Comprehensive, hands-on training that solves real-world problems

Red Hat System Administration III

redhat.

DAY ONE	DAY TWO	DAY THREE	DAY FOUR
Introduction	Network Port Security (continued)	File-based Storage	Bash Scripts
Services and Daemons	DNS	MariaDB Databases	Bash Control Structures
IPv6 Networking	Email	Apache HTTPD	Shell Environment
Link Aggregation and Bridging	Block-based Storage		Comprehensive Review
Network Port Security			

DAY ONE

Introduction

Services and Daemons

IPv6 Networking

Link Aggregation and Bridging

Network Port Security

Introduction

- Welcome to Class
- Course Objectives and Structure
- Orientation to Classroom Network
- Internationalization

Welcome to Class

redhat.

Course Objectives and Structure

redhat.

DAY ONE	DAY TWO	DAY THREE	DAY FOUR
Introduction	Network Port Security (continued)	File-based Storage	Bash Scripts
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Network Port Security			

Orientation to Classroom Network

redhat.

Internationalization

DAY ONE

Introduction

Services and Daemons

IPv6 Networking

Link Aggregation and Bridging

Network Port Security

Chapter 1: Controlling Services and Daemons

- **Controlling Services with systemctl**
- **Controlling the Boot Process**
- **Reviewing the System Logs and Journal**

redhat.

Goal:

To review how to manage services and the boot-up process using systemctl.

Objectives:

- Manage how systemd starts up system daemons and network services, using systemctl.
- Control and troubleshoot system boot using systemd targets.
- Troubleshoot issues using log messages in /var/log and the systemd journal.

Controlling Services with systemctl

redhat.

Practice: Using systemctl to Manage Services

redhat.

Controlling the Boot Process

Practice:
Selecting a Boot Target

redhat.

Reviewing the System Logs and Journal

redhat.

Practice:
Finding Events With journalctl

redhat.

Lab:
Controlling Services and Daemons

redhat.

DAY ONE

Introduction

Services and Daemons

IPv6 Networking

Link Aggregation and Bridging

Network Port Security

Chapter 2: Managing IPv6 Networking

- **Review of IPv4 Networking Configuration**
- **IPv6 Networking Concepts**
- **IPv6 Networking Configuration**

redhat.

Goal:

To configure and troubleshoot basic IPv6 networking on Red Hat Enterprise Linux systems.

Objectives:

- Review how to configure IPv4 networking in RHEL 7
- Explain the basic concepts of IPv6 networking and read and write condensed IPv6 addresses
- Configure IPv6 networking using command-line tools and configuration files

Review of IPv4 Networking Configuration

redhat.

Practice:
Configuring IPv4 Networking

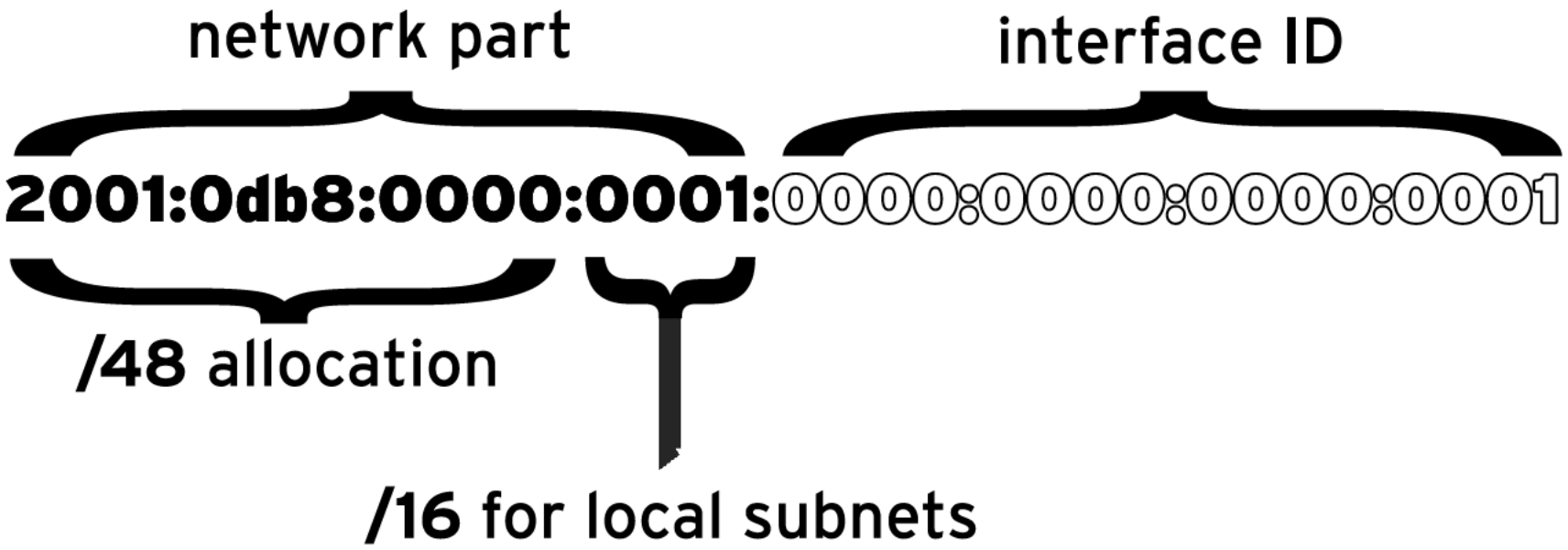
redhat.

IPv6 Networking Concepts

redhat.

IPv6 address is **2001:db8:0:1::1/64**

Allocation from provider is **2001:db8::/48**



Quiz:
Interpreting IPv6 Addresses

redhat.

IPv6 Networking Configuration

redhat.

Practice:
Configuring IPv6 Networking

redhat.

Lab:
Managing IPv6 Networking

redhat.

DAY ONE

Introduction

Services and Daemons

IPv6 Networking

Link Aggregation and Bridging

Network Port Security

Chapter 3:
Configuring Link Aggregation and Bridging

- Configuring Channel Bonding
- Configuring Network Teaming
- Managing Network Teaming
- Configuring Software Bridges

Goal:

To configure and troubleshoot advanced network interface functionality, including bonding, teaming, and local software bridges.

Objectives:

- Use channel bonding to provide network link redundancy or higher throughput.
- Use network teaming to provide link redundancy or higher throughput.
- Manage a network team interface.
- Manage local software bridges and associated interfaces.

Configuring Channel Bonding

Practice:
Configuring Channel Bonding

redhat.

Configuring Network Teaming

Practice:
Configuring Network Teaming

Managing Network Teaming

redhat.

Practice:
Managing Network Teaming

redhat.

Configuring Software Bridges

Practice:
Configuring Software Bridges

redhat.

Lab:
Configuring Link Aggregation and Bridging

redhat.

DAY ONE

Introduction

Services and Daemons

IPv6 Networking

Link Aggregation and Bridging

Network Port Security

Chapter 4: Network Port Security

Managing Firewalld

Managing Rich Rules

Masquerading and Port Forwarding

Adding Custom firewalld Zones and Services

Managing SELinux Port Labeling

redhat.

Goal:

To permit and reject access to network services using advanced SELinux and firewalld filtering techniques.

Objectives:

- Review firewalld concepts and management commands covered in previous courses.
- Configure more complex firewall configurations using firewalld's support for "rich language rules."
- Describe and implement Network Address Translation (NAT).
- Customize and create predefined firewalld services and zones to simplify configuration.
- Ensure network ports have the correct SELinux type so that services are able to bind to them.

Managing Firewalld

redhat.

Practice: Configuring a Firewall

redhat.

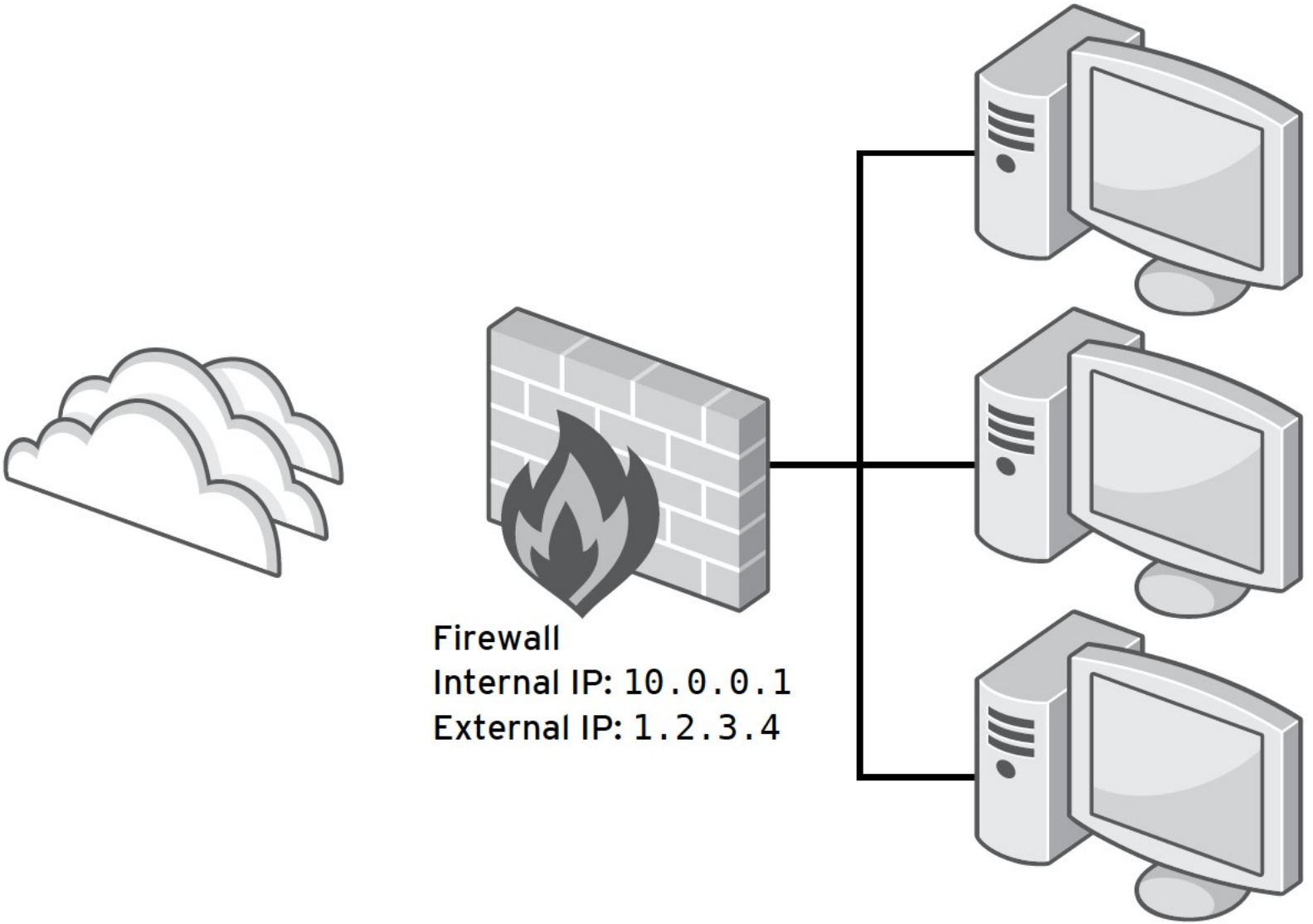
Managing Rich Rules

redhat.

Practice:
Writing Custom Rules

redhat.

Masquerading and Port Forwarding



Practice: Forwarding a Port

Adding Custom firewalld Zones and Services

redhat.

Practice:
Configure a Custom Firewall

redhat.

Managing SELinux Port Labeling

redhat.

Practice:
Managing SELinux Port Labeling

redhat.

Lab:
Network Port Security

redhat.

DAY TWO

DNS

Email

Block-based Storage

Chapter 5:
Managing DNS for Servers

- DNS Concepts
- Configuring a Caching Nameserver
- DNS Troubleshooting

Goal:

To set and verify correct DNS records for systems and configure secure caching DNS name service.

Objectives:

- Explain how DNS is used to resolve names and addresses and the purpose of key DNS resource records.
- Configure unbound to act as a secure local caching nameserver.
- Describe common DNS configuration problems and how to identify and resolve them.

DNS Concepts

Quiz:
DNS Resource Record

Configuring a Caching Nameserver

Practice: Configuring unbound as a Caching Nameserver

DNS Troubleshooting

Practice: Troubleshooting DNS

Lab:
Managing DNS for Servers

redhat.

DAY TWO

DNS

Email

Block-based Storage

Chapter 6: Configuring Email Transmission

Email Overview

Configuring a Send-only Email Configuration

Configuring Send-only Email with Mail Submission Agents

redhat.

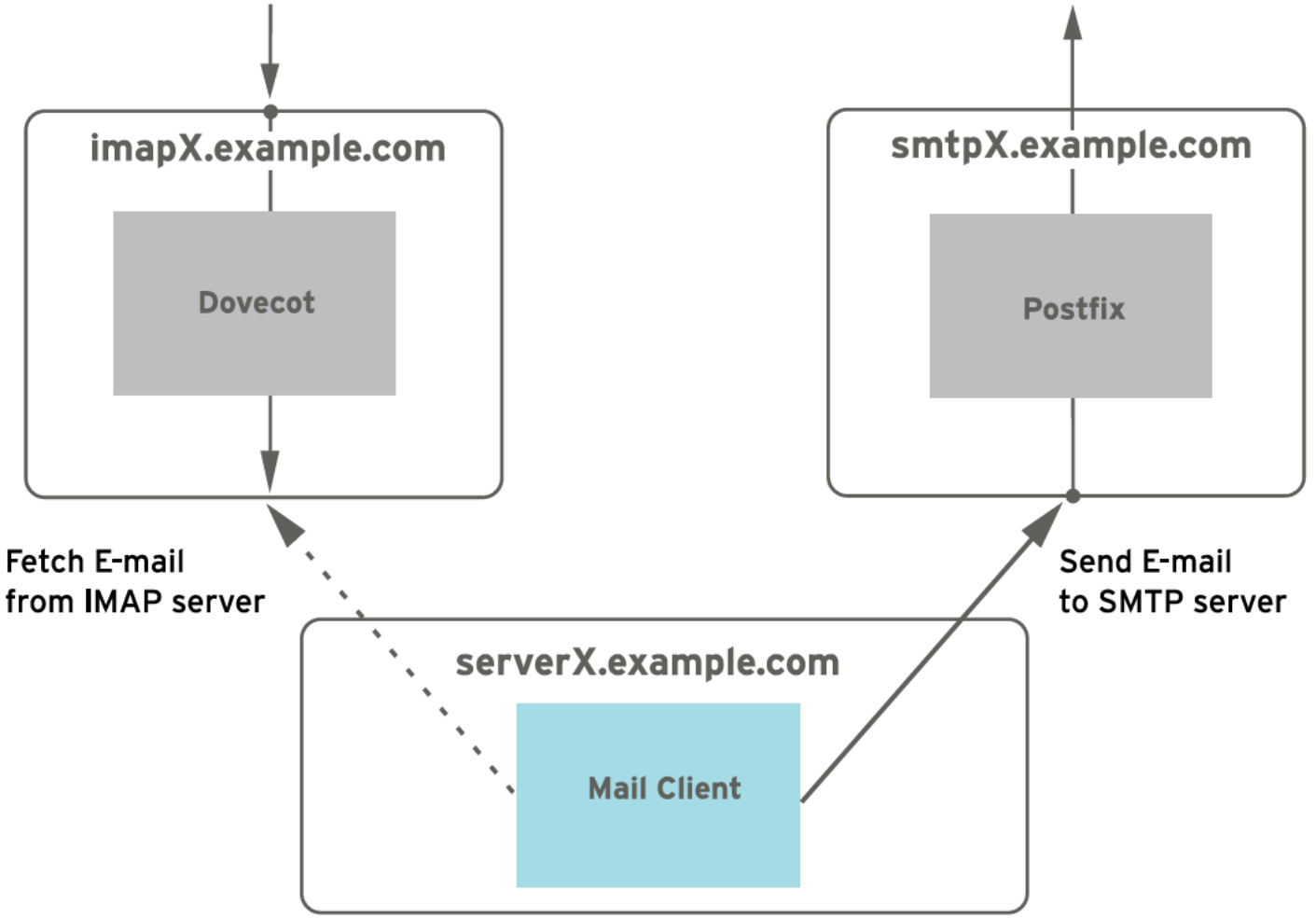
Goal:

To relay all email sent by the system through an SMTP gateway.

Objectives:

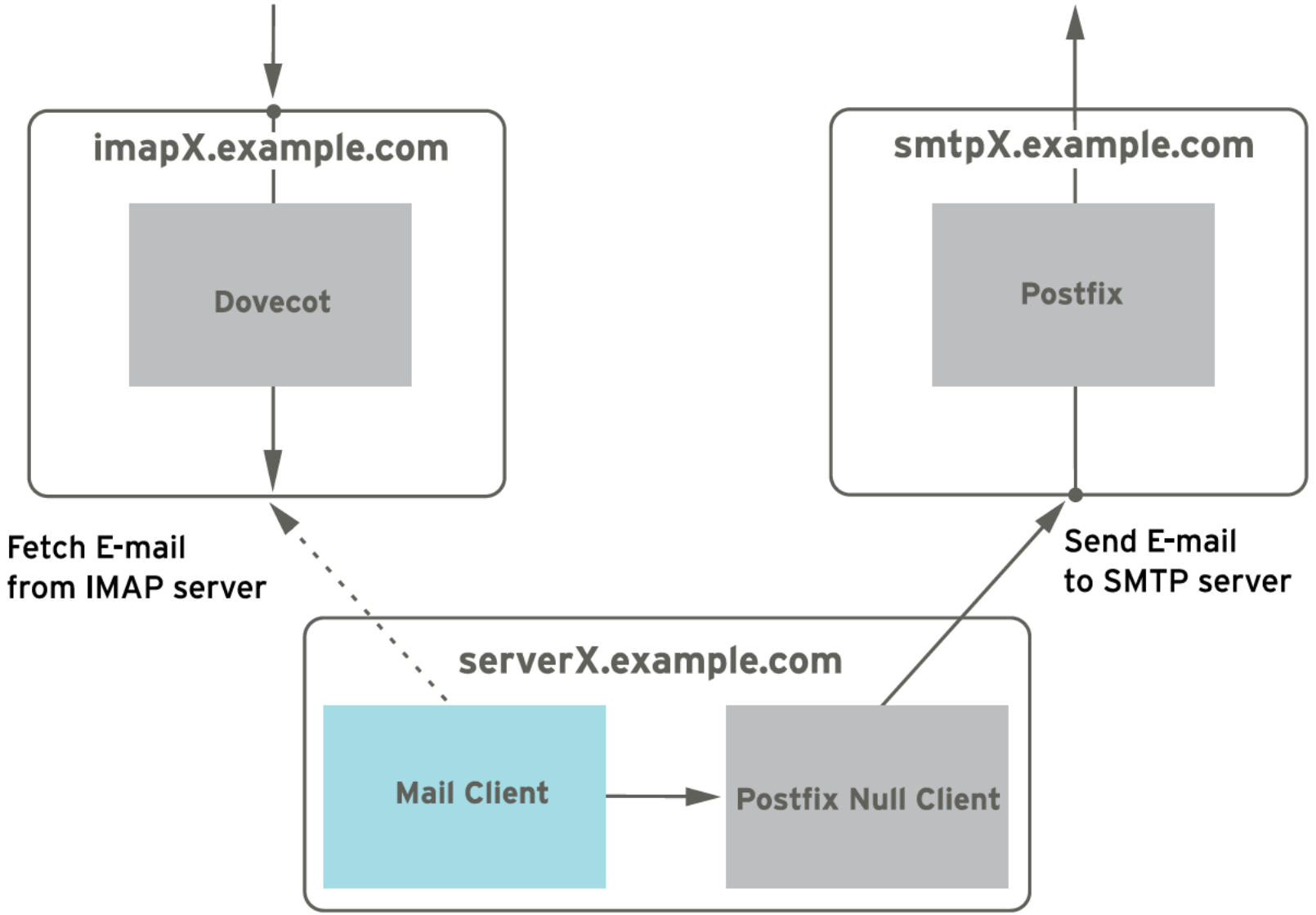
- Explain how email messages are sent and read by Linux mail clients.
- Configure a Red Hat Enterprise Linux server to transmit all email through an unauthenticated SMTP gateway.
- Configure a Red Hat Enterprise Linux server to transmit all email through an SMTP gateway requiring authentication.

Email Overview



Practice:
Sending Email with Telnet

Configuring a Send-only Email Configuration



Practice: Configuring a Send-only Email Configuration

redhat.

Configuring Send-only Email with Mail Submission Agents

redhat.

Practice: Configuring Send-only Email with Mail Submission Agents

redhat.

Lab:
Configuring Email Transmission

redhat.

DAY TWO

DNS

Email

Block-based Storage

Chapter 7: Providing Remote Block Storage

- iSCSI Concepts
- Providing iSCSI Targets
- Accessing iSCSI Storage

redhat.

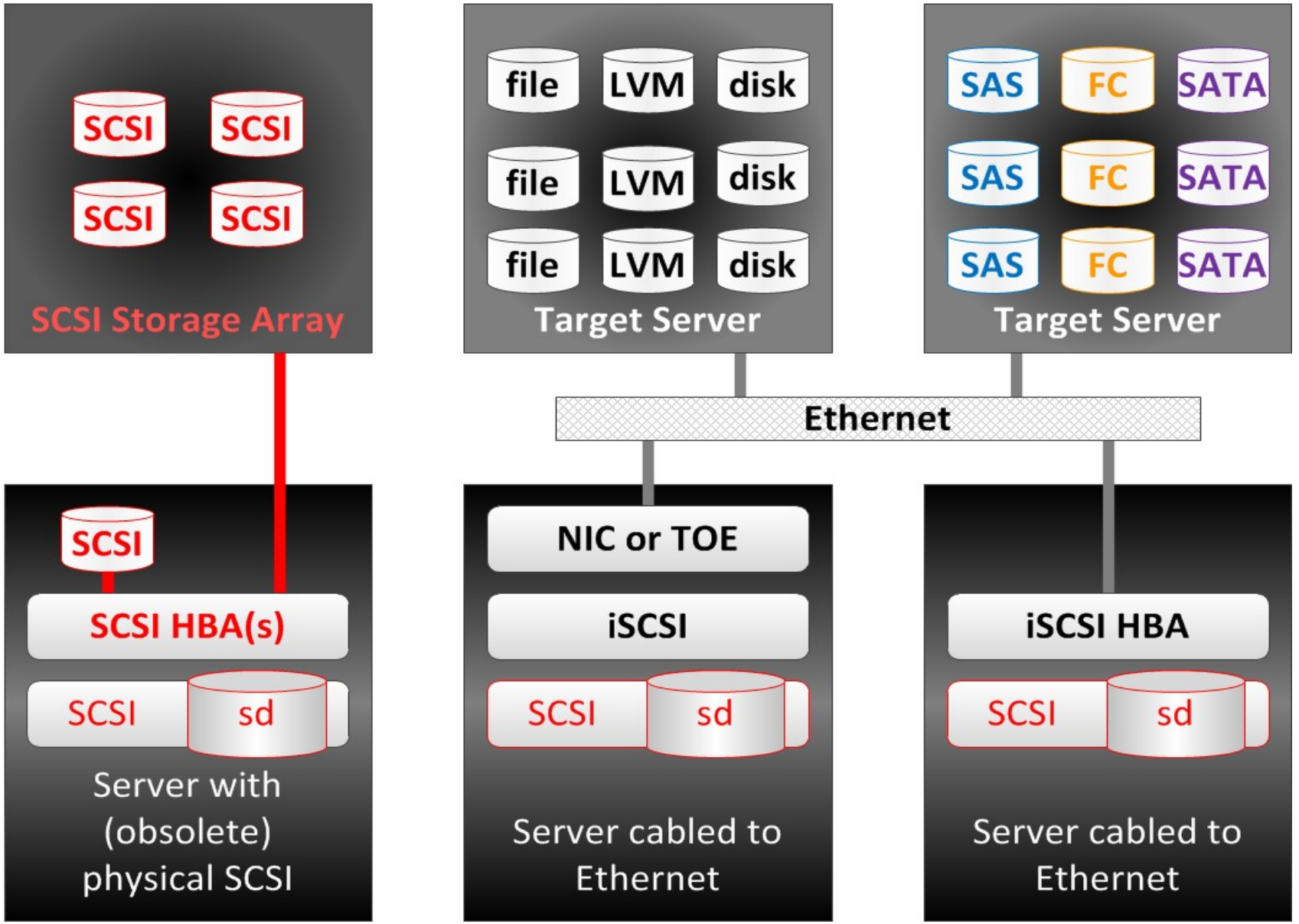
Goal:

To provide and use networked iSCSI block devices as remote disks.

Objectives:

- Explain at a high level how iSCSI is used to provide remote access to block devices.
- Provide remote access using a local disk as a LUN of an iSCSI storage target.
- Access remote storage using an iSCSI initiator and prepare it for use.

iSCSI Concepts



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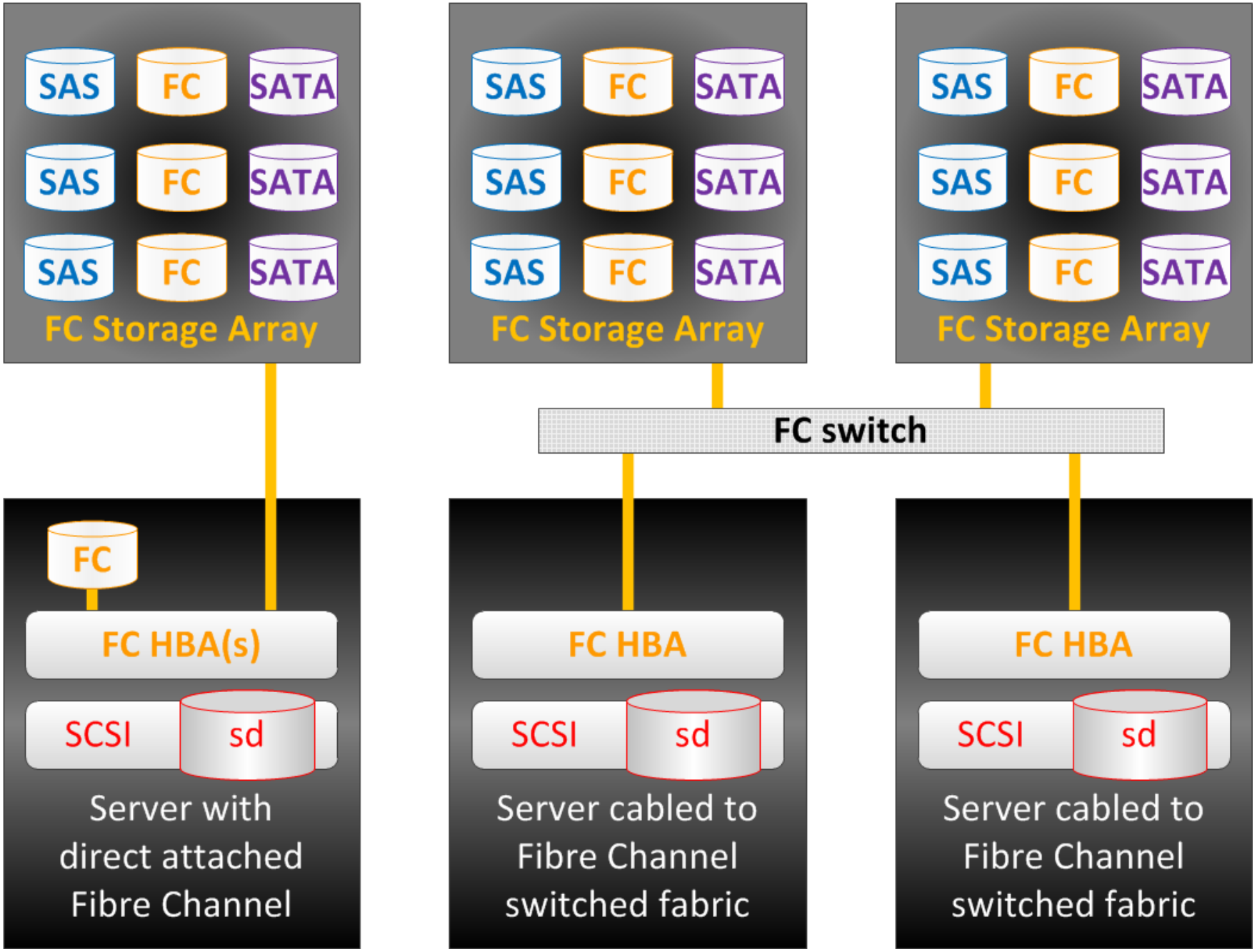

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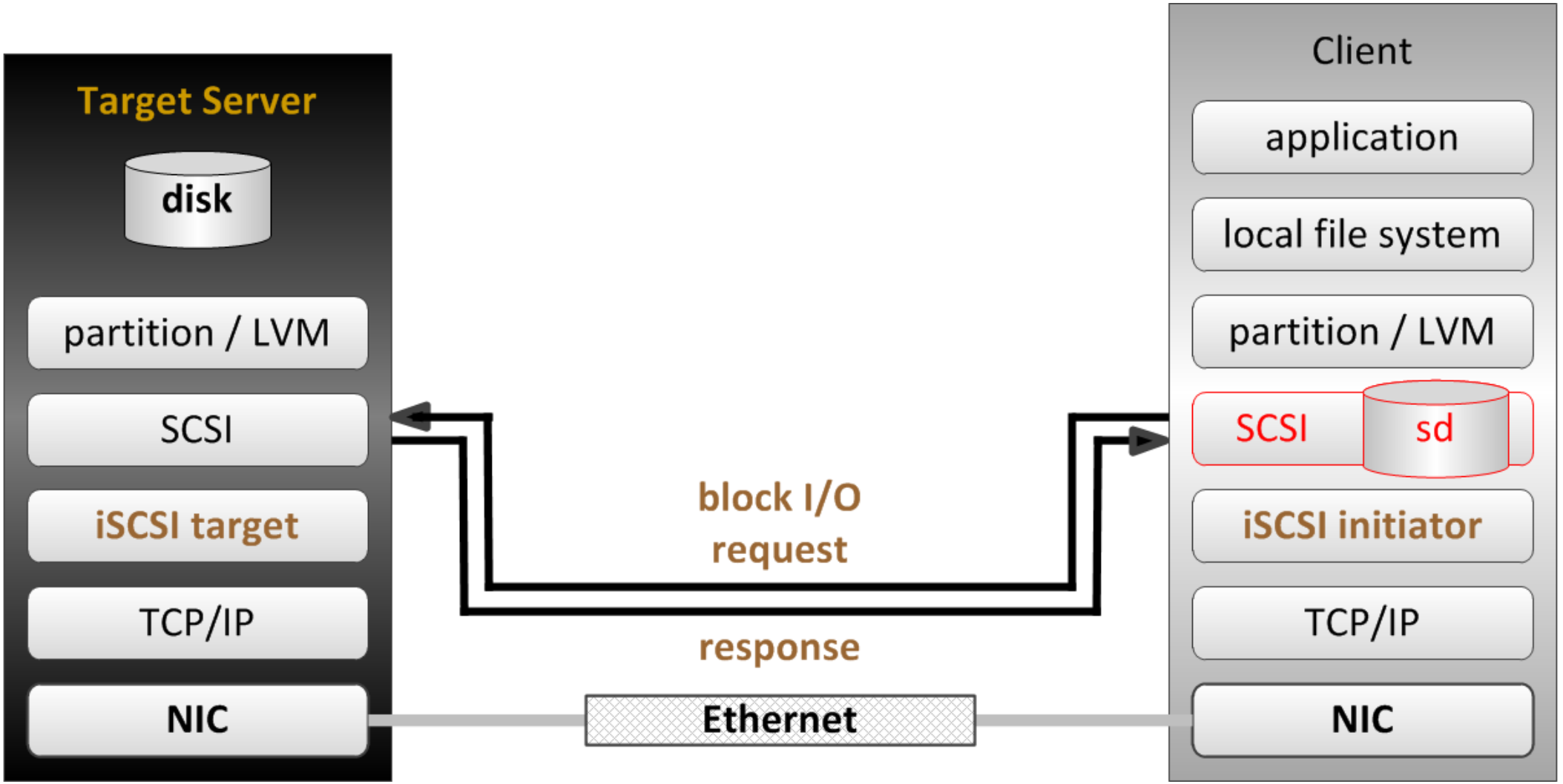
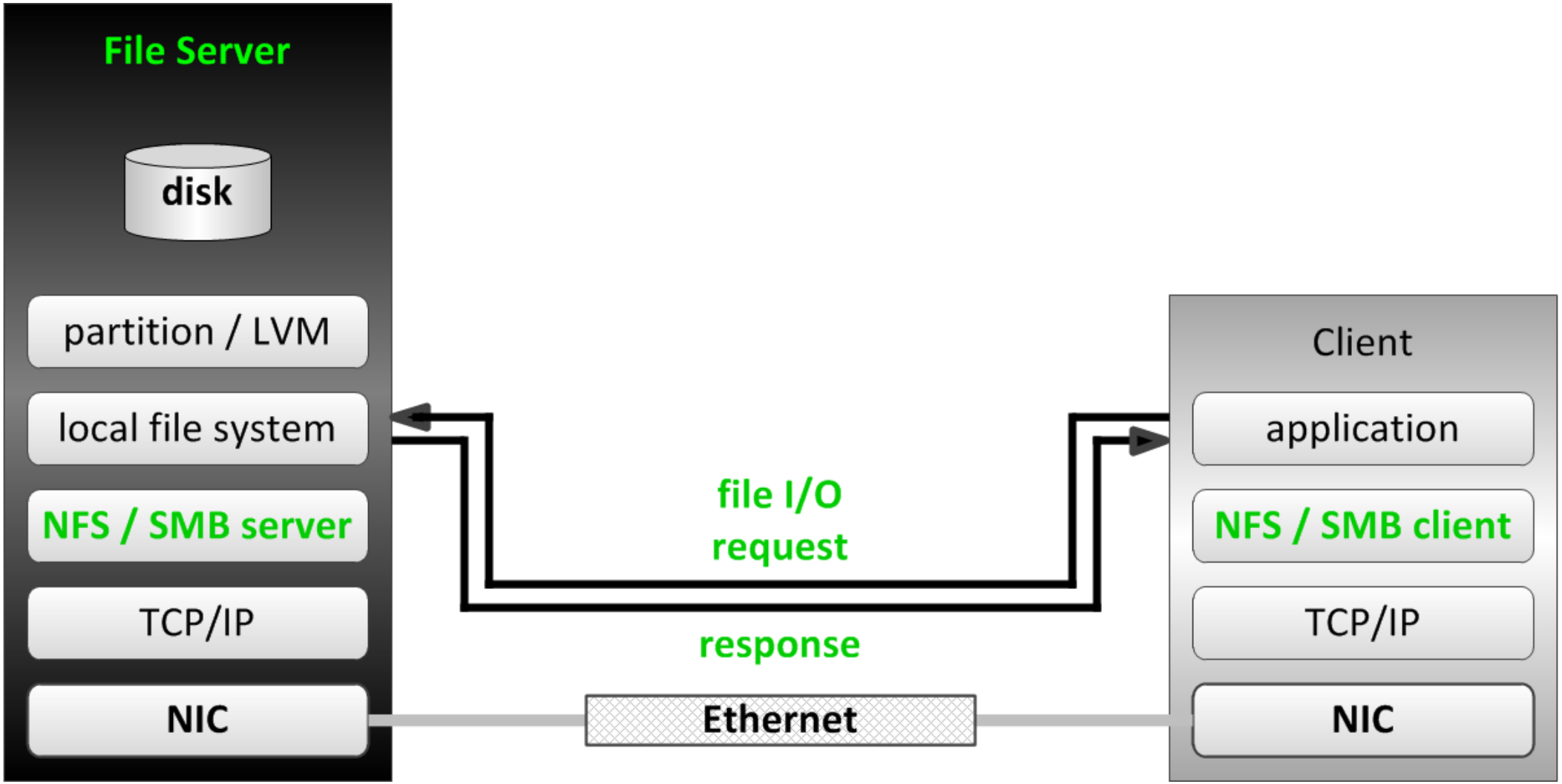




Quiz:
iSCSI Concepts

redhat.

Providing iSCSI Targets

Practice:
Providing iSCSI Targets

redhat.

Accessing iSCSI Storage

redhat.

Practice:
Accessing iSCSI Storage

redhat.

Lab:
Providing Block-based Storage

redhat.

DAY THREE

File-based Storage

MariaDB Databases

Apache HTTPD

Chapter 8: Providing File-based Storage

- Exporting NFS File Systems
- Protecting NFS Exports
- Providing SMB File Shares
- Performing a Multiuser SMB Mount

Goal:

To provide NFS exports and SMB file shares to specific systems and users.

Objectives:

- Export file systems to client systems using NFS, controlling access by IP address.
- Export file systems to clients using NFS, controlling access with Kerberos and using labeled NFS.
- Share file systems with clients using SMB, controlling access by username and password.
- Mount an SMB share with the multiuser mount option, using password-based authentication and cifscreds to control access

Exporting NFS File Systems

Practice:
Exporting NFS File Systems

redhat.

Protecting NFS Exports

redhat.

Practice:
Protecting NFS Exports

Providing SMB File Shares

redhat.

Practice:
Providing SMB File Shares

redhat.

Performing a Multiuser SMB Mount

Practice:
Performing a Multiuser SMB Mount

redhat.

Lab:
Providing File-based Storage

redhat.

DAY THREE

File-based Storage

MariaDB Databases

Apache HTTPD

Chapter 9: Configuring MariaDB Databases

- Installing MariaDB
- Working with MariaDB Databases
- Managing Database Users and Access Rights
- Creating and Restoring MariaDB Backups

redhat.

Goal:

To provide a MariaDB SQL database for use by programs and database administrators.

Objectives:

- Install MariaDB.
- Configure and administer MariaDB.
- Configure user and access rights.
- Back up and restore MariaDB databases.

Installing MariaDB

redhat.

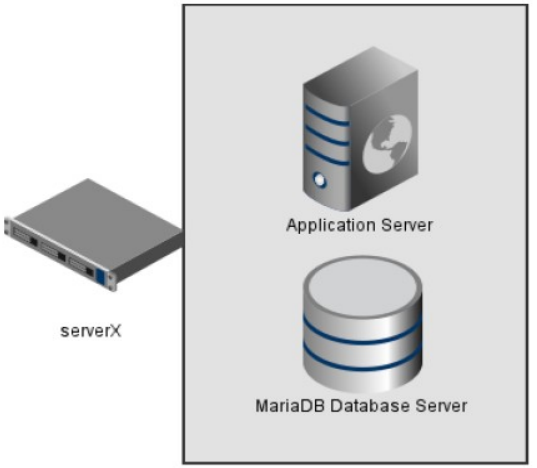
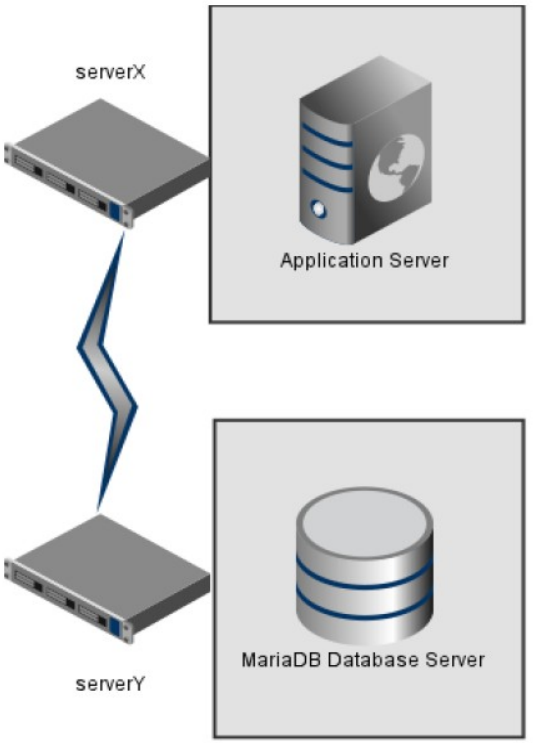


Figure 9.1: Local access to MariaDB



Practice: Installing MariaDB

redhat.

Working with MariaDB Databases

redhat.

Quiz:
MariaDB Commands

Managing Database Users and Access Rights

redhat.

Practice: Managing Users

Creating and Restoring MariaDB Backups

redhat.

Practice: Restoring a MariaDB Database from Backup

redhat.

Lab:
Configuring MariaDB Databases

redhat.

DAY THREE

File-based Storage

MariaDB Databases

Apache HTTPD

Chapter 10: Providing Apache HTTPD Web Service

- Configuring Apache HTTPD
- Configuring and Troubleshooting Virtual Hosts
- Configuring HTTPS
- Integrating Dynamic Web Content

Goal:

To configure Apache HTTPD to provide TLS-enabled websites and virtual hosts.

Objectives:

- Identify the key configuration files, log files, and content directories used by Apache HTTPD.
- Configure Apache HTTPD to provide IP-based and namebased virtual hosts.
- Configure Apache HTTPD to provide TLS-encrypted virtual hosts.
- Configure Apache HTTPD to serve dynamic databasedriven web content.

Configuring Apache HTTPD

redhat.

Practice:
Configuring a Web Server

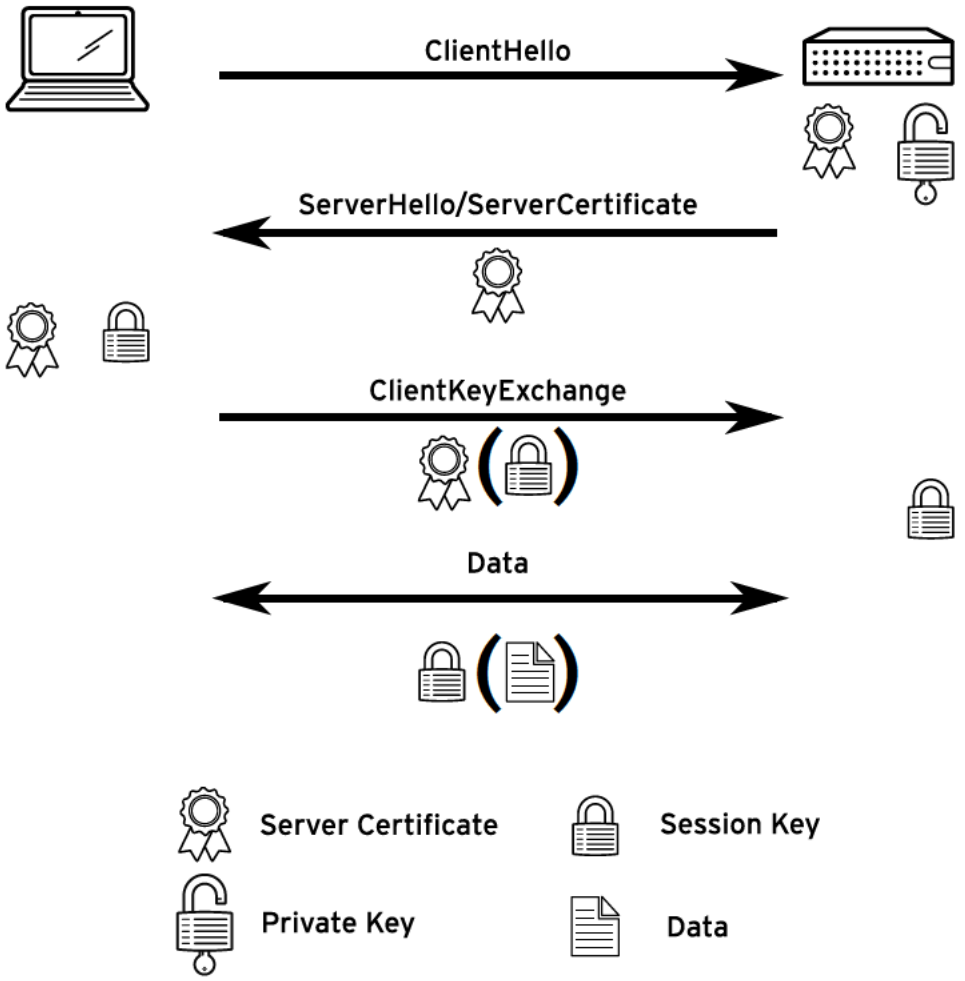
redhat.

Configuring and Troubleshooting Virtual Hosts

redhat.

Practice:
Configuring a Virtual Host

Configuring HTTPS



Practice: Configuring a TLS-enabled Virtual Host

Integrating Dynamic Web Content

Practice:
Configuring a Web Application

redhat.

Lab:
Providing Apache HTTPD Web Service

redhat.

DAY FOUR

Bash Scripts

Bash Control Structures

Shell Environment

Comprehensive Review

Chapter 11: Writing Bash Basics

- Bash Shell Scripting Basics

redhat.

Goal:

To write simple, well-structured shell scripts using Bash's shell expansion features and for-loop construct.

Objectives:

- To write simple shell scripts using Bash.

Bash Shell Scripting Basics

redhat.

Practice:
Writing Bash Scripts

redhat.

Lab:
Writing Bash Scripts

redhat.

DAY FOUR

Bash Scripts

Bash Control Structures

Shell Environment

Comprehensive Review

Chapter 12: Bash Conditionals and Control Structures

- Bash Condition Evaluation and Control Structures

redhat.

Goal:

To use Bash conditionals and other control structures to write more sophisticated shell commands and scripts.

Objectives:

- Incorporate the use of positional parameters, exit status, test conditions, and conditional structures to implement flow control in Bash shell scripts.

Enhancing Bash Shell Scripts with Conditionals and Control Structures

redhat.

Practice:
Enhancing Bash Shell Scripts with Conditionals and Control Structures

redhat.

Lab:
Bash Conditionals and Control Structures

redhat.

DAY FOUR

Bash Scripts

Bash Control Structures

Shell Environment

Comprehensive Review

Chapter 13: Configuring the Shell Environment

- Changing the Shell Environment

Goal:

To customize Bash startup and use environment variables, Bash aliases, and Bash functions.

Objectives:

- Use bash startup scripts to define environment variables, aliases, and functions

Changing the Shell Environment

Practice: Working with Login and Non-Login Shells

redhat.

Lab:
Configuring the Shell Environment

redhat.

DAY FOUR

Bash Scripts

Bash Control Structures

Shell Environment

Comprehensive Review

Chapter 14: Comprehensive Review

Red Hat System Administration III
Comprehensive Review

redhat.

Goal:

To practice and demonstrate knowledge and skills learned in Red Hat System Administration III.

Objectives:

- Review the course chapters to reinforce knowledge and skills.

Red Hat System Administration III
Comprehensive Review

redhat.

Lab:
Comprehensive Review of System Administration III

redhat.