Mobile Edge Computing

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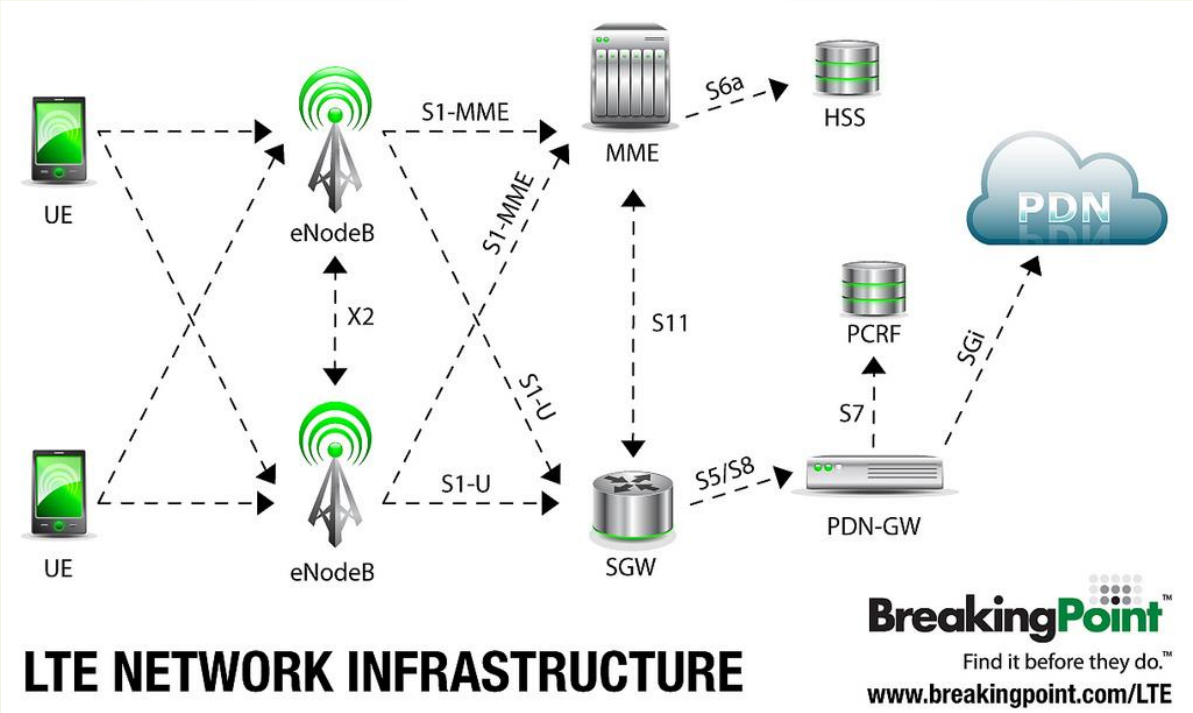
Outline

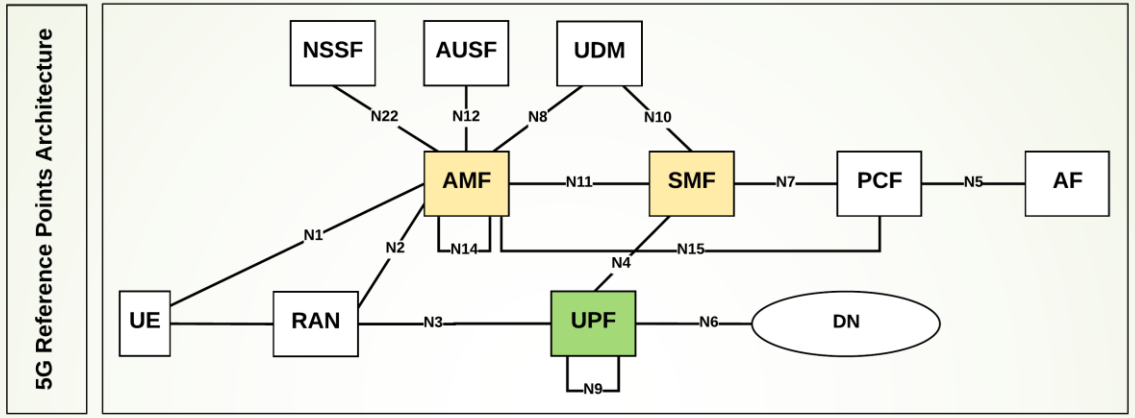
- Background
- 5G Proposed Architecture
- 5G Communication Components

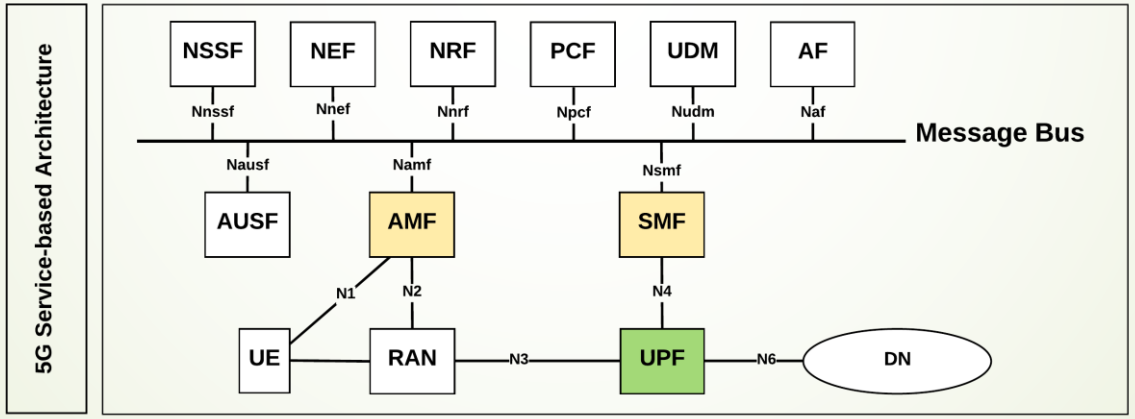
Background

- 4G-LTE Communication Architecture



5G Proposed Architecture





AMF: Access & Mobility Management Function
SMF: Session Management Function
UPF: User Plane Function

NEF: Network Exposure Function
NRF: NF Repository Function
NSSF: Network Slice Selection Function

UDM: Unified Data Management
AUSF: Authentication Server Function
PCF: Policy Control Function

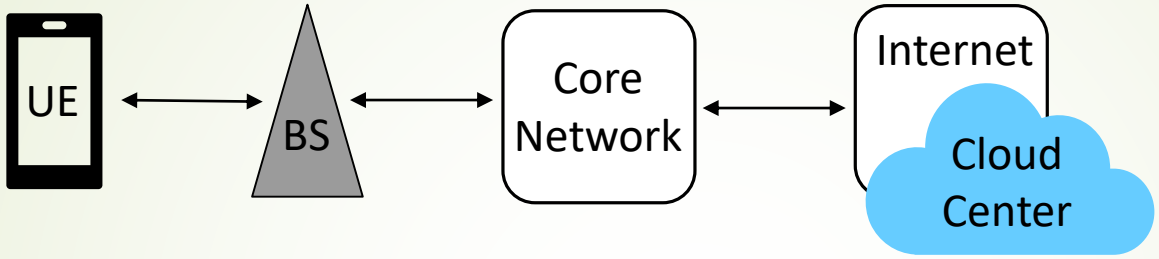
5G Communication Components

- Software Defined Network(SDN)
- Network Function Virtualization(NFV)
- Mobile Edge Computing(MEC)

Mobile Edge Computing

- Defined by ETSI(European Telecommunications Standards Institute)
- Service Based Architecture(SBA)
  - Modern cloud principle
- Cloud to Edge
  - Centralized to distributed

Mobile Cloud Computing

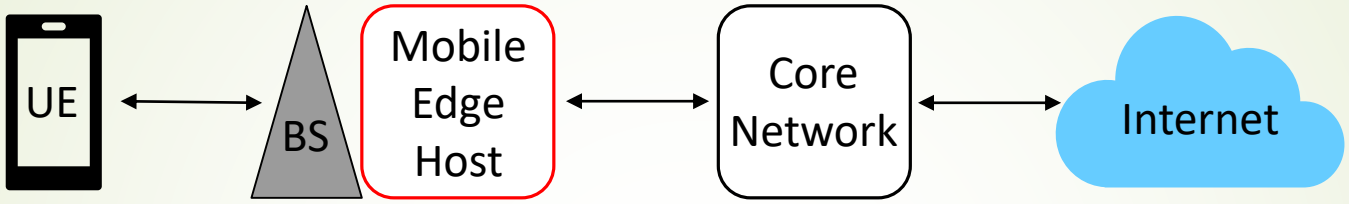


- Provide shared pool on resources
  - Processor, software, storage
  - Amazon EC2, Microsoft Azure
- Centralized
- Long distance results in latency

Mobile Edge Computing

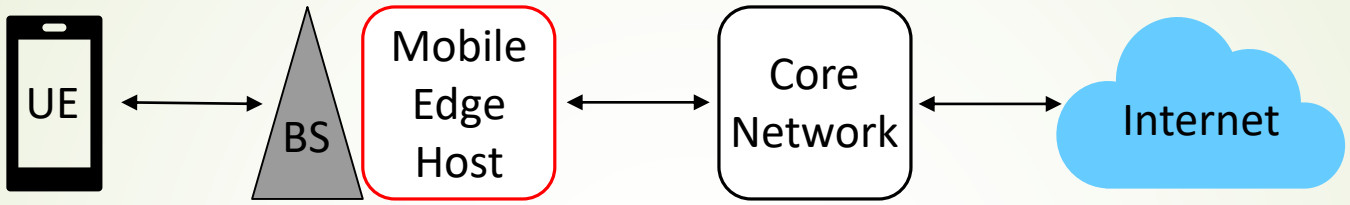
- Distributed Cloud System
  - Small local servers
  - Computing augmented Base Stations
  - Computing resources installed in RAN
- Fog

Mobile Edge Host



- Computing equipment
- Managed by network operator
- Resource virtualized
  - Accessed by API on UE

Mobile Edge Host



- Traffic monitoring
- Content caching
- Local information aggregation
- User location services

Improvements

- Optimization of mobile resources by hosting compute-intensive applications at the network edge.
- Pre-processing of large data before sending it to the cloud.
- Context-aware services with the help of RAN information such as cell load, user location, and allocated bandwidth.

Challenges

- Resource management – The computing and storage resources in individual MEC platform are expected to be limited.
- Interoperability – MEC infrastructures owned by different network providers should be able to each other as well.
- Mobility support – The coverage range of each individual cell is limited in a small cell network. Seamless handoff and migration are necessary.