Presentation outline

- Objective

- Stakeholders

- Scope of Work

- Architecture

- Bill of material

- Timelines

- Discussion points

Objective
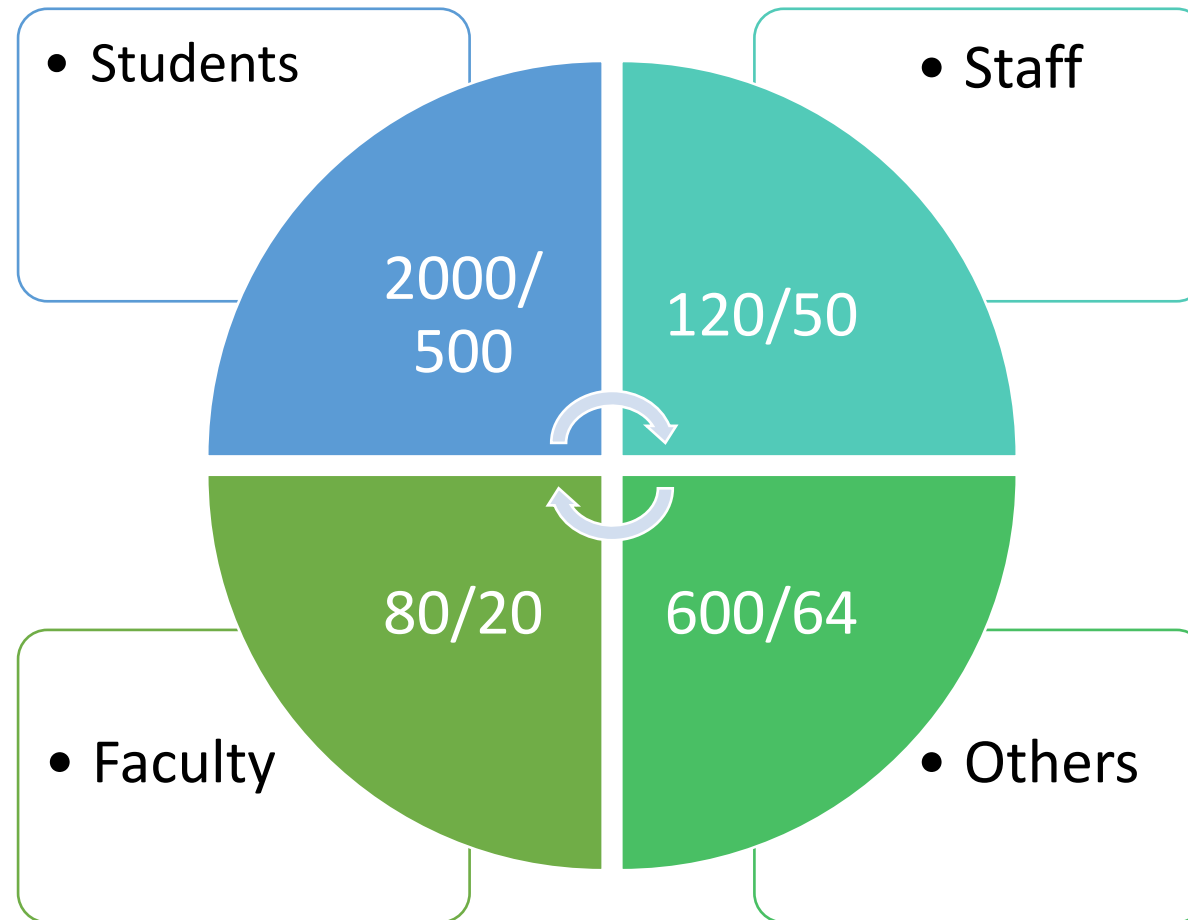
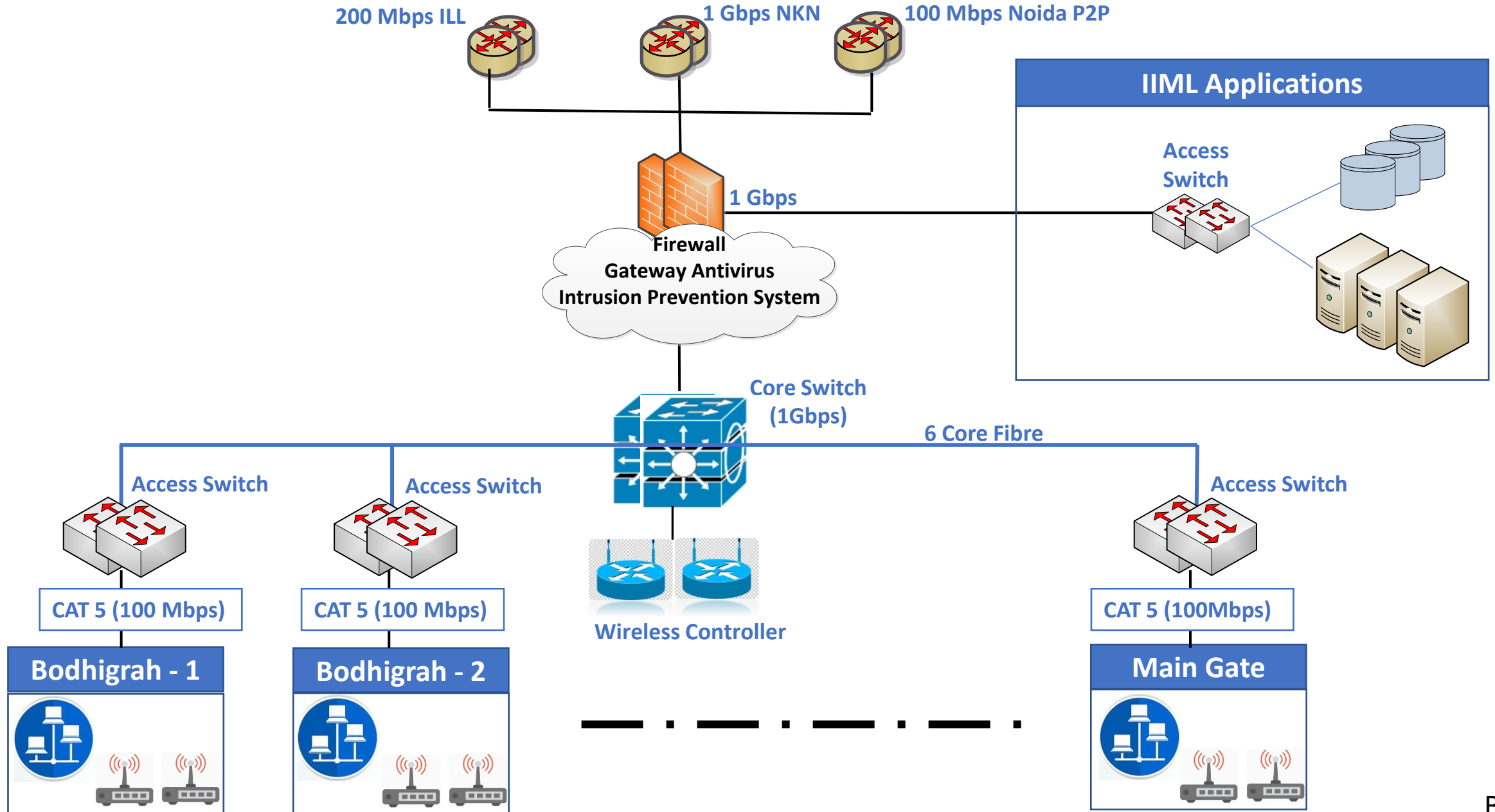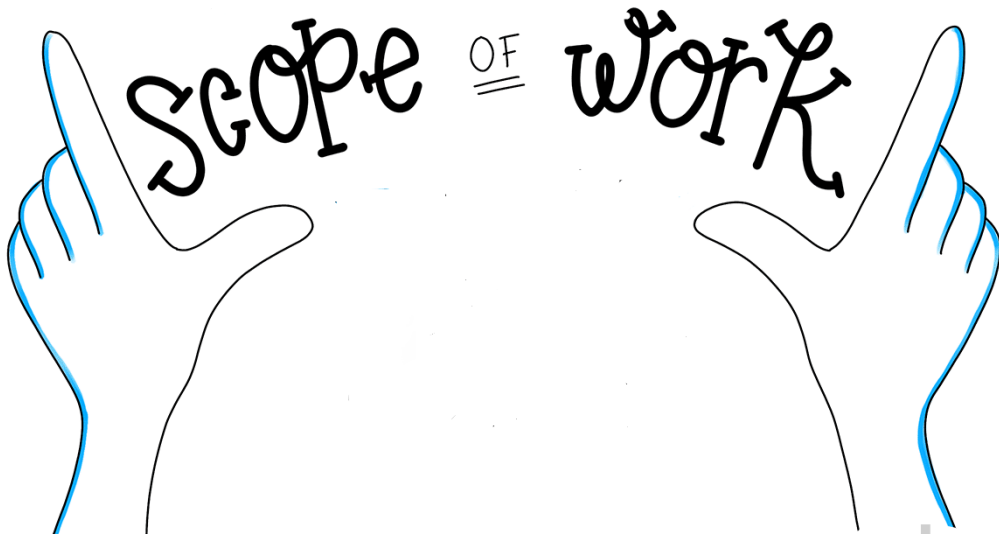Un-interrupted, Assured, Secured and Adequate Network data speed delivery

Stakeholders

- Students
- Staff
- Faculty
- Others

2000/500 · 120/50 · 80/20 · 600/64

Note: Lucknow/ Noida

Network Architecture: As-Is

200 Mbps ILL   1 Gbps NKN   100 Mbps Noida P2P

IIML Applications

Access Switch

1 Gbps

Firewall
Gateway Antivirus
Intrusion Prevention System

Core Switch
(1Gbps)

6 Core Fibre

Access Switch   Access Switch   Access Switch

CAT 5 (100 Mbps)   CAT 5 (100 Mbps)   CAT 5 (100Mbps)

Wireless Controller

Bodhigrah - 1   **Bodhigrah - 2**   **Main Gate**

Back

- **Wi-fi coverage survey (Pre, post implementation)**

- **Supply of equipment , Installation, testing & commissioning**

- **Operations and Maintenance for 7 years**

  - **Technical Manpower for O&M period**

  - **Support Level assurance for longer period**

- **Equipment configuration & Training by OEM/ audited by OEM**

Proposed Network at IIML

Network Infrastructure sizing has been done to cater to next 10 years requirement

New Fiber backbone to cater to next 20+ years requirement in Campus with no single fiber route failure

Modular design of campus network to cater to unplanned requirements (new building, events)

Internet bandwidth (NKN, additional) be augmented with increase in demand

Spare reserve capacity planned for Networking equipment (switches, wireless access points & fiber backbone)
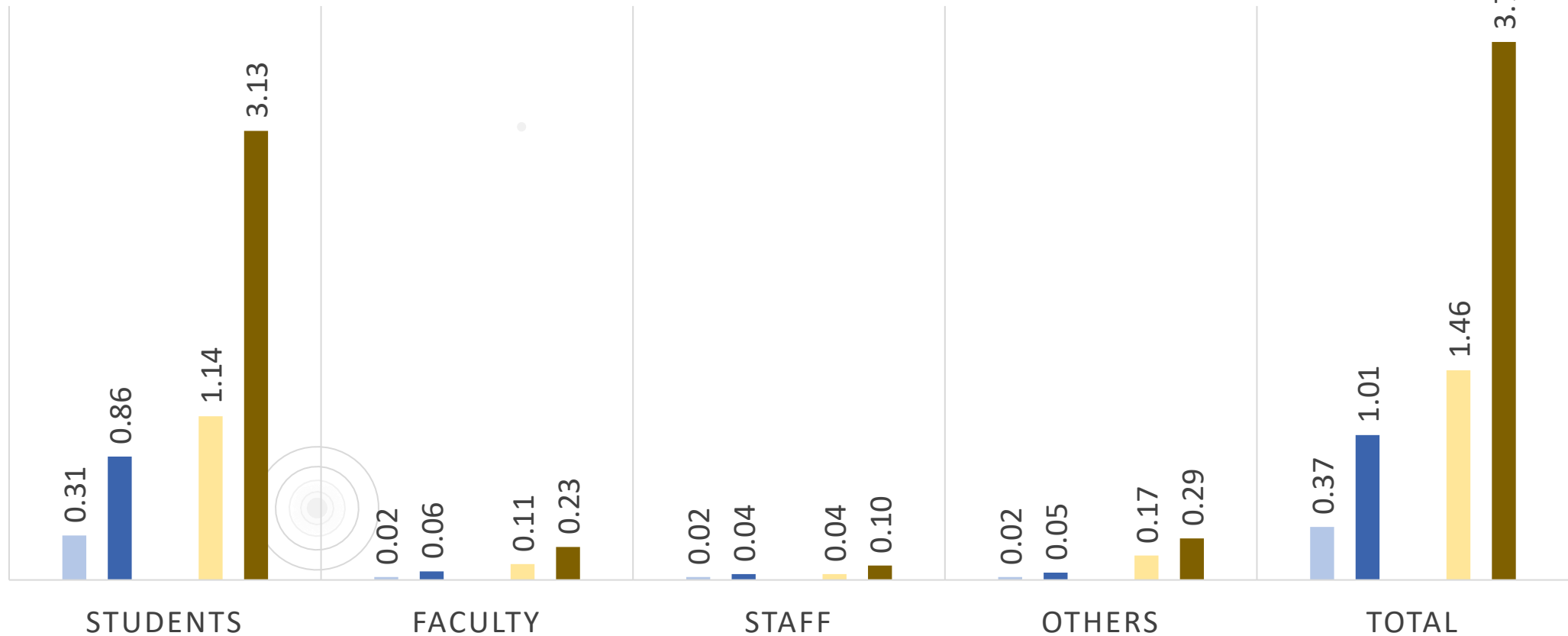
Capability for monitoring and managing Network SLAs through monitoring tools
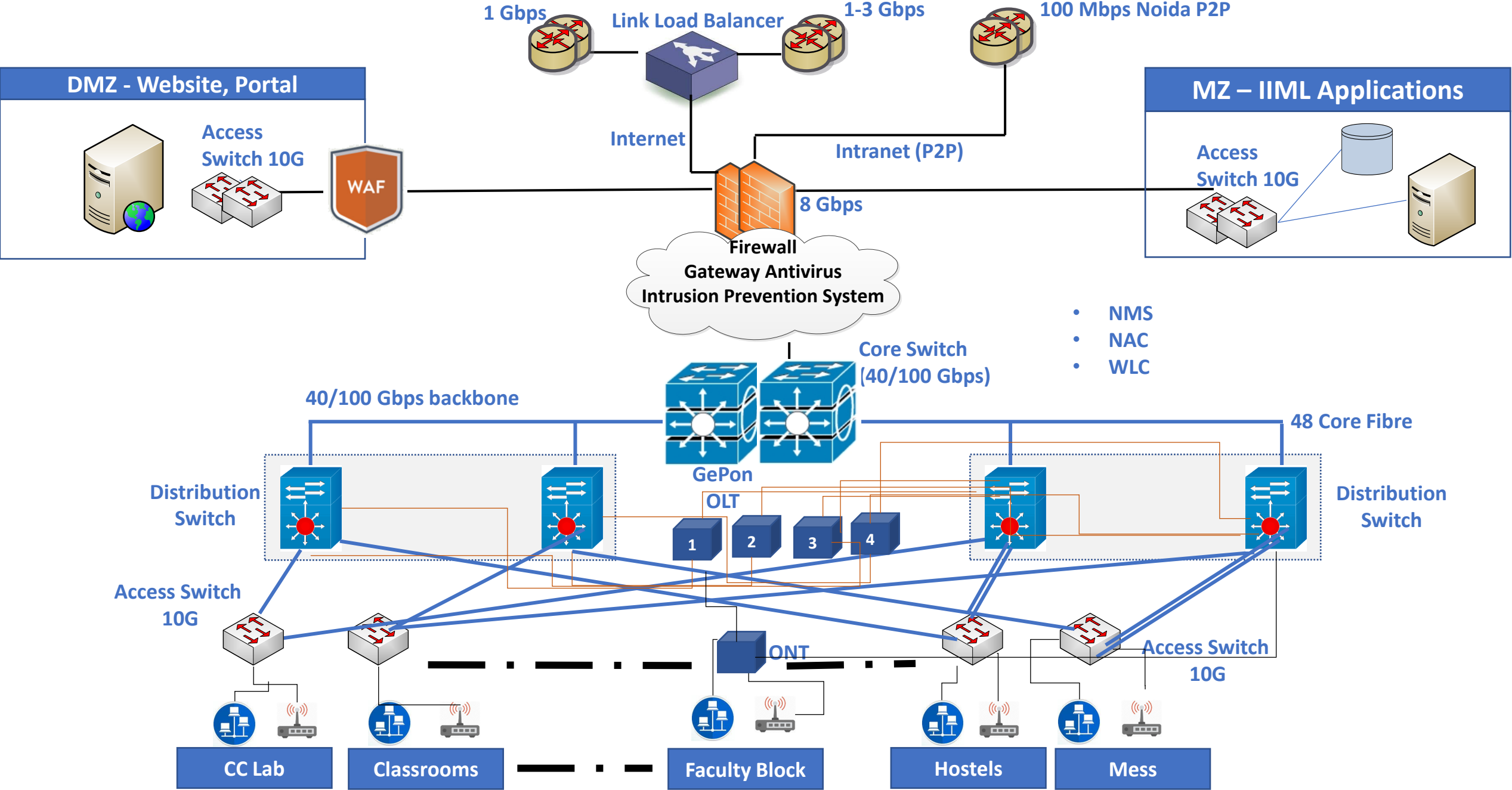
Expected ILL Usage

CURRENT ESTIMATED USAGE VS FUTURE EXPECTED USAGE (Gbps)

Legend:
- As on date (NOIDA)
- After 10 years (NOIDA)
- As on date (LKO)
- After 10 years (LKO)

Category	As on date (NOIDA)	After 10 years (NOIDA)	As on date (LKO)	After 10 years (LKO)
STUDENTS	0.31	0.86	1.14	3.13
FACULTY	0.02	0.06	0.11	0.23
STAFF	0.02	0.04	0.04	0.10
OTHERS	0.02	0.05	0.17	0.29
TOTAL	0.37	1.01	1.46	3.75

Proposed Network Architecture: Lucknow
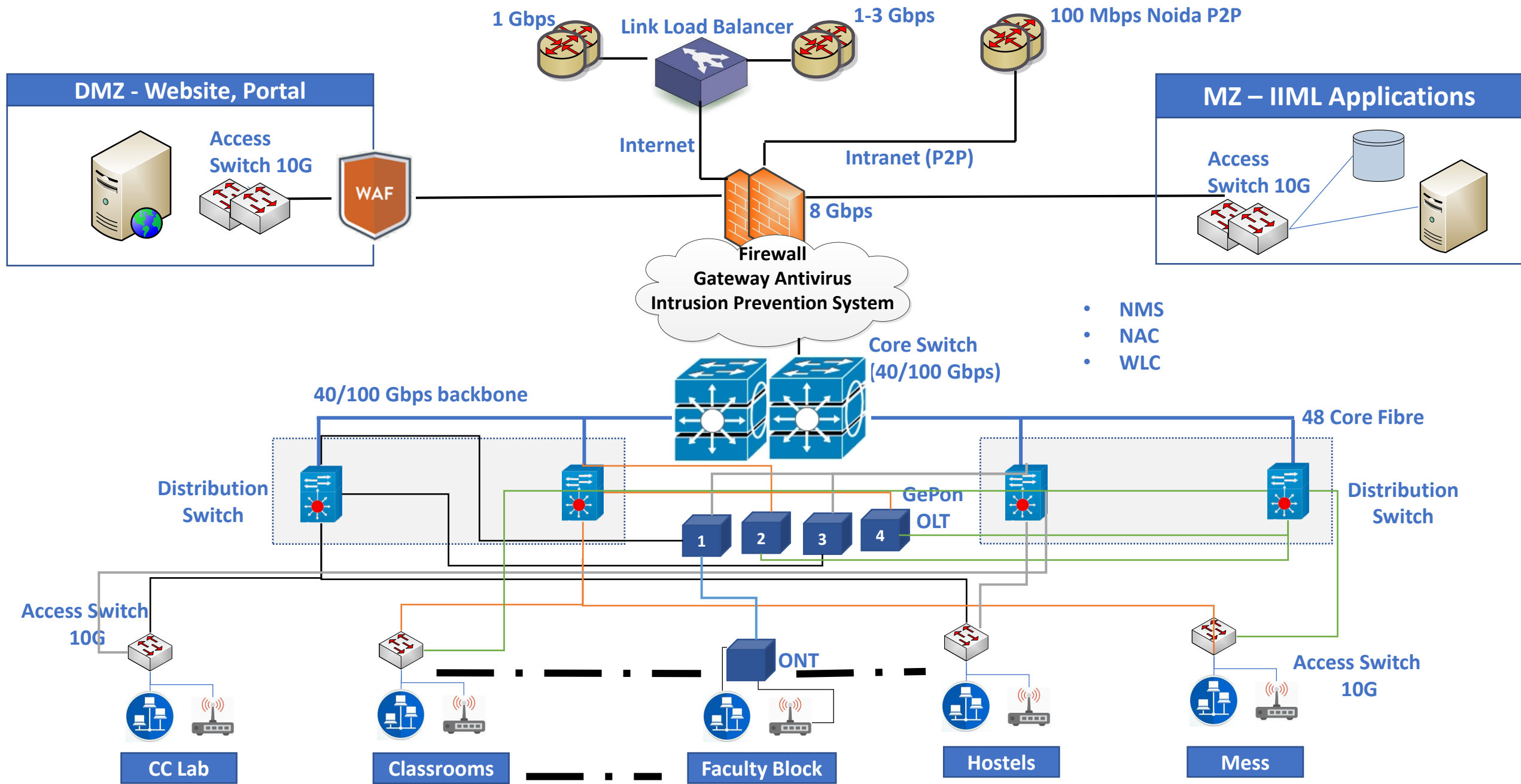
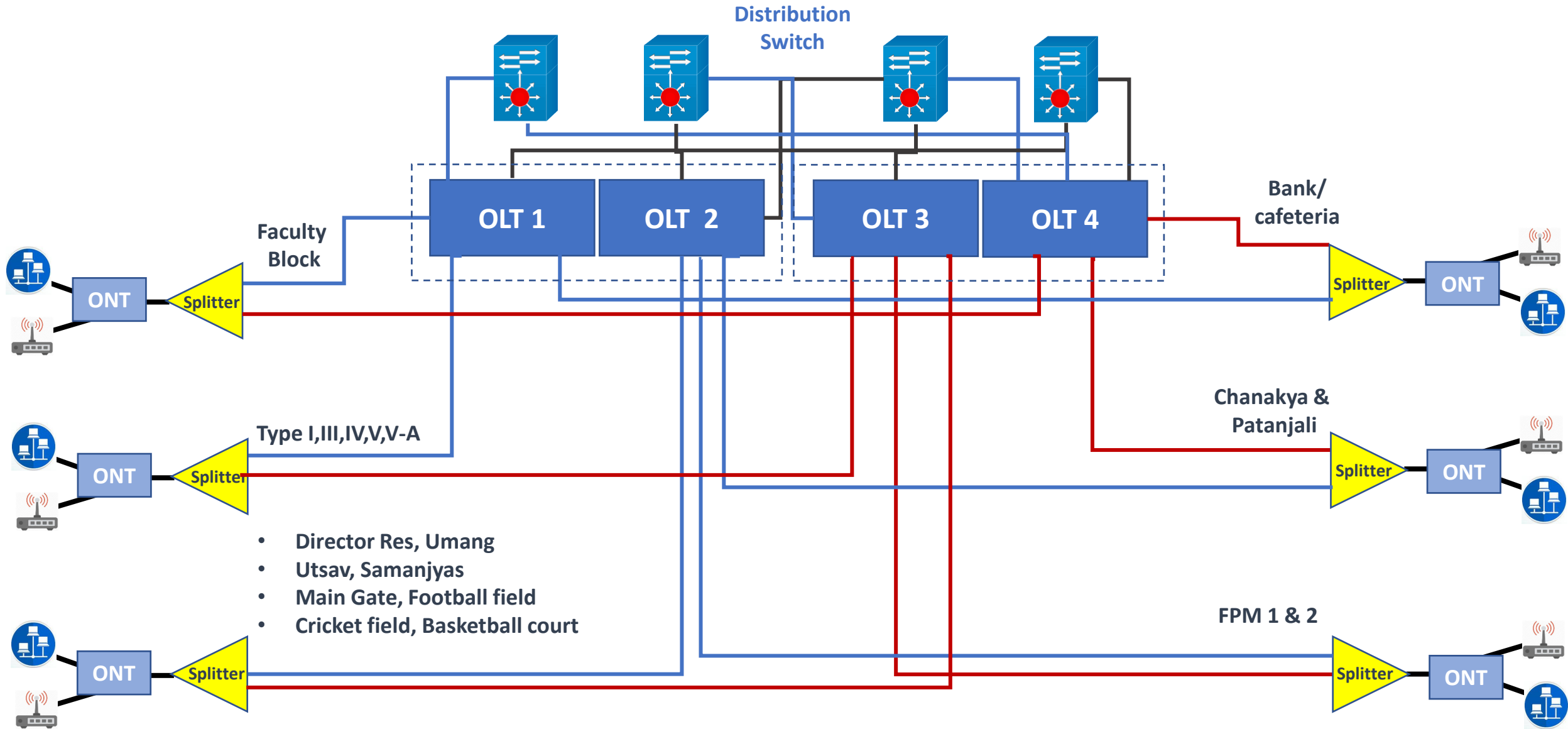# Proposed Network Architecture: Noida
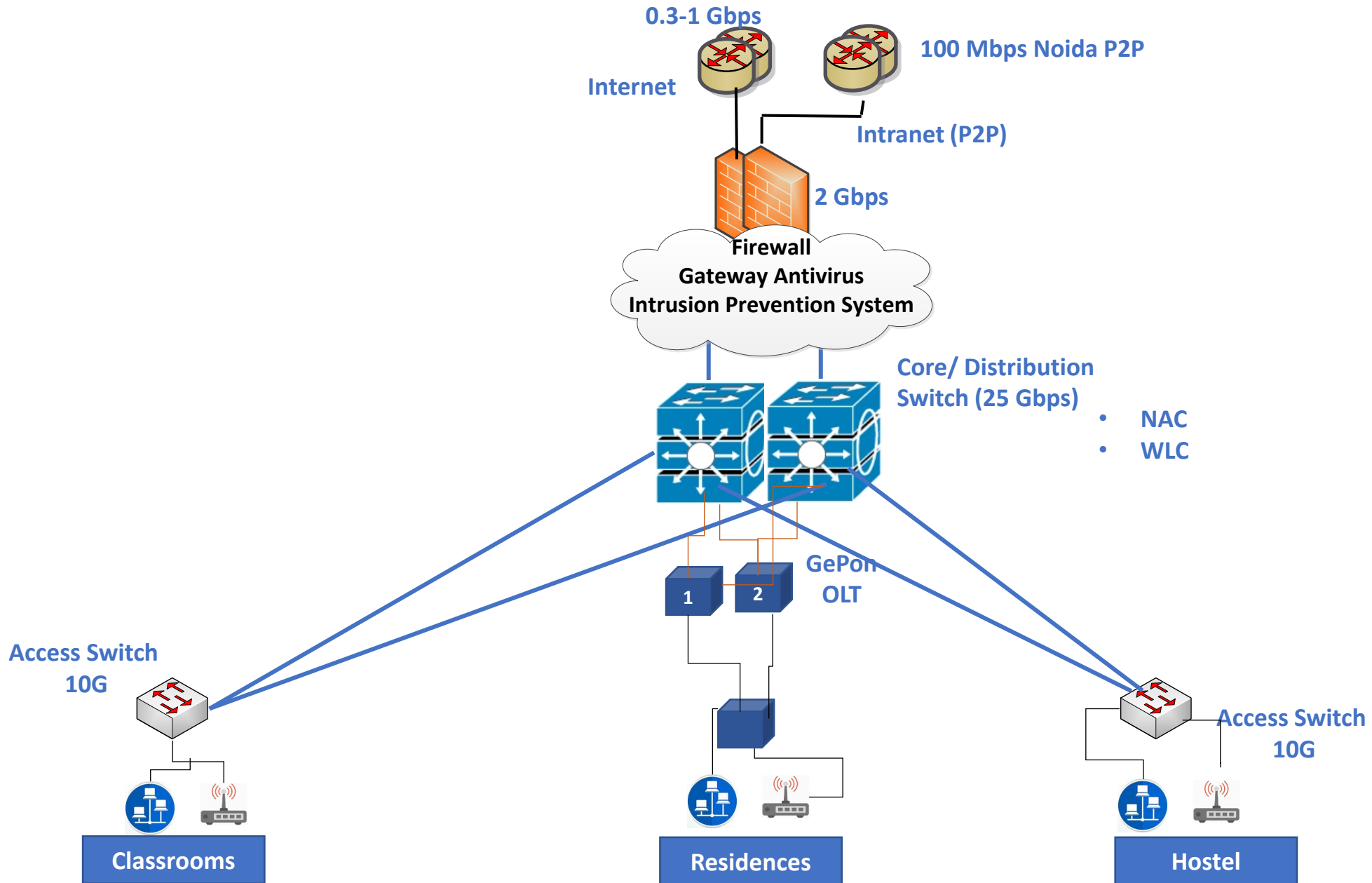
GePon Network Distribution: Lucknow

Distribution Switch

OLT 1 OLT 2 OLT 3 OLT 4

Bank/cafeteria

Faculty Block

Splitter ONT

Type I,III,IV,V-A

Chanakya & Patanjali

Splitter ONT

- Director Res, Umang
- Utsav, Samanjyas
- Main Gate, Football field
- Cricket field, Basketball court

FPM 1 & 2

Splitter ONT

Fiber connectivity

UMANG

UTSAV

17

16

15

HOSTEL

11

14

12

13

10

9

Samanjyas

FPM HOSTEL 1 &2

CHANAKYA

TYPE V-A RESI

ANUSANDHAN + HEALTH CENTER

SBI EXCHANGE

STUDENT MESS

HOSTEL1,2,3

HOSTEL 5,6,7

HOSTEL 4,8

PATANJALI

MAIN GATE

TYPE V RESI

ADMIN BLOCK

BODHI2

MDP BLOCK

TYPE I RESI

TYPE III RESI

FACULTY BLOCK

BODHI 1

TYPE IV RESI

DIRECTORS RESI

CC & Library

Fiber 1

Fiber 2

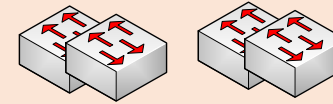# Ensuring Network availability - Redundancies

OFC
Route redundancy

Core Switch
HA

Distribution Switches
2 Virtual sets

Additional Reserves
WAP, Access switch

Residential area network availability using GePON Technology

WAP redundancy using coverage overlap

Noida – Lucknow link
Alternate: VPN tunnel on Internet link

Perimeter Security HA

Security Features of the Proposed Network

- Next Generation Firewall with Application Security, Content inspection, Anti malware & URL filtering

- VPN connection for 4000 user

- Web Application Firewall

- Network Access Control to enforce secure policies on access devices (Laptop/PC, Mobile, Tablet)

- Network Management System (NMS) for monitoring

- WLAN Controller for WAPs

- **Single sign on** – EduRoam, Gmail, VPN, AD, Applications

- Noida to Lucknow link security with site to site VPN

Reducing local power supply dependence

- PoE switches

- Distribution s/w at DC

- Access switch – Central UPS & semi central UPS

Bill of material: Lucknow

SI.	Work Item	Unit	Qty (Q1)
1	**Active component**		
1.1	Core Switch 12X40 G Port	No	2
1.2	Breakout cable 1:4 (40 to 10G) 10 mtr for NGFW & Core sw connection	No	2
1.3	Distribution Switch 24 port (12X10 G ports populated with SM) with 2X40G uplink slots	No	4
1.4	Direct attach copper (DAC) cable 40 G	No	2
1.5	Access Switch 48X1G Ethernet ports with 2X10 G uplink slot	No	2
1.6	Access Switch PoE 48X1G port with 2X10 G uplink slot	No	6
1.7	Access Switch PoE 48 (12X1/2.5/5 multigig, 36 1G) ethernet ports with 2X10 G uplink slot	No	1
1.8	Access Switch 24X1 G ports with 2X10 G uplink slot	No	2
1.9	Access Switch POE 24 ports with 2X10G uplink slots	No	5
1.10	Access switch PoE (8X1/2.5/5 G multigig, 16X1 G) ethernet port with 2X10 G uplink slot	No	24
1.11	Transreceiver 40G SM	No	16
1.12	Transreceiver 10G SM	No	80
1.13	NAC (Appliance/ Software) for 3500 devices (Lucknow & Noida)	No	1
1.14	Wireless LAN Controller with AP licenses	No	1

SI.	Work Item	Unit	Qty (Q1)
1	**Active component**		
1.15	Indoor Access Points 1.6/ 2 G 4X4	No	103
1.16	Outdoor Access Points 1.6/ 2 G 4X4	No	37
1.17	Indoor Access Points 5 G 4X4	No	9
1.18	Indoor Access Points 450 Mbps 4X4	No	125
1.19	Wi-fi device 300 Mbps 2X2	No	394
1.20	Wi-fi 300 Mbps Extender	No	51
1.21	GePON OLT 16 Port	No	4
1.22	Internet Link aggregator/ Load balancer	No	1
1.23	Racks - at Computer Center for Networking equipments	No	4
1.24	Network Management Solution	No	1
1.25	GePON Network Management Solution	No	1
1.26	Ticketing solution	No	1
1.27	Single sign on solution	Subscription/ Year	3500

Bill of material : Lucknow

2	Passive components	Unit	Qty (Q1)
2.1	GePON Splitter 2:32	No	13
2.2	GePON Splitter 2:16	No	5
2.3	GePON Splitter 2:4	No	1
2.4	GePON Splitter 2:8	No	5
2.5	GePON Splitter 2:2	No	5
2.6	GePON Splitter 1:2	No	2
2.7	GePON Bridge/ PoE ONT 4 port	No	11
2.8	OFC 48 Cores	Mtrs	15,000
2.9	OFC Laying within building	Mtrs	2,000
2.10	OFC Laying outside the building	Mtrs	13,000

2	Passive components	Unit	Qty (Q1)
2.11	Cat 6A UTP (500 mtr roll)	Roll	195
2.12	Cat 6A UTP Laying	Mtrs	97,373
2.13	LIU	No	88
2.14	I/O Box,Face Playe & Gang Box with Installation	No	1,014
2.15	Drop cable (fiber)	Mtrs	39,400
2.16	Patch chord 1 mtr	No	533
2.17	Patch chord 2 mtr	No	533
2.18	Patch panel	No	53
2.19	PVC Conduit/ Channels for Laying of Cables	Mtrs	1,01,538
2.20	HDPE Pipe for OFC Laying	Mtrs	1,600

Bill of material: Noida

Sl.	Work Item	Unit	Qty (Q1)
1	**Active component**		
1.1	Core Switch 12X25 G Port populated with SM	No	2
1.2	Access Switch 48X1G Ethernet ports with 2X10 G uplink slot	No	1
1.3	Access Switch PoE 48X1G port with 2X10 G uplink slot	No	1
1.4	Access Switch 24X1 G ports with 2X10 G uplink slot	No	1
1.5	Access Switch POE 24 ports with 2X10G uplink slots	No	8
1.6	Access switch PoE (8X1/2.5/5 G multigig, 16X1 G) ethernet port with 2X10 G uplink slot	No	8
1.7	Transreceiver 25G SM	No	2
1.8	Transreceiver 10G SM	No	38
1.9	NAC hardware (Lic included in Lucknow sheet)	No	1
1.10	Wireless LAN Controller with AP licenses	No	1
1.11	Indoor Access Points 1.6/ 2 G 4X4	No	45
1.12	Outdoor Access Points 1.6/ 2 G 4X4	No	2
1.13	Indoor Access Points 5 G 4X4	No	
1.14	Indoor Access Points 450 Mbps 4X4	No	51
1.15	Wi-fi device 300 Mbps 2X2	No	166
1.16	Wi-fi 300 Mbps Extender	No	21
1.17	GePON OLT 8 Port	No	2
1.18	Racks - at Computer Center for Networking equipments	No	2

Bill of material: Noida

2	Passive components		
2.1	GePON Splitter 2:32	No	6
2.2	GePON Splitter 2:16	No	1
2.3	GePON Splitter 2:4	No	1
2.4	GePON Bridge/ PoE ONT 4 port	No	5
2.5	OFC 24 Cores	Mtrs	2,000
2.6	OFC Laying cost within building	Mtrs	500
2.7	OFC Laying Cost outside the building	Mtrs	1,500
2.8	Cat 6A UTP (500 mtr roll)	Roll	52
2.9	Cat 6A UTP Laying	Mtrs	25,760
2.10	LIU	No	42
2.11	I/O Box,Face Playe & Gang Box with Installation	No	322
2.12	Drop cable (fiber)	Mtrs	16,600
2.13	Patch chord 1 mtr	No	169
2.14	Patch chord 2 mtr	No	169
2.15	Patch panel	No	22
2.16	PVC Conduit/ Channels for Laying of Cables	Mtrs	20,608
2.17	HDPE Pipe for OFC Laying	Mtrs	400

Bill of material

Sl.	Work Item	Unit	Qty (Q1)
	Security Software		
1	Appliance - Next Generation Firewall 8 Gbps combined throughput with Application Security, Content inspection, Anti malware & URL filtering	No	2
2	Annual subscription component of NGFW 8 Gbps	Subscription/ Year	2
3	Appliance - Next Generation Firewall 2 Gbps combined throughput with Application Security, Content inspection, Anti malware & URL filtering	No	2
4	Annual subscription component of NGFW 2 Gbps	Subscription/ Year	2
5	Web application firewall	No	1

Timelines

Nov 20
Draft RFP on IIML website

Dec 20
RFP floating

Mar 21
Agreement signing

Apr 21
Implementation commencement

July 21
Go-Live
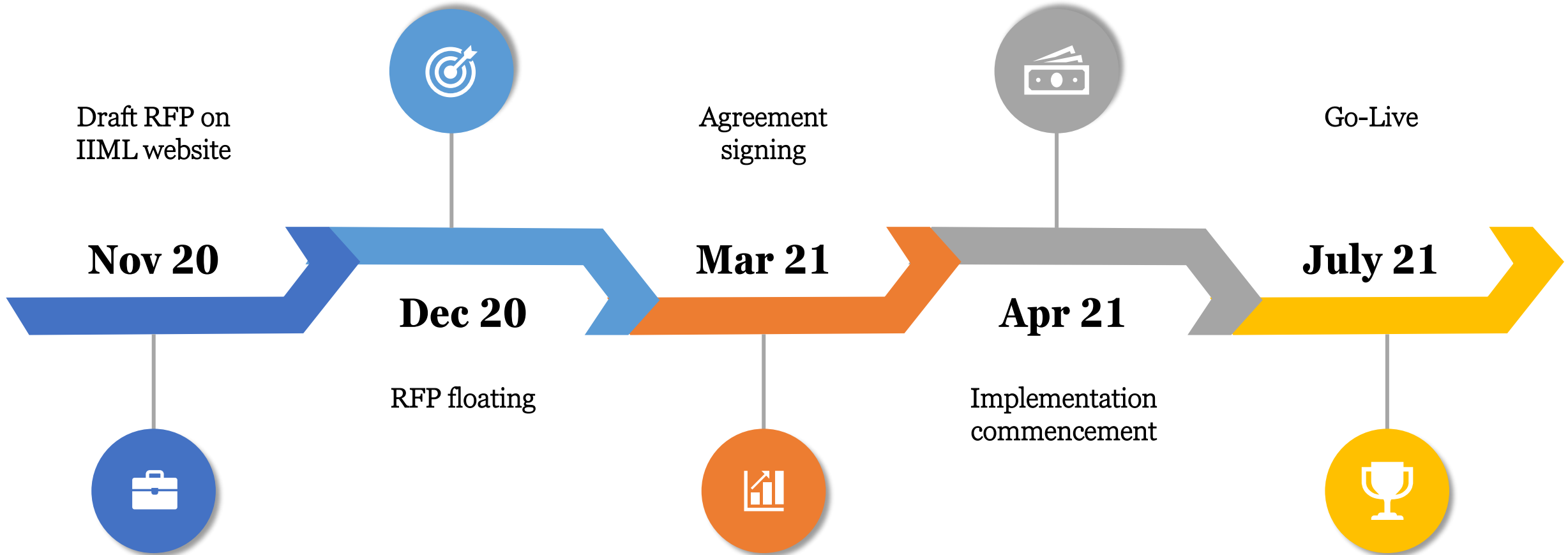
Discussion Point: 1

Any limitation on part of OEM?

- **Reserve OFC Cores**

- **Adding SFP, populating ports**

- **Configuring Access s/w for 2X throughput**

- **Repeat purchase for reserve WAP, Access s/w**

23

Discussion Point: 2

- **Maximum duration?**

  - for 0-2 + 5 Years only

  - whereas equipment performs well for 10+ Years

How to get creditable support for 10 Years?

Discussion Point: 3

Provides incorrect picture

of Capex & Opex:

- **1/3/5 Years**

- **Warranty**

What is yearly support cost in % of Capex?

Any challenge in segregating Capex & Opex from Day-1?

Discussion Point: 4
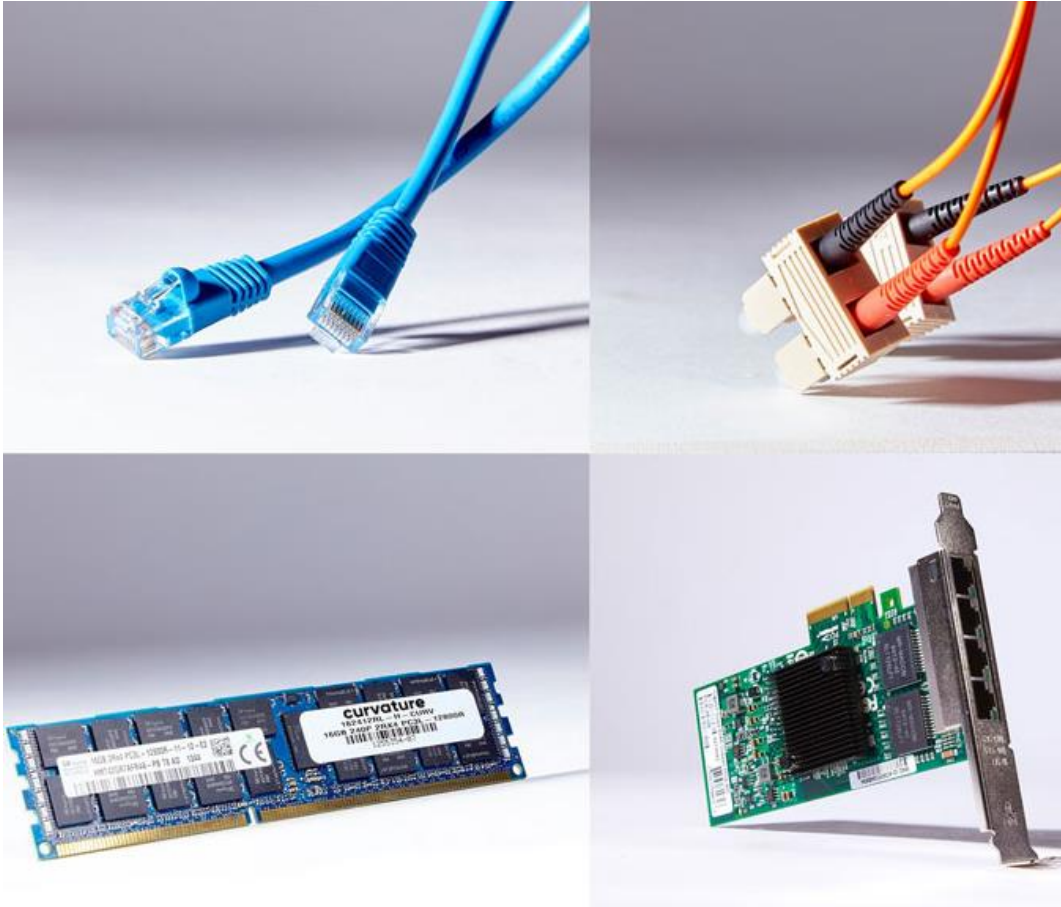
OEM recommendations?

SLA

- **Spares requirement to ensure 99.9% SLA**

Discussion Point: 5

Distributed delivery:

- **Reserve, additional equipment (if required) procurement in 2nd phase, which shall be after Go-Live.**

Dynamics of distributed delivery?

Effect of Covid on delivery timeline?

27

Discussion Point: 6
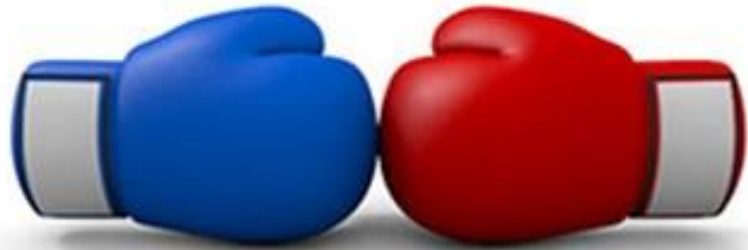
Capex Vs Opex model

- Option-1: Capex, Opex model

- Option-2: Opex model

Feasibility of option-2 for Project?

Discussion Point: 7

Cordial relations

- Transparent RFP

- Suggestions towards Competitive advantage to an OEM & a product

- Offensive tone in response/ suggestions

- Publishing query/ suggestions on website???????

29

Discussion Point: 8

OEM's role in completing bid process in 3 months

- Site survey

- Solution design

- Specifications

- Pre bid query submission

Suggestions ???

Discussion Point: 9

OEM certificate

- MeitY Template

Suggestions ???

Thank you