

Git, Bitbucket, Shell-Python scripting, Terraform, Docker-Container, CiCd

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DEVOPS FUNDAMENTALS

- DevOps Fundamentals
- System Development Life Cycle(SDLC)
- SDLC Models
- Agile Methodology (Backlog, Sprint, Scrum Master)

GIT

Version Control Tool – GIT

Git Repository

- * Creating a Git Repository
- * Git Workflow
- * Tracking File Changes
- * Files or directory add to stage
- * Reset from stage
- * Ignoring Files in Git
- * Commit to Repository
- * Reverting to Earlier Commits
- * Deleting Files in Git

GitHub – Cloud Repository

- * Creating a Repository in GitHub
- * Creating a Repository in GitHub Using SSH
- * Pulling Commits from GitHub
- * Collaborating between Local and Remote Repository
- * Push local Repository to GitHub or remote Repository
- * Merging File Changes in Git
- * Issue Tracking in GitHub

Branching Merging And Rebasing in Git

- * Branching in Git
- * Merging Branches in Git
- * Fast Forward and Recursive Merge
- * Recursive MergePreview
- * Resolving Merge Conflicts in Git
- * Stashing in Git
- * Rebasing in Git
- * Cloning in Git

Getting Started

- Getting Started With BitBucket
 - Creating an Account
 - Configuring Two-step Verification
- Creating a Repository
- Creating a Snippet
- Using the BitBucket User Interface

Working in Teams

- Configuring Your Account
 - Setting Permissions
 - Adding Notifications
- Configuring a Repository
 - Choosing a Branching Model
 - Choosing a Merging Strategy
 - Protecting a Branch
 - Assigning Permissions to Users
- Organizing Your Repositories Into Projects
 - Creating a Project
 - Assigning Repositories to a Project
- Reviewing Code
 - Creating a Pull Request
 - Viewing the Changed Files
 - Adding a Comment
 - Approving a Pull Request
 - Merging a Pull Request
- Using Code Aware Search

Creating Documentation

- Raising an Issue
 - Creating Different Types of Issues
 - Assigning an Issue to a User
- Making a Wiki
 - Creating the Wiki
 - Adding a Page
 - Editing a Page
 - Cloning

Running Pipelines

- Using a Default Template
- Updating a Build Pipeline File
- Monitoring Deployments
- Building Pipeline Triggers
- Using SSH Keys
- Setting Up Notifications
- Building in Concurrency

Installing and Running Jenkins

- * Downloading and Installing Jenkins
- * Running Jenkins as a Stand-Alone Application
- * Initial Configuration

Job Types in Jenkins

- * Different types of Jenkins Items
- * Configuring Source Code Management(SCM)
- * Working with Subversion
- * Working with Git
- * Storing Credentials
- * Service Accounts
- * Schedule Build Jobs

- * Polling the SCM
- * Polling vs Triggers
- * Maven Build Steps

- * Jenkins Plugins - SCM
- * Jenkins Plugins – Build and Test
- * Jenkins Plugins – Analyzers
- * Jenkins for Teams
- * Installing Jenkins Plugins

Distributed Builds with Jenkins

- * Agent Machines
- * Configure Jenkins Master
- * Configure Projects
- * Conclusion

Continuous Delivery and the Jenkins Pipeline

- * Continuous Delivery
- * Continuous Delivery (cont'd)
- * DevOps and Continuous Delivery
- * Continuous Delivery Challenges
- * Continuous Delivery with Jenkins
- * The Pipeline Plugin
- * The Pipeline Plugin (cont'd)
- * Defining a Pipeline
- * A Pipeline Example
- * Pipeline Example (cont'd)
- * Parallel Execution
- * Creating a Pipeline
- * Invoking the Pipeline
- * Conclusion

Docker Containerization

Introduction

- * What can you use Docker for?
- * How Docker fits into the development lifecycle
- * How Docker ensures consistency from development through UAT and staging, and on to production
- * Example use cases of Docker in the real world

The components of Docker

- * Underlying technology
- * Docker client and server
- * Filesystem images
- * Registries
- * Containers
- * Networking

Getting set up to start using Docker

- * Getting set up on Windows
- * Trying out our first container
- * Getting set up for production on Linux
- * Tweaking your production environment for best performance

Container management

- * Container naming
- * Starting and stopping containers
- * Attaching to a container
- * Seeing what is happening in a container
- * Running a process inside a container
- * Daemonizing a container
- * Automatic container restarts
- * Deleting containers when we are finished with them

Docker images and repositories

- * Docker images explained
- * How Docker images work
- * Getting a list of images
- * Searching for images on a repository
- * Pulling an image
- * Creating our own image
- * Specify an image in a Dockerfile

- * Building Dockerfile images
- * Using the build cache for templating
- * Viewing the image we have created
- * Launching a container using our new image

Registries

- * What is the Docker hub?
- * Pushing images to the Docker hub
- * Running your own internal Docker registry
- * Testing the internal registry

A simple use case

- * A single container static website
- * Setting up a container running Nginx
- * Launching our static site
- * Updating our static site from git or bitbucket

Continuous integration with Docker

- * How Docker enables and supports CI
- * Getting set up for Jenkins and Docker
- * A basic Jenkins job
- * Multi configuration jobs
- * Drone
- * Shippable

TERRAFORM

1. Introduction to Terraform

- Introduction to terraform
- Infrastructure Automation
- Install Terraform
- Providers
- Resources
- Basic Syntax
- Exercise: Your First Script main.tf

2. Getting started with Terraform

- Terraform Plan, show, Apply, Destroy
- Exploring Terraform Registry
- Interpolation
- Tainting and Updating Resources
- Terraform Console and Output
- Terraform Variables
- Breaking Out Our Variables and Outputs
- Lab exercises: Breaking down main.tf into variables.tf, output.tf,

3. Terraform Modules

- Introduction to Modules
- Module repositories
- First Basic Module
- The Module code
- Main Terraform Code
- Using git repositories to save modules
- Lab exercises: Modules for Docker
- Lab exercises: The Docker Image Module
- Lab exercises: Modules The Container Module
- Lab exercises: Modules - The Root Module

4. Terraform: Writing in a more organized way

- Maps and Lookups
- Terraform Workspaces
- Breaking Out Our Variable Definitions
- Null Resources and Local-Exec
- Terraform Console

5. Terraform with AWS:

- Overview

6. Terraform

- Remote state
- Data Sources
- Templates
- Conditionals
- Built-in Functions
- Working with state files
- Outputs, count and Join Function

7. Terraform Integration

- Integration with Git
- Packer introduction
- Terraform with Packer
- Terraform with Jenkins
- Terraform Formatting and Remote State

9. Terraform Troubleshooting and Testing

- Terraform Plan revisited
- Debugging the script
- Terraform Testing
- Lab: Writing test scripts for Terraform.
- Lab: Testing with Docker

10. Extending Terraform

- Terraform with Azure cloud
- Terraform with Google Cloud
- Terraform Templates
- Terraform plugins
- Integrating Go Plugins

11. Terraform Best Practices

- Best practices in writing terraform scripts
- Terraform Workflow
- Terraform projects
- Other Hashicorp tools
- New features of Terraform

Bash Shell Scripting

1- The Linux Environment

- The Origin of Linux
- Files and File Systems
- Directories
- Inodes and Links
- Pipe and Socket Files
- Device Files
- Lab Session

2- Basics of Linux

- Command Basics
- Command-Line Editing
- Multiple Commands
- Multiline Commands
- Command History
- Directory Commands
- Basic file permissions
- Lab Session

3- Working with files and users

- Listing Files
- Getting Help
- Fixing the Display
- Working with Files
- Working with People
- Lab Session

4- Working with Shell

- What is a shell?
- Types of shell
- Shell features
- Shell Aliases
- Customizing Your Prompt
- Built-In Versus Linux Commands
- The Bash Hash Table
- The Set and Shopt Commands
- Key Binding
- Lab Session

5- Script Basics

- Which shell?
- Recommended shell
- Pseudo code before writing shell script
- Creating a Script
- Magic Sha-Bang
- How to execute a script
- Exit status
- Shell Debugging Features
- Lab Session

6- Variables

- Introduction to Variables
- Variable Assignment
- Displaying and using variables
- Variable Attributes
- Quoting Variables
- Escape Characters
- The eval Command
- Concatenation and sub-strings
- Lab Session

7- Array variables

- Creating array Variable
- Substituting and counting
- Using integer variables as element numbers
- Lab Session

8- User Input

- Reading user input
- Positional parameters
- Creating positional parameters
- Lab Session

9- Designing Program Output

- Variable attributes
- Formatted output with printf
- Terminal echo
- I/O Redirection
- Pipe and tee
- Lab Session

10- Managing input and output

- File descriptors
- Reading / writing using file descriptors
- Redirecting, parameter lists and 'here' documents
- Creating parameter lists from input lines
- Lab Session

11- Shell arithmetic

- Creating Integer Variables
- Using arithmetic operators and data
- Lab Session

12- Branching and logic testing

- Logic testing
- Conditional operators
- Multi-way branching and the 'case' statement
- Lab Session

13- Shell patterns

- Basic expressions
- Regular expressions

- Meta-characters
- Pattern combinations
- Using Character Classes
- The grep and egrep command
- Lab Session

14- Looping

- The 'while' loop
- The 'until' loop
- The 'for' loop
- Breaking out of a loop and continuing
- The 'select' loop
- Lab Session

15- The 'getopts' Command

- Processing arguments
- The getopts and OPTARG variable
- The OPTIND variable
- Lab Session

16- Functions

- Displaying current shell functions
- Declaring and using functions
- Variable scope
- Function recursion
- Lab Session

17- Traps, Signals and Script Control

- Common signals
- Running Scripts in Background Mode
- Scheduling your script
- Starting the Script at Boot Time
- The trap commands
- Lab Session

18- Introduction to 'awk'

- Record processing
- Pattern matching and relational expressions
- Command line arguments
- Lab Session

19- Introduction to 'sed'

- Substituting text
- Deleting and printing lines
- Reading and writing files
- Multiple 'sed' editor functions
- Lab Session

20- Writing Utility Scripts

- Creating Graphical Script
- User Management Script
- Directory Monitoring Script
- User Login Monitoring Script
- Email Report by Script