

Hybrid Fiber Copper Architecture and Single Chip Solution

Bala Velmurugan
Cortina Systems

- Hybrid Fiber Copper (HFC) Architecture
 - Fiber Deployment Models
 - What makes economic sense
- MDU System Architecture
 - Today's Architecture
 - Problems and Challenges
- Cortina MDU Chip solution
- Cortina Integrated Access Platform

Fiber Deployment Models

 - Fiber

More than 80% of the access subscribers are served today by HFC infrastructure, using MDUs !

- Copper investment protection
- Leverages existing management and operational infrastructure
- Enabler for 10G EPON technology

Fiber: EPON, GPON, Active Ethernet, etc.

Copper: Twisted Pair, Coax etc.

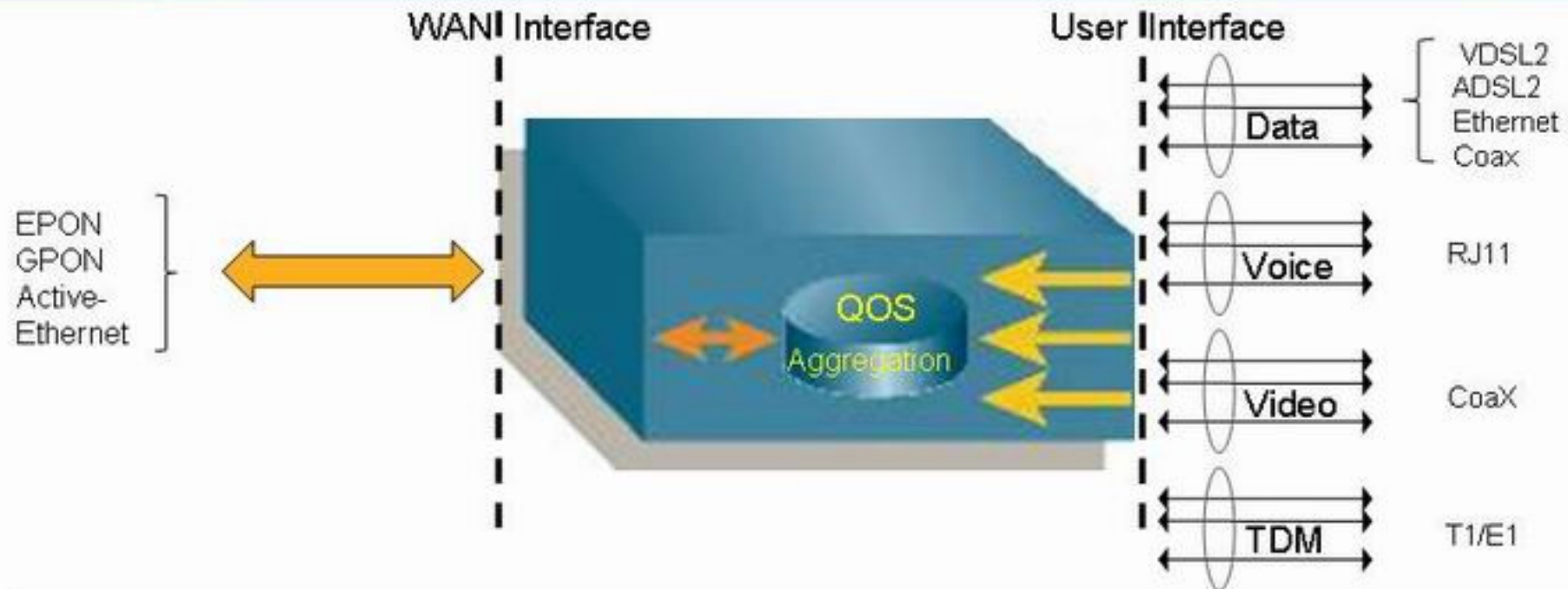


Fiber

FTTH (Home)

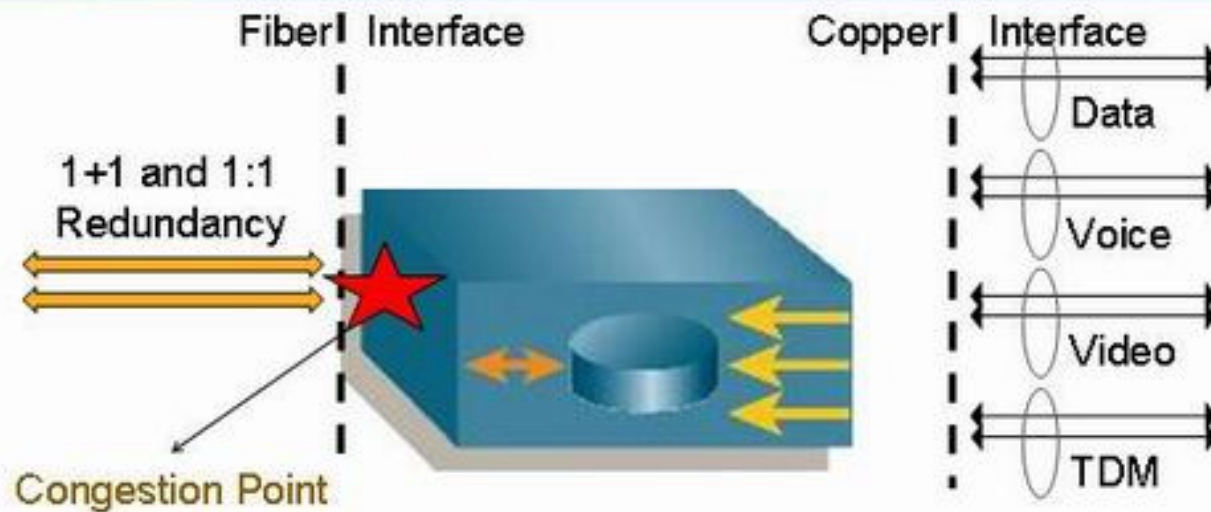


What is a MDU?



1. Aggregation device that connects legacy copper plant to the next generation fiber infrastructure
 - 8 to 128 subscribers, each supporting from 4 to 8 services per subscriber
2. Per subscriber, Per Service traffic Management and oversubscription Management
3. TR-101 compliant aggregation and Switching
4. Efficient mapping of subscriber flows onto WAN containers
5. VLAN aware Multicast , IGMPv3, IPv6 MLD
6. Environmentally hardened system with Low Power, high reliability & RoHS

MDU Requirements: Carrier View



MUST ...

- Aggregate large number of subscribers and Services
- Perform QoS Management
- Deal with Congestion
- Enforce SLA Management
- Must offer High Availability & Fiber Protection

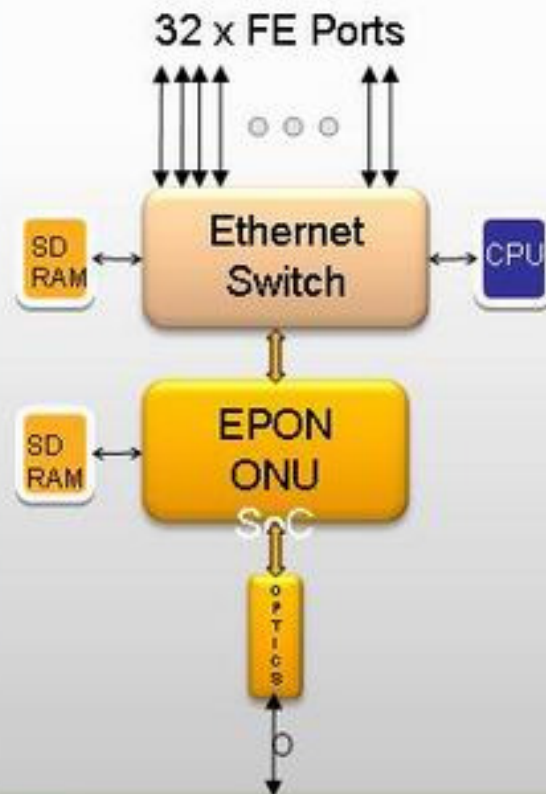
1. Service level agreement insurance
 - I. Per subscriber and per service queuing architecture
 - II. Per subscriber bandwidth guarantee, and fair share (Not just policing)
 - III. Helps to achieve End-to-end SLA contract
2. Subscriber based policy management
 - I. Filtering, counting, logging, service control
3. Scalability and performance
 - I. Scale with the number of subscribers
 - II. Line rate multicast replication
4. Protection, fault tolerance, High availability
 - I. Fiber side protection switching

MDU Architecture Comparison

Ethernet MDU : Case Study



Legacy MDU Architecture

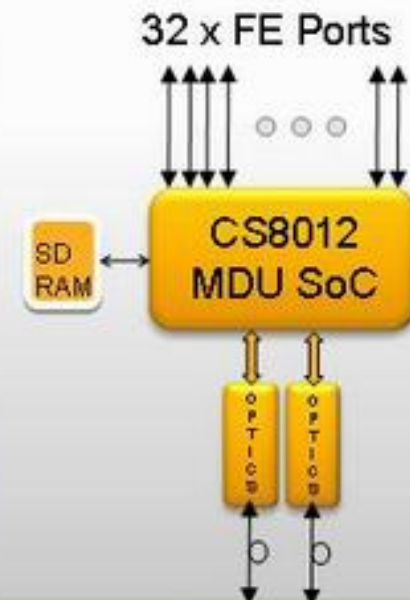


- + The EPON ONU SoC is designed for a single user (SFU), not optimized to support large number of subscribers.
- + The Ethernet Switch not aware of real time PON link usage. Designed for Enterprise and SMB Market. Doesn't implement the concept of subscribers or service. Its not carrier class..
- + Double buffering → Adverse effect on real time services.
- + Doesn't offer redundancy. It is not a scalable carrier platform.



- + Single chip, Custom made for the Fiber MDU application
- + Only solution that offers carrier class QoS & subscriber Management
- + Supports large number of copper copper PHY subscribers (Ethernet, xDSL and Coax)
- + Lowest BOM cost/subscriber and higher performance

NG MDU Architecture

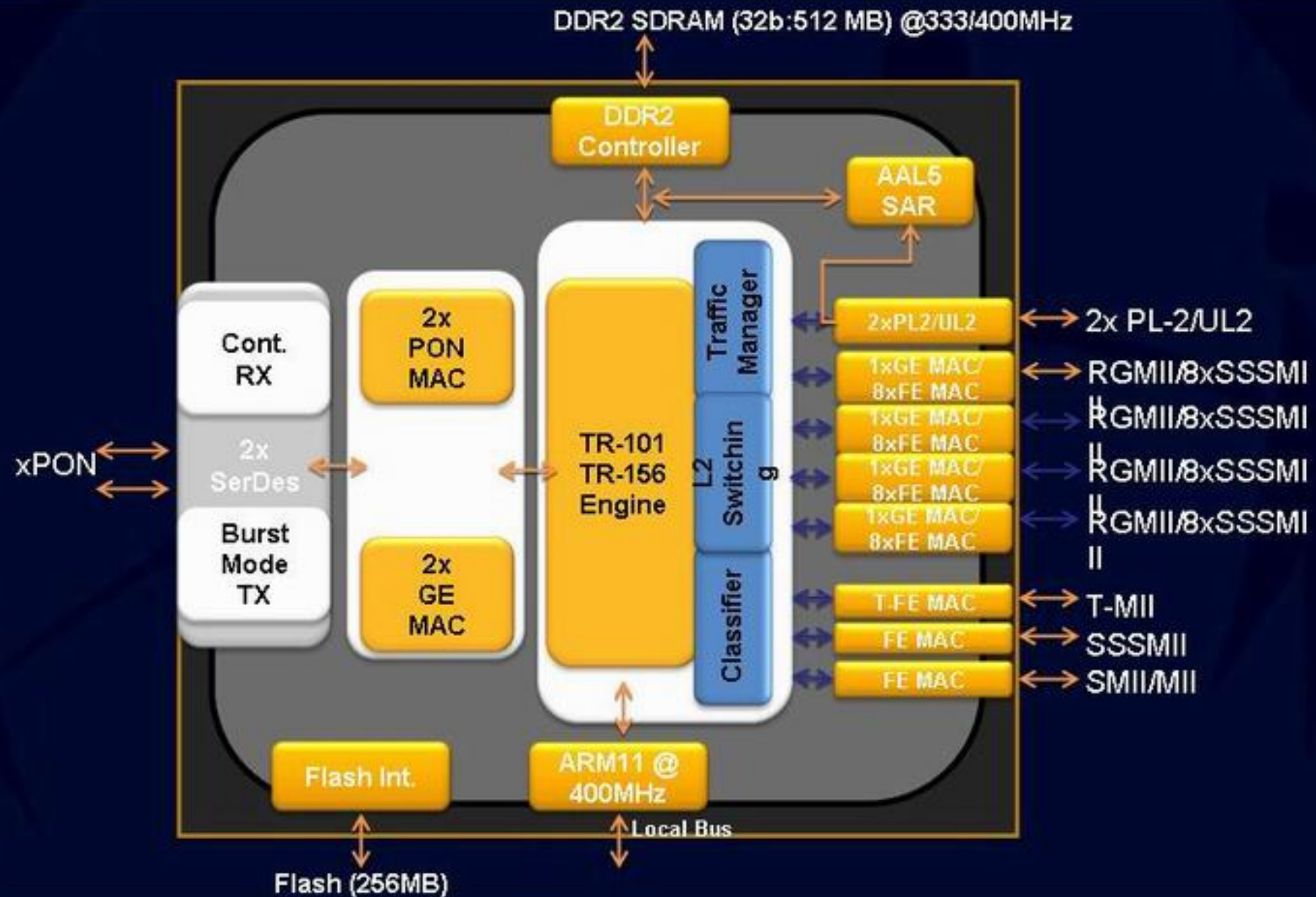


- + Guaranteed line rate and Deterministic QoS

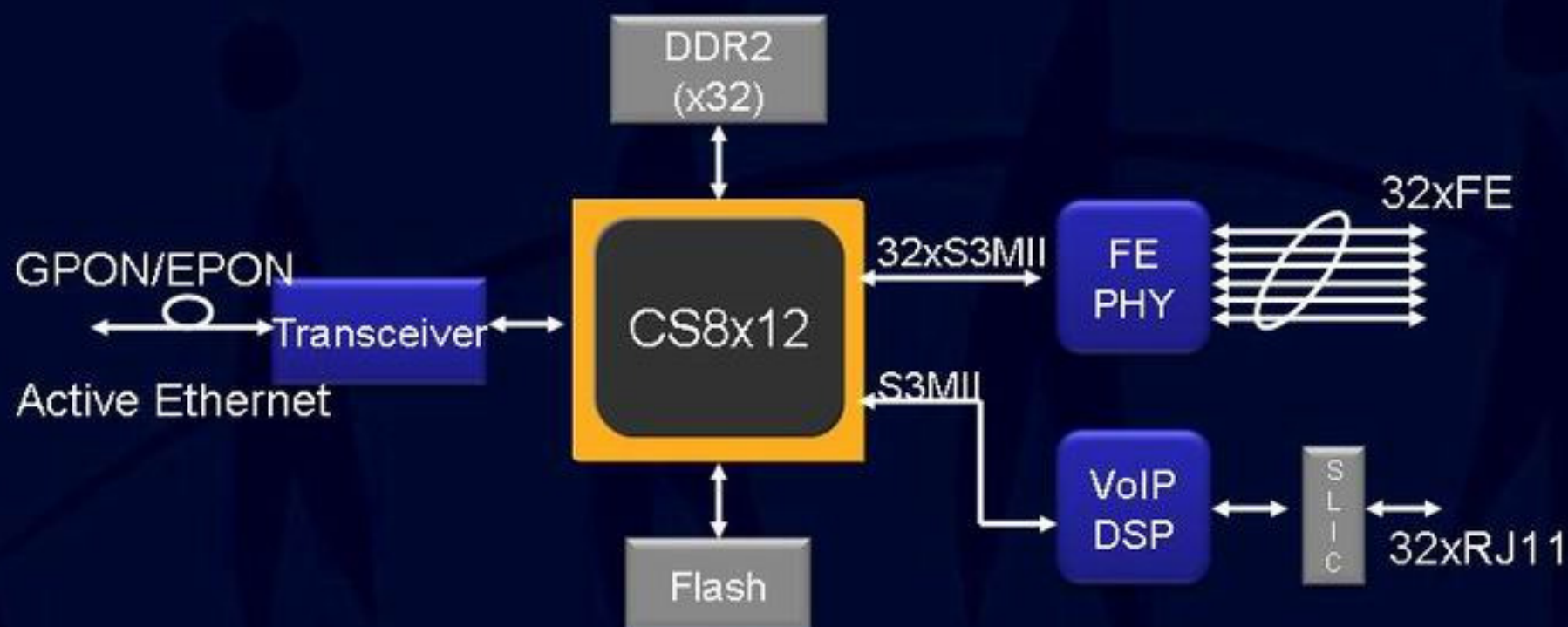


Cortina HFC Silicon Solution

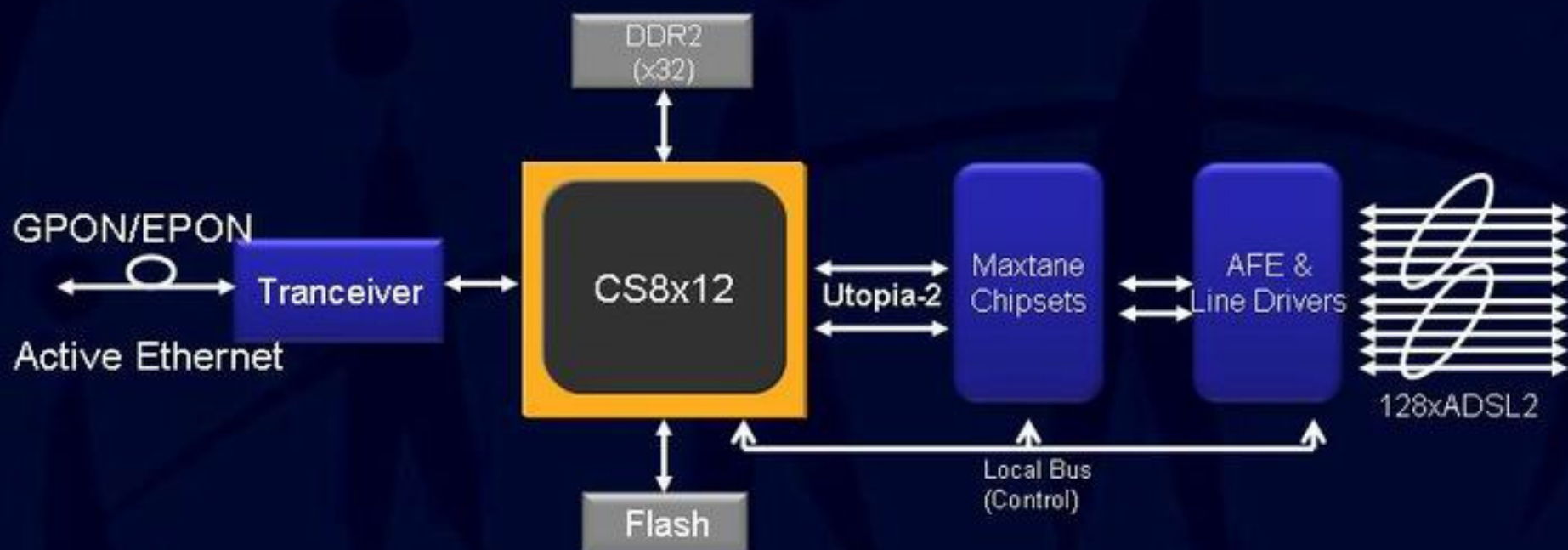
CS8x12 (Separate EPON and GPON Chips)



MDU Offering Native Ethernet Service



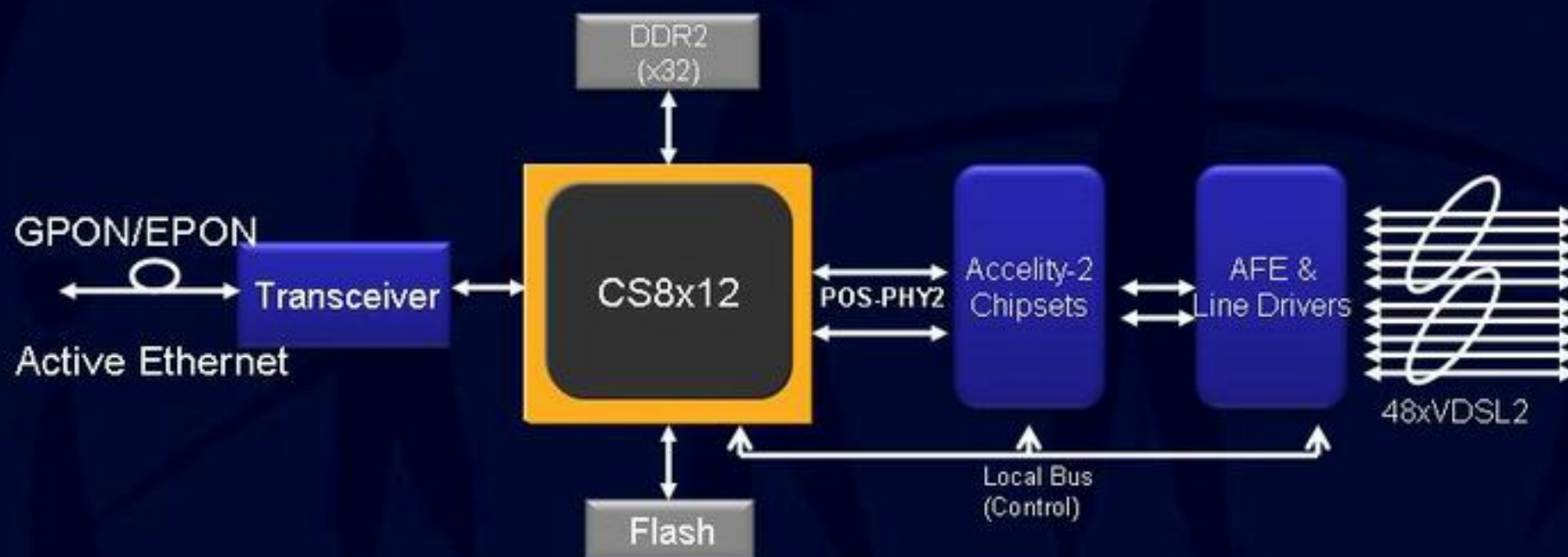
GPON MDU/MTU with ADSL2 UNI



Cortina Advantage

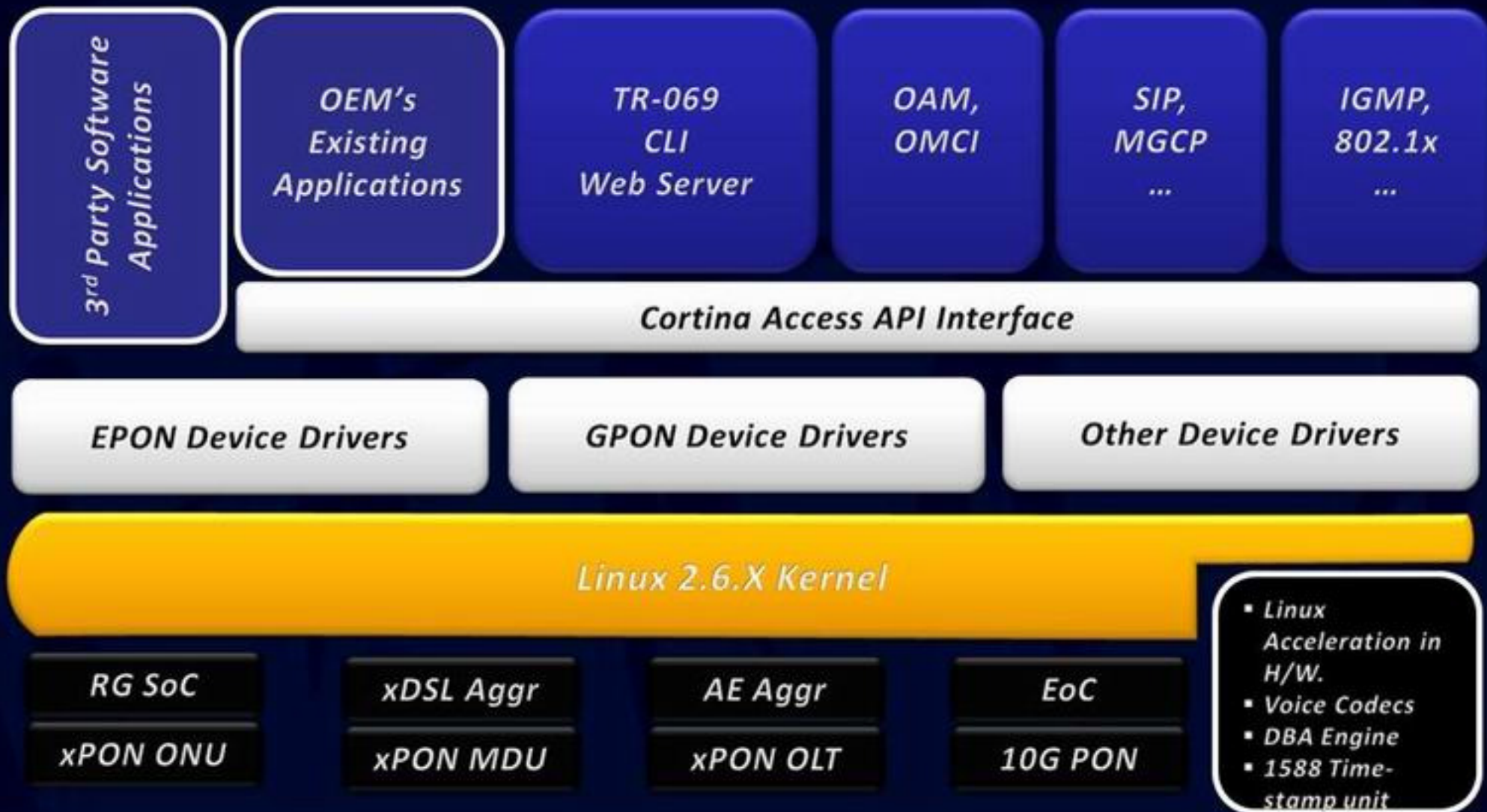
- Seamless integration and aggregation from copper to fiber in a single chip
 - Supports Carrier-class Ethernet and xDSL with built-in SAR engine on the legacy copper end
 - Supports EPON, GPON and Active Ethernet on the fiber end
- Powerful per Subscriber and per Service management and control engine
- Unique, performance intensive single stage packet forwarding and switching engine
- Integrated ARM11 control/management plane processor
- Fiber protection switching to enable high availability
- Lowest BOM cost and power

GPON MDU/MTU with VDSL2 UNI





Cortina Integrated Access Platform



Thank You

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