



DevOps

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Overview

Our DevOps course is mainly designed for training fresh graduates about adopting to DevOps Culture and start their career in Information Technology. This course primarily focuses on delivering in-depth and Hands-on on Linux Administration, version control/ source code Management, Continuous Integration, Configuration Management, Cloud Adoption, Monitoring, Containerization and container orchestration. Different tools taught in this course includes Git/GitHub, Jenkins, Ansible, Amazon Web Services (AWS), Telegraf, InfluxDB, Grafana, Docker and Kubernetes.

By the end of the course, students will be able to:

- Use Jenkins and Ansible for creating a Continuous Integration and Automate the deployment platform on top of AWS.
- Ability to create a Monitoring platform using Telegraf, InfluxDB and Grafana.
- Deploy Microservices using Docker and Kubernetes.



Students

Fresh Graduates	Students who want to improve the skill set and meet the current market Trends in the job market. They will be able to make their own career in the world of Information Technology.
Career Shift	Someone looking for a career shift or start the career after having some gap in their career. This program helps to bridge the gap and make their career in Information Technology.
Managers	Those who are working as Business Analysts, Project Managers and to learn the importance of DevOps and adopt the DevOps culture in the projects and gives them ability to do knowledge transfer to the teams.



Curriculum

General Linux Administration

- **Technical Summary of Linux Distributions**
 - The Advantages of Open Source Software
 - Understanding the Differences between Windows and Linux
 - Single Users vs. Multiple Users vs. Network Users
 - The Monolithic Kernel and the Micro-Kernel
 - Separation of the GUI and the Kernel
 - My Network Places
 - The Registry vs. Text Files
 - Domains and Active Directory

- **Installing Linux in a Server Configuration**
 - Hardware and Environmental Considerations
 - Server Design
 - Uptime
 - Methods of Installation
 - Start the Installation
 - Configure the Network
 - Set Up Users and Passwords
 - Configure the Time Zone
 - Set Up the Disk Partition

- **The Command Line**
 - An Introduction to Bash
 - Job Control
 - Environment Variables
 - Pipes
 - Redirection
 - Command-Line Shortcuts
 - Filename Expansion
 - Environment Variables as Parameters
 - Multiple Commands
 - Backticks
 - Documentation Tools
 - The man Command
 - The texinfo System
 - Files, File Types, File Ownership, and File Permissions
 - Normal Files
 - Directories
 - Hard Links
 - Symbolic Links
 - Block Devices



COURSE CURRICULUM

Devops

- Character Devices
 - Named Pipes
 - File Permissions
 - File Management and Manipulation
 - Copy Files
 - Move Files
 - Link Files
 - Find a File
 - File Compression: gzip
 - File Compression: bzip2
 - File Compression: xz
 - Create a Directory: mkdir
 - Remove a Directory: rmdir
 - Show Present Working Directory: pwd
 - Tape Archive: tar
 - Concatenate Files: cat
 - Display a File One Screen at a Time: more
 - Show the Directory Location of a File: which
 - Locate a Command: whereis
 - Editors
 - vi
 - emacs
 - pico
 - Miscellaneous Tools
 - Disk Utilization: du
 - Disk Free: df
 - Synchronize Disks: sync
 - List Processes: ps
 - Show an Interactive List of Processes: top
 - Send a Signal to a Process: kill
 - Show System Name: uname
 - Who Is Logged In: who
 - Switch User: su
- **Managing Software**
 - The Red Hat Package Manager
 - Managing Software Using RPM
 - Querying for Information the RPM Way (Getting to Know One Another)
 - Installing Software with RPM (Moving in Together)
 - Uninstalling Software with RPM (Ending the Relationship)
 - Other Things RPM Can Do
 - Yum
- **Managing Users and Groups**
 - What Exactly Constitutes a User?
 - Where User Information Is Kept





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- The /etc/passwd File
- The /etc/shadow File
- The /etc/group File
- User Management Tools
- Command-Line User Management
- GUI User Managers
- Users and Access Permissions
- Understanding SetUID and SetGID Programs
- Sticky Bit
- Pluggable Authentication Modules
- How PAM Works
- PAM's Files and Their Locations
- Configuring PAM
- An Example PAM Configuration File
- The "Other" File
- D'oh! I Can't Log In!
- Debugging PAM
- A Grand Tour
- Creating Users with useradd
- Creating Groups with groupadd
- Modifying User Attributes with usermod
- Modifying Group Attributes with groupmod
- Deleting Users and Groups with userdel and groupdel
- **Booting and Shutdown**
 - Boot Loaders
 - GRUB Legacy
 - GRUB 2
 - LILO
 - Bootstrapping
 - The init Process
 - rc Scripts
 - Writing Your Own rc Script
 - Enabling and Disabling Services
 - Enabling a Service
 - Disabling a Service
 - Graphical Service Managers
 - Odds and Ends of Booting and Shutting Down
 - fsck
 - Booting into Single-User ("Recovery") Mode
- **Filesystems**
 - The Makeup of File Systems
 - i-Nodes
 - Blocks
 - Superblocks



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Devops

- ext3
- ext4
- Btrfs
- XFS
- Which File System Should You Use?
- Managing File Systems
- Mounting and Unmounting Local Disks
- Using fsck
- Adding a New Disk
- Overview of Partitions
- Traditional Disk and Partition Naming Conventions
- Volume Management
- Creating Partitions and Logical Volumes
- Creating File Systems

- **Core System Services**
 - The init Daemon
 - upstart: Die init. Die Now!
 - xinetd and inetd
 - The /etc/xinetd.conf File
 - Examples: A Simple Service Entry and Enabling/Disabling a Service
 - The Logging Daemon
 - rsyslogd
 - systemd-journald (journald)
 - The cron Program
 - The crontab File
 - Editing the crontab File

- **TCP/IP for System Administrators**
 - Network Configuration
 - Linux Firewall
 - Local Security
 - Network Security
 - Secure Shell
 - SSH KEY GEN and Password Less Logins
 - DNS
 - Network File System
 - Basic Understanding of LDAP

- **VMWare**
 - Installation and Configuration of ESXi Hypervisor /vCenter Server
 - Configure vSphere Networking
 - Configure vSphere Storage
 - Administer Virtual Machines and vApps
 - VM Availability and Resource Management
 - Perform Basic Monitoring





- Perform Basic Troubleshooting

Configuration Management using Ansible

- **Preparation**

- Environment Setup
- Installation

- **Foundation**

- Inventory
- Host Selection
- Tasks
- Plays
- Playbook Execution

- **Playbooks**

- Packages: apt
- Packages: become
- Packages: with_items
- Service: service
- Support Playbook – Stack Restart
- Services: apache2_module, Handlers, notify
- Files: copy
- Application Modules: php
- Files: file
- Files: Template
- File: lineinfile
- Application Modules: mysql_db, mysql_user
- Support Playbook 2 – Stack Status: wait_for
- Support Playbook 2 - Stack Status: uri, register, fail, when

- **Modular Configuration with ROLES**

- Roles
- Converting to Roles
- Variables
- External Roles and Galaxy

- **Advanced Execution**

- Removing Unnecessary steps
- Limiting Exec by Hosts
- Limit by Tags
- Idempotence
- Accelerated Mode and Pipelining

- **Troubleshooting Testing & Validation**

- Troubleshooting Ordering Problems
- Jumping to Specific Tasks
- Retrying Failed Hosts
- Syntax-Check & Dry-Run
- Debugging

Continuous Integration, Delivery and Containerization



COURSE CURRICULUM

Devops

- **Jenkins, Docker and Kubernetes**
 - Jenkins Management
 - Adding a slave node to Jenkins
 - Building Delivery Pipeline
 - Pipeline as a Code
 - Implementation of Jenkins in the CRUD app Project
 - Build the pipeline of jobs using Jenkins
 - Create a pipeline script to deploy an application over the tomcat server
 - Introducing Docker
 - Understanding images and containers
 - Introduction to Container
 - Container Life Cycle
 - Sharing and Copying
 - Base Image
 - Docker File
 - Working with containers
 - Publishing Image on Docker Hub
 - Managing Containers using Kubernetes
 - Running Containers
 - Introduction to Docker Networking
 - Network Types
 - Docker Container Networking
 - Start Containers on a Cluster with Kubernetes
 - Deploy a multi-tier application over a cluster

AWS Certified Solutions Architect - Associate

- **Identity Access Management (IAM)**
 - IAM 101
 - IAM Lab
- **AWS Object Storage and CDN – S3, Glacier and CloudFront**
 - Launch and EC2 Instance
 - Security Group Basics
 - Volumes and Snapshots
 - Creating a Windows EC2 instance
 - Creating an AMI
 - AMI's – EBS root Volumes vs Instance Store
 - Loadbalancers & Health Checks
 - Cloud Watch EC2
 - The AWS Command Line & EC2
 - Using IAM roles with EC2
 - Using Bootstrap Scripts
 - EC2 Instance Meta-Data
 - Autoscaling 101
 - EC2 Placement Groups
 - EFS Concept and Lab
 - Lambda Concepts
- **ROUTE53**



COURSE CURRICULUM

Devops

- DNS 101
- Route53 Lab
- Route53 Routing Policies
- **Databases on AWS**
 - Databases 101
 - Launching an RDS Instance
 - Backups, Multi AZ & Read Replicas
 - Dynamo DB
 - RedShift
 - Aurora
- **VPC (Virtual Private Cloud)**
 - Build your own Custom VPC
 - Network Address Translation (NAT)
 - ELB's & VPC
 - NATs vs Bastions
 - VPC Flow Logs
 - VPC Cleanup

AWS Certified SysOps Administrator - Associate

- **High Availability**
 - Elasticity & Scalability
 - Scale up and Scale Out
 - Troubleshooting & Potential Autoscaling Issues
- **Data Management**
 - Disaster Recovery, Back Up Part 1 & 2
 - AWS Automated Backup Services
 - Upgrading EBS Volume Types
 - Storing Log Files and other Backups
- **Security**
 - Security Token Service
 - Security on AWS
 - AWS & IT Audits
- **Monitoring using Telegraf, InfluxDB and Grafana**
- **Overview and Importance of creating Hybrid Cloud**
- **Solving Problem statements**