Software Defined Mobile Load Balancing (MLB) in LTE & 5G Networks

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STL's Comprehensive Portfolio:

Optical Interconnect Products

- Glass Preform
- Optical Fibre
- Optical and Speciality Cables
- Optical Interconnect

Virtualised Access Products

- Programmable FTTx
- ORAN compliant Virtualized RAN
- RAN Intelligent Controller
- Network Orchestrator

Network Software Products

- Telecom Billing Operations Software
- Monetization and Engagement Software

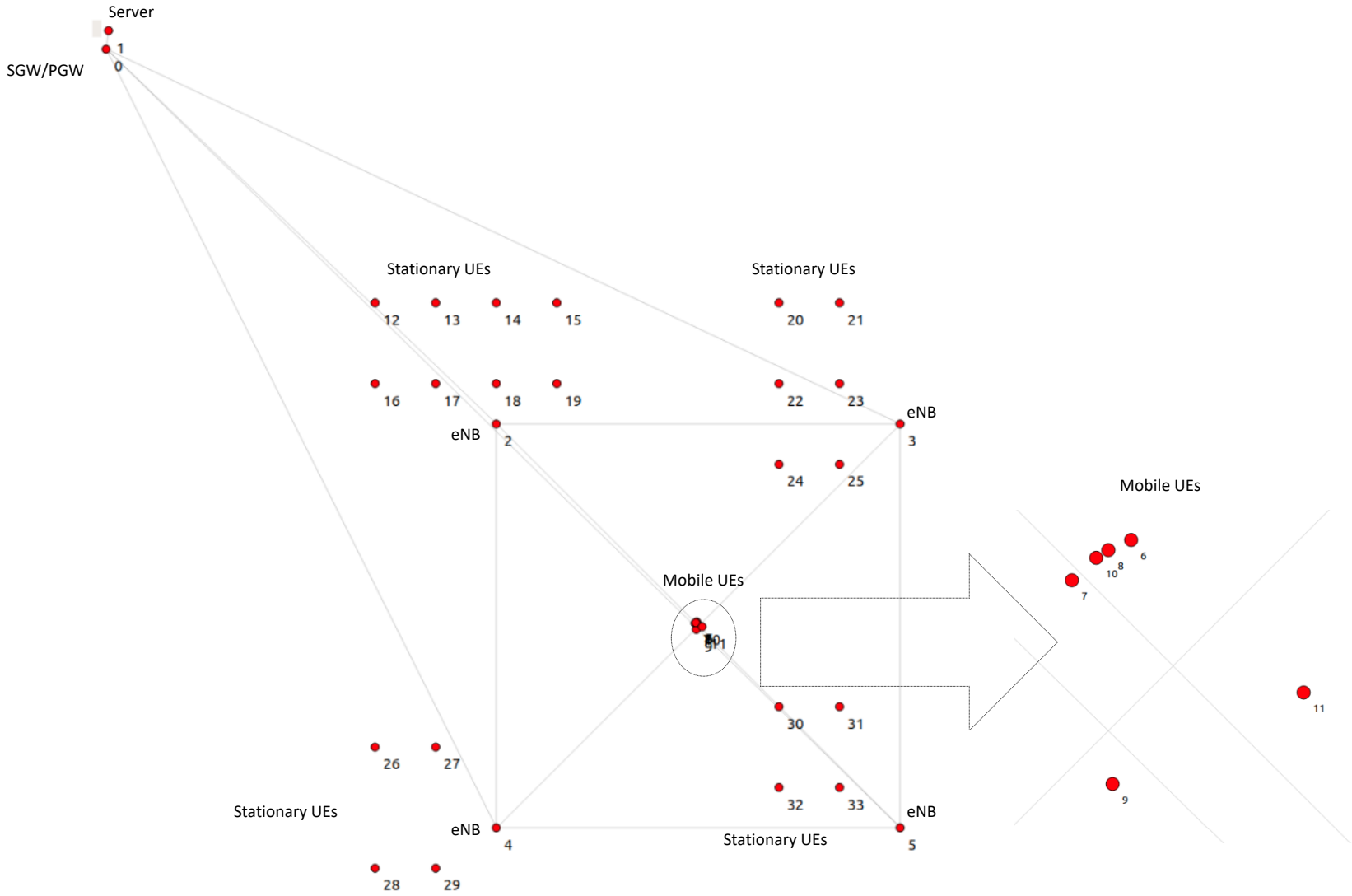
System Integration Services

- Network Design Services
- Fibre Rollout Services
- Network Operations & Mgmt. Services
- Data Centre Network
- Private Enterprise Network

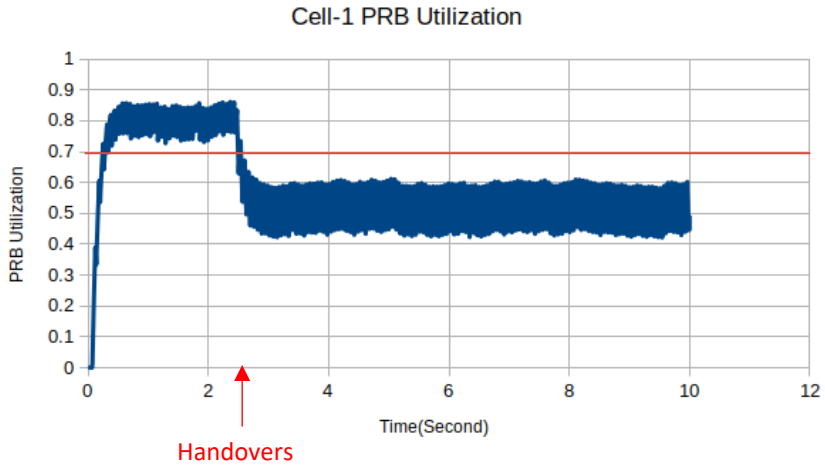
Software Defined Mobile Load Balancing

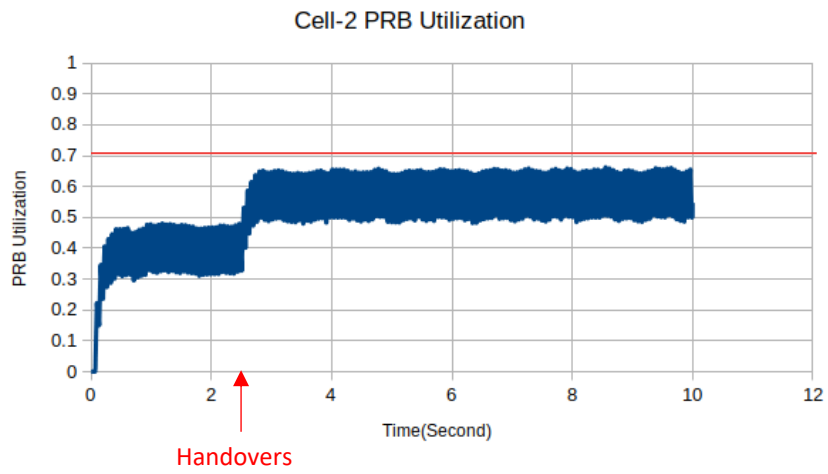
- Future cellular networks will be based on open and disaggregated RAN functions with decoupled control/user plane
- ORAN defines Radio Intelligence Controller (RIC) framework to enable RRM functions in a centralized manner
- We share initial results on centralized MLB in NS-3
  - Cell load dependent adjustment of ‘cell offset’ for controlling cell range.
  - A3 event triggered handovers.
- QoE considerations in selection of handover target cell.

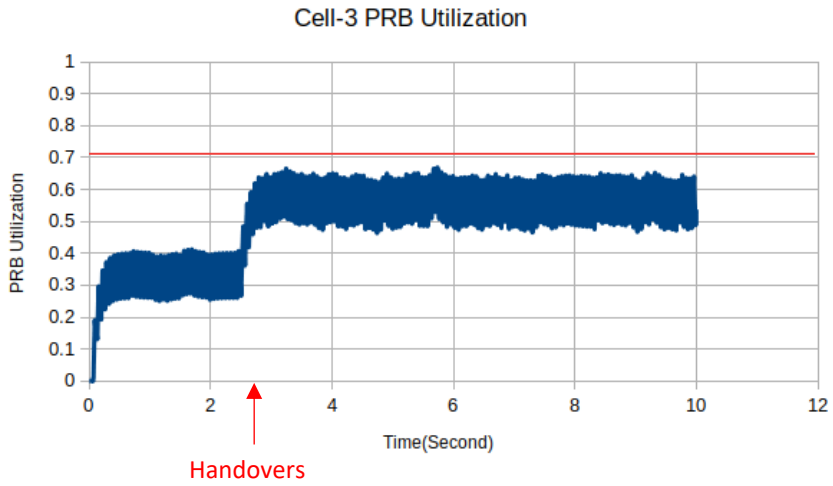
NS-3 LTE Simulation Scenario

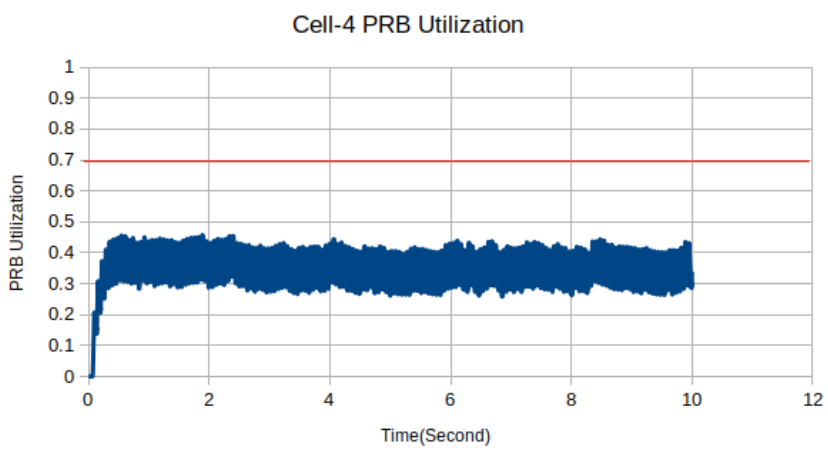


Cell Loading Vs. Time

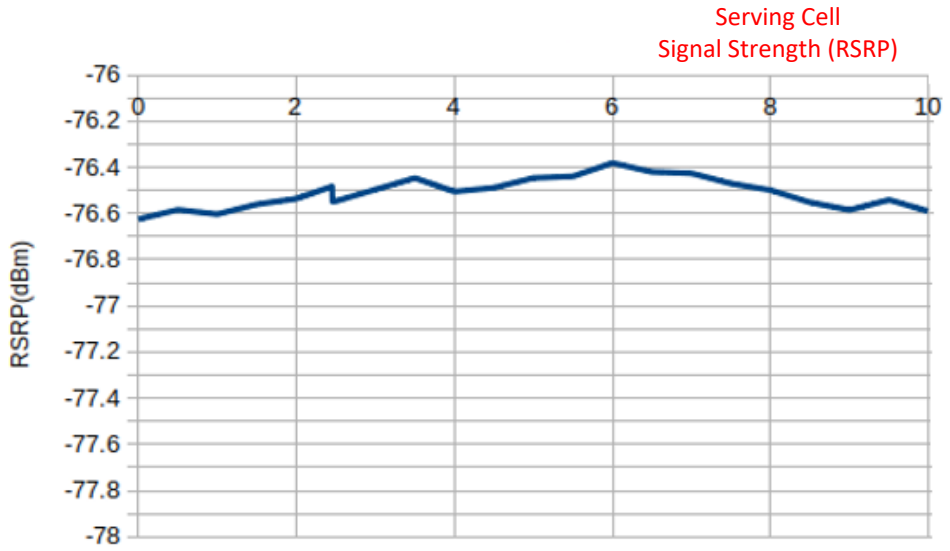


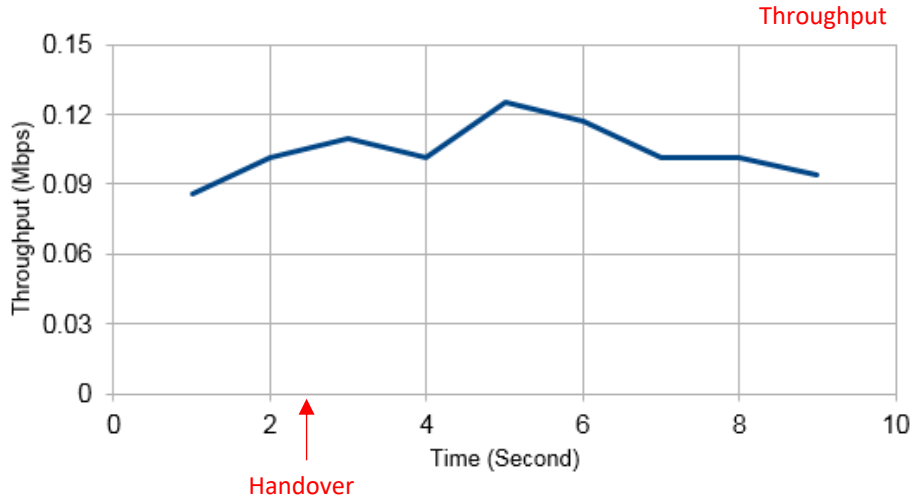






MLB Impacted User Metrics





Observations:

– Signal strength may not suffer significantly.

– Likely to get better performance.

– Induces network-wide fairness.

Desirable Features for NS-3

- More accurate LTE/5G schedulers with easy access to performance metrics (e.g., cell loading).
- Modeling of O-RAN based architecture for 5G.
  - Near-Real-Time and Non-Real-Time RAN Intelligent Controllers (RICs).
  - 5G Base Station split options for Remote Unit (RU), Distributed Unit (DU) & Centralized Unit (CU) disaggregation.