Welcome to
Next Generation Play Networks

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Next Generation Play Networks

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Next Generation Play Networks

What is Next Generation Play Networks Project?

- The broadband, voice, data & video etc services has been clubbed into a brand name "Next Generation Play Network".

- The access technology is GPON or GEPON over FTTH.

- 2.5Gbps downlink and 1.25Gbps uplink bandwidth available through GPON while 1.25 Gbps uplink and downlink simultaneous Bandwidth is available through GEPON.

- Single fibre will cater 32 customers with above B/W.

- 2 Million Customers planned in three phases upto 2010-11.

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What is Next Generation Play Networks Project?...

- 5.5 Lakhs customers proposed based on GPON.

- 1.5 Lakhs customers proposed based on GEPON.

- A -Grade nearly 28 cities have been planned on GPON .

- B- Grade nearly 77 cities have been planned on GEPON.

- Planning of customers Zone wise, State wise, Technology wise and nos. of Chassis city wise projected are listed in the presentation.

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Services Offered

- Basic internet Access Service controlled and uncontrolled from 256Kbps to 1000Mbps.
- TV over IP Service (MPEG2).
- Video on Demand (VoD)(MPEG4) play like VCR.
- Audio on Demand Service
- Bandwidth on Demand (User and or service configurable)
- Remote Education
- Point to Point and Point to Multi Point Video Conferencing, vertual classroom.
- Voice and Video Telephony over IP: Connection under control of centrally located soft switches.
- Interactive Gaming.
- Layer 3 VPN
- VPN on broadband
- Dial up VPN Service
- Virtual Private LAN Service (VPLS)

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Solution Architecture

- **The solution shall provide any service on any device connected to any Optical Network Terminal (ONT) port.**
- **The traffic shall be prioritized (by OLT/ONT for upside and by Broadband Network Gateway (BNG) for down side).**
- **The priority shall be carried across the network by one to one mapping.**
- **The connectivity of different solution components shall be over FE/ GE/ 10 GE interface.**
- **Access nodes (AN); GPON / GEPON OLTs , Metro aggregation unit (MAU)** , Back end applications (EMS, SSSC, SSSS etc.).
- The distance between GPON OLT and HONT shall be upto 20 Km depending.
- Four cascade splitting can be achieved subject to link margin.
- **Voice and video telephony over IP**: MPLS PE Routes of NIB-II shall put the traffic belonging to these services into VPN for VoIP. All call setup messages shall be routed to softswitch of BSNL first. The procurement of the soft switch and media gateways are not in the scope of the current tenders.

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Project Execution

- **Project Circles:**
  - Installation of GPON/ GEPON Chassis and accessories
  - EMS.
  - FDMS/ ODF/ FDF
  - OAN Cables, Leading Cables, Termination Box,
  - Splitters
  - LAN Switch/ Routers,
  - Competition of Acceptance and Testing
  - Handing Over to respective territorial circle
- **Supplier:**
  - Integration of Services to NIB-II and BNG in coordination with respective project circle.
  - Network Elements (GPON/ GEPON/ LAN or Routers) integration with EMS and NMS at Pune and Banglore in coordination with respective project circle.
  - EMS integration with NMS at Pune and Banglore in coordination with respective project circle.
  - AMC for 5 Years
- **Territorial Circles:**
  - **Space provisioning, Power supply provisioning for GPON/ GEPON Chassis, FDMS etc**
  - Installation of HONT at customer primness.
  - Installation of Pluggable Drop Fibres (Pig Tails)
  - Marketing.
  - Customer facilitations etc.
  - Maintenance of all project equipment.
- **BSNL CO:**
  - **Tendering**
  - **Ordering**
  - **Monitoring**

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Project Status as on Date 31.08.2008

- Tenders for First phase has been opened and is under evaluation.
- There will be 3 suppliers selected from the tender and M/s ITI for RQ in GPON.
- There will be 2 suppliers selected from the tender and M/s ITI for RQ in GEPON.
- APOs / POs are expected from the November 2008.
- APOs/ POs on M/s ITI may be issued in September 2008.
- Supply expected from February 2009.
- The Supply of GPON from M/s ITI may start from November / December 2008.

Space Planning of GPON / GEPON Equipments

- One GPON / GEPON Chassis and its accessories will be accommodated in one ETSI Standard Rack.
- LAN switch may be accommodated in same GPON / GEPON rack or in separate rack.
- One GPON Chassis will support 320 customers
- One GEPON Chassis will support 640 customers.
- Number of customers per city for GPON and GEPON are planned for phase-I and annexed below.
- The GPON / GEPON racks are preferably collocated in the exchange equipment.
- Preferably separate racks row shall be provisioned for GPON / GEPON to accommodate future expansion.
- GPON / GEPON racks shall be planned based on customer concentrations in an exchange area.
- Preferably FDMS shall be planned in the OAN cable termination room. FDMS may be planned in opposite site of the GPON / GEPON Row. FDMS may be planned in FDF/ transmission room or exchange MDF room.
- The GPON / GEPON racks are of ETSI standard and FDMS rack as per FDMS GR.
- Lay out diagram shall be prepared by the concerned GMTD territorial Circle and submit to the concerned DGM Project.

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Power requirement

- Based on number of GPON/ GEPON racks planned in an exchange, power requirement shall be accessed by the project circle and intimated to territorial circles well in advance. Project shall not be delayed due to inadequate power availability.

- Nominal power supply requirement is –48V DC for GPON / GEPON.

- The actual power rating/ consumption to be furnished by the manufacturer on the equipment.

- The H-ONT shall be AC powered at 230V and 50Hz with 4 hours battery backup .

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Main Components:

1. **GPON / GEPON Chassis.**
   - GPON Chassis can support 320 customers on ring protection.
   - GEPON Chassis can support 640 customers.
   - FDMS / ODF / FDF
   - OAN Cables (96F or 288F)
   - Leading Cables (12F / 24F)
   - Fibre Termination Box (FTB)
   - Splitters (2:16, 2:32, 1:16, 1:32 etc)
   - Average 100m pluggable pig tail as drop fibre per customer.
   - HONT (Home Optical Network Termination) at customers premises.
   2. (RPR LAN switch or VPLS Routers) Optional

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Basic Architecture

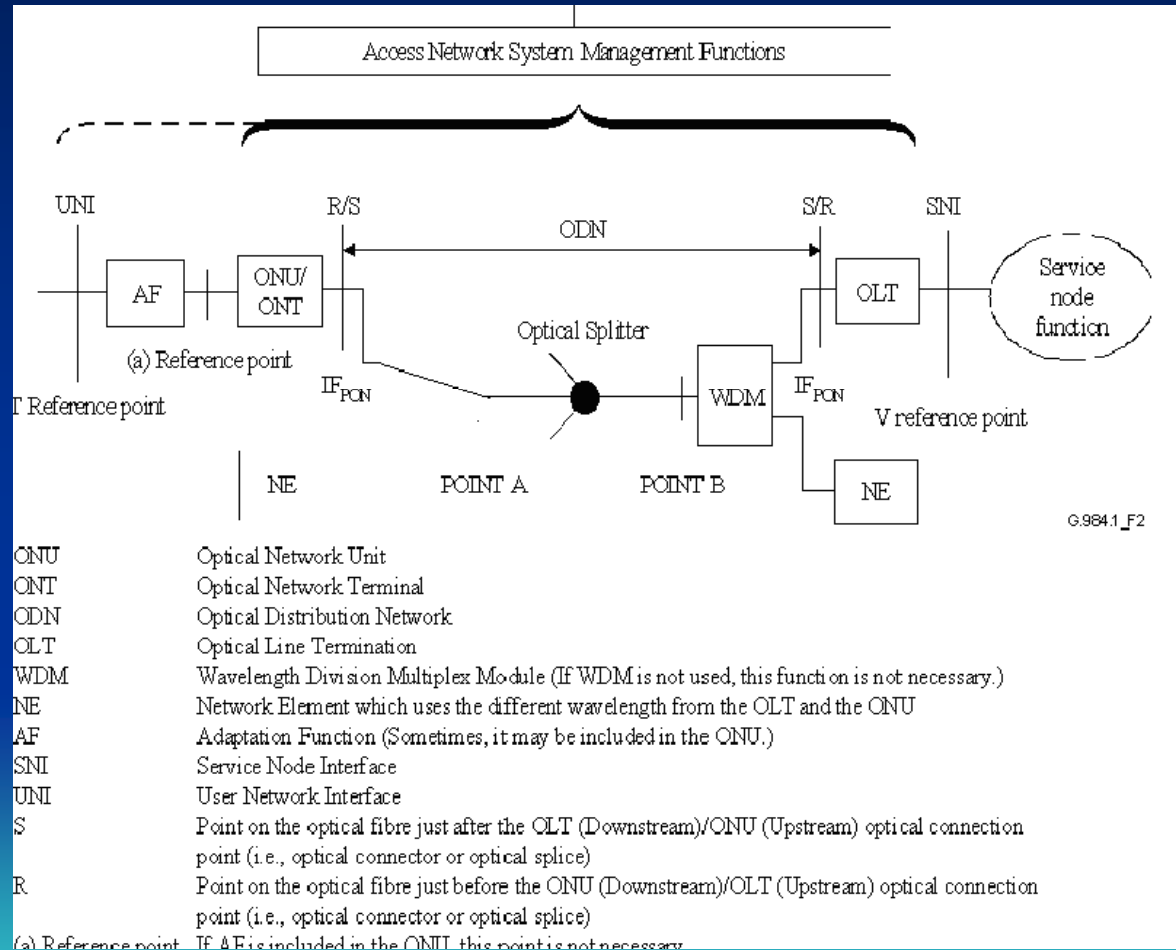Basic passive-optical-network architecture
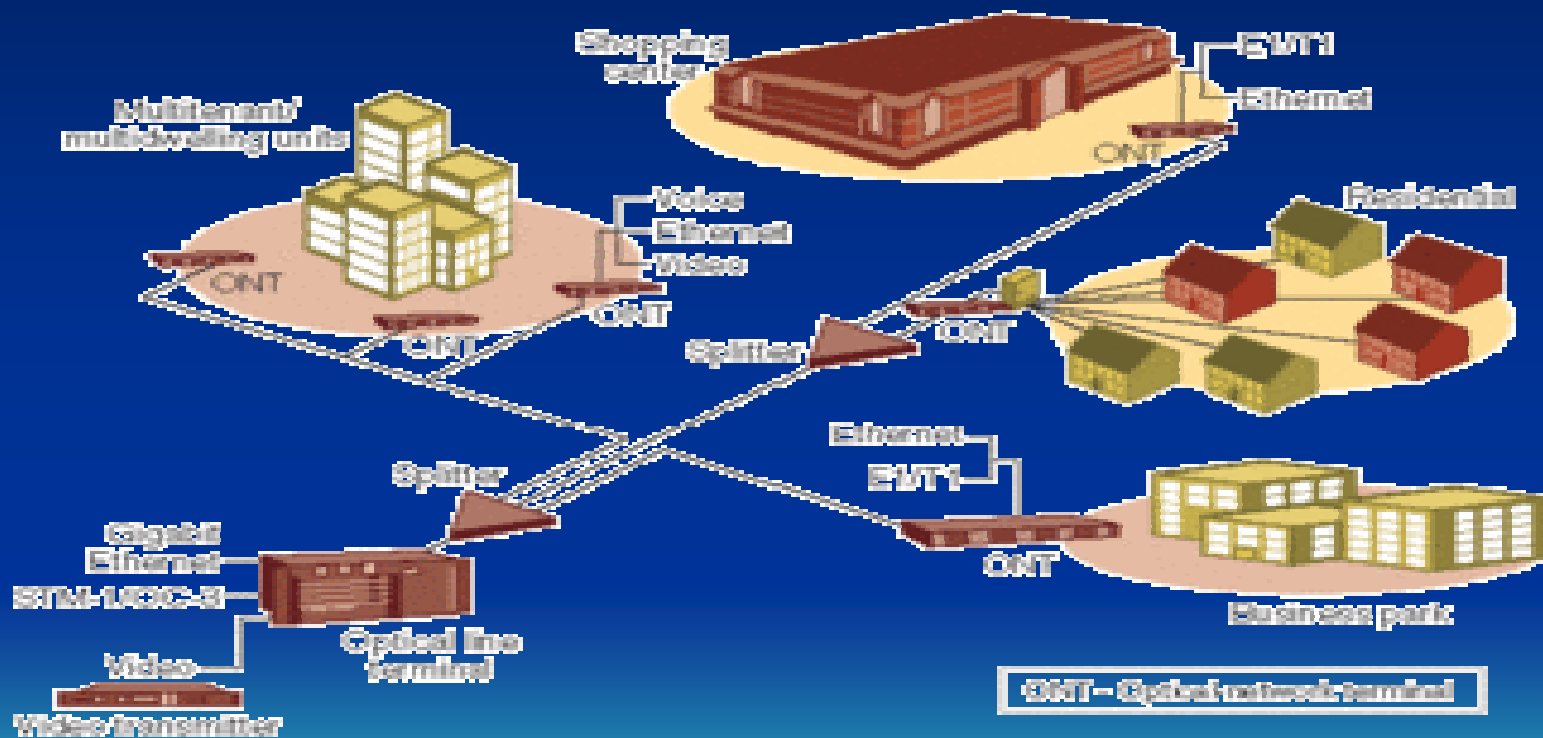
Core network Infrastructure
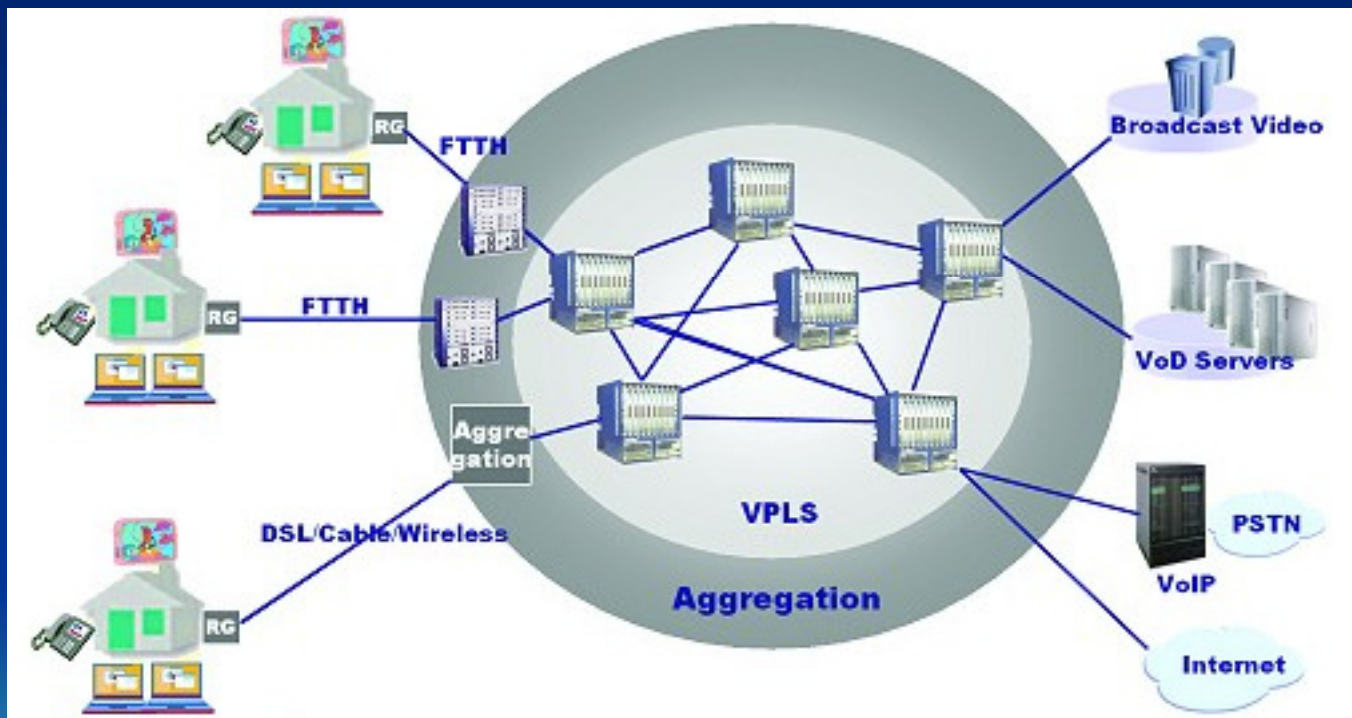
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Network Architecture

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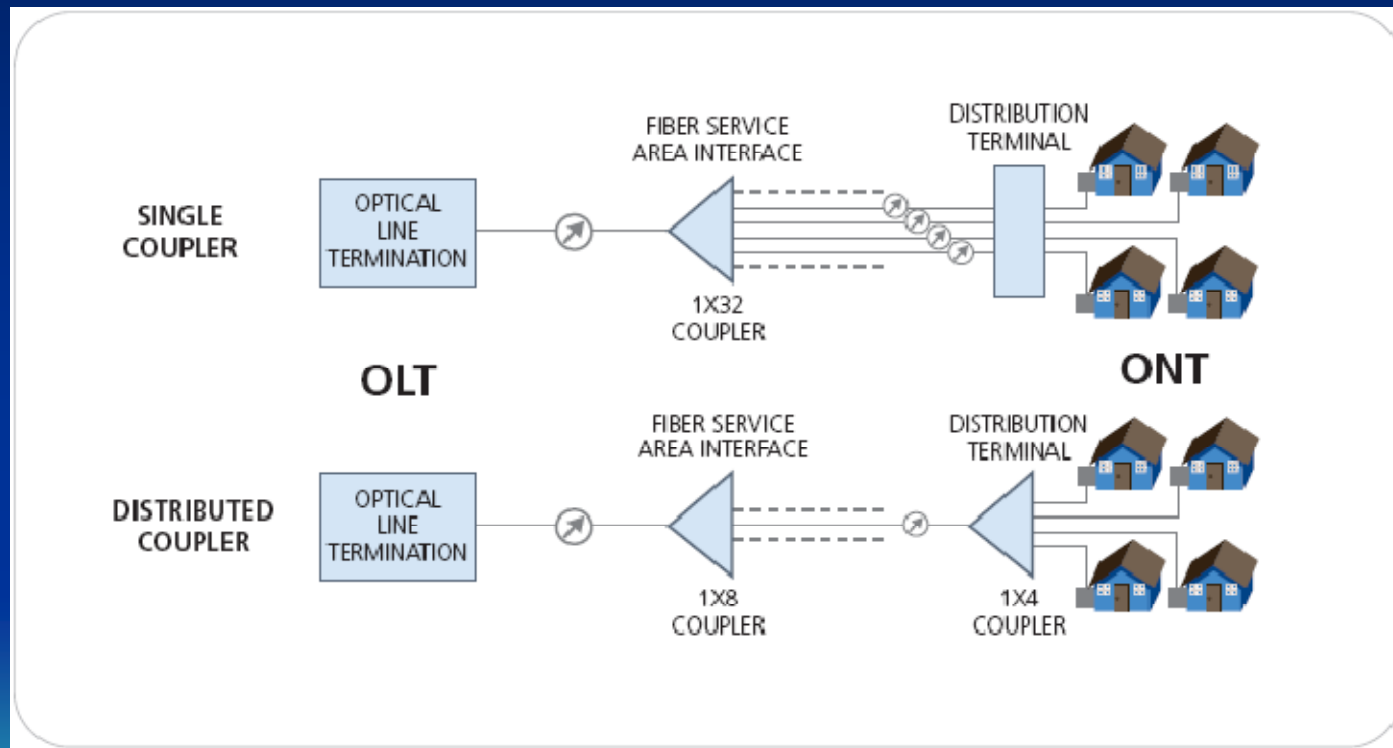
Splitting

Cascade splitting in GPON

(B)   Passive Optical
...etwork

Passive
optical
splitter

CO

N subscribers
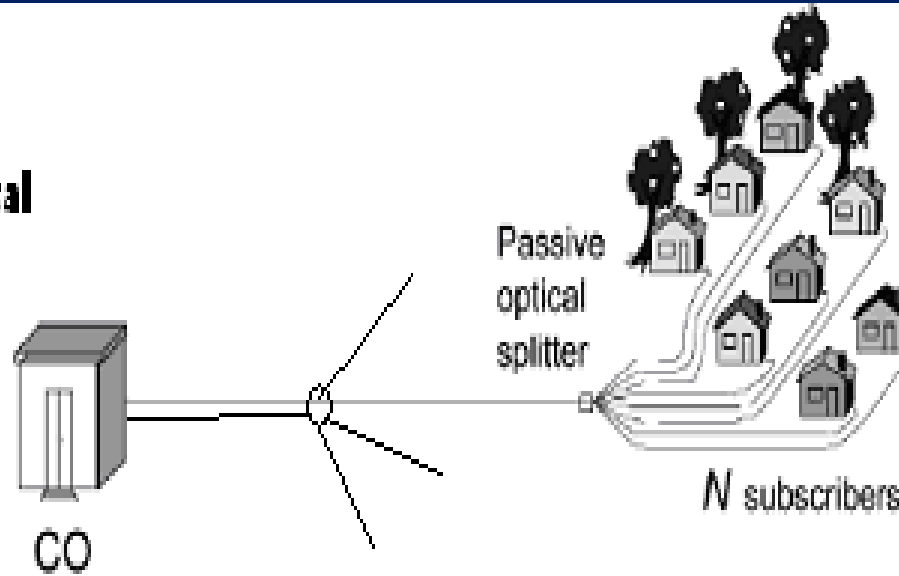
2 Fibre Transceivers for 2:4 split cascade to 1:8 Split
in each.

Cascade splitting in GEPON

D   Passive Optical Network

Passive optical splitter

CO

N subscribers
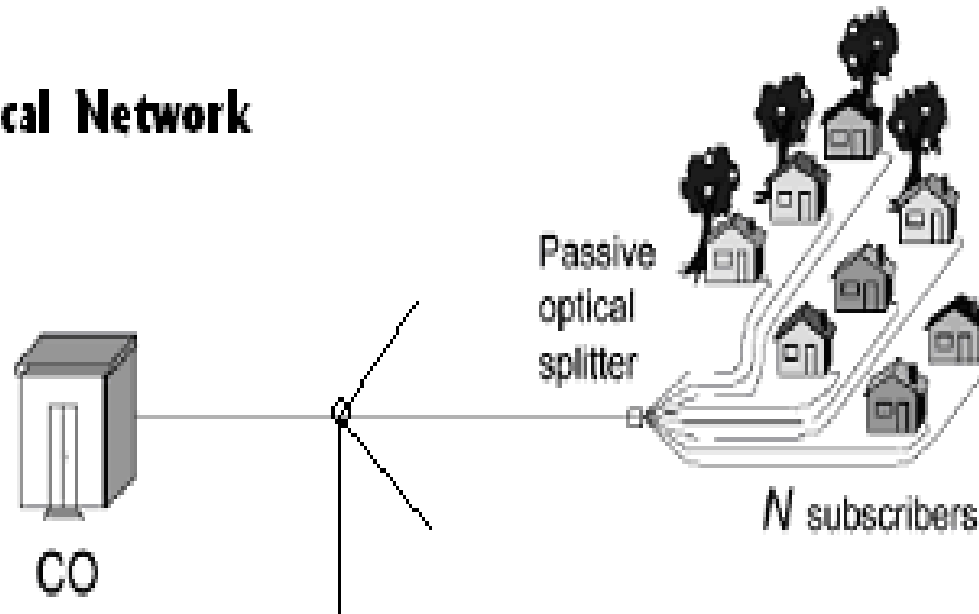
1 Fibre Transceiversfor 1:4 cascade to 1:8 Split each in GEPON

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Equipment design aspects….

1. **OLT** (Optical Line Termination) now called GPON/ GEPON Chassis.

  – Central offices (in exchange location) rack mounted chassis with (10 +10) (PON) Passive Optical Network Ports in case of GPON capable of supporting 320 customers on ring in redundancy.

  – CEPON chassis having 20 PON Ports capable of supporting 640 customers non protected.

  – These equipments will work on -48V DC.

2. ONTs:

  a)   At the customer end the ONTs shall be pizza box type.

  b)   The power input for ONT is 230V AC type with power back for 4 Hrs

  c)   4 Ethernet ports and 2 POTS.

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Equipment design aspects….

3. <u>PON Splitters</u> :

A) For GPON: 2:4, 2:8, 2:16, 2:32.

2 Stands for two input fibres two ends of the ring.

B) 4, 8, 16, 32 out ports of the splitters.

2:4 and 1:16 or1:8 splitters may be in cascade.

C) The Optical power budget is an important consideration.

D) OLT (GPON/GEPON) to ONT distance is upto 20Kms.

Equipment design aspects..

4. RPR LAN or VPLN Router Switch:

– High end 340GB back plane capacity.

– On average 5 LAN switches will form a 10G ring.

– Aggregate LAN switch one among 5 will be connected to Multiplay BNG / NIB-II.

– 4 to 5 GPON/ GEPON Chassis's in star will be connected to each LAN switch with 10G or 1G Ethernet media.

– Instead of LAN switch, Router may be supplied.

Equipment design aspects….

5. EMS for GPON/GEPON

6. EMS for LAN/ Router switches

Integration:

EMS integrations with Network element will be carried out by respective GPON / GEPON suppliers.

7.   Management and service provisioning in PONs:

a) Both the OLTs and HONTs are manageable locally as well as from a remote site.
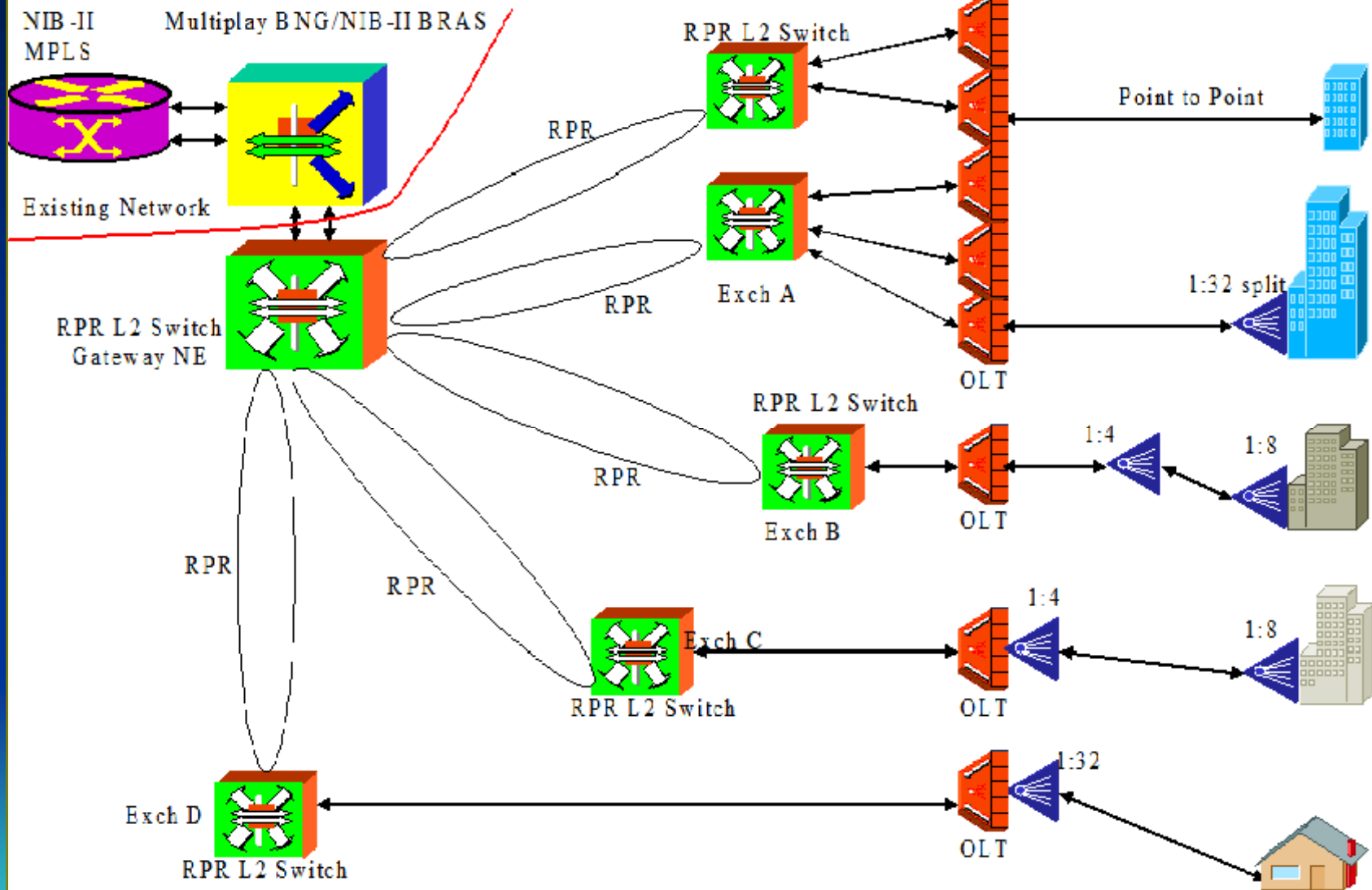
b) The OLTs will have a Local Craft terminal.

c) One Element Manager System is also there for managing the whole network of a particular technology product.

A typical network architecture is shown in next slide.

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A City Network connectivity

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GEPON/ GPON Cities and respective customers proposed

SI No	Region	Circle	GEPON Cities	customers Proposed	GEPON Chassis	GPON Cities	Customers Proposed	GPON Chassis
1	West	Chhattisgarh	Raigarh	638	2	Raipur	15202	48
2		Gujarat	Anand	634	2	Ahmadabad	19362	61
3			Baroda	3590	11	Pune	9196	29
4			Mehsana	1157	4			
5			Rajkot	500	2			
6			Surat	2555	8			
7		Maharashtra	Aurangabad	2180	7	Nagpur	44470	139
8			Dhulia	1194	4			
9			Goa	4057	13			
10			Kalyan	3727	12			
11			Kolhapur	2924	9			
12			Nasik	2451	8			
13			Nanded	785	2			
14		Madhya Pradesh	Bhopal	4169	13	Indore	6621	21
15			Gwalior	1216	4			
16			Jabalpur	1020	3			
17			Sagar	763	2			
18			Satana	200	1			

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GEPON/ GPON Cities proposed

19		Andhra Pradesh	Adilabad	216	1	Hydrabad	30516	95
20			Anantpur	485	2	Vijayawada	6018	19
21			Eluru	388	1			
22			Nellore	1624	5			
23			Rajahmundary	445	1			
24			Tirupathi	413	1			
25			Visakhapatnam	2557	8			
26			Warangal	657	2			
27	South	Kerala	Kalikat	3810	12	Ernakulam	16410	51
28			Palghat	2784	9			
29			Triture	5732	18			
30			Trivandrum	1663	5			
31		Karnataka	Belgaum	499	2	Banglore R	19838	62
32			Hubli& Dharwad	1517	5	Banglore TD	26301	82
33			Karwar	188	1	Manglore	16111	50
34			Mysore	4557	14	Coimbatore	12436	39
35			Raichur	245	1			
36		Tamilnadu	Madurai	869	3	Chennai TD	36677	115
37			Pondicherry	564	2	Kancheepuram	956	3
38			Salem	513	2	Tiruvallur	589	2
39			Trichy	1054	3			
40			Vellore	480	2			
41	Chennai-TD					Chennai TD	36677	115

42		Agra	6780	21	Noida	10468	33
43	UP(W)	Ghaziabad	5967	19	Greater NOIDA	5150	16
44		Murabad	398	1			
45	Uttaranchal	Almora	598	2			
46		Dehradoon	2359	7			
47		Allahabd	5602	18	Lucknow	39600	124
48		Gorakhpur	3339	10			
49	UP (E)	Jhansi	998	3			
50		Kanpur	3982	12			
51		Varanasi	6803	21			
52	Haryana	Amballa	2251	7	Gurgaon	30544	95
53		Faridabad	5602	18			
54		Ajmer	1408	4	Jaipur	35378	111
55		Alwar&Bhiwadi	3734	12			
56	Rajasthan	Jodhpur	2188	7			
57		Kota	1201	4			
58		Udaipur	975	3			
59		Amritsar	7017	22	Chandigarh	9436	29
60		Ferozpore	1907	6	Jalandhar	41094	128
61	Punjab	Ludhiana	9228	29			
62		Patiala	3408	11			
63		Sangrur	2335	7			
64	Himachal Pradesh	Simla	500	2			
65	Jammu & Kashmr	Jammu	625	2			

North

66	Ea st	Kol-TD				Kolkata	40580	127
67		Orissa	Rourkele	435	1	Bhubenes hwar	7504	23
68			Sambalpur	624	2			
69		West Bengal	Durgapur	141 8	4			
70			Siliguri	1125	4			
71		Bihar				Patna	17419	54
72		Jharkhand	Dhanbad	250	1	Ranchi	12506	39
73			Jamshedpur	413	1			
74		Andaman& Nicobar	Port Blare	625	2			
75	NE	Assam	NE	0	0	Gowahati	2943	9
76		North East-I	NE	625	2			
77		North East-II	NE	625	2			
		Total		150 365	474		550002	1719

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Technical Specifications

- The tender document for GPON is available on url. bsnl.co.in in tender watch vide TE No. MM/TX/032008/000352. The technical specifications, Schedule of requirements and further clarifications are also available which can be download from the site.

- Similarly as above for GEPON is available on url bsnl.co.in vide TE No. MM/TX/032008/000353.

- The clarification if any can be asked by email also on email id. rryadava@bsnl.co.in.

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