Achieving International Collaboration

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A collection of baby steps towards federation?

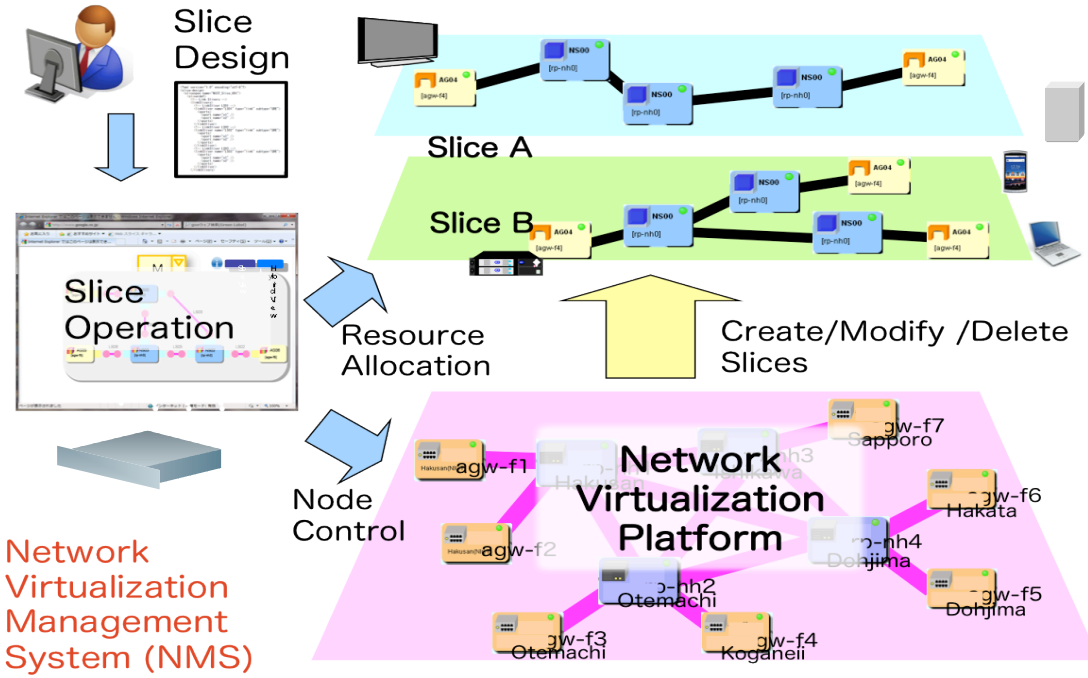
- Applications (requiring international footprint)
- Regular discussion channel (ML) / meetings
- Data-plane connectivity
- Control-plane (not necessarily “connected”)
- Students exchange (summer school)
- Check points (mini-goals)

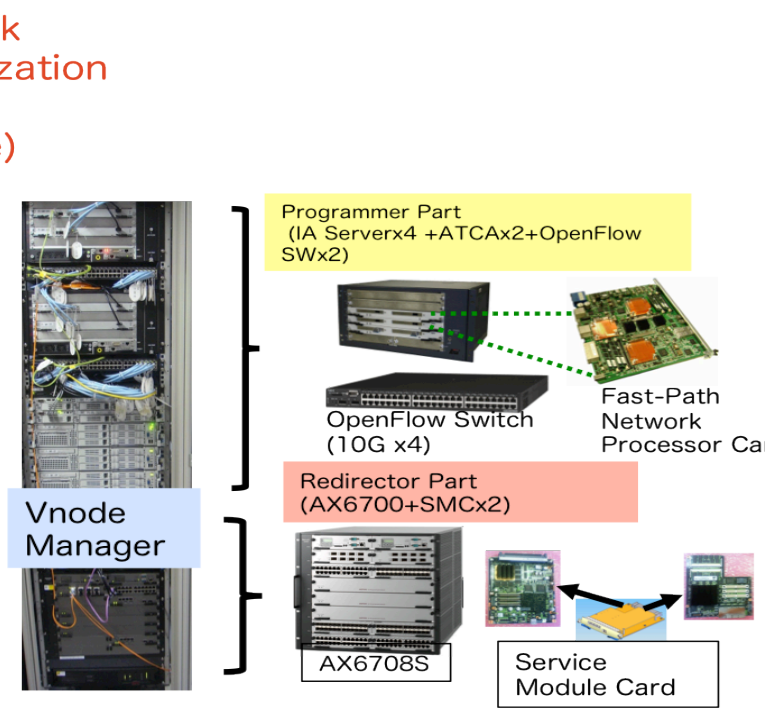
Testbeds in Japan

- VNode
- CoreLab
- WiVi (Wireless Virtualization Infrastructure)
- FLARE
- JGN-X (DCN, OF, Optical)
- G-lambda

VNode Project

- VNode Infrastructure Enables Deeply Programmable Network
  (Project Leader: Aki Nakao)
- 2008-2010 Collaborative Research (NICT/Utokyo/NTT/NEC/Hitachi/Fujitsu)
- 2011-2014 Collaborative Research (Utokyo/NTT/NEC/Hitachi/Fujitsu/KDDI)





VNode System

NTT

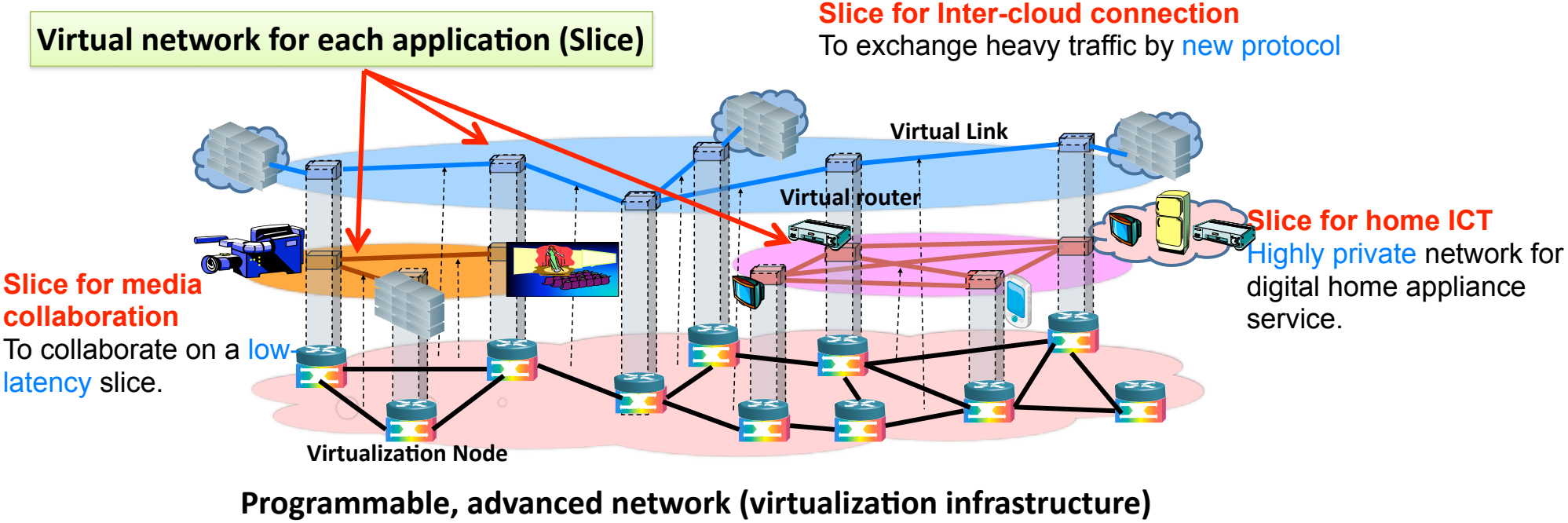
Creating application-specific networks with shared network resources.

Features and Benefits

- **The technologies makes it speedy and dynamic and costless to create private slices with different functionality, quality or protocols.**

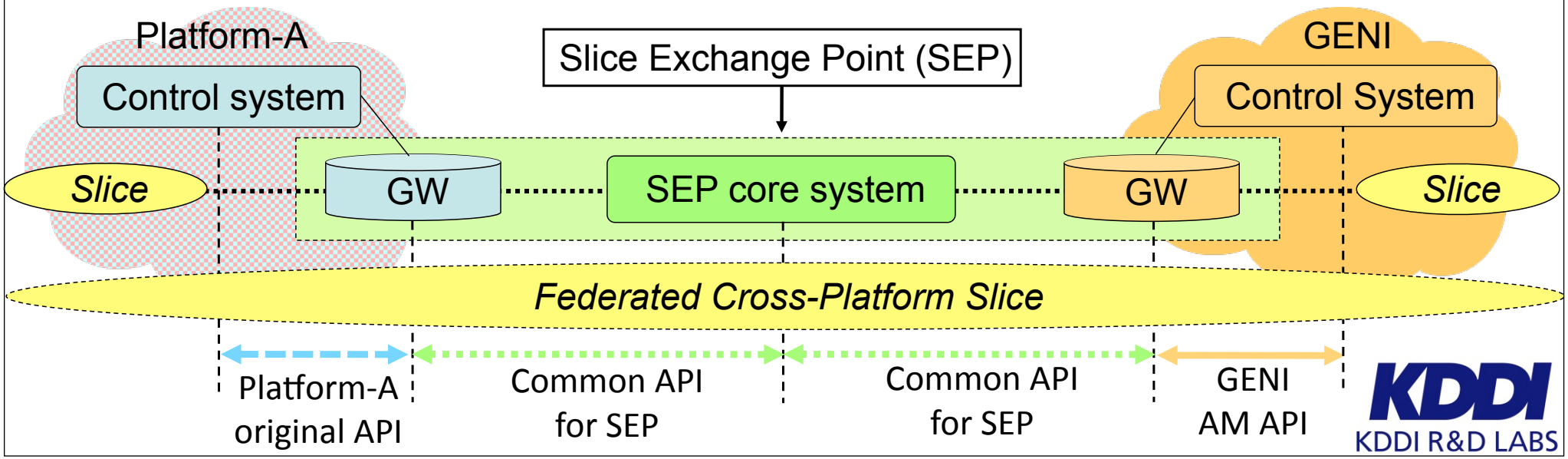
Application scenarios

- **We shows three examples on the figure below.**



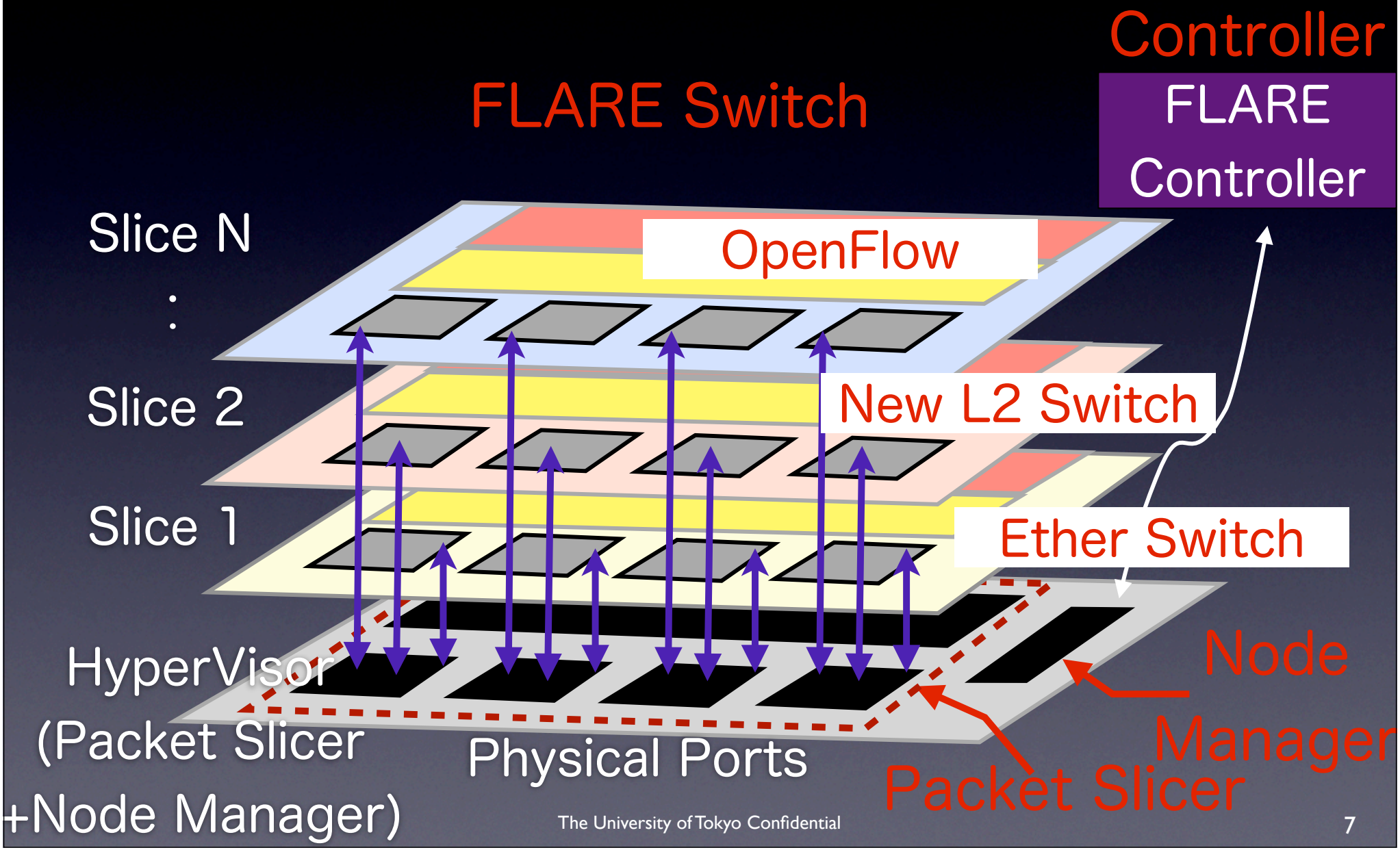
Slice Exchange Point (SEP): Cross-Platform Slice Federation Architecture

- "Different virtualizaion platforms with Different concepts & control architectures."
  - GENI Project : IP (L3) network with VM / Raw PC
  - Japanese Vnode Project : Any frame (L2) / IP (L3) network with VM
  - Japanese G-lambda Project: Lambda (L1) / L2 network with VM / Raw PC
- Slice Exchange Point (SEP): Cross-platform slice federation architecture
  - SEP: An intermediation system, bridging the differences of APIs / data-planes / policies / etc, between platforms
  - Unconsious in user's operation: Slices work like an integrated single slice



KDDI R&D LABS

Multi-Protocol/Control Coexistence



Maybe, we start with an application...