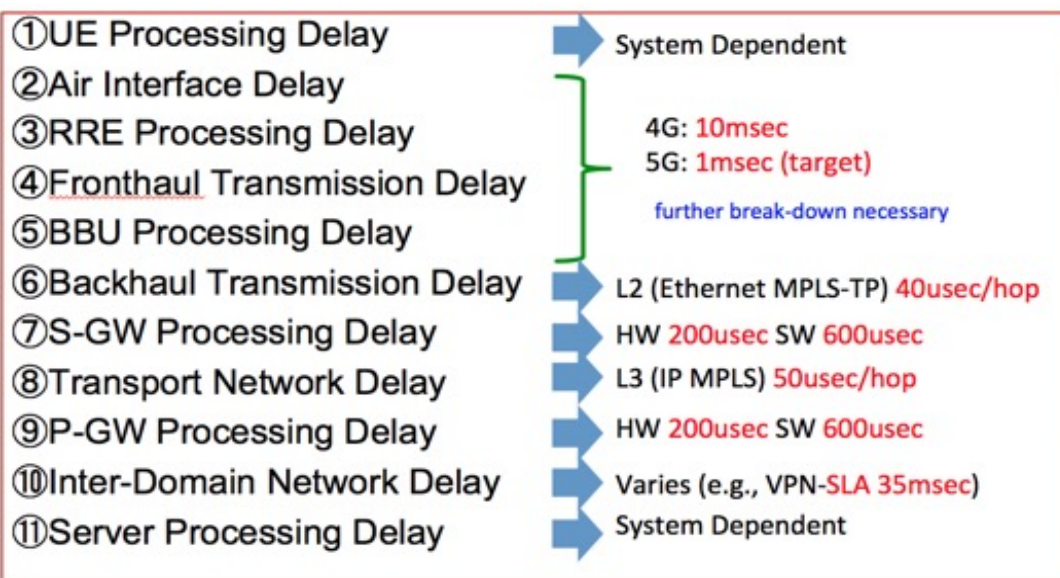
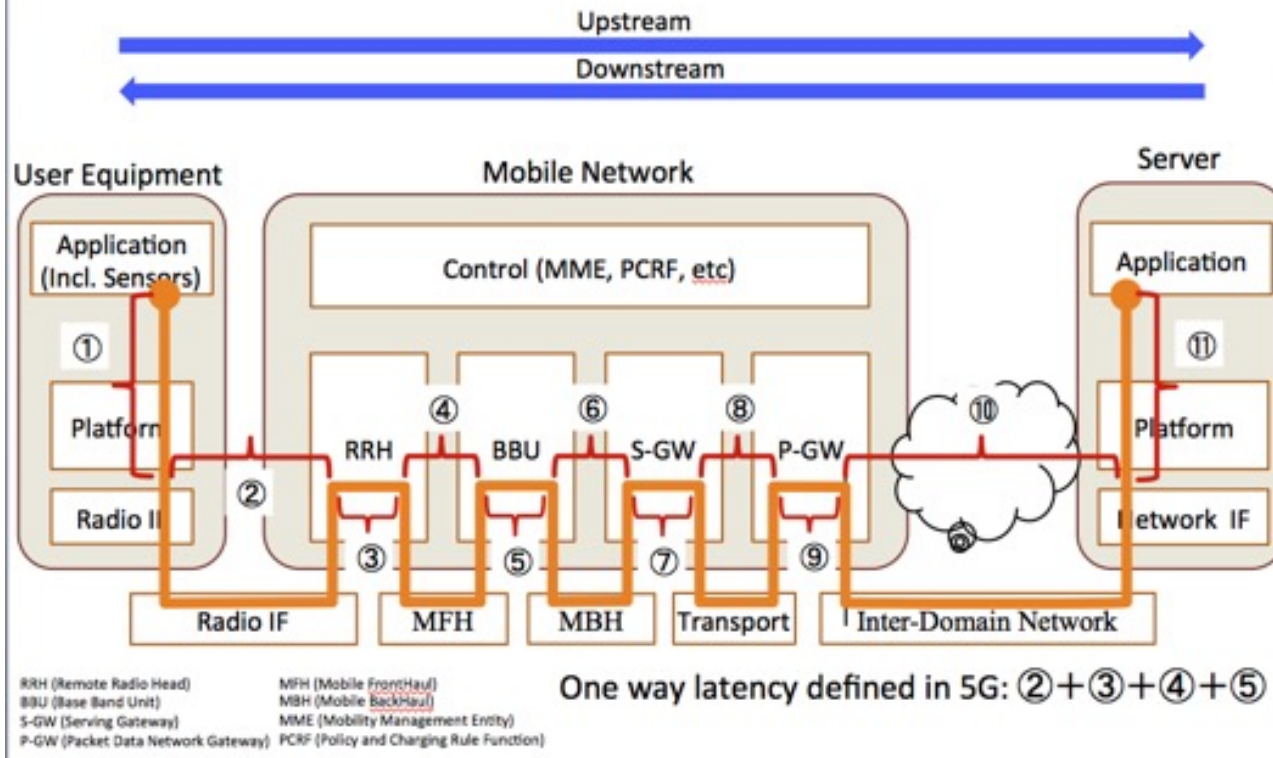


CCNX IN 5G

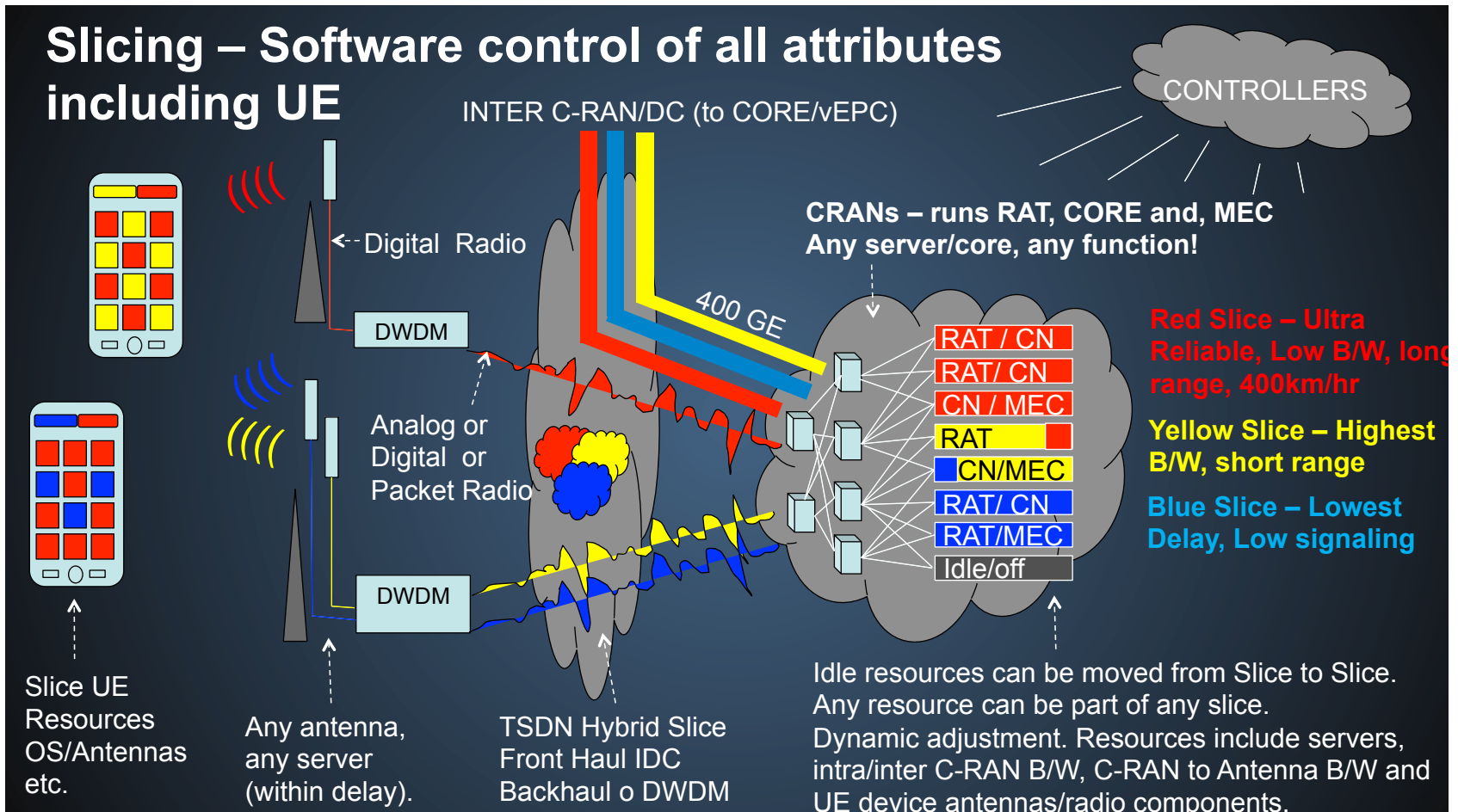
April 19, 2016

Diversified Challenges and Gaps to Reach 5G





Slicing – Software control of all attributes including UE



Why CCN in 5G

Computer networks started as wires or virtual wires

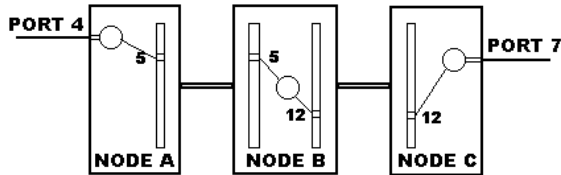
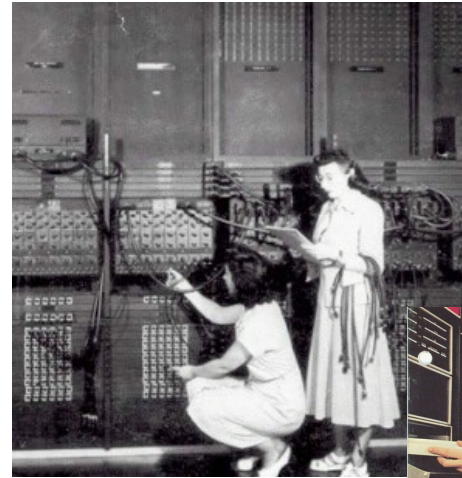


Fig 1. A simple TYMNET virtual circuit.



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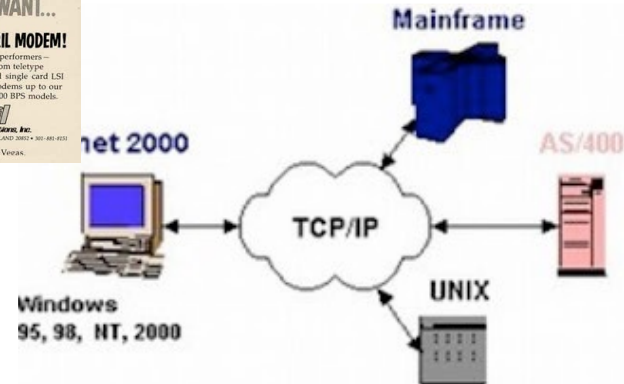
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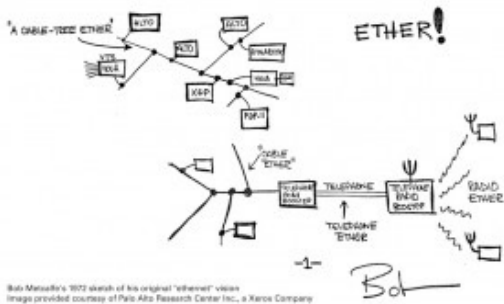
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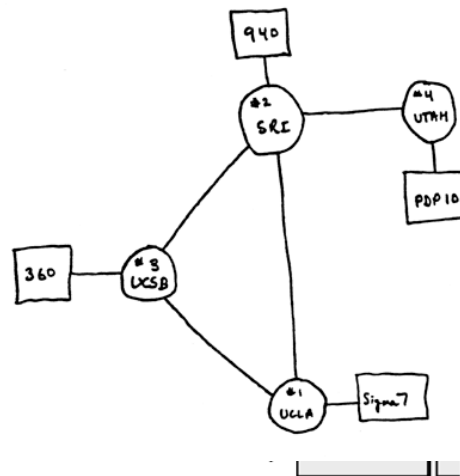
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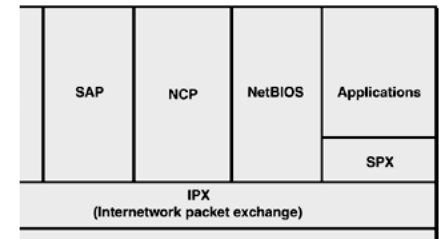
Then evolved to distributing content



Bob Metcalfe's 1972 sketch of his original "ethernet" vision
Image provided courtesy of Palo Alto Research Center Inc., a Xerox Company



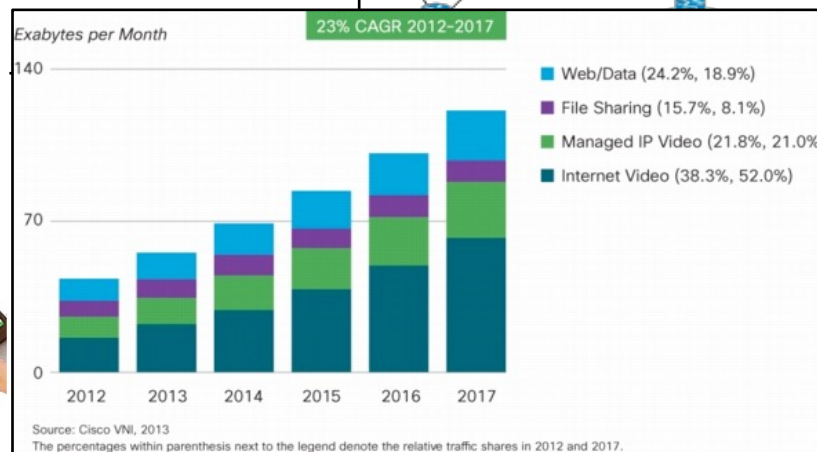
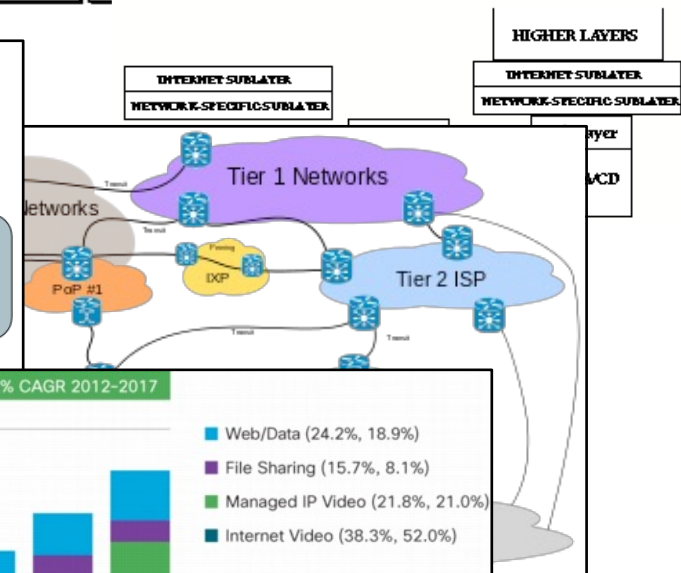
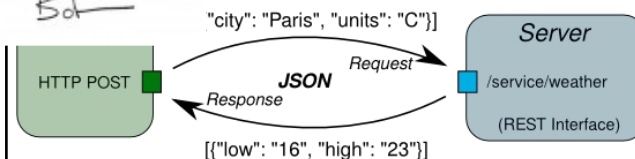
Novell NetWare Protocols



XNS / ETHERNET NETWORK

HIGHER LAYERS

JSON / REST / HTTP



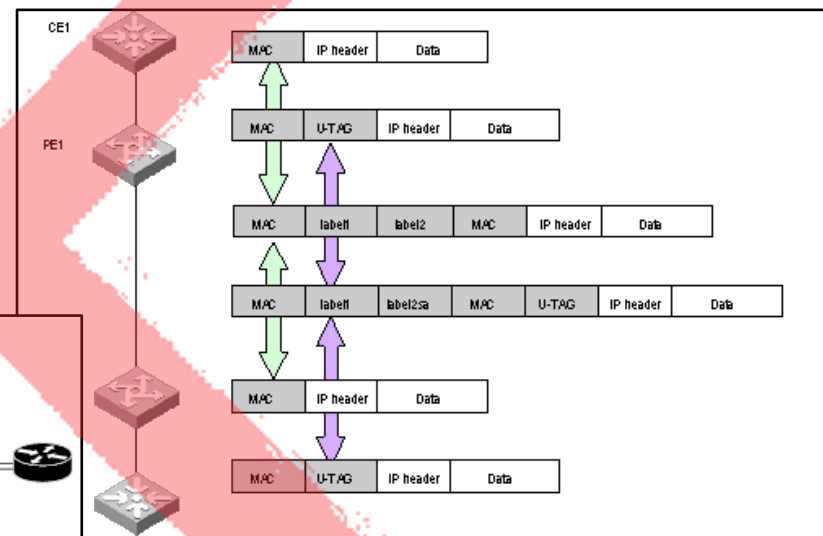
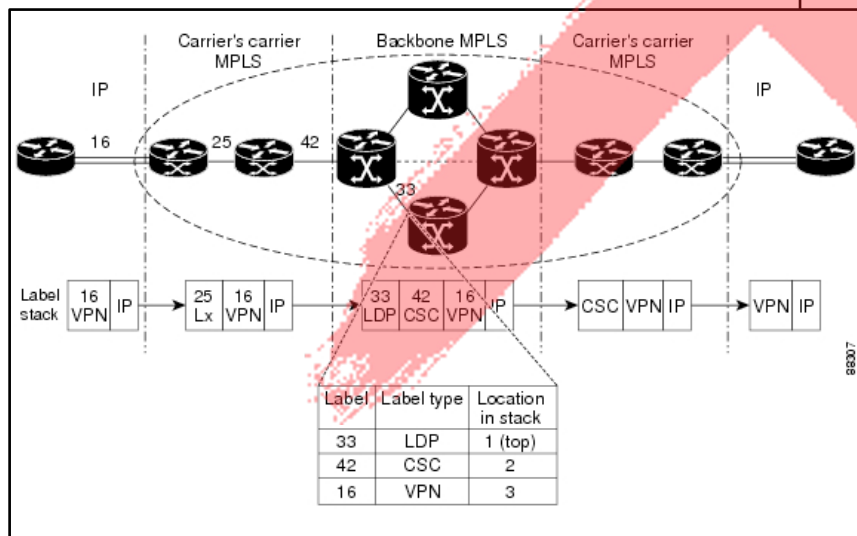
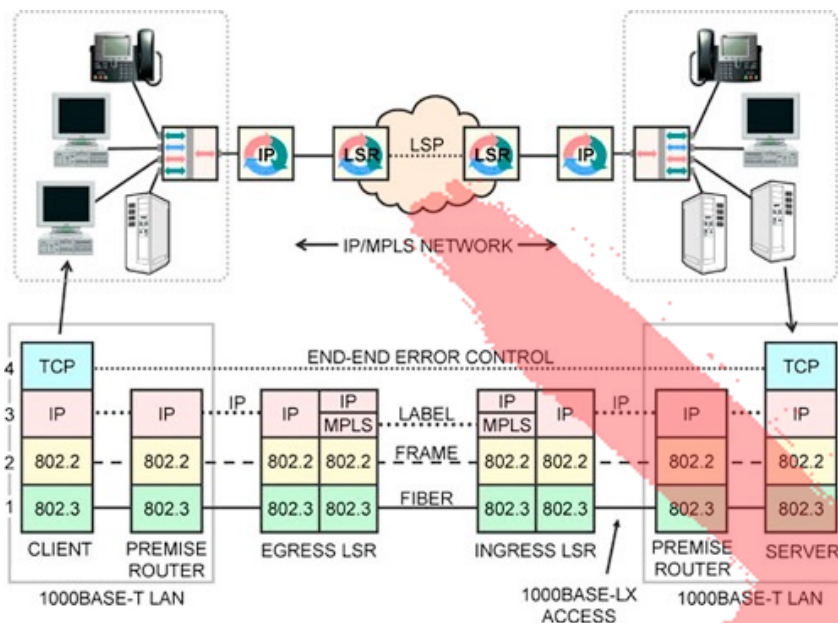
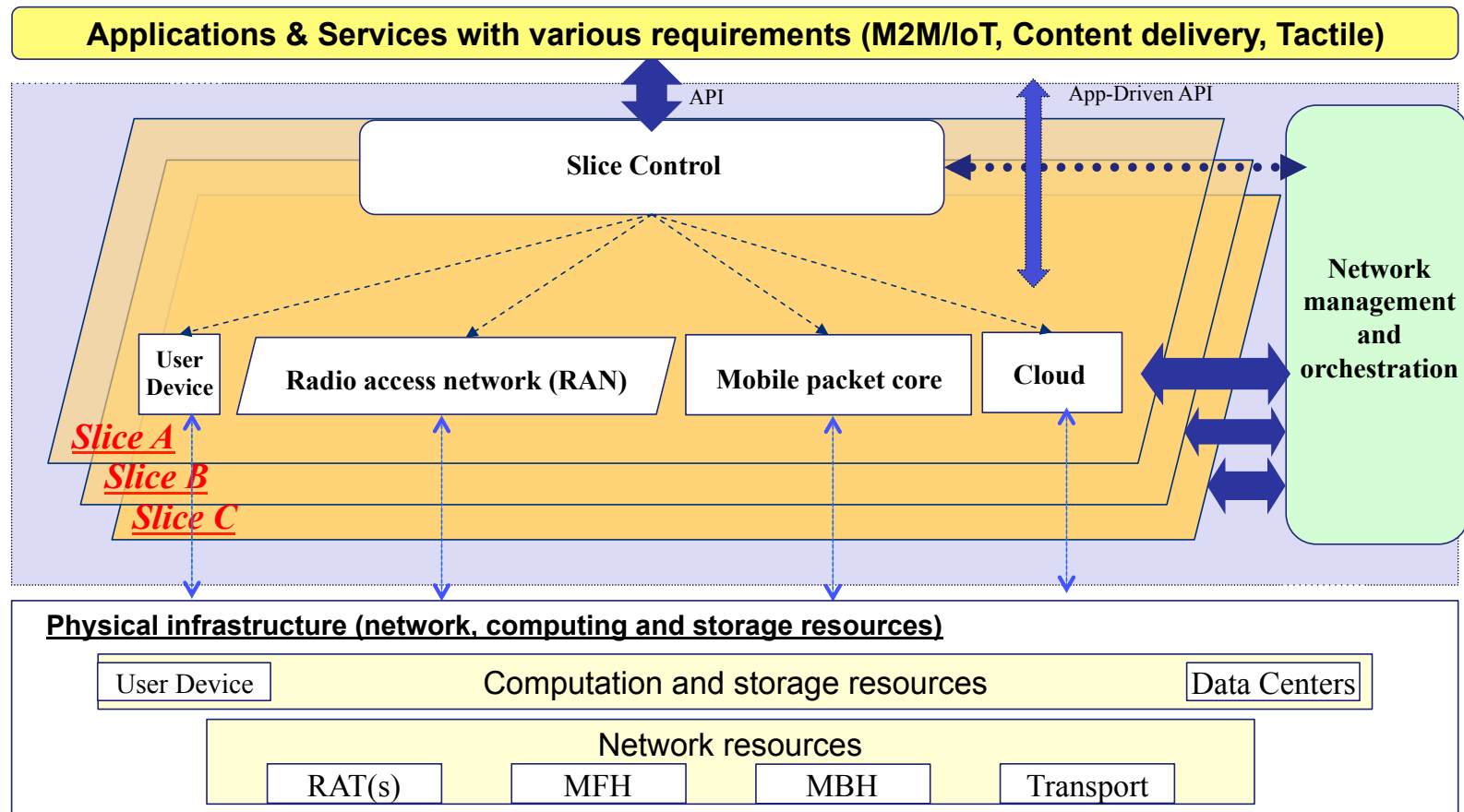


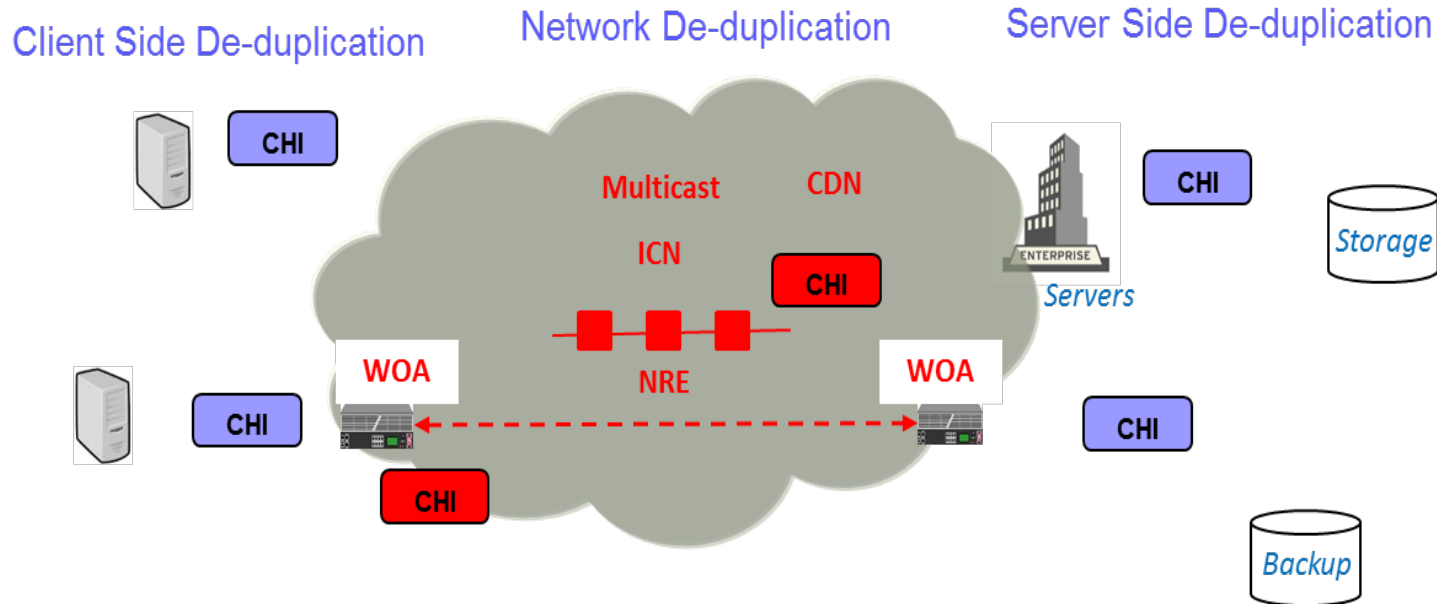
Figure 1: Network Softwarization view of 5G mobile networks



WHERE DOES CCNX FIT

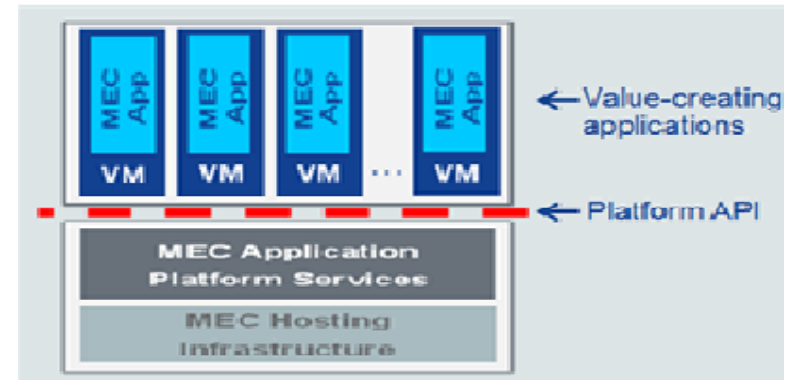
- Over the Top
 - Rides on UDP/IP as an application protocol
- Within a Slice
 - “Native” CCNx within a slice riding over GTP pipes
 - Can use technologies like SIPTO to breakout at eNodeB
 - Can use deep programmability of virtualized network elements
- Below a Slice
 - Inter-NFV *lingua franca* with benefits of naming functions
 - Slice state transfer between sites, VM migration, etc.
 - Side-by-side with GTP or outside the P-GW

5G BENEFITS



- The ICN/CCN reduces latency by caching data packets toward receiving clients.
- ICN/CCN may use hash-based naming for in-network de-duplication without explicit network redundancy elimination (NRE) devices.

CCNx advantages in MEC



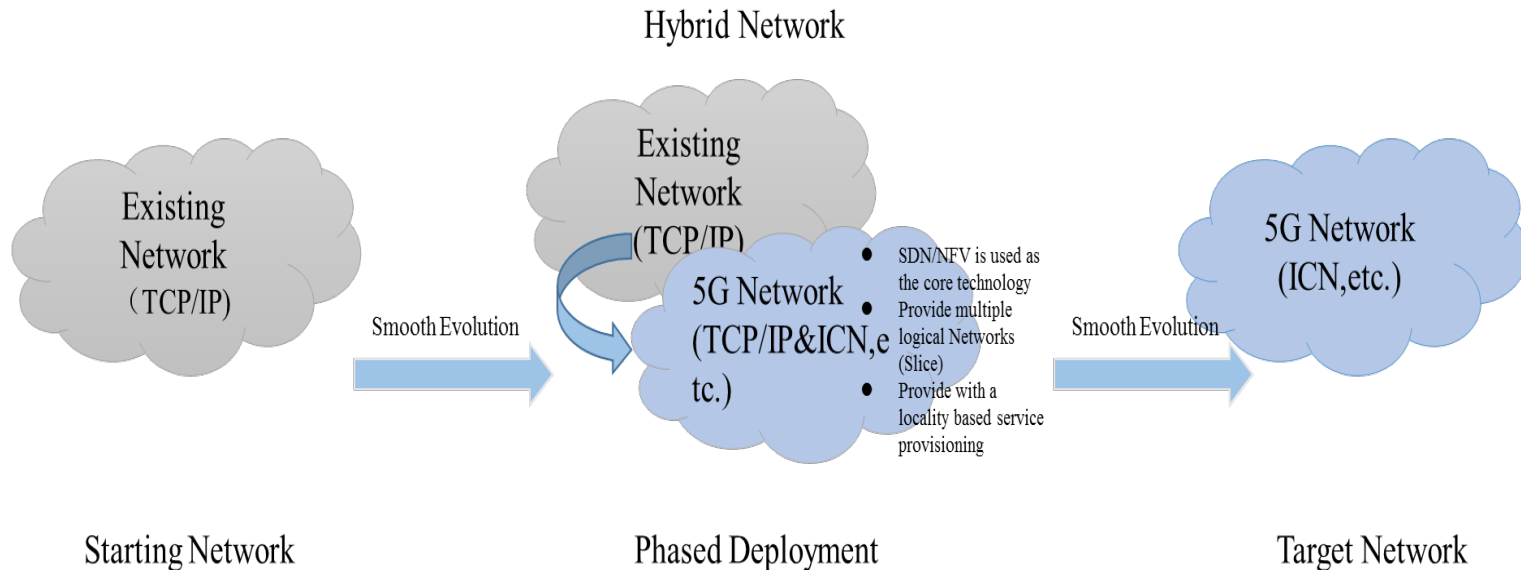
– Homogenized Application Delivery

- Homogenize the application delivery spanning network segments of heterogeneous computing , storage, and bandwidth resources including sensor networks, Delay Tolerant Networks (DTN), Ad hoc environments, while complementing NFV and SDN objectives of service-centric networking in the infrastructure.

– Service Customization and Contextualization

- Services are best delivered by locally customizing them to what users want, because users who are located in different locations have different needs and requirements based on their context. Context can be defined as any information that is used to describe the state of an entity and can be classified as being user-, network-, service-, device-centric.

MIGRATION PATH



Adoption of multiple logical networks (Slice), each having different architecture that fits to the major services provided on the slice: IP slice, ICN slice, IoT slice, and low latency slice, etc. will be candidates.