



Forus Media

Summary

Forus Media is an editorial video production and online video streaming business. It provides professionally produced videos in genres including news, entertainment, education and more to subscribers. Forus Media has one main office and 2 branch offices. They have different production facilities that support both production and editing of videos.

The network has to support collaboration between team members that produce and edit videos and upload and download footage to and from the Archive server. The network should also provide streaming of produced videos from the video streaming server out to consumers on the Internet through a web interface.



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Submission Instructions

- Following these instructions is mandatory for the lab assignment approval.
- Zip this report together with the project packet tracer file and upload the compressed file to Canvas.

Group Details

- I. Insert your group number, name, and student number in Table 1.

Group number	Student Name	UiS Student ID	UiS Email
07	Joar, Wathne	220476	jo.wathne@stud.uis.no
	Sven Ivar, Søyland	952138	si.soyland@stud.uis.no
Table 1. Group number, student name, number, and email			

Implemented Modules

- II. List implemented modules and their associated concepts in Table 3.

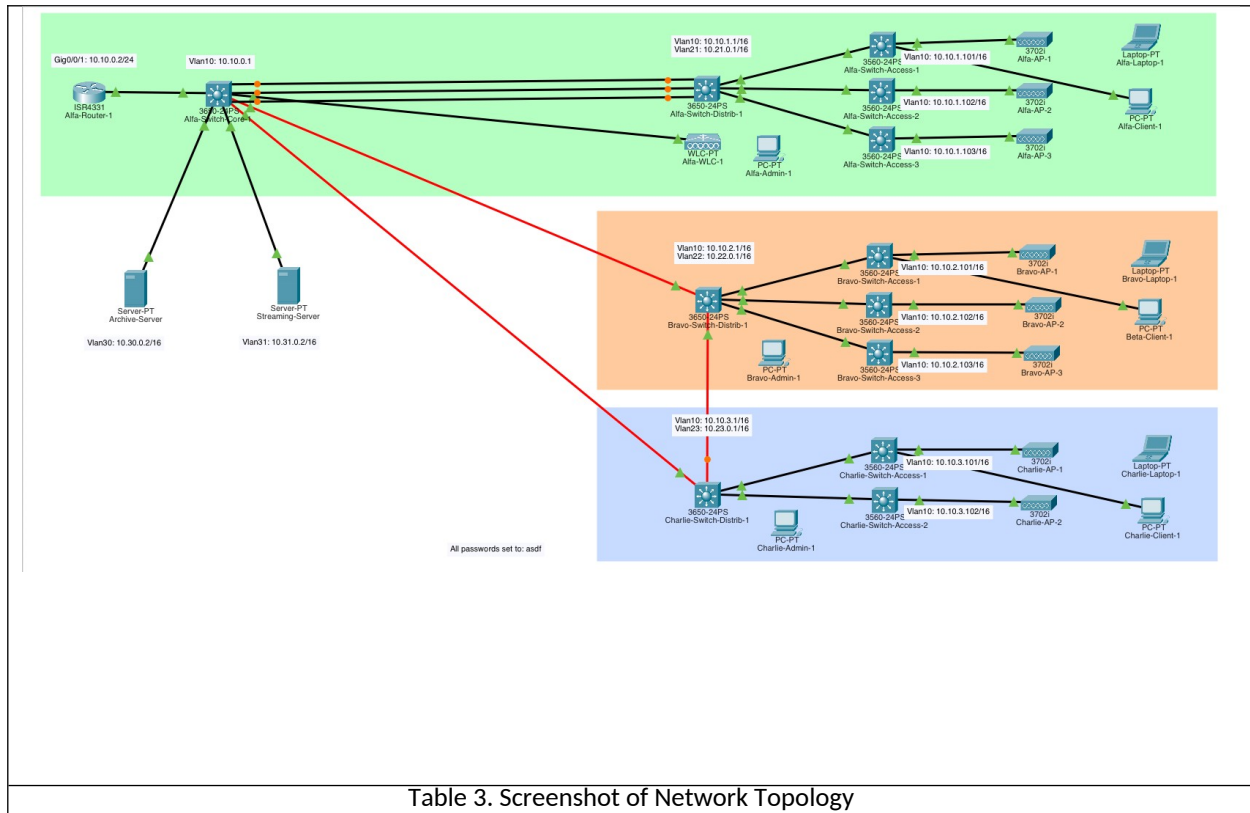
Modules	Concepts	Concepts Implemented?
Switch	Configuring basic switch settings.	<input checked="" type="checkbox"/>
	Configuring an EtherChannel with Cisco PAgP or IEEE 802.3ad LACP.	<input checked="" type="checkbox"/>
	Configuring a Redundant EtherChannel Link.	<input checked="" type="checkbox"/>
	Securing trunks, unused switchports, and implementing port security.	<input checked="" type="checkbox"/>
	Enabling DHCP Snooping.	<input type="checkbox"/>
	Enabling PortFast and BPDU Guard.	<input type="checkbox"/>
WLAN	Connecting and configuring the wireless router.	<input checked="" type="checkbox"/>
	Connecting a wired and wireless device to the wireless router and extending the wireless coverage.	<input checked="" type="checkbox"/>
	Connecting to a wireless LAN controller GUI and configuring a WLAN on a wireless LAN controller.	<input checked="" type="checkbox"/>
	Configuring a new WLAN on a WLC.	<input checked="" type="checkbox"/>
	Securing a WLAN with WPA2-Enterprise.	<input type="checkbox"/>
Single Area OSPF	Configuring OSPF router ID and networks for OSPF routing with or without passive interfaces and verifying OSPF configuration.	<input checked="" type="checkbox"/>
	Verifying the connectivity by modifying OSPF default settings and by propagating a default route.	<input checked="" type="checkbox"/>
	Identifying and verifying the status of OSPF neighbors.	<input checked="" type="checkbox"/>
	Adding a new LAN into an existing OSPF network and verifying connectivity.	<input type="checkbox"/>
ACLs	Verifying and testing local connectivity with and without ACL.	<input checked="" type="checkbox"/>
	Configuring, applying, verifying, and modifying a named and numbered standard ACL.	<input type="checkbox"/>
	Configuring, applying, and verifying an extended named and numbered ACL.	<input checked="" type="checkbox"/>
	Configuring IPv4 and IPv6 static and floating static routes, host routes, and routes to the internal LANs.	<input type="checkbox"/>
	Configure IPv4 and IPv6 default routes.	<input type="checkbox"/>
Table 2. Modules and learned concepts implemented		

Passwords on Routers and Switches

All passwords are set to “asdf”.

Network Topology Screenshot

III. Provide a screenshot of network topology (including IP addresses)



Addressing Table

IV. Describes the types of devices, their interfaces, and associated network configurations.

Device	Interface	IPv4 Address	Subnet Mask	Default Gateway	IPv6 Address
Alfa-Router-1	Gig0/0/1	10.0.0.1	255.255.255.0		
Alfa-Switch-Core-1	Vlan10	10.10.0.1	255.255.0.0	10.0.0.1	
Alfa-Switch-Distrib-1	Vlan10	10.10.1.1	255.255.0.0	10.0.0.1	
Alfa-Switch-Distrib-1	Vlan21	10.21.0.1	255.255.0.0	10.0.0.1	
Alfa-Switch-Access-1	Vlan10	10.10.1.101	255.255.0.0	10.0.0.1	
Alfa-Switch-Access-2	Vlan10	10.10.1.102	255.255.0.0	10.0.0.1	
Alfa-Switch-Access-3	Vlan10	10.10.1.103	255.255.0.0	10.0.0.1	
Alfa-WLC-1	Gig0				
Alfa-AP-1	Gig0				
Alfa-AP-2	Gig0				

Alfa-AP-3	Gig0				
Alfa-Admin-1	Fa0			10.0.0.1	
Alfa-Laptop-1	Wireless0			10.0.0.1	
Bravo-Switch-Distrib-1	Vlan10	10.10.2.1	255.255.0.0	10.0.0.1	
Bravo-Switch-Distrib-1	Vlan22	10.22.0.1	255.255.0.0	10.0.0.1	
Bravo-Switch-Access-1	Vlan10	10.10.2.101	255.255.0.0	10.0.0.1	
Bravo-Switch-Access-2	Vlan10	10.10.2.102	255.255.0.0	10.0.0.1	
Bravo-Switch-Access-3	Vlan10	10.10.2.103	255.255.0.0	10.0.0.1	
Bravo-AP-1	Gig0				
Bravo-AP-2	Gig0				
Bravo-AP-3	Gig0				
Bravo-Admin-1	Fa0			10.0.0.1	
Bravo-Laptop-1	Wireless0			10.0.0.1	
Charlie-Switch-Distrib-1	Vlan10	10.10.3.1	255.255.0.0	10.0.0.1	
Charlie-Switch-Distrib-1	Vlan23	10.23.0.1	255.255.0.0	10.0.0.1	
Charlie-Switch-Access-1	Vlan10	10.10.3.101	255.255.0.0	10.0.0.1	
Charlie-Switch-Access-2	Vlan10	10.10.3.102	255.255.0.0	10.0.0.1	
Charlie-AP-1					
Charlie-AP-2					
Charlie-Admin-1	Fa0			10.0.0.1	
Charlie-Laptop-1	Wireless0			10.0.0.1	
Archive-Server	Vlan30	10.30.0.1	255.255.0.0	10.0.0.1	
Streaming-Server	Vlan31	10.31.0.1	255.255.0.0	10.0.0.1	
Table 4. Network Devices and their Interface Configuration(s)					

Introduction

- Provide a brief introduction (1-2 paragraphs) explaining the purpose of your network design and its objectives.
- The network will support the video production and streaming business Forus-Media. Here several teams will produce videos on various topics in different studios and then edit the videos on workstations across the buildings.
- The network will allow streaming of finished videos from the Streaming server to consumers on the Internet.

Requirements Analysis

- What is the requirement of the network you will design.
- Summarize the answers and how they influenced your design decisions.
- The wired network would need to have relatively high bandwidth to support the transfer of large video files.
- The streaming and archive server needs a high bandwidth connection.
- The users needs to have access to one or more wireless networks that works across all the buildings so that they can seamlessly use the different facilities during their work.
- As the production teams work they might want to have their own separate VLAN and they might want to move around the buildings to use the different facilities.
- **Summary:** The network needs to have a high capacity and needs to be scalable to account for more viewers. It should be possible to create a separate VLAN for a team, if needed.

The network uses high bandwidth switches to provide the required bandwidth where EtherChannel configurations can provide link scalability. The layer 3 switches support inter VLAN routing and simplifies the network design. VLANs are propagated in the network with VTP. Security and confidentiality is ensured by implementing ACLs, disabling unused switch ports and implementing port security.

Network Design Overview

Network Topology Description

- Describe the physical and logical topology of your network design.
- Explain why you chose a particular topology.
- The distribution switches and the core switch are physically connected in a mesh topology to provide redundancy for the part of the network that sees the highest load and could otherwise potentially become a single point of failure.
- Each group of access switches are physically connected to the corresponding distribution switch in a simple spoke and wheel topology.
- Logically the network is divided into different VLANs, separating the management network and different buildings and potentially different working group networks from eachother to ensure security and reliability.

Chosen Modules

- List and describe the three modules from Table 2 that you chose to implement.

Switch

- | |
|---|
| <ul style="list-style-type: none">• Configuring basic switch settings<ul style="list-style-type: none">○ We have configured ... |
|---|

- Configuring an EtherChannel with Cisco PAgP or IEEE 802.3ad LACP
 - An EtherChannel has been configured ...
- Configuring a Redundant EtherChannel Link.
 -
- Securing trunks, unused switchports, and implementing port security.
 -

WLAN

- Connecting and configuring the wireless router.
 -
- Connecting a wired and wireless device to the wireless router and extending the wireless coverage.
 -
- Connecting to a wireless LAN controller GUI and configuring a WLAN on a wireless LAN controller.
 -
- Configuring a new WLAN on a WLC.
 -

ACLs

- Verifying and testing local connectivity with and without ACL.
 -
- Configuring, applying, verifying, and modifying a named and numbered standard ACL.
 -
- Configuring, applying, and verifying an extended named and numbered ACL.
 -
- Configuring IPv4 and IPv6 static and floating static routes, host routes, and routes to the internal LANs.
 -
- Configure IPv4 and IPv6 default routes.
 -

Design Rationale

- Explain why you chose these modules and what problems or scenarios do they address?
- The layer 3 switches provide a simple and cost effective way to separate the different networks and provide routing between them.
- The wireless networks allows the video production teams to seamlessly move between the buildings. The network administrators can also use their own wireless network to administrate devices.
- ACLs provides security and stability by restricting access to networks for certain devices or networks. The video production groups can work with confidential content and use local file sharing without worrying about eavesdropping. The management of the network equipment can safely be done over its own VLAN.

Network Cost

- What is the approximate cost of your designed network?

Device Category	Device	Cost (in NOK)	Cost Reference (per-device)
Core Network Components	Cisco 4331 (routers)	1 x 36.842,00 Kr	https://www.atea.no/eshop/product/cisco-integrated-services-router-4331-ruter-rackmonterbar/?prodid=3104396
	Cisco 3650 (switches)	4 x 71.632,00 Kr	https://www.prisjakt.no/product.php?p=2300423
	Cisco 3560 (switches)	8 x 20.990,00 Kr	https://www.prisjakt.no/product.php?p=3124260
	Cisco 3504 WLC	1 x 16.513,00 kr	https://www.networkhardwares.com/en-no/products/cisco-air-ct3504-k9-cisco-3504-ieee-802-11ac-wireless-lan-controller-air-ct3504-k9?variant=47451653177549&srsId=AfmBOorRhSp6y3bWN9gwU661biUwfuMR-VeDxuD4IQVPi-2oRJNhvIbuNU
	Cisco C9120AXIB	8 x 13.819,00 kr	https://www.networkhardwares.com/en-no/products/cisco-c9120axib-cisco-catalyst-9120ax-series-c9120axib
End Devices	Servers	2 x 86.713,00 Kr	https://www.atea.no/eshop/product/hpe-proliant-dl360-gen10-smb-network-choice-rackmonterbar-xeon-silver-4208-2-1-ghz-16-gb-uten-hdd/?prodid=4188988
	PCs	3 x 8.000,00 Kr	-
	Laptops	3 x 16.000,00 Kr	-
	Total	863.781,00 Kr	
Table 5. Network Devices and their Interface Configuration(s)			

Design Challenges and Solutions

- Describe any potential issues faced during the network design.

Appendix

Device Configurations (Optional)

Router Configuration(s)

- Provide the full text of the exported configurations for all routers used in your design. Include all relevant settings, such as interfaces, routing protocols, and security settings.
- An example has been done for you in the table below:

Alfa-Router-1
!

Switch Configuration(s)

- Provide the full text of the exported configurations for all switches used in your design. Include all relevant settings, such as VLANs, port security, and EtherChannel configurations.
- An example has been done for you in the table below:

Alfa-Switch-Core-1
!

Alfa-Switch-Distrib-1
!

Alfa-Switch-Access-1
!

Alfa-Switch-Access-2
!

Alfa-Switch-Access-3
!

Bravo-Switch-Distrib-1
!

Bravo-Switch-Access-1
!

Bravo-Switch-Access-2
!

Bravo-Switch-Access-3
!

Charlie-Switch-Distrib-1
!

Charlie-Switch-Access-1
!

Charlie-Switch-Access-2
!

Charlie-Switch-Access-3
!