# **CCBoot**

Diskless Boot WinXP/Win2003/Vista/Win7/Win2008

with iSCSI

www.ccboot.com

# **User Manual**



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# **2** Introduction

CCBoot enables diskless boot Windows XP, Windows Server 2003, Vista, Windows 7 and Windows Server 2008 with iSCSI.

Diskless boot makes it possible for computers to be operated without a local disk. The 'diskless' computer is connected to a hard drive over a network and boots up an operating system from a remotely located machine. CCBoot is the convergence of the rapidly emerging iSCSI protocol with gPXE diskless boot technology.

Remote boot over iSCSI, or CCBoot, pushes the iSCSI technology even further, opening the door to the exciting possibility of the diskless computer. CCBoot technology allows a diskless boot of most Windows OS from an iSCSI target machine remotely located over a standard IP network.

CCBoot offers a seamless diskless boot. Eliminating the need for a local hard drive opens a wide range of possibilities for network management. Using this configuration, the disks for many network computers can be centrally managed, thereby facilitating backup, redundancy, and dynamic allocation of valuable storage resources while at the same time reducing cost to the enterprise.

Booting from iSCSI makes system administration considerably easier. Freeing a server of its boot volume allows administrators to manage investments in their iSCSI SANs, attaining improved data security, integrity and recovery, higher availability, quicker server deployment & repurposing, and more efficient utilization of storage resources.

#### Benefits

- Significantly reduce initial capital and implementation costs
- Reduce power and cooling requirements
- Accelerate deployments, upgrades, and server repurposing
- Reduce complexity and risk
- Improve critical system availability
- Implement enhanced Disaster Recovery solutions

## **3 Features**

- Boot Windows XP, Windows 2003, Vista, Windows 7 and Windows 2008 from iSCSI storage/target.
- Inside DHCP, gPXE, TFTP, Image Upload and iSCSI Target. It's all-in-one solution for iSCSI boot.
- Support physical drive, volume drive and VMWare disk file.
- Support upload boot image to the server and save with VMDK format.
- Clients can recovery to a new clear system after reboot.
- Clients can keep own system data after reboot.
- Every client can boot from different images.
- Support image read cache and client write-back cache.
- Support RAM cache with huge memory access (AWE).
- Support SSD cache.
- Support "Save to Image".
- Support multiple servers, multiple NICs and load balance.
- Support multiple disks.
- Auto assigns write-back files for clients.
- Support super clients for image writing.
- Support multi DNS.
- Support client write cache.
- Support one image compatible with different devices (PnP).

# **4 System Requirements**

### • Server Requirements

1. Windows 2000, Windows XP, Windows 2003, Vista or Windows 2008. We recommend Windows 2003.

2. Install latest service packs.

### • Client Requirements

1. Windows XP, Windows 2003, Vista, Windows 7 or Windows 2008.

2. PXE 2.x compliant network adapter

#### • Recommended Server Hardware

25 clients	CPU: 1.7G RAM: 2G System Image Disk: SATA HDD 120G Game Disk: RAID with 2 SATA HDD Client Write-back Disk: SATA HDD 120G Main Board: With SATA support Network: 100Mb Ethernet
50 clients	CPU: 2G RAM: 4G System Image Disk: SATA HDD 120G Game Disk: RAID with 2 STAT HDD Client Write-back Disk: 2 SATA HDD 120G Main Board: With RAID support Network: 1000Mb Ethernet
100 clients	CPU: 2.8G RAM: 8G System Image Disk: RAID with 2 SATA HDD Client Write-back Disk: 4 SATA HDD Main Board: With RAID support Network: 1000Mb Ethernet, 2 - 3 NICs
> 100 clients	Using multiple servers and load balance.

## **5 Quick Start**

### 5.1 Install and Configure CCBoot Server

Before install CCBoot, you would do two modifications in the server system.

- 1. Grant the "Lock Pages in memory" right to "everyone".
  - a) Run "gpedit.msc" to open the Group Policy editor:

Run	? 🛛
	Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.
<u>O</u> pen:	gpedit.msc 💌
	OK Cancel Browse

Figure 5-1-a

b) "Computer Configuration"->"Windows Settings"->"Security Settings"->"User Rights Assignment"->"Lock pages in memory"->"Properties":

🚡 Group Policy			
Eile Action View Help ← → È 📧 × 😭 🗒 😫			
🛐 Local Computer Policy	Policy 🗡	Security Setting	^
Computer Configuration     Software Settings     Windows Settings     Setripts (Startup/Shutdown)     Security Settings     Security Settings     Software Settware Settware Settware Settware Se	Image: Construct of the second sec	SUPPORT_388945a Administrators LOCAL SERVICE,NE Administrators,SER Administrators Administrators	
🗄 🦲 Software Restriction Policies	🗱 Lock pages in memory	Everyone	
🗄 🛃 IP Security Policies on Local Computer	腿Log on as a batch job	SUPPORT_388945a0	
🔃 🧰 Administrative Templates	Bollog on as a service	NETWORK SERVICE	
🗄 👧 User Configuration	Bell Log on locally	Guest, Administrator	
🕀 🦲 Software Settings	Manage auditing and security log	Administrators	
🕀 🦲 Windows Settings	Modify firmware environment values	Administrators	
	Perform volume maintenance tasks	Administrators	

#### Figure 5-1-b

c) Add user "Everyone" here:

Lock pages in memory Properties	? 🔀
Local Security Setting	
Lock pages in memory	
Everyone	
Add <u>U</u> ser or Group <u>R</u> emove	
OK Cancel	pply

Figure 5-1-c

- 2. Add "PAE" option in "C:\Boot.ini".
  - a) Edit "C:\Boot.ini" file properties and remove the "Read Only" property.
  - b) Open "C:\Boot.ini", go to the first line in the section [operating systems], add "/PAE" to the end of the line. For example, multi(0)disk(0)rdisk(0)partition(2)WINDOWS="Windows Server 2003, Enterprise" /fastdetect /PAE

After finished two modifications, reboot the server machine.

Download CCBoot server installation package from:

http://www.ccboot.com/download/ccbootsetup.exe.

Launch ccbootsetup.exe on the server and keep press the next button to the end (Figure 5-1).



Figure 5-1

CCBoot will use the following ports – 67 (DHCP), 69 (TFTP), 3260 (iSCSI), 1000 (Image Upload), 8001 (Service Control). You need to open those ports on the server firewall.

Note: Please shut off other DHCP service in your LAN especially the DHCP service in the router.

Launch CCBoot and you will get the main panel as bellow (Figure 5-2):

CCBoot v1.9 Build 2009	1228		
<u>File Options Client Help</u>			
Add Client Delete Client	Options Start Service St	op Service Refresh Cache	7 Exit
Computer MAC Address	IP Address Rea	. Writ Ima Disk F	Priv Update Time Ima
<			>
Disk Upload Receiving			
iSCSI Boot Serve	e <b>r</b> www.ccboot.com	Online/Total/Mem/Image/Disk/S Service During Time Cache Last Update Time	SD 0/0/11M/0M/0M/0M 0Day 00H 33M 215

Figure 5-2

#### **Demo Environment**

Server IP: 192.168.1.100 Gateway: 192.168.1.1 DNS Address: 192.168.1.1 IP Mask: 255.255.255.0 DHCP Range: 192.168.1.101-192.168.1.250 Image Save Path: D:\CCBootImage Write-back File path: F:\CCBootWrite-back

Menu "Options"->"Options Wizard" and configure step by step as bellow:

Start DHCP	Start TFTP		
DHCP Server IP	192.168.1.100	~	
IP Allocated Start	192.168.1.101		
IP Allocated End	192.168.1.250		
IP Mask	255.255.255.0		
IP Gateway	192.168.1.1		
DNS Address 1	192.168.1.1		
DNS Address 2	1		
Scan DHCP			

Figure 5-3

You need to select correct local IP address as "DHCP Server IP". Press "Scan DHCP" to check if there are other DHCP services on the LAN. You need to stop other DHCP services on the LAN.

Game Server IP	192.168.1.100	
Write-back File Path	F:\CCBootWrite-back	
🔽 Enable Cache	32;0	M Recommend
Write-back Limit	200	м
Image Save Path	D:\CCBootImage	

Figure 5-4

Set "Image Server IP" and "Game Server IP". Normally, they are same as "DHCP Server IP". Set "Write-back File Path" and "Image Save Path" as you want.

Available Physical Memory	318	M Recommend
System Image Read Cache	10	м
Game Disk Read Cache	10	м
All Clients Write-back	10	M
Per Client Write-back	10	M
Enable SSD Cache		
SSD Path	SSD Size 0	M
Auto Update Cache V	Vhen Game Disk Updat	ed

Figure 5-5

Keep default values in "Cache Settings".

Other Settings
<ul> <li>Start iSCSI Service iSCSI Port 3260</li> <li>Enable Super Client Update Game Disk</li> <li>Auto Add Client  Auto Connect Game Disk</li> <li>Computer Name Prefix PC</li> <li>Server and Client Disk Mapping</li> <li>Add</li> <li>Delete</li> <li>Enable Modify Computer Name at Client</li> </ul>
< <u>B</u> ack Finish Cancel

Figure 5-6

Press the "Finish" and confirm the popup dialog box.

### 5.2 Create Boot Image for Win XP and 2003

- 1. Choose one client PC to create boot image. Attach a hard disk on the PC.
- 2. Allocate a small partition about 10G size and format the partition with NTFS and cluster size is 32K. Install Windows (XP or 2003) and the latest SP in to the partition.
- 3. After complete Windows installation, open the local area connection network properties and configure as bellow:

oporal C	1	
eneral Suppor	t	
Connection		
Status:		Connected
Duration:		16:44:04
Speed:		1.0 Gbps
Activity	Sent —	] — Received
Bytes:	358,589	1,224,445
Properties	<u>D</u> isable	
		Chur

Figure 5-7

Click "Properties".

General	Authentication Advanced
Connec	at using:
<b>111</b>	/Mware Accelerated AMD PCNet Ad
This c <u>o</u>	nnection uses the following items:
	Client for Microsoft Networks File and Printer Sharing for Microsoft Networks
	OoS Packet Scheduler
	nstall Uninstall Properties
Desc	ription
Tran wide acro	smission Control Protocol/Internet Protocol. The default area network protocol that provides communication ss diverse interconnected networks.
Sho	w icon in notification area when connected
( INOU	Will when this connection has limited of no connectivity

### Figure 5-8

Select "Internet Protocol (TCP/IP)" and click "Properties".

nternet	Protocol (TCP/IP) Pr	operties ? 🔀
General	Alternate Configuration	
You cai this cap the app	n get IP settings assigned ability. Otherwise, you nee ropriate IP settings.	automatically if your network supports d to ask your network administrator for
<u>o</u> 0	otain an IP address automa	atically
	e the following IP address	·
]P ad	ldress:	and the second s
S <u>u</u> br	net mask:	(*
<u>D</u> efa	ult gateway:	
<u>⊚</u> 0 <u>i</u>	otain DNS server address a	automatically
OU	e the following DNS serve	addresses:
Prefe	arred DNS server:	
Alten	nate DNS server:	· · · ·
		Advanced
		OK Cancel



Select "Obtain an IP address automatically" and "Obtain DNS server address automatically", then click "OK" to save.

4. Go to CCBoot server and you will find a client in the client list (Figure 5-10) that was added by CCBoot automatically when the client PC got IP address from the CCBoot DHCP service.

CCBoot v1	1.9 Build 20091	1228			
<u>File</u> Options	<u> ⊂</u> lient <u>H</u> elp				
R Add Client	Rose Client	Options Start	Service Stop Service	Refresh Cache H	ielp Exit
Computer	MAC Address	IP Address	Rea Writ	Ima   Disk   F	riv   Update Time   Ima
WINXP	00:0C:29:10:AC:	D0 192.168.1.10	18		01-07 04:21:03
<u> </u>					2
Disk Upload Re	eceiving				
iscsi e	Boot Serve	e <b>r</b> www.ccb	000 <i>t.com</i> Online Servic Cache	/Total/Mem/Image/Disk/S e During Time Last Update Time	5D 0/1/12M/0M/0M/0M 0Day 00H 20M 175



Double click the client to edit and check "Enable Upload Image" (Figure 5-11).

lient Properties			
Enabled	<u>~</u>		Save
Computer Name	WINXP		Close
MAC Address	00:0C:29:10	I:AC:D0	
IP Address	192.168.1.1	08	Enable Upload Image
GPXE Drive	gpxe.pxe		Keep Write-back File
Disk Group			
Image Server IP Address	192.168.1.1	00	
Game Server IP Address	192.168.1.1	00	
Write-back File Path	F:\CCBootW	rite-back	
Write-back Limitation	200	м	Save to Private
Enable Client Cache	32;0	м	Save to Image
iner Client			

Figure 5-11

 Go back to the client, download Microsoft iSCSI boot client from: <u>http://download.microsoft.com/download/9/D/D/9DDCBA19-26D6-4B63-B769-242A39</u> <u>91E4EA/Fre-Boot/Initiator-2.08-boot-build3825-x86fre.exe</u>

6. Install iSCSI boot client with all default settings.



Figure 5-12

7. If the system is NOT XP, you need to check "Configure iSCSI Network Boot Support" and select Boot NIC in following graph.

Software Update Insta	llation Wizard			
Microsoft iSCSI Initia	tor Installation			
<ul> <li>Configure iSCSI Netv</li> </ul>	vork Boot Support			
Allow Kernel Paging.	WARNING: only select th	nis if all page	files will be on local d	lisks
Select the network inter	face driver for the NIC tha	t will be use	d to boot via iSCSI	
IP Address	Description		Service Name	
192.168.1.115	AMD PCNET Family PC	l Ethern	PCnet	
			[	1
		< <u>B</u> ack	<u>N</u> ext>	Cancel

#### 8. Download CCBoot client installation package from:

http://www.ccboot.com/download/ccbootsetupclient.exe

Launch ccbootsetupclient.exe and keep press the next button to the end. Then launch CCBoot client and you will see the main panel as bellow (Figure 5-14).

SccBootClient v1.9 Build 20091228		
Client Install	Upload Image	
🔽 Install Cache Driver	System Disk Image	C [4G]
Start Cache After Login Windows	Server IP Address	192.168.1.100
Save Cache When Shutdown	VMDK File Name	XP01.vmdk
Install CCBoot Client	UF	load Image
Cache Settings		
Computer Name PC108 Modify	Star	t Cache Stop Cache

Figure 5-14

Press the "Install CCBoot Client" button. After finished, it will require reboot system. After reboot system, launch CCBoot client again, input the "Server IP address" and press "Upload Image" to upload the image to the CCBoot server. Then CCBoot will create a VMDK file named "D:\CCBootImage\XP01.vmdk" on the server. You can use this vmdk file to boot XP or Win2003.

### 5.3 Create Boot Image for Vista, Win7 and 2008

Take Win7 for example (Vista and Windows 2008 are the same)

 Go to the install directory of CCBoot server, you will find a file named"20G.vmdk". Copy it to the directory that you want to save your images to. Press the "Options" button and select "DHCP Settings", set the "IP Gateway" as CCBoot server's IP (Figure 5-15).

DHCP Settings	Client Default Settings	Cache Settings	Other Settings
	Start DHCP	Start TFT	P
	DHCP Server IP	192.168.1.100	*
	IP Allocated Start	192.168.1.101	
	IP Allocated End	192.168.1.250	
	IP Mask	255.255.255.0	
	IP Gateway	192.168.1.100	]
	DNS Address 1	192.168.1.1	
	DNS Address 2		
	Scan DHCP CC	Boot Serve	r's IP

Figure 5-15

2. Edit the client properties in CCBoot. Specify "20G.vmdk" as the system image for this client and then check "Keep Write-back File". Press "Save" button to save these configurations.

Enabled	~		Save
Computer Name	20GforWin7		Close
MAC Address	00:25:86:18:	FE:E6	Customize
IP Address	192.168.1.10	19	Enable Upload Image
GPXE Drive	gpxe.pxe		Keep Write-back File
Disk Group	D:\CCBootIm	age\20G.vmdk;	>>
Image Server IP Address	192.168.1.10	0	$\geq$
Game Server IP Address	192.168.1.10	0	>>
Write-back File Path	F:\CCBootWr	ite-back	>>
Write-back Limitation	200	м	Save to Private
Enable Client Cache	32;0	м	Save to Image
oor Client			



- 3. Start the client PC and enter BIOS, set "first boot from LAN" and "second boot from CDROM". Insert Win7 installation disk into the DVD box and then restart the client.
- 4. The client will boot from LAN first. It will report that "No more network devices" and then boot from DVD to install Win7. When you get to the interface where you can select the install directory of Win7, you will find an iSCSI disk with 20G size. Install Win7 to this disk. If you cannot find the 20G iSCSI disk, please attach a hard disk on the PC and try it again.
- 5. If the Win7 installation finished, please input "iscsicpl.cpl" in the Run window to active the iSCSI service.
- 6. Install CCBootClient into Win7. Click the "Install CCBoot Client" on the CCBootClient interface and then shutdown Win7.
- 7. Go back to CCBoot server and open the client properties dialog box, press "Save to Image" button to save the image. Now you can use 20G.vmdk to boot Win7.

CCBoot Client		
Client Properties		
Enabled		Save
Computer Name	20GforWin7	Close
MAC Address	00:25:86:18:FE:E6	
IP Address	192.168.1.109	Enable Upload Image
GPXE Drive	gpxe.pxe	Keep Write-back File
Disk Group	D:\CCBootImage\20G.vmd	🛚 🖻 Keep this
Image Server IP Address	192.168.1.100	D option
Game Server IP Address	192.168.1.100	
Write-back File Path	F:\CCBootWrite-back	
Write-back Limitation	200 M	Save to Private
Enable Client Cache	32;0 M	Save to Image
Super Client	Press to d	create an image
Enable Update Image	Enable Update Game	e Disk

Figure 5-18

### 5.4 Diskless Boot Client

Edit the client properties on the CCBoot and select the correct image and you can diskless boot the client PC.

Network boot from UMware UMXNET Copyright (C) 2003–2005 UMware, Inc. Copyright (C) 1997–2000 Intel Corporation

CLIENT MAC ADDR: 00 0C 29 01 F9 A0 GUID: 564DE121-42D8-A0EA-45CB-7453FB01F9A0 DHCP..∑

Figure 5-21 (PXE DHCP)

Network boot from AMD AM79C970A Copyright (C) 2003-2005 UMware, Inc. Copyright (C) 1997-2000 Intel Corporation CLIENT MAC ADDR: 00 0C 29 54 30 19 GUID: 564D63E5-3E77-AADF-C662-FD8468543019 CLIENT IP: 192.168.1.101 MASK: 255.255.255.0 DHCP IP: 192.168.1.202 GATEWAY IP: 192.168.1.1 PXE->EB: 1PXE at 9ECC:0070, entry point at 9ECC:0106 UNDI code segment 9ECC:040D, data segment 9C7F:24D0 (625-638kB) UNDI device is PCI 00:11.0 625kB free base memory after PXE unload gPXE for CCBoot 25/09/2009 http://www.ccboot.com net0: 00:0c:29:54:30:19 on UNDI (open) ILink:up, TX:0 TXE:0 RX:0 RXE:01 Waiting for link-up on net0... ok DHCP (net0 00:0c:29:54:30:19).... ok net0: 192.168.1.101/255.255.255.0 gw 192.168.1.1 Booting from root path "iscsi:192.168.1.202::3260::" iSCSI booting from iscsi:192.168.1.202::3260:: Registered as BIOS drive 0x80

Figure 5-22 (gPXE DHCP)



Figure 5-23 (Win XP Boot)

Microsoft Windows Server 2003	
()	
Copyright © Microsoft Corporation	Microsoft

Figure 5-24 (Win 2003 Boot)



Figure 5-25 (Win 7 Boot)

### **6 Server Settings**

### 6.1 Menu

"File" -> "Start Service": Start DHCP, TFTP and iSCSI service.

"File" -> "Stop Service": Stop all services.

"File" -> "Close UI": Close the main interface but the service is still running.

"Options" -> "Settings": Configure server settings.

"Options" -> "Options Wizard": A Wizard for a beginner.

"Client" -> "Add": Add a new client.

"Client" -> "Edit": Edit the property of a selected client.

"Client" -> "Delete": Delete a selected client or clients.

"Client" -> "Auto Scan": Retrieve all power on clients' MAC address, IP address and computer name. You can set an IP range for auto scanning.

oot Auto Scan		
Low IP Address	High IP Address	
192.168.1.1	- 192.168.1.255	
Start	Stop C	lose



"Client" -> "Wake On LAN": Remotely start the selected clients. The function requires the NIC and motherboard supports "Wake on LAN". Please enable "Wake on LAN" in the client BIOS.
"Client" -> "Delete Private Package": Delete the selected client's private package.
"Client" -> "Delete Write-back File": Delete the selected client's write-back files
"Client" -> "Delete All Write-back File": Delete the all clients' write-back files.

"Help" -> "Help": Open the user manual.

"Help" -> "About & Register": Get the version information and enter the license information.

### 6.2 Server Settings

### 6.2.1 DHCP Settings

HCP Settings	Client Default Settings	Cache Settings	Other Settings
	Start DHCP	Start TFT	P
	DHCP Server IP	192.168.1.100	*
	IP Allocated Start	192.168.1.101	
	IP Allocated End	192.168.1.250	
	IP Mask	255.255.255.0	
	IP Gateway	192.168.1.1	
	DNS Address 1	192.168.1.1	
	DNS Address 2		
	Scan DHCP		

Figure 6-2

**Start DHCP**: Start DHCP service.

**Start TFTP**: Start TFTP service.

DHCP Server IP: If the server has multiple IP, you can specify the DHCP Server IP here.

IP Allocated Start: The first IP address allocated for the clients.

**IP** Allocated End: The last IP address allocated for the clients.

**IP Mask, IP Gateway** and **DNS Address 1**: CCBoot's DHCP will push this mask, gateway and DNS information to clients.

DNS Address 2: You can set the "Alternate DNS Server" here for clients.

Scan DHCP: Press this button to check out whether there're other DHCP servers on the LAN.

### 6.2.2 Client Default Settings

HCP Settings Client Deta	ault Settings	Cache Setting:	S Other Settings
Image Server IP	192.168.1	.100	>>
Game Server IP	192.168.1	.100	
Write-back File Path	F:\CCBoot	Write-back	
Enable Cache	32;0		M Recommend
Write-back Limit	200		м
Image Save Path	D:\CCBoot	Image	
Disk Group			
Disk Group			

Figure 6-3

Client Default Settings is used to define the settings for the auto-added clients.

**Image Server IP**: Define the image server IP of the client. Pressing the ">>" button to add multiple IP addresses. The client will boot from the first IP, if failed, it will try the next one.

Server List Settings	X
Server List	
192.168.1.100 192.168.1.99	Up
	Down
192.168.1.99	
Add Edit Delete	
OK Cancel	

#### Figure 6-4

**Game Server IP**: Define the game server IP of the client. Pressing the ">>" button to add multiple IP addresses. The client will get game disk from the first IP, if failed, it will try the next one.

Write-back File Path: Define the write-back file path of the client. Pressing the ">>" button to add multiple write-back path.

**Enable Cache**: Define the client write cache size. CCBoot clients will store disk-writing data to the client RAM instead of writing back to server. The first number is the write cache size of the image disk and the second one is the write cache size of the game disk. Pressing the "Recommend" button to get recommended cache settings based on the client physical RAM size.

The cache works as the following steps:

- 1. Write into the client cache.
- 2. If client cache is full, write back to server cache.
- 3. If the server cache is full, write back to the write-back path.

**Client Write-back Limit**: Define the maximum write-back size. We do NOT recommend setting a limitation here if unnecessary.

**Image Save Path**: Define the image save path. All images uploaded from the clients will be saved to this path. It should be large enough to store the images.

**Disk Group**: Define the system image and game disk of the client. Pressing ">>" button to define the details.

CCBoot Disk Group	
System Image Selection	
D:\CCBootImage\XP01.vmdk	Other Image Merge Image
Game Disk Selection	
Local Disk List	Game Disk List
<pre>Disk [0] (C:,D:) Disk [1] (F:) Disk [2] (G:) C: D: G: G:</pre>	F:
Recommend game disk as NTFS and cluster size	64K OK Cancel



System Image Selection: Select the image from the combo box list or press the "Other Image"

button to select other image for diskless booting.

**Merge Image**: If you use "Save to image" in client's properties dialog box many times, it will created many additional packages such as XP01-001.vmdk, XP01-002.vmdk. It will make diskless booting slowly. "Merge Image" can merge all those packages to one vmdk file. You need to stop CCBoot service before you do "Merge Image".

Game Disk Selection: You can select a partition or a whole hard disk as game disk.

Apply All Clients: Press this button to apply the client default settings to the existing clients.

### 6.2.3 Cache Settings

OHCP Settings Client Default	Settings	Cache Settings	Othe	er Settings
Enable Cache	V	Enable Huge Me	mory	Access
Available Physical Memory	311		М	Recommend
System Image Read Cache	10		м	
Game Disk Read Cache	10		м	
All Clients Write-back	10		м	
Per Client Write-back	10		м	
Enable SSD Cache				
SSD Path	SSD	Size 0	м	
Auto Update Cache V	Vhen Gam	e Disk Updated		



**Enable Cache:** Enable cache function.

Enable Huge Memory Access: CCBoot can access memory over 2G if enable this option. You need to do two modifications if you want to use this function. Please refer to chapter 5.1.
Available Physical Memory: The current free physical memory of the server.
System Image Read Cache: The image read cache size for all clients.
Game Disk Read Cache: The game disk read cache size for all clients.
All Clients Write-back: Total cache size for all clients write-back.

Per Client Write-back: Each client cache size for write-back.

**Enable SSD Cache**: SSD (Solid State Disk) is a new technology hard disk that disk read and write speed than normal disk. CCBoot can use SSD as the cache storage. If the clients request data from the game disk, CCBoot will search it from SSD first, if existing, it will read the data from SSD. If non-existing, it will read from the physical game disk and store it into SSD. SSD cache will improve the disk read speed.

**SSD Path**: Define the SSD path. For example:  $E: \setminus$ 

SSD Size: Define the SSD file size.

**Auto Update Cache When Game Disk Updated:** When the disk files are modified by some applications, for example, game update application, CCBoot will update the cache immediately.

### 6.2.4 Other Settings

ICP Settings Client Default Settings	Cache Settings	Other Settings
Start iSCSI Service iSCSI F	Port 3260	]
Enable Super Client Update Gam	e Disk	
Auto Add Client	Aut	o Connect Game Disk
Server and Client Disk Mapping	E	
	Add	
	Delete	
Eachla Madifu Cassautas Nassa ak	Clinate	
Enable Modiry Computer Name at	Client	



Start iSCSI Service: Start the iSCSI target service.

**iSCSI Port**: Define the iSCSI target service port.

**Enable Super Client Update Game Disk**: If you want to update game by super client, you need to select this option to lock the read and write operations of the game disk.

**Auto Add Client**: All clients on the LAN will be added into CCBoot with the "Client Default Settings" automatically.

Auto Connect Game Disk: If this option checked, the client will get the game disk automatically.

Computer Name Prefix: Define the computer name prefix.

**Server and Client Disk Mapping**: Define the client's disk letters. Normally used to define the game disk letters. For example, the game disk letter is F on the server and you want to share it to the client with disk letter G.

Disk Mapping	X
Server Disk	Client Disk
F	G 💌
ОК	Cancel



Enable Modify Computer Name at Client: Enable client modify the computer by CCBootClient.

### 6.3 Properties of CCBoot Client

lient Properties			
Enabled	<b>V</b>		Save
Computer Name	WINXP		Close
MAC Address	00:0C:29:10:A	C:D0	
IP Address	192.168.1.108		Enable Upload Image
GPXE Drive	gpxe.pxe		Keep Write-back File
Disk Group			>
Image Server IP Address	192.168.1.100		
Game Server IP Address	192.168.1.100		
Write-back File Path	F:\CCBootWrite	e-back	
Write-back Limitation	200	м	Save to Private
Enable Client Cache	32;0	м	Save to Image
iuper Client			

### Figure 6-12

**Enabled**: Enable the client diskless boot from CCBoot server.

**Computer Name**: Define the computer name of the client.

MAC Address: Define the MAC address of the client.

**IP Address**: Define the IP address of the client.

GPXE Drive: Specify the gPXE drive. The default drive supports the most NICs.

**Disk Group**: Define the system image and game disk of the client. Pressing ">>" button to define the details.

system image selection		
D:\CCBootImage\XP01.vmdk	Other Image	1erge Image
Same Disk Selection		
ocal Disk List	Game Disk List	
<ul> <li>Disk [0] (C:,D:)</li> <li>Disk [1] (F:)</li> <li>Disk [2] (G:)</li> <li>C:</li> <li>D:</li> <li>G:</li> </ul>	F:	

#### Figure 6-13

**System Image Selection**: Select the image from the combo box list or press the "Other Image" button to select other image for diskless booting.

**Merge Image**: If you use "Save to image" in client's properties dialog box many times, it will created many additional packages such as XP01-001.vmdk, XP01-002.vmdk. It will make diskless booting slowly. "Merge Image" can merge all those packages to one vmdk file. You need to stop CCBoot service before you do "Merge Image".

Game Disk Selection: You can select a partition or a whole hard disk as game disk.

**Image Server IP Address**: Define the image server IP of the client. Pressing the ">>" button to add multiple IP addresses. The client will boot from the first IP, if failed, it will try the next one.

Server List Settings	
Server List	
192.168.1.100 192.168.1.99	Up
	Down
192.168.1.99	
Add Edit Delete	
OK Cancel	



**Game Server IP Address**: Define the game server IP of the client. Pressing the ">>" button to add multiple IP addresses. The client will get game disk from the first IP, if failed, it will try the next one.

Write-back File Path: Define the write-back file path of the client. Pressing the ">>" button to add multiple write-back path.

**Enable Cache**: Define the client write cache size. CCBoot clients will store disk-writing data to the client RAM instead of writing back to server. The first number is the write cache size of the image disk and the second one is the write cache size of the game disk. Pressing the "Recommend" button to get recommended cache settings based on the client physical RAM size.

The cache works as the following steps:

- 1. Write into the client cache.
- 2. If client cache is full, write back to server cache.
- 3. If the server cache is full, write back to the write-back path.

**Client Write-back Limit**: Define the maximum write-back size. We do NOT recommend setting a limitation here if unnecessary.

Enable Upload Image: Enable the client to upload its system image to the server.

Keep Write-back File: Keep the write-back file after reboot the client.

**Save to Private**: Save the client's current system state to a package. The client will keep the state when reboot even delete the write-back file.

**Save to Image**: Save the client's current system to the boot image. You'd better stop the client cache and shutdown the client PC before you click "Save to Image".

Enable Update Image: Enable the client to update the image directly as a super client.

**Enable Update Game Disk**: Enable the client to update the game disk directly as a super client. If you want to enable update game disk, you need to select "Enable Super Client Update Game Disk" in "Options" -> "Other Settings" first.

# 7 Game Disk Settings

1. Add game disk in "Options" -> "Client Default Settings" -> "Disk Group" -> ">>".

CCBoot Disk Group	
System Image Selection	
D:\CCBootImage\XP01.vmdk	Other Image Merge Image
Game Disk Selection	
Local Disk List	Game Disk List
<pre></pre>	F:
Recommend game disk as NTFS and cluster si	ze 64K OK Cancel

- Figure 7-1
- 2. Set disk mapping between server and client in "Options" -> "Other Settings".

CBoot Option	IS		Σ
DHCP Settings	Client Default Settings	Cache Settings	Other Settings
Disk Map	ping	3	$\overline{\mathbf{X}}$
Se H	rver Disk Clie	nt Disk	nect Game Disk
F=F G=E		Add Delete	
Enable N	1odify Computer Name at	: Client	OK Cancel

Figure 7-2

Drive F on server is used as a game disk for clients and it will display as F in the client. Drive G on server is used as a game disk for clients and it will display as E in the client. Drive H on server is used as a game disk for clients and it will display as H in the client.

## **8 CCBoot Client Installation**

Download CCBoot client installation package from:

http://www.ccboot.com/download/ccbootsetupclient.exe

Launch it and keep pressing the next button till the end and then you can see the client main panel (Figure 8-2).



Figure 8-1

lient Install	Upload Image	
🔽 Install Cache Driver	System Disk Image	C [4G]
Start Cache After Login Windows	Server IP Address	192.168.1.100
Save Cache When Shutdown	VMDK File Name	XP01.vmdk
Install CCBoot Client	Ur	load Image

#### Figure 8-2

Install Cache Driver: Install cache driver for client.

**Start Cache After Login Windows:** If checked, the client cache will be unavailable until the windows login onto the desktop. If it's unchecked, the client cache will be available at the beginning.

**Save Cache When Shutdown:** If checked, the client will write the cache data back to server when the client shutdown.

Install CCBoot Client: Press to install CCBoot client's drivers and applications.

Computer Name: Define the computer name for the client. You need to select "Enable Modify

Computer Name at Client" in CCBoot server "Options" -> "Other Settings" first.

System Disk Image: Select the system disk.

Server IP Address: Input the CCBoot server's IP address.

VMDK File Name: Define the VMDK file name.

Upload Image: Press it to upload image.

Start Cache: Press it to start client cache function.

Stop Cache: Press it to stop client cache function.

#### Notes:

If the "Keep Write-back File", "Enable Upload Image" or "Super Client" is checked in the client properties, the client cache will be unavailable.

Upload Image	2
System Disk Image	C [4G] 🛛 🖌
Server IP Address	192.168.1.100
VMDK File Name	XP01.vmdk
	oload Image
Sta	rt Cache Stop Cache
	Upload Image System Disk Image Server IP Address VMDK File Name

Figure 8-3

# 9 Cache Settings

Recommended Server Settings					
Server Physical RAM	Image Cache	Game Cache	Write-back Cache		
2G	256M	512M	256M		
4G	512M	1024M	1024M		
8G	1024M	4096M	2048M		
16G	1024M	10240M	4096M		
32G	1024M	20480M	10240M		

Recommended Client Cache Settings					
Client Physical RAM	Image Disk Cache	#1 Game Disk	#2 Game Disk		
1G	256M	64M	64M		
2G	384M	128M	128M		
4G	512M	256M	256M		

Sometimes, the client cache will cause blue screen when boot Windows. You can fix it by three methods.

Method 1 - Reduce the client cache size. If still failed, try method 2.

Method 2 - Disable the client cache.

Method 3 - Reinstall CCBootClient with select "Start Cache After Login Windows".

# **10 Super Client**

The super client can update image or game disk directly.

You can set any client as the super client. Just select "Enable Update Image" or "Enable Update Game Disk" in the client's properties (Figure 10-1).

If you want to update game disk with super client, you need to select "Enable Super Client Update Game Disk" in CCBoot "Options" -> "Other Settings" first (Figure 10-2).

Enabled			Save
Computer Name	WINXP		Close
MAC Address	00:0C:29:10	):AC:D0	
IP Address	192.168.1.1	08	Enable Upload Image
GPXE Drive	gpxe.pxe		Keep Write-back File
Disk Group			$\geq$
Image Server IP Address	192.168.1.1	00	$\geq$
Game Server IP Address	192.168.1.1	00	$\geq$
Write-back File Path	F:\CCBootW	/rite-back	$\geq$
Write-back Limitation	200	м	Save to Private
Enable Client Cache	32;0	м	Save to Image
and the set of the			

Figure 10-1

CCBoot Options	
DHCP Settings Client Default Settings	Cache Settings Other Settings
Start iSCSI Service iSCSI	Port 3260
Auto Add Client	Auto Connect Game Disk
Server and Client Disk Mapping	Add
Enable Modify Computer Name al	t Client
	OK Cancel

Figure 10-2

The super client updates image and disk directly and the updating is unrecoverable. But "Save to Image" in the client properties is recoverable.

## 11 Update Image

#### Method 1: Use "Keep Write-back File" and "Save to Image"

- 1) Choose one client PC as the update client. Select "Keep Write-back File" in the client's properties.
- 2) Diskless boot the client and do some modifications as you wish. For example, upgrade software in the system.
- 3) Shutdown the client PC. Click the "Save to Image" button in the client's properties. Don't forget unselect "Keep Write-back File" when finished.

With this method, you will find a series of vmdk files such as xp.vmdk, xp-001.vmdk, xp-002.vmdk and so on. "Save to Image" will create a new file xp-nnn.vmdk. If you want to recover to the last image state, you can stop CCBoot service and delete the latest xp-nnn.vmdk. That's to say "Save to Image" is recoverable.

However, if you have created many xp-nnn.vmdk files, that will degrade operation performance of the image. In this case, you need to upload the image again or use "Merge Image" to merge all of them to one image (Chapter 6.2.2).

#### Method 2: Use "Super Client"

- Choose one client PC as the update client. Select "Super Client" -> "Enable Update Image" in the client's properties.
- 2) Diskless boot the client and do some modifications as you wish.
- 3) Shutdown the client PC. Unselect "Enable Update Image" in the client's properties.

With this method, the client will update the image directly, so you cannot recover the image to previous state.

# 12 Update Game Disk

#### Method 1: Update game disk on the server.

You can update game disk on the server directly. After reboot clients, they can get new game data.

#### Method 2: Update game disk with super client.

- Choose one client PC as the update client. Select "Enable Super Client Update Game Disk" in CCBoot "Options" -> "Other Settings". Select "Super Client" -> "Enable Update Game Disk" in the client's properties.
- 2) Diskless boot the client and update the games in the game disk.
- 3) Shutdown the client PC. Unselect "Enable Update Game Disk" in the client's properties.

## 13 Load balance and redundancy

CCBoot supports multiple NICs and servers.

#### Suppose

Server A has two NICs – 192.168.1.1 for image accessing and 192.168.1.3 from game accessing. Server B has two NICs – 192.168.1.2 for image accessing and 192.168.1.4 from game accessing. Both of them have write-back file path: E:\CCBootWrite-back and F:\CCBootWrite-back.

#### Settings

Go to Server A, open "Options" -> "Client Default Settings".

1. Add 192.168.1.1 and 192.168.1.2 to "Image Server IP" (Figure 13-1)

Image Server IP	192.168.1.1	;192.168.1.2;	
G. Server List Se	ttings		
W Server List			
<ul> <li>✓</li> <li>192.168.1.1</li> <li>192.168.1.2</li> </ul>			
In			Down
Di			
Add	Edit	Delete	

Figure 13-1

2. Add 192.168.1.3 and 192.168.1.4 to "Game Server IP" (Figure 13-2).

ICP Settings Client De	efault Settings	Cache Settings	Other Settings	
Image Server IP	192.168.1	.1;192.168.1.2;	>>	
Game Server IP	192.168.1	.3;192.168.1.4;		
Server List Sett	tings			
Server List			ommen	d
192.168.1.3 192.168.1.4			Up	
			Down	
Add	Edit	Delete		

Figure 13-2

3. Add "E:\CCBootWrite-back" and "F:\CCBootWrite-back" to "Write-back File Path" (Figure 13-3).

P Settings Client Defa	ault Settings	Cache Settings	Other Settings
Image Server IP	192.168.1	.1;192.168.1.2;	
Game Server IP	192.168.1	.3;192.168.1.4;	
Write-back File Path	E:\CCBoot	Write-back;F:\CC	
E:\CCBootWrite-back	N.		
E:\CCBootWrite-back F:\CCBootWrite-back		<u>~</u> .	

Figure 13-3

4. Click "Apply All Clients". CCBoot will apply the client default settings to all existing clients. Now the clients' settings become as -

Clients	Image Server IP	Game Server IP	Write-back File Path
Client1	192.168.1.1;192.168.1.2	192.168.1.3;192.168.1.4	E:\CCBootWrite-back
Client2	192.168.1.2;192.168.1.1	192.168.1.4;192.168.1.3	F:\CCBootWrite-back
Client3	192.168.1.1;192.168.1.2	192.168.1.3;192.168.1.4	E:\CCBootWrite-back
Client4	192.168.1.2;192.168.1.1	192.168.1.4;192.168.1.3	F:\CCBootWrite-back

Client1 will try to boot from 192.168.1.1 first, if failed, it will try to boot from 192.168.1.2. About game server, it will try to connect to 192.168.1.3 first, if failed, and then try 192.168.1.4. The write-back file path is E:\CCBootWrite-back.

Client2's settings are different from Client1's.

Notes: You need to add all clients before implement load balance and redundancy.

- Copy CCBoot.ini from the Server A's CCBoot installation folder to Server B's. Open "Options" -> "DHCP Settings" on the Server B. Select correct "DHCP Server IP". Restart CCBoot service on the Server B.
- 6. Now you will see that client1 connect to server A and client2 connect to server B. If you shutdown server A, client1 can still boot from server B.

# **14 PnP Different Devices**

Suppose you have 3 clients (A, B, and C) with different devices, and you want to create only one image to boot all of them.

- 1. Install same version of Windows XP on these 3 clients.
- 2. Install CCBoot client on these 3 clients. Press the "Install CCBoot Client" button to install.

ilient Install	Upload Image	
✓ Install Cache Driver	System Disk Image	C [4G] 🛛 💌
Start Cache After Login Windows	Server IP Address	192.168.1.100
Save Cache When Shutdown	VMDK File Name	XP01.vmdk
Install CCBoot Client		oload Image
ache Settings		

Figure 14-1

3. Copy "CCBootPNP" from the installation folder to a USB disk.



#### Figure 14-2

4. Insert the USB disk on the client B. Launch CCBootPNP from the USB disk and press the "Get Local PCI Drivers" button to collect drivers of the client B.

🔀 ССВо	otPNP v1	.9 Build 20091217		X
Available	e PCI Drive	ers		
Driver	Туре	Driver Name	Vendor ID	^
Display fdc Floppy hdc HIDCla HIDCla Keybo MEDIA Net SCSIA( Systen Systen Systen Systen USB USB	Disk ss ard dapter n n	VMware SVGA II Standard floppy disk controller Floppy disk drive Intel(R) 82371AB/EB PCI Bus M USB Human Interface Device USB Human Interface Device Standard 101/102-Key or Micros Creative AudioPCI (ES1371,ES1 VMware Accelerated AMD PCNe VMware Accelerated AMD PCNe VMware SCSI Controller Printer Port Logical Interface Intel 82371AB/EB PCI to ISA bri Intel 82443BX Pentium(R) II Pr USB Root Hub Intel(R) 82371AB/EB PCI to US	VEN_15AD&DEV_0405&SUBSY PNP0700 GENERIC_FLOPPY_DRIVE VEN_8086&DEV_7111&SUBSYS Vid_0e0f&Pid_0003&MI_00 Vid_0e0f&Pid_0003&MI_01 PNP0303 VEN_1274&DEV_1371&SUBSYS VEN_1022&DEV_2000&SUBSYS VEN_104B&DEV_1040&SUBSYS VEN_104B&DEV_1040&SUBSYS MicrosoftRawPort VEN_8086&DEV_7110&SUBSYS VEN_8086&DEV_7191&SUBSYS ROOT_HUB VEN_8086&DEV_7112&SUBSYS	
	Get Lo	cal PCI Drivers Delete Selected D	Drivers Install All PCI Drivers	

#### Figure 14-3

- 5. Plug the USB disk from the client B and insert it on the client C. Launch CCBootPNP from the USB disk and press the "Get Local PCI Drivers" button to collect drivers of the client C.
- 6. Plug the USB disk from the client C and insert it on the client A. Launch CCBootPNP from the USB disk and press the "Get Local PCI Drivers" button to collect drivers of the client A.
- 7. Press the "Install All PCI Drivers" button to install these 3 clients' drivers on the client A.
- 8. Upload image from the client A and this image can be used for booting the client A, B, and C.

# **15 nForce Chip NIC Solution**

Some kind of nForce Chip motherboard NIC cannot boot from CCBoot. You can get solution as below.

- 1. Uninstall nForce NIC default driver if installed. Uninstall the "NVIDIA Network Bus Enumerator" from the device manager.
- 2. Download nForce RISC driver from <u>http://www.ccboot.com/download/nforcerisc.rar</u>. Expand it, right click on the INF file and select "Install".
- 3. Reinstall CCBootClient again. Click the "Install CCBoot Client" button and reboot.
- 4. Upload image.
- 5. Now you can use this image to boot nForce NIC

The default driver of nForce cannot support diskless boot. So you have to replace it with the nForce RISC driver.

### 16 FAQs

### 1. Why it got about 1 minute delay when I get into desktop?

Please disable this service - Windows Firewall/Internet Connection Sharing (ICS).

### 2. Why the client cache doesn't work?

If the "Keep Write-back File", "Enable Upload Image" or "Super Client" is checked in the client properties, the client cache will be unavailable.

### 3. Some already known situations which can lead to blue screen.

a) Wrong version of NIC driver.

b) Some antivirus software will cause a blue screen, please check it out.

c) The client cache is too large, please modify.

d) The client has not been installed correctly. Please make sure you have pressed the "Install CCBoot Client" and complete it with a reboot before uploading the image.

For more FAQs, please refer to <u>http://www.ccboot.com/faq.htm</u>.

# **17 Contact**

# youngrsoft

Product Page: <u>http://www.ccboot.com</u>

Technical Support Email: support@ccboot.com

Sales Support Email: sales@ccboot.com