Quick Start GNS3

GNS3 stand for Graphical Network Simulator 3 and it is a network software emulator that is used to simulate complex networks. GNS3 runs on Windows, macOS, and Linux, but you must have either VirtualBox or VMware already installed on your system.

To get started visit: http://www.gns3.com and click the **Free Download** button.



You must create a free account as shown below.

ŝ	Sign Up Login	
GNS3*	An account is required to download th Community. To create an acco	e GNS3 Software and participate in the punt, just fill in the fields below!
Login to the GNS3 Community	First Name	Last Name
oin the growing GNS3 community of over 1 million	E-mail	School/Organization
etwork professionals.	Password	Confirm Password
	United States	Zip Code
	I use GNS3 Software for:	Education & Training
		Sign me up for the GNS3 newsletter
	Create Accou	unt & Continue
	By creating an account, you agree to the GN	NS3 Terms and Conditions and Privacy Policy

Once the account is created (or you login) you will be presented with the download page.

	DOWNLOAD GNS3	
Sel	lect the installer for your favourite C	DS
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Windows Version 21.6	Mac Version 2.1.6	Linux Version 2.1.6
O DOWNLOAD	O DOWNLOAD	
 Install Guide for Windows Download Mirror 	 Install Guide for Mac Download Mirror 	Install Guide for Linux
For optimal perfo	ormance, make sure to also <u>downlo</u>	ad the GNS3 VM
GNS3 is a Fre	ee and Open Source software under GPL	v3 licensing

You MUST download the appropriate version for your operating system AND the GNS3 VM that matches with your virtualization software. Clicking the **download the GNS3 VM** link presents this page.

	DOWNLOAD GNS3 VM	
The GNS3 VM is recommended development team have worked l avoids multiple com	for most situations when you are using W hard to create a lightweight, robust way o mon issues experienced when using a loo	/indows or Mac OS. The GNS3 f creating GNS3 topologies that cal install of GNS3.
Ŷ		
VIRTUALBOX Version 2.1.6	VMWARE WORKSTATION Version 2.1.6	VMWARE ESXI Version 2.1.6
OWNLOAD	Download	
	<u>Learn more about the GNS3 VM</u>	
GNS3 is a	Free and Open Source software under GPL v3	icensing

Once you have downloaded both the GNS3 software installer for your operating system AND the GNS3 VM which goes with your virtualization software, make note of where you downloaded these files. Then to start the process, FIRST import the GNS3 VM BEFORE installing the GNS3 software.

The GNS3 VM download file will be in zip file format, so you must copy the contents (i.e., file called GNS3 VM.ova) out of the zip file and to another location such as Downloads or your Desktop.

To import the GNS3 VM into VirtualBox, choose **File** from the menu bar and then **Import Appliance...** from the File menu. Click on the little folder icon and navigate to the location of the GNS3 VM.ova file you copied out of the downloaded zip file. Once successfully imported, the GNS3 VM will show within the list of your virtual machines. Select it and click the **Start** button to launch the GNS3 VM. Once it boots up, you should see a screen which shows its IP address. When using VirtualBox, this IP address should be in the range of 192.168.56.x, likely 192.168.56.101 as this is the range VirtualBox provides via DHCP to virtual machines on the host-only adapter.

To import the GNS3 VM into VMWare, use the **Open a Virtual Machine** choose from either the main screen or the **Player/File** menu. Use the file open dialog box to navigate to the location of the GNS3 VM.ova file you copied out of the downloaded zip file. Once it is successful imported, the GNS3 VM will show in your list of virtual machines. Select it and click the **Play virtual machine** button to launch the GNS3 VM. Once it boots up, you should see a screen which shows its IP address. When using VMWare, this IP address is typically in the range of 192.168.157.x under VMnet1, the VMWare host-only adapter.

The example below shows the GNS3 running under VMWare, but the screen looks the same on VirtualBox except for having a different IP range.



Only once you have the GNS3 VM running successfully within your virtualization environment should you proceed to actually installing the GNS3 software itself.

The GNS3 software (the GUI front end of the system) installer is generally named in the format of:

GNS3-x.x.x-all-in-one.exe (where x.x.x is the version number) for Windows or

GNS3.x.x.x.dmg (where again x.x.x is the version number) for macOS.

To launch these installers for Windows or macOS, you simply need to double-click on them to start the install process.

For Linux, things are a bit different...

The download button for the Linux option actually takes you to another page, where there are instructions for different versions of Linux including Ubuntu, Debian, Fedora, OpenSuse, and Gentoo among others. There are also instructions for compiling and installing from the source code. The URL of this Linux install page is below:

https://docs.gns3.com/1QXVIihk7dsOL7Xr7Bmz4zRzTsJ02wklfImGuHwTlaA4/

It should also be noted here that links for install guides for each operating system are available from the download page as well.

Once started the install process for GNS3 is generally fairly easy, but there are a couple of things to make sure of along the way.

- 1. Most default choices work fine, though we will point out a couple important choices below.
- 2. GNS3 will install a number of things along with its core software including winpcap. When asked to install additional components generally choose to do so. The exception is the free and trial stuff offered by Solarwinds, they are completely optional to the functioning of GNS3.
- 3. One of the first important choices during the Setup Wizard is the choice about server type.

Setup Wizard	ſ	×
erver Please choose a server type to run your GNS3 network simulations. The GNS3 VM is strongly recommended on Windows and Mac	os x.	
P. Run modern IOS (IOSv or IOU), ASA and appliances from non Cisco manufacturers.		
This will require an additional VM (the GNS3 VM is available for free) .		
Run only legacy IOS on my computer		
Requires IOS images <= C7200		
Run everything on a remote server (advanced usage)		
The server will be on a remote computer and can be shared with multiple users.		
Don't show this again		

For most people, the first and default choice is appropriate.

4. The most critical thing to get right during the installation is the IP address of the Host binding choice. This MUST be the real IP address of your system's network interface (whether wired or wireless). This usually is in the range of 192.168.0.x or 192.168.1.x using most typical home routers. You can use either ipconfig or ifconfig to check the IP addresses of your interfaces. Make sure you do not pick 127.0.0.1 or an IP assigned to a virtual network interface.

😚 Setup Wiza	rd	?	×
Local server Please co	configuration nfigure the following GNS3 local server settings		
Server path:	C: \Program Files\GNS3\gns3server.EXE	Browse	
Host binding:	169.254.179.250		٠
Port:	3080 TOP		\$

5. The last major thing to get right, is to correctly select the virtualization environment you are using. Once you select the right one, it should auto fill in the GNS3 VM name in the drop down. The example below shows choosing VirtualBox instead of the default VMWare.

GN53 VM In order to run the GNS3 VM you must first l	have VMware or VirtualBox installed and the GNS3 VM.ova impor	rted with one of these software	
Virtualization software:			
VMware (recommended)			
VirtualBox		vmware SAVE 20%	
		GNS3 Exclusive	
		and the second se	
	Leading Edge PC Virtualization.	BUY NOW	
f you don't have the GNS3 Virtual Machine you and import the VM in the virtualization software a /M name:	Leading Edge PC Virtualization. can <u>download it here</u> . and hit refresh.	BUY NOW	
If you don't have the GNS3 Virtual Machine you o And import the VM in the virtualization software a (M name: GNS3 VM	Leading Edge PC Virtualization. can <u>download it here</u> . and hit refresh.	■UX NOW	
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f you don't have the GNS3 Virtual Machine you o and import the VM in the virtualization software a /M name: GNS3 VM /CPU cores: 1	Leading Edge PC Virtualization. can <u>download it here</u> , and hit refresh.	■UY NOW	
f you don't have the GNS3 Virtual Machine you o and import the VM in the virtualization software a /M name: GNS3 VM /CPU cores: 1 XAM size:	Leading Edge PC Virtualization. can <u>download it here</u> , and hit refresh.	▼ Refresh	4.7

Once the install is finished and GNS3 launches, expect to see a small black box (a Command prompt type box, but it will be blank) pop up briefly before the GNS3 GUI appears. If all goes well the 'local' GNS3 server software (i.e., the stuff you just installed on your system) will be able to connect up with the GNS3 VM and you should see two green lights under the Servers heading on the right side of the GNS3 GUI as shown in the image on the next page.

8					Topology Summary Node Console	8 8
-		😵 Project	?	×		
		New project Projects library New project Name: untitled Location: Crijkers/Lee/CRS3/projects/unitided Open project goen a project from dak gecent projects	Browse		Servers Summary Apolo CPU 0.7%, RAM 68.8% GNS3 VM (GNS3 VM) CPU 0.0%, RAM 13	8 8 .4%
5						
	Console	Settinos	OK CM	lea		88
	OIS3 management consele. Rowing GR3 version 2.1.2 on Windows (64-bit) with Python 3. Copyright (c) 2000-2018 GHS3 Technologies. Use Helo -> GHS3 Dector to detect common issues. ⇒>	6.3 Qt 5.8.0 and PyQt 5.8.				

From this dialog you can create your first project or open an existing one. Create **My First Project** by typing this into the **Name** field and clicking **OK**. This creates a blank topology. Click on the second to the last button on the left side to **Browse all devices**. This will display a list of Installed and Available devices. Only a handful of default devices come pre-installed with GNS3. The rest you must add.

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-	Al devices	8				-	Topology Summary		88
66	Installed & Available appliances	4					Node Console		
~	Filter								
-	A10 vThunder								
-	Alcatel 7750								
	Alpine Linux								
-	Arista vEOS								
0	AsteriskNOW						Servers Summary		28
U	ATM switch						Apolio CPU 1.6%, RAM 69. GNS3 VM (GNS3 VM) CPU 0	8% .0%, RAM 13.3%	
0.0	Bin Cloud Fabric								
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	OrSS management console. Running (043) version 2.1.2 on Windows (64-bit Copyright (c) 2006-2018 (453) Technologies. Use Holp -> GHSJ Ductor to detect common issue =>	with Python 3.6.3 Qt :	5.8.0 and PyQt 5.8.						

GNS3 supports a number of different types of virtual devices for use within your simulated network topologies. Most devices you can install by simply double-clicking on them (or by starting to drag one to a topology) to start an install wizard as shown on the next page.

In this case, the wizard is starting to add the Alpine Linux device.

	All devices 28			Topology Summary	88
8	Installed & Available appliances	🗞 Add appliance ? >	×	Node Console	
-	A 10 vThunder	Alpine Linux Alpine Linux is a security-oriented, lightweight Linux distribution based on musl libc and busybox.			
	Apre Linux	Category:			
	Ansta VEOS			Cartaine Summary	88
D	AsteriskVOW ATM switch			Apolo CPU 0.4%, RAM 20.0% GNS3 VM (GNS3 VM) CPU 0.0%, RAM 13.3%	00
	Big Claud Fabric				
-	Brocade Virtual ADX				
2	+New appliance template		1		
	Console				88
	GNS3 management console. Running GNS3 version 2.1.2 on Windows (64-bit) with Py Copyright (c) 2006-2018 GNS3 Technologies. Use Help - SINS3 Doctor to detect common issues.				
	*>	tjext > Cancel			

A critical factors in most cases, is the need to run everything in the GNS3 VM when asked. Always choose to install and run devices within the GNS3 VM as shown below.

				-
	All devices Installed & Available appliances	R Add analiance 2 X	Topology Summary Node Console	00
y	Fiter			
>	A 10 vThunder	Server Please choose a server type to run your new Applance.		
	Alcatel 7750		-	
٦	Apine Linux			
•	Arista vEOS	Server type		
	AsteriskNOW	The grayed server types are not supported or configured.	Servers Summary	88
V	ATM switch	Curl the appliance on a remote terver Run the appliance on the GNS3 VM (recommended)	GNS3 VM (GNS3 VM) CPU 0.0%, RAM 13.3%	
4	3 Big Cloud Fabric	O Run the applance on your local computer		
0	STRD STRD			
1	Brocade Virtual ADX			
2	+New appliance template			
	Console			88
	GNS3 management console. Running GNS3 version 2.1.2 on Windows (64-bit) with P Copyright (c) 2006-2018 GNS3 Technologies. Use Help - SGNS3 Doctor to detect common issues.			
	*>	< gadk [jext > Cancel		
			1	

Once the install is finished, the device should no longer be grey in your list of devices and can now be dragged and dropped into a topology for use. The first time some devices are added to a topology, they will perform a one-time download via a Docker pull.

Other times when you attempt to add a device, it will present a screen such as the following one saying there are missing files.

-	Al devices I III						Topology Summary	88
0	Installed & Available appliances	🔗 Add appliance				? ×	Node Console	
-	Piter	Required files				STA		
5	A 10 vThunder	The following versions are available	e for BIRD internet routing dae	non. Check the status of	files required to install.			
	Alexand 7750					-		
		Click on a version to see the requi	red files and import the file from	your computer.				
	Apine Linux	GNS3 is looking for files in your do	wnloads directory and in the GN	S3 images directory.				
5	Arista vEOS	Version	Filename	Size	Status Marina files	File ve		
		• BIRD internet routing da	bird-brycore64-1	5.0.ing 21.4MB	Missing	1.5.0	Servers Summary	88
	Asternion						Apolio CPU 5.2%, RAM 70.4%	
	ATM switch						GNS3 VM (GNS3 VM) CPU 0.0%, I	RAM 13.2%
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	Console	4				*	-	88
	Running GNS3 version 2.1.2 on Windows (64-bit) with Py	Import Qownload			Create a new version	Refresh		
	Copyright (c) 2006-2018 GNS3 Technologies. Use Help -> GNS3 Doctor to detect common issues.							
	*>			<8	ack Next >	Cancel		

Simply select the missing file(s) from the list, and the **Download** button near the bottom left of the dialog box will become available. Clicking this **Download** button will launch a browser and take you to download the file (if there are more than one needed file, rinse and repeat). Once you have downloaded any needed files, click the **Refresh** button and the screen should switch to saying **Ready to Install** as shown.

	All devices 20 (2)					 Topology Summary 	28
	Installed & Available appliances	Add appliance			? ×	Node Console	00
2	Fiter	C			13 M		
>	A 10 vThunder	Required files The following versions are avail	able for BIRD internet routing daemon. C	heck the status of files requ	red to install.		
-	Alcatel 7750	Click on a version to see the rec GNS3 is looking for files in your	guired files and import the file from your co downloads directory and in the GNS3 imag	mputer. es directory.			
2	Areta UE/IS	Version	Filename Size	Status	File version		
		BIRD internet routing e	daemon 1.5.0 21.4 M8	Ready to install		Convert Commency	20
	AsteriskNOW					Apolo CPU 8.7%, RAM 71.7%	
V	ATM switch					GNS3 VM (GNS3 VM) CPU 0.0%,	, RAM 13.2%
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	Triew applance template					u.	
	Console	4			•	-	88
	GNS 3 management console. Running GNS3 version 2.1.2 on Windows (64-bit) with Py Copyright (c) 2006-2018 GNS3 Technologies. Use Help -> GNS3 Doctor to detect common issues.			Create a	new version Refresh		
	*>			< Back	Next > Cancel		
	100				and the second		

To finish the install, select the **Ready to Install** line and click **Next** to proceed until the **Finish** button, choosing defaults as needed. This device will then be available from the list for use.

There is another way to install devices, which involves using the **Edit**, **Preferences** menu screen. GNS3 support numerous device types as can be seen from the side menu of the Preferences screen. The following example shows adding a new Docker Container. The image name could be any valid Docker pull path.

📂 🗁 🕓 🔣	General	Docker VM templates			
Al devices Installed & Available apor Fitter Allo vThunder Allo vThunder Allo vThunder Allo vThunder Allo vThunder Allo vThunder VPCS nodes VPCS nodes Dynamips IOS routers	GNS3 VM Packet capture * Built-in Ethernet hubs Ethernet switches Cloud nodes * VPCS VPCS nodes * Dynamips IOS routers	General Image name: gra3/kalifuux Gra3 VM (GR3 VM) Graphite Graphite New Docker VM template Pesse choose a Docker virtual machine from the list or provide an image name on Docker hub.		ale	
Astariation Astariation Astariation Astariation Astariation Big Coud Planc Big Coud Plan	* 103 on UNIX IOU Devices * QEMU Qemu VMs * VirtualBox VirtualBox VMs * VMware VMs * VMware VMs * Docker Containers	Existing image image name:		RAM 72.4% 10 CPU 1.4%, RAM 13.4%	88
*2		< Box Bext> Cancel	Qelete Cancel Apply		

Once you have GNS3 up and running, and have added some devices to work with, you will probably then either want to import an existing portable project someone has given you or start your own. Importing a GNS3 portable projects is easy, simply use the **Import portable project** choose from the **File** menu.



Navigate to the portable project file, it should have a .gns3project file extension to its name.

Otherwise, start creating your own topology by dragging in devices and wiring them up with the provided tools. Start by dragging in an Ethernet Switch, note the need to run it in the GNS3 VM as shown.



Then add a few more devices. In the example below we have added two Ubuntu devices and are beginning to connect them together with cabling using the last button on the left side bar which should look like a network cable (or maybe to some a phone cable ⁽ⁱ⁾).



When you click on a device in this cabling mode, a selection pop up will let you choose which port you are connecting the cable to, if there is a choice. Once you have finished wiring up your topology, click the cabling button again to turn off cabling mode.



You will notice that the switch is already 'on' (thus the green lights) but the Ubuntu clients need to be started. To bring up the context menu on any device, simply right-click on it.



As you can see, you can Start, Stop, Configure, Delete, Duplicate, and a number of other choices for each device. The Start, Stop and other buttons along the top button bar affect the entire project (i.e., turning EVERYTHING on or off together), but you can affect individual devices using this right-click menu.

Once a device is running, you can right-click again and select **Console** to bring up a Console. This will either be a Putty session (telnet/console type connections) or a VNC window (remote desktop type connections).



Using these consoles, you can configure and run the devices as you would a real system since they are virtual emulations of the real thing. There are way too many devices to attempt to cover in this guide. But the GNS3 website and Marketplace has tons of useful information and links.

We will close this guide with some common trouble shooting tips.

- If the GNS3 VM doesn't run correctly and get the right IP address range, double-click the VM's settings. The GNS3 VM actually has two network interfaces. The first should be on the host-only adapter and the second should be on NAT with both getting their IP addresses via DHCP. If this is not happening, double-check the virtual network settings of either VirtualBox or VMWare.
- 2. If the GNS3 VM runs fine and gets the right IP address, but the GNS3 GUI will not connect, it is usually due to host binding errors. Either the wrong IP was entered or this IP address has changed due to maybe a reboot and assignment of new IP address. You will see errors like:

🐣 Loca	il server	×
\bigotimes	Could not bind with 192.168.101.112: [WinError 10049] The reque not valid in its context (please check your host binding setting in	ested address is the preferences) OK
~ .		
🔗 Loca	al server	×
😤 Loca	al server Could not start the local server process: C:\Program Files\GNS	×

To fix this, cancel the new project dialog and go to **Edit**, **Preferences**, **Server** and change the IP of the host binding drop-down as shown to match your real IP address.

🚱 Preferences		?	×
General	Server preferences		
Server			
GNS3 VM			
Packet capture	Main server Remote servers		
▼ Built-in	Z Enable local server		
Ethernet hubs			
Ethernet switches	General settings		
Cloud nodes	Server path:		
VPCS	C:\Program Files\GNS3\gns3server_EXE	Browse	
VPC3 houes			
IOS routers	uoroge pari:		
TOS on UNIX	C:\Program Files\GNS3\ubridge.EXE	Browse	
IOU Devices	fe80::a9ed:e42:5b7c:2b44%ethernet_32769		
▼ QEMU	192.168.101.108		
Qemu VMs	fe00::188f:2285:fe7e:8a39%ethernet 32772		
 VirtualBox 	192.168.56.1		
VirtualBox VMs	fash-fh37/ca45-f6/c6476%/athanat 32770		
▼ VMware			
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* Docker	Te80:93:66/3:005:0e29%ethernet_32//1		
Docker Containers	Co 192.168.119.1		
	= = 1		1
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