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SEMESTER PROJECT PROPOSAL
MODULE: Data Communications – Linux System Administration, CODE: IT28X97

Secure Remote Backup system for small businesses

1. Problem and Project Overview

In this fast-growing digital world, data has found computers and cloud storage to be its home, Thus this project focuses on addressing a problem small business people are facing where they find themselves relying on their personal computers or small servers to store their important business files which in that space are not well protected since they don't have a strong data backup system because of money constraints, resources and the biggest factor which is limited IT skills.

With this problem I aim to make an easy-to-use and affordable backup system using Linux. Focusing on giving these small businesses good data protection with no advanced technical skills, have the system back up their files automatically (Remote and locally), encrypt and check data accuracy for security, and provide a simple web interface for users to monitor and restore their files.

2. Goals

- Make a robust backup infrastructure with two Linux machines: a client and a server.
- Protect sensitive business data with strong encryption.
- Carry out automated and incremental backup processes with history.
- Integrate with cloud storage services for offsite backup redundancy.
- Make a user-friendly web interface to monitor backup status and data restoration.
- Make email notifications for backup success or failure.
- Make a comprehensive documentation system(wiki).
- Execute proper security measures for the whole system.

3. System setup and services

3.1 Hardware

Two virtual Ubuntu 22.04 LTS machines:
- Backup Server: Store backup data
- Client System: A typical business computer that needs backing up

3.2 Software and Services

- Borg Backup: Secure, efficient backup duplicating files
- Borgmatic: Atomate and schedule backup

- Nginx: Run web interface
- Vorta: web-based to manage backups
- Postfix: send email notifications
- Docker: Manage system components in containers
- Let's encrypt: provide SSL security for web access
- Rclone: Connect to cloud storage
- Prometheus and Grafana: track and display systems activity

4. How does it work and Expected Results

The system will save backups from the client computer to the backup server on a schedule automatically. The data in question will be compressed, encrypted, and optimized to free space. The backup server will store copies on set and sync them with a cloud server for safety. Users can further check the backup status, see past backups, and restore files on the web interface created. With all that stated, I expect a working secure backup system, which will have a guide of clear instructions to use to install and possibly for troubleshooting. It should be non-technical for the user to manage and work on Linux.