

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)	01/02/2025 TO 31/03/2025
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

In February, the internship progressed from foundational Linux knowledge to more advanced, enterprise-level tools and security mechanisms. This month's primary focus was to understand how large-scale Linux environments are managed and maintained using professional tools and secure configurations. I was introduced to a variety of industry-standard platforms and services such as **Nagios for monitoring**, **BMC for asset and incident management**, **Commvault for backups**, and **SELinux** for system security enforcement. Additionally, I explored **network configuration** and **service management**, which are essential components in any enterprise IT setup.

The objective for this phase was to gain theoretical and practical knowledge of how these tools function, how they are installed and configured, and how they contribute to a secure and stable Linux infrastructure. This exposure gave me insight into real-world system administration tasks and how Linux admins ensure uptime, compliance, and performance in large environments.

2. Work Undertaken

During this month, I worked hands-on with several critical tools and services that are widely used in corporate Linux environments. Key tasks I completed include:

- **Nagios Monitoring Tool:**
 - Installed and configured Nagios Core on RHEL
 - Monitored essential services such as HTTP, SSH, disk usage, and system load
 - Learned to configure Nagios plugins and host/service definitions
- **BMC Remedy:**
 - Explored the interface and workflow for incident and asset management
 - Practiced logging service tickets and tracking system issues in an ITIL-compliant manner
- **Network Configuration:**
 - Configured static IP addresses using nmcli, nmtui, and manual edits in /etc/sysconfig/network-scripts/
 - Practiced network troubleshooting using tools like ping, netstat, and ifconfig
 - Updated and tested DNS resolver settings for proper name resolution
- **SELinux:**
 - Studied how SELinux enforces security through mandatory access control
 - Used tools like getenforce, setenforce, semanage, and audit2allow to investigate and resolve access denials
- **Commvault Backup:**
 - Understood Commvault's architecture for data protection
 - Explored backup policies, data agents, and scheduling backups for specific filesystems
- **Systemd and Logging:**
 - Learned how to manage services using systemctl (start, stop, enable, disable)
 - Analyzed logs using journalctl and reviewed entries from /var/log/ to troubleshoot issues

3. Learning and Skill Development

This phase of the internship was crucial for advancing my system administration skills. Key areas of development include:

- **Monitoring and Alerting:**
 - Learned how to monitor Linux server health and service status using Nagios
 - Understood the importance of setting thresholds and generating email

notifications

- **Network Configuration:**

- Strengthened my ability to configure and troubleshoot Linux network interfaces
- Gained clarity on how routing, subnetting, and DNS settings impact system communication

- **Security Enforcement with SELinux:**

- Understood SELinux modes (Enforcing, Permissive, Disabled) and their implications
- Learned how to analyze denials, create policies, and ensure application functionality without compromising security

- **Backup Management:**

- Gained an overview of how data protection is ensured in enterprises using tools like Commvault
- Understood the role of scheduled backups and disaster recovery planning

- **Service and Log Management:**

- Improved skills in controlling background services and analyzing system logs
- Learned to use systemctl and journalctl effectively for operational oversight

4. Challenges Faced

February introduced a more complex set of tasks that required deeper technical understanding and patience. Some of the challenges I encountered include:

- **Nagios Configuration Issues:**

- Faced difficulties in writing correct syntax for host and service definitions
- Troubleshoot plugin paths and permissions to enable successful monitoring

- **SELinux Troubleshooting:**

- Initially found it difficult to interpret SELinux denials
- Required multiple attempts using audit2why and audit2allow to resolve access issues

- **Network Setup Across VMs:**

- Managing IP configurations on multiple virtual machines with different adapters was tricky
- Misconfigured routes and DNS settings led to temporary connectivity failures

5. Architecture and Contributions

To better understand how these tools integrate in real environments, I designed test scenarios and contributed to my team in several ways:

- **Tool Interaction Mapping:**

- Created a visual diagram showing how tools like Nagios, SELinux, and Commvault interact in a server environment
- Understood how monitoring, security, and backup complement each other in a system architecture

- **Test Lab Setup:**

- Set up isolated virtual machines with static IPs to simulate a mini-enterprise environment
- Installed Nagios server and configured clients (NRPE) to report system health

- **Internal Documentation:**

- Documented basic steps for configuring Nagios, handling SELinux alerts, and managing network settings
- Shared troubleshooting logs and configuration templates with peers to support collaborative learning

These contributions enhanced the practical learning environment for both myself and fellow interns.

6. Future Plan

After gaining theoretical and practical knowledge of these enterprise tools, my goal for the coming month is to **apply them in hands-on, real-world simulations**. Specifically, I aim to:

- Practice configuring **Nagios plugins** and advanced alerting mechanisms
- Apply **SELinux policy adjustments** in service-based environments
- Run full **Commvault backup and restore cycles**
- Integrate **systemd service management and log analysis** into routine operations
- Combine monitoring, backup, logging, and network configuration to simulate real-time issue resolution

By deepening my hands-on experience, I hope to build the confidence and technical skillset required for managing production-level Linux systems effectively.

Signature:

Date:

Name: Ms. Sonali Parab

Industry Guide/Mentor

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