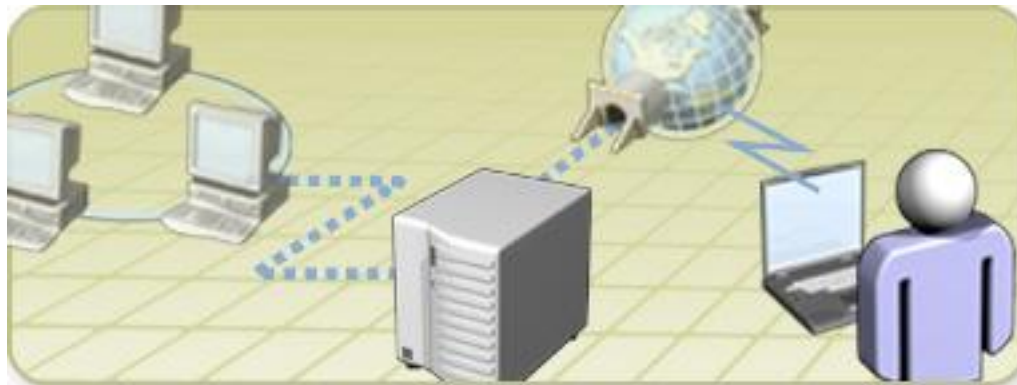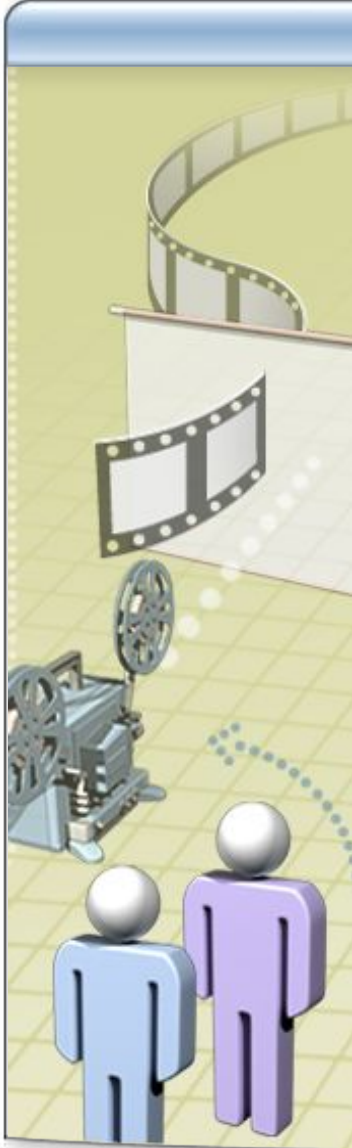# Module 1: Configuring Routing by Using Routing and Remote Access

Overview

- **Multimedia: The Role of Routing in the Network Infrastructure**

- **Enabling and Configuring the Routing and Remote Access Service**

- **Configuring Packet Filters**

Multimedia: The Role of Routing in the Network Infrastructure

- **The objective of this presentation is to provide a high-level overview of routing in the network infrastructure**

- **After this presentation, you will be able to:**

    - Describe how routing fits into the network infrastructure

    - Explain the difference between local and remote routing

    - Describe how the Microsoft routing solution fits into the network infrastructure
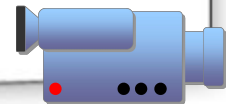
Lesson: Enabling and Configuring the Routing and Remote Access Service

- **What Are Routers?**

- **What Are Routing Interfaces?**

- **What Are Routing Protocols?**

- **What Are Routing Tables?**

- **Why Use the Windows Server 2003 Routing and Remote Access Service?**

- **How to Enable and Configure the Routing and Remote Access Service**

- **How to Add a Routing Protocol**

- **How to Add Routing Interface to a Routing Protocol**

What Are Routers?

Routers are an intermediate system at the network layer that is used to connect networks together based on a common network layer protocol

Router types	Example
Hardware router	A device that performs routing as a dedicated function
Software router	A router that is not dedicated to performing routing only, but performs routing as one of multiple processes running on the router computer

Main routing components include:

- **Routing interface**
- **Routing protocol**
- **Routing table**

What Are Routing Interfaces?

A *routing interface* is an interface over which IP packets are forwarded
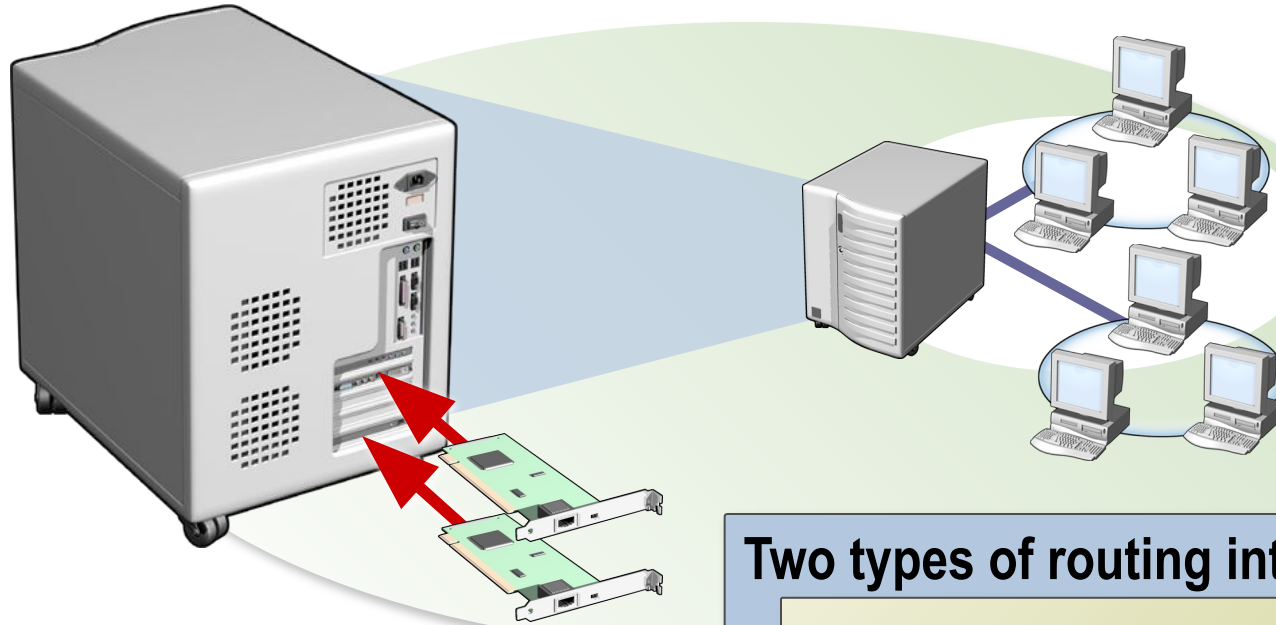
Two types of routing interfaces:

- LAN
- Demand-dial

What Are Routing Protocols?

A *routing protocol* is a set of messages that routers use to determine the appropriate path to forward data

RIP

- Designed for small to medium-size networks
- Uses a routing table
- Easier to configure and manage
- Does not scale well

OSPF

- Designed for large to very large networks
- Uses a link-state database
- Complex to configure and manage
- Operates efficiently in large networks

What Are Routing Tables?

A *routing table* is a series of entries called routes that contain information about the location of the network IDs in the internetwork

```
IPv4 Route Table
===========================================================================
Interface List
0x1 ........................... MS TCP Loopback interface
0x2 ...00 50 56 41 32 54 ...... AMD PCNET Family PCI Ethernet Adapter
0x10004 ...00 50 56 41 32 53 ...... AMD PCNET Family PCI Ethernet Adapter #2
===========================================================================
===========================================================================
Active Routes:
Network Destination        Netmask          Gateway       Interface  Metric
        0.0.0.0            0.0.0.0      192.168.1.30    192.168.1.17     30
      127.0.0.0          255.0.0.0         127.0.0.1       127.0.0.1      1
   192.168.1.16  255.255.255.240      192.168.1.17    192.168.1.17     30
   192.168.1.17  255.255.255.255         127.0.0.1       127.0.0.1     30
   192.168.1.32  255.255.255.240      192.168.1.33    192.168.1.33     30
   192.168.1.33  255.255.255.255         127.0.0.1       127.0.0.1     30
  192.168.1.255  255.255.255.255      192.168.1.17    192.168.1.17     30
  192.168.1.255  255.255.255.255      192.168.1.33    192.168.1.33     30
      224.0.0.0        240.0.0.0      192.168.1.17    192.168.1.17     30
      224.0.0.0        240.0.0.0      192.168.1.33    192.168.1.33     30
255.255.255.255  255.255.255.255      192.168.1.17    192.168.1.17      1
255.255.255.255  255.255.255.255      192.168.1.33    192.168.1.33      1
Default Gateway:        192.168.1.30
===========================================================================
Persistent Routes:
  None
```
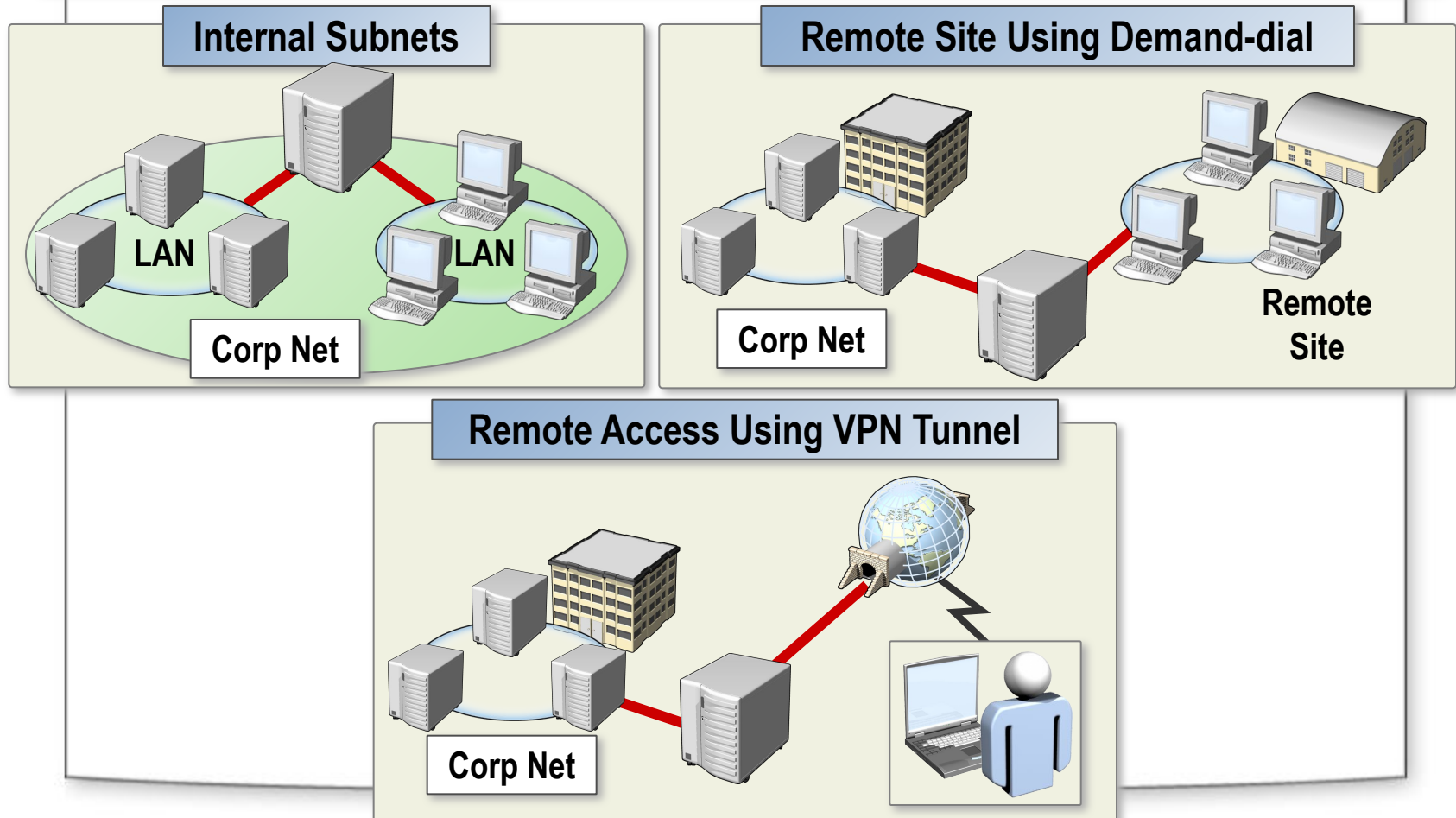
Three types of routing table entries:

- **Network route**
- **Host route**
- **Default route**

Why Use the Windows Server 2003 Routing and Remote Access Service?

Windows Server 2003 Routing and Remote Access is a service that performs routing as one of its multiple processes

Internal Subnets

LAN   LAN

Corp Net

Remote Site Using Demand-dial

Corp Net

Remote Site

Remote Access Using VPN Tunnel

Corp Net

How to Enable and Configure the Routing and Remote Access Service

Your instructor will demonstrate how to enable and configure the Routing and Remote Access service

How to Add a Routing Protocol

Your instructor will demonstrate how to add a routing protocol

How to Add a Routing Interface to a Routing Protocol

Your instructor will demonstrate how to add a routing interface to a routing protocol

# Practice: Enabling and Configuring the Routing and Remote Access Service

In this practice, you will enable and configure routing on the server computer

Lesson: Configuring Packet Filters

- **What Is Packet Filtering?**

- **How Packet Filters Are Applied**

- **How to Configure Packet Filters**

What Is Packet Filtering?

- *Packet filtering* specifies what type of traffic is allowed into and out of a router
- A *packet filter* is a TCP/IP configuration setting that is designed to allow or deny inbound or outbound packets

Router

Inbound Filter

Outbound Filter
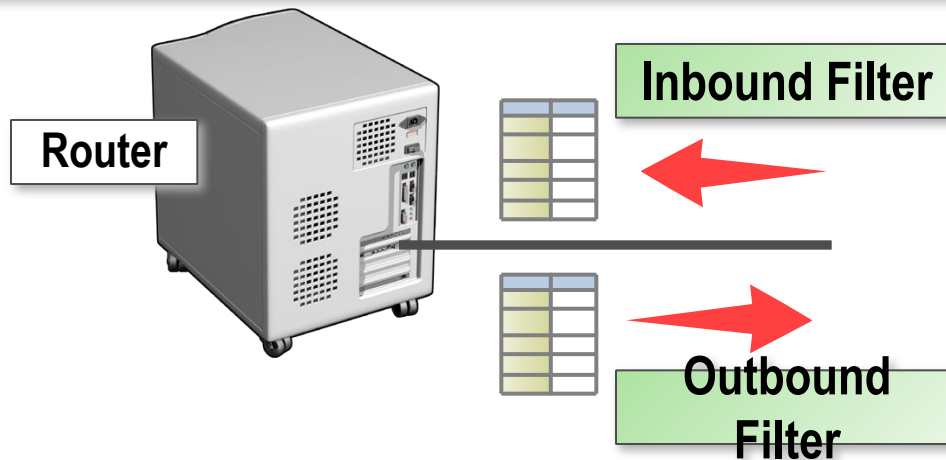
Use packet filtering to:

- Prevent access by unauthorized users
- Prevent access to resources
- Improve performance by preventing unnecessary packets from traveling over a slow connection

How Packet Filters Are Applied

Packet   **Router**
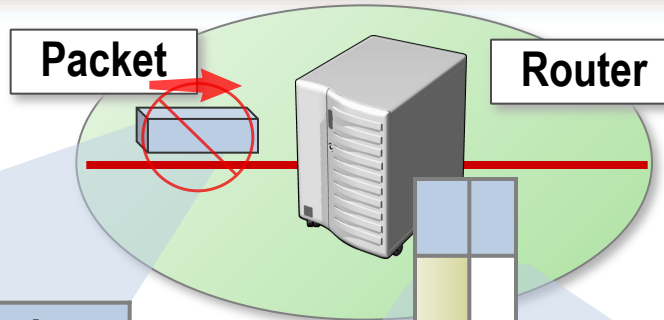
Component	Example
Source network	192.168.0.48
Destination network	192.168.0.32
Protocol	UDP

Inbound Exclusion Filter

Component	Example	
Source network	Any	✓
Destination network	192.168.0.32	✓
Protocol	UDP	✓

Action: Drop

How filters are applied:

- AND is used within a filter
- OR is used between filters

How to Configure Packet Filters

Your instructor will demonstrate how to configure packet filters

Practice: Configuring Packet Filters

In this practice, you will configure a packet filter

Lab A: Configuring Routing by Using Routing and Remote Access

In this lab, you will identify and resolve common issues when configuring routing and packet filters