USING ISCSI CAKE WITH VMWARE ESX SERVER



Dec., 2008, Youngzsoft

ISCSI Cake (CCDisk)

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INTRODUCTION

VMware ESX supports iSCSI SAN to enable IT departments to deploy data center solution using existing storage resources and network devices. iSCSI Cake is a standard iSCSI target which supports a variety of storage resources including disk, partition, VMDK file, and image file. This paper provides instructions of configuring iSCSI Cake and VMware ESX server.

Figure 1 is the system setup which consists of an ISCSI Cake server and an ESX server. A VMDK file is used as source storage in this paper. If a partition is used as storage resource instead, it must be an unformatted partition so that ESX server can recognize and build VMFS on it.



Figure 1. Connect ESX to iSCSI Cake.

SETUP ISCSI CAKE

Download the latest version from <u>http://www.iscsicake.com</u>, install it with default settings. Click "New disk" button to add an iSCSI disk. A new VMDK file G:\filedisk will be created with 100G capacity. Check "Enable super client" and "Disable CHAP" to simplify following instructions.

Disk Information					
Disk information					
Name	Disk1				
Capacity	100000	мв			
Working dir	C:\Program Files\iSCSI Cake\D				
Source					
C Partition					
C Disk					
 File 	G:\filedisk				
🔿 Ramdisk	© Ramdisk				
Start type	Start type Auto				
🔽 Auto access	Auto access control				
Enable super client					
✓ Disable CHAP					
	OK Cance	el			

This is the main interface with the new iSCSI disk.

🤷 iSCSI Cake 1.7.1214 Trial days left: 14		
File(E) View(Y) Help(H)		
📃 🦀 🔜 🦓 💊 😂 🌘 💥 🍳) 🕠	
New disk New client Delete disk Delete client Setup Update cache Start service Stop service Exi	it About	
RJ(Online) Name Status Start type Acess c Capacity Speed Online time Read t	bytes Write bytes	Source
Client	IB OMB	G:\filedisk.vmdk
	1	
Ready	Opline 0	otal 0

SETUP VMWARE ESX

Install VMware ESX server and open VI (VMware Infrastructure Client).

🧬 VMware Infrastructu	re Client	×
🗊 vm ware [.]		
VMware Infras	structure Client	
Server:	192.168.182.132	•
Username:	root	
Password:	*****	_
	Log In Close	Help

ADD NETWORKING

Goto Configuration tab and choose Networking and here is the original settings.

🕝 192.168.182.132 - VMware	Infrastructure Client			
<u>File Edit View</u> I <u>n</u> ventory <u>A</u> dministr	ration Plugins Help			
Inventory Administration				Image: A start of the start
(† †) 🗗 🍯				
localhost.localdomain.com	localhost.localdomain.com VMware ES Getting Started Summary Virtual Mac	X Server, 3.5.0, 59330 Evaluation	(60 day(s) remaining) ance Configuration Users & Groups Ever	nts Permissions
	Hardware	Networking	F	Refresh Add Networking
	Processors Memory Storage • NetworkAg Storage Adapters NetworkAghters Ucensed Features Time Configuration DKS and Routing Virtual Machine Starup/Shutdown Virtual Machine Starup/Shutdown Virtual Machine Starup/Shutdown Advanced Settings	Virtual Switch: VSwitch0 Virtual Muchine Port Group VM Network Service Console Port Service Console vswif0: 192.168.182.132	Remove Properties	
Recent Tasks	,			×
Name Target	Status Initial	ed by 🗢 Time	Start Time Complete Time	
Sasks Sasks				root

Click "Add Networking" to add an iSCSI kernel portal.

🚱 Add Network Wizard					
Connection Type Networking hardware can be partitioned to accommodate each service requiring connectivity.					
Connection Type Network Access Connection Settings Summary	Connection Types Virtual Machine Add a labeled network to handle virtual machine network traffic. VMkernel The VMkernel TCP/IP stack handles traffic for the following ESX server services: VMware VMotion, iSCSI, and NFS. Service Console Add support for host management traffic.				
Help	< Back Next > Cancel				

Choose "VMKernel" and next.

Choose "Use vSwitch0" which is an existing virtual network switch.

Add Network Wizard		
YMkernel - Network Ac The VMkernel reaches	cess : networks through uplink adapters attached to virtual switches.	
Connection Type Network Access	Select which virtual switch will handle the network traffic for this connection. You may also create a new virtual switch using the unclaimed network adapters listed below.	
Connection Settings Summary	C Create a virtual switch Speed Networks	
	Use vSwitch0 Speed Networks	
	Minico 1000 Full 0.0.0.1-255.255.254	
	Preview: VMkemel Port VMkernel O	
	VMkernel Port VMkernel Que Physical Adapters Vitual Machine Port Group	
	Service Console Port	
	vswif0: 192.168.182.132	
Help	< Back Next > Cance	el

Enter IP address 192.168.182.133 and Subnet Mask 255.255.255.0.

🖉 Add Network Wizard				
VMkernel - Connection Se Use network labels to ide	ttings ntify VMkernel connections while mar	naging your hosts and datacenters.		
Connection Type Network Access Connection Settings Summary	Port Group Properties Network Label: VLAN ID (Optional):	VMkernel	×	
	IP Settings IP Address: Subnet Mask:	192 , 168 , 182 , 133 255 , 255 , 255 , 0		
	Preview: VMkemel Port VMkernel 192.168.182.133 Virtual Machine Port Group VM Network Service Console Port Service Console vswif0 : 192.168.182.132	Physical Adapters		
Help			< Back Next >	Cancel

A default gateway must be setup for this new network portal.

🚱 DNS and Routing Configura	ation	×
DNS Configuration Routing		
Service Console		
Default gateway:	192 . 168 . 182 . 1	
Gateway device:	vswif0 💌	
└── ──VMkernel ────		
Default gateway:	192 . 168 . 182 . 1	
	OK Cancel Help	

CHANGE SECURITY PROFILE

Click "Security Profile" and here are the original settings.



Click "Properties" to open port for iSCSI software.

🖉 Firewall Properties 📃 🗖 🗙					
Remote Access By default, remote clients are prevented from accessing services on this host, and local clients are prevented from accessing services on remote hosts. To provide access to a service or client, check the corresponding box. Unless configured otherwise, daemons will start automatically when any of their ports are opened and stop when all of their ports are closed.					
	Label	Incoming Ports	Outgoing Ports	Protocols	Daemon 🔥
Re Se	quired Services cure Shell				
	SSH Server	22		TCP	Running 📃
	SSH Client		22	TCP	N/A
Sir	nple Network Management Protoco	bl			
	SNMP Server	161	162	UDP	N/A
Un	grouped				
	Software iSCSI Client		3260	TCP	N/A
	VMware VirtualCenter Agent		902	UDP	N/A
	VCB		443,902	TCP	N/A
	Active Director Kerberos		464 88	TCP	M/A 🞽
1					
					Options
			ОК	Cancel	Help

ADD STORAGE ADAPTER

Go to Storage Adapters and select "iSCSI Software Adapter". Open "Properties" to check if iSCSI is enabled.



Click "Configure" button to enable iSCSI Initiator.

ð	iSCSI Initiator (iSCSI Software Adapter) Properties	
	Status: Disabled	»
	Close	

💋 General Propert	ies	×
Status Enabled		
iSCSI Properties iSCSI Name:		
	OK Cancel H	lelp

Return to iSCSI Initiator property panel and select "Dynamic Discovery" tab. Click "Add" button to add an iSCSI target.

2	iSCSI	nitiator (vmhba3	2) Proper	ties				
G	General	Dynamic Discovery	Static Disco	very CHAP	Authenticat	ion		
	Send 1 Obtain SendTa	a rgets information about tar rgets command.	get devices o	directly from t	ne following	iSCSI server	's using the	
	iSCSI Server							
	1				1	1		
			_	Add	Edi	t	Remove	
						Close	Help	

Enter the IP address of iSCSI Cake server, default iSCSI port is 3260.

🕝 Add Send Targets Server	×						
Send Targets iSCSI Server: 192 , 168 , 182 , 1 Port: 3260							
Authentication may need to be configured before a session can be established with any discovered targets.							
OK Cancel Help							

Close property panel and return to main interface. Click "Rescan" to search for iSCSI storage.

🖉 192.168.182.132 - VMware Infrastructure Client							
Elle Edit View Inventory Administration Blugins Help							
Inventory Administration							
(+ +) (1) (2)							
localhost.localdomain.com	Mware E5X Server, 3.5.0, 59330 Evaluation (60 day(s) remaining)						
Getting Started Summary	Virtual Machines Resource Allocation Performance Contiguration Users & Groups Events Permissions Storage Adapters	_					
Hardware	Device Type SAN Identifier						
Memory Storage	S3c1030 PCI-X Fusion-MPT Dual Ultra320 SCSI wmba0 SCSI SCSI						
Networking	Sc51 Software Adapter iSC51 iqn.1998-01.com.vmware:						
Storage Adapters Network Adapters							
C-Duran							
Software	Details						
Licensed Features Time Configuration DNS and Routing Virtual Machine Startup/Sh Virtual Machine Swapfile Lo Security Profile System Resource Allocatio Advanced Settings	wnbba32 Properties Model: iSCSI Software Adapter IP Address: iSCSI Name: ign.1998-01.com.vmware:localhost-05c70974 Discovery Methods: Send Targets iSCSI Alias: localhost.localdomain.com Targets: 0						
Recent Tasks	Tribisted by - Time Start Time Complete Time	×					
Add Internet SCSI Send I localhost.local O Completed	root 12/7/2008 5:53:45 AM 12/7/2008 5:53:45 AM 12/7/2008 5:53:59 AM						
Software Internet SCSI	root 12/7/2008 5:52:34 AM 12/7/2008 5:52:34 AM 12/7/2008 5:52:36 AM						
Open Firewall Ports Iocalhost.local Ocompleted Refresh Service Inform Iocalhost.local Ocompleted	root 12/7/2008 5:50:48 AM 12/7/2008 5:50:48 AM 12/7/2008 5:50:51 AM root 12/7/2008 5:50:12 AM 12/7/2008 5:50:12 AM 12/7/2008 5:50:19 AM						
Tasks							

ć	Rescan	×
	 Scan for New Storage Devices Rescan all host bus adapters for new storage devices. Rescanning all adapters can be slow. 	
	Scan for New VMFS Volumes Rescan all known storage devices for new VMFS volumes that have been added since the last scan. Rescanning known storage for new file systems is faster than rescanning for new storage.	
	OK Cancel Help	

The LUN information of iSCSI Cake target is listed in main interface now.

🕝 192.168.182.132 - VMware	e Infrastructure Client						
<u>File E</u> dit Vie <u>w</u> I <u>n</u> ventory <u>A</u> dmini:	istration <u>P</u> lugins <u>H</u> elp						
Inventory Administration			A state of the				
🔶 🔶 📑 🤤							
localhost.localdomain.com	Locahost.localdomain.com localhost.localdomain.com VMware ESX Server, 3.5.0, 59330 Evaluation (60 day(s) remaining)						
	Getting Started Summary Virtual Machi	nes Resource Allocation Performance Configuration	Users & Groups Events Permissions				
	Hardware	Storage Adapters	Rescan				
	Discourse	Device	Type SAN Identifier				
	Memory	53c1030 PCI-X Fusion-MPT Dual Ultra320 SCSI					
	Storage	S vmhba0	SCSI				
	Networking	SUSI Software Adapter	iSCSI ign.1998-01.com.ymware:				
	 Storage Adapters 	0					
	Network Adapters		10				
	Software						
	Licensed Features	Details	Duransking				
	Time Configuration	Model: iSCSI Software Adapter	IP Address:				
	DNS and Routing	iSCSI Name: iqn.1998-01.com.vmware:localhost-05c7	0974 Discovery Methods: Send Targets				
	Virtual Machine Startup/Shutdown	ISCSI Allas: Iocalnost.iocaldomain.com	Targets: 1				
	Virtual Machine Swaphle Location	iSCSI Name: ign 2005-02 com ricecake isosi 00					
	System Resource Allocation	iSCSI Alias:					
	Advanced Settings	Target LUNs: 1	Hide LUNs				
		Path Canonical Path Capac	tity LUN ID				
		vmhba32:0:0 vmhba32:0:0 97.66	GB 0				
Recent Tasks			×				
Name Targ	jet Status Initiate	by Time Start Time	Complete Time				
Rescan VMF5 Rescan All HBA	localnost.local 🛛 Completed root	12/7/2008 5:57:19 AM 12/7/2008 5:57:19 AM 12/7/2008 5:57:11 AM 12/7/2008 5:57:11 AM	12/7/2008 5:57:20 AM 12/7/2008 5:57:19 AM				
Add Internet SCSI Send	localhost.local S Completed root	12/7/2008 5:53:45 AM 12/7/2008 5:53:45 AM	12/7/2008 5:53:59 AM				
nternet SCSI	localhost.local 🛇 Completed root	12/7/2008 5:52:34 AM 12/7/2008 5:52:34 AM	12/7/2008 5:52:36 AM				
🐖 Tasks			root				

ADD STORAGE

<u>E</u> dit Vie <u>w</u> I <u>n</u> ventory <u>A</u>	Iministration Plugins Help					
Administration					ĺ	
• • 5 6						
localhost.localdomain.com	localhost.localdomain.com VMv	#are ESX Server, 3.5.0, 59330	Evaluation (60 day(s) rema	ining)		
	Getting Started Summary Virtual Machines Resource Allocation Performance Configuration Users & Groups Events Permission					
	Hardware	Storage		Refresh Remove	Add Storage.	
	Processors	Identification	Device	Capacity Free Typ	e	
	Memory	storage1	vmhba0:0:0:3	1.75 GB 1.47 GB vmf	\$3	
	► Storage					
	Networking					
	Storage Adapters					
	Network Adapters					
	Software					
	Licensed Features	Details			Properties	
	Time Configuration	storage1	/olumes/49161f9a-7c	1.75 GB Capacity		
	DNS and Routing			285.00 MB 🔲 Used		
	Virtual Machine Startup/Shutdo Virtual Machine Swapfile Locati	own ion		1.47 GB 🔲 Free		
	Security Profile	Path Selection	Properties	Extents		
	System Resource Allocation	Fixed	Volume Label: stora	ge1 vmhba0:0:0:3	1.79 GB	
	Advanced Settings	Paths	Datastore Name: stora	ge1 Total Formatted Capacity	1.75 GB	
		Total: 1	Formatting			
		Broken: 0	Block Size: 1 M	-5-3.31 B		
		Disabled; 0				
ent Tasks						
ne	Target Status	Initiated by	Time Start Time	Complete Time		
		root 12/7/2008	5:57:19 AM 12/7/2008 5:57:1	9 AM 12/7/2008 5:57:20 AM		
Rescan VMFS Rescan All HBA	localhost.local O Completed	root 12/7/2008	5:57:11 AM 12/7/2008 5:57:1	1 AM 12/7/2008 5:57:19 AM		
Rescan VMFS Rescan All HBA Add Internet SCSI Send	Iocalhost.local Completed Iocalhost.local Completed Iocalhost.local Completed	root 12/7/2008 root 12/7/2008	5:57:11 AM 12/7/2008 5:57:1 5:53:45 AM 12/7/2008 5:53:4	1 AM 12/7/2008 5:57:19 AM 5 AM 12/7/2008 5:53:59 AM		

Select "Storage" from Hardware list and existing storage is shown.

Select "Disk/LUN" and next.

🕝 Add Storage Wizard	
Select Storage Type Do you want to format a r	iew volume or use a shared folder over the network?
Disk/LUN Device Location Current Disk Layout Properties Formatting Ready to Complete	 Storage Type Disk/LUN Choose this option if you want to create a datastore or other volume on a Fibre Channel, iSCSI or local SCSI disk. Network File System Choose this option if you want to use a shared folder over a network connection as if it were a VMware datastore. A mount point must be created on the host before it is added as a datastore.
Help	< Back Next > Cancel

Select one from available LUNs and next.

🚱 Add Storage Wizard									
Select Disk/LUN If a device cannot be configu	Select Disk/LUN If a device cannot be configured unambiguously, you will be asked to select a partition.								
	,,,,-								
Disk/LUN Device Location				SAN Identifier contains: 👻		Clear			
Current Disk Layout	Device	Capacity	Available	SAN Identifier	LUN				
Properties	vmhba32:0:0	97.66 GB	97.65 GB	ign.2005-02.com.ricecake.	0				
Formatting									
Keady to Complete									
	1								
Help				< Back	Next >	Cancel			

🖉 Add Storage Wizard				
Current Disk Layout You can partition and form	nat the entire device, all free space, or	a single block of free	space.	
Disk/LUN	Review the current disk layout:			
Current Disk Layout Properties Formatting Ready to Complete	Device /vmfs/devices/disks/	Capacity 97.66 GB	Target Identifier vmhba32:0:0	LUN O
		The hard disk is t	blank.	
	1			
Help			< Back Next >	Cancel

Give a name "disk1" to the new storage.

🖉 Add Storage Wizard								
Disk/LUN - Properties Labels provide stable access to VMFS volumes that is not affected by hardware variations								
Disk/LUN Device Location Current Disk Lavout Properties Formatting Ready to Complete	Datastore Name disk1							
Help	< Back Next >	Cancel						

Accept default setting and next.

🙆 Add Storage Wizard	
Disk/LUN - Formatting The format of your file syst	em determines which class of virtual machines it will be able to support.
<u>Disk/LUN</u> <u>Device Location</u> <u>Current Disk Layout</u> <u>Properties</u> Formatting Ready to Complete	Maximum file size
	Capacity Capacity Image: Capacity Image: GB
Help	< Back Next > Cancel

Double check before finish.

🚱 Add Storage Wizard				
Ready to Complete Review this summary be	fore completing the wizard.			
	Review the proposed disk layout:			
Ready to Lomplete	Device /vmfs/devices/disks/	Capacity 97.66 GB	Target Identifier vmhba32:0:0	LUN O
	Primary Partitions VMFS	Capacity 97.65 GB	Description	
	The following VMware file system will Properties Datastore name: disk1 Formatting File system: VMF5-3 Block size: 1 MB Maximum file size: 256 GB	be created:		
Help			< Back Finish	Cancel

After a short while, storage is successfully added.

🕝 192.168.182.132 - VMware	Infrastructure Client			
<u>File E</u> dit Vie <u>w</u> I <u>n</u> ventory <u>A</u> dministr	ration Plugins Help			
Inventory Administration			[Þ
🔶 🔶 📑 🤤				
Iocalhost.localdomain.com	Iocalhost.Jocaldomain.com VMware ESX Ser Betting Statted Summayi Vitual Machines Hardware Processors S Processors Memory Storage Networking Storage Networking Storage Adapters Networking Storage Networking Storage Adapters D Storage Adapters Network Adapters D Software D D Uccensed Features Time Configuration D DNS and Routing Virtual Machine Startup/Shutdown Network Adapters System Resource Allocation Security Profile System Resource Allocation Advanced Settings I I	SX Server, 3.5.0, 59330 Evaluation (60 day(s) trines Resource Alocation Performance Conf Storage Identification Device Identification Device identification identification identification Device identification Device identification Device identification Device identification Device identification Device	remaining) figuration Users & Groups Events Permissions Refresh Remove Add Storage: Capacity Free Type 1.75 GB 1.47 GB vmfs3 97.50 GB 96.95 GB vmfs3 Properties	
		disk1 Location: /vmfs/volumes/493bad12-b Path Selection Fixed Properties Datastore Name: Paths Datastore Name: Paths Formatting Total: 1 File System: Disabled: 0 Block Size:	97.50 GB Capacity 561.00 MB Used 96.95 GB Free Extents disk1 vmhba32:0:0:1 97.65 GB disk2 Total Formatted Capacity 97.50 GB VMF5 3.31 1 MB	
Recent Tasks				×
Name Target ✓ Create VMFS Datastore In ✓ Rescan VMFS In ✓ Rescan VMFS In ✓ Rescan All HBA In ✓ Add Internet SCSI Send In ✓ Internet SCSI Send In	status Initia ocalhost.local © Completed root ocalhost.local © Completed root ocalhost.local © Completed root ocalhost.local © Completed root	Ced by Time Start Time 12/7/2008 6:01:23 AM 12/7/2008 6:01:23 AM 12/7/2008 5:57:19 AM 12/7/2008 5:57:19 AM 12/7/2008 5:57:19 AM 12/7/2008 5:57:19 AM	Complete Time 101:23 AM 12/7/2008 6:01:43 AM 157:19 AM 12/7/2008 5:57:20 AM 157:11 AM 12/7/2008 5:57:19 AM 153:45 AM 12/7/2008 5:53:59 AM	~
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CONTACT

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