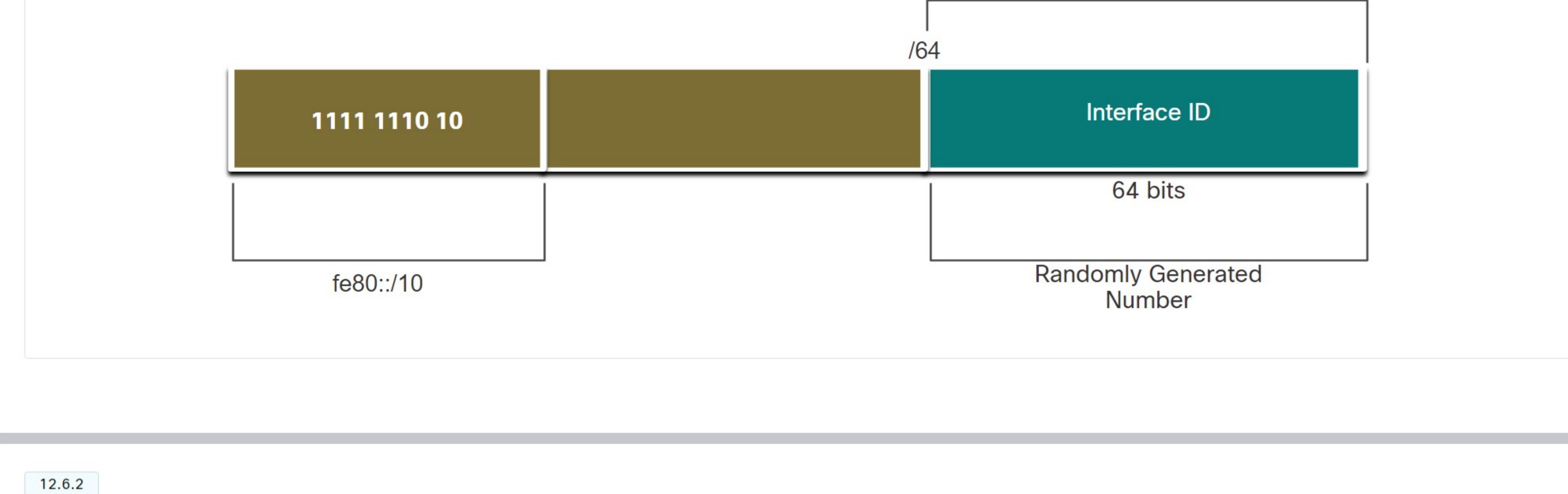


## Dynamic Addressing for IPv6 LLAs

### Dynamic LLAs

All IPv6 devices must have an IPv6 LLA. Like IPv6 GUAs, you can also create LLAs dynamically. Regardless of how you create your LLAs (and your GUAs), it is important that you verify all IPv6 address configuration. This topic explains dynamically generated LLAs and IPv6 configuration verification.

The figure shows the LLA is dynamically created using the fe80::/10 prefix and the interface ID using the EUI-64 process, or a randomly generated 64-bit number.



### Dynamic LLAs on Windows

Operating systems, such as Windows, will typically use the same method for both a SLAAC-created GUA and a dynamically assigned LLA. See the highlighted areas in the following examples that were shown previously.

#### EUI-64 Generated Interface ID

```
C:\> ipconfig
Windows IP Configuration
Ethernet adapter Local Area Connection:
  Connection-specific DNS Suffix . :
  IPv6 Address . . . . . : 2001:db8:acad:1:fc99:47ff:fe75:ce0
  Link-local IPv6 Address . . . . : fe80::fc99:47ff:fe75:ce0
  Default Gateway . . . . . : fe80::1

C:\>
```

#### Random 64-Bit Generated Interface ID

```
C:\> ipconfig
Windows IP Configuration
Ethernet adapter Local Area Connection:
  Connection-specific DNS Suffix . :
  IPv6 Address . . . . . : 2001:db8:acad:1:50a5:8a35:a5bb:66e1
  Link-local IPv6 Address . . . . : fe80::50a5:8a35:a5bb:66e1
  Default Gateway . . . . . : fe80::1

C:\>
```

### Dynamic LLAs on Cisco Routers

Cisco routers automatically create an IPv6 LLA whenever a GUA is assigned to the interface. By default, Cisco IOS routers use EUI-64 to generate the interface ID for all LLAs on IPv6 interfaces. For serial interfaces, the router will use the MAC address of an Ethernet interface. Recall that an LLA must be unique only on that link or network. However, a drawback to using the dynamically assigned LLA is its long interface ID, which makes it challenging to identify and remember assigned addresses. The example displays the MAC address on the GigabitEthernet 0/0/0 interface of router R1. This address is used to dynamically create the LLA on the same interface, and also for the Serial 0/1/0 interface.

To make it easier to recognize and remember these addresses on routers, it is common to statically configure IPv6 LLAs on routers.

#### IPv6 LLA Using EUI-64 on Router R1

```
R1# show interface gigabitEthernet 0/0/0
GigabitEthernet0/0/0 is up, line protocol is up
  Hardware is ISR4221-2x1GE, address is 7079.b392.3640 (bia 7079.b392.3640)
  (Output omitted)
R1# show ipv6 interface brief
GigabitEthernet0/0/0 [up/up]
  FE80::7279:B3FF:FE92:3640
  2001:DB8:ACAD:1::1
GigabitEthernet0/0/1 [up/up]
  FE80::7279:B3FF:FE92:3641
  2001:DB8:ACAD:2::1
Serial0/1/0 [up/up]
  FE80::7279:B3FF:FE92:3640
  2001:DB8:ACAD:3::1
Serial0/1/1 [down/down]
  unassigned
R1#
```

### Verify IPv6 Address Configuration

The figure shows the example topology.



Click each button for the output and a description of the command.

[show ipv6 interface brief](#) [show ipv6 route](#) [ping](#)

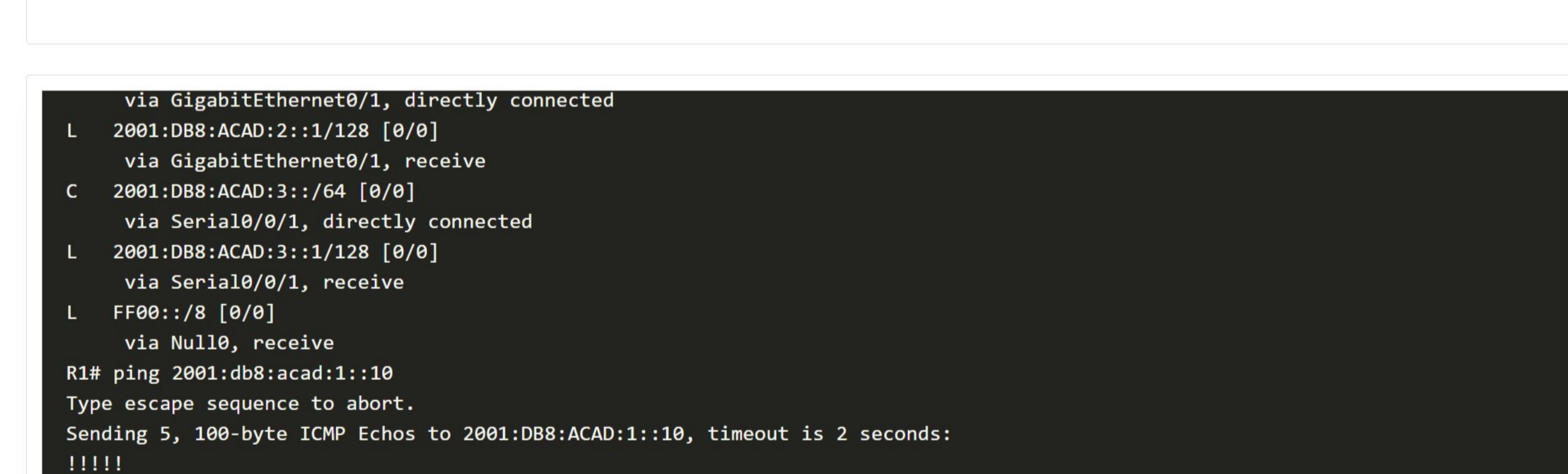
The ping command for IPv6 is identical to the command used with IPv4, except that an IPv6 address is used. As shown in the example, the command is used to verify Layer 3 connectivity between R1 and PC1. When pinging an LLA from a router, Cisco IOS will prompt the user for the exit interface. Because the destination LLA can be on one or more of its links or networks, the router needs to know which interface to send the ping to.

#### The ping Command on R1

```
R1# ping 2001:db8:acad:1::10
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2001:DB8:ACAD:1::10, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
R1#
```

### Syntax Checker – Verify IPv6 Address Configuration

Use show commands to verify IPv6 address configuration on router R1 interfaces.



```
Via GigabitEthernet0/1, directly connected
L 2001:DB8:ACAD:2::1/128 [0/0]
  via GigabitEthernet0/1, receive
C 2001:DB8:ACAD:3::/64 [0/0]
  via Serial0/0/1, directly connected
L 2001:DB8:ACAD:3::1/128 [0/0]
  via Serial0/0/1, receive
L FE80::/0 [0/0]
  via Null0, receive
R1# ping 2001:db8:acad:1::10
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2001:DB8:ACAD:1::10, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
You successfully verified IPv6 address configuration.
```

[Reset](#) [Show Me](#) [Show All](#)

### Packet Tracer – Configure IPv6 Addressing

In this activity, you will practice configuring IPv6 addresses on a router, servers, and clients. You will also practice verifying your IPv6 addressing implementation.

[Configure IPv6 Addressing](#)

[+ Configure IPv6 Addressing](#)