NetShark Innovators (Group 5)
Joshua Marzan
Daniel Rivera
Yadiel Martinez

Project Synopsis: Addressing Network Shortcomings and Data Security Vulnerabilities for Providence Medical Center

Project Overview

A recent cybersecurity (ransomware) attack halted critical operations and negatively impacted network performance. The executives at Providence Medical Center asked us to accommodate the network infrastructure to meet cybersecurity best practices in lieu of the network and data breaches. The healthcare industry is driven by the evolution of information systems, the sensitive data of every patient and data of research conducted in the field, and the system's ability to protect stored data. To meet these demands, a new network will be implemented with industry standards pertaining to security and manageability. Cybersecurity training will be issued to employees to keep the network safe from outside attacks. In addition, we also plan to mitigate the declining wireless connectivity throughout the hospital as stated from our patients, their family, and staff. These improvements will not only yield a more stable and safeguarded atmosphere for hospital operations, but add quality-of-life improvements for those who use the network. Ultimately, our plan is to implement a well balanced secure network that will achieve four-nines availability.

NetShark Innovators (Group 5)
Joshua Marzan
Daniel Rivera
Yadiel Martinez

Strategic Approaches/Objectives

1. **User Security Training:** We are going to develop a user training program to educate staff about the dangers of surfing the web, recognizing phishing attempts that may arise from their emails, and provide necessary procedures to take when coming into contact with threats to the network and sensitive information.
2. **Securing Network:** Putting measures into place that ensures secure access of network resources, ample access control for servers, and HIPAA compliance. Integrating firewalls, IPS, VPNs (for remote access), monitoring and logging, endpoint security applications. Configuring network segmentation, encryption, and strong passwords/authentication policies. As far as physical security goes, we plan to have security contractors hired to monitor the area and invest in port security mechanisms such as port locks for unused ports on access layer switches and cable locks on systems used by staff. Additionally, for access to our MDFs/IDFs we will implement a two-person integrity system with key cards with a configured range of 60 seconds - the time in which the second individual has to scan their card so access can be gained.

3. **Improving Network Design:** Changing network architecture to enable reliable, available, resilient access for authorized users and devices. Laying the groundwork for a scalable, user-friendly, redundant network for IT staff/ network administrators. Employing site surveys to eliminate dead zones, change access point placement, improve signal strength to create a network that can be accessed across most sections of the campus. Focusing on network segmentation to increase performance among endpoints, visibility for the network administrators, and isolation of key services and endpoints. After restructuring the network, periodic site surveys will take place so we can remain informed of the status of the network throughout various areas of the Providence Medical Center and implement changes as needed.
4. **Disaster Recovery Plan/Risk Assessment:** We will have a disaster recovery plan to detail the actions that will be taken in the case of a security breach (physical/cyber) or natural disaster (i.e. hurricanes) to reduce downtime and prevent data loss as much as possible given the potential circumstances. We will discover what the acceptable risks are and determine mitigations for unsolvable risks. The presence of uninterruptible power supplies will supplement the network to ensure services remain running.
5. **Availability:** Design and secure a network that is capable of four nines (99.99%) availability which would amount to 52 minutes of downtime per year - which would be an improvement for Providence Medical Center.

6. **Inventory Tracking:** We will design an inventory system so we could keep track of all the devices that are critical to the infrastructure and provide effective maintenance.

Project Goals/Expected Outcomes

1. A more educated and aware user base less prone to making mistakes that could pose harm to the network and sensitive information such as medical research and patient data.

2. A secure, reliable, and available network that will meet the needs of medical personnel, staff, and patients.

3. Improved overall customer satisfaction stemming from improved network performance.

4. A decrease in money lost as the various services the network provides will be more available to its users and the people they serve. More availability will bring in more funding to Providence Medical Center and its partner sites.