

# **ENTERPRISE NETWORK SECURITY AND INFRACTURETURE DEVELOPMENT**

**BY**

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This Report Presented in Partial Fulfillment of the Requirements for the  
Degree of Masters of Science in Computer Science & Engineering

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Faculty of Science and Information Technology

Daffodil International University



**DAFFODIL INTERNATIONAL UNIVERSITY**

**DHAKA, BANGLADESH**

**DECEMBER 2018**

## APPROVAL

This Project titled “**ENTERPRICE NETWORK SECURITY AND INFRACTURETURE DEVELOPMENT**” submitted by Kazi Ashiqur Rahman (ID: 113-25-225) to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of MSc. in CSE and approved as to its style and contents. The presentation has been held on December, 2018

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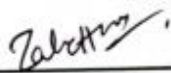
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## DECLARATION

I am declare that, this project has been done by me under the supervision of **Md Zahid Hasan, Assistant Professor, Department of CSE**, Daffodil International University. I also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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## **ABSTRACT**

The basic reasons we care about information systems security are that some of our information needs to be protected against unauthorized disclosure for legal and competitive reasons; all of the information we store and refer to must be protected against accidental or deliberate modification and must be available in a timely fashion that's why we have to implemented Enterprise Network Security and Infrastructure Development. We must also establish and maintain the authenticity (correct attribution) of documents we create, send and receive. Finally, the if poor security practices allow damage to our information systems and security, we may be subject to criminal or civil legal proceedings; if our negligence allows third parties to be harmed via our compromised systems, there may be even more severe legal problems. Another issue that is emerging in e-commerce is that good security can finally be seen as part of the market development strategy. Consumers have expressed widespread concerns over privacy and the safety of their data; companies with strong security can leverage their investment to increase the pool of willing buyers and to increase their market share. We no longer have to look at security purely as loss avoidance: in today's marketplace good security becomes a competitive advantage that can contribute directly to revenue figures and the bottom line. Networks today run mission-critical business services that need protection from both external and internal threats. In this paper we proposed a secure design and implementation of a network and system using Windows environment. Reviews of latest product with an application to an enterprise with worldwide branches are given.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

Information Security is the main part for the Project of Enterprise Network Security and Infrastructure development. To Secure the information Must we have to setup standard Infrastructure for our company. Information security means protecting information and information systems from unauthorized access, use, disclosure, disruption, modification, or destruction. The terms information security, computer security and information assurance are frequently used interchangeably. These fields are interrelated and share the common goals of protecting the confidentiality, integrity and availability of information; however, there are some subtle differences between them. These differences lie primarily in the approach to the subject, the methodologies used, and the areas of concentration. Information security is concerned with the confidentiality, integrity and availability of data regardless of the form the data may take: electronic, print, or other forms.

Governments, military, financial institutions, hospitals, and private businesses amass a great deal of confidential information about their employees, customers, products, research, and financial status. As a career choice there are many ways of gaining entry into the field. It offers many areas for specialization including Information Systems Auditing, Business Continuity Planning and Digital Forensics Science, to name a few.

### 1.2. SECURITY SERVICES AND PROCESSES

Security for the data is very much important for the data process.  
Must we have to follow the below part.

- **Authentication**

Must we have to be used / follow standard Authentication System to access any data or information. Authentication system is a process to access data. We have to identify who are using this data and which type of works he has done.

- **Authorization**

This is the very important to deploy Authorization System for data processing. Suppose we have ERP and this ERP system is using lot of people from the different types of Department. For an example: Accounts Department will get access only for the account related transaction and no need access for production data. So this is very much import for user wise authorization system

- **Auditing**

Data Auditing system also most important of Security Services and Data Processing. Most of the Time we have to find out who has changed this data from whom computers. This has to be identified.

- **Confidentiality**

We have to maintain the confidentially Confidentiality, also referred to as privacy, is the process of making sure that data remains private and confidential

- **Integrity**

To protect the data and information Integrity is very much important. Without Integrity is ERP System will not run properly. So it is very much important for integrity.

- **Availability**

From a security perspective, availability means that systems remain available for the all-important users. The goal for many attackers with denial of service attacks is to crash an application or to make sure that it is sufficiently overwhelmed so that other users cannot access the application.

## CHAPTER 2

### Background and Layout

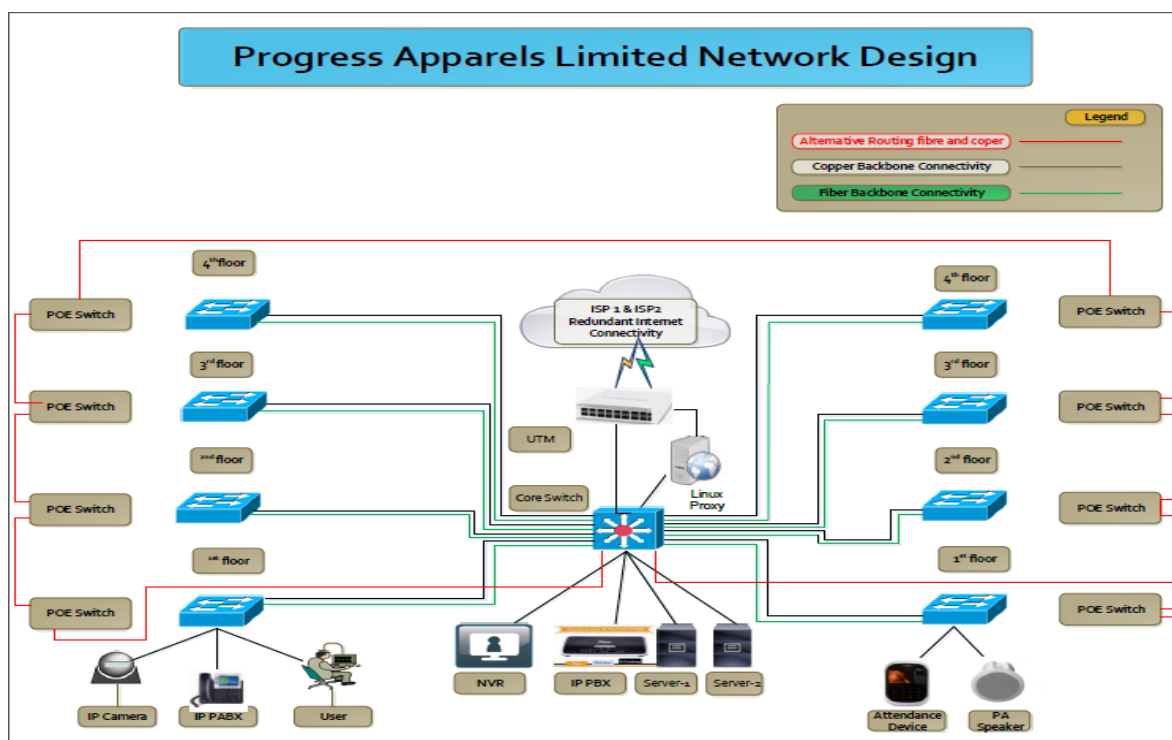


Figure 2.1 network architecture in an enterprise network.

### 2.1 Logical Topology

This section outlines the logical topology (Layer 3) of the PROGRESS APPARELS (BANGLADESH) LIMITED network.

### 2.2 VLANS

The PROGRESS APPARELS (BANGLADESH) LIMITED network is divided into several VLANs, and all of the VLANs correspond to a single wiring closet. The following are the VLAN assignments for the closets:

### 2.3 Network Addressing

IP and IPX are the two network protocols in use on the PROGRESS APPARELS (BANGLADESH) LIMITED network. The following table lists the IP and IPX networks assigned to various part of the PROGRESS APPARELS (BANGLADESH) LIMITED network:

Each switch has an IP address assigned for management purposes. The IP address for each switch is assigned from the VLAN for the closet in which it resides.

### 3.2 Network Architecture

In the small or large corporate business network architecture is the key for communication. To secure the communication or data transfer network architecture should be in planned way. Every single device in any layer of network is very much important.

In this project we'll show the standard network architecture with globally reliable network devices and we ensure the protection of the outside attack and internal traffic management with latest UTM device, like Cyberoam. Figure 3 shows the network architecture in an enterprise network. This is the real time network architecture of our work.

Table: 2.2 VLAN & IP Distribution

| VLAN & IP Distribution |                 |                 |
|------------------------|-----------------|-----------------|
| Vlan ID                | Vlan Name       | Network         |
| 11                     | GFW             | 172.16.11.0/24  |
| 12                     | GFE             | 172.16.12.0/24  |
| 13                     | FFW             | 172.16.13.0/24  |
| 14                     | FFE             | 172.16.14.0/24  |
| 15                     | SFW             | 172.16.15.0/24  |
| 16                     | SFE             | 172.16.16.0/24  |
| 17                     | TFW             | 172.16.17.0/24  |
| 18                     | TFE             | 172.16.18.0/24  |
| 22                     | Biometric       | 172.16.22.0/24  |
| 25                     | SRV             | 172.16.25.0/24  |
| 50                     | WIFI            | 172.16.50.0/24  |
| 30                     | CCTV            | 172.16.30.0/24  |
| 40                     | PABX            | 172.16.40.0/24  |
| 60                     | Progress_Guest  | 172.16.60.0/24  |
| 70                     | Progress_Mobile | 172.16.70.0/24  |
| 100                    | Management      | 172.16.100.0/24 |
| 31                     | B2-GFW          | 172.16.31.0/24  |
| 32                     | B2-GFE          | 172.16.32.0/24  |
| 33                     | B2-FFW          | 172.16.33.0/24  |
| 34                     | B2-FFE          | 172.16.34.0/24  |
| 35                     | B2-SFW          | 172.16.35.0/24  |
| 36                     | B2-SFE          | 172.16.36.0/24  |
| 37                     | B2-TFW          | 172.16.37.0/24  |
| 38                     | B2-TFE          | 172.16.38.0/24  |

## 2.4 BOQ of the Required Product:

Networking Active Part:

| B  | Financial Proposal for Supply, installaton and configuration of LAN Active Equipment                        |                                      |                           |     |
|----|-------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------------------|-----|
| LN | Part Number                                                                                                 | Description                          | Service Duration (Months) | Qty |
| 1  | 48 Port SFP Layer-3 Core Switch with 26 x 1GE SX Transceiver and 2 x 1 GE Copper Transceiver (Brand: CISCO) |                                      |                           |     |
|    | N3K-C3548P-10GX                                                                                             | Nexus 3548-X 48 SFP+ ports, Enhanced | ---                       | 2   |
|    | CON-SNT-3548P10X                                                                                            | SNTC-8X5XNBD Nexus 3548-X 48 SFP+    | 12                        | 2   |

|   |                                                          |                                                                                                                                                                                             |           |    |
|---|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----|
|   | N3K-C3064-ACC-KIT                                        | Nexus 3K/9K Fixed Accessory Kit                                                                                                                                                             |           | 2  |
|   | N3548-BAS1K9                                             | Nexus 3500 Base License                                                                                                                                                                     |           | 2  |
|   | N2200-PAC-400W                                           | N2K/N3K AC Power Supply, Std airflow (port side exhaust)                                                                                                                                    |           | 4  |
| 2 | 48 Port PoE Switch (Brand: CISCO)                        |                                                                                                                                                                                             |           |    |
|   | WS-C2960X-48PS-L                                         | Catalyst 2960-X 48 GigE PoE 370W, 4 x 1G SFP, LAN Base                                                                                                                                      | ---       | 14 |
|   | CON-SMBS-WSC224SL                                        | SMBS 8X5XNBD Catalyst 2960-X 48 GigE PoE 370W, 4 x 1G                                                                                                                                       | 12        | 14 |
|   | CAB-ACU                                                  | AC Power Cord (UK), C13, BS 1363, 2.5m                                                                                                                                                      | ---       | 14 |
| 3 | 24 Port PoE Switch (Brand: CISCO)                        |                                                                                                                                                                                             |           |    |
|   | WS-C2960X-24PS-L                                         | Catalyst 2960-X 24 GigE PoE 370W, 4 x 1G SFP, LAN Base                                                                                                                                      | ---       | 6  |
|   | CON-SMBS-WSC224SL                                        | SMBS 8X5XNBD Catalyst 2960-X 24 GigE PoE 370W, 4 x 1G                                                                                                                                       | 12        | 6  |
|   | CAB-ACU                                                  | AC Power Cord (UK), C13, BS 1363, 2.5m                                                                                                                                                      | ---       | 6  |
| 4 | 1 GE Transceiver (Brand: CISCO)                          |                                                                                                                                                                                             |           |    |
|   | GLC-SX-MMD=                                              | 1000BASE-SX SFP transceiver module, MMF, 850nm, DOM                                                                                                                                         | ---       | 80 |
|   | GLC-TE=                                                  | Modular Cooper                                                                                                                                                                              |           | 10 |
| 5 | Cyber Room 300ing/500ing/Shopos XG 330/430/450/Fortinate |                                                                                                                                                                                             |           |    |
|   | Cyber Room 300ing/500ing/Shopos XG 330/430/450/Fortinate | TSecurity Value Subscription Plus (3 Years) - includes Anti Malware, Anti-Spam, Web and Application Filter, Intrusion Prevention System, 24x7 Support, hardware warranty and RMA fulfilment | 36 Months | 1  |
| 6 | MIKROTIK ROUTER                                          |                                                                                                                                                                                             |           |    |
|   | CLOUD LEVEL MIKROTIK Router                              | Cloud based Mikrotik Router                                                                                                                                                                 | 12        | 2  |
| 7 | Wireless Access Point Controller for HA                  |                                                                                                                                                                                             |           |    |
|   | C1-AIR-CT2504-K9                                         | Cisco ONE - 2500 series WLAN Controller w/ 0 AP lics                                                                                                                                        | ---       | 1  |

|   |                                                                            |                                                                     |     |    |
|---|----------------------------------------------------------------------------|---------------------------------------------------------------------|-----|----|
|   | CON-SNT-CT2504K9                                                           | SNTC-8X5XNBD<br>C1-2500 Wireless<br>LAN Con w/ 0 AP<br>lics         | 12  | 1  |
|   | LIC-CT2504-BASE                                                            | Base Software<br>License                                            | --- | 1  |
|   | CON-ECMU-LIT4BASE                                                          | SWSS UPGRADES<br>Base Software Licens                               | 12  | 1  |
|   | AIR-CT2504-CCBL                                                            | 2504 Wireless<br>Controller Console<br>Cable                        | --- | 1  |
|   | AIR-CT2504-K9                                                              | 2504 Wireless<br>Controller with 0 AP<br>Licenses                   | --- | 1  |
|   | AIR-CT2504-SW-8.0                                                          | Cisco 2504 Wireless<br>Controller SW Rel.<br>8.0                    | --- | 1  |
|   | CAB-AC2UK                                                                  | AC Power cord UK                                                    | --- | 1  |
|   | AIR-CT2504-RMNT                                                            | 2504 Wireless<br>Controller Rack<br>Mount Bracket                   | --- | 1  |
|   | PS-SWITCH-AC-2P                                                            | 2 Prong C7/C8 On-<br>Off AC Power Supply<br>Switch                  | --- | 1  |
|   | LIC-CT25-DTLS-K9                                                           | 2504 Wireless<br>Controller DTLS<br>License                         | --- | 1  |
| 8 | Wireless Access Point add on License for Existing C1-AIR-CT2504 Controller |                                                                     |     |    |
|   | C1-AIR-K9                                                                  | Cisco ONE Access -<br>Wireless - CHOOSE<br>ONLY QTY 1 HERE          | --- | 1  |
|   | CON-ECMU-C1AIRK                                                            | SWSS UPGRADES<br>Cisco ONE - Wireless                               | 12  | 1  |
|   | C1-MSE-PAK                                                                 | Cisco ONE MSE<br>License PAK                                        | --- | 1  |
|   | C1FPAIRK9                                                                  | Cisco ONE<br>Foundation Perpetual<br>- Wireless                     | --- | 30 |
|   | CON-ECMU-C1FPAIR                                                           | SWSS UPGRADES<br>C1 Foundation<br>Perpetual - Wireless              | 12  | 30 |
|   | C1-WLC-1                                                                   | Cisco ONE Wireless<br>LAN Controller AP<br>License (any WLC)        | --- | 30 |
|   | C1-WLC-PAK                                                                 | Cisco ONE Wireless<br>LAN Controller AP<br>License PAK (any<br>WLC) | --- | 1  |
|   | C1-PI-LFAS-AP-K9                                                           | Cisco ONE PI Device<br>License for LF & AS<br>for WLAN              | --- | 30 |
|   | C1-ISE-BASE-AP                                                             | Cisco ONE Identity<br>Services Engine 25<br>EndPoint Base Lic       | --- | 30 |

|   |                       |                                                              |     |    |
|---|-----------------------|--------------------------------------------------------------|-----|----|
|   | C1-MSE-LS-1           | Cisco ONE CMX OnPrem Base (Location + Connect) - 1AP license | --- | 30 |
|   | C1F1VAIR-04           | Tracker PID v04 Fnd Perpetual AIR - no delivery              | --- | 1  |
| 9 | Wireless Access Point |                                                              |     |    |
|   | AIR-AP1832I-C-K9      | 802.11ac Wave 2; 3x3:2SS; Int Ant; C Reg Domain              | --- | 30 |
|   | CON-SMBS-AIR32ICK     | SMBS 8X5XNBD 802.11ac Wave 2; 3x3:2SS; Int Ant; C Reg        | 12  | 30 |
|   | SW1830-CAPWAP-K9      | Cisco 1830 Series CAPWAP Software Image                      | --- | 30 |
|   | AIR-AP-BRACKET-1      | 802.11n AP Low Profile Mounting Bracket (Default)            | --- | 30 |
|   | AIR-CMX-CLD-CPA-1Y    | CMX Cloud - Connect with Presence Analytics 1Yr license      | --- | 30 |
|   | AIR-AP-T-RAIL-R       | Ceiling Grid Clip for Aironet APs - Recessed Mount (Default) | --- | 30 |
|   |                       |                                                              |     |    |

## 2.5 Layer-2 Configuration

In network access layer we use top category global best brand Cisco devices. We design our network with 48 port (PoE) Cisco 2960 X series switch.

Catalyst 2960X-48LPS-L

Configuration Script of Cisco Catalyst 2960-X Series Switches

```

=====
PuTTY log 2018.12.08 17:25:01
=====

```

```

% Username: timeout expired!
Username: admin
Password:
Prog-Acc-TFE-01#
Prog-Acc-TFE-01#
Prog-Acc-TFE-01#sh run

```



Building configuration...

Current configuration : 9667 bytes

!

! Last configuration change at 13:24:37 UTC Sat Dec 8 2018 by admin

! NVRAM config last updated at 19:57:04 UTC Tue Dec 4 2018

!

version 15.2

no service pad

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname Prog-Acc-TFE-01

!

boot-start-marker

boot-end-marker

!

enable secret 5 \$1\$RNUP\$iDBIFJXA8qfhJmfkSnmMs0

!

username admin privilege 15 secret 5 \$1\$9pdr\$OBzHDKUInk4s82peVGR5M.

no aaa new-model

clock timezone UTC 6 0

switch 1 provision ws-c2960x-48lps-l

--More-- !

!

ip domain-name progress-bd.com

!

!

crypto pki trustpoint TP-self-signed-3507878784

enrollment selfsigned

subject-name cn=IOS-Self-Signed-Certificate-3507878784

revocation-check none

rsakeypair TP-self-signed-3507878784

!

!

crypto pki certificate chain TP-self-signed-3507878784

certificate self-signed 01

3082022B 30820194 A0030201 02020101 300D0609 2A864886 F70D0101 05050030

31312F30 2D060355 04031326 494F532D 53656C66 2D536967 6E65642D 43657274

69666963 6174652D 33353037 38373837 3834301E 170D3137 31303035 31303538

31385A17 0D323030 31303130 30303030 305A3031 312F302D 06035504 03132649

--More-- 4F532D53 656C662D 5369676E 65642D43 65727469 66696361 74652D33

35303738

37383738 3430819F 300D0609 2A864886 F70D0101 01050003 818D0030 81890281

81009535 C8CCFE4E 341D2F36 BC2E4033 73D1FF69 8B384135 C560F691

B5A5392D

56C1BC02 E9899B2D E0112289 8A852518 632A9682 6CA8A90E FA3491C7

6A55FB77

```

B0AFFB96 09F6EF34 5C6E84E8 340AEE58 4374A894 2BDBA540 738B9953
425575AD
CC930861 57C43B76 C30CE30E 52ECB640 E2BB00C5 0F20D218 4F56A6F8
D8749B3C
401D0203 010001A3 53305130 0F060355 1D130101 FF040530 030101FF 301F0603
551D2304 18301680 145714A1 F122A73C 1553CC4A F2E2A964 41BDD0D0
67301D06
03551D0E 04160414 5714A1F1 22A73C15 53CC4AF2 E2A96441 BDD0D067
300D0609
2A864886 F70D0101 05050003 81810011 08BBAA03 A6884A5A 8CF69208 D965111D
4854E293 CAFA3A82 70CC75A2 4F556234 6AECED0 C2AB7348 3EFBA89B
4FF688D6
25C68F2F 5A26CB70 525E720E 0E1D4CD8 97145032 871B48F0 30E6FB68
00DBE82F
25E16E60 451BEE7D 83BC519F 9105904D 890F3F6C 51CC829F 13EC6425
4296FBEC
CAD34BEA 35F8B90A 0527D32A 4C3F28
quit
!
spanning-tree mode rapid-pvst
spanning-tree extend system-id
auto qos srnd4
!
!
--More--      vlan internal allocation policy ascending
!
!
!
interface Port-channel17
switchport mode trunk
!
interface FastEthernet0
no ip address
shutdown
!
interface GigabitEthernet1/0/1
description ###Lan User###
switchport access vlan 18
switchport mode access
--More--!
interface GigabitEthernet1/0/2
description ###Lan User###
switchport access vlan 18
switchport mode access
!
interface GigabitEthernet1/0/3
description ###Lan User###
switchport access vlan 18
switchport mode access
!

```

```

interface GigabitEthernet1/0/4
switchport access vlan 222
switchport mode access
switchport port-security violation restrict
switchport port-security aging time 2
switchport port-security aging type inactivity
switchport port-security
macro description cisco-desktop
spanning-tree portfast
spanning-tree bpduguard enable
!
interface GigabitEthernet1/0/5
--More--description ###Lan User###
switchport access vlan 18
switchport mode access
!
interface GigabitEthernet1/0/6
switchport access vlan 18
switchport mode access
!
interface GigabitEthernet1/0/7
description ###Lan User###
switchport access vlan 18
switchport mode access
!
interface GigabitEthernet1/0/8
description ###Lan User###
switchport access vlan 18
switchport mode access
!
interface GigabitEthernet1/0/9
description ###CCTV###
switchport access vlan 30
switchport mode access
switchport port-security violation restrict
--More--      switchport port-security aging time 2
switchport port-security aging type inactivity
switchport port-security
macro description cisco-desktop
spanning-tree portfast
spanning-tree bpduguard enable
!
interface GigabitEthernet1/0/10
description ###Lan User###
switchport access vlan 18
switchport mode access
!
interface GigabitEthernet1/0/11
description ###Lan User###
switchport access vlan 18

```

```

switchport mode access
!
interface GigabitEthernet1/0/12
description ###Lan User###
switchport access vlan 18
switchport mode access
!
interface GigabitEthernet1/0/13
--More--description ###Lan User###
switchport access vlan 18
switchport mode access
!
interface GigabitEthernet1/0/14
description ###Lan User###
switchport access vlan 18
switchport mode access
!
interface GigabitEthernet1/0/15
description ###Lan User###
switchport access vlan 30
switchport mode access
!
interface GigabitEthernet1/0/16
description ###Lan User###
switchport access vlan 18
switchport mode access
!
interface GigabitEthernet1/0/17
description ###AP Connectivity###
switchport access vlan 100
switchport mode access
--More--!
interface GigabitEthernet1/0/18
description ###AP Connectivity###
switchport access vlan 100
switchport mode access
!
interface GigabitEthernet1/0/19
description ###TFW Lan_User###
switchport access vlan 18
switchport mode access
!
interface GigabitEthernet1/0/20
description ###CCCAM###
switchport access vlan 30
switchport mode access
!
interface GigabitEthernet1/0/21
description ###CCCAM###
switchport access vlan 30

```

```

switchport mode access
!
interface GigabitEthernet1/0/22
description ###CCCAM###
--More--      switchport access vlan 30
switchport mode access
!
interface GigabitEthernet1/0/23
description ###CCCAM###
switchport access vlan 30
switchport mode access
!
interface GigabitEthernet1/0/24
description ###CCCAM###
switchport access vlan 30
switchport mode access
!
interface GigabitEthernet1/0/25
description ###CCCAM###
switchport access vlan 30
switchport mode access
!
interface GigabitEthernet1/0/26
description ###CCCAM###
switchport access vlan 30
switchport mode access
!
--More--      interface GigabitEthernet1/0/27
description ###Biometric###
switchport access vlan 22
switchport mode access
!
interface GigabitEthernet1/0/28
description ###Biometric###
switchport access vlan 22
switchport mode access
!
interface GigabitEthernet1/0/29
description ###Biometric###
switchport access vlan 22
switchport mode access
!
interface GigabitEthernet1/0/30
description ###Biometric###
switchport access vlan 22
switchport mode access
!
interface GigabitEthernet1/0/31
description ###Mangement-AP###
switchport access vlan 100

```

```

--More--      switchport mode access
!
interface GigabitEthernet1/0/32
description ###CCTV###
switchport access vlan 30
switchport mode access
!
interface GigabitEthernet1/0/33
description ###Biometric###
switchport access vlan 22
switchport mode access
!
interface GigabitEthernet1/0/34
switchport access vlan 50
switchport mode access
switchport port-security violation restrict
switchport port-security aging time 2
switchport port-security aging type inactivity
switchport port-security
macro description cisco-desktop
spanning-tree portfast
spanning-tree bpduguard enable
!
--More--      interface GigabitEthernet1/0/35
description ###CCTV###
switchport access vlan 30
switchport mode access
!
interface GigabitEthernet1/0/36
description ###CCTV###
switchport access vlan 30
switchport mode access
!
interface GigabitEthernet1/0/37
description ###PABX###
switchport access vlan 11
switchport mode access
!
interface GigabitEthernet1/0/38
description ###PABX###
switchport access vlan 12
switchport mode access
!
interface GigabitEthernet1/0/39
description ###Test for PA#
switchport access vlan 13
--More--      switchport mode access
!
interface GigabitEthernet1/0/40
switchport access vlan 100

```

```

switchport mode access
switchport port-security violation restrict
switchport port-security aging time 2
switchport port-security aging type inactivity
switchport port-security
macro description cisco-desktop
spanning-tree portfast
spanning-tree bpduguard enable
!
interface GigabitEthernet1/0/41
switchport access vlan 14
switchport mode access
!
interface GigabitEthernet1/0/42
switchport access vlan 30
switchport mode access
!
interface GigabitEthernet1/0/43
description ###LAN USER###
--More--      switchport access vlan 18
switchport mode access
!
interface GigabitEthernet1/0/44
switchport access vlan 18
switchport mode access
switchport port-security violation restrict
switchport port-security aging time 2
switchport port-security aging type inactivity
switchport port-security
macro description cisco-desktop
spanning-tree portfast
spanning-tree bpduguard enable
!
interface GigabitEthernet1/0/45
description ###LAN USER###
switchport access vlan 18
switchport mode access
!
interface GigabitEthernet1/0/46
switchport access vlan 100
switchport mode access
!
--More--      interface GigabitEthernet1/0/47
description ###PA_System###
switchport access vlan 222
switchport mode access
!
interface GigabitEthernet1/0/48
description ###Management Port###
switchport access vlan 100

```

```

switchport mode trunk
!
interface GigabitEthernet1/0/49
switchport mode trunk
channel-group 17 mode active
!
interface GigabitEthernet1/0/50
switchport mode trunk
channel-group 17 mode active
!
interface GigabitEthernet1/0/51
!
interface GigabitEthernet1/0/52
!
interface Vlan1
--More--      no ip address
shutdown
!
interface Vlan100
description ####Management Interface###
ip address 172.16.100.18 255.255.255.0
!
interface Vlan222
ip address 172.16.222.4 255.255.255.0
!
interface Vlan600
ip address 10.111.111.1 255.255.255.0
!
interface Vlan601
ip address 10.111.112.1 255.255.255.0
!
interface Vlan602
ip address 10.111.113.1 255.255.255.0
!
ip default-gateway 172.16.100.1
ip http server
ip http secure-server
!
--More--      !
!

```

## 2.6 CISCO Catalyst 2960 POE Switches Specifications

We have chosen cisco Catalyst 2960 POE switch because this switch through put high and more effectiveness. We will use POE Attendance device, CC-Camera that's why we have chosen it. This device throughput is high and more powerful. The Tables has given details for this switches.

## 2.7 Cisco Catalyst 2960 POE Configuration Hardware Status

| Model             | 10/100/1000    | Uplinks | Feature Set |  | PoE+ Power | Flexstack-Plus and          |
|-------------------|----------------|---------|-------------|--|------------|-----------------------------|
|                   | Ethernet Ports |         |             |  |            | Flexstack-Extended Stacking |
| WS-C2960X-48FPD-L | 48             | 2 SFP+  | LAN Base    |  | 740W       | Optional                    |
| WS-C2960X-48LPD-L | 48             | 2 SFP+  | LAN Base    |  | 370W       | Optional                    |
| WS-C2960X-48TD-L  | 48             | 2 SFP+  | LAN Base    |  | -          | Optional                    |
| WS-C2960X-48FPS-L | 48             | 4 SFP   | LAN Base    |  | 740W       | Optional                    |
| WS-C2960X-48LPS-L | 48             | 4 SFP   | LAN Base    |  | 370W       | Optional                    |
| WS-C2960X-48TS-L  | 48             | 4 SFP   | LAN Base    |  | -          | Optional                    |
| WS-C2960X-48TS-LL | 48             | 2 SFP   | LAN Lite    |  | -          | No                          |

## Software

All Cisco Catalyst 2960 POE Switches use a single universal Cisco IOS Software image for all SKUs. Most of the Cisco Switch are configured LAN and Ethernet based software.

## 2.8 Switch Management

All Cisco Switch we are able to manage LAN Command Mode and Web GUI Mode. Cisco Catalyst 2960 Switch has high Throughput and more dependable for all aspect for enterprise network solutions. We are Progress Apparels (Bangladesh) Limited very happy to use this types of manageable switch. We will get very smart feature for this switch like: Dashborad, Configure (Smartports, Express Setup, Portsetting and other very important options), Monitor, Maintenance, Network Assitant and Active advisor.

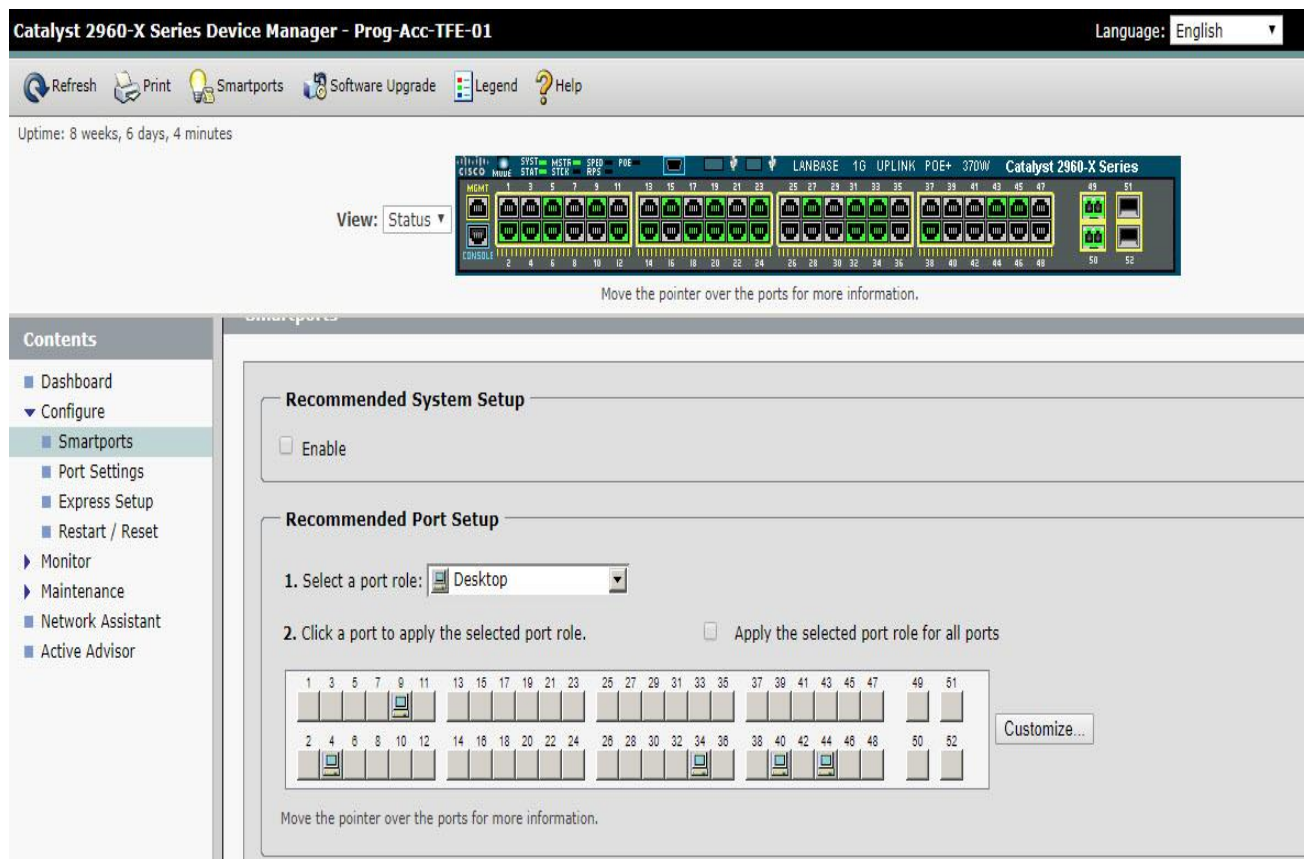


Figure 2.2. Cisco 2960 Switch GUI Live Management

## 2.9 Network Management

We are Managing Network by using the Layer2 Switch 2960 as a access switch and 3548 Switch as a Core Switch (We can do inter VLAN Routing by using this Switch), We are using MIKROTIK Router for DHCP Server. Figure: 2.3 Mikrotik Roter DHCP Server. We are also using Wireless Access Pont and Wireless Controller to Controlling for our Enterprise Network Solutions and Cyberoam using as a UTM.

admin@172.16.50.5 (MikroTik) - WinBox v6.37.4 on CCR1036-12G-4S (tile)

Session Settings Dashboard

Safe Mode Session: 172.16.50.5

Quick Set CAPsMAN Interfaces Wireless Bridge PPP Mesh IP MPLS Routing System Queues Files Log Radius Tools New Terminal LCD Partition Make Supout.rif Manual New WinBox

DHCP Server

DHCP Networks Leases Options Option Sets Alerts

Check Status

| Address       | MAC Address                   | Client ID            | Server | Active Address | Active MAC Address | Active Host Name         | Expires After | Status  |
|---------------|-------------------------------|----------------------|--------|----------------|--------------------|--------------------------|---------------|---------|
| 172.16.11.100 | 2C:30:33:9A:03:8F             | 1:2c:30:33:9a:3:8f   | GFW    | 172.16.11.100  | 2C:30:33:9A:03:8F  | ProgressB1GFW            | 21:21:30      | bound   |
| ...           | Bappy-Store/Desktop           |                      |        |                |                    | DESK-BAPPY-STR           |               | waiting |
| 172.16.11.101 | D4:6E:0E:1F:4E:C6             | 1:d4:6e:e:1f:4e:c6   | GFW    |                |                    |                          |               | waiting |
| ...           | Younous-Store/Desktop         |                      |        |                |                    | DESK-YOUNOUS             | 22:28:12      | bound   |
| 172.16.11.102 | F4:28:53:0F:76:C5             | 1:f4:28:53:f:76:c5   | GFW    | 172.16.11.102  | F4:28:53:0F:76:C5  |                          |               | waiting |
| ...           | BappyK-Mobile                 |                      |        |                |                    | android-faa1f392e648a631 |               | waiting |
| 172.16.11.107 | 84:55:A5:9D:69:66             | 1:84:55:a5:9d:69:... | GFW    |                |                    |                          |               | waiting |
| ...           | Mustak-Stor/Laptop            |                      |        |                |                    | LAP-MUSTAK               |               | waiting |
| 172.16.11.126 | 0C:54:15:29:72:1E             | 1:c:54:15:29:72:1e   | GFW    |                |                    |                          |               | bound   |
| 172.16.11.127 | 3C:52:82:5C:5D:13             | 1:3c:52:82:5c:5d:... | GFW    | 172.16.11.127  | 3C:52:82:5C:5D:13  | DESK-AL_MAMUN            | 23:59:09      | bound   |
| ...           | Bappy_Store_Executive/Desktop |                      |        |                |                    |                          |               | bound   |
| 172.16.11.129 | 3C:1E:04:EB:4B:B8             | 1:3c:1e:4:eb:4b:b8   | GFW    | 172.16.11.129  | 3C:1E:04:EB:4B:B8  | DESK-BAPPY               | 21:21:26      | bound   |
| ...           | Hiron-Store/Desktop           |                      |        |                |                    |                          |               | bound   |
| 172.16.11.131 | E4:BE:ED:A7:9E:52             | 1:e4:be:ed:a7:9e:... | GFW    | 172.16.11.131  | E4:BE:ED:A7:9E:52  | DESK-HIRON               | 23:33:10      | bound   |
| ...           | Motiu-DEO/Desktop             |                      |        |                |                    |                          |               | bound   |
| 172.16.11.168 | E4:BE:ED:28:80:D5             | 1:e4:be:ed:28:80:... | GFW    | 172.16.11.168  | E4:BE:ED:28:80:D5  | DESK-MOTIUR              | 23:39:01      | bound   |
| 172.16.13.50  | 00:00:00:00:00:00             |                      | FFW    | 172.16.13.50   |                    |                          | 21:36:51      | busy    |
| ...           | InspectionRoom-AP             |                      |        |                |                    |                          |               | bound   |
| 172.16.13.51  | 00:04:56:B4:55:C2             | 1:0:4:56:b4:55:c2    | FFW    | 172.16.13.51   | 00:04:56:B4:55:C2  |                          | 22:33:55      | bound   |
| 172.16.13.52  | 40:A3:CC:04:98:0E             | 1:40:a3:cc:4:98:e    | FFW    | 172.16.13.52   | 40:A3:CC:04:98:0E  | LAP-RIAJUL               | 22:01:42      | bound   |
| ...           | Saiful_QC_Myntra/Mobile       |                      |        |                |                    |                          |               | waiting |
| 172.16.13.53  | 94:87:E0:40:C8:CD             | 1:94:87:e0:40:c8:... | FFW    |                |                    | MIX-DNATS                |               | waiting |
| ...           | Kawser-Matalan/Laptop         |                      |        |                |                    |                          |               | bound   |
| 172.16.13.54  | 54:13:79:89:81:85             | 1:54:13:79:89:81:... | FFW    | 172.16.13.54   | 54:13:79:89:81:85  | DESKTOP-48CBJUV          | 21:26:22      | bound   |
| ...           | Saiful_QC_Myntra/Laptop       |                      |        |                |                    |                          |               | waiting |
| 172.16.13.55  | 40:A3:CC:3C:FC:76             | 1:40:a3:cc:3c:fc:76  | FFW    |                |                    | BANW000MT0599            |               | waiting |

Figure: 2.3 Mikrotik Roter DHCP Server

CISCO

MONITOR WLANs CONTROLLER WIRELESS SECURITY MANAGEMENT COMMANDS HELP FEEDBACK

Save Configuration Ping Logout Refresh

Home

Wireless

All APs

Entries 1 - 18 of 18

Current Filter None [Change Filter] [Clear Filter]

Number of APs 18

| AP Name | IP Address(Ipv4/Ipv6) | AP Model         | AP MAC            | AP Up Time           |
|---------|-----------------------|------------------|-------------------|----------------------|
| AP04    | 172.16.100.54         | AIR-AP1832I-C-K9 | d4:2c:44:e8:13:e8 | 15 d, 23 h 53 m 12 s |
| AP09    | 172.16.100.59         | AIR-AP1832I-C-K9 | 70:d3:79:da:17:e8 | 22 d, 04 h 19 m 01 s |
| AP08    | 172.16.100.58         | AIR-AP1832I-C-K9 | 70:d3:79:da:02:40 | 14 d, 14 h 36 m 29 s |
| AP05    | 172.16.100.55         | AIR-AP1832I-C-K9 | d4:2c:44:e8:11:98 | 15 d, 23 h 53 m 12 s |
| AP02    | 172.16.100.52         | AIR-AP1832I-C-K9 | d4:2c:44:ee:16:50 | 18 d, 02 h 12 m 46 s |
| AP03    | 172.16.100.53         | AIR-AP1832I-C-K9 | d4:2c:44:e8:01:58 | 14 d, 14 h 36 m 28 s |
| AP06    | 172.16.100.56         | AIR-AP1832I-C-K9 | d4:2c:44:e8:02:88 | 61 d, 20 h 29 m 51 s |
| AP01    | 172.16.100.51         | AIR-AP1832I-C-K9 | d4:2c:44:e8:11:a0 | 14 d, 04 h 41 m 54 s |
| AP11    | 172.16.100.70         | AIR-AP1832I-C-K9 | 70:d3:79:da:14:80 | 20 d, 01 h 36 m 37 s |
| AP07    | 172.16.100.57         | AIR-AP1832I-C-K9 | 70:d3:79:da:46:68 | 6 d, 15 h 14 m 13 s  |
| AP13    | 172.16.100.72         | AIR-AP1832I-C-K9 | f8:b7:e2:d0:56:d0 | 2 d, 22 h 33 m 17 s  |
| AP12    | 172.16.100.71         | AIR-AP1832I-C-K9 | f8:b7:e2:d0:55:f8 | 0 d, 02 h 09 m 53 s  |
| AP23    | 172.16.100.82         | AIR-AP1832I-C-K9 | 70:d3:79:da:15:10 | 0 d, 02 h 07 m 21 s  |
| AP14    | 172.16.100.73         | AIR-AP1832I-C-K9 | f8:b7:e2:d0:48:88 | 0 d, 01 h 49 m 03 s  |
| AP15    | 172.16.100.74         | AIR-AP1832I-C-K9 | f8:b7:e2:d0:56:b8 | 0 d, 01 h 36 m 28 s  |
| AP16    | 172.16.100.75         | AIR-AP1832I-C-K9 | f8:b7:e2:d0:55:98 | 0 d, 01 h 15 m 25 s  |
| AP25    | 172.16.100.84         | AIR-AP1832I-C-K9 | 70:d3:79:da:15:d8 | 0 d, 00 h 10 m 44 s  |
| AP26    | 172.16.100.85         | AIR-AP1832I-C-K9 | f8:b7:e2:d0:55:d0 | 0 d, 00 h 13 m 52 s  |

Figure: 2.4: WLC and viewing Access point information.

## 2.10 Application Visibility and Control (AVC)

We have able to control application Visibility and other system information for our Network and intervlan Routing. Also we are using WLC to control the all Access Point. Please see the figure of WLC Configuration Status.

| SYSTEM INFORMATION              |                               | WLC-1 | X |
|---------------------------------|-------------------------------|-------|---|
| System Name                     | WLC                           |       |   |
| Model                           | AIR-CT2504-K9                 |       |   |
| Serial Number                   | PSZ21051D6B                   |       |   |
| Software Version                | 8.2.151.0                     |       |   |
| Field Recovery Version          | 7.6.101.1                     |       |   |
| Up Time                         | 10 days, 15 hours, 36 minutes |       |   |
| System Time                     | Tue Nov 27 21:51:45 2018      |       |   |
| Timezone                        |                               |       |   |
| Redundancy Mode                 | N/A                           |       |   |
| Country                         | MY - MALAYSIA                 |       |   |
| Management IP Address           | 172.16.100.50                 |       |   |
| Memory Usage                    | 36%                           |       |   |
| AP Licenses in use              | 12                            |       |   |
| Permanent AP Licenses Installed | 0                             |       |   |
| Max Access Points Supported     | 12                            |       |   |

Figure: 2.5 WLC Configuration.

## 2.11 Features and Benefits

| Feature                             | Function                                  | Benefit                                     | 2960-X and -XR | HP 2920                        | Juniper EX2200/ EX3300      |
|-------------------------------------|-------------------------------------------|---------------------------------------------|----------------|--------------------------------|-----------------------------|
| <b>Scalable</b>                     |                                           |                                             |                |                                |                             |
| Stacking for up to 8 members        | Unified data and control plane management | Lower OpEx<br>Simplicity and resiliency     | ✓              | ✗                              | EX2200 ✗<br>EX3300 up to 10 |
| Backward compatible stacking        | Stacks with 2960-S and -SF                | Investment protection                       | ✓              | ✗                              | ✗                           |
| Highest PoE density in the industry | 740W of PoE without external power source | Lower CapEx and power costs                 | ✓              | ✗                              | ✗                           |
| <b>Smart</b>                        |                                           |                                             |                |                                |                             |
| Hibernation modes                   | Programmed based on time of day           | Lower power costs and more energy efficient | ✓              | ✗                              | ✗                           |
| Power efficient switch              | Optimized energy usage                    |                                             | ✓              | 2960-X consumes 27% less power | ✗                           |
| EnergyWise                          | Reduces device power consumption          |                                             | ✓              | ✗                              | ✗                           |

● Up to

| Feature                              | Function                                                    | Benefit                                                     | 2960-X<br>and -XR                                                                    | HP 2920                                                                               | Juniper<br>EX2200/<br>EX3300                                                          |
|--------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Simple</b>                        |                                                             |                                                             |                                                                                      |                                                                                       |                                                                                       |
| Smart Install                        | Automatically<br>downloads IOS and<br>switch configuration  | Reduced OpEx<br>Zero-touch<br>deployment of<br>new switches |    |    |    |
| Auto Smartports                      | Automatically<br>configures port<br>based on device<br>type |                                                             |    |    |    |
| Smart Call Home                      | Proactively runs<br>diagnostics and<br>health checks        | Reduced downtime                                            |    |    | —                                                                                     |
| Auto QoS                             | Automatically<br>detects devices and<br>configures QoS      | QoS consistency<br>protects applications<br>and voice       |    |    |    |
| <b>Secure</b>                        |                                                             |                                                             |                                                                                      |                                                                                       |                                                                                       |
| Identity Services<br>Engine with SXP | Precise access<br>controls                                  | Secure network<br>architecture                              |    |    |    |
| 802.1X Monitor<br>Mode               | 802.1X<br>implementation<br>without affecting<br>traffic    |                                                             |    |    |    |
| IPv6 First Hop<br>Security®          | Protection against<br>Denial of Service                     |                                                             |   |   |   |
| MACsec hardware<br>capable           | Can be turned on<br>later with simple<br>software update    |                                                             |  |  |  |

## Benefit of Core and high end switches

| Trend                   | Feature                                                     | Installed-Base Access Switches |              |                       | Catalyst 9000 Series            | Benefits                                                                                                |
|-------------------------|-------------------------------------------------------------|--------------------------------|--------------|-----------------------|---------------------------------|---------------------------------------------------------------------------------------------------------|
|                         |                                                             | 3560-X, 3750-X Series          | 3750G Series | 3850 Series           | Catalyst 9300 Series            |                                                                                                         |
| Scale and Performance   | Bandwidth per stack                                         | No stacking/ 64 Gbps           | 32 Gbps      | 480 Gbps              | 480 Gbps                        | Support Multigigabit access growth for wired and wireless/802.11ac<br>1G, 2.5G, Multigigabit, 10G, 40G; |
|                         | Uplinks                                                     | 2x 10G <sup>1</sup>            | 4x 1G        | 4x 10G or 2x 10G      | 24 or 48x 10G<br>8x 10G, 2x 40G |                                                                                                         |
|                         | Multigigabit technology                                     | -                              | -            | ✓                     | ✓                               |                                                                                                         |
| Advanced Security       | Native Flexible NetFlow                                     | -                              | -            | ✓                     | ✓                               | Orchestrate role-based access to corporate resources<br>AES-256/MACsec-256                              |
|                         | Cisco TrustSec® and SGT <sup>3</sup> for wired and wireless | Wired                          | -            | ✓                     | ✓                               |                                                                                                         |
|                         | Trustworthy Systems                                         | -                              | -            | ✓                     | ✓                               |                                                                                                         |
|                         | Native MACsec-256 encryption                                | -                              | -            | mGig/10G models       | ✓                               |                                                                                                         |
|                         | Encrypted Traffic Analytics                                 | -                              | -            | -                     | ✓                               |                                                                                                         |
| Simplicity & Automation | Common features for wired   and wireless                    | -                              | -            | ✓                     | ✓                               | proactively assess, monitor and troubleshoot network<br><br>Simplicity and business agility             |
|                         | Smart Operations                                            | ✓                              | -            | ✓                     | ✓                               |                                                                                                         |
|                         | SD-Access <sup>4</sup> programmability                      | -                              | -            | Optional Subscription | ✓                               |                                                                                                         |
| BYOD and Mobility       | Integrated wireless LAN controller                          | -                              | -            | ✓                     | ✓                               | Enable converged wired and wireless access for operational simplicity and scale                         |
|                         | Wave 2 access points                                        | -                              | -            | 24                    | 48                              |                                                                                                         |
|                         | UADP <sup>2</sup> ASIC for wired and wireless convergence   | -                              | -            | ✓                     | ✓                               |                                                                                                         |
|                         | Application visibility across wired and wireless            | -                              | -            | ✓                     | ✓                               |                                                                                                         |
|                         | Hierarchical wireless Quality of Service (QoS)              | -                              | -            | ✓                     | ✓                               |                                                                                                         |

<sup>1</sup> G: Gigabit Ethernet    <sup>2</sup> UADP ASIC: Unified Access Data Plane ASIC    <sup>3</sup> SGT: Security Group Tag    <sup>4</sup> SD-Access: Software-Defined Access

## CHAPTER 3

### Core & Distribution Switches

#### 3.1 Cisco Nexus 3548-X Switch

CISCO Nexus 3548 Switch we are using two pcs. This is more secure and high reliability switch and already discuss that cisco 2960 switch we are using as a access and distribution switch.

#### 3.2 Configuration Script of Cisco Nexus 3548 (Core Switch) Switch

```
=~::~~::~~::~~::~~::~~::~~::~~::~~::~~::~ PuTTY log 2018.11.20 14:53:55
=~::~~::~~::~~::~~::~~::~~::~~::~~::~~::~
```

Login timed out after 60 seconds

```
=~::~~::~~::~~::~~::~~::~~::~~::~~::~~::~ PuTTY log 2018.11.20 14:55:12
=~::~~::~~::~~::~~::~~::~~::~~::~~::~~::~
```

adin admin

Password:

Prog-Core-01# copy r s

```
[# ] 1%
[##### ] 50%
[#####] 100%
```

Copy complete, now saving to disk (please wait)...

Prog-Core-01# sh run

!Command: show running-config  
!Time: Tue Nov 20 08:48:18 2018

```
version 6.0(2)A7(2)
hostname Prog-Core-01
```

```
feature telnet
feature vrrp
cfs eth distribute
feature pim
feature interface-vlan
feature lacp
feature vpc
```

feature lldp  
feature nat

```
ip domain-lookup
ip domain-name progress-bd.com
crypto key param rsa label Prog-Core-01.progress-bd.com modulus 1024
ip access-list copp-system-acl-bfd
  10 permit udp any any eq 3784
[7m--More--[27m
  20 permit udp any any eq 3785
ip access-list copp-system-acl-eigrp
  10 permit eigrp any any
ip access-list copp-system-acl-ftp
  10 permit tcp any any eq ftp-data
  20 permit tcp any any eq ftp
  30 permit tcp any eq ftp-data any
  40 permit tcp any eq ftp any
ip access-list copp-system-acl-http
  10 permit tcp any any eq www
  20 permit tcp any any eq 443
ip access-list copp-system-acl-icmp
  10 permit icmp any any
ip access-list copp-system-acl-ntp
  10 permit udp any any eq ntp
  20 permit udp any eq ntp any
ip access-list copp-system-acl-ping
  10 permit icmp any any echo
  20 permit icmp any any echo-reply
ip access-list copp-system-acl-routingproto1
  10 permit tcp any any eq bgp
  20 permit tcp any eq bgp any
  30 permit tcp any any eq 639
[7m--More--[27m
  40 permit tcp any eq 639 any
  50 permit ospf any any
ip access-list copp-system-acl-routingproto2
  10 permit 112 any 224.0.0.0/24
ip access-list copp-system-acl-snmp
  10 permit udp any any eq snmp
  20 permit udp any eq snmp any
  30 permit udp any any eq snmptrap
ip access-list copp-system-acl-ssh
  10 permit tcp any any eq 22
  20 permit tcp any eq 22 any
ip access-list copp-system-acl-stftp
  10 permit udp any any eq tftp
  20 permit udp any any eq 1758
  30 permit udp any eq tftp any
  40 permit udp any eq 1758 any
  50 permit tcp any any eq 115
```

```

60 permit tcp any eq 115 any
ip access-list copp-system-acl-tacacsradius
10 permit tcp any any eq tacacs
20 permit tcp any eq tacacs any
30 permit udp any any eq 1812
40 permit udp any any eq 1813
[7m--More--[27m
50 permit udp any any eq 1645
60 permit udp any any eq 1646
70 permit udp any eq 1812 any
80 permit udp any eq 1813 any
90 permit udp any eq 1645 any
100 permit udp any eq 1646 any
ip access-list copp-system-acl-telnet
10 permit tcp any any eq telnet
20 permit tcp any any eq 107
30 permit tcp any eq telnet any
40 permit tcp any eq 107 any

```

```

class copp-s-default
  police pps 400
class copp-s-ping
  police pps 100
class copp-s-l3destmiss
[7m--More--[27m
  police pps 100
class copp-s-glean
  police pps 500
class copp-s-l3mtufail
  police pps 100
class copp-s-ttl1
  police pps 100
class copp-s-ip-options
  police pps 100
class copp-s-ip-nat
  police pps 100
class copp-s-ipmcmiss
  police pps 400
class copp-s-ipmc-g-hit
  police pps 400
class copp-s-ipmc-rpf-fail-g
  police pps 400
class copp-s-ipmc-rpf-fail-sg
  police pps 400
class copp-s-dhcpreq
  police pps 300
class copp-s-dhcpresp
  police pps 300
[7m--More--[27m
class copp-s-igmp

```

```

    police pps 400
class copp-s-routingProto2
    police pps 1300
class copp-s-eigrp
    police pps 200
class copp-s-pimreg
    police pps 200
class copp-s-pimautorp
    police pps 200
class copp-s-routingProto1
    police pps 1000
class copp-s-arp
    police pps 200
class copp-s-ntp
    police pps 1000
class copp-s-bfd
    police pps 350
class copp-s-bpdu
    police pps 12000
class copp-s-dpss
    police pps 6400
class copp-s-cdp
[7m--More--[27m
    police pps 400
class copp-s-lacp
    police pps 400
class copp-s-ldp
    police pps 500
class copp-icmp
    police pps 200
class copp-telnet
    police pps 500
class copp-ssh
    police pps 500
class copp-snmp
    police pps 500
class copp-ntp
    police pps 100
class copp-tacacsradius
    police pps 400
class copp-stftp
    police pps 400
class copp-ftp
    police pps 100
class copp-http
    police pps 100
[7m--More--[27m
control-plane
service-policy input copp-system-policy
class copp-s-default

```

```

    police pps 400
class copp-s-ping
    police pps 100
class copp-s-l3destmiss
[7m--More--[27m
    police pps 100
class copp-s-glean
    police pps 500
class copp-s-l3mtufail
    police pps 100
class copp-s-ttl1
    police pps 100
class copp-s-ip-options
    police pps 100
class copp-s-ip-nat
    police pps 100
class copp-s-ipmcmiss
    police pps 400
class copp-s-ipmc-g-hit
    police pps 400
class copp-s-ipmc-rpf-fail-g
    police pps 400
class copp-s-ipmc-rpf-fail-sg
    police pps 400
class copp-s-dhcpreq
    police pps 300
class copp-s-dhcpresp
    police pps 300
[7m--More--[27m
class copp-s-igmp
    police pps 400
class copp-s-routingProto2
    police pps 1300
class copp-s-eigrp
    police pps 200
class copp-s-pimreg
    police pps 200
class copp-s-pimautorp
    police pps 200
class copp-s-routingProto1
    police pps 1000
class copp-s-arp
    police pps 200
class copp-s-ptp
    police pps 1000
class copp-s-bfd
    police pps 350
class copp-s-bpdu
    police pps 12000
class copp-s-dpss

```

```
    police pps 6400
    class copp-s-cdp
[7m--More--[27m
    police pps 400
    class copp-s-lacp
    police pps 400
    class copp-s-ldp
    police pps 500
    class copp-icmp
    police pps 200
    class copp-telnet
    police pps 500
    class copp-ssh
    police pps 500
    class copp-snmp
    police pps 500
    class copp-ntp
    police pps 100
    class copp-tacacsradius
    police pps 400
    class copp-stftp
    police pps 400
    class copp-ftp
    police pps 100
    class copp-http
    police pps 100
```

```
snmp-server user admin network-admin auth md5
0x11a2a51c1dcb75c12c27772537e85531
priv 0x11a2a51c1dcb75c12c27772537e85531 localizedkey
```

```
vlan 1
vlan 11
    name GFW
vlan 12
    name GFE
vlan 13
    name FFW
vlan 14
    name FFE
vlan 15
    name SFW
vlan 16
    name SFE
vlan 17
vlan 18
    name TFE
vlan 22
    name Biometric
```

```

[7m--More--[27m
vlan 25[K
    name SRV
vlan 30
    name CCTV
vlan 31
    name B2-GFW
vlan 32
    name B2-GFE
vlan 33
    name B2-FFW
vlan 34
    name B2-FFE
vlan 35
    name B2-SFW
vlan 36
    name B2-SFE
vlan 37
    name B2-TFW
vlan 38
    name B2-TFE
vlan 40
    name PABX
vlan 50
[7m--More--[27m
    name WiFi
vlan 60
    name ###Guest_WiFi_VLAN###
vlan 70
    name WIFI_Progress_mobile
vlan 100
    name ##Management#
vlan 160
    name #uplink#
vlan 210
    name cyberoam
vlan 222
    name TEST-for-PA
vlan 400
    name test
vrf context management
vpc domain 999
    peer-keepalive destination 172.20.20.2 source 172.20.20.1
    peer-gateway

interface Vlan1

interface Vlan11
[7m--More--[27m
    description ##Ground Floor WEST#

```

```
no shutdown
no ip redirects
ip address 172.16.11.2/24
ip directed-broadcast
vrrp 11
    address 172.16.11.1
    no shutdown
```

```
interface Vlan12
    description ##Ground Floor East#
    no shutdown
    no ip redirects
    ip address 172.16.12.2/24
    ip directed-broadcast
    ip pim sparse-mode
    vrrp 12
        address 172.16.12.1
        no shutdown
```

```
interface Vlan13
    description #First Floor West#
    no shutdown
[7m--More--[27m
    no ip redirects
    ip address 172.16.13.2/24
    ip directed-broadcast
    ip pim sparse-mode
    vrrp 13
        address 172.16.13.1
        no shutdown
```

```
interface Vlan14
    description #First Floor East#
    no shutdown
    no ip redirects
    ip address 172.16.14.2/24
    ip directed-broadcast
    vrrp 14
        address 172.16.14.1
        no shutdown
```

```
interface Vlan15
    description #Second Floor West#
    no shutdown
    no ip redirects
    ip address 172.16.15.2/24
[7m--More--[27m
    ip directed-broadcast
    vrrp 15
        address 172.16.15.1
```

```

no shutdown

interface Vlan16
  description ##Second Floor East#
  no shutdown
  no ip redirects
  ip address 172.16.16.2/24
  ip directed-broadcast
  vrrp 16
    address 172.16.16.1
  no shutdown

interface Vlan17
  description #Third Floor West#
  no shutdown
  no ip redirects
  ip address 172.16.17.2/24
  ip directed-broadcast
  vrrp 17
    address 172.16.17.1
[7m--More--[27m
  no shutdown

interface Vlan18
  description ###Third Floor East VLAN###
  no shutdown
  no ip redirects
  ip address 172.16.18.2/24
  ip directed-broadcast
  ip pim sparse-mode
  vrrp 18
    address 172.16.18.1
  no shutdown

interface Vlan22
  no shutdown
  ip address 172.16.22.2/24
  vrrp 22
    priority 150
    address 172.16.22.1
  no shutdown

interface Vlan25
  description ##Server-Firm-VLAN##
[7m--More--[27m
  no shutdown
  no ip redirects
  ip address 172.16.25.2/24
  ip directed-broadcast
  vrrp 25

```

```

    address 172.16.25.1
    no shutdown

interface Vlan30
    description ###CCTV#####
    no shutdown
    no ip redirects
    ip address 172.16.30.2/24
    ip directed-broadcast
    vrrp 30
        priority 150
        address 172.16.30.1
    no shutdown

interface Vlan31
    no shutdown
    no ip redirects
    ip address 172.16.31.2/24
[7m--More--[27m
    ip directed-broadcast
    ip pim sparse-mode
    vrrp 31
        address 172.16.31.1
    no shutdown

interface Vlan32
    description ##B2-SampleDept.##
    no shutdown
    no ip redirects
    ip address 172.16.32.2/24
    ip directed-broadcast
    ip pim sparse-mode
    vrrp 32
        address 172.16.32.1
    no shutdown

interface Vlan33
    no shutdown
    no ip redirects
    ip address 172.16.33.2/24
    ip directed-broadcast
    ip pim sparse-mode
[7m--More--[27m
    vrrp 33
        address 172.16.33.1
    no shutdown

interface Vlan34
    description ##B2-HRDept.##
    no shutdown

```

```
no ip redirects
ip address 172.16.34.2/24
ip directed-broadcast
ip pim sparse-mode
vrrp 34
    address 172.16.34.1
    no shutdown
```

```
interface Vlan35
    no shutdown
    no ip redirects
    ip address 172.16.35.2/24
    ip directed-broadcast
    ip pim sparse-mode
    vrrp 35
        address 172.16.35.1
[7m--More--[27m
    no shutdown
```

```
interface Vlan36
    no shutdown
    no ip redirects
    ip address 172.16.36.2/24
    ip directed-broadcast
    ip pim sparse-mode
    vrrp 36
        address 172.16.36.1
    no shutdown
```

```
interface Vlan37
    no shutdown
    no ip redirects
    ip address 172.16.37.2/24
    ip directed-broadcast
    ip pim sparse-mode
    vrrp 37
        address 172.16.37.1
    no shutdown
```

```
interface Vlan38
[7m--More--[27m
    no shutdown
    no ip redirects
    ip address 172.16.38.2/24
    ip directed-broadcast
    ip pim sparse-mode
    vrrp 38
        address 172.16.38.1
    no shutdown
```

```

interface Vlan40
  description #####PABX####
  no shutdown
  no ip redirects
  ip address 172.16.40.2/24
  ip directed-broadcast
  vrrp 40
    priority 150
    address 172.16.40.1
    no shutdown

interface Vlan50
  no shutdown
  no ip redirects
  [7m--More--[27m
  ip address 172.16.50.2/24
  ip directed-broadcast
  ip pim sparse-mode
  vrrp 50
    priority 150
    address 172.16.50.1
    no shutdown

interface Vlan60
  no shutdown
  no ip redirects
  ip address 172.16.60.2/24
  ip directed-broadcast
  vrrp 60
    priority 150
    address 172.16.60.1
    no shutdown

interface Vlan70
  description ###WIFI_Progress_Mobile###
  no shutdown
  no ip redirects
  ip address 172.16.70.2/24
  [7m--More--[27m
  ip directed-broadcast
  vrrp 70
    priority 150
    address 172.16.70.1
    no shutdown

interface Vlan100
  description ###management###
  no shutdown
  ip address 172.16.100.2/24
  vrrp 100

```

```

    priority 150
    address 172.16.100.1
    no shutdown

interface Vlan160
    no shutdown
    no ip redirects
    ip address 172.17.10.3/24

interface Vlan210
    description ### Cyberoam #####
    no shutdown
[7m--More--[27m
    no ip redirects
    ip address 172.16.109.3/29
    vrrp 210
        priority 150
        address 172.16.109.5
        no shutdown

interface Vlan222
    no shutdown
    no ip redirects
    ip address 172.16.222.2/24
    ip pim sparse-mode
    vrrp 222
        priority 150
        address 172.16.222.1
        no shutdown

interface Vlan400

interface port-channel11
    speed 1000
    switchport mode trunk
    vpc 11
[7m--More--[27m

[K
interface port-channel17
    speed 1000
    switchport mode trunk
    vpc 17

interface port-channel18
    speed 1000
    switchport mode trunk
    vpc 18

interface port-channel19

```

```
speed 1000
switchport mode trunk
vpc 19
```

```
interface port-channel20
speed 1000
switchport mode trunk
vpc 20
```

```
interface port-channel21
speed 1000
[7m--More--[27m
```

```
[K
interface Ethernet1/19
speed 1000
switchport mode trunk
channel-group 19 mode active
no shutdown
```

```
interface Ethernet1/20
speed 1000
switchport mode trunk
channel-group 20 mode active
no shutdown
```

```
interface Ethernet1/21
speed 1000
description ###Connected to ACC SW6 through VPC###
switchport mode trunk
channel-group 21 mode active
no shutdown
```

```
interface Ethernet1/22
speed 1000
switchport mode trunk
[7m--More--[27m
channel-group 22 mode active
no shutdown
```

```
interface Ethernet1/23
speed 1000
switchport mode trunk
channel-group 23 mode active
no shutdown
```

```
interface Ethernet1/24
speed 1000
switchport mode trunk
channel-group 24 mode active
```

```

no shutdown

interface Ethernet1/25
speed auto
description ### Connected to Cyberoam ###
switchport access vlan 210
no shutdown

interface Ethernet1/26
speed 1000
[7m--More--[27m
no shutdown

interface Ethernet1/27
speed 1000
switchport mode trunk
channel-group 27 mode active
no shutdown

interface Ethernet1/28
speed 1000
description ###Connected to Spare Dist SW2###
switchport mode trunk
channel-group 28 mode active
no shutdown

interface Ethernet1/29
no shutdown

interface Ethernet1/30
no shutdown

interface Ethernet1/31
no shutdown
[7m--More--[27m

[K
interface Ethernet1/32
no shutdown

interface Ethernet1/33
speed 1000
switchport mode trunk
no shutdown

interface Ethernet1/34
no shutdown

interface Ethernet1/35
no shutdown

```

```

interface Ethernet1/36
  no shutdown

interface Ethernet1/37
  speed 1000
[7m--More--[27m
interface Ethernet1/46
  no shutdown

interface Ethernet1/47
  speed 1000
  no shutdown

interface Ethernet1/48
  speed 1000
  description ###Connected to Server Farm Switch###
  switchport mode trunk
  channel-group 48 mode active
  no shutdown

interface mgmt0
  vrf member management
  ip address 172.20.20.1/30
line console
line vty
boot kickstart bootflash:/n3500-uk9-kickstart.6.0.2.A7.2.bin
boot system bootflash:/n3500-uk9.6.0.2.A7.2.bin
ip route 0.0.0.0/0 172.16.109.1
ip route 172.16.222.0/24 172.16.222.3
[7m--More--[27m
ip pim ssm range 232.0.0.0/8
ip multicast multipath s-g-hash next-hop-based

```

### 3.3 Features and capabilities

We have no doubt about the Cisco Switches Features and capabilities. We have given below the standard chart for this switches.

# Cisco Catalyst 2960 Series Switches

## Cisco® Catalyst® 2960 LAN Base Series

## Catalyst 2960 LAN Lite Series



- Provides Fast Ethernet, Gigabit Ethernet, and Power over Ethernet for entry-level enterprise and mid-market customers
  - Offers enhanced Layer 2+ intelligent LAN services:
    - Availability
    - Enhanced security
    - Advanced quality of service (QoS)
  - Offers simplified management and troubleshooting for lower total cost of ownership
  - Offers CiscoWorks LMS, Cisco Network Assistant and Cisco Smartports
  - Provides limited lifetime hardware warranty and software updates at no additional charge
- Offers Fast Ethernet in 8, 24- and 48-port configurations for small branch offices and wiring closets
  - Offers standard Layer 2 services with entry-level availability, security, and QoS
  - Scalable and secure network management
  - Offers simplified management and troubleshooting for lower total cost of ownership
  - Offers CiscoWorks LMS, Cisco Network Assistant and Cisco Smartports
  - Provides limited lifetime hardware warranty and software updates at no additional charge



Figure 5, Cisco Nexus 3548-X Switch

### Cisco NX-OS Software overview

Cisco NX-OS is a data center-class operating system built with modularity, resiliency, and serviceability at its foundation. Cisco NX-OS helps ensure continuous availability and sets the standard for mission-critical data center environments. The self-healing and highly modular design of Cisco NX-OS makes zero-impact operations a reality and provides exceptional operational flexibility.

Focused on the requirements of the data center, Cisco NX-OS provides a robust and comprehensive feature set that meets the networking requirements of present and future data centers. With an XML interface and a Command-Line Interface (CLI) like that of Cisco IOS® Software, Cisco NX-OS provides state-of-the-art implementations of relevant networking standards as well as a variety of true data center-class Cisco innovations.

Table 1. Benefits of Cisco NX-OS Software

| Feature                                                                                                                                                                                                                                                                                                                                                                                                                             | Benefit                                                                                                                                                                                                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Common software throughout the data center: Cisco NX-OS runs on all Cisco data center switch platforms (Cisco Nexus 7000, 5000, 4000, and 1000V Series Switches and Cisco Nexus 2000 Series Fabric Extenders).                                                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>• Simplification of data center operating environment</li> <li>• End-to-end Cisco Nexus and Cisco NX-OS fabric</li> <li>• No retraining necessary for data center engineering and operations teams</li> </ul> |
| Software compatibility: Cisco NX-OS interoperates with Cisco products running any variant of Cisco IOS Software and also with any networking OS that conforms to the networking standards listed as supported in this data sheet.                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>• Transparent operation with existing network infrastructure</li> <li>• Open standards</li> <li>• No compatibility concerns</li> </ul>                                                                        |
| Modular software design: Cisco NX-OS is designed to support distributed multithreaded processing. Cisco NX-OS modular processes are instantiated on demand, each in a separate protected memory space. Thus, processes are started and system resources allocated only when a feature is enabled. The modular processes are governed by a real-time preemptive scheduler that helps ensure timely processing of critical functions. | <ul style="list-style-type: none"> <li>• Robust software</li> <li>• Fault tolerance</li> <li>• Increased scalability</li> <li>• Increased network availability</li> </ul>                                                                            |
| Troubleshooting and diagnostics: Cisco NX-OS is built with unique serviceability functions to allow network operators to take early action based on network trends and events, enhancing network planning and improving Network Operations Center (NOC) and vendor response times. Cisco Smart Call Home and Cisco Online Health Management System (OHMS) are some of the features that enhance the serviceability of Cisco NX-OS.  | <ul style="list-style-type: none"> <li>• Quick problem isolation and resolution</li> <li>• Continuous system monitoring and proactive notifications</li> <li>• Improved productivity of operations teams</li> </ul>                                  |
| Ease of management: Cisco NX-OS provides a programmatic XML interface based on the NETCONF industry standard. The Cisco NX-OS XML interface provides a consistent API for devices. Cisco NX-OS also provides support for Simple Network Management Protocol (SNMP) Versions 1, 2, and 3 MIBs.                                                                                                                                       | <ul style="list-style-type: none"> <li>• Rapid development and creation of tools for enhanced management</li> <li>• Comprehensive SNMP MIB support for efficient remote monitoring</li> </ul>                                                        |
| Using the Cisco Nexus Data Broker software and Cisco Plug-in for OpenFlow agent, the Cisco Nexus 3500 platform can be used to build a scalable, cost-effective, and programmable                                                                                                                                                                                                                                                    | <ul style="list-style-type: none"> <li>• Scalable and cost effective</li> </ul>                                                                                                                                                                      |

| Feature                                                                                                                                                                                                                                          | Benefit                                                                                                                                                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| tap or SPAN aggregation infrastructure. This approach replaces the traditional purpose-built matrix switches with these switches. You can interconnect these switches to build a multilayer topology for tap or SPAN aggregation infrastructure. | <ul style="list-style-type: none"> <li>• Traffic aggregation from multiple input ports across different switches</li> <li>• Traffic replication and forwarding to multiple monitoring tools</li> <li>• Support for packet truncation and time stamping</li> </ul> |
| Role-Based Access Control (RBAC): With RBAC, Cisco NX-OS enables administrators to limit access to switch operations by assigning roles to users. Administrators can customize access and restrict it to only the users who require it.          | <ul style="list-style-type: none"> <li>• Effective access control mechanism based on user roles</li> <li>• Improved network device security</li> <li>• Reduction in network problems arising from human error</li> </ul>                                          |

### 3.4 Switches Description

#### Core Switch

48 Port SFP Layer-3 Core Switch with 26 x 1GE SX Transceiver and 2 x 1 GE Copper Transceiver (Brand: CISCO, Model: N3K-C3548P-10GX)

(Description: Nexus 3548-X 48 SFP+ ports, Enhanced, SNTC-8X5XNBD Nexus 3548-X 48 SFP+). We have taken two pcs. Core Switch for redundant purpose. Each core switches we have 26 Fibre SFP Modular and 2 Pcs. Copper Modular for each core switch.

#### Server Farm Switch

We are taking Server Farm Switch (CISCO WS-C2960X-24TS-L, Catalyst 2960-X 24 GigE, 4 x 1G SFP, LAN Base) Server Farm Switch will be connected with directly with Core Switch by Coper Modular.

#### Physical Topology

The following section describes the physical layout of the switches in the network, along with the cabling.

#### Server Room

The server room contains the CISCO N3K-C3548P-10GX core switch. Server Farm Switch will have connected with the Core Switches and All Servers will have connected with Server Farm Switch.

#### Floor Rack & Switches

Each Switches contains Catalyst 2960-X 48 GigE PoE 370W, 4 x 1G SFP, LAN Base switches. Floor Switches will have connected with both core switches by fibre optic cable. The closet layouts are as follows:

There are two active connections from the core switch to each closet. In each closet, the fiber connections terminate in the GigabitEthernet0/1 interfaces in the top and bottom switches in each closet. In each closet, inter-switch connections are made through GigaStack

|                                                               |                                                |
|---------------------------------------------------------------|------------------------------------------------|
| Goals                                                         | Efficiency, Scalability, Accessibility Results |
| Integrity, Authenticity Processes, Access control, AAA, Audit |                                                |
| Tools                                                         | FW, IDS, VPN, Encryption, AV                   |

## CHAPTER 4

### WAN Protection

#### 4.1 Data Protection from WAN

NO one can get directly access data of our company from Wide Area Network. If anyone want to access our data from outside, then must he/she has to be used VPN. We have Three types VPN.

- IP Sec VPN.
- PPTP
- Secure VPN

#### 4.2 Virtual Private Network ‘VPN’

Actually Most of the IT People are using PPTP VPN to get access his/her server for troubleshooting. We are using for this purpose. But some causes we need to access from outside to into our some software also.

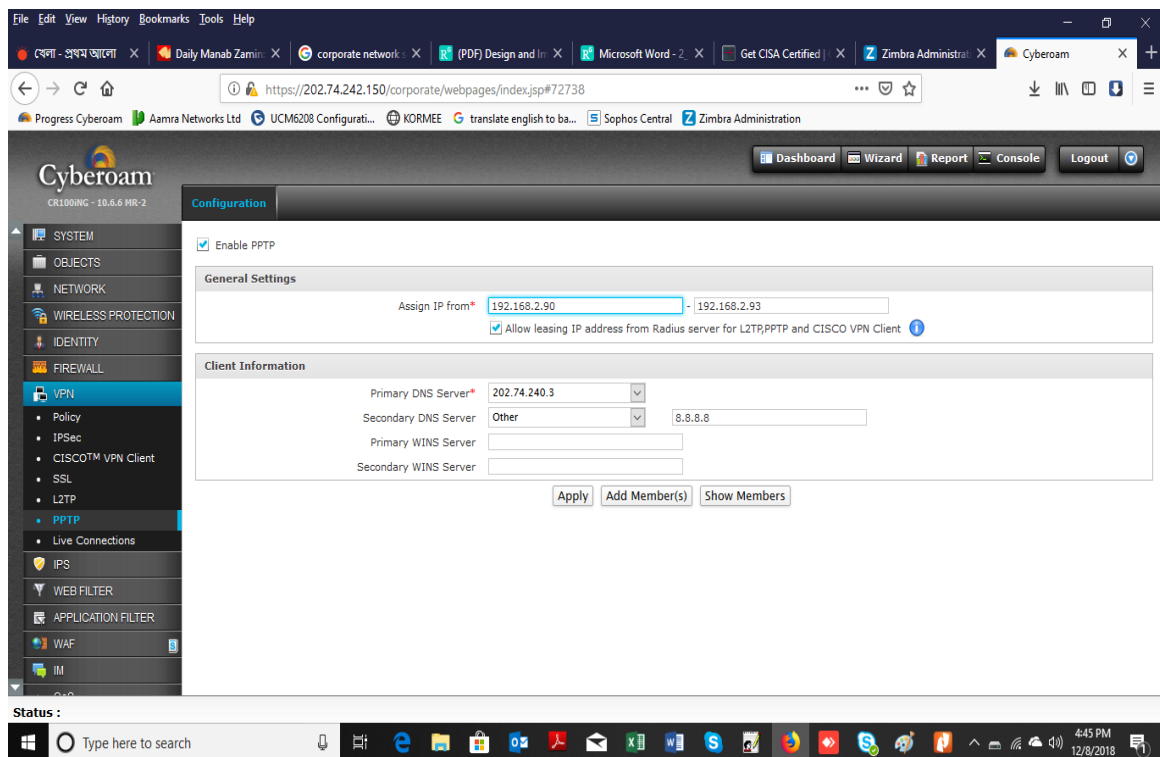


Figure 4.1: PPTP VPN to access our sever from outside.

### 4.3 IPSec VPN:

IPSec VPN we are using for to connect our one business unit to another business unit. At Progress Apparels Limited we are suing to connect SAP from our Bangladesh office to India office.

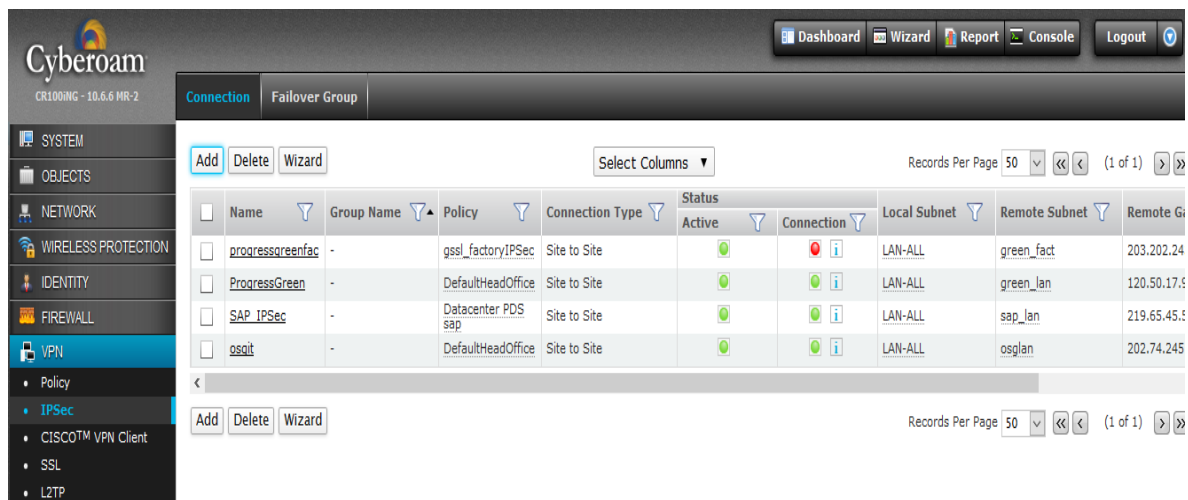


Figure 4.2: IPSec VPN for SAP connectivity

### 4.4 Encryption

Encryption is one of best processes of encoding a message or data through a mathematical key in a manner that hides its substance from anyone who does not process the mathematical key. However, encryption has not always been applicable to network security.

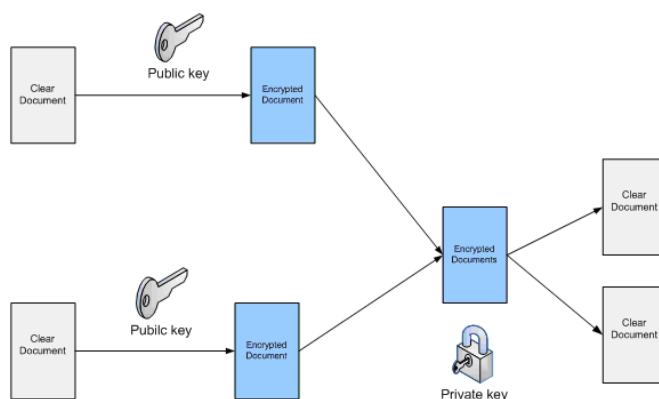


Figure 4.3: Encryption System for data Transfer.

### 4.5 LAN PROTECTION

The vast topic of network security is analyzed by researching the following:

- History of security in networks
- Internet architecture and vulnerable security aspects of the Internet
- Types of internet attacks and security methods
- Security for networks with internet access
- Current development in network security hardware and software

When considering network security, it must be emphasized mainly that the whole network should be remain secure. Network security does not only concern the security in the computers at each end of the communication chain. When transmitting data the communication channel should not be vulnerable to attack, where the chances of threats are more penetrating. A possible hacker could target the communication channel, obtain the data, decrypt it and reinsert a false message. Hence, securing the network is just as important as securing the computers and encrypting the message which we want to be kept private. When developing a secure network, the following need to be considered:

#### **4.6 Block Website List**

##### **Music Download:**

MP3 File Download, Hotfile Download, AttachLargeFile Download, Putlocker Download, FileRio Download, Box, Live-sync Download, Jdownloader Update, Multiupload Download, Google Drive File Download, GitHub Download, Diino File Download, Internet Download Manager, FTP Download Request, D1 Free Upload Download, MyDownloader, Bitshare Download, File2hd Web Download, EXE File Download, Manolito P2P Download, QQ Download P2P, Cocstream Download, Bearshare Download, RAR File Download, Cnet Download, Badongo File Download, Mediafire Download, JDownloader, MP3 Rocket Download, Dropsend Download Applications, Free Download Manager, Rapidgator Download, Adobe Website Download, 1Fichier Download, Nomadesk Download, Depositfiles Download, Facebook Pics Download, Mediaget Installer Download, DC++ Download P2P, Dropbox Download, Rapidshare Download, Badonga Download, Hotline Download, E-Snips Download, DAP Download, GetRight Download, Last.fm Free Downloads, FileMail Webbased Download, Sendspace Download, 2shared Download.

##### **Torrentz (Movie and Documents)**

utorrentz Update, Torrent Clients P2P, TorrentHunter Proxy

##### **Mail Services**

Gmail, Yahoo, Outlook and others mail services

##### **Virus and Treat**

ManyCam Update, MIRC Update, TrendMicro AV Update, Antivir Antivirus Update, AVG Antivirus Update, Flock Update, Jdownloader Update, Adobe Reader Update, Panda Antivirus Update, Twitter Status Update, VLC Update, Windows MediaPlayer Update, All Player Update, Itunes Update, Facebook Status Update, Opera Update, Your freedom Update, Adobe Flashplayer Update, GTalk Update, Norton Updates, MS Essentials AV Update, Samsung Kies Update, Windows Update, Avira Updates, Winamp Update, ATube Catcher Update, VirtualBox Update, Duba Update, Metasploit Update, Google Chrome Update, Quick Heal Anti-virus Update, Firefox Update, LinkedIn Status Update, Apple OTA Updates, Foxit Reader Update, Nimbuzz IM Update, Real Player Update, utorrentz Update, Microsoft Updates, Ubuntu Update Manager, Mipony Update, Avast Antivirus Update, McAfee Update, Pcperformer Update, Java Update, Getright Update, Eset NoD32 Update, Miro Update, Altools Update, GOMPlayer Update, Kaspersky Antivirus Update, Kaixin001 Status Update, FileZilla Update, CCleaner Update, Avant Update, Songbird Update, Tuenti Status Update, DAP Update, Notepadplus Update, Picasa Update, Forticlient Update, Malware Bytes Updates, Filehippo Update

## **Video Site**

Youtube Video Streaming, Youtube Website, Youtube Video Upload

## **Android Apps Including Facebook**

Facebook Iphone, Hitpost Android, Blogger Android, Orkut Android, Zedge Android, Nimbuzz Blackberry Messenger, Box, Platinum Dialer, Waze Android, Diino File Download, YikYak, MyDownloader, DAP FTP FileTransfer, Qeep Android, Twitter Android, LiveProfile Android, Musical.ly, Viber Message, Cocstream Download, Datei.to FileTransfer, Bearshare Download, Dialer Plus, Cnet Download, Mediafire Download, Maps Iphone, Hike, QQ Xuanfeng, Rapidgator Download, Puffin Academy, Zshare Download, NDTV Android, Saavn Iphone, SoundHound Android, OLX Android, Depositfiles Download, SoundCloud Android, WikiEncyclopedia Android, KiK Messenger Android, iCloud Contacts, WeChat, Saavn Android, Meebo Iphone, Zello, Last.FM Android, Rapidshare Download, MTV Asia, Badonga Download, Hotline Download, Storage.to FileTransfer, Moviefone Android, UC Browser, Propel Accelerator, Secret, Blackberry Appworld, HelloByte Dialer, Mobyler Android, Tubemate, Sendspace Download, Yourfilehost Download, Raaga Android, TruPhone Android, Mint Iphone, Hotfile Download, LivingSocial Android, Google Translate Android, Youtube Downloader, AttachLargeFile Download, iCloud Bookmarks, Google Reader Android, iSwifter Games Browser, Microsoft Outlook, Goggles Android, EuroSport, BlueStacks Cloud Connect, OKCupid Android, Fuel Coupons Android, DL Free Upload Download, Google Sky Android, iPTT, Craigslist Android, SnapBucket Android, TripAdvisor Android, Zemplus Mobile Dialer, Miniclip Pool Game, Snapchat, Turbobit Download, Ask.fm, Badongo File Download, LinkedIN Android, Meetup Android, TalkBox Android, TuneIN Radio Android, DoPool, HeyTell, Wunderlist, 1Fichier Download, Eagleget, Tagged Android, Sonar, BBM, CodeAnywhere Android, All Recipes Android, Ebuddy Android, CricInfo Android, Whisper, MangaBlaze, Baidu Video, Voxer Walkie-Talkie PTT, E-Snips Download, NateApp Android, Tango Android, Windows Marketplace, Fring Android, FileMail Webbased Download, Puffin Web Browser, 2shared Download, Amazon Iphone, Worldcric, Putlocker Download, Gmail Android Application, FileRio Download, WhatsApp File Transfer, CNN News Android, AIM Android, IM+ Android, BBC News Android, Foursquare Android, Megaupload, TuneUp Mobile, Chat On, Flash Alerts on Call-SMS, Scydo Android, DroidVPN, Internet Download Manager, Odnoklassniki Android, Engadget Android, Bitshare Download, File2hd Web Download, Speedtest Android, Periscope, Nokia Here, ICQ Android, Android Market, MxiT Android, Yousendit Web Download, TiKL, Viber Voice, Free Download Manager, MobileVOIP, EspnCricinfo Android, DaumMaps Android, GoChat Android, Nomadesk Download, Fling, Foxtel Go, Weibo, FileMail WebMail, Sharefile, Game Center, ExchangeRates Android, iCloud Calender, WeatherBug Android, vBuzzer Android, Storage.to Download, CB Radio Chat Android, ScoreCenter Android, Line Games and Applications, Shazam Android, iCloud Photos, KakaoTalk, Apple FaceTime, Facebook Blackberry Chat, Vine, Yahoo Sportacular Android, GetRight Download, NewsRepublic Android, Akamai Client, IMO-Chat Android, Live-sync Download, Multiupload Download, StumbleUpon Android, FreeMovies Android, Guilt, Instagram, TransferBigFiles Application, Mig33 Android, BookMyShow Android, WhatsApp, TransferBigFiles Web Download, 8Track Iphone, SendSpace Android, Hungama MyPlay Android, Dropsend Download Applications, Apple Push Notification, DirectTV Android, Apple OTA Updates, FunForMobile Android, iTel Mobile Dialer Express, E-Bay Android, Facebook Blackberry, ADrive Web Upload, Google Hangout Android App, Dropbox Download, IMDB Android, DAP Download, HotFile

Website, NPR News Android, Hideninja VPN, DailyCartoons Android, Facebook Android, AstroSage Kundli, Gtalk Android, Tumblr Android, Ipomo, Google Street Android.

### **TV & Porn**

NDTV Streaming, Tapin Radio, Amarujala Streaming, NHK World TV, Xogogo Video Streaming, Renren Music Website, DouBan FM, Zenga, iHeart Radio Streaming, Mixwit Website, Startv Website, Movieclips Website, Grooveshark Music Streaming, LeTV Streaming, WVX Video Streaming, CNTV Live Streaming, StarSport Video Streaming, Svtplay Streaming, ThisAV Streaming, WMX Video Streaming, Liveleak Streaming, SonyLiv Streaming, AOL Radio Streaming, EarthCam Website, Tnaflx Website, JB Hi-Fi, NicoNico Douga Streaming, HDpornstar Video Streaming, Hahaha Website, ReadonTV Streaming, Shufuni Video Streaming, QQ Live Video Streaming, nexGTV, Ditto TV, Spotify Streaming, 51.com mp3 Streaming, Qik Streaming, 9Jumpin, Stagevu Streaming, Dhingana Streaming, Slacker Website, Diodeo Streaming, Youku Streaming, YuppTV Streaming, ErosNow, MunduTV Desktop App Login, NeonTV, Voot, Rutube Streaming, Jibjab Website, Tagoo.ru Music Streaming, MP4-Octet Streaming, Deezer Website, Tubi TV, Al-Arabiya Streaming, Hardsextube Streaming, Times of India Videos, Ezyflix TV, Babes Video Streaming, Archaeology Video Streaming, Eporner Video Streaming, PuthiyathalaimuraiTV, Naked Streaming, Mediamonkey website, Userporn Video Streaming, 8Tracks, xHamster Streaming, Grooveshark Website, LightBox, Bromygod Website, AIM Messenger Video Chat, Plus7, Spinjay Website, Moviesand Video Streaming, BanaCast, VGO TV, Baidu Music, Pandora Music Streaming, Tvtonic Streaming, Last.FM Streaming, WWE Video Streaming, Fame, AdnstreamTV Website, PP Video Accelerator, Magnatune Website, WLM Video and Voice Chat, Music.com Website, Qiyi Com Streaming, Redtube Streaming, My18tube Streaming, VeohTV Streaming, Totorosa Media Website, Livestream Website, Limelight Playlist Streaming, VHO Website, Bustnow Website, Ebaumsworld Video Streaming, Melon Audio Streaming, Slingbox Streaming, Rdio Website, ZeeTV App, Keyhole TV Streaming, Tagoo Website, Magnatune Audio Streaming, Megabox Streaming, Yahoo Video Streaming, Windows Audio Streaming, Sexyandfunny Website, Meettheboss Website, Neokast Streaming, Yahoo Douga Streaming, Baidu Player, MTV Website, Uusee Streaming, Keyhole Video Login, Movenetworks Website, Ooyala Video Services, Yourlust Streaming, Presto, RTMPE Streaming, Sciencestage Streaming, Jigiy Website, JW Player, Freetv Website, CNTV Video Streaming, Facebook Video Playback, Totorosa Music Website, Winamp Player Streaming, RealTime Streaming Protocol, Sbs Netv Streaming, Hungama, MP4 Streaming, ABC Web Player, Flixster Website, Shockwave Based Streaming, Dainik Bhaskar Streaming, Tunein Website, MunduTV Desktop App Streaming, IndiaTV live, Willing Webcam Streaming, Imlive Streaming, Fotki Website, HelloTV, Music Tube, Bestporntube Streaming, Youtube Website, Stileproject Video Streaming, Fuq Website, Espnstar Video Streaming, SBS On Demand, 4Tube Streaming, Realnudeart Website, SWF Streaming, Vodafone Play, Ooyala Streaming, 6.cn Music Streaming, SinaTV, RealTime Messaging Protocol, Istream Website, NetFlix Website, TENplay, Wetpussy Streaming, BBC Video Streaming, QuickTime Streaming, Pornsharia Video Streaming, Jio TV, 51TV, Photobucket Streaming, Adobe Player Streaming, TV3, WorldTV Streaming, BigFlix Website, Brightalk Play, ABC iView, Youtube Video Streaming, Thiswebsiterules Website, Vakaka Website, Live Station Streaming, QQ Messenger Video Chat, ShoutCast Website, Zuzandra Website, Baidu Video Streaming, Brazzers, IMDB Streaming, Pornjog Video Streaming, Yobt Video Streaming, Indianpornvideos Streaming, Nejat TV Streaming, MySpace Video Streaming, Channel4 Streaming, QuickFlix, Vimeo Streaming, Time Video Streaming, ppFilm, STAR Sports, Zattoo Streaming, Break Video Streaming, Naughtyamerica Streaming, Pandora.TV

Streaming, Nate Video Streaming, SiriusXM Website, Blip.TV Streaming, Submityourflicks Streaming, DailyMail Streaming, Colors Video Streaming, Saavn Website, WebM Based Streaming, KKBox Web Streaming, ONTV Live Streaming, Funshion Streaming, Orgasm Video Streaming, Skyplayer Streaming, Amazon Unbox Video Streaming, Live365 Web Streaming, WM Video Streaming, Playboy.tv Streaming, PPStream Streaming, CBox Streaming, Real Player, Guvera, Aaj Tak, TV18 Streaming, Tv4play Streaming, QQ Streaming Application, Madthumb Video Streaming, Vakaka Streaming, Free18 Video Streaming, Xunlei Streaming, Youporn Streaming, Pornhub Streaming, Last.FM Client Streaming, Flixwagon Streaming, Ap.Archive Streaming, QvoD Streaming, TVB Video Streaming, Archive.org Video Streaming, Google Video Chat, Vodddler Website, Sina Video Streaming, Hotstar, XBMC, Quick Player Streaming, GolfTV Streaming, ABP Live, Alphaporno Video Streaming, Fapdu Video Streaming, X-Flv Streaming, Sopcast Streaming, Videobash Video Streaming, Kinolive.pl Streaming, NPR Radio Streaming, Mpeg Streaming, ASX/ASF Video Streaming, Tudou Streaming, MediaDrug, GQ Website, Joost Website, Clarin Web Video Streaming, Metacafe Videos Streaming, Pornerbros Streaming, FastTV, Octet-FLV Streaming, Ustream.TV Web Streaming, Youtube Video Upload, Webshots Streaming, iTunes Internet, Yahoo IM Video and Voice Chat, Tube8 Streaming, Tvnz, Duomi Music, Fark Website, Drunkt Website, QQ Music Streaming, Indiatimes Live Streaming, Videologygroup Streaming, Stan, PBS Video Streaming, Bing Videos, Orb Website, Napster Streaming, Asianxtv Website, Cam4 Streaming, Gmail Video Chat Streaming, Realmedia Streaming, Youpunish Video Streaming, Vevo, Crictime Video Streaming, Microsoft Media Server Protocol, Google Video Streaming, Hungama Streaming, Pornyeah Streaming, PLUS7, Pullbbang Video Streaming, Pinterest Streaming, Raaga Streaming, Gyao Streaming, PPLive Streaming, Kuwo.cn Web Music Streaming, WMV Video Streaming, Hyves Website, Tata Sky Mobile, ILikeMusic Streaming, Cienradios Streaming, MediaPlayer Streaming, MobiTV - Watch TV Live, Fux Video Streaming, Vankoi Website, 56.com Streaming, ShoutCast Streaming, ezPeer Website, 6.cn Video Streaming, Smutty Website, Yobt Website, Hyves Music Streaming, Wynk Movies, Veetle Streaming, Yuvutu Streaming, Meettheboss Video Streaming, Streamaudio Streaming, RTMPT Streaming, FLV Streaming, RaidoFM, Motherofporn Video Streaming, Dailymotion Streaming, StarPlus Video Streaming, Octoshape Streaming, Vidmate, SonyLiv, KwMusic App Streaming, Playwire, iFood, Fucktube Streaming, Xvideos Streaming, Vudu, Clips and Pics Website, Extremesextube Streaming, Sonyliv Video Streaming

### **Porn Site**

Facebook Game, Bejeweled-Facebook Games, Marketland, Armor Games, Soliter Arena, Boule & Bill, Xbox LIVE, Bomberclone Game, Bigfishgames Website, Buggle, MobWars Facebook Game, Real Basketball, Battle-Net, Diamond Dash, Addicting Game, TeenPatti, Palnts vs. Zombies Advanture, JinWuTuan Game, Social Wars, Origin Games, Word Chums, Baidu.Hi Games, Mafia Wars-Facebook Games, Pet City, Pool Live Tour, Happy Family, Flow Game, EA.FIFA Game, FarmVille-Facebook Games, Pet Rescue Saga, Hatrick Game, Top Eleven Be a Football Manager, Evony Game, Disney City Girl, Jelly Splash, TreasureIsle-Facebook Games, Roblox Game Play, Hangame, Playstation Network, Miniclip Games, Zango Website, Rival Kingdoms, Asphalt-8 Airborn, CafeWorld-Facebook Games, Farm Heroes Saga, Monster Busters, Vector, Party Poker Website, Sina Games, 8 Ball Pool - Android, Steam, 8 Ball Pool, Necromanthus Game, JungleJewels Facebook Game, Call Of Duty 4 Game, Yoville Facebook Game, Runesofmagic Game, Marvel Avengers Alliance Tactics, Monster World, Mutants: Genetic Galdiators, Family Farm, FrontierVille-Facebook Games, Gamespy Game, Juice Cubes, Jelly Glutton, Panda

Jam, Pepper Panic Saga, Village Life, Kitchen Scramble, Flashgames247 Game, Bubble Island, Texas HoldEm Poker, Trivia Crack, TypingManiac Facebook Game, Marvel Avengers Alliance, NightClubCity Facebook Game, Hit It Rich! Casino Slots, Shockwave, Monster Legends, AIM Games, Shockwave Game Website, Quake Halflife Game, Allslotscasino Game, Bored Website, Poker-Facebook Games, Hay Day, Candy Crush Saga, League Of Legends, PremierFootball Facebook Game, Royal Story, Chosenspace Game, Real Boxing, Mahjong Trails, Puzzle Charms, School of Dragons, Minecraft Games, Windows Live Games, Bubble Witch Saga, Baseball Heroes, Angry Birds Friends, Bingo Bash, Poker Stars Website, Metin Game, MillionaireCity-Facebook Games, Gamehouse Website, Ibibo Game, ChefVille, Fish Epic, Freeridegames Website, Deer Hunter 2014, CityVille, Lost Bubbles, CSR Racing, Wordfeud Game, Yahoo game, MindJolt-Facebook Games, Lost Jewels, MSN Games, Bet365 Game, Sploder Game, Jetpack Joyride, Uplay Games, Pokemon Go, Godgame, DoubleDown Casino Free Slots, Shadow Fight, Omerta, Criminal Case, DEAD TRIGGER 2, Train Station, Farm Epic , Doom3 Game, Extreme Road Trip 2, Bigpoint Game, Tetris Battle, Pokerstars Online Game, Zynga Game, StreetRace Rivals

### **Facebook & Facebook Game**

Faces Website, Itsmy Website, Facebook Posting, Daum Blog, Facebook Graph API, Lokalisten, Cloob Website, Hatena Message, Elixio Website, Weibo New Post, Trombi Website, Zoo Website, Playfire Website, Babycenter Name Search, LinkedIN Posts Search, Gaiaonline Website, PartnerUp, Mysee Website, BiggestBrain FacebookApp, We Heart It, People BBS, Schmedley Website, Sharethemusic Website, LinkedIN Status Update, 360quan, eHarmony, Gogoyoko Website, Iwiw Website, Aol Answers, Mobsters2 FacebookApp, Chinaren Club, Internations Website, YeeYoo, Termwiki Website, Playlist Website, 51.COM BBS, Purevolume Website, Plock FacebookApp, Facebook Questions, Twitter Search, Pinterest Website, Asmallworld Website, Hubculture Website, Chinaren, Twitter Website, Facebook Plugin, Xinhuanet Forum, Xiaonei, Fotolog Website, Fan FacebookApp, Meetin Website, Stickam Website, Myheritage Website, Skyrock Website, Fanpop, Tuenti Video Search, Between, Mog Website, Xanga Website, Hainei, Digg Web Login, Italki Website, Ameba Blog Post, Fishville FacebookApp, LinkedIN Groups Search, Wattpad Website, Qzone Website, Fluttr, My Mail.ru, Lokalistens Photo Upload, Advogato Website, PerezHilton, 5460 Net, Friendfeed Web Login, Friendica Website, Shelfari Website, Wellwer Website, Dailystrength Website, Filmow Website, Hi5 Website, Fuelmyblog Website, Gapyear Website, Listography Website, Tweetie, Work, Outeverywhere Website, Google wave Website, Cnxp BBS, Twitter Upload, Xinhuanet, CastleVille FacebookApp, Tom, Howardforums Website, The-sphere Website, Tianya, QQ BBS, Craigslist Website, Epnericus Website, Goodreads Website, LinkedIN Compose Webmail, Audimated Website, LinkedIN Limited Access, CuteBears FacebookApp, Hotlist Website, Swapper Website, Jammer Direct, Tuenti Website, LinkedIN Mail Inbox, Blogger Create Blog, Meinvz Website, NinjaSaga FacebookApp, 43things Website, Mymfb Website, Yammer, LovePhoto FacebookApp, DayTimeTV, Pcpop BBS, Caringbridge Website, Facebook Share, Sonico Website, Makeoutclub Website, Bloomberg Businessweek, LinkedIN People Search, Social Networking, Ameba Now, Flickr Website, Weibo Website, Xing Website, Twtkr, Facebook Login on YahooMail, LinkedIN Universities Search, Lifeknot Website, 163 Alumni, Dailybooth Website, Friendsreunited Website, Dcinside, Facebook Limited Access, Facebook Applications, Mylife Website, Dxy Website, Lagbook Website, Quora, Hospitalityclub Website, Ameba Now - New Post, Tumblr Blog, CityVille FacebookApp, Mouthshut Website, Eyejot, Ibibo Website, Ravelry Website, Egloos, Cat898 BBS, Supei, Viadeo WebLogin, 51.COM, Fledgewing Website,

Jumpingdog FacebookApp, Goodwizz Website, Marvel Website, Studivz Website, Dudu, Athlinks Website, Weread Website, Blauk Website, Weeworld Website, LinkedIN Jobs, Bigo Live, Librarything Website, Myopera Website, Niwota, Passportstamp Website, Patientslikeme Website, Scispace, Blogspot Blog, Ryze Website, Docstoc Website, Orkut Website, 163 BBS, Reverbnation Website, Focus Website, BigAdda, Wakoopa Website, Hootsuite Web Login, Kaixin001 Comment Posting, Xt3 Website, Facebook Status Update, Facebook Like, Facebook Message, Travellerspoint Website, Tribe Website, Weourfamily Website, Daum Cafe, Crosstv Website, Livejournal Website, Tikifarm FacebookApp, Vampirefreaks Website, LinkedIN Website, Google Plus Website, QQ City, Dontstayin Website, Gamedna Website, Voc, Mubi Website, Facebook Like Plugin, Draugiem Website, Indabamusic Website, Grono Website, Chinaren Class, Plaxo Website, Gizmodo, Flickr Web Upload, Jiayuan, Nk Meeting Place, Heart FacebookApp, DeviantART Website, Zoosk, MySpace.cn Website, Japan FacebookName, Circle of Moms, Meetme Website, Academia Website, SadorHappy FacebookApp, Geni Website, Yelp Website, VK Social, Cyworld Website, Hr Website, Anobii Website, Kiwibox Website, Perfspot Pic Upload, BIIP Website, Travbuddy Website, Opendiary Website, Twitter Limited Access, Hatena, Renren Website, Taringa Website, Ning Website, Fruehstueckstreff Website, Nexopia Website, Tumblr Reblog, Getglue Website, Naszaklasa Website, Weibo Microblogging, Virb Website, Zhanzuo, Wayn Website, Identica Website, Baidu Tieba, Classmates Website, Airtime, Bebo Website, Tumblr Post, ProfileSong FacebookApp, Wordpress, Facebook Video Chat, Tumblr Like, Tuenti Photo Upload, Socialvibe Website, Twtkr Search, 2CH, Zooworld FacebookApp, Kaixin001 Status Update, Researchgate Website, Ning Photo Upload, Tuenti Status Update, Socialbox FacebookApp, Wepolls Website, Blog.com, Xcar, Gather Website, Plurk Website, Facebook Post Attachment, Exploroo Website, MySpace Website, LinkedIN Company Search, Facebook Website, Talkbiznow Website, Ngopost Website, Twitter Message, Pingsta Website, Twitter Status Update, Busuu Website, Tumblr Search, Cafemom Website, Mekusharim, Govloop Website, Care2 Website, Livemocha Website, Netlog Website, Rednet BBS, Perfspot, Twitter Follow, Dol2day Website, Experienceproject Website, Tagged Website, Jiaoyou - QQ, Cozycot Website, Bigtent, Facebook Pics Upload, Douban Website, Tylted Website, Facebook Video Upload, Qianlong BBS, Kaixin001 Website, Couchsurfing Website, Blogster Website, Sciencestage Website, LinkedIN Universities, Facebook Events, Yoono, Egloos Blog Post, Reunion, Meetup Website, Tumblr Follow, Mocospace Website, Blogger Post Blog, Zooppa Website, Tistory, Gays Website, Social Calendar, Twitter Discover, Twitter Notifications, Taltopia Website, Linkexpats Website, LinkedIN Companies, Faceparty Website, 55bbs, Wiser Website, LinkedIN Groups, LinkedIN Job Search, Blackplanet Website, Eyejot Video Message, Pengyou, Disaboom Website, Woome, Ircgalleria Website, LinkedIN Search, Filmaffinity Website, Badoo Website, Habbo Website, Xici, Elftown Website, Asianave Website, Sohu Club, Friendster Web Login, Wooxie Website, BabyCenter, Laibhaari Website, Partyflock Website, Me2day Website, Facebook Pics Download, Writeaprisoner Website, Lafango Website, Xilu, Yahoo Groups, Aol Answers - Ask, Twitter Retweet, Lastfm Website, WordsWithFriends FacebookApp, Delicious Website, Crunchyroll Website, Status-Net, Mixi, Fubar Website, Tiexue, Ning Invite, Facebook Commenting, Kaixin001 Photo Upload, Wer-kennt-wen Website, Buzznet Website

### **Messenger Site**

Whatsapp, IMO, Viber, CastleVille FacebookApp, FaceBook IM on Yahoo Messenger, CityVille FacebookApp, BiggestBrain FacebookApp, Facebook Android, Facebook

## CHAPTER 5

### Network Monitoring System

#### 5.1 Network Security Monitoring:

We are using Firewall Cyberoam CR100ing for bandwidth Management, WAN Security and Monitoring.

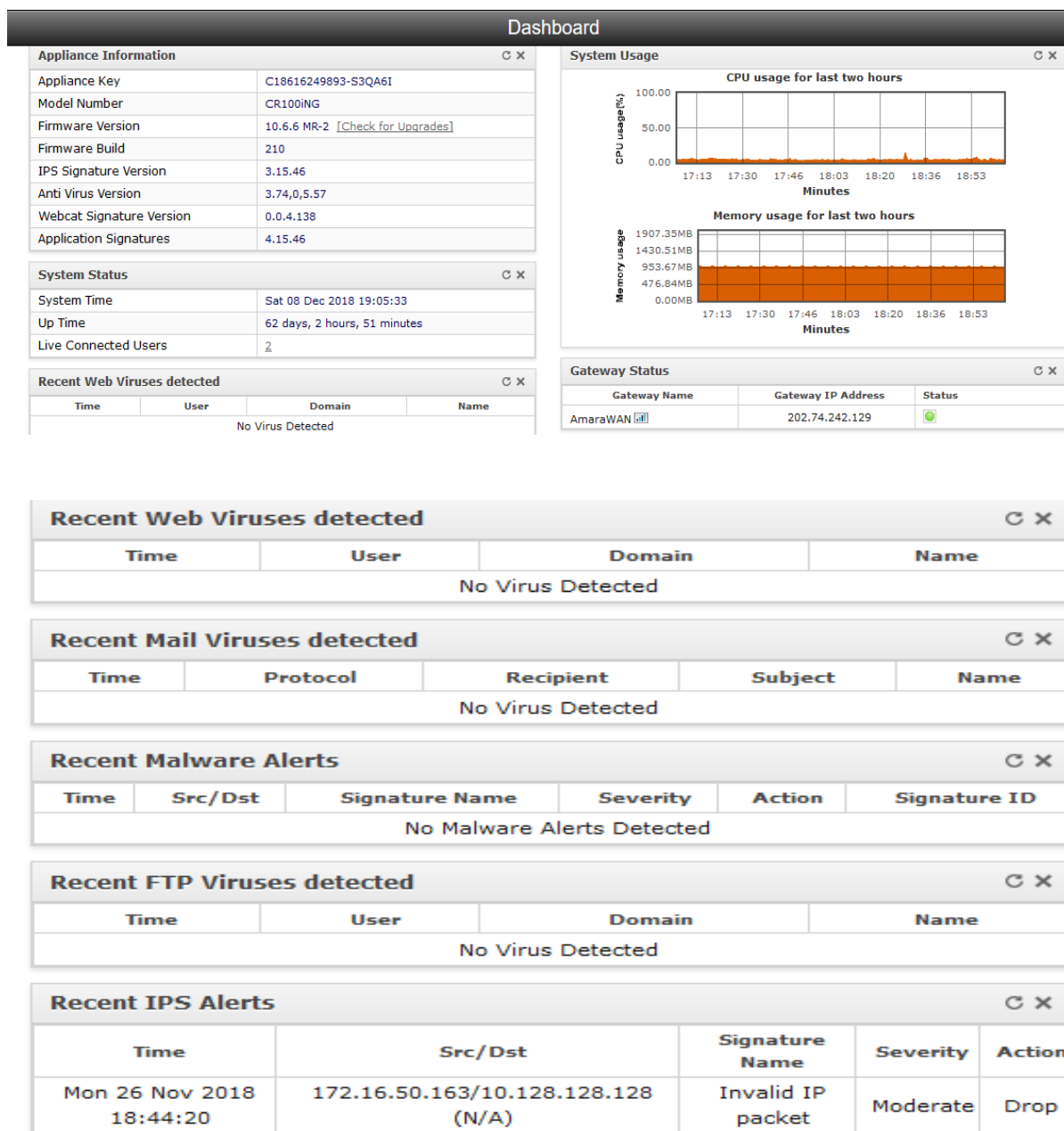


Figure: 5.1: Dashboard of Networking Monitoring System

## 5.2 TOP Users and Top Hosts:

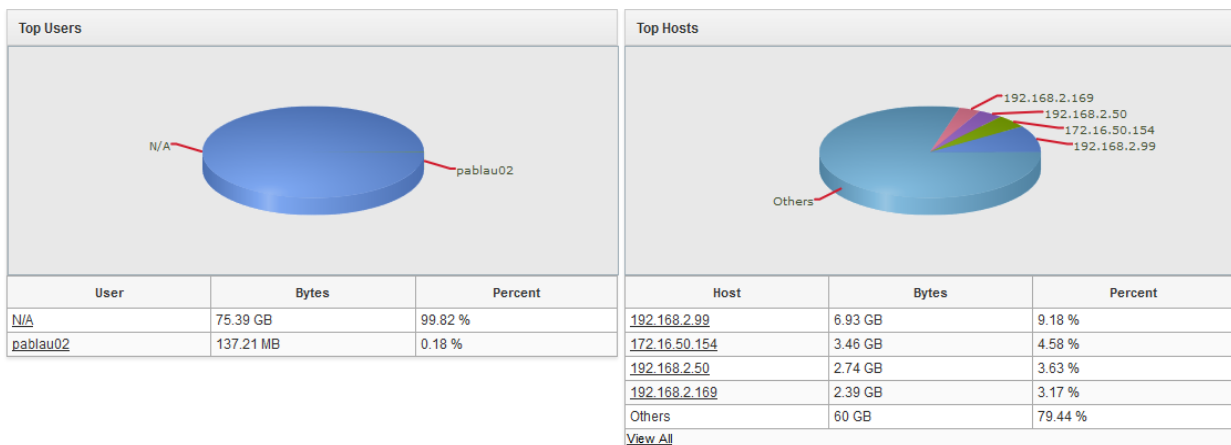


Figure 5.2: Top Users and Top Hosts

## 5.3 Top Source Countries and Top Destination Countries:

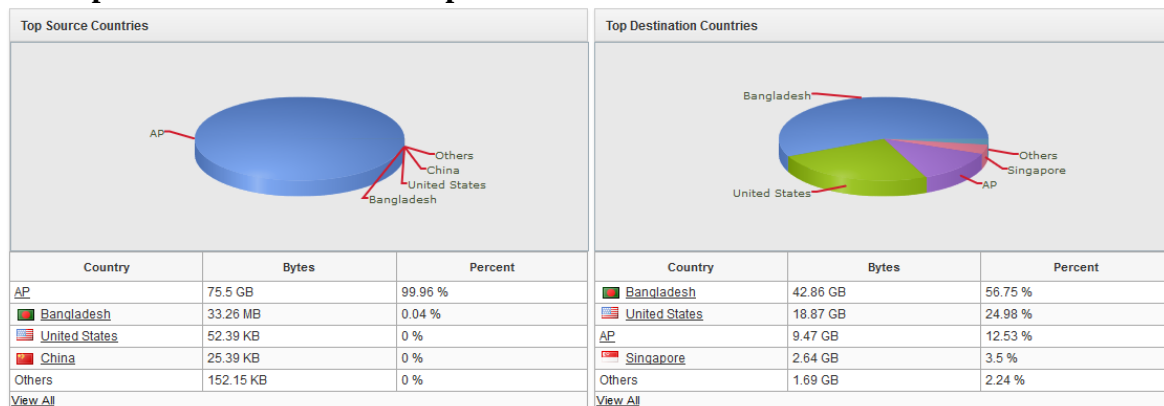


Figure 5.3: Top Source Countries and Top Destination Countries

## 5.4 Top Applications and Applications Categories:

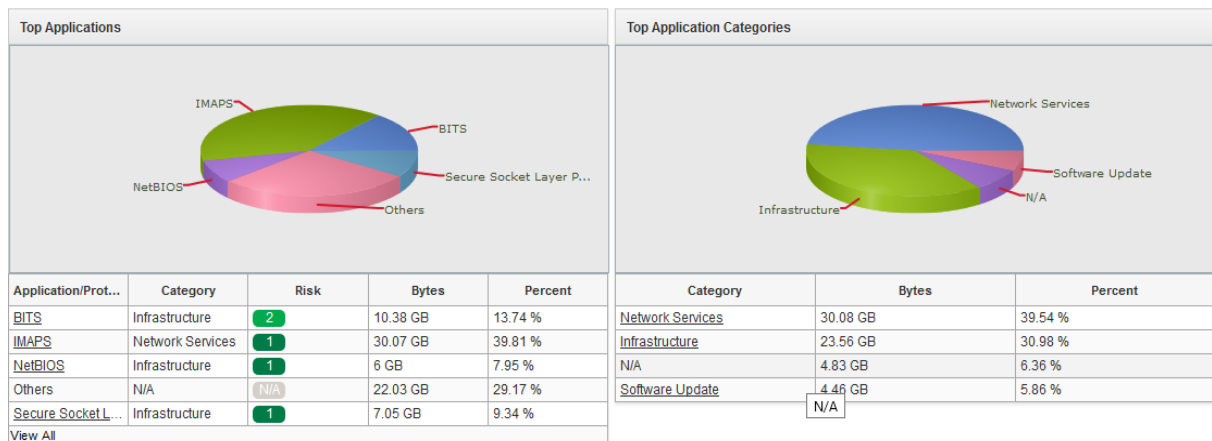


Figure 5.4: Top Source Countries and Top Destination Countries

## 5.5 Top Rule ID and Top We Categories:

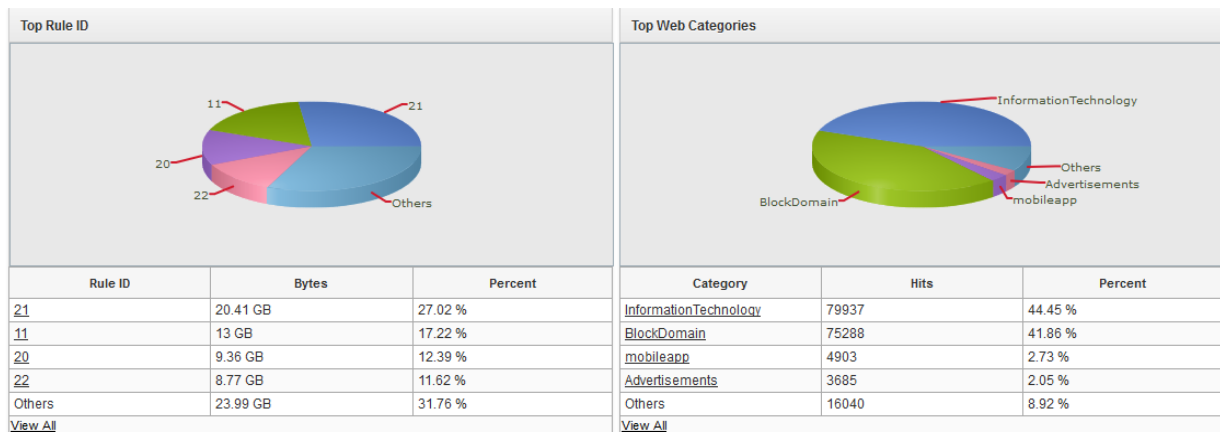


Figure 5.5: Top Rule ID and Top We Categories:

## 5.6 Top Web Users and Top Domain:

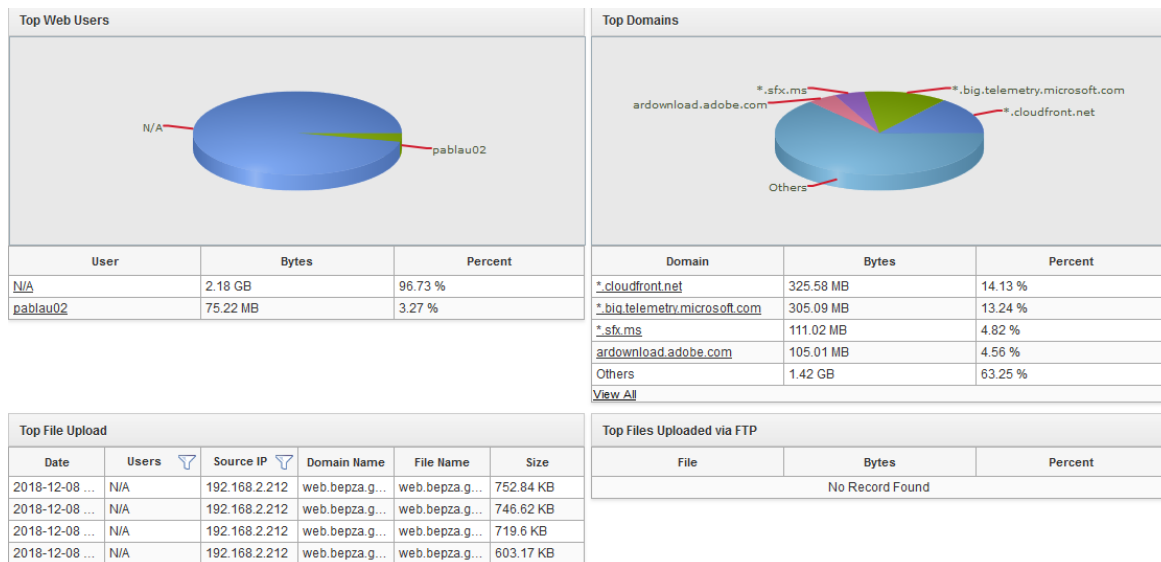


Figure 5.6: Top Web Users and Top Domain:

## CHAPTER 6

### Implemented Enterprise Network Security and Infrastructure

#### 6.1 Finally, Implemented Network Infrastructure Design

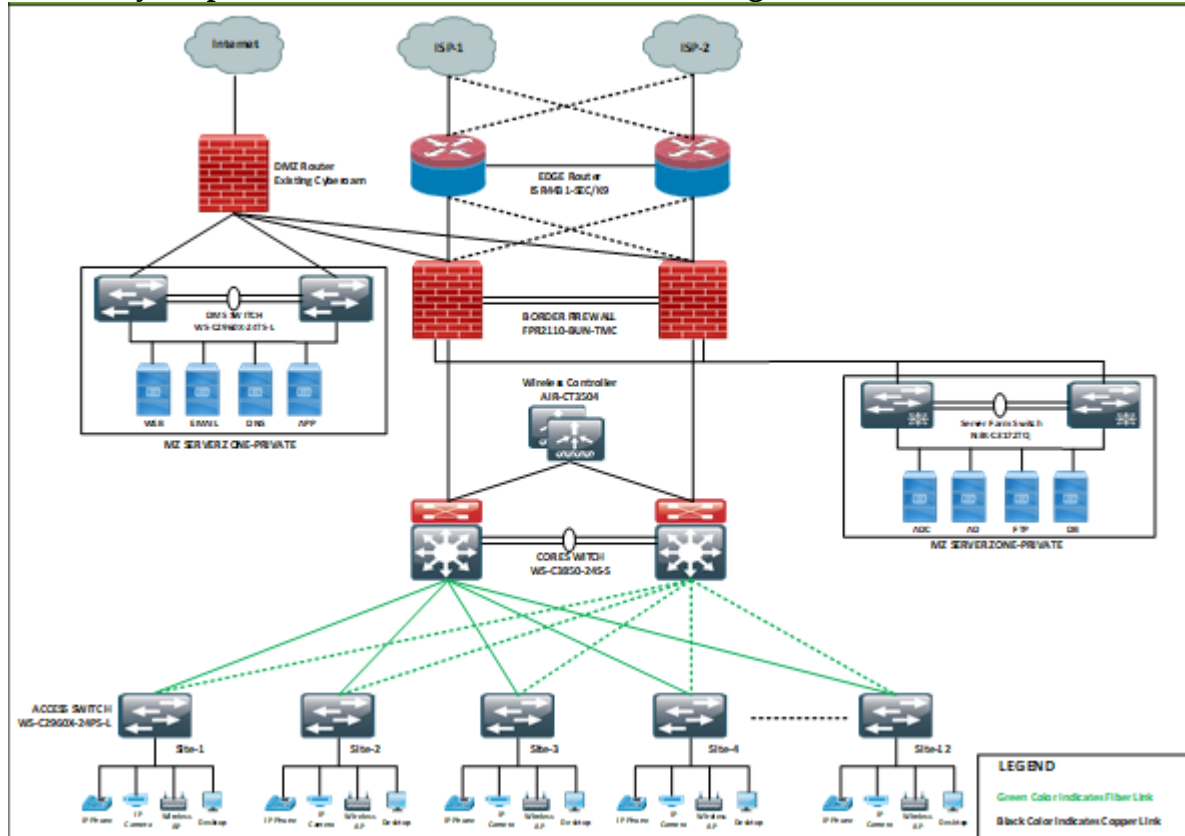


Figure: 5.7: Finally, Implemented Network Infrastructure Design.

## **CHAPTER 7**

### **Conclusion and Future Development**

#### **7.1 Conclusion**

Cloud computing based network security system is very useful to countermeasure distributed network attacks. Its operation resulted in big data outputs, such as network traffics, security events, etc. In this paper, we propose to use cloud computing systems to explore the large volume of collected data from CNSMS to track the attacking events. Traffic archiving is implemented in collaborative UTM to collect all the network trace data and the cloud computing technology is leveraged to analyze the experimental data in parallel. An IaaS cloud platform is constructed with Microsoft Hyper-V and Barracuda spam firewall virtual appliance. Phishing attack forensic analysis as a workable case is presented and the required computing and storage resource are also evaluated by using real trace data. All phishing filtering operation is cloud-based and operated in parallel, and the processing procedure is also evaluated. The results show that the proposed scheme is practical and can be generalized to secure any types of data communication for enterprise solution.

#### **7.2 Future Development**

Cyberoam will analyze huge amount of traffic data within less time and executing the attack detection techniques for network security management simultaneously by cloud computing, attack detection and hence resolution becomes more efficient. Cloud storage can be used to store huge network traffic and in future parallel processing can also use for data classification. Thus cloud computing and parallel processing can incorporate for high speed vulnerability analysis. High speed classification of vulnerabilities using collaborative network security management can also be used for the detection of other network attacks in the future.

### 7.3 References

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- [9] [https://www.cisco.com/c/.../access\\_point/.../configuration/.../cg15-3-3-chap4-first.html](https://www.cisco.com/c/.../access_point/.../configuration/.../cg15-3-3-chap4-first.html)