

VERITAS Cluster Server™ for Solaris (Suite)

COURSE DESCRIPTION

Delivery Method
Instructor-led

Duration
Five days

Course Objectives

You will learn how to use VERITAS Cluster Server to manage applications in high availability environment. After gaining the fundamental skills that are needed to manage a highly available application in an existing cluster, you will deploy VCS in a lab environment to implement a sample cluster design. You learn to:

- Manage existing highly available application services using VERITAS Cluster Server.
- Install VCS and create a cluster.
- Configure service groups and resources.
- Implement and verify failover and failback capability for application, storage, and network services.
- Configure and optimize cluster behavior.
- Protect data in a shared storage environment.
- Configure VCS to manage an Oracle database, an NFS share, and other applications.
- Analyze, troubleshoot, and correct cluster problems.
- Implement four-node clusters.
- Configure service group dependencies and workload management.
- Implement alternative storage and network configurations.
- Perform ongoing maintenance.

Who Should Attend

This course is for system administrators, system engineers, network administrators, system integration or development staff, and technical support personnel who will be working with VERITAS Cluster Server.

Prerequisites

You should have experience as a system and network administrator working in a UNIX environment. Experience developing shell or Perl scripts is helpful.

Hands-On

This course includes practical exercises that enable you to test your new skills and begin to transfer them into your working environment.

COURSE OUTLINE

High Availability Using VERITAS Cluster Server, Fundamentals

VCS Building Blocks

Cluster Terminology
Cluster Communication
Maintaining the Cluster Configuration
VCS Architecture
Failover Configurations Supported by VCS
Clustering Solutions Using VCS

Using VERITAS Cluster Server

Managing Applications in a Cluster Environment
VCS Management Tools
Service Group Operations
Using the VCS Simulator

Preparing a Site for VCS Implementation

Planning for Implementation
Hardware Requirements and Recommendations
Software Requirements and Recommendations
Preparing Cluster Information

Installing VERITAS Cluster Server

Installing VCS Using the Common Product Installer
Configuration Files Created During Installation
Viewing the Running VCS Configuration
Fencing Considerations
Installing the Cluster Manager Java Console

Preparing Services for High Availability

Preparing Applications for VCS
Configuration and Migration Process Overview
One-Time Configuration Tasks
Testing the Application Service
Stopping Resources
Manually Migrating a Service
Validating the Design Worksheet

VCS Configuration Methods

Overview of Configuration Methods
Controlling Access to VCS
Online Configuration
Offline Configuration
Starting and Stopping VCS

Online Service Group Configuration

An Online Configuration Procedure
Using a Design Worksheet and Diagram
Adding a Service Group Using Online Configuration Tools
Adding Resources
Solving Common Configuration Errors

Testing the Service Group

COURSE OUTLINE

continued

Offline Service Group Configuration

Offline Configuration Procedure: New Cluster
 Offline Configuration Procedure: Existing Cluster
 Using a Design Worksheet During Configuration
 Adding a Service Group Using Offline Configuration
 Tools
 Solving Common Offline Configuration Problems
 Testing the Service Group

Sharing Network Interfaces

Sharing Network Interfaces Among Service Groups
 Alternate Network Configurations Using Proxy Resources
 Using Parallel Service Groups with Network Resources
 Configuring a Parallel Service Group
 Localizing Resource Attributes

Configuring Notification

Notification Overview
 Configuring Notification
 The NotifierMngr Resource Type
 Configuring the ResourceOwner Attribute
 Configuring the GroupOwner Attribute
 Configuring the SNMP Console to Receive VCS Traps

Configuring VCS Response to Resource Faults

The Role of Critical Resources in Failover Decisions
 How VCS Responds to Resource Faults
 Determining Failover Duration
 Controlling Fault Behavior with Resource Type Attributes
 Recovering from Resource Faults
 Fault Notification
 Extended Event Handling Using Triggers

Cluster Communications

VCS Communications Review
 How VCS Determines Cluster Membership
 Interconnect Configuration Files
 How Systems Join the Cluster Membership

System and Communication Failures with I/O Fencing

Understanding the Data Protection Problem
 Data Requirements for I/O Fencing
 I/O Fencing Concepts and Components
 Fencing Implementation
 Configuring I/O Fencing in a Running Cluster
 Recovering Fenced Systems

System and Communication Failures without I/O Fencing

Ensuring Data Integrity
 VCS Response to System Failure

LLT Link Failures

Interconnect Failures with a Low-Priority Public Link
 Interconnect Failures with Service Group Heartbeats
 Preexisting Network Partition
 Changing the Interconnect Configuration

Clustering Applications

Application Service Overview
 VCS Agents for Managing Applications
 The Application Agent

Clustering Databases

Database Service Example
 VCS Databases Agents
 HA Database Preparation
 Installing Agents
 Adding Resource Type Definitions
 High Availability Database Configuration Overview
 Oracle Service Group Configuration Example
 Defining Database Failover Behavior

Clustering NFS

Preparing NFS for High Availability
 Configuration and Migration Process Overview
 One-Time Configuration Tasks
 Testing the NFS Service
 Validating the Design Worksheet
 Configuring an NFS Service Group
 NFS Considerations in a VCS Environment

Troubleshooting

Monitoring VCS
 Using the VERITAS Support Web Site
 Troubleshooting Guide
 Cluster Communication Problems
 VCS Engine Startup Problems
 Service Group Problems
 Resource Problems
 Agent Problems and Resource Type Problems
 Backing Up VCS-Related Files

High Availability Using VERITAS Cluster Server, Implementing Local Clusters

Workshop: Reconfiguring Cluster Membership

- Workshop Overview
- Task 1: Removing a System from a Running VCS Cluster
- Task 2: Adding a New System to a Running VCS Cluster
- Task 3: Merging Two Running VCS Clusters

Configuring Service Group Interactions

Common Application Relationships
 Service Group Dependencies
 How Dependencies Affect Failover
 Configuring Service Group Dependencies

Limitations of Service Group Dependencies
Using Resources to Control Service Group Interactions

COURSE OUTLINE

continued

Using Triggers to Control Service Group Interactions

Configuring Service Group Workload Management

Rules for Automatic Startup of a Service Group
Automatic Startup Policies
Rules for Automatic Failover of a Service Group
Failover Policies
Additional Startup and Failover Controls
Configuring Startup and Failover Policies
Controlling Overloaded Systems
Using the Simulator to Model Workload Management

Alternate Storage and Network Configurations

Alternative Storage Configurations
Alternative Network Configurations
Network Design Requirements
Additional Network Resources
The MultiNICA Resource and Agent
Additional Network Design Requirements on Solaris
The MultiNICB Resource and Agent
Example MultiNIC Setup
Testing Local Interface Failover

Maintaining VERITAS Cluster Server

Guidelines for Replacing a System in a VCS Cluster
Upgrading Software and Hardware in a Running Cluster
Performing a Rolling Upgrade in a Running Cluster
Upgrading VERITAS Cluster Server to Version 4.0
Alternative VCS Installation Methods
Staying Informed About VCS

Validating Implementation

Best Practices Review
Solution Acceptance Testing
Knowledge Transfer
Implementation Report
References for High Availability