MySQL High Availability with InnoDB Cluster ELS

MySQL

DURATION	MODULES	COURSE CODE
2 Days	9 Lectures	—

Course Overview

MySQL High Availability with InnoDB Cluster teaches DBAs to implement a robust high availability solution to protect MySQL databases from different type of failures. Learn to architect, deploy, and manage InnoDB cluster.

What You Will Learn

Introduction to MySQL

- Objectives
- Course Goals
- Course Lesson Map
- Introductions
- Classroom Environment
- MySQL Powers the Web
- Database of the Year
- MySQL Enterprise Edition
- MySQL Database Service
- Oracle Premier Support for MySQL
- MySQL and Oracle Integration
- MySQL Websites
- Community Resources
- Oracle University: MySQL Training
- MySQL Certification
- Summary
- Practices

MySQL Multiserver Solutions

- Objectives
- Topics
- Limitations of a Single Server

- Benefits of Multiserver Solutions
- Replication
- Group Replication
- NDB Cluster
- InnoDB Cluster
- InnoDB ReplicaSet
- Topics
- MySQL Shell (mysqlsh)
- Using MySQL Shell
- AdminAPI
- dba Object
- Cluster Class
- ReplicaSet Class
- Topics
- InnoDB Cluster
- InnoDB Cluster Components
- InnoDB Cluster As a High Availability Solution
- Comparing InnoDB Cluster with NDB Cluster
- InnoDB ReplicaSet
- Components of InnoDB ReplicaSet
- InnoDB ReplicaSet to Scale Reads
- Comparing InnoDB ReplicaSet with MySQL Replication
- Comparing InnoDB Cluster with InnoDB ReplicaSet
- Quiz
- Topics
- MySQL Router
- Cluster Metadata and State
- Connecting Clients to the Cluster
- Summary
- Practices

InnoDB Cluster and Group Replication

- Objectives
- Topics
- Group Replication in InnoDB Cluster
- Using AdminAPI to Administer Group Replication
- InnoDB Cluster Metadata
- Topics
- MySQL Group Replication
- Group Members
- Single-Primary Mode
- Multi-Primary Mode
- Conflict Resolution
- Consensus and Quorum
- Quiz

- Topics
- Database Requirements
- Network Requirements
- Binary Log Configurations
- Transactional Configurations
- Replication Configurations
- Instance Configurations
- Limitations
- Additional Limitations for Multi-Primary
- Quiz
- Topics
- Distributed Recovery
- Replication User
- Clone Recovery
- Incremental Recovery
- Manual State Transfer
- Topics
- Group Communication
- Transaction Certification
- Transaction Replication
- View and View Changes
- View Change: A Member Joins
- State Transfer and Queued Transactions
- Instance Online
- Failure Detection Mechanism
- Expel Timeout
- Auto-Rejoin
- Exit Action
- Network Partitioning
- Summary
- Practices

Deploying InnoDB Cluster

- Objectives
- Topics
- Steps
- Requirements
- Example: Scenario
- Topics
- Checking the Instances
- Configuring the Instances
- Configuring the Instances Locally
- Creating an Administration User Account
- Example: Preparing the Instances
- Quiz

- Topics
- Creating an InnoDB Cluster
- Customizing the Cluster
- Viewing the Cluster Status
- Interpreting the Status
- Adding Instances to the Cluster
- Customizing the Instance
- Checking the Instance State
- Example: Creating the Cluster
- Example: Monitoring the Cluster
- Quiz
- Topics
- Removing Instances from the Cluster
- Changing the Primary Instance
- Adding Administration User Accounts
- Upgrading Administration User Accounts
- Topics
- Adopting a Group Replication
- Quiz
- Summary
- Practices

Monitoring InnoDB Cluster and Group Replication

- Objectives
- Topics
- Retrieving an InnoDB Cluster Object Handler
- Viewing InnoDB Cluster Name
- Viewing InnoDB Cluster Structure
- Viewing InnoDB Cluster Status
- Instance Status
- Viewing InnoDB Cluster Options
- Viewing Group Replication Variables
- Quiz
- Topics
- Performance Schema
- The replication_group_members Table
- Server States
- Finding the Primary Server
- The replication_group_member_stats Table
- Topics
- MySQL Enterprise Monitor
- Replication Dashboard
- Replication Overview
- Displaying a Replication Group
- Status Tab

- Replication Topology
- Summary
- Practices

Deploying MySQL Router

- Objectives
- Topics
- Bootstrapping MySQL Router
- System-Wide Versus Self-Contained Configurations
- Bootstrapping Process
- Configuring User Account
- Configuring Listener Ports
- Other Bootstrapping Options
- Configuration File
- Other Files
- Starting and Stopping MySQL Router
- MySQL Router Process
- Routing Strategies
- Metadata Cache Refresh
- Quiz
- Topics
- Types of Connections
- Connecting Through MySQL Router
- Handling of Connection Lost
- Quiz
- Topics
- Monitoring MySQL Router
- Enabling REST API
- Configuring Realm Authentication
- Creating Credentials
- Listing the APIs
- Router Status
- Metadata Information
- Routing Information
- Quiz
- Summary
- Practices

Administering InnoDB Cluster

- Objectives
- Topics
- InnoDB Cluster Metadata
- Rescanning the Cluster
- Removing Cluster Metadata
- Listing Registered Routers

- Removing a Router Instance Metadata
- Quiz
- Topics
- Changing to Multi-Primary Mode
- Changing to Single-Primary Mode
- Resetting Recovery Accounts Password
- Dissolving an InnoDB Cluster
- Other Tasks
- Quiz
- Topics
- InnoDB Cluster Options
- Setting Options for InnoDB Cluster
- Setting Options for an Instance
- Configuring the Election Process
- Configuring the Transaction Consistency
- Transaction Consistency Levels
- Choosing a Consistency Level
- Session-Level Transaction Consistency
- Quiz
- Topics
- IP Address Permissions
- Configuring IP Address Permissions
- Example: IP Address Permissions
- Secure Socket Layer (SSL) Support
- Configuring SSL of InnoDB Cluster
- Quiz
- Summary
- Practices

Handling Failures in InnoDB Cluster

- Objectives
- Topics
- Instance Failure
- Network Failure
- Topics
- Causes of an Expelled Instance
- Configuring expelTimeout
- View from the Expelled Instance
- View from the Remaining Instances
- Expelled Instance Restarts
- Expelled Instance Reconnects
- Configuring Automatic Rejoin of Instances
- Rejoining an Expelled Instance to the Cluster
- Add the Instance Back to the Cluster
- Quiz

- Topics
- Causes of a Quorum Loss
- Identifying a Quorum Loss
- Checking for Network Partitioning
- Restoring a Cluster from Quorum Loss
- Quiz
- Topics
- Causes of a Complete Cluster Outage
- Restoring a Cluster from a Major Outage
- Re-create the InnoDB Cluster
- Quiz
- Summary
- Practices

Conclusion

- Course Goals
- Oracle University: MySQL Training
- MySQL Websites
- Your Evaluation
- Thank You
- Q&A Session
- A Managing Sandbox Instances Using AdminAPI
- Objectives A-2
- Sandbox Instances A-3
- Deploying Sandbox Instances A-4
- Deploying an InnoDB Cluster A-5
- Stopping Sandbox Instances A-6
- Starting Sandbox Instances A-7
- Killing Sandbox Instances A-8
- Deleting Sandbox Instances A-9
- Life Cycle of a Sandbox Instance A-10
- Quiz A-11
- Summary A-12
- Practices A-13