DevOps Masters Program Syllabus

Linux Administration

AWS

Python

DevOps

- A Linux Introduction
- Open Source Philosophy
- Distributions
- Embedded Systems
- Command Line Basics
- Basic Shell
- þÿ C o m m a n d L i n e S y n t a x l s
- þÿ C o m m a n d L i n e S y n t a x $ P A T H , C a s e S e n s i t i v i t y
- þÿ C o m m a n d L i n e S y n t a x B a s i c C o m m a n d s
- þÿ C o m m a n d L i n e S y n t a x u n a m e
- þÿ C o m m a n d L i n e S y n t a x C o m m a n d H i s t o r y , C o m m a n d C o m p l e t i o n
- þÿ C o m m a n d L i n e S y n t a x c d a n d p w d
- Shell Configuration Files
- þÿ V a r i a b l e s E n v i r o n m e n t / S y s t e m V a r i a b l e s
- þÿ V a r i a b l e s U s e r D e f i n e d

- Globbing
- Quoting
- Formatting Commands
- Working with Options
- Using the Command Line to Get Help
- Man
- Info
- locate, find, whereis, and using /usr/share/doc/
- Exercise: Man Page Walkthrough
- Exercise: Basic Command Line
- Using Directories and Listing Files
- The Linux File System
- Files, Directories
- Hidden Files and Directories
- Home
- Absolute and Relative Paths
- Exercise: Maneuvering the Linux File System
- Creating, Moving and Deleting Files
- Files and Directories
- Case Sensitivity
- Simple Globbing and Quoting

- The Power of the Command Line
- Archiving Files on the Command Line
- Files, Directories
- Archives, Compression
- Searching and Extracting Data from Files
- Commands (Revisited)
- Command Line Pipes
- I/O Redirection
- Regular Expressions
- Exercise: Practicing with Pipes and Grep
- Turning Commands into a Script
- Basic Text Editing
- Basic Shell Scripting
- Basic Shell Scripting, Continued
- Exercise: Using the vi Text Editor
- Available
- The Linux Operating System
- Choosing an Operating System
- Windows, Mac, and Linux Differences
- Distribution Life Cycle Management
- Understanding Computer Hardware

- Hardware
- Where Data is Stored
- Kernel
- Processes
- syslog, klog, dmesg
- /lib, /usr/lib, /etc, /var/log
- Your Computer on the Network
- Internet, Network, Routers
- Domain Name Service and the Default Gateway (Network Router)
- Network Configuration
- Security and File Permissions
- Basic Security and Identifying User Types
- Root and Standard Users
- System Users
- Creating Users and Groups
- User IDs
- User Commands
- Group Commands
- Exercise: Managing User Accounts
- Exercise: Creating User Groups
- Managing File Permissions and Ownership

- File/Directory Permissions and Owners
- Special Directories and Files
- Symbolic Links
- System files, Special Files, and Sticky Bits

- Amazon EC2
- Amazon Elastic Load Balancer
- Amazon Route 53
- Amazon VPC
- Amazon Simple Storage Service (Amazon S3)
- Amazon Elastic Block Store (Amazon EBS)
- Amazon Content Delivery Network (Amazon CloudFront)
- Amazon Relational Database Service (Amazon RDS)
- Amazon DynamoDB
- Amazon ElastiCache
- Amazon Simple Notification Service (SNS)
- Amazon CloudWatch
- Amazon CloudTrail
- Amazon Simple Email Service (Amazon SES)
- AWS Identity and Access Management (IAM)
- Amazon Command Line Interface API

- S3-Browser

- Introduction
- Memory management and Garbage collections
- Statements and Syntax
- File Operations
- Functions
- Modules and Packages
- Classes
- Exception Handling
- Advanced Concepts
- Django

Module1: Introduction to DevOps (Duration-1hr)

- DevOps Principles in detail

- DevOps Engineer Skills in the market
- Knowing DevOps Delivery Pipeline
- Market trend of DevOps
- DevOps Technical Challenges
- Tools we use in DevOps

þÿ M o d u l e 2 : G I T A v e r s i o n c o n t r o l t o o l (D u r a t i o n - 5 h r s)

- Knowing about Version control
- þÿ G i t A C L I
- Essentials of GIT in industry

  How to setup GIT

  - Installing Git
  - First-Time Git Setup
  - Getting a Git Repository

- Working with various commands in GIT

  Recording Changes to the Repository

  - How to check the Status of Your Files
  - How to track New Files
  - Staging our modified files
  - Ignoring Files from GIT
  - Viewing Your Unstaged and Staged Changes
  - How to commit Your Changes
  - Skipping the Staging Area and commit
  - Removing Files from GIT

  Viewing the Commit History

  - Limiting Log Output
  - Using a GUI to Visualize History

Undoing Things

- Changing Your Last Commit
- Unstaging a Staged File
- Unmodifying a Modified File

Working with Remotes

- Showing Your Remotes
- Adding Remote Repositories
- Fetching and Pulling from Your Remotes
- Pushing to Your Remotes
- Inspecting a Remote
- Removing and Renaming Remotes

Branching and Merging in Git

- What a Branch Is
- Basic in Branching and Merging
- Branch Management in GIT
- Branching Workflows and its usage
- þÿ R e m o t e B r a n c h e s c r e a t e a n d d e l e t e
- Rebasing

- Git workflows
- Git cheat sheet

þÿ M o d u l e 3 : J e n k i n s C o n t i n u o u s i n t e g r a t i o n (D u r a t i o n - 1 0 h r s)

- Essentials of Continuous Integration
- An example scenario where CI is used
- Know about Jenkins and its architecture in detail
- Jenkins tool Management in detail
- Installing Jenkins

  Post-installation setup wizard

  - Unlocking Jenkins
  - Customizing Jenkins with plugins
  - Creating the first administrator user

- Know about User management in Jenkins

  Authentication

  - Jenkins own database user creation
  - Options to enable integration with LDAP

  Authorization

  - Matrix based authorization
  - Project based authorization

  Overview of Maven

  - Maven project structure
  - Maven plugins

- þÿProject Object Model (POM) fundamental unit of work in Maven project
- Maven build lifecycle
- Adding external dependencies to maven pom.xml
- aven build and test project

Creating jobs and automatic build settings

- What is Jenkins Pipeline?
- Why Pipeline?
- Integration with GIT
- How to enable project based authorization for a job
- Source code management while creating jobs
- Triggering automated build
- Maven job setup

  Know about post build options for jobs like notifications, trigger another build, publishing reports, etc.

  - Adding a slave node to Jenkins
  - Building Delivery Pipeline
  - Notification settings in Jenkins
  - Plugin management in Jenkins

þÿModule 4: Docker A containerization technology (Duration-8hrs)

Introduction

- Real-world Shipping Transportation Challenges
- Introducing Docker and its technology
- Understanding of Docker images and containers

Working with container

- How to Share and copy a container
- Container Life Cycle
- How to use Base Image and customize
- Creation of Docker File
- How to Publish Image on Docker Hub

Introduction to Docker Networking

- Network Types in docker technology
- Docker Container Networking
- þÿ D o c k e r C o m p o s e A n i n t r o d u c t i o n

þÿ D o c k e r S w a r m A n i n t r o d u c t i o n

- Use Docker Compose to create php, wordpress, mysql
- How to Start Containers on a Cluster with Docker Swarm
- Creating and Scaling an application in Docker swarm

þÿ M o d u l e 5 : A n s i b l e A c o n f i g u r a t i o n M a n a g e m e n t (D u r a t i o n - 9 h r s)

þÿ I n t r o d u c i n g A n s i b l e A c o n f i g u r a t i o n m a n a g e m e n t t o o l

- Basics / What Will Be Installed
- Understanding Ansible architecture
- Control Machine Requirements
- Managed Node Requirements

Inventory

- Hosts and Groups
- Host Variables
- Group Variables

- Learn various ansible Modules

  How to use adhoc commands

  - Parallelism and Shell Commands
  - File Transfer
  - Managing Packages
  - Users and Groups
  - Deploying From Source Control
  - Managing Services

- Introduction to YAML script

  Playbook

  - About Playbooks
  - þÿ P l a y b o o k L a n g u a g e E x a m p l e Y A M L

- How to Write Playbooks
- Tasks in Playbooks
- Understanding about various tasks in playbook
- Introduction to Handlers and variables
- Learn about using handlers, variables in the playbook
- Become (Privilege Escalation)

Roles

- Role Directory Structure
- Using Roles
- Role Duplication and Execution
- Role Default Variables
- Role Dependencies
- Role Search Path
- Ansible Galaxy

Including and Importing

- Includes vs. Imports
- Importing Playbooks
- Including and Importing Task Files
- Including and Importing Roles

- Writing a playbook to install and configure webservers and deplo0y an application

- How to create Ansible Role and use it
- Using an ansible role in playbook
- How to use Ansible Galaxy to download roles.
- þÿ E x a m p l e I n s t a l l a n d u s e J e n k i n s r o l e s f r o m a n s i b l e g a l a x y

Module 6: DevOps on Cloud (Duration-2hrs)

- Essentials of Cloud computing?
- Cloud and virtualization architecture
- Cloud deployment architecture
- þÿ C l o u d p r o v i d e r s A n o v e r v i e w
- Why we need DevOps on Cloud?
- Introducing to Amazon web services
- þÿ V a r i o u s A W S s e r v i c e s f o r D e v o p s A n o v e r v i e w
- þÿ D e v O p s u s i n g A W S D e m o