

IEEE802/IETF Workshop on Data Center Networks

Bangkok, November 2018

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If you have questions, contact the IEEE-SA Standards Board Patent Committee Administrator at patcom@ieee.org

Agenda

1:30PM - 1:40PM	Opening Remarks	Paul Congdon	Tallac/Huawei	10
1:40PM - 2:10PM	IEEE 802 Network Enhancements for the Next Decade (Nendica): Lossless Data Center Networks Activity and Report	Roger Marks	Chair, IEEE 802 Nendica	30
2:10PM - 2:40PM	P802.1Qcz - Congestion Isolation	Paul Congdon	Tallac/Huawei	30
2:40PM - 3:00PM	Converged Ethernet and Storage Appliances	Richard Scheffenegger	NetApps	20
3:00PM - 3:30PM	Improving Link-Layer Performance with L4S	Bob Briscoe	CableLabs	30
3:30PM - 3:45PM	Break			15
3:45PM - 4:15PM	Data Center Silicon Considerations	Barak Gafni	Mellanox	30
4:15PM - 4:45PM	Routing in Fat Trees (RIFT)	Tony Przygienda	Juniper	30
4:45PM - 5:15PM	Discovery, liveness and auto-configuration in Data Centers	Randy Bush	Arrcus & IJJ	30
5:15PM - 5:30PM	Wrap-up	Paul Congdon	Tallac/Huawei	15

IEEE 802 / IETF Coordination

- This has been going on for years...
 - <https://www.iab.org/wp-content/IAB-uploads/2018/06/Potential-areas-for-IETF-IEEE802-Coordination-27.txt>
- Examples of project coordination:
 - Enabling use of Local Addresses for virtualization and IoT
 - IETF and IEEE 802.1 OmniRAN TG
 - Coordination between the IETF and IEEE 802 on Pervasive Monitoring
 - Layer2/Layer 3 Interaction for Time-Sensitive Traffic
 - Development of YANG models in the IEEE 802
 - IETF NVO3 and IEEE 802.1 DCB
- Goal of this workshop is to explore potential future areas of coordination/collaboration with respect to Data Center Networks

Different SDOs with different processes, but similar goals – quality open standards

- IEEE and IETF develop standards differently – From July 2012
 - [Introduction to the IETF Standards Process \(Russ Housley\)](#)
 - [Introduction to IEEE 802 \(Pat Thaler\)](#)
- Some personal observations of the differences
 - PARS vs “rough consensus and running code”
 - Ballots vs Last Calls
 - Voting vs Humming
 - Face-to-face meetings
- “Working on topics that span Standards Development Organizations (SDOs) take *significantly* more effort to be successful”

Data Center Focused Activities

- IETF

- I2RS - <https://datatracker.ietf.org/doc/draft-ietf-i2rs-yang-dc-fabric-network-topology/>
- MBONED - <https://datatracker.ietf.org/doc/draft-ietf-mboned-dc-deploy/>
- SFC - <https://datatracker.ietf.org/doc/draft-ietf-sfc-nsh-dc-allocation/>
- SPRING - <https://datatracker.ietf.org/doc/draft-ietf-spring-segment-routing-msdc/>
- LSVR - <https://datatracker.ietf.org/wg/lsvr/documents/>
- SDNRG - <https://datatracker.ietf.org/doc/draft-kong-sdnrg-routing-optimization-sdn-in-dc/>
- NWG - <https://datatracker.ietf.org/doc/draft-purkayastha-dc-routing-leading-indicators/>
- RTGWG - <https://datatracker.ietf.org/doc/draft-sl-rtgw-gfar-dcn/>
- RIFT - <https://datatracker.ietf.org/wg/rift/documents/>
- IDR - <https://datatracker.ietf.org/doc/draft-heiz-idr-msdc-bgp-aggregation/>
- BIER - <https://datatracker.ietf.org/doc/draft-ietf-bier-entropy-staged-dc-clos/>

- IEEE

- 802.1Qcy – VDP Extension to Support NVO3 - <https://1.ieee802.org/dcb/802-1qcy/>
- 802.1Qcz – Congestion Isolation - <https://1.ieee802.org/tsn/802-1qcz/>

802.1 DCB History

The peak of activity (2005-2012) was motivated by converged Ethernet data centers and virtualization

Currently inactive - <https://1.ieee802.org/dcb/>

- 802.1Qau – Congestion Notification
- 802.1Qaz – Enhanced Transmission Selection
- 802.1Qbb – Priority-based Flow Control
- 802.3bd – MAC Control Frame for Priority-based Flow Control
- 802.1Qbg – Edge Virtual Bridging
- 802.1BR – Bridge Port Extension
- 802.1Qcd – Application VLAN TLV
- 802.1Qcy – VDP Extension to Support NVO3

Opportunities looking forward

- Switch architecture support for end-to-end congestion management
- RDMA Congestion Control improvements
- Improved visibility and diagnostics (OAM, CFM)
- Congestion aware load balancing
- Network assistance with the incast problem
- Discovery and auto-configuration
- Others...