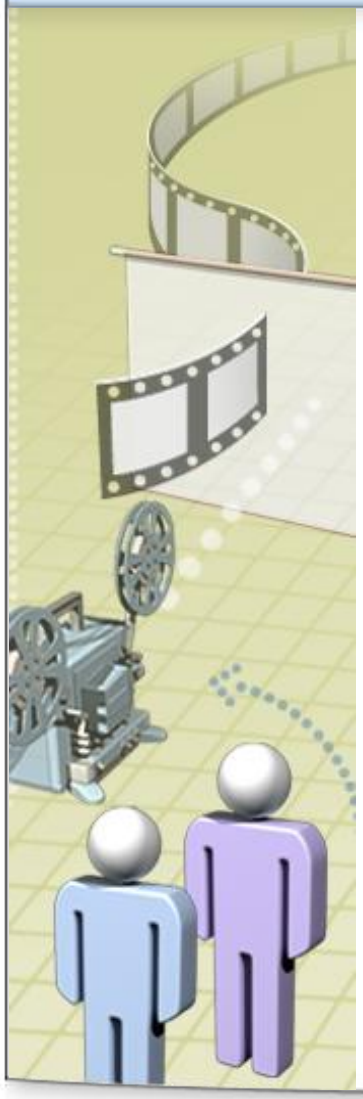
Module 2: Allocating IP Addressing by Using Dynamic Host Configuration Protocol (DHCP)

Overview

- Multimedia: The Role of DHCP in the Network Infrastructure
- Adding and Authorizing a DHCP Server Service
- Configuring a DHCP Scope
- Configuring a DHCP Reservation
- Configuring DHCP Options
- Configuring a DHCP Relay Agent

Multimedia: The Role of DHCP in the Network Infrastructure



- **The objective of this media is to provide a high-level overview of DHCP in the network infrastructure**
- **At the end of this presentation, you will be able to:**
  - Explain what DHCP is
  - Describe how DHCP works
  - Explain how routers can forward DHCP broadcast packets
  - Describe how a DHCP relay agent works

Lesson: Adding and Authorizing a DHCP Server Service

- Why Use DHCP?
- How DHCP Allocates IP Addresses
- How the DHCP Lease Generation Process Works
- How the DHCP Lease Renewal Process Works
- How to Add a DHCP Server Service
- How a DHCP Server Service Is Authorized
- How to Authorize a DHCP Server Service

Why Use DHCP?

DHCP reduces the complexity and amount of administrative work by using automatic TCP/IP configuration

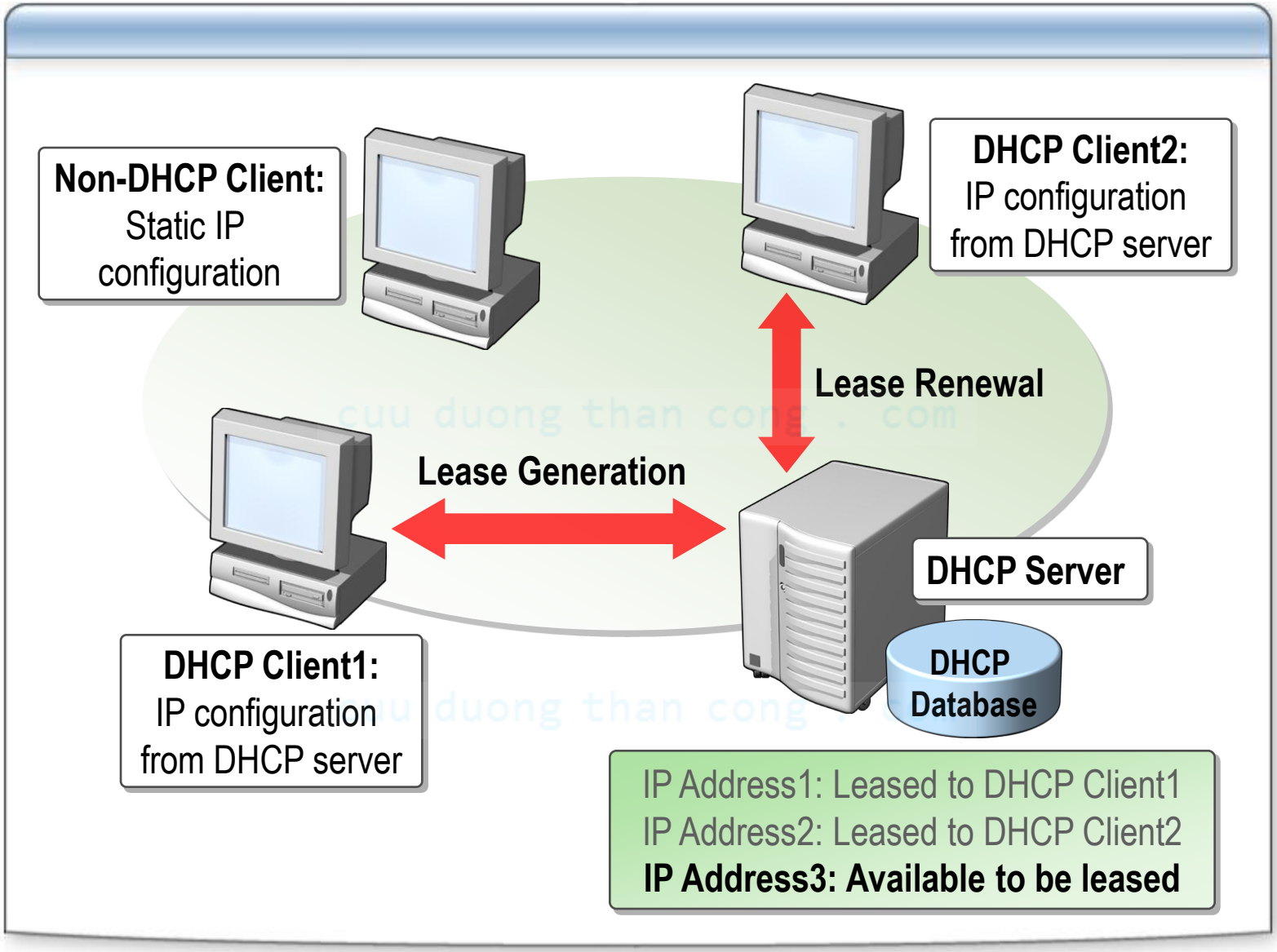
Manual TCP/IP Configuration

- IP addresses are entered manually on each client computer
- Possibility of entering incorrect or invalid IP address
- Incorrect configuration can lead to communication and network issues
- Administrative overload on networks where computers are frequently moved

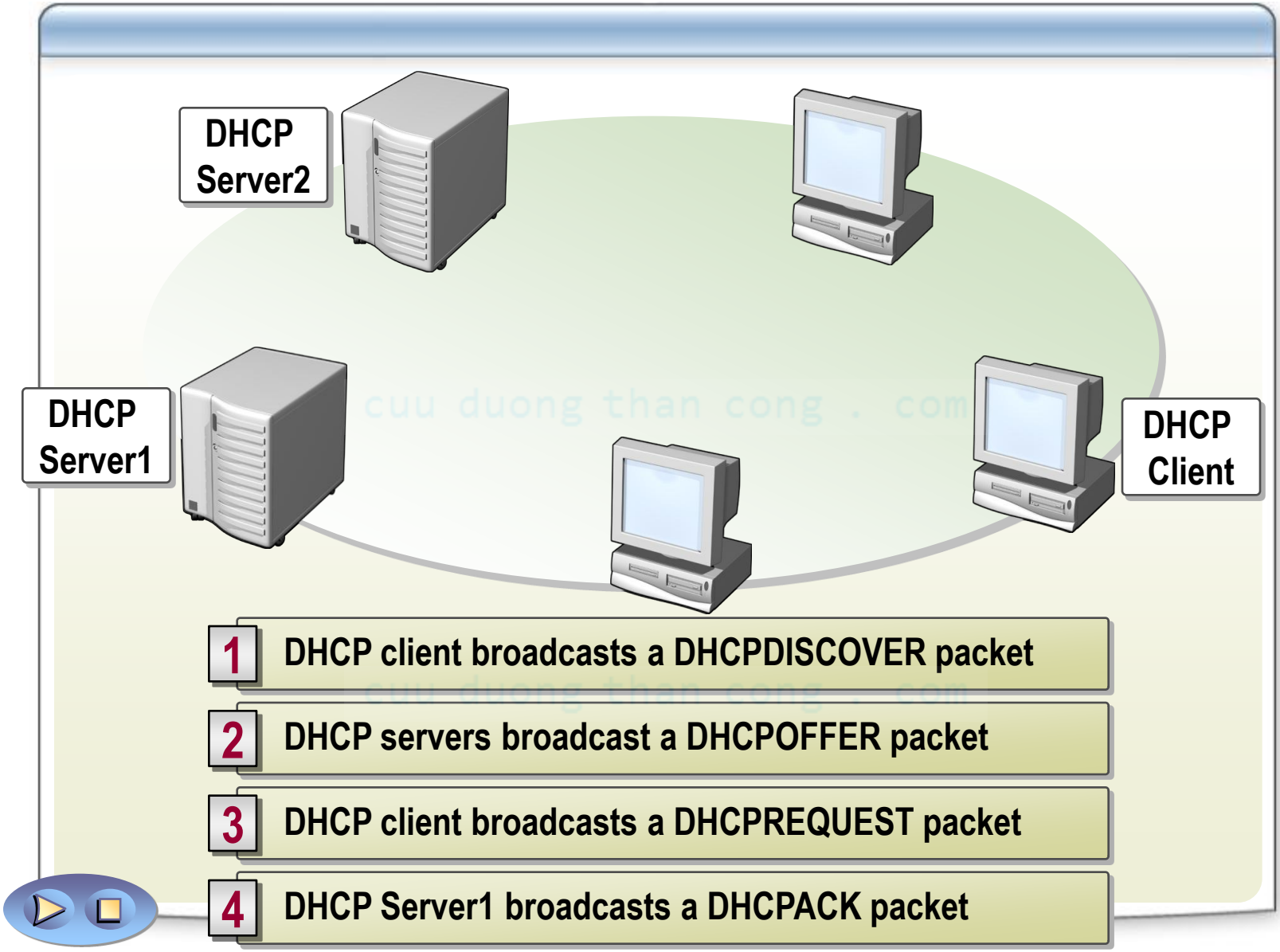
Automatic TCP/IP Configuration

- IP addresses are supplied automatically to client computers
- Ensures that clients always use correct configuration information
- Client configuration is updated automatically to reflect changes in network structure
- Eliminates a common source of network problems

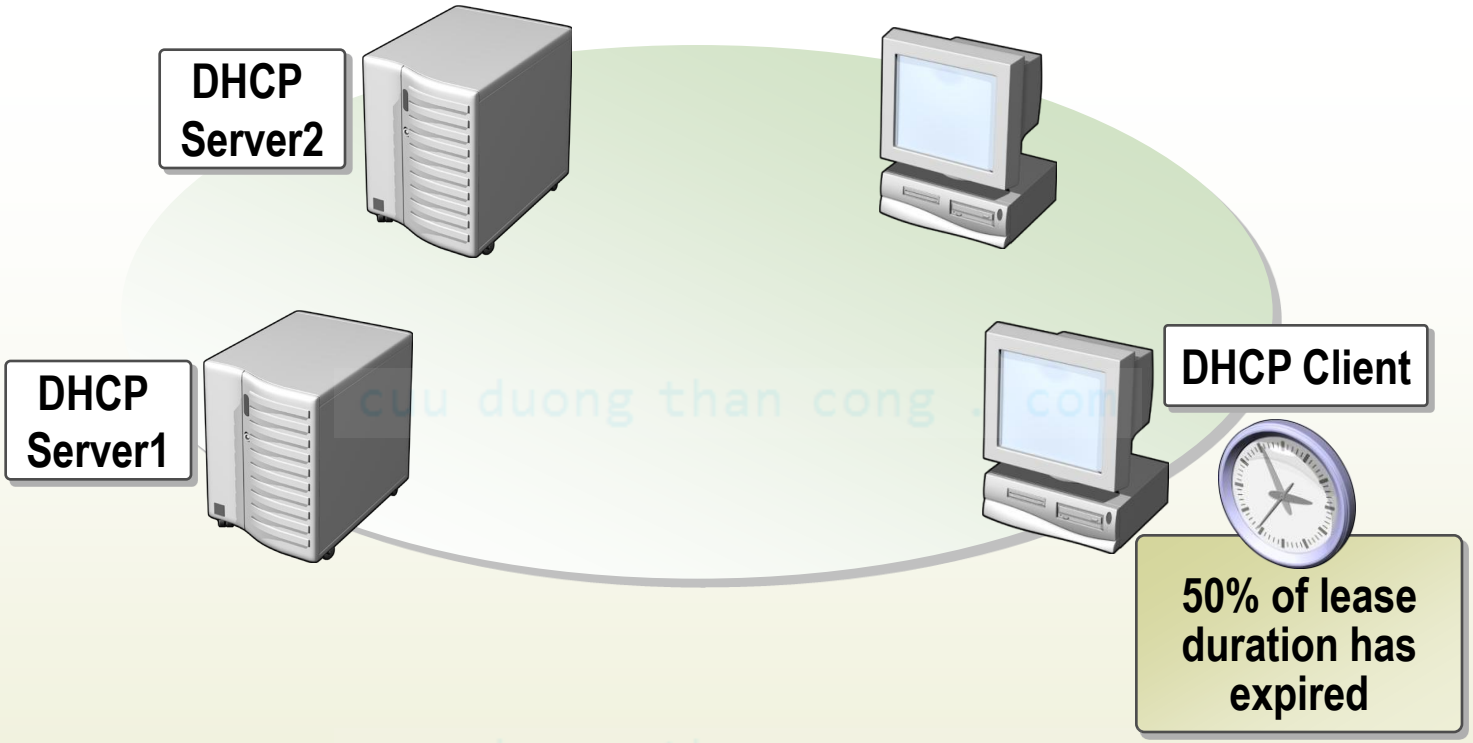
How DHCP Allocates IP Addresses



How the DHCP Lease Generation Process Works



How the DHCP Lease Renewal Process Works



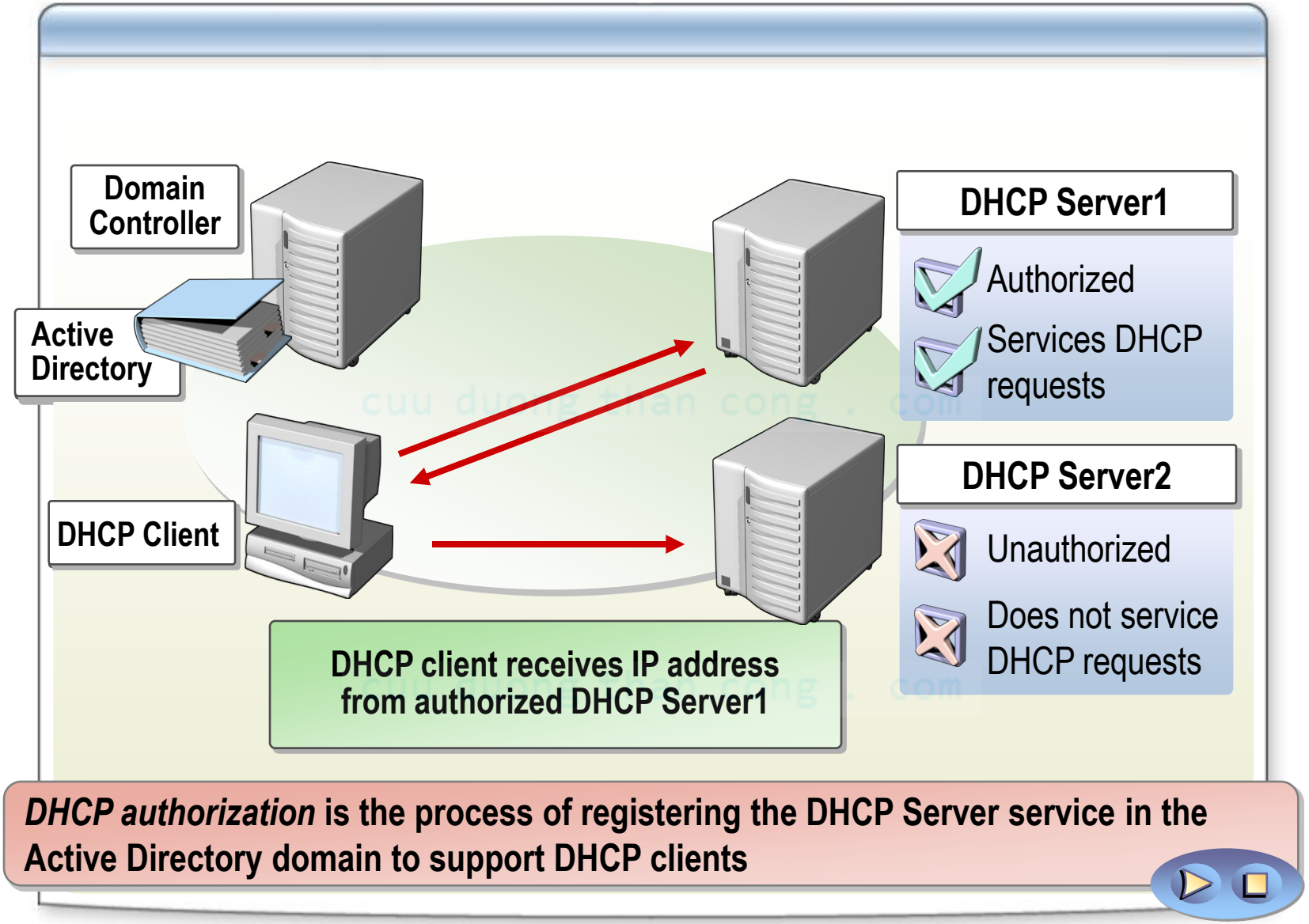
1. DHCP client sends a DHCPREQUEST packet
2. DHCP Server1 sends a DHCPACK packet

How to Add a DHCP Server Service

Your instructor will demonstrate how to:

- Prepare to add a DHCP Server service
- Add a DHCP Server service

How a DHCP Server Service Is Authorized



DHCP authorization **is the process of registering the DHCP Server service in the Active Directory domain to support DHCP clients**

How to Authorize a DHCP Server Service

Your instructor will demonstrate how to:

- Apply the requirement for authorizing a DHCP Server service
- Authorize a DHCP Server service

Practice: Adding and Authorizing a DHCP Server Service

In this practice, you will add and authorize a DHCP Server service

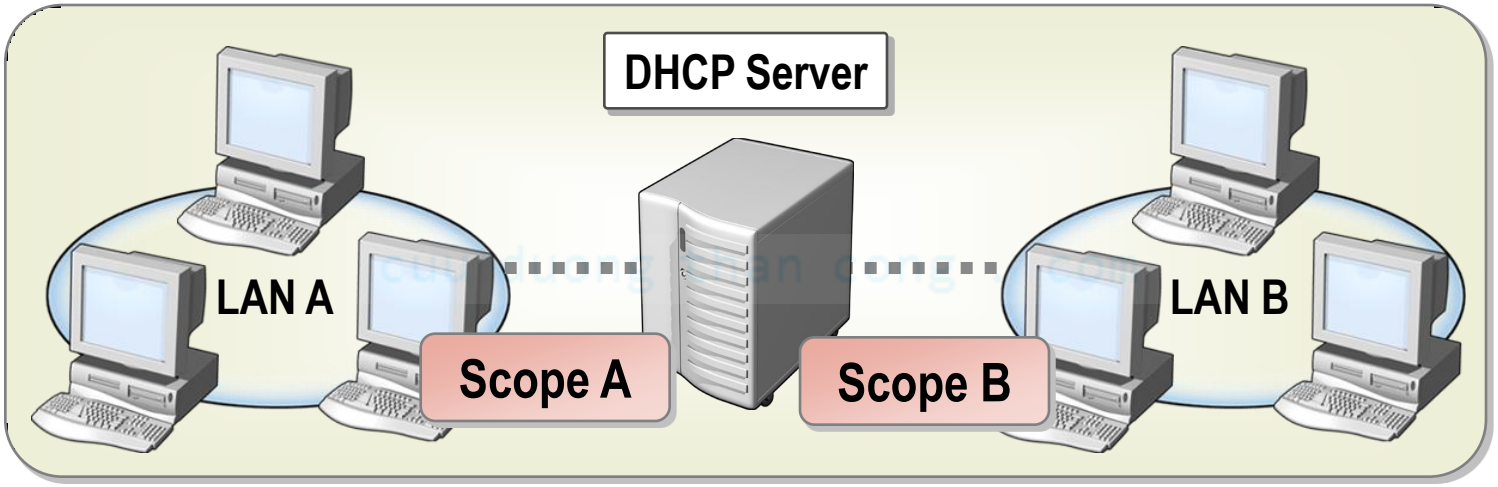
Lesson: Configuring a DHCP Scope

- What Are DHCP Scopes?
- How to Configure a DHCP Scope

cuu duong than cong . com

What Are DHCP Scopes?

A *scope* is a range of IP addresses that are available to be leased



Scope Properties

- Network ID
- Subnet mask
- Network IP address range
- Lease duration
- Router
- Scope name
- Exclusion range

How to Configure a DHCP Scope

Your instructor will demonstrate how to:

- Configure a DHCP scope
- Activate a DHCP scope

Practice: Configuring a DHCP Scope

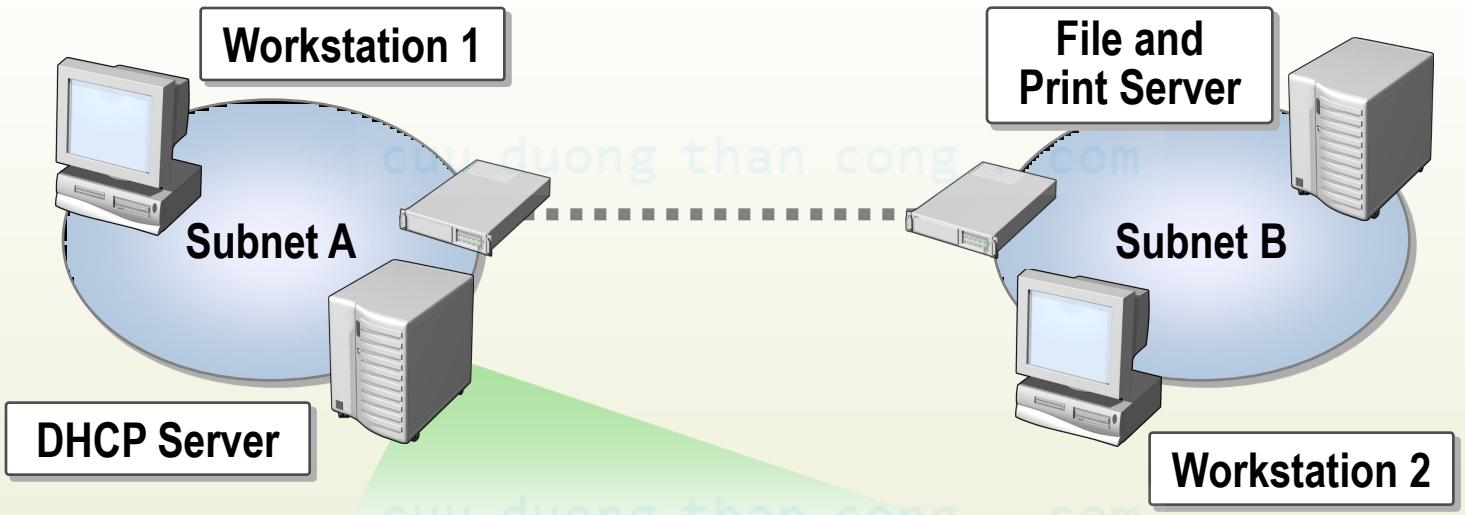
In this practice, you will configure a DHCP scope

Lesson: Configuring a DHCP Reservation

- What Is a DHCP Reservation?
- How to Configure a DHCP Reservation

What Is a DHCP Reservation?

A *reservation* is a specific IP address, within a scope, that is permanently reserved for leased use to a specific DHCP client



How to Configure a DHCP Reservation

Your instructor will demonstrate how to:

- Configure a DHCP reservation
- Verify a DHCP reservation

Practice: Configuring a DHCP Reservation

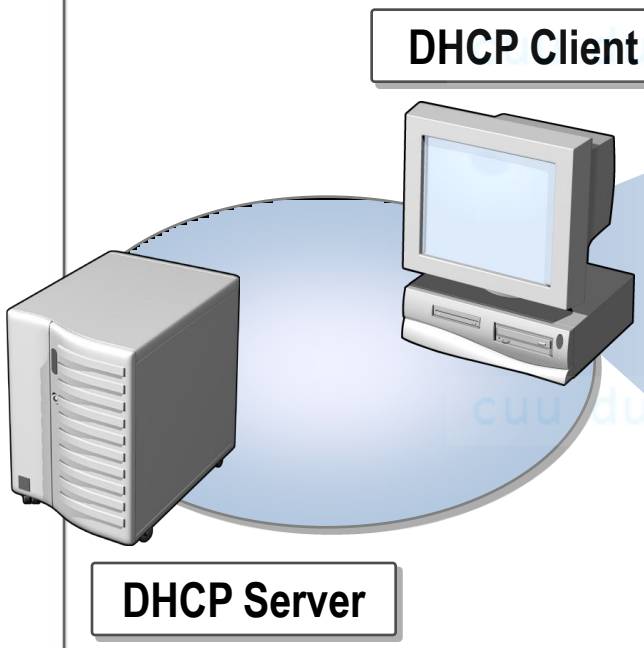
In this practice, you will configure a DHCP reservation

Lesson: Configuring DHCP Options

- What Are DHCP Options?
- How DHCP Server, Scope, and Reserved Client Options Are Applied
- How DHCP Class-level Options Are Applied
- How to Configure DHCP Options

What Are DHCP Options?

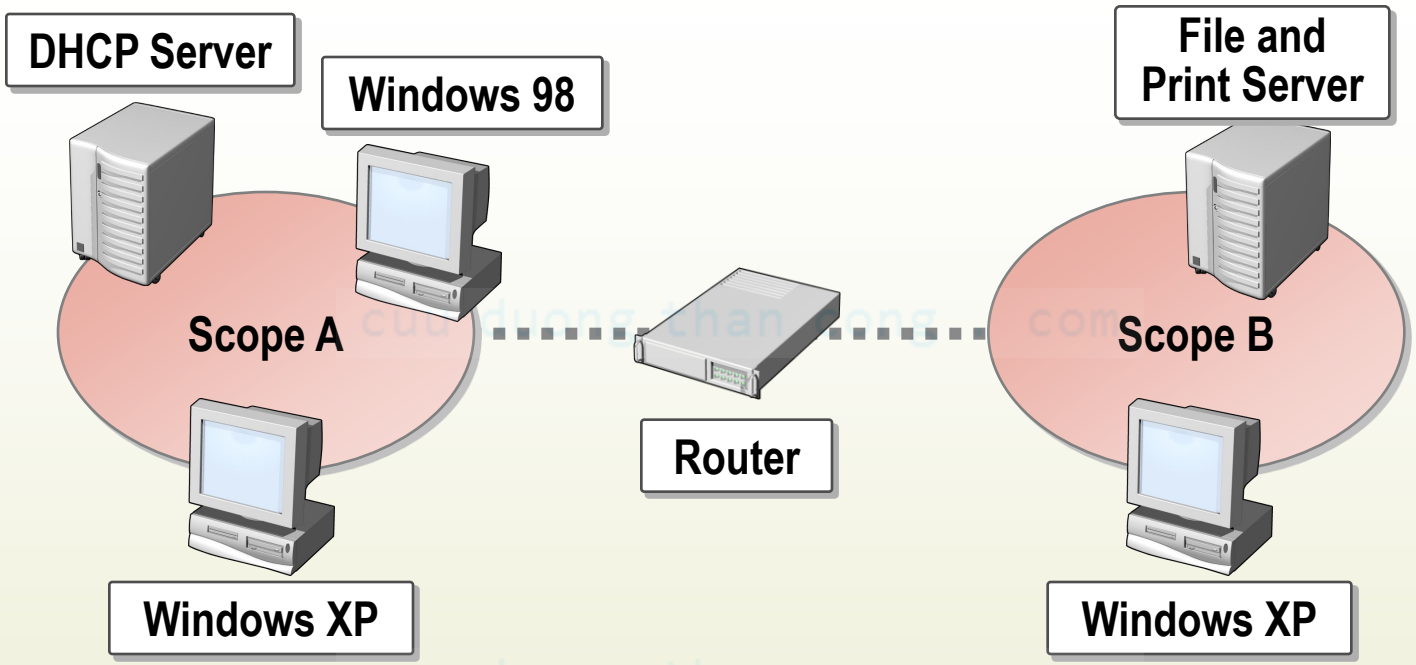
DHCP options **are configuration parameters that a DHCP service assigns to clients along with the IP address and default gateway**



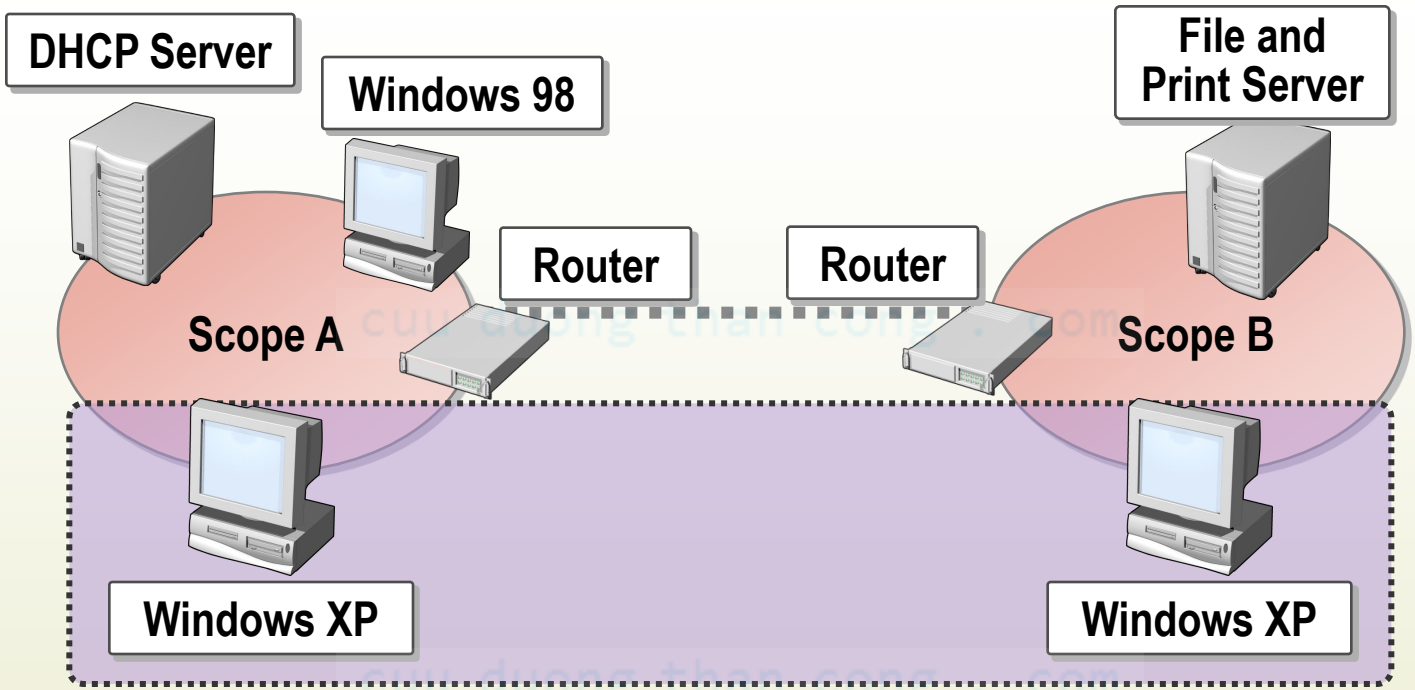
DHCP Client IP Configuration Data

- Client's IP address
- Client's subnet mask
- DHCP options such as:
  - Router's IP address
  - DNS server's IP address
  - WINS server's IP address
  - DNS domain name

How DHCP Server, Scope, and Reserved Client Options Are Applied



How DHCP Class-level Options Are Applied



DHCP option applied at the *class level*

How to Configure DHCP Options

Your instructor will demonstrate how to:

- Configure a DHCP server option
- Configure a DHCP scope option

Practice: Configuring DHCP Options

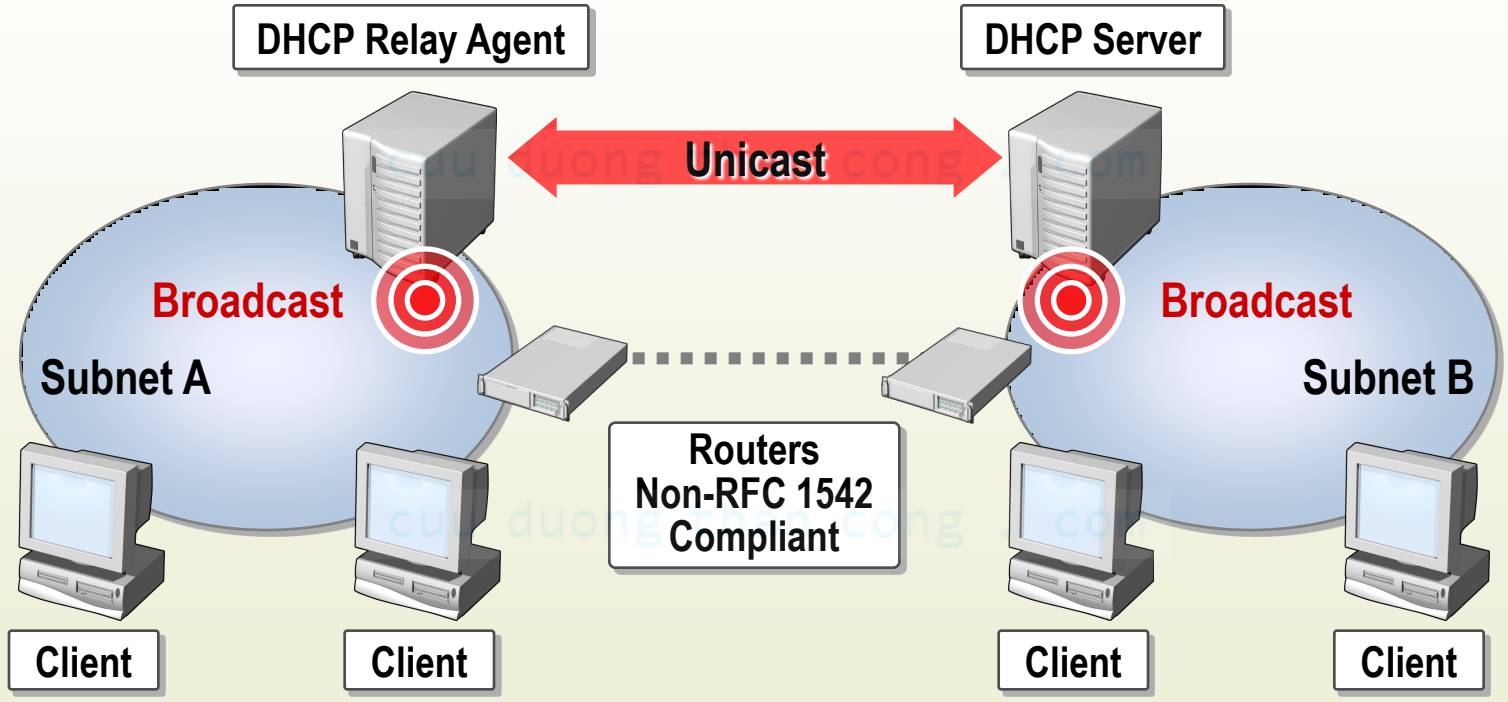
In this practice, you will configure DHCP options

Lesson: Configuring a DHCP Relay Agent

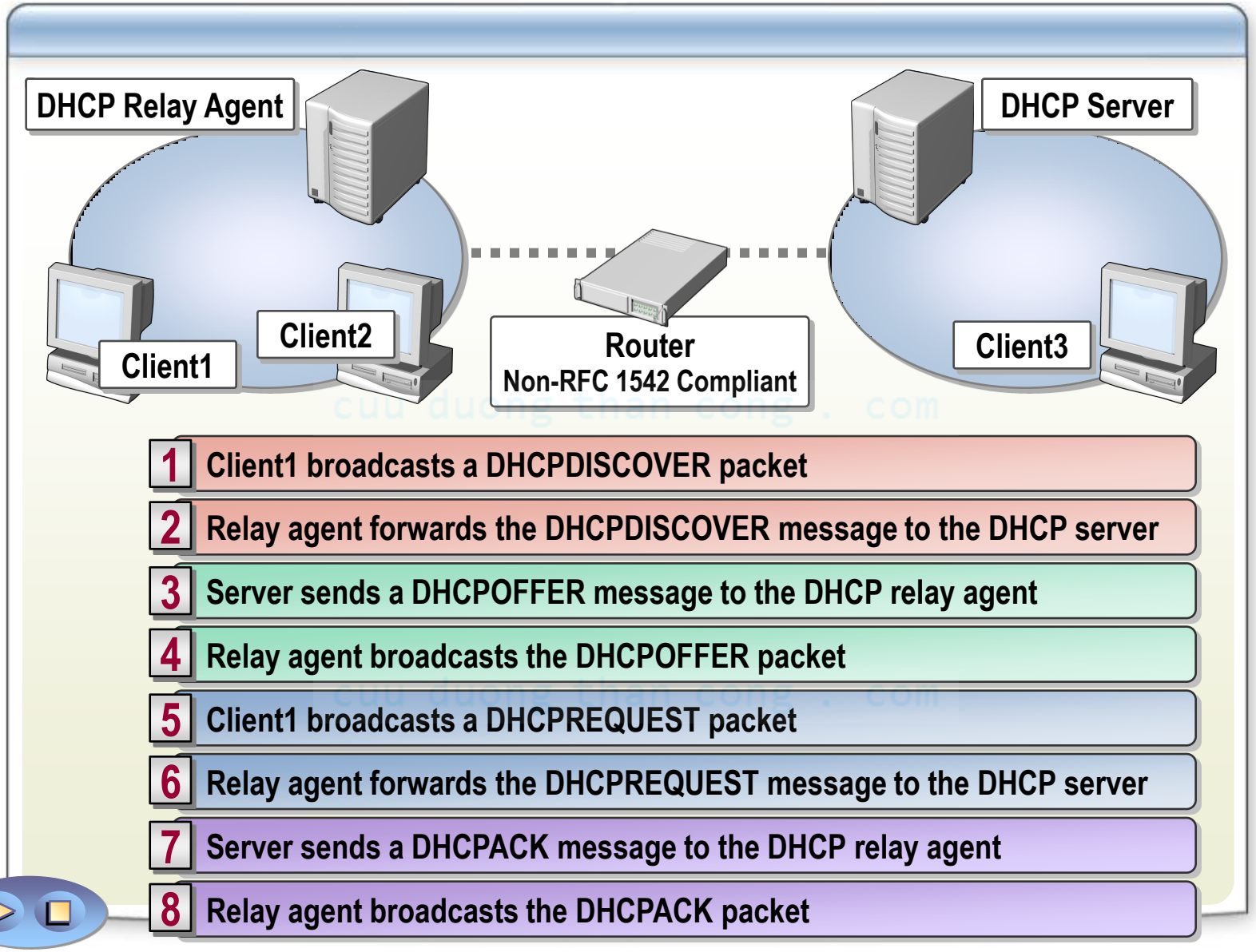
- What Is a DHCP Relay Agent?
- How a DHCP Relay Agent Works
- How a DHCP Relay Agent Uses Hop Count
- How a DHCP Relay Agent Uses Boot Threshold
- How to Configure a DHCP Relay Agent

What Is a DHCP Relay Agent?

A DHCP *relay agent* is a computer or router configured to listen for DHCP/BOOTP broadcasts from DHCP clients and then relay those messages to DCHP servers on different subnets

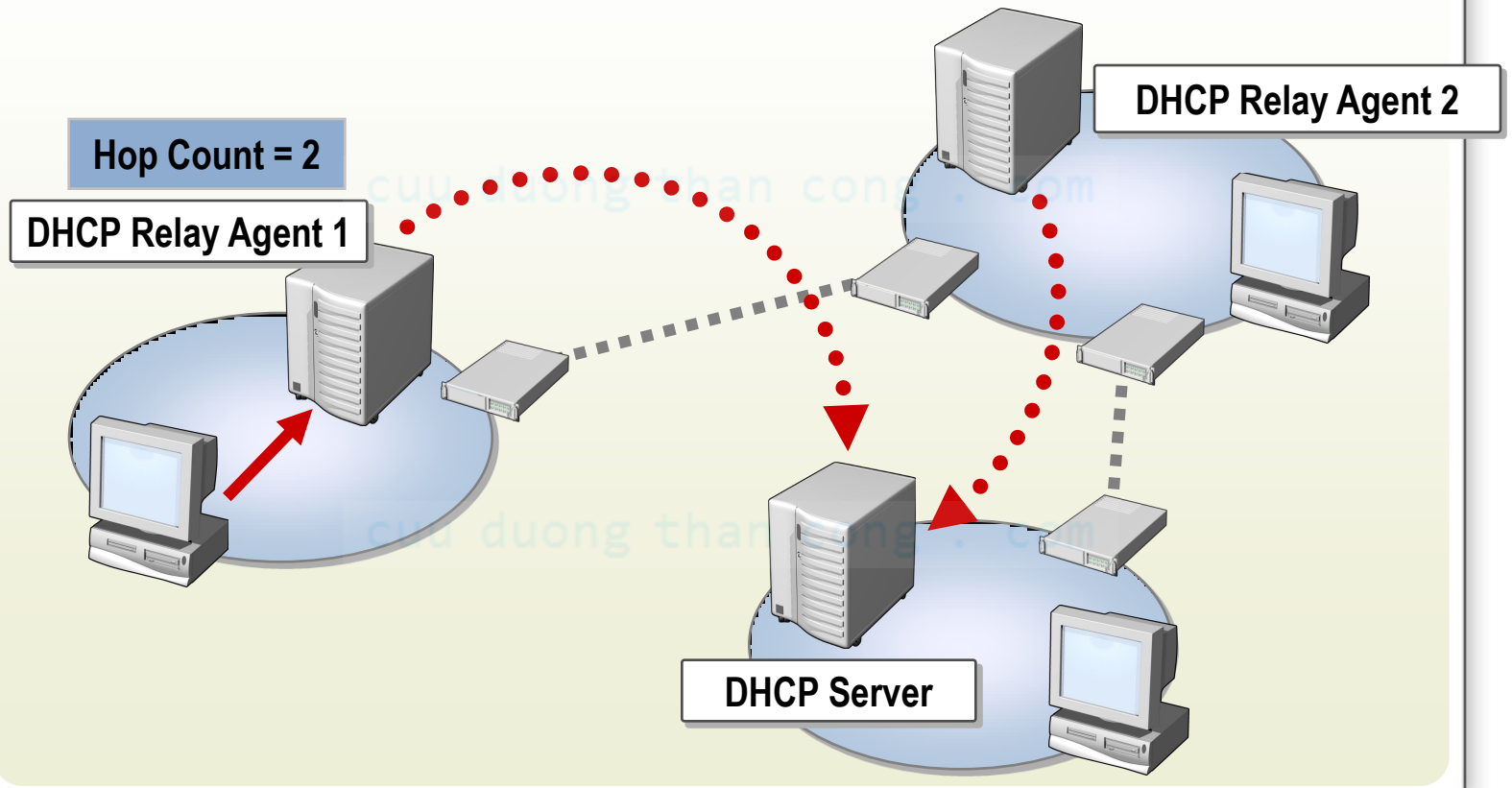


How a DHCP Relay Agent Works



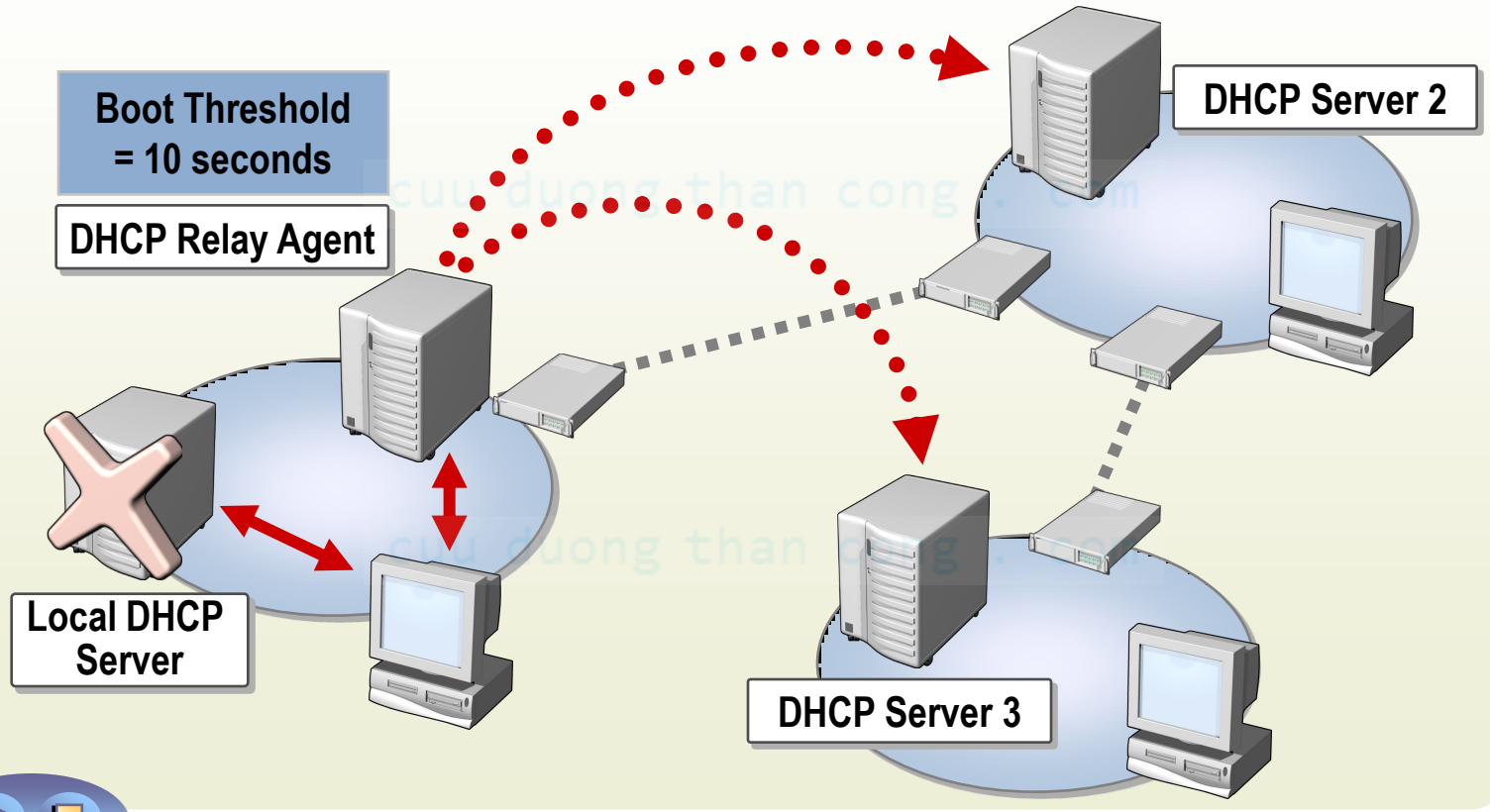
How a DHCP Relay Agent Uses Hop Count

The *hop count threshold* is the number of routers that the packet can be transmitted through before being discarded



How a DHCP Relay Agent Uses Boot Threshold

The *boot threshold* is the length of time in seconds that the DHCP Relay Agent will wait for a local DHCP server to respond to client requests before forwarding the request



How to Configure a DHCP Relay Agent

Your instructor will demonstrate how to:

- Apply guidelines for setting the hop count and boot threshold
- Add a DHCP Relay Agent
- Configure a DHCP Relay Agent with the IP address of the DHCP server
- Enable the DHCP Relay Agent on a router interface

Practice: Configuring the DHCP Relay Agent

In this practice, you will configure a DHCP Relay Agent

Lab A: Identifying and Resolving Common Issues When Allocating IP Addressing by Using DHCP

In this lab, you will identify and resolve common issues when allocating IP addressing by using DHCP