



Liaison to IEEE 802.1 / 802.3

ESUN 1.0 Overview

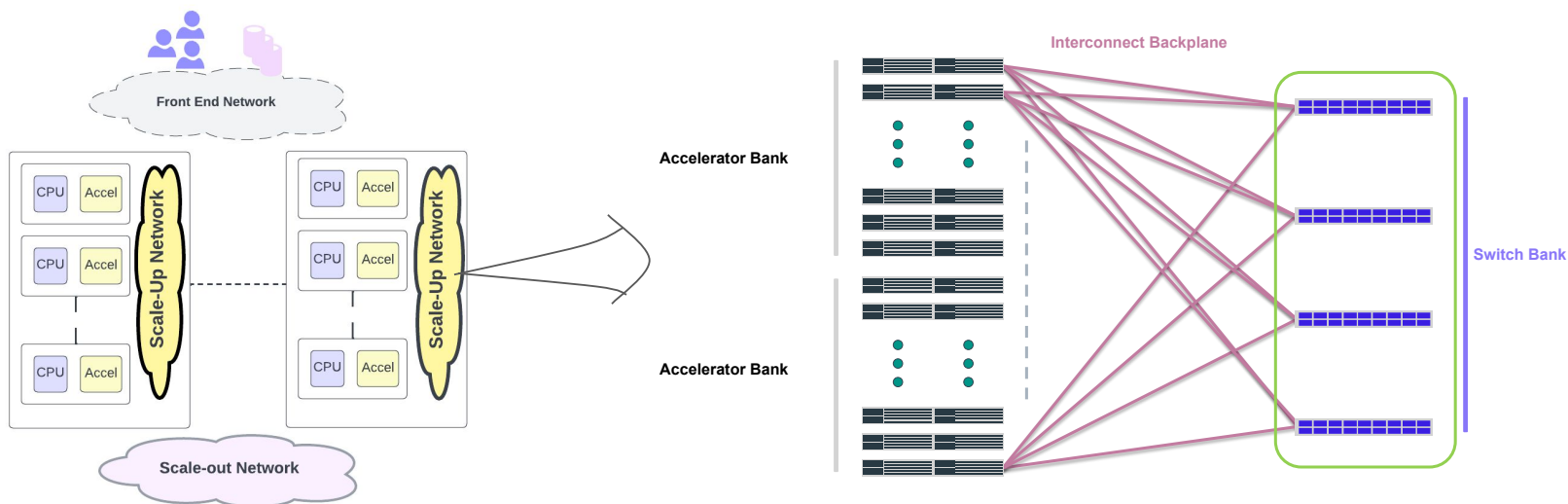
Manoj Wadekar (Meta)

Pratik Moralia (Microsoft)

Agenda

- Motivations for ESUN
- ESUN Spec progress so far
- ESUN 1.0 Spec overview
- Q & A

AI Systems: Scale-Up Networks

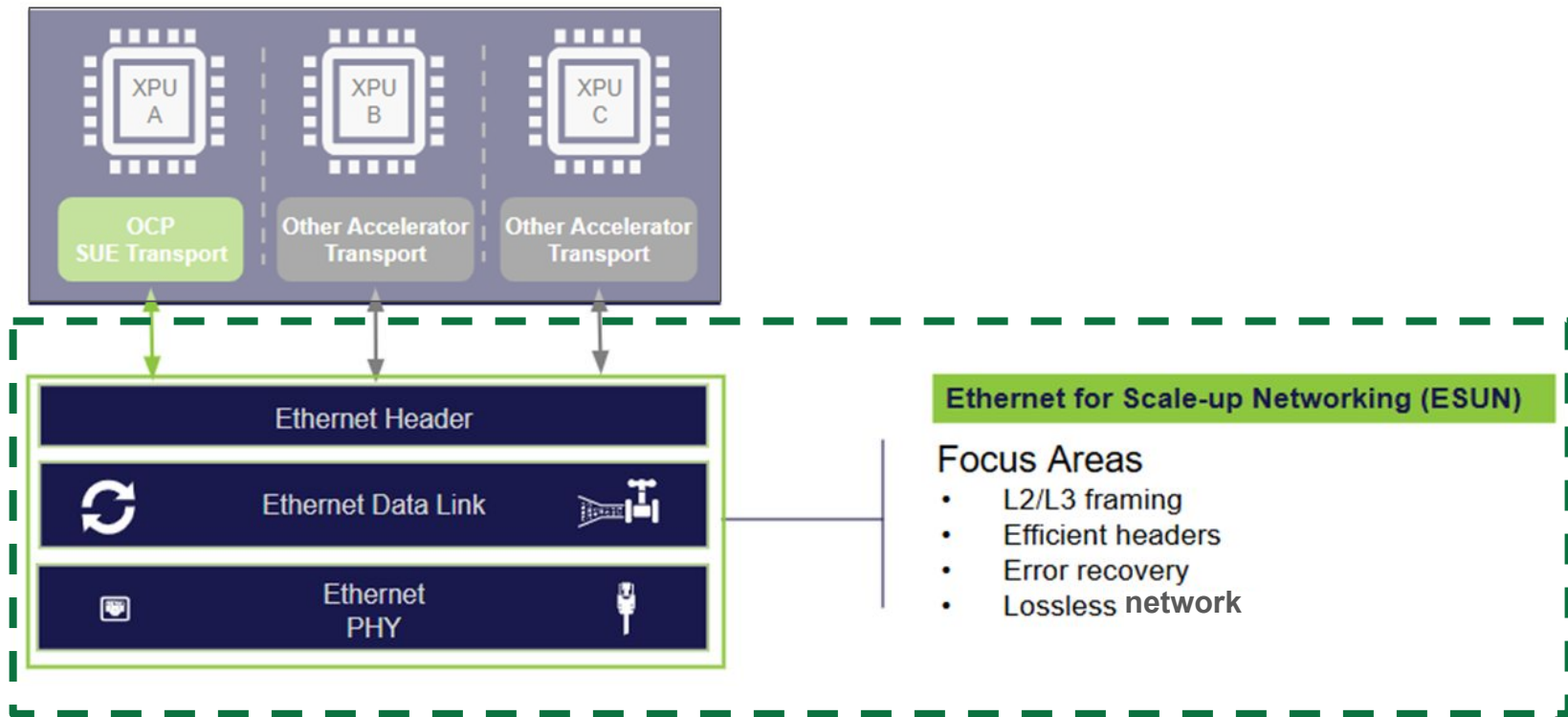


Scale-Up Networks critical for AI Systems
High Bandwidth and Goodput, Low Latency, Lossless Network, Hierarchical Topology

ESUN: Ethernet Scale Up Network

- Proposes Ethernet as an open interconnect for Scale-Up
- Leverage strong Ethernet eco-system of NOS, operational and performance tools
- Complementary with existing standards; Fast Iteration for convergence
- Establishes clear Operator/End User requirements
- Clear demarcation between networking and host functionality
 - Start with minimal specification based on existing standards/open specifications for Ethernet
 - Allows Accelerator developers to evolve and execute at their own pace

ESUN : Technical Focus area



ESUN 1.0 Spec Process so far

- Bi-Weekly meeting:
 - 237 Members
- [ESUN 1.0 Spec: OCP ESUN - Network Operator Requirements](#) (CLA: Meta and Microsoft)
 - 12/10/2026: Rev0.2 Spec released to the community
 - 12/18/2026: Presented to the team on 01/15/2026 with Feedback Agreement
 - Received feedback (during meeting, on the mailing list and by email)
 - 01/15/2026: Presented updated document Rev 1.0-Final to the group
 - 02/09/2026: Presented today to Networking Project
 - 02/12/2026: Present to Steering Committee
 - Published: ESUN 1.0 spec is approved



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ESUN 1.0 Spec Overview

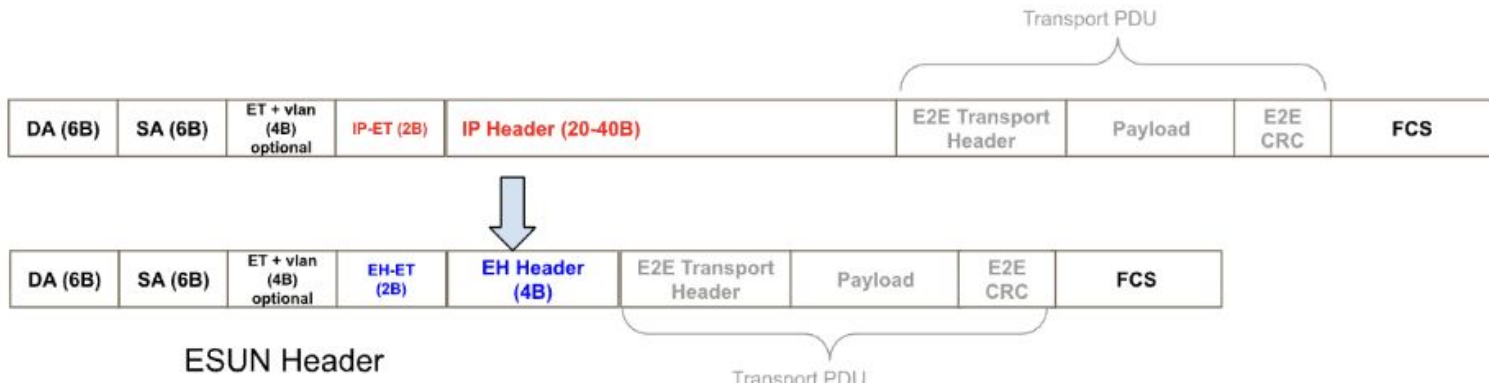
ESUN: Targeted improvements

- Goodput efficiency: Improve throughput efficiency and latency characteristics for all packet sizes
 - Smaller packets need efficient headers
- High performance SU network with Hierarchical Topologies
 - Congestion Management, Traffic Differentiation, Load Balancing
- Lossless, power/cost efficient design
 - Improving link level reliability through faster error recovery (e.g. LLR)
 - Buffering efficient link level congestion management mechanisms (e.g. PFC, CBFC)
- Focus on Fabric Interface and functionality

ESUN Enhancements

	Link Level CM (Transient Congestion)	Fabric Feedback (Persistent Congestion)	Traffic Differentiation	Resilience and Load balancing	Multi-Hop Topology
Ethernet	PFC	IP based ECN	DSCP, 802.1p*	No LLR ECMP	TTL, IP Based ECN
ESUN	PFC, CBFC	EH-ECN	EH-CoS	LLR, EH-Flow Label	EH-ECN, EH- TTL

Header Efficiency



- **Standard Ethernet Header:**
 - Small packets carry large overhead
- **ESUN Header**
 - Uses tag-based method to provide **optimal** functionality that reduces header overhead

ESUN Header Fields

Rev (2b)	F	EH-CoS (3b)	EH-ECN (2b)	Flow label (16b)	TTL (4b)	UD (2b)	RSVD (2b)
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ESUN Header Definition

- Maintains QoS, ECN, TTL functionality to provide hierarchical topology capability to Scale Up clusters
- Adds Flow Label to achieve load balancing in the network
- End points are expected to be XPU. Any further de-multiplexing is expected to be handled by them

ESUN Reliability and Congestion Management

- **Link Reliability**
 - LLR optional capability to improve the quality of the channel by reducing exposure to BER
- **Congestion Management**
 - Continue to support PFC for link level flow control
 - Provide optional capability to use Credit Based Flow Control (CBFC) as defined in UEC

ESUN Feature Comparison

	Link Level CM (Transient Congestion)	Fabric Feedback (Persistent Congestion)	Traffic Differentiation	Resilience and Load balancing	Multi-Hop Topology
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ESUN	PFC, CBFC	EH-ECN	EH-CoS	LLR, EH-Flow Label	EH-ECN, EH- TTL

Next Steps

- ESUN workstream plans
 - Teams are formed for future discussions
 - Will start discussing requirements and proposals
- Join the effort
 - <https://www.opencompute.org/wiki/Networking/ESUN>



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Q & A

Questions



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