Innovations in NGN – Future Network and Services Session IV: Virtualization and mobility in NGN

Presentations

- *Overlay Private IP Address Networks over Wide Area Ethernet*
- *A Study on fast MMD session control methods in 3G mobile communications*
- *Two Buffer Model-based QoS Estimation Method for 3G wireless IP networks in Bullet Trains*
- *Mashing the real world with virtual worlds - A monetizing opportunity*

Virtualization: Overlay Private IP Address Networks over Wide Area Ethernet

- Research purpose: New remote access methods for Overlay private IP address networks over Wide area Ethernet to achieve better security and lower management cost than legacy PPP+VPN method

- Proposal: two solutions are proposed made based on FA-mode MIP (MIPv4): MIP+PPPoE , MIP+VLAN

- MIP+VLAN has more advantages: low implementation cost (no new protocol for MN), lower access delay

- Future work
  - Layer 2 encryption and wireless security
  - Scalability for Wide area Ethernet service supporting device mobility (testbed)

- Discussion on scalability issues (VLAN mapping cost)

Mobility: A study on fast MMD session control methods in 3G mobile communications

- Multimedia service session control in IMS/MMD:
  - Session Management (SIP) – call control
  - Mobility Management (MIP) – MN reachability
- IMS/MMD issues: fast session control required, redundancy of MIP and SIP independent registration and authentication

- Proposal: collaborative methods between SIP and MIP (four methods proposed) achieving control traffic reduction
- Experimental measurements (Integrated method is the best)
  - registration time reduced (more than expected)
  - re-connection time still high (7s) - methods are not applied to other processes (processing, radio link changing time)

- Future work: application of fast methods to other processes

- Discussion on values used for backbone and access network delays

Mobility: Two Buffer Model-based QoS Estimation Method for 3G wireless IP networks in Bullet Trains

- Research purpose: To improve transport layer protocols over 3G wireless IP networks in high-speed mobile environment
- Idea: introduction of route characteristics in QoS metrics for communication quality

- Communication environment modelling on simulator
  - Usage of two buffer model-based QoS estimation method
- Measurement of communication quality and raw packet transmission characteristics of CDMA2000 1xEV-DO
  - Tokaido Shinkansen route experiment: measures of RTT (Probing CE, Echo CE), Packet Loss Ratio, Probing CE Status

- Future work
  - Statistical estimation of throughput
  - Usage of various parameters for modelling of communication environment on simulator

Virtualization: Mashing the real world with virtual worlds - A monetizing opportunity

- Social networks (SN) and Virtual Worlds (VW) are about communication among members and avatars
  - Multi-modal communication
  - Communication not entirely using traditional telecom networks (SN/VW providers provide communication facilities inside their applications)
  - Cross border communication is not yet possible
- Open standards are key to interconnect, but:
  - Each SN/VW provider currently provides its own APIs to facilitate communication between the SN/VW and the real world
  - Telecom operators are essentially communication providers
- Business opportunities for Telecom operators in this emerging space
  - They may be the instance to interconnect SN/VW
  - They may provide identity mapping (keeping anonymity if required)
  - They may augment SN/VW capabilities with their own telecom enablers (Presence/Location, Customers' phone book, …)
  - Multiple business scenarios
- Operators may force open standards for inter SN/VW communication

Some standardization opportunities (1)

- Wide Area Ethernet: today's technology for NGN transport
  - Optimized VPN solutions over Wide Area Ethernet are for today => proposals for discussion in appropriate SDOs (IEEE, ongoing cooperation with ITU-T on Wide Area Ethernet)

- Seamless service mobility: key objective in NGN & beyond
  - Fast IMS/MMD session control methods: considerations similar to above apply in the medium-term (3GPP/3GPP2, IETF, (ITU-T))

Some standardization opportunities (2)

•Emerging high-speed mobile environments: enhancing transport protocols to meet application requirements

- Comprehensive environment modelling is necessary
- Academic studies and experiments are advancing the understanding of these emerging environments
- Requirements and solutions could be moved within standardisation in the medium-term (IETF, ISO, ITU-T)

• Social Networks and Virtual Worlds: popular applications, but still requiring interoperability and linkage with telecom world

- SN/VW standardised APIs to communicate with real world
- Full communication-enabled SN/VW applications
- Open standards for inter SN/VW communications
- Integration and harmonization of SN/VW APIs standardisation within global, cross-SDO standardisation effort on SOA for IT-Telecom convergence (OMA, Parlay, OASIS, ITU-T)
- Standardisation could start asap with requirements
- Involvement of social actors and users