SEMINAR PAPER

Telecommunications and Internet Technologies IP Networks & Planning

Deployment of the Network topology to Internet over a NIC card in GNS3

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Contents

1	Introduction	3
2	Deploying our GNS Topology to the Internet	4
2.1	Creating a virtual router by using NIC card	4
2.2	Connecting our virtual router to Internet	9
3	Bibliography	14
4	List of Figures	15

1 Introduction

GNS3 is a network emulator with making us to work with virtual routers with almost real IOSes differentiates itself from the other network simulators.Briefly it is used to setup topologies with a variety of network elements.

GNS3 is a graphical network simulator that allows simulation of complex networks. To provide complete and accurate simulations, GNS3 is strongly linked with:

- Dynamips, a Cisco IOS emulator.
- Dynagen, a text-based front end for Dynamips.
- Qemu, a generic and open source machine emulator and virtualizer.
- VirtualBox, a free and powerful virtualization software.

GNS3 is an excellent complementary tool to real labs for network engineers, administrators and people wanting to study for certifications such as Cisco CCNA, CCNP, CCIP and CCIE as well as Juniper JNCIA, JNCIS and JNCIE.

It can also be used to experiment features of Cisco IOS, Juniper JunOS or to check configurations that need to be deployed later on real routers. Thanks to VirtualBox integration, now even system engineers and administrators can take advantage of GNS3 to make labs and study for Redhat (RHCE, RHCT), Microsoft (MSCE, MSCA), Novell (CLP) and many other vendor certifications.

This project is an open source, free program that may be used on multiple operating systems, including Windows, Linux, and MacOS X.

2 Deploying our GNS Topology to the Internet

The main purpose of this article is to show how to incorporate our Laptop/PC to the topology we create on GNS3 Network emulator and then to the internet.

2.1 Creating a virtual router by using NIC card

1) As a first step we will create a basic topology to start with.Consist of 2 routers and a cloud – representing ISP/Internet.

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Nodes Types B × Router c1700 Router c2600 Router c2691 Router c3600 Router c7200 PIX firewall AASA Firewall Juniper router Ethernet switch ATM switch Frame Relay switch EtherSwitch router	Router_1 Router_2 192.168.100.1/24 192.168.100.2/24	Topology Summary My_computer ⊕ ● Router_1 ⊕ ● Router_2	8 ×
ID5		Captures	₽×
Qemu guest		Hostname Interface	ĺ
Host			
Cloud	My_computer	1	

Figure 2.1 : Basic topology

2) We will be connecting the cloud – for the time being representing our PC – to Router_1's fa0/0 interface with serial cable.In order to do this,we have to configure the cloud by selecting our NIC card.

Right click the cloud Configure Left click on My_computer and NIO Ethernet sublist Dropdown menu select Local Area Connection / if you connected to LAN via ethernet

OR select Wireless Network Connection / if you connected to LAN via wireless

See Fig 2.2

GN53		_ _
Node configurator		<u>? × </u>
En Clouds	My_computer node	e ×
	NIO Ethernet NIO UDP NIO TAP NIO UNIX NIO VDE NIO NULL Generic Ethernet NIO (Administrator or root access required) Irpcap://Device\NPF_(FE093233-DB49-4667-9CC3-A7D02FF0D373) : Network adapter "Intel(R) 82567LM Gir rpcap://Device\NPF_(FE093233-DB49-4667-9CC3-A7D02FF0D373) : Network adapter "Intel(R) 82567LM Gir rpcap://Device\NPF_(FE093233-DB49-4667-9CC3-A7D02	Ð×
Reset	OK Cancel Apply	

Figure 2.2 : Assigning NIC card to the cloud

3) We should be from now on make a telnet connection from our computer to the router. Giving the IP addresses to the Router_1 interface – which will be the gateway for our PC

See Fig 2.3

🐴 GN53 - D:\Documents	and Settings\aasan\GNS3\Projects\Project GNS3-PC pairing\topology.net		
<u>File Edit View</u> Control	Device Annotate Help		
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Nodes Types P × Router c1700 Router c2600 Router c2601 Router c2601 Router c3600 Router c700 Router c7200 P2X frewall Janiper router Ethernet wwtch ATM switch Frame Relay switch Etherst wwtch TM bridge VirtualBox guest VirtualBox guest Host Cloud	Router_1 192.168.100.1/24 192.168.100.2/24 192.168.100.2/24 192.168.0.1/24 Ny_computer	Topology Summary Topology Summary Router_1 Router_2 Router_2 Coptures Hostname Interface	8 ×

Figure 2.3 : Topology Steps

4) Now its time to prove really that our PC is connected to the router.First thing we should do is to ping router form PC's command tool.See Fig 2.4

C:\WINNT\system32\cmd.exe

Figure 2.4 : A successful ping process from PC to router

5) Now – we should be able to make a telnet from PC with the aid of PuTTY.See Fig 2.5

FI- Session	Basic options for your Pu	TTY session
 Logging Terminal Keyboard Bell Features Window Appearance Behaviour Translation Selection Colours Connection Data Proxy Telnet Rlogin ESH Serial 	Specify the destination you want to Host Name (or IP address) 192.168.0.2 Connection type: C Raw Telnet C Rlogin C Load, save or delete a stored sessi Saved Sessions	connect to Port 23 C SSH C Seria on
	Default Settings	Load Saye Delete
	Close window on exit: C Always C Never I Or	nly on clean exit

Figure 2.5 : Making Telnet to router using PuTTY

6) Press Open . HA-ha for the ones who get this error message ;-)

Due to TELNET is being a secure connection. It won't be allowed without setting password specifically for this reason



Figure 2.6 : Telnet error message of PuTTY

7) No Worries - We can fix this problem by adding 3 more commands to the Router_1

Router_1(config)#line vty 0 4

Router_1(config-line)#login

Router_1(config-line)#password class

Now try that step shown in Fig 2.5 and lets see if we can reach the router from our PC

7) Voilaa; Here we are. See Fig 2.7



Figure 2.7 : Telnet session succeeded

Now that we created a virtual router using our NIC card.Which represents as if we have a real router anywhere in our LAN and we control it from our office.

2.2 Connecting our virtual router to Internet

In the first section we have set up a connection between our PC and GNS3 router.Please note that given with the LAN IP addresses this router will only be accessed by local LAN members.As if you have set up a router somewhere in your LAN and controlling it from your office.With chapter 2 - we will be freeing our router.How does controlling your router from anywhere in the world sounds? Exciting isn't it? Internet will make this happen.Lets begin at once.

1) As a first step – we will be creating a Loopback Adapter in our PC (Here process within Windows XP will take place – but with the other OS systems its more-or-less the same)

Control Panel \rightarrow Printers and Other Hardware \rightarrow Add Hardware

See Figure Sequence 2.8



ld Hardware Wizard			
The following hardware is alread	y installed on your co	mputer	E.
From the list below, select an install properties or troubleshoot a probler	led hardware device, ther n you might be having.	n click Next to ch	eck
To add hardware not shown in the	list, click "Add a new har	dware device."	
Installed hardware:			
😋 USB Root Hub			
USB Root Hub			
HISE Boot Hub			
USB Composite Device			
Add a new hardware device			E I
		<u> </u>	
	< Back	Next >	Cancel

naruwa The wiza	ard can help you install other hardware
per a disponse	
The know	vizard can search for other hardware and automatically install it for you. Or, if you exactly which hardware model you want to install, you can select it from a list.
Whal	do you want the wizard to do?
C	Search for and install the hardware automatically (Recommended)
e	Install the hardware that I manually select from a list (Advanced)
	< <u>B</u> ack <u>N</u> ext> Cancel

From the list below, select the type of h	ardware you a	re installing	ENT.
If you do not see the hardware category yo	u want, click Sho	w All Devices.	
Common hardware types:			
b Modems			
Multi-port serial adapters			
Network adapters			
NT Apm/Legacy Support			100
PCMCIA adapters			
PCMCIA and Flash memory devices			
Portable Devices			
Ports (LUM & LPT)			-
			in codili
	18		<i></i>

Click the Netwo installation disk f	rk Adapter for this com	that matches your hardware, then click OK. If you have an ponent, click Have Disk.
fanufacturer	•	Network Adapter:
Proadcom ntel ntel Corporation Arcrosoft AVIDIA	-	Bluetooth Device (RFCOMM Protocol TDI)
		Haue Dick

Figure Sequence 2.8 : Creating Loopback Adapter

2) Afterwards Next \rightarrow Finish.Then we can see the Loopback Adapter we created in My computer \rightarrow Network Connections section.

3) Now it's time to give IP address to our Loopback Adapter (also the name Local Area Connection 4) manually. IP address will be 192.168.0.1 with the network mask 255.255.255.0 and the gateway IP address will be the router interface that we will be connecting our cloud to : 192.168.0.2/24 See Fig 2.9

	Lonfigure
nternet Protocol (TCP/IP) Pr	operties
General	
C Obtain an IP address auto Use the following IP addr IP address:	omatically ess. 192., 168. 0., 1
Subnet mask:	255 . 255 . 255 . 0
Default gateway:	192.168.0.2
C Obtain DNS server addre	ess automatically
_ ┌ ┍ Use the following DNS se	erver addresses.
Preferred DNS server:	<u> </u>

Figure 2.9 : Creating Loopback Adapter

4) The next step will be sharing our internet connection with our Loopback Adapter.In my case , because of me using Wireless LAN connection; Wireless LAN connection will be shared by right clicking the icon from Network Connections; See Fig 2.10

Windows Firewall			
Protect my compute or preventing acces the Internet	er and network by limitir is to this computer from	ng Settings.	
Internet Connection	Sharing		_
Allow other netv computer's Inter	vork users to connect t met connection	hrough this	
Home networkir	ng connection:		
Local Area Con	nnection 4		
Allow other netv shared Internet	vork users to control or connection	disable the	
Learn more about <u>li</u> <u>Sharing</u> .	nternet Connection	Settings.]

Figure 2.10 : Sharing internet connection with Loopback Adapter

5) Now final checks take place.Now that from our router CLI we are able to ping our NIC interface IP 192.168.0.1 and one of the popular DNS server 4.2.2.2 and even www.google.com . There we go See Fig 2.11



Figure 2.11: Resultive successful ping tests

3 Bibliography

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4 List of Figures

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