Redundancy

Cisco Unified CallManager provides several forms of redundancy:

- Call-processing redundancy—Using Cisco Unified CallManager groups, you can designate backup Cisco Unified CallManagers to handle call processing for a disabled Cisco Unified CallManager in a form of redundancy known as device failover.
- Media resource redundancy
- CTI redundancy

This section covers the following topics:

- Cisco Unified CallManager Redundancy Groups, page 7-1
- Media Resource Redundancy, page 7-4
- CTI Redundancy, page 7-4
- Where to Find More Information, page 7-4

Cisco Unified CallManager Redundancy Groups

Groups and clusters form logical collections of Cisco Unified CallManagers and their associated devices. Groups and clusters do not necessarily relate to the physical locations of any of their members.

A cluster comprises a set of Cisco Unified CallManagers that share a common database. When you install and configure the Cisco Unified CallManager software, you specify which servers and which Cisco Unified CallManagers belong to the same cluster.

A group comprises a prioritized list of up to three Cisco Unified CallManagers. You can associate each group with one or more device pools to provide call-processing redundancy. You use Cisco Unified CallManager Administration to define the groups, to specify which Cisco Unified CallManagers belong to each group, and to assign a Cisco Unified CallManager group to each device pool.

Cisco Unified CallManager Groups

A Cisco Unified CallManager group comprises a prioritized list of up to three Cisco Unified CallManagers. Each group must contain a primary Cisco Unified CallManager, and it may contain one or two backup Cisco Unified CallManagers. The order in which you list the Cisco Unified CallManagers in a group determines the priority order.

Cisco Unified CallManager groups provide both redundancy and recovery:

- *Failover*—Occurs when the primary Cisco Unified CallManager in a group fails, and the devices reregister with the backup Cisco Unified CallManager in that group.
- *Fallback*—Occurs when a failed primary Cisco Unified CallManager comes back into service, and the devices in that group reregister with the primary Cisco Unified CallManager.

Under normal operation, the primary Cisco Unified CallManager in a group controls call processing for all the registered devices (such as phones and gateways) that are associated with that group.

If the primary Cisco Unified CallManager fails for any reason, the first backup Cisco Unified CallManager in the group takes control of the devices that were registered with the primary Cisco Unified CallManager. If you specify a second backup Cisco Unified CallManager for the group, it takes control of the devices if both the primary and the first backup Cisco Unified CallManagers fail.

When a failed primary Cisco Unified CallManager comes back into service, it takes control of the group again, and the devices in that group automatically reregister with the primary Cisco Unified CallManager.

You associate devices with a Cisco Unified CallManager group by using device pools. You can assign each device to one device pool and associate each device pool with one Cisco Unified CallManager group. You can combine the groups and device pools in various ways to achieve the desired level of redundancy. For example, Figure 7-1 shows a simple system with three Cisco Unified CallManagers in a single group that is controlling 800 devices.

Figure 7-1 Cisco Unified CallManager Group

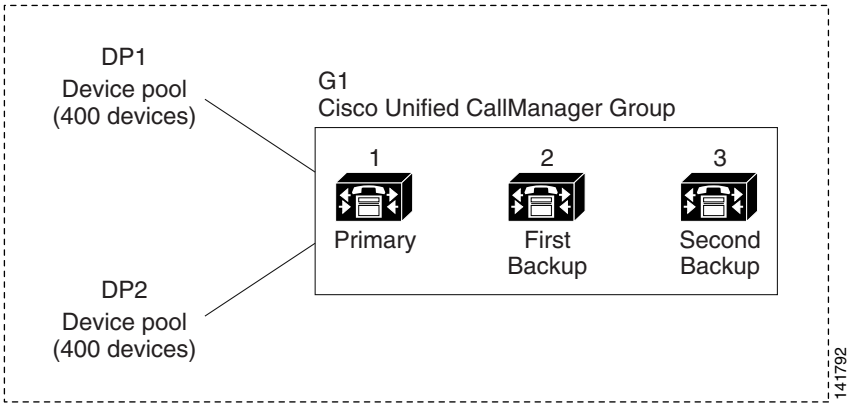

Figure 7-1 depicts Cisco Unified CallManager group G1 that is assigned with two device pools, DP1 and DP2. Cisco Unified CallManager 1, as the primary Cisco Unified CallManager in group G1, controls all 800 devices in DP1 and DP2 under normal operation. If Cisco Unified CallManager 1 fails, control of all 800 devices transfers to Cisco Unified CallManager 2. If Cisco Unified CallManager 2 also fails, control of all 800 devices transfers to Cisco Unified CallManager 3.

The configuration in Figure 7-1 provides call-processing redundancy, but it does not distribute the call-processing load very well among the three Cisco Unified CallManagers in the example. For information on load balancing, see the "Distributing Devices for Redundancy and Load Balancing" section on page 7-3.

Note Empty Cisco Unified CallManager groups will not function.

Distributing Devices for Redundancy and Load Balancing

Cisco Unified CallManager groups provide both call-processing redundancy and distributed call processing. How you distribute devices, device pools, and Cisco Unified CallManagers among the groups determines the level of redundancy and load balancing in your system.

In most cases, you would want to distribute the devices in a way that prevents the other Cisco Unified CallManagers from becoming overloaded if one Cisco Unified CallManager in the group fails. Figure 7-2 shows one possible way to configure the Cisco Unified CallManager groups and device pools to achieve both distributed call processing and redundancy for a system of three Cisco Unified CallManagers and 800 devices.

Figure 7-2 Redundancy Combined with Distributed Call Processing

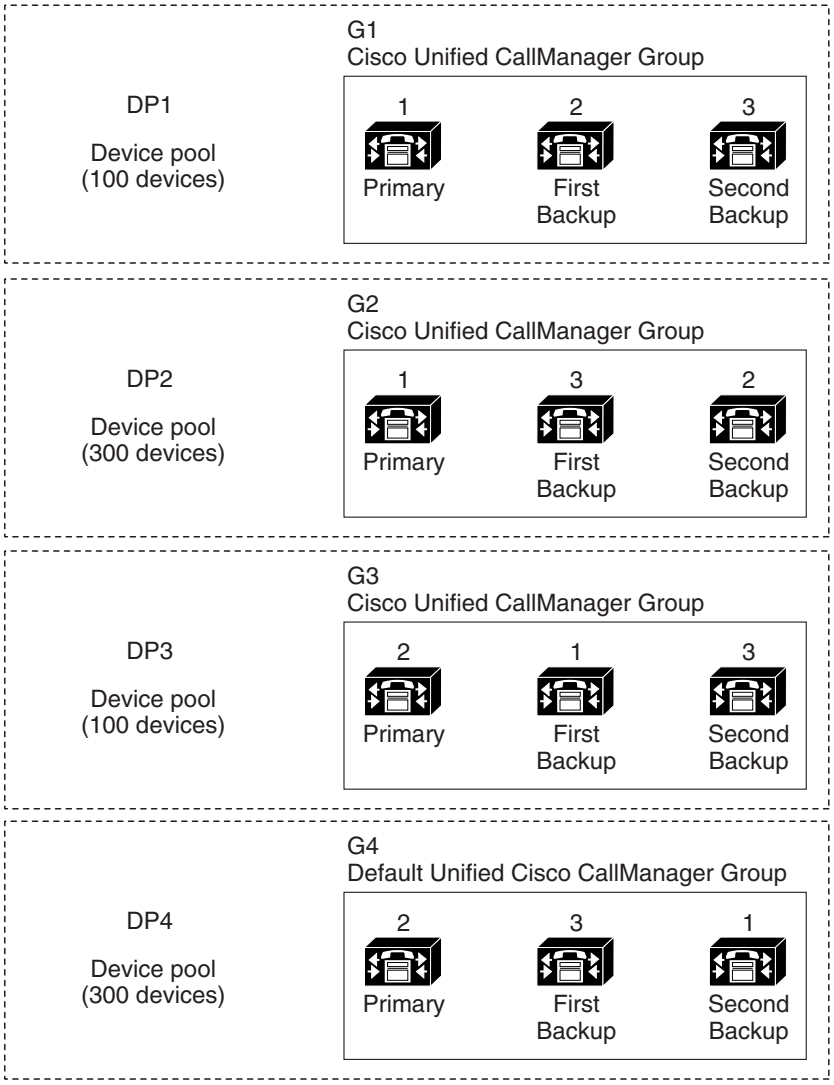

Figure 7-2 depicts the Cisco Unified CallManager groups as they are configured and assigned to device pools, so Cisco Unified CallManager 1 serves as the primary controller in two groups, G1 and G2. If Cisco Unified CallManager 1 fails, the 100 devices in device pool DP1 reregister with Cisco Unified CallManager 2, and the 300 devices in DP2 reregister with Cisco Unified CallManager 3.

Similarly, Cisco Unified CallManager 2 serves as the primary controller of groups G3 and G4. If Cisco Unified CallManager 2 fails, the 100 devices in DP3 reregister with Cisco Unified CallManager 1, and the 300 devices in DP4 reregister with Cisco Unified CallManager 3. If Cisco Unified CallManager 1 and Cisco Unified CallManager 2 both fail, all devices reregister with Cisco Unified CallManager 3.

For more information on distributed call processing, see the "Balanced Call Processing" section on page 6-3.

Media Resource Redundancy

Media resource lists provide media resource redundancy by specifying a prioritized list of media resource groups. An application can select required media resources from among the available ones according to the priority order that is defined in the media resource list. For more information on media resource redundancy, see the "Media Resource Management" section on page 22-1.

CTI Redundancy

Computer telephony integration (CTI) provides an interface between computer-based applications and telephony functions. CTI uses various redundancy mechanisms to provide recovery from failures in any of the following major components:

- Cisco Unified CallManager
- Cisco CTIManager
- Applications that use CTI

CTI uses Cisco Unified CallManager redundancy groups to provide recovery from Cisco Unified CallManager failures. To handle recovery from failures in Cisco CTIManager itself, CTI allows you to specify primary and backup Cisco CTIManagers for the applications that use CTI. Finally, if an application fails, the Cisco CTIManager can redirect calls that are intended for that application to a forwarding directory number.

Where to Find More Information

Related Topics

- Clustering, page 6-1
- Media Resource Management, page 22-1

Additional Cisco Documentation

- *Cisco Unified Communications Solution Reference Network Design (SRND)*