Intel® Server RAID Controller U2-1
Integration Guide
For Microsoft* Windows NT* 4.0

Revision 1.0
February 2000

intel®

Revision History

Revision	Revision History	Date
1.0	Initial Release	02/10/00

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Integrating an SRCU21 in a High- Performance File/Print Server

This installation procedure will describe the steps required to install Microsoft Windows* NT* 4.0 on a system where the SRCU21 has created and controls an array of RAID 5 drives that will contain the bootable operating system. The system will contain no other hard drives.

Hardware Requirements

System:

- 9MB free hard drive space
- CD-ROM
  - SCSI, boot from NT boot diskettes
  - IDE, Enable system BIOS to boot CD
- Video
- Floppy Drive
- 1 available PCI slot
- PCI 2.2 compliant BIOS (3.3 Volts to the PCI slot)
- Intel Integrated RAID adapter:
  - SCSI hard drives
  - SCSI cabling and terminators

Hardware Integration Overview

- Install the memory DIMM on the SRCU21.
- Install the SRCU21 into the server system.
- Flash the latest SRCU21 firmware update.
- Make a diskette containing the SRCU21 drivers for Windows NT.
- Follow Normal Windows NT 4.0 installation procedure using the diskette driver just created.

Your Resource CD

The SRCU21 was shipped with a bootable CD the contains the following items.

- A ROM-DOS menu system that can be accessed when you boot from the CD.
- A flash update utility and flash update code.
- An option available from the menu to make operating system driver diskettes.
- An option available from the menu to make RAID troubleshooting diskettes.
- An option available from the menu to make recover diskettes.
- A GUI interface available from Windows* that includes the Windows NT setup utility.
- Other options available from the GUI interface.

- The SRCU21 User's Manual and other documentation.

1. Place your CD into the CD-ROM drive of your system and boot to the CD.
2. At the ROM-DOS menu, create driver diskettes for Windows NT.
3. At the ROM-DOS menu, update the firmware on the SRCU21 with the latest firmware revision available at http://support.intel.com/support/motherboards/server/SRCU21

Creating a Drive Array.

Because the operating system will be loaded on drives controlled by the SRCU21, it is necessary to create the drive array prior to operating system installation. This drive array is sometimes referred to as a RAID volume and must not be confused with an operating system volume. During this installation, a set of three drives will be configured as a RAID 5 array (RAID volume). A Windows NT volume will then be created on an a Windows NT partition, this volume will be assigned the drive letter "C". During this installation the set of three hard drives will look like one drive. Further explanation of RAID levels and theory is contained in the SRCU21 User's Manual.

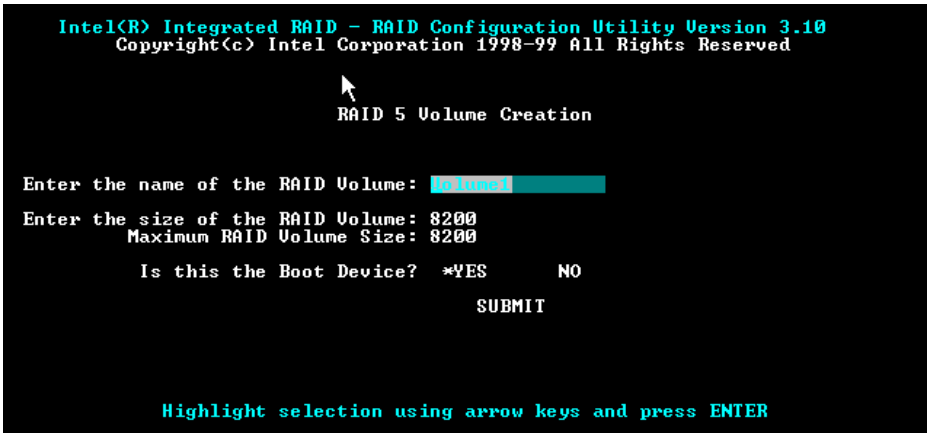
Array configuration Steps

1. Invoke the RAID Configuration Utility by pressing Ctrl C during the POST process. The following ROM-DOS menu will display.

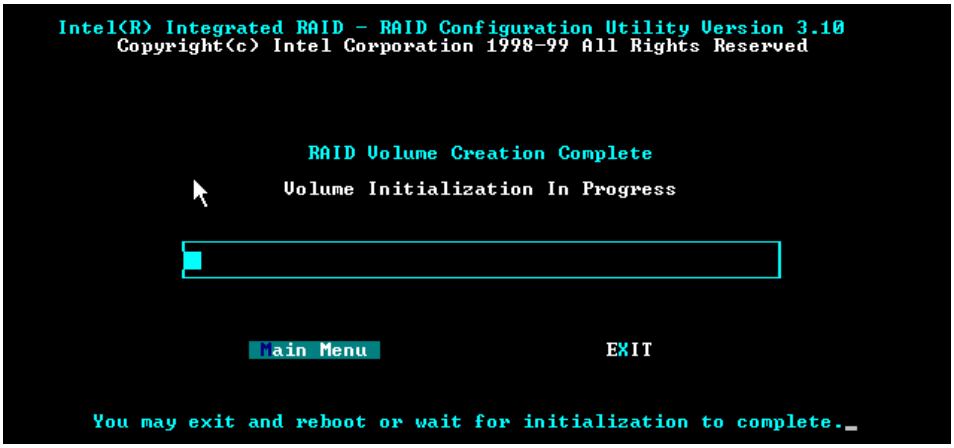
2. Create a RAID Volume, at the main menu, highlight "Create RAID Volume" and press enter.

3. The number of drives present in your system determines the type of menu the user sees next. The following graphic depicts a system with thee or more drives available and the RAID options they allow. If only two drives were available, the options would be for RAID 0 and RAID 1.

4. Create a RAID 5 Volume by pressing enter on the RAID 5 option above. You will see the following screen.



5. You may now name the volume by overtyping in the space containing the label “volume1”. The name you choose must be 15 characters or less.
6. In addition, you may choose the volume size, the system will default to the largest size. Remember that parity storage takes space. You will lose the space equivalent to one drive. In the example above, we have three – 4Gb drives but space available is 8Gb due to parity.
7. You should then choose submit and press enter. The volume will then begin the initialization process as indicated on the graphic below.



8. At the initialization progress screen, you can choose to allow the initialization to continue or choose to exit. Although it is advisable to complete the initialization prior to installation of the OS, you can choose to exit. Initialization will complete even if the system is rebooted.

Installing Microsoft Windows NT Server 4.0

NOTE: When operating under Microsoft Windows NT Server 4.0 it is recommended to use at least 64MB of memory for each processor installed in the system. For Windows NT Server 4.0 64MB is good starting point for amount of memory but more is almost always better. More memory will increase system performance under multi-tasking loads including user file/print requests. A list of qualified memory modules for Intel server boards can be downloaded from the following web site:
http://support.intel.com/support/motherboards/server

Pre-Installation Steps

A) Label a blank high density (HD) formatted 3.5” floppy disk “Emergency Repair Disk” and have it available for use during the install routine.

B) Determine what protocol(s) this server will be running. Assuming TCP/IP record information below.

IP Address _____

Subnet Mask _____

Default Gateway _____

Machine Name _____

NOTE: It is not recommended to use DHCP to assign the IP information of a server.

C) Prepare driver disks for on board devices such as the video, network interface adapter, and other SCSI devices. Use the latest drivers available.

Microsoft Windows NT* Server 4.0 Installation Steps[1]

1. Insert the Microsoft Windows NT 4.0 Server - Setup Disk 1 into the 3.5" floppy drive and power on the system. Insert the Microsoft Windows NT 4.0 Server CD into CD-ROM drive after the system has started booting from the floppy drive.

2. System will automatically start the installation and will prompt you for Disk 2. Insert Disk 2 and hit <Enter> to continue. An initial Windows NT screen will appear recognizing one processor (regardless of what you actually have installed), the amount of memory present, and a multi-processing kernal. This is normal at this stage.

3. After 3 to 5 minutes the "Welcome to Setup" screen will appear. Press <Enter> to continue.

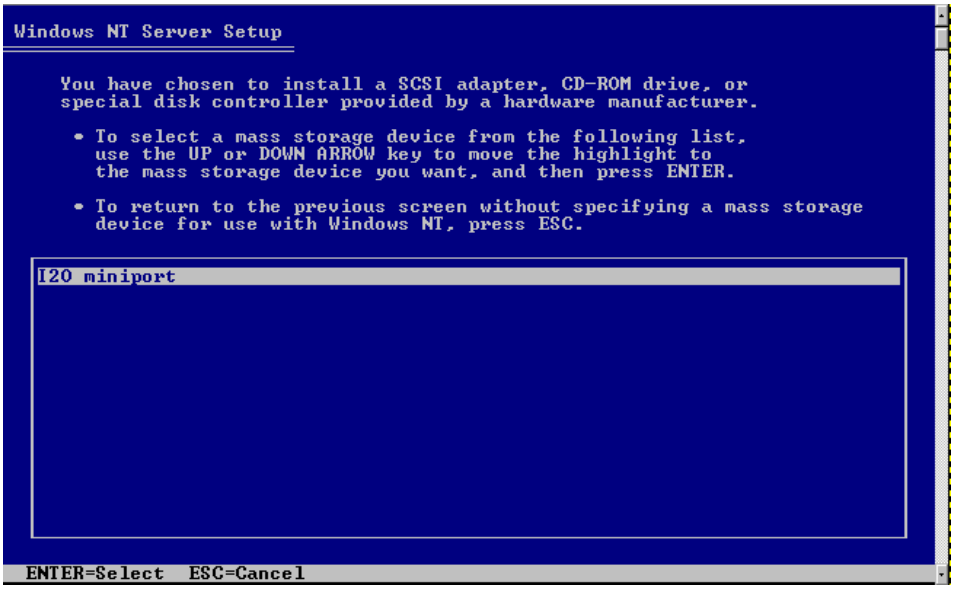
4. The next screen will ask you if you want to run or skip automatic detection of mass storage devices. Press <S> to force NT to skip auto-detection of mass storage devices.

5. This screen will prompt for specification of mass storage devices. Press <S> to specify additional devices.

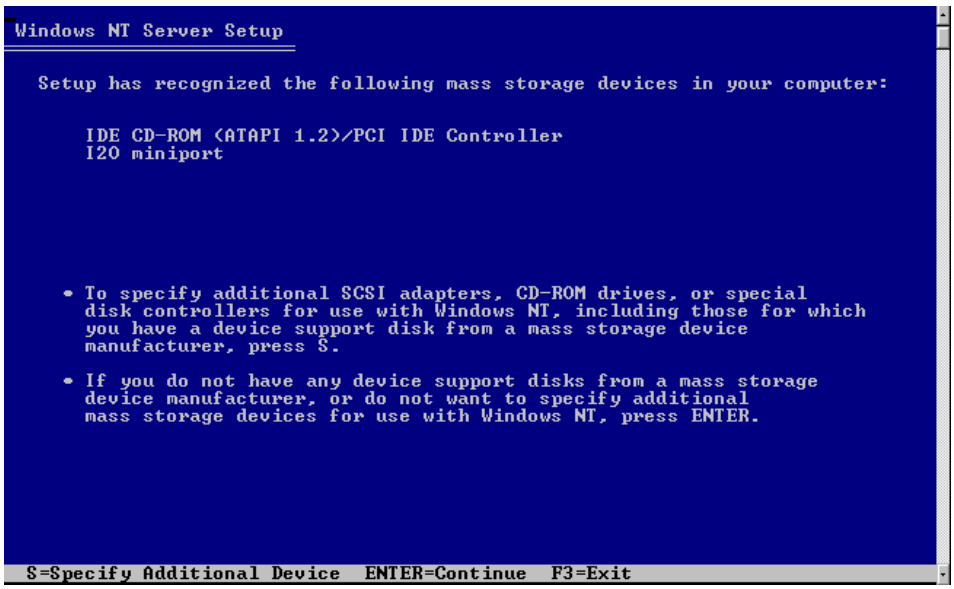
6. By default Other (Requires disk from manufacturer) will be highlighted. Hit <Enter>.

7. Remove Disk 2 and insert the SRCU21 driver disk that shipped you made using the SRCU21 CD. <Enter>.

[1] This installation assumes that Windows NT is being installed with the three set-up diskettes. If you are installing directly from a "bootable" CD-ROM, you must press <F6> several times to bypass the automatic detection of mass storage devices. Resume at step 4 above after this is accomplished.



8. I20 miniport will be highlighted. Hit <Enter> to select and continue. You should see a message at the bottom of the screen that says "Loading Device Driver and then another screen stating that "Setup has recognized the following mass storage devices in your computer" as shown below.



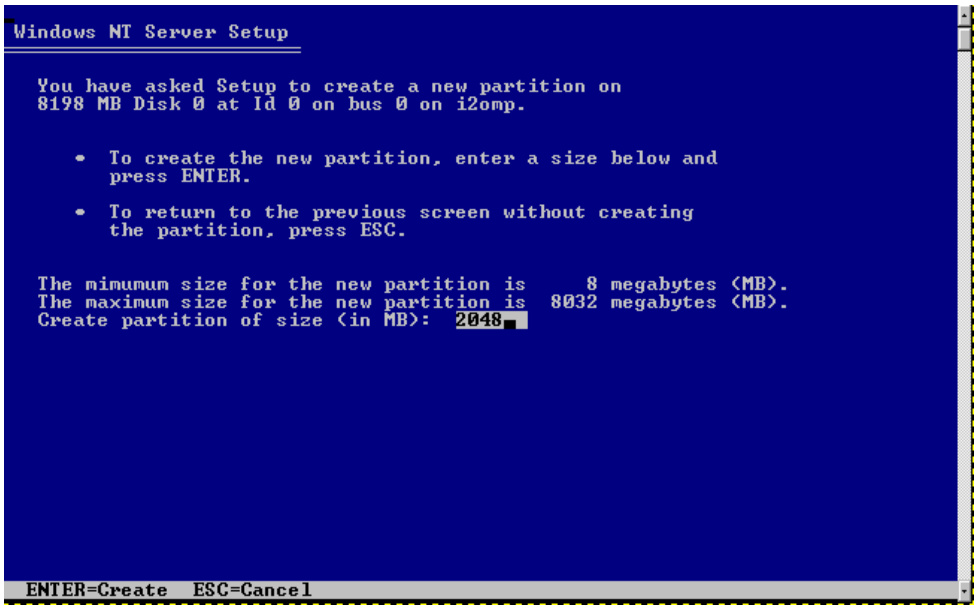
9. Press <S> to specify an additional device, if other non-detected storage devices are used in the system. Press <Enter> to continue.

10. Insert Disk 3 when prompted and hit <Enter> to continue. **Notes:** If you have any hard drives with greater than 1024 cylinders an advisory will appear acknowledging this. Press <Enter>. If any of your hard drives are new or unpartitioned an advisory will appear telling you that continuing the installation will destroy any information on the disk(s). Press <Enter> to continue.

11. The Windows NT Licensing Agreement will eventually appear. Scroll to the bottom of the agreement by pressing the <Page Down> key and press the <F8> key if you agree with the license.

12. You should see a list of your systems components on screen. Computer, Display, Keyboard, Keyboard layout, and Pointing Device. Press <Enter> to accept if the list is correct.

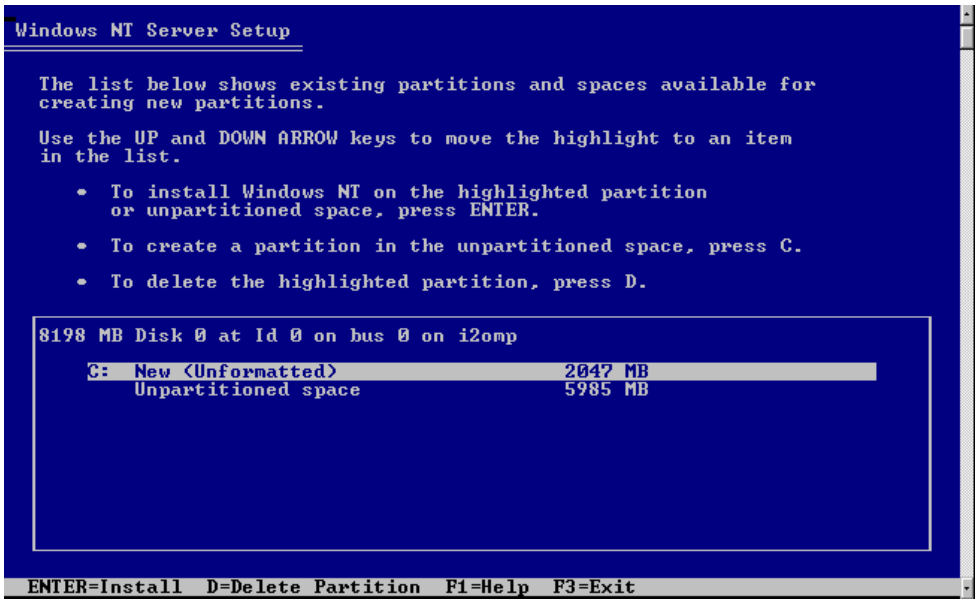
13. The next step in the installation is to specify the partition on which to install Windows NT. Highlight the "Un-partitioned space" press <c> to create a partition. (Note: If there are any partitions listed on this disk press <d> to delete them.)



14. Enter a partition size that matches the maximum size of your hard disk array and press <Enter>. **Note**: If you are installing to a FAT partition, you should change the partition size to 2048MB or less, if you are installing to an NTFS partition, you should change the partitions size to 4096MB or less. If you choose not to use the entire drive for your O/S, ensure you create a "C:" partition of at least 500MB-1GB[2]

[2] This number indicates the capacity of the "C:" drive in which NT and associated utilities will be installed. The smallest partition size for installing NT is about 200MB. However this will leave very little room for growth and installation of other applications which default to a directory in "C:". You must also note that this partition is used for NT's swap space, meaning for every megabytes of RAM you install, NT will require at least 1 MB of space in "C:". If you install 256MB of RAM then the minimum space recommended is 200+256 or roughly 500MB. Remember, there is no penalties for a large C: partition size, so a 1024 or 2048 MB is advisable.

15. Verify that the Disk shows: C: New (Unformatted) and press <Enter>..



16. If an unformatted partition is selected for the install, a choice of file system formats will be presented. NTFS file system format is recommended. Select NTFS and press <Enter> to continue. The system will show a yellow status bar to indicate formatting progress.

17. Next you will be asked to choose the directory where NT is to be installed. Choose the default of \WINNT by pressing <Enter> or type in the desired directory name and press <Enter>.

18. The next screen prompts for an exhaustive examination to be performed on your disk. The time required for the examination increases in proportion to available drive space. An examination of a 1 GB drive takes well under 1 minute. Press <Enter> to run the examination.

19. You will be asked to insert the SRCU21 diskette into drive A:.

20. The installation will now copy necessary files from the CD-ROM. After this is done you will be prompted to remove any floppy or CD-ROM that may be present and press <Enter> to reboot. This completes the first stage of the install.

    NOTE: At this time NT will recognize multiple processors if present. Also, the installation routine will convert the C: partition to NTFS if that was selected. This will require an additional automatic reboot of the system. This is normal.

21. When NT comes up after the second reboot, you will be prompted to re-insert the Windows NT CD-ROM disk to continue Set Up. Then you will be presented with the Windows NT Server Setup dialog box. Click <Next> to continue.

22. Enter in a username and an organization name. After entering in the names desired, click on <Next> to continue.

23. Enter in the product ID number. This number can be found on the Certificate Of Authenticity provided with the software or on the CD case. Click on <Next> to continue.

24. This next screen is for licensing. Enter the number of concurrent connections that you have licensed. Click <Next> to continue.

25. Enter in a computer name of 15 characters or less. Click <Next> to continue.

26. Select a server type. For this example, select “Stand Alone Server.” Click <Next> to continue.

27. For the Administrator Account Password, use something simple to begin with as you can always change it later. Click <Next> to continue.

28. Select “No, do not create an emergency repair disk”. While this is an important step, it is more efficient to wait until you have completed the install. Click <Next> to continue.

29. At the next screen, accept the default list of components to be installed. Click <Next> to continue.

30. The installation of Windows NT networking will now start. Click <Next> to continue.

31. Verify “Wired to the network” is selected. Click <Next> to continue.

32. You should select “Install Microsoft Internet Information Server (IIS)” since this is required for proper operation of the SRCU21 and will be updated by application of the service packs. Click <Next> to continue.

33. When prompted for the type of NIC card you have, Click “Select from list”

34. Click “Have Disk…”

35. Insert the Intel PRO 100 NIC Driver disk created during the pre-installation routine and hit <Enter>.

36. A dialog box indicating the “Intel PRO 100 Adapter” should be displayed and highlighted. Click OK.

37. Verify the “Intel EtherExpress PRO Adapter” has a check mark beside it and click on <Next>.

38. Select the Network protocols you wish to install. For the purpose of this install only TCP/IP need be selected, deselect all other protocols. Click <Next> to continue.

39. Next you will be presented with a dialog box that lists the Network Services to be installed. Click <Next> to continue.

40. NT is now ready to install the Networking Components that you selected. Click <Next> to continue. Files will be copied from the CD-ROM.

41. Since the Intel® PRO 100+ onboard adapter is being used, an “Adapter properties” dialog box is presented.

42. Ensure that one end of a Category 5 Unshielded Twisted Pair (Cat V UTP) Ethernet cable is plugged into the RJ-45 connector on the server board and the other end is plugged into a hub or a switch.

43. Click “Test” to run diagnostics on the NIC hardware and the cable connectivity.

44. When tests are complete, click <OK> to continue.

45. DHCP is used in large organizations where there may be a shortage of available IP addresses. The IP address of a server is then dynamically assigned by a DHCP server as soon as it logs on to the network. Because it is inadvisable for a server to have a dynamic IP address, select <NO> to continue.

46. The Microsoft TCP/IP properties dialog box will eventually appear, prompting for TCP/IP information. Enter in the TCP/IP information recorded in the pre-installation steps. After entering in the data click <OK> to continue. If a dialog box appears

reporting that an adapter card has an empty WINS address, click <YES> to continue. Other TCP/IP fields should remain empty.

47. The next dialog box that appears will show the bindings that are enabled for the server being installed. Selected bindings may be disabled/enabled here. Click <Next> to continue. These can be changed after the installation if so desired. The network is now ready to be started. Click <Next> to continue.

48. Enter a workgroup name. Click <Next> to continue.

49. The "Finishing Setup" dialog box will now appear. Click <Finish>.

50. You chose to install Microsoft Internet Information Server so you will be prompted with an install dialog box. Make the choices desired and click OK to continue. You will probably get a warning message indicating that no Internet Domain name has been specified. Click OK to continue. Select the SQL Server driver when prompted and click <OK>.

51. Select the appropriate time zone and deselect/select "Automatically adjust clock for daylight savings changes" as appropriate.

52. Click on the Date & Time tab to verify the time and date are correct. Click <Close> to continue.

53. The detected display dialog box will be shown next. Click <OK> to continue. Adjust the Desktop Area and the Color Palette if desired, and click <Test>. Testing will begin after clicking <OK>. If the test bitmap was displayed properly and could be viewed clearly, click <Yes>, then <OK> to verify the instructions. Click <OK> to continue.[3] Additional file copying and system setup will occur.

54. A Windows NT Set Up dialog box will be displayed stating: "Windows NT has been successfully installed." Remove the Windows NT CD-ROM disk and click <Restart Computer> to complete the baseline installation of Windows NT 4.0.

55. After selecting Windows NT* 4.0 Server as the Operating System to start, a login screen will be presented. Press <Ctrl+Alt+Del> to login. Enter the Administrator password and press <Enter> to login.

56. When the "Welcome" screen appears, click <Close>. Windows NT 4.0 Server is now installed and running.

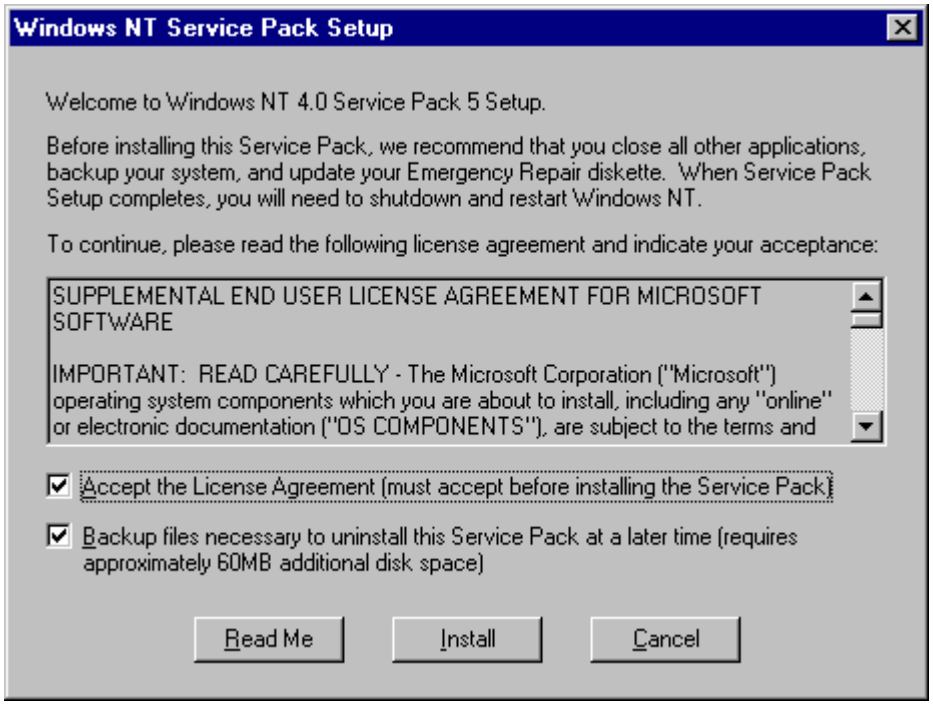
57. Install the video drivers. Select <Start>, <Control Panels>,<Display>, the tab <Settings> and click on the button for <Display Type>, under "Adapter Type," click <change>. Select <Have disk> and when prompted, insert the video driver diskette created earlier, and apply the driver. You will need to "test" the video display before proceeding and restart the server before the new changes take effect.

[3] You cannot change the video driver at this point, it must be installed after the O/S install is complete.

Microsoft Windows NT Server 4.0 Service Pack Installation Steps

1. Obtain the latest service pack, proper operation of the SRCU21 requires service pack 5.0 or later. It is recommended that the service pack be copied to a directory on your OS drive so that it can be easily applied when required.

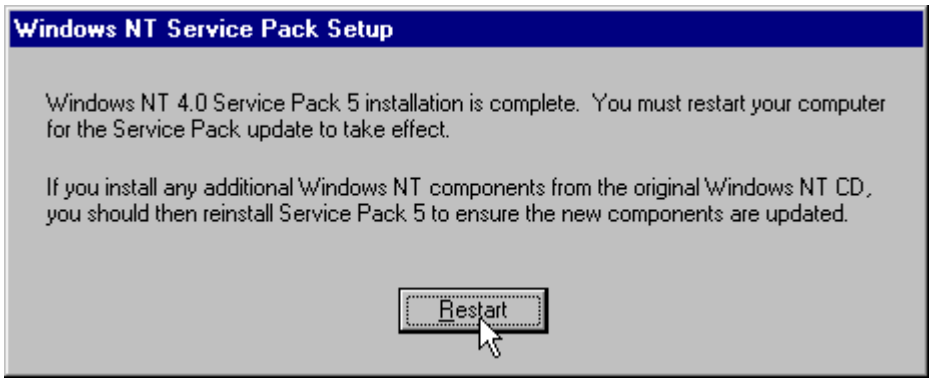
2. Double click on the service pack file and you will be presented with the following license agreement.



3. Accept the license agreement by placing a check mark in the appropriate box and click Install.

4. The service pack will begin copying files.

5. You will be notified when the process is complete with the following screen.

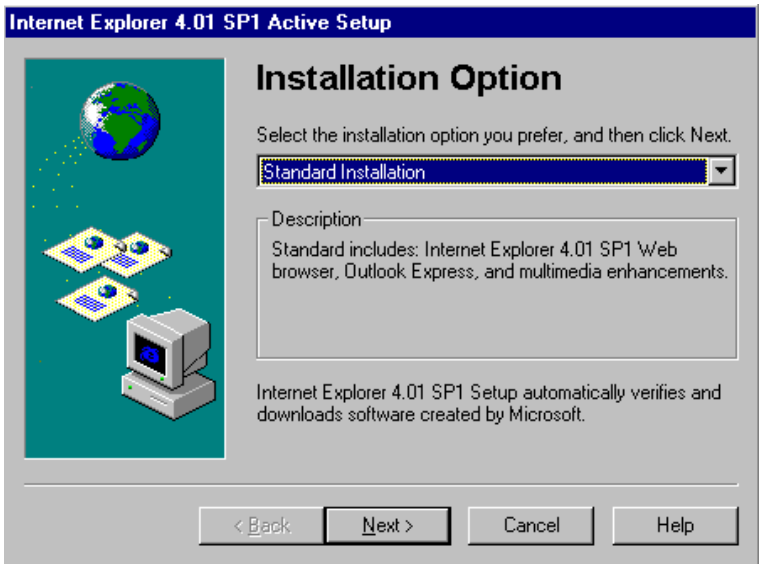


6. Click on restart to restart the computer.

Installation of Internet Explorer Service Pack

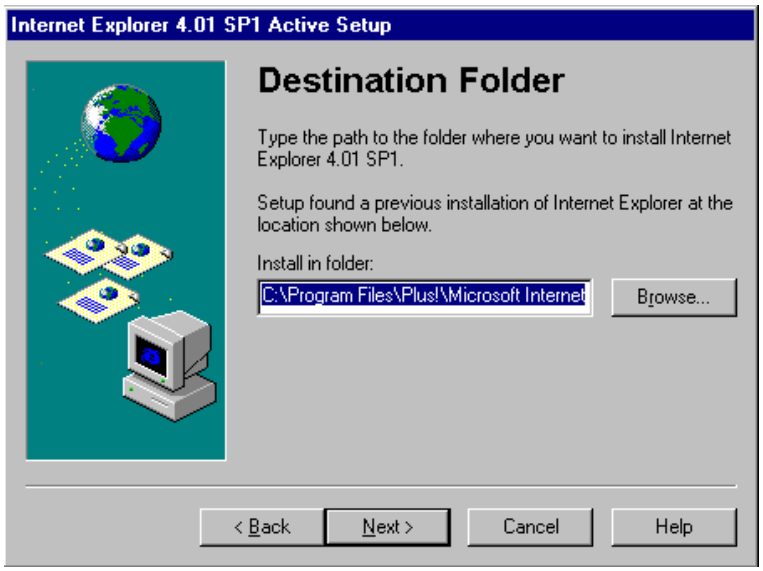
1. Proper operation of the SRCU21 requires installation of Internet Explorer 4.0 and Service Pack 1 or later. Service Pack installation steps follow.

2. Obtain the latest service pack for IE4 and double click on the file. You will be presented with the following screen.



3. You will be asked if you would like to update your desktop, click yes or no depending on your choice.

4. You will be prompted for the Country local, choose your country and click next.



5. You will be prompted for a destination folder, the default is probably correct unless you have installed Internet Explorer in another directory. Choose the destination folder and click next.

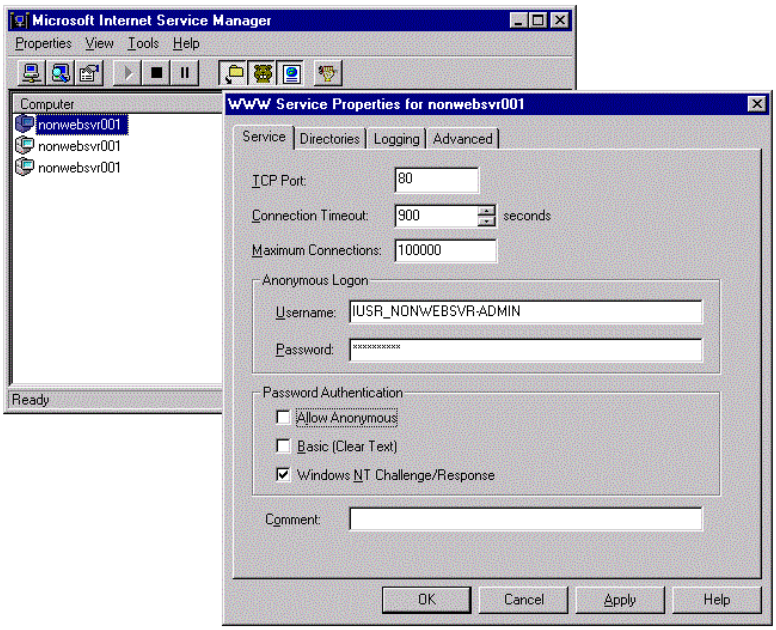
6. The service pack update will begin copying files and updating your system.

7. You will be notified when the process is complete.

Installation of Storage Manager

1. Configure Microsoft Internet Information Server 3.0 by starting Internet Service Manager from the Microsoft Internet Server program group. Double-click on the server name in the WWW Service row (top computer name). Under the Service tab in the WWW Service Properties window clear the Allow Anonymous checkbox in the Password Authentication section. See the figure below.

WWW Service Properties



2. Select “OK” and close Internet Service Manager.
3. Install the Intel Integrated RAID software (run the Intel Integrated RAID setup). The system should be powered on and logged into NT with an administrators account before proceeding.

✏ *NOTE*

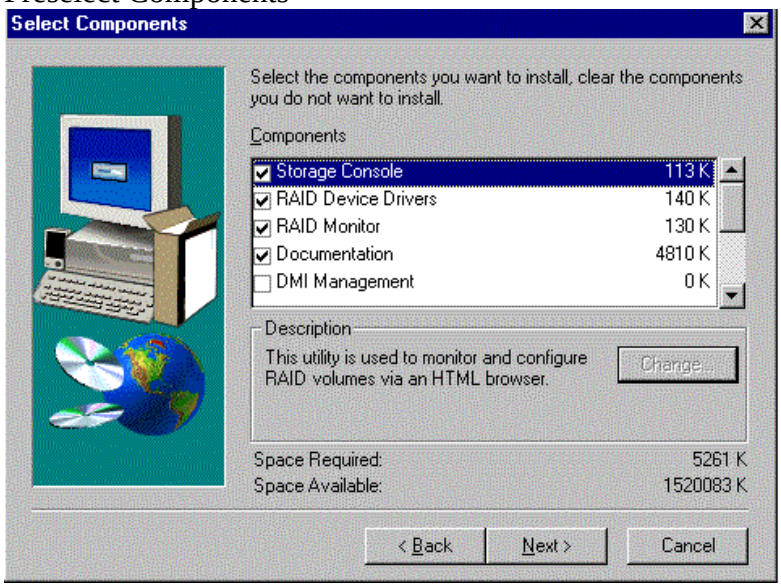
You must have administrative level permissions to install Intel Integrated RAID software.

4. Insert the Intel Server RAID Controller U2-1 CD-ROM in the CD-ROM drive. (If the RAID Installer Menu does not appear, then run the setup.exe file that resides at: <CD-ROM root>\os_setup\winnt\setup.exe on the CD-ROM and skip step B.)
5. Click on the Setup button. See the following figure. Follow the on-screen prompts to complete installation.

Intel Integrated RAID Installer Main Menu

6. The four components in the "preselected components" window below are preselected. Accept this configuration by clicking on Next.

Preselect Components



NOTE

The DMI and SNMP components are not selected by default.

NOTE

Refer to section "Intel Integrated RAID Software Component Installation" in chapter 4 of the Intel Server RAID Controller U2-1 User's Manual for information on HP Openview and RAID Monitor.

7. Reboot the server at the completion of the installation.
8. See Section 4.5 in the Intel Server RAID Controller U2-1 User's Manual to customize your RAID volumes using Storage Console.