

GNS-3 TUTORIAL

Welcome to the first tutorial for the **alpha release of GNS-3**. GNS-3 is a GUI for the network simulator NS-3 (http://www.nsnam.org) and for Dynamips, an IOS emulator which allows the user to run IOS binary images from Cisco Systems.



Users must provide their own Cisco IOS to use GNS-3 with Dynamips.

In the current version (alpha release) which is **still under heavy development**, GNS-3 works only with Dynamips. The ns-3 simulation mode has not been implemented yet.

To run IOS systems with Dynamips, GNS-3 uses it in a mode called "hypervisor". This mode is in fact a server that waits for commands from the local host or the network.

1 – Initial setup (optional):

Starting and stopping Dynamips in hypervisor mode is handled entirely by GNS-3. To run the hypervisor automatically with GNS-3, just edit the gns3.conf file or run gns3-config.pyw.

The program will ask you for:

- The path to Dynamips.
- The port on which to run dynamips in hypervisor mode (default is 7200).
- An optional working directory for Dynamips (logs will be put here).
- The command to execute when connecting to an IOS instance, which is typically a console that starts telnet.

▼ GNS-3 configura	ator _ 🗆 X
Dynamips	
Path to Dynamips:	
Working directory:	
Port:	7200
Connection Specify the telnet p The following subst %h = host %p = port %d = device name Command: xterm	orogram to use when connecting to an IOS titutions are performed: -T %d -e 'telnet %h %p > /dev/null 2>&1 &

2 - Start GNS-3:

To start GNS-3, just run gns3.pyw. If you have not installed the dependencies, please look at the README.3 – The design mode:



By default, GNS-3 starts in "design mode". In this mode you can create your network topology by dragging and dropping nodes from the list on the left to the scene on the right.



Note: currently the symbols are purely decorative, meaning there isn't any difference between them. This will change in a future release.

Before configuring your nodes, you have to record IOS images by selecting Cisco IOS -> IOS images from the menu, and then choosing the path to an IOS image, the platform, the chassis (if applicable), and an IDLE PC value. By default you are using the integrated hypervisor (the dynamips managed by GNS-3) to run your IOS.



Note: Setting an IDLE PC value lessens CPU load. Please see the README for Dynamips to learn how to determine an IDLE PC value. In a future release we will provide a way to do this directly from GNS-3 (via the menu).

▼ IOS images	s and hyperviso	rs	
IOS images	New IOS image	Hypervisors	
General se	ettings		Hypervisor
			\checkmark Use the integrated hypervisor
Image file	: /home/grossmj/	c3640	
Platform:	3600	\$	
Chassis:	3640	\$	
IDLE PC:			
🗌 Use gł	nost file size:		
			Save IOS image
			[· ·· · · · · · · ·



Note: The options "Use ghost file" and "size" are currently not used. This will change in a future release.

All of the recorded IOS systems and hypervisors are saved in gns3.conf, so you just have to record them once.

🔻 IOS images a	nd hypervisor	s			×
IOS images N	lew IOS image	Hypervisors			
IOS file name	Platform	Chassis	Idle PC	Hyperviso	r
localhost:/ho	3600	3640	1	localhost:7200	
			<u>E</u> dit	Delete	<u>C</u> lose

If you want to use external hypervisors (started by yourself), you can record them in the "hypervisors" table. This will allow you to load-balance the emulation effort on multiple hosts/hypervisors.

IOS imag	jes and	d hyperviso	rs			
IOS images	s Nev	v IOS image	Hypervisors			
Host	Port			Working directo	ory	
localhost	7200	/tmp/				
pluto mars	7200 7204					
mercury	7202					
Working dii	rectory:					Add
Host		mercury		Port: 7202		Delete
1000		lineredity				Delete

When you record your IOS you can bind it to an external hypervisor by choosing one from the list.

6 images New IOS	image Hypervisors	
General settings —		Hypervisor
Image file : /home/g Platform: 3600 Chassis: 3640 IDLE PC: Use ghost file	grossmj/c3640	localhost:7200 pluto:7200 mars:7204 mercury:7202

IOS image	s and hyperviso	rs				
IOS images	New IOS image	Hypervisors				
	0S file name	Platform	Chassis	Idle PC	Hypervisor	
localhost:/h	ome/grossmj/c3640	0.bin 3600	3640		localhost:7200	
mars:/home	/grossmj/c3640.bin	3600	3640		mars:7204	
				e da		
				Eait		ose

After your IOS images are recorded, you can configure your nodes by double-clicking on them to bring up the Node configuration window.

▼ Node configuration				×
General and advanced se	ttings Memories and	disks	Slots	
General settings			Advanced	settings
IOS image: localho	st:/home/grossmj/c3640	\$	✓ Use mr	nap
Startup-config:			confrom	0x2102
Console port:			conneg:	0x2102
Midplane:		\$	exec area:	64 MB
NPE:		\$	iomem :	5%
	Restore Defaults	🗸 🗸	oply 🔀 🤇	Cancel X Close

The Node configuration window has three tabs. There are a number of settings under each tab. Under General and advanced settings, you must at least select an IOS image. You may also need to adjust the RAM size under Memories and disks. Under Slots you will need to choose at least one network module (contains one or more interfaces) if you wish to connect your node to another node.



Note: In a future release we will provide a way to configure network modules dynamically (when linking to other nodes).

 Node configuration 			×
General and advanced settings	Memories and disks	Slots	
Memories	Dis	ks	
RAM size: 128 MB	PC	MCIA disk0 size:	0 MB
ROM size: 4 MB	PC	MCIA disk1 size:	0 MB
NVRAM size: 128 MB			
Re	store Defaults 🛛 🖌 Ap	ply 🛛 🗶 Cancel	X Close

▼ Node o	onfiguration			×
General	and advanced settings	Memorie	s and disks	Slots
slot0:	NM-1FE-TX	\$	slot4:	
slot1:	NM-4E	\$	slot5:	•
slot2:		\$	slot6:	
slot3:		\$	slot7:	
	Pa	store Defa		
	Re	store Dela		

After configuring your network modules, add links between your nodes. Click the "Add a link" button on the toolbar. Select your source node, and then your destination node. Used interfaces are green; available interfaces are red.



Note: Ethernet links are drawn whether you choose a serial or Ethernet interface. This will change in a future release.



4 – The emulation mode:

After your network topology is created and configured, you may switch to "emulation mode" by clicking the button on the toolbar.



Your network topology and settings are then applied on the hypervisor(s). You may start or stop an IOS instance by right-clicking on a node, or you may start a console session.





All IOS instances may be started at once by clicking the button on the toolbar. However, starting all IOS's at once may slow down your computer. In a future release, you will have the option to provide a 10 second delay between IOS launches.

<pre>File Edit View Terminal Tabs Help *Mar 1 00:00:05.939: %LINEPROTO-5-UPDOWN: Line protocol on Interface VoIP-Null0 *Mar 1 00:00:05.943: %LINEPROTO-5-UPDOWN: Interface FastEthernet0/0, changed state t o up *Mar 1 00:00:06.943: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state t o ud *Mar 1 00:00:28.903: %LINK-5-CHANGED: Interface FastEthernet0/0, changed state to administratively down *Mar 1 00:00:30.939: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthern et0/0, changed state to down *Mar 1 00:00:30.939: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthern et0/0, changed state to down *Mar 1 00:00:35.991: %SYS-5-RESTART: System restarted Clsco IOS Software, 3600 Software (C3640-IS-M), Version 12.3(8)T, RELEASE SOFTWA RE (fc2) Technical Support: http://www.cisco.com/techsupport Copyright (c) 1986-2004 by Cisco Systems, Inc. Compiled Thu 13-May-04 16:38 by eaarmas *Mar 1 00:035.703: %SNMP-5-COLDSTART: SNMP agent on host Router is undergoing a cold start Router>en</pre>	▼ R0 _ □ X
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Router>en	a cold start
Nou Lei Zeit	
Router#conf t	
Enter configuration commands, one per line. End with CNTL/7	Enter configuration commands, one per line. End with (NTL/7.
Router(config)#	Router(config)#

The GNS-3 team welcomes your feedback on this alpha release. Enjoy.....