Good job!

You have successfully identified the correct answers.

1. A router is not needed to forward packets between local hosts on the network.
2. The default gateway is the IP address of a router on the local network.
3. The commands **netstat -r** and **route print** will display the routing table of a Windows host.

You answered 3 out of 3 questions correctly.

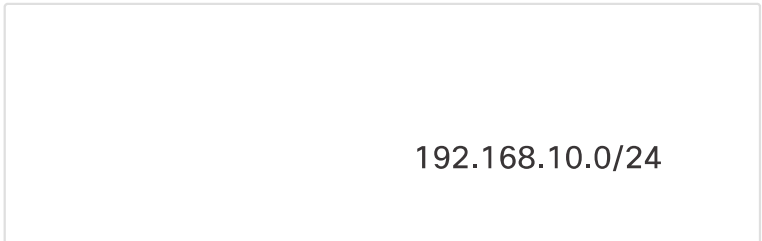
Host Forwarding Decision

With both IPv4 and IPv6, packets are always created at the source host. The source host must be able to direct the packet to the destination host. To do this, host end devices create their own routing table. This topic discusses how end devices use routing tables.

Another role of the network layer is to direct packets between hosts. A host can send a packet to the following:

- **Itself** – A host can ping itself by sending a packet to a special IPv4 address of 127.0.0.1 or an IPv6 address ::1, which is referred to as the loopback interface. Pinging the loopback interface tests the TCP/IP protocol stack on the host.
- **Local host** – This is a destination host that is on the same local network as the sending host. The source and destination hosts share the same network address.
- **Remote host** – This is a destination host on a remote network. The source and destination hosts do not share the same network address.

The figure illustrates PC1 connecting to a local host on the same network, and to a remote host located on another network.

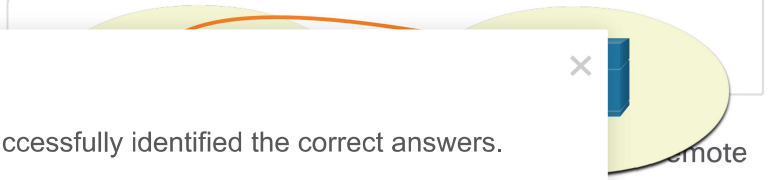


Good job!

You have successfully identified the correct answers.

1. A router is not needed to forward packets between local hosts on the network.
2. The default gateway is the IP address of a router on the local network.
3. The commands **netstat -r** and **route print** will display the routing table of a Windows host.

You answered 3 out of 3 questions correctly.



emote
The source
n IP
e device
s by IP

ubnet mask
stination

- **In IPv6** – The local router advertises the local network address (prefix) to all devices on the network.

In a home or business network, you may have several wired and wireless devices interconnected together using an intermediary device, such as a LAN switch or a wireless access point (WAP). This intermediary device provides interconnections between local hosts on the local network. Local hosts can reach each other and share information without the need for any additional devices. If a host is sending a packet to a device that is configured with the same IP network as the host device, the packet is simply forwarded out of the host interface, through the intermediary device, and to the destination device directly.

Of course, in most situations we want our devices to be able to connect beyond the local network segment, such as out to other homes, businesses, and the internet. Devices that are beyond the local network segment are known as remote hosts. When a source device sends a packet to a remote destination device, then the help of routers and routing is needed. Routing is the process of identifying the best path to a destination. The router connected to the local network segment is referred to as the default gateway.

8.4.2

Default Gateway

Good job!

You have successfully identified the correct answers.

1. A router is not needed to forward packets between local hosts on the network.
2. The default gateway is the IP address of a router on the local network.
3. The commands **netstat -r** and **route print** will display the routing table of a Windows host.

You answered 3 out of 3 questions correctly.

The default gateway is the network device (i.e., router or
etworks. If
om, then
ant to get
ne doorway.

outer with

ss range as

d forward

- It routes traffic to other networks.

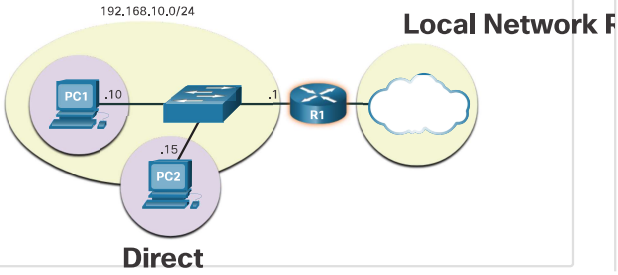
A default gateway is required to send traffic outside of the local network. Traffic cannot be forwarded outside the local network if there is no default gateway, the default gateway address is not configured, or the default gateway is down.

8.4.3

A Host Routes to the Default Gateway

A host routing table will typically include a default gateway. In IPv4, the host receives the IPv4 address of the default gateway either dynamically from Dynamic Host Configuration Protocol (DHCP) or configured manually. In IPv6, the router advertises the default gateway address or the host can be configured manually.

In the figure, PC1 and PC2 are configured with the IPv4 address of 192.168.10.1 as the default gateway.



Having a default gateway configured creates a default
Connection
route is the
it tries to

send all

Good job!

You have successfully identified the correct answers.

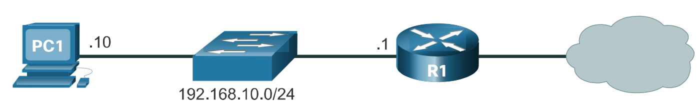
1. A router is not needed to forward packets between local hosts on the network.
2. The default gateway is the IP address of a router on the local network.
3. The commands **netstat -r** and **route print** will display the routing table of a Windows host.

You answered 3 out of 3 questions correctly.

Host Routing Tables

On a Windows host, the **route print** or **netstat -r** command can be used to display the host routing table. Both commands generate the same output. The output may seem overwhelming at first, but is fairly simple to understand.

The figure displays a sample topology and the output generated by the **netstat -r** command.



IPv4 Routing Table for PC1

```
C:\Users\PC1> netstat -r
(output omitted)
IPv4 Route Table
===============================================

Active Routes:
Network Destination          Netmask
Gateway         Interface     Metric
          0.0.0.0            0.0.0.0
192.168.10.1   192.168.10.10       25
        127.0.0.0          255.0.0.0
On-link         127.0.0.1       306
        127.0.0.1    255.255.255.255
On-link         127.0.0.1       306
  127.255.255.255    255.255.255.255
On-link         127.0.0.1       306
```

192.168.10.0 255.255.255.0

Good job!

You have successfully identified the correct answers.

1. A router is not needed to forward packets between local hosts on the network.
2. The default gateway is the IP address of a router on the local network.
3. The commands **netstat -r** and **route print** will display the routing table of a Windows host.

You answered 3 out of 3 questions correctly.

Show Menu

8 Network Layer

8.4.4 Host Routing Tables

8.4.5 Check Your Understa a Host Routes

8.5 Introduction to Routing

8.6 Module Practice and Quiz

9 Address Resolution

On-link 192.168.10.10 281
(output omitted)

Note: The output only displays the IPv4 route table.

Entering the **netstat -r** command or the equivalent **route print** command displays three sections related to the

11 IPv4 Addressing

12 IPv6 Addressing

13 ICMP

14 Transport Layer

15 Application Layer

16 Network Security Fundamentals

17 Build a Small Network

network-capable interface on the host, including Ethernet, Wi-Fi, and Bluetooth adapters.

- **IPv4 Route Table -** Lists all known IPv4 routes, including direct connections, local network, and local default routes.
- **IPv6 Route Table -** Lists all known IPv6 routes, including direct connections, local network, and local default routes.

8.4.5

Check Your Understanding - How a Host Routes

Check your understanding of how a host routes by choosing the BEST answer to the following questions.

Good job!

You have successfully identified the correct answers.

1. A router is not needed to forward packets between local hosts on the network.
2. The default gateway is the IP address of a router on the local network.
3. The commands **netstat -r** and **route print** will display the routing table of a Windows host.

You answered 3 out of 3 questions correctly.

1. Which statement about host forwarding decisions is

me local

out the

cover the

best path to a destination.

2. Which default gateway statement is true?

You got it!

- A default gateway is required to send packets to other hosts on the local network.
- The default gateway address is the IP address of a switch on a remote network.
- The default gateway address is the IP address of the router on the local network.
- Traffic can only be forwarded outside the local network if there is no default gateway.

3. Which two commands could be entered on a Windows host to view its IPv4 and IPv6 routing table? (Choose two.)

You got it!

- [ ] **netroute -l**
- [x] **netstat -r**
- [ ] **print route**
- [x] **route print**
- [ ] **print net**

Check

Show Me

Show Me

Good job!

You have successfully identified the correct answers.

1. A router is not needed to forward packets between local hosts on the network.
2. The default gateway is the IP address of a router on the local network.
3. The commands **netstat -r** and **route print** will display the routing table of a Windows host.

You answered 3 out of 3 questions correctly.

8.5 Rout...