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B2B Internet Network Development Phase-2 Project

FRM (Final Report Meeting)

4 November. 2015.

NEC Corporation

Requirements of B2B Internet Services

MPT/KSGM Plan:

MPT/KSGM is planning to provide high Broadband internet service for B2B users ungently by using existing Metro Ethernet network.

MPT/KSGM Requirements:

→ Urgent service start for priority users with interim development plan together with permanent development plan.

→ Needs to introduce new passive network management concept.

→ Needs to synchronize with long term plan.

Project Overview

Project Name : B2B Internet Network Development PH-2

PJ Duration : 13th July, 2015 to 4th Nov, 2015

Area : Yangon, NayPyiTaw and Mandalay

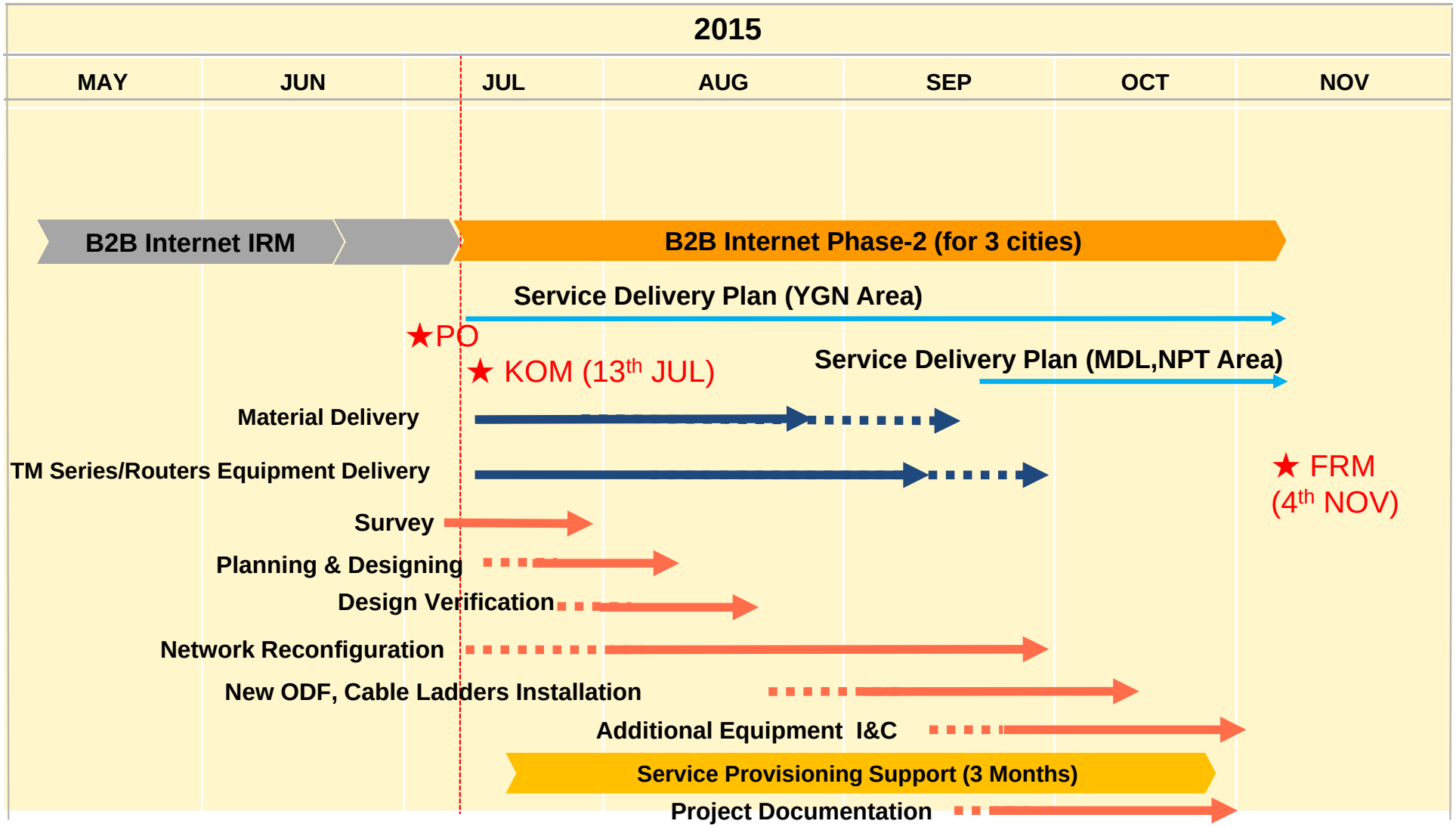
No. of MetroE AP: 33 sites in total

Yangon: 24 sites

NayPyiTaw: 4 sites

Mandalay: 5 sites

B2B Internet Development PH-2 Schedule



Note: Service Delivery Plan Schedule shows only for NEC SOW portion.
Service Delivery Schedule may delay due to other party dependency, such as delayed of OSP fiber laying schedule.

KOM: Kick-off Meeting
FRM: Final Report Meeting

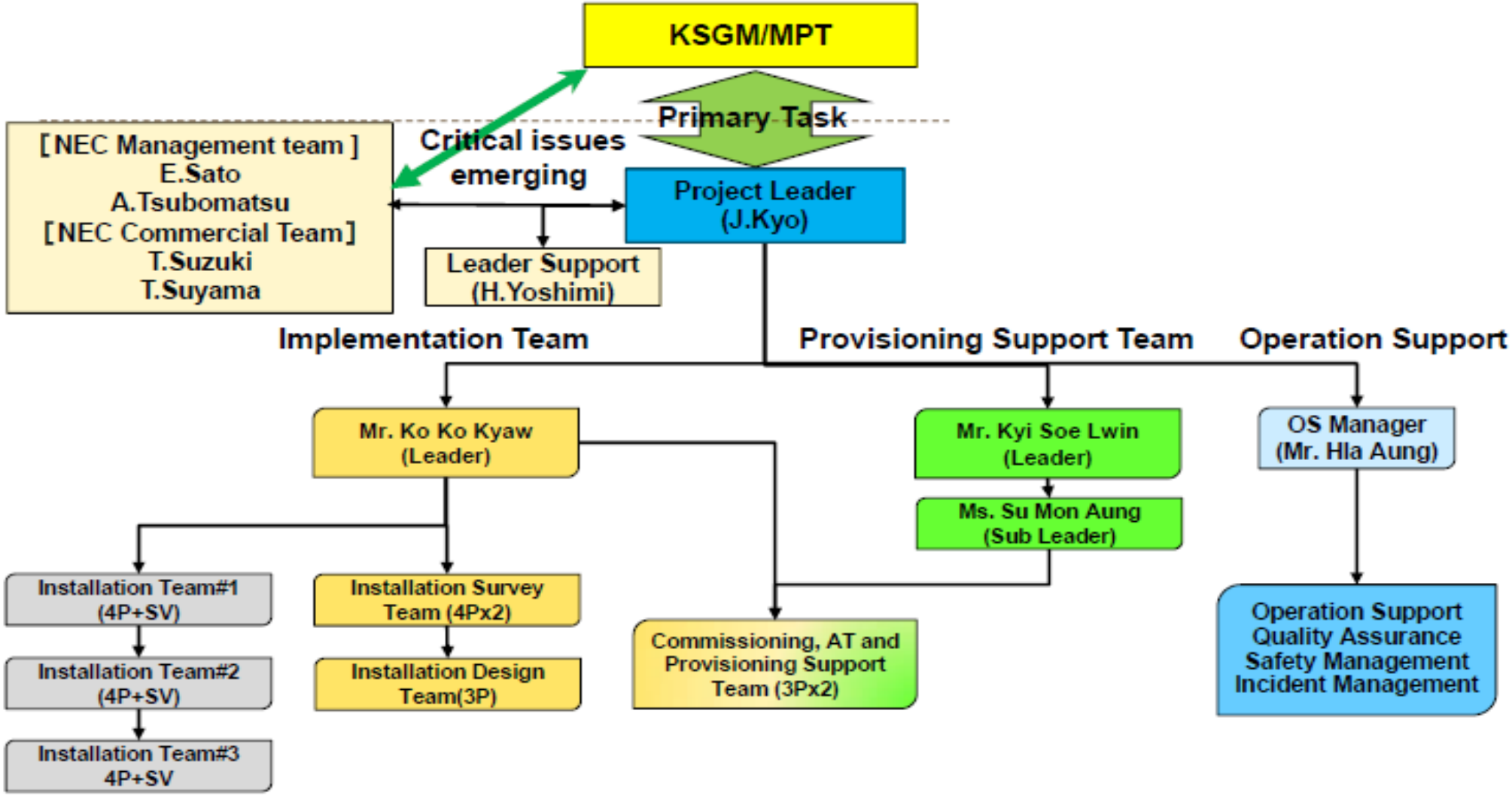
SOW Matrix Table

M: Main Scope, S: Support

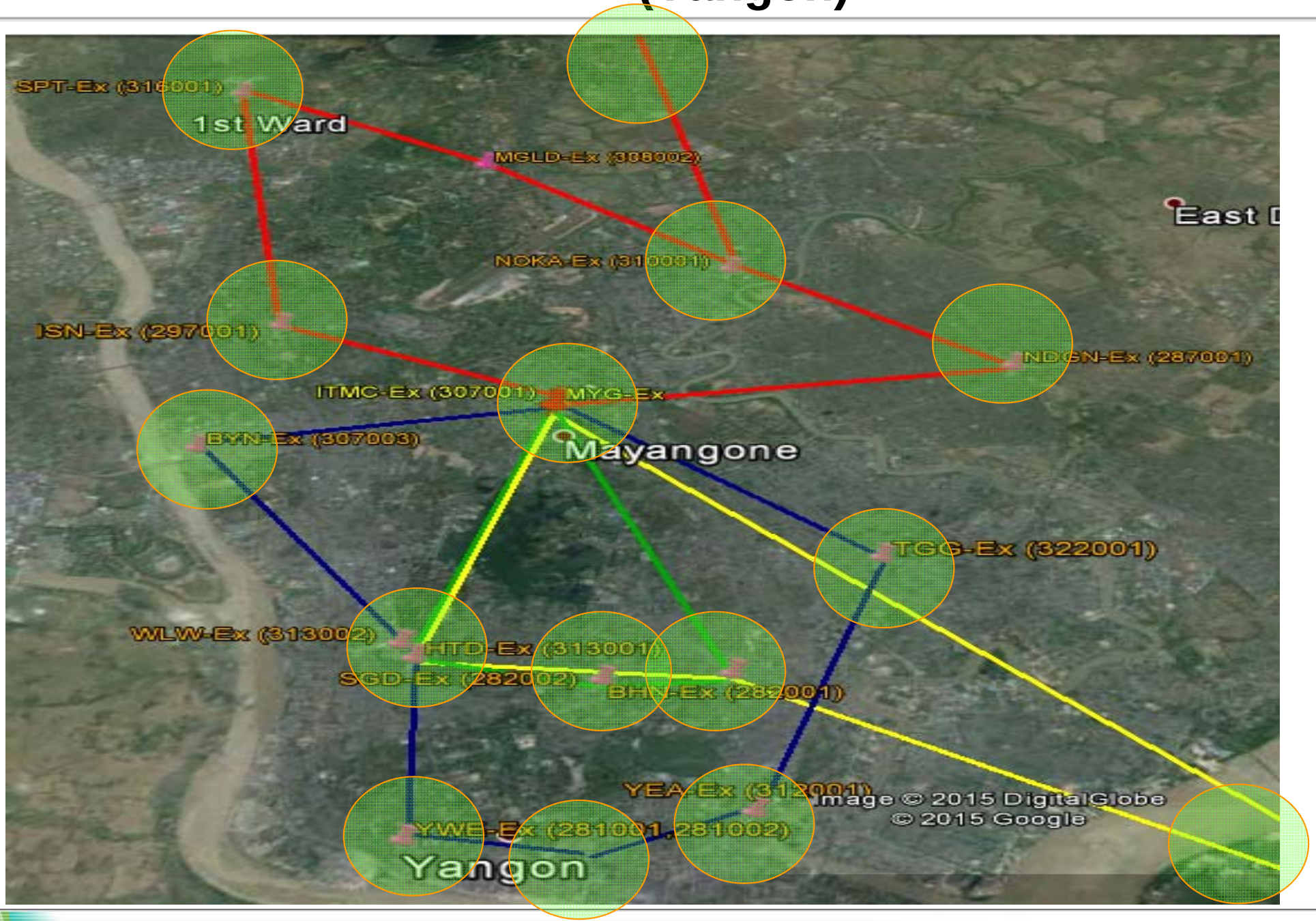
	Task Lists	SOW		
		MPT/KSGM	NEC	OSP
1	User Access Planning & Designing			
1.1	Identify User Location	M	S(Note)	-
1.2	Identify Fiber Route	M	-	-
1.3	Decide User's AN Location	M	S	-
1.4	AN Port Design	S	M	-
1.5	User Paths (User port to POP) Design (VLAN, PWE labels, etc.)	S	M(Note)	-
1.6	AN Parameter Design (L1, L2, MPLS-TP, Protection, QoS, etc.)	S	M	-
2	Metro Network Expansion			
2.1	Access Office Survey	S	M	-
2.2	ODF & Rack Installation	S	M	-
2.3	Indoor Fiber Laying & Termination	S	M	-
2.4	AN Capacity Expansion	S	M	-
2.5	Constructing 802.1ad Network	S	M	-
2.6	AN Commissioning	S	M	-
2.7	AN Acceptance Test	M	M	-
3	OSP Construction			
3.1	Access Fiber Route planning, Fiber Laying	S	-	M
3.2	ODB (an Exchange Site) Preparation	-	M	-
3.3	CPE to AN Connection	S	S	M
4	New POP SW Construction	S	M	-
4.1	POP Switch Installation	S	M	-
4.2	End User IP Configuration	M	S	-
5.	B2B User Provisioning Support Service			
5.1	Design and setup of Subscriber connection path	-	M(Note)	-
5.2	E2E (including last mile access fiber) connection Test for new users	-	S(Note)	M
5.3	Patch Cord Connection for users (excluding patching from old ODBs)	-	M(Note)	-
5.4	Cooperation to OSP, for new user connection	-	M(Note)	-

Note:
Within NEC's Provisioning support service period only.

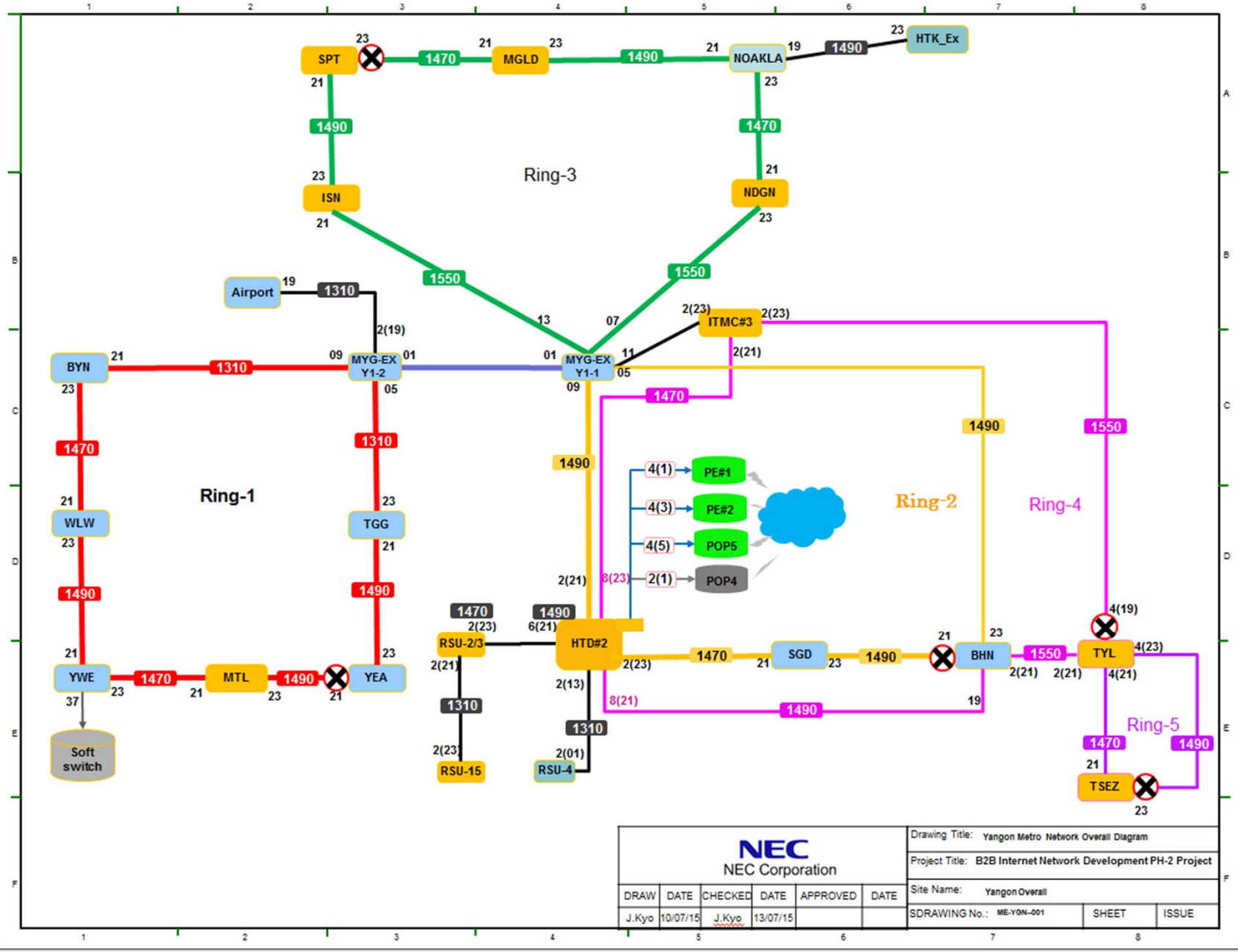
Organization Chart



Metro Ethernet Access Point Coverage Map After Phase-2 (Yangon)



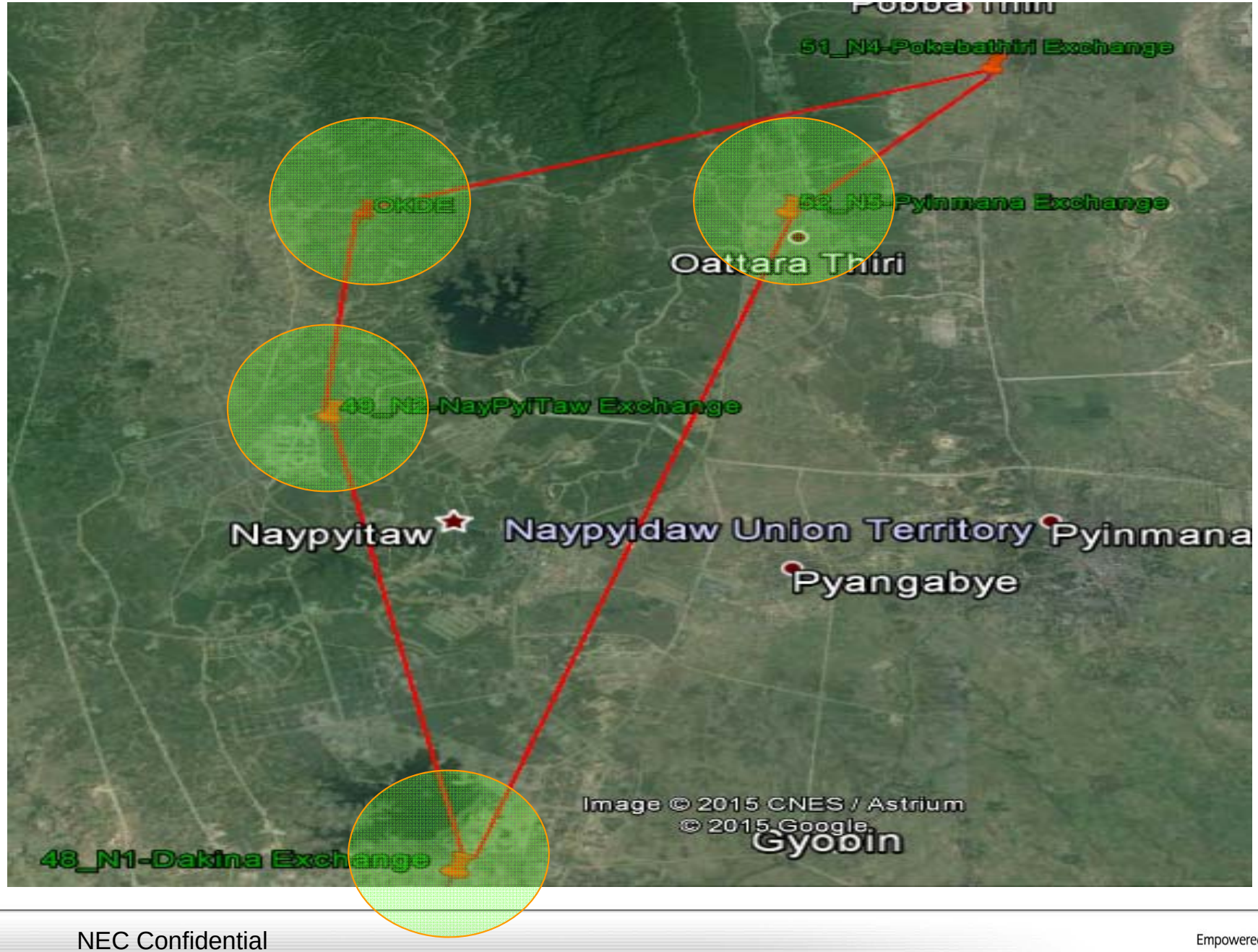
Yangon B2B Network (After Phase-2)



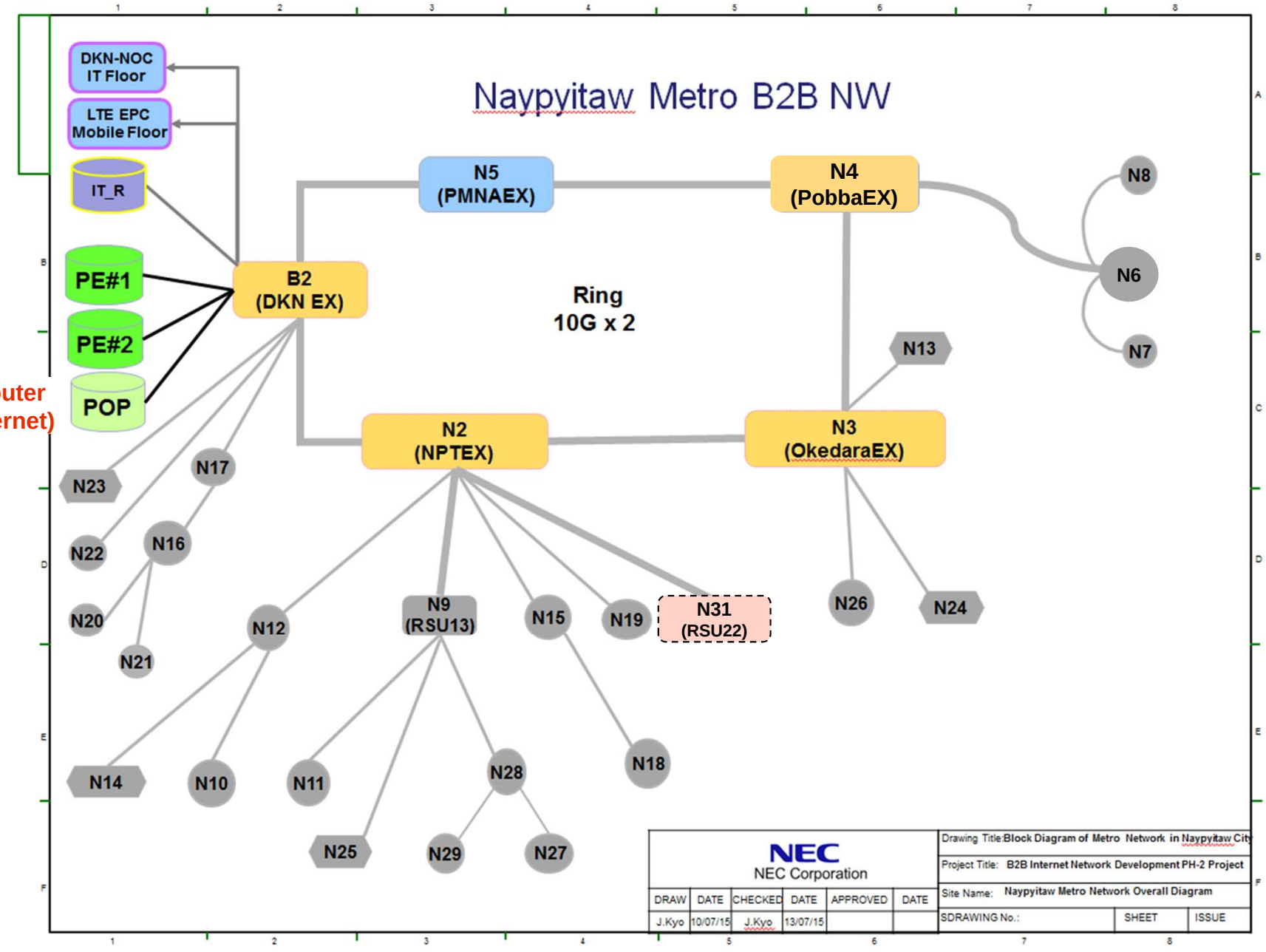
B2B Port Usage Lists (For Yangon)

No.	Exchange Name	1GbE Total	Yangon Metro 1GbE List												
			Total	Modules Mounted											Usable Ports
				Single Core SFP			*Two Core SFP*			*Electrical SFP*			Total In-Use	Total Idle	
				Total	*In-Use*	*Idle*	*Total*	*In-Use*	*Idle*	Total	*In-Use*	*Idle*			
1	MYG#2	10	5	1	1	0	4	4	0	0	0	0	5	0	5
2	BYN	32	32	20	3	17	12	3	9	0	0	0	6	26	26
3	WLW	29	29	20	0	20	9	0	9	0	0	0	0	29	29
4	YWE	32	32	18	6	12	10	9	1	4	4	0	19	13	13
5	MTL	154	154	128	22	106	26	24	2	0	0	0	46	108	108
6	YEA	32	32	19	3	16	13	7	6	0	0	0	10	22	22
7	TGG#1	22	20	19	0	19	1	0	1	0	0	0	0	20	22
8	TGG#2	10	10	1	1	0	5	5	0	4	0	4	6	4	4
9	Airport	10	10	0	0	0	10	4	6	0	0	0	4	6	6
10	MYG#1	10	6	2	2	0	1	1	0	3	0	3	3	3	7
11	SGD	32	32	20	0	20	11	10	1	1	1	0	11	21	21
12	BHN	32	32	20	3	17	11	10	1	1	1	0	14	18	18
13	HTD#2	110	110	93	14	79	17	8	9	0	0	0	22	88	88
14	HTD#1	10	3	0	0	0	3	3	0	0	0	0	3	0	7
15	RSU2-3	66	66	60	3	57	6	0	6	0	0	0	3	63	63
16	RSU4	22	21	19	3	16	2	0	2	0	0	0	3	18	19
17	RSU15	66	66	60	4	56	6	1	5	0	0	0	5	61	61
18	TYL	32	29	21	1	20	5	2	3	3	1	2	4	25	28
19	TSEZ	8	4	0	0	0	4	0	4	0	0	0	0	4	8
20	ITMC#3	66	62	51	0	51	8	2	6	3	3	0	5	57	61
21	ISN	32	27	20	3	17	7	5	2	0	0	0	8	19	24
22	SPT	32	28	20	1	19	5	2	3	3	0	3	3	25	29
23	MGLD	32	28	20	3	17	5	0	5	3	0	3	3	25	29
24	NOKLA	32	32	20	0	20	12	1	11	0	0	0	1	31	31
25	NDGN	32	29	20	2	18	7	4	3	2	0	2	6	23	26
26	HTK	22	22	20	0	20	2	2	0	0	0	0	2	20	20
	Total	967	921	692	75	617	202	107	95	27	10	17	192	729	775

Metro Ethernet Access Point Coverage Map After Phase-2 (NayPyiTaw)



NayPyiTaw B2B Network (After Phase-2)

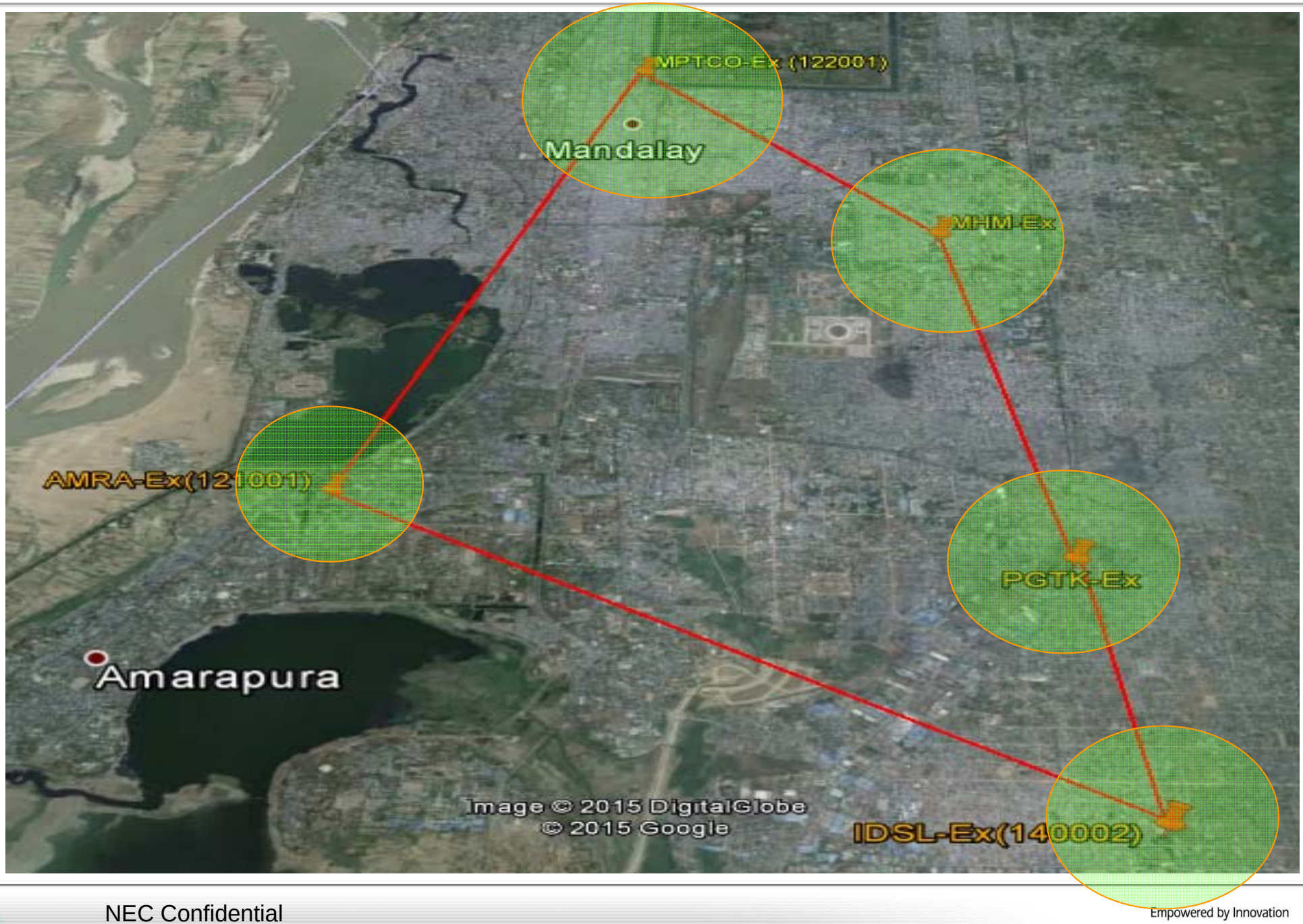


new POP Router (for B2B Internet)

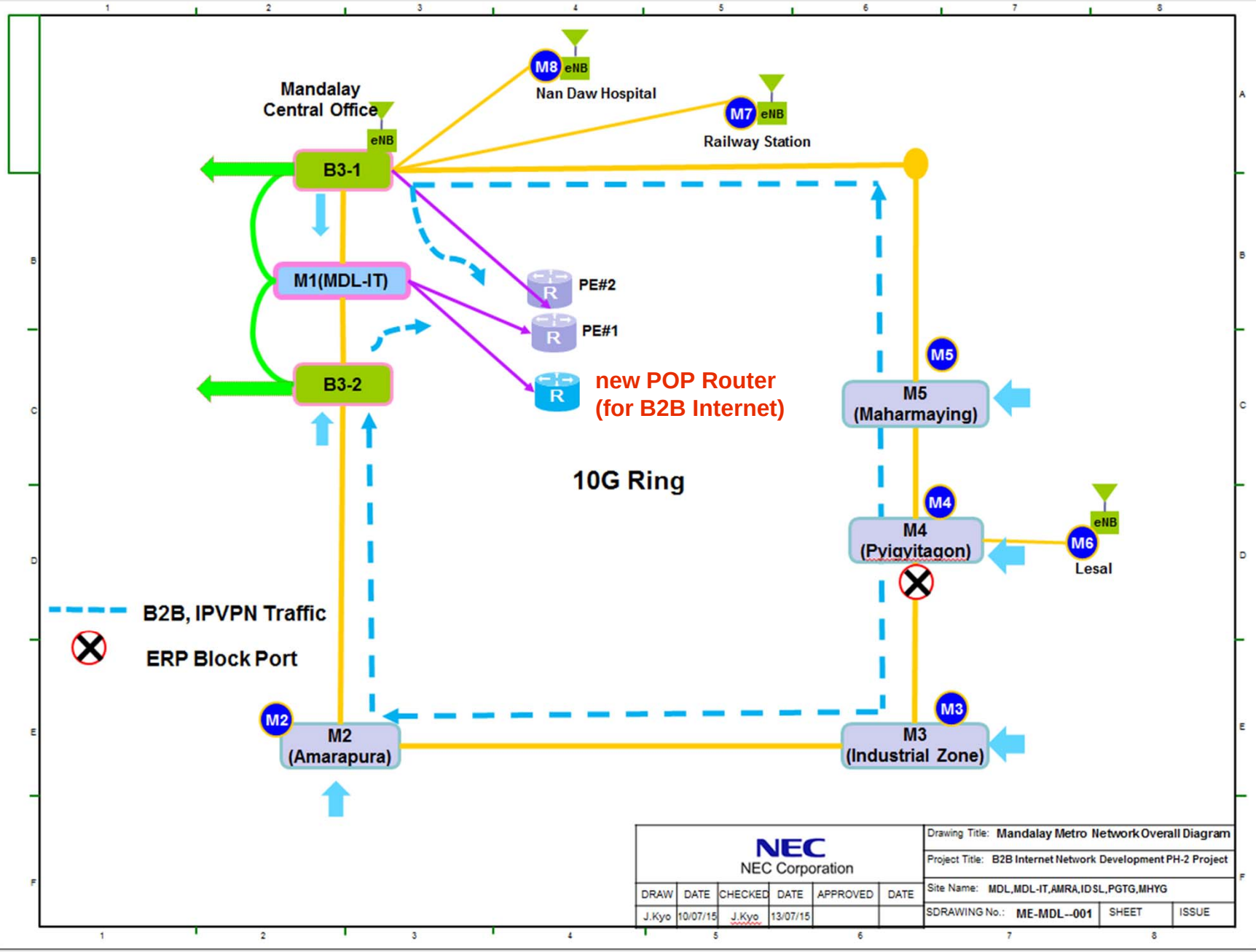
B2B Port Usage Lists (For NayPyiTaw)

No.	Exchange Name	1GbE Total	Naypyitaw Metro 1GbE List												
			Total	Modules Mounted									Total In-Use	Total Idle	Usable Port
				Single Core SFP			*Two Core SFP*			*Electrical SFP*					
				Total	*In-Use*	*Idle*	*Total*	*In-Use*	*Idle*	Total	*In-Use*	*Idle*			
1	DKN#1-1	10	10	0	0	0	5	4	1	5	3	2	7	3	3
2	DKN#1-2	32	31	20	0	20	6	0	6	5	1	4	1	30	31
3	N2-NPTE	32	32	0	0	18	10	6	4	4	1	3	7	25	25
4	N3-OKDE	32	32	18	0	18	9	2	7	5	0	5	2	30	30
5	N4-PKBE	10	10	0	0	0	5	1	4	5	2	3	3	7	7
6	N5-PMNE	1	1	0	0	0	0	0	0	1	1	0	1	0	0
7	N9-RSU13	10	10	0	0	0	5	5	0	5	0	5	5	5	5
8	N31-RSU22	32	31	20	0	20	6	0	6	5	0	5	0	31	32
	TOTAL	159	157	58	0	76	46	18	28	35	8	27	26	131	133
	Total	318	314	116	0	152	92	36	56	70	16	54	52	262	266

Metro Ethernet Access Point Coverage Map After Phase-2 (Mandalay)



Mandalay B2B Network (After Phase-2)



B2B Port Usage Lists (For Mandalay)

No.	Exchange Name	1GbE Total	Mandalay Metro 1GbE List												
			Total	Modules Mounted											Usable Port
				Single Core SFP			*Two Core SFP*			*Electrical SFP*			Total Use	Total Idle	
				Total	*In-Use*	*Idle*	*Total*	*In-Use*	*Idle*	Total	*In-Use*	*Idle*			
1	MDL#1-1	10	10	0	0	0	5	3	2	5	2	3	5	5	5
2	MDL#1-2	32	32	20	0	20	7	0	7	5	0	5	0	32	32
3	MDL_IT	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	M2-AMRA	32	32	20	0	20	7	0	7	5	0	5	0	32	32
5	M3-IDSL	32	32	20	0	20	7	0	7	5	0	5	0	32	32
6	M4-PGTG	32	32	20	0	20	7	1	6	5	0	5	1	31	31
7	M5-MHYG	32	32	20	0	20	7	0	7	5	0	5	0	32	32
	Total	170	170	100	0	100	40	4	36	30	2	28	6	164	164

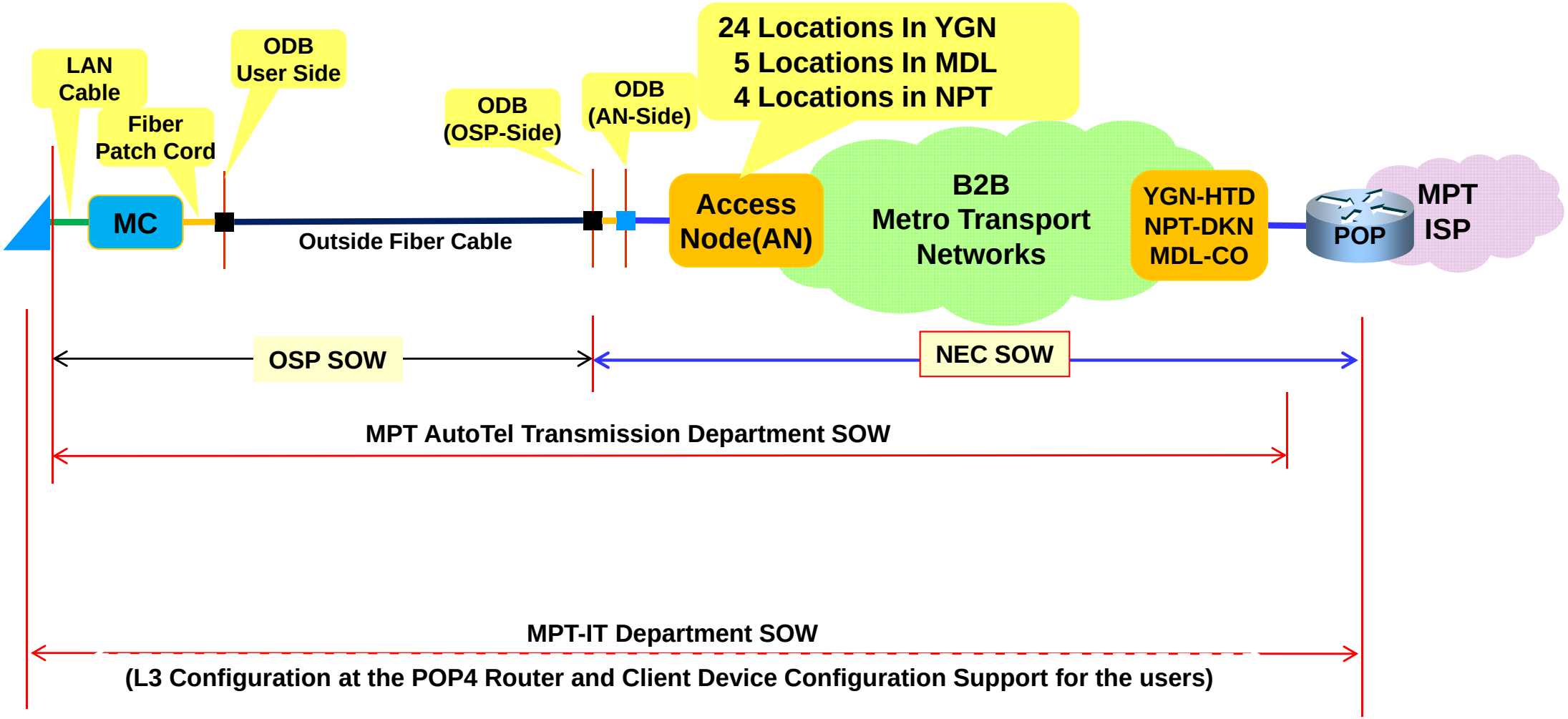
B2B Internet Service Provisioning Support

B2B Internet Service Provisioning Support SOW

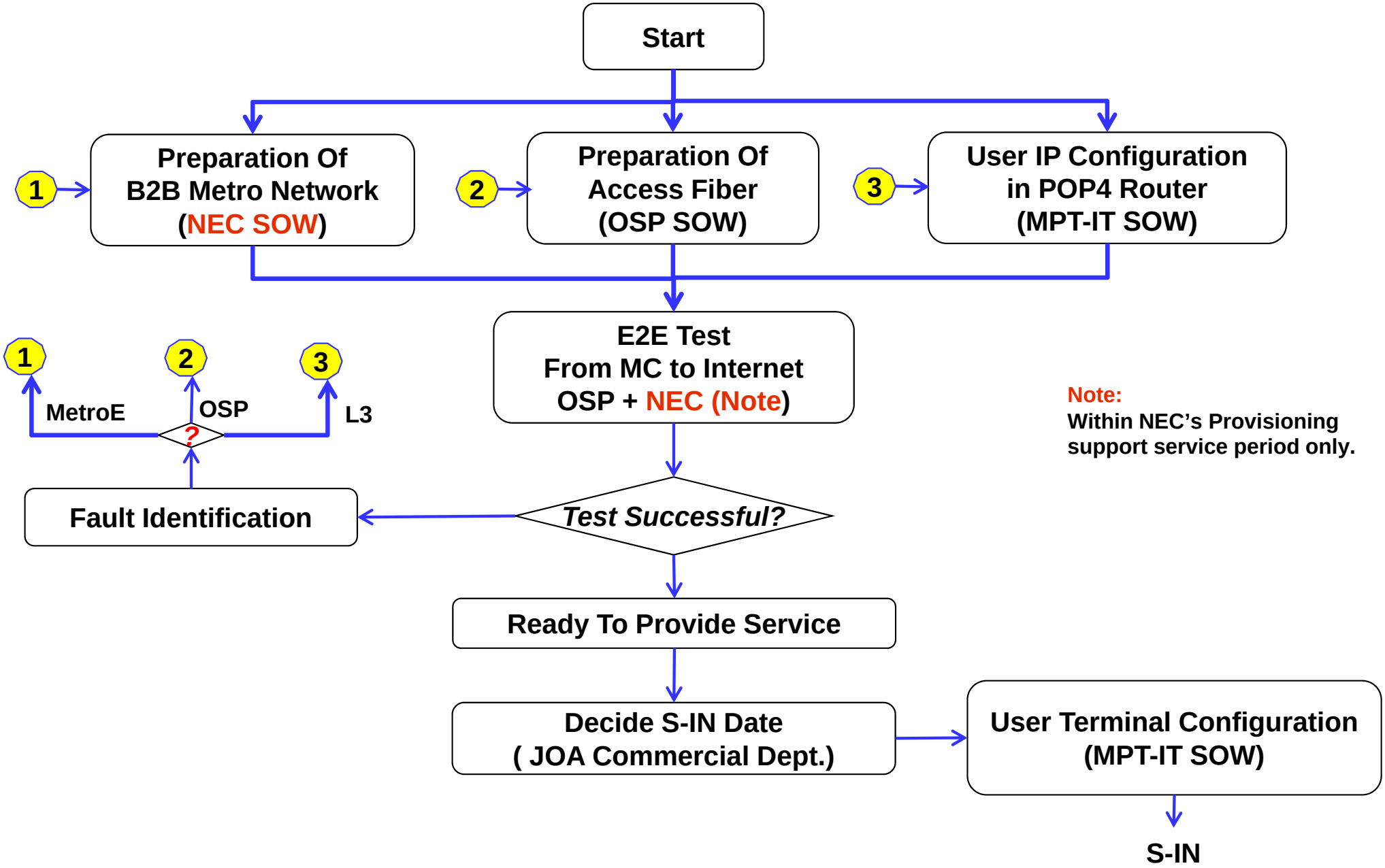
Scope of Work

1. **VLAN Assignment and Management**
2. **B2B Internet Service Paths design**
3. **B2B Internet Paths Configuration (From NMS)**
4. **B2B Internet fiber path connection including labeling (at the AN office)**
5. **Co-work with LSP for B2B internet E2E test and troubleshooting**
6. **Fiber Level Measurement and Data Collection**
7. **Updating of NE drawing and node management data.**

B2B Internet PH-2 Project SOW



Work Flows to Start B2B Internet Service (S-In)



B2B Internet Network Provisioning Support Service

		B2B PH-1	B2B PH-2	Total
No. of B2B Users		45	157	202
IP-VPN Users		0	6	6
P2P Ethernet Users		3	9	11
Total Configured Bandwidth(Mbps)	B2B	694	2,444	3,138
	IP-VPN	0	600	600
	P2P ETH	300	708	1,008
	Total	994	3752	4,746

Provisioning Training provided to MPT on;

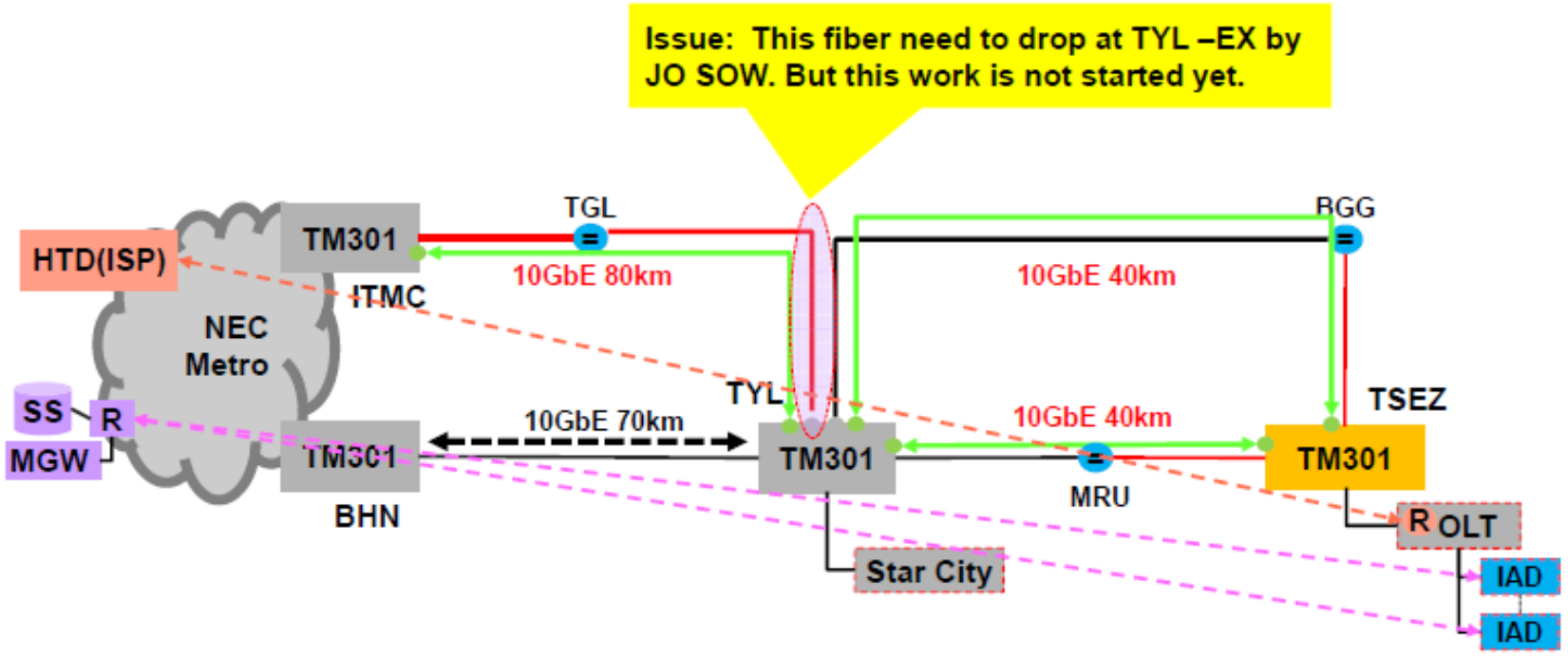
1. How to assign Users VLAN
2. How to configure B2B parts
3. How to connect and tests for B2Buser
4. How to measure and manage Fiber quality

MPT attendants: U Soe Win, U Aung Zin Moe, U Thet Lwin (one day)

Pending Item

Pending Item

Pending Item: TYL to HTD Backup link is not finished yet due to pending of OSP work (KSGM SOW)



Recommendations for Next Step

Recommendations

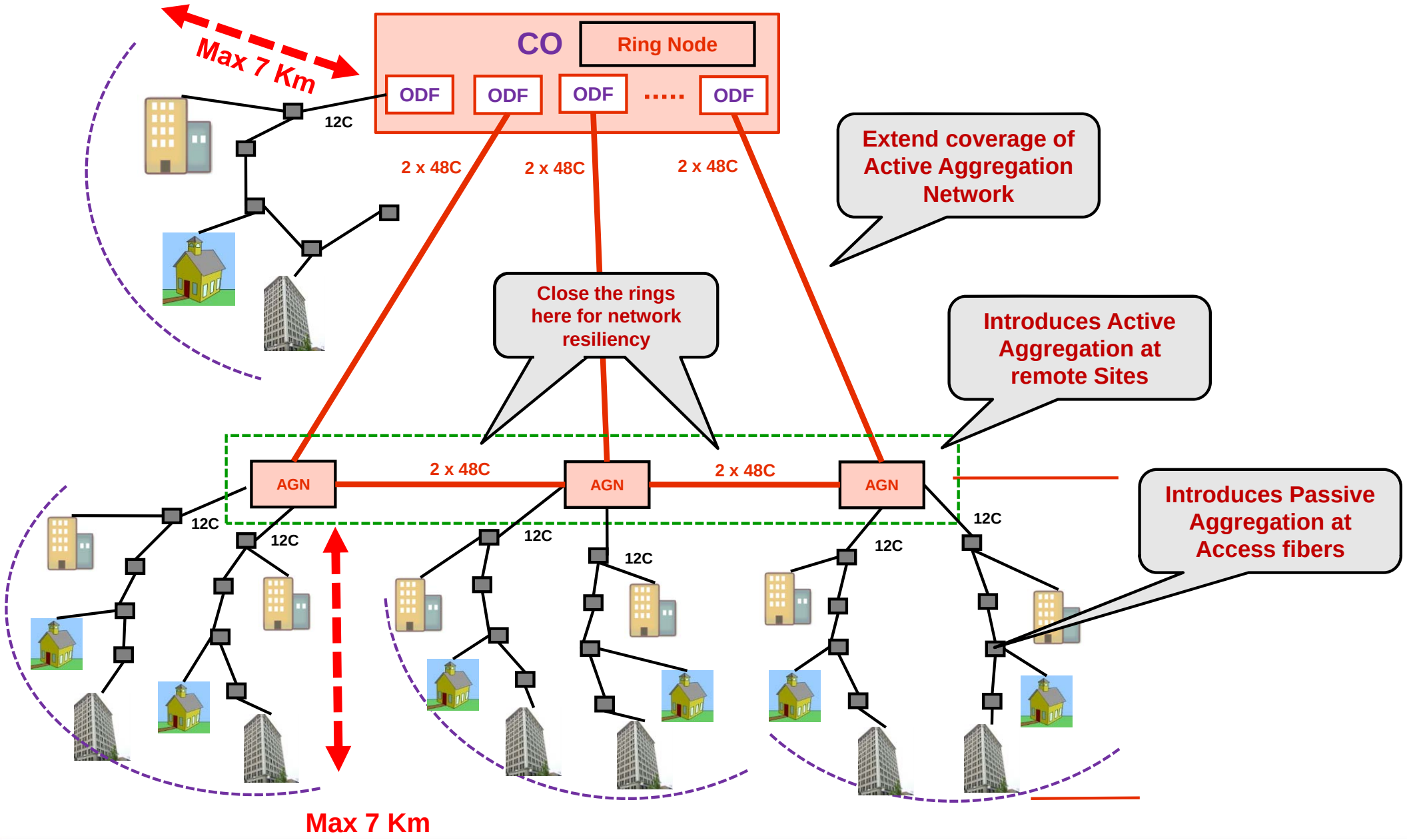
Issues

1. Need to improve quality of OSP fiber termination at ODF.
2. Need to reduce number of fiber cores terminating to main exchanges
3. Need to reduce last mile distance

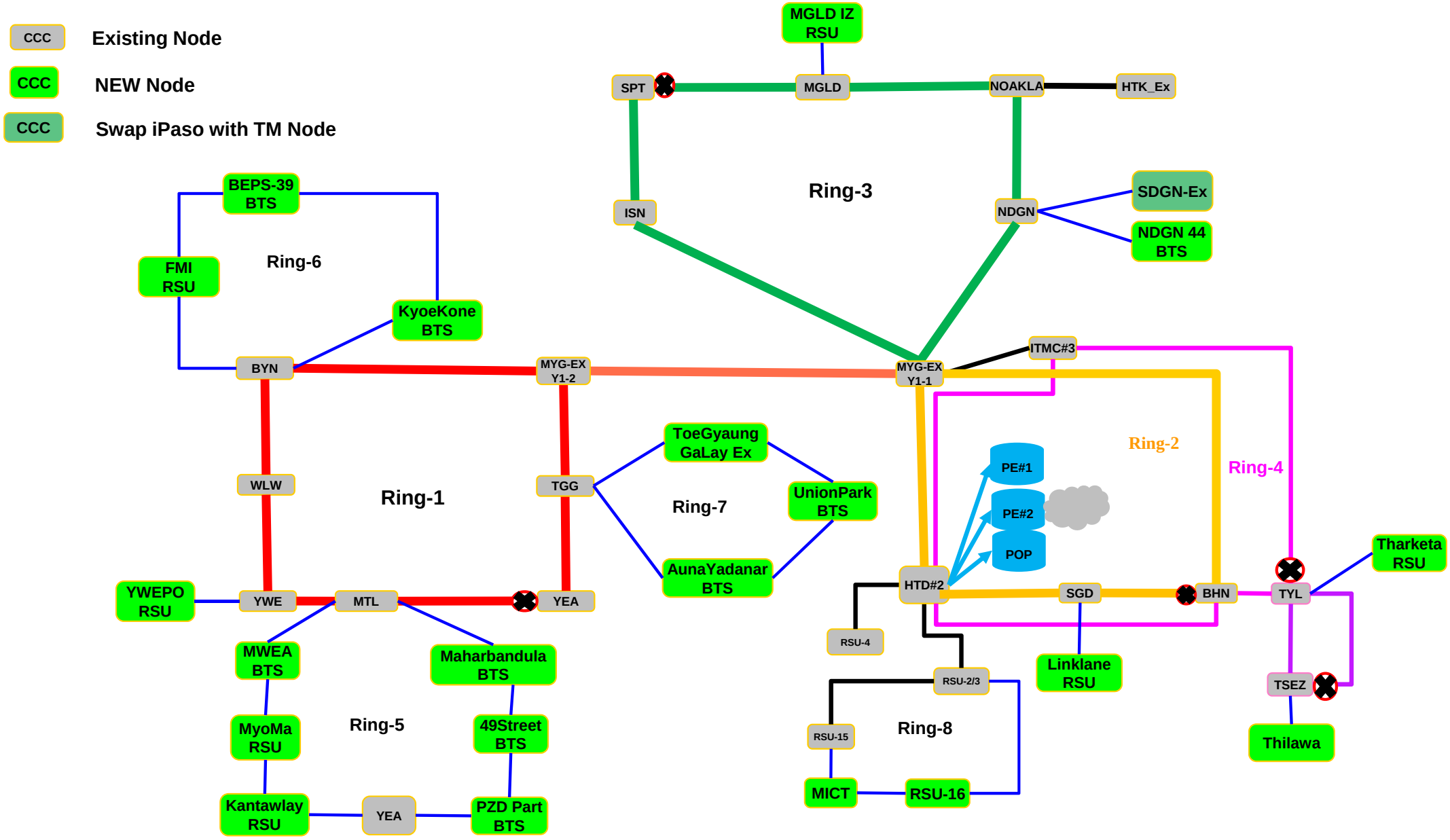
Solution Requirements

1. Need to improve OSP Quality control.
2. Introduce Passive aggregation and Active aggregation outside the main exchange
3. Need to expand B2B Access Points

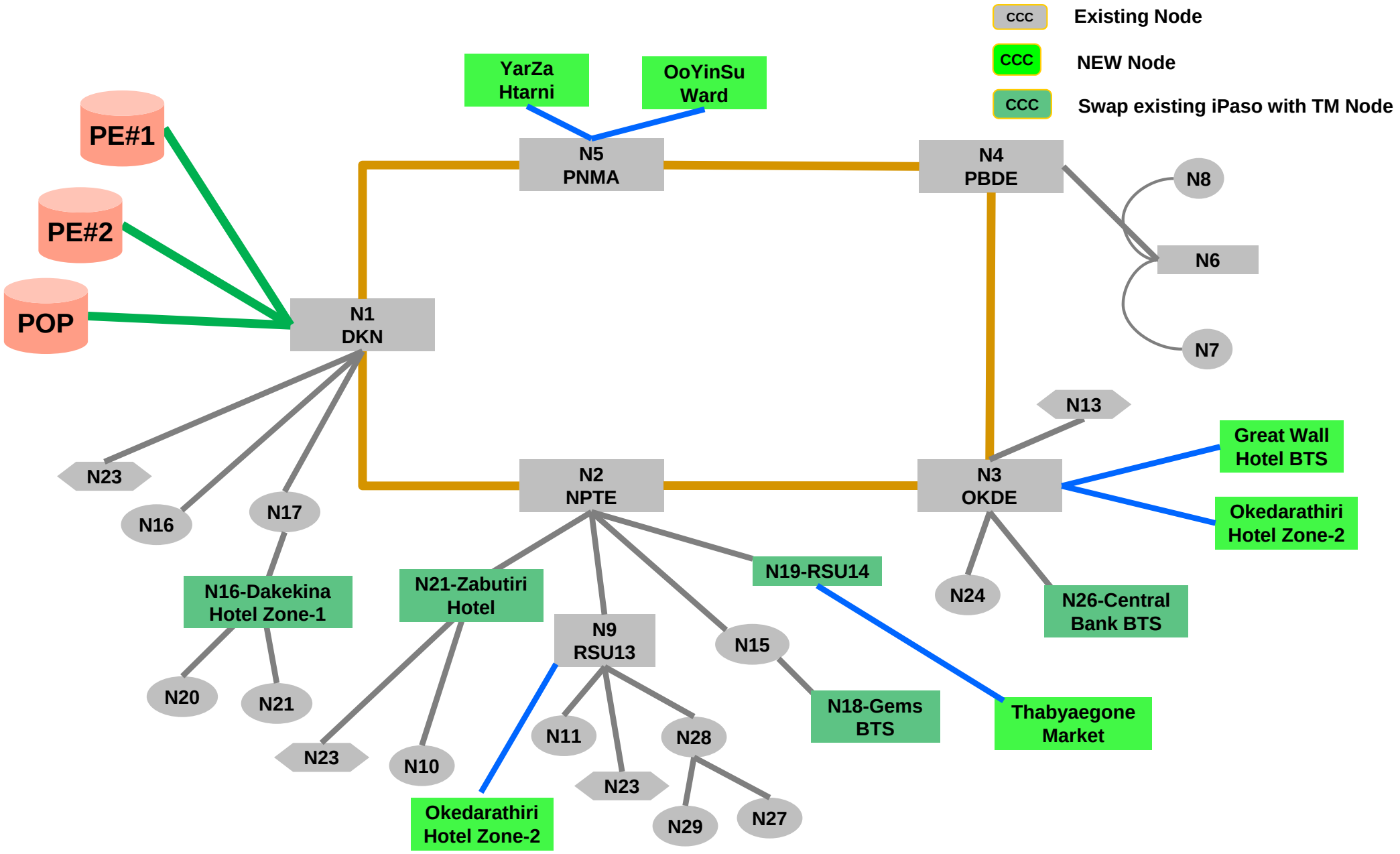
Passive + Active Aggregation Outside the Main Exchange



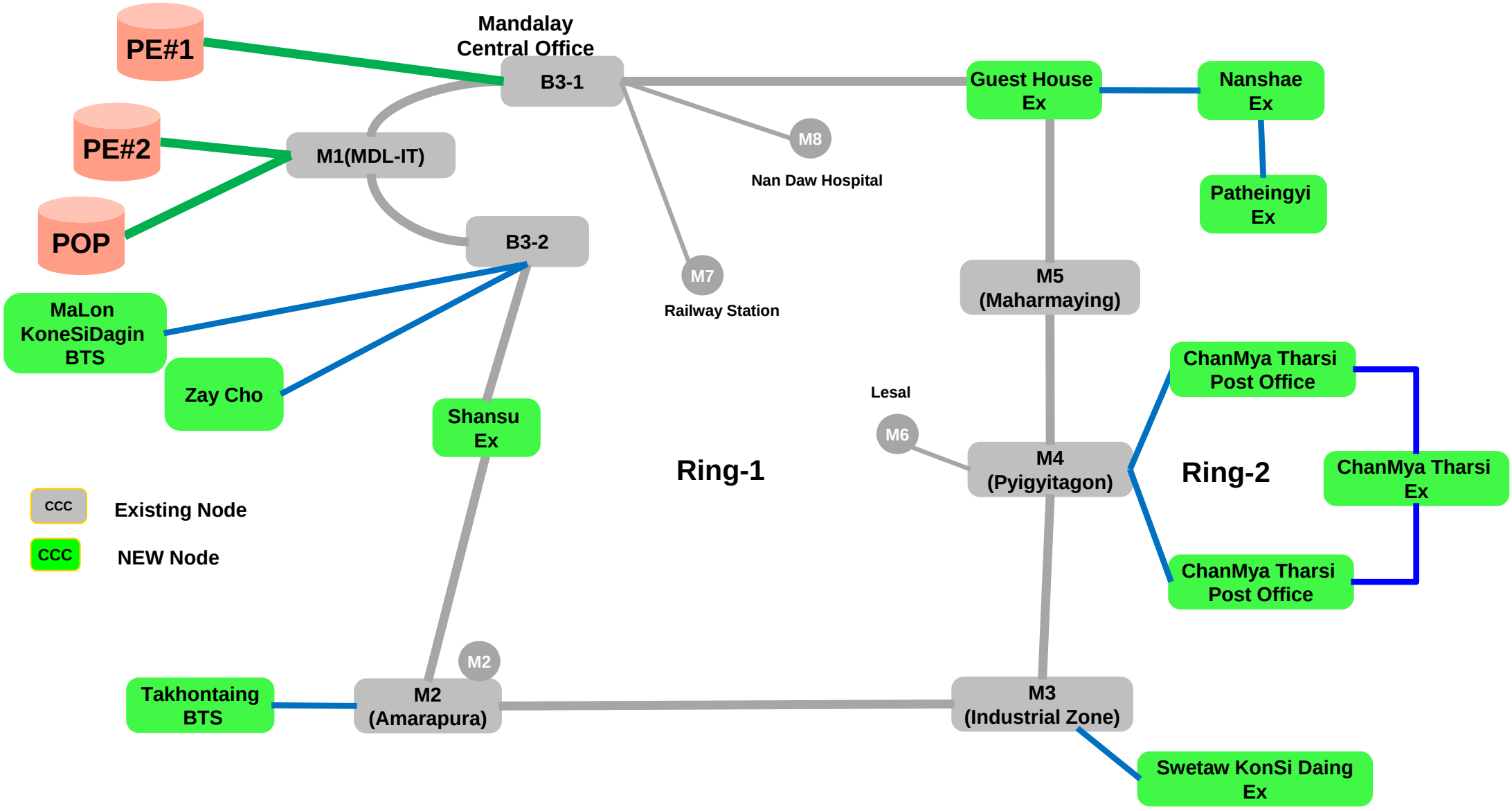
Access Area Expansion Proposal for Yangon Metro Ethernet



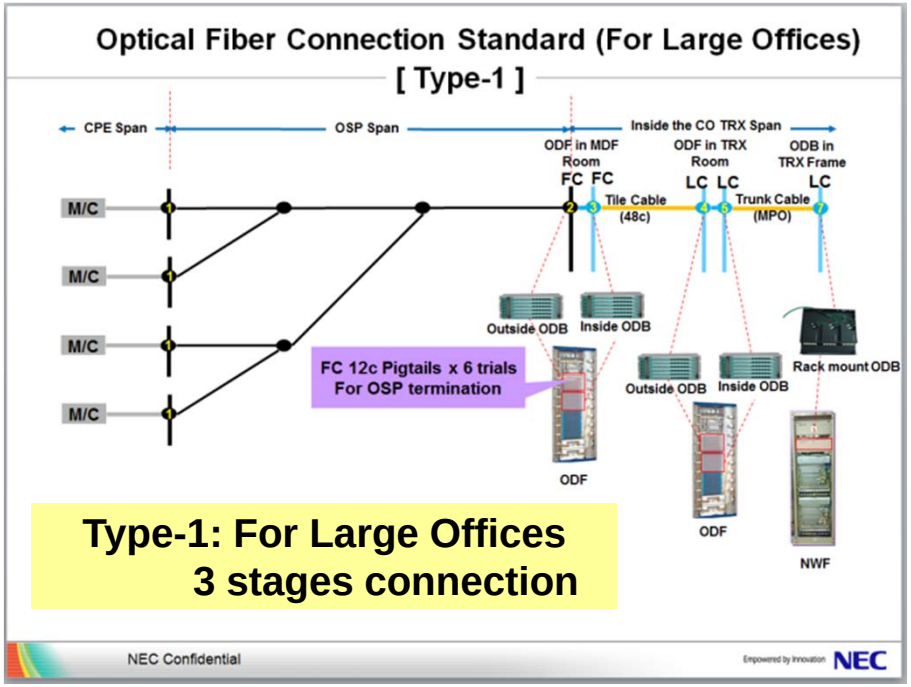
Access Area Expansion Proposal for NayPyiTaw Metro Ethernet



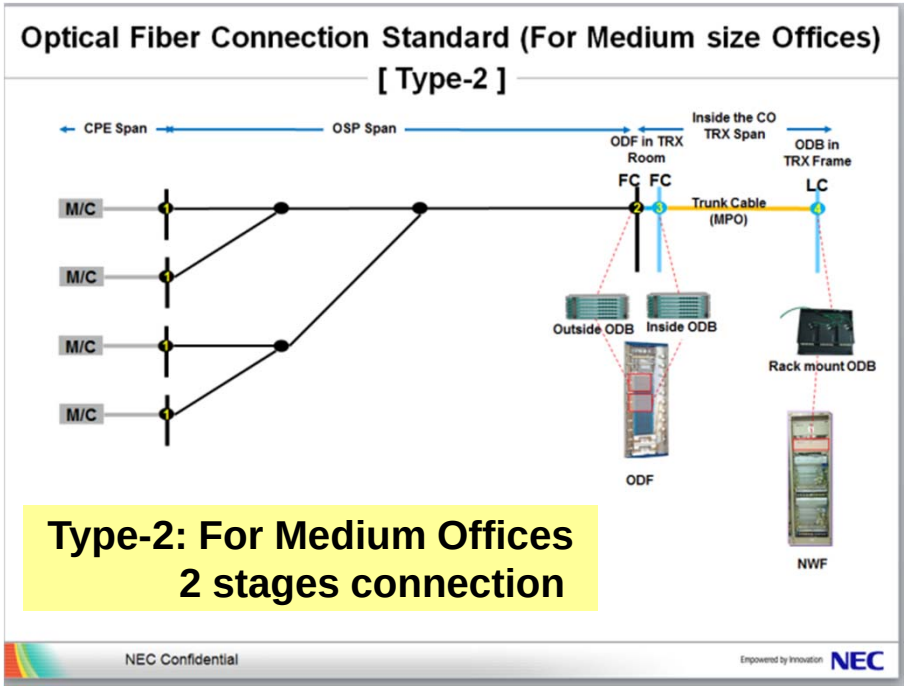
Access Area Expansion Proposal for Mandalay Metro Ethernet



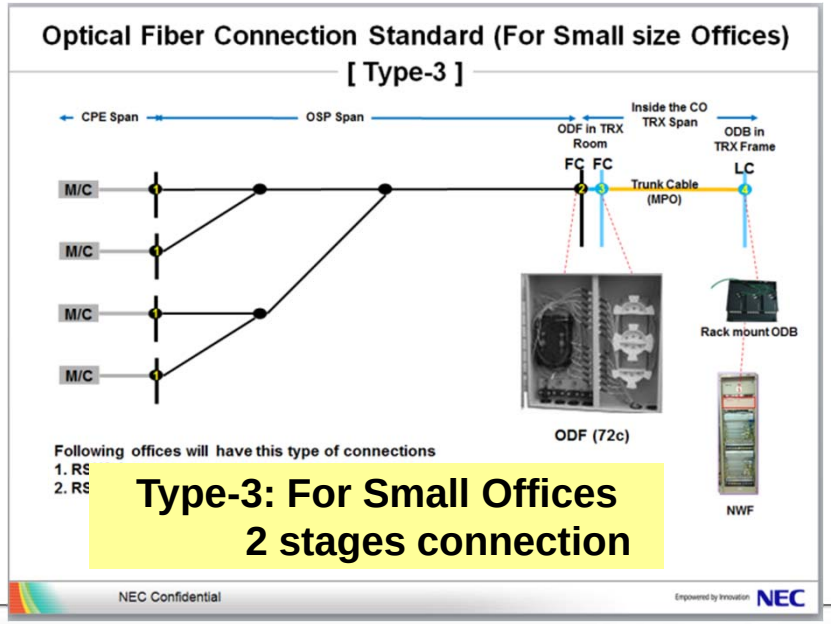
Current B2B Network Design (with 3 types)



Type-1: For Large Offices
3 stages connection



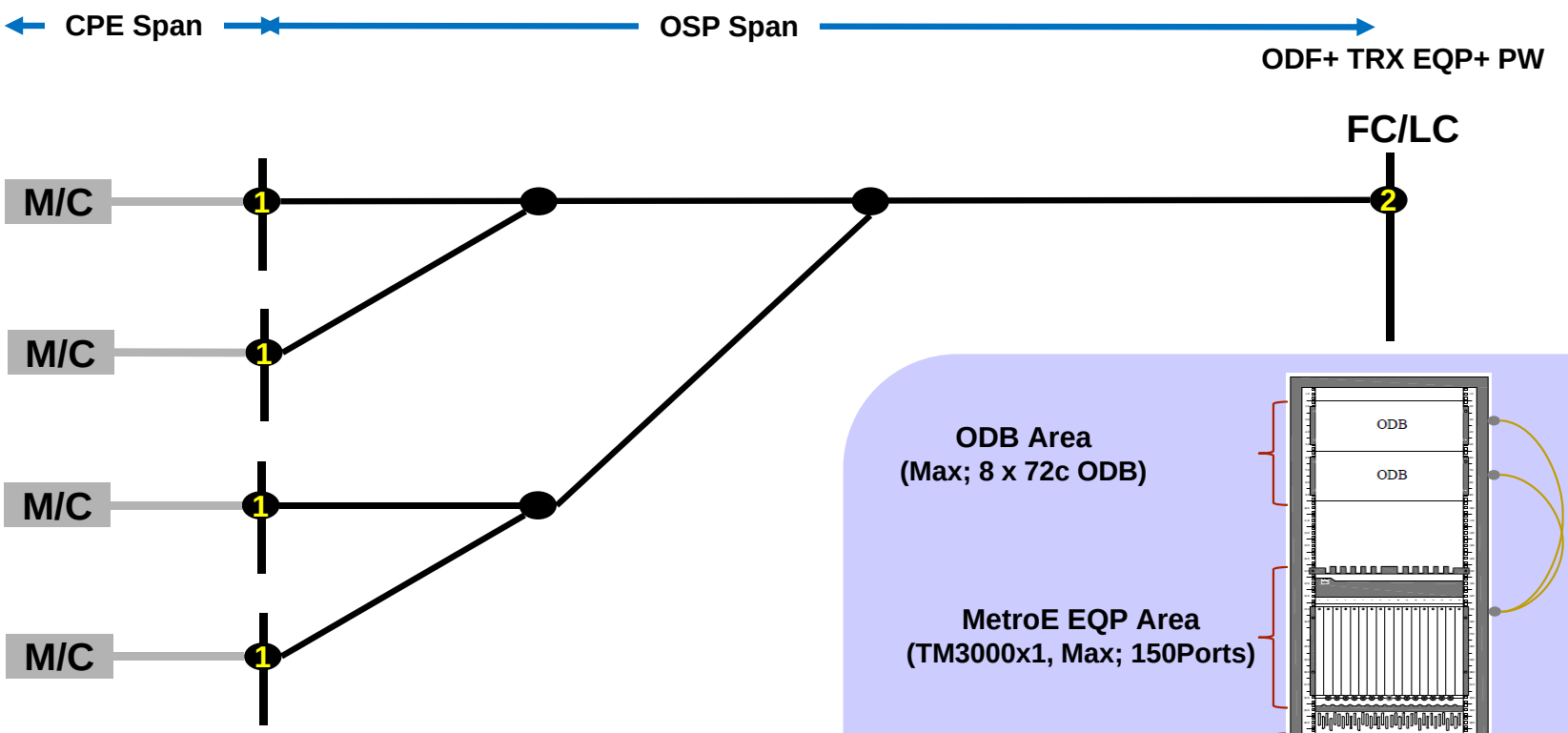
Type-2: For Medium Offices
2 stages connection



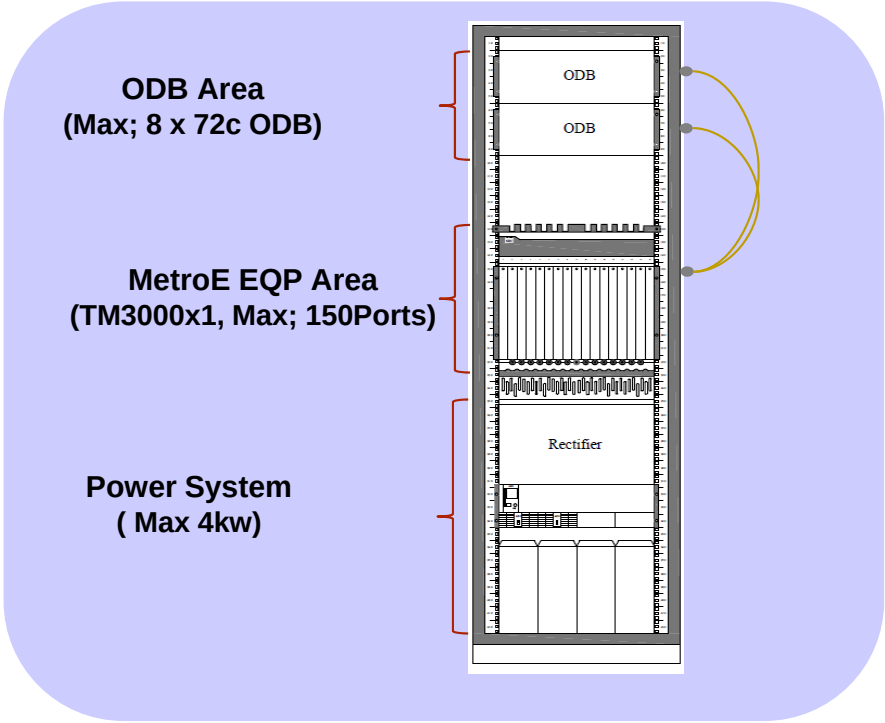
Type-3: For Small Offices
2 stages connection

All in one Active and Passive Aggregation Approach

[Type-4]



Introduce new all in one system for the small offices.



Thank you very much for your cooperation!