Lab 3: Spanning Tree Protocol and Physical Security

CNIT34400-006
Group 30
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EXECUTIVE SUMMARY

The project outlined in this report was focused around adding security and redundancy to the already existing network architecture. Multiple Spanning Tree Protocol (MSTP) was utilized to prevent loops from forming due to the added redundancies. In addition, a second router was added to the network to split up Virtual Local Area Network (VLAN) traffic and therefore improve speeds across the network. Inline documentation on all in-use ports and VLANs was added to all routers and switches, and all unused ports were disabled. All routers and switches were locked down with passwords if they did not already have them.

The Business Scenario section of this report depicts the network architecture before the project was implemented. The Procedures section details the steps taken to implement the project. The Results section explains the network architecture after the project was completed. The Conclusions and Recommendations section analyzes how well the project went and makes recommendations on how to complete the project if something similar must be done again in the future. The Bibliography section contains the materials referenced to complete the project. Appendix A at the end of this report includes the finalized configuration files of all routers and switches utilized in the project.

Spanning Tree Protocol and Physical Security

BUSINESS SCENARIO

Craft-A-Palooza, a small business focused on helping niche artists market their art, was looking to bolster the reliability and security of their architecture by implementing physical security measures and redundancy within their switches. The physical redundancies required a manual implementation of MSTP to avoid unnecessary loops in the network. In addition, another router was added to the configuration to divide VLAN traffic between the two routers. The applications used in this project were Windows 10, Ubuntu, Cisco IOS, HPE ArubaOS, PuTTY, Windows Command Prompt, Ubuntu Terminal, and Wireshark. The beginning network architecture, including IP addressing, can be viewed in Figures 1 and 2 below.

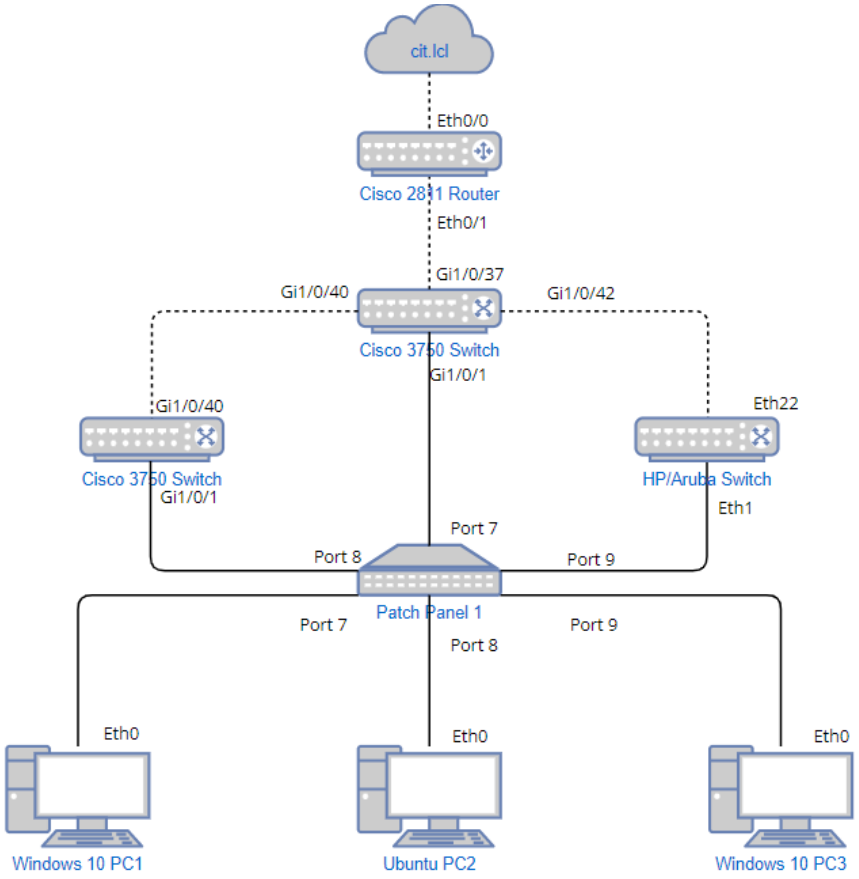

Figure 1: Beginning Physical Diagram

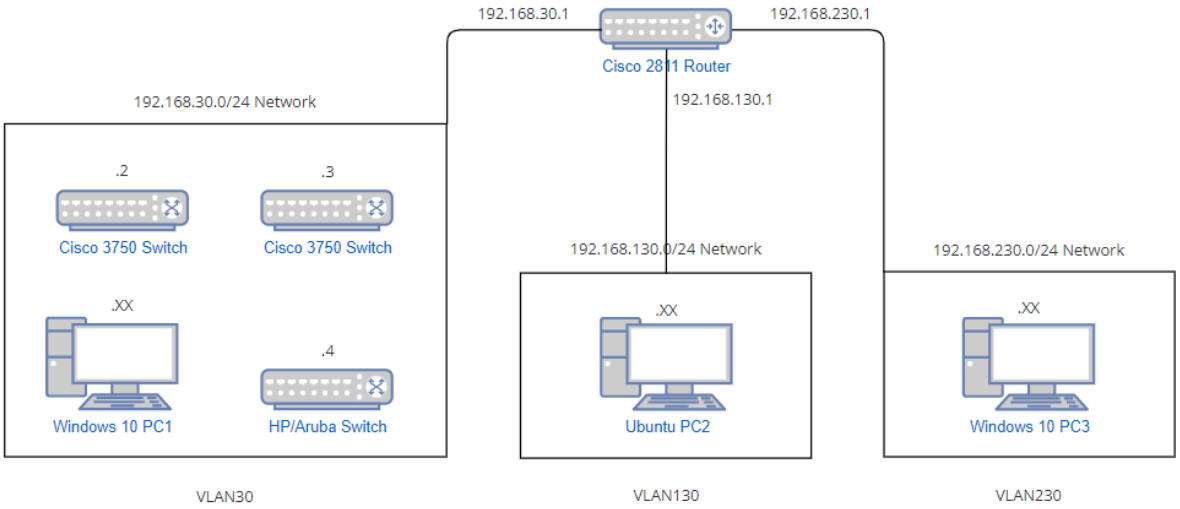

Figure 2: Beginning Logical Diagram

PROCEDURES

This section includes steps to recreate what was achieved in the previous few weeks. In this report, **buttons** are bolded, *options* are italicized, text entered the computer is underlined and menu navigation is notated by the pipe symbol (|).

Set up network architecture

The following steps are required to set up a network architecture that is needed to set up Spanning Tree Protocol and physical security.

1. Connected Cisco 2811 router port 0 to CIT 10.25.0.0/16 network via gray uplink cable
2. Connected Cisco 2811 router port 1 to top Cisco switch port 37
3. Connected Cisco 1921 router port 0 to CIT 10.17.0.0/16 network via gray uplink cable
4. Connected Cisco 1921 router port 1 to bottom Cisco switch port 37
5. Connected top Cisco switch port 40 to bottom Cisco switch port 40
6. Connected bottom Cisco switch port 41 to HP switch port 21
7. Connected top Cisco switch port 42 to HP switch port 22
8. Connected top Cisco switch port 11 to Rack 16 Patch Panel 1 port 7
9. Connected bottom Cisco switch port 12 to Rack 16 Patch Panel 1 port 8
10. Connected HP switch port 13 to Rack 16 Patch Panel 1 port 9
11. Connected Cisco router console port to Rack 16 Patch Panel 2 port 7
12. Connected top Cisco switch console port to Rack 16 Patch Panel 2 port 8
13. Connected Cisco 1921 router console port to Rack 16 Patch Panel 2 port 9
14. Connected PC1 to Rack 16 Patch Panel 1 port 7

15. Connected PC2 to Rack 16 Patch Panel 1 port 8
16. Connected PC3 to Rack 16 Patch Panel 1 port 9

Renamed all switches and routers

The networking devices (switches and routers) were configured with proper names, which includes Cisco's and HP/Aruba.

1. For Cisco models:
    a. config t
    b. hostname [name]
    c. exit
    d. copy run start
    e. top cisco sw was named g30sw1
    f. bottom cisco sw was named g30sw2
    g. 2811 router named g30rtr1
    h. 1921 router named g30rtr2
2. For HP:
    a. enable, log in
    b. configure
    c. hostname g30sw3
    d. exit
    e. write memory

Changed password(s) on g30rtr2

To secure Cisco 1921 router, the router needed to have password. The following shows command inputted to set up the password configuration for Cisco router.

1. Typed configure terminal to enter configuration mode
2. Entered the following command:
    a. service password-encryption to turn on password encryption
    b. line console 0 to enter console port configuration mode
    c. password [cnit344] to set password
    d. login to set the password to login
    e. end to exit configuration mode
3. Typed copy run start to save configuration

Disabled unused switch and router ports

Ports not in use were disabled for security. Not necessary for routers - all ports disabled by default and enabled manually when needed

1. For Cisco switches:
    a. Typed configure terminal to enter configuration mode
    b. Entered the following command:
        i. interface Gi1/0/1 to enter interface configuration mode
        ii. shutdown to disable port 1
        iii. exit to leave interface configuration mode
    c. Repeated for all ports except 11, 12, 13, 37, 40, 42 on g30sw1

   d. Repeated for all ports except 11, 12, 13, 37, 40, 41 on g30sw2

2. For HP:

   a. Typed configure to enter configuration mode

   b. Entered interface 1 disable to disable port 1

   c. Repeated for all ports except 11, 12, 13, 21, and 22

Configured inline documentation for in-use ports

The following documents what routers and switches are used for using descriptions for Cisco and names for HP.

1. For Cisco switches:

   a. Typed configure terminal to enter configuration mode

   b. Entered the following command:

      i. interface Gi1/0/11 to enter interface configuration mode

      ii. description VLAN30Access to document port type

      iii. exit to leave interface configuration mode

   c. Repeated for ports 11, 12, 13, 37, 40, 42 on g30sw1

   d. Repeated for ports 11, 12, 13, 37, 40, 41 on g30sw2

   e. copy run start

2. For Cisco routers:

   a. Typed configure terminal to enter configuration mode

   b. Entered the following command:

      i. interface fa0/0 to enter interface configuration mode

      ii. description ‘WAN Uplink to CIT-NET’ to document port type

iii. exit to leave interface configuration mode

c. Repeated for ports 0/1, 0/1.30, 0/1.130, 0/1.230 on g30rtr1 and g30rtr2 with proper descriptions

3. For HP:

a. Typed configure to enter configuration mode

b. Entered the following command:

i. interface 11 name VLAN30Access to document port type

ii. interface 12 name VLAN130Access to document port type

iii. interface 13 name VLAN230Access to document port type

iv. interface 21 name TrunkToG30sw2 to document port type

v. interface 22 name TrunkToG30sw1 to document port type

vi. exit

vii. write memory

Configured inline documentation for VLANs

Documented what they're all being used for using descriptions for Cisco and names for HP. The VLANs do not technically exist on the routers so there is no documentation for them - see previous section for documentation of sub interfaces.

1. For Cisco models:

a. Typed configure terminal to enter configuration mode

b. Entered the following command:

i. interface vlan 30 to enter VLAN configuration mode

ii. description 'VLAN 30 Network' to set description for VLAN

iii. exit

iv. interface vlan 130 to enter VLAN configuration mode

v. description 'VLAN 130 Network' to set description for VLAN

vi. exit

vii. interface vlan 230 to enter VLAN configuration mode

viii. description 'VLAN 230 Network' to set description for VLAN

ix. exit

c. Typed in copy run start to save

2. For HP:

a. Typed configure to enter configuration mode

b. Typed ??? to ???

c. exit

d. write memory

Configured sub-interfaces on g30rtr2

The following documents setting up sub-interface on the Cisco 1921 router on VLAN 30, 130, 230, and setting up IP and subnet mask of each VLANs.

1. Typed configure terminal to enter configuration mode
2. Entered the following command:

a. interface GigabitEthernet 0/1.30 to enter interface configuration mode

b. encapsulation dot1Q 30 to set the sub-interface as the VLAN 30 interface

c. Ip address 192.168.30.12 255.255.255.0 to set the IP and subnet mask

d. no shutdown to enable the sub-interface

e. exit to leave interface configuration mode

f. interface GigabitEthernet 0/1.130 to enter interface configuration mode

g. encapsulation dot1Q 130 to set the sub-interface as the VLAN 130 interface

h. Ip address 192.168.130.12 255.255.255.0 to set the IP and subnet mask

i. no shutdown to enable the sub-interface

j. exit to leave interface configuration mode

k. interface GigabitEthernet 0/1.230 to enter interface configuration mode

l. encapsulation dot1Q 230 to set the sub-interface as the VLAN 230 interface

m. ip address 192.168.230.12 255.255.255.0 to set the IP and subnet mask

n. no shutdown to enable the sub-interface

o. exit to leave interface configuration mode

3. Entered copy run start to save configuration

Configured WAN Ethernet interface on g30rtr2

The uplink port was configured as a WAN interface to connect to the cit.lcl network.

1. Typed configure terminal to enter configuration mode
2. Entered the following command:
    a. interface Gi 0/0 to enter interface configuration mode
    b. ip address 10.17.30.254 255.255.255.0 to set IP address and subnet mask on the interface
    c. no shutdown to enable the interface
    d. exit to leave interface configuration mode
    e. copy run start to save configuration

Adjusted DHCP on g30rtr1

The following changed DHCP settings on g30rtr1 to direct VLAN 30 to new router (gateway of .12) and exclude .12 from available dhcp pools to avoid duplicate addresses.

1. Typed configure terminal to enter configuration mode
2. Entered the following command:
    a. ip dhcp excluded-address 192.168.30.12 to reserve address for new router
    b. ip dhcp excluded-address 192.168.130.12 to reserve address for new router
    c. ip dhcp excluded-address 192.168.230.12 to reserve address for new router
    d. ip dhcp pool DHCP30 to enter DHCP pool configuration mode for VLAN 30
    e. default-router 192.168.30.12 to set default router for devices on VLAN 30
    f. end to leave configuration mode
3. Typed copy run start to save configuration

Configured NAT on g30rtr2

The following sets up the NAT on second router. The process involves setting up interfaces 30, 130, 230, access lists to give networks to allowed addresses for NAT, sub-interface as inside and outside for NAT purpose, and NAT pool for outside addresses.

1. Entered configuration mode by typing configure terminal
2. Entered the following command:
    a. interface GigabitEthernet0/1.30 to enter interface configuration mode for .30 sub-interface
    b. ip nat inside to set sub-interface as inside for NAT purposes

c. exit to leave interface configuration mode
d. interface GigabitEthernet0/1.130 to enter interface configuration mode for .130 sub-interface
e. ip nat inside to set sub-interface as inside for NAT purposes
f. exit to leave interface configuration mode
g. interface GigabitEthernet0/1.230 to enter interface configuration mode for .230 sub-interface
h. ip nat inside to set sub-interface as inside for NAT purposes
i. exit to leave interface configuration mode
j. interface GigabitEthernet0/0 to enter interface configuration mode for eth0 interface
k. ip nat outside to set interface as outside for NAT purposes
l. exit to interface configuration mode
m. access-list 12 permit 192.168.30.0 0.0.0.255 to add .30 network to allowed addresses for NAT
n. access-list 12 permit 192.168.130.0 0.0.0.255 to add .130 network to allowed addresses for NAT
o. access-list 12 permit 192.168.230.0 0.0.0.255 to add .230 network to allowed addresses for NAT
p. ip nat pool outsideconnet 10.17.30.254 10.17.30.254 netmask 255.255.255.0 to create NAT pool for outside IP addresses
q. ip nat inside source list 12 interface GigabitEthernet0/0 overload to enable dynamic NAT

r. ip route 0.0.0.0 0.0.0.0 10.17.30.1 to set IP default route

s. copy run start to save configuration

Added trunked ports to g30sw2

The following adds tagged VLANs (30, 130, 230) needed on new connection to g30sw2.

1. Typed configure terminal to enter configuration mode
2. Typed in the following commands to trunk port 37:
    a. int Gi1/0/37 to enter interface configuration mode
    b. switchport trunk encapsulation dot1q to set protocol to VLANs
    c. switchport mode trunk to set the port to trunk mode
    d. switchport trunk allowed vlan add 30 to add VLAN 30 to the port
    e. switchport trunk allowed vlan add 130 to add VLAN 130 to the port
    f. switchport trunk allowed vlan add 230 to add VLAN 230 to the port
    g. exit to leave interface configuration mode
3. Typed in the following commands to trunk port 41:
    a. int Gi1/0/41 to enter interface configuration mode
    b. switchport trunk encapsulation dot1q to set protocol to VLANs
    c. switchport mode trunk to set the port to trunk mode
    d. switchport trunk allowed vlan add 30 to add VLAN 30 to the port
    e. switchport trunk allowed vlan add 130 to add VLAN 130 to the port
    f. switchport trunk allowed vlan add 230 to add VLAN 230 to the port
    g. exit to leave interface configuration mode
4. Entered copy run start command to save configuration

Added tagged VLANs to g30sw3

The following adds tagged VLANs (30, 130, 230) needed on new connection to g30sw3 (HP/Aruba).

1. Typed configure to enter configuration mode
2. Typed in the following commands:
    a. interface 21 tagged vlan 30 to assign VLAN 30 to port 21 as a trunked port
    b. interface 21 tagged vlan 130 to assign VLAN 130 to port 21 as a trunked port
    c. interface 21 tagged vlan 230 to assign VLAN 230 to port 21 as a trunked port
    d. exit to leave configuration mode
    e. write memory to save running configuration into startup configuration

Configured MSTP for g30sw1

The following involves configuration of MSTP. The instance was configured on the left side of the network architecture, which involved configuring the g30sw1 switch. The g30sw1 switch is the top Cisco 3750 switch.

1. Entered configure terminal to enter configuration mode
2. Typed in the following commands:
    a. spanning-tree mst configuration to enter spanning tree configuration mode
    b. instance 1 vlan 30 to create new MSTP instance for vlans 30
    c. instance 2 vlan 130,230 to create new MSTP instance for vlans 130 & 230
    d. name MSTPLeft to specify MSTP
    e. revision 2 to specify revision number

f. exit to leave spanning tree configuration mode

g. spanning-tree mst 2 priority 0 to set high priority for vlans 130 & 230

h. spanning-tree mst 2 root primary to set high priority for vlans 130 & 230

i. spanning-tree mode mst to swap switch to use to MSTP

j. copy run start to save configuration

Configured MSTP for g30sw2

The following involves configuration of MSTP. The instance was configured on the right side of the network architecture, which involved configuring the g30sw2 switch. The g30sw2 switch is the bottom Cisco 3750 switch.

1. Entered configure terminal to enter configuration mode
2. Typed in the following commands:
    a. spanning-tree mst configuration to enter spanning tree configuration mode
    b. instance 1 vlan 30 to create new MSTP instance for vlans 130 & 230
    c. instance 2 vlan 130,230 to create new MSTP instance for vlans 130 & 230
    d. name MSTPLeft to specify MSTP
    e. revision 2 to specify revision number
    f. exit to leave spanning tree configuration mode
    g. spanning-tree mst 1 priority 0 to set high priority for vlan 30
    h. spanning-tree mst 1 root primary to set high priority for vlans 130 & 230
    i. spanning-tree mode mst to swap switch to use to MSTP
    j. copy run start to save configuration

Configured MSTP for g30sw3

The following involves configuration of MSTP. The instance was configured neither side of the network architecture, which involved configuring the g30sw3 switch. The g30sw3 switch is the HP/Aruba switch. This MSTP was configured to have low priority for both g30sw1 and g30sw2 (Top and Bottom Cisco Switch respectively).

1. Entered configure to enter configuration mode
2. Typed in the following commands:
    a. spanning-tree instance 1 vlan 30 to create MSTP instance for vlan 30
    b. spanning-tree instance 2 vlan 130 230 to create MSTP instance for vlans 130 & 230
    c. spanning-tree instance 1 priority 3 to set low priority for vlan 30
    d. spanning-tree instance 2 priority 3 to set low priority for vlans 130 & 230
    e. spanning-tree config-name MSTPLeft to name MSTP
    f. spanning-tree config-revision 2 to set revision number
    g. spanning-tree enable to enable spanning tree
    h. spanning-tree mode mstp to swap switch to use MSTP
    i. write memory to save configuration

RESULTS

In this project, extra links were added between the switches to create fallback redundancy in the network. Additionally, Multiple Spanning Tree Protocol was implemented to prevent endless loops in the network. In-use ports were labeled descriptively and unused ports were disabled for security. Figure 3 below shows the physical configuration of routers and switches. Figure 4 below shows the logical configuration of the network with VLANs and IP addresses.

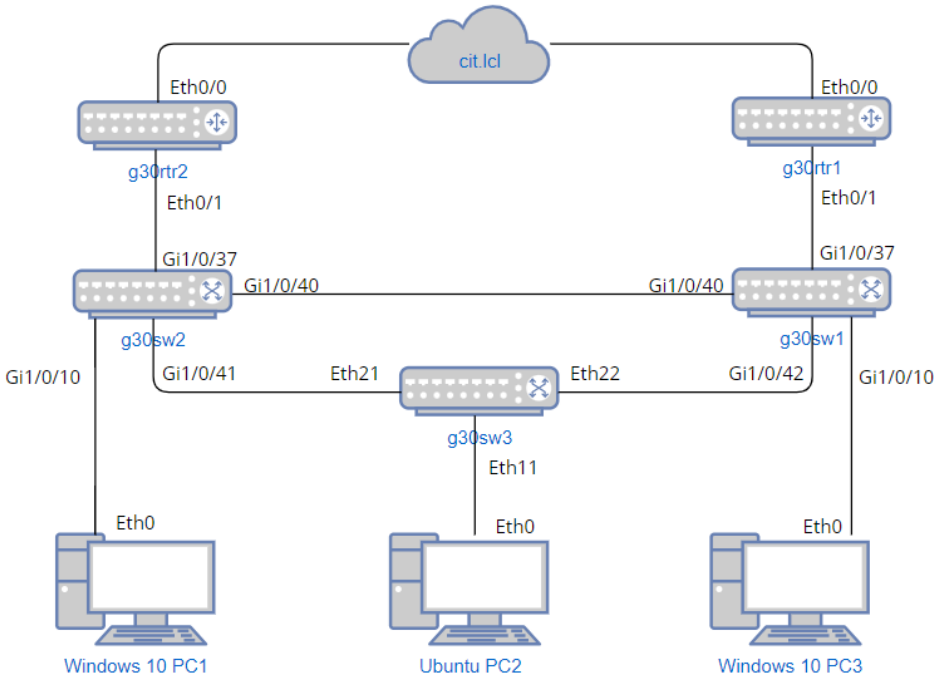

Figure 3: Ending Physical Diagram

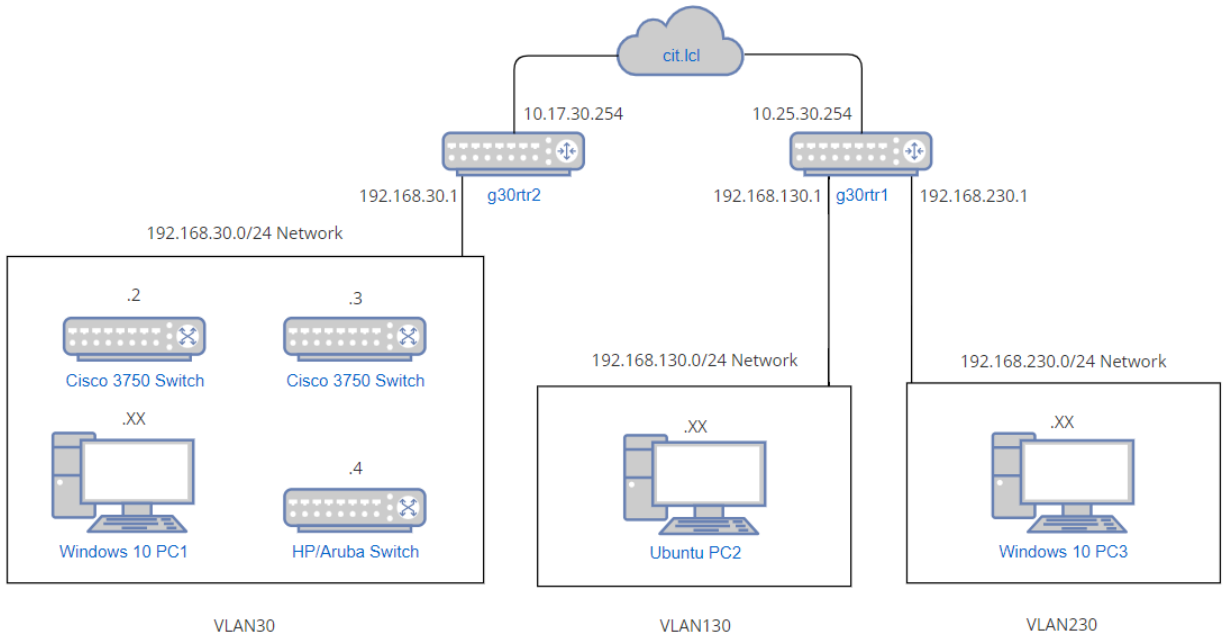

Figure 4: Ending Logical Diagram

CONCLUSIONS AND RECOMMENDATIONS

The project described in this report was a success. All project requirements were implemented and functional, including the network architecture adjustments, the Multiple Spanning Tree Protocol (MSTP) configuration, the disabling of unused ports, and the addition of inline documentation for in-use ports.

Recommendations

The following are recommendations for how to complete the security and redundancy projects outlined in this report.

Recommendation 1: When disabling multiple ports at a time, use the "disable in range" functionality of Cisco IOS. This functionality was not utilized in this report, but it would have saved time if it were used.

Recommendation 2: The recommended sequence to complete the Procedures in would be to adjust the network architecture, add necessary trunked ports, set up the password(s), WAN port, and sub-interfaces on the second router, add inline documentation and disable ports on all routers and switches accordingly, and finally, set up MSTP instances on the switches. This sequence allows for the router configuration and newly trunked ports to be tested and verified before MSTP is implemented.

Recommendation 3: Pay careful attention to the MSTP configurations, as the names, revision numbers, and instance numbers need to be the same across all switches for MSTP to work properly. The best way ensure success would be to decide on the name, revision number, and instance number(s) to use before implementing any configurations.

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APPENDIX A: CONFIGURATION FILES

This section includes configuration files for the various switches and routers referenced in this report.

g30rtr1

```
Current configuration : 2776 bytes
Last configuration change at 19:28:08 UTC Fri Mar 25 2022
version 15.1
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
hostname g30rtr1
boot-start-marker
boot-end-marker
no aaa new-model
dot11 syslog
ip source-route
ip cef
ip dhcp excluded-address 192.168.30.1
ip dhcp excluded-address 192.168.130.1
ip dhcp excluded-address 192.168.230.1
ip dhcp excluded-address 192.168.30.2
ip dhcp excluded-address 192.168.30.3
ip dhcp excluded-address 192.168.30.12
ip dhcp excluded-address 192.168.130.12
ip dhcp excluded-address 192.168.230.12
ip dhcp pool DHCP130
 network 192.168.130.0 255.255.255.0
 default-router 192.168.130.1
 dns-server 10.2.1.11
ip dhcp pool DHCP230
 network 192.168.230.0 255.255.255.0
 default-router 192.168.230.1
 dns-server 10.2.1.11
ip dhcp pool DHCP30
 network 192.168.30.0 255.255.255.0
 default-router 192.168.30.12
 dns-server 10.2.1.11
ip domain name doctorpark
no ipv6 cef
multilink bundle-name authenticated
voice-card 0
crypto pki token default removal timeout 0
```

```
license udi pid CISCO2811 sn FTX1131A2AZ
username park password 7 051B071D2A
redundancy
ip ssh version 2
interface FastEthernet0/0
 description 'WAN Uplink to CIT-NET'
 ip address 10.25.30.254 255.255.255.0
 ip nat outside
 ip virtual-reassembly in
 duplex auto
 speed auto
interface FastEthernet0/1
 description 'LAN Link'
 no ip address
 duplex auto
 speed auto
interface FastEthernet0/1.30
 description 'Subinterface for VLAN 30'
 encapsulation dot1Q 30
 ip address 192.168.30.1 255.255.255.0
 ip nat inside
 ip virtual-reassembly in
interface FastEthernet0/1.130
 description 'Subinterface for VLAN 130'
 encapsulation dot1Q 130
 ip address 192.168.130.1 255.255.255.0
 ip nat inside
 ip virtual-reassembly in
interface FastEthernet0/1.230
 description 'Subinterface for VLAN 230'
 encapsulation dot1Q 230
 ip address 192.168.230.1 255.255.255.0
 ip nat inside
 ip virtual-reassembly in
interface Serial0/0/0
 no ip address
 shutdown
 clock rate 2000000
interface Serial0/0/1
 no ip address
 shutdown
 clock rate 2000000
ip forward-protocol nd
no ip http server
no ip http secure-server
ip nat pool outsideconnet 10.25.30.254 10.25.30.254 netmask 255.255.255.0
```

```
ip nat inside source list 30 interface FastEthernet0/0 overload
ip route 0.0.0.0 0.0.0.0 10.25.30.1
access-list 30 permit 192.168.30.0 0.0.0.255
access-list 30 permit 192.168.130.0 0.0.0.255
access-list 30 permit 192.168.230.0 0.0.0.255
control-plane
mgcp profile default
line con 0
 password 7 110A170C03415F58
 login
line aux 0
line vty 0 4
 login local
 transport input ssh
scheduler allocate 20000 1000
end
```

g30rtr2

```
Current configuration : 2073 bytes
Last configuration change at 17:11:14 UTC Fri Mar 25 2022
version 15.5
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
hostname g30rtr2
boot-start-marker
boot-end-marker
no aaa new-model
ethernet lmi ce
ip cef
no ipv6 cef
multilink bundle-name authenticated
license udi pid CISCO1921/K9 sn FTX182485NW
redundancy
interface Embedded-Service-Engine0/0
 no ip address
 shutdown
interface GigabitEthernet0/0
 description 'WAN Uplink to CIT-NET'
 ip address 10.17.30.254 255.255.255.0
 ip nat outside
 ip virtual-reassembly in
 duplex auto
 speed auto
interface GigabitEthernet0/1
```

```
 description 'LAN Link'
 no ip address
 duplex auto
 speed auto
interface GigabitEthernet0/1.30
 description 'VLAN 30 Network'
 encapsulation dot1Q 30
 ip address 192.168.30.12 255.255.255.0
 ip nat inside
 ip virtual-reassembly in
interface GigabitEthernet0/1.130
 description 'VLAN 130 Network'
 encapsulation dot1Q 130
 ip address 192.168.130.12 255.255.255.0
 ip nat inside
 ip virtual-reassembly in
interface GigabitEthernet0/1.230
 description 'VLAN 230 Network'
 encapsulation dot1Q 230
 ip address 192.168.230.12 255.255.255.0
 ip nat inside
 ip virtual-reassembly in
interface Serial0/0/0
 no ip address
 shutdown
 clock rate 2000000
ip forward-protocol nd
no ip http server
no ip http secure-server
ip nat pool outsideconnet 10.17.30.254 10.17.30.254 netmask 255.255.255.0
ip nat inside source list 12 interface GigabitEthernet0/0 overload
ip route 0.0.0.0 0.0.0.0 10.17.30.1
access-list 12 permit 192.168.30.0 0.0.0.255
access-list 12 permit 192.168.130.0 0.0.0.255
access-list 12 permit 192.168.230.0 0.0.0.255
control-plane
 vstack
line con 0
 password 7 094F40000D564346
 login
line aux 0
line 2
 no activation-character
 no exec
 transport preferred none
 transport output pad telnet rlogin lapb-ta mop udptn v120 ssh
```

```
 stopbits 1
line vty 0 4
 login
 transport input none
scheduler allocate 20000 1000
end
```

g30sw1

```
Current configuration : 4362 bytes
Last configuration change at 01:13:17 UTC Wed Jun 15 2011
NVRAM config last updated at 01:16:50 UTC Wed Jun 15 2011
version 15.0
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
hostname g30sw1
boot-start-marker
boot-end-marker
enable secret 5 $1$zS83$5nkbkQI4lwSzJJlPq.ctf.
enable password 7 0222015A0F280A351F1A5D
username park password 7 095C4F1B12
no aaa new-model
switch 1 provision ws-c3750e-48pd
system mtu routing 1500
ip domain-name docterpark.com
spanning-tree mode mst
spanning-tree extend system-id
spanning-tree mst configuration
 name MSTPLeft
 revision 2
 instance 1 vlan 30
 instance 2 vlan 130, 230
spanning-tree mst 2 priority 0
vlan internal allocation policy ascending
interface FastEthernet0
 no ip address
 shutdown
interface GigabitEthernet1/0/1
 shutdown
interface GigabitEthernet1/0/2
 shutdown
interface GigabitEthernet1/0/3
 shutdown
interface GigabitEthernet1/0/4
```

```
 shutdown
interface GigabitEthernet1/0/5
 shutdown
interface GigabitEthernet1/0/6
 shutdown
interface GigabitEthernet1/0/7
 shutdown
interface GigabitEthernet1/0/8
 shutdown
interface GigabitEthernet1/0/9
 shutdown
interface GigabitEthernet1/0/10
interface GigabitEthernet1/0/11
 description VLAN30Access
 switchport access vlan 30
 switchport mode access
interface GigabitEthernet1/0/12
 description VLAN130Access
 switchport access vlan 130
 switchport mode access
interface GigabitEthernet1/0/13
 description VLAN230Access
 switchport access vlan 230
 switchport mode access
interface GigabitEthernet1/0/14
 shutdown
interface GigabitEthernet1/0/15
 shutdown
interface GigabitEthernet1/0/16
 shutdown
interface GigabitEthernet1/0/17
 shutdown
interface GigabitEthernet1/0/18
 shutdown
interface GigabitEthernet1/0/19
 shutdown
interface GigabitEthernet1/0/20
 shutdown
interface GigabitEthernet1/0/21
 shutdown
interface GigabitEthernet1/0/22
 shutdown
interface GigabitEthernet1/0/23
 shutdown
interface GigabitEthernet1/0/24
 shutdown
```

```
interface GigabitEthernet1/0/25
 shutdown
interface GigabitEthernet1/0/26
 shutdown
interface GigabitEthernet1/0/27
 shutdown
interface GigabitEthernet1/0/28
 shutdown
interface GigabitEthernet1/0/29
 shutdown
interface GigabitEthernet1/0/30
 shutdown
interface GigabitEthernet1/0/31
 shutdown
interface GigabitEthernet1/0/32
 shutdown
interface GigabitEthernet1/0/33
 shutdown
interface GigabitEthernet1/0/34
 shutdown
interface GigabitEthernet1/0/35
 shutdown
interface GigabitEthernet1/0/36
 shutdown
interface GigabitEthernet1/0/37
 description TrunkToG30rtr1
 switchport trunk encapsulation dot1q
 switchport mode trunk
interface GigabitEthernet1/0/38
 shutdown
interface GigabitEthernet1/0/39
 shutdown
interface GigabitEthernet1/0/40
 description TrunkToG30sw2
 switchport trunk encapsulation dot1q
 switchport mode trunk
interface GigabitEthernet1/0/41
 shutdown
interface GigabitEthernet1/0/42
 description TrunkToG30sw3
 switchport trunk encapsulation dot1q
 switchport mode trunk
interface GigabitEthernet1/0/43
 shutdown
interface GigabitEthernet1/0/44
 shutdown
```

```
interface GigabitEthernet1/0/45
 shutdown
interface GigabitEthernet1/0/46
 shutdown
interface GigabitEthernet1/0/47
 shutdown
interface GigabitEthernet1/0/48
 shutdown
interface GigabitEthernet1/0/49
 shutdown
interface GigabitEthernet1/0/50
 shutdown
interface GigabitEthernet1/0/51
 shutdown
interface GigabitEthernet1/0/52
 shutdown
interface TenGigabitEthernet1/0/1
 shutdown
interface TenGigabitEthernet1/0/2
 shutdown
interface Vlan1
 no ip address
interface Vlan30
 description 'VLAN 30 Network'
 ip address 192.168.30.3 255.255.255.0
interface Vlan130
 description 'VLAN 130 Network'
 no ip address
interface Vlan230
 description 'VLAN 230 Network'
 no ip address
ip default-gateway 192.168.30.1
ip http server
ip http secure-server
snmp-server community exit RO
line con 0
 password 7 05080806351F1A5D1E1718071B5F54
 login
line vty 0
 password 7 140E1718
 login
line vty 1
 password 7 1511050510797F702F213A37035446
 login local
 transport input ssh
line vty 2 4
```

```
 password 7 0716245F
 login
line vty 5 15
 password 7 0716245F
 login
monitor session 1 source interface Gi1/0/42
monitor session 1 destination interface Gi1/0/10
end
```

g30sw2

```
Current configuration : 4468 bytes
Last configuration change at 01:22:26 UTC Wed Jun 15 2011
NVRAM config last updated at 01:24:09 UTC Wed Jun 15 2011
version 15.0
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
hostname g30sw2
boot-start-marker
boot-end-marker
enable secret 5 $1$ZNe/$aBzp4Xv2Cib6i3GVf9Fj3.
enable password 7 052F030E25624B1D4A5143
username park password 7 001412140F
no aaa new-model
switch 1 provision ws-c3750e-48pd
system mtu routing 1500
ip domain-name docterpark.com
spanning-tree mode mst
spanning-tree extend system-id
spanning-tree mst configuration
 name MSTPLeft
 revision 2
 instance 1 vlan 30
 instance 2 vlan 130, 230
spanning-tree mst 1 priority 0
vlan internal allocation policy ascending
ip ssh version 2
interface FastEthernet0
 no ip address
 shutdown
interface GigabitEthernet1/0/1
 shutdown
interface GigabitEthernet1/0/2
 shutdown
```

```
interface GigabitEthernet1/0/3
 shutdown
interface GigabitEthernet1/0/4
 shutdown
interface GigabitEthernet1/0/5
 shutdown
interface GigabitEthernet1/0/6
 shutdown
interface GigabitEthernet1/0/7
 shutdown
interface GigabitEthernet1/0/8
 shutdown
interface GigabitEthernet1/0/9
 shutdown
interface GigabitEthernet1/0/10
interface GigabitEthernet1/0/11
 description VLAN30Access
 switchport access vlan 30
 switchport mode access
interface GigabitEthernet1/0/12
 description VLAN130Access
 switchport access vlan 130
 switchport mode access
interface GigabitEthernet1/0/13
 description VLAN230Access
 switchport access vlan 230
 switchport mode access
interface GigabitEthernet1/0/14
 shutdown
interface GigabitEthernet1/0/15
 shutdown
interface GigabitEthernet1/0/16
 shutdown
interface GigabitEthernet1/0/17
 shutdown
interface GigabitEthernet1/0/18
 shutdown
interface GigabitEthernet1/0/19
 shutdown
interface GigabitEthernet1/0/20
 shutdown
interface GigabitEthernet1/0/21
 shutdown
interface GigabitEthernet1/0/22
 shutdown
interface GigabitEthernet1/0/23
```

```
 shutdown
interface GigabitEthernet1/0/24
 shutdown
interface GigabitEthernet1/0/25
 shutdown
interface GigabitEthernet1/0/26
 shutdown
interface GigabitEthernet1/0/27
 shutdown
interface GigabitEthernet1/0/28
 shutdown
interface GigabitEthernet1/0/29
 shutdown
interface GigabitEthernet1/0/30
 shutdown
interface GigabitEthernet1/0/31
 shutdown
interface GigabitEthernet1/0/32
 shutdown
interface GigabitEthernet1/0/33
 shutdown
interface GigabitEthernet1/0/34
 shutdown
interface GigabitEthernet1/0/35
 shutdown
interface GigabitEthernet1/0/36
 shutdown
interface GigabitEthernet1/0/37
 description CIT-NETUplink
 switchport trunk encapsulation dot1q
 switchport mode trunk
interface GigabitEthernet1/0/38
 shutdown
interface GigabitEthernet1/0/39
 shutdown
interface GigabitEthernet1/0/40
 description LinkToG30sw1
 switchport trunk encapsulation dot1q
 switchport mode trunk
interface GigabitEthernet1/0/41
 description LinkToG30sw3
 switchport trunk encapsulation dot1q
 switchport mode trunk
interface GigabitEthernet1/0/42
 shutdown
interface GigabitEthernet1/0/43
```

```
 shutdown
interface GigabitEthernet1/0/44
 shutdown
interface GigabitEthernet1/0/45
 shutdown
interface GigabitEthernet1/0/46
 shutdown
interface GigabitEthernet1/0/47
 shutdown
interface GigabitEthernet1/0/48
 shutdown
interface GigabitEthernet1/0/49
 shutdown
interface GigabitEthernet1/0/50
 shutdown
interface GigabitEthernet1/0/51
 shutdown
interface GigabitEthernet1/0/52
 shutdown
interface TenGigabitEthernet1/0/1
 shutdown
interface TenGigabitEthernet1/0/2
 shutdown
interface Vlan1
 ip address 10.5.30.2 255.255.255.0
interface Vlan30
 description 'VLAN 30 Network'
 ip address 192.168.30.2 255.255.255.0
interface Vlan130
 description 'VLAN 130 Network'
 no ip address
interface Vlan230
 description 'VLAN 230 Network'
 no ip address
ip default-gateway 192.168.30.1
ip http server
ip http secure-server
snmp-server community exit RO
line con 0
 password 7 03075502125C7518491B161007415B
 login
line vty 0
 password 7 131C1201
 login local
 transport input ssh
line vty 1
```

```
 login local
 transport input ssh
line vty 2 4
 password 7 131C1201
 login local
 transport input ssh
line vty 5 15
 password 7 140E1718
 login
monitor session 1 source interface Gi1/0/41
monitor session 1 destination interface Gi1/0/10
end
```

g30sw3

```
; JL259A Configuration Editor; Created on release #WC.16.08.0001
; Ver #14:07.6f.f8.1d.9b.3f.bf.bb.ef.7c.59.fc.6b.fb.9f.fc.ff.ff.37.ef:24
hostname "g30sw3"
module 1 type jl259a
interface 1
   disable
   exit
interface 2
   disable
   exit
interface 3
   disable
   exit
interface 4
   disable
   exit
interface 5
   disable
   exit
interface 6
   disable
   exit
interface 7
   disable
   exit
interface 8
   disable
   exit
interface 9
   disable
   exit
```

```
interface 10
  disable
  exit
interface 11
  name "VLAN30Access"
  exit
interface 12
  name "VLAN130Access"
  exit
interface 13
  name "VLAN230Access"
  exit
interface 14
  disable
  exit
interface 15
  disable
  exit
interface 16
  disable
  exit
interface 17
  disable
  exit
interface 18
  disable
  exit
interface 19
  disable
  exit
interface 20
  disable
  exit
interface 21
  name "TrunkToG30sw2"
  exit
interface 22
  name "TrunkToG30sw1"
  exit
interface 23
  disable
  exit
interface 24
  disable
  exit
interface 25
```

```
   disable
   exit
interface 26
   disable
   exit
interface 27
   disable
   exit
interface 28
   disable
   exit
snmp-server community "public" unrestricted
vlan 1
   name "DEFAULT_VLAN"
   no untagged 11-13
   untagged 1-10,14-28
   ip address dhcp-bootp
   ipv6 enable
   ipv6 address dhcp full
   exit
vlan 30
   name "VLAN30"
   untagged 11
   tagged 21-22
   no ip address
   exit
vlan 130
   name "VLAN130"
   untagged 12
   tagged 21-22
   no ip address
   exit
vlan 230
   name "VLAN230"
   untagged 13
   tagged 21-22
   no ip address
   exit
spanning-tree
spanning-tree config-name "MSTPLeft"
spanning-tree config-revision 2
spanning-tree instance 1 vlan 30
spanning-tree instance 1 priority 3
spanning-tree instance 2 vlan 130 230
spanning-tree instance 2 priority 3
no tftp server
```

```
no autorun
no dhcp config-file-update
no dhcp image-file-update
no dhcp tr69-acs-url
password manager
password operator
```