This research survey guides the critical mechanisms of Spanning Tree Protocol (STP) and Ethernet Ring Protection Switching (ERPS), understanding their roles in maintaining network stability, reliability, and efficiency. It provides an understanding of these loop prevention protocols, their comparative merits, and their essential role in interconnected networks. This survey offers insights into how loop avoidance methods are deployed in various industries, providing an understanding with the help of Engineers working in IT Infrastructure. The survey conducts a comparative analysis of the loop avoidance methods, highlighting their respective advantages, limitations, and best-use scenarios in various network architectures and scenarios. A detailed survey of STP, its variants, and its role in preventing loops in network topologies. The survey inspects the principles, configurations, and practical implementations of Spanning tree protocol (STP), Rapid spanning tree protocol (RSTP), Multiple spanning tree protocol (MSTP) and Ethernet ring protection switching (ERPS) loop avoidance methods. With this research, IT administrators and Infrastructure analysts can understand which protocol to choose over the Spanning tree protocol (STP), Rapid spanning tree protocol (RSTP), Multiple spanning tree protocol (MSTP) and Ethernet ring protection switching (ERPS). Also, which method is faster and provides more flexibility, less complexity, and a lower risk of network outage. The research helps network administrators and engineers choose the most appropriate protocol for their network environment by providing comparative analysis and guidance.

The stability of a Network Infrastructure depends on factors like redundancy, and low outages of the network. A wide range of network issues might arise from this. When a packet of information has multiple routes to take to reach its destination, but the network is unsure of which path to take, it sends data in a never-ending loop this is known as network looping. Data collisions from this can result in network outages and slowdowns, like never-ending paths. Suppose that a message is constantly passed by a group of people in a circle, but the message never gets to its destination because it becomes trapped in the loop. This results in delays and network congestion as they do not reach their intended destination. We utilize a loop avoidance protocol to assist the network in selecting the best course and prevent data from getting trapped in loops to prevent these loops.

In computer networking, network redundancy includes a design and operational technique used to guarantee fault tolerance, availability, and security of the network. Network redundancy involves replicating important network elements, like pathways, devices, and links, to have backups that can be turned on in case the primary components malfunction. Reducing downtime, maintaining network continuity, and offering fault tolerance in the event of hardware malfunctions, network overload, or other unexpected issues are the main objectives of network redundancy.

This research will help to choose the right metrics to compare spanning tree protocol technique with ethernet ring protection switching with the help of survey. Further doing survey to the customer with respect to the technological and organisational factors affecting the adoption of ethernet ring protection switching technology as well the spanning tree protocol. It was able to calculate the relationship between the spanning tree protocol and ethernet ring protection switching structures when it was provided with a user-inputted priority list of metrics based on the user scenario. The result will then help us understand if these guidelines were able to bring in a significant change in the adoption of ethernet ring protection switching across the organisations.