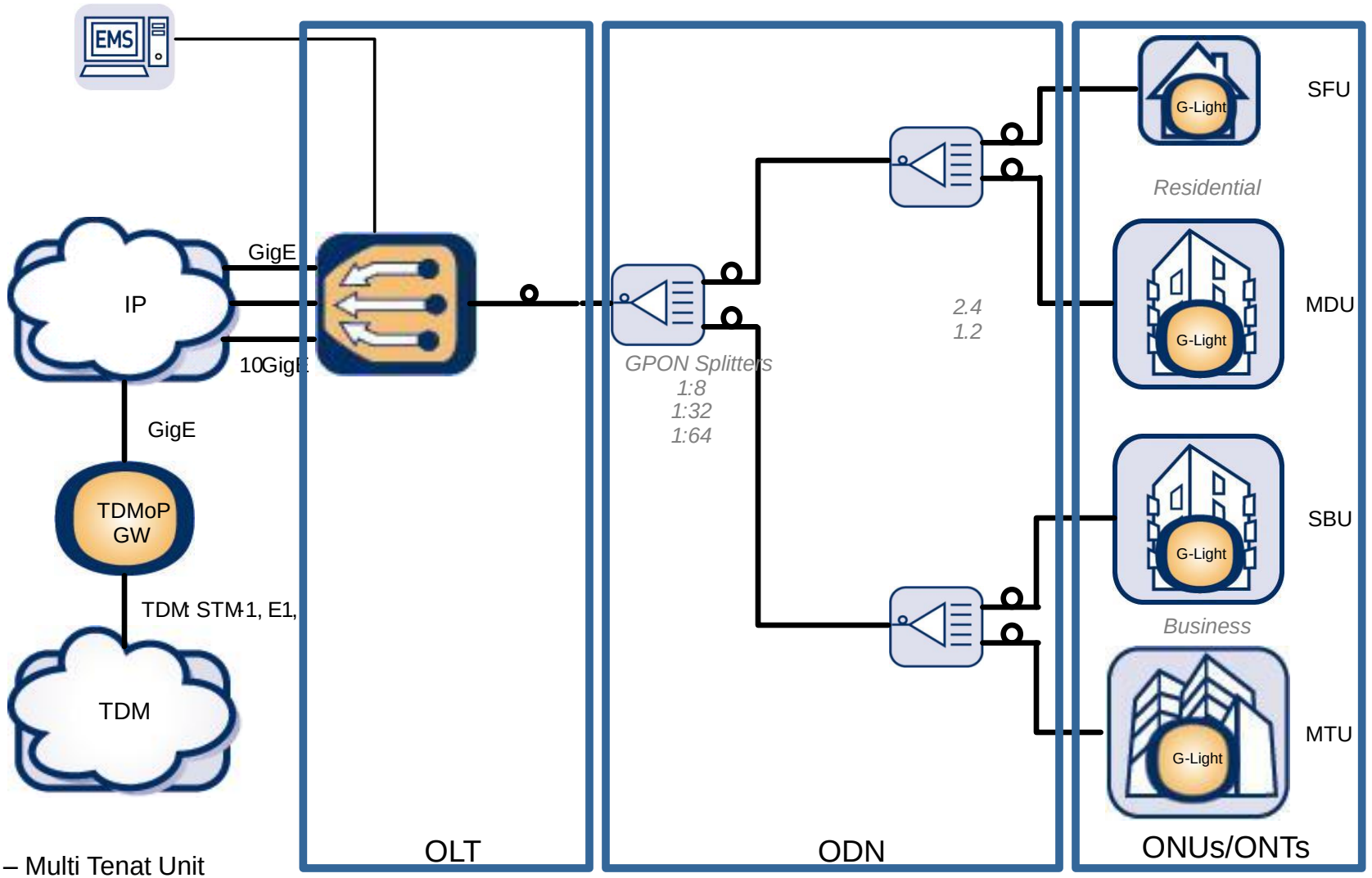
Hi-FOCuS GPON

Building Blocks

GPON System Architecture



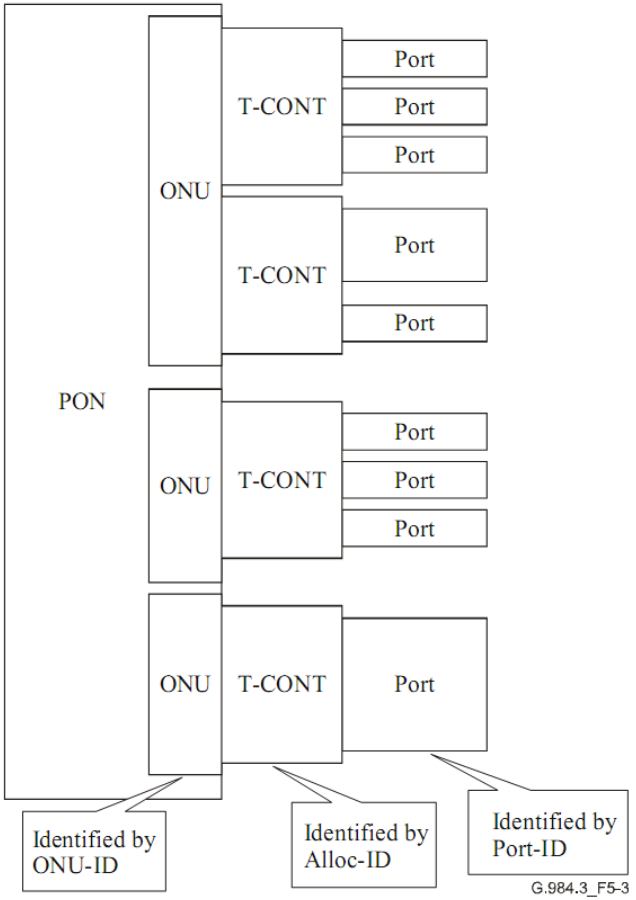
MTU – Multi Tenat Unit
SBU – Small Bussiness Unit
MDU – Multi-Dwelling Unit - apartment buildings
SFU – Single Family Unit

GPON Terms (1)

- PON optics classes – link budgets
  - Class A – min. 5dB to max. 20dB
  - Class B – min. 10dB to max. 25dB
  - Class B+ – min. 10dB to max. 28dB
  - Class C – min. 15dB to max. 30dB
- FEC – Forward Error Correction
  - increases link budget by approximately 3-4 dB
- GEM – GPON Encapsulation Method
  - method which encapsulates data over G-PON (Ethernet ...)
  - concept and framing format are similar to GFP

GPON Terms (2)

- Activation Method
  - activation of ONU at OLT (transmission delay measurement, ONU-ID assignment)
- T-CONT - Transmission Container
  - is used for the management of upstream bandwidth allocation
  - can carry GEM traffic with various service classes (QoS)
- Port-id
  - is used for multiplexing traffic flows over a T-CONT in GEM service



GPON Terms (3)

- OMCI - ONU Management and Control Interface
  - OAM service that provides a standard way to discover ONU capabilities, and to manage and control them
- DBA – Dynamic Bandwidth Allocation
  - is the process by which ONUs (and their associated T-CONTs) dynamically request upstream bandwidth
    - Status Reporting DBA (SR-DBA) - bandwidth assignment according to report from ONU
    - Non-Status Reporting DBA (NSR-DBA) - bandwidth assignment by using traffic monitoring by OLT itself
- AES – Advanced Encryption Standard
  - because the downstream data is broadcast the traffic could be encrypted

ECI's Hi-FOCuS Platforms

Subscribers

Central office solutions

SAM 960E, F152

Multi service platform
Near Terabit backplane
17 slots (15 LC + 2 NI)
DSL, Fiber, Voice

Outdoor/remote solutions

F61

Multi service platform
10GE architecture
7 slots (5 LC + 2 NI)

M41

Multi service platform
GbE architecture
5 slots (4 LC + 1 NI)
GPON/GbE uplink / NI

MicroRAM 24/48V
GPoweRAM 24/48V

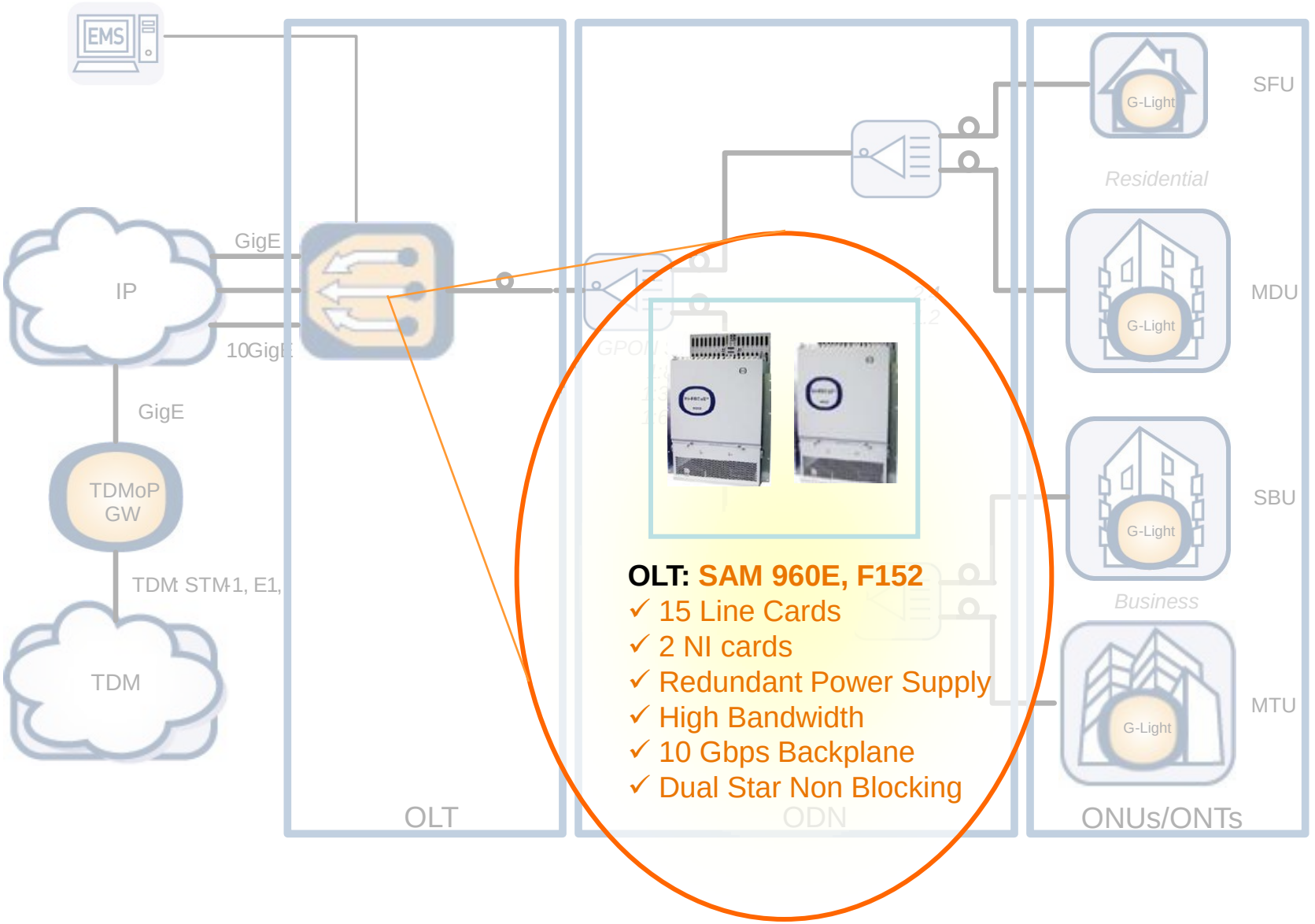
MicroRAM32A

MiniCAB

Outdoor platform
GbE architecture
48 ADSL2+ lines
1 GbE uplink

Function/flexibility

ECI's GPON Building Blocks



F152/960E Platform

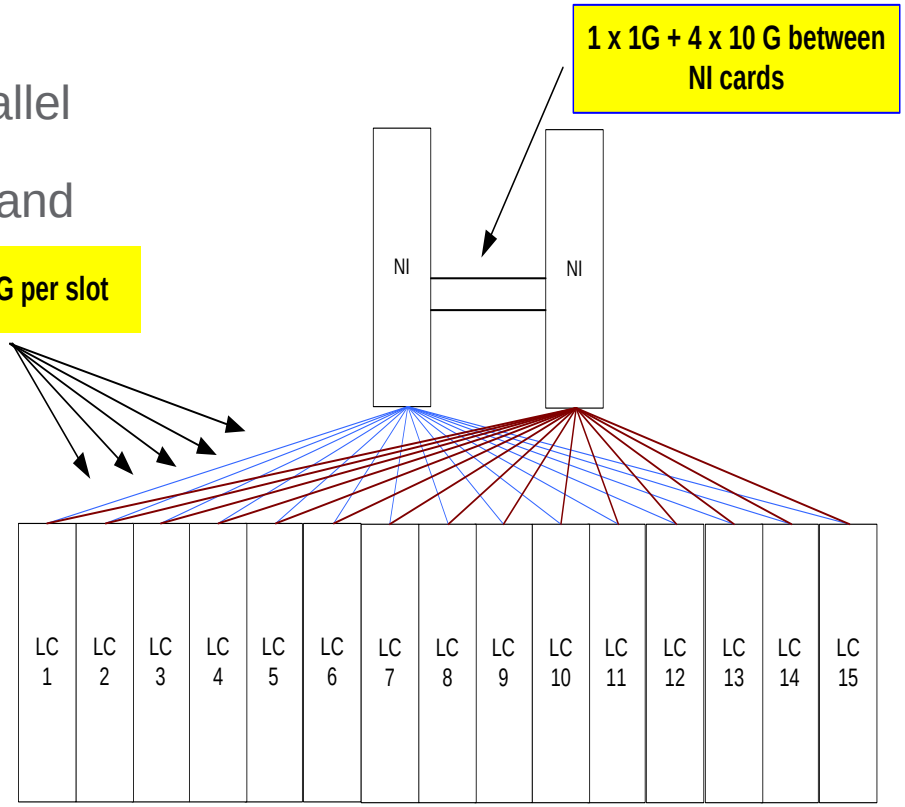
- Resides in CO
  - 15 slots for line cards
  - 2 slots for network interface
  - Fits 19” racks
- Serves as OLT for GPON Services
- Serves as DSLAM for xDSL Services
  - Enables mixed copper/fiber services
- Enables Integrated Voice Solution
- Future Proof Platform

F152

SAM960E

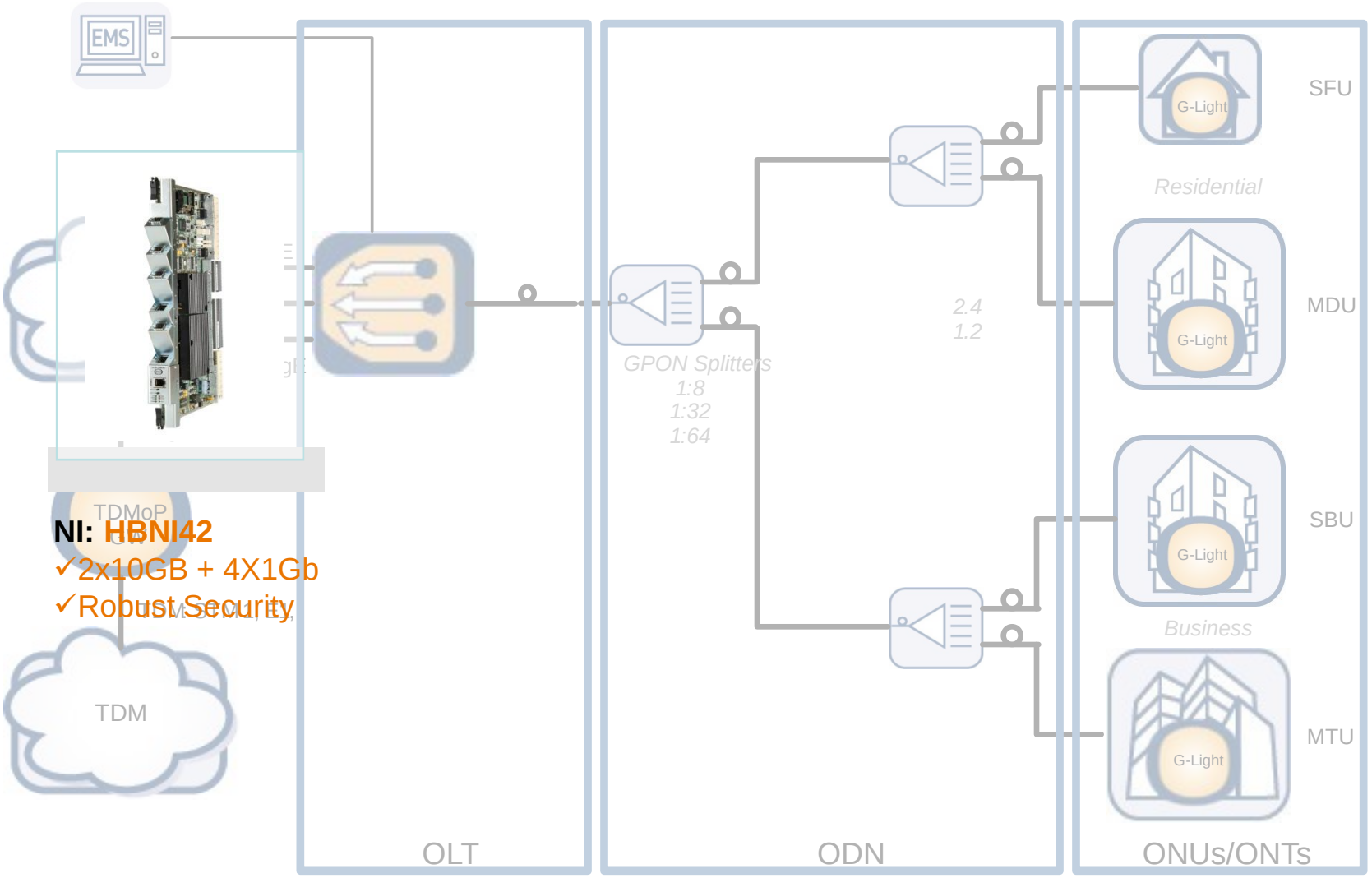
F152/960E Internal View

- Advanced Bus Architecture
  - 2*10 Gbps per line card
  - 2*1 Gbps per line card
    - Both bus layers operate in parallel
    - Any mix-and-match of 1 Gbps and 10 Gbps tributary cards
- 4 x 10 Gbps between NI cards



Non-Blocking Architecture

ECI's GPON Building Blocks



NI: HBNI42

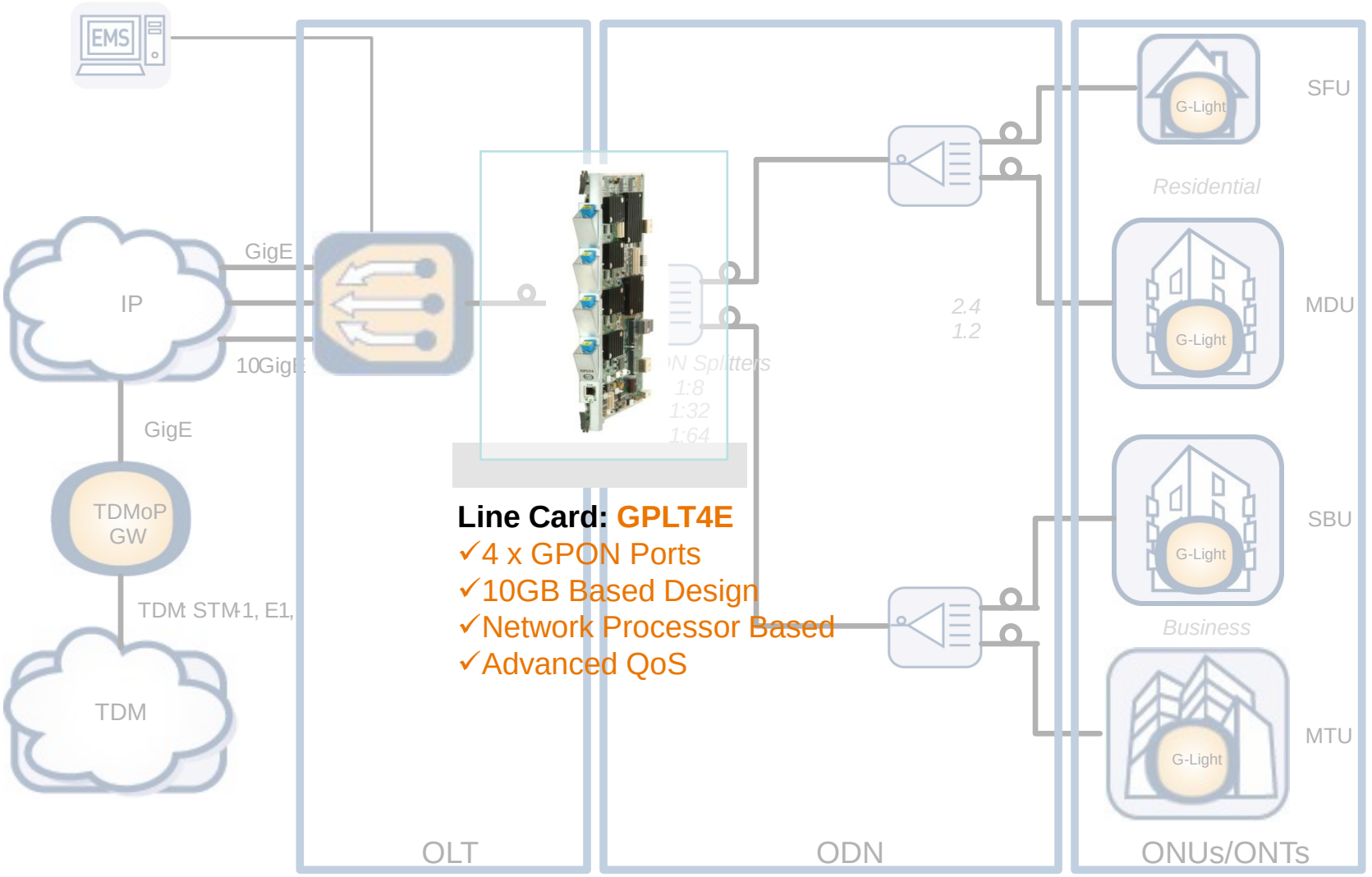
- ✓2x10GB + 4X1Gb
- ✓Robust Security

HBNI- 42 (network interface)

- Support up to 4 Uplinks
  - Up to 2 interfaces of 10G
  - Up to 4 interfaces of 1G
- 10 Gbps or 1 Gbps per Line Card (over bus)
  - Auto-sensing
- High Availability
  - Link redundancy
  - Card redundancy
- High Bandwidth Switch Fabric
  - More than 400 Gbps per card
  - Non blocking

Hi-Bandwidth & Future Proof

ECI's GPON Building Blocks



Line Card: GPLT4E

- ✓4 x GPON Ports
- ✓10GB Based Design
- ✓Network Processor Based
- ✓Advanced QoS

GPLT4E Overview (line card)

- Non Blocking Architecture
  - 2x10G (XAUI) interface (over bus)
- Open Design
  - Cutting Edge 10G network processor for maximum flexibility
  - Future Proof
    - Flexible to operators future demand
- Extensive QoS
- Traffic Engineering
- VLAN Manipulation

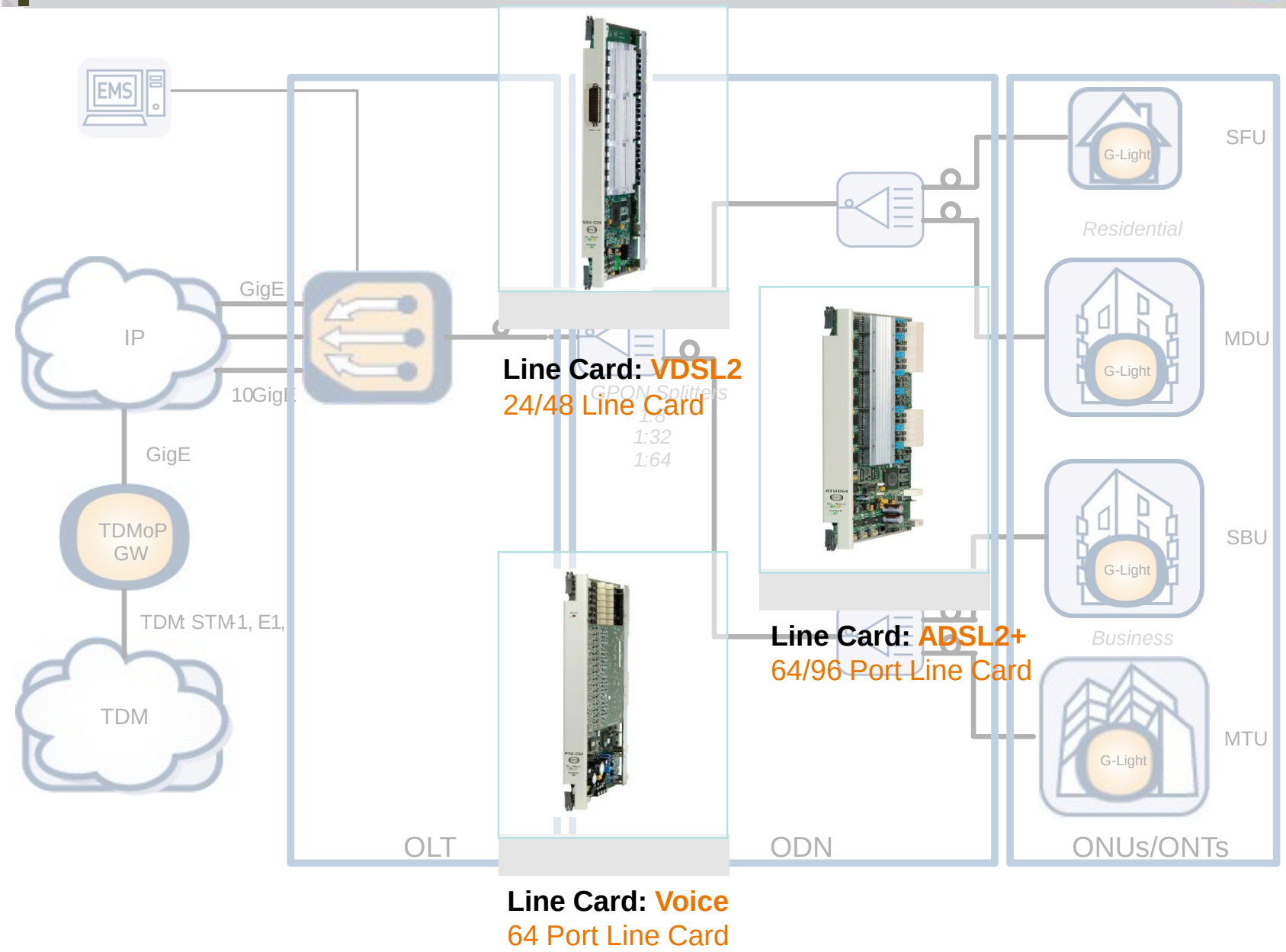
GPLT4E– GPON Features (1)

- GPON Features
  - B+ optics, SFP ready
  - 128 split
  - GEM – GPON Encapsulation Method
  - Multiple T-CONT support for QoS
  - OMCI - 3rd party ONT interoperability
  - DBA – Dynamic Bandwidth Allocation
    - NSR DBA
  - Flexible Activation Modes:
    - Serial-Number with Password learning
    - Password with Serial-Number learning
    - Any combination
  - AES
  - D/S FEC

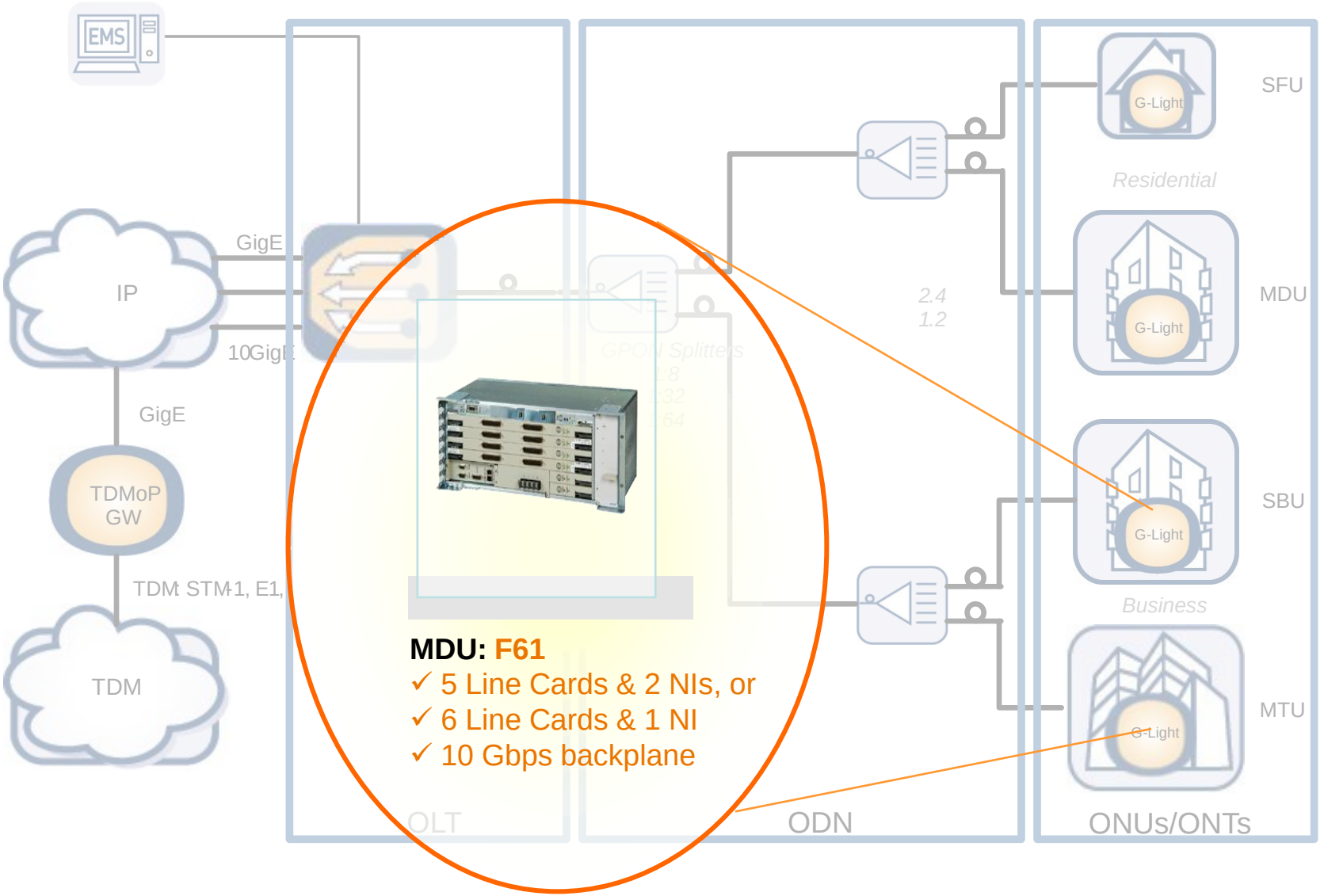
GPLT4E– GPON Features (2)

- GPON Features
  - Up to 4096 T-CONTs per GPON card (1K per port)
  - Up to 16k Port IDs per GPON card (4K per port)
  - Multiple T-CONTS per ONT/ONU
  - ITU-T G.984.4 OAM and Alarm

ECI's GPON Building Blocks



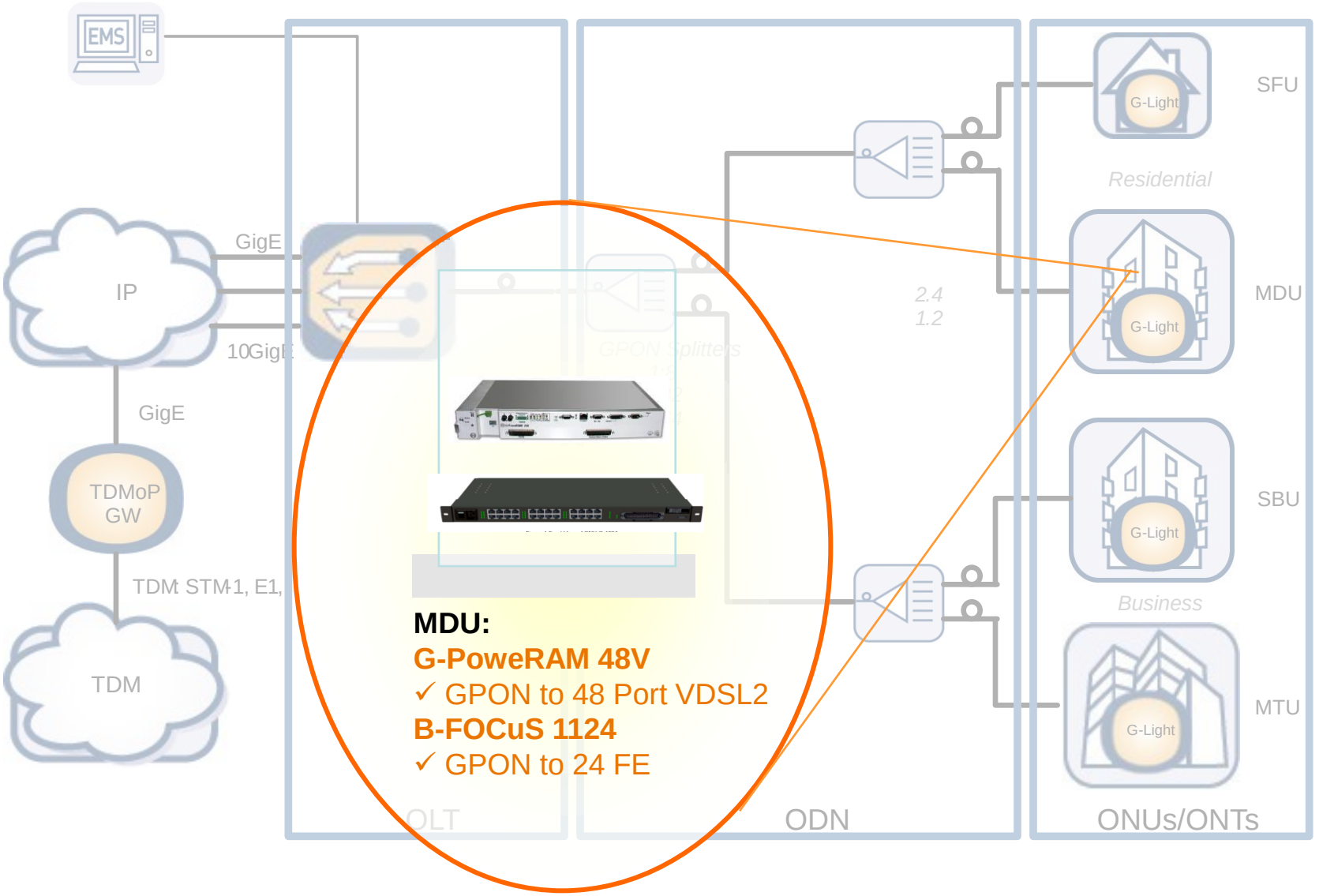
ECI's GPON Building Blocks



F61Platform

- Resides in sub-CO or Street cabinet
  - 5/6 slots for line cards
  - 1/2 slots for network interface
  - Fits 19” racks
- Serves as OLT for GPON Services
- 1/10 Gbps backplane capacity
- Fully 3Play support (HSI, VoIP and IPTV)
- FTTB/C Deployment

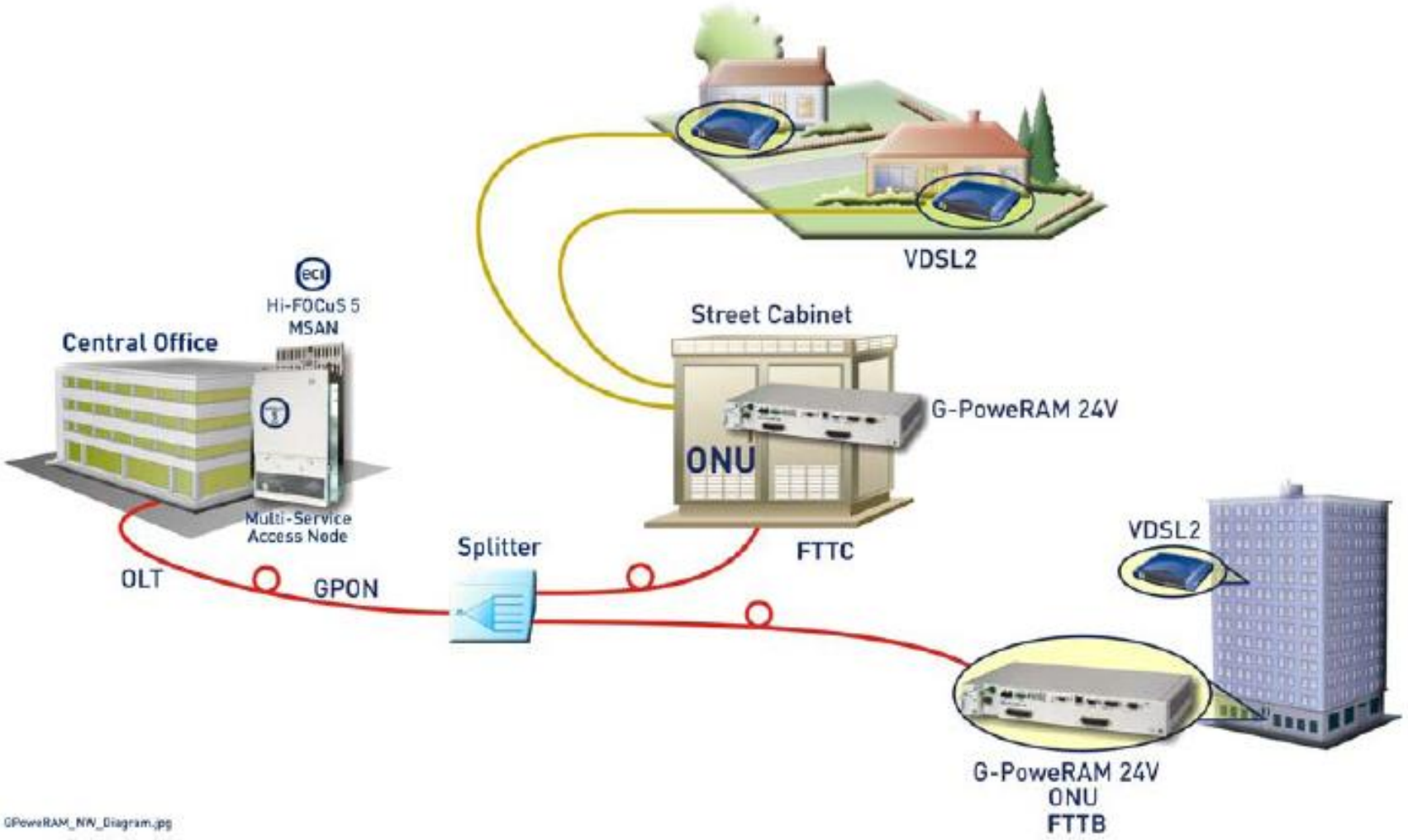
ECI's GPON Building Blocks



G-PoweRAM 24/48V

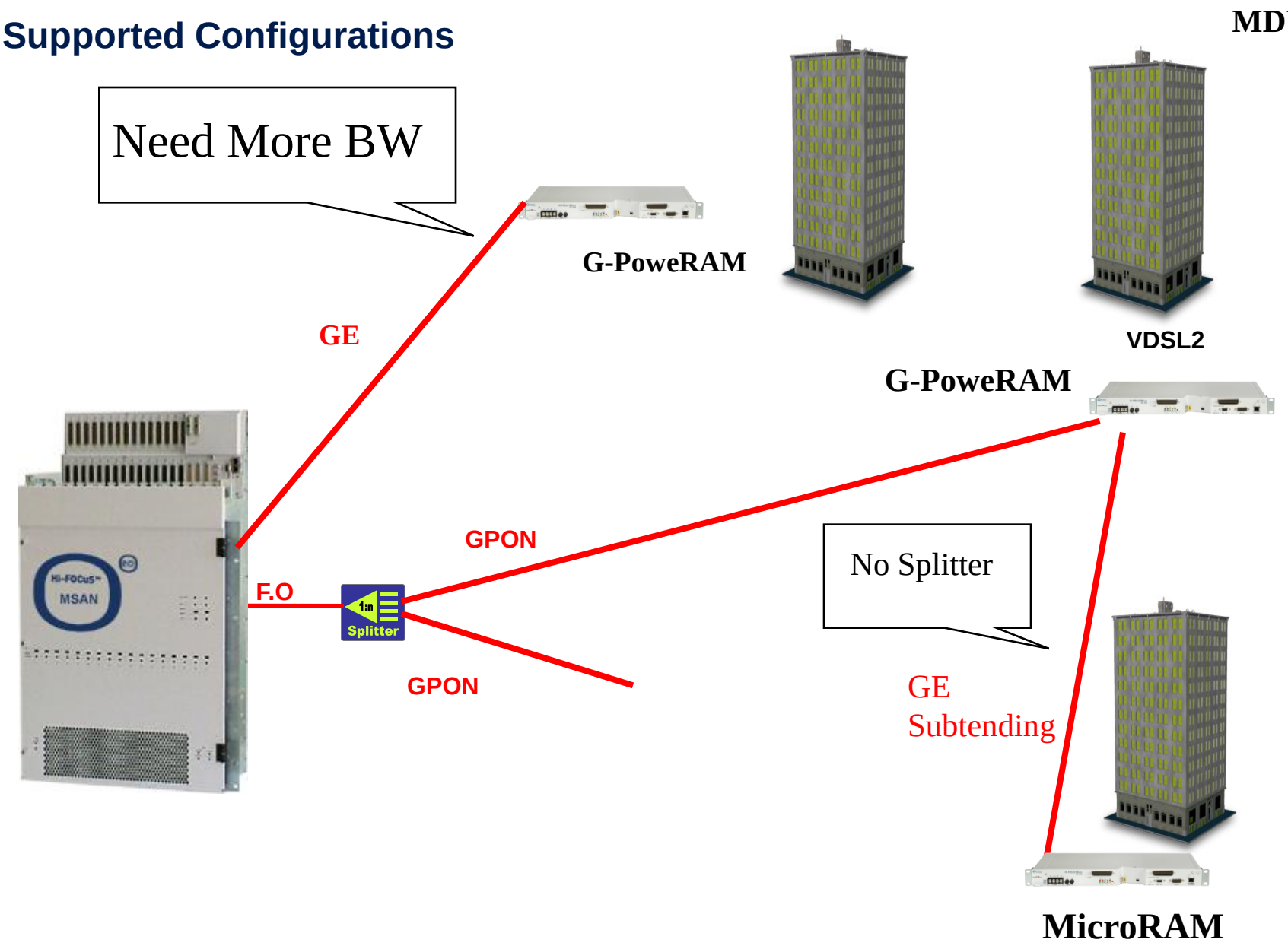
- Pizza box with VDSL2 24 ports
  - Integrated splitters
- PON I/F – 2.48Gbps (DS), 1.24Gbps (US)
  - Dual GPON interface for redundancy
- Mini DSLAM functionality
- Field proven Hi-FOCuS 5 mass-deployed VDSL2
- GPON uplink
  - ITU-T G.984.x compliant
  - Supports Class B+ optical link budget
  - AES encryption
  - Forward Error Correction (FEC)
  - SNMP based management

G-PoweRAM Applications

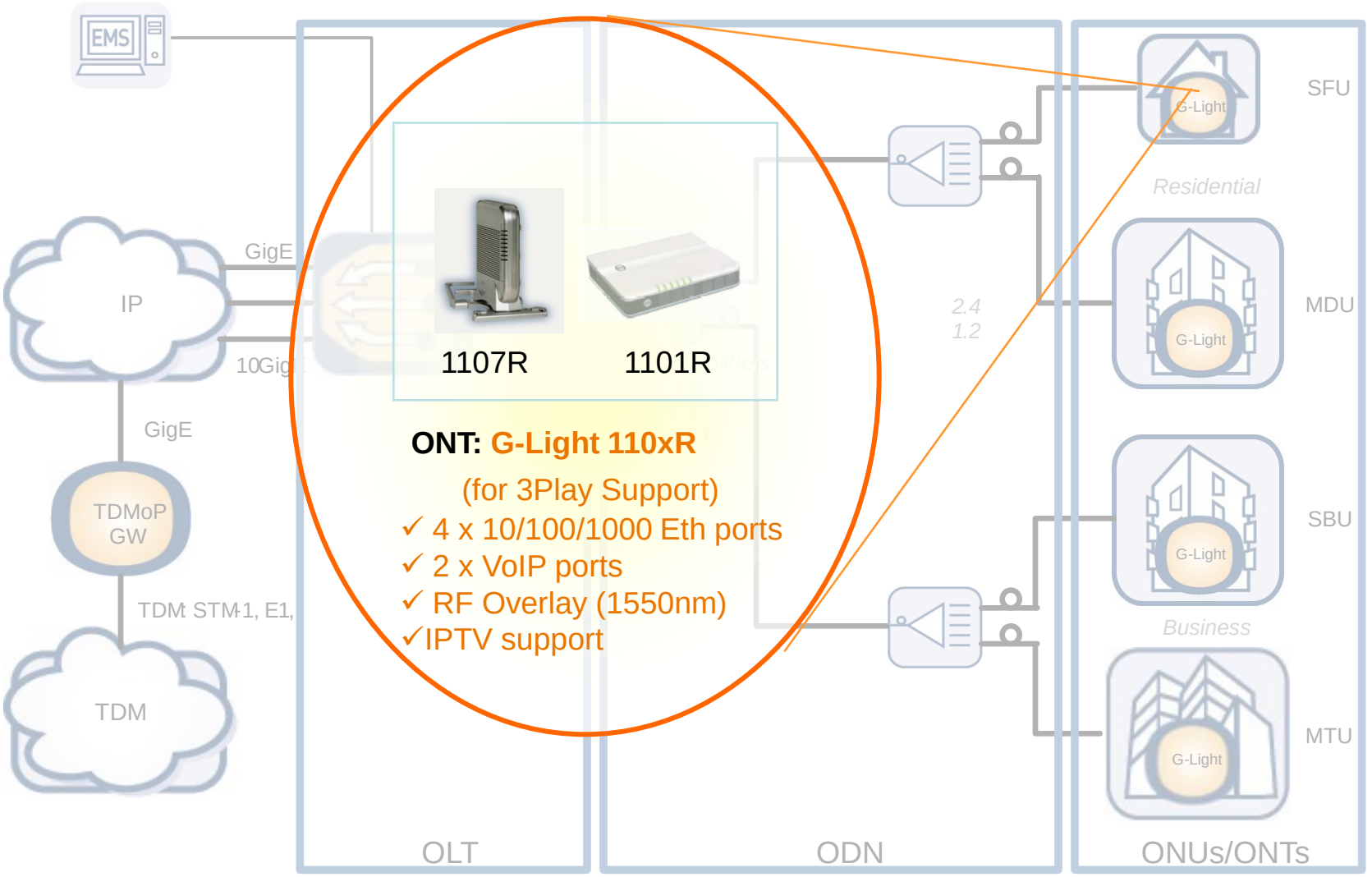


FTTC/FTTB Scenario– MDU/MTU

Supported Configurations



ECI's GPON Building Blocks



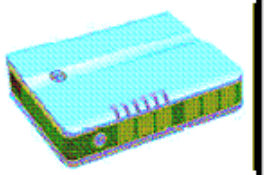
B-FOCuS Series

- PON I/F – 2.48Gbps (DS), 1.24Gbps (US)
  - ITU-T G.984.x compliant
  - Supports Class B+ optical link budget
  - FEC
  - AES
  - DBA
  - OMCI
  - Multi T-CONTs (4 CoS)

- User side
  - 10/1000/1000BT
  - POTS
  - SIP
  - E1
  - RF Overlay
  - 802.1q
  - 802.1p

- IP multicast support

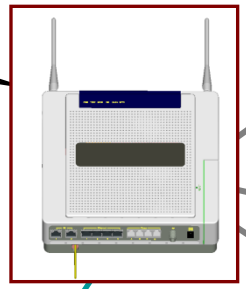
B-FOCuS Models

Product	Ethernet Ports	POTS SIP	RF Overlay (CATV)	WiFi Firewall	Picture
G-Light 1101R	1 GE	None	None	None	
G-Light 1104R	4 FE	None	None	None	
G-Light 1105R	4 FE	None	√	None	
G-Light 1107R	4 FE	2	√	None	
G-Light HGW	4 FE	2	Optional	√	

FTTH Scenario

HGU G-light
Single Box at Home

ONT
GW



STB

Eth.

PC

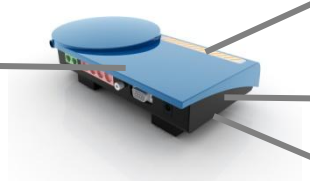
Hi-FOCuS 5 OLT

GPLT4E

GPON

GPON

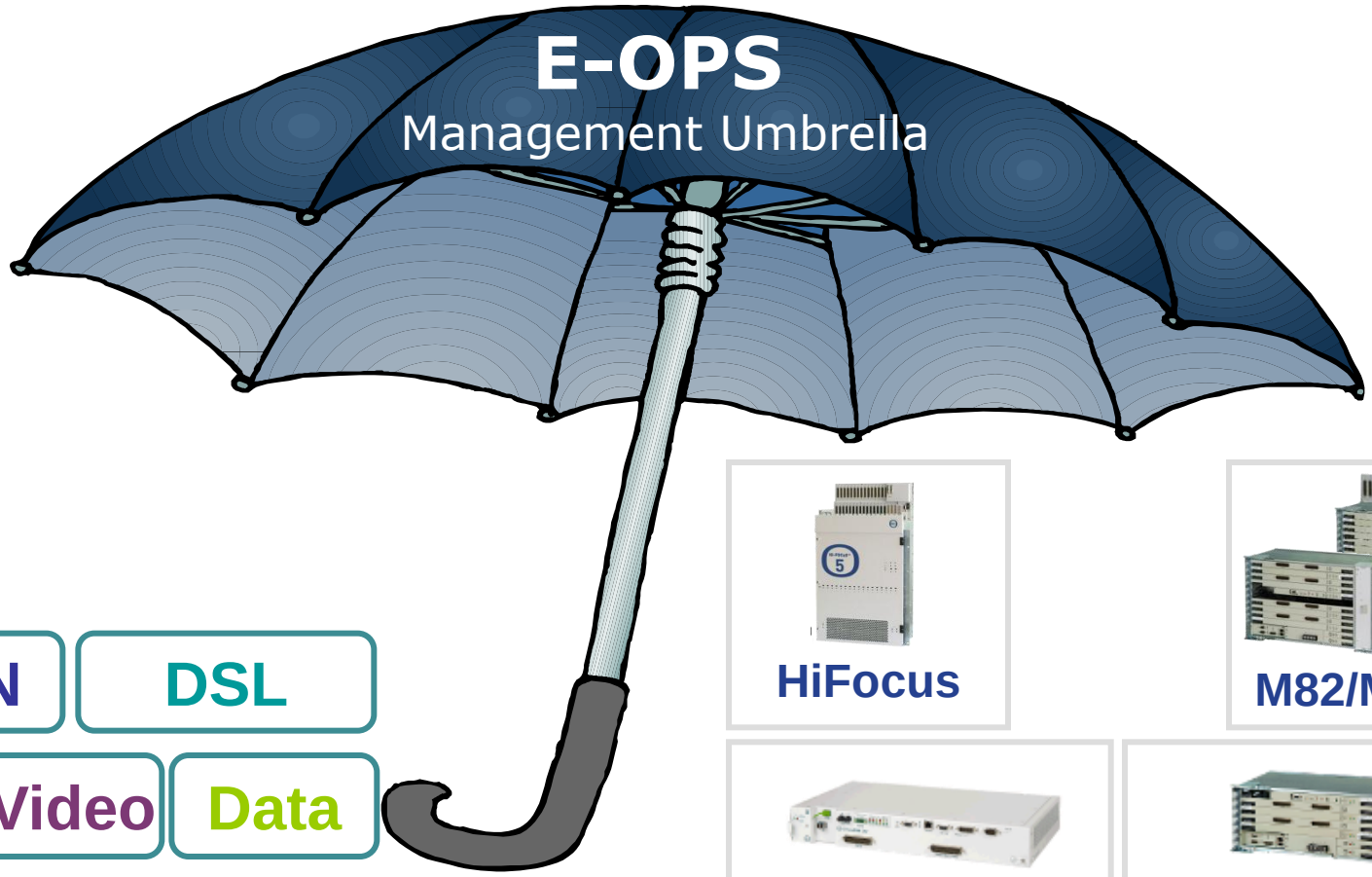
GPON



GPON

G-Light 11xx

Access Network Management



GPON DSL

Voice Video Data

Aggregation L2,L3

HiFocus

M82/M82C

GPoweRAM 24V

M41

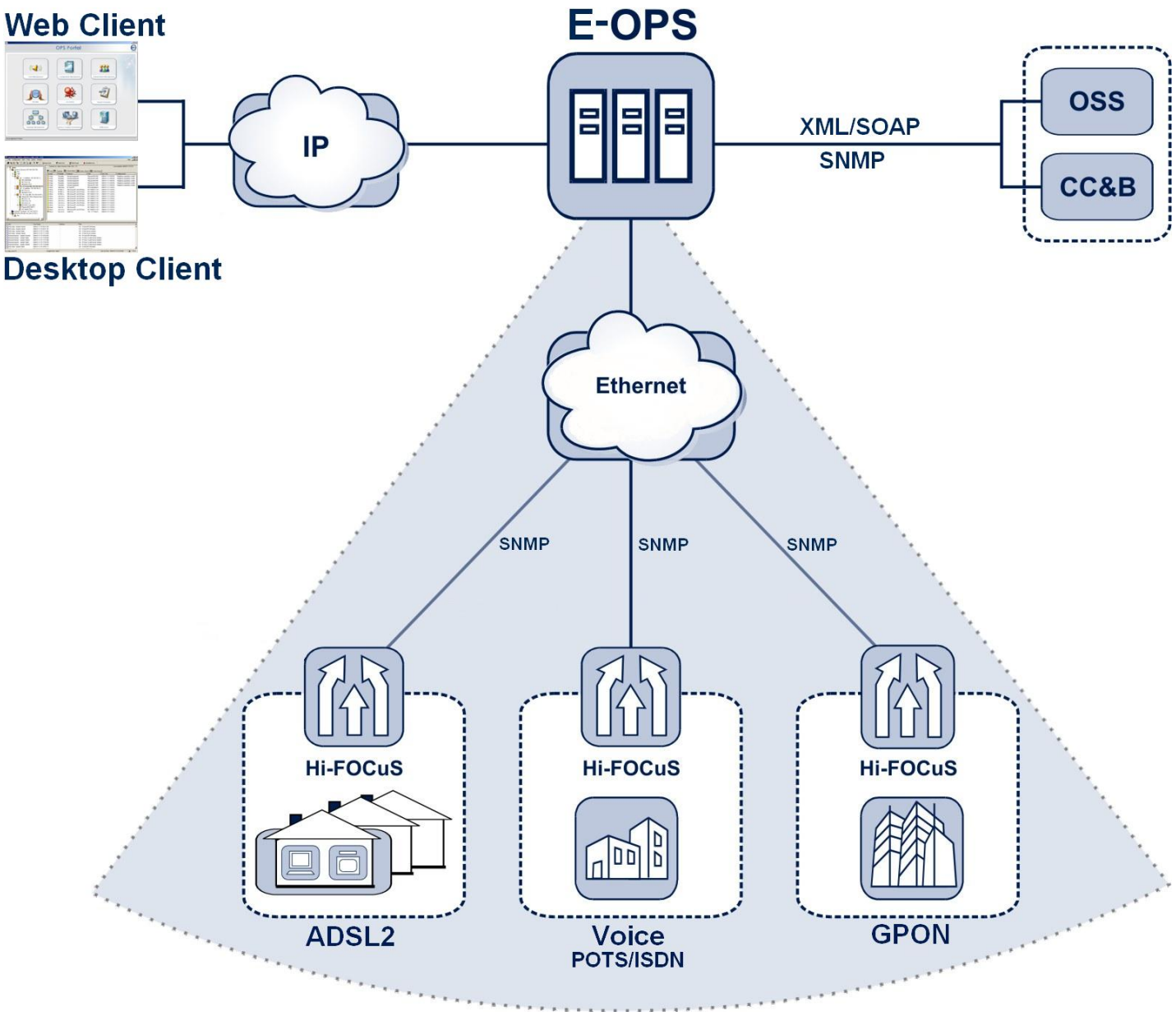
Enhanced-OPS Highlights

- Carrier-class Management System
  - High availability, Geo Redundancy, Oracle DB
  - Transition towards Web technologies – HTTP, XML
- Centralized Management
  - FTTx, xDSL, Voice
- Enhanced Capacity
  - Up to 3000 NEs and 800K line
- Smooth OSS Integration
  - XML/SOAP Interfaces
  - SNMP Northbound from the NE
- Added-value Web-based Expert Tools
  - OCTOPUS
  - Hi-Care

E-OPS Management Suite

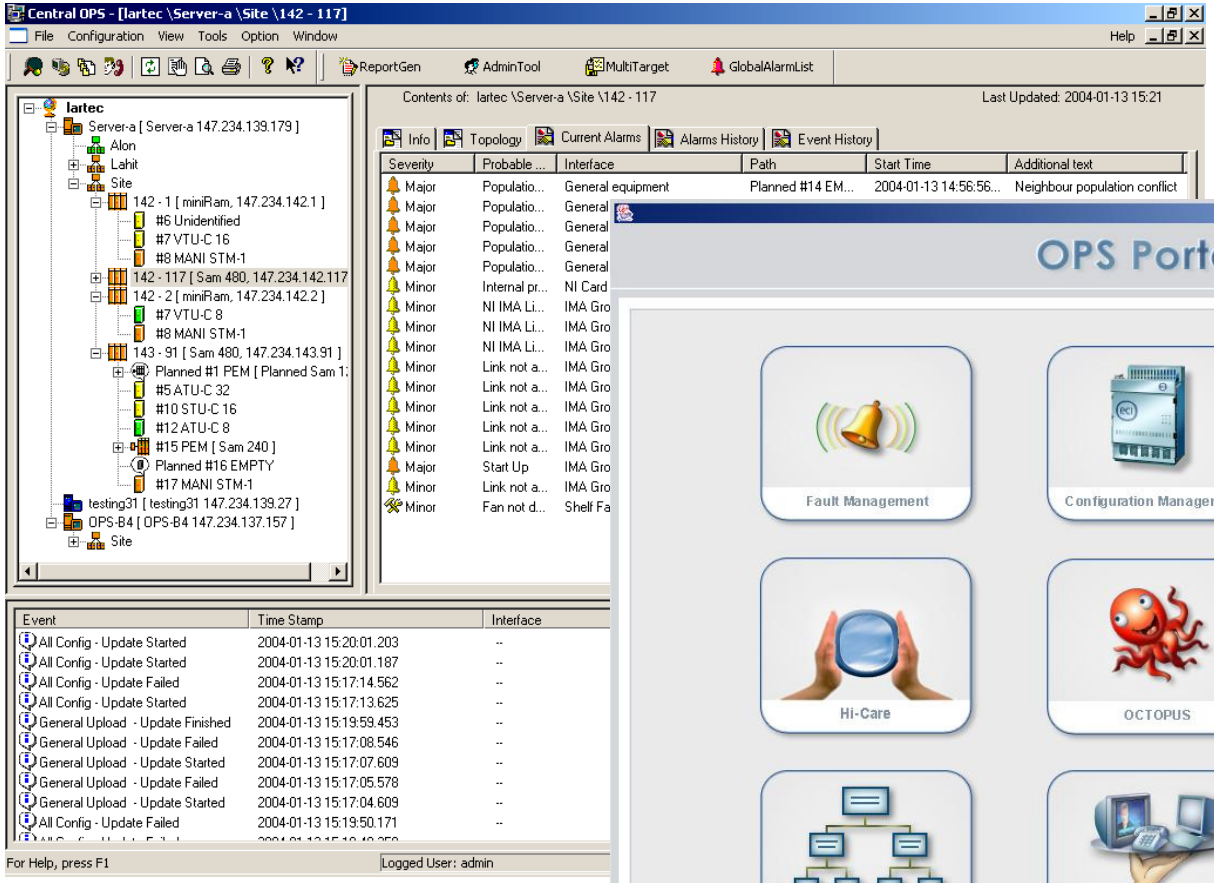
E-OPS plays an integral role in the complete service lifecycle

E-OPS Architecture



E-OPS Clients

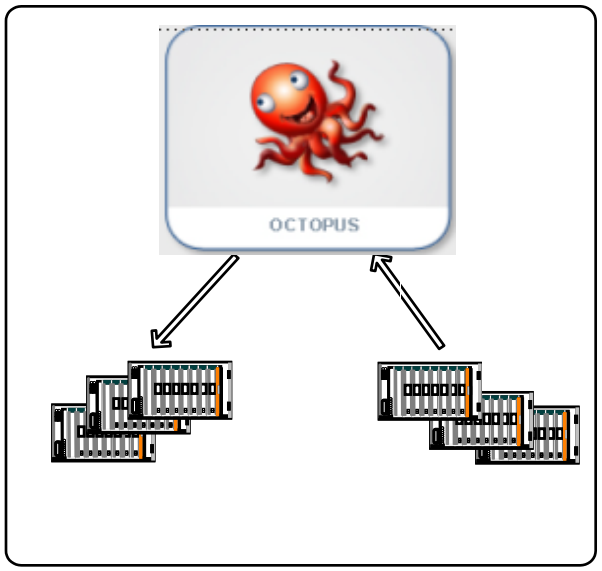
Desktop Client



Web Client

OCTOPUS

- Web-based mass-configuration Tool
- Design to work alongside the OSS
- A quick way for introducing new Profiles & Services
- Design for mass deployment of VoIP & IPTV services



- Software Upgrade Procedure
- Profiles Management
- Voice Gateway Management
- Multicast Channel Management
- Backup & Restore Procedure

Hi-FOCuS GPON

Benefits

ECI GPON's Benefits (1)

- Lower Total Cost of Ownership with Simpler Network Structure
  - Single and Comprehensive Network Edge
  - Any subscriber interface (GPON, POTS, ADSL2+/VDSL2/G.SHDSL
- Lower Setup OPEX
  - Simpler ONT deployment & commissioning with various Activation Modes
- Future Proof and Highly Scalable
  - Multiple 10Gbps & Gbps uplinks
  - Network processor based cards s/w upgradable with services and standards
- Secured Network Edge
  - AES encryption
  - Advanced multi-level user defined filters

ECI GPON's Benefits (2)

- Enhanced Revenue Engine with Advanced QoS
  - OLT
    - Enables fine granularity differentiated service packages while guaranteeing Quality of Experience
      - Shaping & Scheduling per Service Flow (i.e. Per User Per Service
    - Superior QoS machine for SLA assurance based on advanced per card Network Processor
  - ONU
    - Shaping Per port Per Service
    - Access Control Lists
- Allows Flexible Deployment Architectures
  - Bandwidth Re-Selling
    - Sharing of infrastructure fairly assured by TM
  - FTTH, FTTN, FTTC, FTTB

Thank You

experience