

NEC's View on Challenges and Technologies for Rel-12

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■ Key Challenges and Opportunities for Rel-12 Timeframe:

- Data Traffic Growth
- Signaling Overload
- Machine Type Communication
- Proximity-based Services

Rapid growth of data traffic is a key challenge for mobile operators in the coming years

To address this challenge in a timely manner, NEC recommends the following Rel-12 features:

- **User Plane Congestion Management**

- Motivation: User plane congestion is inevitable during peak times or in hotspots areas, leading to degradation of the user service experience
- Objective:
 - Allow operators to improve their overall service quality during congestion periods
 - Enable efficient use of available network resources to support more active users with an adequate level of user experience
- Relevant Rel-12 Work Items:
 - **UPCON**: User Plane Congestion Management

Recommended Rel-12 features: (Cont'd)

● Traffic offloading to Wi-Fi Networks

- Motivation: User plane congestion typically occurs in the RAN – due to limited capacity in the 3G (or even LTE) radio access and/or backhaul
- Objective: Allow operators to offload traffic to Wi-Fi networks in an efficient and controlled manner in order to relax the capacity demand in the mobile access, backhaul and potentially the core network
- Relevant Rel-12 Work Items:
 - **WLAN_NS**: WLAN Network Selection for 3GPP Terminals
 - **OPIIS**: Operator Policies for IP Interface Selection
 - **FS_NBIFOM**: IP Flow Mobility for S2a & S2b Interfaces

● Traffic offloading at Small Cell Networks

- Motivation: Small cells are considered a key enabler to handle future traffic growth and offload traffic from the macro-cellular network
- Objective: Enable flexible traffic offload at small cell networks to relax the capacity demand in mobile backhaul and core networks
- Relevant Rel-12 Work Items:
 - **LIMONET**: Selected IP Traffic Offload at the Local Network
 - **OPIIS**: Operator Policies for IP Interface Selection

- Fast increase of smartphones in the market leads to high signaling load in operator networks
- To address the problem in a timely manner, NEC recommends the following Rel-12 features:
 - **Solution for Core Network Signaling Overload**
 - Motivation: The surge of signaling traffic from smartphones led to critical overload situations in recent years
 - Objective: Improve the 3GPP system in order to make it resilient against critical signalling overload
 - Relevant Rel-12 Work Items:
 - **FS_CNO**: Study on Core Network Overload solutions

MTC is an enabler for new services and thus creates new revenue sources for operators

To address the new business models associated with MTC, NEC considers the following Rel-12 features most important:

- **Efficient Small Data Transmission**

- Objective: Optimized signaling procedures for frequent and infrequent small data transmissions from and to UEs / MTC devices
- Relevant Rel-12 Work Item:
 - **MTCe-SDDTE**: Small Data and Device Triggering Enhancements

- **Group Communication**

- Objective: Resource-efficient data delivery to specific groups of UEs in the network, not limited to MTC devices
- Relevant Rel-12 Work Item:
 - **MTCe-GROUP**: Group Based MTC

- **Reduction of UE Power Consumption**

- Objective: Significant decrease of power consumption in the UE / MTC device and increase of the battery lifetime
- Relevant Rel-12 Work Item:
 - **MTCe-UEPCOP**: UE/ Power Consumption Optimizations

Discovery and direct communication are enablers for new proximity-based services under operator control, and thus new revenue sources for operators

Recommended Rel-12 features:

- **Proximity-based Services**

- Motivation: Proximity-based services are urgently required for Public Safety communications in some regions. The technology, once available, will also allow other usage, e.g. alternatives for network offload or coverage extension.
- Objective: To enable operator network controlled discovery and communications between UEs that are in proximity.
- Relevant Rel-12 Work Items:
 - **ProSE**: Proximity-based Services.

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