

<b>Subject:</b>	<b>How to use DynamicAccess Boot Services to Automate Ghost Roll-outs</b>
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## **Building OS Deployment Solutions with Dynamic Access Boot Services**

### **Introduction to 3Com's DynamicAccess Boot Services**

DynamicAccess Boot Services (DABS) is a software package that includes TFTP, BOOTP, PXE, Boot Image Editor, and a BOOTPTAB editor that allows you to edit and manage boot image files and BOOTPTAB database files. DABS is fully compatible with MBA, PXE boot ROMs, and Lanworks Bootware ROMs.

You can use the DABS to create boot images , OS rollouts, Virus checks and etc. to create a boot image file from a client boot image diskette. MBA provides the method for the client computers to access and boot from that boot image file.

### **DABS Components**

DABS supports all the popular methods of remote booting such as PXE, DHCP, and BOOTP. The boot protocol you use, PXE, DHCP, or BOOTP, will be determined by the boot ROM you are using. For example, if your boot ROM only support the PXE protocol, then BOOTP booting is not an option for you. If you have a boot ROM that supports any of the above boot protocols, you can use one or all the DABS components to enable a complete solution.

#### **PXE**

If you want to boot via PXE, you will need the following DABS components:

- Image Editor - to create the PXE menu file and boot image file.
- BOOTPTAB Editor - to create and maintain the BOOTPTAB database.
- PXE server - to provide the boot files to the PXE client (boot ROM).
- TFTP server - transfer the boot files to the PXE client.

Note: You need to configure the PXE Service options tab to point to the location of the BOOTPTAB file.

A PXE menu file (network bootstrap program) is required in addition to the boot image file when remote booting via PXE. This PXE menu file is assigned to the client in the BOOTPTAB database.

A DHCP server, such as Microsoft DHCP service, is mandatory if you wish to remote boot via PXE.

#### **DHCP**

If you want to boot via DHCP, you will need the following DABS components:

- Image Editor - to create the boot image file.
- TFTP server - transfer the boot files to the client.

Note: A DHCP server, such as Microsoft DHCP service, is mandatory if you wish to remote boot via DHCP.

## **BOOTP**

If you want to boot via BOOTP, you will need the following DABS components:

- Image Editor - to create the boot image file.
- BOOTPTAB Editor - to create and maintain the BOOTPTAB database.
- BOOTP server - to provide the IP information and boot files to the PXE clients (boot ROM).
- TFTP server - transfer the boot files to the clients.

## **BUILDING OS DEPLOYMENT SOLUTIONS WITH DABS, NORTON GHOST & WINDOWS UNATTENDED INSTALL.**

### **Why use DynamicAccess Boot Services for OS Deployment?**

The use of 3Com's DynamicAccess Boot Services (DABS) and 3Com's Managed PC Boot Agent (MBA) with **Norton Ghost and Windows NT Unattended Install**, will help to automate the use of an OS Install and consequently reduce the Total Cost of Ownership (TCO).

Time saved from the drudgery of manual PC software installation and configuration means more time for IT staff to provide professional, high-level support.

This paper will illustrate how to use DynamicAccess Boot Services and Managed PC Boot Agent in combination with **Norton Ghost and Windows NT Unattended Install** to automate the distribution of software to networked PCs. DABS and MBA eliminate the need to visit a Client PC with a Ghost boot disk because the client boots from the boot ROM. Also, DABS eliminates the need to maintain multiple boot images on floppy disks, one boot image is maintained on the server.

## **USING NORTON GHOST TO ROLLOUT WINDOWS NT 4.0 WORKSTATION**

### **Introduction to Norton's Ghost**

Norton Ghost 6.0 Enterprise Edition was designed for IS managers in large organizations who expect more from a PC deployment and upgrade solution. Norton Ghost 6.0 Enterprise Edition provides the technology for fast, reliable PC imaging and management that serves to further IT cost containment by providing a means to restore and configure machines that have been cloned. Norton Ghost:

- Dramatically reduces IT costs with PC recovery and deployment solutions
- Restores failed PCs
- Offers a PC cloning solution for disk image management, roll-outs, and ongoing PC configuration

This paper will focus on using Norton's Ghost in conjunction with 3Com's DynamicAccess boot services and Managed PC Boot Agent to perform a workstation roll-out.

### 3Com's Managed PC Boot Agent and Norton Ghost

With MBA installed, a client PC can boot from the network regardless of the contents of their local hard drives. MBA enables new and existing PCs to take advantage of pre-boot management technology to perform operating system and application installations or upgrades as well as desktop disaster recovery.

Using MBA means that, at boot time, the client can connect to the BOOTP/PXE or DHCP Server and load an image file that contains the Ghost DOS Multicast Boot Disk.

#### **WHAT WILL BE NEEDED**

##### **Required:**

- 3Com's DynamicAccess Boot Services
- Symantec's Norton Ghost Enterprise Edition, v.6.0
- PXE Remote Boot ROM, for example, 3Com's Managed PC BootAgent

##### **Optional:**

Remote Wakeup and shutdown utilities

#### **Hardware Environment Used in Following Examples**

<b>Role</b>	<b>PC</b>	<b>Processor</b>	<b>OS</b>	<b>HD</b>	<b>RAM</b>	<b>NIC</b>
Server	Clone	Pentium II 233	NT Server 4.0 SP5	600 MB	32 MB	3C980
Source	HP Vectra	Pentium II 350	NT Workstation 4.0	10 GB	64 MB	3C905C
Target	Compaq DeskPro	Pentium 133	None	600MB	32 MB	3C905C

Note: A 3Com Office Connect 100M hub to network these machines.

A Step by Step Guide to using 3Com's DynamicAccess Boot Services with Norton Ghost

Installation of Norton Ghost Enterprise 6.0 on the Server

Norton Ghost was installed on the root, c:\ghost, of the NT 4.0 Server.

#### **Installation of DABS on the Server**

1. Run setup.exe. You will then be presented with a license agreement.
2. After you accept the license, you will be prompted for an install location. Select the default directory, c:\programfiles\ 3Com\DynamicAccess boot services, for installation.
3. During the installation process for DABS, you will be prompted to choose between 3 options: Administrator, Custom, or Server. Install the Server setup to install all applications, services, utilities and help documentation.

4. Create a directory in your c:\ drive called tftpboot. Copy the bootptab file (c:\program files\3Com\DynamicAccess Boot Services\Bootptab) into the c:\tftpboot directory.

5. Configure the PXE Service options tab to point to the location of the bootptab file.

### Implementation

At the Target machine:

1. The client PCs had 3Com 3C905C NICs installed.

2. To create the initial image, copy ghost.exe (c:\ghost\ghost.exe) to a floppy and install the Norton Ghost Client on the source machine.

**At the Server:**

1. Installed a 3Com 3c980 NIC, 3Com's DynamicAccess Boot Services (server setup), and Norton Ghost 6.01 on the NT 4.0 server.

2. Use the Norton Ghost Multicast Assist Wizard to create a Ghost Multicast DOS Boot Disk. The DOS Boot Disk contains the following files:

command.com autoexec.bat config.sys  
drvspace.bin io.sys msdos.sys  
ghost.err ghost.exe wattcp.cfg  
dis\_pkt.dos el90x.dos netbind.com  
protman.dos protman.exe protocol.ini  
ghstwalk.exe, emm386.exe himem.sys

Note: ghstwalk.exe, emm386.exe and himem.sys were manually added to the boot disk. Ghstwalk.exe was added to the boot disk so that Ghostwalker could be included in the batch file and be used to automate changing the Client PC's computer names, passwords and SIDs.

### Example of Config.sys

```
REM /testmem:off is use so the ramdrive does not get corrupted  
Device=himem.sys /testmem:off
```

```
Device=emm386.exe noems  
Dos=high, umb
```

```
REM loads driver for the network adapter  
Device=el90x.dos  
Lastdrive=z
```

### Example of Autoexec.bat

```
@echo off  
prompt $p$g  
\net\netbind.com  
cd \ghost  
echo Loading...
```

REM Starts Ghost Client in Multicast Mode and starts the download of the Ghost image

```
ghost.exe -clone,mode=load,src=@MCDeploy,dst=1 -sure -fx
```

Note: you can configure the Autoexec.bat to "dump" an image from the client first, and then configure the Autoexec.bat to "load" an image to the client (as the example above illustrates.)

Note: The Ghostwalker utility can be added to the autoexec.bat to automatically change the

Client's computer name, password, permissions, and SID.

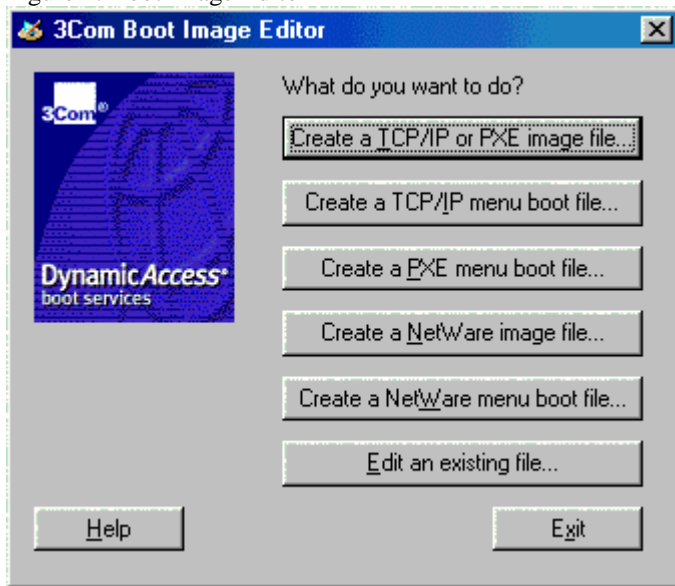
### Using the Boot Image Editor to Make an Image of the Norton DOS Boot Disk.

To eliminate the need of having to visit the client PCs with the Norton Boot Disk, the Boot Image Editor can be used to create a boot image from the Norton Boot Disk and this single image can then be stored and maintain on a server.

To create the image:

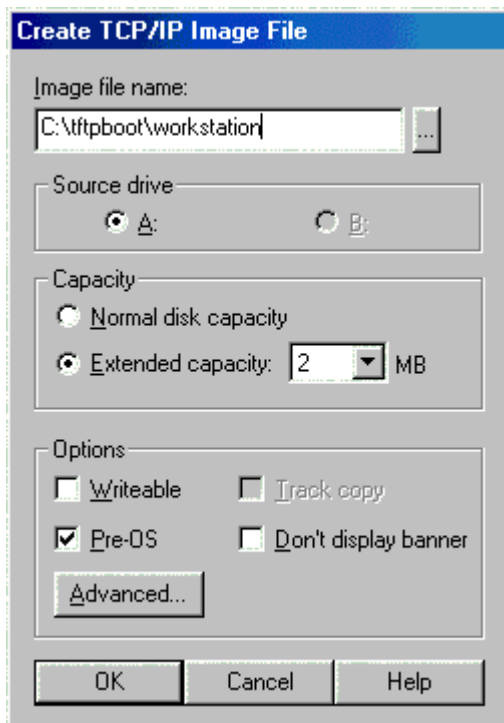
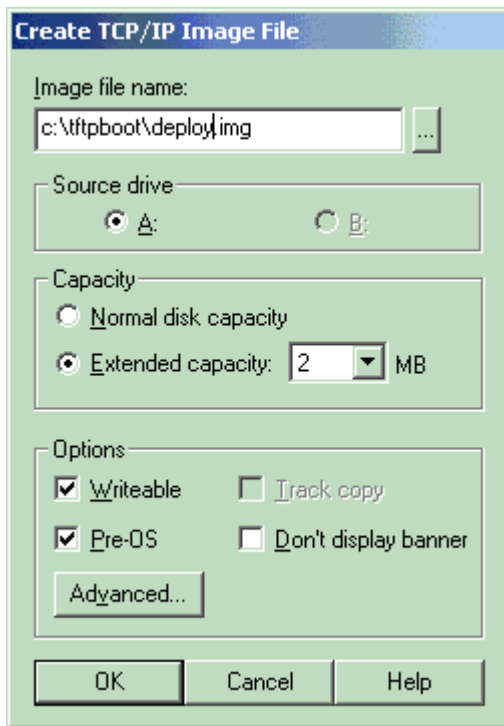
- i) Launch the Boot Image Editor (Start, Programs, DynamicAccess Boot Services, Boot Image Editor).
- ii) Select "Create a TCP/IP or PXE image file", see Figure 1

Figure 1: Boot Image Editor



- iii) Change the path to the tftpboot directory you created in step 3 (c:\tftpboot), see Figure 2.
- iii) Name the image <filename>.sys, see Figure 2.
- iv) Select extended capacity, the image needs to be 2MB or larger to accommodate the ghostwalker utility, see Figure 2.
- v) Select the Writeable Option, see Figure 2.
- vi) Select the Pre-OS Option, see Figure 2.
- vi) Put the Norton Ghost client boot diskette you created previously in Step 4 in the source drive, A:\.
- vii) Press OK to create the image, see Figure 2.

Figure 2: Create TCP/IP Image File Dialog Box



4. To automate the Norton Ghost Multi Cast Session, create a batch file that starts the multicast server and starts the download. Here is an example such a batch file "deploy.cmd":

## **Deploy.cmd**

```
@echo off
```

```
@echo starting Norton Ghost multicast server
```

```
REM Starts GhostServer in Multicast Mode and waits for client to connect
```

```
c:\ghost\ghostsrv c:\ghost\deploy.gho DEPLOY -n1 -ls -fe:\ghost.log -c
```

```
@echo All Done
```

For a complete list and explanation of Norton Ghost command-line switches, see the Norton Ghost Enterprise Implementation Guide Appendix A. The file is called ngcons.pdf and you can find it in the c:\ghost directory.

## **Using DynamicAccess Boot Services' PXE with Norton Ghost**

### **At the Server:**

5. Run your batch file, eg. "deploy.cmd."

1. Start Microsoft DHCP service
2. Start the 3Com PXE Server.
8. Start the 3Com TFTP Server.

### **At the client:**

1. Turn on the client, either manually or this could be done at the server by remote wakeup if the client has remote wakeup capability.
2. Configure MBA with either the MBACFG.EXE utility found on the MBA Utility Disk or by pressing CTRL+ALT+B on startup. Configure MBA to boot PXE.

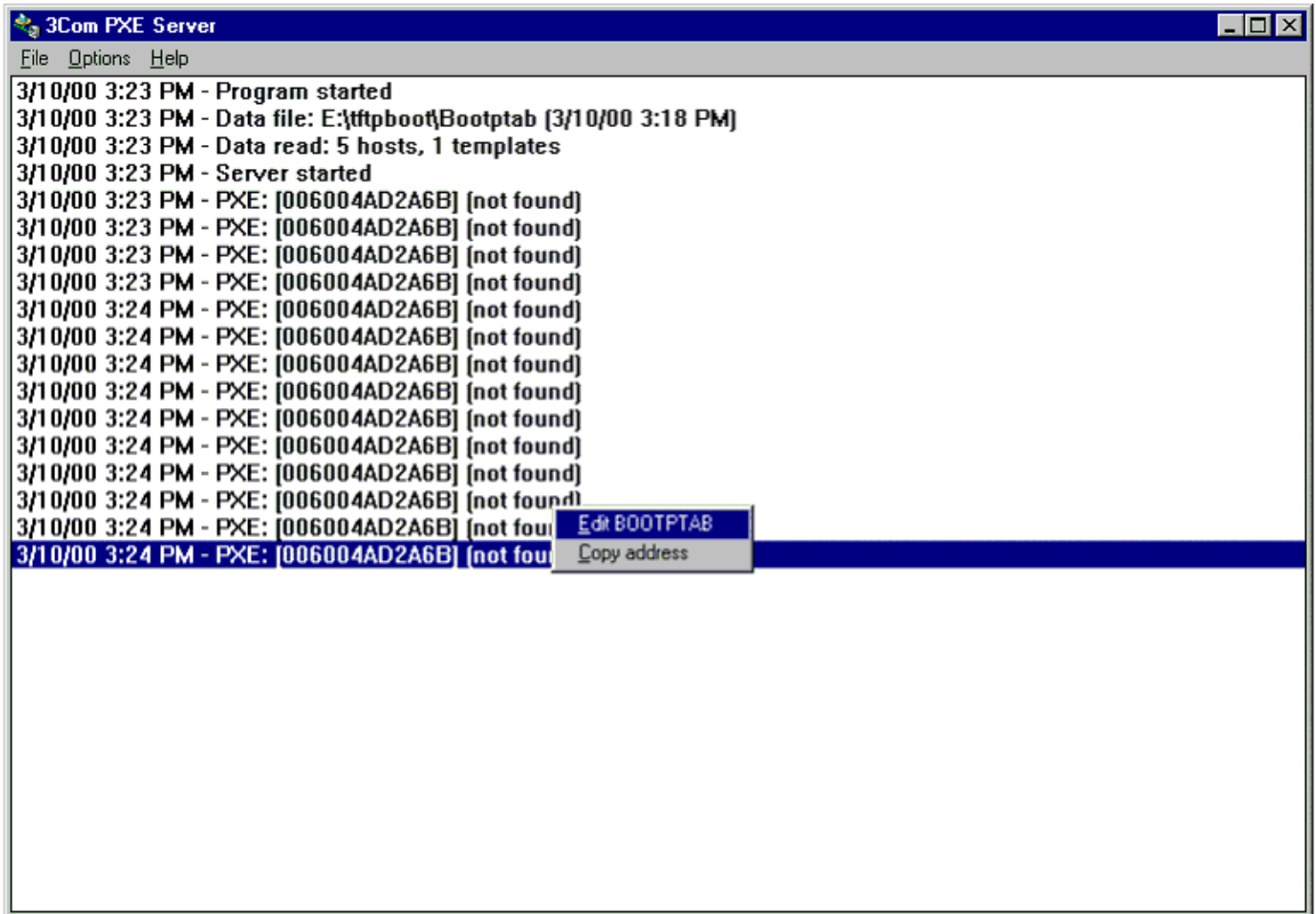
### **At the server:**

1. In the 3Com PXE Server window, you will see the client PC's MAC address followed by a "not found" comment. This is because the client has not been added to the BOOTPTAB file. To add the client to the BOOTPTAB file:
  - i) Right click the "not found" line, see Figure 1.



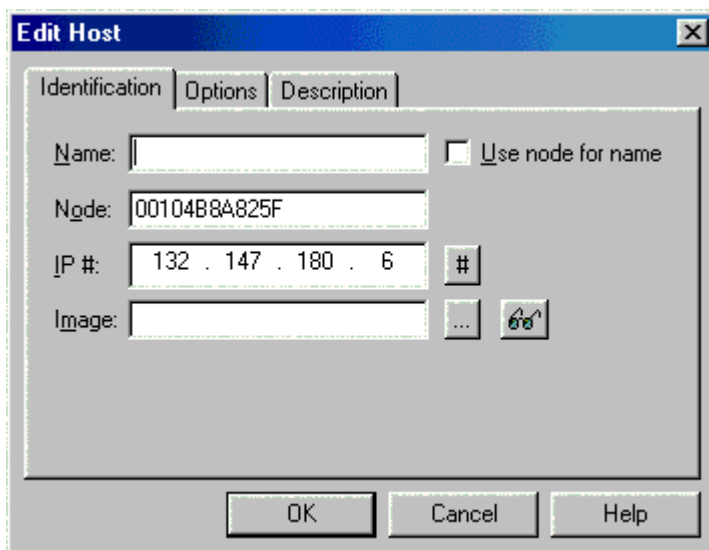
ii) Select "edit BOOTPTAB" and the Edit Host box will appear, see Figure 2.

Figure 2: Edit BOOTPTAB



iii) The Client's MAC address is already filled in, enter a name, and an IP address, see Figure 3.

Figure 3: Edit Host Dialog Box



iv) Use the Browse button (...) to find the image <filename>.img

**At the Server:**

1. Use the Boot Image Editor to create a PXE menu boot file.

i) Select "Create a PXE menu boot file"

ii) Select "Add"

iii) Browse for the image file <filename>.img, press Open, Ok, and then Save.

iv) Select a <filename.pxe>.

v) Save and exit.

1. Launch the BOOTPTAB Editor and double click the client. Edit the image file path to point to the <filename.pxe> image you just created in step 3.

Note: After editing the client, you must save the BOOTPTAB file (Edit, save.)

2. Run your batch file, eg. "deploy.cmd."

3. Start the client either manually or by using a remote wakeup utility.

MBA or PXE ROMs guarantee that new PCs on the network with no OS and unformatted hard drives will connect to the network. Using DABS and MBA while performing a roll-out will greatly reduce TCO by compressing new-hire setup, reducing downtime due to PC problems, and accelerating upgrades to the latest PC technologies and applications.

In combination with Norton Ghost, the Ghost Multicast Server enables multiple machines to be cloned simultaneously using a single efficient stream of information sent over a computer network.

Ghost Walker (GWEVAL.EXE) is a Security Identifier (SID) update utility that assigns a new statistically unique SID to a Windows NT workstation and updates the NT volume with the new SID.

## **USING WINDOWS NT UNATTENDED INSTALL WITH DABS**

The unattended installation option automates the installation or upgrade process so you do not have to sit at the keyboard and respond to Setup prompts. You can tell Winnt.exe file in advance where to find the installation files by using the /s switch. You can also create an answer file to that contains responses to the final Setup prompts. By using the /u switch with an answer file, you can automate the entire installation.

You can use the Setup Manager (SETUPMGR.EXE, utility can be found on the Windows NT Workstation and Server Resource kit) to create an answer file, or you can use any text editor to edit the answer file template unattend.exe (found on the Windows NT installation CD-ROM).

The following answer file is the default Unattend.txt file provided on the Windows 2000 CD.  
Sample Answer File for Unattended Setup:

## What You Will Need

- 3Com's Managed PC BootAgent on client PCs
- Client PCs and NICs with remote wakeup capability
- Remote wakeup and shut down utilities
- 3Com's DynamicAccess Boot Services
- Network client disk

## Creating a Network Client Disk

1. Create a bootable diskette.  
Ex. Sys A: (From a DOS or Windows 9x Session)
2. Go to the Network Client Administrator (Start, Programs, Administrator Tools) to make a Client Network Installation Disk.
  - i) Path- select the Clients folder
  - ii) Verify- Server name and share name
  - iii) Choose the network client and network adapter
  - iv) Enter the computer name, user name and domain
  - v) Select the network protocol (if TCP/IP then verify the TCP/IP settings).
  - vi) Select the destination path a:\

Note: If your network adapter was not available in step iii, you will have to manually edit the protocol.ini and system.ini on the client diskette to reflect your network adapter.

3. In the Config.sys, make sure that the option testmem:off switch is added to Himem.sys.

4. Modify the autoexec.bat to start unattended install from a shared directory:

### Sample Autoexec.bat

REM Standard MS Client Disk Files

```
path=a:\net
a:\net\net initialize
a:\net\netbind.com
a:\net\umb.com
a:\net\tcptsr.exe
a:\net\tinyrfc.exe
a:\net\nmtsr.exe
a:\net\lemsbfr.exe
REM Automate the login process
net logon administrator password /savepw:no /y
```

REM Mapping the drive where the Windows NT Install files are located

```
net use z: \\bootserver\images
echo Running Setup...
```

REM This will launch the Windows NT Unattended Install

```
Z:\i386\winnt /b /u:z:\i386\unattend.txt /s:z:\i386 /x
```

*This option should be the last line in the autoexec.bat.*

5. Use the DABS Boot Image Editor to create boot image from the boot diskette you just created.
6. Choose a protocol to boot with and see the section "Required DABS Components" to find out which DABS components you will need to configure.

7. Copy unattend.txt to share directory.

**Sample NT Unattended File:**

**[Unattended]**

UnattendMode = FullUnattended  
OemPreinstall = No  
TargetPath = Winnt  
Filesystem = LeaveAlone

**[UserData]**

FullName = "*Your user name*"  
OrgName = "*Your organization name*"  
; It is recommended that you avoid using spaces in the ComputerName value.  
ComputerName = "*YourComputer\_name*"  
; To ensure a fully unattended installation, you must provide a value for the ProductId key.  
ProductId = "*Your product ID*"

**[GuiUnattended]**

; Sets the TimeZone. For example, to set the TimeZone for the  
; Pacific Northwest, use a value of "004." Be sure to use the  
; numeric value that represents your own time zone. To look up  
; a numeric value, see the Unattend.doc file on the Windows 2000 CD.  
TimeZone = "*YourTimeZone*"  
; It is recommended that you change the administrator password  
; before the computer is placed at its final destination.  
AdminPassword = AdminPassword  
; Tells Unattended Setup to turn AutoLogon on and log on once.  
AutoLogon = Yes  
AutoLogonCount = 1

**[LicenseFilePrintData]**

; This section is used for server installs.  
AutoMode = "PerServer"  
AutoUsers = "5"

**[GuiRunOnce]**

; List the programs that you want to start when you log on to the computer for the first time.

**[Display]**

BitsPerPel = 8  
XResolution = 800  
YResolution = 600  
VRefresh = 70

**[Networking]**

; When you set the value of the InstallDefaultComponents key to Yes, Setup will install default  
networking ;components.  
; The components to be set are TCP/IP, File and Print Sharing, and Client for Microsoft Networks.  
InstallDefaultComponents = Yes

**[Identification]**

; Identifies your workgroup. It is recommended that you avoid using spaces in this value.  
JoinWorkgroup = "*YourWorkgroup*"

## **BUILDING PXE MENU'S TO MANAGE OS ROLLOUTS**

3Com's DynamicAccess Boot Services Image Editor allows the process of creating PXE Boot Menu's to suit differing needs of the end users and client PCs on a network. You can configure the remoteboot network such that each client PC has a unique boot image.

In the process of using a PXE Menu to automate OS rollout we will be modifying the deploy.cmd file to take advantage of the of PXE menu file.

### **HOW TO CREATE A PXE MENU FILE:**

The first menu image that is to be created should include either the Ghost or Windows unattended image. The second image will just include an option to boot local.

- 1) From the main Boot Image Editor window, Select **Create a PXE Menu Boot File**
- 2) Select Add in the Files tab.
- 3) Select Browse to select an existing boot image or if the image is going to boot local choose the option to boot from the hard drive.
- 4) Type the Description of the Image file.
- 5) Repeat steps 1 to 4 for each menu or boot options that is needed.

### **MODIFIED DEPLOY.CMD TO USE WITH THE GHOST**

```
@echo off
@echo starting deployment...
```

```
REM The master PXE image(mba.pxe) is copied to a temp file (temp.pxe)
copy c:\tftpboot\mba.pxe c:\tftpboot\temp.pxe >nul
```

```
REM The image that will use to initiate the os install(deploy.pxe) is copied and renamed as the
REM master image(mba.pxe)
copy c:\tftpboot\deploy.pxe c:\tftpboot\mba.pxe >nul
```

```
REM the winwake.exe is only used if you have one or more machines
REM that you would like to use for remote waking up machines for a rollout
d:\wakeup\winwake.exe /F d:\wakeup\wakeup.ini
d:\ghost\ghostsrv e:\ghost\win98.gho DEPLOY -n1 -ls -fe:\ghost.log -c
```

```
REM After ghost completes imaging of the os in copy the temporary PXE image back to the
REM master image
copy c:\tftpboot\temp.pxe c:\tftpboot\mba.pxe >null
```

### **MODIFIED AUTOEXEC.BAT TO USE WITH WINDOWS UNATTENDED INSTALL**

```
path=a:\net
a:\net\net initialize
a:\net\netbind.com
a:\net\umb.com
a:\net\tcpsr.exe
a:\net\tinyrfc.exe
a:\net\nmtsr.exe
a:\net\emsbfr.exe
REM Automate the login process
net logon administrator password /savepw:no /y
```

```
REM Mapping drive to the remote boot images
net use p: \\bootserver\tftpboot
```

```
REM Mapping
net use z: \\bootserver\images
echo Running Setup...
Z:\i386\winnt /b /u:z:\i386\unattend.txt /s:z:\i386 /x
```

```
REM The master PXE image(mba.pxe) is copied to a temp file (temp.pxe)
copy p:\mba.pxe p:\temp.pxe >nul
```

```
REM The image that will use to initiate the os install(deploy.pxe) is copied and renamed as the
REM master image(mba.pxe)
copy p:\<localboot>.pxe p:\mba.pxe >nul
@echo All Done
```

### **Conclusion**

3Com's DynamicAccess Boot Services and Managed PC Boot Agent improve IS productivity and responsiveness as well as end-user satisfaction by eliminating the majority of on-site visits. MBA guarantees that new PCs on the network with no OS and unformatted hard drives will connect to the network. MBA also improves IS productivity and reduces administration costs by enabling administrators to configure or update any number of PCs by making changes to a single image on a network server. Using DABS and MBA while performing a roll out will greatly reduce TCO by compressing new-hire setup, reducing downtime due to PC problems, and accelerating upgrades to the latest PC technologies and applications.