Savitribai Phule Pune University

M.Sc.(Computer Science)

Progress Report for CS-651-MJP : Full Time Industrial Training (IT)

(This Progress report is to be submitted monthly to the college guide/Mentor)

Name of College	Rajmata Jijau Shikshan Prasarak Mandal's ARTS, COMMERCE & SCIENCE COLLEGE
Roll No./ID and Name of Student	ANANTU AJAYAN VISHWAKARMA
Date of Report Submission	
Duration of Report (From date — To date)	01/01/2025 TO 31/01/2025
Name of Organization	Tata Consultancy Services
Date of Joining in the organization	25/12/2024
Name of Industry Guide/Supervisor	Ms. Sonali Parab
Name of College Guide/Mentor	Prof. Swapnil More Sir

1. Introduction

January marked the beginning of my internship as a Linux System Administrator at Tata Consultancy Services (TCS). As a beginner stepping into the field of system administration, my primary goal during this month was to build a strong foundation in Linux. I focused on understanding the structure, behavior, and practical usage of the **Linux operating system**, with a particular emphasis on **Red Hat Enterprise Linux (RHEL)**—a widely adopted and stable platform used in enterprise environments.

I was introduced to the **Linux command-line interface (CLI)**, which plays a critical role in system management tasks. Through continuous practice, I became familiar with basic command-line operations such as navigating directories, managing files and permissions, and monitoring system processes. I also explored the **core system architecture of Linux**, learning how components like the kernel, shell, and file system interact.

A major part of my initial training involved the **manual installation of RHEL** on virtual machines using platforms like VirtualBox and VMware. I learned to configure partitions, manage LVM, and set up users, time zones, and network parameters during installation. This hands-on experience helped me gain confidence in managing Linux systems via terminal tools, setting the stage for more advanced topics and tools in the upcoming months.

2. Work Undertaken

My hands-on work primarily revolved around using and managing Red Hat systems. I worked extensively on installations and system configurations using the RHEL platform. Key tasks included:

- Basic Command-Line Operations in RHEL:
    - Navigation and file management: ls, cd, cp, mv, rm
    - Viewing files: cat, less, tail, head

- Installation and Setup of RHEL:
    - Installed RHEL on virtual machines using VirtualBox and VMware
    - Created manual partitions (/, /home, /var, and swap) with LVM
    - Configured bootloaders and user accounts during installation
    - Set up repositories using .repo files for package installation
- User and Permission Management:
    - Created and modified users and groups: useradd, groupadd, passwd
    - Applied correct permission settings using chmod, chown
- Initial System Configuration:
    - Configured hostname and timezones
    - Managed basic network settings with nmcli and /etc/sysconfig/network-scripts/

This phase helped me become comfortable working with enterprise-level systems, specifically tailored to Red Hat-based environments.

3. Learning and Skill Development

Throughout January, I developed essential Linux administrative skills using RHEL as the platform. Some of my key takeaways included:

- Command-Line Mastery:
    - Grew confident with Red Hat's terminal tools and bash shell usage
    - Practiced working without GUI to improve speed and precision
- System and Disk Management:
    - Used df, du, mount, umount, lsblk for managing disks
    - Learned to manage Logical Volume Management (LVM) using lvcreate, vgcreate, pvcreate
- User & Access Control:
    - Implemented file-level access controls through permission and ownership settings
    - Understood user account policies and security configuration
- Package and Service Management:
    - Explored yum package manager and dnf (for RHEL 8+)
    - Used systemctl to manage services and targets

These skills not only enhanced my understanding of Red Hat systems but also prepared me for deeper administrative tasks in the months ahead.

4. Challenges Faced

Transitioning into a Linux CLI environment brought several challenges:

- CLI Learning Curve:
    - Initially struggled with remembering command options and syntax
    - Errors due to wrong paths or permission issues were common at the start
- RHEL Installation Troubleshooting:
    - Faced bootloader configuration issues during installation
    - Manual partitioning and LVM setup were difficult without prior experience
- Networking Issues:
    - Encountered problems when manually configuring static IPs using nmcli
    - Resolved by editing config files in /etc/sysconfig/network-scripts/ and restarting services

5. Architecture and Contributions

To apply my learning, I created a test lab using RHEL virtual machines. Key contributions include:

- Lab Environment Setup:
    - Configured multiple RHEL VMs to simulate a small enterprise environment
    - Connected VMs using bridged/adapted networks for testing remote access
- Knowledge Documentation:
    - Created a command reference guide for basic and advanced RHEL commands
    - Maintained an installation checklist to avoid repeat errors in future setups

This mini-lab not only helped me experiment safely but also allowed others in my team to follow and replicate my process, fostering collaborative learning.

6. Future Plan

Having laid the groundwork with Red Hat systems in January, my primary focus going forward is to expand my understanding of Linux beyond the basics. My next steps include:

- Gain Deeper Knowledge of Linux:
    - Strengthen my command-line expertise further by exploring advanced file system operations, shell scripting, and user management techniques
    - Understand Linux kernel behavior, service management, and system performance monitoring
- Explore Tools and Services:
    - Begin learning about essential tools used in enterprise Linux environments such as:
        - Nagios for system monitoring
        - BMC Remedy for IT service management
        - Commvault for backup and recovery
        - SELinux for access control and security
        - Systemd for service and boot management
        - Log management tools for event tracking and troubleshooting
    - Understand their purpose, architecture, and basic configuration

The goal for the upcoming months is to build a comprehensive understanding of these tools and services, preparing me for hands-on experience in real-world administrative scenarios.

Signature:	Signature:
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