



# LabExpert®

## Documentation

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## Executive Summary

As a resource manager for computer classrooms or labs, much of your time is spent installing software, stringing cables and manually resetting computers, etc.

As the industry's premier networked computer automation software, LabExpert provides managers of networked computers with outstanding control over their resources. LabExpert lets you manage your computers from a single node on the network. From any computer, you can be in control.

LabExpert helps you control costs as well. Companies invest large sums of money to develop labs and classrooms for testing and training, yet fail to manage on-going expenses contributing to the bill. IS personnel for instance—spend much of their time completing redundant tasks.

LabExpert not only reduces overall administrative costs, it allows you to devote your time and energy to real challenges. For example, LabExpert helps you optimize your efficiency and accuracy, which allows more time for design, test analysis and program planning.

## What LabExpert can do for you

- Easily store and restore images
- Quick turnaround of test environments
- Fast change-over of classroom resources
- Quick and easy cleanup of PCs in student labs
- Fast restore of corrupt PCs in classroom or student lab
- Fast installation and configuration of Windows 95/98 and NT

## Overview

LabExpert is a flexible suite of six closely integrated automation tools and technologies as shown in Table 1.

**Table 1: LabExpert Suite Components**

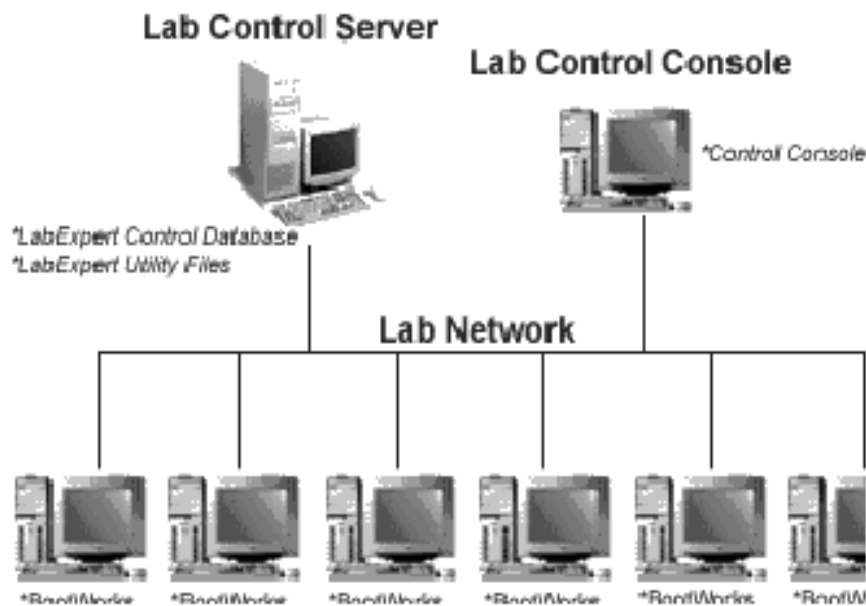
<u>BootWorks®</u>	A virtual boot ROM governing the boot sequence of the computer.
<u>LabExpert Control Console (LCC)</u>	The central point of control for managing the entire automation process.
<u>ImageBlaster Agent™</u>	A disk imaging technology providing rapid duplication of software to networked resources.
<u>SIDgen™</u>	A security attribute modification utility for Windows NT that regenerates SIDs for NT Workstations and Servers (standalone, PDC and BDC).
<u>Registry Management</u>	Tools that help manage the registry files in Windows 95/98/NT
<u>Remote Control Agents</u>	Software agents residing on each computer allowing you to cause a remote reboot from the control console.

**Table 1: LabExpert Suite Components**

<u>Process Builder</u>	A utility that instantly configures all required batch files for basic image management (task chaining, console scripting, etc.).
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## LabExpert Basic Model

The LabExpert basic configuration model is shown in Figure 1. It consists of a server, control console and any number of computers. The server can be any type of server providing file-sharing capabilities, such as a dedicated file and print server or a peer-to-peer workstation to which the networked computers can establish a connection.



**Figure 1: LabExpert Basic Model**

The Lab Control Server (LCS) contains the BootWorks control database as well as any disk images, registry sets or other files needed to individually configure the computers.

The LabExpert Control Console (LCC) is a Windows 95/98/NT workstation or Windows NT server from which the LabExpert Control Console is executed. This can be your console (or any PC) from which the automation process is managed.

The computers can be any type of Intel-based PCs having a network connection to the LCS. The BootWorks agent is executed on each computer.

**Note:** Figure 1 shows all components on the same network. The LCS, LCC and the networked computers can be on any network as long as the computers and console can establish a connection to the server. You can, of course, share the same computer under Windows for the LCS/LCC.

## BootWorks

One major problem in configuring several computers with new software is getting the computers into a state where the desired software can be installed. For example, to install Windows 95/98 onto computers that previously had a UNIX-based operating system, boot each computer from a "bootable" floppy, load the necessary LAN drivers and client software to gain access to a central server and install Windows 95/98 from the central server. This process requires you to go to each computer, boot it and type the proper instructions on the keyboard everytime you want to make a change.

To alleviate the need for operator input at each computer, LabExpert provides BootWorks, Altiris' patented technology. When BootWorks is installed on a workstation's hard drive, it controls the boot sequence of the computer by acting as a 'virtual floppy'. When some sort of automation work is to be performed on the computer, BootWorks causes the computer to "boot" from the virtual floppy. BootWorks examines the LabExpert Control Database residing on the server, determines the type of automation work to be performed, then initiates the desired work. When no automation work is intended, BootWorks causes the computer to "boot" normally into the "production" operating system.

In this way, you set up the necessary automation work through the LCC and let BootWorks start the work on each computer. BootWorks can be executed from a bootable floppy or it can be installed on a computer's hard drive and act as a virtual boot ROM.

Installing BootWorks on a computer's hard drive alleviates the need to use a floppy disk to get the computer to perform some type of automation work. When the computer is running the "production" operating system, BootWorks is NOT in memory nor visible on the hard drive; therefore, it does not interfere with the "production" operating system.

## **The Control Console**

The console is the central point of control for LabExpert. It's a GUI-based application from which you control the automation process for the networked computers. It presents the computers to you as icons, allowing you to create or edit DOS batch and script files to be "assigned" to the computers. It provides a mechanism whereby the computer can be booted remotely when needed. The information used and manipulated by the LCC is contained in the control database on the LCS.

The process of "assigning" a DOS batch file to a computer is as simple as dragging a batch file to the computer's icon. It's like putting the batch file on the virtual floppy for that computer. The next time the computer boots and runs BootWorks, it executes the "assigned" DOS batch file. Since the computer is running DOS while in the automation mode, any valid DOS command or program can be executed in the DOS batch file.

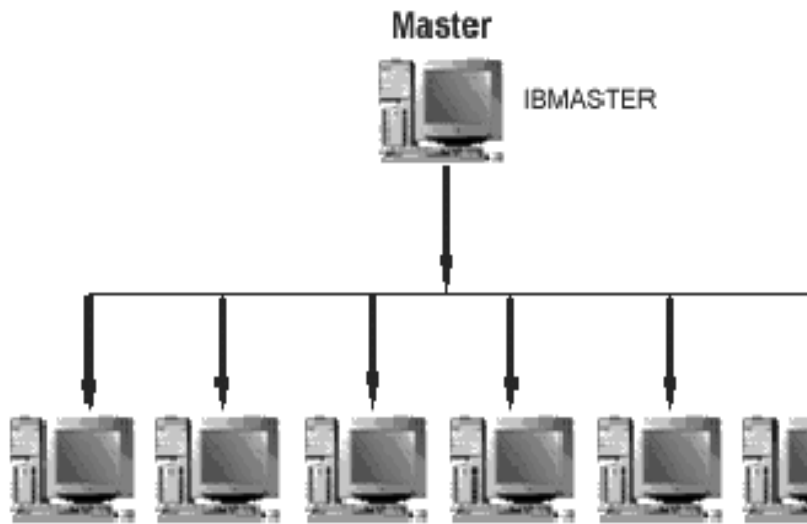
This process makes it easy to launch the ImageBlaster Agent imaging tools.

## **ImageBlaster Agent**

ImageBlaster Agent consists of four utilities: IBMASTER, IBSLAVE, NWPREP, and SIDgen. These tools allow data located on one computer to be replicated (or imaged) to other computers independent of drive geometry.

IBMASTER is a DOS-based program used to create images (upload the contents of a hard drive to an image file on a server) or restore images (download the contents of an image file located on a server and placing it on another computer's hard drive). This tool can image the contents of an entire hard drive or it can image only selected partitions. Also, the content of the hard drive is unimportant. ImageBlaster Agent works on FAT partitions as well as NTFS, OS/2 HPFS, NetWare and Unix partitions.

ImageBlaster Agent can also replicate the contents of one computer to any number of other computers simultaneously without creating or reading data from an image file (see Figure 2). This is referred to as "peer-to-peer" imaging. IBMASTER multicasts the drive data onto the wire once and all computers running IBSLAVE pick up the data and write it to their own drives.



**Figure 2: ImageBlaster Agent Peer-to-Peer Model**

Imaging tools from other companies require the image data be located in an image file on a server and each computer receiving the image read the data from that file. This means more data is sent across the network as more computers are imaged with the same image. This not only creates more network traffic, it also slows the entire process (almost exponentially). Since ImageBlaster Agent uses a multicast mechanism, the time required to image 1000 computers is the same amount of time required to image two or three.

ImageBlaster Agent can also use a combination of the above methods. It can create an image file on the server while it multicasts the data to the slave computers or it can restore an image from an image file stored on a server and multicast that image to the slave computers.

Disk imaging is a fast and convenient way to distribute the same software to many computers ensuring all computers are configured identically. Libraries of images can be created so reconstruction of a networked environment can be accomplished by downloading the original images to the computers—thus ensuring each computer is configured exactly as it was originally.

## Registry Management

One of the great features of disk imaging is all computers are configured with EXACTLY the same software, same OS, same drivers, same utilities, etc. One of the drawbacks of disk imaging is all computers receive EXACTLY the same configuration settings.

This presents a problem for products such as Windows 95/98/NT that keep both hardware and software configuration information in their “registries.” The registry for one computer may not be what is needed on another computer due to changes in hardware as well as software or environment changes.

To overcome this problem, LabExpert provides a set of registry tools. The first set of tools allows you to “archive” the registry files for the computers, store them on the LCS and restore them after subsequent imaging.

For example, an image might contain Windows 95/98 along with specific tools and applications. This image can be replicated to all of the networked computers after which Windows 95/98 is allowed to “discover” any differences in hardware and update the registry accordingly. Customizations such as computer name, workgroup, IP addresses, etc. can be made to each computer.

When all the computers are configured as desired, their registry files can be archived with the registry manager tool and stored on the LCS. This “registry archiving” procedure is performed only once when the image is first created.

From this point forward, the exact configuration can be recreated by first distributing the image to all computers and then restoring the archived registries from the LCS.

The second registry tool allows you to create one database file (text file) containing the specific registry keys and values to be changed on each computer and have a .reg file created on each computer containing only the values for that particular computer. The .reg file can be imported into the computer's registry.

By combining the Registry Management tools with use of the Remote Control Agents, you have complete control of every computer, whenever you want.

## The Remote Control Agents

The Remote Control Agents are services or programs executed on each computer able to receive command instructions from the LCC. When you want a computer to reboot or execute a particular command, a command instruction is sent from the control console to the designated computer. The agent on the computer receives the command and executes the command or reboots the computer. The following agents are currently available:

- DOS agent
- Windows 95/98 service
- Windows NT service

These services are configured and installed when you use the Client Install diskette.

## Process Builder

Many setup and configuration tasks for computers require several events. For example, to restore a Windows 95/98 computer from an image file, complete with its original registry files, requires multiple steps. As an overview of what's required:

- An image is restored to the computer using the ImageBlaster Agent.
- The computer is rebooted so the new data on the hard drive can be read by the operating system.
- The registry files are restored via the registry manager.
- The computer is rebooted again to boot the newly installed/re-installed Windows 95/98, complete with the new registry data.

This process can be completed manually or automatically. Because the management work performed via the LabExpert Control Console (LCC) is immediate and singular, meaning it happens immediately and one thing at a time, you can manually input each command at the LCC to start each event. From the LCC you can:

- Assign a batch file to the computer that launches and performs the image process.
- Send a reboot command from the console to force the computer to reboot and execute the assigned batch file.
- Assign a second batch file that runs the registry manager to restore the registry files.
- Send a second reboot command from the console to force the computer to reboot and execute the assigned batch file.
- Mark the computer to boot to its production partition.
- Send another reboot command to make the computer boot to the new Windows 95/98.

As you can see, this is not necessarily a complex process, but one that requires manual input at several different points in the process.

Or, you can "chain" these events to each other so each step follows the previous step without your input with two additional utilities.

## LABCMD and NEXTSTEP

LabExpert provides two utilities to make command chaining possible: the console scripting tool LABCMD and the NextStep command. Using LABCMD, construct one batch file to automatically execute a second batch file when the first completes and forces the computer to reboot. The second batch file uses NextStep to mark the computer to boot to its production partition and forces the reboot when complete.

In this chaining scenario, you use the LCC to assign the first batch file and, with LABCMD and NextStep, you reboot the computer and walk away. All the events are performed in sequence without further intervention.

# LabExpert Quick Start Guide

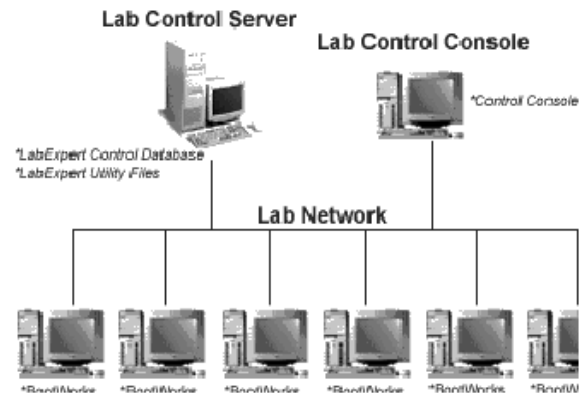
Welcome to Altiris LabExpert! If you require more information beyond the scope of this Quick Start guide, see the details in the Configuration and How Do I? sections of the on-line manual. Once you have installed LabExpert, you can perform any of the following tasks instantly:

- Save and restore images at will, manually or unattended
- Reboot and control every networked computer from a single PC (your Control Console)
- Upload each client's registry files individually
- Upload new registries anytime without creating entirely new images
- Download registries (separate from the entire image) one at a time or in groups whenever necessary

## LabExpert Components

LabExpert includes the use of a Lab Control Server (LCS), a LabExpert Control Console (LCC), and client computers (When using Windows 95/98/NT, the LCS and the LCC can be the same computer.) This Quick Start Guide illustrates the use of LabExpert using only two client computers plus a server and a Control Console. Each client should be designated as either:

- An image source computer (a computer already loaded with Windows, etc.)
- An image recipient computer (any other computer)



## Before You Proceed

These instructions assume the following:

- You have already downloaded the LabExpert Suite onto a network server (either a dedicated server or a shared server device) but not installed the suite, or you are installing from a distribution CD-ROM.
- You have a computer already configured with an operating system, applications and files you want to image.

**Note:** If you don't have a computer ready to image, see Create a Base Image Computer in the on-line manual.

## Install LabExpert

1. From the Windows 95/98/NT client that you want to become the LabExpert Control Console (LCC), login as an administrator to the server to which LabExpert has been downloaded.
2. From the LCC, run the LabExpert setup utility LE\_SETUP.EXE.

Accept the recommended server directory name LABEXPRT (for example: F:\LABEXPRT where F:\ is the drive mapping to the LabExpert server).

**Note:** Notice the missing "E" in the directory name.

3. Enter the License key information acquired from your reseller or from Altiris. The licensee and key are both case and space sensitive.

## Create a BootWorks User

1. Use the appropriate network administration utility to create a user called "bootwork" with no password.
2. Grant "bootwork" sufficient rights to create, open, read and write to the \LABEXPRT directory.

For a Windows server:

- a. Make the LABEXPRT folder a shared folder (a Share point).

For NetWare networks only:

- a. Configure the "bootwork" user to automatically set a search path to the \LABEXPRT\BIN directory.
- b. Make \LABEXPRT\DATA the current working directory for the "bootwork" user.

## Create BootWorks Diskettes

BootWorks lets you reboot all client computers from the LCC. You can also specify which commands each computer processes as it boots. You must first install BootWorks on each client PC with a BootWorks Install diskette.

Use the Boot Disk Wizard to create three diskettes:

- Two “Install” diskettes
- One “Boot” diskette

### Create the Install Diskettes

Two Install diskettes are required to install the BootWorks Partition on two client computers. The BootWorks Partition (also called the Automation Partition) lets LabExpert remotely image and configure the client computers.

**Note:** You can use either IP or IPX protocol. If using IPX, one Install diskette works on multiple clients, so you would only need to make one Install diskette.

To create the Install diskettes,

1. Make sure the LCC client has Internet access to retrieve the necessary drivers.
2. Select **Start > Programs > Altiris LabExpert > Boot Disk Wizard**
3. Select the appropriate DOS for the clients.
4. Select the server type.
5. Select the protocol.
6. Select and configure the appropriate NIC type.
7. Using the directions provided in the information frame of the **Server Authentication** window, set your network drive mapping.
8. Select the **LabExpert Install** application type.
9. Accept the default partition size of **4 MB** when building an **Install** diskette.
10. Set the duplication count to two (2) and change computer name when prompted for the second diskette.

### Create the Boot Diskette

You need to create one Boot diskette to boot and connect a client to the server and map the required drives to the LabExpert directories.

1. Repeat steps 1 through 8 above, substituting **LabExpert Boot** for the application type in step 8. See the Boot Disk Wizard documentation in the on-line manual for more information.

## Create Batch Files

Altiris provides the LabExpert Process Builder to automatically create a series of batch files simplifying the image file configuration process. The following exercise uses two client computers: one as a Master computer, the other as a Slave (it doesn't matter which client is the Master or Slave).

To create batch files,

1. **Choose Start > Programs > Altiris LabExpert > LabExpert Control Console.**  
The “Getting Started” help system is displayed. You can follow these abbreviated steps anytime you need a reminder of what to do and how to do it. For now, close the Getting Started window and continue with step 2.
2. Run the LabExpert Process Builder by opening **Tools > LabExpert Process Builder**.
3. Fill in all applicable fields by following the prompts in the right portion of the window.
4. Make note of the category and image descriptor you specify to contain the batch files. These names define the directory structure and image file name used and displayed in the LCC. For example:  
A <category> of **training** and an <image descriptor> of **win95** results in the creation of two folders and an image filename. The actual structure created from the example above looks like this:  
**\LABEXPT\DATA\TRAINING\WIN95\WIN95.IMG**
5. Set the number of Slave computers to **1** (one).



6. In the lower right corner, select **Automation Partition** for this build.
7. After providing the required information, click **Build**.  
The Process Builder instantly creates the required batch files according to the selections you make.
8. Click **Exit**.
9. To verify creation of the batch files you just created, at the LabExpert Control Console, click the plus signs (+) next to **Batch Files**, **<Category>**, and **<Image Descriptor>**. The batch files should appear.
10. Write down the names of the **<Category>** and **<Image Descriptor>** you created. These names are used again in step 13 of the **Create the Image File** section.

## Create the Image File

Now you are ready to create an image file. The image must include LabExpert's Remote Control agents. The Client Install Wizard creates a diskette with the necessary files.

**Warning: Before creating an image for a computer running Windows NT, modify your c:\boot.ini file so all references to Partition (1) are changed to Partition (2).** See IBMIGRAT.EXE in the online documentation.

1. Obtain a blank, formatted diskette.
2. At the LCC computer, choose **Start > Programs > Altiris Client Install > Make Client Diskette**  
The diskette is created with the appropriate files.
3. Insert the new Client Diskette into the image source computer (it should currently be up and running Windows) and run A:\SETUP.EXE.
4. Select **Remote Control for LabExpert** and click **Next, Next, Finish**.
5. Boot the image source computer with the LabExpert Boot Diskette you created earlier in the Create BootWorks Diskettes section. This establishes a temporary connection with the server.
6. (Windows NT only) When asked to create a password file, press Enter, type **Y** and press Enter. Without typing anything more, press Enter again. The process stops at a **NONE FOUND** message.
7. When prompted for the computer's object name, enter a unique name used to identify this computer at the LCC.
8. The BootWorks (Automation) Partition must reside in the first partition on a hard drive. You are going to move your current partition using the LabExpert utility IBMIGRAT.EXE.
9. At the F:\DATA prompt, run IBMIGRAT.EXE.
10. Type **S** to Slide the partition. Your existing partition is redefined to reside in Partition 2. IBMASTER.EXE start automatically.
11. Select **Upload to image file**.  
IBMaster displays the partition as if it were installed on partition 2.
12. Select Partition 2 by pressing the Space Bar and Enter.
13. Type an image file name to fit the following pattern:  
.\<CATEGORY>\<IMAGE DESCRIPTOR>\<IMAGE DESCRIPTOR>.IMG  
replacing the **<category>** and **<image descriptor>** with the same values recorded from step 10 in the **Create Batch Files** section. For example: .\TRAINING\WIN95\WIN95.IMG
14. Select **Start**.  
An image is created of your Windows partition. The image is saved in the  
F:\LABEXPT\DATA\<category>\<image descriptor> directory and is called **<image descriptor>.img**.
15. **While your image is uploading, complete the Install BootWorks section for the image recipient computer.**  
When you return to this PC after the upload is complete, choose **L** to leave the partition in its shifted state.

**Check Point :** When complete, the image file is stored on the server, ready to download to the client computers.

## Install BootWorks

While the base image computer (the first client) is uploading the image, install BootWorks on the second client.

1. Use one of the BootWorks install diskettes to boot the second client (the image recipient computer).

2. If a partition is found on this computer, you are prompted for a decision. Since you are currently saving the partition you want to use from the other client, and will download it to this client PC later, select **E to erase** this partition and follow the on-screen instructions
3. When the Automation Partition installation is complete, the computer is left at the A:\ prompt. Remove the diskette and reboot the computer.
4. As the computer reboots:
  - a. NetWare logs you in without additional steps
  - b. Windows NT requires you to press Enter to accept “bootwork” as the user login name and press Enter again. When asked to create a password file, type **Y** and press Enter. Without entering anything more, press Enter again.
5. When prompted for the computer’s object name, enter a unique name used to identify this computer at the LCC.
6. Using the second install diskette, repeat steps 1 (erasing the existing partition) through 4 on the image source computer, once it has completed its upload procedure. The second “install” diskette is used so this computer receives a unique IP address and computer name (if using IP).

Step 5 is not repeated because this computer already has an object name (computer name) in the LCC database, so you are not prompted for the object name again.

**Important:** This computer stops at a **BootOrg or non-system disk** message. This is correct. Continue with the **Test the Installation** section.

## Test the Installation

Test your installation by following these steps:

1. From the LCC, verify that the client computers are displayed in the console’s list view. Click the **All Computers** icon in the left half of the LabExpert console screen.  
You should see a computer icon for each computer configured with BootWorks. You can press **F5** anytime to refresh the display.
2. Create a group at the console.
  - a. Right click the Groups icon.
  - b. Select **New > Group** and enter a name.
  - c. Click the **Groups** icon to see the Groups.
  - d. Click the **All Computers** icon to see the computers in the group.
3. Drag and drop the icons for the client computers to the new group.
4. Choose **View > Options**, check **Boot to Automation Upon Batch Assignment** and click OK (you can remove this check mark whenever you want to force a normal reboot, even when a batch assignment exists.)
5. Assign your new group to the KEYTEST.BAT file:
  - a. Click the (+) next to the **Batch Files** icon.
  - b. Click the (+) next to the **Samples** folder.
  - c. Drag the new group’s icon to KEYTEST.BAT. The batch file name is displayed next to each computer icon to which it has been assigned.
6. Manually reboot both client computers.
7. Verify that the client computer screens display **LabExpert Now Functional** message.
8. At the LCC, press **F5** and verify the status field as **Functional test complete**.

If the computer icons aren’t displayed in the right window, click the All Computers item in the top left window.

**Check Point :** LabExpert is installed, the image saved and the client computers are ready to receive the image.

## Multicast the Image File

During a multicast, one target computer is designated as a Master to first receive the image, decompress and multicast the image to all other target (slave) computers. This methodology reduces the load on the server and requires the image to cross the wire only twice instead of once for each target, even if you are imaging 2000 computers.

1. At the LCC, drag the group you created earlier to SLAVE.BAT (in the <image descriptor> directory specified earlier for the batch files creation).
2. Drag one computer icon to MASTER.BAT (in the same directory) overriding the slave assignment made in step 1 (it doesn't matter which computer you use as Master or Slave).
3. Right click the group and select **Reboot**. (If you selected IPX while creating the boot diskettes, open View > Options > Remote Control and select IPX/SPX in the Communications Protocol box.)  
The two client computers reboot, come up in Automation Mode and receive the image. After automatically rebooting again and, if the image is a Windows 95/98/NT image, the computers try to download registries. Because the registries have not been uploaded yet, an error message is displayed stating the registries can't be found. **Do NOT press Esc**.
4. After receiving the error, mark the computers to boot to **Production Mode** through the LCC (right-click the group and select **Boot to > Production**).
5. Reboot both client computers.  
The computers boot to Production Mode. If the image is using Windows 95/98/NT, an error message appear because both computers received the same registry files.
6. Click OK. The normal process of trying to auto-detect hardware might delay boot completion. This means you might need to wait a few minutes to ensure the computers have completed all necessary auto-detection of hardware before continuing.

## Upload Registry Files

1. When auto-detection is complete, physically go to each computer and ensure that all Computer Names and IP Addresses are set to unique values. Allow the computers to restart as prompted by Windows.
2. At the LCC, drag your group to REGUP.BAT in your batch file directory and reboot both client computers.  
When the computers reboot, they upload (back up) their registries, then reboot again to Production Mode.

**Check Point:** The necessary Registries have been backed up. You now have the three required components: 1) the image file, 2) the individual registries and 3) the batch files necessary to place this Image Configuration on one or more computers.

## Test the Complete Solution

1. At the LCC, drag one client computer icon to SLAVE.BAT.
2. Drag the other client computer icon to MASTER.BAT.
3. Reboot both client computers.

The computer screens display each client's progress.

**Check Point:** The computers all receive the same image, then reboot and receive their own backed up registries, and finally reboot again to production mode, each with their own Computer Name, IP address and any other settings that were stored in the registries.

**Important:** The REGUP.BAT and REGDOWN.BAT files are two very powerful tools that make the automatic restoration of registries possible. Once the registries are established, you don't need to visit each client every time you multicast an image. From then on, the correct registry files are automatically downloaded to the appropriate computer whenever they receive this image. You can even download just the registries anytime you want. Learn about the full potential of these tools in the How Do I? section of the on-line manual.

By repeating the procedures above, you can set up any computer or group of computers for control by LabExpert. Once you've taken a computer all the way through the Upload Registry Files process, you don't need to physically visit that computer again. You can reboot, re-image, and reconfigure a computer from the LCC. For information about all Altiris products, see our Web pages at [www.altiris.com](http://www.altiris.com).

# Install LabExpert

## System Requirements

Listed below are the basic hardware and software requirements for installing LabExpert:

### Network Server

- Any dedicated server or peer-to-peer device allowing connection between itself and the clients
- Any network adapter with a DOS-based driver
- IP or IPX protocol stack
- 10 MB free disk space for LabExpert program files
- Additional disk space if storing workstation image files

**Note:** From here on, the network server is referred to as the LabExpert Control Server (LCS) or the server that stores the LabExpert program files and images.

### LabExpert Control Console (LCC)

- Computer running Windows 95/98/NT (3.51 or above)
- 16 MB RAM
- Network connection to LCS
- IP or IPX Protocol Stack

### Networked Computers

- Network adapter with connectivity to LCS
- IP or IPX protocol stack

## Prerequisites

- Complete the hardware installation of your network configuration including computers, network adapters, cables, hubs, etc.
- Determine the computer to be used as the LabExpert Control Console (LCC). Because the installation of LabExpert creates icons and makes registry entries, you need to install LabExpert from the computer you will later use as the LCC.

## Overview

All components of LabExpert are designed to be used either on the LabExpert Control Console (**LCC**) or the client computers. To ensure access to all components from any networked computer, they are stored on the Lab Control Server (**LCS**).

Accept the default directory \LABEXPRT on the LCS during installation and the components are installed in this and following sub-directories.

**Note:** Please see the Update Information page (on line) and the README.TXT file for the latest information on changes, installation issues and known problems.

## Setup

The setup utility, LE\_SETUP.EXE completes these four tasks:

- creates a “home” directory for LabExpert
- extracts the proper files for distribution and places them in a specific directory structure off the “home” directory
- applies your license key information to the proper utilities
- creates several icons on your desktop to access the LCC and the various documents

Since the setup utility creates icons on the desktop, run LE\_SETUP.EXE from the computer acting as the LCC.

The setup utility can be found in the root directory of the LabExpert distribution media or the directory to which you copied the LabExpert package from the net ([www.altiris.com](http://www.altiris.com)).

During installation, you are prompted for a destination directory for the program files. Enter a path to a directory on the LCS. If this path doesn't exist, the setup utility creates it.

**Note:** We recommend you install LabExpert into a directory called LABEXPRT (i.e. F:\LABEXPRT where F:\ is the drive mapping to the LCS). The examples and discussions in this manual assume the product was installed in the \LABEXPRT directory.

Also during the installation, you are prompted to enter the License key information. This information can be obtained from either the letter accompanying the product or an Email from Altiris.

The license key information is case sensitive as well as space sensitive. You must enter it exactly as written. The setup utility doesn't allow you to progress further until a valid key has been entered.

## Directory Structure

The setup utility creates a "home" directory for LabExpert, extracts the proper files from the distribution media and places them in a specific directory structure as illustrated below.

\LABEXPRT

```

|__DATA
    |_ SAMPLES
    |_ TEMPLATES
|__BIN
|__DOCS
|__BOOTWOR
|__TECHSUP

```

**Table 2: Product Directory Structure**

DATA	Contains the LCC along with the computer resource database files. This should be the current working directory for the LCC. This should also be the home directory for the BootWorks clients.
SAMPLES	Contains sample batch files to test the installation and provide you with examples.
TEMPLATES	Contains template batch files that perform most basic setup tasks for computer configurations. These templates can be the starting point for new computer configurations.
BIN	Contains most of the tools except for the LCC. This directory should be in the BootWorks' path during automation mode.
DOCS	Contains the LabExpert manuals. These manuals are in HTML format and can be viewed with any Web browser at <a href="http://www.altiris.com">www.altiris.com</a> .
BOOTWORK	Contains the BootWorks workstation distribution and setup files.
TECHSUP	Contains several debug tools. These tools are used in conjunction with Altiris' technical support staff in troubleshooting problems.

## Licensing Altiris Applications

The setup utility applies the license key to the proper utilities during installation. However, this only applies to the files contained in the initial distribution. From time to time, you may receive updated tools via Email or the Altiris web site. Before they can be used they must be licensed.

A license utility (**LICENSE.EXE**) is included with LabExpert in the **\LABEXPRT\BI** directory. Use this tool to apply your license to executables you receive from patches or upgrades.

You should have received your license information via E-mail, FAX, letter or license file on the distribution media, depending on how you purchased (or obtained for evaluation) the product. You need this information/file as you use the **LICENSE.EXE** utility to license the following files

**Table 3: Tools to be Licensed**

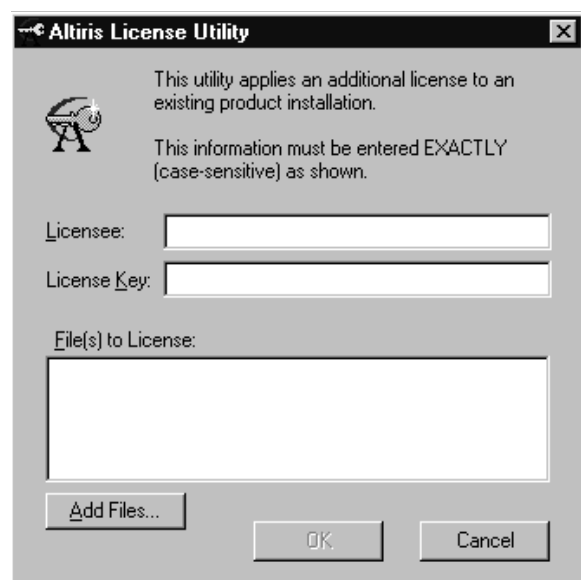
Tool Description	Executable Pathname
Imaging tool	LABEXPRT\BIN\IBMASTER.EXE
Control Console	LABEXPRT\DATA\LABEXP.EXE
Command-line control tool	LABEXPRT\BIN\LABCMD.EXE
BootWorks	LABEXPRT\BOOTWORK\BOOT\BOOTWORK.EXE

The additional utilities in LabExpert are licensed as a part of the suite installation.

**Licenses are additive.** This means you can increase the number of nodes supported by LabExpert by purchasing an additional license with more nodes and applying the new license to the necessary utilities. For example, if your IBMASTER is licensed for 50 nodes and you need 75 nodes, you can purchase a license for an additional 25 nodes and apply the license to IBMASTER thus increasing its license to 75 nodes.

## License Utility

The license utility (**LICENSE.EXE**) is Windows-based, see Figure 3.



**Figure 3: License utility**

To apply a license, either select a license file in the top left window or click New, then enter the license information into the two edit boxes in the top middle. Select an executable in the lower left window and click Apply. To store this information for later use, click Save and enter a filename.

When you select an executable in the lower left window, the current license information for that EXE is displayed in the window to the immediate right. This allows you to see all licenses that have been applied to the EXE.

**Note:** You cannot apply the same license to an executable multiple times. If you try, an error message is displayed.

## Create a user account

The clients need to log into the LCS computer in order to run assigned batch files. Therefore, a user account must be configured for this purpose.

Use the appropriate network administration utility for your server to create a username “bootwork” without a password; otherwise you may need to type the password at each computer when it boots from the network.

**Note:** For security reasons, do not use the “Admin” user for this purpose. Another user name should be created. The actual user name isn’t important, but it must match the name specified when creating a BootWorks install or boot disk.

You may also want to create “Login” or “Profile” scripts that arrange drive mappings so the user has access to utilities and directories of interest (directories accessed to perform work, such as directories that hold disk images, etc.). These steps are usually accomplished with the Client Install Wizard. However, if you wish to perform this work manually, a sample login script is shown below.

After the client has logged into the server the current working directory must be the directory containing the computer resource database in \LABEXPRT\DATA. The \LABEXPRT\BIN directory should also be put in the computer’s path.

### Sample login script

```
PCCOMPATIBLE
map ins s1:=sys:labexpirt\bin
map f:=sys:labexpirt\data
drive f:
```

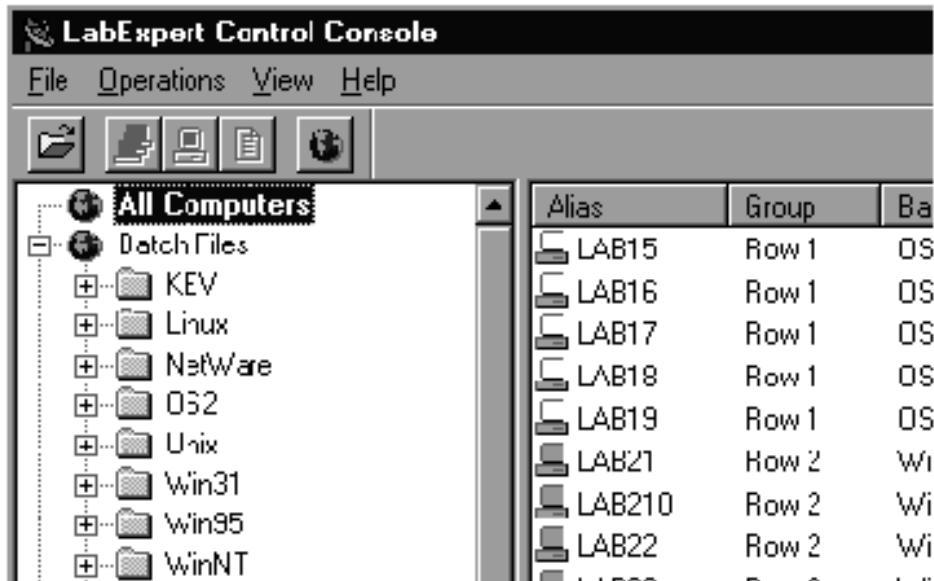
If you elect not to use a “Login Script” or “Profile” to set up the proper paths, make sure you indicate such as you create BootWorks install or boot disks.

**Important:** Rights must be granted to the new user account so it can access (read, write, create, etc.) the home directory, as well as other directories the client uses in performing its work.

## Control Console

The control console (LABEXPEXEXE) is a Win32-based application that must be run on a Windows 95/98/NT client. The LabExpert Control Console (LCC) computer should have a network connection to the LCS with the current working directory mapped to the path where the files are installed. Or, both the LCS and the LCC can be the same computer.

The console is similar to the Windows Explorer utility with drag-and-drop capabilities. It contains two fields or displays: a “tree” view on the left and a “list” view on the right. A sample screen of the console is shown in Figure 4.



**Figure 4: Control Console Display**

Each of the views are discussed below, followed by instructions on their usage.

### Tree View vs. List View

The tree view on the left side controls what is displayed in the list view on the right side. The primary objects in the tree view are “All Computers,” “Batch Files” and “Groups.” When a tree view object is selected, information relative to that object is displayed in the list view on the right as follows:

### All Computers

When you click the All Computers icon, icons representing each computer are displayed in the right frame. Depending on what functions have been assigned, computer names, group names, batch files, addresses and status are also displayed.

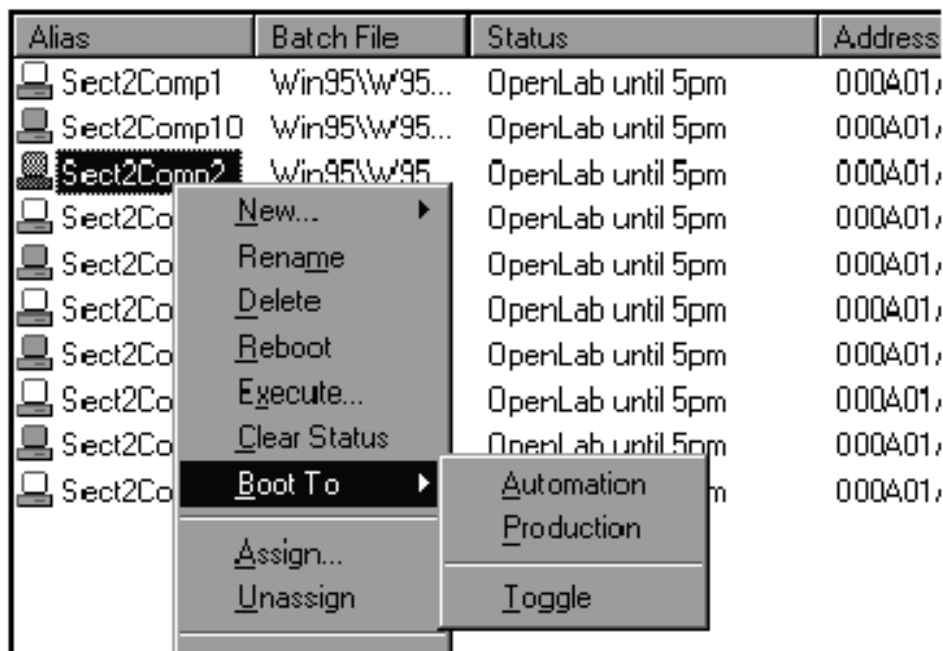
### Groups

One of the powerful features of the Control Console is the ability to create groups containing computers or sub-groups. This allows you to organize your networked computers into logical groups and perform operations on these groups instead of only individual computers.

All operations that affect computers (i.e., batch file assignments, reboot and execute instructions, etc.) applied to a group are applied to all computers within the group and its subgroups.

Right mouse clicking on a group displays a pop-up menu from which most group operations can be made.





**Figure 5: Pop-up menu**

Make assignment operations by dragging and dropping selected objects from the tree view or the list view onto the group. This drag and drop method can be used to put groups within groups as well as computers within groups.

To take a computer out of all groups (so it is not a member of any group), drag the item(s) onto the Root node of all groups labeled 'Groups' (with the earth icon).

## Batch Files

One of the primary functions of the control console is to provide a mechanism whereby DOS batch files can be created/edited and then "assigned" to the networked computers. The console provides an interface for maintaining (creating/editing) these batch files before they are assigned to the computers.

The batch files in the current working directory along with any subdirectories or folders are displayed under the 'Batch Files' object in the tree view. Right mouse clicking on a batch file or folder displays a pop-up menu from which most operations can be made.

The Edit option launches a text editor allowing you to modify an existing batch file. The contents of the batch file are entirely up to you. The console displays the text after the first REM statement as the description for the batch file.

To "assign" a batch file to a computer, list of computers or group, you can:

- click the 'All Computers' object in the tree view to show a list of all networked computers. Select the desired computer(s) in the list view and drag the selection onto the desired batch file in the tree view.
- click the desired group and drag it onto the desired batch file.
- click the desired batch file and drag it onto either the group in the tree view or the computer in the list view.

## Template Batch Files

Altiris includes template batch files as a starting point for your configurations. They include batch files to restore images and restore or manipulate registry files. The template batch files are located in \LABEXPRT\DATA\SAMPLES\TEMPLATE and include the following.

- MASTER.BAT launches IBMASTER.EXE to download an image file and multicast it to slave computers. You can "chain" this batch file to one of the registry template batch files to finish a configuration setup.

- SLAVE.BAT launches IBSLAVE.EXE. This batch file can “chain” to one of the registry template batch files to finish a configuration setup.
- REGUP.BAT uploads the registry files for either Windows 95/98/NT based on which registry tool is uncommented in the batch file.
- REGDWN.BAT restores the registry files for either Windows 95/98/NT based on which registry tool is uncommented in the batch file.
- UDATEREG.BAT launches MREGFILE.EXE to create a .reg file on the target computer that can be imported into the registry via Windows' REGEDIT.
- ONE.BAT launches IBMASTER.EXE to download an image file to the target computer WITHOUT multicasting to any slaves. This batch file can “chain” to one of the registry template batch files to finish a configuration setup.
- MAKE-IMG.BAT launches IBMASTER.EXE to upload an image file from a client to the folder created under \LABEXPRT\DATA.

## Remote Control Agents

The Remote Control Agents are services or programs that run on networked computers and receive commands from the control console. These agents require access to either an IP or IPX protocol stack in order to receive commands from the console. The Remote Control Agents are located on the distribution media under \LABEXPRT\BIN.

There are separate Remote Control Agents for Windows 95/98 and Windows NT. They are installed in the production partition of the master image computer when you run the Client Install Wizard and included in the image downloaded to all other networked computers.

If you want to manually configure the remote control agents, copy the appropriate agent (**RCTRL9x.EXE** for Windows 95/98, **RCTRLNT.EXE** for Windows NT) into a directory on the networked computer. To update the Windows Registry so the agent loads the next time Windows is loaded, type either

```
RCTRL9x -install or
RCTRLNT -install
```

In Windows 95/98, the install process makes an entry in the registry at the key:

HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\RunServices

- In Windows NT, the agent gets loaded as a service viewable within the Services Control Panel.

## Console Scripting Tool

The control console requires you to manipulate the computer resources in “current” time, meaning operations performed via the control console happen immediately.

The LABCMD scripting tool allows you to perform any of the operations normally performed via the control console—such as creating groups, putting computers in groups, assigning batch files to the computers or groups, rebooting the computers, etc.—at the command line.

Therefore, a “script” file can be built that makes all necessary manipulations to computer resources at some “future” time through one of the scheduling programs provided by Windows NT or Windows 95/98.

For example, if you desire all computers in an office to run the ImageBlaster Agent program at 2:00 am after everyone has left, you can write a “script” file containing the necessary LABCMD commands to start and control this image process.

Then you can schedule your NT or 95/98 computer to launch the script file at 2:00 am. The scripting capability coupled with the task mechanism make a very powerful management tool.

**Warning: Care should be taken when creating the LABCMD commands since it has the ability to affect any computer resource in the resource database files, not just resources for the computer it is running on.**

## Usage

The LABCMD utility is a Windows 32 bit application and must be executed in Windows 95/98/NT.

The following should be noted:

- Capital letters indicate the required portions (minimum characters) that must be specified to make a valid option.
- Identifiers and operations can be combined on the same command-line.
- Order of parameters is not important. LABCMD process them according to precedence. For example, if you specify the -batch parameter along with the -r option, LABCMD assigns the batch file before rebooting the computers.  
Status messages must be contained within quotes (“ ”), i.e., “-status:Finished task #1” The status message must be no longer than 40 characters.
- Multiple/combinations of identifiers are allowed. For instance, if you specify a computer and a group on the same line along with the -execute parameter, the computer as well as all computers in the group and its subgroups receive the execute instruction.  
Creating a group with members and making the new group a member of another group is possible all in one command. For instance,  
C:> LABCMD name:C1 name:C2 -create:SubGroup2 -parent:ParentGroup1  
creates a new group called SubGroup2 and puts the computers named C1 and C2 into it, then makes the new group a subgroup of ParentGroup1.
- The -delete parameter deletes the explicit elements listed on the command line, not the members. For instance,  
C:> LABCMD name:Group1 -delete  
takes out all members of that group, then deletes the group itself. It does not delete the subgroups or the computers within it.
- There is a parameter of `@filename' that takes a list of identifiers as an input file. For instance,  
C:> LABCMD @mylist.fil -batch:GO.BAT -reboot  
assigns GO.BAT from the current working directory and then reboots all elements listed in the input file.
- Specifying the parameters -me and -reboot sends the reboot instruction as it normally does. You need to make sure the local computer is in the database and is running the appropriate agent.
- You can export members of the groups by using the -export option. For instance, if you wish to move all computers from one group another, you could export the members from the one group into a file, then use that file as an import file in the next command, using the -parent parameter to make them members of the parent group.

LABCMD returns the following error codes (usable with ERRORLEVEL in batch files):

- 0 - Success
- 1 - Invalid Parameter
- 2 - Node Not Found
- 3 - Conflicting Parameters
- 4 - Database I/O Failure (after 60 seconds of retrying)

## Process Builder

The LabExpert Process Builder (LEPRCBLD.EXE) utility automatically builds the template batch files for a new configuration.

- Creates a folder or directory under \LABEXPRT\DATA for the new configuration. For example, \LABEXRPT\DATA\CONFIG1.
- Creates all the template batch files.

**Note:** If you have any questions on the switches and usage for any of the tools used in these template batch files, please refer to the applicable usage section for that tool.

## Computer Boot Commands

Getting a networked computer to actually process a batch file is a two step process at the LCC.

1. A batch file must be “assigned” to the computer as discussed above. This puts the batch file on the computer’s “virtual” floppy disk.
2. The computer must be instructed to boot the virtual floppy in order to execute the newly assigned batch file.

These options are available:

- Command to Boot Virtual Floppy
- Rebooting Computers
- Executing Commands Remotely
- Optional Settings

### Command to Boot Virtual Floppy

Remember the BootWorks' virtual boot ROM was likened to a virtual floppy. The batch file assignment process discussed earlier, changes the contents on the computer's virtual floppy. The control console is also the mechanism that inserts/removes the virtual floppy into/from the computer's "virtual disk drive." This provides control for when the computer actually processes the assigned batch files.

The computer icon by each computer's alias name indicates whether the virtual floppy is in or out of the computer's virtual floppy drive. When the icon is green, the virtual floppy is "in" and the computer processes the batch file during its next boot. When the icon is white, the virtual floppy is "out" and the computer won't process the assigned batch file but boots to its production partition instead.

For the group icons in the tree view, a green icon indicates all members of the group will boot to the automation mode. A gray icon indicates some of the members of the group will boot to the automation mode, while a white icon indicates no members of the group will boot to the automation mode.

In [Figure 5](#), the computers LAB21 - LAB24 are set to process their assigned batch files during their next boot. The remaining computers won't, but will boot to their production system instead.

To manage the boot command (whether the virtual floppy is in or out of the virtual floppy drive) for a computer, list of computers or group, do one of the following.

1. Click the 'All Computers' object in the tree view to show a list of all networked computers.
2. Select the desired computer(s) in the list view and right click.
3. On the pop-up menu, select the desired boot command under the 'Boot To' option.
  - a. 'Automation' means the computer boots to the automation mode and processes the assigned batch file.
  - b. 'Production' means the computer won't process the assigned batch file but boots the "production" operating system.
4. Click the desired group and use the pop-up menu as described in #3 above.

**Hint:** You can also toggle a computer by double-clicking on its computer icon.

### Rebooting Computers

If the computers are running one of the Remote Control Agents, they can be rebooted via the control console. To reboot a computer, select the desired computer or group, open the pop-up menu with a right mouse click, and select the 'Reboot' option.

**Important:** In order for the reboot mechanism to work, both the computer running the control console and the computers to be rebooted must have a protocol stack loaded in memory

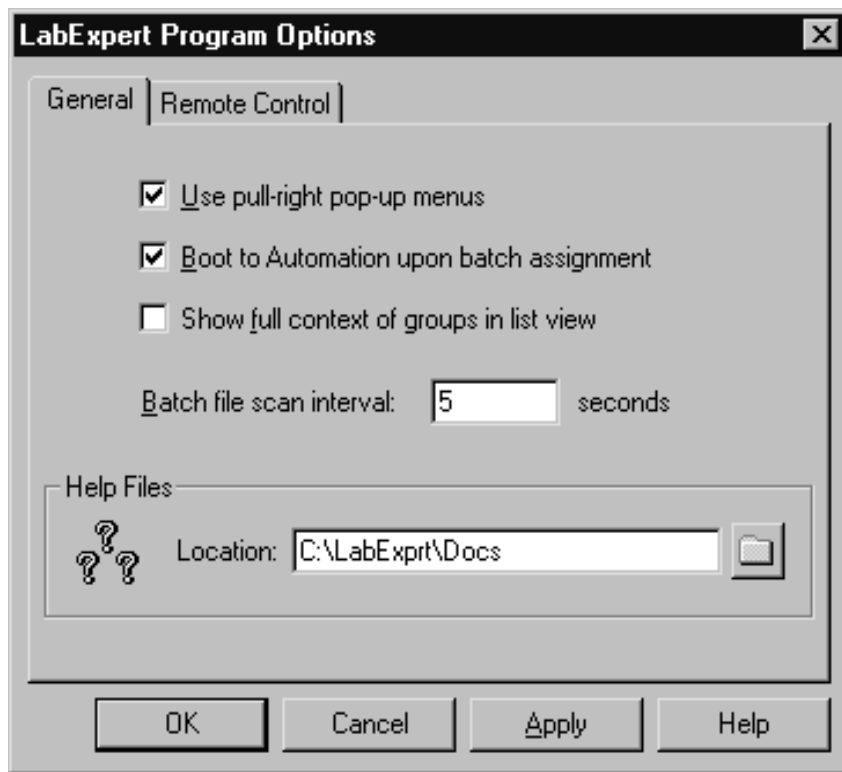
### Executing Commands Remotely

LabExpert can send execution commands to clients running the Remote Control Agents. This allows you to remotely start programs that reside on the target computer. To send execution commands to a computer, select the desired computer or group, open the pop-up menu with a right mouse click and select the 'Execute' option. A dialog appears where you enter the name of the application to launch.

**Important:** Both the computer running the control console and the computers to be controlled must have the same protocol stack loaded in memory (IP or IPX).

### Optional Setting

The LabExpert Control Console has several options that can be customized for your convenience. To access these optional settings select View > Options. A sample options screen is shown in [Figure 6](#).



**Figure 6: Options Screen**

These options help you easily use the control console. Each option is described below.

#### **Remote Control Commands**

**Send Command Immediately** - Selecting this option causes the console to send reboot commands as soon as you select the reboot function.

**Delayed by Groups** - If you want a certain number of computers to reboot at a time with some interval between the groups of computers, select this option.

**Clear Status** - Selecting this option causes the computer status field on the console to be cleared whenever a reboot command is sent to the computer.

**Prompt for Confirmation** - Selecting this option causes the console to prompt you for confirmation before sending any reboot command.

#### **Help Files**

Allows you to specify the directory location of the HTML files supplied with LabExpert.

#### **Communication Protocols**

**Use pull-right menus** - determines whether certain functions are accessed directly in one pop-up menu or by pulling-right on the pop-up menu.

**Boot to Automation** - causes computers to be marked for boot to automation automatically when batch files are assigned to them.

**Show Full Context** - causes the console to display the full context of groups in the list view on the console.

## BootWorks Overview

The tools in LabExpert are stored on the Lab Control Server (LCS) and executed on the clients. However, BootWork software is installed on each computers' hard drive or run from a floppy disk. BootWorks controls the computer boot sequence and connects the computer to the network during automation mode.

## BootWorks Options

The batch/boot control process requires that BOOTWORK.EXE be executed on each lab computer during automation mode. This can be accomplished in one of two ways.

- A. The BOOTWORK.EXE utility along with the proper LAN drivers and client software for your network can be permanently installed on the lab computer's hard drives.
- B. BOOTWORK.EXE utility can be put on a bootable floppy disk containing the proper LAN drivers and client software for your network. There are pros and cons with each method.

BootWorks installed on a hard drive acts like a 'virtual floppy', controlling the boot sequence of the computer each time it boots. When some sort of automation work is to be performed on the computer, BootWorks causes the computer to "boot" from the virtual floppy (automation mode). When no automation work is intended, BootWorks causes the computer to "boot" normally into the OS installed on the workstation (production mode).

This means the computer is always ready to perform automation work. Each time the computer boots, it checks the LabExpert control database and immediately processes any pending automation scripts. There is no need to 'visit' the computer to insert a floppy disk each time automation work is to be performed. However, this requires an 'automation' partition (4 MB) be created on the hard drive to house BootWorks.

BootWorks installed on a floppy disk removes the need for an 'automation' partition on the computer's hard drive, but it also requires the floppy disk to be manually inserted into the computer's floppy drive each time automation work is desired. This means the floppy must also be manually removed after automation work before the computer can boot to 'production' mode.

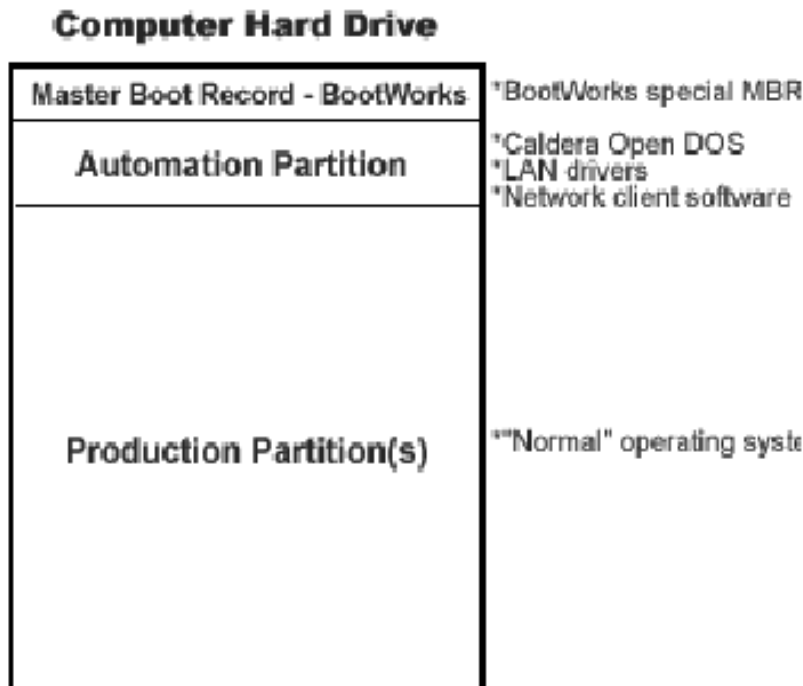
In other words, BootWorks installed on the computer hard drive provides total 'hands-off' automation at the expense of some drive space, while BootWorks on a floppy requires operator intervention during some portion of the automation work.

**Note:** To take full advantage of the automation capabilities in LabExpert, it is recommended that BootWorks be installed on each lab computer's hard drive.

## BootWorks Installed On Hard Disks

When BootWorks is installed on a hard disk, it creates a 4 MB default size partition at the beginning of the hard drive (in slot one of the partition table) and installs DOS in that partition. This partition must also contain the proper LAN drivers for the computer's NIC, along with the network client software needed to establish a connection with the LCS.

This partition is referred to as the "automation" partition (see Figure 7) since most automation processes occur during DOS execution from this partition.



**Figure 7: BootWorks Drive Configuration**

**Important:** If you want to install BootWorks onto a computer already containing a desired software configuration (OS, applications, etc.) and there is no free space at the beginning of the drive to accommodate the automation partition, please refer to the IBMIGRATE utility for a work around.

**Warning:** You should have a license for each copy of DOS you use.

BootWorks also replaces the code in the computer's master boot record (MBR). The master boot record code ensures the automation partition gains control during the computer's boot sequence.

Each time the computer boots, the MBR code causes the computer to boot to DOS where the LAN drivers and client software are loaded and a connection is established with the LCS.

The control database on the LCS is examined to determine if there is work (a batch file) for the computer to do while on the network. If there is work to do, the work is performed.

If there is no work, the network client and LAN drivers are removed from memory and the computer does a soft boot to run the "normal" operating system (contained in a partition referred to as the "production partition"). The process of loading DOS and checking the data stored on the LCS takes only seconds.

### Automation Partition Drive Assignments

It is important to understand how the automation partition interacts in relation to other partitions that may be on the drive during the "automation mode" and the "production mode."

Automation mode is the time when the computer boots DOS from the automation partition and processes any assigned automation work. Production mode is when the computer boots the "normal" operating system found in the production partition.

Operating systems typically assign a drive letter to all partitions and file systems they recognize so the operator can gain access to these file systems.

For example, if a computer has a primary partition with Windows 95/98 and an extended partition with two logical drives, drive letter C: is assigned to the primary partition (operating system files) while drive letters D: and E: are assigned to the two logical drives in the extended partition. Drive C: is always assigned to the bootable partition. The following tables show how drive letters are assigned to the production and automation partitions in both an automation mode and a production mode.

**Table 4: Drive Assignments for FAT 12/16 File Systems**

	Automation Mode before BootWorks	Automation Mode during/after Boot- Works	Production Mode
Production Partition (FAT)	D:	C:	C:
Automation Partition (FAT)	C:	D:	No drive letter. Partition marked INVALID

From the above table, it is important to note the following:

1. Because DOS understands the production file system, a drive letter is assigned to this file system while in automation mode. This allows access to automation tools like the registry managers in the production file system.
2. By default, the BootWorks agent, which is executed in automation mode and launches assigned batch files, switches the drive letter assignments so the production partition is referenced as drive C:. This allows you to write automation batch files using drive letters as if you were in production mode.
3. There is no drive letter assigned to the automation partition file system while the computer is in production mode because the partition is marked "INVALID" and hence not recognizable by the production operating system. This prevents users of the computer from accidentally accessing and changing data in the automation partition.

**Table 5: Drive Assignments for FAT32 & non-FAT file systems**

	Automation Mode before BootWorks	Automation Mode during/after Boot- Works	Production Mode
Production Partition (FAT32, NTFS, HPFS, UNIX)	No drive letter	No drive letter	C:
Automation Partition (FAT)	C:	C:	No drive letter. Partition marked INVALID

From the above table, it is important to note the following:

- A. Because DOS does not understand the production file system(FAT32, NTFS, HPFS, or UNIX), a drive letter is NOT assigned to this file system while in automation mode. There-



fore automation tools such as the registry managers CANNOT access the production file system.

- B. Since there are no other drive letters assigned, BootWorks cannot switch drive letters. Hence, the automation partition remains as drive C:.
- C. There is no drive letter assigned to the automation partition file system while the computer is in production mode because the partition is marked "INVALID" and hence, not recognizable by the production operating system. This prevents users of the computer from accidentally accessing and changing data in the automation partition.

## Automation Partition Sizing

Because the automation partition is visible and usable during automation mode, but not visible or usable during production mode, the automation partition acts like a second drive in the computer connected during automation mode and disconnected in production mode. The size of this "second" drive (the automation partition) defaults to 4 MB, but can be sized from 4 MB up to 2,000 MB when creating the BootWorks install disk.

Size the automation partition to store data such as images or registry sets in this partition instead of on the network server. This means "snapshots" of the computer can be stored "locally" without using disk space on the server.

For example, a computer is used for a particular task (task #1) from 8:00 a.m. to 5:00 p.m. The same computer is used for a completely different task (task #2) from 6:00 p.m. to 10:00 p.m. ImageBlaster Agent takes a "snapshot" image of the computer as task #1 at 5:15 p.m. and stores the image locally in the automation partition.

Then, task #2 image is placed on the computer for use at 6:00 p.m. At 10:15 p.m. ImageBlaster Agent restores task #1 image (snapshot image created at 5:15 p.m.) to the production partition making the computer ready for the next 8:00 a.m. session.

In other words, the automation partition can be used for a sort of "Image Task Switching" without using any drive space on the server. This can be completely automated by using scheduling utilities such as Windows NT AT.EXE.

The REGUP.BAT and REGDWN.BAT files can be used to replace the registry files so each user gets the same configuration as when they last left.

## BootWorks Install

The BootWorks install program must put the automation partition at the beginning of the hard drive and must put the definition for this partition in the first slot of the partition table.

If you already have an operating system on the hard drive, its partition is most likely defined in the first slot. The BootWorks install program moves, at your okay, the existing partition definition in slot 1 to another free slot so it can put the automation partition definition in slot 1.

**Warning: This causes a problem with Windows NT because NT maintains partition information on its boot partition. IT IS HIGHLY ADVISED THAT YOU REMOVE ANY EXISTING OPERATING SYSTEM FROM YOUR HARD DRIVE BEFORE RUNNING THE INSTALL PROGRAM** (or let the install program remove it for you—see the following), install BootWorks, re-install your operating system, and re-install the BootWorks master boot record (in that order).

The install program has several command-line options allowing you to customize the installation procedure. In most cases, the default options are sufficient. However, there may be times when customizations to the install program are needed for your environment. These options are described below.

On each target computer, boot the install floppy. The BOOTWORK install program runs automatically. Phase one of the installation checks requirements and performs preliminary setup work. After phase one completes, the computer automatically reboots and runs phase two of the installation. You must leave the floppy in the disk drive while both phases of the installation are running.

Phase One

Phase Two

Starting Bootworks for the first time

## Phase One

The installation program checks to see if there's room at the beginning of the hard disk for the automation partition. The automation partition requires a minimum of four Megabytes of disk space (rounded up to the next whole cylinder), located at the beginning of the physical media. If this space on the disk is used by another partition, you have the option of exiting the install program or allowing the install program to automatically (and destructively) remove the overlapping partition.

The installation program then checks to make sure the first slot in the partition table is available. If an existing partition is found in the first slot of the table, you can choose to erase the partition, move it to a different slot (not recommended), or quit the install. The following message and prompt is displayed if an existing partition is found in the first slot of the partition table (the message is long because it's warning of the potentially destructive nature of the "move partition" choice):

The automation slot in the partition table is occupied by an existing partition, but I need that partition-table slot to create the automation partition. You have three options from which to choose:

(E/M/Q).

- (E)rase the existing partition to make room for the automation partition.
- (M)ove the existing partition to slot 2 (which is currently unused), thus freeing up the automation partition slot.

**Note:** Some operating systems contain partition-slot-dependent configuration data that becomes invalid if you elect to Move their partition. These operating systems are rendered unbootable if you move their partition slots without first updating their partition-slot-dependent files.

For example, Windows NT contains a 'partition(n)' specifier in the boot.ini file which controls where the operating system finds boot files. If you are running Windows NT on this system, you need to make sure no entries in the boot.ini file refer to partition 1 before you let me Move the partition to slot2. You should change any strings of the form 'partition(1)' to 'partition(2)' just prior to running this installation program. That way, when I move the partition, you'll have already updated the boot.ini to point to the new partition, and the operating system will still be able to find its boot files.

- (Q)uit the program and don't modify the disk.

If an existing partition contains a special "automation partition" signature, the install program tells you it has found an existing automation partition. You have three options.

- a. You can remove that partition and reinstall the automation partition from scratch (e.g., to load new or different LAN drivers).
- b. You can leave the automation partition and its contents alone and choose only to rewrite the Master Boot Record code (useful if some other program has overwritten the MBR sector).
- c. You can also abort the program if you want neither of these options.

If an automation partition already exists, the following prompt is displayed:

I've found what appears to be an existing automation partition in the automation slot of the partition table. You have some options from which to choose: (E/K/Q)

- a. (E)rase the existing partition and recreate it from scratch.
- b. (K)ee the existing partition, but rewrite the program in the disk's Master Boot Record.
- c. (Q)uit the program and don't modify the disk.

If the "Keep" option is selected, the install program rewrites the MBR code only (and the installation is complete). Otherwise, the install program creates a new partition on the disk.

This partition always occupies the first slot in the partition table, and the partition itself is always located at the beginning of the physical media.

The install program also "hides" the other partitions on the disk so they won't be disturbed during phase two of the installation.

The install program then writes a "phase one complete" stamp in the automation partition and reboots the computer. This reboot is needed for DOS to recognize the new partition so it can be formatted.

## Phase Two

When the computer boots the second time, the install program runs again. This time, the install program detects the “phase one complete” flag and proceeds to run phase two of the install program. The install program calls the DOS format program to format the automation partition.

After the format is complete, the install program calls the COPYDOS.BAT file to copy DOS to the automation partition. Then the COPYNET.BAT file is called to copy the LAN drivers to the automation partition.

Following this, the original partition entries are restored and the MBR boot code is overwritten with a special program that boots the automation partition on each subsequent boot of the computer.

## Installation Command Line Options

Command-line switches enable you to “preload” your decisions so you don't need to respond to the prompts at installation time.

If all installation pre-conditions are met (or can be met given suitable operator input), the installation program creates the automation partition and reboots the computer. When the computer reboots, phase two of the installation runs automatically from the AUTOEXEC.BAT file. This phase performs the following tasks.

- Formats the automation partition
- Copies DOS files to the automation partition
- Copies LAN driver files to the automation partition
- Writes new code in the Master Boot Record

**Table 6: Available Install Switches**

+b	On IDE drives, allows you to force the use of CMOS to establish the maximum cylinder setting.
-u	Removes the automation partition from disk and restores the original Master Boot Record code. Do NOT put this switch in a batch file, but you can use it interactively if you need to remove the automation partition.
-c	Checks for the presence of the Altiris' Master Boot Record on the disk. The program prints a message indicating the presence of Altiris' MBR code and then exits with one of the following status codes: 0 - Altiris' MBR code is present on the disk 1 - Altiris' MBR code is NOT present on the disk 2 - An error occurred while reading the MBR sector
-mbr	Re-writes Altiris' Master Boot Record (MBR) code to the hard drive and then exits. This is useful after installing an operating system that overwrites the MBR.
-sX	Creates the automation partition X Megabytes in size. If a % character follows X, the automation partition is created as the specified percentage of the hard drive.
-ms	Invokes the FORMAT utility with options that work with MS-DOS. If a version of DOS other than the supplied Caldera OpenDOS is desired on the automation partition, this switch must be used.

**Table 6: Available Install Switches**

+q	Queries the user to confirm various stages of installation. When “query mode” is enabled, the user is prompted before several actions are performed including: 23 Writing to the MBR sector 24 Stamping the OEM BPB field in automation partition 25 Rebooting the computer
-q	Disables “query mode.” This is the default setting.
+v	Explains in verbose mode while installing. Use this switch at the request of Altiris’ technical-support staff to aid in debugging installation failures.
-v	Disables “verbose mode.” This is the default setting.

## OS Considerations

This section discusses how BootWorks acts with different operating systems and how to work with them. These topics include the following:

- Master Boot Record
- Partition Slot Dependencies
- Windows NT

### Master Boot Record

When BootWorks is installed, it replaces the Master Boot Record on the disk. This is the first sector on the hard drive. The BootWorks installation procedure also saves the original MBR code in the second sector on the hard disk, so this code can be used for “production” boots.

Some operating systems overwrite the Master Boot Record code when they are installed. This overwrites Altiris’ BootWorks MBR code, which disables the BootWorks software on that computer. If this occurs, you need to run the BootWorks install program again to place Altiris’ MBR code back on the disk.

When the install program runs, it detects the existing automation partition at the end of the disk and gives you an option of rewriting the MBR code instead of reinstalling the automation partition from scratch. If you select the “Rewrite MBR code only” option, BootWorks software is re-enabled, and you don’t have to run the entire two-phase installation. You can also use the install program’s -mbr command-line switch to only rewrite the MBR code instead of running a two-phase installation.

### Partition Slot Dependencies

One of the installation requirements for BootWorks is that the first slot in the partition table be free so BootWorks can install the entry for the automation partition in the first slot of the partition table.

If the first partition slot is occupied, the install program prompts the operator to either move the existing partition entry to a different slot or remove the partition entirely.

Clearly, removing the partition is destructive and moving the partition entry to a different slot would normally be the preferred alternative. In some cases however, moving a partition renders the partition as unusable as if it had been deleted.

The key factor in determining if a partition is “slot dependent” or “slot independent” is the operating system’s knowledge of the partition slot. DOS, for example, does not store partition slot information so it doesn’t “know” the partition-table-slot occupied by a particular drive letter. So it is safe to move a DOS partition from one slot in the partition table to another.

Windows NT does have partition-slot knowledge (e.g. in the BOOT.INI file), and this is why it can be destructive to move a Windows partition-table entry from one slot to another. Other operating systems might also store partition slot information on the disk, so they exhibit the same slot-dependent behavior as Windows NT.

## Windows NT

Here's a summary of the anomalies we know about Windows NT. It's important to note there may be other unknown partition-slot dependencies stored in the OS.

**IT IS HIGHLY ADVISED THAT YOU REMOVE ANY EXISTING OPERATING SYSTEM FROM YOUR HARD DRIVE BEFORE RUNNING THE INSTALL PROGRAM**

(or let the install program remove it for you—see below), install BootWorks, re-install your operating system, and then re-install the BootWorks' master boot record, if necessary.

Microsoft claims neither the presence nor the absence of partition-slot-dependent information in Windows NT, so it's impossible to know for sure if such dependencies exist. This means "move partition" procedures described below may cause bizarre and seemingly inexplicable software malfunctions.

If such a malfunction is encountered, it probably means there is some partition-slot-dependent information that wasn't updated when the partition was moved. The point is, there's no way to be absolutely sure that moving an NT partition is safe. Here's what we do know about NT.

- NT stores partition-dependent information in the root directory of the boot partition in a hidden file named **BOOT.INI**. This file contains information about the partition table slots containing NT partitions and this is where NT maintains knowledge of the partition slot.  
If the information in **BOOT.INI** doesn't match the contents of the partition table, NT won't boot properly, which is why changing the partition table contents can be dangerous. If the **BOOT.INI** file and the partition table aren't in sync, NT won't boot.
- If, when installing BootWorks software, it becomes necessary to move an NT partition (we don't recommend it), then you need to edit the **BOOT.INI** file immediately **prior** to the installation of BootWorks software.  
To find out which values to change in the boot.ini file, run only the first part of the BootWorks install program. When it detects a partition in the first slot of the partition table, it tells you where it needs to move the partition.

**Warning: Do NOT allow the install program to move the partition yet!**

Write down this new partition slot information and **exit** the BootWorks installation. Then boot NT, and edit the boot.ini file to refer to the "new" partition locations.

Boot using the BootWorks install floppy again, and this time let the install program move the partition. By following this procedure, you can make sure the partition table and the **BOOT.INI** file are in sync, and hopefully NT continues to be bootable.

**Warning: If you make any mistakes when editing the boot.ini file, your system becomes unbootable.**

The **BOOTWORK** install program must put the automation partition at the end of the hard drive and must put the definition for this partition in the first slot of the partition table.

## Running BootWorks

**BOOTWORK.EXE** is the main component of the BootWorks technology. Each of the BootWorks components can be customized for various environments. **BOOTWORK.EXE** is located on the "automation partition" on each computer's hard drive or on a bootable floppy, depending on how you configure your computers. **BOOTWORK.EXE** determines if there is work to be done while on the network and when the "production partition" should be booted.

**BOOTWORK.EXE** scans the **BOOTWORK.BIN** file on the LCS. If the computer's MAC address is found in the file, **BOOTWORK** processes the entry and determines if there is work to be done or if it should boot the "production" partition.

If customizations to the **BOOTWORK** utility are needed for your environment, make them in **AUTOEXEC.BAT** residing in the automation partition or on the boot floppy. The **BOOTWORK** utility is invoked there and allows you to add command-line switches. You can also customize the automation batch files on a per-computer basis using an environment variable.

**Table 7: Available BootWork Switches**

-w	Causes <b>BOOTWORK.EXE</b> to continue to scan <b>BOOTWORK.BIN</b> until there is work to be processed while in the automation mode.
----	--

**Table 7: Available BootWork Switches**

-hr	Causes BOOTWORK.EXE to do a hard reboot (which is slower because the computer completes the entire POST phase - count memory, etc.) when it tries to boot into the “production” partition. If the computer hangs when booting into the production partition (soft boot), try using the -hr switch to force a different type of boot.
-p	Causes BOOTWORK.EXE to pause before booting the production partition. With this switch, the operator must press a key before the production partition is booted.
-ns	<p>Causes BOOTWORK.EXE NOT to shift drive letters when running automation batch files. When a computer boots a DOS partition, such as the automation partition, it assigns the drive letter C: to the partition. If other DOS partitions (FAT file system partitions) are detected on the hard drive, subsequent drive letters (i.e. D:, E:, etc.) are assigned to the other partitions.</p> <p>For example, if a computer contains Windows 95/98 in the production partition and Caldera OpenDOS in the automation partition, drive letters are assigned as follows upon an automation boot: drive C: is assigned to the automation partition (Caldera OpenDOS) and drive D: is assigned to the production partition (Windows 95/98). Normally, BootWorks shifts these drive letter assignments so C: points to the production partition (if it is FAT file system based) and drive D: points to the automation partition. This allows batch files that work with files on the production partition to use drive letter C: to access the partition.</p> <p>When the BootWorks tool exits, all drive letters are switched back to normal assignments. The -ns switch causes BootWorks NOT to shift the drive letter assignments, keeping the normal assignments valid during the processing of batch files. This means a batch file referring to drive C: would actually access the automation partition instead of the production partition.</p>
-f	Causes BOOTWORK NOT to modify the partition table when performing a “production” boot. Normally, BOOTWORK.EXE sets a flag in the partition table on the boot disk to notify the MBR code that a “production” boot is desired. The -f switch prevents these modifications, thus allowing BootWorks to be run on a computer that has no automation partition installed, or to be run from a floppy disk (the “f” switch stands for “floppy operation”).
-a	Causes BootWorks to use the specified alias name when searching the LabExpert control database for assigned work. Normally, BootWorks uses the computer's MAC address to retrieve the computer's alias name from the control database. This switch overrides the MAC address lookup on the control database and forces BootWorks to use the specified name. The entire command line switch must be surrounded by “ ” (double quote marks, i.e. “-a Computer 1”) NOTE: The -a switch must replace the -w switch. They CANNOT be used at the same time.
-l	Causes BOOTWORK to display all licenses that have been applied to the executable.

## Environment variables

If you have configured the BOOTWORK utility to use BOOTWORK.BIN, you can use an additional feature to customize your automation batch files. Each computer's name or alias is stored in BOOTWORK.BIN.

Prior to executing the automation batch file, BOOTWORK.EXE sets the environment variables called NODENAME and NODEFULL. NODENAME contains up to the first eight characters (or up to the first SPACE character) of the computer's alias or name. NODEFULL contains the entire alias name; it isn't limited to the first eight characters.

This allows you to customize automation batch files with constructs such as these:

```
echo %NODENAME% >c:\node.id  
copy f:\stuff\%NODENAME%\config.sys c:\config.sy
```

The first line creates a file called node.id on the computer's local hard disk and populates this file with the computer's name. The second line copies a file from a computer-specific directory on a network server and stores it on the local hard disk.

By maintaining a set of directories (under f:\stuff in this example), you can maintain per-computer configuration files on your server. Using this mechanism, you can collect information from each computer and store it on the server or you can distribute information from the server to individual clients.

## Starting the BootWorks client for the first time

Each time the BootWorks client boots, it examines the resource database on the LCS to determine if there is any work to be executed.

When a computer first boots after BootWorks has been installed on its drive, it detects that it is not yet identified in the resource database and prompts you for a name. This is the alias name that is displayed on the control console. You can make the name anything that helps you identify that particular computer.

**Important:** Several of the tools use the first eight characters as a unique ID for the computer, so you may want to ensure the first eight characters are unique across all the computers.

## Disk Imaging

Included in the LabExpert suite of tools are the disk imaging utilities used to set up and configure your resources. These utilities are grouped under the ImageBlaster Agent technology and are detailed in the [User Manual](#) at the Altiris' Web site. It contains information and instruction on the operation of these tools.

## Registries Management

After computers have been imaged, the contents of their hard drives EXACTLY match the image of the computer from which the image came. Windows 95/98 and Windows NT keep specific information relative to the computer hardware (i.e., IDE drive controller chip set, video chip set, etc.) in their registries.

If an image is created on one vendor's computer and subsequently restored to another vendor's computer, the hardware entries in the registry may not match the local hardware.

Windows 95/98 then goes through several "processes" discovering the correct hardware and updating the registry entries. Windows NT is less forgiving—it might not even boot. LabExpert contains registry-management tools to help resolve problems associated with registry settings.

Along with hardware-specific entries, the registry contains other information that might need to be unique for each computer—such as computer name, IP address (if hard coded), user name, etc.

LabExpert has two types of registry management tools:

- those that control archiving of the registry files ([95REGMGR.EXE](#) and [NTREGMGR.EXE](#)). These are usually called by the [REGUP.BAT](#) and [REGDWN.BAT](#) files when called by the IBMASTER or IBSLAVE batch files
- those that allow you to change only specific registry key values by making a .reg file to be imported into the registry ([MREGFILE](#))

These tools are presented below.

**Note:** These registry managers only manage registry files loaded on FAT 12/16 file systems and FAT 32 if you're using Windows 95/98 DOS. They DO NOT manage registry files on NTFS file systems.

## 95REGMGR and NTREGMGR

These registry tools help make (or restore) unique registries to each computer by archiving the registry files on the LCS and then restoring them when needed. The process involves creating an image on one computer and replicating it to all desired computers using the ImageBlaster Agent.

Each Windows 95/98 or Windows NT computer goes through its hardware detection routine, making necessary changes for computer name, IP address, etc.

After the registries are properly configured, use 95REGMGR or NTREGMGR to archive the registries on the LCS. The next time the image is restored to the computers, 95REGMGR or NTREGMGR restores previously saved registry files. This saves time and operator intervention.

To make sure registry files are restored to the proper computer, they are copied to a unique file name on the LCS, based on the computer's MAC address as follows:

YYYYYYYY.SDT - system registry file

YYYYYYYY.UDT - user registry file

where YYYYYYYY = last eight numbers of computer's MAC address.

**Important:** In order for the registry tools to obtain the computer's MAC address, a protocol stack must be loaded in the computer's memory.

## Usage

### 95REGMGR [switches]

- U Upload registry files (archive)
- D Download registry files (restore)
- Ly Local path to registry files y = path
- Ry Remote path to registry files y = path
- Naaa Don't process registry file aaa where aaa =
  - sdt (system.dat)
  - udt (user.dat)

### NTREGMGR [switches]

- U Upload registry files (archive)
- D Download registry files (restore)
- Ly Local path to registry files y = path
- Ry Remote path to registry files y = path
- Naaa Don't process registry file aaa where aaa =
  - stm (system)
  - sft (software)
  - sec (security)
  - sam (sam)
  - def (default)

The local path (-l) is the location on the local drive where the registry files are located. For Windows 95/98, this is typically c:\windows.

For Windows NT, the path is typically c:\winnt\system32\config

The remote path (-r) specifies the location on the LCS where the registry files are to be stored and retrieved. Only a path name is specified, not a file name.

The (-U) and (-D) flags are used to specify which type of operation is to be performed. (U)pload archives the registry files to the LCS. (D)ownload restores the registry files from the LCS back to the computer.

The (-N) flag can be used to specify registry files that should not be processed.



## MREGMGR

The MREGFILE utility performs three functions:

- acquires the first eight characters of the computer's ID from the environment variable set by BootWorks
- scans the master file specified on the command line for lines of text associated with the computer's ID
- copies the lines of text to a user-specified file. This file can then be imported into the Windows 95/98 or Windows NT registry by using the REGEDIT utility.

With MREGFILE you can customize specific registry properties without having to manually enter the changes on each computer.

The process involves using REGEDIT to:

- find the desired registry keys for the properties to be changed (i.e., IP addresses, computer names etc.)
- export these keys to a .REG text file
- group the individual keys into a "master" registry data file
- cut and paste copies of the set of keys for each computer
- make the necessary changes to the properties for the various keys.

### Example

An example "master" registry data file is shown below.

REGEDIT4

{Brian\_1}

[HKEY\_LOCAL\_MACHINE\System\CurrentControlSet\  
control\ComputerName\ComputerName]

"ComputerName"="STRESS1"

[HKEY\_LOCAL\_MACHINE\System\CurrentControlSet\  
Services\VxD\VNETSUP]

"ComputerName"="STRESS1"

[HKEY\_LOCAL\_MACHINE\System\CurrentControlSet\  
Services\VxD\MSTCP]

"HostName"="STRESS1"

[HKEY\_LOCAL\_MACHINE\System\CurrentControlSet\  
Services\Class\Neutrals\0006]

"IPAddress"="207.49.11.25"

"IPMask"="255.255.255.192"

"DefaultGateway"="207.49.11.62"

{Chris\_2}

[HKEY\_LOCAL\_MACHINE\System\CurrentControlSet\  
control\ComputerName\ComputerName]

"ComputerName"="STRESS2"

[HKEY\_LOCAL\_MACHINE\System\CurrentControlSet\  
Services\VxD\VNETSUP]

"ComputerName"="STRESS2"

[HKEY\_LOCAL\_MACHINE\System\CurrentControlSet\  
Services\VxD\MSTCP]

"HostName"="STRESS2"

[HKEY\_LOCAL\_MACHINE\System\CurrentControlSet\  
Services\Class\Neutrals\0006]

```
"IPAddress"="207.49.11.26"
"IPMask"="255.255.255.192"
"DefaultGateway"="207.49.11.65"
```

```
{Eric_3}
[HKEY_LOCAL_MACHINE\System\CurrentControlSet\
control\ComputerName\ComputerName]
"ComputerName"="STRESS3"
[HKEY_LOCAL_MACHINE\System\CurrentControlSet\
Services\VxD\VNETSUP]
"ComputerName"="STRESS3"
[HKEY_LOCAL_MACHINE\System\CurrentControlSet\
Services\VxD\MSTCP]
"HostName"="STRESS3"
[HKEY_LOCAL_MACHINE\System\CurrentControlSet\
Services\Class\NetTrans\0006]
"IPAddress"="207.49.11.27"
"IPMask"="255.255.255.192"
"DefaultGateway"="207.49.11.62"
```

Notice the computer ID "tag" for each computer (i.e. {Brian\_1}). The MREGFILE utility copies the lines following the computer ID tag to the local file specified on the command line. Using the example file above, the contents of the local file for computer ID Brian\_1 would be:

```
REGEDIT4
[HKEY_LOCAL_MACHINE\System\CurrentControlSet\
control\ComputerName\ComputerName]
"ComputerName"="STRESS2"
[HKEY_LOCAL_MACHINE\System\CurrentControlSet\
Services\VxD\VNETSUP]
"ComputerName"="STRESS2"
[HKEY_LOCAL_MACHINE\System\CurrentControlSet\
Services\VxD\MSTCP]
"HostName"="STRESS1"
[HKEY_LOCAL_MACHINE\System\CurrentControlSet\
Services\Class\NetTrans\0006]
"IPAddress"="207.49.11.26"
"IPMask"="255.255.255.192"
"DefaultGateway"="207.49.11.65"
```

This local file can be imported into the local registry using the REGEDIT utility. To automate this process, create a batch file such as the following which is executed each time the operating system loads. In order for this sample batch file to work properly, the local file specified on the command line for MREGFILE would be

```
"c:\newreg.reg".
```

```
IF NOT EXIST C:\NEWREG.REG GOTO NO_UPDATE
C:\WINDOWS\REGEDIT C:\NEWREG.REG
DEL C:\NEWREG.REG
:NO_UPDATE
```

To make Windows 95/98 process the above batch file each time Windows 95/98 is loaded, put the command to load the batch file in C:\AUTOEXEC.BAT. If the above batch file were named STARTREG.BAT, the entry in the AUTOEXEC.BAT file would be:

CALL C:\STARTREG.BAT

### **MREGFILE Switches**

- B Not using BootWorks(tm), try NDS for name search
- Ly Local path to reg file (y = path and name)
- Ry Remote path to master registry file (y=path and name)

### **REGUPBAT and REGDOWN.BAT**

REGUP.BAT provide the capability to record (make an image of) one or more computers and store them on the LCS. Whether you're in a 24 hour work environment with three different users per computer, per day or a classroom full of students who just have to customize their computers, you can restore each computer's registry files as often as you need to with REGDOWN.BAT

REGUP.BAT and REGDOWN.BAT are often run in conjunction with other imaging options. However, you can restore a user's registry anytime by assigning the REGDOWN.BAT file from within the LCC (LabExpert Control Console) and causing the computer(s) to reboot. You can even automate the process using a Windows scheduler so the download occurs at the same time every day.

### **Power Tools**

A collection of miscellaneous tools is provided with LabExpert to facilitate setup and configuration. They are used to chain tasks in a sequence, help finish setup after computers have been imaged, gather data from the computers after test runs, and other general computer maintenance. This section briefly describes each. NextStep

Many setup and configuration tasks for the lab computers require several events to happen in a sequence. The NextStep tool allows a computer to manipulate its own properties in the resource database (BOOTWORK.BIN) and allows the chaining of events to occur.

Unlike the LABCMD utility which manipulates properties for any computer in the resource database, NextStep can only affect properties for the computer on which it is executed. It cannot change the properties of any other computer in the lab.

NextStep is a DOS-based utility that must be run from a DOS prompt or batch file. This utility searches the database and makes changes to this computer's entry. This cannot make changes to any other computers' listed. To change other entries, use the Win32 console application or the Win32 GUI tools.

### **Command line options**

Syntax: nextstep <function(s)>

Functions:

Batch:<batch\_file> (Assign a batch file to run)

Unassign (Unassign from all batch files)

Automation (Boot to automation)

Production (Boot to local production partition)

Status:<message> (Set the status message)

Reboot (Reboot this computer)

The command line options for NextStep are listed in the help screen above. The following should be noted:

- Capital letters indicate the required portions (minimum characters) that must be specified to make a valid option.
- Order of parameters is not important. NextStep processes them according to precedence. For example, if you specify the -batch parameter along with the -r option, NextStep assigns the batch file before rebooting the computers

- Status messages must be contained within quotes (“ ”). (i.e. “-s:Finished task #1”) The status message must be no longer than 40 characters.

NextStep returns the following error codes (usable with ERRORLEVEL in batch files):

- 0 - Success
- 1 - Invalid Parameter
- 2 - Node Not Found
- 3 - Conflicting Parameters
- 4 - Database I/O Failure (after 60 seconds of retrying)

### Example

The following example is given to help you understand the power and use of the NextStep tool.

The process of restoring a Windows 95/98 image to a computer, along with its original registry settings, is a two step process requiring two separate batch files: one to invoke the imaging process and one to restore the original registry settings via the 95REGMGR tool.

The NextStep tool can be used in each batch file to cause a “chaining” of steps so they are performed in sequence.

The first batch file contains:

```
@echo off
rem Download Win 95 image
ibmaster -md -ff:\labexp\images\win95.img
nextstep “-s:Finished win95 image” -b:demo\put95reg.bat -r
```

This batch file invokes the IBMASTER tool to download (restore) the image file f:\labexp\images\win95.img to the local computer.

When the imaging is complete, the NextStep command sends the status “Finished win95 image” to the control console, assigns the computer to run the “put95reg.bat” batch file in the demo directory during its next boot, and reboots the computer.

The second batch file contains:

```
@echo off
rem Put Win 95 registry files on computers
95regmgr -d -lc:\windows -rf:\labexp\images\95reg
nextstep “-s:Put 95 reg files on computer” -p -r
```

This batch file invokes the 95REGMGR tool to restore the registry entries stored in the f:\labexp\images\95reg directory. When this process is completed, NextStep sends the status “Put 95 reg files on computer” to the control console, assigns the computer to boot to “Production” mode during the next boot and reboots the computer.

To complete the entire restoration process, assign the first batch file to the computer via the control console or LAB-CMD utility and walk away. The computer performs each step in sequence.

## UPLOADDDB

UPLOADDDB reads data from a user-specified file on the local computer (source file) and appends it to a user-specified file on the LCS (destination file). If this tool is executed on several computers and the same destination file is specified, the contents of all source files are stored in the same destination file. This mechanism can be used to gather results of a test stored on networked computers and then compile them into a single file on the LCS.

UPLOADDDB inserts the first eight characters of the computer ID of the local computer into the destination file before appending the contents of the source file. This identifies the data received from each computer in the destination file.

### Usage

```
UPLOADDDB <localfilename> <reportfilename>
```

The local file name is the name of the source file on the local computer, and the report file name is the name of the destination file where the source file is appended.

## COMPID

The COMPID utility acquires the first eight characters of the computer's ID from the BootWorks database and writes it to a user-specified file (generally on the computer's hard drive). This file can then be used by other tools, batch files, etc., as a unique name/ID for customization purposes.

For example, if the computer needed to log into a server with a unique user name, the contents of the COMPID file could be used as the login name.

### Usage

COMPID id\_file\_name

The id\_file\_name is the name of the file where the computer ID is written.

## IBMIGRATE

The IBMIGRATE utility allows you to use a disk image from a computer without an Automation Partition, on computers with an Automation Partition. IBMIGRAT.EXE shifts the Partition Entries in the Partition Table up one slot to prevent a conflict with the location of the Automation Partition, which is always in slot one. IBMIGRAT.EXE alters the Master Boot Record using information from the BOOTORG.BIN file so it contains the proper information.

The drive is now ready to be imaged and IBMASTER.EXE is launched. The image is created and when IBMASTER.EXE is finished, the Master Boot Record is restored to its original state.

### Usage

**Note:** For Windows NT only, when using IBMIGRAT.EXE on a partition containing Windows NT, it's necessary to first edit the BOOT.INI file to change the "...partition(n)..." entries to represent the new slot in the partition table. For example, change ...partition(1)... to ...partition(2).... When making this change, it is necessary to remove the Read Only flag before making the change and resetting it when done.

1. Boot the computer using an Automation Boot Disk. See "Creating BootWorks Boot Diskette". Enter the Computer Alias name if the Not Found message is displayed. This registers the computer in the database.
2. Reboot using the same Automation Boot Disk. When the message "Waiting for work. Next check in ..." appears, press Ctrl-C then choose Y for yes to cancel.
3. Type IBMIGRAT and press enter.
4. The computer should display a screen asking if you want to Slide or Quit. Choose Slide.
5. The IBMaster program screen should now appear. Choose "Upload to image file." Press the space bar on each partition to be imaged and press enter. Enter the name and location of the image file to be created (e.g. f:\DATA\WIN95\WIN95.IMG). Then choose Start.

**Important:** The IBMIGRAT.EXE utility can be used as a work around for installing BootWorks on an existing computer that does not have ample free space at the beginning of the drive, BUT DOES HAVE AMPLE FREE SPACE AT THE END THE DRIVE. This is accomplished by creating an image of the desired computer following the steps above, installing BootWorks on the computer and then restoring the newly created image back to the computer.

## SIDgen

Imaging or cloning Windows NT computers presents a unique problem. Typically Windows NT servers and workstations are identified to a Domain-based network by a Security ID (SID). Since this identifier must be unique, sharing an image of one Windows NT computer with other computers on the network could cause conflicts. To resolve this problem, Altiris provides an NT SID replacement tool called SIDgen. Information on the use and features of SIDgen are contained in the SIDgen User Manual available at the Altiris Web site.

## ImageExplorer

Altiris' ImageExplorer allows users to view and make modifications to image files created by Altiris' products. User can view information about partitions and files contained within such an image file, and can extract files from the image, include and exclude files from imaging, search for files, and even replace files within the image. All of these

features can be accessed via standard Windows menus, toolbars buttons, hotkeys, and context menus (right-clicking on an item). For details, see ImageExplorer documentation.

## **AutoImager**

AutoImager is another adaptation of Altiris' ImageBlaster technology. By creating a self-extracting executable file from either a new or existing image, you can give your clients an instant disaster recovery solution, whether they're in the next cube or around the world.

If you're a manufacturer wanting to provide a simple image re-creation tool for your distributors or an IS center needing a self-contained recovery technique to mail a client in outer-anywhere, AutoImager is your answer. With AutoImager, you gain substantial versatility in how to distribute "factory fresh" or customized images for individual situations. For details, see AutoImager documentation.

## Technical Support

Altiris is dedicated to giving you the best support possible. Please check the Automated FAQ System on our web site before contacting us with your questions.

Be sure to include a detailed description of your environment, the problem, and any error messages you have received. We welcome and encourage all feedback and enhancement requests.

You can contact the Altiris Support staff by phone, fax, mail or e-mail.

### Mail

Altiris, Inc.  
387 South 520 West  
Lindon, Utah 84042

### Email

Quick response E-mail support at [support@altiris.com](mailto:support@altiris.com)

### Phone

Call us at (801) 226-8500 (Monday through Friday, 8am to 5pm MDT). Phone support is always free during a product evaluation period and for at least 90 days following purchase.

### Fax

Send a Fax to Altiris' Support by using (801) 226-8506.

### Web

[www.altiris.com](http://www.altiris.com)

### Feedback

To submit comments and suggestions about this documentation, send an email to:  
[support@altiris.com](mailto:support@altiris.com)

Please include complete details of your questions, suggestions and examples.

Thank you for using Altiris products!

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## Patents

U.S. PATENT NO.: 5,764,593 was issued for "BootWorks," a METHOD AND SYSTEM FOR THE INTERCEPTION AND CONTROL OF THE COMPUTER BOOT PROCESS.

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