The Installation Guide for the VM image of EstiNet 9.0 Network Simulator and Emulator



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Produced and maintained by EstiNet Technologies Inc.



Revision History

Rev.	Date	Revision Description
1.0	July 20, 2016	Initial version
1.1	August 18, 2016	Add the information to connect EstiNet License Server on 2.2
		Network Setting
1.2	September 22, 2016	Remove 2.5 close firewall because firewall had been closed from
		the VMImage 9.0.6.3744



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1 Install VMware Workstation Player

Because "EstiNet Network Simulator and Emulator" must be installed in Fedora 20(64bit) Operation System, we recommended that user installed Operation System and Simulator in "Virtual Machine" **VMware Workstation Player**. We introduced how to install VMware Player as below.

 a. Please download VMware Player from website of VMware Inc. as below and select the type of Operation System which you have. We selected
 VMWare Workstation Player for Windows (as Figure 1).

https://my.vmware.com/en/web/vmware/free#desktop_end_user_compu ting/vmware_workstation_player/12_0

https://my.vmware.com/w/v	wb/ymware/fine#desktop	and user comput	ong/vmware, y	workstation,	playmy712_0		. ≅ /Ω
Sec. Lives and States		- My	ebblam Per	et Eventre	Terring Community	Non Inc.	g.
vm ware [.]	Products (Cloud Services	Support	Downios	ads Consulting	Partners	Company
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Figure 1 Download VMware Workstation Player



b. Before download EstiNet VM Image, user must register as an EstiNet member. Please visit EstiNet Home Page: <u>www.estinet.com/ns/</u> then click Support → Free Trial to process this. The registration email will receive two mails. The first one is ":::EstiNet Technologies::: Member Activation". Please click the member activation link from this email. Then user click the

"Free Trial" button to apply a free trial version license. After click "Free Trial" button, user will receive the second mail ":::EstiNet Technologies::: Free Trial" which include the EstiNet FTP download message and Free Trial license key (as Figure 2).

EstiNet - 記事本
#案(F) 編輯(E) 相式(O) 检視(V) 説明(H)
TP: 211.20.104.63 port: 21 TP user account: TP password:
icense Server: lic1.estinet.com port: 22222
icense Key (organization):
o use EstiNet, your internet must has the capability to connect to EstiNet license erver, EstiNet license server uses the domain name lic1.estinet.com and port 22222 to provide the service, so if your internet has the firewall to block the specific port connection, please apply to free the port 22222 with TCP connection for using EstiNet.
o test if your internet can connect to license server, please do the following tests:
. Obtain the root privilege and invoke the command # telnet lic1.estinet.com 22222
xample: อ
root@localhost ~]# telnet lic1.estinet.com 22222 rying 211.20.104.64 Connected to lic1.estinet.com. iscape character is '^]'.

Figure 2 Download EstiNet image package from EstiNet FTP

c. Please login to EstiNet FTP server. Estinet recommends using FileZilla

(The Free FTP solution <u>https://filezilla-project.org/</u>) to download EstiNet VM image such as EstiNet_9.0.6.3744VMImage.rar then unzip it.



d. After install VMWare Workstation Player and unzip EstiNet VM Image, please click the icon "Open a Virtual Machine" (as Figure 3).



Figure 3 Click Open a Virtual Machine

e. Please select the path of VM image file then click file .vmx (as Figure 4).

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	Construction in the	
		Control to Updates to Welcase Weinstein
	and the second sec	

Figure 4 Click file .vmx

f. When loading EstiNet VM Image, it will pop-up a dialogue box. Please select I **Copied It** (as Figure 5 Dialogue box).





Figure 5 Dialogue box

g. After complete pre-steps, it will display the EstiNet Image file name that user loaded. Please click "**Power on this virtual machine**" to power on the Virtual machine (as Figure 6).



Figure 6 Power on virtual machine



2 To start up the EstiNet Simulator

2.1 The Boot menu

 a. Choose the EstiNet kernel such as "Fedora (3.11.10.estubet20150430.fc20) 20 (Heisenbug)" on the operation selection screen (as Figure 7 Choose the EstiNet kernel on the operation selection screen).



Figure 7 Choose the EstiNet kernel on the operation selection screen



b. Login to Fedora20



Figure 8 Login to Fedora20

2.2 Network Setting

a. After login, please check the Network status is worked well or not (as Figure 9 Check network status).



Figure 9 Check network status



b. If the network can't work well, please click the power button on the upper right corner and choose the setting button (as Figure 10).



Figure 10 To choose the setting button



c. Please click "Network" after entering setting windows.

		All	Settings		Q ×
Personal					
	2			100	a
Background	Notifications	Online Accounts	Privacy	Region & Language	Search
Hardware					
*	*				
Bluetooth	Color	Displays	Keyboard	Mouse & Touchpad	Network
			Z		
Power	Printers	Sound	Wacom Tablet		
System					
\odot			Ť	8	
Date & Time	Details	Sharing	Universal Access	Users	

Figure 11 Click Network.



d. Click "Add Profile" after entering Network setting.

<	Network	Airplane Mode OFF ×
₽ <mark>,</mark> Wired	Wired	o/s
교 Network proxy	<i>e</i> ,	
<u>+ -</u>	Add Profile	

Figure 12 Click Add Profile

e. Click "Add" after entering Profile setting. The network should be work well.

		New Profile
Security	802.1x Security	OFF
Identity		
IPv4	Authentication	MD5 V
Pv6	Username	
	Password	
		Ask for this password every time
		C Show password
		Cancel Add

Figure 13 Click Add



f. If the network can't work well after pre-steps, please click
 Player→Manage→Virtual Machine Settings on the upper left corner.



Figure 14 Click Player→Manage→Virtual Machine Settings



g. Click "Network Adapter" on window Virtual Machine Settings.



Figure 15 Click Network Adapter



 h. There are two ways for this setting. The one is click "NAT: Used to share the host's IP address" to replace "Custom: Specific virtual network" (as Figure 16). The other is select "VMnet (NAT)" to replace "WMnet (Hostonly)" on "Custom: Specific virtual network" (as Figure 17).

Device Memory Processors Hard Disk (SCSI) CD/DVD (IDE) Network Adapter USB Controller USB Controller Display	Summary 2 GB 1 20 GB Using file Z:\ISO\Fedora-20-x86_64-D Custom (VMnet1) Present Auto detect Present Auto detect	Device status Connected Connect at power on Network connection Bridged: Connected directly to the physical network Replicate physical network connection state NAT: Used to share the host's IP address Host-only: A private network shared with the host Custom: Specific virtual network VMnet1 (NAT) LAN segment: LAN Segments Advanced

Figure 16 Choose NAT: Used to share the host's IP address



Device	Summary	Device status
Memory Processors Hard Disk (SCSI) CD/DVD (IDE) USB Controller Sound Card Printer Display	2 GB 1 20 GB Using file Z:\ISO\Fedora-20-x86_64-D Custom (VMnet1) Present Auto detect Present Auto detect	Connected Connected Connection Bridged: Connected directly to the physical network Replicate physical network connection state NAT: Used to share the host's IP address Host-only: A private network shared with the host Custom: Specific virtual network VMnet0 (Host-only) VMnet1 (Host-only) VMnet1 (NAT) VMnet5 VMnet5 VMnet5 VMnet5 VMnet6 VMnet1 VMnet10 VMnet11 VMnet13 VMnet14 VMnet13 VMnet14 VMnet15 VMnet16 VMnet1 VMnet16 VMnet16 VMnet16 VMnet16 VMnet16 VMnet16 VMnet1 VMnet16 VMnet16 VMnet1 VMnet1 VMnet1 VMnet1 VMnet1 VMnet1 VMnet1 VMnet16 VMnet1 V
	Add Remove	VMnet18 VMnet19

Figure 17 Choose VMnet (NAT) on Custom: Specific virtual network



i. Execute **#ifconfig** to confirm the network device had got local IP after all settings. (as Figure 18 Ifconfig_getIP)

				feo	lora20@localhost:/home/fedora20	×
File	Edit	View	Search	Terminal	Help	
[roo ens3	t@lc 3: f	ocalhos lags=4 inet 1 inet6 ether RX pac RX err TX pac TX err	t fedor 163 <up 92.168 fe80::2 00:0c:2 kets 11 ors 0 kets 12 ors 0</up 	ra20]# 11 BROADCAS 126.133 20c:29ff: 29:b9:a8: 29:b9:a8: dropped 27 bytes dropped	config T,RUNNING,MULTICAST> mtu 1500 netmask 255.255.255.0 broadcast 192.168.126.255 feb9:a882 prefixlen 64 scopeid 0x20 <link/> 82 txqueuelen 1000 (Ethernet) 225430 (24.8 KiB) 0 overruns 0 frame 0 212963 (12.6 KiB) 0 overruns 0 carrier 0 collisions 0	
lo:	flag	µs=73 <u inet 1 inet6 loop RX pac RX err TX pac TX err</u 	P,L00PE 27.0.0 ::1 pr txqueue kets 10 ors 0 kets 10 ors 0	BACK,RUNN 1 netma refixlen elen 0 () bytes dropped) bytes dropped	ING> mtu 65536 sk 255.0.0.0 128 scopeid 0x10 <host> Local Loopback) 940 (940.0 B) 0 overruns 0 frame 0 940 (940.0 B) 0 overruns 0 carrier 0 collisions 0</host>	
[roo	t@lc	ocalhos	t fedor	ra20]#		

Figure 18 Ifconfig_getIP

j. To make sure that the network device can connect to Internet. For example: **#ping www.google.com** (as Figure 18 Ifconfig getIP)

```
[root@localhost fedora20]# ping www.google.com
PING www.google.com (74.125.203.104) 50(84) bytes of data.
64 bytes from th-in-f104.1e100.net (74.125.203.104): icmp_seq=1 ttl=128 time=12.
3 ms
64 bytes from th-in-f104.1e100.net (74.125.203.104): icmp_seq=2 ttl=128 time=12.
3 ms
64 bytes from th-in-f104.1e100.net (74.125.203.104): icmp seq=3 ttl=128 time=11.
4 ms
64 bytes from th-in-f104.1e100.net (74.125.203.104): icmp_seq=4 ttl=128 time=16.
4 ms
64 bytes from th-in-f104.1e100.net (74.125.203.104): icmp seq=5 ttl=128 time=16.
1 ms
64 bytes from th-in-f104.1e100.net (74.125.203.104): icmp_seq=6 ttl=128 time=15.
9 ms
64 bytes from th-in-f104.1e100.net (74.125.203.104): icmp_seq=7 ttl=128 time=53.
8 ms
^С
--- www.google.com ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6036ms
rtt min/avg/max/mdev = 11.481/19.818/53.853/14.028 ms
[root@localhost fedora20]#
```

Figure 19 Ping www.google.com



k. To make sure the network device can connect to EstiNet License Server

EstiNet license server using domain name : lic1.estinet.com IP : 59.124.181.130 and Port : 22222 to provide license service. If your internet has the firewall to block the specific IP and port connection, Please provide this information (domain name, IP and Port number) to the "Computer and Information Networking Center" or MIS (Management Information System) in your site.

Test 1: Get root permission and execute # telnet lic1.estinet.com 22222 (as Figure 20 Excute # telnet lic1.estinet.com 22222). If the Network connection is successful, you could see this message.

```
[root@localhost ~]# telnet lic1.estinet.com 22222
Trying 59.124.181.130...
Connected to lic1.estinet.com.
Escape character is '^]'.
```

Figure 20 Excute # telnet lic1.estinet.com 22222

Test2: Get root permission and execute **# nslookup lic1.estinet.com** .(as Figure 211 Excute **#** nslookup lic1.estinet.com). If your DNS server could parsing the EstiNet license server IP address successfully, you should get the result as: license server IP address is 59.124.181.130 and domain name is lic1.estinet.com.

```
[root@localhost ~]# nslookup lic1.estinet.com
Server: 192.168.136.2
Address: 192.168.136.2#53
Non-authoritative answer:
Name: lic1.estinet.com
Address: 59.124.181.130
```

Figure 211 Excute # nslookup lic1.estinet.com

If you can connect Internet successfully, but you can't find any message that I mentioned above, please **apply to free them with TCP connection** for using EstiNet (domain name : lic1.estinet.com > IP : 59.124.181.130, Port: 22222).



2.3 First time to start up the EstiNet Simulator

a. After rebooting, you have to login and open a terminal to input command (as Figure 22). You have to use the command "su –" to obtain the root privilege (as Figure 23). If this is your first time to run EstiNet, you have to execute the program named "inputkey" to enter the license key which send to your e-mail by EstiNet. Next, you have to execute the program named "reserve" to obtain the permission from the license server to run EstiNet (as Figure 24).



Figure 22 Open terminal



root@localhost;~	×
File Edit View Search Terminal Help	
[estinet@localhost ~]\$ su - Password: Last login: Thu Jun 26 09:56:30 CST 2014 on pts/2 [root@localhost ~]# ■	

Figure 23 Get root privilege





2.4 General steps to star up the EstiNet Simulator

a. Open another terminal, execute the command "su -" to obtain the root privilege, and then execute the program "dispatcher" (as Figure 25).

root@localhost:~	×										
File Edit View Search Terminal Tabs Help											
root@localhost:~ × estinet@localhost:~ × estinet@localhost:~	×										
<pre>[estinet@localhost ~]\$ su - Password: Last login: Fri Jul 1 14:08:45 CST 2016 on pts/1 [root@localhost ~]# dispatcher ServerSocket listen to port:9810 ServerSocket listen to port:9800 (Active:0 fd:3) (Active:1 fd:4)</pre>											
Figure 25 Execute the program dispatcher											

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b. Open another terminal, execute the command "su -" to obtain the root privilege, and then execute the program "coordinator" (as Figure 26).

root@localhost:~	×
File Edit View Search Terminal Tabs Help	
root@localhost:~ × estinet@localhost:~ ×	¢
<pre>[estinet@localhost ~]\$ su - Password: Last login: Wed Jun 25 20:02:53 PDT 2014 on pts/7 [root@localhost ~]# coordinator /usr/local/estinet/bin/ Bind Error! Port#9830 Address already in use ServerSocket listen to port:9831 FD:4 Bind Error! Port#9840 Address already in use ServerSocket listen to port:9841 FD:5 Bind Error! Port#9880 Address already in use ServerSocket listen to port:9881 FD:6 UnixDomainSocket Bind Path:/tmp/estinet FD:7 [To Dispatcher] register 127.0.0.1 9831 9841 IDLE [From Dispatcher] 0K</pre>	

Figure 26 Execute the program coordinator

c. Open another terminal, execute the command "su -" to obtain the root privilege, and then execute the program "estinetgui". Now, you can start using EstiNet to conduct simulations and emulations.

root@localhost;~	×
File Edit View Search Terminal Tabs Help	
estinet@localhost:~ × estinet@localhost:~ ×	root@localhost:~ ×
<pre>[estinet@localhost ~]\$ su - Password: Last login: Fri Aug 29 14:54:39 CST 2014 on pts/3 [root@localhost ~]# estinetgui create udp server UDP Server - socket() is 0K! mkdir /root/.estinet mkdir /root/.estinet/etc mkdir /root/.estinet/tmp LogID : 39160 no:0, name:basic, value:0, isKeyValue:0 no:1, name:ext, value:0, isKeyValue:0 no:2, name:80216, value:0, isKeyValue:0 no:3, name:satellite, value:0, isKeyValue:0 no:4, name:80211p, value:0, isKeyValue:0 no:5, name:80211n, value:0, isKeyValue:0 no:6, name:lte, value:0, isKeyValue:0 no:7, name:openflow, value:0, isKeyValue:0 no:12, name:of13, value:, isKeyValue:0 no:13, name:of14, value:, isKeyValue:0 Could not read image file FormGroup, using single-col</pre>	or instead.





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-	6																		
in the		Swart																	
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1		8																	
Host		Router	_																
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OpenFlow			-																
802.11(n)			-																
External			-																
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802.11(p)			9																×.
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Figure 28 Start to use EstiNet Simulator



Appendix

Video https://youtu.be/AGjSj4KSC2k (EstiNet9.0 VMImage Installation Guide)

Login information in VM Image

User name: estinet Password: estinet Root password: estinet

File directory in VM Image

Installation package path: /home/estinet/Documents/estinet-9.0.6.xxxx-1.fc20.x86_64.release

Topology:

Using the command tar to decompress the compressed file .tar.bz2 or .tar.gz #tar xvf xxx.tar.bz2 (xxx is a file name) #tar zxvf xxx.tar.gz (xxx is a file name)

Ethernet_Wi-Fi:

80211ag_adhoc: /home/estinet/EstiNet/Ethernet_Wi-Fi/80211ag_adhoc 80211n_adhoc: /home/estinet/EstiNet/Ethernet_Wi-Fi/80211n_adhoc 80211n_AODV: /home/estinet/EstiNet/Ethernet_Wi-Fi/80211n_AODV 80211n_Infra:/home/estinet/EstiNet/Ethernet_Wi-Fi/80211n_Infra openflow_stp_of13_odl: /home/estinet/EstiNet/Ethernet_Wi-Fi/ openflow_stp_of13_odl

SDN:

Openflow: Opendaylight_SpanningTree:



/home/estinet/EstiNet/SDN/OpenFlow/Opendaylight_SpanningTree OpenFlow_Network: /home/estinet/EstiNet/SDN/OpenFlow/OpenFlow_Network Openflow_Server_Client: /home/estinet/EstiNet/SDN/OpenFlow/OpenFlow_Server_Client

SDN_Wi-Fi_Ad-hoc: Ad-hoc: /home/estinet/EstiNet/SDN/SDN_Wi-Fi_Ad-hoc/Ad-hoc SDN_WiFi_AdHoc: /home/estinet/EstiNet/SDN/SDN_Wi-Fi_Ad-hoc/SDN_WiFi_AdHoc Ls

SDN_Wi-Fi_Infra: SDN_Mobile_to_Mobile_Add_Delete: /home/estinet/EstiNet/SDN/SDN_Wi-Fi_Infra/SDN_Mobile_to_Mobile_Add_Delete Wi-Fi_Infra: /home/estinet/EstiNet/SDN/SDN_Wi-Fi_Infra/Wi-Fi_Infra

VANET:

Application: 9.MultiInterfaceCar_20160419: /home/estinet/EstiNet/Vanet/Application/9.MultiInterfaceCar_20160419 10.VanetRouting: /home/estinet/EstiNet/Vanet/Application/10.VanetRouting 15.Jammer20160420: /home/estinet/EstiNet/Vanet/Application/15.Jammer20160420

General:

1.VANETDEMO:

/home/estinet/EstiNet/Vanet/General/1.VANETDEMO

2.LaneChangingAndCarProfile:

/home/estinet/EstiNet/Vanet/General/2.LaneChangingAndCarProfile

3.RealWorldMapAndDeployCarAutomatically:

/home/estinet/EstiNet/Vanet/General/3.RealWorldMapAndDeployCarAutomatically

4.Landmark: /home/estinet/EstiNet/Vanet/General/4.Landmark



IEEE802.11p 1609:

5.ProviderServiceAndUserService: /home/estinet/EstiNet/Vanet/IEEE802.11p_1609/5.ProviderServiceAndUserService 6.ProviderServiceAndUserServiceCCH: /home/estinet/EstiNet/Vanet/IEEE802.11p_1609/6.ProviderServiceAndUserServiceCCH 7.WSM_0129: /home/estinet/EstiNet/Vanet/IEEE802.11p_1609/7.WSM_0129 8.WSM_Forwarding_0130: /home/estinet/EstiNet/Vanet/IEEE802.11p_1609/8.WSM_Forwarding_0130

vanet350: /home/estinet/EstiNet/Vanet/vanet350
VANET1000: /home/estinet/EstiNet/Vanet/VANET1000
VehicularRouteAssignment:
/home/estinet/EstiNet/Vanet/VehicularRouteAssignment