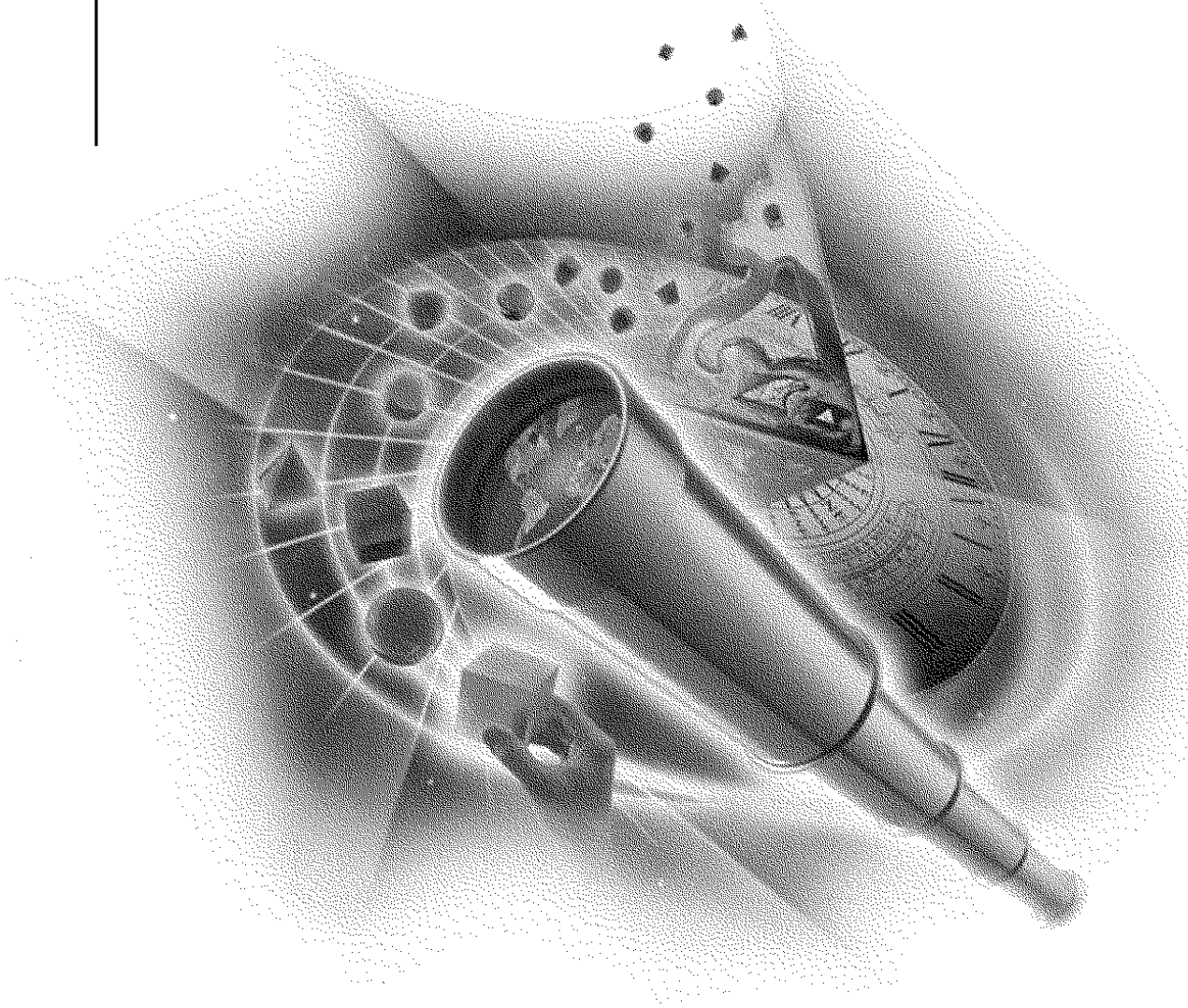


VERSION 2.0

Synchronicity
Overview & Installation
Guide



Synchronicity[™]
NETWORK DIRECTORY INTEGRATION SOFTWARE

Novell[®]

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U.S. Patent No. 5,721,825 protects NetVision's Global Event Services.

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Welcome to Synchronicity 2

Synchronicity™ is a solution that automatically synchronizes account and password information for multi-vendor networks. This document provides the necessary information to properly install the various Synchronicity products. The installation process described is the combined installation program capable of installing all of the Synchronicity products at one time.

Before installing any of the Synchronicity products, consult NetVision's web site to determine if the product versions on the CD-ROM are still the most recent versions. NetVision's web site is <http://www.netvision.com>. The Product Version Information dialog presented during the installation process indicates the versions of the individual products and components that are part of the installation program being executed.

This section contains the following information:

- “Synchronicity 2 Product Component Introduction” on page vi
- “About Synchronicity 2 Documentation” on page vii
- “Additional Documentation Resources” on page viii
- “User Comments” on page ix

Synchronicity 2 Product Component Introduction

There are four main product components.

Component	Description
Global Event Services Broker (NVGES.NLM)	A NetWare [®] Loadable Module [™] (NLM [™]) for NetWare 4.1 and later that provides event notification as changes are made to NDS [™] .
Synchronization agent	A software component that receives NDS change notifications from the Global Event Services broker NLM and synchronizes those changes with the desired directory. The synchronization agent for the NetWare 3 product is implemented as an NLM for NetWare 4.1 and later, while the synchronization agent for the Windows NT [®] and Lotus Notes [®] products require Windows NT (workstation or server) version 3.51 or later.
Synchronicity Snapin Modules for 32-bit Netware Administrator for Windows 95/98 and Windows NT	These NetWare Administrator snapin modules provide capabilities for managing native Exchange accounts from NDS. In addition, these snapins also support management of the Global Event Services NLM. 32-bit Novell [®] NetWare Administrator for Windows 95/98 and Windows NT [®] are supported.
Synchronicity Password Utilities for Windows 95/98 and Windows NT	These program files can be executed by users and network administrators to easily change network passwords in a manner which supports synchronization with all products linked with Synchronicity products.

About Synchronicity 2 Documentation

Synchronicity includes various types of documentation to support you in your network administration tasks.

If you want to	Refer to
Get a “big picture” understanding of Synchronicity 2.0 and assess how it fits your requirements	This guide
Read about Synchronicity 2.0 product details	The user guide for each Synchronicity product
Plan your Synchronicity 2.0 installation/configuration	This guide
Install Synchronicity 2.0 using minimal instructions	The Quick Starts booklet
Install Synchronicity 2.0 using detailed instructions	This guide and the Installation Help.
Plan an upgrade to Synchronicity 2.0	This guide
Install and use Synchronicity 2.0 online documentation	The Quick Starts booklet
Configure/customize your Synchronicity installation	This guide
Learn the details of using Synchronicity	The user guide for each Synchronicity product
Troubleshoot problems with Synchronicity	Technical information documents on the NetVision web site, www.netvision.com
Learn about a specific command or utility	Use the Search feature in online help
Resolve an error code or system message	Technical information documents on the NetVision web site, www.netvision.com

Additional Documentation Resources

For additional information, see the following resources:

To learn more about	See
The installation process that is common to all Synchronicity products	<i>Synchronicity Overview and Installation Guide</i> . This document can be found in electronic form on the CD-ROM or on the NetVision web site, http://www.netvision.com .
The procedures to get started installing the Synchronicity products right away	<i>Quick Starts</i> . This document can be found in electronic form on the product CD-ROM or on the NetVision web site, http://www.netvision.com .
Details about using Synchronicity	Online help. Online help for the Synchronicity product is available within NetWare Administrator. To access Help, select Tools > Synchronicity Product > Help Topics on Synchronicity Product from the NetWare Administrator menu bar. You may also click Help within any dialog for context-sensitive help.
The configuration and operation of the Global Event Services Broker NLM	<i>Global Event Services Administrator Guide</i> . This document can be found in electronic form on the product CD-ROM or on the NetVision web site, http://www.netvision.com .
Vital program information such as changes to the program, files, or documentation	Readme files.

User Comments

We want to hear your comments and suggestions about this manual and the other documentation included with Synchronicity 2.0. Some things we would like to know are

- Is the information complete?
- Is it readable?
- Do the organization and format make sense to you?
- Is the information accurate?
- Are the examples and illustrations helpful?

To contact us, you can e-mail us from our website or fax us:
<http://www.netvision.com>
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1 **Synchronicity 2 Overview**

Synchronicity 2 Product Component Overview

There are three major components of Synchronicity™ 2.0:

- The Global Event Services™ NetWare Loadable Module™
- A platform-specific synchronization agent for Windows NT®, Lotus Notes®, Exchange®, or NetWare® 3
- The NetWare Administrator snapin module

Global Event Services NLM

Global Event Services extends NDS™ to provide a global event system that can monitor any change to NDS across an entire network. With Global Event Services, Synchronicity is able to detect any change anywhere in a global NetWare 4™ network and communicate the NDS changes to any synchronization agent in real-time.

The Global Event Services NLM™ can run in one of three modes. Mode 1 requires that Global Event Services run on every NetWare 4 server that has a read/write replica of any partition to be synchronized with the NT account database. This provides real-time synchronization regardless of which replica was changed. Mode 2 requires that the Global Event Services NLM be run on one server that has replicas of all partitions to be synchronized with NT. Mode 3 synchronizes a selected portion of a network tree.

Platform-Specific Synchronization Service Agent

The second component is the synchronization agent for NT, Lotus Notes, Exchange, or NetWare 3. The synchronization agent registers with Global Event Services so that any time changes are made within NDS that apply to the domain the agent is running in, Global Event Services will notify the

synchronization agent of the NDS event. The synchronization agent, then, acts on behalf of the network administrator and implements the same event on the specific platform, based on the defineable rules. Administrators can define multiple user and group synchronization settings or rules, each acting on a different portion of the NDS tree.

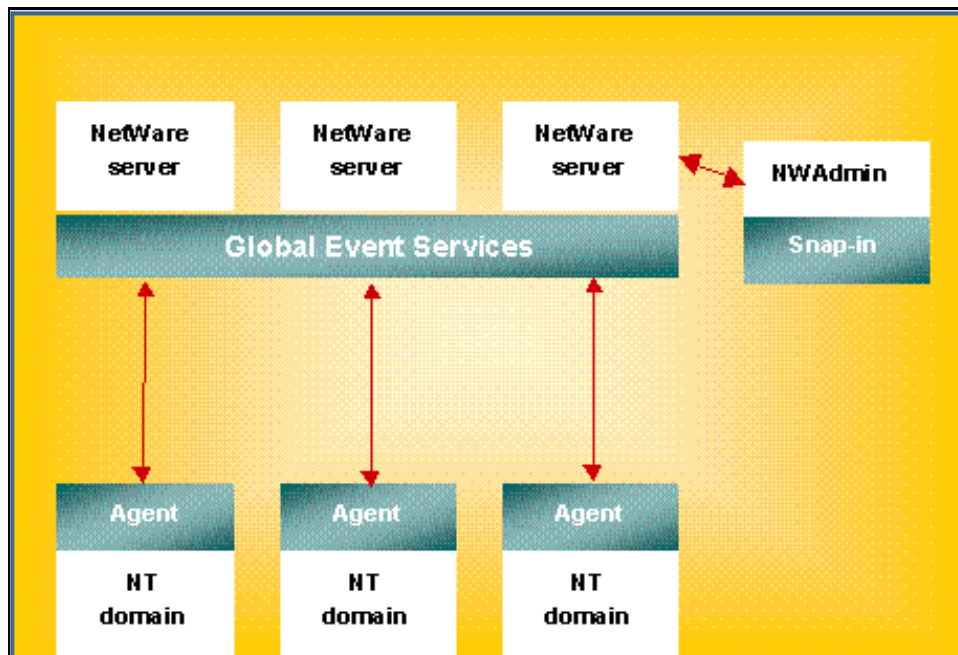
In Synchronicity 2.0 the agents are service-based (except for NetWare 3) and can be configured as any other service, from the Control Panel.

NetWare Administrator Snapin Module

The third component is the NetWare Administrator snapin module that enhances the NDS utility to be able to define and set up the NT, Lotus Notes, or Exchange Server objects within NDS. It provides the same functionality as Microsoft's User Manager for Domains, Exchange Administrator, Lotus Notes, and SYSCON.

For example, administrators can use NetWare Administrator to manage NetWare and any NT domain on the network. The NetWare Administrator snapin allows the administrator to set up and modify synchronization settings for each domain. It also provides a robust set of integration tools to integrate existing systems.

Figure 1-1
Synchronicity 2.0 Architecture



2 **Planning Overview for All Synchronicity Products**

This chapter summarizes some of the issues you should consider before installing and configuring Synchronicity™ software. More information about these issues can be found in later chapters of this guide.

For prerequisite and system requirement information, refer to *Synchronicity Quick Starts*.

Global Event Services Issues

The main planning issue for Global Event Services™ is determining which NetWare® 4.1 or later servers will require Global Event Services. In most situations, we recommend that Global Event Services be loaded on every server in the NDS™ tree.

Global Event Services can be configured in three different modes. For details on these three modes, see “Global Event Services Planning Issues” on page 9.

Synchronicity for NT Issues

Consider the following issues before you install or configure Synchronicity for NT:

- Determine which NT domains and/or workgroup servers are to be synchronized. A workgroup server is defined to be an NT server that is not participating in any domain.
- Determine on which NT system the synchronization agent will be loaded. Only one synchronization agent should be loaded for each NT domain or NT workgroup server being synchronized.

Because the synchronization agent needs to run continuously, it is best to install it on a primary controller, not on a user workstation.

- Determine where to place the NDS container objects that are used to represent NT Domains and NT Workgroup Servers.
- Determine which NT domains/workgroup servers will synchronize with which parts of the NDS tree.
- Determine which workstations need to have the NetWare Administrator Snapins installed. For example, in a large company you may need to install the Snapins on several administrator workstations.

For more information on planning your installation of Synchronicity for NT, see “Synchronicity for NT Planning Issues” on page 17.

Synchronicity for Exchange Issues

Consider the following issues before you install or configure Synchronicity for Exchange:

- Determine whether to use Synchronicity for NT or NDS for NT.

Synchronicity for Exchange requires one or the other.

- Determine which Exchange Sites are to be synchronized.
- Determine which NT systems require the synchronization agent.

Only one synchronization agent should be loaded for each Exchange Site. This synchronization agent must be installed on a server that already has Microsoft Exchange Administrator installed, thus providing the proper Exchange access mechanisms (DAPI and MAPI32).

Because the synchronization agent needs to run continuously, we recommend installing it on a primary domain controller and not on a user workstation.

- Determine where to place the NDS object that represent Exchange Organizations.

Since this object represents the entire Exchange organization and not just an Exchange server, this NDS object may be contained by [Root], Locality, Country, Organization or Organizational Unit.

- Determine the synchronization setting preferences for Mailboxes and Distribution Lists.

These settings include NDS Container to Exchange container mappings, Exchange template selections, and Naming Rules. Although default settings are created by default, these settings should be reviewed before use because of the rich customization supported.

- Determine which NetWare servers require the NetWare Administrator snapins installed.

Because the Synchronicity for Exchange snapin can only be used on a computer that has Microsoft Exchange Administrator and because Microsoft Exchange Administrator is not supported on Windows 95/98, use NetWare Administrator on an NT server or workstation that has Microsoft Exchange Administrator installed.

For more information on planning your installation of Synchronicity for Exchange, see “Synchronicity for Exchange Planning Issues” on page 21.

Synchronicity for Notes Issues

Consider the following issues before you install or configure Synchronicity for Lotus[®] Notes[™]:

- Determine which Lotus Notes servers are to be synchronized.
- Determine on which NT system the synchronization agent will be loaded. Only one synchronization agent should be loaded for each Lotus Notes server being synchronized. This synchronization agent should also not be loaded on the same computer as the Lotus Notes server software.

Because the synchronization agent needs to run continuously, it is best to install it on a primary domain controller, not on a user workstation.

- Determine where to place the NDS objects that are used to represent Lotus Notes servers.
- Determine which Lotus Notes servers will synchronize with which parts of the NDS tree.

For more information on planning your installation of Synchronicity for Lotus Notes, see “Synchronicity for Notes Planning Issues” on page 23.

Synchronicity for NetWare 3 Issues

Consider the following issues before you install or configure Synchronicity for NetWare 3:

- Determine which NetWare 3 servers are to be synchronized.
- Determine which NetWare 3 servers will synchronize with which parts of the NDS tree.
- Determine which NetWare 4™ or later servers will be managing which NetWare 3 servers. These NetWare 4 or later servers will need to be running the Synchronicity for NetWare 3 synchronization agent.
- Determine where to place the NDS objects that are used to represent NetWare 3 servers.

Synchronicity Utilities

Synchronicity 2.0 comes with utilities that make it easy to diagnose your network to deploy Synchronicity, manage passwords, and determine how many licenses your site requires.

Synchronicity Password Change Utilities

Using the Synchronicity Password Utilities, network administrators, help desk personnel, and users can easily change a password to one network connection and have the passwords for any current network connections (monitored by a running Synchronicity agent) be synchronized to the new password.

The Synchronicity Password Utilities work in conjunction with other Synchronicity agents that monitor network platforms.

The Synchronicity Password Utilities are briefly described below. For more information, see the Synchronicity Password Utilities Help file.

Administrator Password Utility

With this utility, network administrators and help desk personnel can change the passwords of selected users on any or all current network connections monitored by a running Synchronicity agent.

User Password Utility

With this utility, network administrators and help desk personnel can change the passwords of selected users on any or all current network connections monitored by a running Synchronicity agent.

Password Provider

When changing their Windows password with this utility enabled, users can concurrently change their passwords to any or all current network connections monitored by a running Synchronicity agent, as well as change passwords for any workstation-specific passwords such as the Windows 95/98 screen saver password.

Password Monitor

The Synchronicity Password Monitor for Windows NT monitors password changes for any NT user and then, for those NT users linked to an NDS object, initiates password changes with all current accounts synchronized via Synchronicity agents.

The Synchronicity Password Monitor works with current NDS to NT synchronization settings when synchronizing from NT to NDS.

For more information, see the Password Monitor ReadMe file, READ_PWM.TXT.

License Auditor

Synchronicity products are licensed by the number of unique user accounts to be synchronized. For example, if a single NDS user account is linked to NT accounts in three different NT domains, only a single Synchronicity for NT user license is required.

You can run the Synchronicity License Auditor to determine the number of licenses you should have for the Synchronicity products you are using. Click Start > Programs > Synchronicity > Synchronicity License Auditor.

DSMedic

DSMedic is a set of tools that you can use as you deploy and diagnose Synchronicity. To run the utility, click Start > Programs > Synchronicity > DSMedic.

3 **Global Event Services Planning Issues**

This section will discuss the following information:

- How to plan and configure the installation of Global Event Services™
- Global Event Services Broker NLM™ security implementation

Global Event Services Configuration Modes

Global Event Services can operate in three modes to customize your network management. Strategic placement of NDS™ replicas determines the exact number and location of the NDS servers that need to run the Global Event Services NLM.

Note that each synchronization agent logs into only one Global Event Services broker. That Global Event Services broker receives event notifications from other brokers and passes their registered event notifications to the synchronization agent (except when running in Mode 3).

Mode 1—the most common and recommended approach—requires Global Event Services to be loaded on multiple servers. Installing Global Event Services on all servers with master or read/write replicas ensures that a change made to NDS on any server will result in the fastest event notification.

Modes 2 and 3 minimize the servers that need to run Global Event Services. In Mode 2 Global Event Services can synchronize an entire tree, but may be loaded on only one server containing replicas of the partitions to be synchronized.

Mode 3 is the same as Mode 2, except that you can manage portions of the tree separately.

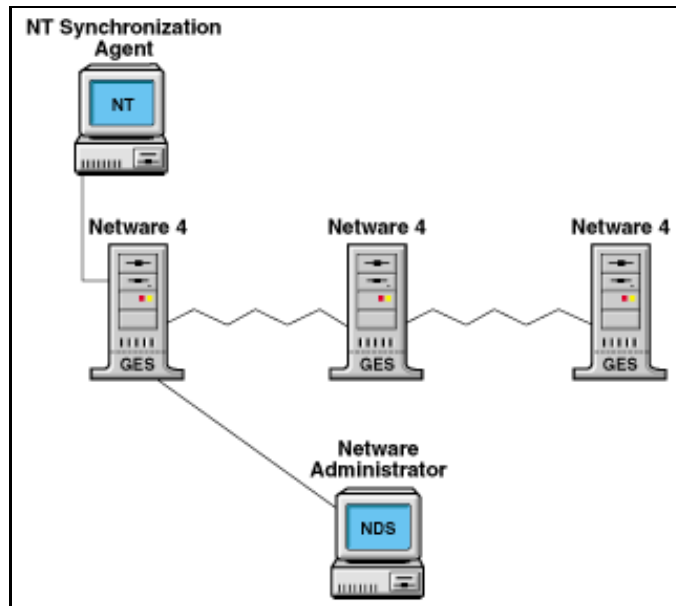
The following table summarizes the advantages and disadvantages of each mode. The paragraphs that follow explain each mode in more detail.

Mode	Advantages	Disadvantages
Mode 1—Recommended for most situations. Global Event Services detects local events only and is installed on all servers with master or read/write replicas of the partitions to be synchronized.	Decreased synchronization time—when an event occurs, Global Event Services synchronizes in real time.	Increased installation time if installed manually—must be installed on all NDS servers.
Mode 2—for WAN administrators who do not want to install Global Event Services on all servers but need to manage partitions across the WAN.	Only needs to be installed on one server, which contains replicas of all the partitions to be managed.	Because Global Event Services relies on NDS replication services to occur first, synchronization can take longer (in some environments, up to an hour).
Mode 3—for WAN administrators who need to manage domains separately within the WAN.	Global Event Services synchronizes only within specified domains, so traffic between Global Event Services brokers is reduced.	WAN-wide synchronization is not possible from one location.

Mode 1

Mode 1 indicates to Global Event Services that only local DS events will be processed. This means Global Event Services needs to be loaded on all servers containing the master replica and all read/write replicas of the partitions being synchronized. DS events that are received locally will be distributed to other Global Event Services brokers that have registered for the events on behalf of their clients.

Figure 3-1
Mode 1—Global Event Services on All NetWare 4 Servers



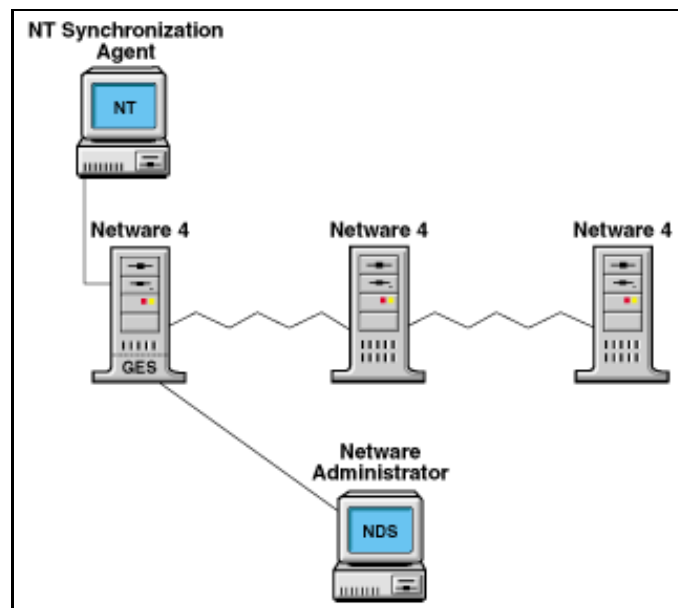
Mode 2

Mode 2 indicates to Global Event Services that local DS events and synchronized DS events will be processed. A synchronized DS event is a DS event that has occurred on a different NetWare[®] server but will eventually be synchronized by DS to a replica residing on this server.

DS events that are received (locally or otherwise) will be distributed to other Global Event Services brokers that have registered for the events on behalf of their clients.

Important To avoid processing events more than once when using Mode 2 or Mode 3, do not load Global Event Services on servers that contain replicas of the same partition. That is, if any servers have any replicas in common, do not load Global Event Services on more than one of these servers.

Figure 3-2
Mode 2—Global Event Services on Only One
NetWare 4 Server, Containing Replicas of All
Partitions

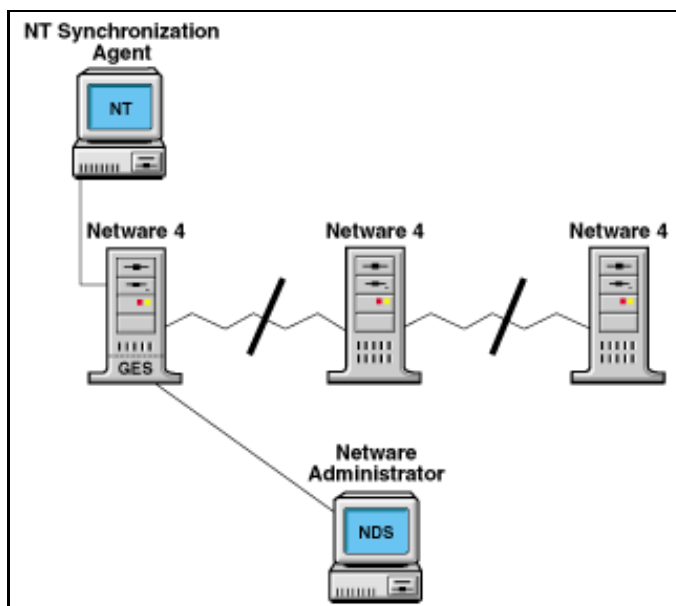


Mode 3

This mode is the same as Mode 2 except that DS events received (locally or otherwise) will NOT be distributed to other Global Event Services Brokers that have registered for the events on behalf of their clients. This mode supports the synchronization of different portions of the tree to clients located over WANs.

For example, suppose there are two NT domains being synchronized; one in New York (NY) and one in Los Angeles (LA). The NY domain is being synchronized from a client located in New York and is synchronizing the New York container (also a partition). The LA domain is being synchronized from a client located in Los Angeles and is synchronizing the Los Angeles container (also a partition). Global Event Services loaded in Mode 2 would not only send events to the local synchronization client but would also send the events to the Global Event Services Broker located on the server across the country. Global Event Services loaded in Mode 3 would send the events to any other Global Event Services Brokers but only to local synchronization clients.

Figure 3-3
**Mode 3—Global Event Services on One Netware
4 Server, Synchronizing Selected Portions of the
Tree**



Mode Summary and Recommendations

The following table summarizes the three modes based on how Global Event Services operates.

Global Event Services Mode	Detects Local Events Only	Sends Events to Other Global Event Services Brokers
1	Yes	Yes
2	No	Yes
3	No	No

Modes 2 and 3 are for WANs. These modes minimize the number of servers that need to run Global Event Services, but notification of DS events may be delayed while waiting for DS to synchronize between replicas. Mode 3 can reduce traffic between Global Event Services brokers.

Mode 1 requires Global Event Services to be loaded on more servers but supports rapid DS event notification. Since DS traffic is distributed and since Global Event Services is a highly scalable component, Mode 1 distributes the workload of synchronization throughout the network, thereby preventing bottlenecks and reducing server workloads. Mode 1 is the most practical configuration for most users.

Global Event Services Broker NLM Security Implementation

The Global Event Services broker NLM™ has several different security levels. The active Global Event Services security level can be set using the NetWare Administrator snapin module provided for Global Event Services, by obtaining the details of the object named Global Event Services, which is located at the root of the NDS tree. Global Event Services uses the power and flexibility of the NDS security system. Due to the sensitive nature and timing of network events, Global Event Services has three levels of security checking. These security checks are performed as follows:

Security Level 1—Basic: This security level resolves the NDS distinguished name (DN) of the client associated with this server connection only at login, although rights must be present for additional register requests. This level of

security does not prevent a client connection (and associated DN) from being replaced by another client (friendly or hostile).

Security Level 2—Recommended: In addition to security level 1, all client requests are verified for authenticity. That is, each request is checked to ensure the user (DN) is the same as the one that was verified upon Global Event Services login. This security level ensures that the client connection on this server is a logged-in and authenticated NDS connection. Each request made by the client is verified for this authentication. Requests to register, unregister, fire, and get events are first verified within NDS for proper rights. Once allowed access to the system, all events are allowed until the user logs out of the system.

Security Level 3—High overhead: In addition to security level 2, an NDS rights check is performed on each operation. This includes each "get event" request by the client. This additional security allows administrators to revoke rights within NDS and be ensured that clients already registered for those events will be denied any further access.

4 Synchronicity for NT Planning Issues

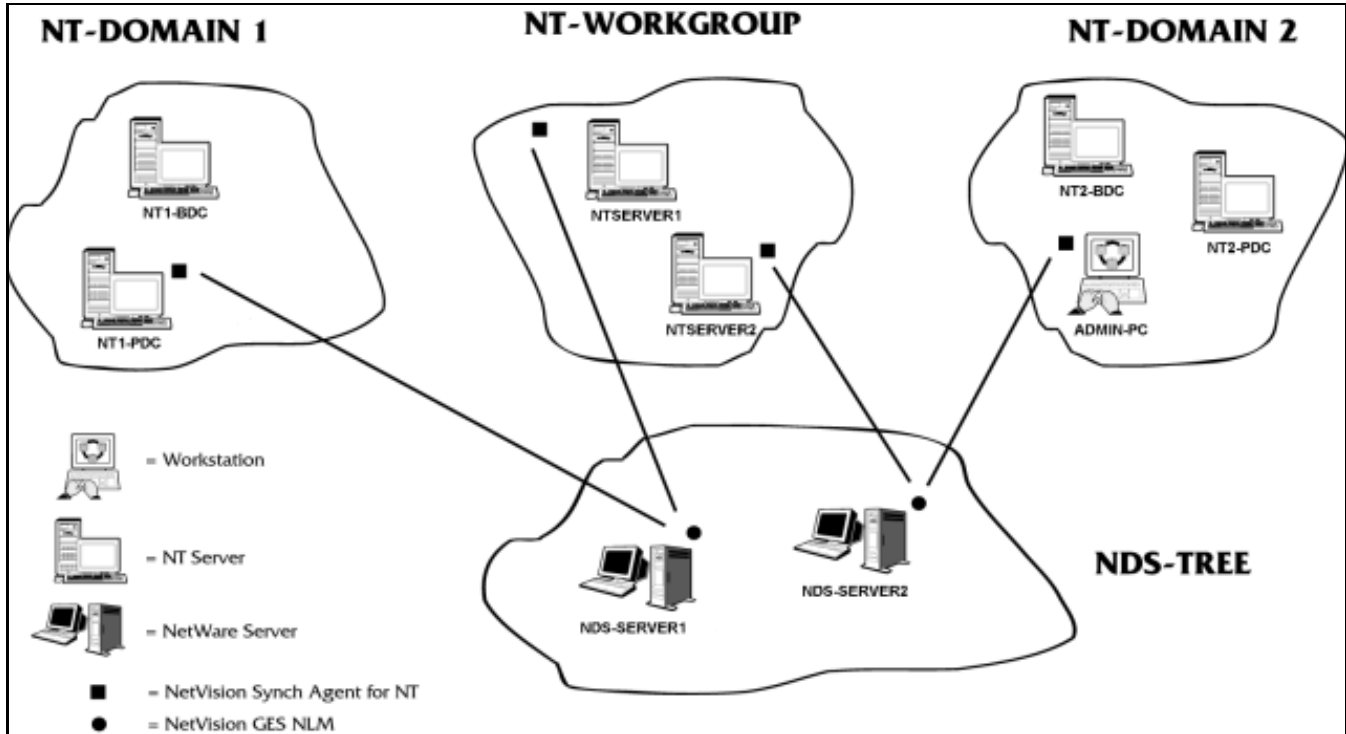
This section will discuss how to plan and configure the installation of Synchronicity™ for NT.

Configuration Issues

The Synchronicity for NT synchronization agent must run on Windows® NT® Server 4.0 or later. NT servers that are participating in domains or workgroups are supported. If the NT network is set up as a domain, the synchronization service can run on an NT Workstation with administrator privileges, instead of the primary domain controller (PDC) or other server within the domain. Only one server or workstation in a domain needs to be running the Synchronicity synchronization agent, while each server within a workgroup must be executing the synchronization agent.

The synchronization agent needs to communicate with only one Global Event Services server. The synchronization agent also supports re-synchronization of NDS and other directories after a system shut-down. The service-based agent can be set up to perform re-synchronization of the NDS directory database in any direction (for example, NDS-to-NT and NT-to-NDS synchronization). Figure 4-1 illustrates the three main configuration options available.

Figure 4-1
Possible Synchronicity for NT Configurations



The NT server or workstation that is running the synchronization agent for Windows NT must also be running the Novell® NetWare Client™ for NT. This client enables the synchronization agent to register for and receive any NDS event notifications from the Global Event Services™ Broker NLM™.

Domain Model Implications

This section describes the impact of the various NT domain configurations. For detailed descriptions of these domain models, please refer to the *Microsoft NT Server Resource Kit*.

Single Domain Model

- All unique user accounts in the domain to be synchronized must be licensed.
- Only one Windows NT server or workstation needs to be running the Synchronicity for NT synchronization service for each domain to be synchronized.

Master Domain Model

- All unique user accounts in the master domain must be licensed.
- Only the master domain needs to be synchronized, unless local groups are to be synchronized.

Multiple Master Domain Model

- All unique user accounts among all master domains must be licensed.
- Only each master domain needs to be synchronized, unless local groups are to be synchronized.

Complete Trust Model

- All unique user accounts among all domains must be licensed.
- One Windows NT server or workstation needs to be running the Synchronicity for NT synchronization service for each domain.

Workgroup Server Support

In addition to support for Windows NT domains, Synchronicity for NT also allows synchronization of workgroup servers with NDS. A workgroup server is defined as a Windows NT server that is not participating in a domain. The following guidelines should be followed when deploying Synchronicity for NT in an environment containing workgroup servers:

- All unique user accounts among all workgroup servers to be synchronized must be licensed.
- Each workgroup server to be synchronized needs to be running the Synchronicity for NT synchronization service.

Windows NT Workstation Support

For those sites that do not wish to install the Synchronicity for NT service on a server, the software can also be run on a workstation that has proper rights to the NDS and NT portions of the network. This capability may be useful in situations where the NT portion of the network is using the TCP/IP protocol and the NetWare portion of the network is using IPX/SPX™. In this situation,

only the workstation that is running the Synchronicity for NT service would need to contain both protocol stacks.

Placement of Domain and Workgroup Server Objects in NDS

For each Windows NT domain or workgroup server that is integrated with NDS, an object needs to be created in the NDS tree. These objects permit manipulation of domain-specific or server-specific information. The following approaches can be used to determine the locations for these objects.

- Place all NT Domain and NT Workgroup Server objects in one NDS container.
- Distribute the NT Domain and NT Workgroup Server objects throughout the NDS tree.

For more information on planning the installation and configuration of Synchronicity for NT, see the *Synchronicity Quick Starts*.

5 ***Synchronicity for Exchange Planning Issues***

Synchronicity for Exchange integrates Microsoft Exchange with Novell Directory Services (NDS), enabling administrators to manage users and groups across both network environments. NDS users are associated with Exchange mailboxes and NDS groups are associated with Exchange distribution lists. Network administrators can add, modify, and delete users and groups within Novell's NetWare Administrator, and Synchronicity for Exchange will make the corresponding changes to Microsoft Exchange objects.

Directory object attributes that are common between the two directories are automatically synchronized when entered or changed. No user intervention is required to keep the two system synchronized.

Although synchronization is completely automatic, administrators still have full control over the synchronization process. The synchronization of object creations, deletions, modifications and renames can be customized for each Exchange Recipients Container.

Finally, administrators are able to perform Exchange-specific administration within NetWare. Administrators may create, modify, and delete Exchange mailboxes and distribution lists without first having to create an associated NDS user or group. The entire Exchange directory can be browsed.

This section will discuss how to plan and configure the installation of Synchronicity™ for Exchange.

Configuration Issues

Normally there should be only one Exchange Organization object in NDS. This object is used by the Synchronicity for Exchange synchronization agent to log in.

In the details for the Exchange Organization NDS object, set the default Exchange server to be used by the synchronization agent and for browsing Exchange from within NetWare Administrator. This single Exchange Organization object can synchronize with different Exchange sites but the Home Server for mailboxes must be set to an Exchange server within the site of the specified recipients container.

Use Exchange directory connectors when you want basic directory replication within Exchange. Doing so allows Microsoft Exchange Administrator (and the Synchronicity for Exchange snapin for NetWare Administrator) to browse all "connected" sites when connected to a single Exchange server.

- Do not have multiple synchronization agents synchronize the same subtrees within NDS. Only one Exchange mailbox is allowed to be linked to any one NDS user and only one Exchange distribution list is allowed to be linked to any on NDS group.
- Do not have more than one Synchronicity for Exchange Synchronization Agent log in to any one Exchange Organization NDS object.

Synchronicity for Exchange supports integration with Synchronicity for NT or Novell's NDS for NT.

Note that integrating or synchronizing an NDS object with NT will not automatically create an Exchange mailbox or distribution list if the NT account already exists. In the case of the mailbox, if an NDS object is integrated with an existing NT account, it is likely that this account already has an associated mailbox so a duplicate is not created. Simply link the NDS user/group with the appropriate Exchange mailbox/distribution list within the Synchronicity for Exchange snapin for NetWare Administrator.

For more information on planning the installation and configuration of Synchronicity for Exchange, see the *Synchronicity Quick Starts*.

6 **Synchronicity for Notes Planning Issues**

Synchronicity™ for Notes™ integrates the Lotus® Notes Name and Address Book with Novell® Directory Services™ (NDS™), enabling administrators to manage users and groups across both network environments. Network administrators can add, modify, and delete users and groups within Novell's NetWare® Administrator, and Synchronicity for Notes will make the corresponding changes to the Lotus Notes Name and Address Book.

Directory object attributes that are common between the two directories, such as passwords, are automatically synchronized when entered or changed. No user intervention is required to keep the two systems synchronized.

Although synchronization is completely automatic, administrators still have full control over the synchronization process. The synchronization of object creations, deletions, modifications, renames, and passwords can be customized for each Notes server.

Finally, administrators are able to perform Notes-specific administration within NetWare Administrator. Administrators may create, modify, and delete Notes users and groups without first having to create an associated NDS user or group. Administrators can also administrate information specific to Lotus Notes, such as Notes mail accounts and hierarchies, from NetWare Administrator.

This section will discuss the following information:

- How to plan and configure the installation of Synchronicity for Lotus Notes

Configuration Issues

Before attempting to install Synchronicity for Notes, please consider the following issues:

- Which Notes Domino™ server is to be synchronized
- Which NetWare 4.1 and later servers will require the Global Event Services™ NLM™
- The security implementation
- Where to place the NDS objects used to represent Notes Domino servers
- Which parts of the NDS tree the Notes Domino server will be synchronized with
- Determine which Domino servers and which Lotus Notes™ clients on NT servers or workstations, require the service agent.

We recommend always starting the Synchronicity for Notes service agent manually from a Notes client site.

Running the service agent on the same NT server or workstation running Lotus Notes client requires either Option 1 or 2:

Option 1—A zero-length user ID password be used and the Notes client be installed on the NT location where the service agent will be manually started.

Option 2—If a zero-length user ID password is not used, the Notes client must be running with the Domino server Address Book open before manually starting the service agent and use one or the other of the following settings:

- the local User ID file be added to the Managed ID Files > User ID File Used by Sync Agent setting for the NDS Notes Server object
- Share passwords with Notes add-ins be selected (in client, File > Tools > User ID)

For more information on planning the installation and configuration of Synchronicity for Lotus Notes, see the *Synchronicity Quick Starts*.

chapter **7** ***Installation***

The Synchronicity™ installation program supports Windows® 95/98 and Windows NT®.

Before You Install

Before attempting to install any of the Synchronicity products, please do the following:

- Read the planning chapters in this document, beginning with “Planning Overview for All Synchronicity Products” on page 3. The planning chapters give valuable information on how to install Synchronicity so that you can optimize it for your particular situation.
- Read the README.TXT file on the CD-ROM. This file contains the latest information and may contain corrections or clarifications to the information provided in this document.
- Make sure a Novell® client is properly installed on the computer on which the installation will be performed. The Novell clients supported include the Novell Client for Windows 95/98 and the Novell Client for Windows NT.
- Because the installation process may attempt to modify the NDS™ schema, make sure you have appropriate rights for this.
- If you want to access the Synchronicity documentation and the HTML pages on the CD while you install, make sure that a Netscape or a Microsoft web browser is installed.

Installation Preview

The Synchronicity installation process includes the following macrotasks:

- Select components to customize your installation.
- Copy files and create icons.
- Modify NDS schema (conditional).
- Configure the Synchronicity Services.

Begin the Installation

To begin the installation, complete the following steps.

- 1. Insert the Synchronicity CD-ROM.**

The opening install screen will usually be brought up automatically when the Synchronicity CD-ROM is inserted into a CD-ROM drive.

- 2. If the AutoPlay feature has been disabled for the CD-ROM drive, run SETUP.EXE to begin installation.**

Note that the opening screen lets you access documentation for each of the Synchronicity products. Click Documentation to view the associated PDF or HTML documents on the CD.

The installation process is shown and explained in the following sections. You can accept the detected and default settings, or you can modify the settings to meet the needs of your networking environment.

Navigation

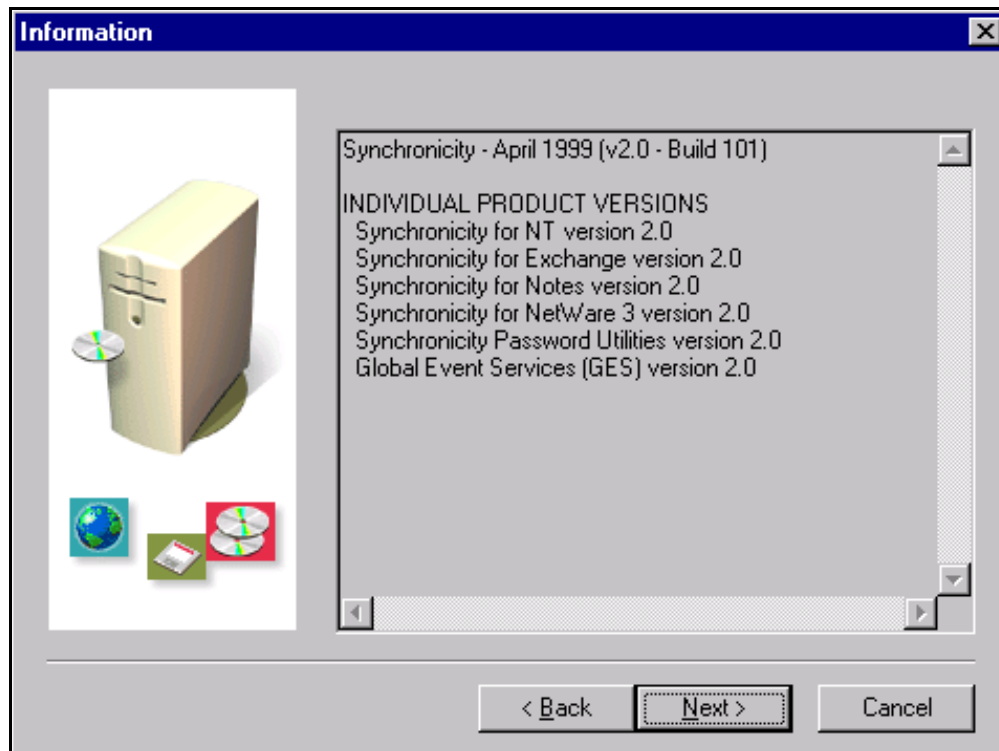
The installation process begins by displaying several informational pages. To advance to the next page, click Next. To return to a previous page, click Back.

Initial Information Gathering

When you begin installation, the following dialog boxes appear:

- A welcome page
- The Synchronicity Software License Agreement and Warranty
- The product version dialog (shown in Figure 7-1), which lists the versions of the individual products contained on the CD-ROM.

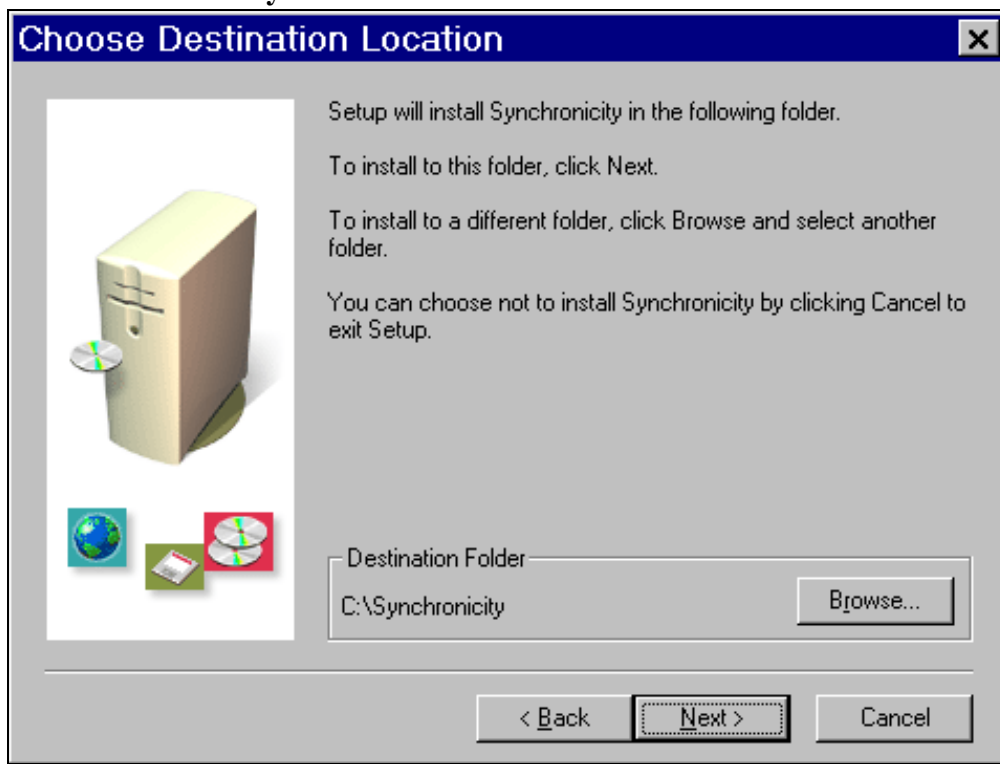
Figure 7-1
Product Version Information



- The destination dialog, which lets you specify where the files to be installed will be copied (see Figure 7-2).

Figure 7-2

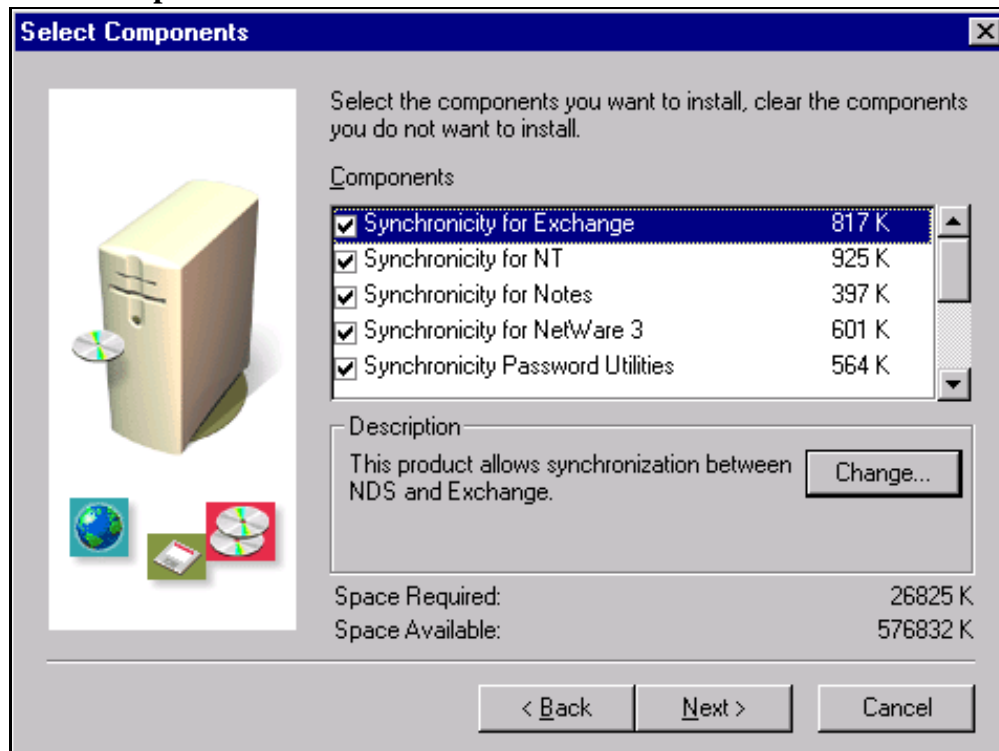
Specifying Destination Directory



Product Options Selection

The dialog in Figure 7-3 lets you select the Synchronicity products to be installed.

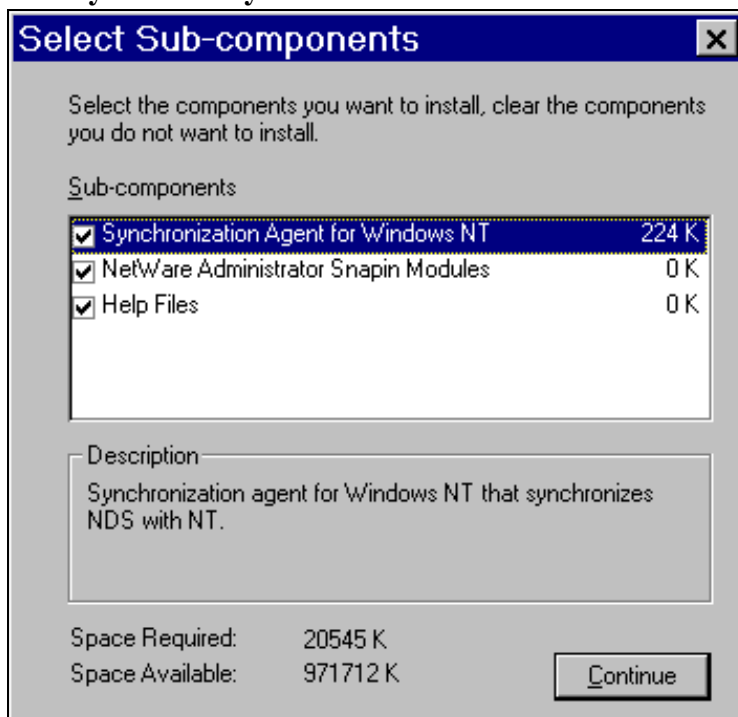
Figure 7-3
Selecting Product Components to Install



Click Change to bring up a dialog that lets you select individual components for the selected product (Figure 7-4).

Figure 7-4

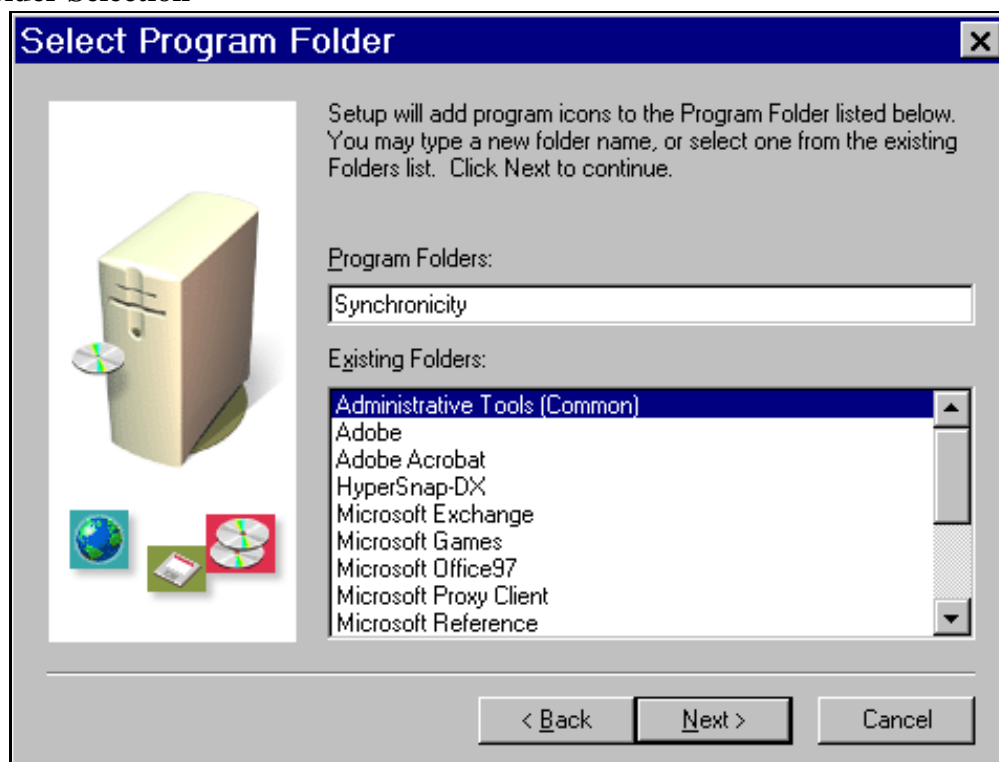
Individual Components of Synchronicity for NT



Copying of Files and Icon Creation

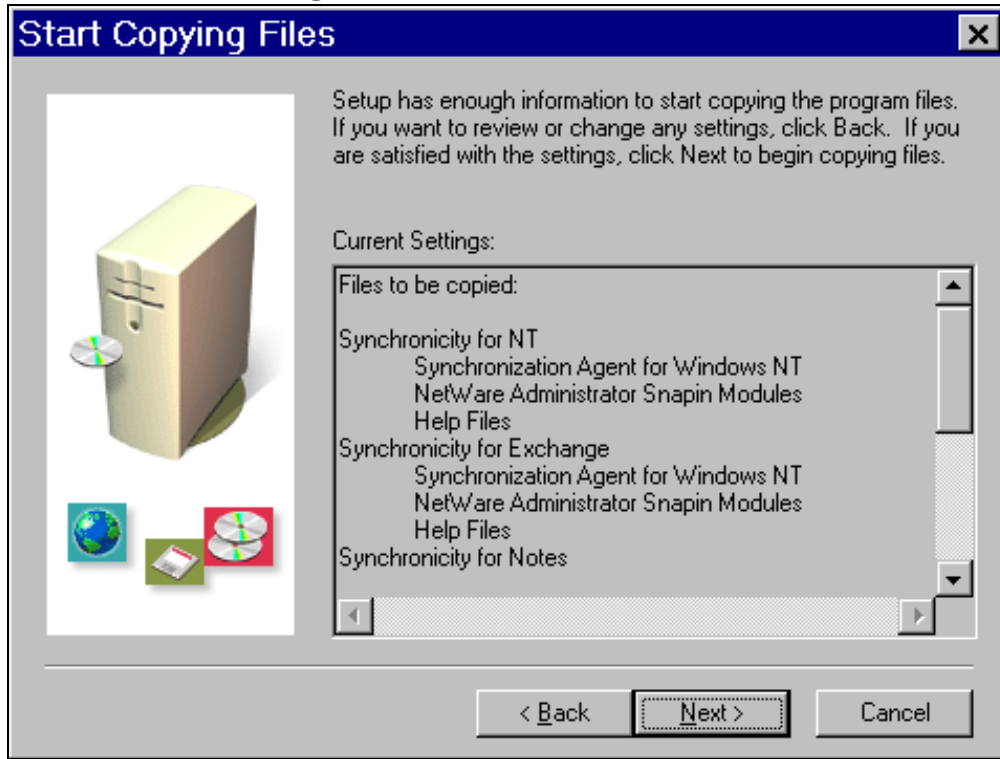
After you have selected the various product files to be copied, you must select a program folder before file copying begins (see Figure 7-5). You can accept the standard Synchronicity folder or select from existing program folders. After a successful installation, the selected program folder will contain icons for the various documentation and executable files that were installed.

Figure 7-5
Program Folder Selection



A review dialog summarizes the options selected (Figure 7-6). Click Next to copy the selected files.

Figure 7-6
Review Selected Installation Settings



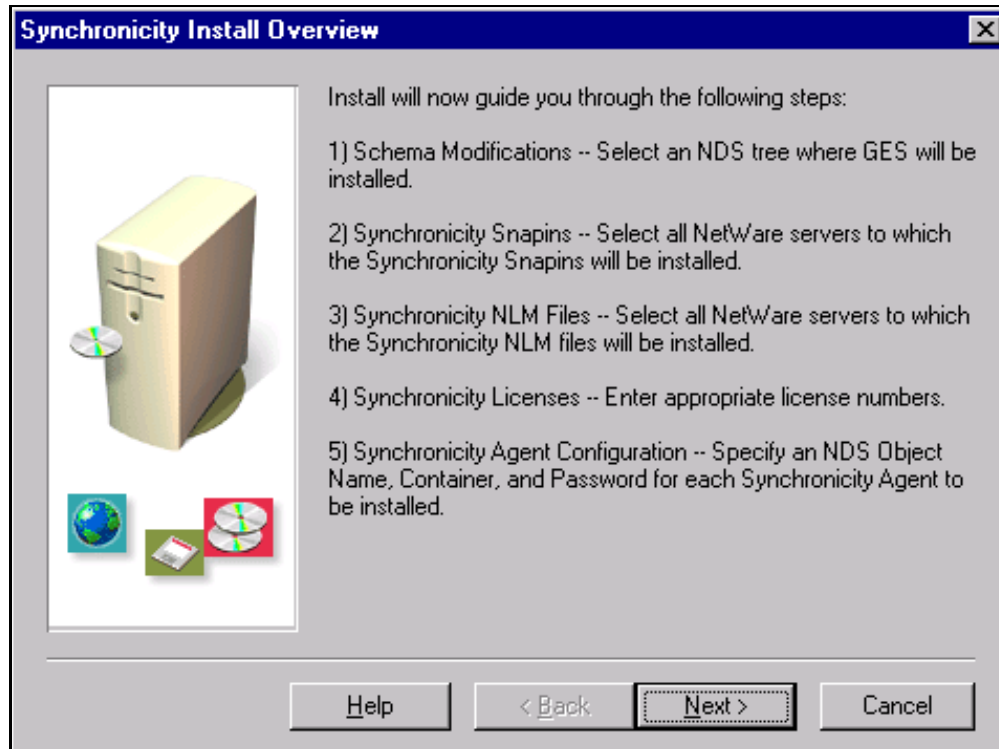
Online Help for Installing Synchronicity

From this point on in the installation program, you can access online Help for each of the dialogs. Click the Help button on a dialog for more information specific to that part of the installation process.

Installation Overview

The Install Overview dialog summarizes the tasks that complete your installation (Figure 7-7). Click Next to continue.

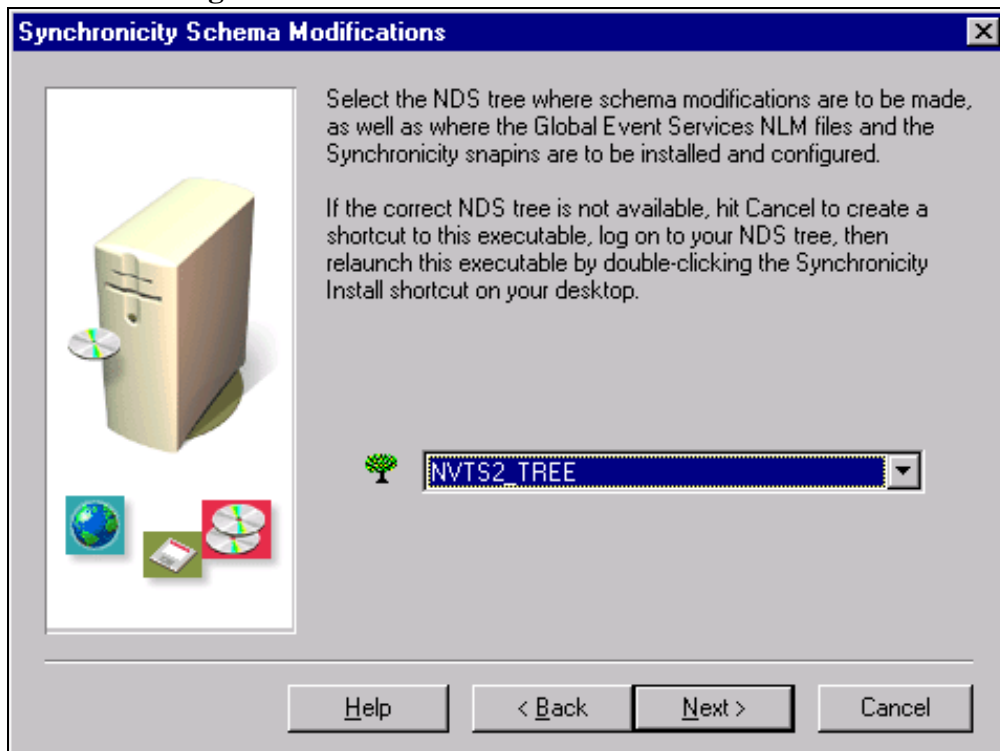
Figure 7-7
Installation Overview



NDS Schema Modification

After the files have been copied, the NDS schema may need to be modified. If any of the NDS trees to which the current computer is authenticated need to be modified, a dialog will appear (see Figure 7-8). In order to modify the NDS schema for the selected Synchronicity products, the currently active user account must have write access to the root portion of the NDS tree. This is usually only available to users designated as security equivalent to the user Admin.

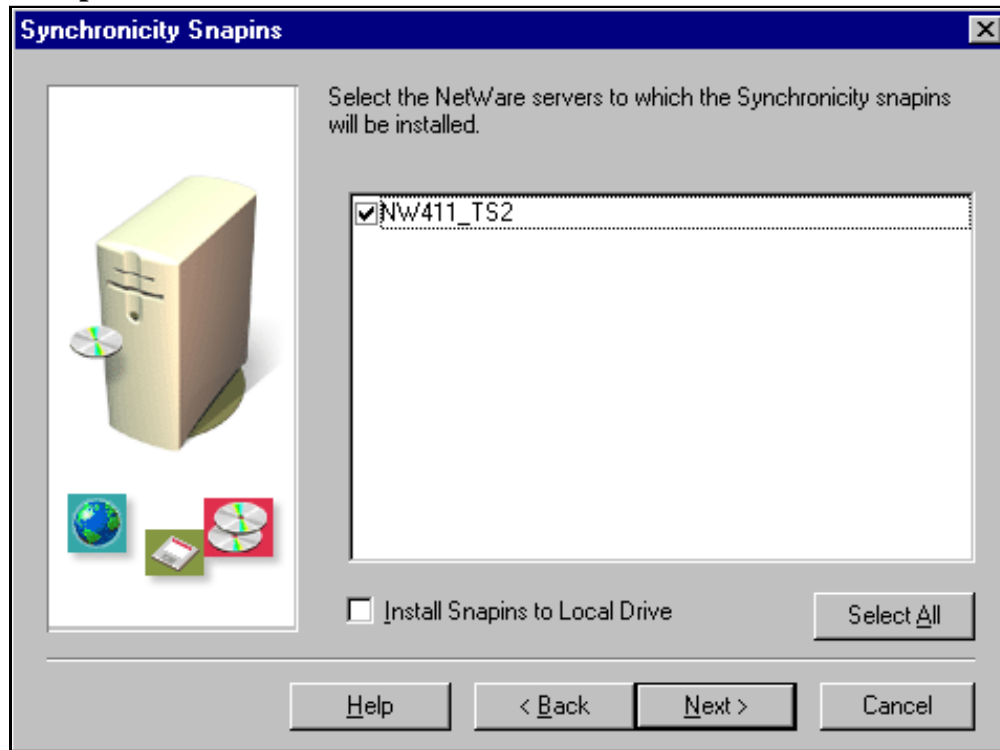
Figure 7-8
Schema Modification Dialog



Install Snapins

The next step in installation is to decide where to install the Synchronicity snapins that appear on NetWare Administrator (see Figure 7-9). You can install them on just one server and administer Synchronicity remotely, or you can install them on multiple servers where NetWare Administrator exists.

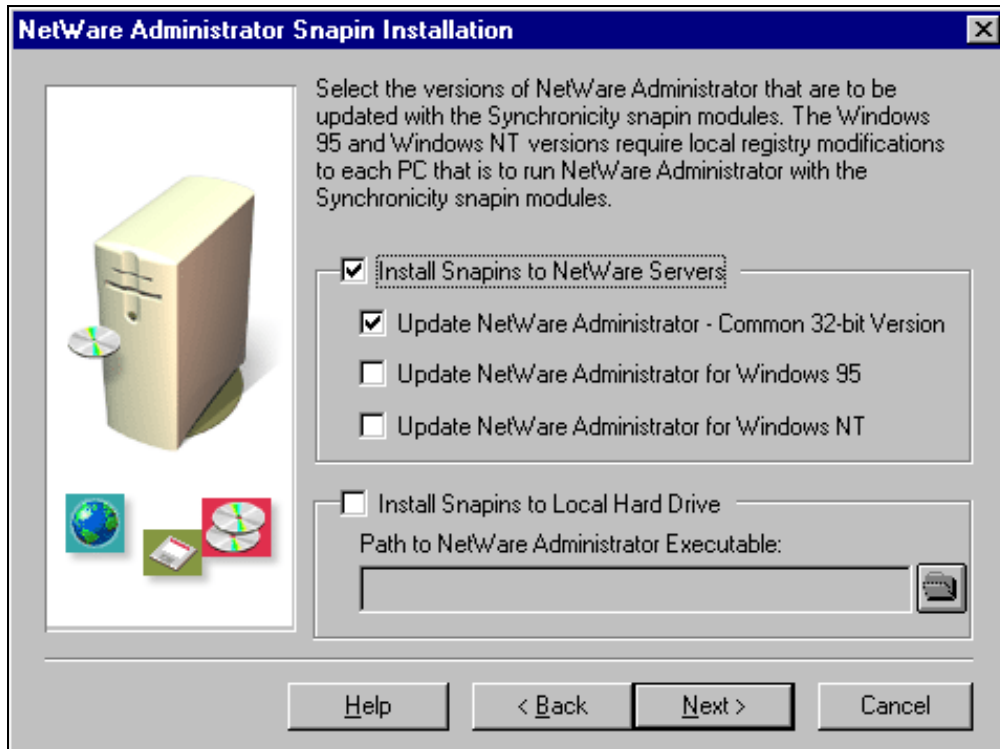
Figure 7-9
Installing the Snapins



Installing the NetWare Administrator Snapins

The next dialog (see Figure 7-10) lets you select the version of NetWare Administrator where the Synchronicity snapins will be installed.

Figure 7-10



Installing Global Event Services

If the products and components selected for installation require any of the Synchronicity NetWare Loadable Module™ (NLM™ programs), the dialogs shown in Figure 7-11 and Figure 7-12 will be displayed. The currently active NDS tree will be specified in the dialog as the default.

Figure 7-11
Selecting the Servers for the NLM

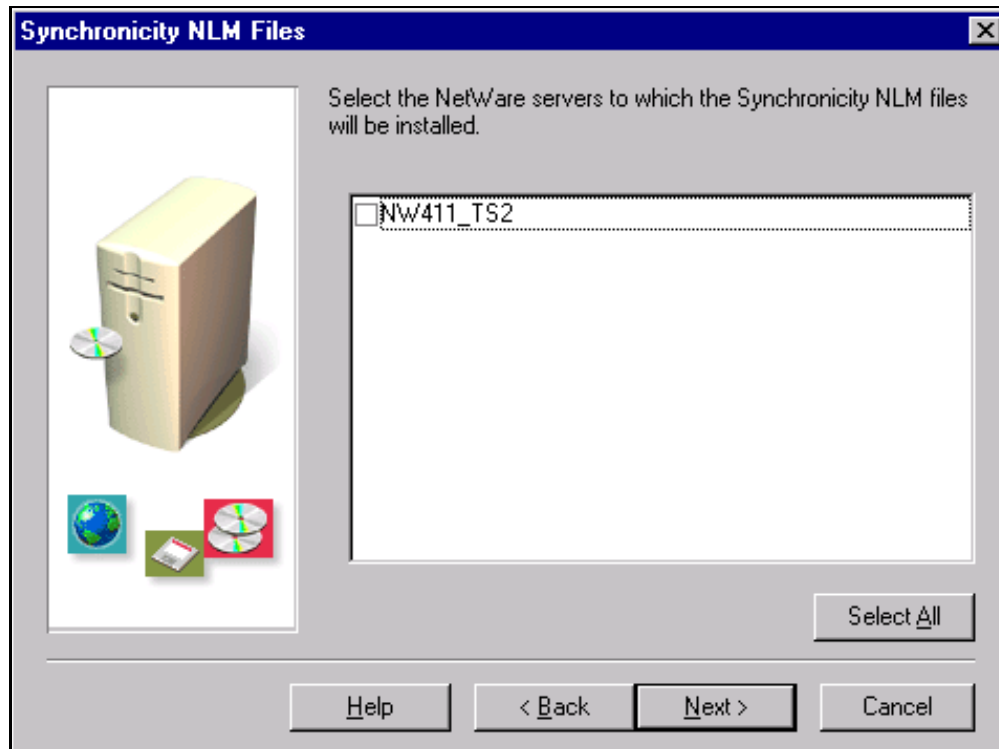
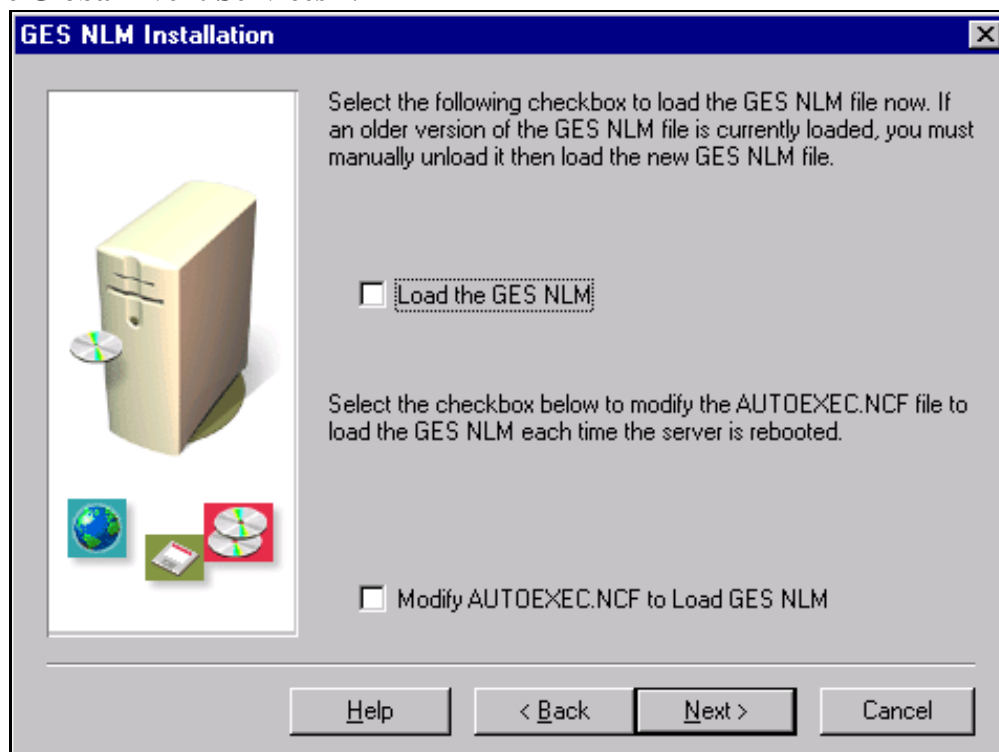


Figure 7-12
Installing the Global Event Services NLM

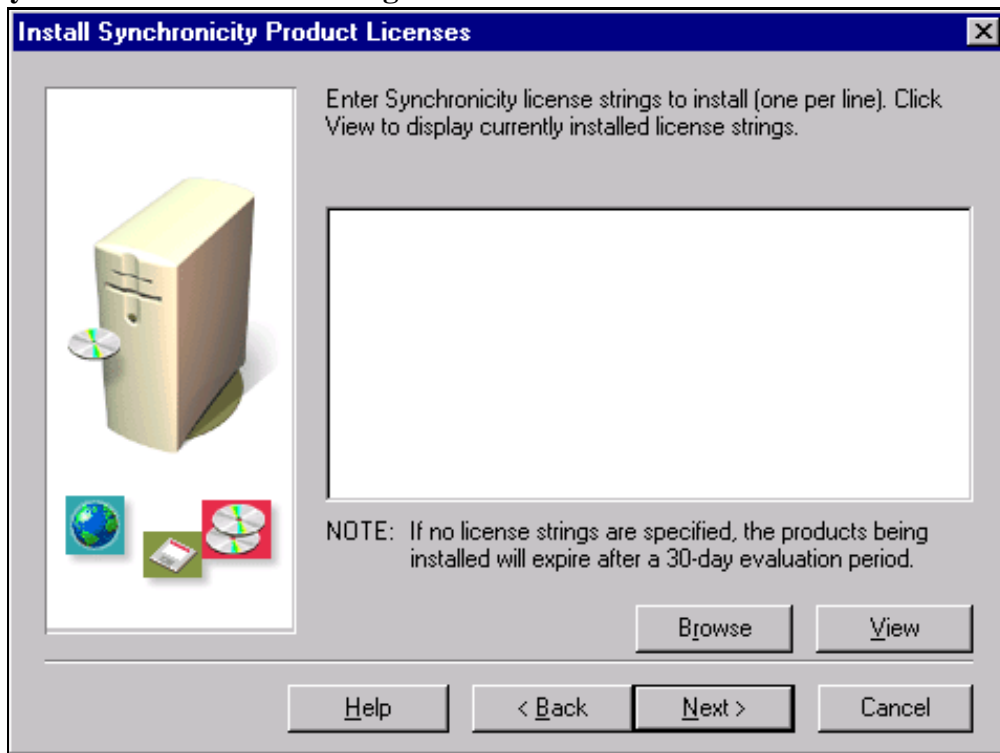


The Synchronicity NLMs can also be installed later. In NetWare Administrator, click Tools > Global Event Services (GES) > Install Global Event Services Broker NLM on an NDS Server. This menu will only appear when the NetWare Administrator snapin modules supplied with the various Synchronicity products have been properly installed.

Installing Synchronicity Licenses

Each of the Synchronicity products is set to expire after a 30-day evaluation period unless valid Synchronicity licenses are properly installed. The dialog displayed in Figure 7-13 lets you enter the Synchronicity license strings during the installation process. Synchronicity licenses may also be installed later from NetWare Administrator by clicking Tools > Synchronicity Shared Components > Manage Synchronicity Licenses. The NDS schema must have been successfully modified in order for the license installation to be completed without error. Click View to display a list of the currently installed licenses. The currently active NDS tree will be specified in the dialog as the default.

Figure 7-13
Synchronicity License Installation Dialog



Configuring the Service Agents

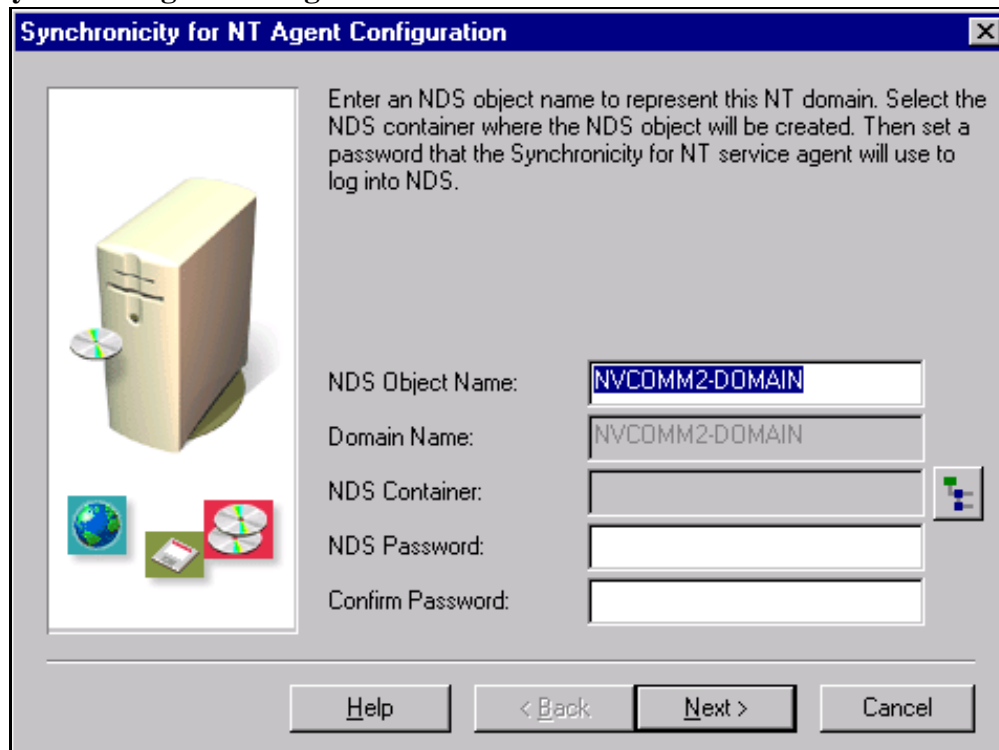
For each Synchronicity product you are installing (such as Synchronicity for NT or Synchronicity for Lotus Notes), you must configure the agent. You can change these service agent settings at any time using the Control Panel.

After installing Synchronicity for NetWare 3, you must manually create an NDS object, in NetWare Administrator, to represent each NetWare 3 server, then specify the NetWare 4 or 5 server (which must be running NVSYNNW3.NLM) that will be responsible for managing the NetWare 3 server.

The graphics in this section show the screens you will use to configure each agent.

If you are installing Synchronicity for NT, complete the information in the following dialog.

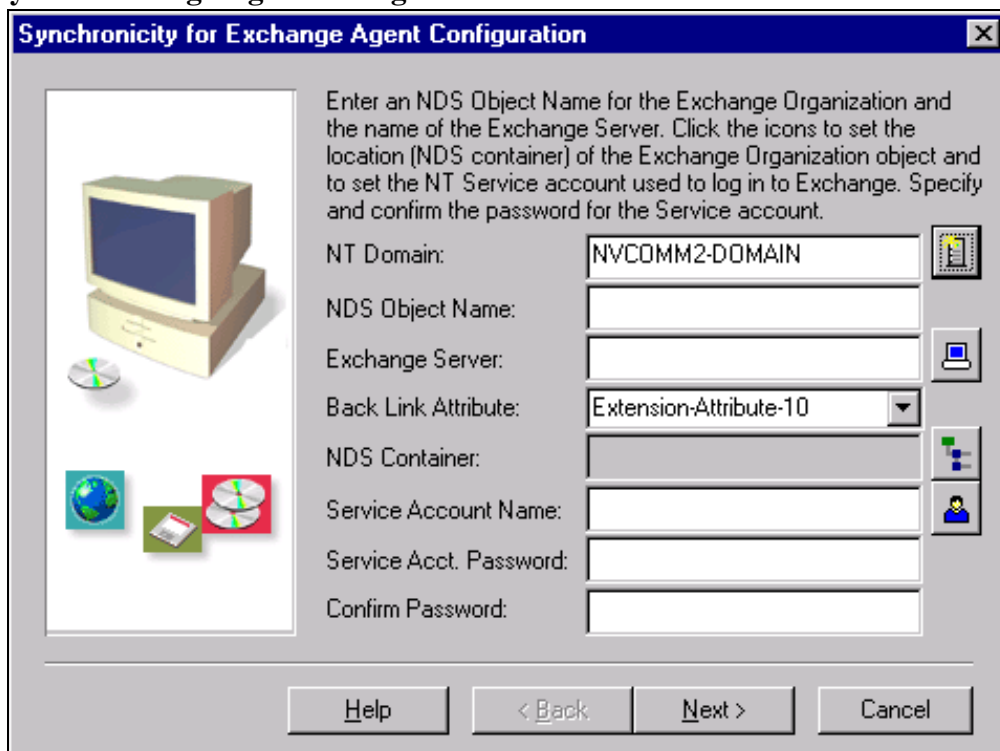
Figure 7-14
Synchronicity for NT Agent Configuration



If you are installing Synchronicity for Exchange, complete the information in Figure 7-15.

Figure 7-15

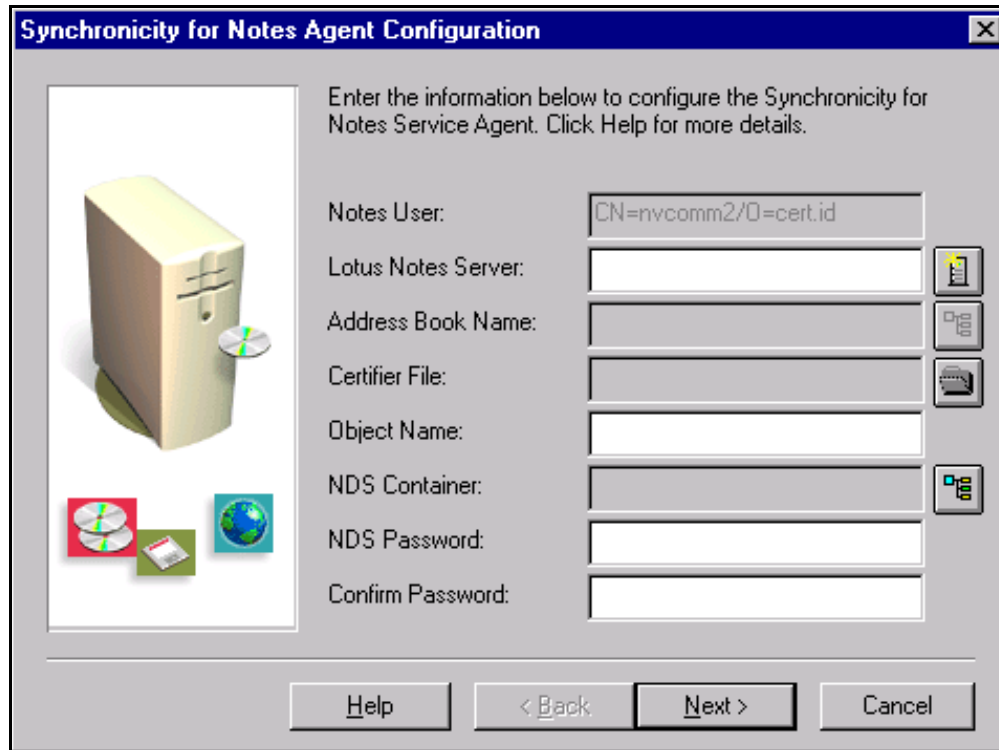
Synchronicity for Exchange Agent Configuration



The screenshot shows a Windows-style dialog box titled "Synchronicity for Exchange Agent Configuration". On the left is a graphic of a computer monitor, keyboard, mouse, and CD-ROM. On the right is instructional text: "Enter an NDS Object Name for the Exchange Organization and the name of the Exchange Server. Click the icons to set the location (NDS container) of the Exchange Organization object and to set the NT Service account used to log in to Exchange. Specify and confirm the password for the Service account." Below this are several input fields: "NT Domain:" with a text box containing "NVCOMM2-DOMAIN" and a browse icon; "NDS Object Name:" with an empty text box; "Exchange Server:" with an empty text box and a server icon; "Back Link Attribute:" with a dropdown menu showing "Extension-Attribute-10"; "NDS Container:" with an empty text box and a folder icon; "Service Account Name:" with an empty text box and a user icon; "Service Acct. Password:" with an empty text box; and "Confirm Password:" with an empty text box. At the bottom are four buttons: "Help", "< Back", "Next >", and "Cancel".

If you are installing Synchronicity for Lotus Notes, you need to complete the information in Figure 7-16.

Figure 7-16
Synchronicity for Lotus Notes Agent
Configuration



Setup Complete

When the installation process has been completed, the Setup Complete dialog appears. After finishing installation, restart the computer.

8 *Selecting Service Logon Options*

If you delete and then reinstall a server object, you must also reconfigure the service agent for that object.

Specifying Service Settings

In version 2.0, Synchronicity™ can be set up to automatically logon as a service on NT. With Synchronicity running in the background, you can lock a workstation to prevent unauthorized users from making changes to your settings. As with other NT services, you can select various options to configure the system to start Synchronicity properly in case of a power failure or reboot. For this process to work as desired, the following steps should be performed:

1. **On the NT Control Panel, click Synchronicity Services.**
2. **Select a Synchronicity product from the drop-down list.**
3. **Select Automatic, Manual, or Disabled to indicate how you want Synchronicity to start up.**
4. **Select the options you want in the Log On As group box.**
5. **Specify the NDS tree and object you want to synchronize when the system boots up.**

The password used for the NDS account must match exactly with the Windows® NT account.

9 **Uninstalling the Products**

Synchronicity™ provides an uninstall capability. Due to limitations in the NDS™ APIs, the schema extensions made to the base User and Group classes in NDS™ cannot currently be removed by the uninstallation program.

Removing Objects and Schema Modifications

To properly uninstall Synchronicity products, follow the steps described below.

1. **Stop the Synchronicity agents that are running, along with the Synchronicity NLM™ programs that are loaded.**

If any of the synchronization agents are running when you delete the NDS objects in the following step, the linked accounts will also be deleted.

2. **In NetWork Administrator, delete all of the objects in the NDS tree of the new custom types created by Synchronicity (such as NT Domains, NT Users, and NetWare 3 Servers) and all contained objects.**

The schema modifications cannot be uninstalled if there are objects defined that are classes (object types) defined by the Synchronicity product schema extensions.

3. **Delete the Global Event Services Event container object, located at the root of the NDS tree, and all contained objects.**
4. **To remove the Global Event Services schema changes, click Tools > Global Event Services > Undo Schema Modifications for Global Event Services.**

If the menu item is not present, the snapin modules have not been properly installed. If the menu item is present but disabled, the current NDS user may not have sufficient rights to modify the schema or the schema has not been modified.

- 5. To remove the schema changes for Synchronicity products, click Tools > Synchronicity Shared Components > Uninstall NDS Schema Modifications, select the NDS Trees and Synchronicity Products whose schema modifications you want to remove, then click OK.**

If the menu item is not present, the snapin modules have not been properly installed. If the menu item is present but disabled, the current NDS user may not have sufficient rights to modify the schema or the schema has not been modified.

- 6. To remove NT accounts for the synchronization agent services, in User Manager for Domains, delete the service accounts for the synchronization agents.**
- 7. Click Start > Settings > Control Panel > Add/Remove Programs and select Synchronicity, then click Add/Remove.**
- 8. Restart the computer.**