Softwarized LTE in FLARE network slices

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EU-Japan Collaboration Project Proposal

5G!Pagoda

"A network slice for every service"

5G! PAGODA

Federating Japanese and European 5G Testbeds to Explore Relevant Standards and Align Views on 5G Mobile Network Infrastructure Supporting Dynamic Creation and Management of Network Slices for Different Mobile Services.

サービスに応じたスライス動的生成・管理機能の実証と標準化を目的とする日欧連携 5G 移動通信基盤テストベッド

Call: EUJ1-2016 - 5G - Next Generation Communication Networks

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5G!Pagoda Project Scope

- Softwarized Network Realization w/ NFV, SDN and 5G
- Research-Innovation and Standardization
- Objectives are

i) the development of a scalable 5G slicing architecture towards supporting specialized network slices composed on multi-vendor network functions, through the development of

ii) a scalable network slice management and orchestration framework for distributed, edge dominated network infrastructures, and convergent software functionality for

iii) lightweight control plane and

iv) data plane programmability and their integration, customization, composition and run-time management towards different markets.

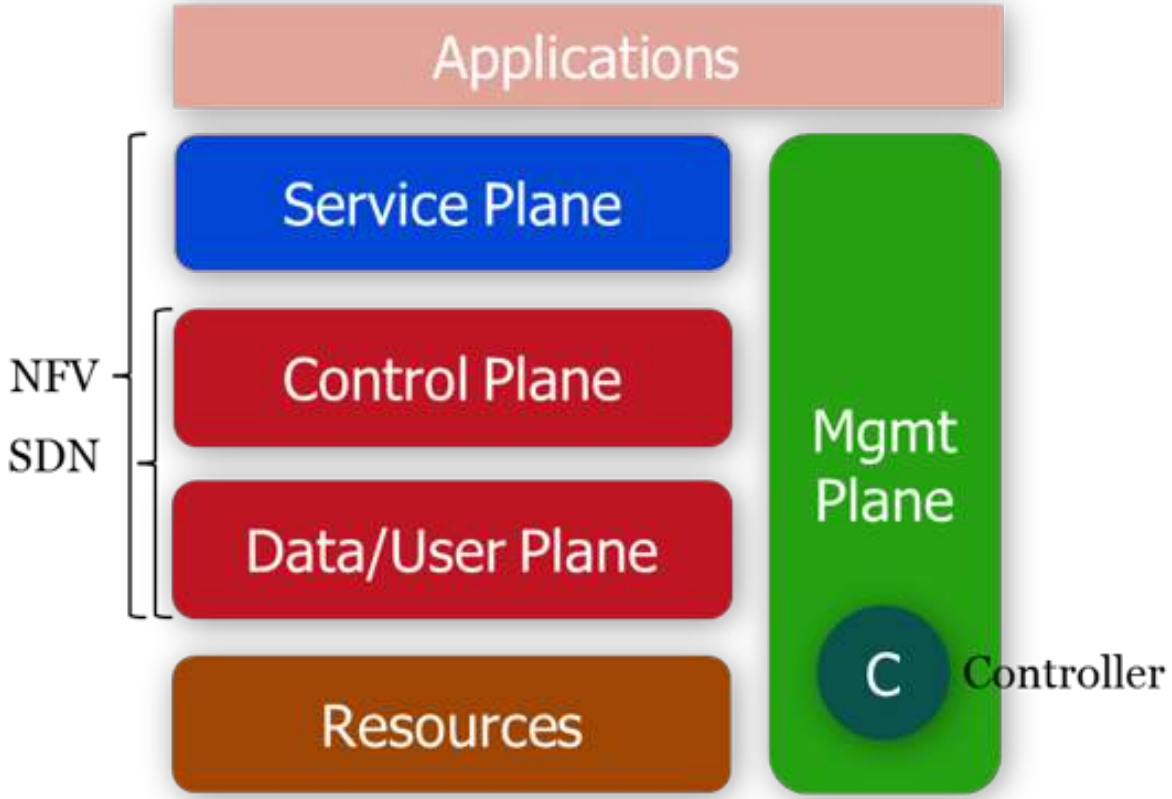
Definition of Slice

Slice = An isolated set of programmable resources to enable network functions and services

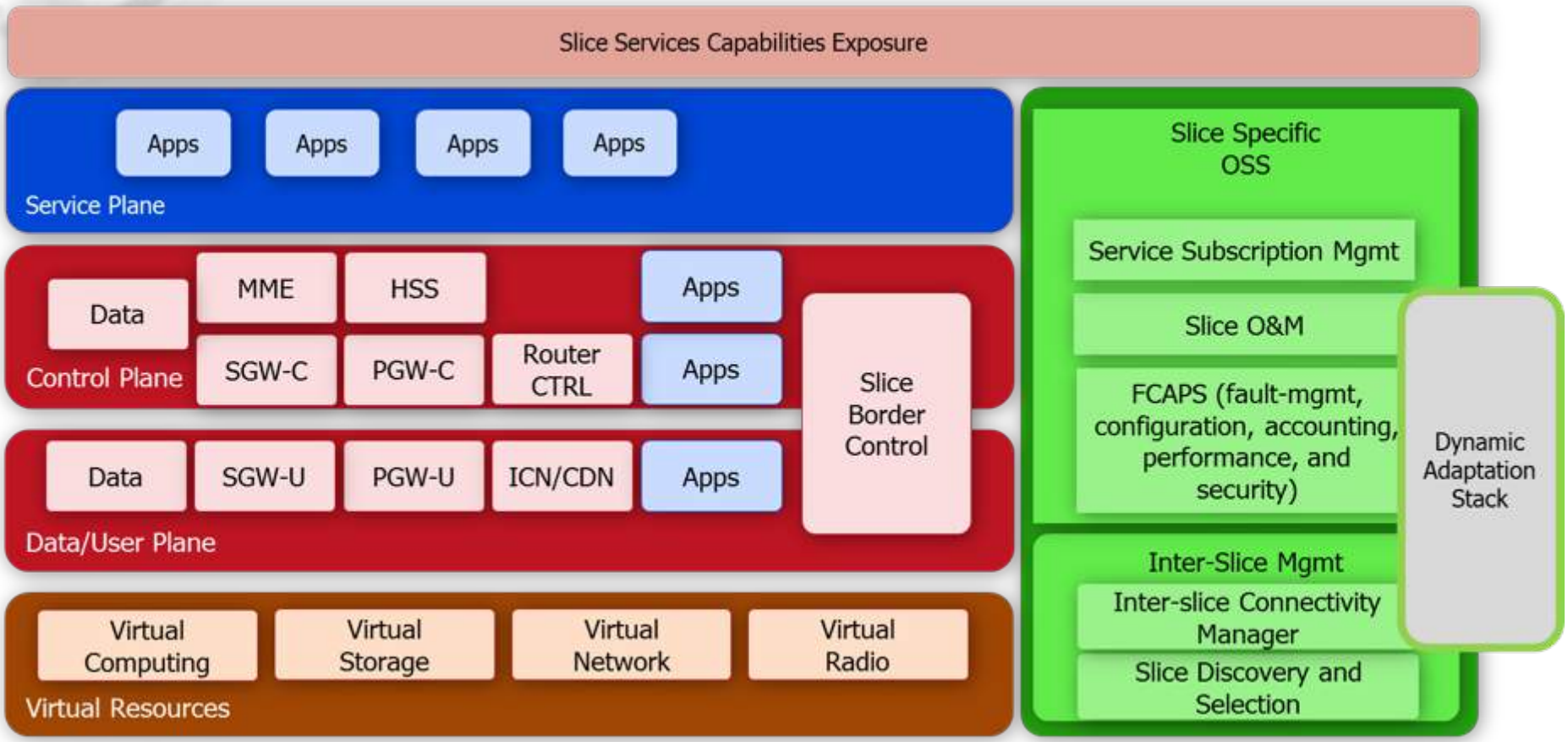
Two important features to be required

- **Resource Isolation**
- **Programmability**

Slice high-level architecture Templates



Instantiated 5G slices



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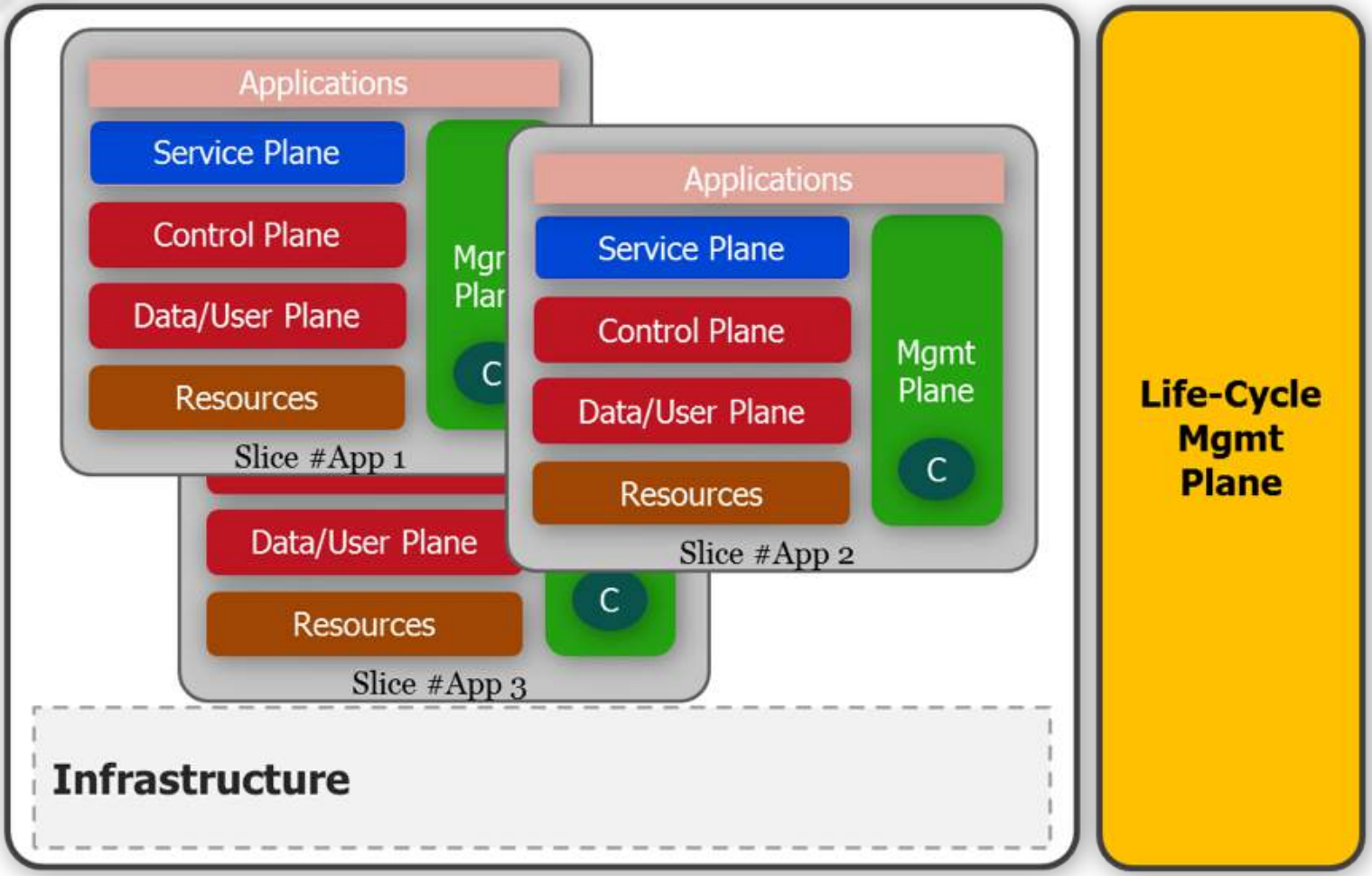
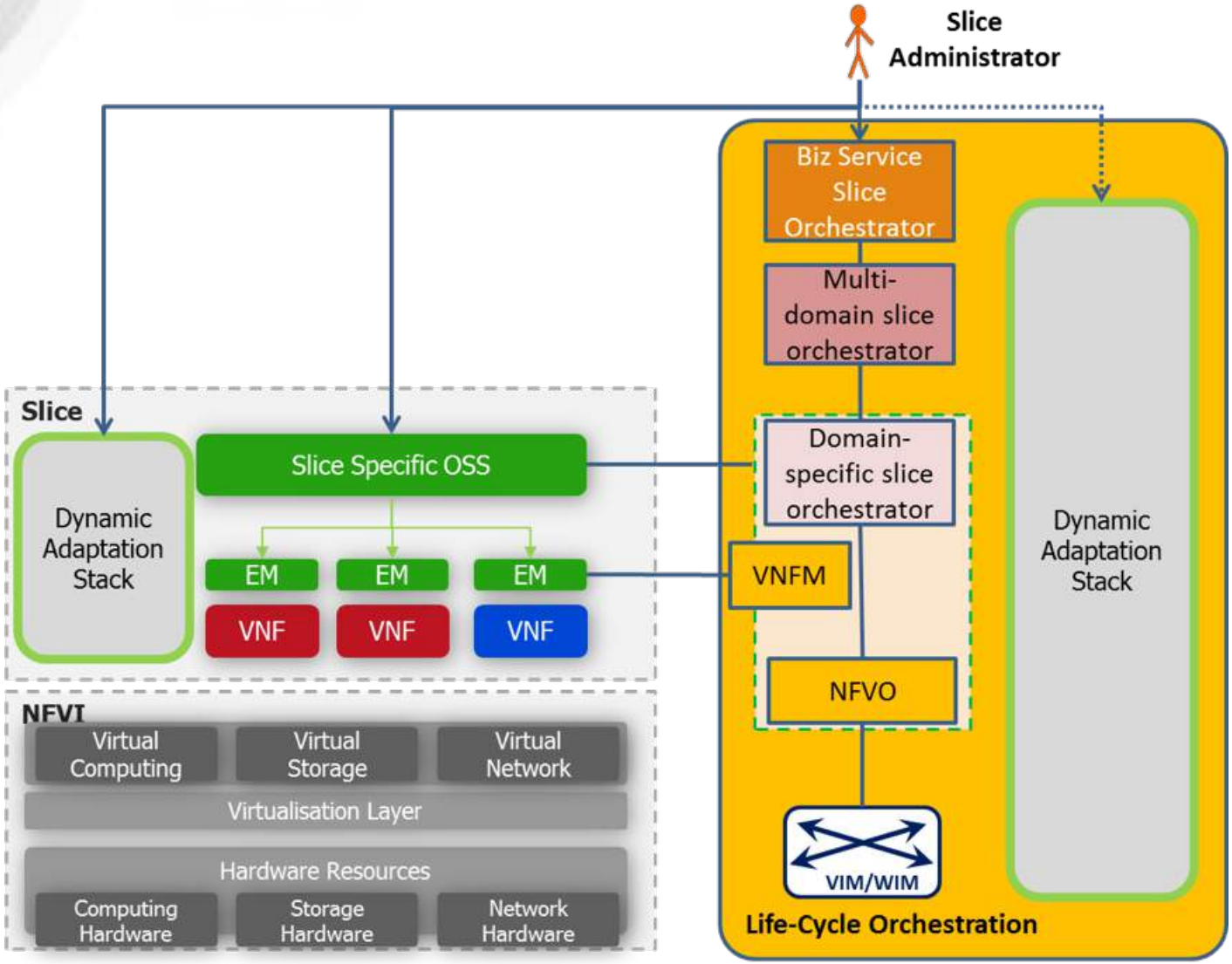
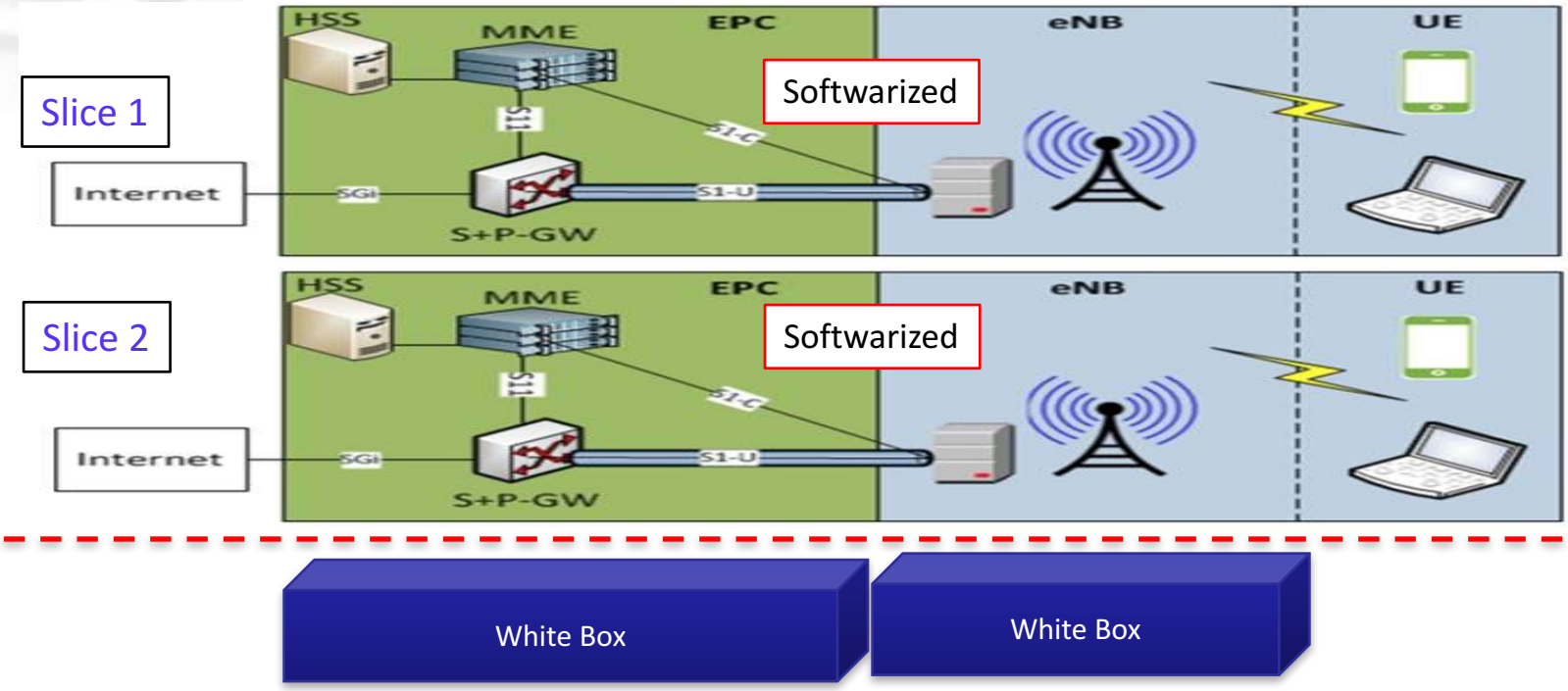


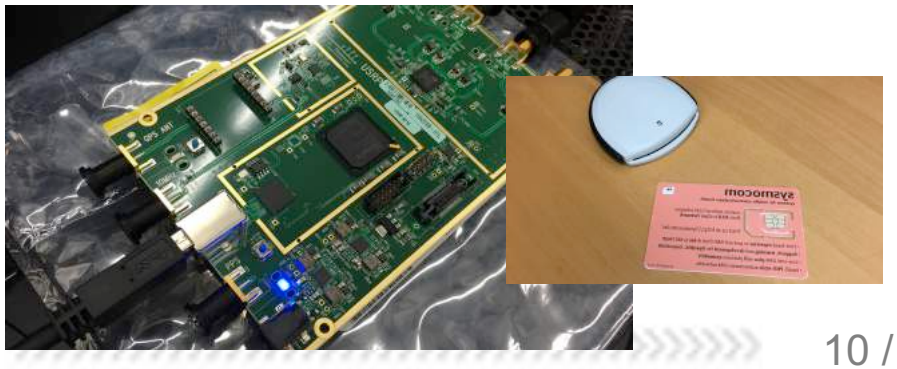
Life-cycle orchestration for multi-domain architecture

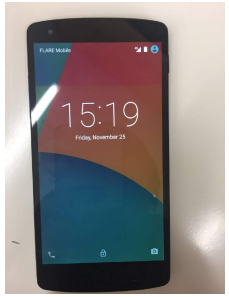


Open Air Interface (OAI)

Softwarized LTE in A Slice







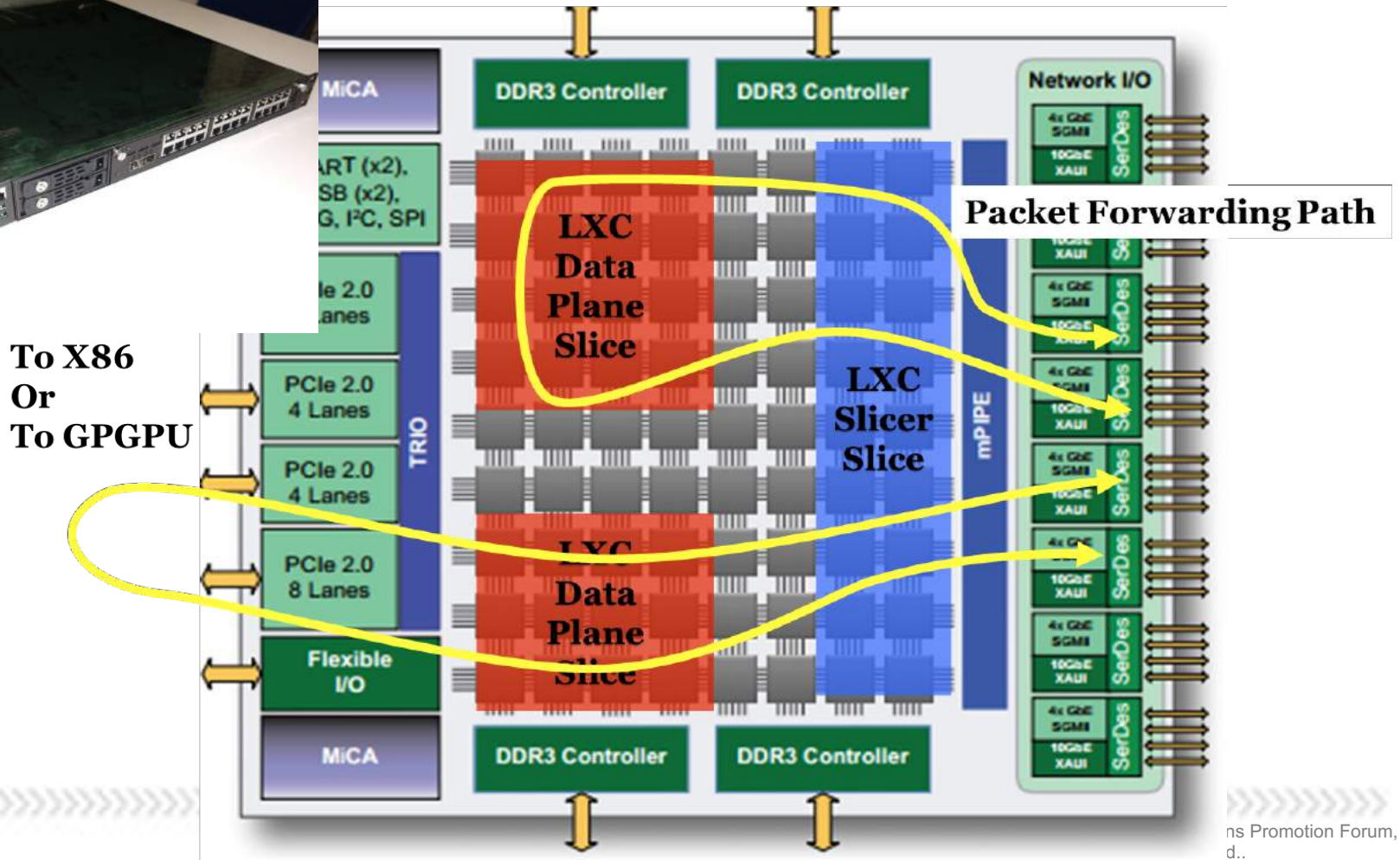
Contribution from U-Tokyo

THE UNIVERSITY OF TOKYO

OKI

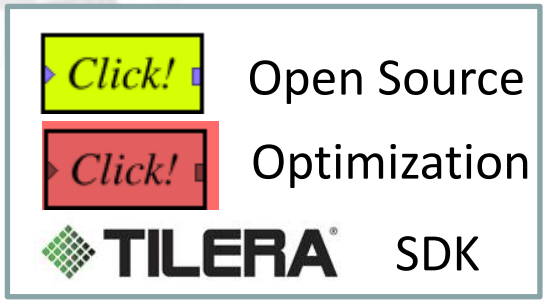
- ***FLARE Platform will be enhanced towards 5G Slicing***

  Current Spec: 72 core EZ-Chip Network processor, GbE: 24 ports and 10GbE
  SFP+: 2 ports, Up to 128GB memory / 1TB SSD, Redundant Power supply

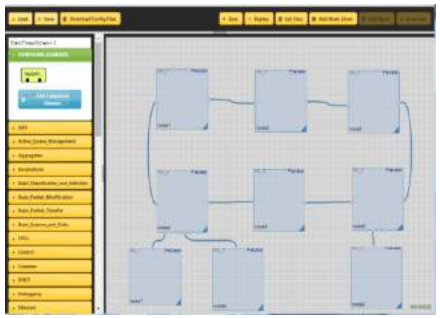


FLARE Software Suite

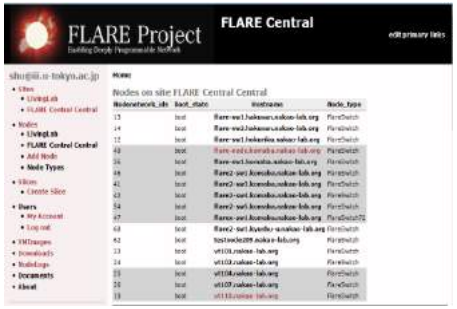
◆ *Open Source based Network Softwarization Platform*



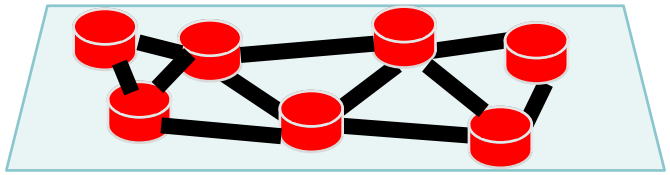
Network Functions Software Defined Data Plane



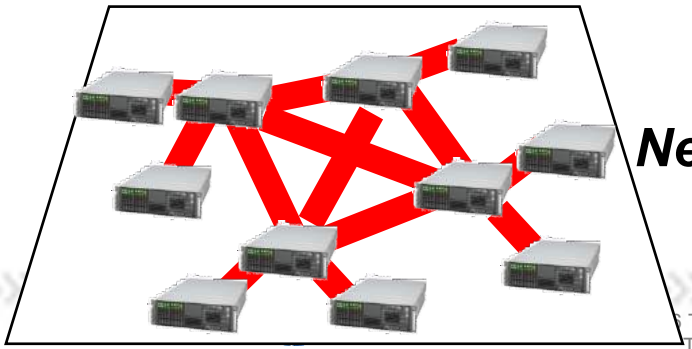
Toy-Block Networking GUI



Resource Management Center



Slice (Logical NW View)

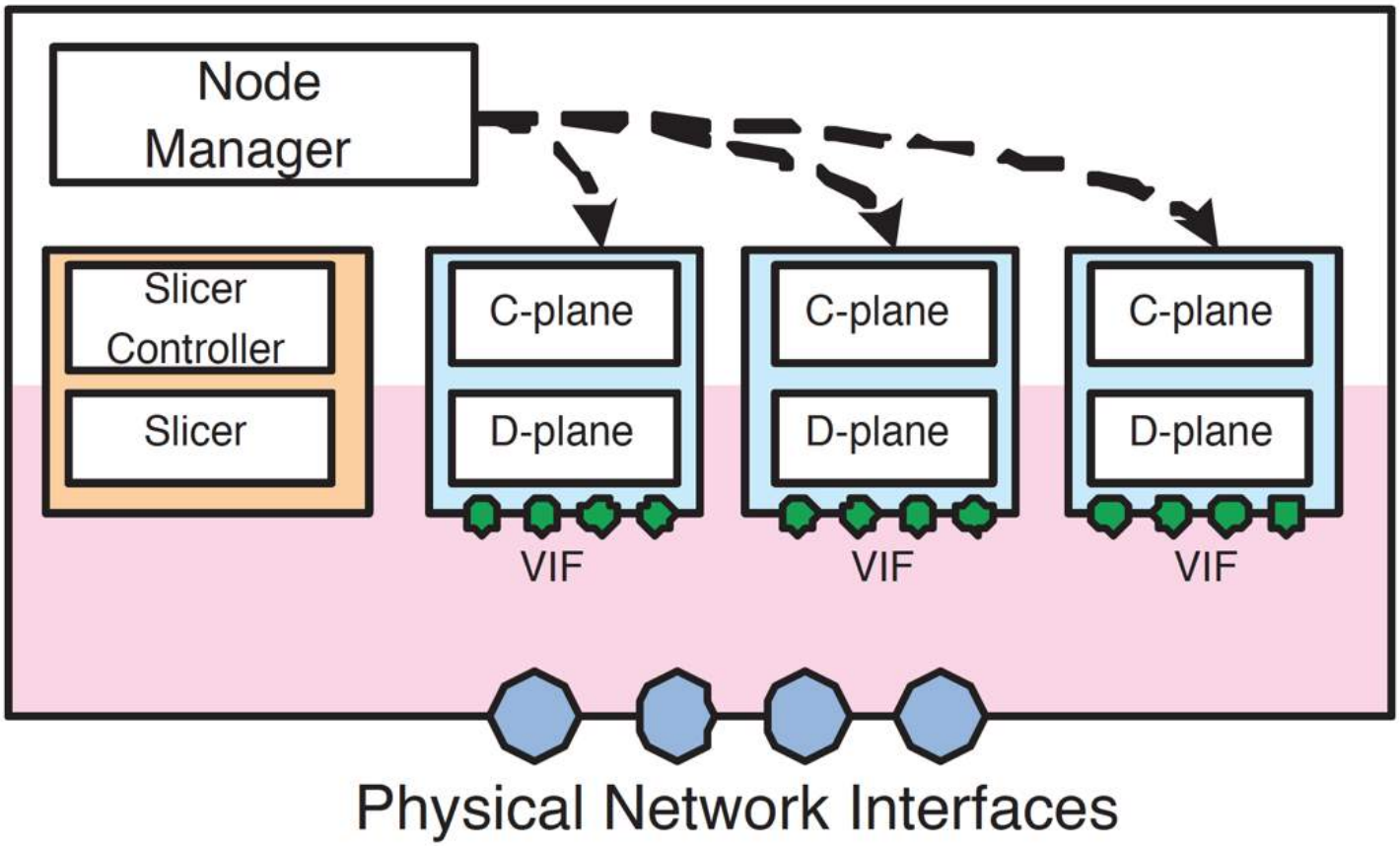


Network of FLARE nodes (Physical NW View)

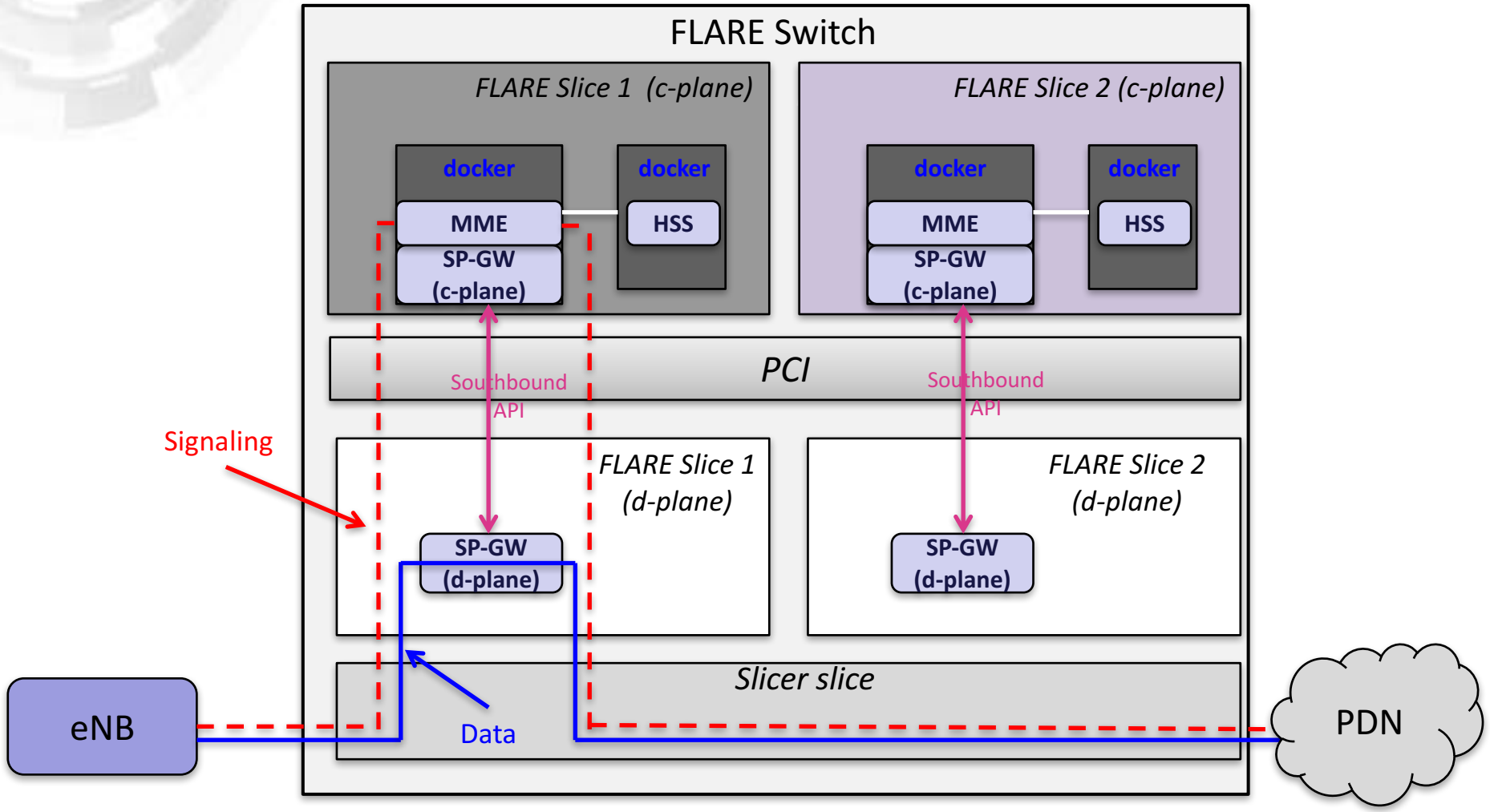
FLARE Node Architecture

Cplane
(Intel x86
processor)

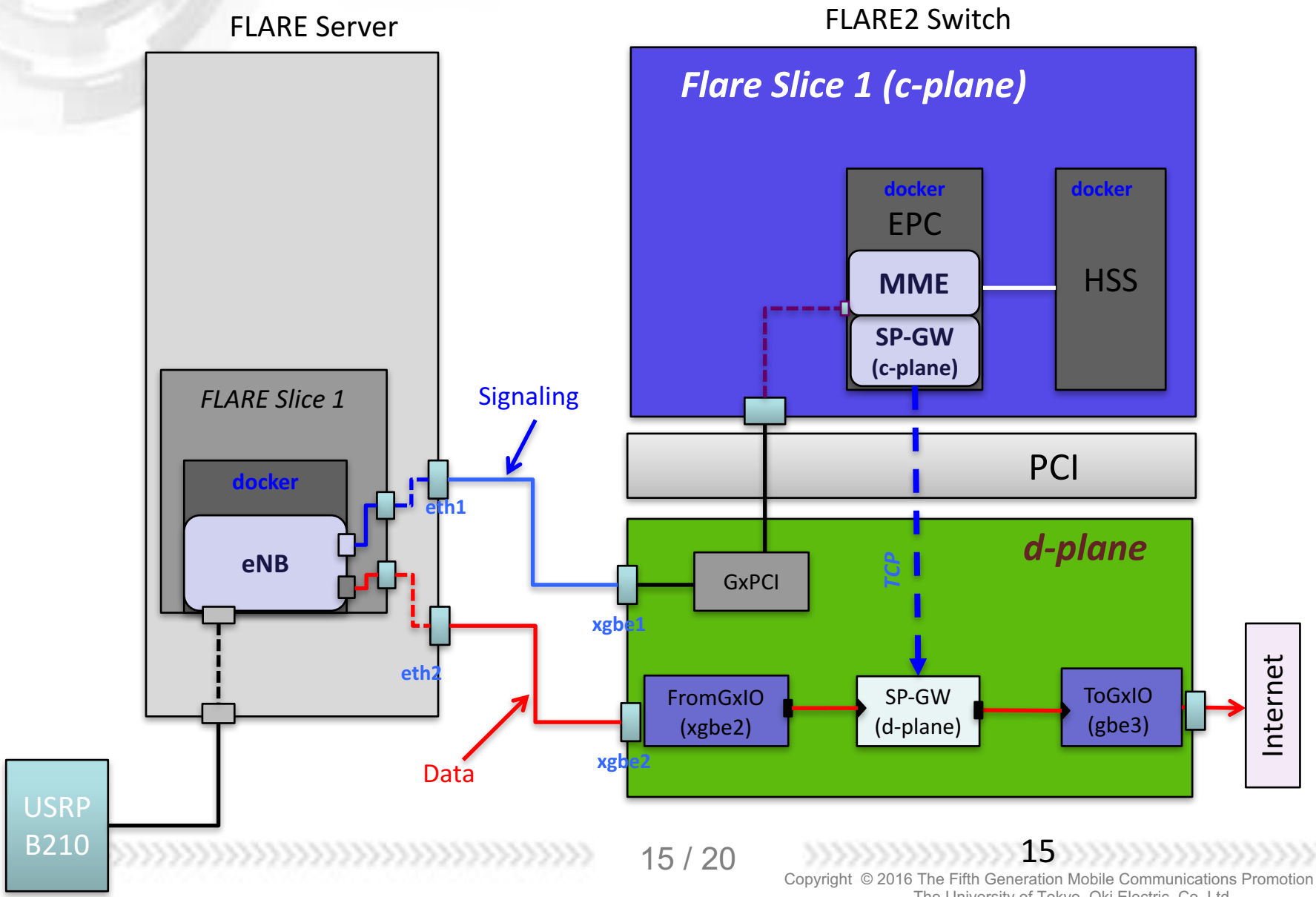
Dplane
(Many core
processor)



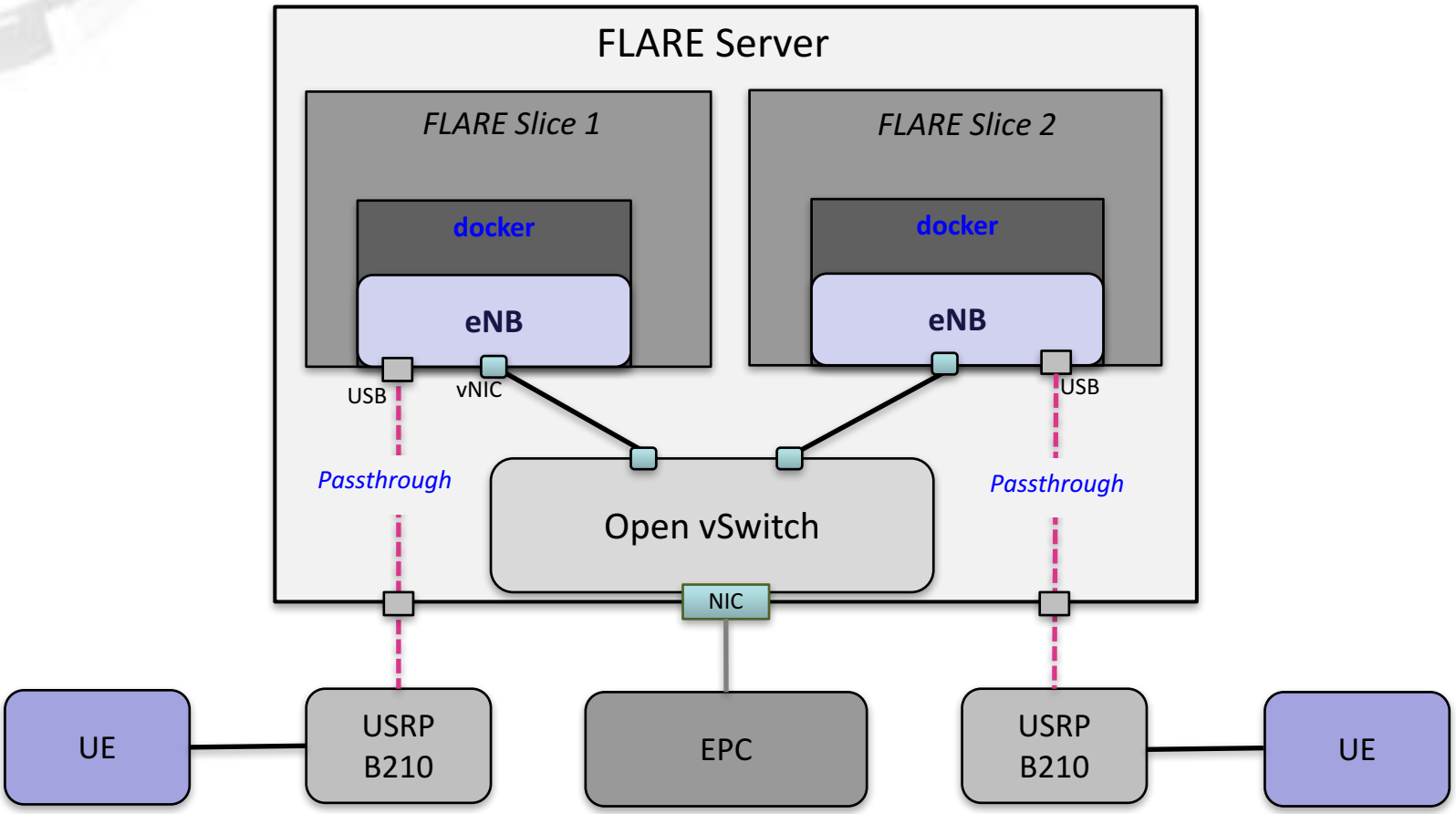
Dockerized EPC on FLARE Node



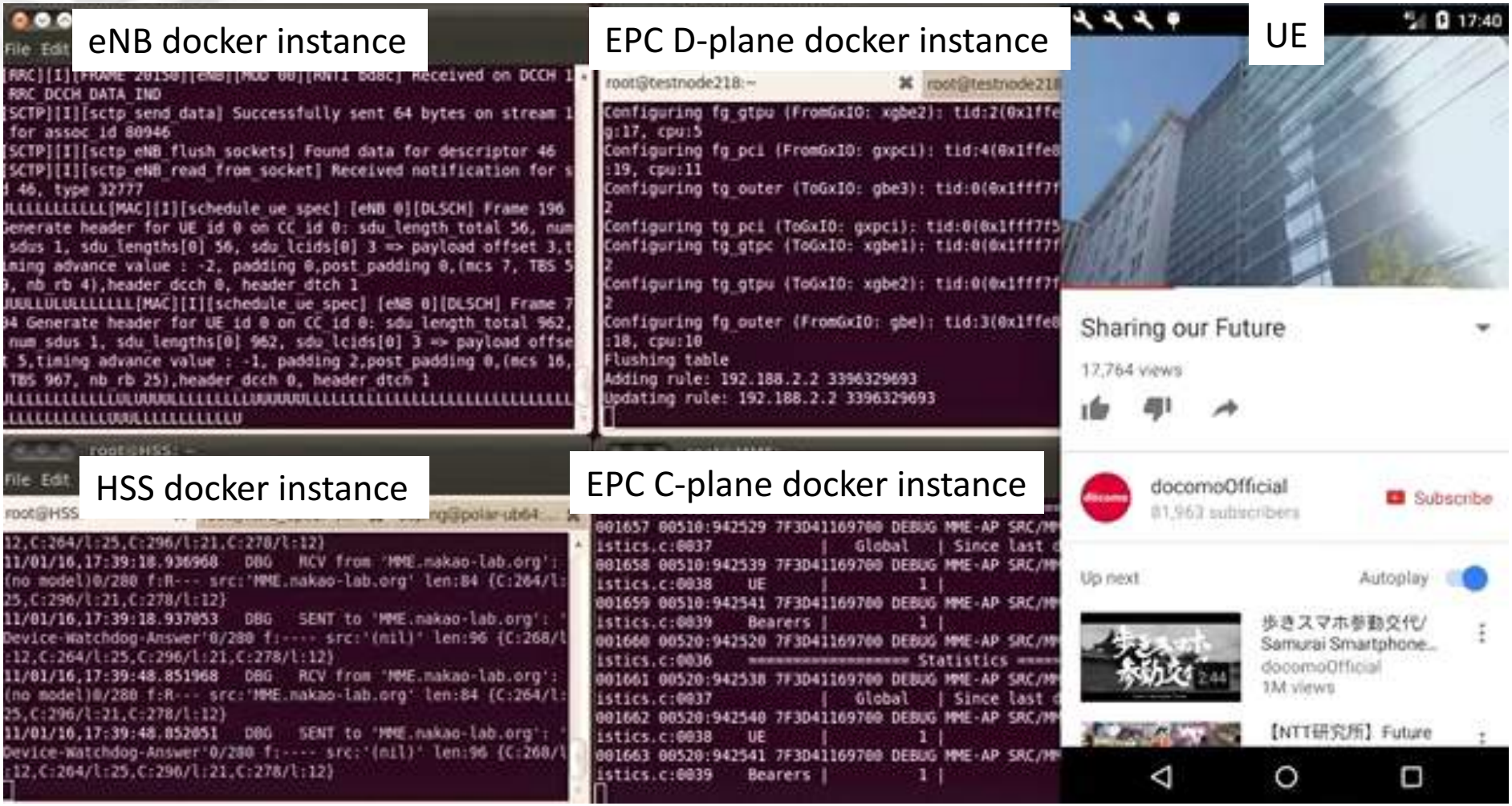
Architecture in Demo



OAI eNB Integration in FLARE Node

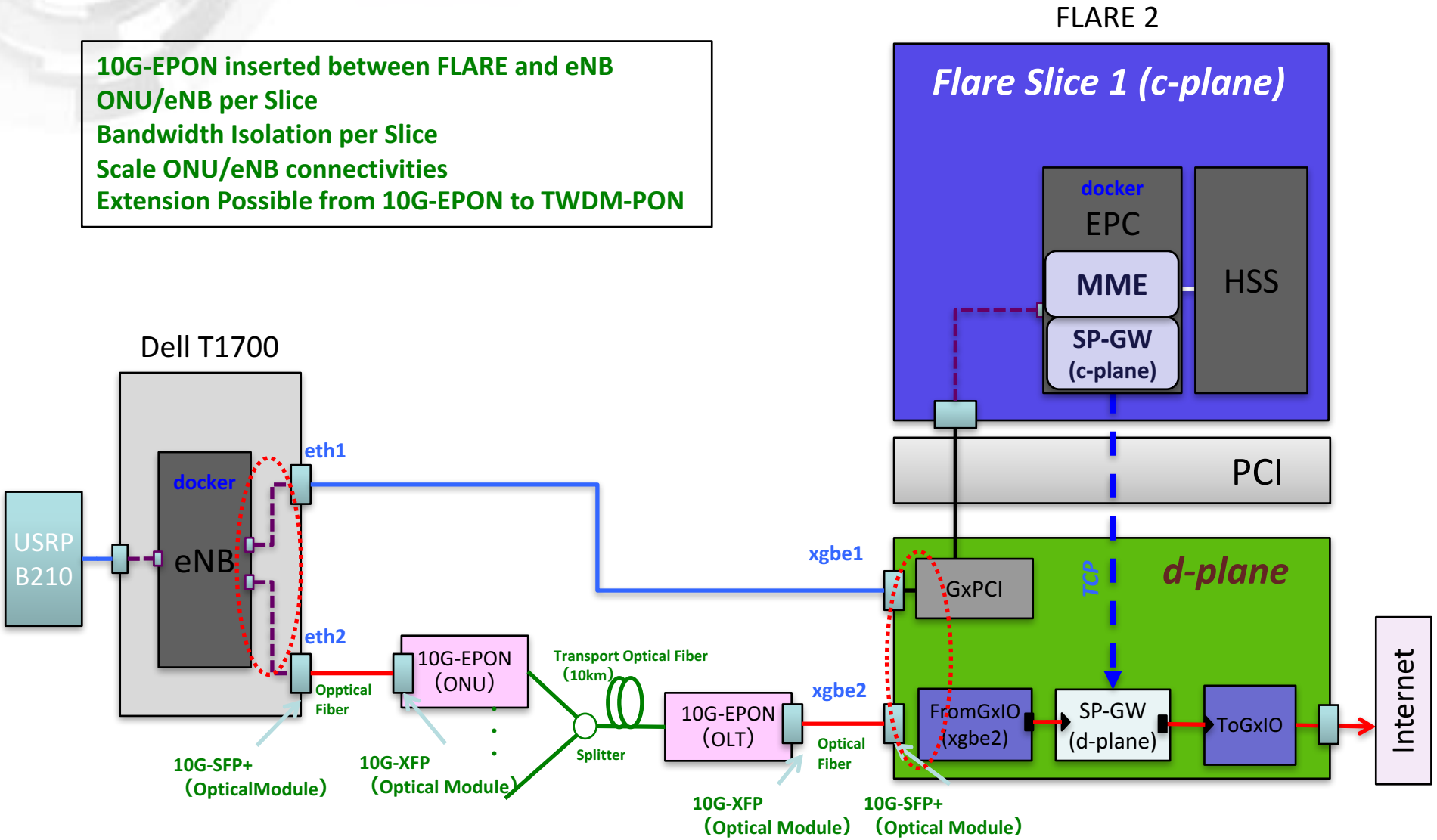


LTE in A Slice in Operation

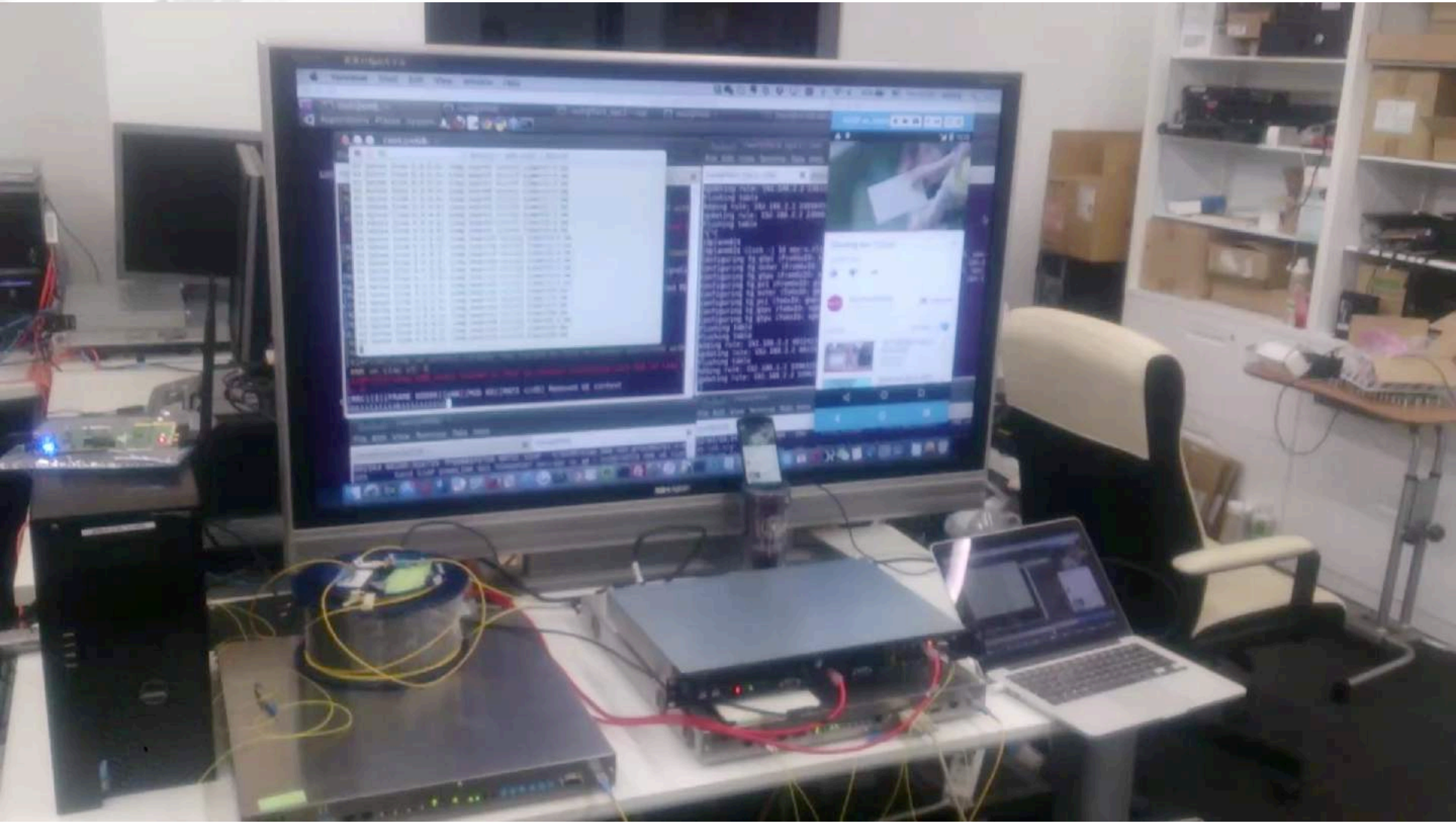


OKI's BH Slicing Inserted

10G-EPON inserted between FLARE and eNB
ONU/eNB per Slice
Bandwidth Isolation per Slice
Scale ONU/eNB connectivities
Extension Possible from 10G-EPON to TWDM-PON



FLARE EPC Slicing + BH Slicing



Conclusion

- Network Softwarization / Network Slicing is key technology for 5G mobile applications
- End-to-end slicing including Transport, Core, FH/BH and RAN is just around the corner