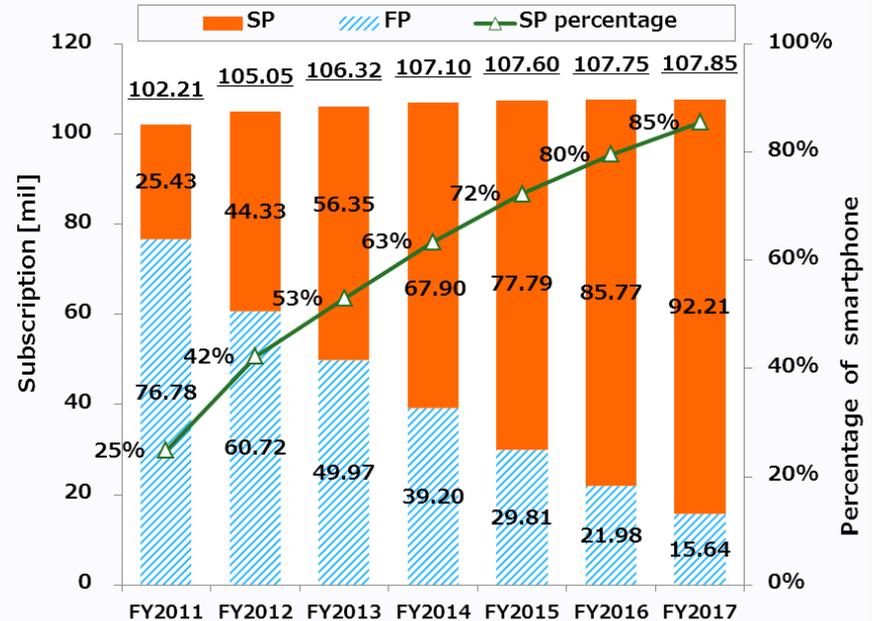


# **Network Enhancements for Better Customer Experience**

3GPP TSG SA#58  
Barcelona, Spain, 10-12 Dec 2012  
Agenda Item: 5.1  
Source: KDDI Corporation

- Background
- Main Message
- Proposal 1: Congestion Control and Offloading
- Proposal 2: Flexible Multiple Access Application
- Future Vision...
- Conclusion

- Proportion of smartphones vs. feature phones in Japan still growing
- But subscription growth in Japan is reaching a plateau
- Subscriber saturation but continuation of traffic explosion
- From operators' perspective: need to minimize capital investment associated with traffic growth



**Cell phone subscribers forecast in Japan**

Source: KDDI

**Must take action in Rel-12, else we cannot make it!!**

**How to survive?**

## KDDI would like 3GPP to address...

- Congestion Control and Offloading
  - In response to 3GPP NW congestion, offload traffic to non-3GPP access NWs
- Flexible Multiple Access Applications
  - To provide services without customers being aware of access NW transition



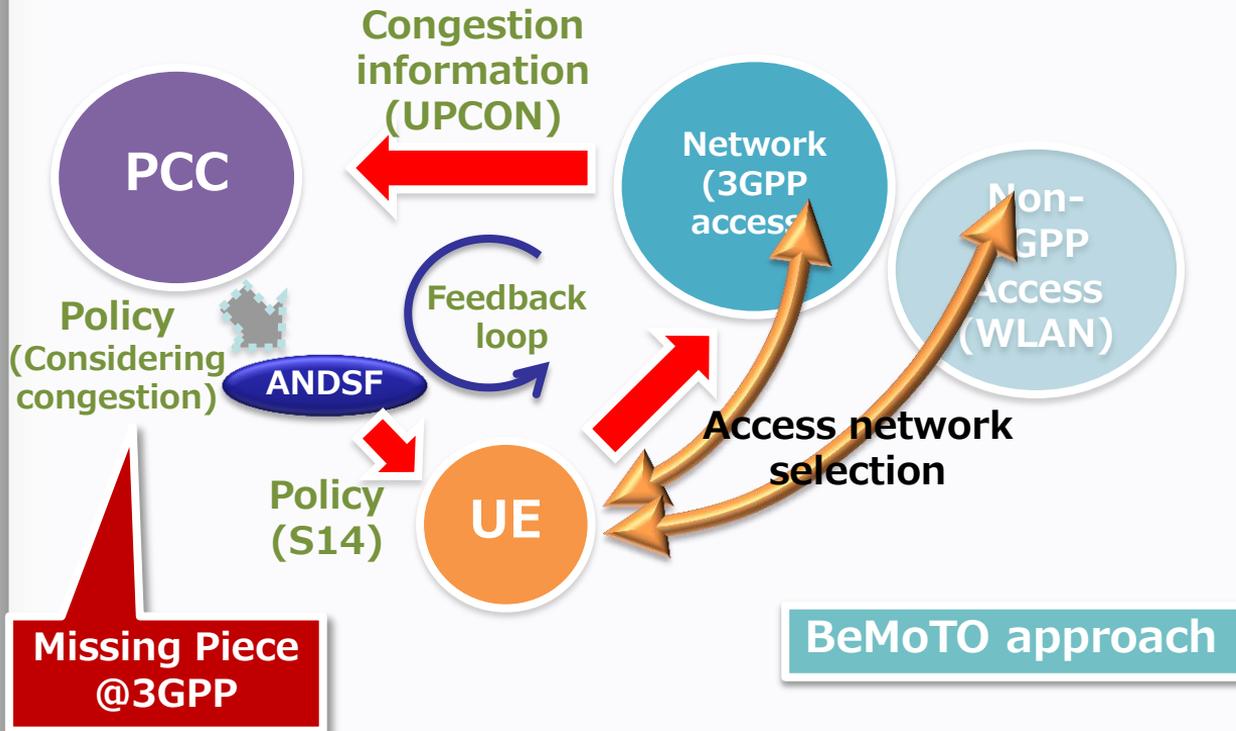
**Satisfy both customer experience and operator sustainability**

# Congestion Control and Offloading

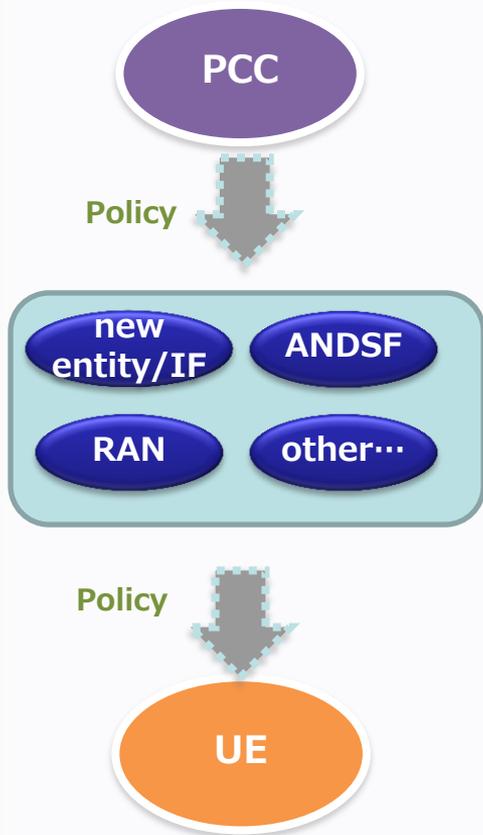
Key issues for effective offloading. Lose no time progressing these with highest priority!!

- **UPCON**: CN awareness of RAN congestion leads to immediate offloading and optimal NW selection
- **FS\_CNO**: Through CN congestion control, more active offloading action can be taken
- **WLAN\_NS**: UE awareness of Wi-Fi AP congestion via HS 2.0 enables making Wi-Fi connectivity much better with policies from ANDSF
- *But, there is a missing piece in 3GPP spec...*
  - No technology is identified to inform UE of 3GPP NW congestion information
  - UPCON scope is limited within RAN congestion awareness
  - Availability and use of congestion information enables more efficient offloading

## Missing Piece of 3GPP Spec



- UE's involvement forms a feedback loop for congestion control
- However, there is no "responsive" interface between PCC and UE



- Determine solution in Rel-12 among possible options from the following perspective:
  - Scalability, Frequency, Responsiveness, etc.
  - System impact
  - Implementation cost
  
- Possible options:
  - **New entity/IF:** Create new entity or I/F for dynamic policy delivery
  - **ANDSF:** BeMoTO approach and/or utilize new “light weight” MO for dynamic policy delivery
  - **RAN:** Feedback policy to eNB and inform UE of NW congestion via RAN I/F
  - **Other...**

# Flexible Multiple Access Application

Key issue: Policy control, seamless mobility and technologies that provide services without making customers aware of access NW transition

- **P4C\_F, P4C\_TC, P4C\_TI**: Enable customers to enjoy services provided by an operator without being aware of which access NW is being used
- **FS\_SaMOG**: Seamless mobility for UE with IP address preservation
- **FS\_NBIFOM**: IP flow mobility without Dual Stack Mobile IP

## Next step...

- Create flexible QoS network
  - Offer QoS over multiple access NWs: perfect marriage of multiple access NWs
  - Features required for flexible QoS in Rel-12 should be allocated sufficient resource:  
**MOSAP, FS\_ABC, FS\_ACDC, FS\_UMONC, OPIIS**
  - And beyond...
- Toward Rel-13, start talking about future EPC

## Conclusion

- Essential to improve QoE and to minimize CAPEX suitable for changing traffic trends  
=> **Efficient offloading**

### ① **Congestion Control and Offloading**

UPCON, FS\_CNO, WLAN\_NS

### ② Flexible Multiple Access Application

P4C\_F, P4C\_TC, P4C\_TI, FS\_SaMOG, FS\_NBIFOM



Most  
Important!

# Thank you.