Linux Development Environment Description Based on VirtualBox Structure

V1.0

VirtualBox is open source virtual machine software. It mainly has three advantages:

(1) Free (2) compact (3) powerful. At the same time it is simple to configure, easy to use.

This manual describes the installation of the VirtualBox virtual machine and the setting of installing Linux system and a set of shared files in VirtualBox.

1 VirtualBox installation

Prepare environmental, download VirtualBox virtual machine installation package to start installation.



interface. Referto figure 1-1:



Figure 1-1

(2) Select the installation path and VirtualBox application:

B Oracle VM VirtualBox 4.1.16 Setup	X
Custom Setup Select the way you want features to be installed.	
Click on the icons in the tree below to change the w	vay features will be installed.
VirtualBox Application VirtualBox USB Support VirtualBox Networking	Oracle VM VirtualBox 4.1.16 application.
VirtualBox Bridger VirtualBox Host-C	This feature requires 118MB on your hard drive. It has 3 of 3 subfeatures selected. The subfeatures require 600KB on yo
Location: D:\Program Files\Oracle\VirtualBox\	Browse
Version 4.1.16 Disk Usage < B	ack Next > Cancel

Figure 1-2

(3) Choose whether to create a desktop shortcut and click on "Next":

😸 Oracle VM VirtualBox 4.1.16 Setup	x
Custom Setup Select the way you want features to be installed.	
Please choose from the options below: Image: Create a shortcut on the desktop Image: Create a shortcut in the Quick Launch Bar	
Version 4.1.16 < Back Next > Can	cel

Figure 1-3

(4) Click "Yes" and then enter the next screen, click "Install" to begin virtual machine installation:

🛃 Oracle VM VirtualBox 4.1.16 Setup	Testas dancas	×
Ready to Install		
The Setup Wizard is ready to begin the in	stallation.	
Click Install to begin the installation. If you installation settings, click Back. Click Cance	u want to review or change any of your el to exit the wizard.	
Version 4.1.16	< Back Install Ca	ncel

Figure 1-4

(5) Installation process may pop up prompt dialog box asking if install it. At this situation it is all choose to install. The following are some icons:

➡ Windows 安全
<u>您想安装这个设备软件吗?</u> 名称: Oracle Corporation 通用串行总线控制器 ダ ^发 布者: Oracle Corporation
□ 始终信任来自 "Oracle Corporation" 的软件(A)。 安装(I) 不安装(N)
🕡 您应仅从可信的发布者安装驱动程序软件。我如何确定哪些设备软件可以安全安装?

Figure1-5

➡ Windows 安全
您想安装这个设备软件吗?
名称: Oracle Corporation Network Service 发布者: Oracle Corporation
始终信任来自 "Oracle Corporation" 的软件(A)。
🕡 您应仅从可信的发布者安装驱动程序软件。我如何确定哪些设备软件可以安全安装?

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Figure 1-6





(6) After the installation is completed, the interface is shown in figure 1-8:



Figure 1-8

Click "Finish" to complete the VirtualBox installation.

2 Creating a virtual machine

Open the VirtualBox software, there will be " new ", " set ", " start", " clear four buttons in the menu.

(1) Click button "New", select " Next " to begin to create a new virtual machine in the

pop-up dialog box.

🚱 Oracle VM VirtualBox Manager		
<u>File Machine H</u> elp		
New Settings Start Discard		Details 💿 Snapshots
Vew Settings Start Discard	General Name: linux OS Type:Linux 2.6 System Display Video Memory: 6 MB Remote Desktop Server:Disabled Storage IDE IDE Primary Master (CD/DVD): IDE Primary Slave (CD/DVD): IDE Secondary Master (CD/DVD): IDE Secondary Master (CD/DVD): SATA SATA Port 0: Audio Host Driver: Windows DirectSound Controller: ICH AC97 WsB Device Filters: 0 (0 active) Shared Folders	VBoxGuestAdditions.iso (49.75 ME) Empty : Empty linux.vdi (Normal, 8.00 GE)
	Shared Folders: 1	

Figure 2-1

(2) Input computer name and select operating system type:

-	A based	? <u>×</u>
Create New Virtual N	Nachine	
VM Name and O	S Туре	
Enter a name for the plan to install onto	e new virtual machine and select the t o the virtual machine.	ype of the guest operating system you
The name of the virt will be used by all	tual machine usually indicates its sof VirtualBox components to identify you	tware and hardware configuration. It r virtual machine.
N <u>a</u> me kimball		
US <u>T</u> ype		
Operating <u>S</u> ystem:	Linux	
<u>V</u> ersion:	Vbuntu	▼
		Next Cancel

Figure 2-2

(3) Configure virtual machine memory:

Create New Virtual Machine	
Memory	
Select the amount of base memory (RAM) in megabytes to be allocated to the virtus	1 machine.
The recommended base memory size is 512 MB.	
Dase Memory Size	
	512 M
4 MB 5120 /	MB
	C

Figure 2-3

(4) Select to use virtual hard:

Create New Virtual Machine	
Virtual Hard Disk If you wish you can now add a st virtual disk or select one from	art-up disk to the new machine. You can either create a new the list or from another location using the folder icon
If you need a more complex virtu the machine settings once the ma	al disk setup you can skip this step and make the changes to chine is created.
The recommended size of the star	t-up disk is 8.00 GB .
Oreate new hard disk	
Use existing hard disk	▼
	<u>N</u> ext Cancel

Figure 2-4

(5) Select file type and then select disk storage type. It is recommended to use dynamic allocation.

Create New Virtual Disk
Welcome to the virtual disk creation wizard This wizard will help you to create a new virtual disk for your virtual machine. Use the Next button to go to the next page of the wizard and the Back button to return to the previous page. You can also press Cancel if you want to cancel the execution of this wizard. Please choose the type of file that you would like to use for the new virtual disk. If you do not need to use it with other virtualization software you can leave this setting unchanged. File type Image: VDI (Virtual Box Disk Image) WDDK (Virtual Machine Disk) WDD (Virtual Hard Disk) HDD (Parallels Hard Disk)
Next Cancel

Figure2-5

Create New Virtual Disk	? <u>*</u>
Virtual disk storage details	
Please choose whether the new ·	virtual disk file should be allocated as it is used or if it should be
created fully allocated.	
A dynamically allocated vir	tual disk file will only use space on your physical hard disk as it
fills up, although it will not	shrink again automatically when space on it is freed.
A fixed size virtual disk fil	e may take longer to create on some systems but is often faster to use
-Storage details	
Oynamically allocated	
🔘 Fixed size	-
	Next Cancel

Figure 2-6

(6) Set disk size, select " Next " and " created " in new pop-up dialog box:

/irtual disk file lo	ocation and	size					
lease type the nam elect a different	e of the new v folder to cres	virtual disk ate the file	c file into e in.	the box be	elow or clic	k on the folde	r icon to
Location							
kimball							2
4.00 MB	r r n	ni n n	. 0	î î î	î î	2.00 TB	8.00 0
						03353 3980	

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- Figure 2-7
- (7) Create a virtual machine successfully. Refer to figure 2-8:



Figure 2-8

After the completion of virtual machine, click "settings", and then appears setup virtual machine interface. Refer to figure 2-9:

🔅 Kimball - Settings	? <mark>- × -</mark>
 Kimball - Settings General System Display Storage Audio Network Serial Ports USB Shared Folders 	Ceneral Basic Advanced Description Name: Kimball Operating System: Linux Version: Linux 2.6
	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 Help

Figure 2-9

In addition to sharing file, other functions can be changed based on personal preferences habit, which is not specifically described. This sharing file will be described in detail below.

3 Install Linux System

(1) Ready Linux system image, click "Start" button to start created virtual machine, find "device" in start interface, select "CD-ROM distribution ", "choose a virtual CD-ROM" to add ready system image. Download ubuntu 10.04:

32-bit systems:

http://releases.ubuntu.com/lucid/ubuntu-10.04.4-desktop-i386.iso

64-bit systems:

http://releases.ubuntu.com/lucid/ubuntu-10.04.4-desktop-amd64.iso

Image download process is as follows:

Oracle VM VirtualBox Manager		
<u>F</u> ile <u>M</u> achine <u>H</u> elp		
New Settings Start Discard		Details 💿 Snapshots
Kimball	📃 General	📃 Preview
Vered Off	Name: Kimball OS Type:Linux 2.6	
	System	
		Kimball
	📃 Display	
	Video Memory: 6 MB Remote Desktop Server:Disabled	
	(2) Storage	
	IDE IDE Primary Master (CD/DVD): VBoxGu IDE Primary Slave (CD/DVD): Empty IDE Secondary Master (CD/DVD): Empty SATA SATA Port 0: linux.	vdi (Normal, 8.00 GB)
	De Audio	
	Host Driver: Windows DirectSound Controller: ICH AC97	
	🗗 Network	
	Adapter 1: Intel PRO/1000 MT Desktop (NAT)	
	(^	-) •
		th.

Figure 3-1



Figure 3-2

New folder			8≅ • 🗖	
^	Name	Date modified	Туре	
	ubuntu-10.04-desktop-i386.iso	2010/5/13 23:40	ISO File	
:.)):)				
);) ;)				
2) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c				
2.) 2.) 2.) 2.) 2.) 2.) 2.) 2.0				
(;;) ;;) ;) ;) ;) ;) ;) ;) ;) ;) ;)				
::)):) :) :) ≡ :) /e (I-	111			

Figure 3-3

(2) Add a mirror after restart virtual machine, the operation is as follows:

KI KI								
Mac	hine View Devices Help							
٩	Settings	Host+S						
\odot	Take Snapshot	Host+T						
Ø	Session Information	Host+N						
٨	Disable Mouse Integration	Host+I						
۲	Insert Ctrl-Alt-Del	Host+Del						
00	Pause	Host+P						
0	Reset	Host+R						
٢	ACPI Shutdown	Host+H						
\bigtriangledown	Close	Host+Q						



(3) Start to install Linux system, select " Install ..." :

😣 🔿 Install		
Dansk	A 1	Welcome
Deutsch Eesti		/ou can try Ubuntu 10.04 LTS from this CD without naking any changes to your system.
English Español	= (Try Ubuntu 10.04 LTS
Esperanto Euskara Français Gaeilge Galego Hrvatski Italiano Kurdî Latviski Lietuviškai	F c s t t	Ready to install? Once you answer a few questions, the contents of the live CD can be installed on this computer so you can run Ubuntu 10.04 LTS at full speed without the CD. Answering the questions should only take a few minutes.



- (4) Select the time zone and keyboard layout.
- (5) Select the virtual hard disk partition, in general, it is to select the default system

that is "Erase and use entire disk".

😣 🔿 Install				
Prepare disk space				
This computer has no operating systems on it.				
Where do you want to put Ubuntu 10.04 L	'S?			
Erase and use the entire disk				
SCSI3 (0,0,0) (sda) - 8.6 GB ATA VBO	HARDDISK		▼	
 Specify partitions manually (advance) 	ed)			
Ubuntu 10.04 LTS				
Step 4 of 7	Quit	Back	Forward	

Figure 3-6

(6) Input computer name, password, and then confirm the installation. Refer to

figure 3	3-7:
----------	------

📀 Install			-
Who are you?			
What is your name?			
Kimball		«	
What name do you want	to use to log in?		
kimball	✓		
If more than one person winstallation.	ill use this computer, you can se	t up multiple accounts after	Ξ
Choose a password to ke	ep your account safe.		
•••••	•••••	Strength: weak	U
What is the name of this	computer?		
kimball-laptop	4		
This name will be used if y	you make the computer visible to	others on a network.	~
Step 6 of 8	Quit	Back Forwa	rd

Figure 3-7

our new operating system v	vill now be ir	nstalled with the	following se	ttings:
Language: English Keyboard layout: China Name: Kimball Login name: kimball Location: Asia/Shanghai Migration Assistant:				
If you continue, the chang Otherwise, you will be ab	ges listed bel le to make f	ow will be writte urther changes n	n to the disk nanually.	(S.
				Advanced.

Figure 3-8

System begins to install automatically, then as long as installation is complete, and then select to restart it.

4 Shared file settings

4.1 VirtualBox system (recommended)

(1) Start virtual machine, and then choose to install enhancements. After the installation is complete, start next step configuration.





Figure 4-1

(2) Choose "Settings - > shared folder, and then click" add shared folder. Refer to

figure 4-2:



Figure 4-2

🔅 kimball - Settings			_	?	x
E General System	Shared Folder	ers			
 Display Storage Audio Network Serial Ports 	Name Pat Machine Folders forlinux G:\ Transient Folder	tth s ∖forlinux rs	Auto-M Yes	lount Access Full	
USB					
	Select a settings over a settings i	s category from the list on the left-	hand side and mon DK Cance	re the mouse	

Figure 4-3

(3) Select the sharing file path, set it as "automatic" Mount ", the fixed allocation":

🔅 Add Share	🔅 Add Share
Folder Path: <pre></pre>	Folder Path: 🎴 D:\sharefile 👻
Folder Nam :: 😡 Other	Folder Name: sharefile
Read only	<u>R</u> ead-only
Auto-mount	🔽 <u>A</u> uto-mount
🔲 Make Permanent	🔲 <u>M</u> ake Permanent
OK Cancel	OK Cancel

Figure 4-4

(4) After select "OK", setting interface displays name and shared folder path:

Ę	🄉 kir	mball - Settings	-				?	x
	▣	General	Shared	Folders				
		System	<u>F</u> olders Lis	t				
		Display	Name	Path		Auto-Mount	Access	
	9	Storage	 Machin 	e Folders				6
	1999	Audio	sharef Transie	ile D:\sharefile nt Folders		Yes	Full	
	2	Network						
		Serial Ports						
	Ø	USB						
		Shared Folders						
							_	
			Select a : mouse over	settings category - a settings item	from the list on the left-hau to get more information.	nd side and mo	re the	
				2	_			

Figure 4-5

(5) After these steps, it has been completed Windows folder sharing setting. But it

also needs user permissions to modify Linux system, the following concrete steps:

Firstly, switch to directory/media. As follows:

```
#cd /media
#ls -l
drwxrwx--- 1 root vboxsf 4096 2012-08-15 11:44 sf_sharefile
dr-xr-xr-x 4 kimballkimball 2048 2012-05-22 21:08 VBOXADDITIONS_4.1.16_78094
```

See "sf_sharefile" folder in /Media director. The file folder sharefile is set in Windows,

but it can't directly be accessed, so you need to add a native user to user group vboxsf.

The command is as follows:

#sudogpasswd -a kimballvboxsf

Note: kimball is native user name, the actual operation should be carried out by facts.

Log to access the shared folders sf_sharefile, the test results are as follows:

kimball@kimball-laptop:/media\$ cd sf sharefile/
kimball@kimball-laptop:/media/sf sharefile\$ ls
jdk-1_5_0_22-linux-i586.bin share.txt 新建日记本文档.jnt
kimball@kimball-laptop:/media/sf sharefile\$

Figure 4-6

4.2 SAM-BA file sharing setting

Samba is a Linux system comes with a component, achieving the communication between the host windows and virtual machine Linux. The following detailed describes setup steps.

Network Setting

(1) Set virtual machine to double card. The card 1 is set to "NAT" mode, the card 2 is set to "Host-only" mode, as shown in figure 4-7:

🔅 kimball - Settings	? 💌
General	Network
Display	Adapter <u>1</u> Adapter <u>2</u> Adapter <u>3</u> Adapter <u>4</u>
Storage	Attached to: NAT
Network Serial Ports	Name:
🖉 USB	Adapter Type: Intel PRO/1000 MT Desktop (82540EM)
Shared Folders	Promiscuous Mode: Deny
	Mat Address. 0002100001 ✓ Cable connected
	Port Forwarding
	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

Figure 4-7

🧐 kimball - Settings	? <mark>- × -</mark>
 General System Display Storage Audio Network Serial Ports USB Shared Folders 	Adapter 1 Adapter 1 Adapter 1 Adapter 1 Adapter 1 Adapter 1 Attached o: Host-only Adapter Image: Mage: VirtualBox Host-Only Ethernet Adapter Image: Mage: VirtualBox Host-Only Ethernet Adapter Image: Adjuanced Image: Image: Image: Here the Mame field on the General page is not complete. Image: Image:
6	Invalid settings detected OK Cancel Help

Figure 4-8

(2) Check whether the network is set up successfully.

Input "ifconfig" in virtual machine terminal to view virtual machine IP firstly, and then

input "ping <u>www.baidu.com</u>" to test, the result is shown in figure 4-7:

kimball@k:	imball-laptop:~\$ ifconfig
eth0	Link encap:Ethernet HWaddr 08:00:27:a6:69:3d
	inet addr:10.0.2.15 Bcast:10.0.2.255 Mask:255.255.255.0
	inet6 addr: fe80::a00:27ff:fea6:693d/64 Scope:Link
	UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
	RX packets:16 errors:0 dropped:0 overruns:0 frame:0
	TX packets:97 errors:0 dropped:0 overruns:0 carrier:0
	collisions:0 txqueuelen:1000
	RX bytes:2074 (2.0 KB) TX bytes:16245 (16.2 KB)
eth1	Link encap:Ethernet HWaddr 08:00:27:7f:3b:5b
	inet addr:192.168.56.102 Bcast:192.168.56.255 Mask:255.255.255.0
	inet6 addr: fe80::a00:27ff:fe7f:3b5b/64 Scope:Link
	UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
	RX packets:402 errors:0 dropped:0 overruns:0 frame:0
	TX packets:311 errors:0 dropped:0 overruns:0 carrier:0
	collisions:0 txqueuelen:1000
	RX bytes:54859 (54.8 KB) TX bytes:40037 (40.0 KB)

Figure 4-7

Type "ping 192.168.56.102" in Windows Terminal (Note: "192.168.56.102" is virtual machine IP which is checked by "ifconfig").

```
C:\Users\kimball>ping 192.168.56.102
        192
              168
                       92
                           with
                                32 bytes
                                           of data
   ging
  ng statistics for 192.168.56.102:
Packets: Sent = 4, Received = 4
                                            Lost = 0 (0% loss),
                                  in milli-seconds:
       imate round trip times
    Minimum
                                  1ms, Average
                1ms.
                      Maximum
                                                    1ms
C:\Users\kimball>
```



Set samba

(1) Install amba

#sudo apt-get install samba

#sudo apt-get installsmbfs

(2) Install shared module of system settings

#sudo apt-get installkdenetwork-filesharing

(3) Create a shared directory

#mkdirshare (Create a folder in the current user which is kimball)

(4) Modify the permissions of shared directory

#chmod 777share

The directory is set to everyone can read and write

(5) For security reasons, backup smb.conf firstly

#sudocp /etc/samba/smb.conf /etc/samba/smb.conf_backup

(6) Start to configure smb.conf

Use the editor to open the configuration file

#sudo vim /etc/samba/smb.conf

Make the following changes in the [global] section:

```
workgroup = WORKGROUP
netbios name = kimball
server string = Linux Samba Server TestServer
security = share
[share]
    path = /home/kimball/share
    writeable = yes
    browseable = yes
    guest ok = yes
```

The following analysis the related command parameters.

[global] is the global configuration, so it is must be written. Workgroup is displayed

in Windows work group and **netbios name** is displayed in Windows. **server string** is Samba Server description which can be defined by your own. **security** which is authentication and login, here using the share and there are a variety of authentication methods. This is one of them, another is common user verification. If you use share would not have set user and password to log in; **[share]** is displayed in Windows shared directory. **path** can be set to \directory you want to share, here is set to "/home/Kimball/share". Whether **writeable** can be written, it can be set to write here. **Browseable is** whether visible, **guestok** anonymous user is logged as **guest**.

(7) samba configuration is completed, save and exit. Then start samba, and check whether samba service conform the requirements.

#sudoservice smbd start #testparm

The following information is said to have been configured correctly.

kimball@kimball-laptop:~\$ sudo service smbd start smbd start/running, process 1573 kimball@kimball-laptop:~\$ testparm Load smbconfig files from /etc/samba/smb.conf rlimit_max: rlimit_max (1024) below minimum Windows limit (16384) Processing section "[share]" Processing section "[printers]" Processing section "[printers]" Loaded services file OK. Server role: ROLE_STANDALONE

Press enter to Referto a dump of your service definitions

(8) Restart samba and view the IP address.

#sudoservicesmbd restart #ifconfig

The IP address is displaied as shown in figure 4-7.

Note: selectting eth1 is that eth2 is "Host-only" mode in the previous step.

(9) Input string "\\192.168.56.102" to open page. Refer to figure 4-9:



Figure 4-9

At this point, SAMBA sharing settings are completed.