Lotus Foundations Start

Users Guide

Lotus Foundations Start Users Guide

Contents

Introduction

Welcome to the **Lotus Foundations Start Users Guide**. This document is intended for administrators and provides the instructions required to install a completely functional Lotus Foundations Start server. In addition, core Lotus Foundations features are included to provide you with an understanding of the Lotus Foundations Start server overall.

First-time Lotus Foundations setup - Net Integrator

Net Integrator Components

You should have received the following components in your Net Integrator package:

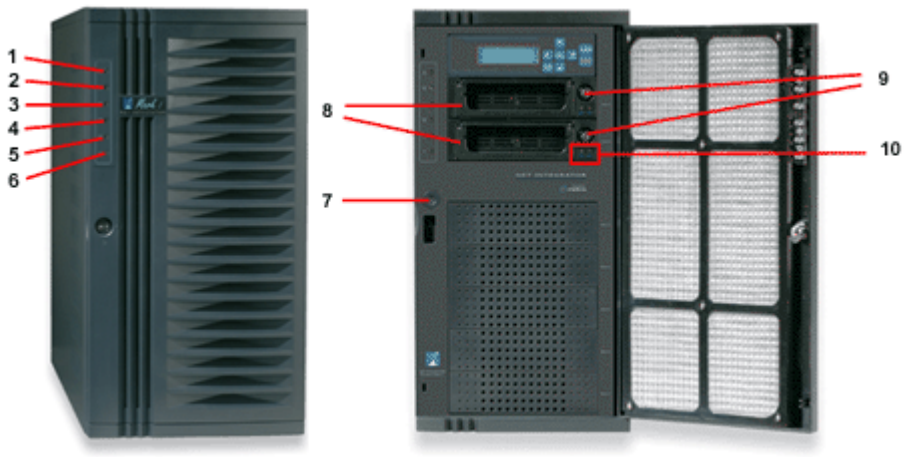
Mark I and Mark II

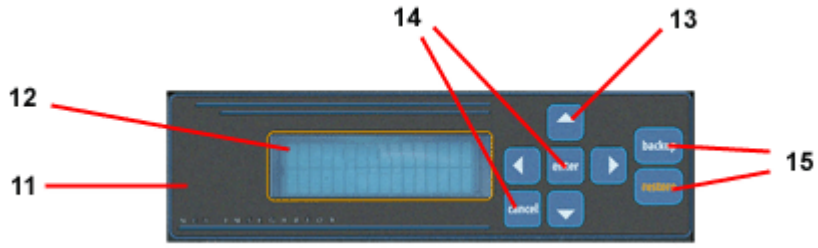
1. Net Integrator Mark I or Mark II server (1)
2. Lotus Foundations User Manual CD (1) and Net Integrator Quick Start Guide (1)
3. Hard disk keys (2) and Face Plate Keys (2)
4. Power supply cord (1)
5. Category 5 Ethernet cables (3)

Meet Your Net Integrator

Mark I and Mark II

Front View

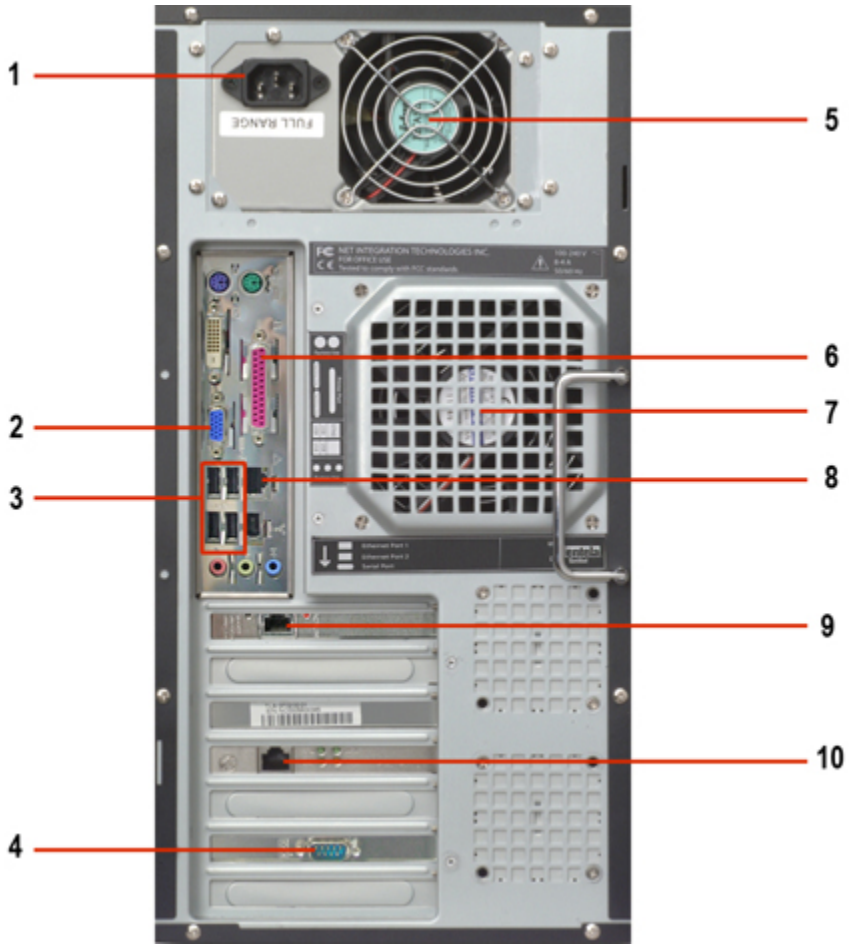




These images correspond to our Mark I and Mark II models.

1. System Failure LED - lights up when there is a failure on the system.
2. Ethernet 0 Activity LED - indicates activity on the Ethernet 0 interface.
3. Ethernet 1 Activity LED - indicates activity on the Ethernet 1 interface.
4. Ethernet 2 Activity LED - indicates activity on the Ethernet 2 interface.
5. Boot Activity LED - lights up while the software is booting.
6. Power LED - lights up when power is on.
7. Power button - used to turn the box on and off.
8. Removable hard disk trays - houses the hard disk(s).
9. Hard disk key lock - locks the face plate preventing physical access.
10. Hard disk power LEDs - both light up when power is on.
11. Control panel - contains the display panel and all control buttons.
12. Display panel - displays the status of the Net Integrator.
13. Direction arrows - used to execute commands from the control panel.
14. Enter and Cancel buttons - used to execute commands from the control panel.
15. Backup and Restore buttons - used to initiate backup and restore procedures.

Back View

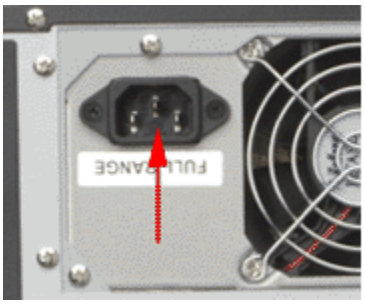


1. Power socket - where the power cord is connected.
2. VGA port - used to connect a monitor to the server.
3. USB ports - reserved for future use.
4. Serial port - for an external dial-up modem.
5. Power supply fan - provides cooling for internal components.
6. Parallel printer port - used for a shared printer.
7. Primary cooling fan - provides additional cooling for internal components.
8. Ethernet Port 0 - used to connect to the local area network (LAN).
9. Ethernet Port 1 - used to connect to a LAN segment or to the Internet.
10. Ethernet Port 2 - used to connect to a LAN segment or to the Internet.

Connecting the Power

1. Ensure that the Net Integrator has adequate ventilation. Place the back of the unit at least one to two feet (12"-24") away from the wall. Make sure the front of the unit is easily accessible.

2. Connect one end of the power cord into the power socket on the back of the Net Integrator:



The left image is of a Mark I or Mark II and the one on the left is a Micro unit.

3. Connect the other end of the cord into a standard power outlet.
4. Turn on the main power switch.
5. Press the power button. Certain power line surges can cause the server to reset. It is recommended that you install an uninterruptible power supply (UPS) to protect against such surges.

Ethernet Connections

What is Ethernet?

Ethernet connects computers in a local area network (LAN). An Ethernet connection is very fast, and unlike modem and ISDN connections, one Ethernet network can have many computers attached to it. There are different kinds of Ethernet cables: category 3 and category 5 are two examples. It is recommended that you use category 5 at minimum for 100baseT networks, and category 5e at minimum for 1000baseT networks.

10baseT, 100baseT, and 1000baseT hubs and switches have a number of ports that you connect to workstations, routers, servers, printers, or other devices, using Ethernet cables. Connect your Net Integrator to a free port using one of the supplied category 5 cables. If the port lights up after you connect and then turn on your Net Integrator, you have a proper connection.

You can cascade more hubs or switches to increase the number of available ports. (Consult the manual that comes with your hub/switch before trying this).

Connecting Ethernet Port 0

1. Connect one end of an Ethernet cable into Ethernet Port 0 on your Mark I and Mark II, (located on the back of your Net Integrator).

The left image is of a Mark I or Mark II and the one on the left is a Micro unit.

2. Connect the other end of the cable into your LAN hub or switch. Ethernet Port 0 should not be connected to a router providing internet access. Ethernet Port 0 is typically reserved for internal (Local Network) access.

Connecting Ethernet Ports 1 and 2

Ethernet ports 1 and 2 are used to connect to the internet or to other segments of your LAN. Use an Ethernet cable to connect to your high-speed internet routing device. Some devices may require the use of a cross-over cable that is normally supplied with the device.

The left image is of a Mark I or Mark II and the one on the left is a Micro unit.

If you are using your Net Integrator as a workgroup server without a direct connection to the internet, it is possible to use Ethernet ports 1 and 2 to connect to other segments of the LAN. This is typically done to improve network throughputs when large numbers of users are connected to Net Integrator.

Secondary segments must be physically separate from the primary network segment connected to the Ethernet 0 port. You cannot connect all Ethernet ports to the same segment in order to improve network throughput.

Connecting an External Dial-up Modem

1. Connect the cable included with your own external dial-up modem to the Serial port on the back of your Net Integrator.

The left image is of a Mark I or Mark II and the one on the left is a Micro unit.

2. Connect one end of the standard telephone cable to the external modem, and connect the other end to your telephone wall jack.

   The external modem will be auto-detected when the server goes through a power-up sequence.

Power-up Sequence - Mark I and Mark II

1. Press the Power button (located on the front of your Net Integrator).
2. The Net Integrator needs a few moments to start up. During the start-up you will observe the following sequence of events:
   - The hard drive and fans start up.

- The Net Integrator beeps several times.
- The LCD panel will become active and the Boot Activity LED will blink as the software loads.

3. Let your Net Integrator sit undisturbed while it discovers its surroundings and auto-configures its network parameters. Messages indicating what kind of network discovery is being performed appear on the display panel. After approximately 10-30 seconds, the IP address that the Net Integrator has chosen for itself will be displayed. The number will look something like this: 192.168.0.1 (based on the LAN to which it is connected).
4. When the start-up sequence is over, the display panel will show the status of various Net Integrator systems. The first line on the display panel shows Net Integrator's IP address; the second line cycles messages displaying the current date, time, and operating system version. You are ready to proceed with the setup when an IP address appears on the display panel. In the event that the Net Integrator server is unable to detect an appropriate IP address for your LAN, you will have to manually set the IP address for the server. Refer to *Manually Setting the IP Address* for more information.

Manually Setting the IP Address - Mark I and Mark II

Follow these steps if your Net Integrator is unable to automatically select an IP address (the display continues to read Choosing Address) or if you want to change the chosen address:

1. Press the Enter button on control panel. The following menu will be displayed:
   `MENU [Net] Info`
   `Dialer System`
2. [Net] is already selected. Press the Enter button. The following menu will be displayed:
   `NETWORK [IPAddr]`
   `Netmask DHCP`
3. [IPAddr] is already selected. Press the Enter button. The current IP address (e.g. 192.168.0.1) will be displayed. If the Net Integrator was unable to select an IP address, 0.0.0.0 will be displayed.
4. Use the Left and Right direction arrows to move the cursor from digit to digit. Use the Up and Down direction arrows to increase or decrease a digit's value.
5. Press the Enter button to save the new IP address.
6. Navigate to Netmask using the direction arrows. Press Enter and the default Netmask will be displayed.
7. Use the Left and Right direction arrows to move the cursor from digit to digit. Use the Up and Down direction arrows to increase or decrease a digit's value.
8. Press the Enter button to save the new Netmask.
9. You may also turn on or off the DHCP server (which automatically assigns IP addresses to the workstations connected to your local network). Unless you have some other server providing DHCP services, it is recommended that you turn DHCP on. To do so, navigate to DHCP using the direction arrows. Press the Enter button.
10. Navigate to On using the direction arrows. Press Enter. The DHCP server is now on.

11. Press the Cancel button twice to return back to the standard status display.

First-time Lotus Foundations setup - third-party hardware

When setting up Lotus Foundations on third-party hardware, please refer to the vendor’s documentation for product overview and installation instructions.

Minimum server requirements

To successfully run the Lotus Foundations operating system, the following requirements must be satisfied:

Minimum server requirements:

- x86 based system
- At least one hard disk
- At least one Network Interface Card
- CD-ROM drive
- VGA based video card
- One GB of memory

Required external peripherals:

- Monitor
- Keyboard

Before you begin

1. Connect the monitor cable to the VGA based Video Card output on the server.
2. Connect the keyboard to the keyboard input on the server.
3. Plug in the power cords for the server and monitor.

Configuring the system

For installation, the system must boot from the CD-ROM. This can be accomplished through the boot settings in the motherboard's BIOS. Lotus Foundations installs onto the hard disks after they have been configured through the WebConfig menu. For first time disk configuration, do not use the "Disk Installation" option on the Console menu. For more information on configuring your hard disks, see Chapter 26: Disk management.

Important Note
If you are running Lotus Foundations from the CD-ROM without configured hard disks, configurations are lost when you reboot.

These are general setup guidelines.

1. Connect the power cord and turn on the main power.
2. Connect the LAN connection to the Ethernet port 0 on the server. Connect the other end of the cable into your LAN hub or switch. If you have additional Ethernet ports to connect to the internet or to other segments of your LAN, connect them now.
3. Connect a monitor and keyboard to the appropriate connectors on the server.
4. Turn on the power button.
5. When the system boots, the Lotus Foundations boot screen will be displayed. To load Lotus Foundations, select option #1 *Launch Lotus Foundations* by typing 1 and then pressing Enter.

   If you do not select an option, the Lotus Foundations OS will automatically load after 10 seconds.

6. When the Lotus Foundations operating system has finished loading, the following prompt is displayed:
   `Press ENTER for a shell...`
7. Press Enter. A Configuration screen is displayed.
8. A red warning box might be displayed advising you to set up the server using Lotus Foundations's Web-based configuration screen. Press Enter to continue.
9. Take note of the display's Settings and Status boxes. These display various information about the server.
10. Take note of the WebConfig URL shown in the Status box. This is the LAN IP address of the server. You will need this IP address to finish the configuration of your server. In the event that the server is unable to detect an appropriate IP address for your LAN, you have to manually set the IP address for the server. Refer to *Manually Setting the IP Address* in this chapter for more information.
11. You are now ready to proceed with the setup (see Chapter 3: Connecting to WebConfig) when an IP address is displayed in the console's Status box.

Manually setting the IP address

Follow these steps if your Lotus Foundations-powered server is unable to automatically select an IP address (the console's Status box continues to read Choosing Address) or if you want to change the chosen address:

1. Select IP Address from the Main Menu box on the Configuration screen (see above).
2. You are prompted to enter a new IP address. Enter the new IP address and press <Enter>.
3. Confirm the new IP address by pressing <Y>.

4. You can turn on or off the DHCP server that automatically assigns IP addresses to the workstations connected to your local network. Unless you have some other server providing DHCP services, turn DHCP on. To turn DHCP on, select DHCP server from the Main Menu on the Configuration Screen - if a message is displayed communicating that, “The DHCP server is currently DISABLED”, press <Y> to enable the DHCP server.

Connecting to WebConfig

What is WebConfig?

Although some basic system configuration can be done through the front control panel on Net Integrator hardware, the Web-based configuration system (WebConfig) is where you set most Lotus Foundations options.

Secure WebConfig

Lotus Foundation's WebConfig uses 128-bit encryption to protect administrator information and passwords. Most recent versions of Web browsers contain built-in support for this. The following Web browsers are specifically supported by Lotus Foundation's WebConfig:

- Internet Explorer 6 and any later versions.
- Firefox 1.0.5 and any later versions.

Failure to support 128-bit encryption results in WebConfig being unreachable.

Other Web browsers which might work but are not explicitly supported are:

- Opera
- Safari
- Netscape
- Mozilla

Configuring TCP/IP

Before you can access WebConfig, you have to configure your workstation to use TCP/IP. If TCP/IP is already configured, proceed to *Creating an administrator account*. If TCP/IP is not configured, follow the appropriate steps for your operating system.

For Windows 95/98/ME:

1. In Windows, select Start > Settings > Control Panel. The Control Panel window is displayed.

2. Select Network from the list. The Network window is displayed.

   Click Add if TCP/IP is not displayed in the installed components list.

3. The Select Network Component window is displayed. Select Protocol from the window and click Add.
4. The Select Network Protocol window is displayed.
5. Select Microsoft in the Manufacturers section of the window. Select TCP/IP in the Network Protocols section of the window. Click OK. TCP/IP is now displayed in the Network window.
6. Select TCP/IP from the installed components list on the Network window. Click Properties. The TCP/IP Properties window is displayed.
7. Click the IP Address tab. Select Obtain an IP address automatically.
8. Click the DNS tab. Select Enable DNS.
9. Select all entries in the DNS Server Search Order section of the window and click Remove.
10. Select all entries in the Domain Suffix Search Order section of the window and click Remove.
11. Select Obtain an IP address automatically.
12. Click the Gateway tab. Select any entries in the Installed gateways section of the window and click Remove.
13. Click the WINS Configuration tab. Select all entries in the WINS Server Search Order section of the screen and click Remove. Select Use DHCP for WINS Resolution.
14. Click OK. The Network window is displayed. Click OK again.
15. Reboot the computer.

For Windows 2000/XP:

1. In Windows, select Start > Settings > Control Panel (or in Windows XP, Start > Control Panel).
2. Select Network and Dial-up Connections from the list. The Network Connections screen is displayed.
3. Click Local Area Connection and the Local Area Connection window is displayed.
4. Click Properties and the Local Area Connection Properties window is displayed. If Internet Protocol (TCP/IP) is not in the Components checked are used by this connection list, click Install.
5. The Select Network Component Type is displayed. Select Protocol from the window. Click Add.
6. The Select Protocol window is displayed.
7. Select Internet Protocol (TCP/IP) from the list. Click OK. TCP/IP should now be displayed in the Local Area Connection Properties window.
8. Select Internet Protocol (TCP/IP) from the list, and click Properties.
9. The Internet Protocol (TCP/IP) Properties screen is displayed. Select Obtain IP Address automatically. Select Obtain DNS server address automatically.

10. Click Advanced. The Advanced TCP/IP Settings window is displayed. Select any entries in the Default gateways section of the window, and click Remove.
11. Click on the DNS tab. Select any entries in the DNS server addresses section of the window, and click Remove. Select Append primary and connection specific DNS suffixes. Select Append parent suffixes and primary DNS suffixes.
12. Click on the WINS tab. Select any entries in the WINS addresses section of the window, and click Remove. Select the Default NetBios setting.
13. Click OK. Click OK on the TCP/IP Properties screen.
14. Reboot the computer.

For Mac OS 9:

1. Click the Apple icon in the top menu bar. Select Control Panel > TCP/IP.
2. The TCP/IP window is displayed.
3. Select Connect via Ethernet. Select Connect via DHCP. Leave the other fields blank.
4. Click the Close Window button. The Save screen is displayed.
5. Click Save.
6. If the Internet connection does not function immediately, reboot the computer.

For Mac OS X:

1. Click the Apple icon in the top menu bar. Select Control Panel > System Preferences. The System Preferences window is displayed.
2. Click the Network icon. The Network screen is displayed.
3. Select Automatic for location. Select Built-in Ethernet for connection. In the TCP/IP tab, select the DHCP configuration.
4. Click Apply Now.
5. If the Internet connection does not function immediately, reboot the computer.

Creating an administrator account

At this point, the Lotus Foundations-powered server should have an IP address, the workstation should have TCP/IP configured, and both the Lotus Foundations server and the workstation should be connected to the LAN. You now need to create an Administrator account:

1. Open a Web browser on the workstation.
2. Read the IP address on the display panel/console. For demonstration purposes, an example address is: 192.168.0.1

3. Enter https://192.168.0.1:8043 into the browser's address bar. Press Enter. The *Create Administrator Account* page is displayed.
4. Enter a User ID. The default User ID is root - you can use that name or you can create a new ID by typing over the existing text.
5. Enter the administrator's full name.
6. Enter a password.
7. Re-enter your password to ensure that it was entered correctly.
8. Enter your organization's registered internet domain name.
    - The domain name must be entered at this point and cannot be changed once you have installed Lotus Foundations Start.
9. Enter the Software Activation Key in the Activation Key text box.
10. Click *Save Changes*. This takes you directly to Lotus Foundation's main WebConfig page.
    - Some browsers take you to an *Administrator Account Created* page. If this occurs, click *Login* and you are taken to the main WebConfig page. Clicking *Cancel Changes* resets the *Create Administrator Account* form.

> **Important Note**
> Some Lotus Foundations services are not enabled unless hard disks are configured through the WebConfig menu. For first time disk configuration, do not use the "Disk Installation" option on the Console menu. For more information on configuring hard disks, see the user manual chapter Disk Management.

Software activation keys

By default, Lotus Foundations comes configured in a 30-day Trial mode. To get out of Trial mode and activate the features and licenses that you have purchased, you must enter a Software Activation Key.

When you purchase Lotus Foundations software, a Software Activation Key is provided.

> **Important Note**
> An Internet connection is required for activating the Lotus Foundations software license. It is the user's responsibility to ensure that an Internet connection is established when attempting to install the software.

Enter activation key to exit trial mode

1. Login to WebConfig with an administrator account.
2. Click *Software Update*.
3. Enter your Activation Key in the Activation key field.
4. Click *Save Changes*.

Updating your activation key

To replace an existing activation key with a new one:

1. Login to WebConfig with an administrator account.
2. Click Software Update and you see the current activation key displayed.
3. Click the Edit action button and the Lotus Foundations Registration box is displyed.
4. Enter the new activation key in the Lotus Foundations Registration box.
5. Click Save Changes.

System status screen

The system status screen displays the status of the services running on Lotus Foundations. The WebConfig menu helps you to access and configure various Lotus Foundations subsystems.

Features of the system status screen

CPU utilization	Displays the utilization of the system's central processing unit (CPU) in numerical form and as a bar graph. During intensive operations (such as backups or very heavy file transfers), the CPU utilization bar might show 100%. This is normal. One hundred per cent utilization simply means that the CPU is being fully utilized and does not necessarily mean that your Lotus Foundations-powered server is being overloaded or that performance will suffer. However, if the CPU utilization is constantly at 100%, and you experience service slow-downs, you might want to contact support for a services review.
Ethernet 0	Displays the speed of data transfer through Ethernet Port 0 (measured in kbps or Mbps). The bar graph displays the speed as a percentage of the highest transfer rate recorded since the last power-up.
Ethernet 1 and 2	Displays the speed of data transfer through the Ethernet Ports 1 and 2 (measured in kbps or Mbps). The bar graph displays the speed as a percentage of the highest transfer rate recorded since the last power-up.
PPP link	Displays the speed of data transfer through the DSL PPPoE or dial-up Internet connection (measured in kbps). The bar graph displays the speed as a percentage of the maximum measured speed.
Disk load	Displays the amount of data being transferred to and from the hard disk (measured in kbps or Mbps). The bar graph displays the amount as a percentage of the highest amount recorded since the last power-up.
Disk space used	Shows how full your server hard disk is by displaying the usage and capacity of the drive.

System status details button	Displays System Status resource information in a graphical representation, on a variable time basis, for example, half hour, 1 month, 1 year, etc. Also includes graphs for Physical Memory and Virtual Memory.
Internet status	Displays the status of your internet connection(s). The status light is green when an internet connection is configured properly. The default route used to transfer data to destinations on the internet is also displayed. If a modem is configured, clicking dial modem initiates a connection to the internet. The administrator can choose to terminate the connection through this screen.
Firewall	Displays the status of the firewall (enabled/disabled).
TunnelVision	Displays the status of all TunnelVision connections.
IPsec connections	Displays the status of all IPsec connections.
PPTP connections	Displays the status of all PPTP connections and provides an option to disconnect active connections.
SoftUpdate	Displays the status of the subsystem that automatically checks for available software updates. When the subsystem is active and retrieving a list of available software updates, the status light is green. When the subsystem is operational but idle, the status light is gray. A red status light indicates a problem with the subsystem (usually an inability to access the distribution server). Refer to the Log Messages chapter for more information on download errors.
Disk status	Displays the status of your disk configuration, provides disk reconfiguration options, displays the status of a rebuilding RAID array, and displays idb drive hotswap status.
Backup status	Displays the status of the idb backup disk. It displays how much of the idb disk space is currently available for backups and when the next backup is scheduled to be done.
Quota status	Displays if there are any users over their quota limit. See *Quota Setup* in the User & Team Management chapter for more information.
NS3 status	Displays the status of the Lotus Foundations Scalable Services Structure.
Virtual server	Displays the status of services running in the Virtual Server. In Lotus Foundation Start, Domino specific information is displayed.
User authentication method	Displays the method of authentication currently enabled. It displays "Using normal password authentication" if Lotus Foundations is in Domain Controller Mode or Non-Domain mode. It will display "Using the ‘domainname’ Windows domain" if Lotus Foundations is in Domain Member mode. It also displays the number of Lotus Foundations Client Access Licenses (CALs) available for use.
WebMail	Displays the address for Domino Web Access.
Virus definition updates	If the Virus Scanner is licensed and if the File Virus Scanner and/or Mail Virus Scanner are enabled, it displays when the virus definitions were last updated, how many viruses you are protected against, and links to a report on how many viruses were detected since the last reboot.
File virus scanner	If the Virus Scanner is licensed and File Virus Scanner is enabled, it displays how many files were scanned and how many viruses were found during the last scan once the scan has completed.

Mail virus scanner	If the Virus Scanner is licensed and the Mail Virus Scanner enabled, it displays when the definitions were last updated and how many virulent emails have been identified since system startup.
Spam scanner	Displays whether or not there is a valid Spam Scanner license, and the last reported definitions update. It also displays the number of definite and probable spam that have been detected since the last reboot.
MySQL server	Displays the status of MySQL services. The number of sessions displayed represents the number of active users currently connected to Lotus Foundations and using MySQL database services. The CPU utilization bar graph indicates how much processor time is being used by this service. The status light is gray if service is disabled, green if service is operational, yellow if service is used heavily, and red if there is a problem with the service.
WWW server	Displays the status of Web publishing services. The number of sessions displayed represents the number of active Web sessions currently open. The CPU utilization bar graph indicates how much processor time is being used by this service. The status light is gray if service is disabled, green if service is operational, yellow if service is used heavily, and red if there is a problem with the service.
Secure WWW server	Displays the status of the secure Web server. The number of sessions displayed represents the number of active secure Web sessions currently open. The CPU utilization bar graph indicates how much processor time is being used by this service. The status light is gray if service is disabled, green if service is operational, yellow if service is used heavily, and red if there is a problem with the service.
DNS server	Displays the status of the DNS servers.
Windows file server	Displays the status of file services for Windows and NT clients. The number of sessions displayed represents the number of active users currently connected to Lotus Foundations and using file services. The CPU utilization bar graph indicates how much processor time is being used by this service. The status light is gray if service is disabled, green if service is operational, yellow if service is used heavily, and red if there is a problem with the service.
Apple file server	Displays the status of file services for Apple Macintosh clients. The number of sessions displayed represents the number of users currently connected to Lotus Foundations and using file services. The CPU utilization bar graph indicates how much processor time is being used by this service. The status light is gray if service is disabled, green if service is operational, yellow if service is used heavily, and red if there is a problem with the service.
NFS file server	Displays the status of the NFS file server for UNIX and similar systems. The number of sessions displayed represents the number of active users currently connected to Lotus Foundations and using file services. The CPU utilization bar graph indicates how much processor time is being used by this service. The status light is gray if service is disabled, green if service is operational, yellow if service is used heavily, and red if there is a problem with the service.

FTP server	Displays the status of FTP services. The number of sessions displayed represents the number of active FTP downloads currently in progress. The CPU utilization bar graph indicates how much processor time is being used by this service. The status light is gray if service is disabled, green if service is operational, yellow if service is used heavily, and red if there is a problem with the service.
SMTP server	Displays the status of SMTP services. The number of sessions displayed represents the number of emails being transferred by this server (normally none). The CPU utilization bar graph indicates how much processor time is being used by this service. The status light is gray if service is disabled, green if service is operational, yellow if service is used heavily, and red if there is a problem with the service.
Mail queue status	Displays the number of remote email messages in the email queue.
IMAP and POP3 server	Displays the status of servers responsible for delivery of email messages from IMAP and POP3 mailboxes. The number of sessions displayed represents the number of users currently downloading email messages from their IMAP or POP3 mailboxes. The status light is gray if service is disabled, green if service is operational, yellow if service is used heavily, and red if there is a problem with the service.
LDAP server	Displays the status of the LDAP server, which is used to publish user names and email addresses into the internal directory. The number of sessions shows how many users are connected. The status light is gray if service is disabled, green if service is operational, yellow if service is used heavily, and red if there is a problem with the service. The CPU utilization bar graph indicates how much processor time is being used by this service.
Reboot button	Click on this button to reboot your Lotus Foundations-powered server.
Shutdown button	Click on this button to properly shut-down your Lotus Foundations-powered server. Failure to click on the Shutdown button means that your RAID array has to rebuild. See Disk Status Messages in the Disk Management chapter for more information.
*Others	Other items might be displayed on the system status screen depending on the addition of any optional software modules. Please refer to the appropriate software documentation for the description of the status indicators.

Notices box

In most cases, when you change a service option in WebConfig and click Save Changes, Lotus Foundations displays a drop down list of major actions that are happening in the background at the top of that sub-service screen. Failure notices also are displayed in the Notices drop down box.

System status details

The System Status Details page is a history of critical system information that has been stored by Lotus Foundations and can be viewed using an array of graphs. These graphs represent the usage of CPU load, memory usage, ethernet traffic, and more.

Historical system status graphs

In addition to the real time status indicators on the system status page, located under these bars is a button that leads to a page which displays historical graphs of system status.

1. Click system status in the left menu bar.
2. Underneath the system status snapshot is a button labeled system status details. Click this button to navigate to the historical graphs.
3. On this page is a number of graphs for various resources on the server.

These graphs incorporate a new graphical representation of server usage. The system status history graphs have been extended to include not only the average resource usage over various time periods but also the minimum and maximum resource usages experienced during these periods. The average resource usage is displayed as a brightly-colored line against a background of progressively darker colors that show the variance of resource usage over various time periods. For example, on the above graph, the brightly colored line sits near the bottom of the graph, while the differently-shaded bands of color sit above and below the average.

The most important aspect of the improved status history graphs is that it is immediately evident on all the graphs for all time periods if there is a high variance for the resource usage because the shaded backgrounds corresponding to the ranges of measurements will be much wider. On the other hand, if these backgrounds are narrow, the system does not experience much variation in the resource usage at all.

Installing the Lotus Foundations virtual server

Lotus Foundations virtual server introduction

The Lotus Foundations virtual server is designed to provide an environment where Domino can run alongside Lotus Foundations. This enables the customization of the environment for Domino without affecting the core Lotus Foundations system. Lotus Foundations can still be relied upon to provide security, backup, remote connectivity, internet uptime, and more.

> **Important Note**
> Before you start the Lotus Foundations installation, make sure you have an administrative user account on the server named root. If the account root is not present on the system, the Lotus Foundations installation will not work properly.

Lotus Foundations installation

If you are installing Lotus Foundations on a Net Integrator Mark II, begin at step 1.

If you are installing Lotus Foundations on an IBM server or other third party hardware, insert the Lotus Foundations CD into the CD-ROM drive of that server. Lotus Foundations automatically detects the installation in the SoftUpdate section of WebConfig. You can then proceed immediately to step 7.

1. With the Lotus Foundations server booted, insert the Lotus Foundations CD into a workstation.
2. Explore the contents of the CD and copy the folder with the `.pkg` extension .
3. Connect to the autoinstall file share on the Lotus Foundations server. To do this, click Start in Windows, select Run..., then enter the server IP address followed by `\autoinstall`.
4. Log in using the administrative account credentials you created on Lotus Foundations.
5. Paste the `.pkg` folder into *autoinstall* share.
6. Wait for all files to copy from the CD.
7. Go to the Lotus Foundations WebConfig screen and click the reload button to reload the status page.
8. Select SoftUpdate from the menu on the left side of the WebConfig screen.

9. A list of installable packages are displayed, with only one package available. If there is no list of installable packages, wait several minutes and refresh the screen again. The Lotus Foundations package should be listed, and should read:
   `Team autoinstall/`**`FILENAME:`** `NVS 1.0a - Lotus Foundations v1.0`
10. Click *Install* on the far right side of the of the Lotus Foundations line in the Add-on section of the screen.
11. Read the terms of the Domino license agreement and click Accept License. The Lotus Foundations installation process then begins automatically.
12. After the installation process finishes, it typically takes a few more minutes for the NVS status in WebConfig to display a green light. Wait until the light turns green before proceeding.

ECL alerts

To avoid client side security alerts popping up in Notes, the server ID and any administrator IDs need to be added to the server ECL. This should be done using the AppExpress setup in Notes, prior to installing and configuration of the Notes clients.

Modifying the ECL list

Immediately after installing Lotus Foundations, the administrators on the server will receive an email providing a Lotus Notes link to the LotusFoundations App Express administrator's page.

This page contains instructions for modifying and adding administrators as trusted senders of Domino related actions. By adding these administrators, users do not have to accept these warnings, as they are authorized automatically by the Notes clients.

Recognizing and accepting ECL alerts

For any existing sites that already have Notes clients installed, you might encounter the circumstance where users have to accept the a security alert at least once.

If the signed by section is an known administrator on the server, the user can select "Start Trusting the signer..." option.

Configuring Lotus Foundations

Proceeding with configuration

You are ready to proceed with the system configuration once you have:

1. Configured your workstation to use TCP/IP.
2. Created an administrator account.
3. Logged in and connected to WebConfig.
4. Configured disks. For instructions, see the user manual chapter Disk Management for details on configuring your disks.

> **Important Note**
> Some Lotus Foundations services are not enabled unless hard disks are configured through the WebConfig menu. For first time disk configuration, do not use the Disk Installation option on the Console menu. For more information on configuring your hard disks, see Chapter 26: Disk Management.

Configuring General Network Settings

1. Select Local from the Network Setup menu on the left side of any WebConfig screen. The Local Network Options screen is displayed.
2. Lotus Foundations NetIntelligence feature automatically assigns a random host mame to the Lotus Foundations server during the first boot-up. If appropriate, enter a new host name by typing over the existing text. The new hostname should be unique, it should use only numbers and letters, and it should contain no spaces.
    - Host names should be unique because they are used to distinguish your server from others on the local network and are used by local users to identify Lotus Foundations file and print-sharing resources. In addition, the host name (in conjunction with the domain name) forms a unique internet name under which the Lotus Foundations server and its Web, FTP, and email services are addressed on the internet.
3. Indicate whether or not you want to *Display the system status page for non-admin users?* on users' personal WebConfig screens.
4. Once you have installed Lotus Foundations Start into the NVS, the Domain Name is no longer modifiable.
    - Domain Names are part of the Internet naming standard (which applies to every device connected to the Internet). Each host has a unique name,

which consists of a host name and domain name. In general, all Internet hosts owned by your company belong under the same domain.

5. Indicate whether or not you want the rsync server to be enabled. This option is for Unix-style clients only. Leave the default setting.
6. Select the appropriate public DNS resolution option.
    - Select Yes if you want Lotus Foundations to perform DNS resolution for Internet hosts.
    - Select No if you do not want Lotus Foundations to perform DNS resolution.
    - Select Dynamic if you want Lotus Foundations to perform Dynamic DNS resolution.

    If the public DNS server is enabled, internet hosts can resolve name-to-IP number queries for internet services provided by Lotus Foundations. Dynamic DNS resolution helps you to host email, Web, and FTP services using an internet connection with a dynamic IP address.
7. The DHCP server is set by default to “turned off” on eth0, if no other DHCP server is on that segment. Turn this on.
8. Indicate whether or not you want to enable the SNMP (Simple Network Management Protocol) server.
    - SNMP is used to collect statistical information from the host about parameters such as network throughput and CPU utilization. It is also used for network monitoring.
9. If you enable the SNMP server, enter an appropriate SNMP community name.
10. Indicate whether or not you want to enable the Network Information Server (NIS). Leave NIS disabled if you are using Windows. If you are using Unix or a similar system, leave it disabled unless you need NIS Service.
    - Lotus Foundations built-in Network Information Server (NIS) is used to share usernames and groups across a network to simplify user access. Unix and similar systems can be configured to use NIS. Lotus Foundations uses NIS version 2.
11. Indicate whether or not you want to enable Lotus Foundations as a Network Time Protocol (NTP) Server.
    - An NTP client is required to synchronize the desktop clocks to the Lotus Foundations server.
12. Choose whether or not to *Restrict Outgoing Connections*.
    - As part of Lotus Foundations ICSA compliance, Lotus Foundations can restrict outgoing connections to a few protocols. Enabling this option enables outgoing traffic based on the server’s configuration. All other traffic is blocked. See Chapter 22: Firewall Services for more information.
13. Lotus Foundations synchronizes its clock with a source on the Internet. To set the proper time, select your Time Zone from the drop-down list. Lotus Foundations attempts to auto-detect the proper time-zone and display its detected results for you.
14. Click *Save Changes*.

Configuring advanced DHCP settings

DHCP lease length

For each interface that has DHCP enabled on it, a row is displayed listing the Interface, Length, and Actions you can perform on it. You can click the edit button on any of these rows to select the lease time that should be applied to that interface.

DHCP ranges

This is a list of ranges, giving Interface, the Range, and Actions you can perform on them. You can create a new DHCP range by clicking New DHCP Range.

1. Choose a starting IP address and ending IP address that you want to have the DHCP server give out.
2. Click *Save Changes* for it to take effect.

You can also edit the ranges in a similar fashion by selecting the edit action button in the DHCP Ranges list.

Static DHCP leases

Static DHCP Leases help you to choose which Workstation receives a particular IP address by assigning that IP to its MAC Address.

1. Click *New Static DHCP*.
2. Enter the interface on which this static lease should occur.
3. Enter the MAC address of the workstation to receive an IP.
4. Enter the IP address that the workstation should receive.

You can also edit leases in a similar fashion by clicking on the edit button in the Action column of the Static DHCP Leases list.

DHCP leases

This section displays a table of current leases that have been served to workstations. You can determine which MAC addresses are currently receiving specific IP addresses.

Configuring advanced network settings

The Advanced Network Settings screen helps you to configure some of Lotus Foundations more advanced features. Changing advanced network settings can potentially cause odd behavior on your network; for example, if you change your Lotus Foundations-powered server's IP address or network mask to an incorrect value, you may not be able to reach it from your web browser to change it back. If something goes wrong with these settings, you may be forced to change them back by logging into the local console menu, or use the control panel on the front of a Lotus Foundations-powered Net Integrator server.

If you intend to use TunnelVision or IPsec, every network in each office location that will be connected through a VPN must have a separate network subnet. If Lotus Foundations servers in various locations auto-configure their local network interfaces to the same subnet, you have to change your subnet number and IP address to a different value. Refer to Reconfiguring network devices in this chapter for information on how to do that.

Advanced network settings screen

To access the advanced network settings screen:

1. Select Local from the Network Setup menu found on the left side of any WebConfig screen. The Local Network Options screen is displayed.
2. Click Advanced... at the bottom of the screen. The Advanced Network Settings screen is displayed.

Network devices

The following list describes the network devices section of the screen:

Column	Description
Device	Lists the network interfaces installed on the Lotus Foundations-powered server. Eth0 should be connected to your LAN. Eth1, Eth2, and PPP0 should be connected to the Internet
IP Address	Lists the IP addresses to the interfaces.
Netmask	Lists the IP network mask assigned to a particular interface.
Mode	Describes how an IP address was assigned to an interface. • "Forced" means that a permanent IP address was assigned by an administrator. Eth0 should always have a forced IP address. • "DHCP" means that a temporary IP address was assigned by the DHCP server. DHCP addresses change each time you turn-on your Lotus Foundations-powered server. • "NetMap" indicates that the IP address was automatically assigned by Lotus Foundations.

Trust	An important parameter that needs to be set with careful consideration. • "Yes" signifies a trusting relationship with all hosts attached to that interface (meaning that no firewall protection is applied to that interface). Eth0 should always be configured as trusted. • "No" means that any traffic arriving at that interface is considered non-trusted; as such, appropriate firewall protection is applied. All Internet connections should be configured as non-trusted.
Action Button	Clicking this button displays a screen where interface settings can be changed.

Reconfiguring network devices

1. Select Local from the Network Setup menu found on the left side of any WebConfig screen. The Local Network Options screen is displayed.
2. Click Advanced.... The Network Devices list is displayed. Click on an interface's Action button.
3. The Network Settings screen for that interface is displayed.
4. Optional: Enter a new IP address (in the format 192.168.12.10).
5. Optional: Enter a new network mask (in the format 255.255.255.0).
6. Optional: Indicate whether or not to trust computers on this network.
7. Optional: Indicate whether or not you want Lotus Foundations to automatically choose an IP address and network mask.
    - The default setting is "Yes", meaning that Lotus Foundations automatically selects an IP address and network mask.
    - The default setting is changed to "No" (and autoconfiguration is disabled) if you entered a new IP address or a new network mask and clicked *Save Changes*.
    - Eth0 should never be set to choose automatically. Once an IP has been chosen, the interface should have its option forced (not automatic) unless you are running a separate DHCP server on the local network.
8. Optional: If your DHCP server, for example, your cable modem provider, pecified that you need a DHCP Client ID when setting up your network, enter it here.
9. Optional: Indicate whether or not you want Lotus Foundations to use this link as the default gateway.
    - If this is set to "Yes", Lotus Foundations will create a default route to the network through this interface at the highest priority level, so this link will be used by default for incoming and outgoing traffic.
    - If this is set to "Only as last resort", Lotus Foundations will create a default route to the network through this interface with a lower priority level, so it will be used only if your higher-priority ("Yes") links stop working.
10. Click Save Changes.

Network routes

The Network routes section of the screen displays the IP routes known to Lotus Foundations. Because Lotus Foundations automatically discovers its network surroundings and sets up routing tables, you generally do not need to edit them. However, depending on your Internet connection, your ISP might assign you a new route (in which case you have to edit the default route).

Whether or not you have to change any route settings depends on your network setup and Lotus Foundations connection to the LAN and to the internet.

Deleting network routes

1. Select Local from the Network Setup menu found on the left side of any WebConfig screen. The Local Network Options screen is displayed.
2. Click Advanced.... The Network Routes list is displayed.
3. Click on the appropriate route's delete button.
4. In the window that appears, confirm the deletion by clicking OK.

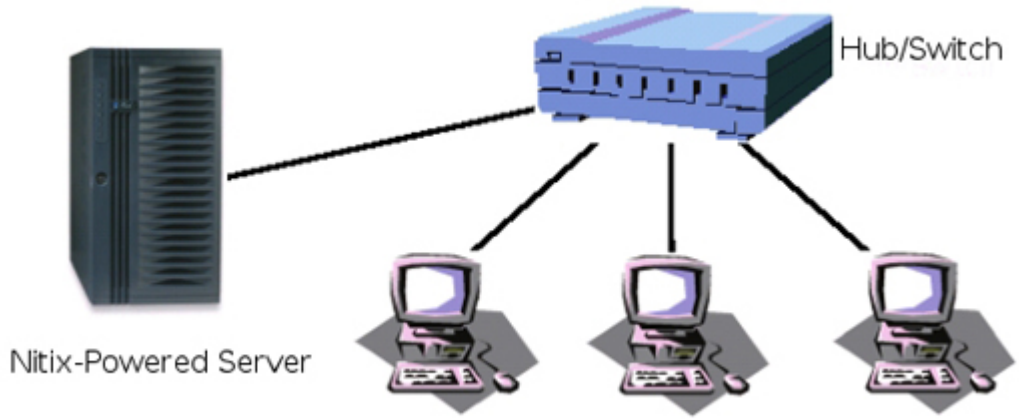
If the server prevents the route from being deleted, the server deems the route as required or important, as it must relate to another setting or subnet in your Device list. If you continue to have issues, review FAQs for a Netscan option or contact support.

Editing network routes

1. Select Local from the Network Setup menu found on the left side of any WebConfig screen. The Local Network Options screen is displayed.
2. Click Advanced.... The Network Routes list is displayed.
3. Click on the appropriate route's edit action button. The Route Modification screen is displayed.
4. Optional: Enter a new destination IP address and netmask (in the format 192.168.12.0/24).
5. Optional: Click on the Interface drop-down and select the interface over which this network can be accessed.
6. Optional: If this is not a local network route entry (eth1 or eth2), enter the network's gateway address.
7. Click Save Changes.

Network configuration scenarios

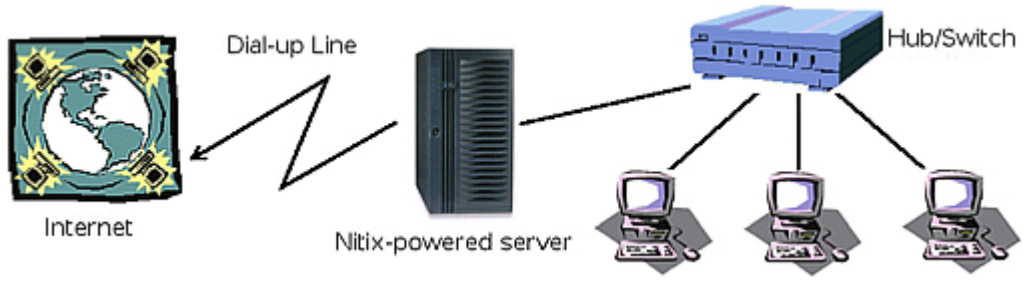
1. Lotus Foundations-powered server as a Workgroup Server without a direct connection to the Internet



In this scenario, you would go to the *Advanced Network Settings* screen to change the IP address or the network mask of the local network interface or Lotus Foundations default route. Although you generally do not need to change these settings, you can still do so:

1. In the Network Devices or Network Routes section of the Advanced Network Settings screen, click the appropriate action button.
2. Depending on your choice, the Modify Route or the Network Settings screen is displayed. Refer to Reconfiguring Network Devices and Editing Network Routes earlier in this chapter for full descriptions of these two screens.
3. Change the appropriate settings and click Save Changes.

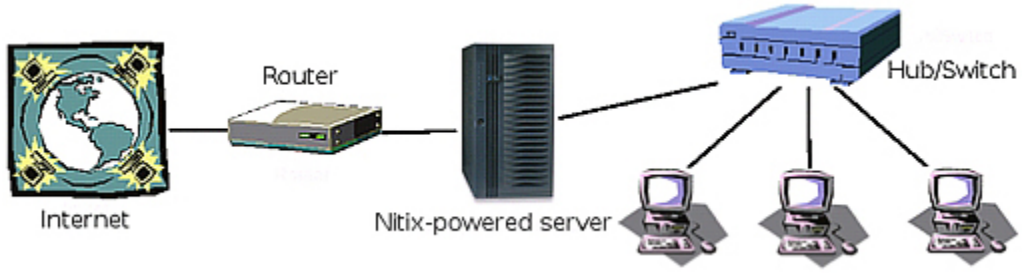
4. Lotus Foundations-powered server as a Workgroup Server and Dial-up Gateway to the Internet



If Lotus Foundations has automatically chosen the proper IP addresses, there is nothing else for you to change. If you want to change the Lotus Foundations-powered server's local IP addresses, you can do so by clicking the edit button on the line describing the parameters for the Ethernet 0 interface.

The default route is automatically determined when Lotus Foundations dials in to the Internet. In this case, there should be no default route entry in the Routes Table.

5. Lotus Foundations-powered server as a Workgroup Server and High-speed Gateway to the Internet



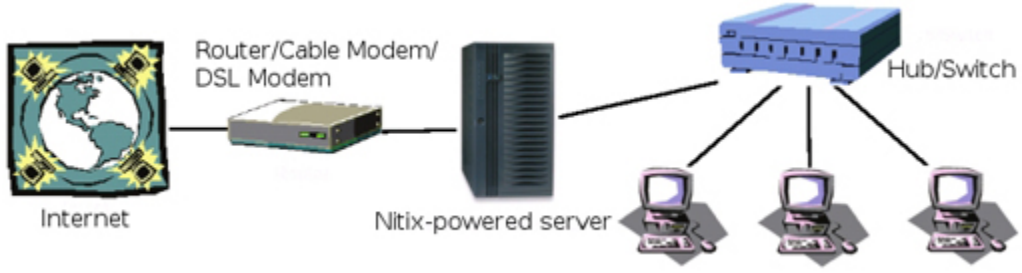
Lotus Foundations auto-configures its parameters if the ISP uses DHCP as a means of automatic network configuration. In this case, there should be nothing for you to do on the Advanced Network Setup screen (although you can change the address of your local network interface if you wish to do so).

If your ISP assigns a unique static IP address, network mask, and default route, Lotus Foundations discovers the proper default route, but does not know which IP address to select. Although Lotus Foundations finds the available address and establish a proper connection to the internet, you should change the IP address of your Internet interface to the address assigned by your ISP. You should do the same with the default route setting. If you run into problems configuring advanced network settings, contact technical support.

To change these settings:

1. In the Network Devices section of the Advanced Network Settings screen, click the eth1 action button.
2. The Network Settings screen is displayed. Enter the new IP address and click Save Changes.
3. In the Network Routes section of the Advanced Network Settings screen, click the default action button which the last entry in the list.
4. The Modify Route screen is displayed. Change the default route and click Save Changes.

5. Lotus Foundations-powered server as a Domain Controller and High-speed Gateway to the Internet.



Lotus Foundations can serve as a Windows NT style domain controller for all the computers running Windows on the network. As the domain controller, Lotus Foundations provides authentication services for the computers on the network. When this function is enabled, the Windows file server is set up as a domain

controller, and a domain replaces the Windows workgroup. For specific information on configuring domain controllers, please see Chapter 10: NT Domain Services.

Configuring your internet connection

Configuring a dial-up modem

1. Select Dial-up from the Network Setup menu found on the left side of any WebConfig screen. The Dial-up Networking Setup screen is displayed.
2. Optional: If you have an external modem connected, you might need to click Detect Modems to initiate the Modem Detection Cycle. Refer to Chapter 6: DoubleVision for information on using multiple dial-up modems.
    - If the modem is undetected, check cables/power, etc. Cycle power on the modem and initiate a new Detect Modems test. Refer to FAQ for more troubleshooting tips.
3. Click on the Modem #1 action button. The Dial-up networking setup screen is displayed.
4. Enter the phone number provided by your ISP. If you have to dial 9 to get an outside line, enter this number. For example, enter: 9, 123-123-1234 .
5. Enter the Internet account username provided by your ISP.
6. Enter the account password provided by your ISP.
7. Re-enter your password to ensure that it was entered correctly. If the passwords do not match, you are asked to re-enter your password in both fields.
8. Indicate the number of idle seconds before automatic disconnection.
    - If you enter zero, the connection never automaticallys disconnect. Be careful with this setting, especially if you do not have an unlimited internet access package from your ISP.
9. Select the appropriate dialing mode:
    - Select Yes if you want the Lotus Foundations-powered server to dial automatically to the internet when someone tries to reach it.
    - Select No if you want to manually initiate a connection by clicking Dial Modem on the System Status page.
    - Select Only as a last resort if you want to use a dial-up connection when one or more of your high-speed connections fail. The dial-up connection stays active until one of the high-speed connections becomes functional. Although all traffic is forwarded to the high-speed connection when it returns to normal, the dial-up connection remains active for a few minutes in case the high-speed connection fails again. In that case, the system re-routes traffic back to the dial-up connection immediately without having to wait for a dial-up connection to be re-established.
10. Indicate whether or not you want your Lotus Foundations-powered server to emulate Windows Dial-up Networking.

    - Some internet providers are setup to work only with Windows dial-up clients. If you have problems establishing dial-up connection, try enabling this option.
11. Indicate whether or not users are able to establish a remote dial-in modem connection to the internal network.
    - VPN (PPTP) and Dial-In access has to be enabled before you establish a remote connection. See *Creating Users* in Chapter 7: User & Team Management for more information.
12. Click Save Changes.

Configuring a DSL connection (PPPoE)

1. Select Dial-up from the Network Setup menu found on the left side of any WebConfig screen. The Dial-up Networking Setup screen is displayed.
2. Click the action button in the appropriate ADSL row (eth1 or eth2 only). The ADSL Dialer Options screen is displayed.
3. Enter the Internet account username provided by your ISP.
4. Enter the account password provided by your ISP.
5. Re-enter your password to ensure it was entered correctly. If the passwords do not match, you are asked to re-enter your password in both fields.
6. Optional: Enter your gateway IP address. Leave this blank if you do not know the address.
7. Indicate whether or not you want to enable the connection.
    - Select Yes if you want to establish a permanent connection.
    - Select No if you do not want to establish a connection.
    - Select Only as a last resort if you want to use this connection only if the primary connection fails.
8. Click Save Changes.

Configuring a leased line connection

1. Select Dial-up from the Network Setup menu found on the left side of any WebConfig screen. The Dial-up Networking Setup screen is displayed.
2. Click the Leased Line action button. The Configuring a Leased Line screen is displayed.
3. Enter the account username provided by your ISP.
4. Enter the account password provided by your ISP.
5. Re-enter your password to ensure that it was entered correctly. If the passwords do not match, you are asked to re-enter your password in both fields.
6. Indicate whether or not you want to enable this connection.
    - Select Yes if you want to establish a permanent connection using the leased line. This is the recommended setting.
    - Select No if you do not want to establish a connection using the leased line.

- Select Only as a last resort if you want to use the leased line connection only if the primary connection fails.

7. Click Save Changes.

Take a snapshot

Now that you have taken the time to configure Lotus Foundations you can use the Take Snapshot item in the menu to display all the information available on one scrollable page.

Client access licenses

Client Access Licenses, or "CALs," help individuals within a company to legally use the Lotus Foundations server operating system: when you purchase a Lotus Foundations CAL, you are purchasing the rights for a user to use the software.

Client access licensing requirements

Lotus Foundations uses a "Per User" licensing model. That is, any number of individuals can connect to the Lotus Foundations-powered server; however, you must purchase a Lotus Foundations Client Access License (CAL) for each individual, or "user account," where access to Lotus Foundations services (such as email, file, print, MySQL and FTP services) is needed. For example, if an individual is only utilizing the Lotus Foundations-powered server as gateway or firewall, that person does not require a CAL. See Chapter 7: User & Team Management for more information.

Lotus Foundations CALs are not required for team accounts without a password; team members can still access team data/services using their personal user account passwords.

A defined number of Lotus Foundations CALs come with each version of the Lotus Foundations server operating system. One additional "free" Lotus Foundations CAL is allocated for a Lotus Foundations administrator.

License information

To see how many Lotus Foundations CALs are licensed for the system and currently being used:

1. Login to WebConfig with your administrator username and password.
2. Select *Software Update* from the WebConfig screen.
3. Click "Show Licenses" after entering the Software Update section in order to see the license information.
4. The *Software Update* screen is displayed with a Notices box at the top of the screen showing how many Lotus Foundations CALs you have.

The User Authentication Method line on WebConfig’s main System Status screen also displays how many Lotus Foundations CALs are licensed for the system and currently being used.

If you exceed your licensed number of Lotus Foundations CALs, a Notices box will appear at the top of each page in WebConfig. To purchase additional Lotus Foundations licenses, please contact your authorized reselling partner.

DoubleVision

What is DoubleVision?

DoubleVision is a Lotus Foundations feature that helps you to configure two or more internet connections. For example, you can combine a cable modem and an ADSL link, two ADSL links, multiple dial-up modems (to the same ISP or different ISPs), or any combination of internet connections supported by Lotus Foundations.

There is no single place to configure DoubleVision. Instead, it is automatically configured when more than one internet connection is used at the same time.

> **Important Note**
> For DoubleVision to activate, you must have at least two gateway connections. You can choose a default connection.

What DoubleVision offers

Using Double Vision technology, Lotus Foundations helps you to set up as many internet connections as you want and use them all simultaneously.

For example:

- You can have two ADSL lines and subscribe to two different ADSL services, so if either service fails, you are still online. When both services are working, your connection is twice as fast.
- You can have a cable modem and an ADSL line at the same time, and share the load between them.
- In areas without high-speed internet support, you can configure multiple dial-up modems using multiple accounts, and reach ISDN-equivalent speeds at a fraction of the price.
- You can set up a dialup modem as a fallback connection. Lotus Foundations automatically switchs to your dial-up ISP when your normal internet connection (one or more ADSL, cable, or other high-speed lines) fails.

Advantages to DoubleVision

Increased performance	Internet traffic is increased by being able to use the bandwidth of both lines. You cannot specify which connection is used. It is automatically chosen by NetIntelligence.
Increased reliability	If one ISP's internet connections fails, the remaining ISP's connection stays functional. This means that your downtime is limited (also known as fail-over, or redundant connectivity).
Last Resort dial-up mode	If one or more of your high-speed internet connections fail, Lotus Foundations can dial your modem automatically and use dial-up access instead. When your high-speed links are restored, the modem automatically disconnects after it verifies that the high-speed connections are stable and active. The same applies to high-speed connections if you choose to use them as a last resort connection.
Dynamic DNS Integration	If you are using Dynamic DNS, Lotus Foundations automatically publishes appropriate DNS names so that people can always find your Web site, even if your high speed links are down and you need to use a dial-up connection. See Chapter 23: Domain Name Services for more information.
NetIntelligence	No human intervention is required to activate and deactivate internet services when they fail or are restored. NetIntelligence automatically takes care of these situations.
Full automation	You do not have to reconfigure any client workstations on your local network to take advantage of DoubleVision. DoubleVision is fully automated and managed by the server.

Modem connections

Since modems are normally much slower than other internet connections, you probably do not want to use a modem as your primary connection. Instead, you can configure your modem as a "last resort" option, meaning that your modem only connects if one or more of the high-speed connections fails.

If a modem is configured as the primary connection, it connects to the internet even if high-speed connections are available. This is useful if you want to test the modem connection.

How DoubleVision and internet failover work

What internet failover does

- You can set up multiple links in order of priority by setting some to Enable: As last resort instead of Enable: yes. These links only get activated when the primary links are marked broken by NetIntelligence.
- We detect broken links using a method called Demi-Ping. It detects most kinds of link failures to the Internet, although certain kinds of partial failures cannot be detected. Net Intelligence should always notice if you unplug the physical connection to a link and automatically switch to your secondary links, and this is the easiest way to check that it is working.
- You can see that you are using Internet Failover by checking the "number.letter." code next to your various Internet links on the status page of WebConfig. Ignoring the letter, the different numbers imply the different backup priorities. For example, if you have "1.a. Indirect on eth1", "1.b. Indirect on eth2", and "2.a. Modem", then your primary links (1.x) are the first two and your secondary link (2.x) is the last (modem) link.
- The DNS server (including Dynamic DNS) will publish one of the IP addresses for the "most important non-broken link" as the IP address for your domain. That is, if a #1 link is non-broken, then is publishs its address; if all #1 links are broken, then it publishes a #2 address.
- Because incoming connections are usually addressed to your domain name, whichever IP your DNS is publishing is the one to receive most incoming traffic. However, if there is more than one non-broken link, any of those should be able to receive incoming traffic if you ping the IP address of that link.
- All outgoing connections go through the first non-broken link. There is no way to force an outgoing connection to use another link.

What Double Vision Does

- Double Vision does outgoing load balancing, or load sharing, between multiple links at the same priority level. In the previous example, if you have 1.a. Indirect on eth1, 1.b. Indirect on eth2, and 2.a. Modem, then if all links are non-broken, Double Vision will split outgoing web traffic between the two 1.x. links.
- Double Vision's load sharing works differently from typical load balancing routers. It takes each individual session, such as a single Web page, and assigns it to one internet link or another, and all packets for that session go through the same link. This is unlike the usual load balancing routers, which split packets randomly across links, even packets belonging to the same session. This means two things:
    1. You do not need both links to be through the same co-operating ISP that can decode a single session from multiple links which is the major advantage of Double Vision.
    2. If you only have one session at a time or your sessions are unluckily assigned to links, you get little to no performance improvement.
- Some types of outgoing traffic either cannot be or should not be load shared in this way: for example, FTP, ping, traceroute, and SMTP. This is usually because many protocols, such as FTP, ping, and traceroute use multiple TCP sessions for one

logical session. SMTP is special because of spam relay protection, which makes it so you have to use a different outgoing SMTP server depending which link is in use. To avoid these problems, we only use Double Vision for outgoing Web sessions; for other kinds of sessions, Net Intelligence chooses the best link as a "default" link and uses that for all outgoing non-HTTP traffic. In practice this is not much of a problem, since almost all high-bandwidth traffic comes from the Web.

- Incoming traffic is treated very differently from outgoing traffic: we accept connections on all non-broken links, but the DNS for your domain name is only registered to point at the default link chosen by Net Intelligence. This is because you cannot actually tell client software to use the best link or alternate between these two links in a reasonable way, so we have to choose the best one and tell them to use that. Occasionally, the DNS-advertised best link starts to get too loaded down, probably because all the incoming traffic is using it, so Net Intelligence decides to advertise the second-best link for a while instead. Of course, remote users may have a DNS cache of 5 minutes or more, so this change does not take effect immediately.

Quick summary version

- You are using Internet Failover if you have multiple links with different numbers: "1.a.", "2.a.", etc.
- You are using Double Vision if you have more than one highest-priority non-broken link with the same number and more than one letter: "2.a.", "2.b.", etc.
- With either Double Vision or Internet Failover, unplugging any link should cause Net Intelligence to switch you over to a different, working one. If it does not, something is misconfigured or you have encountered one of the limitations below.
- Your DNS server always publishes the address of its favorite non-broken, high-priority link. So incoming traffic generally comes in on that address.
- Incoming traffic is always accepted at the address of any non-broken link, even if DNS currently gives users no way of actually getting there.
- Outgoing Web traffic always goes through all highest-priority Double Vision links.
- Outgoing non-Web traffic always goes through Net Intelligence's favorite highest-priority link.

Code limitations

- Currently TunnelVision, like all non-Web traffic, just uses Net Intelligence's favorite route. Eventually it supports using all the highest-priority Double Vision routes.
- Net Intelligence's favorite route selection algorithm, while not bad, could be better. It should choose a different favorite route as soon as possible if the current one starts getting overloaded - right now it waits too long.
- When transmitting a lot of data, sometimes this dramatically slows down receiving; this is counterintuitive, but it is a general problem for ADSL and cable modem links, where uplink speed is much slower than downlink speed. This tends to confuse Net Intelligence's link selection, but this is with the active queue management feature.

User & team management

Service integration

User and team management is integrated with a number of other Lotus Foundations services. It is very important that you understand how user and team management relates to these other functions before creating, editing, and deleting users and teams. Please read the following section carefully.

Lotus Foundations email, file, Web, and FTP services are tightly integrated. Every user and team account that is created has instant and automatic access to all of these services. When a user is created, a number of things happen in the background:

- a login account is created and the password defined by the administrator is assigned to that account.
- a personal user directory is created on the server. This directory is accessible in Windows' Network Neighborhood or on Macintosh's AppleShare drive. If NFS is enabled, UNIX and similar systems can use the path `/export/home/`**`USERNAME`** to access this directory. For example, the path for someone with the username `janedoe` would be `/export/home/janedoe`.
- a WWW directory is created within the user's personal directory. Any file stored in this directory is automatically published on the user's personal Web page.
- an FTP account (which points directly to the user's personal directory) is created for the user. If the user logs in to the FTP server using the proper username and password, they can access the files in their personal directory.
- an email account is created for the user. Email is available through either POP3, IMAP, WebMail or the Domino mail protocol.

Similarly, when a team is created, a number of things happen in the background:

- a team login account is created and the password defined by the administrator is assigned to that account.
- a team directory is created. This directory is accessible to all team members in Windows' Network Neighborhood or on Macintosh's AppleShare drive. If NFS is enabled, UNIX and similar systems can use the path `/export/home/`**`TEAMNAME`** to access this directory. For example, the path for a team named `sales` would be `/export/home/sales`.
- a WWW directory is created within the team directory. Any file stored in this directory is automatically published on the team's Web page.

- an FTP account (which points directly to the team directory) is created for the team. If a team member logs into the FTP server using the proper team name and password, they can access the files in the team directory.
- an email distribution account is created for members of the team. Team email can be accessed through either POP3 or IMAP mailboxes. Email received by the team email account can be set to be automatically forwarded to all members of the team.

> **Important Note**
> All Lotus Foundations user and team accounts with a password require a Lotus Foundations CAL. Lotus Foundations CALs are not required for team accounts without a password; team members can still access team data/services using their personal user account passwords. Users who do not need to access Lotus Foundations services (such as email, file, print, MySQL, and FTP services), do not require a CAL. One additional "free" Lotus Foundations CAL is allocated for a Lotus Foundations administrator. See Chapter 5: Client Access Licenses for more information.

User accounts

Browsing users

Users are listed in the *User Setup* section of WebConfig. You can search for users and teams by user id, team id or full name. Teams will always be listed first, followed by administrators, then regular users.

Disabled users show up in this list with “(disabled)” appended to the Full Name field. Users are considered disabled when they have no password set.

Creating users

1. Select *User Setup* from the menu on the left side of any WebConfig screen.
2. Click *Add New User*.
3. Enter the User ID (also known as a "username") that serve as the user’s login and personal directory name.

> **Important Note**
> User IDs cannot contain spaces or any punctuation other than hyphens, periods, and underscores, for example, jane-doe, jane.doe, jane_doe are all acceptale user IDs.

   - With Lotus Foundations Start installed, this user ID becomes part of the user’s email address. For example, if the username `janedoe` is created on a Lotus Foundations-powered server that resides in the `example.com` domain, Jane's email address is `janedoe@example.com`.

4. Enter the user's full name. This full name must be unique to all other names when running Lotus Foundations Start.
5. Enter a password for the user. User passwords should also be unique.
6. Re-enter the password to ensure that it has been entered correctly. If the passwords do not match, you will be asked to re-enter the password in both fields.
7. Indicate whether or not this user will have administrative privileges.
    - Administration privileges means that this user has unrestricted access to all configuration functions of Lotus Foundations. If you give a user Administrative privileges disk and email quota values are not configurable. Admin users automatically have unlimited quotas.
8. Indicate whether or not this user will have FTP access to his or her private directory.
    - FTP has to be enabled before the user has FTP access. If FTP is enabled in Trusted Hosts Only mode, the user can access files from a trusted, internal network or from a VPN. If FTP is enabled in open mode, the user can access files using FTP from anywhere on the Internet.
9. Indicate whether or not the user is allowed to establish a remote VPN (PPTP) or dial-in modem connection to the internal network.
    - For security reasons, most users should not be able to establish a remote connection. VPN services must be enabled before a user can establish a VPN connection. Similarly, dial-in for a specific modem has to be enabled before a user can establish a dial-in connection on that modem. See the user manual chapter Remote Access Services for more information.
10. If the domain controller is enabled, choose a drive that the user's files can be automatically mounted to when logged into a domain workstation. The default drive is X:.
    - Be sure to choose a drive that is not already in use. For more information, see the user manual chapter NT Domain Services.
11. Select a quota value for this user. For more information, see the user manual chapter Disk Quotas.
12. Select an email quota value for this user.
13. Enter any nicknames that are required for this user. Email sent to any of these nicknames will be delivered to this user.
14. Under Join Teams, select the team(s) from the Available Teams list that this user is a part of. Click Join. The teams are displayed in the Member of Teams box.

> **Important Note**
> Team membership gives users full access to the team's shared directory. If one of the joined teams is a member of any other team(s), when it is added to the Member of Teams list it will have (# inherited) listed after it. The user has "inherited" team membership to those other team(s).

15. Click *Save Changes*. This returns you to the main User Setup page, and the user is displayed in the list of previously created users.

Editing users

1. On the main User Setup page, click the appropriate user's edit action button. The Modify User screen is displayed.

> **Important Note**
> While running Lotus Foundations Start, User and Team names are not modifiable.

2. Change the user's information as necessary. Refer to *Creating Users* (in this chapter) for a description of the fields on this screen.
3. Click *Save Changes*.

Other Actions

- Remove a user's password to disable the account.

Deleting Users

> **Important Note**
> Deleting a user means that all of the user's personal files, email settings, mailbox, and any undelivered email in the mailbox is deleted. Once this is done, none of the above can be recovered (unless you restore the data from a previous backup).

To delete an individual user:

1. On the main *User Setup* screen, click the appropriate user's Delete button.
2. An "Are you sure you want to delete user" confirmation box is displayed. Click *OK* to continue and delete the user.

To delete multiple users

To delete multiple users, you can use pre-existing pwdump2 or spreadsheet data using the following syntax:

```
username1, username2, username3, username4.
```

Usernames should be separated by new lines or commas.

Fields other than the username field are optional and should use the following syntax:

```
username[,user2,user3(...)]:password:full_name
```

The ":" (colon) separator can be replaced by ";" (semi-colon) or [TAB].

1. In WebConfig, click *User Setup* in the menu.
2. Click *Import Users* and the *Import Users* screen is displayed.
3. In the *Action* field, select "Delete Users".
4. Right-click the field called Import Users Info. Select Paste. This copies the contents of the file.
5. Click Save Changes.
6. Click Save Changes.

Import users from Windows

To upload user information from a Windows 2000 or NT server:

1. You need to download an executable file called `pwdump2`. The program is freely available online and can be found at various locations on the Internet. Here is one:

   "pwdump2." by BindView. Accessed 2007-01-09.

2. Download the file called `pwdump2.zip` and unzip the contents to its own folder. For example, extract the contents to a folder called `pwdump2` on your C drive.
3. Click on the Start menu, and choose Run.
4. Enter cmd, then click OK.
5. Type the following, then press Enter:
   `cd pwdump2`
6. This changes the directory to the folder you created on your C drive that contains the contents to the file `pwdump2.zip`.
7. Type the following, then press Enter:
   `pwdump2 > list.txt`
8. This runs the file called `pwdump2.exe` and generates a text file called `list.txt` in the same folder.
9. Open the file called `list.txt`. This contains a list of Windows users. Highlight the users that you wish to import, right-click and choose Copy.
10. In WebConfig, click User Setup in the menu.
11. Click Import Users.
12. Right-click the field labelled Import Users Info. Select Paste. This copies the contents of the file called `list.txt` into this space.
13. When importing users, you can specify each user's quota value as small, medium, or large by using the following syntax: (For more information on quota values, see Chapter 9: Disk Quotas.)
    `username[,user2,user3(...)]:password:full_name:quota.`
14. Click Save Changes. The Import Users screen is displayed.
15. Click Save Changes.

Because Windows uses a one-way hash algorithm for storage of passwords, the passwords are not easily recovered. The Administrator needs to create new passwords for each imported user from the Modify User screen.

You can only import either a block of pwdump2-generated data or a block of spreadsheet-generated data at one time. If you need to import both, import each type separately.

Export users

Exported user information from a Lotus Foundations server can only be imported to another Lotus Foundations server.

To export user information from a Lotus Foundations server:

1. Click *User Setup* in the WebConfig menu. The main *User Setup* screen is displayed.
2. Click *Export Users*. A File Download screen is displayed.

1. Click *Save*, and save the file as a `.dat` file.

Modifying user email settings

1. Click User Setup in the WebConfig menu. The main User Setup screen is displayed.
2. Click the appropriate user's edit action button. The Modify User screen is displayed.
3. Click E-mail... (located at the bottom of the screen).

The following fields are displayed on the user email page:

- **Retrieve Mail from POP Server:**
  - Used to POP mail from your current mail provider and/or used to pull third party POP mail (i.e. Yahoo/Hotmail).
  - Configure by entering the full server name used to pull mail down from your ISP (i.e. pop1sympatico.ca).
- **Remote POP Username:**
  - Enter the appropriate account credentials for the mail service you are retrieving from.
- **Remote POP Password:**
  - Enter the password for the POP account.
- **Re-enter POP Password:**
  - Re-enter the password for the POP account to ensure that it was typed correctly.

For more information about the following Spam related fields, please see the Spam Scanner chapter.

- **Treatment of definite spam:**
- **Treatment of probable spam:**
- **Spam Scanner Whitelist/Blacklist:**
- **Receive Spam Summary Notification?**

Mailing lists

To subscribe to a mailing list, perform the following steps:

1. Assume that the mailing list is named 'maillist'.

2. Send an email, similar to the following:

```
To: maillist+manager@yourdomain.com
Subject: <provide an appropriate subject>

subscribe maillist
```

3. You will receive a response asking you to send a confirmation request. The confirmation request looks similar to the follwing:

```
<email starts here>
To: maillist+manager@yourdomain.com
Subject: <provide an appropriate subject>

auth <some key code subscribe maillist <your email address>

<email ends here>
```

Unsubscription is similar. However, majordomo does not use unsubscription confirmation unless you send the unsubscribe email from the same address that you subscribed from. For example, if you subscribed as user1@mydomain.com but you sent the following message as user2@mydomain.com.

```
unsubscribe maillist user1@mydomain.com).
```

After you have subscribed to the mailing list you can send messages to maillist@yourdomain.com as usual to send emails to other members of the mailing list.

You can use Mozilla Thunderbird clients to send email however, to check mail you have to log in to the box and check the Maildir since there's no IMAP on the boxes.

Old mailing lists will not be migrated from the old system. This is relatively easy but time consuming.

Team accounts

Creating teams

1. Select User Setup from the WebConfig menu. The main User Setup screen is displayed.
2. Click Add New Team. The Create New Team screen is displayed
3. Enter a team ID.
    - This ID serves as the name of the team's shared directory and as the team's FTP login name (which gives team members FTP access to the shared directory and the WWW directory). Team IDs cannot contain spaces or any punctuation other than the hyphen, the dot, or the underscore.
4. Enter a descriptive name for the team in the Full Name field. This descriptive name must be unique.
5. Enter a login password for the team. Team passwords should be unique.
6. Re-enter the password to ensure it was entered correctly. If the passwords do not match, you are asked to re-enter the password in both fields.
7. Indicate whether or not the team has FTP access to the team directory.
    - FTP has to be enabled before the team has FTP access. If FTP is enabled in Trusted Hosts Only mode, the team can access files from the internal network or from a VPN. If FTP is enabled in open mode, the team can access files using FTP from anywhere on the Internet.
8. Indicate whether or not team members are allowed to establish a remote VPN (PPTP) or dial-in modem connection to the internal network. For security reasons, most teams should not be able to establish a remote connection.
    - VPN services and dial-in services have to be enabled before a team member can establish a VPN or dial-in connection. See Chapter 21: Remote Access Services for more information.
9. Select the team type to create this team as:
    - Normal Team
    - Room
    - Resource

    Teams created as a room or a resource can be reserved by users using Lotus Notes.
10. If you chose to create the team as a room please select the capacity of the room referred to.
11. Select a Quota Value for this team. For more information, see Chapter 9: Disk Quotas.
12. Enter any Nicknames required by this team. Email sent to any of these nicknames are delivered to the team.

13. Under *Team Members*, select the user(s) from the *Users* list who are a part of this team. Click *Add*. The user(s) is displayed in the *Team Members* box.
    - Team membership gives users full access to the team's shared directory.
    - If one of the members is a team, when it is added to the *Team Members* list it has (# members) listed after it. That team's members have "inherited" team membership.
14. Click *Save Changes*. This returns you to the main *User Setup* page, and the team is displayed in the list of previously created teams.

Editing Teams

1. On the main *User Setup* screen, click the appropriate team's edit action button.
2. The *Modify Team* screen is displayed.

> **Important Note**
> While running Lotus Foundations Start the team name and the team type are not modifiable. If you created a team as a room you cannot convert it to a resource, but you can modify the capacity of the room. Similarly if you created a team as a normal team or a resource, you cannot convert it to another team type.

3. Change team information as necessary. Refer to *Creating Teams* (in this chapter) for a description of the fields on this screen.
4. Click *Save Changes*.

Other actions

- Click Send to send this team a test email.

Deleting teams

> **Important Note**
> Deleting a team means that the team's shared network directory and all of the files contained within the directory are deleted. Once this is done, none of the above can be recovered unless you restore the data from a previous backup.

1. On the main User Setup screen, click the appropriate team's Delete button.
2. In the confirmation dialog that displays, click OK.

Searching for users

The User Setup screen restricts the number of entries that are displayed by default. If there are a large number of users, only the first 30 users are displayed in the User Setup section. At the bottom of the section there are links to a series of users. For example, if you have 43 users, the screen displays: [show all] [a - o] [p - y]. Clicking on the [p - y] link displays all users with usernames beginning P through Y. To help administrators to easily locate users' records, there is a Search field at the top of the *User Setup* screen. To search for a user, type in that user's UserID (or portion thereof) and click *Search*.

Password policy

The Password policy feature helps an administrator to set restrictions on the format of passwords chosen by users. For example, the administrator can specify that uppercase and lowercase letters must be included in the password and/or that passwords must be of a particular minimum length.

Creating a password policy

1. Select User Setup from the WebConfig menu.
2. Click Password Policy.
3. Choose whether or not to enforce the password policy on passwords set by admins.
    - The Password Policy settings are always enforced for passwords chosen by users. If this option is enabled, the Password Policy settings are also enforced for passwords chosen by administrators, including their own passwords.
4. Select which Password Policy criteria should be enforced by checking the appropriate boxes. Passwords must contain letters.
    - The Passwords must contain letters and "Passwords must contain both uppercase and lowercase letters rules are tied to each other. Therefore, enabling the Passwords must contain both uppercase and lowercase letters rule enables the Passwords must contain letters rule, and vice versa.
5. If you wish to enforce a minimum password length, enter the number of characters in the Password minimum length text box. Use 0 for no minimum.
6. Click Save Changes.

Illegal passwords

When a password that does not conform to the policy as specified by the administrator is entered for a user, that user receives an email notifying them that they need to change their

password to one that conforms to the policy. The email also includes instructions on how to perform this password change.

If a user changes their password in their personal WebConfig to one that does not meet the policy criteria, they get a pop-up error message.

They also receive an error message in WebConfig's Notices box telling them that their password was not changed.

If the Enforce password policy on passwords set by admins option is set to No, Administrators are able to change a user's password to one that does not meet the policy criteria. This helps administrators to set an easy-to-remember temporary password for a new user, until that user can set his or her own password.

The administrator receives a warning message in WebConfig's Notices box informing him or her that the password does not meet the Policy criteria, but that the password has been changed.

If a user is already set up and the administrator creates or changes a password policy, that user's password will be valid -- even if it does not meet the policy criteria -- until the next time he or she logs onto WebConfig.

File services

File sharing services

Lotus Foundations is designed to provide high performance file sharing services for Windows, Macintosh, and UNIX-style clients. Files created by Windows users can transparently be seen by Macintosh users and vice versa.

The management and administration of file services is tightly integrated with user management and administration. Please refer to *Service Integration* in user manual chapter User & team management for a detailed explanation of how file sharing services are automatically set up during user and team creation.

Configuring file services

1. Click *File*, located in the main menu of WebConfig.
2. If appropriate, enable the file virus scanner. With this option selected, all files on the system will be automatically scanned for viruses every 12 hours. When a virus is encountered, it will be cleaned, if possible. Otherwise it will be renamed to “filename-INFECTED” and the user whose directory the file was found in will be informed via email of the virus.
    - This option is only available if you have purchased Lotus Foundations AntiVirus software.
3. If appropriate, enable the NFS files server, which allows UNIX, GNU/Linux, and similar computers to access shared directories on the server.
4. If appropriate, enable the Macintosh File Server.
    - If Macintosh file services are not enabled, users will not have access to their personal network directories or shared team directories from Macintosh workstations.
5. In the *Windows File Server* section, enable the file server by selecting *Stand Alone* from the drop down box. If you want to turn off the file server, select *Disabled*. If you would like to enable *NT Domain Controller* or *NT Domain Member*, please read the chapter NT Domain Services for further instructions.
6. Enter a workgroup name if you are not acting as a domain member or a domain controller. This name indicates the workgroup under which the Lotus Foundations-powered server is listed as a resource in Windows Network Neighborhood.
    - Enter the Windows workgroup name being used by other workstations in the office. If you are setting up a new network, you can use any workgroup

name you want (just make sure that you configure your Windows workstations so that they belong to the same workgroup).

7. In the section labeled *WINS Support* select whether or not the Lotus Foundations server responds to WINS requests by clicking "Enable" or "Disable".
8. If you select "Enabled" for the option above, specify the WINS server on the network in *WINS Server* section. If you want that Lotus Foundations server to act as the WINS server, leave the text box as is. If you want to use another server on the network to act as the WINS server, enter the IP address of that server.
9. Click *Save Changes*.
10. To ensure that the status of the file server has changed, select *System Status* from the WebConfig menu. The Windows, Apple, and NFS File Server sections of the System Status screen should display the updated status.
    - It may take up to 15 seconds for file services to start, and during that time the status may read Error starting service.

Active server connections

The *Active Connections* section displays which server resources, such as opened files, are being used by client workstations.

To view the current active connections in Nitix:

1. From the main *Files* section in WebConfig, click *Active Connections*.
2. In the main window you see a table that displays the following:
   - *User Name* indicates which user account is used to login to the network share.
   - *Machine Name* indicates the workstation used to log into the network share.
   - *IP Address* indicates the IP associated with the *Machine Name*.
   - *Connection Time* indicated what time the share was connect to.
   - *Action* provides the option of looking into further details of the connection by clicking (...) button, or deleting the connection by clicking 'X'.

- If you click the edit (...) button, you see a screen that displays the following:
  - *User Name* indicates which user account is used to login to the network share.
  - *Machine Name* indicates the workstation used to log into the network share.
  - *Path* indicates the path location of the share connection. If a file is in use, the actual file may display.
  - *Time* indicates when the share was initially accessed.

Access control lists

An Access Control List (ACL) is a set of data that informs a computer's operating system which permissions, or access rights, that each user or team has to a specific file or directory.

Administrators can modify a Lotus Foundations user or team's permissions ("Read Only," "Read/Write" or "None") on directories through the Lotus Foundations Permissions feature.

Setting a user's permissions

1. Click File in the WebConfig main menu. Locate the Permissions button.
2. Click Permissions at the bottom of the screen. The Select Folders screen is displayed.
3. Scroll down the list of teams, admins, and users in the selection box and click on the directory of the user to whom you want to assign permissions. Click on the check mark icon to the right of the list.
4. The Modify Folder Permissions screen is displayed showing the current permissions for that directory.
5. Modify the user's permissions by selecting either the Read Only, Read/Write, or None radio button. Click the check mark button in Include Subfolders if you want the same permission applied recursively, then click the check mark symbol in Action.
6. To set all of the files and folders under the current directory back to the default permission value, click Resent Folder.
7. To set all of the files and folders under the current directory, including all sub-folder files back to the default permission value, click Resent Folder.

Setting a team's permissions

1. Click File in the WebConfig main menu. Locate the Permissions button.
2. Click Permissions. The Select Folders screen is displayed.
3. Scroll down the list of teams, admins, and users in the selection box and click on the directory of the team to whom you want to assign permissions. Click on the check mark icon to the right of the list.
4. The Modify Folder Permissions screen is displayed, showing the current permissions for that directory.
5. Modify the team's permissions by selecting either the Read Only, Read/Write, or None radio button. Click the check mark button in Include Subfolders if you want the same permission applied recursively, then click the check mark symbol in Action.
6. To view the permissions of all users assigned to that team, click on the Plus symbol to the left of the team name in the Modify Folder Permissions section. This expands the team list and show all users within that team as well as their permission levels.
7. To set all of the files and folders under the current directory back to the default permission value, click Resent Folder.
8. To set all of the files and folders under the current directory, including all sub-folder files back to the default permission value, click Resent Folder.

Setting permissions in Windows

Alternatively, you can configure file and folder permissions in Windows. Please refer to the following links for further information:

"How to Share and Set Permissions for Folders and Files Using WindowsXP." by Microsoft TechNet. Accessed 2007-02-06.

"File and Folder Permissions (Windows 2000)." by Microsoft TechNet. Accessed 2007-02-06.

Disk quotas

Disk quota defines the maximum amount of hard disk space allowed for a user's files and email. The disk quota feature in Lotus Foundations Start helps administrators to set specific disk quotas for individual users.

For example, a user's disk quota value can be set to predetermined values such as small, medium, or large, to a specified value for that user, or you can choose not to have the user's disk usage subject to a quota.

Disk quotas pertain to a user's files and email data, which can each be configured separately. The ability to modify the quotas for files and email separately is unique to Lotus Foundations Start.

Setting default disk quota values

To set default disk quota values that can be used when assigning disks quotas to users:

1. Select Quota Setup from the menu on the left side of any WebConfig screen. The main Quota Options Setup screen is displayed.
2. Enter a Default Small Quota Value.
3. Enter a Default Medium Quota Value.
4. Enter a Default Large Quota Value. The maximum size that a Disk Quota value can be is 2 TB.
5. Click *Save Changes* to save the default quota values.

Setting individual user disk quotas

To define a user's disk quota:

1. Select User Setup from the menu on the left side of any WebConfig screen. The main User Setup screen is displayed.
2. Click on the appropriate user's edit action button. The Modify User screen is displayed. There are two separate sections for Quota Setup. Quota Value is for the user's files and Email Quota Value is for the user's emails.
3. In each field, select a quota value from the drop-down list for that user. Your options are:
    - Unlimited (no limit set for this user)

    - Small (uses the value from the Quota Setup page)
    - Medium (uses the value from the Quota Setup page)
    - Large (uses the value from the Quota Setup page)
    - Specified... (When selected, a text field opens that allows the user to specify the quota in MB.)
4. The value set within *Quota Setup* can be used for both files and emails. Therefore, if you have set a quota value of 100 MB, you can assign 100 MB for files and 100 MB for email. The maximum size that a Disk Quota value can be is 2 TB.
5. Click Save Changes to save the quota values for that user.

Quota limit

All Disk Quota limits on Lotus Foundations are enforced, or hard limits. This means that administrators can only define an absolute maximum and not a soft limit for warnings to users. When a user's quota limit is reached, the system prevents that user from using any more space on the hard disks by preventing them from creating new files, editing existing files, receiving emails, etc.

User accounts with a quota over the limit will:

- not be permitted to write anymore to the disk (until having cleared some space).
- be unable to login to WebMail.
- not receive any new email.

Administrators will:

- see a yellow warning light in the Quota section on the *System Status* screen and it will tell you that there are users over their quota.
- notice the user's Disk Space Used column on the *User Setup* screen says something similar to: "4.1 MB / 1.5 MB (274 %)".
- see a list user(s) over their quota on the *Quota Setup* screen.
- receive an Email Report when the server’s disks reach 90% full (another notice will not be sent unless the disk space drops below 85% usage and then rises again above 90%).

NT domain services

Configuring Lotus Foundations Domain Settings

The domain settings for Lotus Foundations are located in the *File* section in WebConfig.

The options for configuring domain settings are located in the *Windows File Server* section drop down box.

The four options listed provide you with the following:

- "Disabled" disables Windows file sharing and domain services in Lotus Foundations.
- "NT Domain Controller" configures the Lotus Foundations server as a domain controller.
- "NT Domain Member" configures the Lotus Foundations server as a domain member.
- "Active Directory Member" configures the Lotus Foundations server as a member of an Active Directory environment.
- "Stand Alone" enables Windows file sharing services in Lotus Foundations and disable the domain settings.

See the user manual chapter File Services for more information on:

- File services in "Stand Alone Mode"
- The *Permissions* section
- The *Active Connections* section

> **Important Note**
> Because different versions of Lotus Foundations can contain modifications to domain functionality, it is strongly recommended that the same version of Lotus Foundations be run on each server. Running different versions of Lotus Foundations can have adverse effects on features such as authentication and file sharing.

What is a domain controller?

A domain controller provides authentication services to the rest of the computers on the network. It stores user account and security information in a central database for one

domain. When a user logs on to a computer that is part of the domain, the domain controller authenticates the username and password against the information in the directory database.

Lotus Foundations can serve as a Windows domain controller for all the computers running Windows on the network. When this function is enabled, the Windows file server is set up as a domain controller and a domain name replaces the Windows workgroup.

The network domain name has nothing to do with the internet domain name. They do not interact and are independent of each other.

> **Important Note**
> Do not use the same internet domain name as your local network domain name.

Configuring the domain controller

To enable Lotus Foundations as a domain controller:

1. Select *File* under Server Setup from the menu on the left side of any WebConfig screen. The *File Server Setup* screen is displayed.
2. From the *Windows File Server* drop down box, select "NT Domain Controller".
3. Enter a name in the Windows Workgroup/Domain name field. This is the domain name once the domain controller is enabled. Avoid using the default name of Workgroup.
4. In the Domain Admin Team section, you can select any additional users to add to the domain_admins team. Members of this team have the exclusive ability to authenticate workstations to the Lotus Foundations domain.
5. Use the Roaming Profiles section to select whether or not you want to enable roaming profiles for Windows workstations.
6. In the section labeled WINS Support select whether or not the Lotus Foundations server responds to WINS requests by clicking Enable or Disable.
7. If you select Enabled for the option above, specify the WINS server on the network in WINS Server section. If you want that Lotus Foundations server to act as the WINS server, leave the text box as is. If you want to use another server on the network to act as the WINS server, enter the IP address of that server.
8. Click Save Changes.

You need to set each Windows workstation’s domain name to match this in order for Windows file and printer sharing to work properly.

What is a Windows NT domain member?

Lotus Foundations can become a member of a Windows NT domain, enabling Lotus Foundations to authenticate users using a pre-existing Windows NT domain controller rather than local passwords.

The Windows NT domain stores all user account and security information in a central database. When a user logs on to Lotus Foundations, the Windows NT domain authenticates the username and password against the information in the directory database. This means that you do not need to maintain a separate directory database for both Lotus Foundations and Windows systems; Lotus Foundations users can access their network files from both Windows and Lotus Foundations systems with the same username and password. All administration can be done with Windows NT.

Configuring the domain member

To enable Lotus Foundations as a domain member:

1. Select File under Server Setup from the menu on the left side of any WebConfig screen. The File Server Setup screen is displayed.
2. From the Windows File Server drop down box, select NT Domain Member. The Domain Member Enabled page is displayed.
3. Enter the domain name in the Windows Workgroup/Domain text box.
4. In the Domain Admin Username section, enter the username of a member of the domain_admins team on the Lotus Foundations domain controller. If you are authenticating to a Windows domain controller, enter a username belonging to the domain_admins group on the Windows server.
5. In the Domain Admin Password section, enter the corresponding password to the username you provided in the previous box.
6. In the section labeled WINS Support select whether or not the Lotus Foundations server responds to WINS requests by clicking "Enable" or "Disable".
7. If you select Enabled for the option above, specify the WINS server on the network in the WINS Server section. If you want that Lotus Foundations server to act as the WINS server, leave the text box as is. If you want to use another server on the network to act as the WINS server, enter the IP address of that server.
8. Click Save Changes.

Connecting the active directory member

To add the Lotus Foundations server as a member of an active directory environment:

1. Select File under Server Setup from the menu on the left side of any WebConfig screen. The File Server Setup screen is displayed.
2. From the Windows File Server drop down box, select NT Domain Member.

3. Enter the domain name in the Windows Workgroup/Domain text box.
4. In the Domain Admin Username section, enter the username of a member of the domain_admins team on the domain controller. If you are authenticating to a Windows domain controller, enter a username belonging to the domain_admins group on the Windows server.
5. In the Domain Admin Password section, enter the corresponding password to the username you provided in the previous box.
6. In the section labeled WINS Support select whether or not the Lotus Foundations server responds to WINS requests by clicking Enable or Disable.
7. If you select Enabled for the option above, specify the WINS server on the network in the WINS Server section. If you want that Lotus Foundations server to act as the WINS server, leave the text box as is. If you want to use another server on the network to act as the WINS server, enter the IP address of that server.
8. Click Save Changes.

Verifying server connectivity

Once you have selected and configured a mode in Lotus Foundations, you can verify the status on the main System Status page of WebConfig in the User Authentication Method section.

If you have set Windows File Server to Disabled you should see:

User Authentication Method:  Using normal password authentication. x of x user licenses available.

If you have set Windows File Server to NT Domain Controller you should see:

User Authentication Method:  Authenticating users for domain DOMAIN_NAME as a Windows NT domain controller. Using normal password authentication. x of x user licenses available.

If you have set Windows File Server to NT Domain Member you should see:

Windows Domain Membership:  Joined domain **DOMAIN_NAME** (**SERVER_NAME/IP_ADDRESS**)

User Authentication Method:  Using Windows domain DOMAIN_NAME via password server SERVER_NAME/IP_ADDRESS. x of x user licenses available.

If you have set Windows File Server to Stand Alone you should see:

User Authentication Method:  Using normal password authentication. x of x user licenses available.

Monitoring machine accounts

Machine account monitoring is available in NT Domain Controller mode and lists all machine trust accounts of the current domain.

Click the Machine Account link in the main File section in WebConfig.

The status of a machine trust accounts is displayed as one of the following:

Joining: The machine is in the process of joining the current domain.

Joined: The machine has already joined the domain, but no user is currently accessing the domain controller through that machine.

Active: One or more users are currently accessing the domain controller through that machine.

If you want to remove a machine account from the list, click X. This can be used to clean up the list or remove domain access for a workstation which will occur during the next login.

Importing domain users and groups

> **Important Note**
> Each account that is imported uses a license on the member server. If there are not enough licenses on the member server, you receive an error message indicating that your CAL limit has been exceeded and accounts might not work correctly.

From a member server, you can import domain groups and users from the domain controller. This helps you to selectively choose which accounts you want to import and ensures that authentication and other domain related features are consistent across the network.

The Import Users section can be used for importing accounts using the `pwdump2` utility or by manually entering the accounts syntactically. For more information, please read the section Import users from Windows in the user manual chapter User & team management.

To import domain users and groups:

1. Click User Setup in the WebConfig main menu.
2. Click Import Users.
3. From the Domain Controller Groups and Domain Controller Users fields, highlight the accounts that you want to import to the member server and click Import.

> **Important Note**
> The only user account that cannot be imported is *root*.

4. Click Save Changes. A page displaying the imported items, along with other information is displayed.
    - PWDUMP2 Generated Users - Indicates which accounts have been imported using the pwdump2 utility. The information provided includes the user name of the account, along with the Lanman hash and MD5 hash strings.
    - Syntactically Generated Users - Indicates user accounts that have been manually entered into the Import Users section. The information provided is the user name of the account, the password for the account (in plain text), the full name, and the quota and quota type, if one has been assigned.
    - Imported Domain Groups - Indicates which groups you have specified to import to the member server. The information provided will be the group name, the members of that group, and the quota and quota type, if one has been assigned. Group members who exist in the domain controller, but not in the domain member, will not show up in the Members field.
    - Imported Domain Users - Indicates which users you have specified to import to the member server. The information provided will be the user names, their passwords (in plain text), and the quota and quota type, if one has been assigned.
5. Once you have verified all of the imported accounts, click Save Changes.

Authentication status

Once a domain member server is connected to the domain controller and all of the desired accounts have been imported, you can verify the authentication status. In the User Setup section in WebConfig, a new column labeled Authenticate is displayed and indicate whether an account is local or remote.

If the status indicates local, the account only exists on the member server. If the status indicates remote, the account exists on both the member server and the domain controller.

> **Important Note**
> If the same user account exists on both servers, prior to domain connectivity, the accounts synchronize and automatically use the authentication on the domain controller.

File mounting/drive mapping

Once the domain controller is enabled, a user's files can be mounted directly onto any domain workstation upon login. The shared files of any team that the user belongs to can also be mounted.

For users:

1. Select User Setup from the menu on the left side of any WebConfig screen. Click on the edit action button for the appropriate user. The Modify User screen is displayed.
2. From the drop-down menu in the Automatically mount files as field, select the drive that the user's files should be mounted as on the workstation. The default drive is X.
    - Be sure to choose a drive that does not conflict with drives already in use.
3. Click Save Changes.

This can also be done when the user is created.

For teams:

1. Select User Setup from the menu on the left side of any WebConfig screen. Click on the edit action button for the appropriate user. The Modify Team screen is displayed.
2. From the drop-down menu in the Automatically mount files as field, select the drive that the team's shared files should be mounted as on the workstation. The default, None, is to not mount the files at all. This ensures that there is no conflict between use of drive space.
3. Click Save Changes.

This can also be done when the team is created.

Joining Windows systems to a domain

All Windows workstations need to authenticate to the domain once the domain controller is enabled. Authentication to the domain only works using a user account that belongs to the domain_admins team.

Once a Windows workstation has joined the domain, users can change their passwords using the standard Windows interface or from WebConfig.

Windows operating systems which are not officially supported for use with Lotus Foundations domain controllers are:

- Windows 95

- Windows 98
- Windows ME

For Windows NT:

1. In Windows, select Start > Settings > Control Panel. The Control Panel window is displayed.
2. Select Network from the list. The Network window is displayed. Click the Identification tab.
3. Click Change. The Identification Changes window is displayed.
4. In the Member of section of the window, select Domain. Enter the name of the domain as entered in the Windows workgroup name field on the File Server Setup WebConfig screen.
5. Check the box for Create a Computer Account in the Domain. Enter a domain_admins username, and the corresponding password.
6. Click OK. The Network window is displayed. Click OK again.
7. Reboot the workstation. The next time you log in to Windows, a drop down box is displayed. Select the domain name, for example, MAINOFFICE, and a user account and password belonging to that domain.

For Windows 2000:

1. In Windows, select Start > Settings > Control Panel. The Control Panel window is displayed.
2. Select System from the list. The System Properties window is displayed. Click the Network Identification tab.
3. Click Properties. The Identification Changes window is displayed.
4. In the Member of section of the window, select Domain. Enter the name of the domain as entered in the Windows workgroup name field on the File Server Setup WebConfig screen.
5. Click OK. The next time you log on, the login window has an additional Domain field.

For Windows XP Professional:

1. Install the registry patch:

   http://www.nitix.com/support/registry_patch/samba_xp_domain_member.reg For information on the latest features available in Samba as a domain controller, download this PDF: http://www.nitix.com/support/docs/csamba6.pdf

2. In Windows, select Start > Settings > Control Panel. The Control Panel window is displayed. On the left menu bar under Control Panel, select Classic View if you are currently in Category View.
3. Select System from the list. The System Properties window is displayed. Click the Computer Name tab.
4. Click Change.... The Computer Name Changes window is displayed.
5. In the Member of section of the window, select Domain. Enter the name of the domain as entered in the Windows workgroup name field on the File Server Setup WebConfig screen.
6. Click OK. The next time you log in to Windows, a drop down box is displayed. Select the domain name, for example, MAINOFFICE, and a user account and password belonging to that domain.

Logon scripts

Logon scripts are supported through DOS batch files found at `\\Servername\netlogon`. All scripts are called `USERNAME.bat`. These batch files call upon `_logon.bat`. If manual modifications are required, create a file called `_logon.bat`. All manual modifications should be made to `_logon.bat` as `USERNAME.bat` is automatically generated, and modifications will be lost.

To prevent conflicts, if you upgrade to Nitix version 3.75 or higher from a previous version, your `logon.bat` file is automatically renamed `_logon.bat` and a new file called `logon.bat` is created. The new `logon.bat` file links to your `_logon.bat` file.

Automated drive mapping

User folders and team folders can be automatically mounted through the selection of a drive mount in the User/Team setup. These drive mappings are done through the Logon scripts. Note that any drives previously mounted are not be automatically disconnected as Windows caches these drive connections.

Workstation administrative rights

Administrators can add users to the domain_admins team to give them workstation administrative rights to all computers running Windows on the network. Users have full control over workstation administration without giving them access to other server administrator functions.

To give users workstation administrative rights

1. Select User Setup from the menu on the left side of any WebConfig screen. The main User Setup screen is displayed.
2. Add any users to the domain_admins team that you want to grant access to workstation administrative features. See the user manual chapter User & Team Management for instructions on how to create a team.
3. The next time that user logs in to the domain, they have workstation administrative rights.

   When you import users from a Windows NT domain, those users are automatically added to the domain_admins team.

Email services

Configuring email services

The *Email Setup* section is divided into several tabbed sections that allow you to effectively manage all of the email services offered in Lotus Foundations Start.

The tabbed sections are as follows:

Summary tab

The *Summary* tab displays a list of services, indicates the status and provides additional comments where necessary.

The options displayed are:

- **POP3 Server**: A system that receives a user's email messages and stores them in the user's mailbox. When a user's email client checks for new mail, it communicates with the POP3 server, which ensures proper user authentication and delivery of email to the user's email client. POP3 is the most commonly used mail delivery protocol.
- - **SSL Server (POP3)**: This is the secure POP3 server. The Secure Sockets Layer (SSL) is a commonly-used protocol for managing the security of a message transmission on the Internet.
- **IMAP Server**: An advanced system that is similar to POP3. Because IMAP is relatively new, not all mail clients support it. IMAP offers superior user authentication and allows users to store their email on a server instead of downloading messages to a workstation (as is the case with POP3). This allows users to check their email from various workstations and lets them see a complete list of the emails kept in their folders.
- - **SSL Server (IMAP)**: This is the secure IMAP server. The Secure Sockets Layer (SSL) is a commonly-used protocol for managing the security of a message transmission on the Internet.
- **ExchangeIt! Server**: Allows Microsoft Outlook clients to share information through the server. This option also requires MySQL to be enabled.
- **SMTP Server**: A mail delivery system. When you send an email, the SMTP server takes this message from your email client and delivers the message to the recipient's POP3 server. If your ISP forces you to use a specific SMTP server, Lotus Foundations can deliver to that server rather than directly to the destination servers. This is known as a " smarthost".

- **Virus scan**: Scans all outgoing and incoming mail for viruses. If a virus is found, it is immediately removed from the email. A warning is then sent to the sender and all recipients along with the original (but virus-free) message. You must buy the Lotus Foundations AntiVirus license for Lotus Foundations for this feature to be enabled.
- **Spam scan**: Scans all incoming mail for possible spam. If spam is detected, it will categorize the email as either probable or definite spam, and allow you to choose what to do with the email, including marking it, moving it to a spam folder, or deleting it.
- **RBL**: Sets the level of RBL (real time blacklist) spam protection that the server will use. "No RBL" allows all mail into the system without doing any checks on the sources. "Medium RBL" blocks all mail originating from known spam sources. "Strong RBL" blocks mail from known spam sources as well as spam relay servers and dialup accounts.
- **Mail logging**: This option when enabled, will automatically make a copy of all incoming and outgoing mail into an archive. A ‘privacy warning’ (which cannot be edited) is appended to all incoming and outgoing email indicating that a copy of the email message has been saved by the server. The archive can be accessed through a shared folder in IMAP or through WebMail.
- **SMTP Authentication**: Allows remote users to send email through the Lotus Foundations server, preventing the need for the mail setting to be modified every time a user changes locations. Lotus Foundations user account information must be provided within the mail client settings for this feature to work.
- **Smarthosting**:
- **Attachment filter**: Allows Lotus Foundations to filter incoming emails that contain file attachments. The filtering can be done based on specified document extension types and specific users can be exempt from individual extension types.
- **Allowed relays**: IP addresses or domain names can be added to allow for email relaying from those specified locations.

Features handled by IBM Lotus Domino

The following features are administered in Lotus Foundations WebConfig, but are actually being handled by IBM Lotus Domino:

- SMTP
- POP3
- POP3/SSL Server
- IMAP
- IMAP/SSL Server

Servers tab

The *Servers* tab allows you to control the various mail features in Lotus Foundations. The options are as follows:

1. **SMTP (mail delivery) server**
    - *Enable* - Enables the SMTP server and allows any computer on the internal network or on the Internet to send email using the Lotus Foundations-powered server as a mail server. Messages from computers on the Internet are accepted only if their destination is the local domain hosted by your Lotus Foundations server. (This prevents your server and Internet bandwidth from being used to send unsolicited emails).
    - *Only Trusted Hosts* - Enables the SMTP server and allows internal users and users connected to the internal network through a VPN to send email using the Lotus Foundations-powered server as their mail server.
    - *Disable* - Disables the SMTP server completely.
2. **POP-3 (mail reader) server**
    - *Enable* - Enables the POP3 server and allows any computer on the internal network or on the Internet to access the POP3 mailbox. Select Yes only if you have users who will be accessing their email from outside of the office.
    - *Only Trusted Hosts* - enables the POP3 server and allows internal users to access the POP3 mailbox.
    - *Disable* - disables the POP3 server.
3. **POP-3/SSL (secure mail reader) server**
    - *Enable* - allows incoming secure POP-3 connections from anywhere. This means that your users could download their email from anywhere on the Internet.
    - *Only Trusted Hosts* - allows incoming secure POP-3 connections only from the local network, and not from the internet.
    - *Disable* - disables the secure POP-3 server.
4. **IMAP (advanced mail reader) server**
    - *Enable* - allows incoming IMAP connections from anywhere. This means that your users could read their email from anywhere on the Internet.
    - *Only Trusted Hosts* - allows incoming IMAP connections only from the local network, and not from the internet.
    - *Disable* - disables the IMAP server.
- **IMAP/SSL (secure advanced mail reader) server**
    - *Enable* - allows incoming secure IMAP connections from anywhere. This means that your users could read their email from anywhere on the Internet.
    - *Only Trusted Hosts* - allows incoming secure IMAP connections only from the local network, and not from the internet.
    - *Disable* - disables the secure IMAP server.
- **WebMail Server**

    - *Enable* - enables the WebMail server. Enabling the WebMail server automatically enables the IMAP and Web servers. If you disable IMAP or the Web servers, the WebMail server will not be functional.
    - *Disable* - disables the WebMail server completely.
- **ExchangeIt! Server**
    - *Enable* - enables the ExchangeIt! server. Enabling the ExchangeIt! server automatically enables the MySQL and Web servers. If you disable MySQL or the Web servers, the ExchangeIt! server will not be functional.
- *Disable* - disables the ExchangeIt! server completely.
- **LDAP directory server**
    - *Enable* - enables the LDAP server (which answers directory queries). The LDAP directory is automatically populated with the names and email addresses of all users configured on the Lotus Foundations-powered server.
    - *Disable* - disables the LDAP server completely.
- **Mail Domain**

  Allows you to change this field if you want email coming from the server to have a different domain.

- **SMTP Authentication**
    - *Enable* - allows the mail server to be used as an SMTP gateway for remote Lotus Foundations users.
    - *Disable* - disables the SMTP Authentication service.
- **Mail Domain**

  Enter the name of your Lotus Foundations mail domain (e.g. abc.com).

- In the field for ISP's SMTP Server enter the server name if your ISP forces you to use a specific SMTP server. This will make Lotus Foundations deliver to that server rather than directly to the destination servers. This is known as a “ smarthost”. You should leave this blank whenever possible.
- **Reject Unknown Users**
    - *Enable* - blocks incoming emails containing users that do not exist on the Lotus Foundations server.
    - *Disable* - disables the rejection of emails to known users.
- **Require TLS for Incoming Connections**
    - *Enable* - will allow inbound mail from a cryptic data transmission using the TLS protocol.
    - *Disable* - disables the inbound cryptic data transmission using the TLS protocol.
- **Require TLS for Outgoing Connections**
    - *Enable* - allows outbound mail using a cryptic data transmission via the TLS protocol.
    - *Disable* - disables outbound cryptic data transmission using the TLS protocol.
- **Number of Incoming SMTP Connections**

  Enter the number of incoming SMTP connections that you want to permitted at once.

- **Email Size Limit in MB**

Enter the number limit for the size of incoming email messages

- **Minutes Between Remote POP Mailbox Checks**

  Enter the number of minutes that the server will wait until it checks for remote POP email messages.

- **ISP's SMTP Server**

  If your ISP forces you to use a specific SMTP server, enter that server's name.

- **ISP's SMTP Port**

  Enter a number only in the event that the SMTP port for the ISP is not 25.

- **ISP's SMTP Username**

  Enter your ISP login username if required.

- **ISP's SMTP Password**

  Enter your ISP login password if required.

- Click *Save Changes*.

Filters tab

The Filters tab allows you to control the mail filter and mail logging features in Lotus Foundations. The options are as follows:

1. **Mail Virus Scanner**
   - *Inbound Only* - scans inbound email only.
   - *All Emails* - scans all inbound and outbound email.
   - *Disabled* - disables mail virus sccanning.
- **RBL (spam blocker)**
  - *Strong RBL* - blocks known spam servers and spam relay servers. Strong RBL blocks all spam mail, but may also block other mail. Senders receive a message if their mail is blocked.
  - *Medium RBL* - clocks known spam servers. Medium RBL blocks most spam mail.
  - *No RBL* - disables RBL spam protection.
- **Mail Spam Scanner**
  - *Enable* - enables email spam scanning. By clicking on "Enable" the box will expand to include the option to activate whitelists and blacklists as well as the the option to choose from the options in *Definite Spam Categories*.
  - *Disable* - disables email spam scanning.

If you see the "Enable" and "Disable" radio buttons but not the "Configure" link, the content layer scanner is activated but the network layer scanner is not. For more detailed information on using the spam scanning features in Lotus Foundations, refer to the user manual chapter Spam Scanner.

- **Attachment filter**
  - *Enable* - enables the attachment filter.
  - *Disable* - disables the attachment filter.

  The attachments file types that you want filtered as well as the users who you want excluded from filtering rules, can be defined in the *Attachment Extensions* section, under the *Advanced Filtering* tab.

- **Mail Logging**
  - *All local inboxes* - enables mail logging on all user account on the server.
  - *Selected users only* - enables mail logging on user accounts specified in the section *Users or teams selected for logging*. If this option is selected the *Filters* section will expand to include the list of users and teams on the Lotus Foundations server
  - *Disabled* - disables mail logging for all user accounts on the server.

  Enabling mail logging will automatically copy all incoming and outgoing mail. Each email that is sent/received will include a ‘privacy warning’ indicating that the email is being logged by the server into a mail archive. This warning cannot be edited.

  A maillog team is created and will appear under Team Setup. The archived mail can be accessed through WebMail or IMAP by adding users as members of the maillog team. For more information please see Chapter 7: User & Team Management.

- **Users or teams selected for logging**

  1. Highlight the users and teams you want to select for mail logging.
  2. Click *Add* >> to move the selected users and teams into the *Selected Users* box.

- Click *Save Changes*.

Addressing tab

The Addressing tab allows you to manage virtual mail domains, mailing lists and email aliases.

Available mail domains

This section lists the all of the domains hosted on the server and allows you to specify which users can use the domain for email purposes.

By default, all users on the server will have access to all of the domains. If no users are added, the server will assume that all users have access.

Should you want to modify user access to a specific domain, proceed with the following:

1. Click on the virtual domain action button.
2. In the *Modify Virtual Domain* box, highlight the users you want to add for this domain and click *Add* >>.
3. Click *Save Changes*.

Mailing list

The *Mailing List* section allows you to indicate which virtual domain on the server will respond to, with respect to team mailing lists.

A team mailing list is first created in the main *User Setup* section of WebConfig.

In the *Mailing List* section, you should see that team name with a *Responding Domain* which should be the main Lotus Foundations domain.

To allow this mailing list to use a specific virtual domain:

1. Click on the action button for the mailing list team.
2. In the *Modify Mailing List Domain* box, use the drop down section to select the virtual domain you want to use.
3. Click *Save Changes*.

Email DNS configuration

Although email services are functional after the administrator enables the appropriate mail servers, the mail delivery DNS records must be configured before users can send mail to and receive mail from outside of the internal network.

In the scenario that an email message is sent to `johndoe@example.com`, the message is downloaded to the SMTP server, which needs to know the IP address of `example.com` in order to deliver the message. The SMTP server consults the root DNS server on the Internet and through a series of queries is eventually pointed to the DNS server that stores the names and IP numbers of the hosts in `example.com`.

DNS Resolution

It is vital that your DNS server (which maintains information about your domain) is set up correctly. DNS resolution service can be provided by Lotus Foundations, or it can be provided by another DNS server maintained by you or by your ISP. If DNS resolution is provided by your ISP and you want Lotus Foundations to receive all emails for your domain, then make sure that you request the following from your ISP:

MX records for your domain should be pointed to your Lotus Foundations-powered server's public IP address (the address typically assigned to the eth1 interface).

If DNS resolution is provided by Lotus Foundations, make sure that the public IP address is registered with a proper domain name registrar as your domain DNS host.

> **Important Note**
> In order for your Lotus Foundations-powered server to function properly as a mail server for global email delivery, you must have a static IP address or use Dynamic DNS.

Configuring Lotus Foundations as a DNS server

To properly configure Lotus Foundations as a DNS server:

1. Click *Local* in the WebConfig main menu. The *Local Network Options* screen is displayed.
2. In the *Act as public DNS server* field, select "Yes".
3. Click *Save Changes*.

Email client configuration

Although there are many different email clients available, the configuration of most clients is very similar. The exact configuration of your email client depends on how you want your mail delivery to be configured. The two most common configurations are listed below. Configure your mail client according to the configuration that resembles your email setup.

General setup

If your mail is hosted on your ISP's mail server:

All users in your office have their own mail address and mailbox hosted on the ISP's server. Your ISP supplies you with the name of the POP3 or IMAP server where your mail has to be retrieved and with the address for the SMTP mail delivery server. Enter this address into the appropriate field during the configuration of your mail client.

Using your Lotus Foundations server as an SMTP server (even if your mail is hosted by an ISP) has its advantages, especially if you often send large messages or if you have a slow internet connection. Your email client may be tied up for minutes or even hours if you attempt to send a large email message to an ISP's SMTP server. If you use your Lotus Foundations server as an SMTP server, large files are quickly transferred over the high-speed LAN. Although a file is then slowly transferred over your internet connection, your email client is free to perform other tasks.

Enter the following information when configuring your email client:

- In the SMTP server field, enter the IP address or host name provided to you by your ISP. Alternatively, use your Lotus Foundations server as the SMTP server and enter the IP address or host name of your Lotus Foundations-powered server.
- In the POP3 or IMAP server field, enter the IP address or host name provided to you by your ISP.
- In the POP3 or IMAP mailbox name field, enter the first part of your email address. For example, if your email address is `johndoe@example.com`, enter `johndoe` into this field.
- In the POP3 or IMAP password field, enter the password provided to you by your ISP.

If your mail is hosted on your Lotus Foundations server:

Enter the following information when configuring your email client:

- In the SMTP server field, enter the internal IP (Eth0) address or host name of your Lotus Foundations server. You do not need to enter the domain name.
- In the POP3 or IMAP server field, enter the internal IP (Eth0) address or host name of your Lotus Foundations server.
- In the POP3 or IMAP mailbox name field, enter your Lotus Foundations username.
- In the POP3 or IMAP password field, enter your Lotus Foundations password.

LDAP setup

Lotus Foundations has a built-in Lightweight Directory Access Protocol (LDAP) server, which provides a directory of user names and email addresses. It is automatically populated with names and email addresses of all Lotus Foundations users. Most email clients support access to read-only LDAP servers.

Configuring LDAP in Microsoft Outlook

To configure your Outlook client to user the Lotus Foundations LDAP service:

1. Open Microsoft Outlook. From the main menu, select *Tools* > *Accounts*. The *Internet Accounts* screen is displayed.
2. Select *Add* > *Directory Service*. The *Internet Connection Wizard* will be displayed:
3. In the *Internet directory (LDAP) server* field, enter the name or IP address of your Lotus Foundations server.
4. Click *Next*.
5. Indicate whether or not you want your email client to check addresses using the LDAP directory. If this option is selected, you can enter partial email addresses when sending emails. Outlook will automatically find the closest match in the LDAP directory and enter the correct email address.
6. Click *Next*.
7. Click *Finish*. The *Internet Accounts* screen is displayed again.
8. Click *Properties*.
9. Select the *Advanced* tab. The *Advanced* screen is displayed.
10. In the *Search Base* field, enter the following, replacing **EXAMPLE.COM** with the Internet domain name hosted on the Lotus Foundations server.
    ○=**EXAMPLE.COM**
11. Click *OK*. The *Internet Accounts* screen will be displayed again. Click *Close*.

The LDAP server is now set-up, and users can search through the LDAP data directory for the names and email addresses of Lotus Foundations users.

Using Domino email

Domino Web Access

As soon as Lotus Foundations Start is installed, you can begin using Domino Web Access (DWA) to view and send email, as well as interact with other available Domino features. In a Web browser that supports 128 bit encryption, go to the following URL:

```
http://DOMAIN_NAME/email
```

You are asked to provide authentication. Enter a user account and password that has been created in Lotus Foundations Start. Once you are authenticated, the Domino Web Access screen is displayed.

For assistance with DWA, use the help feature provided.

Domino workstation clients

In addition to DWA, you can use Windows client software to interact with Lotus Foundations start mail services. For more information on installing IBM Lotus Notes and Domino Access for Microsoft Outlook (DAMO), please see the Lotus Foundations Start Getting Started Guide chapter Installing IBM Lotus Domino Clients.

Web services

Web server

The high-performance Web server featured in Lotus Foundations is based on the industry standard Apache Web server and it supports CGI scripts. Perl and PHP are also integral parts of the Web services of Lotus Foundations.

Lotus Foundations provides Web services on a Master Web Server and on Virtual Web Servers.

Master Web server

What is the master Web server?

The master Web server is designed to serve your intranet site and the personal web pages of your Lotus Foundations users. Although it is possible to make these sites available to outside users, you can choose to keep them private for security reasons.

Master Web services are provided from IP addresses assigned to the internal and external network interfaces of Lotus Foundations. If the Web server is enabled and access is granted to outside users, anyone accessing the Lotus Foundations server's internal or external IP address from a Web browser can access information on the master server.

Webmaster directory

A `webmaster` team is created and configured as the master Web server administrator. When the webmaster team is created, a shared network directory called `webmaster` is made available to all members of the webmaster team, and the subdirectory `WWW` is created in the webmaster network drive. This is the directory from which Intranet files are served. Any files saved in this directory are automatically accessible through the master Web site.

The `webmaster` directory also contains a `log` subdirectory, where server access and error logs are maintained, and a `cgi-bin` directory (where all CGI scripts are stored).

Configuring your master Web server

1. Select WWW from the main WebConfig menu. The WWW Setup screen is displayed.
2. Indicate whether or not you want to enable the Web server.
    - Selecting Enable enables the server and helps users on the internal network and users on the internet to access Web pages on this server. If enabled, the Web server serves pages out of the webmaster's WWW directory. In addition, Web server logs are written in the webmaster's directory.
    - Selecting Only Trusted Hosts enables the server and enables users on the internal network to access Web pages on this server. If enabled, the Web server serves pages out of the webmaster's WWW directory. In addition, Web server logs are written in the webmaster's directory.
    - Selecting Disable disables the server. No one can access Web pages on this server.
    - Selecting Dynamic Redirect enables the redirection of Web connections. Dynamic redirection can be employed to circumvent blocked HTTP (Web) ports. If this option is chosen, all Web requests directed at Lotus Foundations are handled by a Dynamic DNS server, which automatically redirects them to a different port on the Lotus Foundations-powered server. This is almost transparent for clients, who only notices that the hostname and port have changed slightly. For Dynamic Redirect to work, you must enable DynamicDNS (see Domain Name Services).
3. Indicate whether or not you want to enable the secure Web server.
    - Selecting Enable enables the secure Web server and enables users on the internal network and users on the Internet to access secure Web pages on this server. If enabled, the Web server serves pages out of the webmaster's WWW directory. In addition, Web server logs are written in the webmaster's directory.
    - Selecting Only Trusted Hosts enables the secure Web server and enables users on the internal network to access secure Web pages on this server. If enabled, the Web server serves pages out of the webmaster's WWW directory. In addition, Web server logs are written in the webmaster's directory.
    - Selecting Disable disables the secure Web server. No one can access secure Web pages on this server. Selecting Disable also means that you cannot access WebMail.
4. Indicate whether or not you want to enable the MySQL database server. MySQL is an advanced feature for users that are familiar with SQL (Structured Query Language). Refer to MySQL server (Lotus Foundations) for more information.
    - Selecting Enable enables the MySQL server and enambes users on the internal network to access personal databases and the databases of any teams that they belong to. WebMail uses the MySQL database server to store user preferences; as such, the server has to be turned on for WebMail to work.

    - Selecting Disable disables the MySQL server. Users do not have access to personal or team databases. This is the default setting.
    - User and team databases are automatically created when user and team accounts are set up. MySQL databases can be used to store dynamic Web page data for services such as on-line catalogues and stores.
5. Indicate whether or not you want to serve personal home pages from the WWW subdirectory, located in each user's personal network directory. You can choose to serve Web pages to users on your network or to the entire internet.
    - Select Enable to enable personal pages to be viewed from anywhere. For this to work, the master Web server also has to be enabled. The address for personal home pages is in the following format: http://server.domain/~username.
    - Select Only Trusted Hosts to enable personal pages to be viewed only from the local network, and not from the Internet. For this to work, the master Web server also has to be enabled.
    - Select Disable to disable personal Web pages.
6. Although the default webmaster team is created as the administrator of the master web server, any team can perform server maintenance tasks. If appropriate, select another team to maintain the server from the drop-down list.
7. Enter the email address of the webmaster (the person who is in charge of this website).
8. Enter the appropriate number in the Megabytes of WWW cache field. Refer to Web Caching (in this chapter) for more details.
9. Click Save Changes.

Virtual Web servers

Although virtual Web servers enable you to host a number of websites from the same server, these sites are displayed to outside users as though they are all hosted by different servers. To configure virtual Web servers on the outside interface, your ISP has to assign you multiple IP addresses or you have to use name-based virtual websites (which use names to distinguish between websites that share a single IP address).

Every virtual website has to be associated with a maintenance team (which can maintain only one virtual website). This means that for every virtual website that you create, you also have to create a team that maintains it. If this site is maintained by users on the local network, they can be made members of the maintenance team. If the site is maintained by outside users, they have to use FTP to access to the website directory. If they have an account on the server, they can use their own login name and password. If they do not have an account on the network, they have to use the team name and password.

Creating a new virtual Web server

1. Select WWW from the main WebConfig menu. The WWW Setup screen is displayed.
2. Click Virtual Domains.
3. Click Add Server. The New Virtual Domain screen is displayed.
4. Enter your internet domain name as the virtual domain's host name. This host name is used as a DNS entry for domain name resolution.
5. The name of your Lotus Foundations server automatically populates the IP Address of Virtual Web Server field. If you want to use a different IP address, enter it in this field.
    - Your ISP has to provide you with an extra IP address if you are configuring a virtual Web server on an outside, untrusted interface.
6. Select a team to perform webmaster duties from the drop-down list.
7. Choose whether or not to make the virtual Web site accessible only by trusted hosts. This way, you can easily host both an intranet and a public Web site from the same server.
8. Indicate whether or not you want to serve personal home pages from the WWW subdirectory, located in each user's personal network directory.
9. Click Save Changes.

Deleting a virtual Web server

1. Click Virtual Domains on the WWW Setup screen. The Virtual Domains screen is displayed, showing all existing virtual domains.
2. Click on the appropriate server's delete Action button.
3. Click OK to confirm the deletion in the window that displays.
    - All Web files for that server reside in the team's directory and are not deleted unless the team maintaining the site is deleted.

Editing a virtual Web server

1. Click Virtual Domains on the WWW Setup screen. The Virtual Domains screen is displayed, showing all existing virtual domains.
2. Click on the appropriate server's edit Action button. The Modify Virtual Domain screen is displayed.
3. Change the appropriate server settings.
4. Click Save Changes.

Hosting multiple Web sites

If your Lotus Foundations server is used as a Web hosting platform for a number of websites owned by various customers, you should use the following strategy. For example, if your Lotus Foundations server is used to serve a website for 'AcmeWidgets':

1. Create a team called AcmeWidgets.
2. Create a virtual Web server and choose the AcmeWidgets team as the Webmaster team. Anyone from AcmeWidgets can access these files using FTP.

Secure Web services

Secure Socket Layer (SSL) encryption

The Lotus Foundations Web server can serve secure Web pages, which are transmitted over the internet using Secure Socket Layer (SSL) encryption technology. All browsers on the market support SSL encryption. For SSL to work, the Web server must have a file with a security certificate. This file is unique to every Web server and, for encryption to properly work, the certificate has to be issued by a proper Certificate Authority. When the user loads a secure page, its certificate is compared to the certificate held by the Certificate Authority; if they match, the site is considered trusted, and encrypted communication can commence.

You can purchase SSL security certificates from a number of internet security companies like Entrust and VeriSign.

Lotus Foundations security certificates

The security certificates that Lotus Foundations generates can be checked for authenticity by all Web browsers. The security certificate generated by Lotus Foundations is placed in the `webmaster` directory and named `certificate.pem`.

A user loading the first secure Web page from the server is warned that this security certificate is valid, but that the company issuing it cannot be considered trusted. The user has to manually approve the continuation of the transaction. Despite this warning, information exchanged between the Web browser and the Web server cannot be viewed by others.

If you purchase a security certificate from a Certificate Authority, delete the file automatically created by Lotus Foundations and replace it with the one you purchased. See the *SSL Certificate* section in this chapter for more information. You might also want to store a copy of the purchased certificate in a different directory.

SSL certificate

Although a security certificate is automatically generated the first time you power-up your Lotus Foundations-powered server, you can overwrite this certificate at any time with a 3rd party certificate purchased from a Certificate Authority.

Important Note
You can only use X.509-based certificates.

Replace with 3rd party certificate

1. Select WWW from the main WebConfig menu. The WWW Setup screen is displayed.
2. Click SSL Certificate. The SSL Certificate screen is displayed.
3. Fill in your personal information in the Customize PKCS#10 Certificate Request box.
4. Click Generate Request. A Security Alert window is displayed. Click Yes to proceed.
5. The Notices box at the top of the screen shows that Lotus Foundations is generating a new certificate request based on the information you provided above, and a new certificate request is generated in the PKCS#10 Certificate Request box.
6. Copy and paste the new certificate request from the PKCS#10 Certificate Request box and give it to your Certificate Authority. They use this to generate a new certificate.
7. Once you have received the new certificate from your Certificate Authority, copy and paste it into the X.509 Certificate box.
8. Click Replace Certificate.

Web caching

To improve bandwidth, Lotus Foundations can temporarily store Web files accessed by internal users in a cache. If a user requests any of these stored files, Lotus Foundations serves them from the cache instead of from the original Web site. Internet bandwidth is used only to retrieve Web pages that have not previously been viewed, resulting in much faster access to the internet.

Configuring Web caching

1. Select WWW from the main WebConfig menu. The WWW Setup screen is displayed.
2. Enter the amount of data to be cached in the Megabytes of WWW cache field. Specify 5-10 MB for every active user on the internal network.
    - Once the cache is full, the oldest files are deleted to make space for new ones. Configuring the cache size to zero disables the Web cache server.
3. Click Save Changes.
4. For Web caching to run transparently, ensure that your Web browser is NOT configured to use a proxy server.

Web filtering

Web and content filtering

Lotus Foundations provides positive web filtering, which is a feature that allows the system administrator to permit access to specific Internet sites, while blocking access to all others.

Enabling the Web filter

1. Select *WWW* from the Server Setup menu on the left side of any WebConfig screen. The *WWW Setup* screen is displayed.
2. In the *Content filtering* field, select "Enable".
3. Click *Save Changes*.
4. Click *Configure*. The *Web Filtering* screen is displayed.

If you plan to use web filtering in conjunction with web caching, all proxy server settings must be removed.

Providing full internet access

To provide a specific workstation with access to all Internet sites:

1. Enter their host name or IP address in the *Workstations Exempt from Filtering* section of the screen.
2. Click on the check mark symbol to confirm the entry. The new entry will be displayed in the list of workstations with full access.

   To remove full access for a workstation, click on the *X* action button located next to the workstation name or IP address. The exemption list may take up to two minutes to refresh.

Port exemptions

When enabled, the Lotus Foundations content filter monitors port 80 and all others above 1023 (1024-65535). If an application uses a port between 1024 and 65535, that you need

to open, follow these steps in order to allow that application to bypass the content filter. Note that all other applications using this port will also be exempt from Web filtering.

1. Enter the port number you want to exempt in the "Ports Exempt From Filtering" section.
2. Click on check mark to add the entry.

Adding Permitted Websites

In order for users to access a specific website, the administrator has to add it to the *Permitted Web Sites* list. By default, the websites *lotus.com* and *ibm.com* are automatically added.

To add a Web site you want to permit all users access to:

1. Enter the site's name in the empty *Add New Website* field. To view the 'Permitted Web Site' list, click *Display Permitted Website List*.
2. Click the check mark button to accept the change. The Web site you entered should now be displayed in the *Permitted Web Sites* list.

- Wildcards can be used to enable all prefixes of a given domain. For example, to enable www.example.com, my.home.example.com, and office.example.com, type: `*.example.com`
- Wildcards can also be used in the place of any label (dot-separated block) within a domain name. To do this, replace any label of the domain with an asterisk. For example, in order to allow both example.com and example.org, type: `example.*`
- The two rules above cannot be used at the same time. For example, **.example.** will allow *www.example.com*, *office.example.org*, but not *my.home.example.org*.

Adding denied Web sites

To manually add a denied website, for the first time:

1. Go to the *Content Filtering* section labeled *Content Filtering Request Denials*.
2. Enter the website address in the *Add New Website* text box.
3. Enter the reason for denial. This section is optional.
4. Click the check mark action button to add the entry. Once this is done, the *Content Filtering Request Denials* box will display a link labeled *Display Denied Website List*. You can either click on this link to view the current list and add new entries or add new entries on the main.

Accepting access requests

If a user has requested access to a website that has not been authorized, a notice will display in their browser.

The user can request that this site be authorized by the administrator by clicking the *Request Access* button.

The administrator can view the all the pending requests in the main *Content Filtering* section of WebConfig by clicking the link *Display Pending List*.

To accept or deny requests:

1. Click *Display Pending List*.
2. A list containing the requested sites will appear. Choose to allow the site by clicking the check mark action button.

   Users should now be able to access the permitted web site.

Denying access requests

To deny a requested Web site:

1. Click *Display Pending List* as you would if you were going to accept a request. The list of pending requests is displayed.
2. If you want to immediately deny the request, click on the *X* action button. If you want to provide a reason, click the edit action button (...) and enter it into the text box labeled *Reason for Denial*. When you are done, click *Deny Request*.

List management

The *List Management* feature allows you to import and customize content filtering lists from other Lotus Foundations servers. You can also export and customize the local content filtering list to share with other Lotus Foundations servers.

Importing a list

To import a content filtering list you must first obtain an exported list from another Lotus Foundations server. Exporting lists is explained in the section immediately below. Once this is done, proceed with the following:

1. Click on *List Management* in main *Content Filtering* section. The List Management screen is displayed:
2. Choose whether or not you want the imported list to include the list of permitted websites. Click either the "Enable" or "Disable" radio button.
3. Choose whether or not you want the imported list to include the list of denied websites. Click either the "Enable" or "Disable" radio button.
4. Click on the *Browse* button in the *File To Import* section and locate the file you want to import. The file name and path should now be displayed.
5. Click *Import*.

Exporting a list

To export a content filtering list:

1. Choose whether or not you want the exported list to include the list of permitted Web sites. Click either the "Enable" or "Disable" radio button.
2. Choose whether or not you want the exported list to include the list of denied Web sites. Click either the "Enable" or "Disable" radio button.
3. Click *Export List*. A text file will be generated that you can save and use to port to another Lotus Foundations server.

Email reporting

The Lotus Foundations content filter can send instant email notifications every time a website has been requested, and email a daily report of all requested sites.

To use the email reporting options:

1. From the *Content Filtering* section, click *Report Options*. The Reporting screen is displayed.
2. Enter email address for the administrator in the "Administrator's Email Address" text box.
3. In the *Time of Day for Daily Report* field, choose the time of day that the daily report of pending content filtering requests is to be mailed to the administrator. 0:00 represents midnight.
4. To enable instant notification, set *Instant Notification* to "Enabled". This feature requires the internal SMTP server to be enabled.
5. To enable daily reports, set *Daily Reports* to "Enabled", and choose a time from the *Time of Day for Daily Report* drop-down menu. That this feature requires the internal SMTP server to be enabled.
6. Click *Save Changes*.

FTP services

FTP Server

Lotus Foundations uses a File Transfer Protocol (FTP) server that enables users and teams to access network and Web files. FTP services are automatically enabled for users on the internal network.

Anonymous FTP Server

The FTP server can be used in anonymous mode to enables uploads and downloads of files to a specific directory without authentication from the remote user. This anonymous mode of operation is commonly used for public file distribution on the internet. Although the file can be downloaded from your Web server, FTP is the preferred method because it offers superior performance for high volume and large file transfers.

When Anonymous FTP is enabled, Lotus Foundations automatically creates a team called FTP. Members of this team have access to the FTP directory. All files placed in this directory by team members are accessible to anyone on the internet. Similarly, when Anonymous Upload is enabled, anyone on the internet can upload their own files to the subdirectory in the FTP directory.

Enabling the FTP server

1. Click FTP in the main WebConfig menu. The FTP Server Setup screen is displayed.
2. Indicate whether or not you want to enable the FTP file server.
3. Indicate whether or not you want to enable anonymous FTP.
    - If this option is enabled, anyone can download files from the FTP directory by using anonymous as the FTP login name and their email address as the password.
4. Indicate whether or not you want to enable anonymous uploads.
    - If this option is enabled, anonymous users can upload files to the FTP directory. Be very careful with this option.
5. Enter the total number of connections at any one time.
    - This option is used to prevent the overuse of internet bandwidth. Leave the default setting but increase the number of anonymous users if the server is often busy.

6. Click Save Changes.

Enabling FTP access

1. Select User Setup from the main menu in WebConfig.
2. Click the appropriate user or team's edit Action button.
3. The Modify Users or Modify Teams screen is displayed.
4. Indicate whether or not you want this user or team to have FTP access in the Allow FTP access field.
5. Click Save Changes.
6. Repeat steps 2-5 for any additional users or teams.

User vs. team FTP access

Users can log into the Lotus Foundations FTP server by entering their assigned username and password to access their own user directory.

To access the directory of any team of which they are a member, users need to use the team name in place of their usernames, but they can continue to use their individual passwords rather than a team password.

Backup & restore

Intelligent disk backup (idb)

Lotus Foundations takes a different approach to backup with idb technology, which is both cheaper and easier to use than conventional tape backup systems. The capacity of the idb backup unit varies.

Although the idb system automatically performs backup procedures without input from a system administrator, you can turn off idb and manually initiate backup procedures. Refer to *Initiating an idb Backup* (in this chapter) for more information.

Features of idb

Instead of conventional backup tapes, idb uses a removable high-capacity hard disk, which provides the following advantages:

- **Value** - one hard disk costs less than the five backup tapes needed to maintain a tape backup system.
- **High Capacity** - the idb backup cartridge can, in most cases, store a month or more of backup history.
- **Speed** - idb backup matches and often supersedes the backup speeds achieved by the most expensive tape systems on the market.
- **Instant Access** - regular backup tapes, like cassette tapes, are a linear medium, meaning that you have to fast-forward or rewind to find information. idb technology, like a compact disc, provides almost instant access to data.
- **Backup Intelligence** - you do not need a network administrator to figure out which tapes need to be loaded and when. NetIntelligence determines when a backup needs to be made, and whether the backup should be full or incremental. This decision is based on the amount of data on the main hard disk, the amount of utilized space on the idb system, the compressibility of your data, and the rate at which new data is added and current data is changed or updated. As a result, your idb system maximizes the amount of historical data that is backed up.
- **Durability** - you can backup data on the hard drive continuously without worrying that the drive will wear out.
- **Continuous Backup** - you can backup data in any sequence and as often as every 15 minutes.
- **Hot Swap** - the ability to add and remove idb backup cartridges while the server is running. This means that you can swap idb disks without turning the server off. Hot Swap capability is only supported on SCSI and specific IDE system configurations.

Configuring idb

General configuration

The idb feature of Lotus Foundations automatically backs up your data throughout the entire day, takes care of all backup tasks for you, and notifies you via email about its progress. Although most of the idb process is automated, you can adjust several parameters that determine how and when your backups are completed.

1. Select *Backup* from the Server Setup menu found on the left side of any WebConfig screen.
2. Indicate whether or not you want to enable backup compression. As a general rule, compressed backup runs half as fast as a non-compressed backup but stores twice as much data.
    - If you select "Enable", your backup is slower but takes up less space on the idb disk.
    - If you select "Disable", your backup is faster but uses more space on the idb disk.
3. Select the Backup Schedule that is better for your setup:
    - Optimized for File Backups: With this option, regular backups are run once an hour with the day beginning at 2300 and Domino backups will be run once a day with the day beginning at 0300. This results in more file backups, and without the extra space required by the Domino backup in each.
    - Optimized for Domino Backups: With this option, regular backups and Domino backups are run once an hour with the day beginning at 0100. This enables a finer history for Domino backups.
    - Custom: With this option you are free to customize the backup frequency as follows.
        - Select how often you want the system to perform a backup from the drop-down list.
        - Select when you want the system to perform a final back-up from the drop-down list. It is recommended that you select a time when nobody is using the system such as late at night or early in the morning.
        - Select how often you want the system to perform a Domino backup from the drop-down list.
        - Select when you want the system to perform a Domino backup from the drop-down list.
4. Enter the name of the administrator to whom backup reports should be emailed. If you have the SMTP server enabled, you can enter any email address in this field.
5. Choose how much information to put in the backup reports with the Email Log Level drop-down menu. Your options are: Error, Warning and Information.
    - Normally, backup reports only include error messages, but you can also choose to include warnings or non-critical information. All messages are available from the system logs whether they are included in the backup reports or not.

6. Click Save Changes to save your selections. The idb system automatically performs the backup procedure.

> **Important Note**
> The default backup configuration does not include the Lotus Foundations Start *notes* team . Because this team's data is constantly in use, it is automatically copied over to the *notesbackup* team where it is safely backed up by idb. It is not recommended that you enable the backup for *notes* team as this needlessly increases the time needed to perform backups.

The idb backup team

The `backup` team account grants all members of the team access to the *Backup* page in WebConfig and all associated functions. Users have full control over backups and restores without giving them access to other administrator functions.

1. Select *User Setup* from the menu on the left side of any WebConfig screen. The main *User Setup* screen is displayed.
2. A team named `backup` is created automatically.
3. Add any users to the `backup` team that you want to grant access to the *Backup* configuration screens in WebConfig.

idb backup

Initiating an idb backup

Although the idb system automatically performs backup procedures (without input from a system administrator), you can turn off idb and manually initiate a backup from the *Backup Files* page (located under the Server Setup menu). A procedure initiated from the Backup Files page enables you to configure certain settings on the main *Backup Setup* screen. To change the settings, you have to go to the main *Backup Setup* screen.

This can also be done from the control panel found on the front of Net Integrator servers. A backup initiated from the control panel begins a procedure with the settings that were last configured.

> **Important Note**
> A copy of the server configuration is made each time a backup is performed. This configuration file can be used to restore your settings in the event of a catastrophic system failure.

Initiating a backup from the WebConfig menu

1. Select *Backup* from the Server Setup menu found on the left side of any WebConfig screen. The main *Backup Setup* screen is displayed.
2. In the *Backup Setup* section of the screen, enter the appropriate backup parameters. Refer to *Configuring idb* for more information on these fields.
3. Click *Save Changes*.
4. Click *Backup Files*. A screen that displays all of the directories that can be backed up is displayed.
5. Indicate which directories you want to backup by selecting Yes for those directories.
6. Click *Save Changes*. This does not initiate the backup procedure.
7. Click *Perform Backup* to initiate the backup procedure. When the backup is finished, Lotus Foundations automatically emails a backup report to the administrator.

Initiating a backup from a Net Integrator control panel

This can only be done with Net Integrator Mark I and Mark II servers. All other hardware platforms must initiate a backup from the system's WebConfig menu.

1. Press the Backup button on the front display panel.
2. The display panel shows a 10-second countdown, during which you can stop the backup process by pressing the Cancel button.
3. After 10 seconds, the backup procedure commences and the display panel/console shows a progress bar.
4. You can delay backup for up to 24 hours by pressing the Up and Down arrows during the countdown.

idb restore

There are three restore scenarios:

1. Complete System Restore - Upon total hard disk failure, perform a complete system restore to restore your system to the state of your most recent backup. After a complete system restore, all existing files are overwritten with older copies from the backup disk. However, new files saved to the hard drive after the backup are left untouched. A complete system restore should generally be initiated only when recovering from complete hard disk failure.
2. Specific Directory Restore - It is possible to restore a specific user or team network directory if these files have been lost or mistakenly deleted. A specific directory restore can only be initiated from the Backup menu. There are two types of specific directory restore procedures:
   - Normal Restore - The contents of a user or team directory get overwritten, as with a complete system restore.

    - Safe Mode Restore - The contents of a user or team directory get restored into a new subdirectory called Restore, which is created in the user or team directory. Users can browse through the contents of the directory from the disk, copy any needed files, and then delete the *Restore* sub-directory.
- Specific File Restore - It is possible to restore a specific user's or team's network files if they have been lost or mistakenly deleted. A specific file restore can only be initiated from the Backup menu. There are two types of specific directory restore procedures:
    - Normal Restore - The file is overwritten, as with a complete system restore.
    - Safe Mode Restore - The file is restored into a new subdirectory called *Restore*, which is created in the user or team directory. Users can browse through the files from the disk, copy any needed files, and then delete the Restore sub-directory.
    - Configuring Restore - Restores system configuration.

idb restore options

In the *Restore Files* section, there are a number of action buttons which enable you to control the way your backups and restored data are handled. The action buttons on the right side provide you with the ability to mange individual backups.


The *Open Backup* button enables you to browse the contents of a specific backup.


The *Erase Backup* button enables you to forcibly delete any backup (and its children, if any) that is not locked.


The *Re-Verify Backup* button enables you to manually verify an individual backup.


The *Lock Backup* button enables the user to lock an individual backup. A locked backup cannot be deleted and idb will not expire it.


The *Unlock Backup* button enables the user to unlock an individual backup. If you have a backup that is autolocked because it has a child which is also locked, you must first unlock the child backup.

Locking and unlocking backups

A feature of the idb technology in Lotus Foundations is the ability to lock and unlock individual backups. This enables an administrator to enforce which backups will and will not expire on the idb disk. Backups might also be automatically locked due to the system's autonomics. Locking occurs in the following cases:


An individual backup has been manually locked by the administrator for preservation.


A series of backups have been automatically locked as they are parental backups belonging to an incremental backup which has been manually locked.


A backup which is currently in use is locked automatically for a period of 15 minutes after the task has finished. This occurs during a backup or a restore procedure.

Initiating an idb restore

Initiating a full system restore from the WebConfig menu

A copy of your server configuration is made each time a backup is performed. This configuration file can be used to restore your entire Lotus Foundations server in the event of a catastrophic system failure.

To restore the entire Lotus Foundations system including the server configurations and all of the user data:

1. Select *Backup* from the Server Setup menu found on the left side of any WebConfig screen.
2. Click *Restore Files*, which displays a list of backups and the date that the backup was performed.
3. Click the Yes radio button for only the *Select All* section.
4. Click *Perform Restore* to begin the restore procedure.

Initiating a directory restore from the WebConfig menu

1. Select *Backup* from the Server Setup menu found on the left side of any WebConfig screen.
2. Click *Restore Files*, which displays a list of backups and the date that the backup was performed.
3. To view the contents of a backup file, click the *Open Backup* action button.

> **Important Note**
> The first entry in the *Restore Files* section of the screen is for System Configuration, which is automatically backed up every time any backup is performed. Restoring system configuration files overwrite the current system configuration, so be very careful with this setting. It is recommended that you leave the default setting (No).

4. Indicate which directories you want included in the restore procedure:
   - Select Yes if you want the directory restored in normal mode which overwrites the existing contents of the directories.
   - Select No if you do not want this directory restored.
   - Select Safe if you want the directory restored in safe mode. This restores files to a *Restore* directory. Selecting all directories is the equivalent of performing a full system restore.

- Click *Perform Restore* to begin the restore procedure.

Initiating a file restore from the WebConfig menu

1. Select *Backup* from the Server Setup menu in WebConfig.
2. Click *Restore Files*, which displays a list of backups and the date that the backup was performed.
3. To view the contents of a backup file, click the *Open Backup* action button. The following screen displays the date and time the backup was performed and the directories that can be restored.

> **Important Note**
> The first entry in the *Restore Files* section of the screen is for System Configuration, which is automatically backed up every time any backup is performed. Restoring system configuration files overwrites the current system configuration, so be very careful with this setting. It is recommended that you leave the default setting (No).

4. Select the appropriate directory in which the data that you want to restore is located and click the *Open Backup* action button.
5. Indicate which file(s) you want included in the restore procedure.
   - Select "Yes" if you want this file or folder restored in normal mode. The existing data will be overwritten.
   - Select "No" if you do not want this file or folder restored.
   - Select "Safe" if you want the files and folders restored in safe mode. The data is saved in the *Restore* file in each respective user's share. Selecting all files is the equivalent of performing a full directory restore.
6. Click *Perform Restore* to begin the restore procedure.

Initiating a restore from a Net Integrator control panel

This can only be done with Net Integrator Mark I and Mark II servers. All other hardware platforms must initiate a restore from the system’s WebConfig menu.

> **Important Note**
> Initiate a restore procedure from the control panel only if you want to perform a complete system restore.

Press the *Restore* button. The display panel shows a 10-second countdown, during which time you can stop the restore process by pressing the *Cancel* button. After 10 seconds, the restore procedure commences and the display panel/console shows a progress bar.

Domino restore procedures

Restoring idb data from Domino differs somewhat from the standard idb restore process. Follow the instructions carefully to ensure a successful restoration of your Domino data.

When restoring Domino data, you can choose from data that is automatically saved to the live *notesbackup* folder, or from the *notesbackup* folder from an idb backup.

The following sections discuss each scenario.

Restoring data from idb

1. In WebConfig, click *Virtual Server*, located in the main menu.
2. Click on the edit button for the *domino* server.
3. In the *Modify A Process* section, select the "Disable" radio button, then click *Save Changes*.
4. In the WebConfig main menu, click *Backup*, then *Restore Files*.
5. Open *notesbackup* > *Files* > *notesdata*, and you should see a directory labelled *backup*.
6. Select the "Safe" radio button for the *backup* directory, then click *Perform Restore*. The restore time varies, depending on the amount of data that is contained the the folder.
7. From a Windows workstation, click *Start* > *Run* and in the text box, type: `\\SERVER_IP\notesbackup\RESTORE\Files\notesdata`
8. Copy the *backup* folder, then go to the following locations: `\\SERVER_IP\notes`
9. Paste the *backup* folder in this location.
10. In the *notes* directory, delete the folder labelled *notesdata*.
11. Rename the *backup* folder to *notesdata*.
12. Go back to WebConfig and re-enable the Domino virtual server and save the changes.

Restoring live backup data

1. In WebConfig, click *Virtual Server*, located in the main menu.

2. Click on the edit button for the domino server.
3. In the *Modify A Process* section, select the "Disable" radio button then click *Save Changes*.
4. From a Windows workstation, click *Start*, *Run* and in the text box, type:
   `\\SERVER_IP\notesbackup`

5. Click on the *notesdata* folder and you should see a folder labelled *backup*.
6. Copy the *backup* folder, then go to the following locations:
   `\\SERVER_IP\notes`
7. Paste the *backup* folder in this location.
8. In the *notes* directory, delete the folder labelled *notesdata*.
9. Rename the *backup* folder to *notesdata*.
10. Go back to WebConfig and re-enable the Domino virtual server and save the changes.

Individual Domino data

If you want to restore Domino data for an individual user, please read the KB article Restoring an individual user's Domino data in the Lotus Foundations knowledgebase.

Modifying ownerships after a restoration

If you are restoring Domino data such as individual .nsf files or entire folders, such as *mail* or *RELAVIS*, you may notice that although the files are copied over, they cannot be read. This is typically the result of permissions being modified when the data is copied over from one location to another.

Should you encounter this, the permissions can be modified using the following procedure:

1. Telnet into the Lotus Foundations server and log in as an administrative user.
2. Move to the location where the folder or individual file has been restored. For example, if you have restored the Relavis folder, type:
   `cd /home/notes/Files/notesdata`

   If you are restoring and individual .nsf file, and have already moved it to the live location, type:

   `cd /home/notes/Files/notesdata/mail`
3. To verify that the ownership has been modified and needs to be changed, type:
   `ls -al`

4. The following example uses Relavis CRM as an example. If you have renamed the existing *RELAVIS* folder to *RELAVIS_old* and have moved over a backup copy of *RELAVIS*, you should see the following files listed:
```
-rw-r--r-- 1 notes notes 21495808 Apr 9 05:00 NaSsInstall.nsf
-rw-r--r-- 1 notes notes 838656 Apr 9 05:00 NitixDWA.nsf
drwxrws--x 2 _root otheruser 896 Apr 9 15:58 RELAVIS/
drwxrwx--- 2 notes notes 896 Apr 9 14:49 RELAVIS_old/
-rw-r--r-- 1 notes notes 1266688 Apr 9 05:05 activity.ntf
-rw-rw-r-- 1 notes notes 2359296 Apr 9 17:13 admin4.nsf
-rw-r--r-- 1 notes notes 1921536 Apr 9 05:00 admin4.ntf
-rw-rw-r-- 1 notes notes 648 Apr 9 17:09 admindata.xml
```
   Note that the ownership for the copied folder has been modified.

5. If you are restoring an individual file, type:
```
chown notes:notes filename
```
   If you are restoring an entire folder, type:
```
chown -R notes:notes directory_name
```
6. Open the client used to interact with your Domino data, such as Lotus Notes, and make sure you can view all of your data.

idb hot swap

Hot swap is only supported on SCSI and specific IDE system configurations. The Net Integrator Mark I and Mark II models support hot swap.

There are four possible hot swap messages that can appear on the display console:

- **idb HotSwap:OK** - This messages means that hot swap is supported and the idb disk is inactive, so it can be safely removed and replaced with another idb drive.
- **DON'T REMOVE IDB** - This message means that hot swap is supported, but the disk is currently being used for a Backup/Restore. You must wait until you see the "idb HotSwap:OK" message again before removing the disk.
- **NO BACKUP DISK!** - This message means that Lotus Foundations does not detect the presence of an idb disk. You should insert an idb disk and then choose the *Update Disk Status* link on the main page of WebConfig. The "No Backup Disk" message will also display if the server is set up with all RAID disks and no idb disk(s).
- **CAN'T HOTSWAP** - This message means that hot swap is not supported on your server; therefore, you should never remove the idb disk without powering down the system. If you want hot swap support, please contact your Net Integration Technologies representative.

The idb software leaves the idb disk off until it needs to perform a backup or a restore. During this time, if you remove an idb disk from the Lotus Foundations server, the display panel continues to show "idb HotSwap:OK" until one of these events occurs:

- You manually start a backup/restore,
- You click the *Update Disk Status* link in WebConfig, or
- The next scheduled backup begins.

After which, Lotus Foundations detects that there is no idb disk installed and change the display console message to "No Backup Disk!".

Swapping idb hard disks (with hot swap)

1. Verify that the display console says, “idb HotSwap:OK.” idb hot swapping is only available on certain hardware platforms.
2. Remove the idb disk from the server.
3. Insert the new idb disk into the drive.

Lotus Foundations detects the new idb disk during either its next scheduled backup, or if you log in to WebConfig and click the *Update Disk Status* link.

Swapping idb hard disks (without hot swap)

1. Turn off the main power.
2. Remove the disk from the server.
3. Slide the new hard disk into the drive as far as you can, keeping the handle horizontal.
4. Insert the new idb disk into the drive.
5. Turn the main power back on.
6. Press the power button.

Software update

Software Updates

Periodically, Lotus Foundations contacts distribution servers through its internet connection and requests an updated list of available software releases. A list of available software releases is found on the *Software Update* screen.

Upgrading Lotus Foundations

> **Important Note**
> If you are running Lotus Foundations from a CD-ROM, you must configure your disks from the WebConfig menu, shut down the system, remove the Lotus Foundations CD and restart the system before SoftUpdate can work. For more information on configuring your hard disks, see Disk management (Lotus Foundations).

It is best to upgrade your software after-hours because rebooting disconnects all users and causes all services to stop functioning until the server has restarted.

1. Select Software Update from the menu on the left side of any WebConfig screen. The *Software Update* screen is displayed, showing the Lotus Foundations software version your server is currently running and all versions available for download.
2. Click *Check Versions* to update the list of available versions.
3. The *System Status* screen is displayed. The SoftUpdate line displays the progress of the download.
4. Click on a version's Release Notes link to access its release notes.
    - The release notes outline the version's new features and provide important information that you need to know before upgrading your software. Please read the release notes carefully.
5. The new software has to be downloaded to your server. To do so, click on the appropriate version's *Download* link. The *System Status* screen is displayed. The SoftUpdate line displays the progress of the download.
6. When the download is complete, the SoftUpdate line tells you that a software update has been installed, and prompt you to reboot your system.
7. Click the *Reboot* link.
8. Click *Return* when an IP address appears on your Lotus Foundations server's display console. The *System Status* screen is displayed. The SoftUpdate line asks if you want to keep the new software release:
    - Selecting "Yes" permanently installs the new operating system.
    - Selecting "No" reboots your Lotus Foundations-powered server and reverts to the previous operating system.

9. If the newer version of the Lotus Foundations operating system is not installed properly, the server uses the old version when it reboots. If the server encounters any difficulty starting the new operating system, the previous version starts instead. If you choose not to confirm your download, and a power loss or reboot occurs, the server reverts back to the last-used operating system.
10. To revert back to the old version, select *Software Update* from the WebConfig menu. Click the *Activate* link in the *Versions already installed* section of the screen:

Switching languages from English to Japanese

Lotus Foundations currently enables you to view WebConfig in English and Japanese (Kanji). To switch from English to Japanese, perform the following steps:

1. In the *Software Update* section, locate the section titled "Language Selection".
2. Using the drop down box, select the Japanese icon as shown below.
3. Click the checkmark to confirm the change.

Switching languages from Japanese to English

If you have changed the language setting to Japanese and need to set it back to English, perform the following steps:

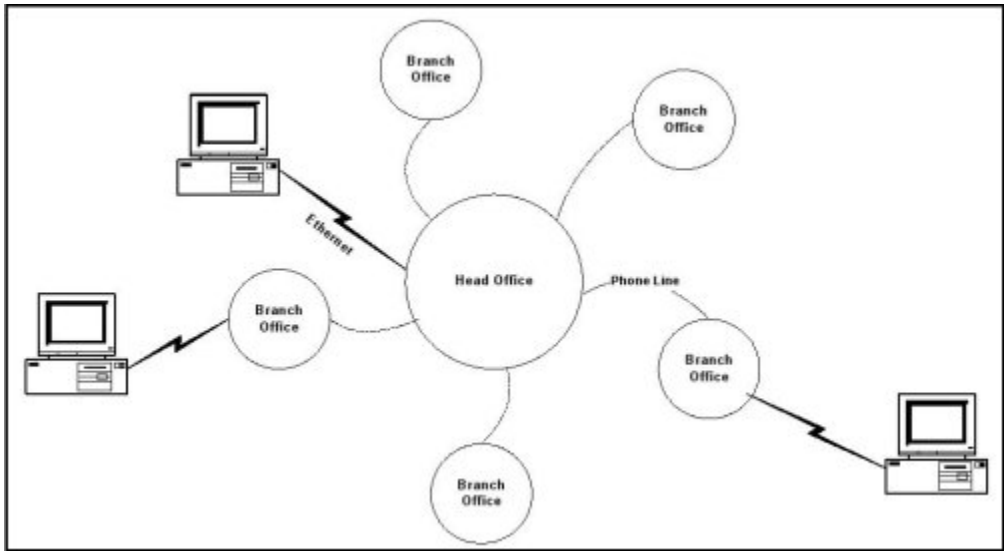
1. In the *Sofware Update* section, locate the option that resembles the following:

2. Select "English" from the drop down box.
3. Click the checkmark and WebConfig should now be displayed in English.

Virtual private networks

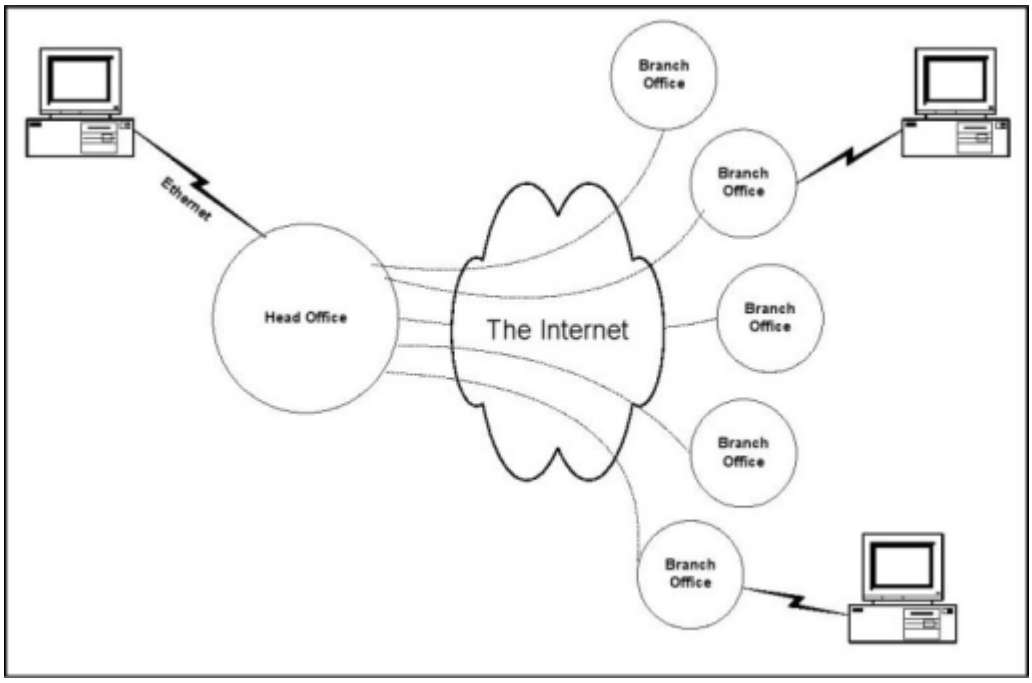
Private networks

In the past, private networks were created by using routers to connect different office locations through dedicated phone lines. This procedure is often called a wide area network (WAN). Conventional private networks can be illustrated like this:



Virtual private networks

TunnelVision enables you to create a virtual private network (VPN) using the internet instead of a WAN and dedicated phone lines for server-to-server or network-to-network connections. A VPN can be illustrated this way:



Making a virtual network private

In a conventional private network, your company owns all the routers, all the computers, and all the phone lines involved. Because the only people using the network are employees, the network is secure, at least in theory.

The internet, on the other hand, is connected to any number of businesses and organizations. As your private data passes through the internet, it is possible that people may intercept what you are sending. In order to prevent this from happening, all of the data that passes through a VPN is encrypted with the strongest encryption technology available: 1024-bit RSA and 128-bit Blowfish algorithms. Such encryption makes it very difficult to access the data in your transmissions.

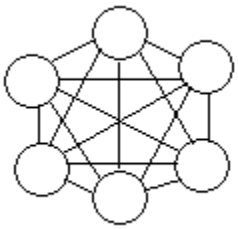
VPN network topologies

Topology refers to the shape of a network, or the network's layout. How different nodes in a network are connected to each other and how they communicate are determined by the network's topology. A VPN enables organizations to interconnect their offices securely. Applications and data can be readily shared throughout the VPN network if desired. For example, you could have the accounts departments of each branch connected to each other or each department could be connected to a central point.

TunnelVision can work in either a “fully meshed” topology or a “non-meshed” topology.

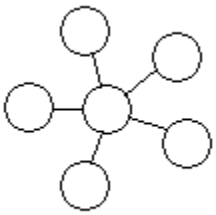
Fully meshed topology

In a mesh topology, devices are connected with many redundant interconnections between network nodes. In a true mesh topology every node has a connection to every other node in the network. An advantage of such a network would be that no branch is reliant upon a single connection.



Non-Meshed Topology

In a non-meshed, or “hub-and-spoke,” topology all devices are connected to a central hub, or headquarters, which dictates the access rules of the VPN to the other branches. Nodes communicate across the network by passing data through the hub. A typical application would be to implement a Terminal Services solution using the headquarters as the gateway for the branch sites.



How TunnelVision works

A VPN enables all of the computers on two networks to communicate with each other. For this to happen, you have to first configure their subnet addresses.

When you install Lotus Foundations, the IP addresses used on your local network do not really matter. Internet standards recommend that all IP addresses that are owned by internal business networks (and not used on the internet itself) begin with 192.168. The third part of the IP address specifies which private subnet number you are using, and the fourth part identifies an individual computer on the network. In special circumstances, however, you can use any subnet number at all (the first three parts of the IP address).

The important thing is that the Lotus Foundations server and the computers on the local network have the same subnet number and unique IP addresses.

Network address translation (NAT)

When you communicate with other computers on the internet, Lotus Foundations uses network address translation (NAT) to give each connection a valid, unique IP address that does not conflict with other networks.

But for a VPN, we do not want Lotus Foundations to use NAT, because then only two addresses will be visible: Lotus Foundations server #1 and Lotus Foundations server #2. Instead, Lotus Foundations should pass addresses on each network through to the other network unchanged.

For this to happen. you need to assign different subnet numbers to each Ethernet network involved in the VPN. For example, use 192.168.1 for Network #1 and 192.168.2 for Network #2. That means each computer on Network #1 has an address starting with 192.168.1, and each computer on Network #2 has an address starting with 192.168.2.

The steel pipe

To summarize, Network #1 is connected to the internet through Lotus Foundations server #1 and has the subnet number 192.168.1. Network #2 is connected to the internet through Lotus Foundations server #2 and has the subnet number 192.168.2.

Gateway settings work like this: a computer on your Ethernet send packets directly to another computer if its subnet number is the same. That means that 192.168.1.15 will transmit directly to 192.168.1.46, since they are both on the same subnet. However, 192.168.1.15 cannot send packets directly to 192.168.2.20 - the subnet numbers are similar, but they are not the same. The station then sends the data through its default gateway: Lotus Foundations server #1.

Now TunnelVision can work its magic, as long as you have configured the Lotus Foundations servers to create a VPN (you will do that later in this chapter). When TunnelVision starts, it creates an encrypted connection between the two Lotus Foundations-powered servers through the Internet. This connection is sometimes called a steel pipe because, like a true steel pipe, it is hard to see what is inside or to break through it. More often it is known as a tunnel.

Lotus Foundations server #1 treats data addressed to Network #2 from its local Ethernet in a special way. Rather than just passing the data to your ISP, Lotus Foundations encrypts it and sends it through the tunnel. When Lotus Foundations server #2 receives the encrypted data, it decrypts the information and forwards it on to Network #2 as if it had arrived directly

from Network #1. That way, Network #1 can communicate securely with Network #2 without any need for special changes to individual workstations.

Creating a VPN (server-to-server)

Because your Lotus Foundations-powered server does most of the work for you, creating a VPN is much easier than it sounds. All you have to do is create the encrypted tunnel.

Using unique subnet numbers

We have already mentioned it once in this chapter, but it is so important that we will say it again: each Ethernet network in your VPN must use a different subnet number. We recommend using any of the networks from 192.168.1 to 192.168.255, since these numbers are specifically reserved for private use.

The master server needs an IP address or FQDN

The only way to find someone on the internet is to know their IP address. This can be accomplished with either a static IP address (a static IP address is guaranteed never to change, so people on the Internet can always find you), or through the use of a fully qualified domain name (FQDN) such as server.domain.com. The DNS system translates the FQDN into an IP address. This is particular useful for systems that utilize Dynamic DNS.

The Lotus Foundations Dynamic Domain Name System (DDNS) feature automatically updates DNS information when a new IP address is assigned to a network, allowing you to publish DNS entries and provide internet services even if you have a dynamic IP address.

To create a connection between two Lotus Foundations-powered servers, someone needs to act as the Client and someone as the Master server. Think of it like a phone call to your ISP: you (the client) need to know their phone number, but they (the server) don't need to know yours. With TunnelVision, you have a similar situation: the server side (accepting a connection) needs a static IP address or FQDN, while the client side can have either a static or dynamic IP address.

Only one Lotus Foundations-powered server (usually the computer with the fastest internet connection at your head office) needs to act as the server and have a static IP address or fully qualified domain name. All the others can simply act as clients.

A static IP address is guaranteed never to change, so people on the internet can always find you. To obtain a static IP address, talk to your ISP. DynamicDNS can be used in place

of a static IP address. Refer to DynamicDNS in Chapter 23: Domain Name Services for more information.

Configuring a TunnelVision master server

Ensure that the Lotus Foundations server that you are configuring as the Master server has a static IP address, or has a fully qualified domain name.

1. Select *VPN* from the Network Setup menu on the left side of any WebConfig screen. The *VPN Setup* screen is displayed.
2. Select "Enable" for the *PPTP Server* setting.
3. Select "Enable" in the *Tunnel Vision* section of the screen.
4. In the *Tunnel Vision: Use Fully Meshed Mode* box, select "Yes" to run Tunnel Vision in a Fully Meshed mode, and "No" to run it in a Non-Meshed mode.
    - If you enable TunnelVision to work in "fully meshed" mode, then your server can learn about other servers on the VPN by exchanging information through the Master Server. Then each server will make connections directly to each of the other VPN-connected servers directly, as needed, without needing to go through the master. If you disable "fully meshed" mode, then your server only communicates directly with the master server and the master's local network. Your server cannot see any of the other VPN-connected servers or networks.
    - In previous versions of the Lotus Foundations software, "fully meshed" mode was always enabled, and this is still the recommended setting.
5. Leave the *Address of Master Server* field empty (since the Master server does not initiate connections).
6. Enter a password that the server and client will use to prove to each other that they are trusted.
7. Re-enter the password to ensure it was entered correctly.
8. Click *Save Changes*.

Configuring a TunnelVision client

A Lotus Foundations-powered server does not need a static IP address to act as a TunnelVision client, but it needs to know the static IP address or fully qualified domain name of the Master server.

To find this information, select *Local* from the Network Settings menu on the master server. On the screen that is displayed, click *Advanced...*. Then look at the address assigned to eth1.

1. Select *VPN* from the Network Setup menu on the left side of any WebConfig screen. The *VPN Setup* screen is displayed.
2. Leave the default *PPTP Server* setting.

3. Select "Enable" in the *Tunnel Vision* section of the screen.
4. In the *Tunnel Vision: Use Fully Meshed Mode* box, select "Yes" if you are running Tunnel Vision in a Fully Meshed mode, and "No" if you are running it in a Non-Meshed mode.
    - If you enable TunnelVision to work in "fully meshed" mode, then your server can learn about other servers on the VPN by exchanging information through the Master Server. Then each server makes connections directly to each of the other VPN-connected servers directly, as needed, without needing to go through the master. If you disable "fully meshed" mode, then your server only communicates directly with the master server and the master's local network. Your server cannot see any of the other VPN-connected servers or networks.
    - In previous versions of the Lotus Foundations software, "fully meshed" mode was always enabled, and this is still the recommended setting.
5. Enter the Master server's static IP address or fully qualified domain name.
6. Enter the password that was used in step 6 of *Configuring a Master Server*.
7. Re-enter the password to ensure it was entered correctly.
8. Click *Save Changes*.
    - TunnelVision immediately begins to create the tunnel between the client and the master server. If the client and the server are connected to the internet and everything is configured correctly, this process should only take a few seconds.

To configure another Lotus Foundations-powered server as a client, simply repeat this process.

TunnelVision status

The *System Status* screen always displays the status of active VPNs. You may need to click your browser's *Refresh* button to see the latest information.

The idle time-out

If either end of the tunnel does not receive any data for approximately 20 minutes, it assumes that one end has disconnected from the Internet or that the tunnel is no longer needed.

If one end of the tunnel is still on-line, it will try to rebuild the connection automatically. Since this only takes a few seconds and happens only when the tunnel has been idle for a long time, this should not affect you. However, this behavior can often cause the VPN Tunnel's status light to turn yellow or red. This is not a sign of malfunction.

Licensing

IBM has licensed TunnelVision under the terms of the GNU Lesser General Public License (LGPL).

IPsec

Known configurations

The IPSec functionality in Lotus Foundations uses the industry standard ISAKMP/IKE protocol and has been proven to be compatible with other standard IPSec devices.

For a complete list of tested products and configurations, please the following site: http://www.nitix.com/downloads/IPSec_Compatibility/

Adding an IPsec route

To create a new IPsec route:

1. Select *VPN* from the *Network Setup* WebConfig menu.
2. Select *IPsec Setup...* and the *IPsec Setup* screen is displayed.

3. Select *Add New Route*. The *Create IPsec Route* screen is displayed.

4. In the *Remote Server* field, enter the public IP address or the fully qualified domain name (FQDN) of the remote server.
5. To include a private subnet behind the remote server's firewall, enter the internal subnet containing the internal IP address of the remote unit in the *Remote Subnet* field. For example, if the unit's internal IP address is 192.168.10.1 with a subnet mask of 255.255.255.0, you would enter 192.168.10.0/24.
6. Enter your the remote IKE key. This is a password that should be unique and entered on both ends of the IPSec connection.
7. Enable the *Perfect Forward Secrecy (PFS)* feature. The two ends do not negotiate this automatically, so make sure that the setting is the same on both ends.
8. In the section *Enable this connection*, click "Yes".
9. Click *Save Changes*.

Adding an anonymous incoming connection IPsec route

Creating an anonymous IPsec route enables multiple remote locations, with a dynamic IP address, to connect to your Lotus Foundations server.

To configure an anonymous connection:

1. Select *IPsec Setup...* from the *VPN Setup* screen. The *IPsec Setup* screen is displayed:
2. Select *Add New Route*. The *Create IPsec Route* screen is displayed.
3. Enter 0.0.0.0 in the *Remote Server IP address* field. The Lotus Foundations-powered server must have a static IP address.
4. To include a private subnet behind the remote server's firewall, enter the internal subnet containing the internal IP address of the remote unit in the *Remote Subnet* field. For example, if the unit's internal IP address is 192.168.10.1 with a subnet mask of 255.255.255.0, you would enter 192.168.10.0/24.
5. Enter your the remote IKE key. This is a password that should be unique and entered on both ends of the IPSec connection.
6. Enable the *Perfect Forward Secrecy (PFS)* feature. The two ends do not negotiate this automatically, so make sure that the setting is the same on both ends.
7. In the section *Enable this connection*, click "Yes".
8. Click *Save Changes*.

Editing an IPsec route

To edit an existing IPsec route:

1. Select the appropriate IPsec route's edit action button on the *IPsec Setup* screen.
2. The *Modify IPsec Route* screen is displayed.
3. In the *Remote server* field, enter the fully qualified domain name or IP address of the remote server that you want to connect to.
4. To include a private subnet behind the remote server's firewall, enter the internal subnet containing the internal IP address of the remote unit in the *Remote Subnet* field. For example, if the unit's internal IP address is 192.168.10.1 with a subnet mask of 255.255.255.0, you would enter 192.168.10.0/24.
5. Enter your the remote IKE key. This is a password that should be unique and entered on both ends of the IPSec connection.
6. Enable the *Perfect Forward Secrecy (PFS)* feature. The two ends do not negotiate this automatically, so make sure that the setting is the same on both ends.
7. Click *Save Changes*.

Setting up third party IPsec clients

With the large number of IPsec servers available, we cannot provide configuration parameters for each device on the market. The following does, however, provide the best configuration for allowing a Lotus Foundations-powered server to create a virtual private network (VPN), with third party devices:

Lotus Foundations setup:

- **Remote server**: Enter the external IP address of the remote unit.
- **Remote subnet**: Enter the internal IP address of the remote unit as well as the subnet. For example, if the unit's internal IP address is 192.168.10.1 with a subnet mask of 255.255.255.0, you would enter "192.168.10.0/24".
- **Remote IKE key**: Enter your shared key that is being used.
- **Key Type**: Select PSK.
- **Perfect Forward Secrecy (PFS)**: Select Yes.

Third party IPsec client setup:

- **Encryption / Tunnel**: 3DES and MD5.
- **Security Association (SA) Lifetime**: set to 3600 seconds.
- **Mode**: If there are different modes available, select Main Mode.
- **Private Key Secret**: Use preshared secret keys (PSK), not RSA keys or other keys such as PKI, as these are not supported on Lotus Foundations.
- **Perfect Forward Secrecy**: Perfect Forward Secrecy (PFS) must be enabled on both ends of the connection. The IPsec protocols do not provide a method for the two ends to negotiate this, so you must ensure to set it correctly.

Remote access services

What is RAS?

Remote Access Services (RAS) is a feature that enables you to access an internal network while at home or on the road. You can take advantage of RAS with:

- A VPN (which requires the Internet and a PPTP client)
- A dial-in connection (which requires a dial-up modem and a phone line)

Windows typically has a Point to Point Tunneling (PPTP) client built-in. You might have to purchase a separate software package if you are using a Macintosh.

To establish a remote connection, users have to have PPTP or dial-in access. Refer to the *Creating Users* section in the user manual chapter User & Team Management for more information.

PPTP - client-to-server VPN service

Configuring VPN service on Lotus Foundations

1. Select *VPN* from the Network Setup menu on the left side of any WebConfig screen. The *VPN Setup* screen is displayed.
2. Enable the PPTP server by selecting "Enable".
3. Click *Save Changes*.

Configuring VPN service in Windows

Before you can establish a VPN connection, you have to install VPN service on a Windows 95/98/Me workstation. Windows 2000 and Windows XP workstations already have VPN services installed.

1. From the *Start* menu, select *Settings* > *Control Panel*. Double-click on the Add/Remove programs icon.
2. The *Add/Remove Programs Properties* screen is displayed. Select the *Windows Setup* tab.

3. Select *Communications* from the Components list and click *Details...*. A second Components list is displayed, showing the communications components that are already installed and those that can be installed.
4. Scroll to *Virtual Private Networking* in the Components list.
    - If it already has a check, then VPN software has already been installed. Proceed to *Establishing a VPN Connection*.
    - If it does not have a check, you have to install the VPN software. Proceed to the next step.
5. Place a check in the Virtual Private Networking box and click *OK*.
6. The Windows Setup screen is re-displayed. Click *Apply*. The software is installed automatically.
7. Reboot the computer when the software is finished installing.

You might be asked to insert your Windows 95/98/Me disk for additional software components to be loaded. Follow the instructions provided, and refer to Microsoft Support for more information.

Establishing a VPN connection

To establish a VPN connection to a Lotus Foundations server, you need to know your username and password and the the Lotus Foundations server's domain name or IP address.

Windows XP/2000

The following steps help guide you through a successful VPN connection, Windows XP or 2000.

1. In Windows, go to *Network Connections*.
2. Select *New Connection Wizard* and click *Next*.
3. In the *Network Connection Type* window, select the radio button labeled "Connect the network at my workplace", then click *Next*.
4. In the following Window, select the "Virtual Private Network" option then click *Next*.
5. In the *Connection Name* windows, enter a name that will distinguish the location you are connecting to.
6. In the *Public Network* window, select "Do not dial the initial connection" and click *Next*.
7. In the *VPN Server Selection* window enter the hostname of the Lotus Foundations server followed by the domain name, or alternatively, the public IP address. Click *Next* to proceed.
8. Click *Finish*.

    Now that the VPN connection has been created, you need to configure the settings before connecting to the remote network.

9. Open the VPN connection. Before logging in for the first time click on *Properties*.
10. Click the *Networking* tab and from the "Type of VPN" drop-down box, select *PPTP VPN* and click *OK*. This only needs to be set once for each connection.
11. Login using the provided Lotus Foundations username and password and click *OK*. Various messages display such as "Verifying the connection..." and "Registering the user..." prior to a complete connection.

Windows 95/98/Me

Follow these steps to establish a VPN connection in Windows 95/98/Me systems:

1. From the Start menu, select *Programs* > *Accessories* > *Communications* > *Dial-up Networking*.
2. Double-click on the *Make New Connection* icon.
3. Enter a name for the VPN connection. Click *Next*.
4. Enter your Lotus Foundations-powered server's host name or external IP address:
    - Enter a host name (such as `www.example.com`) if Lotus Foundations provides DNS resolution for your domain.
    - Enter an IP address (such as 192.168.0.1) if Lotus Foundations does not provide DNS resolution. To find the external IP address, select *Local* from the Network Setup menu. On the screen that is displayed, click *Advanced...*. In the *Network Devices* section of the screen, look at the IP address of the un-trusted Ethernet interface (usually Eth1).
5. Click *Next*.
6. Click *Finish*. You have created an icon that activates a VPN connection to your home network through your Lotus Foundations-powered server.
7. Right-click on the icon that you just created and select *Properties*. In the window that is displayed, click on the *Server Types* tab.
8. In the Advanced options section of the screen, ensure that only the following are checked:
    - Enable software compression
    - Require encrypted password
    - Require data encryption.
9. In the Allowed network protocol section of the screen, ensure that only TCP/IP is checked. Click *OK*.
10. Once you are connected to the internet, establish a VPN connection to the internal network by double-clicking the icon that you created in step 6.
11. Enter your Lotus Foundations login name and password. Click *Connect*.
12. Click *Close* to minimize this window.
13. You are now connected to your local network through a secure VPN. Depending on your internet connection, it may take longer than normal to complete network requests. An icon showing traffic between your workstation and the Lotus Foundations-powered server you are connected to is displayed in the bottom right corner of the screen.

14. To terminate the VPN connection, double-click the icon. Select *Disconnect* in the window that is displayed.

Disconnect a PPTP connection

1. On the *System Status* page, in the *Services Status Snapshot* section, the *PPTP Connections* line displays the status of all PPTP connections. If there are active connections, a Details link is displayed.
2. Click on the *Details* link. The *Active PPTP Users* screen is displayed.
3. Click on the delete action button of the user whose PPTP connection you want to disconnect.
4. A window is displayed that asks "Are you sure you want to disconnect ‘username’?" Click *OK* to disconnect the PPTP connection.

Dial-in service

Configuring Dial-in Service on Lotus Foundations

1. Select *Dial-up* from the Networking Setup menu on the left side of any WebConfig screen. The *Dial-up Networking Setup* screen is displayed.
2. Click the appropriate modem’s action button.
3. A second *Dial-up Networking Setup* screen is displayed.
4. In the *Allow Dial in connections* section, select "Yes".
5. Click *Save Changes*.

Configuring Dial-in Service in Windows

1. From the Start menu, select *Settings* > *Control Panel*. Double-click on the Add/Remove programs icon.
2. The *Add/Remove Programs Properties* screen is displayed. Select the *Windows Setup* tab.
3. Select *Communications* from the Components list and click *Details...*. A second Components list is displayed, showing the communications components that are already installed and those that can be installed.
4. Select *Dial-Up Networking* from the Components list.
    - If it already has a check, then dial-in software has already been installed. Proceed to *Establishing a Dial-in Connection*.
    - If it does not have a check, you have to install the dial-in software. Proceed to the next step.
5. Place a check in the Dial-Up Networking box and click *OK*.

6. The Windows Setup screen will be re-displayed. Click *Apply*. The software is installed automatically.
7. Reboot your computer when the software is finished installing.

You might be asked to insert your Windows 95/98/Me disk for additional software components to be loaded. Follow the instructions given to you.

Establishing a dial-in connection

When a user dials into a Lotus Foundations-powered server, the username is displayed in the Internet Status field of the System Status screen for the duration of the connection. The administrator can terminate the connection from this screen.

To establish a dial-in connection to your network, you need to know your Lotus Foundations username and password and the phone number of a modem that is connected to an external phone line. Depending on your Internet connection, it might take longer than normal to complete network requests.

Follow these steps to establish a dial-in connection on Windows 95/98/Me systems:

1. From the Start menu, select *Programs* > *Accessories* > *Communications* > *Dial-up Networking*.
2. Double-click on the *Make New Connection* icon.
3. Enter a name for the dial-in connection. Click *Next*.
4. Enter your area code, phone number, and country code.
5. Click *Next*.
6. Click *Finish*. You have created an icon that activates a dial-in connection to the internal network.
7. Establish a dial-in connection by double-clicking on the icon that you created in the previous step.
8. Enter your Lotus Foundations login name and password. Click *Connect*.
9. A window showing you the progress of the connection will be displayed.
10. An icon showing traffic between your workstation and the Lotus Foundations-powered server you are connected to is displayed in the bottom right corner of your screen when you are connected to the local network:
11. To terminate the connection, double-click on the icon. Select *Disconnect* in the window that is displayed.

Terminating a connection from WebConfig

When a user dials into the Lotus Foundations-powered server, their username is displayed in the Internet Status section of WebConfig's *System Status* screen for the duration of the connection. The administrator can choose to terminate the user's connection from this screen.

Firewall services

The firewall subsystem featured in Lotus Foundations is entirely auto-configuring and automatically reconfigures its parameters to adapt to any Lotus Foundations server settings. There are no user controls needed. However, you can choose to restrict outgoing traffic and view a log of all requests to traverse the firewall.

To learn more about just how sophisticated the firewall is, go to:
http://www.nitix.com/products/features_connectivity_firewall.php

ICSA Firewall Security Compliance

Starting with Nitix version 3.71, Nitix incorporates features to be ICSA compliant. The ICSA Labs test firewall products against a standard and evolving set of criteria. Their Firewall Certification Criteria are composed of both functional and assurance requirements, and the criteria requirements define an industry-accepted standard that all products claiming to have firewalling capabilities must attain.

Traffic denied inbound

The firewall denies all inbound network traffic that is not for:

- Remote administration
- Private network hosts
- Service network hosts
- The firewall itself

Traffic permitted inbound

The firewall supports access requests for the following services, if enabled (see Chapter 29: Log Messages for which firewall request information is logged):

- FTP (Active and Passive Mode)
- HTTP
- HTTPS
- SMTP

Traffic permitted outbound

Lotus Foundations permits the following protocols through the firewall:

Protocol	Purpose
Telnet (TCP/23)	To access resources on a Unix/Linux computer.
FTP (TCP/20-21)	To copy files between computers.
HTTP (TCP/80)	To make Web pages available over the Internet.
HTTPS (TCP/443)	To make secure Web pages available over the Internet.
SMTP (TCP/25)	To transfer or send email messages between servers.
DNS (TCP and UDP/53)	To navigate the Internet using domain names instead of IP addresses.
POP3 (TCP/110)	To read email from a single Inbox.
IMAP (TCP/143)	To read email from a remote location.

All other non-Remote Administration traffic from both private, service and public network clients directed to or through the Lotus Foundations firewall is dropped or denied.

This feature is disabled as the default setting for Lotus Foundations. Once the feature is enabled, users within your network cannot use programs that do not adhere to the above protocols, such as ICQ.

To enable the Restrict Outgoing Traffic option:

1. Select *Local* under Network Setup from the menu on the left side of any WebConfig screen. The *Local Network Options* screen is displayed.
2. Enable the *Restricts outgoing connections* option to configure Lotus Foundations to only enable the above outbound ports. Disable this option to enable all outgoing traffic.
3. Click *Save Changes*.
    - Restricting outgoing traffic helps to block applications such as MSN Messenger, Yahoo Messenger, Kazaa, Morpheus, etc.

Firewall log

Please see Log Messages for information on Firewall logs.

Domain name services

What is DNS?

DNS is the protocol used to convert internet domain names into IP addresses. If DNS is configured, users can access information on the local network and the internet using domain names instead of specific IP addresses.

Configuring DNS services can be complicated because it often requires dealing with outside organizations called Domain Registrars. If you are uncertain about issues related to DNS, ask your ISP to help you.

DNS Services

Lotus Foundations runs two different kinds of DNS services:

- DNS Lookup and Caching Server - This server converts domain names (such `www.yahoo.com`) into IP addresses and then sends the IP addresses to your browser. Lotus Foundations runs the DNS lookup and caching server on your local network and blocks connections to the lookup server from the internet. There are no special options to configure the DNS lookup and caching server.
- DNS Publishing Server - This server adds names for your own network (such as `www.example.com`) into the global DNS system so that people can find your IP address to access your website or to send you email. The DNS Publishing Server and how it can be configured is explained in the rest of this chapter.

Configuring Public DNS

1. Select *Local* from the Network Setup menu on the left side of any WebConfig screen. The *Local Network Options* screen is displayed, with the DNS line that prompts you to Act as a public DNS server.
2. The default DNS server setting is "No", meaning that you are not publishing any DNS entries.
    - This option only controls the DNS publishing server and how people outside your local network communicate with it. The DNS publishing server is always active for computers on your local network.
    - If you want to provides services, such as email, to the outside world, you need to enable the DNS server.

- To do so, select "Yes" or "Dynamic". Your choice depends on some relatively complex issues involved in domain name registration.

3. Click *Save Changes* when you have selected the appropriate DNS setting.

How the DNS system works

DNS hierarchy

The internet DNS server network is arranged as a hierarchy in which a single 'root' domain, sometimes called dot ('.'), links to the set of top-level domains, such as .com and .org. Each of the top-level domains contains a link to each of the second-level domains (such as `net-itech.com` and `mydomain.org`). Third- and fourth-level domains are less common and are used in large organizations like universities.

You most likely publish a second-level domain name such as `example.com`. When you do that, your DNS server, if enabled, automatically publishes the names inside `example.com`, such as `www.example.com` and `mail.example.com` .

Domain registrars

However, there is still a part that must be done manually: in this example, you have to create a link on the .com server to ask your second-level domain to be referred to your Lotus Foundations-powered server's IP address. To do this, you need to visit a Domain Registrar (such as `www.easydns.com` or `www.opensrs.org`) to make sure that your domain name is not already being used by someone else and to give them the outside IP address of your Lotus Foundations-powered server.

To register a domain name, your Lotus Foundations-powered server must have a static IP address. Most ISPs provide this service for an additional fee. DDNS can be used in place of a static IP address. Refer to Dynamic DNS in this chapter for more information.

When you enable your Public DNS Server and register with a Domain Registrar, people should be able to look up the IP address associated with your domain name. To test this:

1. Click *WWW* from the Server Setup menu.
2. Select "Yes" in the *Enable Web Server* field.
3. Ask someone outside the local network if they can view your domain.

Dynamic DNS

Dynamic DNS is a Lotus Foundations feature that enables you to publish DNS entries and provide internet services even if you have a dynamic IP address, as opposed to a static IP address.

When you register your domain with a registrar, you give them the address of the primary server and backup server owned by Net Integration Technologies, which already have static IP addresses. When your Lotus Foundations-powered server connects to the internet, it automatically informs the Net Integration Technologies servers about your current IP address and asks them to publish your up-to-date DNS information.

You need to provide a Domain Registrar with the following DNS server addresses:

1. dyndns1.ivivanet.com 209.5.34.82
2. dyndns2.ivivanet.com 207.176.197.14
3. dyndns3.ivivanet.com 194.124.152.28

All you need to do then is set your *Public DNS Server* to "Dynamic". Lotus Foundations does the rest.

Manually creating DNS entries

Based on the servers you have enabled, Lotus Foundations automatically decides which DNS names to publish. For example, if your domain name is `example.com`, and the *Enable Web Server* option is set to "Yes" (not "Trusted Hosts Only"), then Lotus Foundations automatically publishes the DNS name `www.example.com` as a pointer to your Web server. Similarly, if you enable the SMTP email delivery server, it publishes the name `mail.example.com`.

Although Lotus Foundations publishes names automatically, you might want to occasionally add extra names to your DNS server. You might also want to add an entry that allows people to access your site without typing `www.` before the address.

Changing DNS information at a registrar can often take 24 - 72 hours to replicate through the DNS backbone.

Types of DNS entries

You can create four kinds of DNS entries:

- **A (address)** - Creates an entry for converting a name (such as `www.example.com`) to an IP address (such as 111.22.33.44). This is the most common type of entry.
- **NS (copy from nameserver)** - Enables you to mirror someone else's DNS server. Every DNS server should have a backup server with an additional copy of the data. When you register a domain name, the registrar generally asks for a primary and a secondary server. If someone asks you to act as their secondary DNS server, you can add their domain name and primary server's IP address as an NS entry.
- **MX (mail exchanger)** - Occasionally, you might want to publish a Web server and a mail server with the same name but different IP addresses. For example, you might want people to reach you by email when they send to `user@example.com`, but you might want the `example.com` Web server to point to a different address. To do that, you would add Address records for </tt>example.com</tt> and `www.example.com` pointing to your Web server, and then you would add an MX entry for `example.com` pointing to your mail server. You do not need to create a separate MX entry if it points to the same address as the Address record.
- **DR (Dynamic Redirect)** - Dynamic redirection can be used to circumvent blocked HTTP (Web) ports. Any Web requests directed to the address entered as "Name" are automatically redirected by a Dynamic DNS server to port 4201 on the site entered as "Value". This is almost transparent for clients, who only notice that the hostname and port have changed slightly.

Creating a DNS entry

1. Select *DNS* from the Server Setup menu. The *DNS List* screen is displayed.
    - To list, create or edit your private DNS entries, click *Private Entries*.
    - Private DNS entries are available only to the internal network and include hostnames of all the computers the Lotus Foundations-powered server can find on the local network.
    - Public DNS entries include the mail exchange (MX) record and entries for the un-trusted (external) network interface. Virtual Web server DNS records also go on the public DNS list. Most of the listings, both public and private, are automatically set up by Lotus Foundations.
2. Click *Add DNS*. The *DNS Add* screen is displayed.
3. Enter a name for the entry.
4. Select the entry type.
5. Enter the target IP address in the Value field.
6. Click *Save Changes*.

Editing an existing DNS entry

1. Select *DNS* from the Server Setup menu. The *DNS List* screen is displayed.
2. To edit your private DNS entries, click *Private Entries*.
3. Click on the entry's edit action button. The *DNS Edit* screen is displayed.

4. Make the appropriate changes and click *Save Changes*.

Workstation viewer

What is the workstation viewer?

The workstation viewer is a Lotus Foundations subsystem that can list the workstations and servers that are connected through the local network. The *Workstations* screen tells you which computers are on the network, what their names and IP addresses are, and who is logged on.

If a workstation can be administered remotely using virtual network computing, the remote administration program can be accessed from WebConfig.

Accessing the workstation viewer

1. Select *Workstations* from the Network Setup menu on the left side of any WebConfig screen. The Workstations screen is displayed.
2. Scanning for workstations can waste bandwidth, no workstations are displayed in the list by default. Click *New Scan* to view an updated list of workstations.
3. Click *Refresh* (at the bottom of the screen) after a few seconds to view the updated list. Workstations are displayed in the list if they are connected to the network.
4. Workstations can be sorted by the IP Address or Workstation Names by clicking on the appropriate header.

Virtual network computing (VNC)

Using free Windows software called Virtual Network Computing (VNC), you can configure Windows, Mac, and Unix workstations so they can be controlled remotely from a central workstation. If users need help or settings need to be changed, an administrator does not have to physically go and sit in front of the workstation in question.

Computers with a VNC remote administration server installed are displayed with the words "Remote Admin" next to them on the Workstations screen.

Configuring VNC

There are two parts to configuring remote administration:

1. VNC Server (which should be installed on every user's workstation).
2. VNC Viewer (which should be installed on the administrator's workstation).

Once the servers and viewers are configured, clicking the "Remote Admin" link on the *Workstations* screen connects you to the remote VNC server and displays the remote desktop.

Configuring the VNC server

1. To download VNC, go to one of the following:
    - http://www.realvnc.com/download.html
    - http://download.cnet.com/ (and search for VNC)
    - For the MAC version, go to: http://www.chromatix.uklinux.net/vnc/
2. The file comes in a zipped format. Unzip the file in a temporary location for installation. Run the Setup program and follow the instructions. Accept all defaults during the installation process.
3. When installation is finished, reboot the workstation.
4. From the *Start* menu, select *Applications* > *VNC* and start VNC (App mode).
5. The first time you start VNC you have to set up a password, which is needed to connect to your workstation.
6. When VNC is active, a small VNC icon displays in the bottom right corner of your screen.

Configuring the VNC viewer (for the administrator's workstation)

1. Download VNC from the internet and configure the VNC server.
2. Look for `vncviewer.exe`, and copy it somewhere obvious (such as `C:\windows\`).
3. From the *Start* Menu, select *Programs*> *Windows Explorer*.
4. From the *Tools* menu, select *Folder Options*. Click on the *File Types* tab and the *File Types* screen is displayed.
5. Click *New Type...*. The *Add New File Type* screen is displayed.
6. Enter a description of the file type (such as VNC Viewer Admin) in the *Description of Type* field.
7. Enter "vnc" in the *Associated extension* field.
8. Enter "application/x-vnc" in the *Content Type (MIME)* field.
9. Click *New*. The *New Action* window is displayed.
10. Enter "Open" in the *Action* field.
11. Enter the following line in the *Application used...* field. "c:\windows\" refers to the location where VNC has been installed. The quotations around "%1" are required.

```
c:\windows\vncviewer.exe /config "%1"
```

12. Click *OK*. VNC Viewer Admin is displayed in the *Registered file types* list of the *File Types* screen.

FastForward

What is FastForward?

The FastForward technology in Lotus Foundations enables you to forward internet traffic from a specific address and interface to another address and interface. A subsystem that performs this function is usually called a proxy server.

When computers on the internet access services on your internal, protected network, they “talk through” your Lotus Foundations-powered server. FastForward makes sure that these untrusted computers can only access the information and services that you want them to.

If FastForward is disabled, no-one can see anything on your local network because Lotus Foundations acts as a firewall. If you enable FastForward, you are making a protected “hole” in your firewall that enables computers on the outside to access your network. To decide whether you want to use FastForward, you need to decide whether it is worth the added security risk.

> **Important Note**
> Because you are affecting the firewall security of your network, it is very important that you understand what you are doing while configuring FastForward.

FastForward belongs to a class of programs known as Proxy Servers and is the Lotus Foundations inbound proxy server. Its job is to accept TCP or UDP connections on one address and port, and forward them off to some other address and port. There are lots of programs around that do this, but FastForward provides simplified configuration, uses less memory, and is generally faster than any other solution we know of. It uses zero-forking technology to keep its resource usage to a minimum while still running faster than most other proxies.

Introduction to TCP/IP

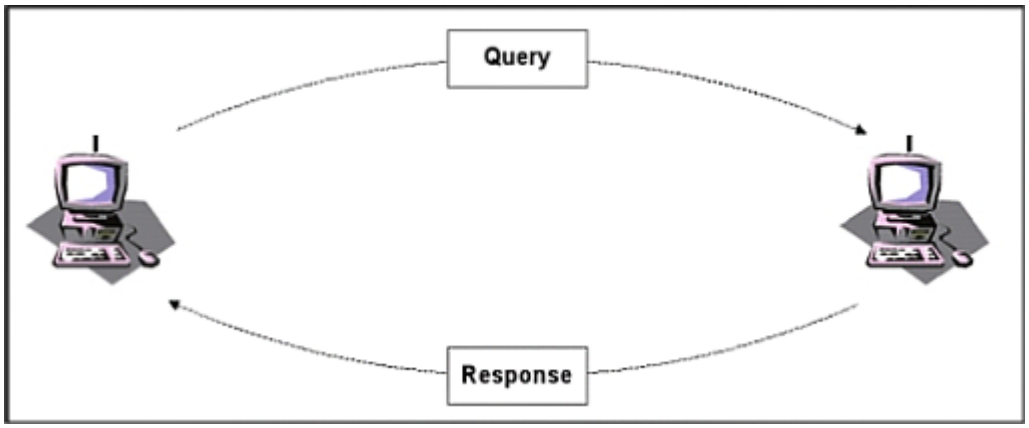
Entire books have been written on this subject. To save you some time, we will try to explain everything you need as briefly as possible. As mentioned earlier in this guide, each computer on the internet must have a unique IP address. Network protocols come in layers and IP is just one of those layers. The job of IP is to get data, split it into small chunks called packets, and then transport those packets from one computer to another on the Internet.

When it receives an IP packet, the computer needs to figure out what service it belongs to, and which open connection it is involved in. For that, it uses two higher-level protocols known as TCP (Transport Control Protocol) and UDP (User Datagram Protocol). TCP and UDP introduce port numbers which specify where the data is supposed to go and how the computer is supposed to handle it.

FastForward can handle both TCP and UDP. It processes them differently from each other, but you do not need to worry about this for configuration purposes.

User Datagram Protocol (UDP)

Using UDP is very much like sending a telegram. You receive a message, and you can send a reply. The DNS (Domain Name Service) mentioned earlier uses UDP. One computer sends a message asking to translate a name (say `www.example.com`) into a number. The answering DNS server sends a message saying that the IP address of `www.example.com` is 192.168.1.1.



Transport Control Protocol (TCP)

Using TCP is very much like making a telephone call. A person calls you, and you answer. You go through an introductory sequence, you have a conversation, and then you finish the call (or in TCP terminology, you close the connection). TCP is used for more complicated network tasks, like Web browsing.

Proxy servers

Lotus Foundations acts as a firewall, meaning that it blocks computers on the internet from having access to your private servers.

If you want to make a service available to the outside world, FastForward controls the connection for you. When someone outside wants to access the service, they send the request to a port on your Lotus Foundations-powered server. FastForward then connects them to the service. This process has two connections: one from the client to the Lotus Foundations server, and another from the Lotus Foundations server to the service. When either the client or the server transmits information, Lotus Foundations forwards it to the opposite end of the connection.

As a result, you need to know the addresses and port numbers of both the source of the information and the destination of the information. Lotus Foundations receives connection requests from the source address and forwards them to the destination.

If you want to use FastForward, you probably already have a clear idea of what your destination address will be. The source, however, might be more difficult to determine and ultimately depends on how your IP address is configured.

Static and Dynamic IP Addresses

A person trying to access FastForward services through your Lotus Foundations-powered server must know your assigned IP address to locate you on the internet. Each time you connect to the internet, your ISP assigns you a IP address. Dynamic IP addresses are inconvenient for use with FastForward because your address changes each time you connect (making it difficult for your clients to find you).

If you specifically ask for one, your ISP can give you a static IP address (which never changes). Once you have a working static IP address, you can add it to a DNS server (which will convert your domain's readable name into its IP address).

Configuring FastForward

You can configure FastForward once you know your source and destination addresses. If you still are not sure where the addresses come from, a few examples are displayed in later sections.

> **Important Note**
> Remember that you decrease firewall security when you enable FastForward.

1. Login to WebConfig with your administrator username and password. WebConfig's *System Status* page is displayed.
2. Select *Fast Forward* from the Network Setup menu. The *Fast Forward* screen is displayed, showing the list of addresses being forwarded. This list might be empty if no addresses are being forwarded.

Creating a new forward

1. Click *Add New Forward* and the *Add Forward* screen is displayed.
2. Enter the source address and port number in the *From Address* and *From Port* fields.
    - If you enter "NetIntegrator" (with no space) as the source address, Lotus Foundations automatically uses your assigned address (whether it is static or dynamic).
    - You can only attach one forward connection to any given source address and port.
3. Enter the destination address and port number in the *To Address* and *To Port* fields. Ensure that you have entered the destination information correctly. If you forward connections to a server that is not answering, Fast Forward drops the connection.
4. Enter a description of the Fast Forward to keep track of its purpose or destination.
5. Click *Save Changes*.

Editing a forward

1. On the *Fast Forward* screen, click on the appropriate forward's edit action button. The *Modify Forward* screen is displayed.
2. Change the appropriate source or destination information.
3. Click *Save Changes*.

Deleting a forward

1. On the *Fast Forward* screen, click on the appropriate forward's delete action button.
2. To confirm the deletion, click *OK* in the window that is displayed.

Forwarding scenarios

Here are a few common examples:

1. Your internal network has an email server called Fred running Windows NT. The address of the server is 192.168.1.5. Set the source to hostname/port 25 (which is the SMTP port) and the destination to 192.168.1.5/port 25 . Now people can send email to your Lotus Foundations-powered server's static IP address, and it is forwarded to your mail server.
2. If Fred has a DNS server on port 53, you can forward hostname/port 53 to 192.168.1.5/port 53. That way, people on the internet can look up hostnames that belong to your local network.

3. You can make WebConfig accessible from the outside world (so that, for example, Net Integration Technologies technical support can access your Lotus Foundations-powered server and help you resolve problems). Port 80 on Lotus Foundations is already in use for the company Web server, so use port 81 as the source. WebConfig uses Port 8043 and if the destination IP is 192.168.1.1, the complete destination address is 192.168.1.1/port 8043 . To access WebConfig from the outside, we would need to use a special address: http://www.yournetwork.com:81/

Multiple static IP addresses

In certain cases, you want FastForward to treat connections differently depending on their target. For example, you might want email from `mail1.yournetwork.com` to be sent to Fred (your NT server) and email from `mail2.yournetwork.com` to be sent to Barney (your Unix server). To do this, your ISP needs to assign you multiple static IP addresses. Some ISPs may not offer this service.

If you have two static IP addresses (207.6.60.1 and 207.6.60.2), and you want the setup we just described, you can:

- create one forwarding entry with source 207.6.60.1 / port 25 and destination 192.168.1.5 / port 25.
- create another forwarding entry with the source 207.6.60.2 / port 25 and destination 192.168.1.6 / port 25.

Common port numbers

Here are a few common port numbers that you can use with FastForward.

Port	Use
22	SSH (Secure Shell)
23	Telnet
25	SMTP (Simple Mail Transfer Protocol)
79	Finger
80	HTTP (Hypertext Transfer Protocol) - Web server
110	POP (Post Office Protocol)
5631	PCAnywhere
443	Web server secure port (HTTPS) Some ports cannot be used with FastForward. For example, port 21 (FTP) does not work because it uses multiple connections that include both ports 20 and 21.

Troubleshooting FastForward

The WebConfig screen in Lotus Foundations might display the following message:

```
An error occurred while Fast Forward tried to bind to one or more of the address
```

This message might be displayed if:

- you are trying to forward to ports that are already being used by your Lotus Foundations-powered server (port 80, for example).
- FastForward has more than one entry trying to use the same source port and address. You cannot have more than one FastForward entry attached to the same source.

If you see this message, turn off the server that is already using the port. For example, to forward port 80 (the port used for Web services) to another address, you would first have to shut off the Web server on Lotus Foundations. The log message viewer,Log messages, shows which FastForward entries did and did not work.

Disk management

Important Note
Some Lotus Foundations services are not enabled unless hard disks are configured through the WebConfig menu. See the section on “Configuring you disks” for more information.

Important Note
For first time disk configuration, do not use the "Disk Install" option on the Console menu.

Disk configuration (idb and RAID)

To take advantage of RAID, you must have Lotus Foundations Software RAID Technology. Software RAID Technology comes standard with the Lotus Foundations Premium Edition.

RAID (Redundant Array of Inexpensive Disks) is a system of backing up information that reduces risk by saving data on two or more drives. If one drive fails, your data is still safely stored on another drive. Although you do not need to know much about RAID to configure it on your Lotus Foundations-powered server.

Intelligent Disk Backup (idb) is a system that automatically performs backup procedures as often as every fifteen minutes without input from a system administrator. See Intelligent Disk Backup (idb) in Backup & Restore for more information.

If your Lotus Foundations-powered server has one disk, then you cannot take advantage of idb or RAID. If your Lotus Foundations-powered server has exactly two disks, you can have idb backup or a two-disk RAID array (but not both). If you have three or more disks, you can have a two (or more) disk RAID array and idb backup or a RAID array with all available disks and no idb backup.

Configuring your disks:

1. The *Disk Status* section in the *Services Status Snapshot* table on the *System Status* page in WebConfig has a link telling you that disk(s) have not been configured.
2. Click the appropriate link to configure your disks.
    - For example, if you have three disks, the *Disk Status* section states, “Your main disk is not configured. You can configure disks #1 and #2 all in a RAID or disk #1 as a standalone disk with disk #2 as an idb backup disk”.

- For a RAID configuration you would click on the “all in a RAID” link; if you want to enable idb backup, you would click on “disk #2 as an idb backup disk”.
- If you select a RAID configuration, then the RAID array will begin to rebuild. This process (which can take up to two hours) does not noticeably affect the performance of Lotus Foundations.

Reconfiguring your disks

You are able to reconfigure your disk at any time. The *Disk Status* section of WebConfig’s *System Status* screen displays your disk status and provides you with disk reconfiguration options.

Converting an idb disk to RAID

You can only convert an idb disk to part of a RAID array if your Lotus Foundations-powered server has exactly two disks. If you have 3 or more disks, you cannot convert an idb disk to RAID.

> **Important Note**
> Converting your idb disk to part of a RAID array means that you will lose idb backup capabilities. In addition, the backup information that is stored on the idb disk is permanently deleted.

1. The *Disk Status* section of the *System Status* screen has a link telling you that you can configure your last disk to your RAID array to improve redundancy. Click this link.
2. The RAID array then begins to rebuild. This process, which can take up to two hours, will not noticeably affect the performance of Lotus Foundations. Click on your browser’s Refresh button to view an updated status of your RAID array.
3. When the array has finished building, the a message is displayed in the *Disk Status* section of the screen.

Converting a RAID disk to idb

If your RAID array is working correctly, you can convert a RAID disk to idb.

> **Important Note**
> Converting your last RAID disk to idb reduces disk redundancy, regardless of how many disks your Lotus Foundations-powered server has.

1. The *Disk Status* section of the *System Status* screen has a link telling you that you can configure your last disk as idb. Click this link.
2. The *Disk Status* section of the screen displays your new disk configuration.

Disk status messages

Depending on your disk configuration, one or more of the following messages are displayed in the *Disk Status* section of WebConfig's *System Status* screen:

Message	Reason for Display
The RAID array is rebuilding. Please do not add or remove any disks until this process is finished. (% complete)	A RAID array needs to build itself the first time it is used, and rebuild when a new disk is added or when the power is turned off suddenly. Always click *Shutdown* (at the bottom of the *System Status* screen) before turning off your Lotus Foundations-powered server; failure to do so means that your RAID array will need to rebuild when you turn the server back on. Although this process does not noticeably affect the performance of Lotus Foundations, it can take up to two hours to complete.
Your disk array is working correctly.	This message is displayed after a RAID array is finished building.
No disks detected! Are your drives inserted or locked?	This message is displayed when your drives are not fully inserted and properly locked or when all available drives have crashed. If your drives are not locked, insert the hard disk key into the lock and turn it clockwise until it snaps back into the locked position. If your disks have crashed, refer to *Recovering from Disk Failure* (in this chapter) for information on how to replace failed disks.
The RAID array is in degraded mode. If you remove a disk, you will lose access to your files.	This message is displayed if you are missing one configured drive in a RAID array. You can create a proper RAID array by configuring a second disk.
The primary disk is in standalone mode. If you remove the disk, you lose access to your files.	This message is displayed if have a single disk drive, if you are not using RAID, or if your two-disk RAID array is in degraded mode.
There is no disk available for idb backup.	This message is displayed when all available disks are configured in a RAID array.
Disk #_ is being used for Intelligent Disk Backup (idb).	This message is displayed when the last disk is used for idb instead of as part of a RAID array.
You can add disk #_ to your RAID array to improve redundancy.	This message is displayed when you have at least one un-configured disk or if your last disk is being used for idb. Click the link to add the disk to the RAID array.

The following messages are displayed in addition.

Message	Reason for Display
You can configure disk #_ for use in idb backups.	This message is displayed if the last disk drive is un-configured. The previous message also displays, but you can only choose one of the options.
There is no reason to use disk #_.	This message is displayed for any extra disks in the system that can not be used. This occurs when the RAID array is complete, and there is already an idb disk.
Disk #_ is too small to be added to the RAID array.	This message is displayed for any unconfigured disks that are too small to fit into the RAID. To solve this problem, turn the machine off and replace the disk with a larger disk.
Disk #_ cannot be used until a RAID license is purchased.	This message is displayed when a system has three or more disks installed, but the system does not have a RAID license. To solve this problem, either remove the disk or purchase a RAID license for the system.

Recovering from disk failure

If one of the disks in your RAID array fails:

1. Turn off the main power.
2. Remove the hard disk and replace it with a new one as soon as possible. See *Installing a New Hard Drive* (in this chapter) for more information.
3. Turn the main power switch back on.
4. Press the power button.
5. Connect to WebConfig and login. The *System Status* page is displayed.
6. The *Disk Status* section of the screen presents you with two options:
    - To configure the new disk as part of the existing RAID array, click on add disk #_ to your RAID array.
    - To configure the new disk as idb, click on configure disk #_ for use in idb backups.
7. Depending on your choice, Lotus Foundations configures the new disk as idb or as part of your RAID array.

Disk recovery (SystemER)

SystemER (Emergency Recovery), a unique Lotus Foundations feature that is not available from any other manufacturer, is an advanced set of features and procedures that:

- enables rapid data recovery in case of complete hard disk failure.
- enables Lotus Foundations to run in emergency mode after a hard disk failure.

Lotus Foundations is designed in such a way that the operating system, along with simple backup and restore procedures, enables quick recovery in case of system failure.

Hard disk failure

If your problem is a hard disk failure, you need the following to restore your Lotus Foundations-powered server:

- Last Backup - from which you can recover data from your last backup. All changes to system configuration, user files, and new files created by users since the last backup are not recoverable
- New hard disk

Installing a new hard drive

1. Turn off the main power.
2. Remove the disk from the unit.
3. Insert a new hard disk into the drive.
4. Insert your idb cartridge. Skip this step if your idb disk is already in.
5. Turn the main power back on.
6. Press the power button.
7. Initiate a Restore from WebConfig. See Backup & Restore.
8. The length of the restore process depends on the size of your hard disk and the amount of data that has to be restored. The entire process can take up to several hours.

Disk install from Lotus Foundations CD

If you are running Lotus Foundations from a CD on third-party hardware you can use the "Disk Install" option on the Console menu to force Lotus Foundations to mirror the current Lotus Foundations image booted from CD across all disks that have been previously configured (in 4.0 or later).

Mirroring the image across disks allows for additional redundancy as Lotus Foundations can be booted off of any drive. The boot order can be specified in the system's BIOS settings. This enables Lotus Foundations to run without a CD and allows SoftUpdate capabilities.

Once you have booted from disk, downloading new images via SoftUpdate also causes the system to mirror them across configured disks -- again, only for disks configured under Nitix 4.0 or later. When Nitix 4.0 or later configures disks it automatically mirrors the currently running Lotus Foundations image to that drive, regardless of whether or not the system was booted from CD. If the system was not booted from a CD then the "Disk Install" option is still available, but has no effect. Similarly, attempting to perform a "Disk Install" on unconfigured disks has no effect. Disks configured in versions of Nitix prior to 4.0 will not have a sufficiently large partition available for Lotus Foundations images. This means that systems using disks configured under Nitix 3.76 will have to continue to boot from CD.

To install Lotus Foundations to disks:

> **Important Note**
> Your disks must be configured before you install Lotus Foundations to disks. If your disks have not been configured, please make sure that you first configure them via WebConfig, shutdown the system, remove the CD, and reboot. For first time disk configuration, see Configuring your Disks earlier in this chapter.

1. Telnet into the Lotus Foundations server and log in as an admin user.
2. Type in the following command:
   `setup`
3. The main Configuration screen is displayed.
4. A red warning box might be displayed advising you to set up your server using the Web-based configuration screen in Lotus Foundations. Press *Enter* to continue.
5. From the Main Menu select *Disk Install*.
6. Press the Y key to install the currently running version across disks.

MySQL server

What is the MySQL Server?

MySQL is an advanced database administration tool that can be used to store dynamic Web page data for services such as on-line catalogues and stores, create accounting databases, and create address books. MySQL is an advanced feature for users that are familiar with databases and SQL (Structured Query Language). For more information, go to http://www.mysql.com.

If the MySQL server is enabled, users on the internal network can access personal databases and the databases of any teams to which they belong. Because WebMail uses the MySQL server to store user preference information, the MySQL server has to be enabled for WebMail to work properly. User and team databases are automatically created when user and team accounts are set up.

Setting up Windows for MySQL Access

You can use Microsoft Access to access and manage database tables.

1. You first have to download MySQL ODBC (Open Database Connectivity). Go to http://www.mysql.com/downloads/api-myodbc.html.
2. On the screen that is displayed, click the link for the most recent stable release. Always download the most recent stable release. For this example, we downloaded MyODBC 2.50.
3. From the Windows downloads section of the screen that displays, click the Download link for Windows 95/98/Me systems.
4. On the screen that is displayed, select the nearest server to download from.
5. In the window that is displayed, select *Save* (to save MyODBC to your desktop).
6. Double-click the icon on your desktop. Extract the zip file to a directory called `myodbc`.
7. Double-click on the myodbc folder that you created in the previous step. Double-click on `Setup.exe`.
8. The Microsoft ODBC Setup screen is displayed. Click *Continue*.
9. Select MySQL from the *Available ODBC Drivers* list. Click *OK*.
10. From the Windows *Start* menu, select *Settings* > *Control Panel* > *ODBC Data Source*. The *ODBC Data Source Administrator* screen is displayed:

11. Click *Add...*. The *Create New Data Source* screen is displayed.
12. Select MySQL from the list. Click *Finish*.
13. Provide the following information:
    - a Windows DSN Name (such as MySQL Address Book)
    - your Lotus Foundations-powered server's host name or IP address
    - your MySQL database name, user name, and password.
14. Click *OK* on this screen and then on the *ODBC Data Source Administrator* screen.
15. Open Microsoft Access.
16. Create a database named address book.
17. Anywhere in this window, right-click your mouse. Select "Link Tables".
18. In the *Files of Type* section of the screen that is displayed, select "ODBC Databases". The *Select Data Source* screen is displayed.
19. Select the *Machine Data Source* tab and select *MySQL Address Book*. The *Link Tables* screen is displayed.
20. Select the appropriate table and click *OK*.
21. Make sure that the appropriate table is highlighted and click *OK*. The table opens in Microsoft Access.

What is a dynamic Web site?

Dynamic web sites, such as online stores or catalogues, use databases to store information and PHP or Perl script to produce the Web page based on the data stored in the database. This enables the changing information to be reflected on the site as it changes. Dynamic Web sites require advanced knowledge of PHP or Perl script, and it is advisable that you seek the help of a qualified programmer to create your own.

Generating dynamic Web sites

The following PHP script is used to render the example address book into a dynamic Web site.

1. Enter the following script into a text file and save it as `addressbook.php`:
```
<?php
mysql_connect("localhost", "john", "password");
mysql_select_db("john");
$result = mysql_query("SELECT * FROM AddressBook");
while ($line = mysql_fetch_array($result))
list ($name[],$phone[]) = $line;
for ($i = 0; $i < sizeof($name); $i++)
echo "<tr><td>$name[$i]</td><td>$phone[$i]</td></tr>\n";
?>
```
2. In the Windows Network Neighborhood, copy the script in John's WWW folder (on the local server).

3. Open an Web browser on your workstation. In the address bar of the browser, enter:

   http://**SERVER_NAME**/~john/addressbook.php

4. The address book opens in the browser.

Hardware components reporting

Hardware components reporting

Lotus Foundations has the capability to report on hardware that is detected in the server -- including processors, memory, Ethernet and hard drives -- and verify whether or not that hardware is currently supported by the version of Lotus Foundations being run.

The *Hardware Status* screen displays the details of all the hardware on the system, and information pertaining to the compatibility/support of the hardware within the current version of Lotus Foundations.

To view the Hardware Status list, select *Hardware Status* from the menu on the left side of any WebConfig screen. The main *Hardware Status* screen is displayed. The information displayed varies according to the specific hardware in your server.

- The *Type* column displays the type of hardware being reported, for example, CPU and memory.
- The *Description* column displays the brand of hardware.
- The *Device ID* column displays information on where the hardware is located in your server.
- The *Status* column displays whether the hardware is Supported, Unsupported, or Support Unknown.
    - A "Supported" device has its required drivers installed in the Lotus Foundations OS.
    - An "Unsupported" device does not have its driver installed.
    - Devices are deemed as "Support Unknown" when the Lotus Foundations OS cannot determine its required driver.

Log messages

Accessing log messages

Lotus Foundations keeps a log that displays the messages from all of the Lotus Foundations subsystems. To view the log from the firewall subsystem, please refer to the firewall log section below. To access this log:

1. Select *Logs/Reports* from the menu on the left side of any WebConfig screen. The *Log Messages* screen is displayed.

Informational messages have a black background. Warning messages have a yellow background. Error messages have a red background.

Customizing message display

The *Highlight* drop-down menu enables you to highlight messages coming from a specific Nitix subsystem (such as Disk manager and Fast Forward), making them much easier to see. To customize your message log display:

1. Select a subsystem from the *Highlight* drop-down menu.
2. Select an option from the *Priority* drop-down list.
    - The *Priority* list customizes what kind of message is highlighted.
    - By default, only messages that show a change in the system display. However, you can make error messages and debug messages display.
3. Click *Apply*. The appropriate messages are highlighted.

Firewall log

For ICSA firewall compliance, Lotus Foundations logs requests to send traffic through the firewall. Please see Chapter 22: Firewall services for more information on the Lotus Foundations firewall. The following firewall information is logged:

- All permitted inbound access requests from public network clients that use a service identified in the security policy hosted on the Lotus Foundations-powered server itself or on a private or service network server.
- All permitted outbound access requests from private and service network clients that use a service identified in the security policy on a public network server.
- All access requests from private, service and public network clients to traverse the Lotus Foundations firewall that violate the security policy.

- All access requests from private, service and public network clients to send traffic to the Lotus Foundations-powered server itself that violate the security policy.
- All attempts to authenticate at an Administrative Interface on the Lotus Foundations-powered server itself.
- All access requests from private, service and public network clients to send traffic to the Lotus Foundations-powered server itself on the port or ports used for Remote Administration.
- Each Startup.

The logs contain the following information:

- Date and Time - when the event occurred with an accurate Date/Timestamp.
- Protocol - TCP, UDP, ICMP, other; Source IP Address.
- Destination IP Address.
- Destination Port, either TCP and UDP, or Message Type, for example, ICMP.
- Disposition of the event, for example Blocked or allowed.

To view the firewall log, you must be a member of the Log team. The firewall log file is displayed in the team folder on Lotus Foundations. This team is automatically created by Lotus Foundations.

To add a user to the Log team:

1. Select *User Setup* from the menu on the left side of any WebConfig screen. The main *User Setup* screen is displayed:
2. Click on the appropriate user's edit action button. The *Modify User* screen is displayed.
3. Choose the Log team in the *Available Teams* field. Click *Join* >>. The team is displayed in the *Member of Teams* field.
4. Click *Save Changes*.
5. Access the team folder on Lotus Foundations.

Network file system

What is NFS?

NFS (Network File System) is a protocol invented by Sun Microsystems that enables clients using UNIX and similar operating systems to mount file systems from remote servers. This chapter is for advanced users that are familiar with UNIX and similar operating systems. Refer to http://en.tldp.org/HOWTO/NFS-HOWTO/ for more information on NFS.

Installing and configuring ugidd

If your user ID on the local system is different than your user ID on the Lotus Foundations server, you cannot access mounted directories. To avoid this problem:

1. Install ugidd, which is an application that provides user name and ID information to NFS on your local system.
2. Select *File* from the Server Setup menu on the left side of any WebConfig screen. The *File Server Setup* screen is displayed.
3. In the Mapping scheme for NFS field, select "ugidd".
4. Click *Save Changes*.

If you are using NIS (Network Information Server) or a similar application that provides usernames and IDs to the network, you generally do not need ugidd.

Mounting an NFS directory

To mount a directory, you must have superuser privileges. Follow these steps to mount an NFS directory:

1. If necessary, install ugidd on your workstation.
2. This step is optional. If you already know what directories you are able to mount, proceed to step 3. From a shell prompt, type:
   `showmount -e` **`SERVER_HOSTNAME`**

   Where **SERVER_HOSTNAME** is the hostname of the Lotus Foundations server.

3. At the prompt, type:

`mount` **`NFS_DIR LOCAL_DIR`**

- **LOCAL_DIR** is the path to an existing directory on the local network
- **NFS_DIR** is specified as `hostname:/path/directory`
- For example, to mount the home directory of the user josefk under the local directory `/mnt/josefk`, enter the following information: `mount hostname:/export/home/josefk /mnt/josefk`

Unmounting an NFS directory

You should unmount when you are done with a mounted directory or when you are going to logout. From a shell prompt, type (using `/mnt/josefk` for an example):

```
umount /mnt/josefk
```

rsync

What is rsync?

Rsync is a Unix based utility that enables incremental files and directory synchronization from one location to another. This can be used to copy data files from the Lotus Foundations server, to another system which must also support rsync. An advantage to using this file transfer method is that only the changed portions of the files are transferred, rather than the entire new version of the files and directories.

> **Important Note**
> In order to use rsync, commands must be run within a telnet session. Therefore, basic knowledge and understanding of the Linux command line is strongly recommended.
>
> For a more detailed explanation of rsync, please visit the following Web site:
>
> http://samba.anu.edu.au/rsync/

Enabling rsync

1. Log into WebConfig as an administrative user.
2. In the *Network Setup* menu in WebConfig, click *Local*. You should now see the *Rsync Server* section.
3. Click the "Enable" radio button in the *Rsync Server* field.
4. Click *Save Changes*.

Rsync From a Telnet session

Pushing data to another location

```
rsync -zav --progress /home/LOCAL_USER/Files REMOTE_USER@REMOTE_SERVER::F
```

Item	Explanation
`rsync`	This of course is the executable command.

`-z`	With this option, rsync compresses any data from the files that it sends to the destination computer. This option is useful on slow connections. The compression method used is the same method that the classic UNIX gzip compression utility uses.
`-a`	A quick way of saying you want recursion and want to preserve almost everything during the synchronization.
`-v`	This option increases the amount of information you are given during the transfer. By default, rsync works silently. A single -v gives you information about what files are being transferred and a brief summary at the end. Two -v flags will give you information on what files are being skipped and slightly more information at the end.
`--progress`	Displays the progress of individual files.
`/home/`**`LOCAL_USER`**`/*`	The local directory to push out to the remote location.
`REMOTE_USER``@`**`REMOTE_SERVER`**	**REMOTE_USER** is the team name at the remote location. **REMOTE_SERVER** can be either the remote servers IP address or the fully-qualified domain name.
	The password prompt following the rsync line is for this account.
`::`	A double colon in the destination field tells rsync to copy from the local server to the remote server. The double colon also separates the host name from the path that follows.
`REMOTE/PATH`	The destination folder or path.
`/`	The “/” appended to the trailing directory eliminates confusion rsync might have with the command. Without this, the path might be interpreted with `/remote_user/dir/dir/` or something similar.

You are then prompted to provide the password for the **REMOTE_USER** account entered into the syntax.

Pulling data from another location

```
rsync -zav --progress remote_admin@REMOTE_SERVER::remote_user/* /home/local_user
```

- The transfer is initiated by the local server, but the files are pulled from the remote server.
- The double colon indicates where the files will be copied from.
- `/home/local_user/Files` represents the path to the destination folder on the local system.

As with the push method, you are prompted to provide a password for the *remote_admin* account.

Using rsync for email

Along with files and folders, rsync can also be used to synchronize email from one location to another. The following is an example of how to send email from one location to another, using a telnet session.

```
rsync -zav /home/local_user/Maildir/ admin_user@REMOTE_SERVER::email-remo
```

- `rsync`: This is the executable command.
- `-z`: With this option, rsync compresses any data from the files that it sends to the destination machine. This option is useful on slow connections. The compression method used is the same method that the classic UNIX gzip compression utility uses.
- `-a`: A quick way of saying you want recursion and want to preserve almost everything during the synchronization.
- `-v`: This option increases the amount of information you are given during the transfer. By default, rsync works silently. A single -v will give you information about what files are being transferred and a brief summary at the end. Two -v flags will give you information on what files are being skipped and slightly more information at the end.
- `/home/local_user/Maildir/`: The local mail account from where the mail is being copied.
- `remote_admin@REMOTE_IP`: *remote_user* is the team name at the remote location. The fully-qualified domain name might alternatively be used. The password prompt following the rsync line is for this account.
- `::` - A double colon in the destination field tells rsync to copy from the local server to the remote server. The double colon also separates the host name from the path that follows.
- `email-remote_user`: The destination folder or path. The email- prefix ensures the data gets synchronized to the user's email directory.

Spam scanner

Spam scanner

The spam scanner is an add-on software module. You must have a valid Spam Scanner license to use this feature.

The spam scanner filters all incoming emails received via SMTP before the messages are delivered to the user's mailbox. Once filtered, incoming emails are categorized into one of the following three categories:

- Not Spam: An email that is identified as not being spam is sent to the recipient.
- Probably Spam: An email that is identified as probably spam is sent to the recipient and have its subject header flagged as `[Spam?]` for easy identification.
- Definitely Spam: An email that is identified as definitely spam has its subject header flagged as `***SPAM***`.

Depending on the rules set by each user, the spam scanner does the following with a spam message:

- Do nothing: The message is not modified and the email will be delivered to the recipient as normal.
- Mark: Send the email to the recipient with its subject header flagged as `***SPAM***` or `[Spam?]` This is the default setting.
- Delete: Delete the message without ever being sent to the recipient.

To set up rules, see *Configuring Users' Spam Filters* later in this chapter.

You can also configure a whitelist or blacklist for each user, enabling you to specify specific email addresses or domains to allow or disallow.

To set up whitelists or blacklists, see the *Configuring Whitelists and Blacklists* section later in this chapter.

To activate your spam scanner license:

1. Select *Email* from the main WebConfig menu.
2. On the *Email Setup* page, select "Enable" in the *Mail Spam Scanner* field.
3. Click *Save Changes*.

Configuring users' spam filters:

1. Select *User Setup* in the main WebConfig menu. The *User Setup* screen is displayed.
2. Click on the user's edit action button. The *Modify User* screen is displayed.
3. Click *E-mail...* at the bottom of the screen. The *Email Setup* screen is displayed.
4. Under *Treatment of definite / probable spam* choose amongst: "Do Nothing", "Mark subject", or "Delete".
5. If you would like to configure a whitelist or blacklist for this user, click *Configure* beside *Spam Scanner Whitelist / Blacklist*.
6. Click *Save Changes*.

Users might change their own treatment of spam setting by logging into the WebConfig with their user account and changing the setting shown above.

Configuring whitelists and blacklists

Lotus Foundations is now equipped to handle whitelists and blacklists on a per-user basis, and globally. Whitelists are domains or email addresses that you want to allow through the spam filter without any checks. One example of this is for your own internal email addresses. Blacklists are domains or email addresses you want to block out entirely, which might be offers from specific companies or mailing houses. You can also add IP addresses to the lists if a particular SMTP server is known to deliver spam.

Configuring a global whitelist / blacklist

1. Click *Email* in the main WebConfig menu.
2. Enable the *Mail Spam Scanner*, and click *Configure*.
3. Select the type of entry to add to the list.
   - Select "Domain" to allow or disallow a particular domain's emails
   - Select "Email" to allow or disallow a particular email address's emails
   - Select "IP Address or Range" to allow or disallow a particular IP address or range of addresses from delivering email to the server

- Enter the domain, email or IP address range into the given text boxes.
- Select "Whitelist" to allow the provided entry into Lotus Foundations mailboxes, or Blacklist to block them.
- Click *Save Changes* to add the entry to the list.
- Lotus Foundations now checks its Whitelist and allow all entries through, then perform a check of the Blacklist to block any matches. The Whitelist always is applied first.

Virus scanner

Virus scanner

Lotus Foundations AntiVirus is an add-on software module. You must have a valid Lotus Foundations AntiVirus virus scanner license to use this feature. The AntiVirus software in Lotus Foundations is provided by a company called Kaspersky, who supplies OEMs (like Net Integration Technologies) with Anti-virus solutions. They have won numerous awards for their anti-virus technology. You can find out more at the Kaspersky website.

Lotus Foundations AntiVirus virus scanner gives you complete antiviral protection for your Lotus Foundations-powered server with both file- and mail-level virus scanning. Lotus Foundations AntiVirus scans for viruses on the local filesystem and incoming and outgoing email messages including mail collected from external mailboxes. Lotus Foundations AntiVirus will detect infected, suspicious, corrupted and password-protected files, as well as files that fail to be scanned because of an error. All infected, suspicious and corrupted objects that can not be automatically repaired are quarantined.

File virus scanner

Lotus Foundations AntiVirus file virus scanner is not a real-time scanner, which means that it does not scan for viruses as data is transmitted/copied/moved to the Lotus Foundations server. Instead, the Lotus Foundations server runs a scheduled file scan once every 12 hours by default. This provides maximum stability and available resources to the daily operations of the Lotus Foundations server, which is especially important if you are using several features of the server at the same time. When a virus is encountered, it will be cleaned up if possible. Otherwise it will be renamed to "filename-INFECTED" and the user in whose directory the file was found will be informed via email of the virus.

Mail virus scanner

Lotus Foundations AntiVirus mail virus scanner scans all incoming and outgoing email messages, including attachments, for viruses. When mail messages that contain infected, suspicious, and other objects are detected, the virus is immediately removed and a warning is sent to the sender and recipient along with the original, but virus-free, mail message.

Activating your file virus scanner license

1. Select *File* from the menu on the left side of any WebConfig screen. The *File Server Setup* screen is displayed.
2. In the *File Virus Scanner* field, select "Enable".
3. Click *Save Changes*.

Activating your mail virus scanner license

1. Select *Email* from the menu on the left side of any WebConfig screen. The *Email Setup* screen is displayed.
2. In the *Mail Virus Scanner* field, select "Enable".
3. Click *Save Changes*.

Glossary

ADSL	Asymmetric Digital Subscriber Line ADSL uses standard phone lines to deliver high-speed data communications. ADSL uses the portion of a phone line's bandwidth not utilized by voice, allowing for simultaneous voice and data transmission.
Bandwidth	This term describes information-carrying capacity of telephone or network wiring. Bandwidth is usually measured in bits per second.
Bit	Binary Digit The smallest unit of computerized data. A bit is represented as either 1 or 0.
Cable Modem	Cable modems provide Internet access over cable TV networks (which use fiber-optic or coaxial cables). They are generally much faster than modems that use phone lines.
Cache	A copy of a program or data that is used for faster access. See also Web Cache.
Certificate Authority	An issuer of Security Certificates used in SSL connections. See also SSL.
Client	A computer system or process that requests a service from another computer system or process.
Data Encryption	Encrypting data is accomplished by applying a scrambling code that makes the data unreadable to anyone who does not have a decryption key. Authorized personnel with access to this key can unscramble it. Data encryption is a useful tool against malicious users.
DHCP	Dynamic Host Configuration Protocol This is an industry-standard protocol that assigns IP information to computers.
Disk Quota	Disk Quota defines the maximum amount of hard disk space allowed for a user's files.
DNS	Domain Name System A set of guidelines and rules that allows you to navigate the Internet using domain names instead of IP addresses.
DDNS or DynamicDNS	Dynamic Domain Name System A system that automatically updates DNS information when a new IP address is assigned to a network.
DNS Server	A computer or server that matches an IP addresses to a domain name. Some ISPs provide a specific DNS address.
DSL	Digital Subscriber Line
Ethernet	A LAN that connects devices like computers, printers, and terminals. Ethernet transmits data over twisted-pair or coaxial cables at 10 or 100 Mbps.
EtherTalk	Networking protocol used by Apple equipment connected directly to Ethernet.
FastForward	The ability to create a passage (or open a port) through your firewall to a service or a server hosting a service. See also Port Number.
Firewall	A device that provides secure Internet access and protects internal networks from intruders.

FTP	File Transfer Protocol An Internet based protocol used to copy files between computers (usually a client and a server) using Unix-based command parameters. You can download shareware or freeware applications that remove all the complexities of Unix and allow you to connect to FTP sites using a web browser.
Gateway	A computer or server that is connected to multiple networks and is capable of routing or delivering packets between them.
HTML	Hypertext Markup Language A set of tags and instructions used to create web pages. HTML tags create page layouts, format text, insert graphics and multimedia, and more.
HTTP	Hypertext Transfer Protocol A protocol that makes hypertext information such as web pages available over the Internet.
Hub	A a piece of hardware that connects computers together in a LAN, allowing information to travel between them.
Internet Gateway	A gateway for accessing the Internet, which is loosely defined as points of entrance to and exit from a communications network. A gateway is the node that translates between two otherwise incompatible networks or network segments. Gateways perform code and protocol conversion to facilitate traffic between data highways of differing architecture. A gateway can be thought of as a function within a system that enables communications with the outside world.
IMAP	Internet Message Access Protocol A popular protocol that allows a client to access email without downloading it to a local computer. Used mainly to read email from a remote location.
IMAP Server	A server that uses IMAP to provide access to multiple server-side folders.
IP Address	Internet Protocol Address The numeric address used to identify and locate a server, computer, or website on the Internet.
IP Address (Dynamic)	A temporary IP address that is assigned to a computer by a DHCP server each time it goes online.
IP Address (Static)	A permanent IP address that is assigned to a computer in a TCP/IP network. Network devices that serve multiple users (such as servers, routers, and printers) are usually assigned static IP addresses.
IPsec	Internet Protocol Secure A type of secure connection between computers at different locations, creating Virtual Private Networks. See also VPN (Virtual Private Network).
ISDN	Integrated Services Digital Networking A digital-communication networking system used for high-speed communication with the Internet. ISDN is available through most telephone companies.
ISP	Internet Service Provider An organization that maintains a server directly connected to the Internet. Users who are not directly connected to the Internet typically connect through an ISP.
Java	Designed by Sun Microsystems, Java is a programming language for adding animation and other action to web sites. In order to view web sites created with Java, your browser has to have Java enabled.
JavaScript	Designed by Sun Microsystems and Netscape as an easy-to-use supplement to Java, JavaScript code can be added to standard HTML pages to create interactive documents. Most modern browsers support JavaScript.

kbps	Kilobits per Second (thousands of bits per second) This is a measure of bandwidth (the amount of data that can flow in a given time) on a data transmission medium.
LDAP	Lightweight Directory Access Protocol The LDAP server provides a directory of users' names and email addresses.
LAN	Local Area Network A LAN links together computers that are in the same building. 10BaseT Ethernet is the most common LAN. See also Hub.
Mbps	Megabits per Second (millions of bits per second) This is a measure of bandwidth (the amount of data that can flow in a given time) on a data transmission medium.
MX Record	Mail Exchange Record A DNS resource record type that indicates which host can handle mail for a particular domain.
NetBIOS	Network Basic Input Output System. A protocol for networking on IBM PC and compatible systems.
NAT	Network Address Translation NAT allows one publicly visible IP address to refer to many IP addresses internally on a LAN, making it look like all traffic was generated by a single external IP address.
NFS	Network File System A protocol developed by Sun Microsystems which allows a computer to access files over a network as if they were on its local drive.
NIC	Network Interface Card An adapter card that physically connects a computer to a network cable.
NTP	Network Time Protocol An Internet standard protocol (built on top of TCP/IP) that assures accurate synchronization to the millisecond of computer clock times in a network of computers. Running as a continuous background client program on a computer, the NTP client sends periodic time requests to external time servers, obtaining server time stamps and using them to adjust the client's clock.
Packet	A unit of data transmitted over a network. Large chunks of information are broken up into packets before they are sent across the Internet.
Packet Filter	A filter that blocks traffic based on a specific IP address or type of application (email, FTP, web, etc.), which is specified by port number.
Peer-to-Peer Network	A network where there is no dedicated server. Computers with access privileges can share files and peripherals with all other computers on the network.
PhpMyAdmin	PHP MySQL Administration A program used to administer MySQL databases, and provides a user interface.
PING	Packet InterNet Groper A program used to determine if a server is functional. It sends small packets to the server, which replies with similar packets.
POP3	Post Office Protocol 3 A popular protocol used most often by ISPs for receiving email messages. POP3 servers allow access to a single Inbox (as opposed to IMAP servers, which provide access to multiple server-side folders.
Port Number	A number assigned to an application program running on a computer in a TCP/IP-based network such as the Internet. The number is used to link the incoming data to the correct service. There are several standard port numbers. For example, port 80 is used for web traffic.

PPP	Point-to-Point Protocol A method of transmitting protocols (such as IP) over a serial link. PPP is most often used in dial-up modem connections from a home computer to an ISP.
PPPoE	Point-to-Point Protocol over Ethernet PPPoE is often used to connect DSL providers. Because it is based on two common standards (PPP and Ethernet), it is easy to integrate into existing networks.
PPTP	Point-to-Point Tunneling Protocol PPTP ensures secure communications over Virtual Private Networks that use public phone lines.
Protocol	A set of rules that govern network exchanges.
Proxy Server	A server that acts as a barrier between an internal network and the Internet. Proxy servers can work with firewalls, which help keep outside users from gaining access to confidential information. A proxy server also allows the caching of web pages for quicker retrieval.
RBL	Realtime Blackhole List A ‘spam’ blocker that has different levels of spam protection (such as Strong or Medium).
Router	A device that handles the connection between two or more networks.
Routing	The act of directing packets between networks.
Routing Table	A list of destinations known to the router (server) that allows user traffic to get to and from its destinations.
RSA	Rivest Shamir Adleman An Internet encryption and authentication system that uses an algorithm developed by Rivest, Shamir, and Adleman.
Security Certificate	Information used by the SSL protocol to establish a secure connection. Contains information about who a certificate belongs to, who issued it, its unique serial number, its valid dates, and its encrypted ‘fingerprint’ that is used to verify the contents of the certificate. See also SSL.
Server	A computer or software package that provides specific services to a client. The term can refer to a particular piece of software (such as a web server) or to the machine on which the software is running. A single server can run several different server software packages.
SNMP	Simple Network Management Protocol A protocol used to collect statistical information from a host about parameters such as central processing unit (CPU) utilization.
SMTP	Simple Mail Transfer Protocol A protocol used for transferring or sending email messages between servers. Another protocol (such as POP3) is used to retrieve the messages.
SQL	Structured Query Language A language used to create advanced databases.
SSL	Secure Sockets Layer A protocol that allows encrypted, authenticated communications to travel across the Internet. SSL is used mostly in communications between web browsers and web servers. URLs that begin with "https" indicate that an SSL connection is being used. Each side of an SSL connection must send a valid Security Certificate to the other. Each side then encrypts what it sends using both certificates, thereby ensuring that only the intended recipient can de-crypt it, that the other side can be sure of the data’s origin, and that the message has not been tampered with.

Subnet	A portion of a network (which may be a physically independent network segment) that shares a network address with other portions of a network. A subnet is distinguished by its own subnet number.
TCP/IP	Transmission Control Protocol/Internet Protocol A popular suite of protocols that allow computers to communicate on the Internet.
Telnet	An application that lets you access resources on a Unix or Linux computer. In order to use Telnet, you need to be familiar with Unix-based programs.
UDP	User Datagram Protocol A protocol used throughout the Internet for services such as DNS.
URL	Uniform Resource Locator The standard method to give an address of any resource on the Internet. A URL looks like this: http://www.nitix.com.
VPN	Virtual Private Network VPNs allow communication between users in different offices. To prevent people on the Internet from intercepting transmissions, all information that passes through a VPN is protected with 128-bit encryption, the strongest encryption technology available.
WAN	Wide Area Network A network that connects different LANs using routers.
Web Browser	An interface that lets you view material on the Internet. The most popular web browsers are from Microsoft and Netscape.
Web Cache	An area on your hard disk that is reserved for storing images, text, and other files that have been viewed on the Internet.
WebConfig	Nitix has a web-based configuration system. To connect to WebConfig, enter http://hostname:8043 in the address bar of a web browser. For example, if your Nitix-powered server's host name is thunder, enter http://thunder:8043 in the address bar. See Chapter 3: Connecting to WebConfig for more information.
WebMail Server	A system that allows users to access their email account using any standard web browser.

Copyright

Copyright statement