CNDC Project Report

Course Name: CSC3205 - Computer Networks and Data Communications
Course Instructor: Mubeen Ahmed

Course Name: CSCL3205 - Computer Networks and Data Communications
Course Instructor: Idrees Darbar

| Group Member	Reg No.
Iqbal Shah	2112114
Aliyan Sayani	2112104
Mazahir Abbas	2112242
Muhammad Saad	2112118

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Network Design and Implementation

This section describes the networking infrastructure for each building within the SZABIST Karachi campus.

99 Campus Requirements

- There are 18 classrooms in 99-building, each classroom has one PC.
- There are around 32 PCs belonging to faculty and 6 printers.
- There are 6 PCs and 2 printers belonging to the Academic department.
- There are 4 PCs and 1 printer belonging to the IT department.
- There are 12 PCs and 4 printers belonging to the EXAMINATION department.
- There are 2 PCs who belong to the ADMINISTRATION department.
- There are 4 servers in a data center: Web, ZABDESK, Email and CMS.
- EDGE router is located at 99-Campus Building.

99 Campus Topology
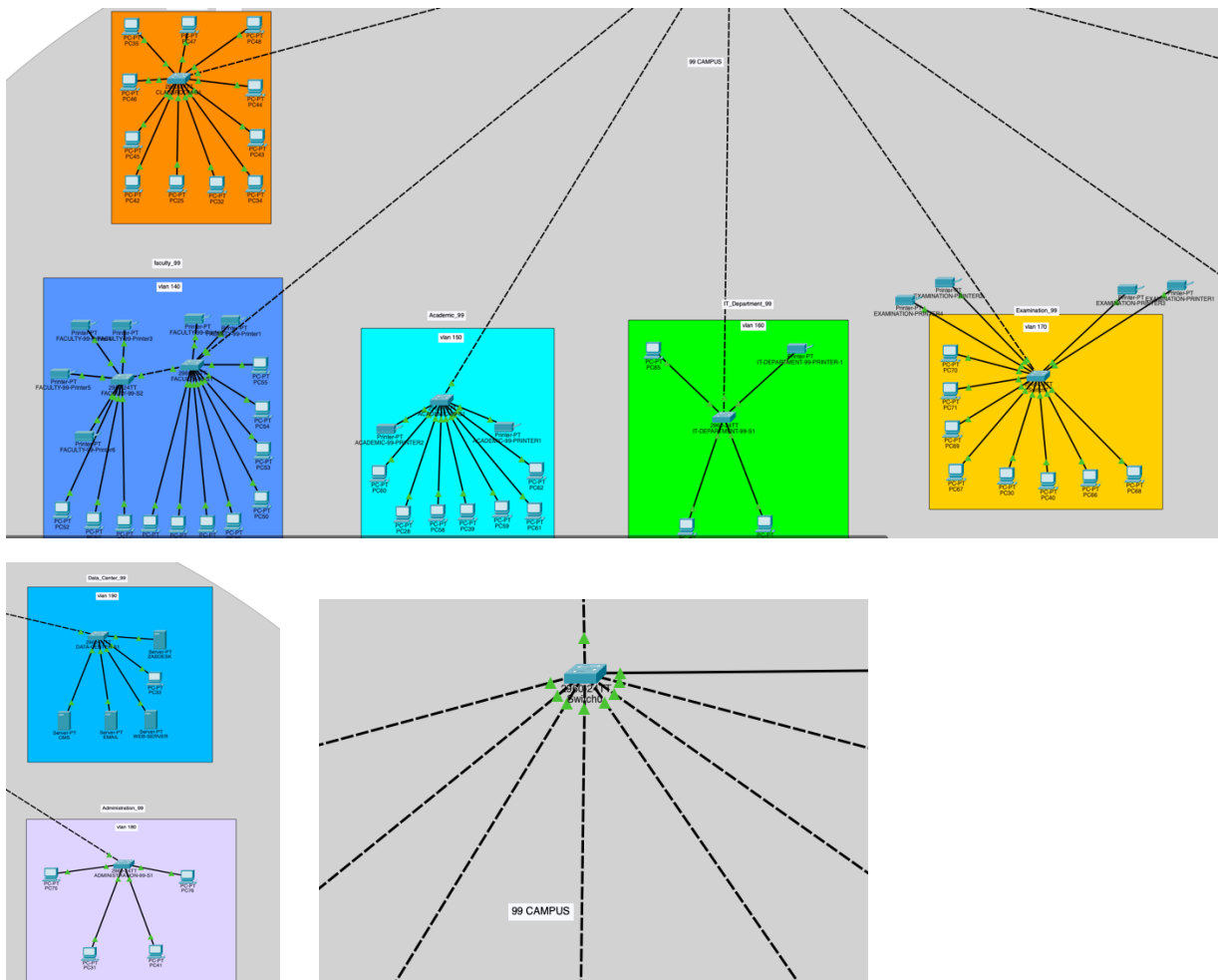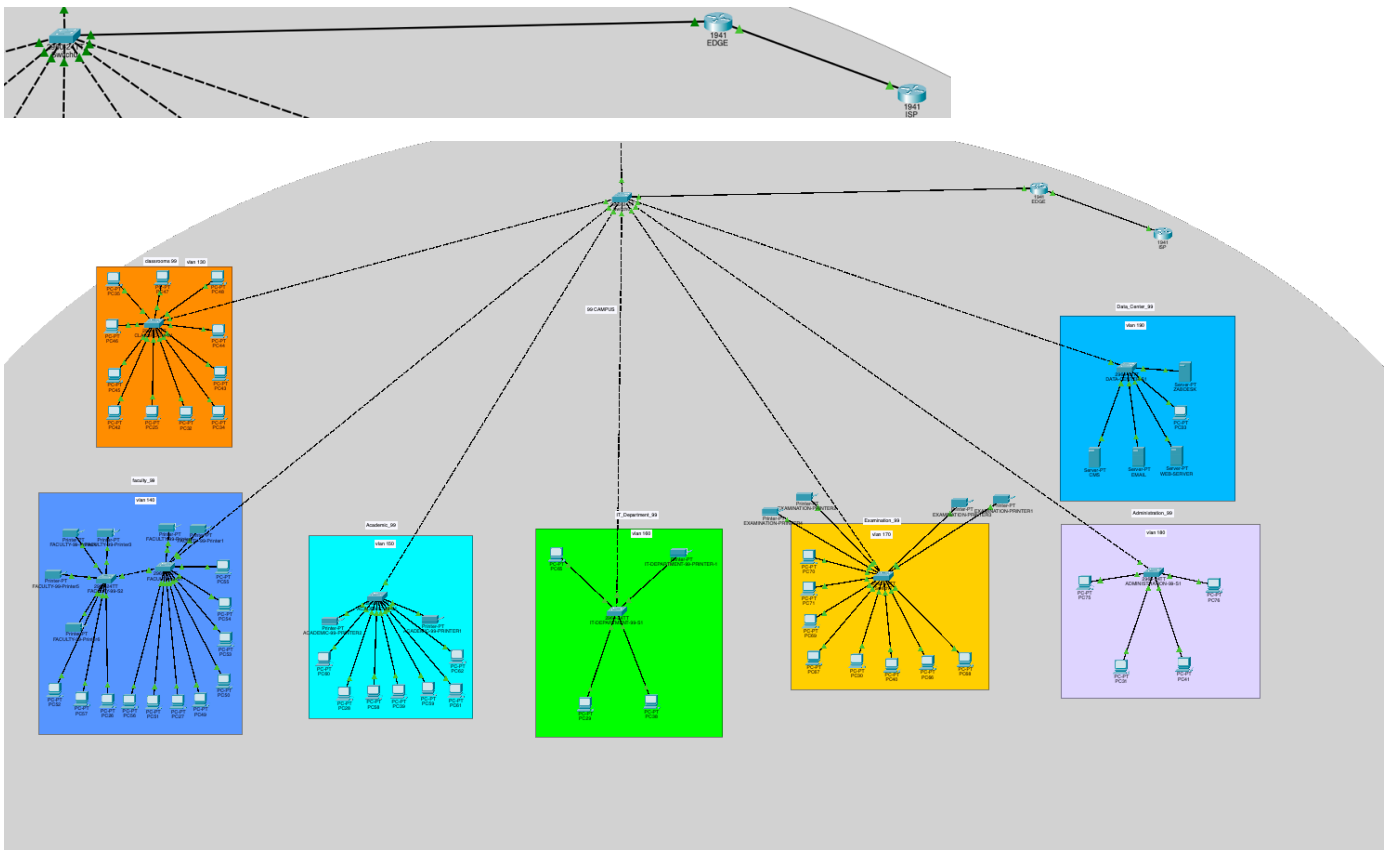
100 Campus Requirements

- There are seven labs in 100 building with following number of devices:
  - CS Lab has 58 PCs, 2 Printer and 1 ftp server.
  - AI Lab has 48 PCs and 1 Printer
  - Lab-3 has 38 PCs, 2 Printers and 1 ftp server. ○ Lab-4 has 35 PCs and 2 Printers.
  - Lab-5 has 35 PCs, 2 Printers and 1 ftp server.
  - Lab-6 has 35 PCs only ○ Smart Lab has 40 PCs and 1 Printer.
  - Gaming Lab has 9 PCs and 2 Printers.
- There are 20 classrooms in 100-building, each classroom has one PC.
- There are around 25 PCs and 4 printers belonging to faculty.
- There are 5 PCs and 3 printers belonging to the Academic department.
- There are 4 PCs belonging to the ADMINISTRATION department. ● There are 10 PCs and 2 printers belongs to IT department.

100 Campus Topology
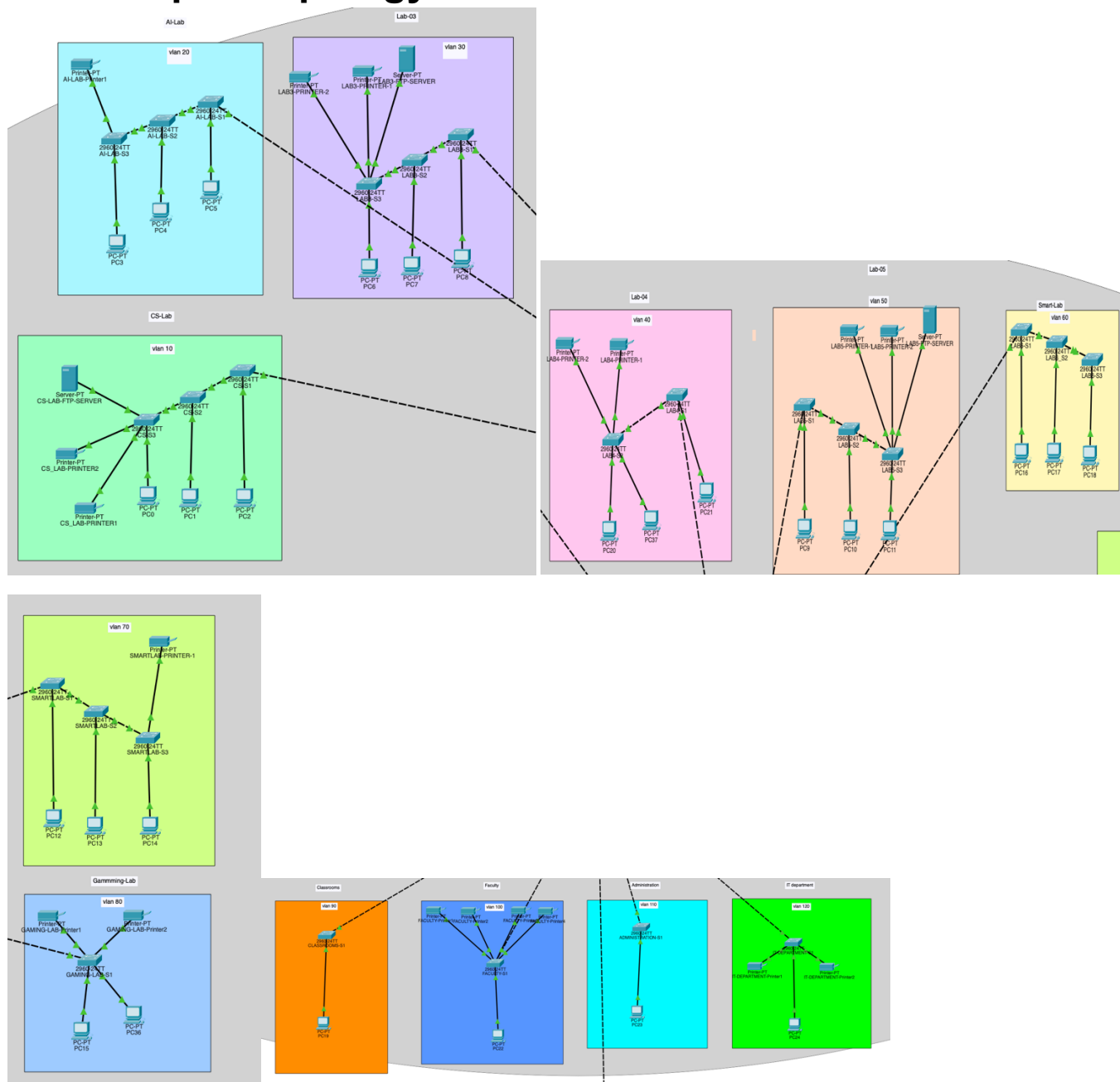
Variable Length Subnet Masking (VLSM)

EDGE AND ISP ROUTER				
DEVICES	INTERFACE	IP ADDRESS	USABLE HOST	SUBNET MASK
EDGE	G0/0	192.168.1.1	2 to 7	255.255.255.248
EDGE	G0/0.10	211.21.18.1	1 to 126	255.255.255.128
EDGE	G0/0.20	211.21.14.65	65 to 126	
EDGE	G0/0.30	211.21.14.129	129 to 190	
EDGE	G0/0.40	211.21.14.193	193 to 254	255.255.255.192
EDGE	G0/0.50	211.21.4.65	65 to 126	
EDGE	G0/0.60	211.21.4.129	129 to 190	
EDGE	G0/0.70	211.21.4.1	1 to 62	
EDGE	G0/0.80	211.21.4.225	225 to 238	255.255.255.240
EDGE	G0/0.90	211.21.4.193	193 to 222	255.255.255.224
EDGE	G0/0.100	211.21.18.129	1 to 30	
EDGE	G0/0.110	211.21.4.241	241 to 246	255.255.255.248
EDGE	G0/0.120	211.21.18.161	61 to 74	255.255.255.240
EDGE	G0/0.130	211.22.42.65	65 to 94	255.255.255.224
EDGE	G0/0.140	211.22.42.1	1 to 62	255.255.255.192
EDGE	G0/0.150	211.21.14.1	1 to 14	255.255.255.240
EDGE	G0/0.160	211.21.14.17	17 - 22	255.255.255.248
EDGE	G0/0.170	211.22.42.97	96 - 110	255.255.255.240
EDGE	G0/0.180	211.21.4.249	249 - 254	255.255.255.248
EDGE	G0/0.190	211.21.18.177	201 - 206	255.255.255.240
EDGE	G0/1	11.11.11.2	1 to 3	255.255.255.252
ISP	G0/1	11.11.11.1		

VLANs and Port Assigning Table

100 Campus

100 CAMPUS				
LABS & DEPARTMENTS	VLAN	IP ADDRESS	USEABLE HOST	SUBNET MASK
CS LAB	10	211.21.18.1 - 126	1 to 126	255.255.255.128
AI LAB	20	211.21.14.65 - 126	65 to 126	
LAB-3	30	211.21.14.129-190	129 to 190	
LAB-4	40	211.21.14.193-254	193 to 254	255.255.255.192
LAB-5	50	211.21.4.65 - 126	65 to 126	
LAB-6	60	211.21.4.129 - 190	129 to 190	
SMART-LAB	70	211.21.4.1 - 62	1 to 62	
GAMING-LAB	80	211.21.4.225 - 238	225 to 238	255.255.255.240
CLASSROOMS	90	211.21.4.193 -222	193 to 222	255.255.255.224
FACULTY	100	211.21.18.129-158	1 to 30	
ADMINISTRATION	110	211.21.4.241-246	241 to 246	255.255.255.248
IT DEPARTMENT	120	211.21.18.161-174	61 to 74	255.255.255.240

99 Campus

99 CAMPUS				
LABS & DEPARTMENTS	VLAN	IP ADDRESS	USEABLE HOST	SUBNET MASK
CLASSROOMS	130	211.22.42.65 - 94	65 to 94	255.255.255.224
FACULTY	140	211.22.42.1 - 62	1 to 62	255.255.255.192
ACADEMIC	150	211.21.14.1 - 14	01 to 14	255.255.255.240
IT DEPARTMENT	160	211.21.14.17 - 22	17 - 22	255.255.255.248
EXAMINATION	170	211.22.42 .97 - 110	96 - 110	255.255.255.240
ADMINISTRATION	180	211.21.4.249 - 254	249 - 254	255.255.255.248
DATA CENTER	190	211.21.18.177 - 190	201 - 206	255.255.255.240

Addressing Table

100 CAMPUS

CS LAB				
DEVICE	TRUNK PORT	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
CS-LAB-S1	F0/23 - 24	211.21.18.2	255.255.255.128	211.21.18.1
CS-LAB-S2		211.21.18.3		
CS-LAB-S3	F0/24	211.21.18.4		
CS-LAB-PRINTER-1	-	211.21.18.5		
CS-LAB-PRINTER-2	-	211.21.18.6		
CS-LAB-PRINTER-3	-	211.21.18.7		

AI LAB				
DEVICES	TRUNK PORT	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
AI-LAB-S1	F0/23 - 24	211.21.14.68	255.255.255.192	211.21.14.65
AI-LAB-S2		211.21.14.67		
AI-LAB-S3	F0/24	211.21.14.66		
AI-LAB-PRINTER-1	-	211.21.14.69		

LAB 3				
DEVICE	TRUNK PORT	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
LAB3-S1	F0/23 - 24	211.21.14.132	255.255.255.192	211.21.14.129
LAB3-S2		211.21.14.131		
LAB3-S3	F0/24	211.21.14.130		
LAB3-PRINTER-1	-	211.21.14.134		
LAB3-PRINTER-2	-	211.21.14.133		
LAB3-FTP-SERVER	-	211.21.14.135		

LAB 4				
DEVICE	TRUNK PORT	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
LAB4-S1	F0/23 - 24	211.21.14.195	255.255.255.192	211.21.14.193
LAB4-S2	F0/23	211.21.14.194		
LAB4-PRINTER-1	-	211.21.14.196		
LAB4-PRINTER-2	-	211.21.14.197		

LAB 5				
DEVICE	TRUNK PORT	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
LAB5-S1	F0/23 - 24	211.21.4.66	255.255.255.192	211.21.4.65
LAB5-S2		211.21.4.67		
LAB5-S3	F0/24	211.21.4.68		
LAB5-PRINTER-1	-	211.21.4.69		
LAB5-PRINTER-2	-	211.21.4.70		
LAB5-FTP-SERVER	-	211.21.4.71		

LAB 6				
DEVICE	TRUNK PORT	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
LAB6-S1	F0/23 - 24	211.21.4.130	255.255.255.192	211.21.4.129
LAB6-S2		211.21.4.131		
LAB6-S3	F0/24	211.21.4.132		

100 SMART LAB

DEVICE	TRUNK PORT	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
SMARTLAB-S1	F0/23 - 24	211.21.4.2		
SMARTLAB-S2	F0/23	211.21.4.3	255.255.255.192	211.21.4.1
SMARTLAB-S3	-	211.21.4.4		
SMARTLAB-PRINTER-1	-	211.21.4.5		

GAMING LAB

DEVICE	TRUNK PORT	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
GAMING-LAB-S1	F0/ 24	211.21.4.226		
GAMING-LAB-PRINTER-1	-	211.21.4.228	255.255.255.240	211.21.4.225
GAMING-LAB-PRINTER-1	-	211.21.4.229		

100 ADMINISTRATION

DEVICE	TRUNK PORT	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
ADMINISTRATION-S1	F0/ 24	211.21.4.242	255.255.255.228	211.21.4.241

100 FACULTY

DEVICE	TRUNK PORT	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
FACULTY-S1	F0/ 24	211.21.18.130		
FACULTY-PRINTER-1	-	211.21.18.135		
FACULTY-PRINTER-2	-	211.21.18.134	255.255.255.192	211.21.18.129
FACULTY-PRINTER-3	-	211.21.18.133		
FACULTY-PRINTER-4	-	211.21.18.132		

100 CLASSROOMS

DEVICE	TRUNK PORT	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
CLASSROOMS-S1	F0 /24	211.21.4.194	255.255.255.224	211.21.4.193

100 IT DEPARTMENT

DEVICE	TRUNK PORT	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
IT-DEPARTMENT-S1	F0/ 24	211.21.18.162		
IT-DEPARTMENT-PRINTER-1	-	211.21.18.164	255.255.255.240	211.21.18.161
IT-DEPARTMENT-PRINTER-2	-	211.21.18.165		

99 CAMPUS

99 FACULTY

DEVICE	TRUNK PORT	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
FACULTY-99-S1	F0/23 - 24	211.22.42.2		
FACULTY-99-S2	F0/24	211.22.42.3		
FACULTY-99-Printer1	-	211.22.42.4		
FACULTY-99-Printer2	-	211.22.42.5	255.255.255.192	211.22.42.1
FACULTY-99-Printer3	-	211.22.42.6		
FACULTY-99-Printer4	-	211.22.42.7		
FACULTY-99-Printer5	-	211.22.42.8		
FACULTY-99-Printer6	-	211.22.42.9		

99 IT DEPARTMENT

DEVICE	TRUNK PORT	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
IT-DEPARTMENT-99-S1	F0/ 24	211.21.14.18	255.255.255.248	211.21.14.17
IT-DEPARTMENT-99-PRINTER-1	-	211.21.14.19		

99 EXAMINATION

DEVICE	TRUNK PORT	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
EXAMINATION-S1	F0/ 24	211.22.42.98		
EXAMINATION-PRINTER-1	-	211.22.42.99		
EXAMINATION-PRINTER-2	-	211.22.42.100	255.255.255.240	211.22.42.97
EXAMINATION-PRINTER-3	-	211.22.42.101		
EXAMINATION-PRINTER-4	-	211.22.42.102		

99 ADMINISTRATION

DEVICE	TRUNK PORT	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
ADMINISTRATION-99-S1	F0/ 24	211.21.4.250	255.255.255.248	211.21.4.249

99 DATA CENTER

DEVICE	TRUNK PORT	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
DATA-CENTER-S1	F0/ 24	211.21.18.178		
ZABDESK-SERVER	-	211.21.18.181		
WEB-SERVER	-	211.21.18.182	255.255.255.240	211.21.18.177
EMAIL-SERVER	-	211.21.18.183		
CMS-SERVER	-	211.21.18.184		

99 CLASSROOMS				
DEVICE	TRUNK PORT	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
CLASSROOMS-S1	F0 /24	211.22.42.66	255.255.255.224	211.21.4.65

99 ACADEMIC				
DEVICE	TRUNK PORT	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
ACADEMIC-99-S1	F0/ 24	211.21.14.2	255.255.255.240	211.21.14.1
ACADEMIC-99-PRINTER1	-	211.21.14.3		
ACADEMIC-99-PRINTER2	-	211.21.14.4		