DHAKA CITY COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (CSE)
Website: dhakacitycollege.edu.bd

PROJECT PROPOSAL

==========

Application form for approval of B.Sc. Hons. In CSE project proposal. All the items of the following list must be mentioned and filled in properly.

Date: 31-07-2023

1. **Name of the Student :** Anindita Koiri Prapte **Section :** A
   Roll No. : 005 **Session:** 2018-2019

2. **Present Address:** Rupayan Elegance, House no-287, Road no-8/A(new), Dhanmondi, Dhaka-1209

3. **Mobile No (Student):** 01779625473

4. **Name of the Supervisor:** **Designation:**

5. **Name of the Guide Teacher:** Anupam Halder **Designation:** Professor

6. **Tentative Title (Block Letters):**

IMPLEMENTING CORE NETWORKING FOR INTERNET SERVICE PROVIDERS (ISPS) TO CREATE A SMART BANGLADESH.

7. **Background and present state of the problem:**

An Internet service provider (ISP) is an essential organization that facilitates access to, management of, and participation in the Internet. It achieves this by employing specific telecommunications, networking, and routing equipment, granting users the ability to establish seamless Internet connectivity.

However, the typical ISP faces challenges concerning weak infrastructure, security vulnerabilities, and connectivity issues in rural areas of Bangladesh. One of the primary obstacles is the conflict between privacy and security within their business model. For example- leaving the SSH port 22 open for remote access poses a potential risk, providing an entry point for malicious actors to exploit the system.

Furthermore, establishing connectivity in rural regions of Bangladesh to realize a technologically advanced "Digital Bangladesh" through Nationwide Telecommunication Transmission Network (NTTN) incurs a considerable 50 percent higher installation cost. Consequently, this affordability barrier prevents the general population from accessing internet services, impeding the nation's overall progress.

To address these challenges, a comprehensive reshuffling of the ISP infrastructure is imperative. It should focus on robust data leakage prevention, enhanced server security, stringent firewall implementation, and the expansion of internet services to rural areas. Employing sophisticated security measures like Port Hiding Mechanism (PHM) with port

knocking, shutting down unnecessary ports, blocking access between VLANs, and enabling strong password encryption will fortify the system against cyberattacks and infrastructure breaches.

By effectively bolstering the ISP infrastructure, we can pave the way for a truly developed "Digital Bangladesh," wherein reliable, secure, and accessible internet services are available to all citizens, propelling the nation towards technological advancement and growth.

8. Objective with specific aims and possible outcome:
The main objectives of this research are:

1. To propose an efficient ISP infrastructure that can fulfill the users' requirements.
2. To ensure a high level of security for the data in the ISP infrastructure.
3. To provide internet connectivity throughout the country at a lower cost, thereby contributing to the realization of a "Digital Bangladesh."

The possible outcomes are:

1. ISPs can effectively manage their network operations, ensuring minimal to no failure and network downtime.
2. ISPs can guarantee the security of server data while delivering uninterrupted and smooth internet services.
3. ISPs will strive to provide internet services smoothly throughout the country at a low cost, contributing to the future digitalization of our country.

9. Outline of Methodology / Experimental Design:

1. To establish an efficient ISPs infrastructure, we will outline the sequence for internet connectivity of ISPs. This involves: **(a)** Establishing multiple International Internet Gateways (IIGs) to ensure seamless global connectivity and access to international internet resources. **(b)**Leveraging SEA-ME-WE Submarine Cables, operated by the SEA-ME-WE consortium, to provide high-speed links connecting Bangladesh to key regions such as Asia, the Middle East, and Europe. **(c)**Utilizing International Terrestrial Cable (ITC) connections to establish additional routes, enhancing redundancy and reducing latency for internet traffic. **(d)**Extending the Nationwide Telecommunication Transmission Network (NTTN) to create a robust backbone infrastructure, facilitating efficient data transmission across the country. **(e)** Collaborating with Internet Service Providers (ISPs) to ensure the smooth delivery of internet services to end-users, thereby driving technological advancement and fostering digital inclusivity throughout Bangladesh.

2. In order to ensure robust server security for data protection, we will diligently implement and adhere to the following measures: network segmentation and firewalls, threat assessment and risk analysis, secure authentication and access control, regular software updates and patch management, data encryption for sensitive information, monitoring,

logging, and intrusion detection, periodic security audits and penetration testing, employee training and awareness, incident response and disaster recovery planning, compliance with regulatory requirements.

3. In conclusion, we will implement and analyze the simulation model for our proposed core networking infrastructure for ISPs, using GNS3 with virtual machines. This process will refine and optimize the framework, ensuring a robust solution for ISP infrastructure and facilitating server security of data while extending internet access to rural areas in Bangladesh.

10. References:

[1] http://www.btrc.gov.bd/

[2] https://www.btcl.gov.bd/profile/projects

[3] https://www.summitcommunications.net/iig

[4] https://www.summitcommunications.net/transmission-network

[5] https://www.submarinecablemap.com/

[6] http://www.bsccl.com/

12. List of Courses so far taken with course no, name of the courses, credit hours, Grade, Grade Points and C.G.P.A. (To be verified and signed by the Guide Teacher).

Student Name: Anindita Koiri Prapte

Course No	Credit Hours	Grade	Grade Points	C.G.P.A.
1st Semester		B+	3.46	3.82
2nd Semester		A	3.95	
3rd Semester		A	3.83	
4th Semester		A	3.86	
5th Semester		A+	4.00	

Signature and Name of the Student:

1. _____