

# META-DX2+ Family

1.6T Ethernet MAC/PHYs Supporting MACsec/IPsec Encryption, Lambda Splitting, and Port Aggregation with Retimer, Gearbox, Hitless 2:1 Mux and Crosspoint



## Summary

The META-DX2+ family of devices are multi-purpose 1.6T Ethernet MAC/PHYs supporting rates from 1 GbE to 800 GbE and 112G PAM4 long reach SerDes. These versatile devices support encryption, lambda splitting, port aggregation, class C/D PTP and hitless 2:1 multiplexing, as well as SerDes crosspoint functionality that enables connectivity to a variety of optical modules, Direct Attach Copper (DAC) cables, packet processors and Ethernet switches.

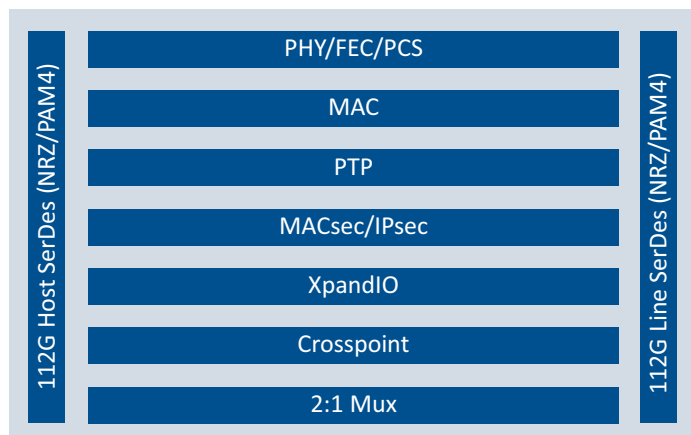
Encryption is a key feature of META-DX2+, providing security via MACsec or IPsec at full line rate. MACsec encrypts Ethernet traffic at the frame level and supports "VLAN tag in the clear", enabling multi-hop routing of encrypted packets. IPsec encrypts IP packets which ensures security across wide-area networks. By providing encryption within META-DX2+, packet processors can offload the task of encryption to META-DX2+, enabling systems to scale up to larger bandwidths while providing end-to-end security.

The META-DX2+ family offers variants with 48 SerDes, enabling 1.6T gearbox or hitless 2:1 mux configurations, which is double the capacity of other solutions and cuts the device count in half to enable smaller form factors. The META-DX2+ 32 SerDes variants are pin compatible with the META-DX2L device, enabling META-DX2L designs to easily add encryption, port aggregation, or MAC layer services such as PTP, all within a single Software Development Kit (SDK).

## Highlights

- 1.6T gearbox and retimer configurations
- 1.6T hitless 2:1 mux for working/protect architectures
- Dual 800GbE, Quad 400 GbE and 16x 1/10/25/40/50/100 GbE MAC/PHYs
- Integrated 1.6T MACsec/IPsec encryption engines
- Lambda Splitting enables splitting of 400 and 800 GbE clients across multiple wavelengths
- XpandIO enables port aggregation of low rate Ethernet clients over higher speed Ethernet interfaces
- Highly configurable crosspoint with ShiftIO, supporting multi-rate services on any port
- Supports Ethernet, OTN, Fibre Channel, and proprietary data rates for AI/ML applications
- PTP (IEEE 1588v2) support up to Class C/D
- 48 or 32 Long Reach (LR) capable 112G PAM4 SerDes
- Direct connectivity to passive copper cables including support for link training and auto-negotiation
- Industrial temperature range support, enabling deployments in outdoor environments
- Software Development Kit (SDK) that is common across the entire META-DX2 family, including all META-DX2+ and META-DX2L devices
- Support for Open Compute Project (OCP) based Switch Abstraction Interface (SAI) APIs

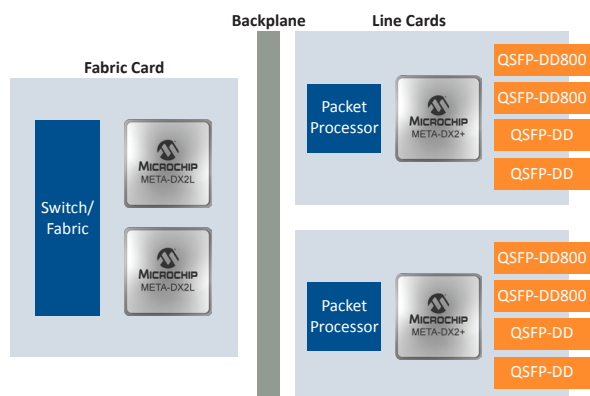
## META-DX2+ Block Diagram



## Applications

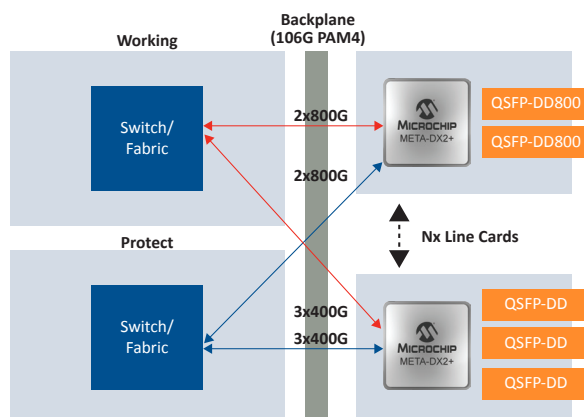
### Switch/Router Applications

- Fabric card in a high-capacity modular system
- High-capacity line card in a modular system
- Fixed form factor switch



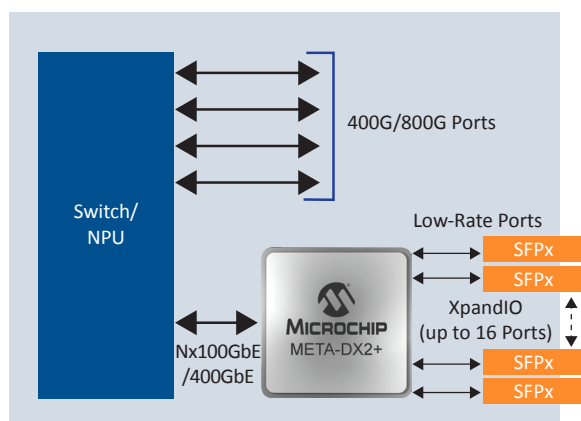
### Working/Protect Switch Using Hitless Mux

- Hitless switching between working and protect cards
- SerDes capable of driving across backplane or copper cables



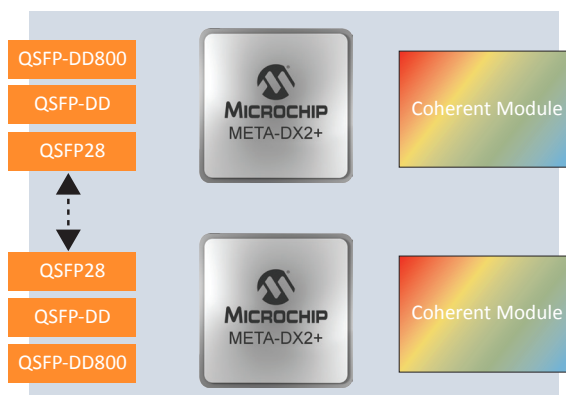
### Port Aggregation

- XpandIO aggregates multiple low-rate client ports, enabling efficient use of higher rate ports on the switch
- Allows client rates not supported by the Switch/NPU to be supported by the system



### Compact Modular Transponders and Muxponders

- Crosspoint and gearbox functionality enable common hardware for QSFP28, QSFP-DD and QSFP-DD800 optics
- Supports Ethernet, OTN and Fibre Channel rates on a per-port basis



| Family Variant | Part#       | Retimer/<br>Gearbox | Cross-point | Shift IO | Hitless 2:1<br>Mux | Encryption | XpandIO | Lambda<br>Splitting | # of SerDes | PCS/MAC<br>Retimer Max<br>Capacity | GearboxMax<br>Capacity | Package Size<br>(mm) |
|----------------|-------------|---------------------|-------------|----------|--------------------|------------|---------|---------------------|-------------|------------------------------------|------------------------|----------------------|
| META-DX2+      | PM6210C-FEI | ✓                   | ✓           | ✓        | ✓                  | ✓          | ✓       | -                   | 32          | 1.6T                               | 800G                   | 23 × 30              |
|                | PM6213C-FEI | ✓                   | ✓           | ✓        | ✓                  | -          | -       | ✓                   | 32          | 1.6T                               | 800G                   | 23 × 30              |
|                | PM6216C-FEI | ✓                   | ✓           | ✓        | ✓                  | ✓          | -       | -                   | 32          | 1.6T                               | 800G                   | 23 × 30              |
|                | PM6214C-FEI | ✓                   | ✓           | ✓        | ✓                  | -          | -       | ✓                   | 48          | 1.6T                               | 1.6T                   | 33 × 33              |
|                | PM6215C-FEI | ✓                   | ✓           | ✓        | ✓                  | -          | ✓       | -                   | 48          | 1.6T                               | 1.6T                   | 33 × 33              |
|                | PM6217C-FEI | ✓                   | ✓           | ✓        | ✓                  | ✓          | ✓       | -                   | 48          | 1.6T                               | 1.6T                   | 33 × 33              |
|                | PM6218C-FEI | ✓                   | ✓           | ✓        | ✓                  | ✓          | -       | -                   | 48          | 1.6T                               | 1.6T                   | 33 × 33              |
|                | PM6219C-FEI | ✓                   | ✓           | ✓        | ✓                  | ✓          | ✓       | ✓                   | 48          | 1.6T                               | 1.6T                   | 33 × 33              |