Introduction to ClearCase Administration

Course Summary

Description

ClearCase is an enterprise level configuration management product which was adopted by many large organizations, both public and private, as part of the IBM Rational Suite. Because ClearCase is an enterprise level product, it has a rich and complex infrastructure that supports a highly customizable environment with a rich feature set. Being able to get the full benefits of ClearCase directly depends on the ClearCase administrator being able to customize the product to the specific environment it runs in, the user requirements and the organizational governance policies and procedures

This course provides students with an administrator's view of how ClearCase works from both architectural and functional perspectives and then builds on that understanding to identify, understand and master the core and critical administration tasks. In addition to developing a thorough understanding of the normal administrative tasks, students also explore identifying and repairing ClearCase problems and issues; planning restructuring and migrating ClearCase artifacts and installations.

Emphasis during the course will be on developing and administering a ClearCase installation that supports the various configurations in both Windows and Unix environments. A critical component of each module is a review of best practices for that topic as well as common errors that administrators make and how to diagnose and fix common problems.

Almost all of the course is presented in a hands on environment where concepts are introduced through both theory and instructor led walk through exercises where students follow along on their own lab machines as the instructor illustrates techniques and ideas. At the end of each module, students work on individual lab problems to reinforce the skills they are learning.

Objectives

After taking this course, students will be able to:
- Describe the ClearCase architecture and infrastructure.
- Create or modify the hosts required for a ClearCase installation.
- Explain the internal structure of VOBs including the internal databases and pools.
- Explain the internal structure of Views.
- Write View config specs and diagnose and rectify config spec issues.
- Explain how ClearCase keeps elements under version control.
- Create, modify and administer VOBs and Views.
- Diagnose and fix common problems with VOBs and Views.
- Explain the various kinds of meta-data used in VOBs – labels, branches, attributes, triggers, data types and hyperlinks – and best practices for their use.
- Create and maintain VOB meta-data.
- Create and administer the ClearCase registry and regions.
- Backup and restore VOBs and other ClearCase artifacts.
- Describe version creation strategies for ClearCase data types.
- Develop administrative support for branching and merging.
- Manage users and permissions.
- Schedule ClearCase cron tasks.
- Perform all ClearCase administrative actions at the command line using ClearTool

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Course Summary (cont'd)

Topics

- Configuration Management Overview
- ClearCase Design and Architecture
- VOB Basics
- View Basics
- The Registry and Regions
- VOB Meta-data Types
- Extended Path Names and config specs

- Administering VOBs
- Administering VOBs
- Snapshot and Dynamic Views
- Merging
- ClearTools
- Administrative Tasks Review

Audience

This course is intended for anyone either in or moving into an administrative role who will be managing or supporting a ClearCase installation, especially for those who will be working in a hands on manner administering the product. The course in not intended for ClearCase end users.

Prerequisites

The course does not require any prior ClearCase knowledge, however since this is an administration course, system administration concepts such as working at the command line, understanding files, permissions, system processes and other topics at a basic will be assumed. Experience with the Unix shell is not necessary but is useful. Prior experience with software configuration management concepts is also useful.

Duration

Three days

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Course Outline

I.   Configuration Management Overview
   A.   Overview of software configuration management (SCM) concepts
   B.   Asset identification, control, audit records and build management
   C.   Strategies for multi-user access to artifacts
   D.   SCM in traditional, Agile and DevOps environments

II.   ClearCase Design and Architecture
   A.   The four primary goals of the ClearCase design and architecture
   B.   How VOBs and views implement design goals
   C.   Architecture of a ClearCase network
   D.   Roles and Responsibilities of the ClearCase Administrator
   E.   Primary ClearCase artifacts and storage locations

III.   VOB Basics
   A.   Structure of VOBs: database, pools and the VOB process
   B.   How elements are maintained under version control
   C.   Data types and type handlers for elements
   D.   Element and VOB meta-data
   E.   VOB tags: mounting and unmounting VOBs
   F.   Creating and deleting VOBs
   G.   Public versus private VOBs

IV.   View Basics
   A.   Structure of a view – view private areas
   B.   Introduction to config specs
   C.   The View process and how it interacts with the VOB and client processes
   D.   Creating a dynamic view
   E.   Using multiple views
   F.   How views are presented to the users and how views present VOBs
   G.   Editing and deleting views

V.   The Registry and Regions
   A.   How the registry works: tags and registry objects
   B.   Registering and unregistering objects with the registry
   C.   Creating and removing tags
   D.   Using multiple regions within a registry
   E.   The role of the registry server
   F.   The ClearCase scheduler
   G.   Users, groups and permissions

VI.   VOB Meta-data Types
   A.   Labels
   B.   Branches
   C.   File types
   D.   Attributes
   E.   Hyperlinks
   F.   Triggers
   G.   Global versus local types
   H.   Administrative VOBs

VII.   Extended Path Names and config specs
   A.   What happens in the VOB when an element is checked in and out
   B.   Version trees of an element
   C.   Element extended paths: eg. elem@@/main/LATEST
   D.   How views interpret extended path names
   E.   Using extended path names to assign meta-data
   F.   How an element gets "branched"
   G.   Writing custom config specs

VIII.   Administering VOBs
   A.   Backing up and restoring VOBs
   B.   Moving and copying VOBs
   C.   Moving elements within and between VOBs
   D.   Removing versions, names and elements
   E.   Common problems: evil twins, eclipsed elements etc.
   F.   Working with the lost+found directory

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Course Outline (cont'd)

IX. Administering VOBs
   A. VOB feature levels and DB schemas
   B. VOB database snapshots and the ClearCase scheduler
   C. Pool scrubbing and tuning
   D. VOB diagnostic and repair utilities
   E. Working with VOB, element and meta-data ownership and permissions
   F. Retiring and exporting VOB contents
   G. Initializing VOBs with clearfsimport

X. Snapshot and Dynamic Views
   A. Permissions and Ownership of view storage
   B. The internal structure of a dynamic view
   C. Snapshot views: how they differ from dynamic views
   D. Load Rules and Snapshot updating
   E. Hijacked elements
   F. When to use snapshot views as opposed to Dynamic Views
   G. Common administration issues with Snapshots Views.

XI. Merging
   A. How ClearCase manages merges.
   B. Additive and subtractive merges
   C. The findmerge and merge tools
   D. Administration responsibilities and activities for merges
   E. Managing a merge process

XII. ClearTools
   A. Using standard command line tools in a VOB with extended pathnames
   B. Using the clearfind tool
   C. Using the clearmake tool
   D. Understanding derived objects

XIII. Administrative Tasks Review
   A. Site preparation and planning
   B. Backup and disaster recovery planning
   C. Understanding the team and user SCM requirements
   D. Creating and populating VOBs and Administrative VOBs and storage locations
   E. Defining meta-data types for users
   F. Defining regular tasks for the scheduler
   G. Setting up the registry regions
   H. Defining and managing the users and their groups
   I. Creating the views and writing config specs
   J. Regular diagnostics on VOBs
   K. Responding to common "crises"
   L. Forensics and recovery from commonly occurring problems
   M. Policies to prevent common ClearCase problems.