



What is GNS3:

GNS3 is a graphical network simulator that allows simulation of network devices like routers & switches. This documents shows step by step instruction how to emulate Cisco IOS. Further details can be found using following url. <u>http://www.gns3.net/</u>

Install GNS3:

You can download GNS3 using following url.

http://www	<u>.gns3.net/dowi</u>	<u>nload/</u>								
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	Download Below you can download C It is particularly useful for or JNCIE). Thanks to Virtu (RHCE, RHCT), Microsoft (I <u>Full Cisco CCNP 12 Week</u> <u>Cisco Configuration tool F</u> <u>CCTE Labs Solutions</u> Pass	SNS3, a network simulator for training to Cisco certificatior alBox integration, now even MSCE, MSCA), Novell (CLP) a g Instructor-led hands on training ree Configuration Management CCIE Lab Exam In First Attemp	r making labs or topolo ns (CCNA, CCNP, CCIP, system engineers and nd many other vendor g Weekday or weekend cl tool for Cisco Routers Sv pt By Studying Real Labs	gies of routers (IC CCSP, CCVP or C administrators car certifications. asses <u>www.30eue.com/</u> vitches Firewall <u>Man</u>	DS, JunOS), f ICIE) or Junip n take advan isce-CCNP ageEnzine com Devic AdChoices (D	firewalls (ASA er certificatio tage of GNS3	, PIX) and hosts. ons (JNCIA, JNCIS to study Redhat			
	Windows									
	New users to GNS3, it is re	commended to download the	all-in-one package be	low.						
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	Mac OS X									
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I am using GNS3 v0.8.3 all-in-one link. Click on this link, it will take you another page, which will allow you to download the software. Click on save once prompted.



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Recommended Projects Image: Dynamips / Pe Image: Dynamips / Pe Image: GNS3 WorkBench Image: Virtual PC Simulator	You have chosen to open GNS3-0.8.3-all-in-one.exe which is a: Binary File (46.6 MB) from: http://kent.disourceforge.net Would you like to save this file? Save F AdChoices D Business Process Management	E Cancel			
	your processes	Eully Reliable Memcached 100% Automated with Auto-Failover. No Data Loss, Zero Management. SarantiaData.com/Mamcached			

Once downloaded, double click to install the software. Following is the screen shot of each screen I get after that, just click highlighted section.





O GNS3 0.8.3 Setup	
License Agreement Please review the license terms before installing GNS3 0.8.3.	5
Press Page Down to see the rest of the agreement.	
GNU GENERAL PUBLIC LICENSE Version 2, June 1991	A
Copyright (C) 1989, 1991 Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.	
Preamble	
The licenses for most software are designed to take away your	-
If you accept the terms of the agreement, click I Agree to continue. You mus agreement to install GNS3 0.8.3.	st accept the
Nullsoft Install System v2,46	
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🚯 GNS3 0.8.3 Setup		
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Check the components you wa install. Click Next to continue.	ant to install and uncheck the comp	onents you don't want to
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WinPcap 4.1.2 Setup
License Agreement Please review the license terms before installing WinPcap 4.1.2.
Press Page Down to see the rest of the agreement.
Copyright (c) 1999 - 2005 NetGroup, Politecnico di Torino (Italy). Copyright (c) 2005 - 2010 CACE Technologies, Davis (California). All rights reserved.
Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:
 Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials
If you accept the terms of the agreement, click I Agree to continue. You must accept the agreement to install WinPcap 4.1.2.
Nullsoft Install System v2.46
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Installation options Please review the following options before installing WinPcap 4.1.2
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Automatically start the WinPcap driver at boot time
Nullsoft Install System v2.46







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License Agreement Please review the license terms	before installing Wireshark 1.6.8 (32-bit).				
Press Page Down to see the rest of the agreement.					
This text consists of three parts	5:	<u>^</u>			
Part I: Some remarks regarding Part II: The actual license that Part III: Other applicable license	the license given in covers Wireshark. es.				
When in doubt: Part II/III is the there to make it easier for peop	e legally binding part, Part I is just de that are not familiar with the GPLv2.				
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🔀 Wireshark 1.6.8 (32-bit) Setup	– – ×
Select Additional Tasks Which additional tasks should be done?	
Create Shortcuts Start Menu Item Con Quick Launch Icon	
File Extensions File Extensions Associate trace file extensions to Wireshark (5vw, acp, apc, atc, bfr, cap, enc, erf, fdc, pcap, pkt, snoop, syc, tpc, tr1, trace, trc, wpc, wpz,	. rf5)
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🕢 Wireshark 1.6.8 (32-bit) Setup	
Install WinPcap? WinPcap is required to capture live network d	lata. Should WinPcap be installed?
Currently installed WinPcap version WinPcap 4.1.2	
Install Install WinPcap 4.1.2 If selected, the currently installed WinF	Pcap 4.1.2 will be uninstalled first.
What is WinPcap?	
Nullsoft Install System v2,46	< Back Install Cancel
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GNS3		_ 0 ×
File Edit View Control Device Annotate Help		
Node Types B ×	 Topology Summary 	8 ×
60 Router c1700		
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This simple setup wizard will help you to configure GNS3 to start your first IOS v	rtual router.	
Ethernet switch Once you have done these 3 steps, you should be able to drag and drop a router	on the	
TM bridge main topology area. Please consult the documentation on our <u>website</u> to find mo	re help.	
X ATM switch		
Frame Relay switch		
EtherSwitch router Check that the path to Dynamips and the working director	rv are valid.	
E IDS La Carlo and the provided button.	y are vana.	
Qemu guest		
VirtualBox guest Step 2		
Host		₽×
Configure the path to your IOS image directory.	c	e
This is where you should store all your images.		
Step 3		
Add one or more uncompressed IOS images.		
Console 3 The IDLE PC will have to be configured later		
GNS3 management core		
Copyright (c) 2006-2012		
	ОК	
Open project or topology file		



Preferences	<u> 8 x</u>
General	Dynamips
Dynamips	
Capture Oemu	Settings
VirtualBox	Executable path to Dynamips:
	dynamips.exe
	C:\Users\mfarooq\AppData\Local\Temp
	Automatically clean the working directory Base port: Base UDP: Base console: Base AUX port:
	7200 TCP 🗘 10000 UDP 🖨 2001 TCP 🖨 2501 TCP 荣
	Enable ghost IOS support
	Enable JIT sharing support (Dynamips > 0.2.8 RC2)
	Enable sparse memory support
	Test Settings
	OK Cancel Apply

Press Apply and then OK.



General	Dynamins	
General Dynamips Capture Qemu VirtualBox	Dynamips Hypervisor Manager Settings Executable path to Dynamips: dynamips.exe Working directory for Dynamips: C: Users\mfarooq\AppData\Local\Temp Working directory Base port: Base UDP: Base console: Base port: Base UDP: Base console: T200 TCP 10000 UDP 2001 TCP Enable ghost IOS support Enable maps support Enable sparse memory support Enable sparse memory support Test Settings Dynamips 0.2.8-RC3 successfully started	
GNS3 File Edit View Control Device Annotate Help		
rme control verov Control verov Annotate Help Image: I	Image: Control of the second secon	8 >

Academy

You can change the directory to save projects and also folder where Cisco IOS are located and then press OK.

🐔 Preferences		8 23
General	General	
Dynamips Capture	General Settings GUI Settings	
Qemu	Language:	
VirtualBox	English (en)	-
	Launch the project dialog at startup	
	Use relative path for projects Automatically check for undate	
	Delay between each device start when starting all devices:	
	1 seconds	<u>.</u>
	Autosave:	
	0 seconds	* *
	Paths	
	Project directory:	
	C: Users Imfarooq IGNS3 (Projects	
	C: Users/mfarooq/GNS3/Images	
	Configuration file	
	C:\Users\mfaroog\AppData\Roaming\gns3.ini	
	Import Evport Clear	
	OK Cancel	Apply



Setup Wizard		9 X
Getting started		
This simple setup wizard will help y Once you have done these 3 steps, main topology area. Please consult	you to configure GNS3 to start your first IOS virtual router , you should be able to drag and drop a router on the ; the documentation on our <u>website</u> to find more help.	r.
Step 1		
1 Check that the path to Test using the provid	to Dynamips and the working directory are val ded button.	id.
Configure the path to This is where you sh	o your IOS image directory. hould store all your images.	
Step 3	compressed IOS images	
Add one or more und The IDLE PC will hav To find out how, plea	ve to be configured later. ase read this <u>tutorial</u> .	OK
Add one or more und The IDLE PC will hav To find out how, plea	ve to be configured later. ase read this <u>tutorial</u> .	ОК
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Add one or more und The IDLE PC will hav To find out how, pleas Getting started This simple setup wizard will help y Once you have done these 3 steps, main topology area. Please consult	you to configure GNS3 to start your first IOS virtual router , you should be able to drag and drop a router on the the documentation on our <u>website</u> to find more help.	ок १ ১ г.
Add one or more und The IDLE PC will have To find out how, please Setting started This simple setup wizard will help y Once you have done these 3 steps, main topology area. Please consult Step 1 Check that the path to Test using the provide	you to configure GNS3 to start your first IOS virtual router you to configure GNS3 to start your first IOS virtual router you should be able to drag and drop a router on the the documentation on our <u>website</u> to find more help.	ок ? Σ r. id.

Add one or more uncompressed IOS images.

The IDLE PC will have to be configured later. To find out how, please read this <u>tutorial</u>.

Select the image file for the IOS you have like c3700 and model 3725, you can change this depending

upon IOS you have. Note that not all IOS will work, use only mentioned in platform & model



3

dropdown menu.

ОК

loo mogeo	External hypervisors	
Images		
IOS image	Model/Chassis	
Settings		Hypervisors
Image file:		Use the hypervisor manager
Base config:	C:\Users\mfarooq\GNS3\Images\baseconfig.txt	
Platform:	c3700	
	3725	
Model:		
Model: IDLE PC:		
Model: IDLE PC: Default RAM:	0 MiB	×
Model: IDLE PC: Default RAM: <u>Check for mir</u>	0 MiB imum RAM requirement	
Model: IDLE PC: Default RAM: <u>Check for mir</u> Ø Default in	0 MiB imum RAM requirement age for this platform	A V

It will prompt you to decompress the IOS file, click on yes will enable GNS3 to start IOS very quickly.

💑 105 lr	nage
?	The IOS image is compressed. Would you like to uncompress it? This will create c3745-adventerprisek9_sna-mz.124-25d.image
	Yes No

Once you select the IOS, GNS3 will select model it self, click save at the end.



OS Images	External hypervisors	
Images		
IOS image	Model/Chassis	
Settings		Hypervisors
occurigo .		
Image file:	jes\c3745-adventerprisek9_sna-mz.124-25d.image	V Use the rivbervisor manager
Base config:	C:\Users\mfarooq\GNS3\Images\baseconfig.txt	
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Base config: Platform: Model: IDLE PC: Default RAM:	C: \Users\mfarooq\GNS3\Images\baseconfig.txt . c3700 3745 128 MiB	
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Click close the close this window.

💑 Setup Woards	8 23
Getting started This simple setup wizard will help you to configure GNS3 to start your first IOS virtual route Once you have done these 3 steps, you should be able to drag and drop a router on the main topology area. Please consult the documentation on our website to find more help	:Г.
Step 1 Check that the path to Dynamips and the working directory are va Test using the provided button.	lid.
Step 2 Configure the path to your IOS image directory. This is where you should store all your images.	
Add one or more uncompressed IOS images. The IDLE PC will have to be configured later. To find out how, please read this <u>tutorial</u> .	
	ОК

Click ok to close this window as well.





This is main interface for GNS3.

Drag router 3700 from Note types to work board







Select Node Type

Right Click on router and select configure.

Node configurator	L X
Node configurator	Node Configuration Please select a node in the list to display the configuration page.
Reset	OK Cancel Apply

Go to Slots tab.



Node configurator	
 Routers c3700 R1 	R1 node
	General Memories and disks Slots Advanced
	Adapters
	slot 3:
	slot 4:
	slot 5:
	slot 6:
	slot 7:
	WICs
	wic 0:
	wic 1:
	wir 2:
Reset	OK Cancel Apply
Reset	OK Cancel Apply
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Reset	OK Cancel Apply Image: Concelent and the state of the
Reset	OK Cancel Apply ? ? R1 node General Memories and disks Slots Adapters slot 0: GT96100-FE slot 1: • • slot 2: NM-1FE-TX • NM-4T slot 3: NM-16ESW NM-16ESW NM-16ESW • slot 4: NM-NAM • slot 5: • • slot 6: • • WICs • • wic 0: • • wic 1: • •
Reset	OK Cancel Apply Image: Concent of the state of the st
Reset	OK Cancel Apply Image: Concent of the state of the st

In slot 2 select any daughter card you need to use and press apply and then ok. I am using NM-16ESW as it gives 16 FastEthernet interfaces as well.



Right click router again and select start from the menu.



Right click router and press Console, it opens the console of the router and works as live router.

₽ NL					
R1#show i					
*Mar 1 00:04:40.067:	<pre>%SYS-5-CONFIG_I: C</pre>	onfigured fro	m console by console		
R1#show ip int brief	—				
Interface	IP-Address	OK? Method	Status	Protocol	
FastEthernet0/0	unassigned	YES unset	administratively down	down	
FastEthernet0/1	unassigned	YES unset	administratively down	down	
FastEthernet1/0	unassigned	YES unset	up	down	
FastEthernet1/1	unassigned	YES unset	up	down	
FastEthernet1/2	unassigned	YES unset	up	down	
FastEthernet1/3	unassigned	YES unset	up	down	
FastEthernet1/4	unassigned	YES unset	up	down	
FastEthernet1/5	unassigned	YES unset	up	down	
FastEthernet1/6	unassigned	YES unset	up	down	
FastEthernet1/7	unassigned	YES unset	up	down	
FastEthernet1/8	unassigned	YES unset	up	down	
FastEthernet1/9	unassigned	YES unset	up	down	
FastEthernet1/10	unassigned	YES unset	up	down	
FastEthernet1/11	unassigned	YES unset	up	down	
FastEthernet1/12	unassigned	YES unset	up	down	
FastEthernet1/13	unassigned	YES unset	up	down	
FastEthernet1/14	unassigned	YES unset	up	down	
FastEthernet1/15	unassigned	YES unset	up	down	
Vlan1	unassigned	YES unset	up	down	
R1#					

This makes your system slow, as it is processor taking part of software and if we drag few routers on work board it makes really slow. So we use one option called Idle PC which decreases the processor cycle when not in use. Using only one router you can see below, it peaked the processor to above 80%.





Right click on router again and select Idle PC option, it takes some time and prompter you following window.

No. 1016 PC values	?	x
Potentially better idlepc values are marked with '*'		
1: 0x60be9420 [39]		•
OK Cancel Apply	Hel	p
)ropdown the menu and select the value with * in beginr	ning.	
Note: PC values	?	x
Potentially better idlepc values are marked with '*'		

Cancel

Press apply and then click ok.	Following windows cor	mes up for confirmation,	click ok to apply.
--------------------------------	-----------------------	--------------------------	--------------------

Apply



OK

* 8: 0x61375a6c [55]

Help



You can see now it is 32 %, if it is not dropping then click idle pc again and chose other value.



Enjoy using your own router.

Topology:

Now I am showing you how to create a simple topology. Drag one more router to work board and then start. Clicks on add a link option and then choose manual.





Right click on R1 and select f0/0 (interface to connect to R2) and then click on R2 and select interface.



Use following sample config to check connectivity.

On router 1

R1# R1#conf t Enter configuration commands, one per line. End with CNTL/Z. R1(config)#interface fas R1(config)#interface fastEthernet 0/0 R1(config-if)#no shut

R1(config-if)# *Mar 1 00:38:10.207: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up *Mar 1 00:38:11.207: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up R1(config-if)#ip add R1(config-if)#ip address 192.168.0.1 255.255.255.0 R1(config-if)#

On router 2

R2#conf R2#configure t Enter configuration commands, one per line. End with CNTL/Z. R2(config)#int R2(config)#interface fas R2(config)#interface fastEthernet 0/0 R2(config-if)#no shut R2(config-if)#ip add *Mar 1 00:14:26.703: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up *Mar 1 00:14:27.703: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up R2(config-if)#ip add R2(config-if)#ip address 192.168.0.2 255.255.255.0 R2(config-if)#exit R2(config)#exit R2# *Mar 1 00:14:41.231: %SYS-5-CONFIG_I: Configured from console by console R2#ping 192.168.0.1

Type escape sequence to abort. Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds: .!!!! Success rate is 80 percent (4/5), round-trip min/avg/max = 20/29/48 ms R2#

Virtual PC:

Now I show you how to add PC to complete the topology. The Virtual PC Simulator is a program that runs within Windows or Linux. It has limited functionality, but most important, it allows pings and traceroutes. These are the most common testing commands used during CCNA or CCNP training and are often the only commands needed. Using VPCS you will save memory and CPU cycles. If you do not need more functionality in a workstation within your topology, I highly recommend VPCS. The Virtual PC Simulator is a free product





Click VPCS and it is best to open the Virtual PC Simulator before starting GNS3.

For help, just type? at the prompt. VPCS supports up to nine PCs. Just type a number to switch to another PC. Use the *Show* command to view a PC's IP or MAC address. To assign an IP address, subnet mask, and default gateway to a PC, follows this format at the prompt.

ip 192.168.1.1 192.168.1.254 24

The above command assigns the PC an IP address of 192.168.1.1 with a /24 subnet mask and a default gateway of 192.168.1.254. To switch to PC2, just type a **2** and press *Enter* and assign connectivity settings to PC2:

ip 192.168.2.1 192.168.2.254 24

Now go to GNS3 and drag host on to work board.





Right click C1 and choose configure. Then go to NIO UDP.

• Node configurator	ି <mark>୪</mark>
Clouds	C1 node
	NIO Ethernet NIO UDP NIO TAP NIO UNIX NIO VDE NIO NULL
	Settings NIOs
	Local port: 30000
	Remote host: 127.0.0.1
	Remote port: 20000
	Add Delete
Reset	OK Cancel Apply

Local port: 30000 Remote host: 127.0.0.1 Remote port: 20000



These settings correspond to VPCS 1. Click the *Add* button and then OK. Assign the following settings to C2 in the same way as C1: Local port: 30001 Remote host: 127.0.0.1 Remote port: 20001

To keep topology simple I am using one router & two host, I have given following config to router and tested connected between hosts.



R1# R1#conf R1#configure t R1(config)#int fastEthernet 0/0 R1(config-if)#ip add 192.168.1.254 255.255.255.0 R1(config-if)#no shut R1(config-if)#exit R1(config)#int fastEthernet 0/1 R1(config-if)#ip address 192.168.2.254 255.255.255.0 R1(config-if)#no shut R1(config-if)#

And then tested on VPCS prompted.





HPCS UPCS Ξ UPCS Г١ UF Γ1 UP UF UF VPCS [1 3>)>)> UPCS Γ1 ping 192.168.1.1 1.1 icmp_seq=1 ttl=64 time=0.001 1.1 icmp_seq=2 ttl=64 time=0.001 1.1 icmp_seq=3 ttl=64 time=0.001 1.1 icmp_seq=4 ttl=64 time=0.001 1.1 icmp_seq=5 ttl=64 time=0.001 Γ1 PCS1177 p1 92.168.1.1 92.168.1.1 92.168.1.1 92.168.1.1 ms MS ms MS 192 .168.1.1 ms VPCS[1]>

Enjoy and let me know if you are feeling any difficulty, remember Google is our best friend. Any query doesn't hesitate to contact.



Usefull links if any one fancy to learn more.

http://www.gns3.net

http://wiki.gns3.net

http://www.ipflow.utc.fr/index.php/Cisco 7200 Simulator Dynamips – the actual emulator

http://www.ipflow.utc.fr/blog

http://dyna-gen.sourceforge.net

Dynagen

Dynamips/Dynagen bug

tracking

Dynamips blog

GNS3's primary Web site

GNS3's Wiki site

http://www.ipflow.utc.fr/bts

http://7200emu.hacki.at

Hacki's forum

