Leveraging LCCM with GHOST®

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Introduction:

GHOST is a disk-imaging product copyrighted by Symantec Corporation.

In normal use, GHOST requires the user to be at each client that is to be imaged. After each client has been imaged, some time will then be spent configuring each client with any necessary unique parameters. This document shows how to use GHOST together with LCCM to image machines entirely from the server. Using the procedures outlined here will allow imaging of multiple clients without the user ever having to go to the clients. The image can also be customized for the known user of a machine. This document shows how to image and customize a Windows 98 or Windows 95 installation. As GHOST can image any kind of partition, these procedures can be used to deploy any kind of operating system, within the limits of that operating system. Imaging a Windows NT installation is not advisable, and is not supported as an installation method for Windows NT. The customization procedure described here is specific to Windows 9x.

These procedures require the use of a registered copy of GHOST version 5.1c (or later). Earlier versions of GHOST have various memory constraints or command-line limitations. Shareware versions of GHOST do not allow the use of batch parameters, so will also not allow these procedures to work in unattended fashion.

These procedures require the creation of text files. They can be created in any text editor. Complete listings of the files are given in the text of the document and as a summary at the end. It may be desirable to create these files before continuing. All these files should be placed in the CLNTFILE directory under the LCCM installation directory (the default will be the c:\lccm\clntfile directory).

The files required are:

1. GETIMG.LCI
2. PUSHIMG.LCP
3. PUSHIMG.LCI
4. REGISTRY.BAT

All these files are available as a zipped file, available for download as, LCCMGH.EXE.

Procedures:

For those who need minimal guidance, here is a summary of what needs to be done:

1. Prepare the client for imaging.
2. Acquire the image onto the LCCM server.
   Use either the LCP file or the LCI file to run GHOST, creating an image on the LCCM Server from the client.
3. Create a profile for imaging.
   Use the preload batch file to move the GHOST image to the client.
   Use the final image batch file to customize the image.

Detailed procedure

To use GHOST with LCCM requires 4 steps, after having a working LCCM setup:

The procedures described here use various example files. The files that actually get used will have to be custom-written for the particular situation. Some of the parameters used in these example files and profile may not be needed. It is the user's responsibility to define parameters as required. The example here is designed to identify many changeable parameters in the registry, and can be used as a jumping-off point to further customization. If a parameter is identified here that will have a global default that will never change, the easiest way to take care of that situation is not to change it in the registry. Remember that only values that are defined will be changed. To keep a value as a universal default in the registry, just do not alter it; that way every machine will get it, and processing time will also be shorter.

1. Install software on a donor client.
2. Prepare the installation for imaging.
3. Create a GHOST image of the client on the LCCM server.
4. Use LCCM to image and customize clients.

1.   Install the software on the donor client

Install all the required software on the client. This paper is for an installation of Windows 95 or Windows 98. The best way to install Windows 9x is to copy the entire win95 or win98 directory from the installation CD-ROM to the hard-drive, and run the setup.exe program from there. This leaves the correct installation path in the registry, so that any updates that require the Windows installation CD-ROM can automatically find the required files. If windows is already installed, it is possible to copy the installation files to the hard drive after the fact, and modify the registry to point to the required files.

2.   Customize the installation for imaging

Customizing the installation image requires editing the registry. Editing the registry incorrectly can leave a computer in a non-bootable condition, so is a task to be undertaken with due care. Always make a copy of the registry before editing it. The procedures to be described here backup the registry as a matter of course. Full procedures for customizing a client installation image are in the documentation for LCCM 2.0. A summary of what needs to be done follows.

A. Create a backup of the Windows 95 Registry.

> **Note:** This file can be used to restore the donor workstation to a working state.

a. In the Windows 95 interface, click on **Start**.
b. Select **Run**.
c. Type REGEDIT in the field provided and select **OK**. The Registry menu appears. Make sure that the top-level folder (in the upper left of the window) is the *My Computer* folder.
d. Select **Registry**.
e. Select **Export Registry File.**
f. Select the All radio button in the Export range section.
g. Type C:\WINDOWS\PRIMARY.REG in the File name field and select **Save**.

B. Modify the Windows 95 Registry with dummy values.

> **Note:** A good working knowledge of the Windows 95 Registry is required. Any errors in the Registry might prevent the workstation from functioning properly. Record all steps taken when editing the Registry.

a. Select **Edit.**
b. Select **Find.** Search for the *Value* name that identifies a parameter for modification. (*see later*)
c. An example of the *Value* name of a global parameter is:

Workgroup - This parameter identifies the workgroup to which the client workstation is connected.

An example of the Value name of a unique client parameter is:

ProductId - This parameter identifies the Windows license product identification number. Each client workstation must have its own ProductId.

Note: Always start a search for a new attribute at the top of the Registry file (the *My Computer* folder).

d. When an attribute is found, click the right mouse button, and then selec**t Modify** from the pop-up menu.
e. In the Edit String dialog box, the Value Data string is highlighted. Change this value to a dummy value and select **OK.**

Use the following lists to add dummy values to the Registry.

COMMON PARAMETERS (these will be defined on the "Parameters" page of the "Software Profile")

Search for *Value* Name	Replace *Value* data with	Comment
Domain	dummy_DomName	TCPIP domain name
NameServer	dummy_NameServ	Domain Name Server
NameServer1	dummy_NameServ1	This is actually the *WINS* Server address
NameServer2	dummy_NameServ2	Second *WINS* server
IPMask	dummy_IPMask	Subnet Mask
DefaultGateway	dummy_DefGate	
RegisteredOwner	dummy_RegName	

Note: If these values will never change, then do not make the changes in the registry, and do not set them up as parameters in the profile. It will also be necessary to not include them for changing in the LCI file (*see later*).

UNIQUE CLIENT PARAMETERS (these will be defined on the "Client Parms" page of the "Software Profile")

Search for *Value* Name	Replace *Value* data with	Comment
ComputerName	dummy_Cname	NetBIOS name of computer

IPAddress	dummy_IPAddr	
Workgroup	dummy_Wkgrp	
HostName	dummy_Hname	TCPIP Hostname (usually the same as the NetBIOS name)
ProductID	dummy_IDNum	
username	dummy_user	

f.   After have modifying the Registry with dummy statements, select **Registry** from the menu bar.
g.   Select **Export Registry Fil**e.
h.   Select the **All** radio button in the Export range section.
i.   Type C:\WINDOWS\CLONE.REG in the File name field and selec**t Save**.

There are now two Registry files: PRIMARY.REG, which contains the original values, and CLONE.REG, which contains dummy values.

3.   Create a GHOST image of the client on the LCCM server

Rather than use manual procedures, these methods describe using LCCM Software Profiles, even to acquire the donor image. This presents a user with the ability to acquire images at will, simply by using LCCM's native ability.

In these procedures, the following assumptions are used to clarify things:

1.   There is a shared directory called by the sharename *FILZ* on the LCCM Server.
2.   The GHOST images will be put in a directory called *LCCMIMG*, that is a sub-directory of the directory shared as *FILZ* on the LCCM Server.
3.   The image file is called *IMAGE.GHO*
4.   The LCCM Server recognizes an administrator account for a user called "*administrator*", with a password called "*password*".

Make substitutions as necessary.

A. Create a Final Image batch file, called *GETIMG.LCI* to be used for acquiring the client image. Here is a listing of the file:

```
net logoff
net logon administrator password
net use m: %lcserver%\filz
ghost -clone,mode=dump,src=1,dst=m:\lccmimg\image.gho -sure -fx -z9
```

This file will create an image called *IMAGE.GHO* in the directory *LCCMIMG* on the LCCM Server. The image will be the entire first hard drive of the client. All command-line parameters of GHOST are supported, so it is possible to image just a single partition or some other desired image. Refer to the GHOST documentation for command-line parameters, and modify the fourth line as required. Specify the image name as required.

B. Create a profile manually by clicking on **Profile,** then on **Create New**, and selecting the manual option.

a.   Elect to create a Clone Profile
b.   Name the profile "*Get GHOST image*".

The screen will look like the picture below.
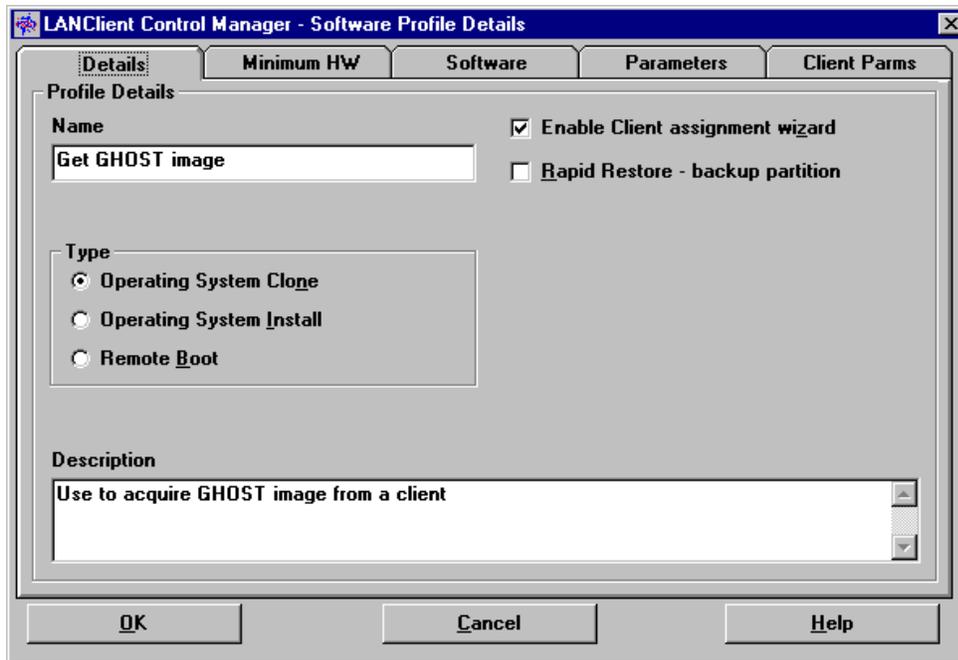
c.   Click on the "Software" page
d.   Uncheck the box to use a Preload Image.
e.   For the Final Image Batch File, point the profile to the *GETIMG.LCI* file that was created before.
f.   Click on **OK** to complete creation of the Software Profile.

g.   Copy the GHOST.EXE file to the *CLNTFILE* directory under the LCCM installation directory (the default will be the c:\lccm\clntfile directory).

h.   To capture an image, drop the pre-configured client onto the "Get GHOST image" profile and click the "Process" button.

4. Use LCCM to image and customize clients

A. Create a Preload Image batch file, called PUSHIMG.LCP to be used for pushing the image to a client.
    Here is a listing of the file:

```
net use m: %lcserver%\filz
%lccmpath%\ghost -clone,mode=load,src=m:\lccmimg\image.gho,dst=1,sze1=f -sure -fx
```

This file will use the image file *IMAGE.GHO* to image the first hard drive of the client. Refer to the GHOST documentation for other options to create images.

B. Create a Final Image batch file, called PUSHIMG.LCI to be used for customizing the client image.
    Here is a listing of the file:

```
if exist %dospath%\smartdrv.exe %dospath%\smartdrv.exe c-
%target%

rem Copy needed configuration files to the client.
xcopy %lccmpath%\deditd.exe %target%\lancli\
copy %lccmpath%\registry.bat %target%\lancli\registry.bat
```

```
rem Prepare client to finish LCCM configuration on next boot
copy %target%\autoexec.bat %target%\lancli\autoexec.bat
echo c:\lancli\registry.bat>>%target%\autoexec.bat

rem Change dummy parameters in clone.reg
cd \windows
%target%\lancli\deditd /R /N0 clone.reg dummy_DomName %DOMAIN%
%target%\lancli\deditd /R /N0 clone.reg dummy_Wkgrp "%WORKGROUP%"
%target%\lancli\deditd /R /N0 clone.reg dummy_NameServ "%NAMESERVER%,%DNS2%"
%target%\lancli\deditd /R /N0 clone.reg dummy_NameServ1 %NAMESERVER1%
%target%\lancli\deditd /R /N0 clone.reg dummy_NameServ2 %NAMESERVER2%
%target%\lancli\deditd /R /N0 clone.reg dummy_IPMask %IPMASK%
%target%\lancli\deditd /R /N0 clone.reg dummy_DefGate %GATEWAY%
%target%\lancli\deditd /R /N0 clone.reg dummy_RegName "%REGNAME%"
%target%\lancli\deditd /R /N0 clone.reg dummy_CName %CNAME%
%target%\lancli\deditd /R /N0 clone.reg dummy_IPAddr %IPADDR%
if not %hostname%.==. %target%\lancli\deditd /R /N0 clone.reg dummy_Hname %HOSTNAME%
if %hostname%.==. %target%\lancli\deditd /R /N0 clone.reg dummy_Hname %CNAME%
%target%\lancli\deditd /R /N0 clone.reg dummy_IDNum "%PRODID1%%PRODID2%"
%target%\lancli\deditd /R /N0 clone.reg dummy_user %USERNAME%
```

C. Create a file called *REGISTRY.BAT* and place it in the *CLNTFILE* directory under the LCCM installation directory (the default will be the c:\lccm\clntfile directory).
   Here is a listing of the file:

```
cd \windows
regedit /l:c:\windows\system.dat /r:c:\windows\user.dat /c clone.reg
del c:\autoexec.bat
copy c:\lancli\autoexec.bat c:\
```

D. Create a profile manually by clicking on **Profile,** then on **Create New**, and selecting the manual option.
   Elect to create a Clone Profile
   Name the profile "*Push GHOST image*"

E. Click on the "Parameters" page and fill in the following parameter names:

Name	Comment
DOMAIN	
NAMESERVER	The Domain Name Server Address
DNS2	The second DNS address
NAMESERVER1	Actually the WINS server
NAMESERVER2	
IPMASK	
GATEWAY	
REGNAME	

Note: The peculiar construction of the registry entry for nameservers requires that these be defined as above. The entries will be correctly concatenated using the Final Image batch file.

Any values assigned will become defaults for the profile.

The screen will look like the picture below.
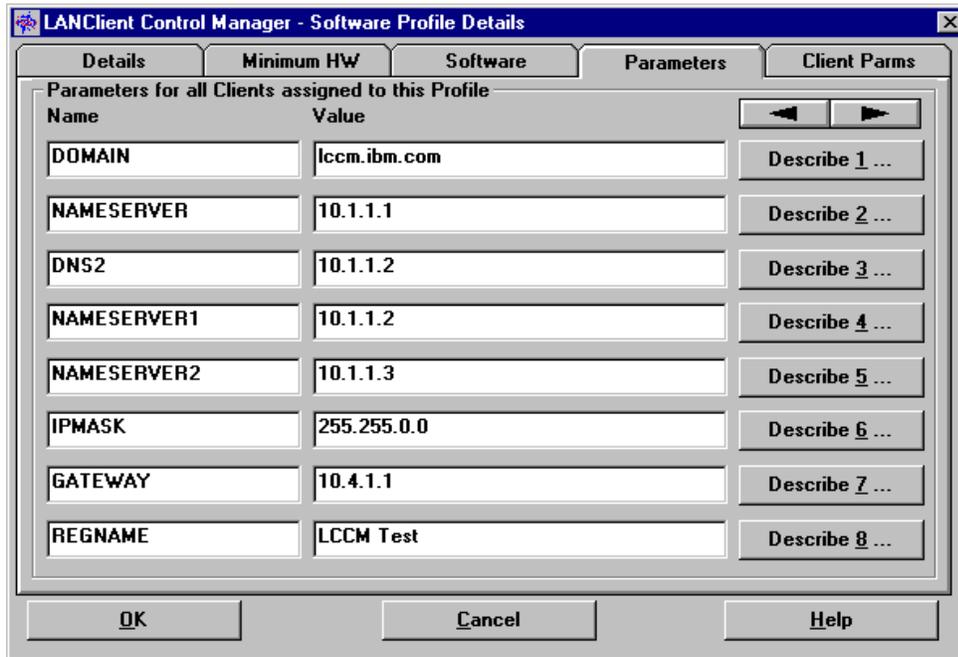
F. Click on the "Client Parms" page and fill in the following parameter names:

WORKGROUP
IPADDR
HOSTNAME
PRODID1
PRODID2
USERNAME

It is necessary to break the Product Registration Number field into 2 parts (PRODID1 and PRODID2) because Windows 98 Registration numbers are 25 characters long. This exceeds the 24-character limit for the fields. The 2 parts of the Product ID are concatenated using the Final Image batch file that is used for customizing the image.

Any values assigned will become defaults for the profile.

The "Describe X…" buttons can be used to input text, which will appear on the screen as a description when the client assignment wizard prompts for input.

The screen will look like the picture below.
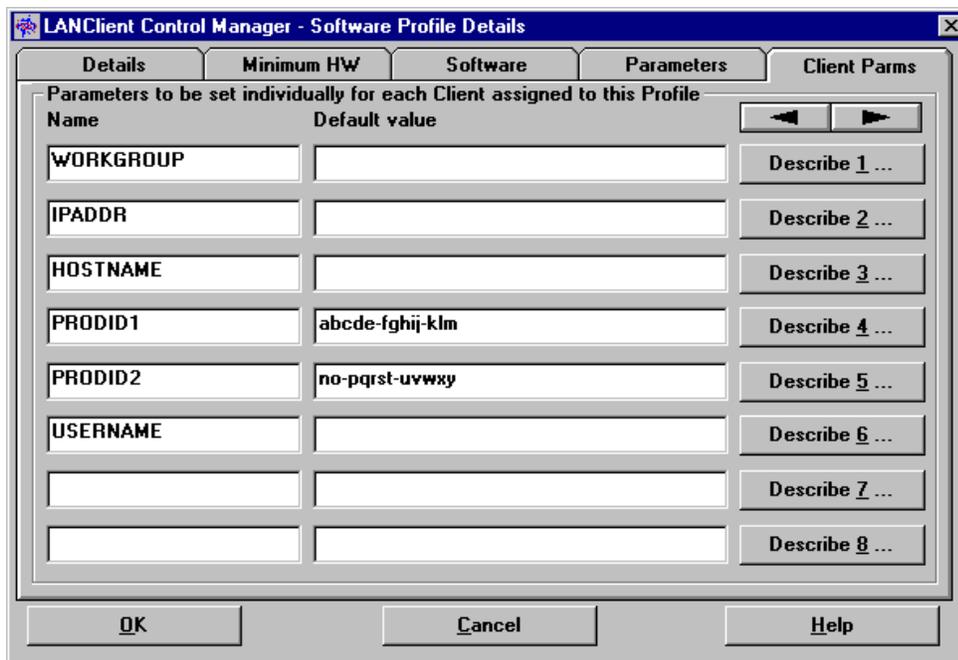
Click on **OK** to close and save the profile just created.

To image a client, drop the client onto the "Push GHOST image" profile and click the "Process" button.

FILE LISTINGS

GETIMG.LCI

```
net logoff
net logon administrator password
net use m: %lcserver%\filz
ghost -clone,mode=dump,src=1,dst=m:\lccmimg\image.gho -sure -fx -z9
```


PUSHIMG.LCP

```
net use m: %lcserver%\filz
%lccmpath%\ghost -clone,mode=load,src=m:\lccmimg\image.gho,dst=1,sze1=f -sure -fx
```


PUSHIMG.LCI

```
if exist %dospath%\smartdrv.exe %dospath%\smartdrv.exe c-
%target%

rem Copy needed configuration files to the client.
xcopy %lccmpath%\deditd.exe %target%\lancli\
copy %lccmpath%\registry.bat %target%\lancli\registry.bat
```

```
rem Prepare client to finish LCCM configuration on next boot
copy %target%\autoexec.bat %target%\lancli\autoexec.bat
echo c:\lancli\registry.bat>>%target%\autoexec.bat

rem Change dummy parameters in clone.reg
cd \windows
%target%\lancli\deditd /R /N0 clone.reg dummy_DomName %DOMAIN%
%target%\lancli\deditd /R /N0 clone.reg dummy_Wkgrp "%WORKGROUP%"
%target%\lancli\deditd /R /N0 clone.reg dummy_NameServ "%NAMESERVER%,%DNS2%"
%target%\lancli\deditd /R /N0 clone.reg dummy_NameServ1 %NAMESERVER1%
%target%\lancli\deditd /R /N0 clone.reg dummy_NameServ2 %NAMESERVER2%
%target%\lancli\deditd /R /N0 clone.reg dummy_IPMask %IPMASK%
%target%\lancli\deditd /R /N0 clone.reg dummy_DefGate %GATEWAY%
%target%\lancli\deditd /R /N0 clone.reg dummy_RegName "%REGNAME%"
%target%\lancli\deditd /R /N0 clone.reg dummy_CName %CNAME%
%target%\lancli\deditd /R /N0 clone.reg dummy_IPAddr %IPADDR%
if not %hostname%.==. %target%\lancli\deditd /R /N0 clone.reg dummy_Hname %HOSTNAME%
if %hostname%.==. %target%\lancli\deditd /R /N0 clone.reg dummy_Hname %CNAME%
%target%\lancli\deditd /R /N0 clone.reg dummy_IDNum "%PRODID1%%PRODID2%"
%target%\lancli\deditd /R /N0 clone.reg dummy_user %USERNAME%
```

REGISTRY.BAT

```
cd \windows
regedit /l:c:\windows\system.dat /r:c:\windows\user.dat /c clone.reg
del c:\autoexec.bat
copy c:\lancli\autoexec.bat c:\
```

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