” on page 5.

14. Click OK.

![Diagram of replication topology]

Figure 13. A gateway replication site

15. Select server9 and click Edit server.
16. Verify that Server is a master is checked and then select Server is a gateway.
17. Click OK. The server roles are represented by icons in the Web Administration Tool. Your topology is now:
   - server1 (master-gateway for replication site1)
     - server2 (forwarder)
       - server3 (replica)
       - server6 (replica)
- server4 (forwarder)
- server7 (replica)
- server8 (replica)
- server5 (master)
- server9 (master-gateway for replication site 2)

* server5 (master)
- server1 (master)
- server2 (forwarder)
- server4 (forwarder)

* server9 (master-gateway)
- server1 (master-gateway)

18. Add replica servers to server9 to create the topology for replication site 2.

19. Repeat this process to create additional replication sites. Remember to create only one gateway server per replication site.

20. When you have finished creating the topology, copy the data from server1 to all the new servers in all the replication sites and add the supplier information to all the new servers. See "Copying data to the replica" on page 6 and "Adding the supplier information to the replica" on page 7 for information about how to do that.
Glossary

Replication terminology

Cascading replication
A replication topology in which there are multiple tiers of servers. A peer/master server replicates to a set of read-only (forwarding) servers, which in turn replicate to other servers. Such a topology off-loads replication work from the master servers.

Consumer server
A server that receives changes through replication from another (supplier) server.

Credentials
Identify the method and required information that the supplier uses in binding to the consumer. For simple binds, this includes the DN and password. The credentials are stored in an entry the DN of which is specified in the replica agreement.

Forwarding server
A read-only server that replicates all changes sent to it. This contrasts with a peer/master server in that it is read only and it can have no peers.

Gateway server
A server that forwards all replication traffic from the local replication site where it resides to other Gateway servers in the replicating network. Also receives replication traffic from other Gateway servers within the replication network, which it forwards to all servers on its local replication site.

Gateway servers must be masters (writable).

Master server
A server that is writable (can be updated) for a given subtree.

Nested subtree
A subtree within a replicated subtree of the directory.

Peer server
The term used for a master server when there are multiple masters for a given subtree. A peer server does not replicate changes sent to it from another peer server; it only replicates changes that are originally made on it.

Replica group
The first entry created under a replication context has objectclass ibm-replicaGroup and represents a collection of servers participating in replication. It provides a convenient location to set ACL’s to protect the replication topology information. The administration tools currently support one replica group under each replication context, named ibm-replicagroup=default.

Replica subentry
Below a replica group entry, one or more entries with objectclass ibm-replicaSubentry can be created; one for each server participating in replication as a supplier. The replica subentry identifies the role the server plays in replication: master or read-only. A read-only server might, in turn, have replication agreements to support cascading replication.

Replicated subtree
A portion of the directory information tree (DIT) that is replicated from one server to another. Under this design, a given subtree can be replicated to some servers and not to others. A subtree can be writable on a given server, while other subtrees may be read-only.

Replicating network
A network that contains connected replication sites.

Replication agreement
Information contained in the directory that defines the ‘connection’ or ‘replication path’ between two servers. One server is called the supplier (the one that sends the changes) and the other is the consumer (the one that receives the changes). The agreement contains all the information needed for making a connection from the supplier to the consumer and scheduling replication.
**Replication context**
Identifies the root of a replicated subtree. The `ibm-replicationContext` auxiliary object class may be added to an entry to mark it as the root of a replicated area. The configuration information related to replication is maintained in a set of entries created below a replication context.

**Replication site**
A Gateway server and any master, peer, or replica servers configured to replicate together.

**Schedule**
Replication can be scheduled to occur at particular times, with changes on the supplier accumulated and sent in a batch. The replica agreement contains the DN for the entry that supplies the schedule.

**Supplier server**
A server that sends changes to another (consumer) server.