

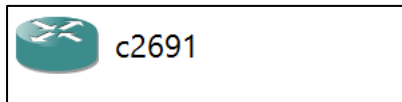
Data Communications and Networking CW2

Zondwayo Mtine

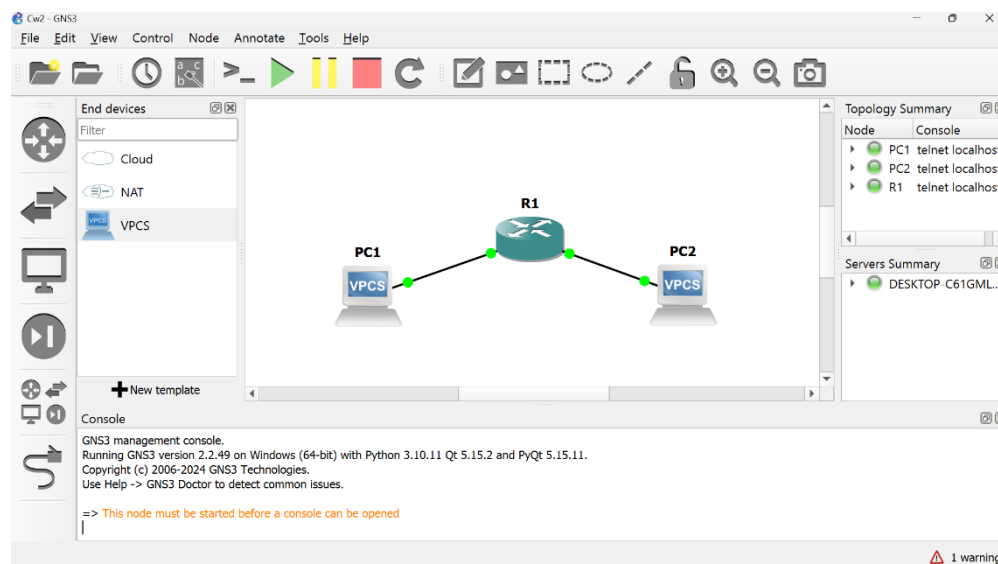
H00373945

BSc Computer Science

Part 1: Router Setup



Part 2: Getting started with Cisco IOS



Configure the PCs with IP addresses 192.168.1.1 and 192.168.2.1. Is PC2 reachable from PC1?

```
DESKTOP-C61GML1 - PuTTY
Dedicated to Daling.
Build time: Apr 10 2019 02:42:20
Copyright (c) 2007-2014, Paul Meng (mirnshi@gmail.com)
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VPCS is free software, distributed under the terms of the "BSD" licence.
Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

PC1> ip 192.168.1.1
Checking for duplicate address...
PC1 : 192.168.1.1 255.255.255.0

PC1> ping 192.168.2.1
No gateway found

PC1> █
```

```
DESKTOP-C61GML1 - PuTTY
Welcome to Virtual PC Simulator, version 0.6.2
Dedicated to Daling.
Build time: Apr 10 2019 02:42:20
Copyright (c) 2007-2014, Paul Meng (mirnshi@gmail.com)
All rights reserved.

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Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

PC2> 192.168.2.1
Bad command: "192.168.2.1". Use ? for help.

PC2> ip 192.168.2.1
Checking for duplicate address...
PC1 : 192.168.2.1 255.255.255.0

PC2> █
```

Right-click on the router and choose Console. You might need to press the return key to get the router to respond. This router starts in privileged mode, indicated by the # in the prompt. Type `conf t` to switch to config mode.

Type `interface fastEthernet 0/0`. This takes you to the `if` (interface) sub-mode, and allows you to configure the router's first Fast Ethernet interface (FE0/0).

Type `ip address 192.168.1.254 255.255.255.0` to assign an IP address to the interface.

Type `no shutdown` to activate the interface.

```
R1
Press RETURN to get started!

*Mar 1 00:00:07.343: %SW_VLAN-4-IFS_FAILURE: VLAN manager encountered file operation error: call = ifs_open/read / code = 3588 (No device available)
/ bytes transferred = 0
*Mar 1 00:00:07.375: %LINEPROTO-5-UPDOWN: Line protocol on Interface VoIP-Null0, changed state to up
*Mar 1 00:00:07.379: %LINEPROTO-5-UPDOWN: Line protocol on Interface IPv6-mpls, changed state to up
*Mar 1 00:00:07.703: %SYS-5-CONFIG I: Configured from memory by console
*Mar 1 00:00:08.003: %LINK-5-CHANGED: Interface FastEthernet0/0, changed state to administratively down
*Mar 1 00:00:08.003: %LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administratively down
*Mar 1 00:00:08.455: %SYS-5-RESTART: System restarted --
Cisco IOS Software, 2600 Software (C2691-ADVENTERPRISEK9-M), Version 12.4(25d), RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2010 by Cisco Systems, Inc.
Compiled Wed 18-Aug-10 05:35 by prod_rel_team
*Mar 1 00:00:08.467: %SNMP-5-COLDSTART: SNMP agent on host R1 is undergoing a cold start
*Mar 1 00:00:09.003: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to down
*Mar 1 00:00:09.003: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#interface fastEthernet 0/0
R1(config-if)#ip address 192.168.1.254 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#
*Mar 1 00:06:01.411: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:06:02.411: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R1(config-if)#interface fastEthernet 0/1
R1(config-if)#ip address 192.168.2.254 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#
*Mar 1 00:08:48.831: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
```

Ping FE0/0 from PC1 and FE0/1 from PC2. Does it work? Why? (Remember that you can use Wireshark to view the traffic on a network link — use it to help answer these questions.)

```
PC1> ping 192.168.1.254 255.255.255.0
84 bytes from 192.168.1.254 icmp_seq=1 ttl=255 time=94.555 ms
84 bytes from 192.168.1.254 icmp_seq=2 ttl=255 time=6.779 ms
84 bytes from 192.168.1.254 icmp_seq=3 ttl=255 time=13.263 ms
84 bytes from 192.168.1.254 icmp_seq=4 ttl=255 time=9.029 ms
84 bytes from 192.168.1.254 icmp_seq=5 ttl=255 time=7.720 ms
```

```
PC2> ping 192.168.2.254
84 bytes from 192.168.2.254 icmp_seq=1 ttl=255 time=9.237 ms
84 bytes from 192.168.2.254 icmp_seq=2 ttl=255 time=7.513 ms
84 bytes from 192.168.2.254 icmp_seq=3 ttl=255 time=5.130 ms
84 bytes from 192.168.2.254 icmp_seq=4 ttl=255 time=10.233 ms
84 bytes from 192.168.2.254 icmp_seq=5 ttl=255 time=9.036 ms
```

The pings work because FE0/0 and FE0/1 are in the same subnet as PC1 and PC2.

Ping FE0/1 from PC1. Does it work? Why?

```
PC1> ping 192.168.2.254 255.255.255.0
No gateway found
```

The ping failed because PC1 and FE0/1 are on different subnets and router hasn't been configured to route traffic between these two subnets.

In order to set the gateway for PC1, use the command `ip 192.168.1.1 192.168.1.254/24` on the VPC interface.

```
PC1> ip 192.168.1.1 192.168.1.254/24
Checking for duplicate address...
PC1 : 192.168.1.1 255.255.255.0 gateway 192.168.1.254
```

Try pinging PC2 from PC1. It shouldn't work. Why?

```
PC1> ping 192.168.2.1
192.168.2.1 icmp_seq=1 timeout
192.168.2.1 icmp_seq=2 timeout
192.168.2.1 icmp_seq=3 timeout
192.168.2.1 icmp_seq=4 timeout
192.168.2.1 icmp_seq=5 timeout
```

Pinging PC2 from PC1 doesn't work as it is not configured to route traffic between the two subnets.

Fix the problem you identified in the previous question.

```
PC2> ip 192.168.2.1 192.168.2.254/24
Checking for duplicate address...
PC1 : 192.168.2.1 255.255.255.0 gateway 192.168.2.254
```

```
PC1> ping 192.168.2.1
84 bytes from 192.168.2.1 icmp_seq=1 ttl=63 time=20.357 ms
84 bytes from 192.168.2.1 icmp_seq=2 ttl=63 time=15.456 ms
84 bytes from 192.168.2.1 icmp_seq=3 ttl=63 time=19.306 ms
84 bytes from 192.168.2.1 icmp_seq=4 ttl=63 time=14.880 ms
```