

How to deploy Syncsort's Backup Express in a Novell® environment

Networking Services

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DEPLOYMENT GUIDE

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syncsort

Novell®

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on Novell NetWare

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deployiNg Backup Express on Novell NetWare®

Backup Express is an enterprise-wide backup and restore system from Syncsort Inc. Its distributed architecture gives it the flexibility to optimize network usage by sending backup data over specifically designated segments of a network. It provides centralized control of all backup and restore functions with a single catalog that is accessible through an intuitive, point-and-click graphical user interface. Backup Express can back up any Novell® node, including NetWare® servers and NetWare clients, in LAN, WAN and/or SAN configurations.

Backup Express consists of three software modules:

- **Master Server.** The Master Server can run on the following supported OS platforms: Windows NT/2000/XP, HP-UX, IBM AIX, SGI, Sun Solaris, Tru 64 or Linux. Note: there only needs to be one Master Server installed in the entire enterprise.
- **Target Service Agent (TSA).** Must be installed on every NetWare node to be backed up. The TSA is installed during the installation of NetWare 5 or NetWare 6.
- **Backup Express Client.** Must be installed on every NetWare node that is IP-enabled and resides on a common network with the rest of Backup Express enterprise.

Backup Express accommodates both IP and IPX NetWare nodes in any combination. IPX-only nodes must be connected to a NetWare server that also runs TCP/IP. Every IPX node to be backed up must have the TSA installed. The NetWare

server must have both the TSA and Backup Express Client installed.

Figures 1 and 2 show two representative scenarios. In Figure 1, all NetWare clients run TCP/IP and reside on the same network as the Backup Express Master Server. All NetWare nodes run both the TSA and Backup Express Client.

In Figure 2, all NetWare clients are running IPX only. These nodes are connected to a NetWare server that runs both IP and IPX. All IPX-only nodes run the TSA. The IP-enabled NetWare server runs both the TSA and the Backup Express Client. The TSA on the IP-enabled NetWare server enables it to access both its own files as well as files on the IPX-based NetWare clients for backup.

NOTE: Because Backup Express must ultimately process data through an IP-enabled NetWare server, Novell recommends running TCP/IP on every NetWare server to be backed up. This eliminates the need to pass data from

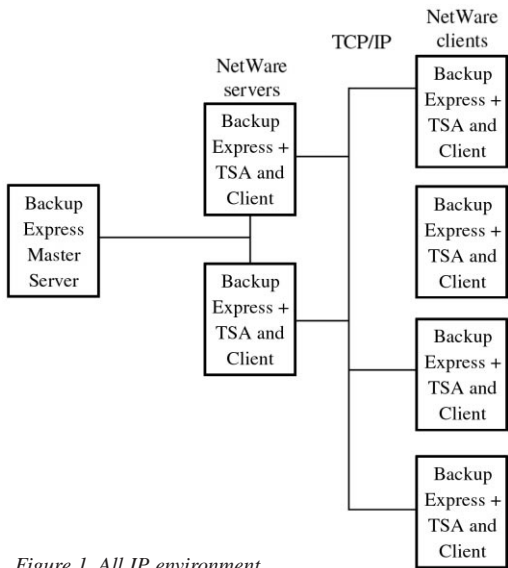


Figure 1. All IP environment.

IPX servers to IP-enabled servers, ensuring optimum performance.

Backup Express also supports tape backup. You can connect a standalone tape device or tape device within a tape jukebox directly to an IP-enabled NetWare Server or a SAN.

This guide provides a step-by-step procedure for installing backup express on a NetWare network.

STEP 1. PRE-INSTALLATION

Make sure you have the following hardware and software in place.

Master Server

- CPU: 500Mhz Pentium III minimum.
- Memory: 256 MB RAM minimum.
- Disk Space: At least 50 MB of free space on the Master Server hard drive to install the BEX program files, plus additional space for the catalog files (approximately 1% of the total

size of all backups you will be tracking in the catalog).

- OS: Windows NT/2000/XP, UNIX (HP-UX, IBM AIX, SGI, Sun Solaris, Tru 64) or Linux.

NetWare Server

- CPU: 500Mhz Pentium III minimum.
- Memory: 256 MB RAM minimum.
- Disk Space: 100 MB minimum.
- OS: NetWare 5.0 or later.

NOTE: You should have the latest NetWare service pack installed. In addition, the TSA that was installed with NetWare 5 will not function properly unless you download the TSA fix from Novell.com. You must add the load statement to the startup file (autoexec.ncf) so that the TSA will be automatically loaded on reboot.

NetWare Client

- CPU: 500 MHz Pentium III minimum.
- Memory: 128 MB RAM minimum.
- Disk Space: 100 MB minimum.
- OS: NetWare 5.0 or later.

- Client Software: Novell Windows Client 2.1.4 or later.

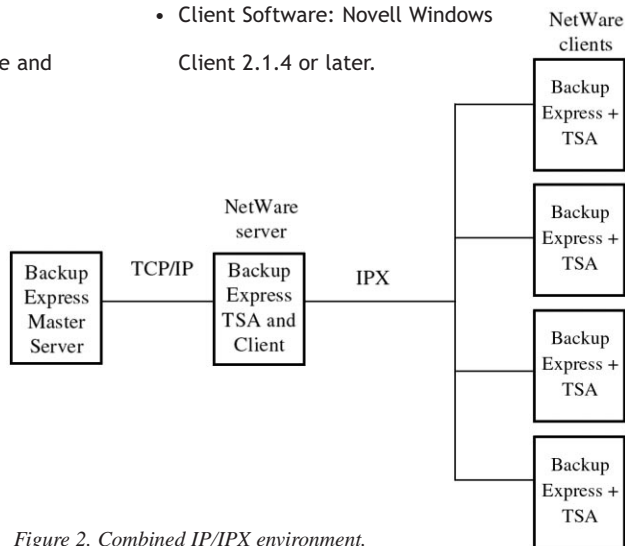


Figure 2. Combined IP/IPX environment.

STEP 2. INSTALL BACKUP EXPRESS SOFTWARE ON IP-ENABLED NETWARE NODES

You must run the installation program on a Windows machine that has the SYS: volume of the NetWare server mapped. If you want to install Backup Express to another volume, map that to a drive letter as well.

NOTE: Currently, you must perform the following procedure separately on every IP-enabled NetWare node to be backed up. Development is underway to automate deploying agents in future releases. Please contact Syncsort for availability.

To install Backup Express on NetWare TCP/IP nodes, perform the following procedure:

1. Mount the CD-ROM on the Windows node on which you mapped the Netware SYS and installation volume. The installation program (setup.exe) is in the \win directory and starts automatically when you insert the CD-ROM.
2. Read and agree to the license agreement. A dialog box will then appear requesting the type of setup you wish to perform.
3. Select NetWare client installation (the last choice in the menu). A dialog box will display requesting you to choose the destination path.
4. Choose a destination path on the mapped volume for Backup Express. Be sure to change the installation directory from the default C:\backex to the mapped volume. For example, if you are installing on VOL1, which is mapped

to H:, specify H:\backex. This will install the Backup Express modules in VOL1:\BACKEX.

The program will confirm your choice of destination directory.

5. You will then be prompted for the drive letter you used to map the SYS volume and the version of NetWare you are running. Enter these values.
6. The installation program copies the program files to the volume and directory that you specified in substep 4 above. When it has completed the copy, the installation program will prompt you for the name of the system volume. Enter the letter of the system volume as it is mapped to the Windows machine you are working on. The installation program will copy the required files to the SYS:ETC directory.
7. Next, you need to add lines to the SYS:\SYSTEM\AUTOEXEC.NCF file to enable Backup Express to start up when the server is started. You can edit this file using Notepad. You must add the following lines after the BIND IP line:
Load SYS:\SSPRODIR\bin\cmdllnlm.lib
(where SSPPRODIR is the directory in which Backup Express is installed usually backex)
Load SYS:\SSPPRODIR\bin\cmagent.nlm
(where SSPPRODIR is the directory in which Backup Express is installed usually backex)
Load Tsa500 for NetWare 5
Load Tsa600 for NetWare 6
Load Tsands

NOTE: The installation program will automatically open the file in Notepad for editing. However, you do not have to edit the file at this point. You can do it later. If you do not wish to add the lines at this time, exit the editor and answer "yes" when prompted whether to save.

8. The installation program checks the dates of system .NLM files and notifies you of any modules that are older than the ones Novell recommends. If you experience problems with the Backup Express client, you may want to update the modules listed.
9. When it completes the installation, the installation program will prompt you to execute the load statements that you added to SYS:\SYSTEM\AUTOEXEC.NCF. You may run these manually from the console or simply reboot the server.

If you are going to use a NetWare server to control a tape device, you will need to load the DEV_FILE.NLM module to create a device driver file in the SYS:\ETC directory on the server (*see Step 6*).

STEP 3. ADD IP-ENABLED NETWARE NODES TO BACKUP EXPRESS ENTERPRISE

Next you must specify which TCP/IP-enabled NetWare nodes you want to back up by adding them to the Backup Express enterprise. These are the nodes on which you have installed both the TSA and the Backup Express client. To specify the nodes, perform the following procedure:

1. On the Master Server, open the Backup Express GUI and go to the Configure Enterprise/Group/Node screen.
2. From the Group window on the left side of the screen, select the node group to which you want to add the node. If you have not yet created any node groups, create one by clicking on the Add Group to Enterprise button and entering the required information into the Group edit dialog box that displays.

NOTE: You need enter only the Group name at this time.

3. Click on the Add Node button. The Add Node to Group dialog box appears.
4. Enter the required information into the following active fields:

- Name: Enter a logical name for the node (for example, testbed). You can use up to 48 characters, no spaces. This is the name Backup Express will use for the node. In most instances, you should use the host name. The host name is the name by which the node is already known on the network.
- Access Method: Select TCP/IP from the pull-down menu.
- IP Addr/Host Name: Enter either the network IP address of the node (for example, 123.45.123.123) or the host name. If you have already entered the host name in the Name field, then you can leave this field blank.

- System Type: Identifies the operating system and communications protocol running on the node. Backup Express will supply this information based on the scan it performs in the next substep.
5. Click on Scan. If you entered a valid IP address or host name, Backup Express will attempt to communicate with the node. If Backup Express succeeds, the Scan button will be replaced by an OK button. If neither the IP address nor the host name is valid, Backup Express displays a message: "Cannot connect to node browser." Check the IP address or host name for accuracy and re-enter.
 6. Based on the scan, Backup Express fills in the System Type field (Novell_via_TCPIP) and the first three fields in the IPX Information window in the bottom half of the dialog box. The fields in this window provide information that enables Backup Express to access data on the NetWare file system. The fields are:
 - Novell Server: Indicates the name entered in the Name field (the second field from the top on the Add Node screen).
 - TSA Name: Specifies a TSA name on the node you are adding. The TSA name has the form *servername.NetWare File System*.
 - Target Name: The system name of the node you are adding as it is known to NetWare.

NOTE: Don't confuse Target Name with the TSA Name field above. The TSA Name is simply a convenient name

for the node within the Backup Express configuration.

7. Complete the remaining two fields in the IPX Information window:
 - User ID: Enter a NetWare user ID for the node you are adding. An administrator ID is necessary to enable Backup Express to access all data on the server.
 - Password: Enter the password for the User ID you are specifying.
8. Click on Test. Backup Express will attempt to log in using the User ID and Password that you have specified. If the Test fails, perform the following:
 - Check that the User ID and Password you specified are correct.
 - Make sure the User ID is fully qualified. This can take the form:
.administrator name.organizational unit.organization
or
cn=administrator name.ou=organizational unit.o=organization
 - Make sure that you have not reached the maximum number of connections on the NetWare server.
9. Click on OK. A password verification box displays.
10. Enter the password again, then press ENTER. The Enterprise/Group/Node screen displays with the newly defined node appearing on the right side of the screen.

STEP 4. ADD IPX-ONLY NETWARE NODES TO BACKUP EXPRESS ENTERPRISE

In this step, we add NetWare nodes to be backed up that aren't IP-enabled. To do so, perform the following procedure separately on every IPX-only node to be backed up:

1. Open the Backup Express GUI and go to the Configure Enterprise/Group/Node screen. From the Group window on the left side of the screen, select the node group to which you want to add the node.
2. Click on the Add Node button. The Add Node to Group dialog box appears.
3. Complete the active fields:
 - Name: Enter a logical name for the node (for example, NetWare5). You can use up to 48 characters, no spaces. This is the name Backup Express will use for the node.
 - Access Method: Because you are adding a node that communicates via IPX, select IPX from the pull-down menu. Backup Express will back up this client through an IP-enabled NetWare server that accesses the node via a TSA. (Remember that Backup Express does not communicate directly with a NetWare node that is not TCP/IP-enabled. Instead, it communicates through a TCP/IP-enabled NetWare server.)
 - IP Addr/Host Name: This field is inactive for IPX nodes.
 - System Type: This field is inactive for IPX nodes.
4. In the IPX Information window, select a server from the pull-down menu in the Novell Server field. This is the IP-enabled NetWare server through which Backup Express will access the node.
5. Click on the Browser button at the lower-right corner of the IPX Information window. The Browser box appears. The Novell server you specified in substep 4 above is shown at the top. The IPX nodes connected to the server are displayed beneath the server.
6. Select an IPX node to add by clicking on the square at the left of the node. The square changes to red, indicating that the item is selected.
7. Click on OK in the Browser box. The Browser box disappears and the Add Node to Group screen appears.
8. Based on a scan, Backup Express fills in the System Type field (Novell via IPX) and the first three fields in the IPX Information window in the bottom half of the dialog box. The fields in this window provide information that enables Backup Express to access data on the NetWare file system:
 - Novell Server: The TCP/IP-enabled NetWare server that communicates with the IPX node.
 - TSA Name: Specifies a TSA name on the server indicated in the Novell Server field. The TSA name has the form: `servername.NetWare File System`.

- Target Name: The system name of the IPX node you are adding, as it is known to NetWare. Don't confuse Target Name with the Name field above. The Name field is simply a convenient name for the node within the Backup Express configuration.

9. Fill in the two remaining fields in the IPX Information window.

- User ID: Enter a NetWare user ID for the node you are adding.
- Password: Enter the password for the User ID you are specifying.

10. Click on Test. Backup Express will attempt to log in using the User ID and Password you have specified. If the Test fails, perform the following:

- Check that the User ID and Password you specified are correct
- Make sure the User ID is fully qualified.

This can take the form:

*administrator name.organizational
unit.organization*

or

*cn=administrator name.ou=organizational
unit.o=organization*

- Make sure that you have not reached the maximum number of connections on the NetWare server.

11. Click on OK. A Password Verification box appears.

12. Enter the password again, then press ENTER. The newly defined node appears on the right side of the Enterprise/Group/Node screen.

STEP 5. CONFIGURE BACKUP EXPRESS JOB

Next, you must configure a backup Express job to perform the desired backups. Refer to the Backup Express Configuration CD on the Backup Express CD-Rom (in the Manuals folder) for instructions on creating job definitions.

STEP 6. ADD TAPE DEVICES TO IP-ENABLED NETWARE NODES (OPTIONAL)

Backup Express supports tape devices connected locally to IP-enabled NetWare servers using a SCSI interface or a Storage Area Network. The tape devices may be stand-alone devices or tape devices contained in a jukebox (Robotic Device).

NOTE: The robotic arm (changer) in the jukebox cannot be controlled by a NetWare server. It can be controlled by the Backup Express Master Server or any other non-NetWare node in your Backup Express enterprise.

To install a tape device driver on a NetWare server:

1. From the NetWare console, enter LIST DEVICES. If the Vendor ID and Product ID of the tape device appear, the tape device is attached properly. If not, make sure the correct drivers are loaded for the SCSI controller and for the tape device. If you do not have the proper drivers, contact your hardware vendor.
2. From the NetWare console, load the DEV_FILE.NLM from the bin directory of Backup Express. This will create SYS:\ETC\TAPEX, which will be used as the Device ID in the

Backup Express configuration. For example, if you installed Backup Express on VOL1, enter `LOAD VOL1:\BACKEX\BIN\DEV_FILE.NLM`.

3. In the Backup Express GUI, go to the Configure Devices screen (or Configure Robotic Devices, if the drives are attached to a jukebox).
4. Click on the Add Device button. The Add Device screen appears.
5. Fill in the active fields:
 - Device Name: Enter a name for the device (up to 14 alphanumeric characters, no spaces). This is the logical name used to refer to the device (for example, `NW_DR1`).
 - Device Node: Select the name of the node to which the device is attached from the pull-down menu (for example, `nw5`). This node must have been previously defined (via the Configure Enterprise screen). You can have multiple devices on a node up to the limit the hardware supports.
 - Device ID: Enter the path to the device file created by `DEV_FILE.NLM`.
 - Comment: You can optionally enter a comment of up to 48 alphanumeric characters.
6. Click OK. The newly defined drive appears on the right side of the screen.

STEP 7. BACKING UP THE DOS PARTITION (OPTIONAL)

Under normal operation, you will see only the NetWare volumes in the Backup window of the

GUI. If you wish to also back up the DOS boot partition of a server, you need to perform the following procedure:

1. From the NetWare console, load `"TSADOSP.NLM"`.
2. Open the Backup Express GUI. Go to the Configure Enterprise/Group/Node screen. From the Group window on the left side of the screen, select the node group that contains the NetWare server.
2. Click on the Edit Node button. In the IPX Information window, the current TSA Name will be `[SERVERNAME].NetWare File System`.
4. Edit the TSA Name field so that it reads `[SERVERNAME].DOS Server Partition TSA`.
5. Go to the Backup screen in the GUI. Browse this node. You will now see the DOS partition.
6. After this partition is backed up, change the TSA Name back to `[SERVERNAME].NetWare File System` to access the NetWare volumes again. In the restore screen, you will be able to restore from both the DOS partition and the NetWare volumes.

STEP 8. TUNE PERFORMANCE (OPTIONAL)

To ensure optimum performance during backup and restore, Novell recommends tuning the network using the following procedure:

1. Check the switch/hub configuration. If the network is misconfigured with half-duplex devices interacting with full duplex devices, excessive collisions will occur that can cause connection problems.

2. Manually adjust the network card or router parameters for optimum performance.

For example, performance is hampered when the network card or router is set to "auto-negotiating" for the card speed or duplex mode.

3. Uncompress all data to be backed up. If the disks are compressed, performance will be slowed due to the extra CPU overhead required to uncompress the data.

4. Disable anti-virus software during backup and restore. If anti-virus software is enabled for file reads and writes, throughput will be reduced.

5. Using the Monitor utility, adjust the system parameters as shown below to optimize performance. (You should adjust the communications parameters first.)

a. Monitor -> Server Parameters ->

Communications

- 1) Minimum Packet Receive Buffers= 500 (or 3 per connection)
- 2) Maximum Packet Receive Buffers= 4000
- 3) Maximum Physical Receive Packet Size=1524 (Ethernet) OR 4540 (Token Ring and FDDI) OR 618

(Arcnet and Localtalk)

b. Monitor -> Server Parameters ->

Directory Caching

- 1) Maximum Concurrent Directory Cache Writes=100
- 2) Maximum Directory Cache Buffers=4000
- 3) Minimum Directory Cache Buffers=500 (or 3 per connection)
- 4) Directory Cache Allocation Wait Time=0.5 sec

c. Monitor -> Server Parameters ->

File Caching

- 1) Maximum Concurrent Disk Cache Writes=500
- 2) Dirty Disk Cache Delay Time=0.5

d. Monitor -> Server Parameters ->

Miscellaneous

- 1) Minimum Service Processes=500 (or 3 per connection)
- 2) Maximum Service Processes=1000
- 3) New Service Wait Time=0.3 sec

e. Monitor -> Server Parameters -> Memory

- 1) Reserved Buffers Below 16MB=200

Congratulations. You have just successfully deployed Backup Express. Now you can rest assured that the valuable data on all NetWare nodes can be automatically backed up and protected from loss.

ADDITIONAL INFORMATION

For additional details on installing Backup Express on NetWare, refer to the Syncsort document *Backup Express and Novell NetWare*. You can obtain a copy from Syncsort Technical Support.

Technical Support

If you need additional help in deploying Backup Express, contact Syncsort Technical Support by telephone or e-mail. Technical Support is available from 9:00 AM to 7:00 PM EST.

Telephone: (201) 930-8280

e-mail: BEXSupport@syncsort.com. (in Europe, e-mail: support@syncsort.nl)

NOTE: Before you contact technical support, you should have a CONFIG.TXT file created and ready to e-mail to the Syncsort Technical Support engineer. This file contains detailed server parameters.

To create the file, simply load the CONFIG.NLM debugging tool by entering:

```
LOAD CONFIG.NLM /ADS at the console prompt.
```

This automatically creates a SYS:\SYSTEM\CONFIG.TXT file.

For additional information on day-to-day management of Novell NetWare, product features, Q&A, etc. please see the following links:

Product Information:	http://www.novell.com/products/netware/produinfo.html
NetWare Documentation:	http://www.novell.com/documentation/lg/nw51/docui/index.html
Novell Cool Solutions:	http://www.novell.com/coololutions/netware/
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Novell Consulting Services:	http://www.novell.com/consulting/
Novell Consulting Business Solutions Offerings (BSOs):	http://www.novell.com/consulting/bso/
Novell Education	http://www.novell.com/education
Novell Partner Network:	http://www.novell.com/partners/locator.html
NetWare Case Studies:	http://www.novell.com/success/by_product.html
Novell Connections Magazine:	http://www.nwconnection.com

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