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Netcamps

Design, configuration and documentation of the exemplary computer network for the campus of dormitories

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Contents

1 Document description **3**

2 Abbreviations **3**

3 Preface **3**

4 Overview **3**
4.1 Introduction . . . 3
4.2 Audience . . . 3

5 Product concept **3**

6 Supported use cases **3**
6.1 Layer 3 (OSI/ISO) connectivity between campus network end-devices . . . 3
6.2 Link Redundancy and VLAN subnetting configuration . . . 3

7 Topology design **4**
7.1 Network equipment . . . 4

8 Configuration analysis **4**

9 Cost analysis **4**

10 Summary **4**
10.1 Summary . . . 4
10.2 Reference files . . . 4
10.3 List of figures . . . 4
10.4 List of tables . . . 4

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6.1 Layer 3 (OSI/ISO) connectivity between campus network end-devices

Layer 3 connectivty is a common requirement from the potential customers of network design and configuration solution providers, the demand can be defined as follows:

As a user, I want to be able to communicate with another campus network device directly after connecting to the internal network

For this reason, the network has been configured with the OSPF protocol. Open Shortest Path First (OSPF) is a routing protocol used in computer networks to help routers dynamically exchange information about network topology. It is an interior gateway protocol (IGP) designed to efficiently determine the best path for routing packets within an autonomous system, typically a single organization's network. OSPF uses a link-state routing algorithm, where routers exchange information about the state of their links with neighboring routers, allowing each router to build a detailed and up-to-date map of the network.

What's more, NetCamps product also predicted the neccesity of introducing DHCP server that provides connected end-devices with the IP address, and allows them to communicate directly with each other right after connecting PC to the internal network. Dynamic Host Configuration Protocol (DHCP) is a network management protocol used to automatically assign and configure IP addresses to devices within a network. It eliminates the need for manual IP address assignment, making it more efficient to manage a large number of devices on a network.

6.2 Link Redundancy and VLAN subnetting configuration

Providing VLAN subnetting and link redundancy, might be a key part of client requirements for a better performance of campus network

As a user, I want to be able to communicate with another campus network device despite the fact of backbone link failure

As a user, I want to secure selected switchports from communicating with devices by assigning them VLAN not supported on trunk link

Link redundancy is crucial in campus networks to ensure high availability, reliability, and fault tolerance. Campus networks typically connect various buildings, departments, and users within an organization's physical location. Redundant links help mitigate the impact of link failures, improving the overall performance and resilience of the network.

When it comes to assigning VLAN to the unused one, this security measure helps mitigate potential VLAN hopping attacks where an unauthorized user attempts to gain access to traffic in a VLAN other than their own. By assigning switch ports to the top unused VLAN, you create an isolated VLAN that is not in active use, reducing the risk of unauthorized access and potential security breaches.

Because of that, given scenario presents two relevant simulations of securing the switch port by assigning it to and unused VLAN and link redundancy scenario

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