

Configure the Default Gateway

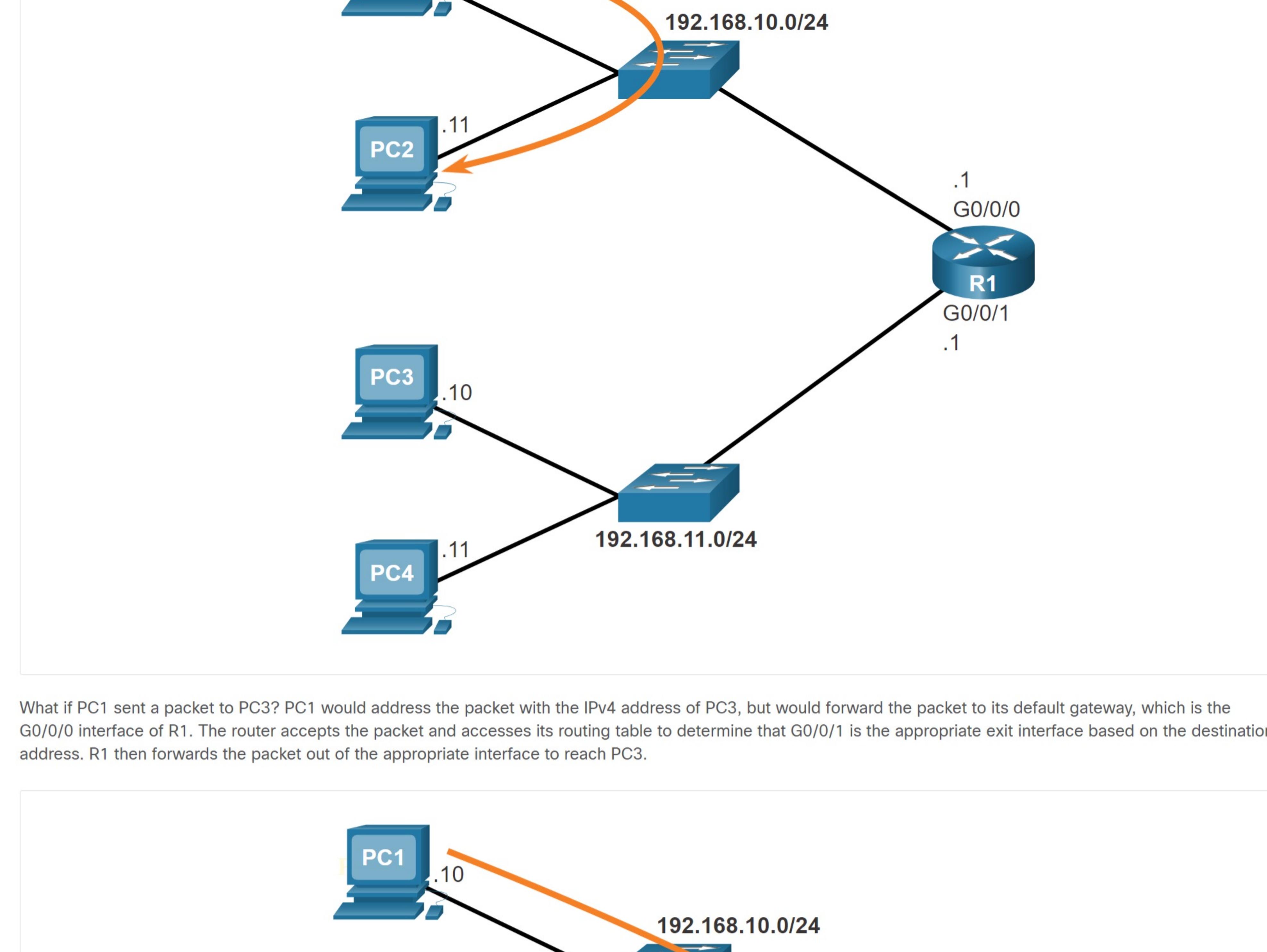
Default Gateway on a Host

If your local network has only one router, it will be the gateway router and all hosts and switches on your network must be configured with this information. If your local network has multiple routers, you must select one of them to be the default gateway router. This topic explains how to configure the default gateway on hosts and switches.

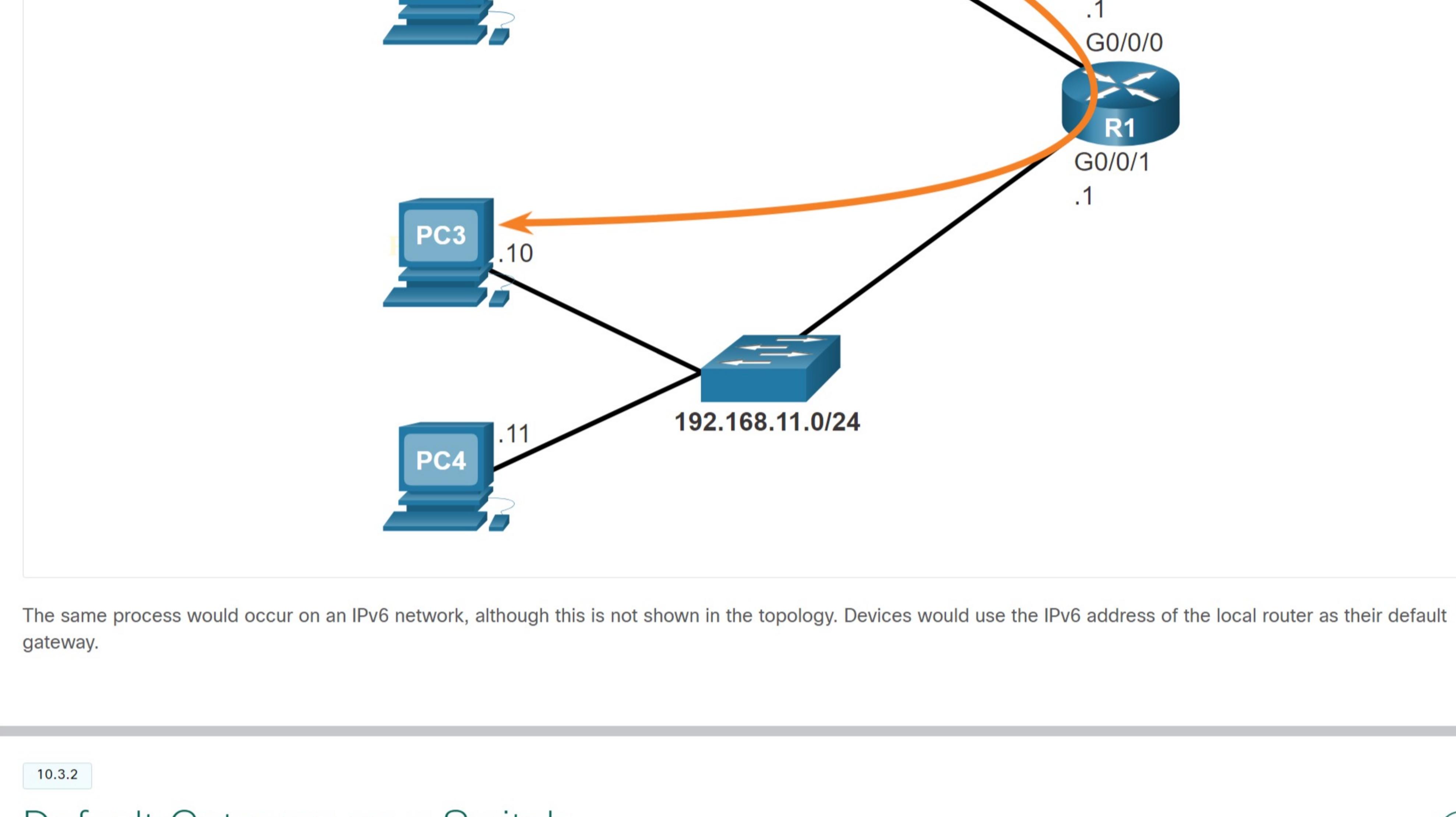
For an end device to communicate over the network, it must be configured with the correct IP address information, including the default gateway address. The default gateway is only used when the host wants to send a packet to a device on another network. The default gateway address is generally the router interface address attached to the local network of the host. The IP address of the host device and the router interface address must be in the same network.

For example, assume an IPv4 network topology consisting of a router interconnecting two separate LANs. G0/0/0 is connected to network 192.168.10.0, while G0/0/1 is connected to network 192.168.11.0. Each host device is configured with the appropriate default gateway address.

In this example, if PC1 sends a packet to PC2, then the default gateway is not used. Instead, PC1 addresses the packet with the IPv4 address of PC2 and forwards the packet directly to PC2 through the switch.



What if PC1 sent a packet to PC3? PC1 would address the packet with the IPv4 address of PC3, but would forward the packet to its default gateway, which is the G0/0/0 interface of R1. The router accepts the packet and accesses its routing table to determine that G0/0/1 is the appropriate exit interface based on the destination address. R1 then forwards the packet out of the appropriate interface to reach PC3.



The same process would occur on an IPv6 network, although this is not shown in the topology. Devices would use the IPv6 address of the local router as their default gateway.

Default Gateway on a Switch

A switch that interconnects client computers is typically a Layer 2 device. As such, a Layer 2 switch does not require an IP address to function properly. However, an IP configuration can be configured on a switch to give an administrator remote access to the switch.

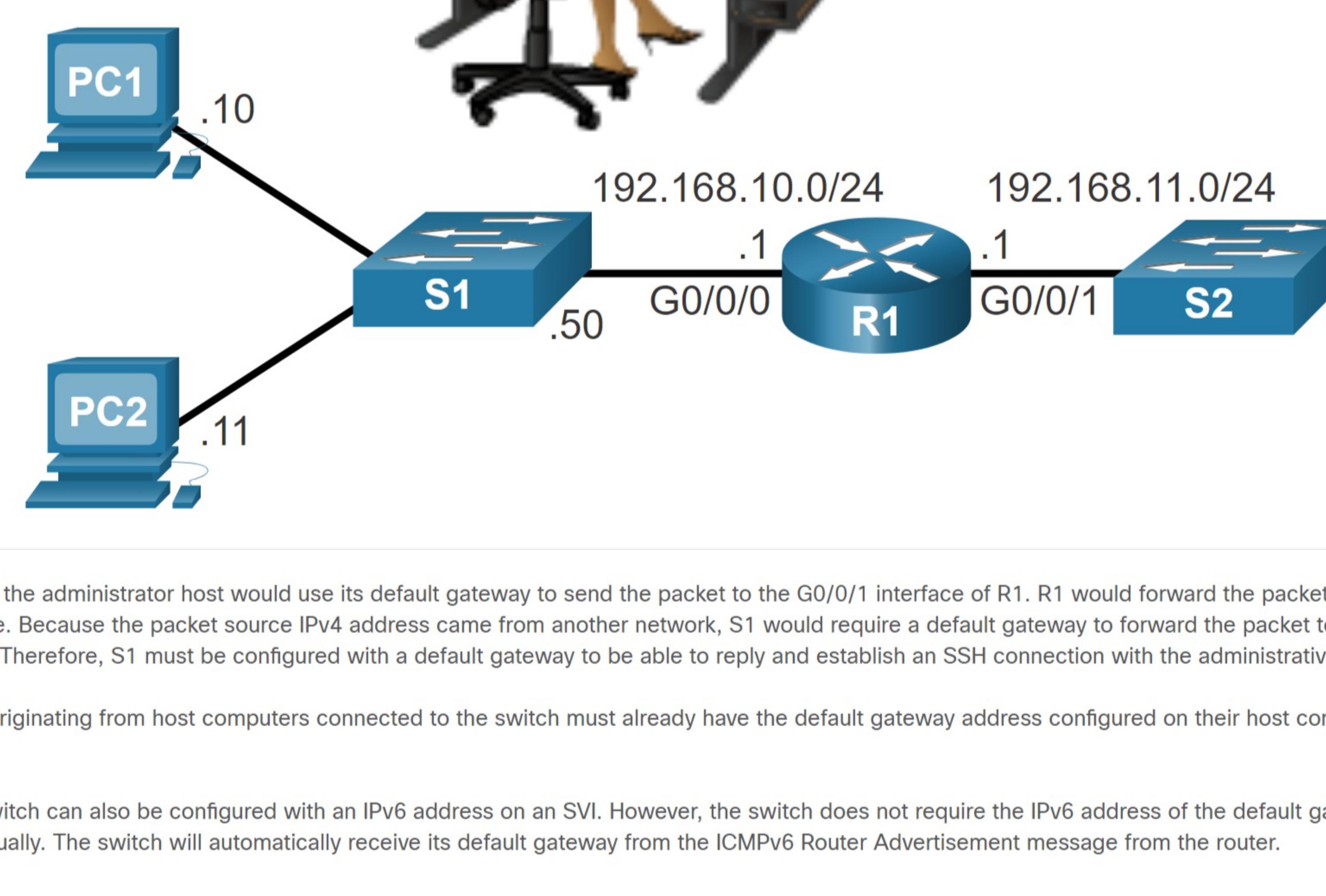
To connect to and manage a switch over a local IP network, it must have a switch virtual interface (SVI) configured. The SVI is configured with an IPv4 address and subnet mask on the local LAN. The switch must also have a default gateway address configured to remotely manage the switch from another network.

The default gateway address is typically configured on all devices that will communicate beyond their local network.

To configure an IPv4 default gateway on a switch, use the `ip default-gateway ip-address` global configuration command. The `ip-address` that is configured is the IPv4 address of the local router interface connected to the switch.

The figure shows an administrator establishing a remote connection to switch S1 on another network.

```
S1# show running-config
Building configuration...
!
<Output Omitted>
service password-encryption
!
hostname S1
!
Interface Vlan1
 ip address 192.168.10.50.255.255.0
!
<Output Omitted>
!
ip default-gateway 192.168.10.1
<Output Omitted>
```



In this example, the administrator host would use its default gateway to send the packet to the G0/0/1 interface of R1. R1 would forward the packet to S1 out of its G0/0/0 interface. Because the packet source IPv4 address came from another network, S1 would require a default gateway to forward the packet to the G0/0/0 interface of R1. Therefore, S1 must be configured with a default gateway to be able to reply and establish an SSH connection with the administrative host.

Note: Packets originating from host computers connected to the switch must already have the default gateway address configured on their host computer operating systems.

A workgroup switch can also be configured with an IPv6 address on an SVI. However, the switch does not require the IPv6 address of the default gateway to be configured manually. The switch will automatically receive its default gateway from the ICMPv6 Router Advertisement message from the router.

Syntax Checker - Configure the Default Gateway

Use this syntax checker to practice configuring the default gateway of a Layer 2 switch.

```
Enter global configuration mode.

S1# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.

Configure 192.168.10.1 as the default gateway for S1.

S1(config)# ip default-gateway 192.168.10.1
S1(config)#
You have successfully set the default gateway on switch S1.
```

Packet Tracer - Connect a Router to a LAN

In this activity, you will use various `show` commands to display the current state of the router. You will then use the Addressing Table to configure router Ethernet interfaces. Finally, you will use commands to verify and test your configurations.

Connect a Router to a LAN

Packet Tracer - Troubleshoot Default Gateway Issues

For a device to communicate across multiple networks, it must be configured with an IP address, subnet mask, and a default gateway. The default gateway is used when the host wants to send a packet to a device on another network. The default gateway address is generally the router interface address attached to the local network to which the host is connected. In this activity, you will finish documenting the network. You will then verify the network documentation by testing end-to-end connectivity and troubleshooting issues. The troubleshooting method you will use consists of the following steps:

1. Verify the network documentation and use tests to isolate problems.

2. Determine an appropriate solution for a given problem.

3. Implement the solution.

4. Test to verify the problem is resolved.

5. Document the solution.

Troubleshoot Default Gateway Issues

Troubleshoot Default Gateway Issues