**EASTERN INTERNATIONAL UNIVERSITY**

**SCHOOL OF COMPUTING AND INFORMATION TECHNOLOGY**

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**PROJECT PROPOSAL**

1. **General Information**

* **Project Title**: Integrated System Management: Combining Local Networks and Cloud Platforms
* **Project Level:** *Internship*
* **Student Name:** Ha Quang Minh
* **Student ID:** 1931220012
* **Supervisor Name**: **Dr.** **Phan Van Vinh**

1. **Project Overview**
2. **Background and Motivation**

* **Problem Statement:**

*In modern organizations, managing IT systems effectively is vital to ensure network stability, performance, and security. Many businesses, including clients like Athena, are moving towards more complex infrastructures that combine both on-premise systems and cloud platforms. Without a proper management plan, it becomes difficult to track resources, assign roles, and monitor performance. This can lead to system overloads, security risks, and operational delays..*

* **Motivation:**

*This project is motivated by the need to research and understand different network management systems and cloud platforms from Google, Amazon, and Microsoft. By comparing these technologies and analyzing the real needs of the client (Athena), the project aims to build a simple and effective strategy for system management. The goal is to help businesses like Athena improve control over their IT environment without depending too much on manual work or outdated tools..*

1. **Objectives and Scope**

* **Primary Objectives:**

*- Research modern network management systems and understand how they are used in real-world environments.*

*- Study and compare cloud platforms from Google, Amazon, and Microsoft to identify their strengths and use cases.*

*- Analyze the requirements of a client (Athena) and propose a suitable system management solution.*

*- Learn how network and cloud management tools can be used together to improve system performance and reliability.*

* **Scope:**

*- Study local network management tools (such as pfSense, Zabbix, or OpManager) to understand how small and medium businesses manage their systems.*

*- Research cloud service providers (AWS, Google Cloud, Azure) and identify key services that support system monitoring and resource control.*

*- Compare the advantages and limitations of using cloud platforms vs. on-premise solutions.*

*- Propose a suitable hybrid system (local + cloud) for the Athena client, based on their expected requirements.*

*-* *Build basic diagrams and documentation to show how the system should be managed.*

*\** ***Limitation:***

*- This project is based mainly on research and theoretical analysis. Therefore, practical implementation will be kept simple and limited to small-scale test environments.*

*- Some advanced tools and features from cloud providers may not be accessible due to account or cost restrictions.*

*- The proposed solutions will be designed based on general assumptions and publicly available data, not from direct access to Athena’s real infrastructure.*

*- Performance testing and real-time monitoring are not within the project scope, as they require complex system access and long-term observation.*

1. **Methodology**

* **Approach:**

*This project follows a research-based approach, focusing on studying network management systems and cloud platforms, then proposing a hybrid model suitable for the needs of a sample business (Athena). The project combines literature review, tool exploration, and visual modeling to provide a complete overview of how network and cloud management can be planned effectively..*

***Phased Implementation:***

* + - 1. **Requirement Analysis**

*Identify common system management needs of small-to-medium enterprises like Athena.*

*Define key concerns: access control, monitoring, network visibility, cloud adoption*

* + - 1. **Research and Tool Review**

*- Study traditional network management tools such as pfSense and Cisco Packet Tracer to understand internal network setup.*

*- Explore modern monitoring solutions like* ***Zabbix*** *and* ***Grafana*** *for performance tracking and alerting.*

*- Research cloud-based services from AWS, Google Cloud, and Microsoft Azure, focusing on how they support system and network administration.*

* + - 1. **Modeling and Stimulation**
* *Use* ***Cisco Packet Tracer*** *to simulate small business network topology.*
* *Configure* ***pfSense*** *in a virtual lab to understand firewall and routing functions.*
* *Create monitoring dashboards using* ***Zabbix*** *and* ***Grafana*** *to demonstrate system visibility.*
  + - 1. **Design Proposal**
* *Combine insights to design a hybrid network + cloud solution.*
* *Use* ***draw.io*** *to build visual architecture diagrams.*
* *Summarize tool usage and their contribution to system management.*
  + - 1. **Final Report and Recommendations**
* *Document findings, comparisons, and conclusions.*
* *Propose a recommended model for Athena, including reasons for selected tools and platforms.*
* **Tools and Technologies:**

*Networking & Stimulation tools: Cisco Packet Tracer, pfSense*

*Monitoring & Visualization: Zabbix, Grafana, draw.io*

*Cloud Platforms (for reference):* *AWS, Google Cloud, Microsoft Azure*

*Virtual Environment (optional for testing): VMware Workstation*

1. **Expected Outcomes**

*By the end of this project, a clear and structured understanding of network and cloud system management is expected. The student will provide a comparative analysis of various tools such as pfSense, Zabbix, Grafana, and cloud platforms including AWS, Google Cloud, and Microsoft Azure. A sample network model will be created using Cisco Packet Tracer, along with basic configurations in pfSense to simulate internal routing and firewall settings. Monitoring dashboards will be demonstrated using Zabbix and Grafana to visualize system performance. Based on the needs of the client (Athena), the student will design and propose a hybrid system that combines both local and cloud-based management solutions. The proposal will include visual architecture diagrams created in draw.io and clear justifications for the tools and platforms selected. All research, findings, and recommendations will be compiled into a final report, serving as both academic evidence and a practical reference for small-to-medium business environments.*

1. **Timeline**

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| # | Timeline | Task | Outcome |
| 1 | Week 1 | Learn about company regulations and Athena’s background needs | Understand the working environment and client’s management requirements |
| 2 | Week 2 | Study Google Cloud Platform (GCP) networking | GCP network diagram and config report |
| 3 | Week 3 | Study Amazon Web Services (AWS) networking | AWS network model and GCP–AWS comparison |
| 4 | Week 4 | Study Microsoft Azure networking | Azure demo and cloud platforms comparison |
| 5 | Week 5 | |  | | --- | |  |  |  | | --- | | Analyze system requirements for network management | | Requirement analysis document |
| 6 | Week 6 | Build experimental network model using VMware | Simulated functional test network |
| 7 | Week 7 | Apply automation tools (Ansible/Terraform) for network configuration | Automation scripts and integration report |
| 8 | Week 8 | Analyze Athena’s current network system | Network diagram and vulnerability assessment |
| 9 | Week 9 | Redesign Athena’s network using NetBox and cloud solutions | Redesigned architecture and NetBox-based demo |
| 10 | Week 10 | Write report | Final report |