

# Administering a SQL Database Infrastructure, Skill Labs

## Course Specifications

Course Number: ACI76-016SL\_rev1.0

Lab Length: Approximately 21 hours

## Data Encryption (70-764)

### Introduction

#### Objective

The Data Encryption module provides you with the instructions and devices to develop your hands-on skills in the following topics.

- Encrypting Data Using Keys
- Managing Column-Level Encryption
- Managing Encryption and Decryption of Files Using Transparent Data Encryption

These layers collectively define the functions and interactions necessary for network communication and interoperability.

In this module, you will explore the functions and components of the OSI model layers.

### Overview

#### Exam Objectives

Three exam objectives are covered in this lab.

- Create symmetric and asymmetric keys.
- Encrypt a column of data using transact SQL.
- Perform real-time I/O encryption and decryption of the data and log files using a symmetric database encryption key (DEK).

## Backup and Connection Encryption (70-764)

### Introduction

#### Objective

The Backup and Connection Encryption module provides you with the instructions and devices to develop your hands-on skills in the following topics.

- Configuring Secure Sockets Layer (SSL) to Encrypt Data
- Working with Encrypted Backup Files

## Overview

### Exam Objectives

Two exam objectives are covered in this lab.

- Create an encrypted backup file using the asymmetric key.
- Configure SSL to encrypt data that is transmitted across a network between an instance of SQL Server and a client application.

## Manage Database Object Permissions (70-764)

### Introduction

#### Objective

The Manage Database Object Permissions module provides you with the instructions and devices to develop your hands-on skills in the following topics.

- Managing SQL Server Logins, Database Users, and Roles
- Working with Database Permissions

## Overview

### Exam Objectives

Five exam objectives are covered in this lab.

- Creating a new role
- Creating a login
- Granting access to database
- Creating views and stored procedures
- Granting access to a database object

## Configure Security Options (70-764)

### Introduction

#### Objective

The Configuring Security Options module provides you with the instructions and devices to develop your hands-on skills in the following topics.

- Working with Row-Level Security
- Securing Sensitive Data

## Overview

### Exam Objectives

Two exam objectives are covered in this lab.

- Restricting access to row-level data by configuring filter and block predicates
- Secure sensitive data using dynamic data masking

## Configure Audits for SQL Server (70-764)

### Introduction

#### Objective

The Configuring Audits for SQL Server module provides you with the instructions and devices to develop your hands-on skills in the following topics.

- Managing Server-Level Audit
- Managing Database-Level Audit
- Working with SQL Server Audit Log

### Overview

#### Exam Objectives

Three exam objectives are covered in this lab.

- Create a server-level audit.
- Create a database-level audit.
- Query the SQL Server audit log.

## Backing Up Databases (70-764)

### Introduction

#### Objective

The Backing up Databases module provides you with the instructions and devices to develop your hands-on skills in the following topics.

- Working with Jobs
- Managing Schedules
- Working with Transaction Logs

### Overview

#### Exam Objectives

Five exam objectives are covered in this lab.

- Creating a Job
- Creating a schedule
- Attaching a schedule to a job
- Configuring automatic backups with task scheduler
- Backing up a transaction log using SQL Server Management Studio (SSMS)

## Piecemeal Restore of Database and File Groups (70-764)

### Introduction

#### Objective

The Piecemeal Restore of Database and File Groups module provides you with the instructions and devices to develop your hands-on skills in the following topics.

- Working with Piecemeal Restore of Database
- Working with Piecemeal Restore of File Groups

### Overview

#### Exam Objectives

Four exam objectives are covered in this lab.

- Piecemeal restore of database under simple recovery model
- Piecemeal restore of some file groups under simple recovery model
- Piecemeal restore of database under full recovery model
- Piecemeal restore of some file groups under full recovery model

## Working with Restore Options (70-764)

### Introduction

#### Objective

The Working with Restore Options module provides you with the instructions and devices to develop your hands-on skills in the following topics.

- Managing Point-in-Time Recovery
- Working with Page Restore
- Automating SQL Server Restores

### Overview

#### Exam Objectives

Three exam objectives are covered in this lab.

- Page restore using SSMS/Transact SQL
- Point-in-time recovery using SSMS/Transact SQL
- Automate SQL Server restores to refresh test environments

## Maintaining Database Integrity (70-764)

### Introduction

#### Objective

The Maintaining Database Integrity module provides you with the instructions and devices to develop your hands-on skills in the following topics.

## Course Outline

- Working with DBCC Commands
- Working with Suspect Pages Table
- Restoring a Database

### Overview

#### Exam Objectives

Three exam objectives are covered in this lab.

- Performing a full database consistency check
- Managing the suspect pages table
- Recovering a database without restoring data

## Monitoring the Database Activity (70-764)

### Introduction

#### Objective

The Monitoring the Database Activity module provides you with the instructions and devices to develop your hands-on skills in the following topics.

- Managing Activity Monitor
- Working with Performance Monitor

### Overview

#### Exam Objectives

Four exam objectives are covered in this lab.

- Open Object Explorer and Activity Monitor.
- Set the Activity Monitor refresh interval.
- Use Activity Monitor to detect and fix blockage.
- Use Performance Monitor with appropriate counters to detect low-performing activities.

## Configuring Database Collection and UCP (70-764)

### Introduction

#### Objective

The Configuring Data Collection and UCP module provides you with the instructions and devices to develop your hands-on skills in the following topics.

- Configuring the Management Data Warehouse
- Managing System Data Collection Sets
- Working with Utility Control Point

## Overview

### Exam Objectives

Four exam objectives are covered in this lab.

- Configure data collector.
- Enable or disable data collection.
- Start or stop a collection set.
- Create a SQL Server utility control point.

## Managing a Query Store (70-764)

### Introduction

#### Objective

The Managing a Query Store module provides you with the instructions and devices to develop your hands-on skills in the following topic.

- Working with Query Store

### Overview

#### Exam Objectives

Two exam objectives are covered in this lab.

- Enabling a Query Store
- Getting information from a Query Store

## Using Trace and Extended Events (70-764)

### Introduction

#### Objective

The Using Trace and Extended Events module provides you with the instructions and devices to develop your hands-on skills in the following topics.

- Working with SQL Server Profiler
- Monitoring System Activity Using Extended Events

### Overview

#### Exam Objectives

Three exam objectives are covered in this lab.

- Create traces on an instance of the SQL Server database using Transact-SQL stored procedures.
- Start an Extended Events session.
- Monitor system activity using Extended Events.

## Managing Indexes (70-764)

### Introduction

#### Objective

The Managing Indexes module provides you with the instructions and devices to develop your hands-on skills in the following topics.

- Handling Indexes
- Working with Types of Indexes

### Overview

#### Exam Objectives

Four exam objectives are covered in this lab.

- Detecting fragmentation of an Index.
- Reorganize and rebuild an index.
- Defragmenting a columnstore index.
- Drop a columnstore index.

## Managing Statistics (70-764)

### Introduction

#### Objective

The Managing Statistics module provides you with the instructions and devices to develop your hands-on skills in the following topic.

- Working with Statistics

### Overview

#### Exam Objectives

Two exam objectives are covered in this lab.

- Collect data about the outdated statistics into a table.
- Use SQL Server Auto Update and Auto Create Statistics options.

## Managing Operators (70-764)

### Introduction

#### Objective

The Managing Operators module provides you with the instructions and devices to develop your hands-on skills in the following topic.

- Working with Alerts and Operators

**Overview**  
**Exam Objectives**

Two exam objectives are covered in this lab.

- Create an operator.
- Assign alerts to the operator.

## **Managing Operators (70-764)**

**Introduction**  
**Objective**

The Managing Operators module provides you with the instructions and devices to develop your hands-on skills in the following topic.

- Working with Alerts and Operators

**Overview**  
**Exam Objectives**

Two exam objectives are covered in this lab.

- Create an operator.
- Assign alerts to the operator.

## **Managing SQL Servers (70-764)**

**Introduction**  
**Objective**

The Managing SQL Server module provides you with the instructions and devices to develop your hands-on skills in the following topics.

- Working with Policies
- Configuring Database Mail
- Using Database Mail

**Overview**  
**Exam Objectives**

Three exam objectives are covered in this lab.

- Configure SQL Server Agent mail to use database mail.
- Create and configure a policy-based management policy.
- Configure alerts to identify and inform available disk space.

## Configuring Log Shipping (70-764)

### Introduction

#### Objective

The Configuring Log Shipping module provides you with the instructions and devices to develop your hands-on skills in the following topics.

- Setting Up Log Shipping Using SQL Server Management Studio
- Setting Up Log Shipping Using Transact-SQL

### Overview

#### Exam Objectives

One exam objective is covered in this lab.

- Configuring log shipping using SQL Server Management Studio and Transact-SQL

## Implementing Availability Groups (70-764)

### Introduction

#### Objective

The Implementing Availability Groups module provides you with the instructions and devices to develop your hands on skills in the following topics.

- Configuring Always On availability groups
- Creating a new availability group

### Overview

#### Exam Objectives

Two lab objectives are covered in this lab.

- Configure always on availability groups
- Create an availability group

## Implementing Failover Clusters (70-764)

### Introduction

#### Objective

The Implementing Failover Cluster Instances module provides you with the instructions and devices to develop your hands on skills in the following topics.

- Creating a failover cluster with a single node
- Managing the failover cluster

## Overview

### Exam Objectives

Three lab objectives are covered in this lab.

- Create a new failover cluster
- Add or remove nodes in a SQL Server failover cluster
- Add a disk to CSV on a failover cluster