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Thank you for purchasing Diana2 cloud terminal from SUNDE by Huiyuan Co., Ltd. Please refer to this manual for the installation of vPoint 2.0 software and setting-up of Diana2 terminal.

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Chapter 1 What' New about vPoint2.0 and Requirements on Host

Server Hardware

1.1 What's New about vPoint2.0?

Compared to earlier vPoint1.0 (single host server version, using VirtualBox 4.2.8), vPoint2.0 Server supports multiple VM host servers, which means you do not need to install vPoint2.0 Server on each VM host servers except one. And you can even install vPoint Server on a small server with no virtualization capability, running no virtual machines. And a sudden shutdown will not affect the working status of Diana devices which are connecting to host servers already.

What's more, vPoint2.0 uses a WebConsole to do its job. This web consoled can be accessed from any pc station through a browser by typing in vPoint2.0 server address in this format: <u>https://192.168.1.88</u> (Here IP address 192.168.1.88 is just for example. Type in your actual vPoint Server instead).

vPoint 1.0 can only support virtualization software virtualbox, so users using virtualization software like VMware, XenServer, Hyper-V, KVM, etc., could not enjoy the fantastic experience brought by Diana. Now vPoint2.0 has changed that. By installing a special part call "iTeam" in the OS of the VM created by VMware, XenServer, Hyper-V and KVM, a Diana user can connect to the VM same way as he connects to a VirtualBox VM, with same PC-like user experience.

We have a separate User Manual for iTeam of vPoint2.0 which can be downloaded from our website.

1.2 Typical Network Construction of vPoint2.0



As shown in Picture 1,

part indicates using VirtualBox as the

virtualization software. In the server group, there should be at least on vPoint Server installed to take care of connection broker and accounts management job.



part indicates how iTeam works with VMs created by other virtualization software like VMware, XenServer, KVM, Hyper-V, etc.. Users only need to install iTeam into the Windows OS of the VMs. Nothing need to be changed to their virtualization platforms. See iTeam User Manual for more details.



part indicates how iTeam turns a PC/workstation/notebook and similar products into virtual desktops that can be used by Diana users. This is very useful for some art design companies who what to have better security on their design works. For example, the CAD workstation can be locked in the computer lab (or datacenter), designers connected to the workstation with Diana devices. The system can prevent Diana users to copy any data from the workstation.

The VDI-Client as shown in Picture 1 is another new product by SUNDE. VDI-Client is the software version of Diana. A PC/Notebook installed with VDI-Client can connect to a virtual desktop provided by vPoint2.0 same as a Diana device. VDI-Client is not a free software. Users need to pay for using it.

1.3 Requirements on Host Server Hardware Configuration

The Host server shall be able to run 64bit version Windows 2008 and its CPU shall support virtualization (VT for INTEL, AMD-V for AMD). The size of RAM is decided by the numbers of virtual machines to be created on the Host PC (Server). For a 10 virtual machines host, If 512Mb to 1024Mb memory is going to be assigned for each virtual machine, an amount of 8Gb to 12Gb RAM in total shall be installed on the Host PC (Server). SSD (Solid State Drive) is recommended for faster storage if the number of virtual machines to be created is above 5. SSD (Solid State Drive) is a perfect choice for housing virtual machines for higher performance.

Chapter 2 Install vPoint2.0 on Host Servers

Before installing vPoint2.0, 64bit operation system (namely 64bit version of Windows 7, Windows 8, Windows 2008R2 or Windows 2012) shall have been already installed on the Host Server. For host server OS, Windows 2008R2 64 bit version is highly recommended.

Host Server OS	VM OS
Windows 7 all 64bit version	All Windows OS Supported by VirtualBox
Windows 2008R2 all 64bit version	All Linux OS Supported by VirtualBox
Windows 8 all 64bit version	All other (MAC, Android) OS by VirtualBox
Windows 2012 all 64bit version	

OS supported by Diana

There are 3 types of installation of vPoint2.0 to meet various actual users situation. Now we will introduce them one by one.

2.1 Only install the Server part (the WebConsole and Connection broker) – for server not to be used as VM host. Here are the steps:

Double click on "vPointInstallationPackage". See Picture 2:



Picture 2

Click on "Next" to continue. Picture 3:

Welcome to the InstallShield Wizard for vPoint
The InstallShield Wizard will install vPoint on your computer. To continue, click Next.
< Back Next > Cancel



Choose "Destination Location". We can use the default. Picture 4:

Choose D Select fo	estination Location Ider where setup will install files.			K
	Install vPoint to: C:\Program Files (x86)\vPoint			Change
InstallShield -		< Back	Next >	Cancel

Picture 4

Select "Server" only. Then continue with "Next" . Picture 5:

Setup Type Select the setup type that best suits your needs.	NA.
Select the types you want to install, and deselect the types you do not wa	nt to install.
✓ Server	
InstallShield <u>Rext :</u>	Cancel



Click on "Install" to start the installation. Picture 6:

Ready to Install the Program	and the second second
The wizard is ready to begin installation.	
Click Install to begin the installation.	
If you want to review or change any of your installation settings, click Ba the wizard.	ack. Click Cancel to exit
InstallShield	
< Back Inst	all Cancel

Picture 6

Installing:

Setup Status	
The InstallShield Wizard is installing vPoint	
Installing	
C:\\Server\WebService\Python27\App\Lib\encodings\cp1257.py	
InstallShield	
	Cancel

Picture 7

When it finishes, click on "Finish" to restart the server:



Picture 8

2.2 Install both the Server and the Client. This is for server that is intended for both vPoint

Server and VM host. Here are the steps:

Run the installation with initial steps same as 2.1 till this windows comes up. Choose both "Server" and "Client":

Setup Type		Color Of Col
Select the setup type that best suits your need	ts.	
Select the types you want to install, and desel	ect the types you do not war	nt to install.
Server Server		
✓ Client		
InstallShield		
	< Back Next >	Cancel

Picture 9

As for the clients, we choose "iVBox". This will install VirtualBox software on this server. Lateron,

we can user VirtualBox to create virtual machines. Picture 10:

Setup Type Select the setup type that best suits your needs	s.	X
Select one of the following Clients.		
○ iTeam ● <u>iMBox</u>		
InstallShield	< <u>B</u> ack <u>N</u> e	xt > Cancel

Picture 10

Click "Install" to start the installation:

Ready to Install the Program	and the second second
The wizard is ready to begin installation.	a start
Click Install to begin the installation.	
If you want to review or change any of your installation settings, click Back. the wizard.	Click Cancel to exit
nstallShield	
< <u>Back</u>	Cancel

Picture 11

Installing:

Setup Status	X
The InstallShield Wizard is installing vPoint	
Installing	
C:\\twisted\internet\iocpreactor\iocpsupport.pyd	
	Cancel

Picture 12

Then comes up the installation of VirtualBox:



Picture 13

Choose location. Defautl is OK:

Custom Setup Select the way you want features to be installed.			
Click on the icons in the tree below to change the way features will be installed.			
VirtualBox Application	Oracle VM VirtualBox 4.3.12 application.		
VirtualBox Bridger VirtualBox Host-C	This feature requires 152MB on your hard drive. It has 3 of 3 subfeatures selected. The subfeatures require 808KB on yo		
Location: C:\Program Files\Oracle\VirtualBox\ Browse			
Version 4.3.12 Disk Usage < B	ack Next > Cancel		

Picture 14

Click on "Next":

Custom Setup Select the way you want features to be installed.
Please choose from the options below: Create a shortcut on the desktop Create a shortcut in the Quick Launch Bar Register file associations
Version 4.3.12 < Back Next > Cancel

Picture 15

Click on "Yes" to confirm:

	Warning
	Network Interfaces
100	Network Interfaces
	Installing the Oracle VM VirtualBox 4.3.12 Networking feature will reset your network connection and temporarily disconnect you from the network.
	Proceed with installation now?
Version 4.3.12	Yes No

Picture 16

Click on "Install" to start the installation:

Ready to Install The Setup Wizard is ready to begin the (Custom installation.
Click Install to begin the installation. If ye installation is the installation settings, click Back. Click Can	ou want to review or change any of your cel to exit the wizard.
Version 4.3.12	< <u>B</u> ack <u>Install</u> <u>C</u> ancel

Picture 17

When "Windows Security" pops up, check "Always trust software from 'Oracle Corporation'", and Click "Install":

Would you like to install this device software?	
Name: Oracle Corporation Universal Serial Bus Publisher: Oracle Corporation	
✓ <u>Always trust software from "Oracle Corporation".</u> <u>Install</u> <u>Don't Install</u>	
You should only install driver software from publishers you trust. How can I decide which device software is safe to install?	

Picture 18

Click on "Finish":



Picture 19

Then it comes back to vPoint installation. Click on "Finish" to restart the server:

InstallShield Wizard Complete The InstallShield Wizard has successfully installed vPoint. Before you can use the program, you must restart your computer. • Yes, I want to restart my computer now. • No, I will restart my computer later. Remove any disks from their drives, and then click Finish to complete setup.
< Back Finish Cancel

Picture 20

2.3 Install only the Client. This is for server that is intended for both vPoint Server

and VM host, here are the steps:

Run the installation with initial steps same as 2.1 till this windows comes up. Choose both

"Client"	only:
----------	-------

Catura Turas		
Select the setup type that best suits your needs.		24
Select the types you want to install, and deseled	st the types you do not want to	install.
Server		
✓ Client		
InstallShield		
	< Back Next >	Cancel

Picture 21

Then, choose "iVBox". This will install VirtualBox:

Setup Type Select the setup type that best suits your need	S.	X
Select one of the following Clients.		
OiTeam ● WBox		
InstallShield	< <u>B</u> ack <u>N</u> ext >	Cancel

Picture 22

Click on "Next" to start the installation:

Ready to Install the Program	. Alan
The wizard is ready to begin installation.	Contra I
Click Install to begin the installation.	
If you want to review or change any of your installation settings, click Back the wizard.	Click Cancel to exit
InstallChield	
< <u>B</u> ack Install	Cancel

Picture 23

When it comes to the windows as shown below, type in the IP address of vPoint Server:

Edit Data Enter requested data.	Next
Set the Server Ip	
Server Ip	
InstallShield	< Back Next > Cancel

Picture 24

For example, the vPoint Server that we have installed in 2.1 has an IP address of 192.168.1.88, and want the current host server to use 192.168.1.88 to be its connection broder, we need to type in the vPoint Server IP address. See Picture 24:

Edit Data			and the second second
Enter reque	ested data.		
Set the Ser	ver lp		
Server Ip	192.168.1.88		
InstallShield —		< Back Ne:	kt > Cancel



Then comes the installation of VirtualBox. Follow the steps as described in 2.2. Restart the

server when the installation is finished.



Picture 26 19 / 73

Notes:

- The "Server" part in vPoint installation package contains vPoint WebConsole and User Account Management, Diana Management. It works as the connection broker between Diana and Host Servers. For a multiple-server configuration environment, one vPoint Server installation is enough for all the Host Servers.
- 2) The client option of "iVBox" in the vPoint installation package refers to the virtualization software "VirtualBox". It shall be installed on each Host Server.
- 3) If there are multiple vPoint Servers in the environment, Host Servers can be pointed to any one of them. And this pointing can be changed any time by modifying "iVMS.ini" file of the Host Server. Say, a Host Server "A" pointed to 192.168.1.88 now needs to be pointed another vPoint Server with IP address 192.168.1.253. Here are the steps:

Log on Host Server A, and go to location C:\Program Files\Oracle\VirtualBox. Picture 26:



Picture 27

Find iVMS.ini and open it with Notepad:

```
File Edit Format View Help
[NETWORK]
iRegisterIP=192.168.1.253
[HOST]
GUID=3F078F59-C863-474A-B970-246C3904CF72
```

```
Picture 28
```

Change iRegisterIP to "192.168.1.253", save it and then restart the server to take effect.

Chapter 3 How to uninstall vPoint2.0

Double click to run "vPointInstallationPackage". When it comes to this window, choose

"Remove":

Welcome	A second s
Modify, repai	ir, or remove the program.
Welcome to installation. C	the vPoint Setup Maintenance program. This program lets you modify the current Click one of the options below.
🔘 Modify	
1 1	Select new program features to add or select currently installed features to remove.
⊖ Repair	Reinstall all program features installed by the previous setup.
Remove Remove InstallShield	Remove all installed features.
	< Back Next > Cancel

Picture 29

Click on "Yes" to confirm:

Do you want to completely remove the selected ap	plication and all of it	ts features?
	<u>Y</u> es	No

Picture 30

Uninstalling:



Picture 31

When it completes, click on "Finish" to restart the server:

Uninstall Complete InstallShield Wizard has finished uninstalling vPoint.
 Yes, I want to restart my computer now. No, I will restart my computer later. Remove any disks from their drives, and then click Finish to complete setup.
< Back Finish Cancel

Picture 32

Note: this uninstallation process only uninstalls vPoint2.0. VirtualBox remains unchanged. 22/73

Chapter 4 The WebConsole of vPoint2.0 Server

When vPoint Server is installed, we can run vPoint WebConsole to manage VMs, setting up

Diana user account, etc.

4.1 How to Log in WebConsole

Double click on "WebConsole" icon:



Picture 33

This action will start the brower as show below. Choose "Continue to this website":

€))	🤗 https://localhost/
8	There is a problem with this website's security certificate.
	The security certificate presented by this website was not issued by a true. The security certificate presented by this website was issued for a different
	Security certificate problems may indicate an attempt to fool you or inter server.
	We recommend that you close this webpage and do not continue to
	Click here to close this webpage.
	Scontinue to this website (not recommended).

Picture 34

Type in Default User Name and Password (It is case sensitive):

login			
	User Name:	Admin	
	Password:	••••	
		Login Clear	

Picture 35

Then we will come to the WebConsole home page:

🖉 vPoint 2.0 Web Console		- 🐴 🔹	N • 🗆	🖶 🔻 P	age 🔻	Safety 🔻	Tools	• 🔞 •
vPoint 2.0				<u>Refresh</u>	中文	English	logout	Admin
Console								
Host List 🔗								
Account Manage								
Console Management								
Console Management								

Picture 36

The list is empty since we have not created any virtual machines yet.

When we finishing creating VMs through VirtualBox Manager and having all needed

softeware and applications installed in the VM, we can shut it down, and click on the Refresh

button on vPoint WebConsole. And then the VM will be shown in the list.

4.2 Functions of vPoint WebConsole:

Host List

🏉 vPoint 2.0 Web Console						۰ 🟠	2	• 🖃	-	Page 🔻	Safety 🔻	Tools •
vPoint 2.0									Refre	<u>esh 中文</u>	<u>English</u>	logout .
Console		VMs										
Host List 🥠	\sim	, .										
▲ 🔄 WIN-1G48GO0BQDP	*	VM i	nfomatio	n								
📄 win701		(P	ower On	Pov	wer Off	Rese	at			Unloc		
🖹 win7		Fower on Fower on Reset Lock Officik										
Centossystem		Cir	nmigrant	em	ligrant							
📄 win7-001			No		Ototo				00.7			
🗎 win7-002			Na	me	State				051	ype		
🗎 win7-003			win	701	Powered (Off			Wind	lows 7		
📄 win7-004	=											

Picture 37

As shown in Picture 37, Host List lists all Host Servers that are set to take this vPoint Server as connection broker. Under each Host Server lists all available VMs on that Host. "VM Information" on the right gives information on VM's name, status, OS Type. Under it is the row of functioning buttons. The below chart gives the details:

	Host List
Power On	Click on this button will power on all selected VMs.
Power Off	Click on this button will power off all selected VMs.
Reset	Click on this button will force shut down all selected VMs.
Lock	Click on this button will lock all selected VMs, so that NO Diana can
	Connect to this VM.
Unlock	Click on this button will unlock all selected VMs, so that they are
	available for Diana users to connect.
	Click on this button will immigrant all selected VMs, so that they
Immigrant	are ready to be connected by Dianna users. In this status, the VMs
	could not be edited or modified by VirtualBox Manager.
Emigrant	Click on this button will emigrant all selected VMs, so that they can
	be edited or modified by VirtualBox Manager. In this status, the
	VMs cannot be connected by Diana users

4.3 User Accounts Management

🏉 vPoint 2.0 Web Con	sole		🟠 🔻 🖾 👻 🚍 🖶 🔻 P	age ▼ Safety ▼ Tools ▼
vPoint 2.0			Refresh	中文 English logout Ad
Console	User Info			
Host List 🛛 🕹	Create Delete	Multi-Modify Mu	lti-import Export to csv file	Create multiple users
Account Manage A	Name	Remark	Account Type	The number of VMs
Admin Continent User	Admin		Super Administrator	-
	User Name:	Admin		
	Remark:			
	Password:	••••		
	Confirm Password:	••••		
		Yes		

Picture 38

There two kinds of User Accounts. Administrator users have full access to all VMs, while Ordinary users only have rights to access those VMs that are assigned to them.

As shown in Picture 38, by default, there is an Administrator user account with name "Admin". Its password by default is also "Admin". More Administrator user accounts can be created if needed.

After new installation of vPoint2.0, the Ordinary User list is empty. We need to create user accounts for all Diana users and then assign proper VMs to them.

	Click on this button, type in User Name and password. Choose user
Create	type "Administrator" or "Ordinary". If the type is "Ordinary", assign at
	least 1 VM to this user. Then click on Yes to finish
Delete	Click on this button will delete all selected user accounts.
	When more than 2 user accounts are selected, click on this button will
Multi-Modify	go to page where we can change account type, password and rights
	to the use of USB devices.
Export to csv file	to the use of USB devices. Save all user account information to a csv file.
Export to csv file Multi-Import	to the use of USB devices. Save all user account information to a csv file. Import user accounts from a csv file.
Export to csv file Multi-Import	to the use of USB devices. Save all user account information to a csv file. Import user accounts from a csv file. Click on this button will go to page where we can create multiple user
Export to csv file Multi-Import Create Multiple	to the use of USB devices. Save all user account information to a csv file. Import user accounts from a csv file. Click on this button will go to page where we can create multiple user accounts with same password, account type and rights to use of USB

Chapter 5 Creating Virtual Machines (VMs)

After installing vPoint2.0 and VirtualBox virtualization software, we can move on to creating virtual machines. The operation system (OS) of a VM could be any operation system that is supported by VirtualBox, including all Windows, Linux, MAC, Android, etc. There could be multiple VMs with same OS (say 5 VMs with Windows XP OS), or multiple VMs with different OS (say 1 with Windows XP, 1 Windows 7 and 1 Ubuntu, etc.).

5.1 Change the global setting of VirtualBox

Before starting to create VMs, we'd better change the default VMs location of VirtualBox, since the default is server OS drive while we very often need to store all VM files in other drives. Open **Oracle VM Manager,** Click on "File", then choose "Preferences":



Picture 43

Choose "Update", uncheck "Check for updates":

📃 General	Update
💌 Input	
🔄 Update	Once per: 1 day
Language Display	Next Check: Never
P Network	Check for: C Stable release versions
Extensions	 All new releases All new releases and pre-releases
Proxy	
	Choose this if you wish to be notified about all new VirtualBox releases.
	OK Cancel <u>H</u> elp

Picture 44 Choose "General", Change the default machine folder:

📃 General	General
💌 Input	
🧭 Update	Default Machine Folder: L C:\Usetrator\VirtualBox VMs
Language	VRDP Authentication Library: 🔀 Other
🖳 Display	🔗 Reset 💌
Network	
Extensions	
Proxy	
	Select a settings category from the list on the left-hand side and move the mouse over a settings item to get more information.
	OK Cancel <u>H</u> elp

Picture 45

Browse the folder where the hard disk space is big enough for the Virtual Machines and click "OK":

Select a directory
> Server2012 Doc ^ > sunde doc > TDDOWNLOAD > template
VMS VMS VMS Vorksoftware
▷ Cocal Disk (E:) ▷ Setwork
Make New Folder OK Cancel

Picture 46

📃 General	General
💌 Input 🎯 Update	Default <u>M</u> achine Folder: D:\VMS
Language Display	VRDP Authentication Library: 🗊 VBoxAuth
P Network	
 Extensions Proxy 	
	Select a settings category from the list on the left-hand side and move the mouse over a settings item to get more information.
	OK Cancel <u>H</u> elp

The Default Machine Folder has been changed. Picture 47:

Picture 47

5.2 Creating Virtual Machines (VMs)

Click "New" to start the guide:



Name the virtual machine, and choose the right operation system:

Ŵ	Create Virtual Machine	? X
Image: Constraint of the second secon	Name and operating system Please choose a descriptive name for the new virtu and select the type of operating system you inten on it. The name you choose will be used throughou to identify this machine. Name: Type: Microsoft Windows Version: Windows 7	ual machine d to install ut VirtualBox
Hide	Description < <u>B</u> ack <u>N</u> ext >	Cancel

Picture 49

Set the RAM size of virtual machine:

Ŷ	Create Virtual Machine	?	х
C	Memory size Select the amount of memory (RAM) in megabytes allocated to the virtual machine. The recommended memory size is 512 MB. 4 MB 24576 MB	to be	MB
	< <u>B</u> ack <u>N</u> ext >	Cance	

Picture 50

Create hard disk for the virtual machine:



Picture 51

Choose the type of file that you would like to use for the new virtual hard drive, default "VDI" is OK:



Picture 52

Select the type of virtual hard disk you want to create:



Picture 53

Set the size of hard disk. Then click "Create":

Ŷ	Create Virtual Hard Drive	?	x
	File location and size Please type the name of the new virtual hard drive file into the box click on the folder icon to select a different folder to create the file win7 Select the size of the virtual hard drive in megabytes. This size is the amount of file data that a virtual machine will be able to store of drive. 4.00 MB 2.00 TB	below in. ne limit n the h	or on hard
	< <u>B</u> ack Create	Cano	el

Picture 54

Now, we can see a virtual machine in the list:



Picture 55

We need to make some changes to the settings of the virtual machine. Click "Settings":

Ŷ		Oracle \	/M VirtualBox Manager	Ŀ
File Machine Hel	p			
New Settings Sta	art Discard			没 Details 🛛
win7	Off General			Preview
	🐲 Settings	Ctrl+S		
	😭 Clone	Ctrl+O		\prec
	💢 Remove	Ctrl+R		- 1
	🛃 Group	Ctrl+U)M, Hard Disk	win7
	real Start		p Paging	
	Pause	Ctrl+P		
	Reset	Ctrl+T		
		Þ		
	Discard saved state	Ctrl+J		
	🔄 Show Log	Ctrl+L		
	⊘ Refresh			
	Show in Explorer] Empty	
	Create Shortcut on Deskto	ор	(Normal, 25.00 GB)	
	Sort			
	Controller: Intel H	ws Directsour D Audio	rd .	
Manage the virtual r	machine settings			

Picture 56

Click "Storage" on the left, and then click "CD drive" in the "Storage Tree". In the "Attributes", choose a system ISO image, or put the system CD in CD/DVD drive and choose "Host Drive":

۲		win7 - Setting	gs	? X	
	General	Storage			pshots
	System Display	Storage Tree	Attributes	<u>_</u>	
	Storage Audio	Controller: SATA	Choose a virtual CD/DVD disk f	ïle	
	Serial Ports	win7.vdi	en_windows_7_ultimate_x86_dv 9200.16384.WIN8_RTM.120725- en_windows_8_enterprise_x86_d	/d_X15- 65921. 1247_X64FRE_I dvd. 917587 iso	iso ENTERP
	Shared Folders		en_windows_7_ultimate_with_s	p1_x64_dvd_u	_677332
		Q 😂 🏠			
		Select a settings category from the list on the item to get more information.	e left-hand side and move the mouse over a	settings	
			OK Cancel	Help	

Picture 57

Click "OK". You can see the ISO image is successfully loaded into to the CD drive:

۲	win7 - Setting	gs ? X
 General System Display Storage Audio Network Serial Ports USB Shared Folders 	Storage Storage Tree Controller: IDE Controller: SATA Source SATA Source SATA Source SATA	Attributes CD/DVD <u>p</u> rive: IDE Secondary Master C () <u>Live CD/DVD</u> Information Type: Image Size: 2.33 GB Location: D:\ISO\ISO2\3212Win7\en_wind Attached To:
	Select a settings category from the list on the item to get more information.	e left-hand side and move the mouse over a settings
		OK Cancel <u>H</u> elp

Picture 58

Next step, choose "Audio", uncheck "Enable Audio". We will install Diana its own audio device, so no need to enable audio device here:

۹	win7 - Settings ? X
 General System Display Storage Audio Network Serial Ports USB Shared Folders 	Audio Image: Enable Audio Host Audio Driver: Windows DirectSound Audio Controller: Intel HD Audio Image: Intel HD Audio Image: Image
	OK Cancel <u>H</u> elp

Picture 59

Then go to "Network", choose "Bridged Adapter" for the virtual machine:

9	win7 - Settings	?	x
 General System Display Storage Audio Network Serial Ports USB Shared Folders 	win7 - Settings Network Adapter 1 Adapter 2 Adapter 3 Adapter 4 Iv Enable Network Adapter Attached to: NAT Ivance Not attached NAT Iv Advanced Bridged Adapter Internal Network Host-only Adapter/Bridged Adapter Generic Driver Generic Driver	2	×
	Select a settings category from the list on the left-hand side and move the mouse over a s item to get more information.	ettin <u>c</u>	75
	OK Cancel	He	p

Picture 60

And also in the "USB" option, check "Enable USB controller". Finally, click "OK" to finish:

2	win7 - Settings ? X
 General System Display Storage Audio Network Serial Ports USB Shared Fold 	USB ✓ Enable USB Controller ✓ Enable USB 2.0 (EH_CI) Controller USB Device Eilters
	OK Cancel <u>H</u> elp

Picture 61

Note: You can also Enable USB 2.0 controller in order to make the VM support USB2.0 devices.

Now, we can start the virtual machine and begin the installation of operation system:



Picture 62
The installation process is just the same as you were installing it on a physical PC (Server):



Picture 63

5.3 Installing Guest Additions to Virtual Machines

Guest Additions need to be installed to the virtual machine for higher performance, for example, screen resolution, shared folder.

Start the virtual machine we have just finished installing operation system. Click "Devices", and then choose "Install Guest Additions". Then the Guest Additions installation ISO image will be mounted to the CD drive of the virtual machine.

%		win7 [Running] - Oracle VM VirtualBox
Machine View	Devices Help	
P	CD/DVD Devices	•
	USB Devices	•
Recycle Bin	Shared Clipboard	•
and particular	Drag'n'Drop	••••
	P Network Adapters	
	Shared Folders	
	📃 Enable Remote Display	
	🥜 Install Guest Additions	Host+D

Picture 64

Open the CD Drive of the virtual machine:

12	win7 [Running] - Oracle VM VirtualBox	
Machine View Devices H	Help	
🔾 🗸 🕌 🕨 Compute	er 🕨 🤟 🗸	Sec
Organize 🔻 Eject	Properties System properties Uninstall or change a program >>	>
★ Favorites ■ Desktop ● Downloads ● Recent Places	 Hard Disk Drives (1) Local Disk (C:) 17.4 GB free of 24.8 GB Devices with Removable Storage (1) 	
 Libraries Documents Music Pictures Videos 	CD Drive (D:) VirtualBox Guest Additions 0 bytes free of 54.7 MB Open Open in new window Share with	

Picture 65

Open VBoxWindowsAdditions:

1	🔝 win7 [Running] - Oracle VM VirtualBox					
Machine View Devices H	lelp					
🔾 🗢 🦁 🕨 Compute	r 🕨 CD Drive (D:) VirtualBox Guest Addi	tions	•	- - i i j	Search (CD Drii
Organize 👻 🛅 Open						
🔆 Favorites	Name			Date modified	Туре	
🧮 Desktop	퉬 32Bit			2/21/2013 12:14 AM	File folde	r
〕 Downloads	퉬 64Bit			2/21/2013 12:14 AM	File folde	r
🗐 Recent Places	퉬 cert			2/21/2013 12:14 AM	File folde	r
	퉬 OS2			2/21/2013 12:14 AM	File folde	r
🥽 Libraries	🛍 AUTORUN			9/13/2012 7:57 PM	Setup Inf	ormati
Documents	📄 autorun.sh			2/21/2013 12:08 AM	SH File	
🚽 Music	📄 runasroot.sh			2/21/2013 12:08 AM	SH File	
Pictures	VBoxLinuxAdditions.run			2/21/2013 12:13 AM	RUN File	
😸 Videos	VBoxSolarisAdditions.pkg			2/20/2013 11:55 PM	PKG File	
	🧐 VBoxWindowsAdditions		Оре	en		n
👰 Computer	🚳 VBoxWindowsAdditions-amd64	(Run	as administrator)n
	🍓 VBoxWindowsAdditions-x86		Tro	ubleshoot compatibilit	v)n
📬 Network					,	
			Send to 🕨			
			Сор	у		
			Crea	ate shortcut		
			Pro	perties		

Picture 66

Click "Yes" to allow the installation:

🚱 User Account (Control	×
Do you change	want to allow s to this comp	the following program to make uter?
Ŷ	Program name: Verified publisher: File origin:	Oracle VM VirtualBox Guest Additions Oracle Corporation CD/DVD drive
Show <u>d</u> etails	;	Yes No
		Change when these notifications appear

Picture 67

Click "Next":



Picture 68

The default destination folder is ok. Click "Next" to continue:

🥸 Oracle VM VirtualBox Guest Additions 4.2.8 Setup		
Choose Install Location Choose the folder in which to install Oracle VM VirtualBox Guest Additions 4.2.	8.	N
Setup will install Oracle VM VirtualBox Guest Additions 4.2.8 in the following fo a different folder, click Browse and select another folder. Click Next to continu	der. To in ie.	istall in
Destination Folder C:\Program Files\Orade\VirtualBox Guest Additions Br	owse	
Space required: 142.0KB Space available: 17.4GB		
VirtualBox Windows Additions 4,2,8	Ca	ancel

Picture 69

Do not check "Direct3D Support":

🥳 Oracle VM VirtualBox Guest /	Additions 4.2.8 Setup		
Choose Components Choose which features of Orac install.	Choose Components Choose which features of Oracle VM VirtualBox Guest Additions 4.2.8 you want to install.		
Check the components you war install. Click Install to start the i	nt to install and uncheck the compo nstallation.	onents you don't want to	
Select components to install:	VirtualBox Guest Addition: Direct3D Support (Experir	Description Position your mouse over a component to see its description.	
Space required: 142.0KB	< <u>ااا</u> ۲		
VirtualBox Windows Additions 4.2.	8	Install Cancel	

Picture 70

Check "Always trust software from 'Oracle Corporation'" and click Install:



Picture 71

When the installation complete, click "Finish" to reboot the virtual machine:



Picture 72

5.4 Install vPointGuest to Virtual Machine Operation System

Now, let's install vPointGuest to the virtual machine. The file is called vPointGuestInstallationPackage. Start the virtual machine and log into the system. Double click on "vPoint Guest Installation Package22.exe" (22 is the version number. Please always install the latest version) to run the installation. You can get the installation file from vPoint CD (if there is any) or download from our website. Here is the link: http://www.sundenc.com/support/download/d1/

The below steps are for 32bit Windows operation system:





Click on "Yes" to continue if this window pops up:

😗 User	r Account Control	—	
\bigcirc	Do you want to allow the following program from an unknown publisher to make changes to this computer?		
	Program name: Publisher: File origin:	vPoint Guest Installation Package22.exe Unknown Hard drive on this computer	
Show <u>d</u> etails		Yes <u>N</u> o	
		Change when these notifications appear	

Picture 74

Click on "Next":



Picture 75

Choose Destination Folder. You can use default settings:

vPoint Guest Version(1.0.0.22)	×
Choose Destination Location Select folder where setup will install files.	
Setup will install vPointGuest in the following folder.	
To install to this folder, click Next. To install to a different folder, click Br another folder.	owse and select
Destination Folder C:\Program Files\vPointGuest	Browse
InstallShield <u>Kack</u>	tt> Cancel

Picture 76

Click on "Next" to continue:

vPoint Guest Version(1.0.0.22)	— ×
Select Program Folder Please select a program folder.	
Setup will add program icons to the Program Folder listed below. You may to name, or select one from the existing folders list. Click Next to continue.	ype a new folder
Program Folder:	
vPointGuest	
Existing Folders:	
Accessories	
Administrative Tools Games	
Maintenance	
Tablet PC	
InstallShield	
< Back Next >	Cancel

Picture 77

Click "Install this driver software anyway" if this window pops up:



Picture 78

Click "Finish" to restart the VM:



Picture 79

The below steps are for 64bit Windows operation system

If the VM uses a 64bit version Windows OS, there are some more steps as shown below (Picture 58 to Picture 68):

After choosing the destination folder and continuing with the installation, you will see this:



Click on the RED "NG" label to enlarge the window.

Click on "Next" to continue:

🧕 Driver Signature Enforcemer	it Overrider	×
NGHQ	It seems that Microsoft has forgotten end users when it introduced a very restricted module of driver signature enforcement in Windows Vista and Windows 7. All drivers and system files must be digitally verified or they cannot run when using both 32-bit and 64-bit versions of Windows Vista and Windows 7. In the past, it was possible to turn that feature off in Vista, but due to new kernel security updates, it is impossible to turn if off without degrading security and stability of your operating system or putting your master boot records in risk by using other software alternatives. So what is the problem with digital certificates? Well, the problem is developers have to pay Microsoft to receive verified certificates, and that makes many applications inaccessible under Windows Vista and Windows 7. However, it is still possible to turn it off by pressing the F8 function key during system boot up, but pressing F8 every time on boot up can be a serious pain in the butt. Others have found workarounds, but most of them are too risky and may trash your master boot records, at least until now thanks to our latest tool.	4 11 2
	< Back Next > Cancel	

Picture 81

Click "Yes":

ŃG,	Softwar	re License Agreement	x
	Ð	Please read the following License Agreement. Press the PAGE DOWN key to see the rest of the agreement.	
	The soft software whateve a service sublicen attempt of terminate under th complian	ware available from NGOHQ.com are provided "as is" with NO TECHNICAL SUPPORT. All is to be used at your own risk; this site does not take any responsibility for any damage in er form or context. The materials on this Website ("WEBSITE") are provided by NGOHQ.com as e to its users and may be used for informational purposes only. You may not copy, modify, ise, or distribute the downloaded software except as expressly provided under this License. Any otherwise to copy, modify, sublicense or distribute the Program is void, and will automatically e your rights under this License. However, parties who have received copies, or rights, from you is License will not have their licenses terminated so long as such parties remain in full nce.	
	All mater circumst	ials available here are provided "as is" with NO TECHNICAL SUPPORT. Under no ances, including negligence, shall this WEBSITE be liable for any incidental, special, indirect or ***	,
	Do you a install this	accept all the terms of the preceding License Agreement? If you choose No, Setup will close. To s product, you must accept this agreement.	
	Prir	nt Kack Yes No	

Picture 82

Choose "Enable Test Mode", then click on "Next":

Driver Signature Enforcement Overrider
NG
Enable Test Mode
C Disable Test Mode
C Sign a System File
C How-To-Use
C Remove Watermarks
C Exit
Next
HAC must be disabled in-order to use this tool = v1.3b
Picture 83

Click on "OK":

Done!		×
i	Test Mode has been ENABLED. You should be able to load unverified signed drivers now. You need to restart your computer now to apply changes.	
	ОК	>

Picture 84

This time, choose "Exit", then click on "Next":

Driver Signature Enforcement Overrider
NG
C Enable Test Mode
C Disable Test Mode
C Sign a System File
C How-To-Use
C Remove Watermarks
© Exit
Next
LIAC must be disabled in-order to use this tool = v1.3b
Picture 85

When this security warning pops up, choose "Install this driver software anyway":



Picture 86

When this Program Compatibility Assistant pops up, click "Close":



Picture 87

Type "Y" to apply the patch:



Picture 88

Press ENTER to exit:



Picture 89

When installation completes, restart the VM:



Picture 90

5.5 The Clone of Virtual Machines

More often, we will be using more than 1 copy of same Operation System, say Windows 7, on the Host PC (server). One quick way to have multiple copies of Windows 7 is to clone it. When you have finished installing Windows 7 and necessary configuration, we can move on to clone it.

There are two way to clone virtual machines: VirtualBox clone function or export/import

VirtualBox Clone function

Open Oracle VM VirtualBox Manager, make sure the VM you want to clone is powered off, choose that VM, right click and choose "Clone":



Picture 91

Input the name for the new virtual machine, and check "Reinitialize the MAC address of all network cards" to avoid the IP address conflict, then click "Next":



Picture 92

Choose "Full clone", and click "Clone" to start:



Picture 93

Clone starts:



Picture 93

After the Clone finished, you can find the new virtual machine in the list:



Picture 94

VirtualBox export/import

Open Oracle VM VirtualBox Manager, make sure the VM that you want to export is powered off, click "File", and choose "Export Appliance":

Ŷ		Oracle VM VirtualBox Manager	
File Machine Help			
🛐 Virtual Media Manager	Ctrl+D		_
ด Import Appliance	Ctrl+I	😔 Details	🔍 <u>S</u> napsh
Export Appliance	Ctrl+E		
Preferences	Ctrl+G	al Preview	
🤝 Exit	Ctrl+Q	stem: Windows 7	
	🔝 Syste	m	_
win7 Clone Powered Off	Base Memor Boot Order: Acceleration	y: 2048 MB Floppy, CD/DVD-ROM, Hard Disk : VT-x/AMD-V, Nested Paging	

Picture 95

Select the virtual machines that you want to export. Picture 96:

1	Export Virtual Appliance	? X
	Virtual machines to export Please select the virtual machines that should be added to the appli can select more than one. Please note that these machines have to turned off before they can be exported. win7 win7 Clone win7x64	ance. You
	Hide Description < <u>B</u> ack <u>N</u> ext >	Cancel

Picture 96

Choose a destination folder to export the virtual machine

Ŷ	Export Virtual Appliance	? X
©	Appliance settings Please choose a filename to export the OVF/OVA to. If you use an <i>ova</i> extension, then all the files will be combined in Virtualization Format Archive. If you use an <i>ovf</i> extension, several files will be written separate Other extensions are not allowed.	to one Open ely.
	Eile: C:\Users\Administrator\Documents\win7.ova	<u>C</u> hoose
	< <u>B</u> ack <u>N</u> ext >	Cancel

Picture 97

Click "Export" to start:

ŷ	Export Virtua	al Appliance		?
©	Appliance setti This is the descriptive in You can change it by do	formation which will l uble clicking on indivi	be added to the virtu dual lines.	ial appliance
	Description	Configuration		·
	Virtual System 1			
	😪 Name	win7		
	🧼 🥥 Product			
	Product-URL			
	🧼 🥥 Vendor			
	🥥 Vendor-URL			-
	🦳 🥥 Version			
	Description			-
	Restore Default	s < <u>B</u> ack	Export	Cancel

Picture 98

Exporting:



Picture 99

After the exporting finished, we can find a win7.ova file in

C:\Users\Administrator\Documents. That is the Virtual Machine we have exported:



Picture 100

Now we can use the ova file to import virtual machine. Open VirtualBox Manager, click "File" and choose "Import Appliance":



Picture 101

Click "Open appliance":

Ŷ	Import Virtual Applicance	?	x
	Appliance to import VirtualBox currently supports importing appliances saved in the O Virtualization Format (OVF). To continue, select the file to import Open appliance	Dpen Below.	
	Hide Description < Back	Cance	el

Picture 102

Browse the folder that we have export the ova file to, select win7.ova and click "Open":

<u>9</u>	Select an appliance	e to import	t	x
(a)	Libraries > Documents >	~ ¢	Search Documents	Q
Organize 👻 New fo	lder		₩ ▼	0
 ★ Favorites ■ Desktop ▶ Downloads ▶ Recent places ▶ Libraries ▶ Documents ▶ Music ■ Pictures ₩ Videos 	 win7.ova 			
F	ile <u>n</u> ame: win7.ova	~	Open Virtualization Format (*.o	~
			Open Cancel	

Picture 103

After select the ova file, click "Next":

Ŷ	Import Virtual Applicance	? X
	Appliance to import VirtualBox currently supports importing appliances saved in the Virtualization Format (OVF). To continue, select the file to imp Open appliance C:\Users\Administrator\Documents\win7	ie Open iort below. '.ova
	Hide Description < Back Next >	Cancel

Picture 104

In the Appliance settings, check the "Reinitialize the MAC address of all network cards" to avoid the IP address conflict. You can also make change to other settings of virtual machine like Name, CPU, etc. click "Import" to start importing:

Ŷ	Import Virtual Applica	nce ? X
e contraction of the second se	Appliance settings These are the virtual machines conta settings of the imported VirtualBox m properties shown by double-clicking of check boxes below.	ined in the appliance and the suggested lachines. You can change many of the on the items and disable others using the
	Description	Configuration 🔺
	Virtual System 1	
	😪 🛞 Name	win7_1
	🐨 🚯 Guest OS Type	🛃 Windows 7
	CPU	1
	RAM	2048 MB
	💿 DVD	
	🧳 USB Controller	✓ –
¢	Reinitialize the MAC address of all	network cards
	Restore Defaults < Ba	ack Import Cancel

Picture 105



Picture 106

When the importing finished, we can find the new virtual machine "win7_1" in the list:



Picture 107

5.6 Add more virtual hard drives to virtual machine

In production environment, we may need more storage space (more often hard drives) to store user data. In the previous steps, we have set up one virtual hard drive for the virtual machine, which has been used by the operation system (drive C). So, adding more storage space means we need to add at least one more virtual hard drive to this virtual machine so that we can have storage space for user data. To store user data in a different virtual hard drive instead of drive C is also a safety measure to protect the user data from damages as caused by system failure or a snapshot restoring operation.

Click on the virtual machine for which you are going to add virtual hard drive, then "Settings",

٨		win7 - Settings	?)	c
	General System Display Storage Audio Network Serial Ports USB Shared Folders	Storage Storage Tree Controller: IDE Empty Controller: SATA Port Count: 1 Win7.vdi Add Hard Disk			•
) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2)			
		Contains all storage controllers for this machine and the virtual images and host drives them.	attache	d to	
		OK Cancel	H	elp	

"Storage", "Controller: SATA", click " 😫 " to add hard disk:

Picture 108

Choose "Create new disk":



Picture 109

Choose the type of the new virtual hard drive. The default VDI is OK:



Picture 110

Select the type of virtual hard disk you want to create:

Ŷ	Create Virtual Hard Drive	? >	c
e	Storage on physical hard drive		
	Please choose whether the new virtual hard drive file should grow (dynamically allocated) or if it should be created at its maximum size size). A dynamically allocated hard drive file will only use space on you hard drive as it fills up (up to a maximum fixed size), although it wagain automatically when space on it is freed. A fixed size hard drive file may take longer to create on some syster of the start to use.	as it is used e (fixed our physical vill not shrini tems but is	 k
	© Eixed size		
	< <u>B</u> ack <u>N</u> ext >	Cancel	



Set the size of hard disk. Then click "Create":



Picture 112

When it is done, you can see a new hard drive is attached to the SATA Controller. Click "OK" to close this window:

۵	win7 - Setting	gs		?	x
 General System Display Storage Audio Network Serial Ports USB Shared Folders 	Storage Tree Storage Tree Controller: IDE Image: Controller: SATA Image: Win 7 wdi Image: Wdin 7 wdi <	Attributes <u>N</u> ame: <u>T</u> ype:	IDE PIIX4 ✓ Use host I/O cache de and move the mouse over	a setting	
			OK Cancel	Hel	p

Picture 113

After all these have been done, we still need to log on to the virtual machine to activate the newly added virtual hard drive.

Start the virtual machine with newly added virtual hard drive. Click "Start", "Control Panel", "Administrative tools", then "Computer management":



Picture 114

In the popup window, choose "Disk Management":



Picture 115

A window called "Initialize Disk" will pop up. Click "OK". A new disk "Disk 1" will appear in the drive list. The status is "Unallocated":

Initialize Disk
You must initialize a disk before Logical Disk Manager can access it.
Select disks:
Line the following and the other selected distant
Ose the following partition style for the selected disks: OMBR (Master Boot Record)
© <u>G</u> PT (GUID Partition Table)
Note: The GPT partition style is not recognized by all previous versions of Windows. It is recommended for disks larger than 2TB, or disks used on Itanium-based computers.
OK Cancel

Picture 116

Right Click the Unallocated Disk and choose "New Simple Volume":

捿 Computer Management					
File Action View Help					
🗢 🔿 🖄 🗔 🚺 🔹	e 😼				
Computer Management (Local)	Volume	Lavout Type	Eile Svet	em Status	
System Tools		Simple Basi	NTES	Healthy (Boot Da	ree File, Crash Dump, Primano
Task Scheduler	System Reserved	Simple Basic	NTES	Healthy (System	Active Primary Partition)
Event Viewer					,
Shared Folders					
Local Users and Groups					
Performance					
🚔 Device Manager					
4 🔄 Storage					
Disk Management					
Services and Applications					
	•		111		New Simela Values
				1	New Simple Volume
	Basic	Suctom Poron	rod	(C)	INew Spanned Volume
	25.00 GB	100 MB NTFS	/eu	24.90 GB NTFS	New Striped Volume
	Online	Healthy (Syster	n, Active,	Healthy (Boot, Page I	New Mirrored Volume
					New RAID-5 Volume
	Disk 1				Properties
	Basic		7777777		
	25.00 GB	25.00 GB			Help
	Online	Unallocated			
		×/////////////////////////////////////			
۰ III + III + I	Unallocated	Primary partition	n		

Picture 117

A new window called "New Simple Volume Wizard" will pop up. Click "Next":



Picture 118

Choose a volume size, the default size is the total space of the disk. Then click "Next":

New Simple Volume Wizard	×			
Specify Volume Size Choose a volume size that is between the maximum and minimum sizes.				
Maximum disk space in MB:	25597			
Minimum disk space in MB:	8			
<u>S</u> imple volume size in MB:	25597			
	< <u>B</u> ack <u>N</u> ext > Cancel			

Picture 119

Assign a drive letter, then click "Next":

New Simple Volume Wizard	×
Assign Drive Letter or Path For easier access, you can assign a drive letter or drive path to your partition.	
 Assign the following drive letter: Mount in the following empty NTFS folder: Browse Do not assign a drive letter or drive path 	
< Back Next > Cance	el

Picture 120

Select the setting to format this volume, click "Next":

New Simple Volume Wizard					
Format Partition To store data on this partition, you must format it first.					
Choose whether you want to format this volume, and if so, what settings you want to use.					
O not format this volume					
 Format this volume with the fol 	lowing settings:				
File system:	NTFS				
Allocation unit size:	Default 👻				
Volume label: New Volume					
📝 Perform a quick format	Perform a quick format				
Enable file and folder compression					
	< Back Next > Cancel				

Picture 121

Click "Finish" to complete the wizard:

New Simple Volume Wizard		×
	Completing the New Simple Volume Wizard	
	You have successfully completed the New Simple Volume Wizard. You selected the following settings:	1
	Volume type: Simple Volume Disk selected: Disk 1 Volume size: 25597 MB Drive letter or path: E: File system: NTFS Allocation unit size: Default Volume label: New Volume Quick format: Yes To close this wizard, click Finish.	
	< Back Finish Cano	el

Picture 122

You can see a "New Volume (E:)" is available now:

🜆 Computer Management			
<u>File Action View H</u> elp			
🗢 🔿 🖄 🖬 🔽 🖬 😫	1		
Computer Management (Local System Tools Compared Task Scheduler Event Viewer	Volume (C:) New Volume (E: System Reserved)	Layout Type File System Simple Basic NTFS Simple Dasic NTFS Simple Basic NTFS	Status Healthy (Boot, Page File, Crash Dump, Prima Healthy (Primary Partition) Healthy (System, Active, Primary Partition)
▷ 10 Shared Folders ▷ 10 Local Users and Groups ▷ 10 Performance	<	m	
 Device Manager Storage Disk Management Services and Applications 	Basic 25.00 GB Online	System Reserved 100 MB NTFS Healthy (System, Active, Pri	(C:) 24.90 GB NTFS Healthy (Boot, Page File, Crash Dump, Primar
	Disk 1 Basic 25.00 GB Online	New Volume (E:) 25.00 GB NTFS Healthy (Primary Partition)	
	CD-ROM 0 CD-ROM (D:) No Media		

Picture 123

5.7 Take Snapshots and restore Snapshots of Virtual Machines

Operation Systems like Windows may suffer from various kinds of problems like system failure or virus affection. VirtualBox has a backup function called "Snapshot". We can take a snapshot for the system when we have installed all the programs and have done all the configurations.

Since VirtualBox will take snapshot for the whole machines (including all hard drives), we need remove all theVirtual Drive except Drive C (system drive) before taking snapshot—we do not want the other drives with user data to be affected by the snapshot.

Go to the Settings of virtual machines, click on "Storage", click is to remove all the drives except the system drive "win7.vdi":

9	win7 - Settin	gs
 General System Display Storage Audio Network Serial Ports USB Shared Folders 	Storage Tree Storage Tree Controller: IDE Controller: SATA Con	Attributes Hard Disk: SATA Port Solid-s Information Type (Format): Normal (V Virtual Size: 25.00 GB Actual Size: 72.10 MB Details: Dynamica Location: C:\Users\ Attached To: win7 tachment (-)
		OK Car

Picture 124



Leave the system drive "win7.vdi", then click "OK":

Picture 125

Then go back to VirtualBox Manager, choose the virtual machines that we are going to take snapshot of. Click on the "Camera" button:



Picture 126

The popup window shows Snapshot Name and you can also input some words as Snapshot Description. Click "OK" to finish. Now you can see "Snapshot 1" in the list:

🦻 Take Snapshot of Virtual Mac	?	x
Snapshot <u>N</u> ame		_
Snapshot Description		
		_
OK Cancel	Help	

Picture 127

When you finish the setting, there is a snapshot available:



Picture 128

After the Snapshot is done, we need to add back the removed virtual drive. Just like the way we add second drive (data drive) to the virtual machines, we need to go to the "Settings", and then" Storage". Here we need to click "Choose existing disk":



Picture 129

Go to the folder, and add the virtual drive we have removed earlier:

Please choose a virtual hard drive file					
🔄 🔄 🔹 🕇 🎩 🤇	/irtualBox VMs ► win7 ► 🗸 🗸 🗸	Search win7 $ ho$			
Organize 👻 New fo	r	III 🔻 🔟 🔞			
_	Name	Date modified Type			
🛱 Libraries	鷆 Logs	10/24/2013 11:28 File fol			
Documents	Snapshots	10/24/2013 1:12 PM File fol			
J Music	WewVirtualDisk1	10/24/2013 11:29 Virtual			
Pictures	💗 win7	10/24/2013 11:29 Virtual			
📑 Videos					
📥 Local Disk (C:)					
👝 Local Disk (D:)					
👝 Local Disk (E:)	<				
F	name: NewVirtualDisk1 🗸	All virtual hard drive files (*.vm/ V			

Picture 130

Now you can see the virtual drive is back:

🤌 win7 - S	ettings
Image: System Storage Image: System Storage Image: Display Storage Image: Storage Image: Storage	Attributes – <u>N</u> ame <u>Type</u>

Picture 131
When the virtual machines suffer a system failure or corruption, we can click is to restore the snapshot. Remember, a newly restored virtual machine is of settings without the second hard drive. So we need add back the second hard drive. Just follow the steps above to accomplish this.



Picture 132

In the window pop up, click Restore to start:



After a new seconds, the VM is set back to state when this snapshot was taken.