



Best Practices for Installation of Microsoft® Windows® on Dell Servers with Broadcom NetXtreme Devices

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1. Revisions and References

1.1. Revision History

Date	Revision #	Explanation of Changes	Author
May 17, 2006	0.1	Initial document	Ken Bignell
May 23, 2006	0.2	Added sections from other authors	Ken Bignell
May 24, 2006	0.3	Updated comments from reviewers	Ken Bignell
May 31, 2006	0.4	Updated answer file examples with comments, use of Broadcom Installer and the addition of installing SNP from the answer file. Added a comparison table of automated install with NetXtreme II devices compared to install without NetXtreme II devices.	Ken Bignell
June 12, 2006	1.0	Added example to see if NX2 devices are installed before running Netset.exe	Ken Bignell
June 16, 2006	1.1	Corrections to syntax and spelling throughout the document	Ken Bignell

1.2. Acronyms and Definitions

TOE	TCP/IP Offload Engine
SNP	Microsoft® Windows Server® 2003 Scalable Networking Pack
NX1	Broadcom NetXtreme Family of Adapters and Drivers
NX2	Broadcom NetXtreme II Family of Adapters and Drivers
PXE	Pre-boot Execution Environment
RIS	Microsoft Remote Install Service
ADS	Microsoft Automated Deployment Service
WinPE	Windows Preinstallation Environment
DSA	Dell Server Assistant
MS	Microsoft
VBD	Virtual Bus Driver
NDIS	Network Driver Interface Specification
BACS	Broadcom Advanced Control Suite
BASP	Broadcom Advanced Service Program

1.3. References

Document	Version	Date	Owner
MS Knowledge Base Article 268781	4.1	26 Jan 05	Microsoft
MS Knowledge Base Article 246184	4.0	22 Sept 03	Microsoft
Microsoft Windows Corporate Deployment Tools User's Guide		24 Mar 05	Microsoft
Microsoft Windows Preinstallation Reference		24 Mar 05	Microsoft
Broadcom NetXtreme II User's Guide	2CS57XX-UM2000-R	Feb 06	Broadcom/Dell
MS Knowledge Base Article 920293	2.0	7 June 06	Microsoft

2. Overview

Broadcom drivers on Dell PowerEdge™ servers support both the NetXtreme and the NetXtreme II family of adapters. The device drivers for the two device families are very different in their architecture, but both devices are supported by common management applications such as the Broadcom Advanced Control Suite (BACS), SNMP, and CIM, and a common intermediate driver that provides teaming (link aggregation) support. Because of this architecture and the dependency on file versions for the various components to function well together, the Broadcom drivers are provided in an InstallShield installer package. The install package ensures that the versions of all of the components are tested to be compatible with each other as well as compatible between the two different families of adapters.

The Broadcom NetXtreme family of devices (NX1), the legacy devices, uses a simple NDIS device driver—one driver for one device. The installation method for this driver using Plug and Play is simple and straight-forward.

New technology delivered by the NetXtreme II (NX2) devices, such as TCP/IP Offload Engine (TOE), require that the Broadcom NX2 devices have two device drivers—the Virtual Bus Driver (VBD) and the NDIS Client Driver. This combination of device drivers makes the installation via Plug and Play a bit more complicated.

In addition to the device drivers, there are the intermediate driver and applications that provide advanced services and functions. This combination of drivers and applications can be quite complicated to install; so Dell and Broadcom provide an InstallShield installer. Using the InstallShield installer simplifies the process since the installer takes care of the order of installation as well as ensuring the versions of all of the components match so that they cooperate well together.

The Broadcom device drivers are still Microsoft® Windows® Plug and Play compliant and may be installed without the assistance of the installer, but the use of the installer is highly encouraged by Dell whenever possible in order to minimize complications.

The unique architecture of the Broadcom NetXtreme II drivers requires some specific steps to successfully complete installations, especially automated or unattended installations, which are different than previous drivers required.

Both the NetXtreme I and NetXtreme II drivers are included in one installer package, along with the management apps, for convenience and version compatibility.

2.1. Obtaining the Plug and Play Drivers

The Broadcom device drivers are Microsoft Windows Plug and Play compliant and may be extracted from the installer by running **setup.exe** from the Broadcom driver directory with the `/a` command line parameter and following the on-screen instructions.

3. Manual Installation of the Drivers and Operating System

Dell highly recommends the use of the Dell Server Assistant (DSA) shipped with your server (or an update received from Dell) to prepare and install your PowerEdge system with an operating system. The DSA contains all of the correct drivers for supported devices in your system and sets up an unattended install, making the installation as smooth and easy as possible.

The DSA also provides replication services to deploy an operating system installation across multiple hardware-alike systems.

Please see the documentation provided with your DSA for further information.

4. Using the Broadcom Installer for Automated Operating System Deployment

The installer may be used to install the Broadcom drivers and management applications in conjunction with Windows unattended installation. This method should be used when the system does not require network access while the installation is running. The Broadcom installer, **setup.exe** can be run at the end of the installation phase, or after the first login after the full Windows installation has completed.

4.1. [SetupParams] Section

The Broadcom installer can be run from the [SetupParams] section of the unattended answer file. The SetupParams section of the unattended answer file contains one entry for running an additional command after Windows Setup completes but before the final reboot of the installation.

Syntax:

```
[SetupParams]  
UserExecute = path_and_filename
```

Example:

```
[SetupParams]  
UserExecute = "C:\broadcom\w2k3\setup.exe"
```

The following restrictions apply:

- Only one command can be specified. If more than one "UserExecute" line exists, only the first line is run and the rest are ignored.
- Enclose *path_and_filename* in quotation marks unless the application is in the %SYSTEMROOT% or %SYSTEMROOT%\system32 folder or search path.

Running the Broadcom installer in this section will install all of the drivers for all of the supported Broadcom network devices in the system, all of the Broadcom management applications, and the Broadcom intermediate driver (teaming driver). The system will then reboot and present the first login prompt of the newly installed operating system.

See **silent.txt** provided with the Broadcom installation program for command line parameters for use with Broadcom's **setup.exe**.

Using this method requires that any non-default network settings, such as static IP addresses, be applied after the operating system is installed. Network settings specified in the unattended answer file will not be applied to Broadcom network devices since the drivers for those devices would not be installed until the very end of the Windows setup. Network settings can be applied manually after the operating system install or they can be applied in the same manner as the Broadcom installer is run, such as using **netset.exe** (see Section 5 of this document) from the SetupParams section of the answer file, or using **cmdlines.txt**.

SetupParams will only execute one command, but that command could be a batch file or script that calls more than one command. To use the installer and apply network settings specified in the unattended answer file, the batch file or script could call the installer, and then call the Microsoft **netset.exe** utility (see MS Knowledge Base article 268781 for information on the **netset.exe** utility) to apply the network settings specified in the answer file to the newly installed Broadcom network devices.

4.2. cmdlines.txt

A more flexible method of running commands at the end of the Windows Setup is to use the **cmdlines.txt** method. To create a **cmdlines.txt** file, use any text editor to create a file named **cmdlines.txt**. Add the following section to the **cmdlines.txt** file

[Commands]

Enter the commands, one per line, below the section just created. Commands are executed serially, meaning that the next command is not executed until the previous is completed. In this manner, the Broadcom drivers and applications can be installed, and then the network settings applied once that command is complete.

Example:

```
[Commands]
"cmd.exe /c C:\Broadcom\setup.exe /s /v/qn"
"C:\Netset c:\unattend.txt"
```

The example above will install the Broadcom drivers and applications silently, and then apply the network settings specified in the **unattend.txt** file (unattended answer file) to the network devices.

The **cmdlines.txt** file must be placed in the **\$OEM\$** directory of the distribution share and the unattended answer file must have the "OemPreinstall = Yes" line under the [Unattended] section.

Joining a domain can be accomplished if the driver installation command and setting of the network parameters using **netset.exe** are done in either the SetupParams or **cmdlines.txt**. If the system being installed will use the default network settings and DHCP, only the driver installation need be specified in either of these sections to successfully join a domain as specified in the unattended answer file.

5. Automated Operating System Deployment Using the Plug and Play Drivers

There are several methods of automated Windows operating system deployment. Those that use the unattended answer file can also use many different methods of identifying the network device that should receive specific network settings.

5.1. Specifying Adapters for Network Settings

The unique architecture of the Broadcom NetXtreme II devices presents some challenges to accomplishing unattended installation when using the bus, device, and function number of the network device to specify which device gets assigned which settings. Specifying the NetXtreme II adapter by its bus, device, and function number in the [Params.Adapter n] section will not work because the network device is viewed by the operating system as a virtual device on a virtual bus. Other methods are provided for identifying network devices as well as an alternate method for applying the network settings using **netset.exe**. The various methods for identifying the adapters to match with their settings are below.

See the *Microsoft Windows Deployment Guide* for more information on how to set up an unattended installation and for more information on how to use each of these methods, <http://support.microsoft.com/kb/229762>.

The following settings are entered under the [params.Adapter n] of the unattended answer file. See the *Microsoft Windows Preinstallation Reference* for detailed instructions on the use of answer files and the sections and parameters listed below.

Using the Plug and Play ID (INFID)

The INFID identifies a network adapter with a value that is the same as the adapter's Plug and Play ID.

For computers with more than one network adapter, you must specify the correct Plug and Play ID of each adapter. For computers with multiple adapters of the same type (that is, the Plug and Play ID for each is the same), you must specify the **NetCardAddress** or PCI location information. If you do not specify the **NetCardAddress** or PCI location, only the first adapter enumerated/detected that matches the InfID receives the answer file entries.

If you specify the **NetCardAddress** or PCI location, Setup does not use the INFID entry because it is the least specific entry.

Example:

```
InfID = *PNP030b
```

Using MAC Address (NetCardAddress)

Specifies the media access control address for the network adapter being configured during unattended setup.

This entry is required when you install multiple network cards of the same type (with the same Plug and Play ID) on a computer and apply non-default entries to the adapters. This entry is not required for PCI adapters if you specify the PCI location information.

Example:

```
NetCardAddress = 0x123456789AB
```

Using Bus, Device, and Function Number

PCIBusNumber, **PCIDeviceNumber** and **PCIFunctionNumber** indicate the PCI bus on which the network card resides, the device number on that bus, and the function number on that device.

You must specify these PCI location entries if:

- You do not specify **NetCardAddress**.
- You install multiple network cards of the same type (with the same Plug and Play ID) on a computer.
- You need to apply non-default entries to the adapter.

If you specify **NetCardAddress**, setup does not use the **PCIBusNumber**, **PCIDeviceNumber**, and **PCIFunctionNumber** entries because **NetCardAddress** provides more specific information than the PCI location information.

Using Bus, Device, and Function Number With Broadcom NetXtreme II Devices

Specifying the NetXtreme II adapter by its bus, device, and function number in the [Params.Adapter*n*] section will not apply the network settings because the network device is viewed by the operating system as a virtual device on a virtual bus. See Microsoft Knowledge Base article 920293 for more information, <http://support.microsoft.com/kb/920293>.

The network settings can be applied from the [SetupParams] section of the unattended answer file by using **netset.exe**. **netset.exe** is a Microsoft tool that reads the answer file and applies the network settings specified therein to the adapters based on the answer file's specifications. See MS Knowledge Base article 268781 for more information on the **netset.exe** utility, <http://support.microsoft.com/kb/268781>.

Example:

```
[SetupParams]  
UserExecute ="C:\netset c:\unattend.txt"
```

The **cmdlines.txt** method can also be used to run the **netset.exe** utility to apply the network settings.

Example:

```
[Commands]  
"C:\Netset c:\unattend.txt"
```

Joining a domain can be accomplished using **netset.exe** in either manner listed above by specifying the domain to join in the normal answer file manner.

Example:

```
[Identification]
JoinDomain = MyDomain
```

A VBScript can be used to determine if NetXtreme II adapters are present before running **netset.exe** if netset is run from within a script in either SetupParams or **cmdlines.txt**, thus allowing one answer file template for systems with NetXtreme II adapters and systems without them. See Appendix E for an example script.

6. NetXtreme II WinPE Considerations

Due to the unique architecture and new technology of the Broadcom NetXtreme II drivers, there are some new process considerations when using the NX2 devices and drivers in conjunction with WinPE.

When building a WinPE image, the following must be considered:

- The “/PnP” switch must be specified in order for the NetXtreme II driver to load.
- The **DRVINST** utility must be used to inject the NetXtreme II drivers. Copying the files to the various directories will not work.
- Only the “-winpe” switch for **factory.exe** works with the VBD and NDIS Client NetXtreme II drivers. A simplistic NDIS driver for RIS use is provided on the Dell support web site that works with the “-minint” switch. See Section 7 for more information on the RIS specific driver.

7. PXE, RIS, and ADS

7.1. ADS

A simplistic NDIS driver must be used for initial network connectivity during the copy portion of the install. This driver resides in the **RIS** directory within the standard NetXtreme II driver package. This driver should be added to the **Presystem** directory as any other driver would be added. This driver is not sufficient, nor will it install in a fully installed operating system. This driver is only for use during operating system deployment and installation; the normal VBD and NDIS client combination of drivers must be used for all other instances.

It is advised that static network settings should be set according to the method described in the ADS documentation under the heading “Image Deployment and IP Address Configuration”. This method uses the “SetStaticIP” VBScript in conjunction with the **set-static-ip.xml** sequence file.

If the ADS deployment solution incorporates custom variables in the **sysprep.inf** file for the various network settings using **PCIBusNumber**, **PCIDeviceNumber**, and **PCIFunctionNumber** as adapter identifiers, the solution must be changed to use the methods described in the sections above.

7.2. RIS

A simplistic NDIS driver must be used for initial network connectivity during the copy portion of the install. This driver resides in the **RIS** directory within the standard NetXtreme II driver package. This driver should be added to the **i386** directory in the particular image that needs 5708 support. For example, if you have a Windows Server 2003 image, the files for this image will reside in a directory such as **\RemotInstall\Setup\English\Images\win2003**; place the drivers in the **i386** subdirectory.

The normal combination drivers (VBD and NDIS Client) drivers should be added to the **\$OEM\$** directory structure as specified in the MS Knowledge Base article 246184.

8. Other Considerations

8.1. Altiris Image Capture/Deploy Using Broadcom NetXtreme II Devices

When performing Altiris Image capture and deploy, do not use the UNDI method of capturing the image. Using the UNDI could result in an operating system halt (BSOD or Blue Screen of Death). Use the Altiris-defined method of specifying and using an NDIS 2 driver. The NDIS 2 driver for NetXtreme II is found in the *DOS Utilities* package of the NX2 driver, available from **support.dell.com**, or available on the *Service Mode CD* of the Dell OpenManage™ CD set.

8.2. Changing TCP/IP Settings With Microsoft SNP Installed

Changing network settings, such as gateway addresses, could cause an operating system halt (BSOD) when the Microsoft SNP package version 9 is installed.

Changing the gateway settings while TOE is active via SNP may cause this issue. The recommended workaround is to disable TOE offload, make the IP settings changes on the system, and then re-enable TOE offload. To do this, use the following commands at a command prompt:

To disable TOE offload:

```
netsh int ip set chimney disable
```

To re-enable TOE offload:

```
netsh int ip set chimney enable
```

Alternately, you can disable the TOE offloading NIC before applying the IP settings changes and then re-enable the NIC in the following manner:

From the Network Connections Properties page, right-click on the TOE enabled network interface and select **Disable** to disable the interface. Make the desired IP settings changes and then re-enable the NIC by right-clicking the disabled interface and choosing **Enable**.

9. Appendixes

9.1. Appendix A – Example Answer File Using netset.exe in SetupParams

```
[UserData]
FullName="DellServer"
OrgName="Dell"
ComputerName="PEServer"
ProductID="Removed, Product ID goes here"
Keyboard="en"

[Unattended]
DriverSigningPolicy=Ignore
NtUpgrade=no
OverwriteOemFilesOnUpgrade=no
FileSystem=ConvertNTFS
OemPreinstall=yes
ConfirmHardware=yes
;ComputerType="Dell PowerEdge Server", "OEM"
ExtendOemPartition=8195
OemFilesPath="C:\dell\%oem$"
OemPnPDriversPath="\drivers;\drivers\r117179;\drivers\r117547;\drivers\r120343;\drivers\r120343\ris_inf;\drivers\r120960;\drivers\r122597;\drivers\r122665;\drivers\r122758;\drivers\r122758\b_29093;\drivers\r122802;\drivers\r122802\sp;\drivers\r97922;\drivers\r99849;\drivers\r99970"
TargetPath=\winnt
OemSkipEula=yes
WaitForReboot=no

[GUIUnattended]
OemSkipWelcome=1
OemSkipRegional=1
AdminPassword=*
EMSBlankPassword = Yes
TimeZone=020

[LicenseFilePrintData]
AutoUsers=500
AutoMode=PERSERVER

[SetupParams]
;The line below will cause netset to execute using the answer file
saved in the root of the C drive.
UserExecute="C:\netset.exe c:\winnt.sif"

[Display]
BitsPerPel=16
XResolution=800
YResolution=600
VRefresh=60
```

```
[Identification]
DomainAdmin="Administrator"
DomainAdminPassword=""
JoinDomain=snacpxe ;Indicates that the server should attempt to
join this domain once OS installation is complete
JoinWorkgroup=

[Networking]
InstallDefaultComponents=Yes

[NetProtocols]
MS_TCPIP=TcpipParams

[NetClients]
MS_MSClient = params.MS_MSClient

[NetServices]
MS_Server = params.MS_Server

[NetOptionalComponents]
SNMP=1
DNS=0
DHCPserver=0
WINS=0

[Components]
iis_common=Off
iisdbg=Off
iis_doc=Off
iis_ftp=Off
iis_htmla=Off
iis_inetmgr=Off
iis_nttp=Off
iis_nttp_docs=Off
iis_smtp=Off
iis_smtp_docs=Off
iis_www=Off
iis_www_docs=Off
indexsrv_system=Off
TSEnable=Off
cluster=Off
snmp_srv=0

[InternetServer]
PathFTPRoot="%systemdrive%\inetpub\ftproot"
PathWWWRoot="%systemdrive%\inetpub\wwwroot"

[TerminalServices]
ApplicationServer=0
```

```
[SNMP]
Community_Name=" "
Limit_Host=localhost
Service=Applications,Internet,End-to-End
Send_Authentication=No
Any_Host=No
Location=" "
Accept_CommunityName=public:Read_Only
Traps=
Contact_Name=" "

[data]
MsDosInitiated="1"
floppyless="1"
AutoPartition="0"
InstallDir="\WINNT"
winntupgrade="no"
win9xupgrade="no"

[NetAdapters]
Adapter0=Params.Adapter0
Adapter1=Params.Adapter1
Adapter2=Params.Adapter2
Adapter3=Params.Adapter3

[TcpipParams]
AdapterSections=TcpipParams.Adapter0,TcpipParams.Adapter1,TcpipParams.Adapter2,TcpipParams.Adapter3

[params.Adapter0]
PciBusNumber=5
PciDeviceNumber=0
PciFunctionNumber=0

[params.Adapter1]
PciBusNumber=9
PciDeviceNumber=0
PciFunctionNumber=0

[params.Adapter2]
PciBusNumber=13
PciDeviceNumber=0
PciFunctionNumber=0

[params.Adapter3]
PciBusNumber=15
PciDeviceNumber=0
PciFunctionNumber=0

[TcpipParams.Adapter0]
SpecificTo=Adapter0
IPAddress=192.168.0.125
```

```
SubnetMask=255.255.255.0
DHCP=no
DefaultGateway=192.168.2.132
WINS=yes
winsServerList=192.168.2.2
DNSServerSearchOrder=192.168.2.120
```

```
[TcpipParams.Adapter1]
SpecificTo=Adapter1
IPAddress=192.168.10.125
SubnetMask=255.255.255.0
DHCP=no
DefaultGateway=192.168.2.132
WINS=yes
winsServerList=192.168.2.2
DNSServerSearchOrder=192.168.2.120
```

```
[TcpipParams.Adapter2]
SpecificTo=Adapter2
IPAddress=192.168.2.125
SubnetMask=255.255.255.0
DHCP=no
DefaultGateway=192.168.2.132
WINS=yes
winsServerList=192.168.2.2
DNSServerSearchOrder=192.168.2.120
```

```
[TcpipParams.Adapter3]
SpecificTo=Adapter3
IPAddress=192.168.3.125
SubnetMask=255.255.255.0
DHCP=no
DefaultGateway=192.168.2.132
WINS=yes
winsServerList=192.168.2.2
DNSServerSearchOrder=192.168.2.120
```

```
[MassStorageDrivers]
"DELL PERC5 RAID Controller Driver (Server 2003 32-bit)"=OEM
```

9.2. Appendix B – Example Answer File Using netset.exe in cmdlines.txt with Example cmdlines.txt

```
[UserData]
FullName="DellServer"
OrgName="Dell"
ComputerName="PEServer"
ProductID="Removed, Product ID goes here"
Keyboard="en"
```

```
[Unattended]
DriverSigningPolicy=Ignore
NtUpgrade=no
OverwriteOemFilesOnUpgrade=no
FileSystem=ConvertNTFS
OemPreinstall=yes ;Required for the automated install to run the
Cmdlines.txt file
ConfirmHardware=yes
;ComputerType="Dell PowerEdge Server", "OEM"
ExtendOemPartition=8195
OemFilesPath="C:\dell\%oem%"
OemPnPDriversPath="\drivers;\drivers\r117179;\drivers\r117547;\dri
vers\r120343;\drivers\r120343\ris_inf;\drivers\r120960;\drivers\r1
22597;\drivers\r122665;\drivers\r122758;\drivers\r122758\b_29093;\
drivers\r122802;\drivers\r122802\sp;\drivers\r97922;\drivers\r9984
9;\drivers\r99970"
TargetPath=\winnt
OemSkipEula=yes
WaitForReboot=no
```

```
[GUIUnattended]
OemSkipWelcome=1
OemSkipRegional=1
AdminPassword=*
EMSBlankPassword = Yes
TimeZone=020
```

```
[LicenseFilePrintData]
AutoUsers=500
AutoMode=PERSERVER
```

```
[Display]
BitsPerPel=16
XResolution=800
YResolution=600
VRefresh=60
```

```
[Identification]
DomainAdmin="Administrator"
DomainAdminPassword=""
JoinDomain=snacpxe ;Indicates that the server should attempt to
join this domain once OS installation is complete
JoinWorkgroup=
```

```
[Networking]
InstallDefaultComponents=Yes
```

```
[NetProtocols]
MS_TCPIP=TcpipParams
```

```
[NetClients]
MS_MSClient = params.MS_MSClient
```

```
[NetServices]
MS_Server = params.MS_Server

[NetOptionalComponents]
SNMP=1
DNS=0
DHCPserver=0
WINS=0

[Components]
iis_common=Off
iisdbg=Off
iis_doc=Off
iis_ftp=Off
iis_htmla=Off
iis_inetmgr=Off
iis_nntp=Off
iis_nntp_docs=Off
iis_smtp=Off
iis_smtp_docs=Off
iis_www=Off
iis_www_docs=Off
indexsrv_system=Off
TSEnable=Off
cluster=Off
snmp_srv=0

[InternetServer]
PathFTPRoot="%systemdrive%\inetpub\ftproot"
PathWWWRoot="%systemdrive%\inetpub\wwwroot"

[TerminalServices]
ApplicationServer=0

[SNMP]
Community_Name=" "
Limit_Host=localhost
Service=Applications,Internet,End-to-End
Send_Authentication=No
Any_Host=No
Location=" "
Accept_CommunityName=public:Read_Only
Traps=
Contact_Name=" "

[data]
MsDosInitiated="1"
floppyless="1"
AutoPartition="0"
InstallDir="\WINNT"
winntupgrade="no"
win9xupgrade="no"
```

```
[NetAdapters]
Adapter0=Params.Adapter0
Adapter1=Params.Adapter1
Adapter2=Params.Adapter2
Adapter3=Params.Adapter3

[TcpipParams]
AdapterSections=TcpipParams.Adapter0,TcpipParams.Adapter1,TcpipParams.Adapter2,TcpipParams.Adapter3

[params.Adapter0]
PciBusNumber=5
PciDeviceNumber=0
PciFunctionNumber=0

[params.Adapter1]
PciBusNumber=9
PciDeviceNumber=0
PciFunctionNumber=0

[params.Adapter2]
PciBusNumber=13
PciDeviceNumber=0
PciFunctionNumber=0

[params.Adapter3]
PciBusNumber=15
PciDeviceNumber=0
PciFunctionNumber=0

[TcpipParams.Adapter0]
SpecificTo=Adapter0
IPAddress=192.168.0.125
SubnetMask=255.255.255.0
DHCP=no
DefaultGateway=192.168.2.132
WINS=yes
winsServerList=192.168.2.2
DNSServerSearchOrder=192.168.2.120

[TcpipParams.Adapter1]
SpecificTo=Adapter1
IPAddress=192.168.10.125
SubnetMask=255.255.255.0
DHCP=no
DefaultGateway=192.168.2.132
WINS=yes
winsServerList=192.168.2.2
DNSServerSearchOrder=192.168.2.120
```

```
[TcpipParams.Adapter2]
SpecificTo=Adapter2
IPAddress=192.168.2.125
SubnetMask=255.255.255.0
DHCP=no
DefaultGateway=192.168.2.132
WINS=yes
winsServerList=192.168.2.2
DNSServerSearchOrder=192.168.2.120
```

```
[TcpipParams.Adapter3]
SpecificTo=Adapter3
IPAddress=192.168.3.125
SubnetMask=255.255.255.0
DHCP=no
DefaultGateway=192.168.2.132
WINS=yes
winsServerList=192.168.2.2
DNSServerSearchOrder=192.168.2.120
```

```
[MassStorageDrivers]
"DELL PERC5 RAID Controller Driver (Server 2003 32-bit)"=OEM
```

Example cmdlines.txt

The **cmdlines.txt** file must be placed in the **\$OEM\$** directory of the distribution share and the unattended answer file must have the "OemPreinstall = Yes" line under the [Unattended] section.

```
[Commands]
"C:\Netset c:\unattend.txt"
```

9.3. Appendix C – Example Answer File Using a Microsoft Visual Basic Script in SetupParams to Install the Broadcom Drivers Via the Installer, Install SNP, and Use netset.exe to Apply Network Settings, With Example VB Script

```
[UserData]
FullName="DellServer"
OrgName="Dell"
ComputerName="PEServer"
ProductID=" Removed, Product ID goes here "
Keyboard="en"
```

```
[Unattended]
DriverSigningPolicy=Ignore
NtUpgrade=no
OverwriteOemFilesOnUpgrade=no
FileSystem=ConvertNTFS
OemPreinstall=yes
ConfirmHardware=yes
```

```
;ComputerType="Dell PowerEdge Server", "OEM"
ExtendOemPartition=8195
OemFilesPath="C:\dell\%oem%"
OemPnPDriversPath="\drivers;\drivers\r117179;\drivers\r117547;\drivers\r120343;\drivers\r120343\ris_inf;\drivers\r120960;\drivers\r122665;\drivers\r122758;\drivers\r122758\b_29093;\drivers\r122802;\drivers\r122802\sp;\drivers\r97922;\drivers\r99849;\drivers\r99970"
"
TargetPath=\winnt
OemSkipEula=yes
WaitForReboot=no

[GUIUnattended]
OemSkipWelcome=1
OemSkipRegional=1
AdminPassword=*
EMSBlankPassword = Yes
TimeZone=020

[LicenseFilePrintData]
AutoUsers=500
AutoMode=PERSERVER

[Display]
BitsPerPel=16
XResolution=800
YResolution=600
VRefresh=60

[Identification]
DomainAdmin=""
DomainAdminPassword=""
JoinDomain=
JoinWorkgroup=WorkGroup

[SetupParams]
; The line below will execute the script "Installit.vbs" using
cscript as the scripting engine
UserExecute = "cmd /c cscript c:\installit.vbs"

[Networking]
InstallDefaultComponents=Yes

[NetProtocols]
MS_TCPIP=TcpipParams

[NetClients]
MS_MSClient = params.MS_MSClient

[NetServices]
MS_Server = params.MS_Server
```

```
[NetOptionalComponents]
SNMP=1
DNS=0
DHCPserver=0
WINS=0

[Components]
iis_common=Off
iisdbg=Off
iis_doc=Off
iis_ftp=Off
iis_htmla=Off
iis_inetmgr=Off
iis_nntp=Off
iis_nntp_docs=Off
iis_smtp=Off
iis_smtp_docs=Off
iis_www=Off
iis_www_docs=Off
indexsrv_system=Off
TSEnable=Off
cluster=Off
snmp_srv=0

[InternetServer]
PathFTPRoot="%systemdrive%\inetpub\ftproot"
PathWWWRoot="%systemdrive%\inetpub\wwwroot"

[TerminalServices]
ApplicationServer=0

[SNMP]
Community_Name=" "
Limit_Host=localhost
Service=Applications,Internet,End-to-End
Send_Authentication=No
Any_Host=No
Location=" "
Accept_CommunityName=public:Read_Only
Traps=
Contact_Name=" "

[data]
MsDosInitiated="1"
floppyless="1"
AutoPartition="0"
InstallDir="\WINNT"
winntupgrade="no"
win9xupgrade="no"
```

```
[NetAdapters]
```

```
Adapter0=Params.Adapter0  
Adapter1=Params.Adapter1  
Adapter2=Params.Adapter2  
Adapter3=Params.Adapter3  
Adapter4=Params.Adapter4  
Adapter5=Params.Adapter5
```

```
[TcpipParams]
```

```
AdapterSections=TcpipParams.Adapter0,TcpipParams.Adapter1,TcpipParams.Adapter2,TcpipParams.Adapter3,TcpipParams.Adapter4,TcpipParams.Adapter5
```

```
[params.Adapter0]
```

```
PciBusNumber=5  
PciDeviceNumber=0  
PciFunctionNumber=0
```

```
[params.Adapter1]
```

```
PciBusNumber=9  
PciDeviceNumber=0  
PciFunctionNumber=0
```

```
[params.Adapter2]
```

```
PciBusNumber=13  
PciDeviceNumber=0  
PciFunctionNumber=0
```

```
[params.Adapter3]
```

```
PciBusNumber=11  
PciDeviceNumber=0  
PciFunctionNumber=0
```

```
[params.Adapter4]
```

```
PciBusNumber=15  
PciDeviceNumber=0  
PciFunctionNumber=0
```

```
[params.Adapter5]
```

```
PciBusNumber=17  
PciDeviceNumber=0  
PciFunctionNumber=0
```

```
[TcpipParams.Adapter0]
```

```
SpecificTo=Adapter0  
IPAddress=192.168.0.254  
SubnetMask=255.255.255.0  
DHCP=no  
DefaultGateway=  
WINS=no  
winsServerList=  
DNSServerSearchOrder=192.168.0.128
```

```
[TcpipParams.Adapter1]
SpecificTo=Adapter1
IPAddress=192.168.1.254
SubnetMask=255.255.255.0
DHCP=no
DefaultGateway=
WINS=no
winsServerList=
DNSServerSearchOrder=192.168.1.128
```

```
[TcpipParams.Adapter2]
SpecificTo=Adapter2
IPAddress=192.168.2.254
SubnetMask=255.255.255.0
DHCP=no
DefaultGateway=
WINS=no
winsServerList=
DNSServerSearchOrder=192.168.2.128
```

```
[TcpipParams.Adapter3]
SpecificTo=Adapter3
IPAddress=192.168.3.254
SubnetMask=255.255.255.0
DHCP=no
DefaultGateway=
WINS=no
winsServerList=
DNSServerSearchOrder=192.168.3.128
```

```
[TcpipParams.Adapter4]
SpecificTo=Adapter4
IPAddress=192.168.4.254
SubnetMask=255.255.255.0
DHCP=no
DefaultGateway=
WINS=no
winsServerList=
DNSServerSearchOrder=192.168.4.128
```

```
[TcpipParams.Adapter5]
SpecificTo=Adapter5
IPAddress=192.168.5.254
SubnetMask=255.255.255.0
DHCP=no
DefaultGateway=
WINS=no
winsServerList=
DNSServerSearchOrder=192.168.5.128
```

```
[MassStorageDrivers]
"DELL PERC5 RAID Controller Driver (Server 2003 32-bit)"=OEM
```

Example Visual Basic Script to Install the Broadcom Drivers and the Microsoft Server 2003 Scalable Networking Pack and apply Network Settings to the Network Devices.

To use the script below, the script, **netset.exe** and the SNP executable must be copied to the root of the installation drive. The Broadcom installer must be copied to a sub of the root installation drive called **broadcom**. The paths and script may be adjusted as necessary.

```
'VBScript Example
'Create the scripting object
Set WshShell = WScript.CreateObject("WScript.Shell")

'Run the Broadcom driver installer in the silent mode, with all
the defaults, in a normal window and wait for it to complete
before executing the next command
ReturnCode = WshShell.Run("c:\broadcom\setup.exe /s /v/qn", 1,
True)
'Run the MS SNP pack executable in the silent mode, in a normal
window and wait for it to complete before executing the next
command
ReturnCode = WshShell.Run("c:\ WindowsServer2003-KB912222-v9-x86-
ENU.exe /passive /norestart", 1, True)
'Run netset.exe, using the answer file saved to the root of the
drive, in a normal window, and wait for it to complete before
running the next command
ReturnCode = WshShell.Run("c:\netset c:\winnt.sif", 1, True)
```

9.4. Appendix D – Comparison of Automated Install with NX2 Versus Without NX2

The following table compares the Microsoft Windows automated deployment experience with Broadcom NetXtreme II devices to the experience without Broadcom NetXtreme II devices. The differences outlined here apply only when the network settings to be applied are other than the defaults.

Passages in bold indicate where the procedures are different.

Without Broadcom NetXtreme II Devices	With Broadcom NetXtreme II Devices
Create answer file, manually or with MS tools.	Create answer file, manually or with MS tools. Add SetupParams section or cmdlines.txt with netset.exe, pointing to the answer file, or use MAC addresses of NetXtreme II devices.
Answer file provided on floppy, USB, CD, or other media for Windows Installer to read.	Answer file provided on floppy, USB, CD or other media for Windows Installer to read. Must also include netset.exe on same media.
Start installation of Windows using winnt.exe with command line options pointing at provided answer file and install directory.	Start installation of Windows using winnt.exe with command line options pointing at provided answer file and install directory.
Windows installer begins copying all installation files to two temp directories on the destination HD, copy over the network or CD is the same. Network driver is typically NDIS2 at this point, but could be ODI16.	Windows installer begins copying all installation files to two temp directories on the destination HD, copy over the network or CD is the same. Network driver is typically NDIS2 at this point, but could be ODI16.
Copy complete, Windows begins text mode installation. No network driver or activity.	Copy complete, Windows begins text mode installation. No network driver or activity.
Text mode complete, Windows starts the Windows GUI. No network driver or activity.	Text mode complete, Windows starts the Windows GUI. No network driver or activity.
If NTFS is selected, conversion from FAT is done, then a reboot.	If NTFS is selected, conversion from FAT is done, then a reboot.
GUI mode install. Several steps, detection of hardware, install of system files, registry hive created, selected Windows components installed.	GUI mode install. Several steps, detection of hardware, install of system files, registry hive created, selected Windows components installed.
Next to the last step is installation of network components and application of network setting as specified in the answer file.	Application of the network settings for Broadcom NetXtreme II devices would fail here if specified by Bus/Device/Function designation.

Without Broadcom NetXtreme II Devices	With Broadcom NetXtreme II Devices
Execute cmdlines.txt or SetupParams instructions.	Execute cmdlines.txt or SetupParams instructions. netset.exe applies the network settings. Bus/Device/Function designation is successful for NetXtreme II devices.
Join the computer to the domain if specified in the answer file.	Join the computer to the domain if specified in the answer file.
Reboot and run Windows in the normal mode, meaning the user is prompted with the login dialog.	Reboot and run Windows in the normal mode, meaning the user is prompted with the login dialog.

9.5. Appendix E – Example Script to Detect NetXtreme II Adapters Before Running netset.exe

This is a portion of a Microsoft VBScript that can be incorporated as a function or in the main part of a VBScript that will check for the installation of Broadcom NetXtreme II devices so that **netset.exe** could be run if the NetXtreme II devices exist or not if they do not exist. The drivers must be installed via Plug and Play, or via the Broadcom installer prior to this portion of the script running.

```

On Error Resume Next
  RegKey = 0
  RegKey =
ws.RegRead("HKLM\SYSTEM\CurrentControlSet\Control\Network\{4D36E97
2-E325-11CE-BFC1-08002BE103133\Descriptions\Broadcom NetXtreme II
GigE (NDIS VBD Client)")
  if RegKey <> 1 then

  NX2Test = "Not Present"
else
  NX2Test = "Present"
end if

```

You can then use the "NX2Test" variable to decide if **netset.exe** should be run or not.