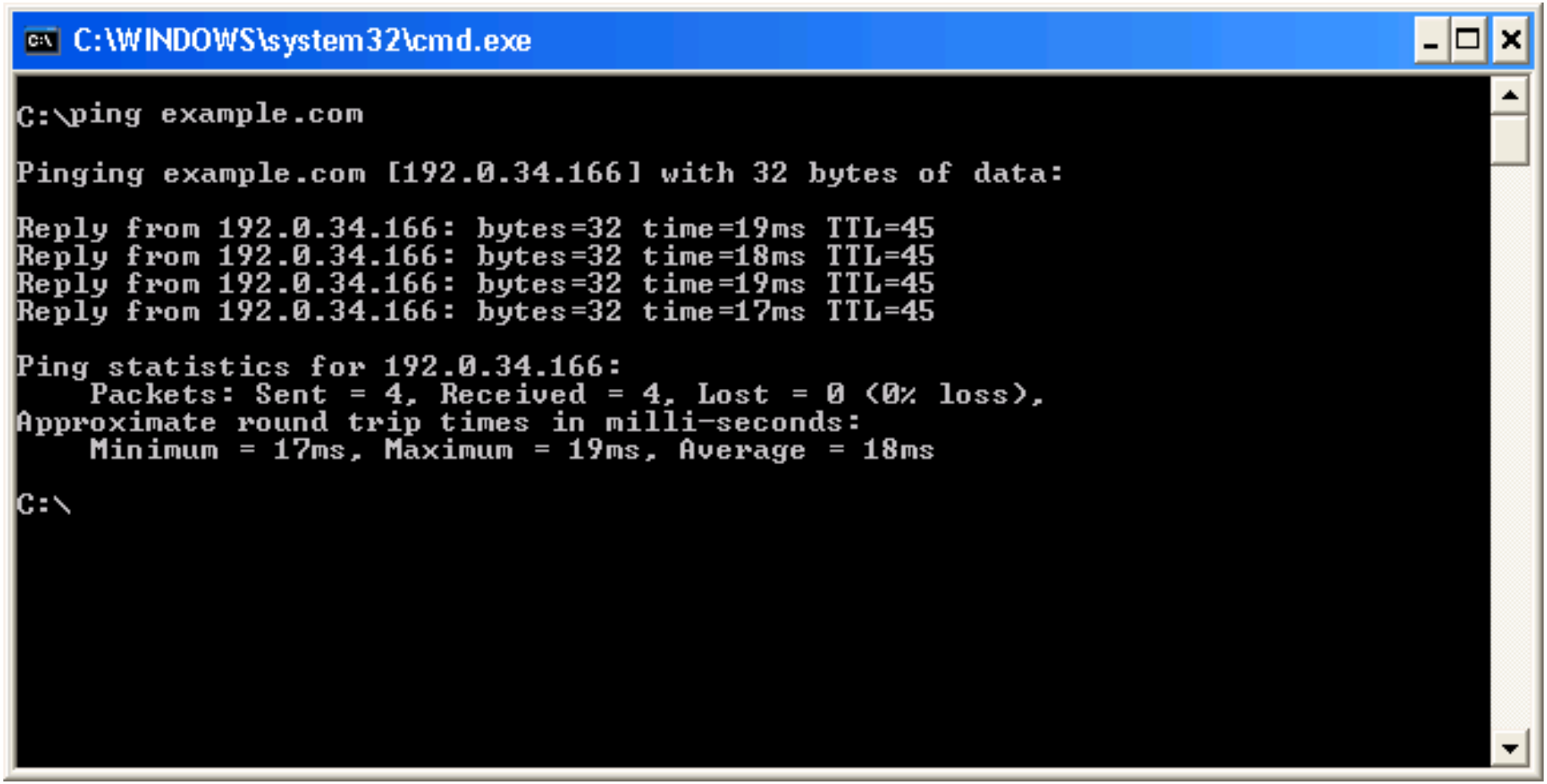
ICMP and Traceroute

Host-Based Tools: ping

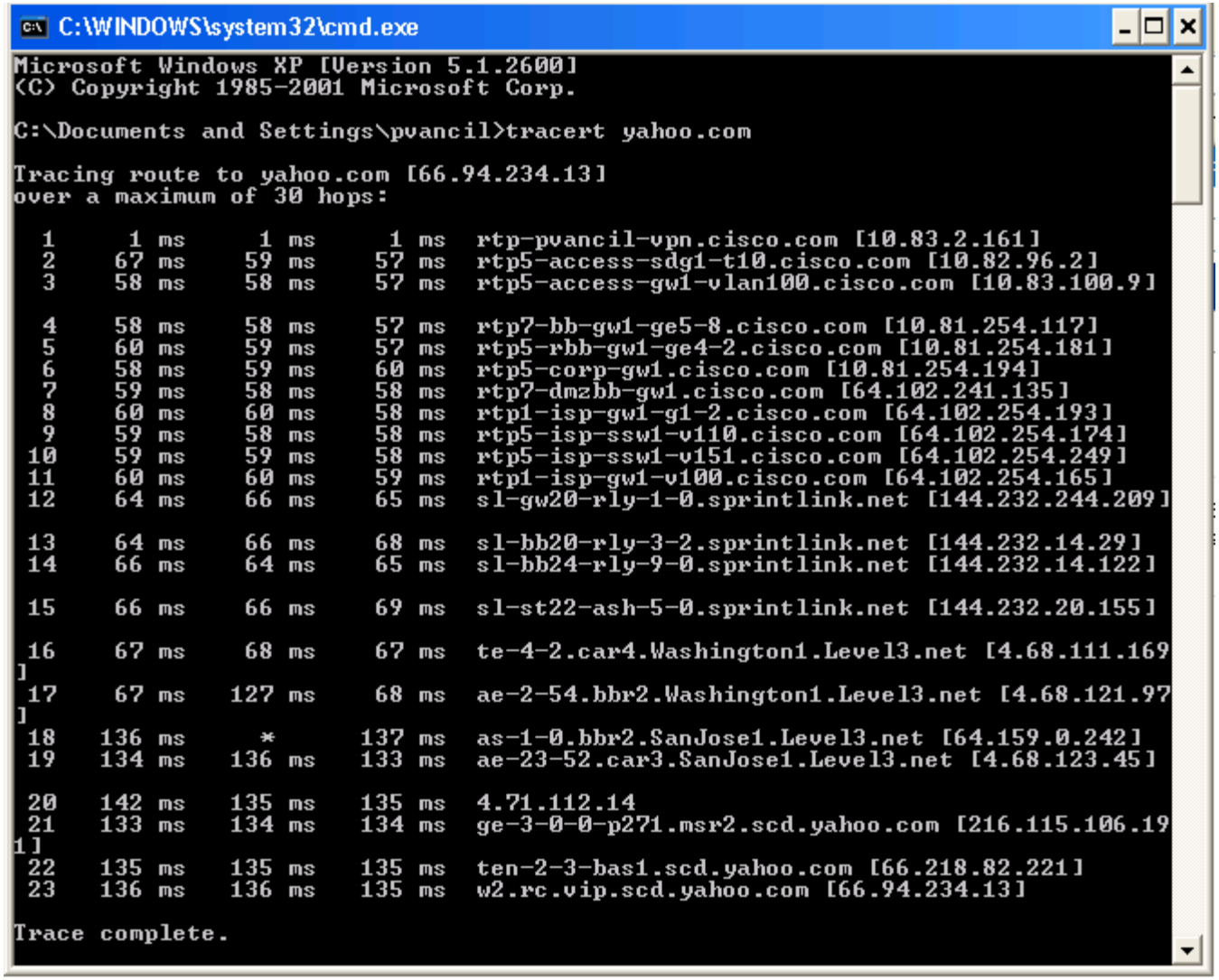


ping

```
Router# ping [[protocol {host-name | system-address}]
```

- To diagnose basic network connectivity, use the ping command in user EXEC or privileged EXEC mode.

Host-Based Tools: tracert



traceroute

```
Router# traceroute [protocol] destination
```

- To discover the routes that packets will actually take when traveling to their destination address, use the traceroute command in user EXEC or privileged EXEC mode.

Redundancy in Static Route

IP SLA

Cisco IOS IP SLA

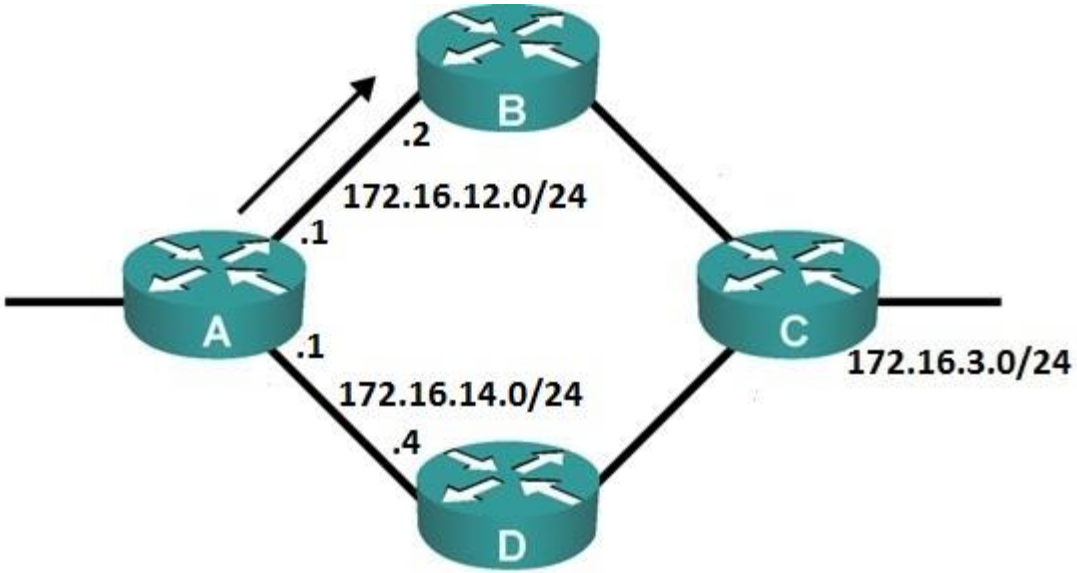
- Cisco IOS IP Service Level Agreement (SLA) performs network performance measurement within Cisco System devices.
- IP SLA actively sends data across the network in a continuous, reliable, predictable manner to measure performance between multiple network locations or across multiple network paths.
- The following steps are required to configure Cisco IP SLA:
  - Define one or more probes.
  - Define one or more tracking objects.
  - Define the action for each tracking object.

Using IP SLA

The administrator can use IP SLA for choose the primary path and backup path for a topology using only static routing.

Considering the following example:

- The administrator at router A wants to use the path transit through B as the primary path to subnet 172.16.3.0/24 and the path transit through D is used as the backup path.
- The routing technique is used is static routing.



Using IP SLA (Cont.)

- Static routes on router A are configured using AD to establish primary route and backup route:

```
A(config)#ip route 172.16.3.0 255.255.255.0 172.16.12.2 5
A(config)#ip route 172.16.3.0 255.255.255.0 172.16.14.4 10
```

- With the configuration above, if the link connect router A and router B down, static route with next – hop is router D will be used to forward traffic to subnet 172.16.3.0.
- However, if the link is down at router B, router A cannot discover this breakdown and the redundancy is not perfomed.
- The solution to the above issue is to use Cisco IP SLA functionality , which can be used to continuously check the reachability of a specific next – hop IP and conditionally announce the static route if the connectivity is verified.

Using IP SLA (Cont.)

```
A(config)#ip sla 1
A(config-ip-sla)#icmp-echo 172.16.12.2 source-ip 172.16.12.1
A(config-ip-sla-echo)#frequency 10
A(config-ip-sla-echo)#exit
A(config)#ip sla schedule 1 start-time now life forever
```

- Set the probe to send an ICMP packet every 10 seconds to IP address 172.16.12.2.
- Start sending packets now and continues forever.

```
A(config)#track 1 ip sla 1 reachability
```

- Define the tracking of object 1 linked to IP SLA 1.

```
A(config)#ip route 172.16.3.0 255.255.255.0 172.16.12.2 5
track 1
```

- Announces the static route with next – hop IP 172.16.12.2 with administrative distance of 5 if tracking object 1 is true.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