Technical white paper

HP Comware Lab (HCL) user guide (Windows)

A Comware OS learning tool

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Introduction

Comware version 7 (v7) is a high-end network HP Networking operating system (OS). It provides control and management to switches, routers, and security appliances.

The HP Comware Lab, is a graphical user interface for the network device emulation software. With the HP Comware Lab, the user can virtualize various models of the HP network equipment and configurations to build a virtual network environment.

Usage for HP Comware Lab:

1. Learn network technology

2. Preperation for HP Networking Certifications.

3. Familiarize with the Comware V7 platform based on network equipment

4. Engineers and technicians who need a virtual environment to test and verify the configuration program

HCL runs virtual machines on Oracle VM VirtualBox. The performance of the virtual machines is determined by the VirtualBox environment, the Windows OS, and the hardware platform.

Note
Some switching features based on ASICs cannot be tested on the HP Comware Lab.

Installing HP Comware Lab

Host PC requirements

For performance purposes, the PC running HCL must meet the requirements listed in the following table.

Table 1: Host PC requirements

Item	Specifications
CPU	CPU frequency: ≥ 3.0 GHz (must support VT-x or AMD-V)
SDRAM	≥ 4 GB
Hardware	≥ 80 GB
Operating system	Windows 7 or later

Installation procedure

Note
The Windows administrator rights are required to install and uninstall HCL.

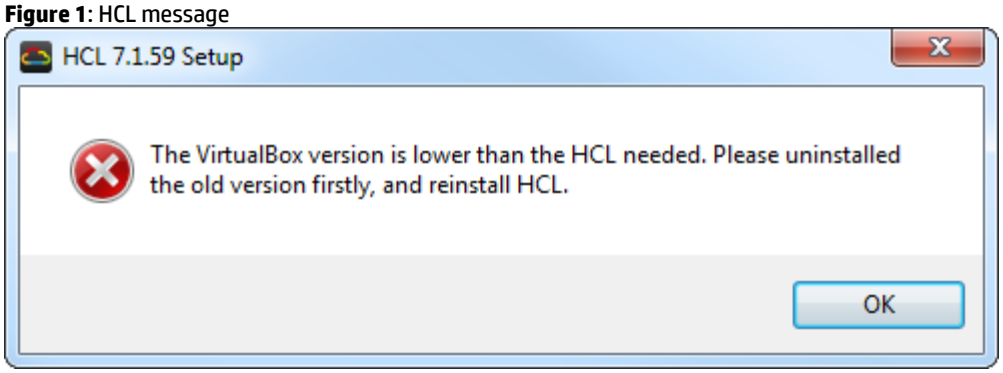
Important
To install an upgraded version of HCL, the current HCL software must first be uninstalled.

1. Obtain and install Oracle VM VirtualBox Release 4.2.18 or later
   A. VM VirtualBox can be downloaded from: VirtualBox.org.

Note
This guide provides VirtualBox installation steps required for an HCL installation. The actual installation of VirtualBox is outside the scope of this document.

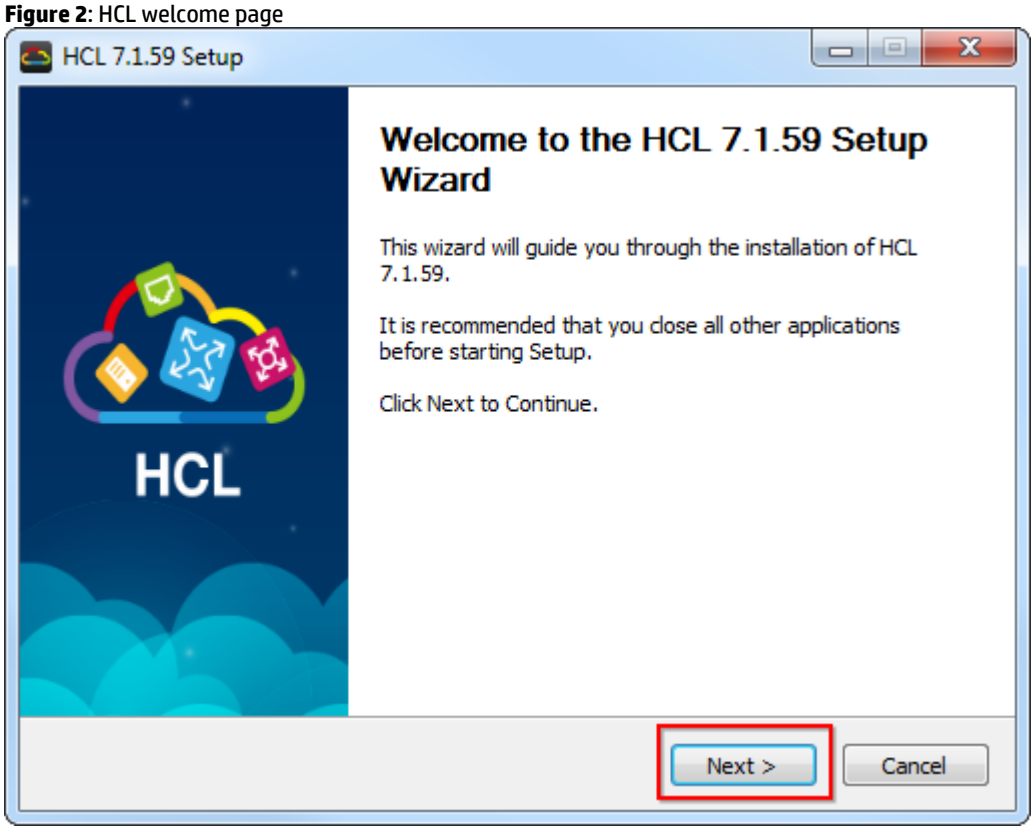
2. Obtain the HCL installation package for the Windows OS running.
   A. HCL can be downloaded from: hp.com/networking/hns
3. Once downloaded, unzip, right-click on the Setup file and “Run as administrator” to start the installation.
4. If the VirtualBox version installed is lower than the minimum version of 4.2.18, then you will get the following message.

Figure 1: HCL message



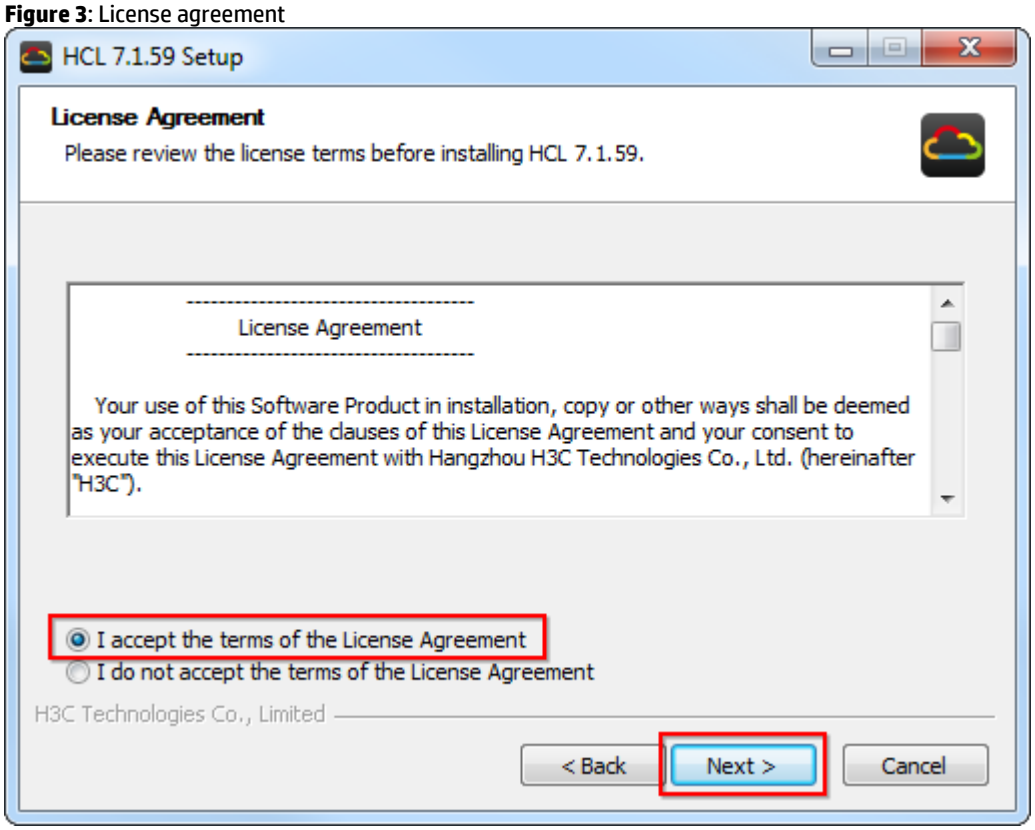
5. If the VirtualBox version is correct, the HCL welcome page appears.

Figure 2: HCL welcome page



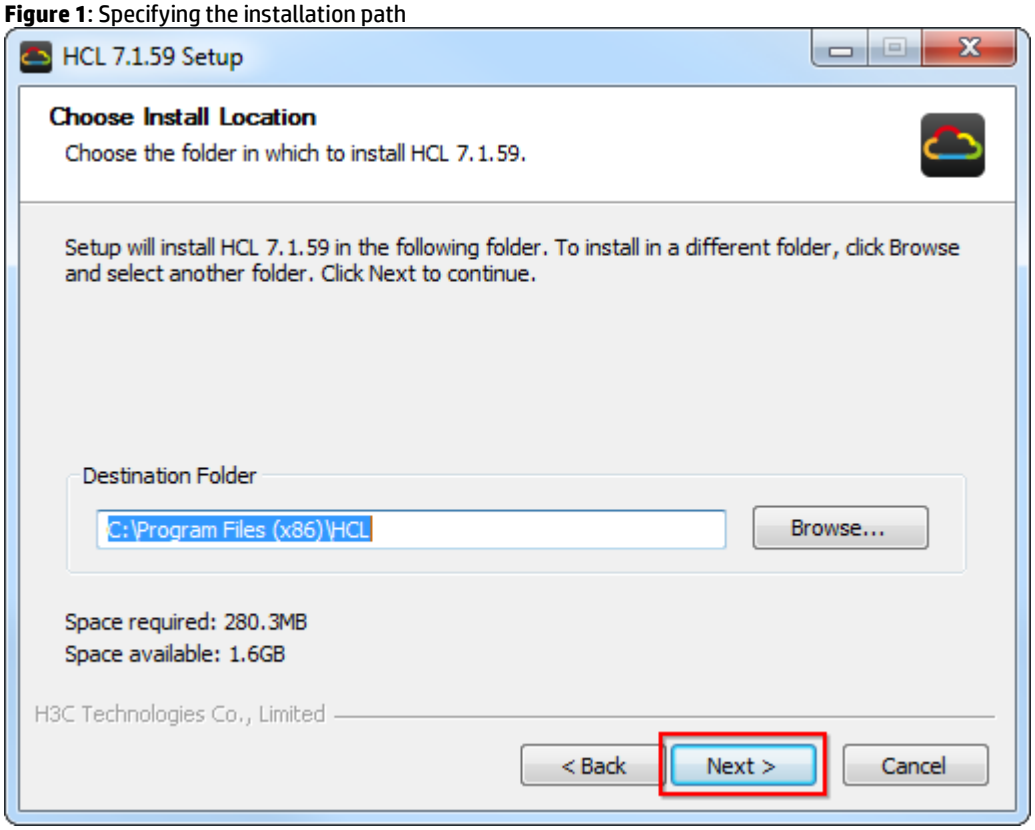
6. Click **Next**.
7. On the license agreement step, select **I accept the terms of the License Agreement** and click **Next**.

Figure 3: License agreement



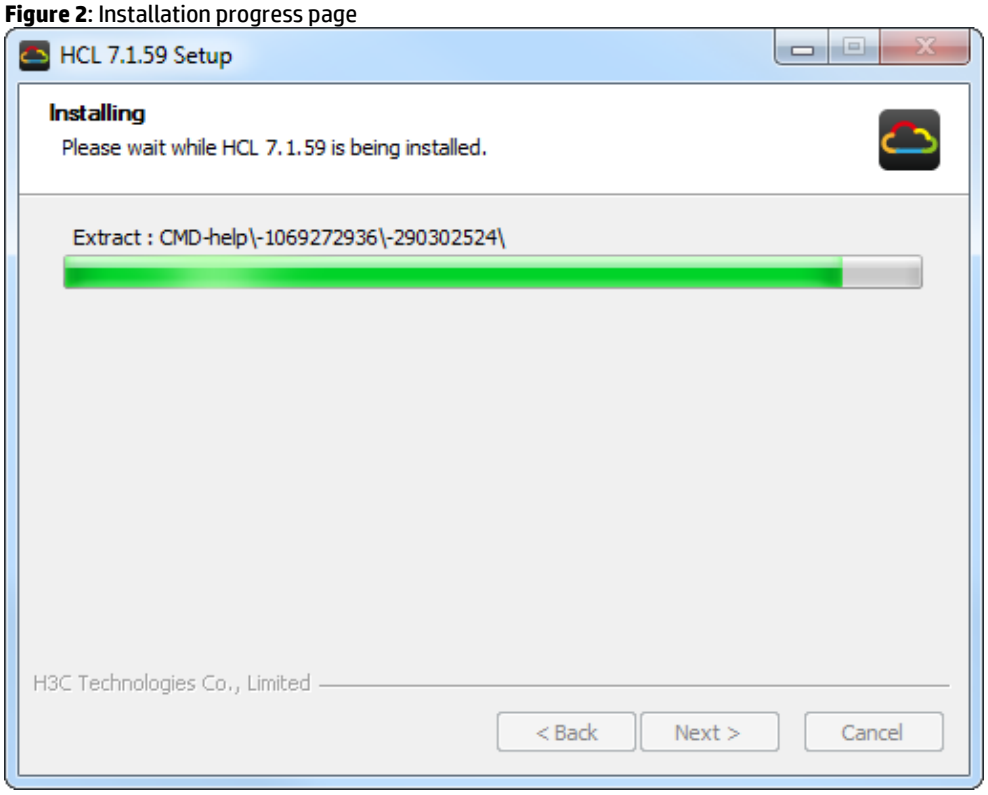
8. Enter or navigate to the destination folder and click **Install**. To use the default folder, click **Next** directly.
   A. The destination folder path and name can contain up to 128 characters. Percent (%) and pound signs (#) are not allowed.

Figure 1: Specifying the installation path



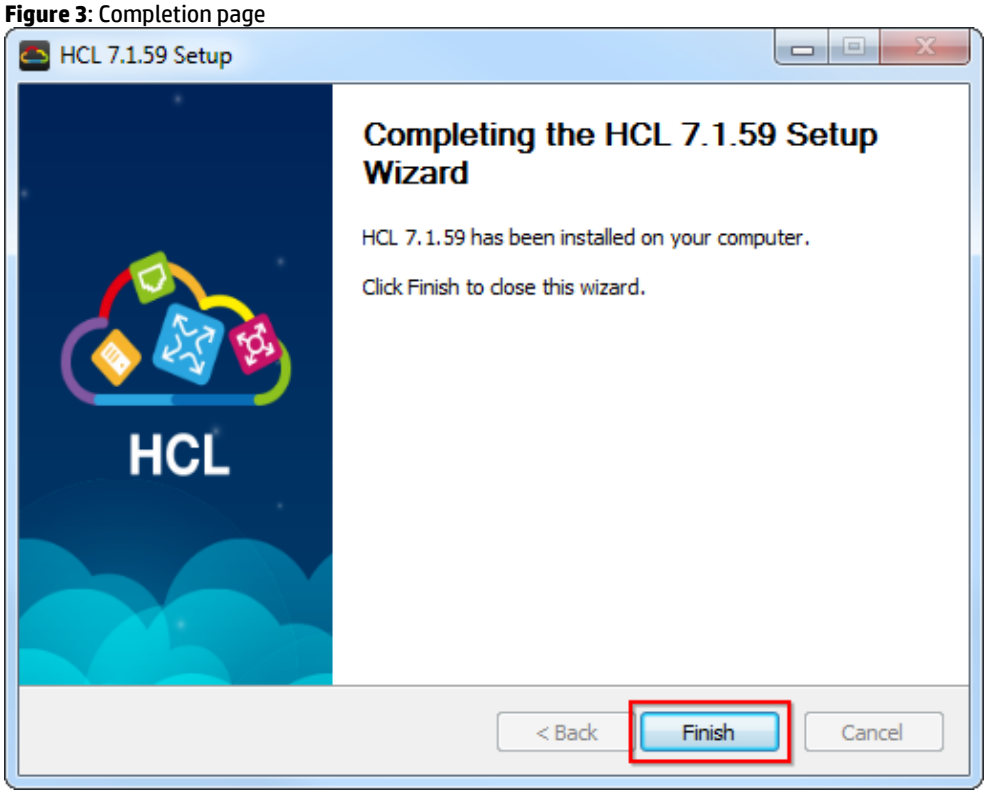
9. After clicking **Next**, the installation progress page appears.

Figure 2: Installation progress page



10. After the installation is completed, the completion page appears. Click **Finish.**

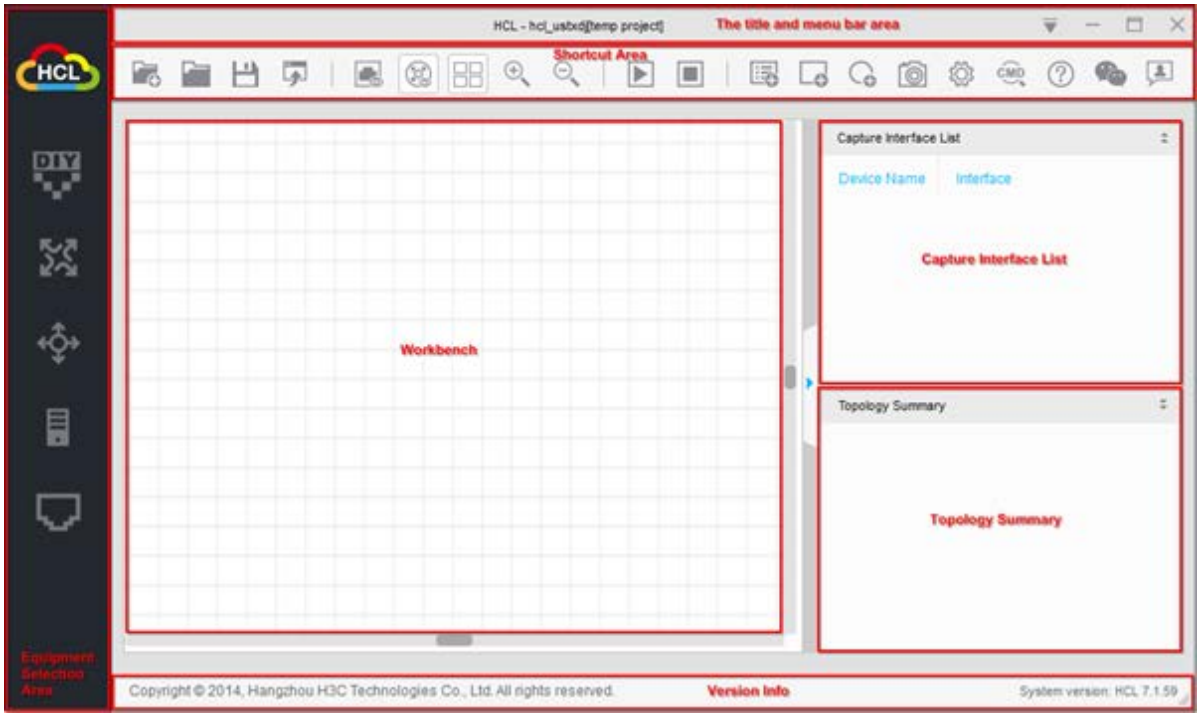
Figure 3: Completion page



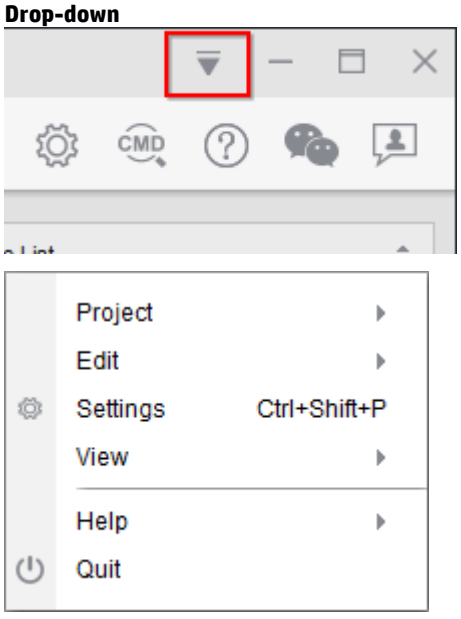
11. A desktop shortcut and a start menu shortcut are created. Either of them can be clicked to start HCL.

Graphical user interface (GUI) introduction

Main interface



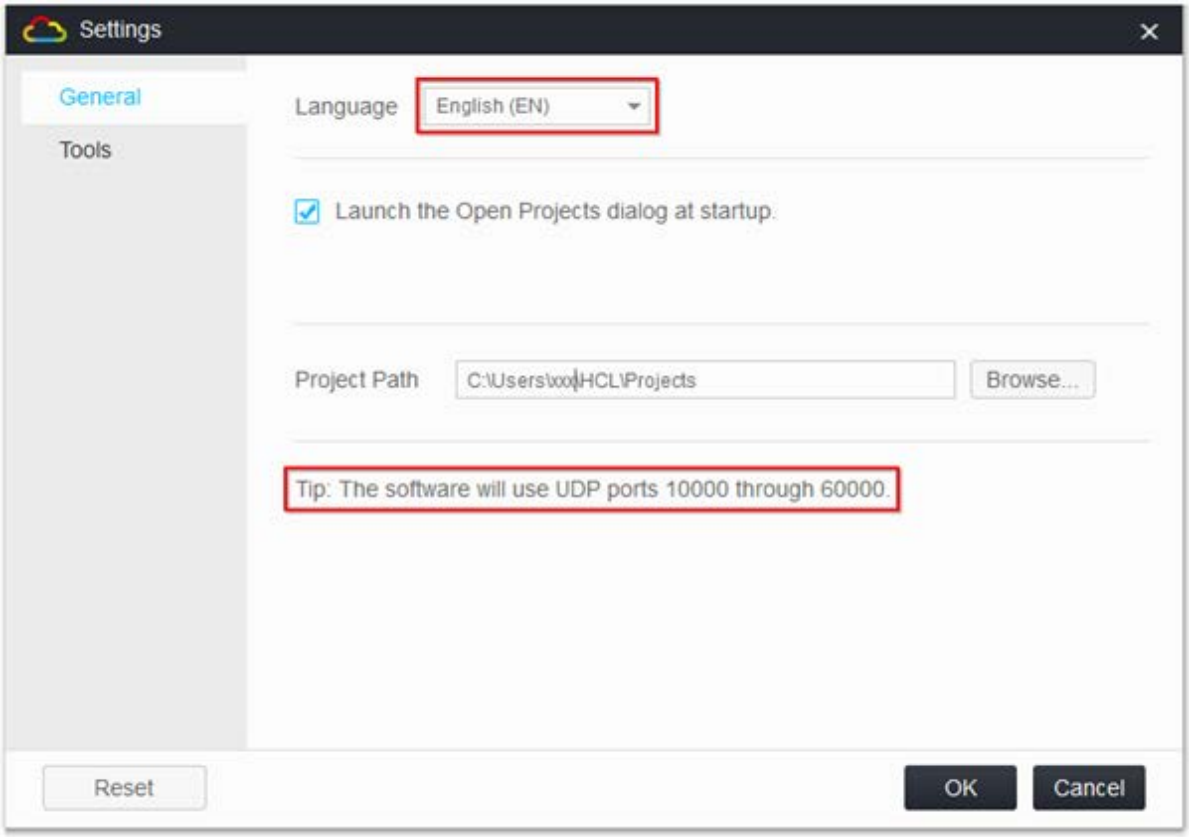
Drop-down



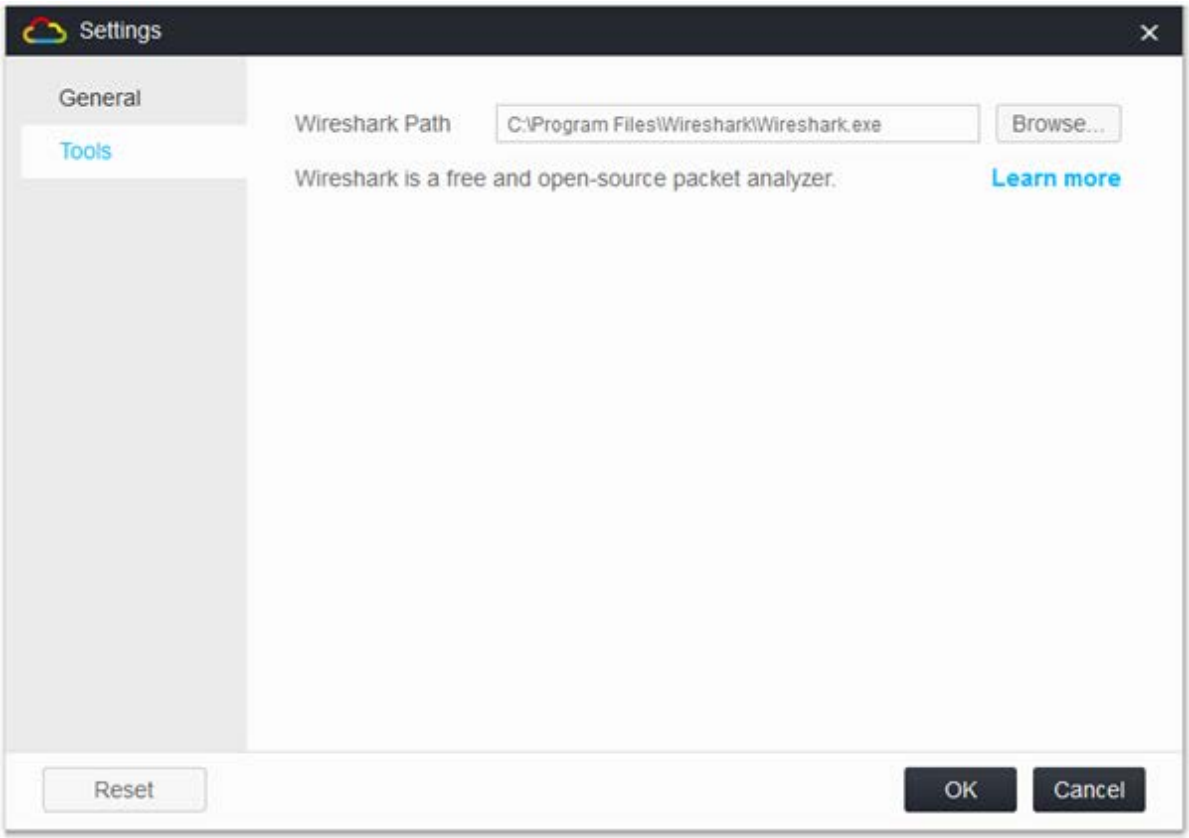
Project and Edit option are explanatory.

Settings

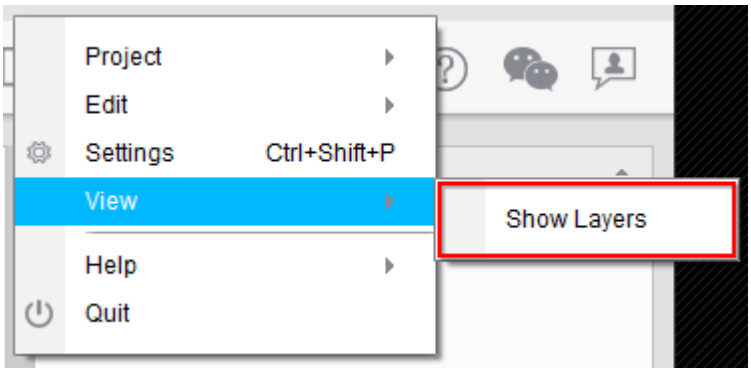
Under setting you can change the language to English or Chinese (Simplified)



HCL supports Wireshark as the packet capture tool



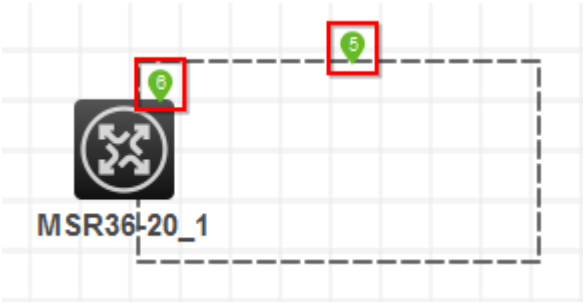
View – Show Layers



The layers are referring to the small green colored numbers which represent the layer number. It's similar to the Microsoft Visio layers,

Note
Virtual device level range is 1 to 99. Annotation, graphic hierarchy are in the range -9 to 99. When the level is negative, comments and graphics cannot be moved.

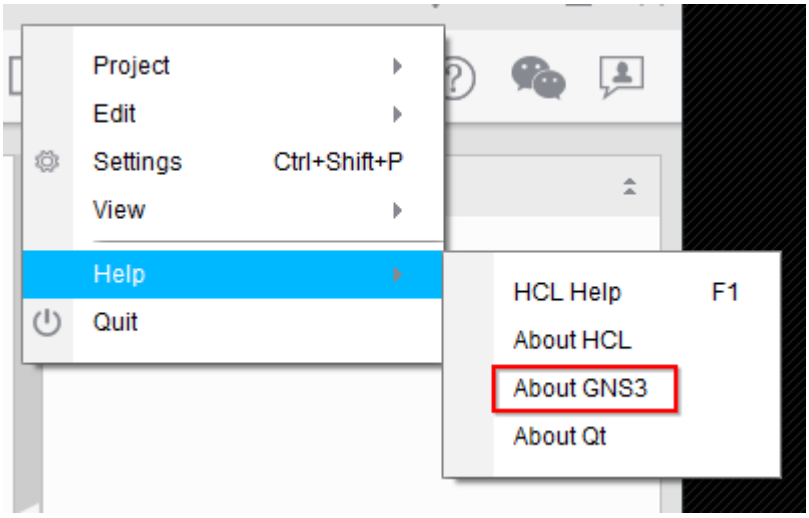
Different types of objects added to the initial table have a default level.



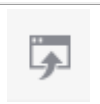
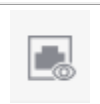
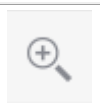
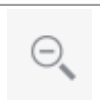
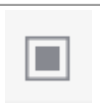
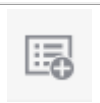
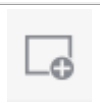
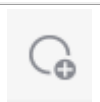
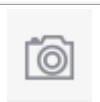
Help

Under the Help section the HCL Help file is in Chinese.

HCL is based on GNS3 and QT open-source code, so with GNS3, QT's copyright notice, click on the "About GNS3" and "on the QT" You can view the copyright notice



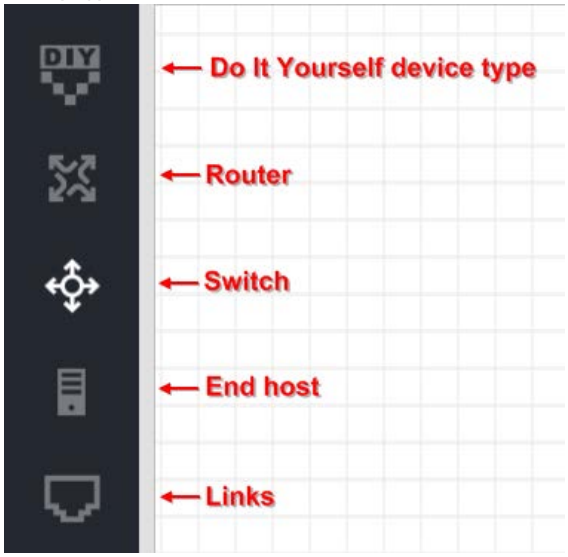
Shortcut Area

Project	
	New Project (Ctrl+N)
	Open Projects (Ctrl+O)
	Save Project (Ctrl+S)
	Export Project
Display	
	Show interface names
	Hide device names
	Hide grid
	Zoom in (Ctrl+=)
	Zoom out (Ctrl+-)
Device	
	Start all devices
	Stop all devices
Image	
	Add note
	Draw rectangle
	Draw ellipse
	Take workspace snapshot

Expand	
	Settings (Ctrl+Shift+P)
	Command lookup tool (Ctrl+M)
	Help (F1)
	H3C training center
	User forum

Equipment

DIY Device



Left click on a DIY device to select it

DIY device type enables the user to create devices with different types of interfaces (TenGigabitEthernet, ATM, POS, E1, GigabitEthernet, and Serial)

Steps to create a DIY device type:

1. Specify unique device type name (Maximum 8 characters)

2. Drag and drop the various interface available from Interface selection area

- To delete the interface added, right-click on the interface and it will be removed

3. Click Save and the newly create device type will appear in Device type list

Steps to remove DIY device type:

1. Select the device type from Device type list

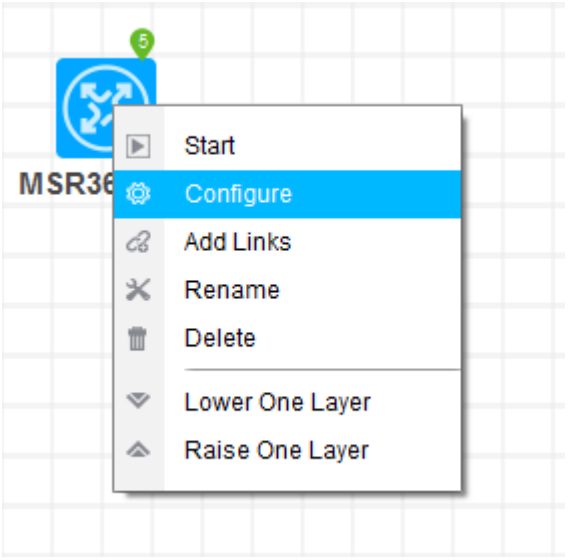
2. Click on Delete

Router

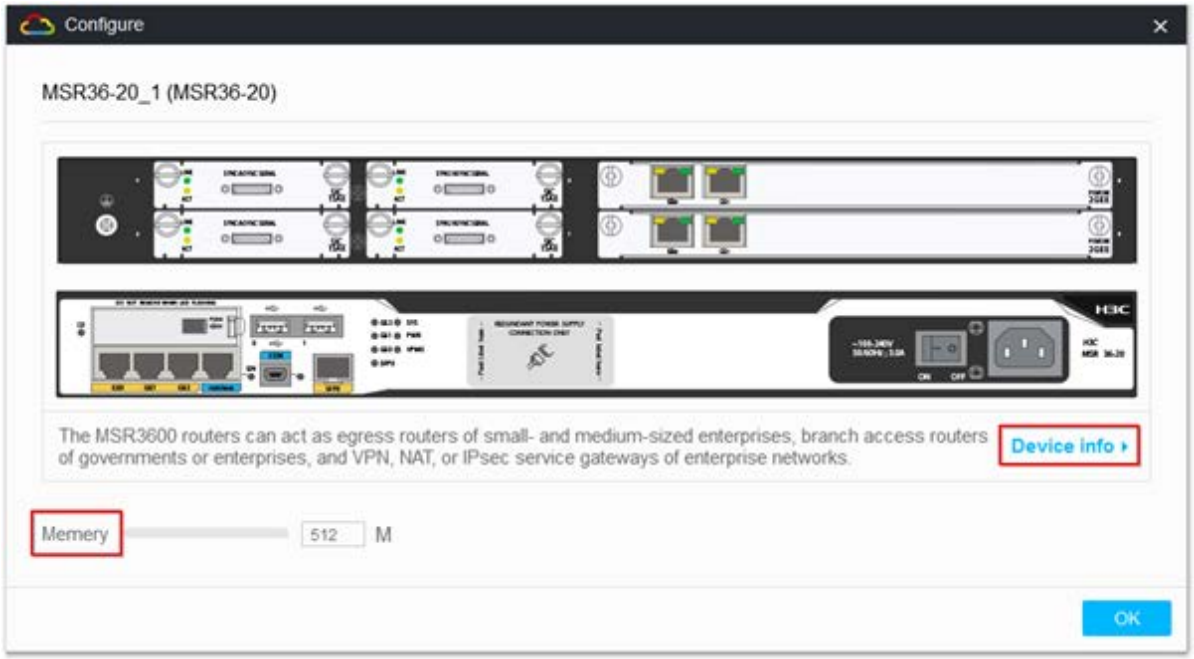
Currently HCL only supports MSR36-20

- Left Click to select, and left click to insert. Right click to release the device.

- Click and place the router object on the Workbench area
- When you right-click and select Configure, you see will see the actual router model image and modules. Device Info will bring you to the actual device/model product page.



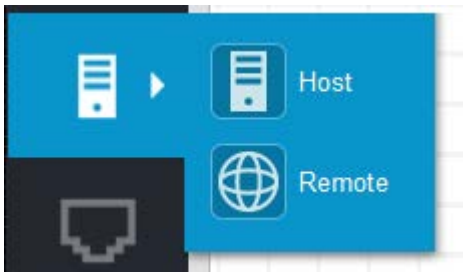
Note
Slight typo – Should be Memery instead of Memery



Switch

Currently HCL only support S5820V2-54QS-GE. Click and place the switch object on the Workbench area.

End device



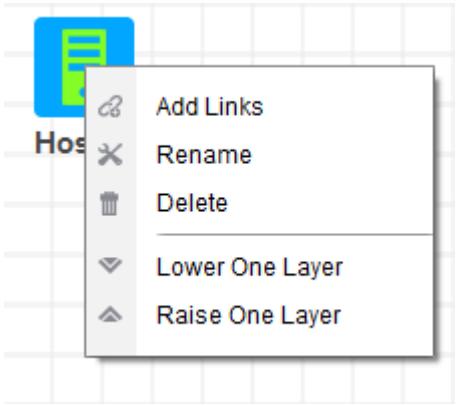
Under the End device, there are 2 selections:

1. Host

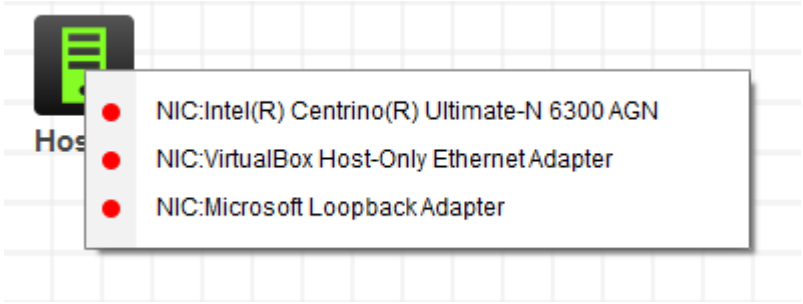
2. Remote

Host option will allow user to bind the connection to an interface on the local machine. The host object is always ON.

Drag and drop a host object and right-click on it to select Add Links

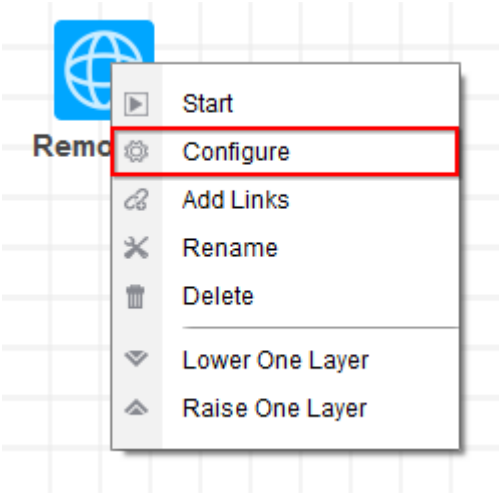


Select the available interfaces shown

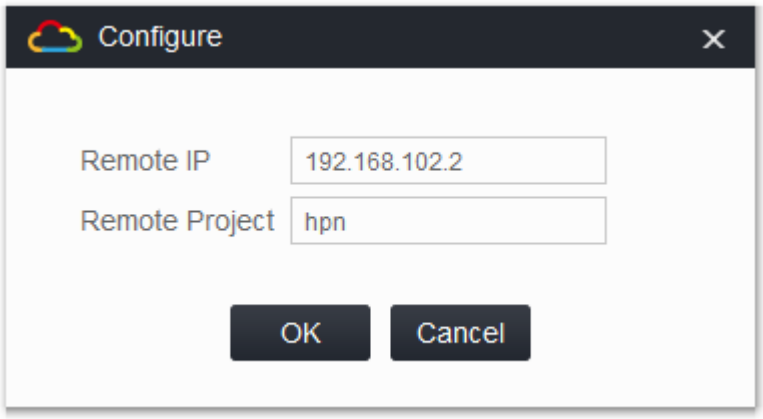


Remote

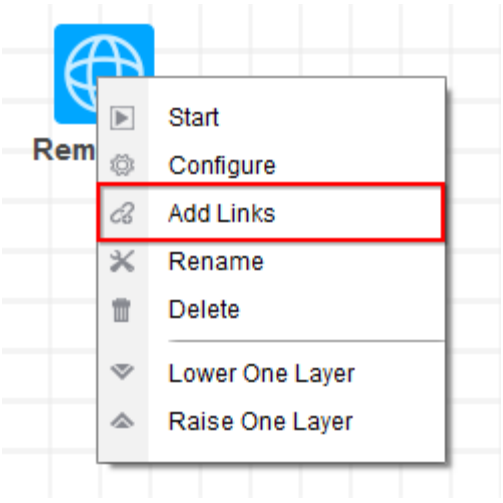
Remote object allows user to connect to a different machine which is running another HCL project.



Specify the remote IP address and project name



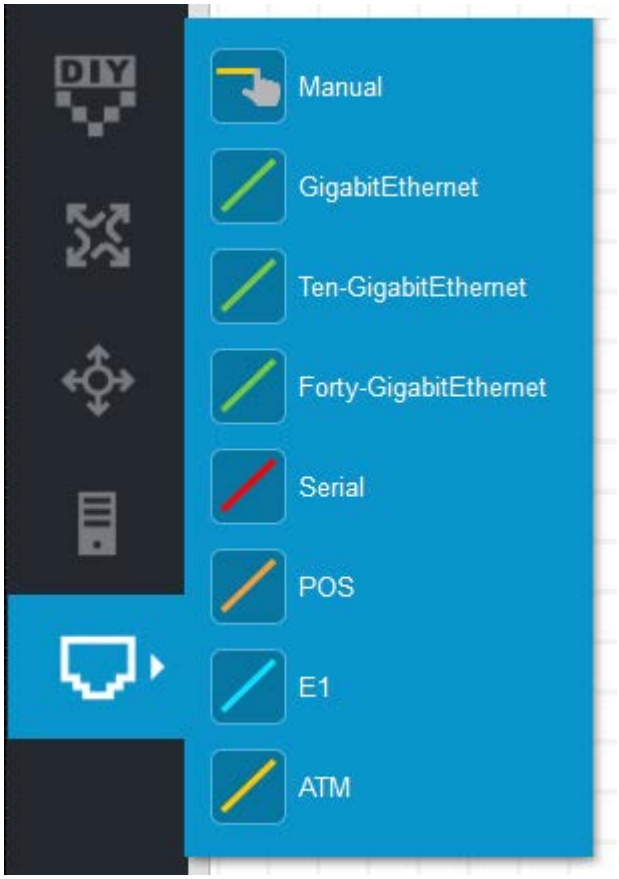
After that, right-click on the Remote object and click Add Links



You need to specify a unique Tunnel name (Maximum 20 character)

Links

Links allow user to choose the virtual cabling media to connect between the virtual devices. Forty-GigabitEthernet is supported.

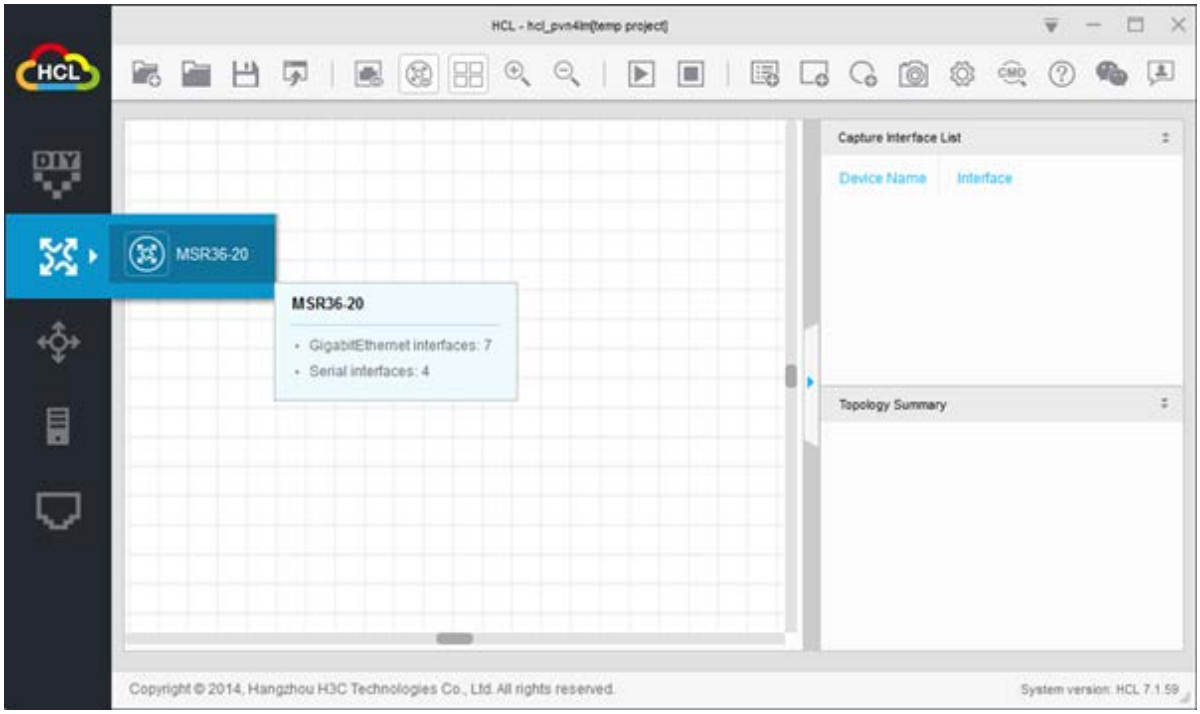


The maximum number of connections for each device is 7.

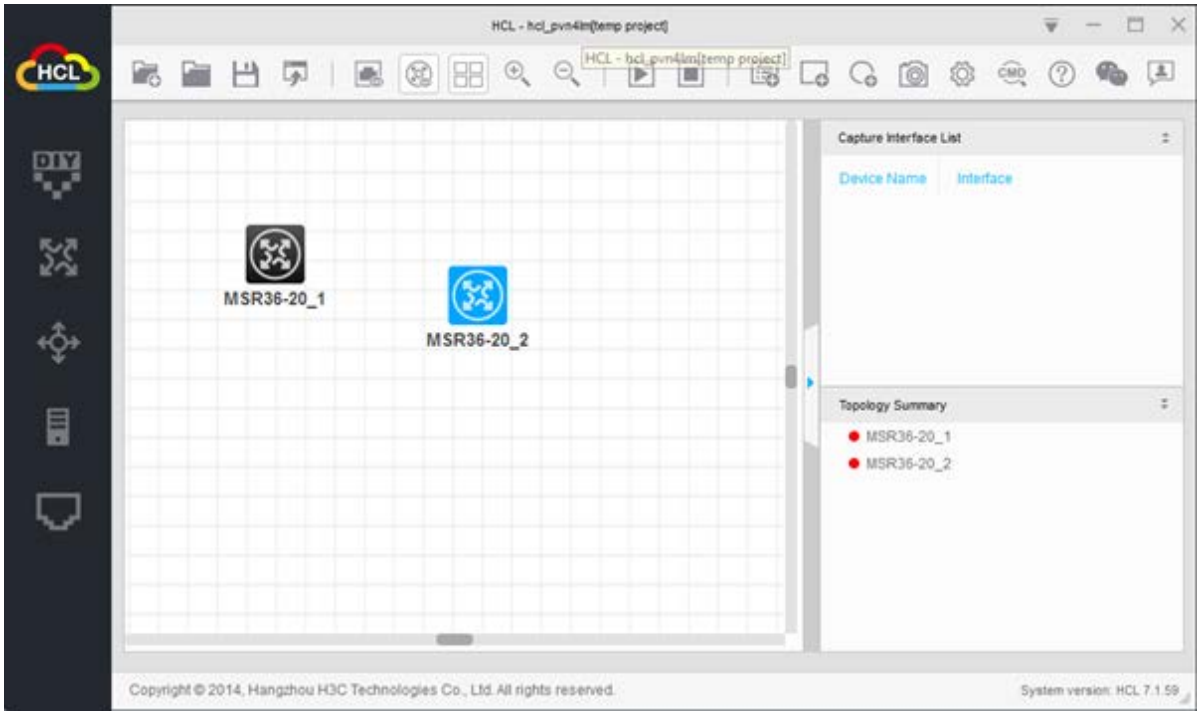
Lab

This lab will be a simple ping test between 2 routers.

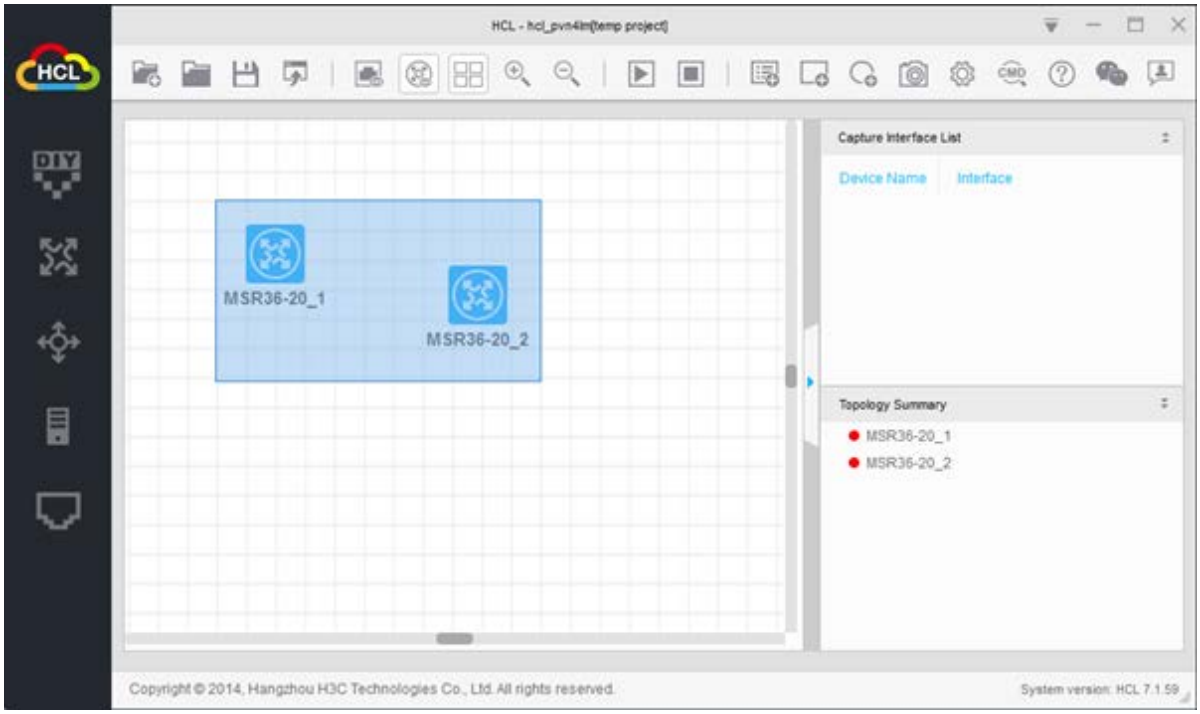
Select the router object on the Equipment Selection Area



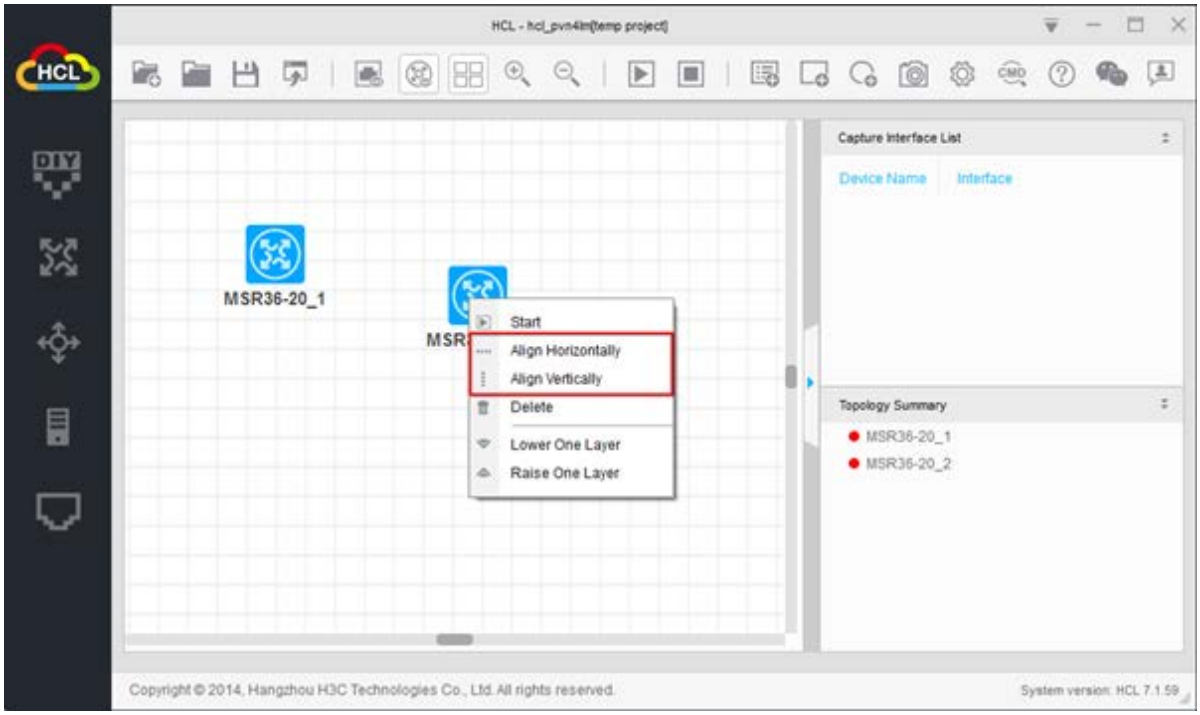
Place 2 routers in the Workbench area



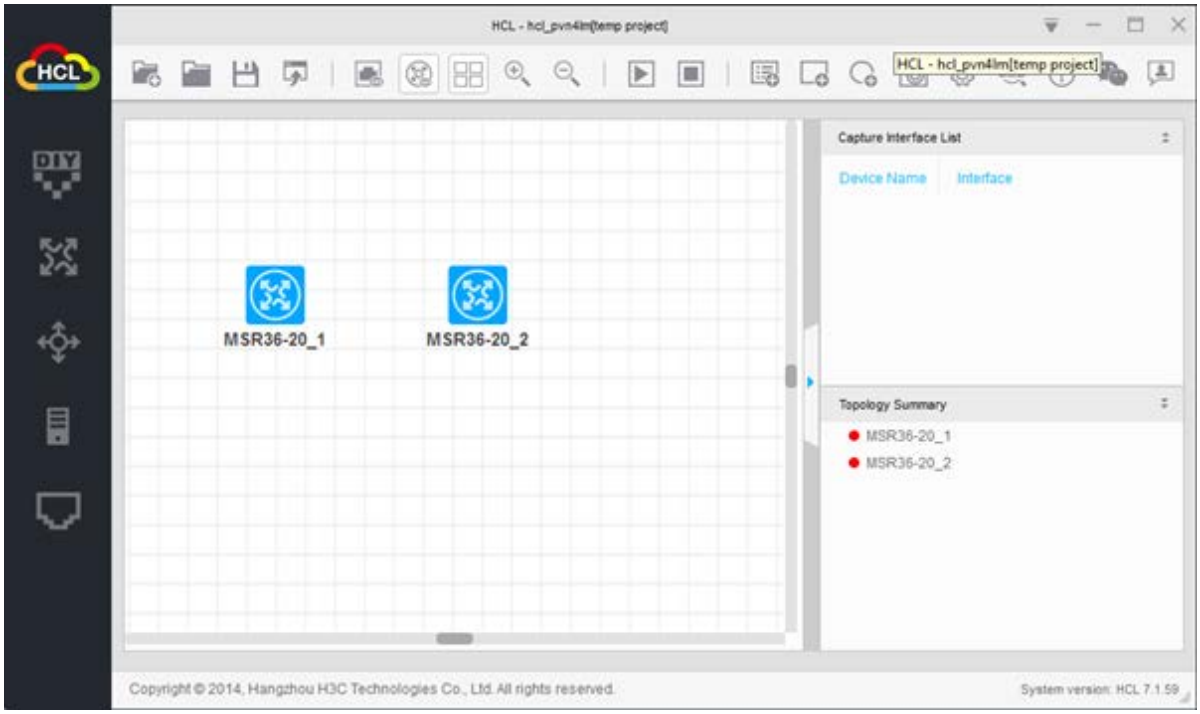
Select both the routers



Then right-click on one of them and select “Align Horizontally (Option only available if you select more than one device)



The devices will be aligned with each other

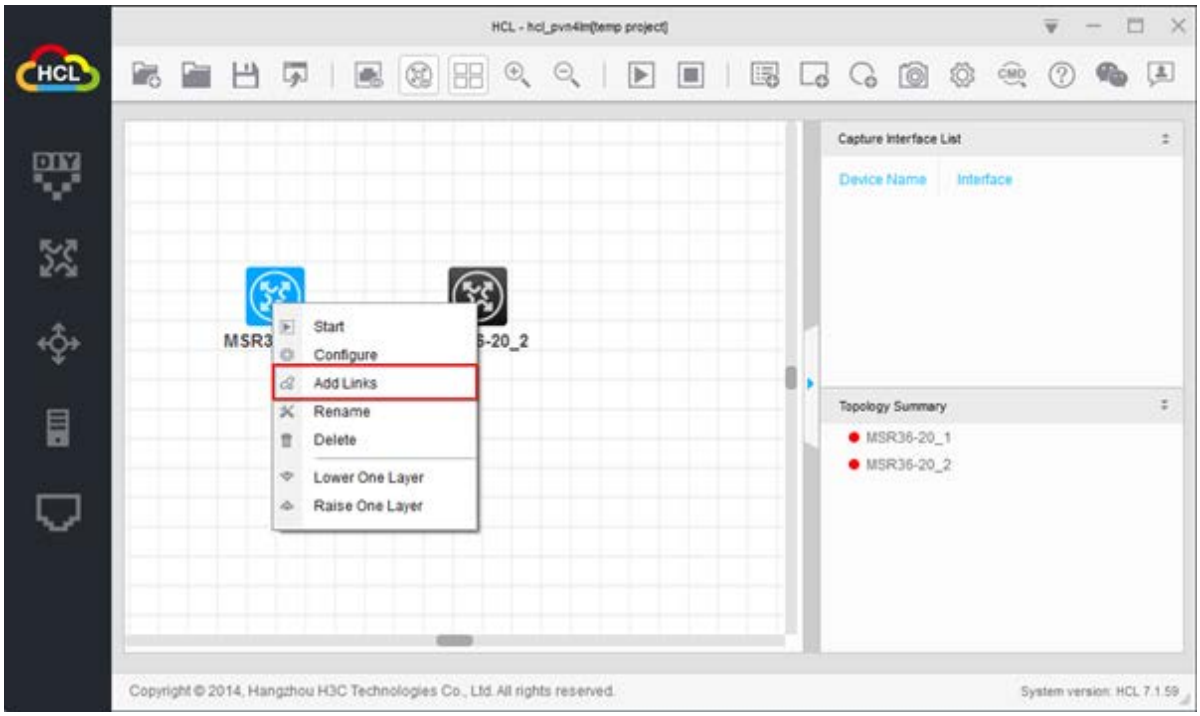


MSR36-20 default comes with

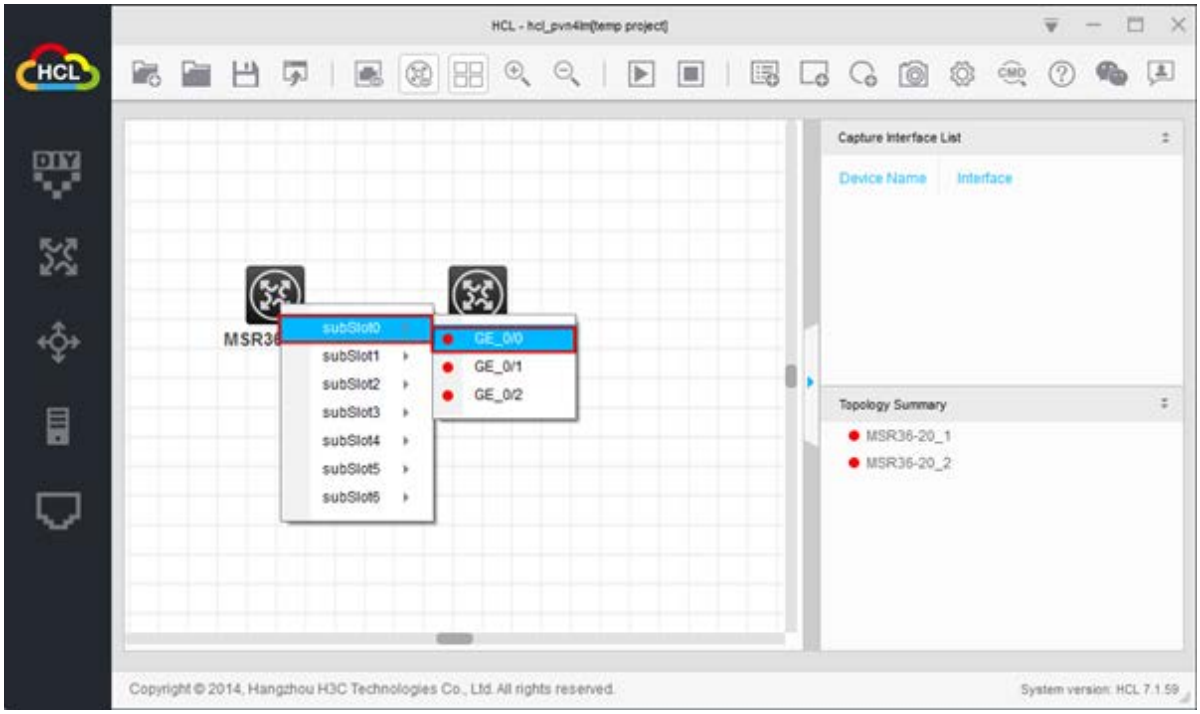
Number of GigabitEthernet interfaces: 7

Number of Serial interfaces: 4

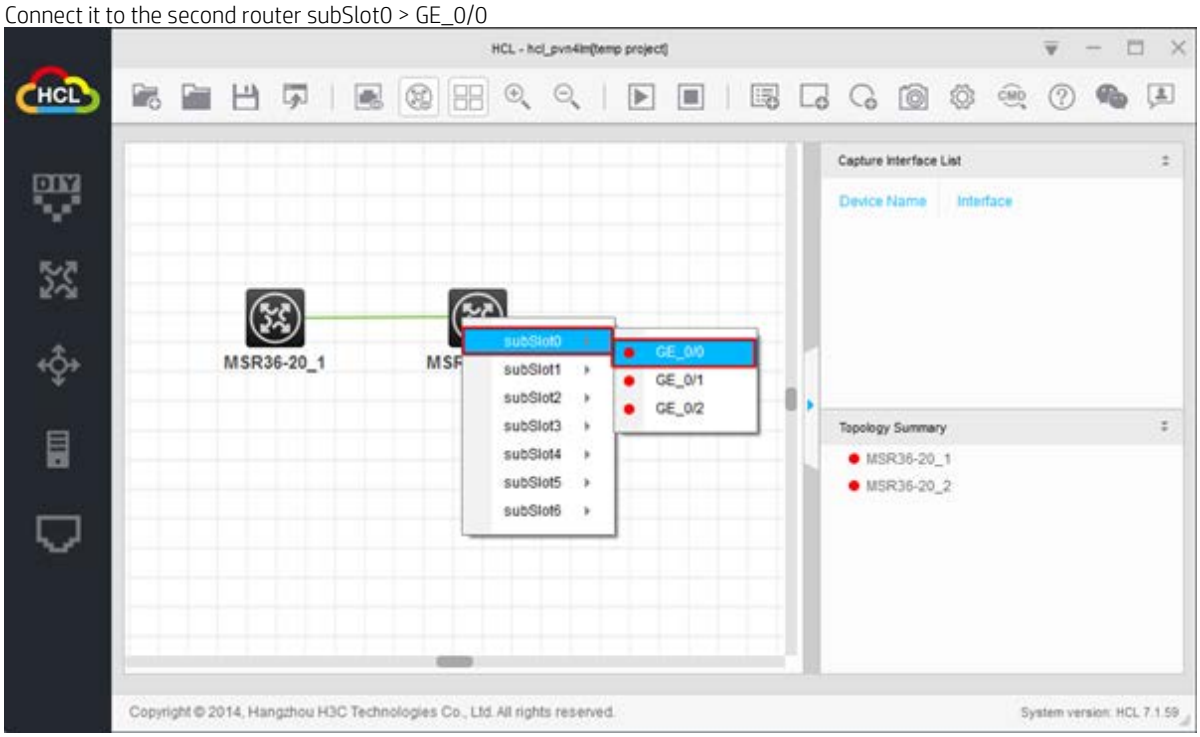
Now we proceed to connect them using the Links. Right-click on the router and select Add Links



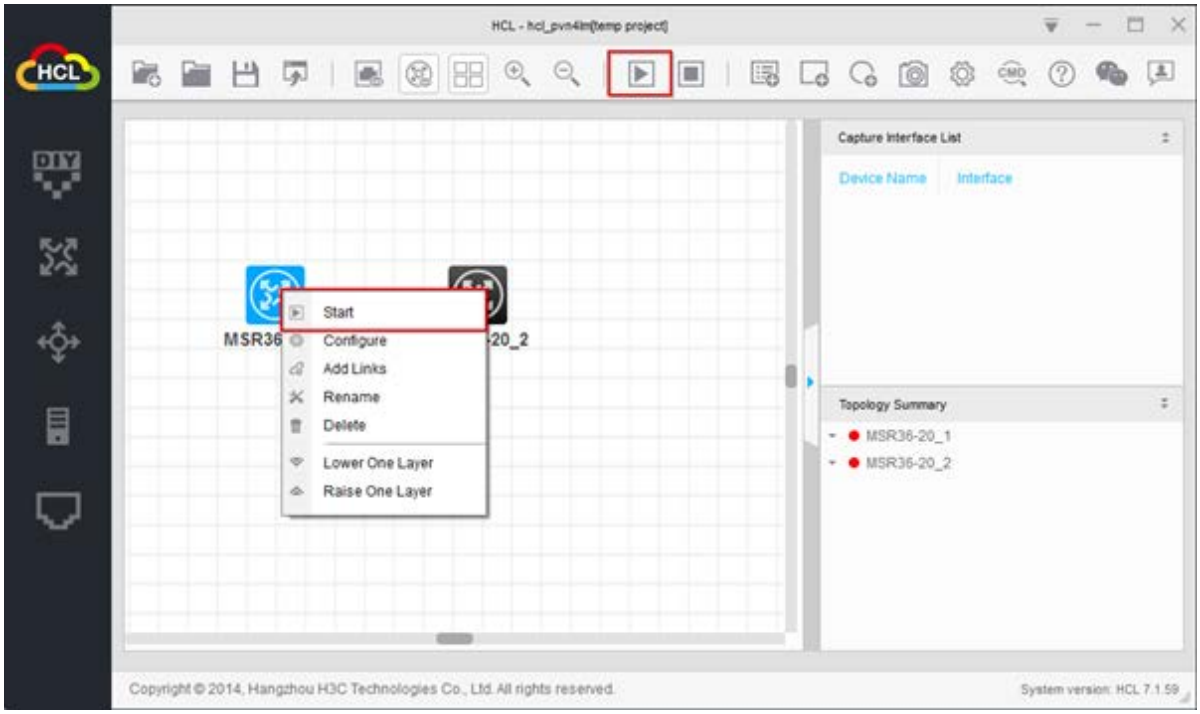
Select subSlot0 > GE_0/0

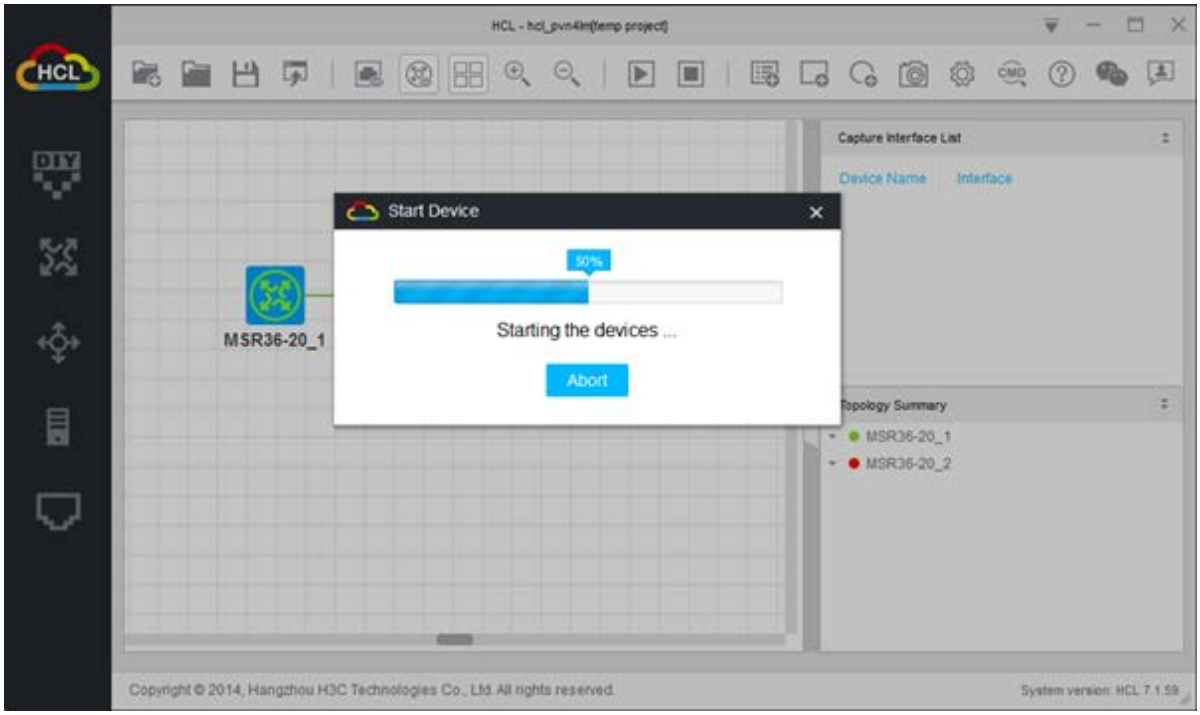


Connect it to the second router subSlot0 > GE_0/0



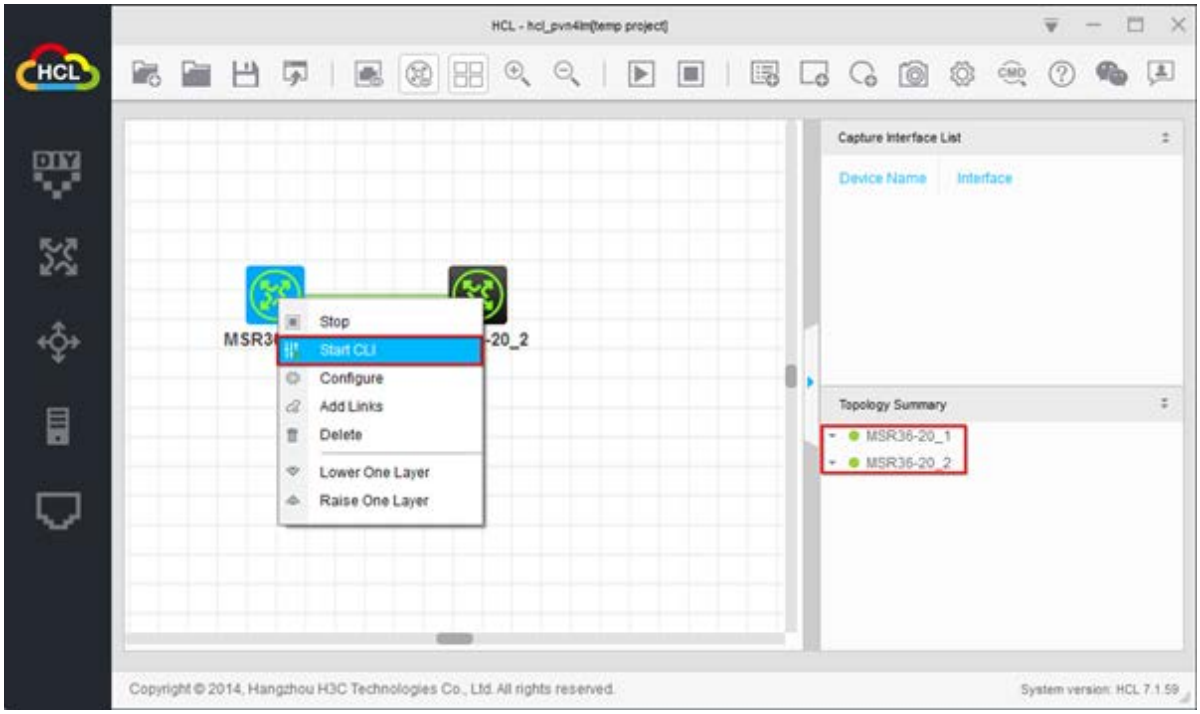
Continue to start the router individually by right-clicking and selecting “Start” OR using the “Start all device” on the Shortcut area



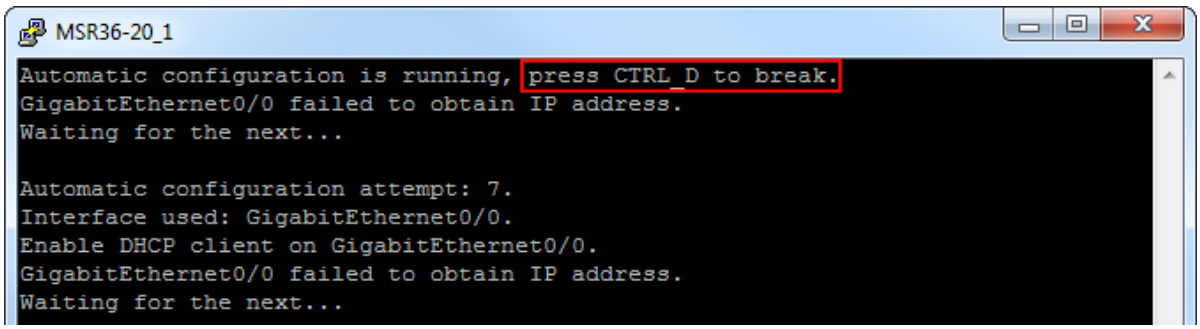


Right-click on one of the routers and select Start CLI

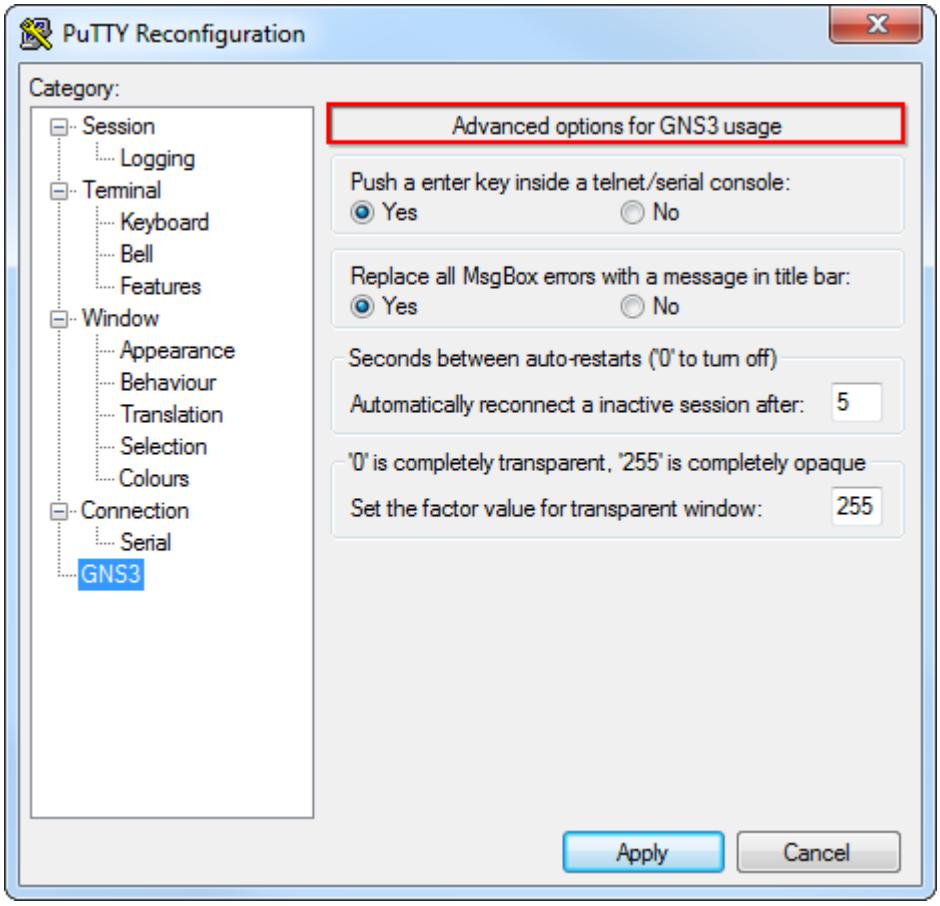
Notice the option available changes according to the device status. In the Topology Summary the routers running are indicated by the green color



CLI starts via Putty. Press Ctrl+D to break the auto DHCP sequence and login via console. (Press Enter to proceed)



It's a special GNS3 Putty.



Configuration for the routers:

```
[R1]
system
interface GigabitEthernet0/0
ip address 192.168.102.1 24
undo shutdown
quit
```

```
[R2]
system
interface GigabitEthernet0/0
ip address 192.168.102.2 24
undo shutdown
quit
```

Verification:

R1 pings R2

```
<R1>ping 192.168.102.2
Ping 192.168.102.2 (192.168.102.2): 56 data bytes, press CTRL_C to break
56 bytes from 192.168.102.2: icmp_seq=0 ttl=255 time=1.842 ms
56 bytes from 192.168.102.2: icmp_seq=1 ttl=255 time=1.108 ms
56 bytes from 192.168.102.2: icmp_seq=2 ttl=255 time=0.902 ms
56 bytes from 192.168.102.2: icmp_seq=3 ttl=255 time=0.701 ms
56 bytes from 192.168.102.2: icmp_seq=4 ttl=255 time=0.749 ms

--- Ping statistics for 192.168.102.2 ---
5 packets transmitted, 5 packets received, 0.0% packet loss
round-trip min/avg/max/std-dev = 0.701/1.060/1.842/0.416 ms
<R1>%Jan  1 17:21:47:014 2015 R1 PING/6/PING_STATISTICS: Ping statistics for 192
.168.102.2: 5 packets transmitted, 5 packets received, 0.0% packet loss, round-t
rip min/avg/max/std-dev = 0.701/1.060/1.842/0.416 ms.
```

R2 pings R1

```
[R2]ping 192.168.102.1
Ping 192.168.102.1 (192.168.102.1): 56 data bytes, press CTRL_C to break
56 bytes from 192.168.102.1: icmp_seq=0 ttl=255 time=1.346 ms
56 bytes from 192.168.102.1: icmp_seq=1 ttl=255 time=0.898 ms
56 bytes from 192.168.102.1: icmp_seq=2 ttl=255 time=0.626 ms
56 bytes from 192.168.102.1: icmp_seq=3 ttl=255 time=1.083 ms
56 bytes from 192.168.102.1: icmp_seq=4 ttl=255 time=0.879 ms

--- Ping statistics for 192.168.102.1 ---
5 packets transmitted, 5 packets received, 0.0% packet loss
round-trip min/avg/max/std-dev = 0.626/0.966/1.346/0.239 ms
[R2]%Jan  1 17:18:45:736 2015 R2 PING/6/PING_STATISTICS: Ping statistics for 192
.168.102.1: 5 packets transmitted, 5 packets received, 0.0% packet loss, round-t
rip min/avg/max/std-dev = 0.626/0.966/1.346/0.239 ms.
```

Display version:

```
<R1>dis version
H3C Comware Software, Version 7.1.059, Alpha 7159
Copyright (c) 2004-2014 Hangzhou H3C Tech. Co., Ltd. All rights reserved.
H3C MSR36 uptime is 0 weeks, 0 days, 0 hours, 21 minutes
Last reboot reason: User reboot
Boot image: flash:/msr36-cmw710-boot-a5901.bin
Boot image version: 7.1.059, Alpha 7159
  Compiled Sep 24 2014 16:10:27
Boot image: flash:/msr36-cmw710-system-a5901.bin
Boot image version: 7.1.059, Alpha 7159
  Compiled Sep 24 2014 16:10:27

CPU ID: 0x2
512M bytes DDR3 SDRAM Memory
1024M bytes Flash Memory
PCB               Version:  2.0
CPLD              Version:  1.0
Basic    BootWare Version:  1.42
Extended BootWare Version:  1.42
```

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HCL configurations are similar to those of the HP 5900 Switch Series. See the HP 5900 Switch Series manuals for configuration guidance.

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