Topic: Network and cyber security

Networking, also known as computer networking, is the practice of transporting and exchanging data between nodes over a shared medium in an information system. Networking comprises not only the design, construction and use of a network, but also the management, maintenance and operation of the network infrastructure, software and policies.

Computer networking enables devices and endpoints to be connected to each other on a local area network (LAN) or to a larger network, such as the internet or a private wide area network (WAN).

Cybersecurity is the practice of protecting critical systems and sensitive information from digital attacks.

Currently one of the main challenges affecting the industry are the cyber-attacks from black hackers that utilize the vulnerable ports in the LAN leading to loss and data leakage. common network ports we use in our day-to-day tasks include 80 for HTTP-web-based browsing in plain text, and 443 for HTTPS-web-based encrypted web pages.

This calls for the need of a software that can be used to do port scanning, identifying the IP addresses on the network and identify the vulnerable ports among the open ports which I intend to solve in this project.

Comparing the existing technologies like Nmap, only the identification of open ports and IP addresses are solved hence giving the project a great chance.

The project will mainly focus on coming up with software that does the above-mentioned tasks. In addition, I intend to come up with a virtual LAN on which the software will be tested since the testing cannot be done on a physical network.

FEASIBILITY STUDY

Minimize availability gaps. Downtime can mean lost revenue, hits to your company's reputation, unhappy customers, and legal risks. To minimize the time between failure and recovery, you need a solid backup storage strategy that's easy to use and with this project above we hope to keep your enterprise safer.

Simplify data management. You likely have multiple types of environments, both on-premises and in the cloud. It's almost impossible to know each environment's interface and functionality inside and out, which makes your backup administrator's job harder than it needs to be. With our system, you should be able to manage your data protection from a single interface, no matter where it lives. This is through monitoring the open ports in the system.

Comparing the available software, money and time injected in data recovery in cases of data leakage, we find the use of the project software worth using. This is because the vulnerable ports can be dealt with before exploitation

SOFTWARE DEVELOPMENT LIFECYCLE

Software Development Life Cycle, SDLC for short, is a well-defined, structured sequence of stages in software engineering to develop the intended software product.

SDLC provides a series of steps to be followed to design and develop a software product efficiently.

SDLC framework includes the following steps:

Communication

This is the first step where the user initiates the request for a desired software product. He contacts the service provider and tries to negotiate the terms. He submits his request to the service-providing organization in writing.

Requirement Gathering

From this step onwards the software development team works to carry on the project. The team holds discussions with various stakeholders from the problem domain and tries to bring out as much information as possible on their requirements. The requirements are contemplated and segregated into user requirements, system requirements, and functional requirements. The

requirements are collected using a number of practices as given:

- studying the existing or obsolete system and software,
- conducting interviews of users and developers,
- referring to the database or
- collecting answers from the questionnaires.

Feasibility Study

After requirement gathering, the team comes up with a rough plan of software process. At this step the team analyzes if a software can be made to fulfill all requirements of the user and if there is any possibility of software being no more useful. It is found out, if the project is financially, practically, and technologically feasible for the organization to take up. There are many algorithms available, that help the developers to conclude the feasibility of a software project

System Analysis

At this step the developers decide a roadmap of their plan and try to bring up the best software model suitable for the project. System analysis includes Understanding of software product limitations, learning system related problems or changes to be done in existing systems beforehand, identifying and addressing the impact of project on organization and personnel etc.

The project team analyzes the scope of the project and plans the schedule and resources accordingly.

Software Design

Next step is to bring down whole knowledge of requirements and analysis on the desk and design the software product. The inputs from users and information gathered in requirement gathering phase are the inputs of this step. The output of this step comes in the form of two designs; logical

design and physical design. Engineers produce meta-data and data dictionaries, logical diagrams, data-flow diagrams and in some cases pseudo codes.

Coding

This step is also known as programming phase. The implementation of software design starts in terms of writing program code in a suitable programming language and developing error-free executable programs efficiently.

Testing

An estimate says that 50% of whole software development process should be tested. Errors may ruin the software from critical level to its own removal. Software testing is done while coding by the developers and thorough testing is conducted by testing experts at various levels of code such as module testing, program testing, product testing, in-house testing and testing the product at user's end. Early discovery of errors and their remedy is the key to reliable software.

Integration

Software may need to be integrated with the libraries, databases and other programs. This stage of SDLC is involved in the integration of software with outer world entities.

Implementation

This means installing the software on user machines. At times, software needs post-installation configurations at the user end. Software is tested for portability and adaptability and integration related issues are solved during implementation.

Operation and Maintenance

This phase confirms the software operation in terms of more efficiency and less errors. If required, the users are trained on, or aided with the documentation on how to operate the software and how to keep the software operational. The software is maintained timely by updating the code according to the changes taking place in user end environment or technology. This phase may face challenges from hidden bugs and real-world unidentified problems.