

## Chapter 15

# Managing the Juniper Networks Database

This chapter describes the Juniper Networks database and how to configure it. Topics include:

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- Redundancy for a Juniper Networks Database on page 135
- Configuration Statements for the Juniper Networks Database on page 135
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## Overview of the Juniper Networks Database

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Each C-series platform contains a Juniper Networks database. The database can store SRC data, SRC sample data, SRC configuration information, and a number of user profiles. You store subscriber data in another database. For information about configuring the SAE to access subscriber data, see the *SRC-PE Network Guide, Chapter 2, Configuring the SAE with the SRC CLI*.

You must enable the database for it to be operational on the system. After the database is operational, you can load sample data and perform other configuration activities that use this database.

When the C-series platform starts for the first time, you must enable the Juniper Networks database. You can operate this database as a standalone database or as a member of a community of Juniper Networks databases. Typically, you run the database in standalone mode only in testing environments. In standalone mode, the database does not communicate with other Juniper Networks databases; there is no data distribution and no redundancy. In community mode, databases distribute data changes among specified databases. When you have two or more C-series platforms, enable the Juniper Networks database to run in community mode, and assign a role to each database:

- **Primary role**—A database that provides read and write access to client applications. It replicates its data and distributes changes to any Juniper Networks databases configured as neighbors.

We recommend that you configure at least two databases to have a primary role.

- **Secondary role**—A database that provides read access to client applications. If client applications try to write data to this database, the database refers the client to a primary database.

Neighbors are Juniper Networks databases that receive data from another Juniper Networks database. When you configure a database to be a neighbor, you configure it as one of the following types:

- **Primary neighbor**—A database that propagates changes that it receives to other Juniper Networks databases configured as neighbors. A primary neighbor must be assigned a primary role.

We recommend that you configure at least two databases as primary neighbors.

- **Secondary neighbor**—A database that only receives database changes. A secondary neighbor must be assigned a secondary role.

When you configure neighbors for the databases, keep in mind the following guidelines:

- A database assigned a primary role can have primary and secondary neighbors.
- A database assigned a secondary role must have at least one primary neighbor, but no secondary neighbors. Because a secondary database cannot distribute changes to its neighbors, if you do configure a secondary neighbor for a secondary database, the software does not use the configuration for the secondary neighbor.

To share processing load, you can configure SRC components, such as SRC-ACP, NIC, or SAE to use a specified database. In the local configuration for SRC components, you configure the URL of the directory.

## Redundancy for a Juniper Networks Database

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Protect SRC data by setting up a redundancy scheme for your Juniper Networks databases. Client applications control which database they connect to as their primary database and as their backup database.

Use the following guidelines to plan which databases are assigned primary or secondary roles, and which databases are primary or secondary neighbors:

- Each Juniper Networks database that is assigned a primary role should have at least one primary neighbor. Should a database assigned a primary role become inoperable, a client application fails over to a primary neighbor.
- Each database that is assigned a secondary role should have at least two primary neighbors.
- Applications that frequently perform write operations to the database should connect to databases that have a primary role. Applications that perform frequent write operations are the C-Web interface, the SRC CLI, back-office applications that provision data, and in some cases the SRC-ACP.
- Applications that rarely perform updates, such as the NIC and SAE, can communicate with databases assigned a secondary role. For example, you could configure the NIC and SAE to communicate with the local directory on a C-series platform, and configure the database on this system to have a secondary role.

## Configuration Statements for the Juniper Networks Database

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Use the following configuration statements to configure the Juniper Networks database at the [edit] hierarchy level:

```
system ldap server {
  stand-alone;
}

system ldap server community {
  role (primary | secondary);
  primary-neighbors [primary-neighbor...];
  secondary-neighbors [secondary-neighbor...];
}
```

## Enabling the Juniper Networks Database to Run in Standalone Mode

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Use the following configuration statements to enable the Juniper Networks database on a C-series platform in standalone mode:

```
system ldap server {
  stand-alone;
}
```

To enable a Juniper Networks database to run in standalone mode:

1. From configuration mode, access the configuration statement that configures the Juniper Networks database.

```
user@host# edit system ldap server
```

2. Enable standalone mode.

```
[edit system ldap server]
user@host# set stand-alone
```

## Enabling the Juniper Networks Database to Run in Community Mode

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If you are adding a Juniper Networks database to an existing community, see *Adding a Juniper Networks Database to an Established Community* on page 137.

Use the following configuration statements to enable the Juniper Networks database on a C-series platform in community mode:

```
system ldap server community {
  role (primary | secondary);
  primary-neighbors [primary-neighbor...];
  secondary-neighbors [secondary-neighbor...];
}
```

To enable the Juniper Networks database to run in community mode:

1. From configuration mode, access the configuration statement that configures the Juniper Networks database in community mode:

```
user@host# edit system ldap server community
```

2. Specify the role of the database as primary or secondary:

```
[edit system ldap server community]
user@host# set role primary
```

or

```
[edit system ldap server community]
user@host# set role secondary
```

3. Configure primary neighbors. Specify each neighbor by IP address, fully qualified hostname, or a hostname that can be resolved through the domain name system:

```
[edit system ldap server community]
user@host# set primary-neighbors neighbor ...
```

For example, set C1 and C2 as primary neighbors:

```
[edit system ldap server community]
user@host# set primary-neighbors C1 C2
```

4. Configure secondary neighbors. Specify each neighbor by IP address, fully qualified hostname, or a hostname that can be resolved through the domain name system:

```
[edit system ldap server community]
user@host# set secondary-neighbors neighbor ...
```

For example, set C3 and C4 as secondary neighbors:

```
[edit system ldap server community]
user@host# set secondary-neighbors C3 C4
```

## Adding a Juniper Networks Database to an Established Community

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When you add a Juniper Networks database to an existing community, make sure that you configure the primary neighbor relationships from the existing primary databases before you enable the new one.



If you assign a primary role to a database new to an existing community before you configure the neighbor relationships from existing community databases that have a primary role, you can lose data on neighbor databases that already have a primary role.

To add a Juniper Networks database to an existing community:

1. On existing databases that have a primary role, configure neighbor relationships for the new database.

For example, to configure primary neighbors for the existing servers C1 and C2 for the new server C-new:

On C1:

```
[edit system ldap server community]
user@C1# set primary-neighbor C-new
```

On C2:

```
[edit system ldap server community]
user@C2# set primary-neighbor C-new
```

2. On the new database, enable the primary role and configure primary neighbors.

For example, to enable the database in primary role and configure C1 and C2 as primary neighbors:

```
[edit]
user@C-new# edit system ldap server community
[edit system ldap server community]
user@C-new# set role primary
user@C-new# set primary-neighbors C1 C2
```

## Updating Juniper Networks Database Configuration for an Established Community with One Primary Database

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Although all communities should have two databases with a primary role, if a community includes one database assigned a primary role and another database assigned a secondary role, promote the database assigned a secondary role to a primary role.

### *Promoting a Secondary Database to a Primary Role*

To promote a Juniper Networks database from a secondary role to a primary role:

1. On the database that has a secondary role, set the role to primary.

For example, if the database on C20 has a secondary role:

```
user@C20# edit system ldap server community
[edit system ldap server community]
user@C20# set role primary
user@C20# commit
```

C20 already has C10 configured as primary neighbor.

2. On the existing database that has a primary role, remove the neighbor as secondary and add it as primary.

For example, to remove C20 as a secondary neighbor and add it as a primary neighbor for the database on C10:

```
user@C10# edit system ldap server community
[edit system ldap server community]
user@C10# set primary-neighbors C20
user@C10# commit
```

3. (Optional if you have two databases with a primary role in a community) Switch the role of the database that originally had a secondary role back to secondary:

```
[edit system ldap server community]
user@C20# set role secondary
user@C20# commit
```

## Recovering Data in a Community with One Primary Database and One Secondary Database

In an environment in which a community includes one database assigned a primary role and another database assigned a secondary role, and the primary database is not operative, you must promote the secondary database to primary and reconfigure the inoperative primary database.

1. On the database that has a secondary role, set the role to primary.

For example, if the database on C20 has a secondary role:

```
user@C20# edit system ldap server community
[edit system ldap server community]
user@C20# set role primary
user@C20# commit
```

C20 already has C10 configured as primary neighbor.

2. On the existing database that has a primary role, remove the neighbor as secondary and add it as primary.

For example, to configure C10 as a primary database with C20 as a primary neighbor:

```
user@C10# edit system ldap server community
[edit system ldap server community]
user@C10# set role primary
user@C10# delete secondary-neighbors C20
user@C10# set primary-neighbors C20
user@C10# commit
```

## Changing the Mode of a Juniper Networks Database

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Because the Juniper Networks database can run in either standalone or community mode, to change modes you must disable the current mode and enable the other mode. Typically, you change from standalone mode, which was used for testing, to community mode for a full deployment.

To change the mode of the Juniper Networks database from standalone to community:

1. Disable standalone mode:

```
[edit system ldap server]
user@host# delete stand-alone
```

2. Enable the database in community mode, and configure the role and neighbors.

See *Enabling the Juniper Networks Database to Run in Community Mode* on page 136.

## Loading Sample Data in to a Juniper Networks Database

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The SRC software provides sample data that you can load into the Juniper Networks database. Typically, this data is used for testing or for demonstration purposes. You can load sample data for:

- Sample residential portal
- Enterprise service portals
- SNMP traps for the SNMP agent

Loading sample data is not required to run the SRC software.

To load sample data for the sample residential portal to demonstrate an application that provides a means for subscribers to directly log in to a subscriber session for their ISP:

```
user@host> request system ldap load data isp-service-portal
```

To load sample data for the sample residential portal to demonstrate an application that provides an association between a subscriber and the equipment being used to make the DHCP connection:

```
user@host> request system ldap load data equipment-registration
```

To load sample data for the Enterprise Manager Portal and the sample enterprise service portal:

```
user@host> request system ldap load data enterprise portal
```

To load sample data for the SNMP agent:

```
user@host> request system ldap load data snmp-agent
```



## Verifying Configuration for a Juniper Networks Database

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To review the configuration for the Juniper Networks database on a C-series platform:

- Run the `show system ldap server` command at the `[edit]` hierarchy level. For example:

```
[edit]
user@host# show system ldap server
community {
  role primary;
  primary-neighbors C2;
}
```

The output indicates the mode, standalone or community. If the database is running in community mode, the output also includes information about the community configuration on this system.

If the command does not display any output, the Juniper Networks database on the system is disabled.

## Example: Configuration for a Database Community

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A community of Juniper Networks databases lets you set up redundancy for client applications that connect to these databases.

This sample configuration describes the tasks for configuring Juniper Networks databases on C-series platforms:

- Requirements on page 141
- Overview and Sample Topology on page 141
- Configuration on page 142

### Requirements

#### Software

Minimum SRC Release 1.0.0

#### Hardware

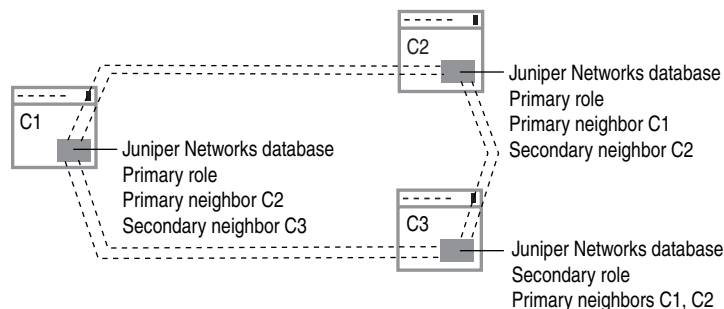
C2000 or C4000

### Overview and Sample Topology

You configure a number of Juniper Networks databases as members of a community to protect data by replicating data from one database to another, and by specifying relationships between databases to support failover if a database that has the primary role for a set of applications becomes inoperable. This example uses C1 and C2 as databases that have a primary role, and C3 configured to have a secondary role.

Figure 15 shows the sample configuration.

**Figure 15: Sample Community of Juniper Network Databases**



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The following configuration shows the configuration statements for databases shown in Figure 15:

## Configuration

### Configuring C1

**Quick Configuration** To quickly configure a Juniper Networks database, copy the following commands into a text editor, and modify them; then load the configuration from the file.

[edit]

```
set system ldap server community role primary
set system ldap server community primary-neighbors C2
set system ldap server community secondary-neighbors C3
```

**Step-by-Step Procedure** To configure the C1 system:

1. From configuration mode, access the configuration statement that configures the Juniper Networks database in community mode.

[edit]

```
user@C1# edit system ldap server community
```

2. Specify the database role as primary.

```
[edit system ldap server community]
user@C1# set role primary
```

3. Specify primary neighbors.

```
[edit system ldap server community]
user@C1# set primary-neighbors C2
```

4. Specify secondary neighbors.

```
[edit system ldap server community]
user@C1# set secondary-neighbors C3
```

## Configuring C2

**Quick Configuration** To customize the configuration example for your needs, copy the following commands into a text editor, and modify them; then load the configuration from the file.

```
[edit]
set system ldap server community role primary
set system ldap server community primary-neighbors C1
set system ldap server community secondary-neighbors C3
```

**Step-by-Step Procedure** To configure the C2 system:

1. From configuration mode, access the configuration statement that configures the Juniper Networks database in community mode.

```
[edit]
user@C2# edit system ldap server community
```

2. Specify the database role as primary.

```
[edit system ldap server community]
user@C2# set role primary
```

3. Specify primary neighbors.

```
[edit system ldap server community]
user@C2# set primary-neighbors C1
```

4. Specify secondary neighbors.

```
[edit system ldap server community]
user@C2# set secondary-neighbors C3
```

## Configuring C3

**Quick Configuration** To customize the configuration example for your needs, copy the following commands into a text editor, and modify them; then load the configuration from the file.

```
[edit]
set system ldap server community role secondary
set system ldap server community primary-neighbors C1 C2
```

**Step-by-Step Procedure** To configure the C3 system:

1. From configuration mode, access the configuration statement that configures the Juniper Networks database in community mode.

```
[edit]  
user@C3# edit system ldap server community
```

2. Specify the database role as primary.

```
[edit system ldap server community]  
user@C3# set role secondary
```

3. Specify primary neighbors.

```
[edit system ldap server community]  
user@C3# set primary-neighbors C1 C2
```