OVERVIEW OF THE PROJECT

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TITLE: Predictive Infrastructure Monitoring and Alert Dashboard

This project aims to demonstrate how predictive monitoring using Zabbix can help system administrators anticipate failures before they occur. Instead of reacting to outages, our goal is to use trend analysis functions in Zabbix to proactively detect early warning signs, such as storage nearing capacity or CPU load rising steadily, and to even alert administrators in advance. This bridges the gap between traditional monitoring and intelligent automation, supporting improved uptime and reliability in IT environments.

- Create 3 VMs in virtual box: one for Zabbix Server, two as monitored clients
- Install the Zabbix Server, frontend, and database (MySQL or Postgresql)
- Install Zabbix Agents on the clients
- Monitor CPU, memory, and disk usage
- Configure email alert notifications
- Report/dashboard showing live performance data

Summary for setup:

The environment of our experiment consists of three virtual machines created in VirtualBox. One VM is designated as the Zabbix Server, which hosts the Zabbix monitoring platform along with its front end and database of MySQL or PostgreSQL. The other two VMs act as monitored client systems. Zabbix Agents are installed on these clients to collect system metrics such as CPU usage, memory utilization, and disk usage. Email alert notifications are configured on the Zabbix Server to notify administrators of critical events. A dashboard on the Zabbix frontend displays live performance data from all monitored clients, enabling real-time monitoring and analysis.

DATA:

Our data will analyze types of metrics collected, where they're stored, and how they're used:

- **CPU usage** – percentage of CPU utilization on each client VM.
- **Memory usage** – available vs used RAM on each client VM.
- **Disk usage** – storage capacity and consumption on each client VM.
- **System alerts** – critical or warning events triggered by resource thresholds.
- **Historical trends** – performance patterns over time for proactive monitoring.

EXPECTED OUTCOMES:

We hope to achieve or demonstrate the following in this project:

1. **Reduced Downtime** – By continuously monitoring system resources and detecting issues early, system interruptions can be minimized.
2. **Functional Monitoring System** – A fully operational Zabbix setup that tracks CPU, memory, and disk usage across multiple client VMs in real-time.
3. **Proactive Incident Response/Prevention** – Timely alerts and notifications allow administrators to respond to potential issues before they escalate, ensuring system reliability and stability.