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Explain the Spanning Tree Protocol (STP) and its role in preventing network loops. (6 marks)

This a network protocol that prevent layer 2 loops in the ethernet networks by blocking redundant paths with the potential of causing network loops.

The protocol is able to perform these functions through;

- Loop prevention – STP identifies redundant links in the network and disables them to ensure there's only one active path between two nodes.
- Convergence – STP recalculates the spanning tree and reconfigures the network every time a network change occur.
- Path cost calculation – STP calculates the path costs to the root bridge, selecting the path with the lowest cost.
- Port states – through the various states of STP ports, there's effective management of port transitions ensuring a loop free topology.

Describe the basic principles and functions of Access Control Lists (ACLs)

Principles

- Permit or deny traffic – They are rules that are used filter network traffic.
- Implicit deny – This is a rule put in place to deny traffic that doesn't match any of the defined rules.
- Order of rules – rules are enforced sequentially from top to bottom.
- Criteria-based filtering – Traffic is filtered based on criteria such as port numbers which makes it easier to filter the traffic.

Functions

- Access control.
- Traffic management.
- Security.
- Network address translation.
- Implements Qos.