Configuring Replication

Sites are generally used to define groups of computers that are located within a single geographic location. In most organizations, machines that are located in close physical proximity (for example, within a single building or branch office) are well connected. A typical example is a LAN in a branch office of a company. All of the computers may be connected together using Ethernet, and routing and switching technology may be in place to reduce network congestion.

Often, however, domain controllers are located across various states, countries, and even continents. In such a situation, network connectivity is usually much slower, less reliable, and more costly than that for the equivalent LAN. Therefore, Active Directory replication must accommodate accordingly. When managing replication traffic within Active Directory sites, you need to be aware of two types of synchronization:

Intrasite *Intrasite replication* refers to the synchronization of Active Directory information between domain controllers that are located in the same site. In accordance with the concept of sites, these machines are usually well connected by a high-speed LAN.

Intersite *Intersite replication* occurs between domain controllers in different sites. Usually, this means that there is a WAN or other type of low-speed network connection between the various machines. Intersite replication is optimized for minimizing the amount of network traffic that occurs between sites.

In the following sections, you'll look at ways to configure both intrasite and intersite replication. Additionally, you'll see features of Active Directory replication architecture that you can use to accommodate the needs of almost any environment.

Intrasite Replication

Intrasite replication is generally a simple process. One domain controller contacts the others in the same site when changes to its copy of Active Directory are made. It compares the update sequence numbers in its own copy of Active Directory with that of the other domain controllers, then the most current information is chosen by the DC in question, and all domain controllers within the site use this information to make the necessary updates to their database.

Because you can assume that the domain controllers within an Active Directory site are well connected, you can pay less attention to exactly when and how replication takes place. Communications between domain controllers occur using the *Remote Procedure Call (RPC) protocol*. This protocol is optimized for transmitting and synchronizing information on fast and reliable network connections. The RPC protocol provides for fast replication at the expense of network bandwidth, which is usually readily available because most LANs today are running on Fast Ethernet (100Mbps) at a minimum.

Intersite Replication

Intersite replication is optimized for low-bandwidth situations and network connections that have less reliability. Intersite replication offers several features that are tailored toward these types of connections. To begin with, two different protocols may be used to transfer information between sites:

RPC over IP When connectivity is fairly reliable, IP is a good choice. IP-based communications require you to have a live connection between two or more domain controllers in different sites and let you transfer Active Directory information. RPC over IP was originally designed for slower WANs in which packet loss and corruption may occur often. As such, it is a good choice for low-quality connections involved in intersite replication.

Simple Mail Transfer Protocol (SMTP) *Simple Mail Transfer Protocol (SMTP)* is perhaps best known as the protocol that is used to send and receive email messages on the Internet. SMTP was designed to use a store-and-forward mechanism through which a server receives a copy of a message, records it to disk, and then attempts to forward it to another email server. If the destination server is unavailable, it holds the message and attempts to resend it at periodic intervals.

This type of communication is extremely useful for situations in which network connections are unreliable or not always available. If, for instance, a branch office in Peru is connected to the corporate office by a dial-up connection that is available only during certain hours, SMTP would be a good choice for communication with that branch.

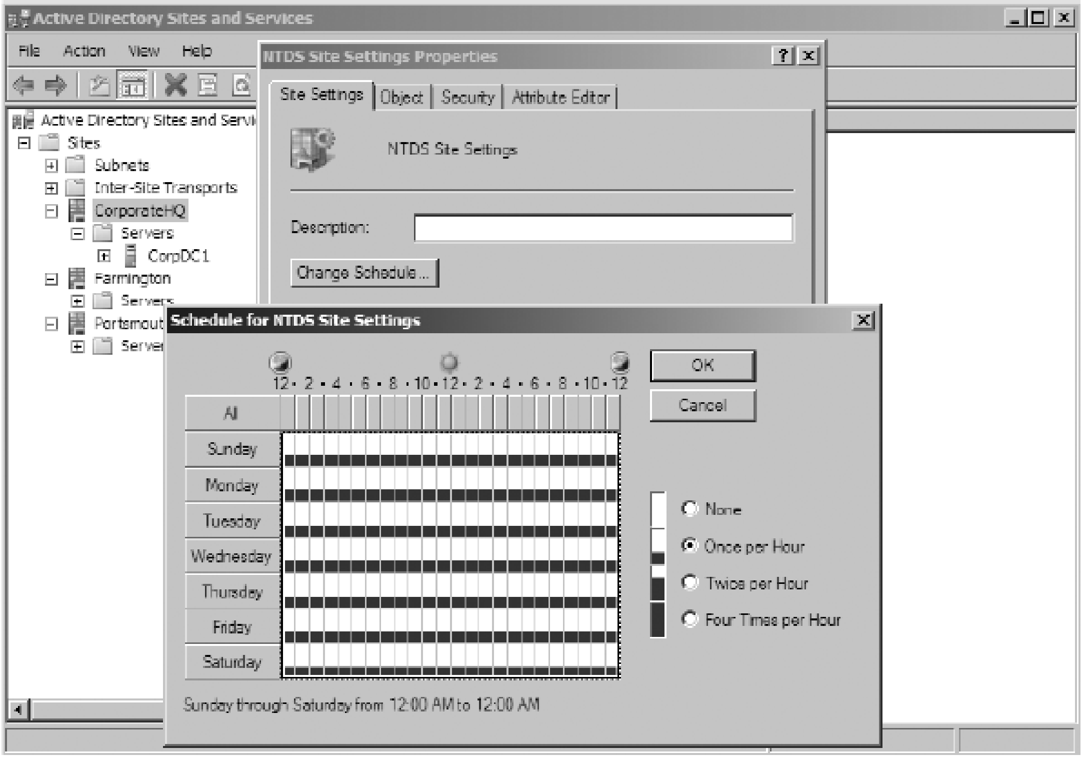
SMTP is an inherently insecure network protocol. Therefore, if you would like to ensure that you transfer replication traffic securely and you use SMTP for Active Directory replication, you must take advantage of Windows Server 2008's Certificate Services functionality.

Other intersite replication characteristics are designed to address low-bandwidth situations and less reliable network connections. These features give you a high degree of flexibility in controlling replication configuration. They include the following:

- Compression of Active Directory information. This compression is helpful because changes between domain controllers in remote sites may include a large amount of information and also because network bandwidth tends to be less available and more costly.
- Site links and site link bridges help determine intersite replication topology.
- Replication can occur based on a schedule defined by systems administrators.

You can configure intersite replication by using the Active Directory Sites And Services tool. Select the name of the site for which you want to configure settings. Then, right-click the NTDS Site Settings object in the right windowpane, and select Properties. By clicking the Change Schedule button in the NTDS Site Settings Properties dialog box, you'll be able to configure how often replication between sites will occur (see Figure 5.4).

FIGURE 5.4 Configuring intersite replication schedules



Description:

○ None
● Once per Hour
○ Twice per Hour
○ Four Times per Hour

Sunday through Saturday from 12:00 AM to 12:00 AM