

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

Mobile Load Balancing

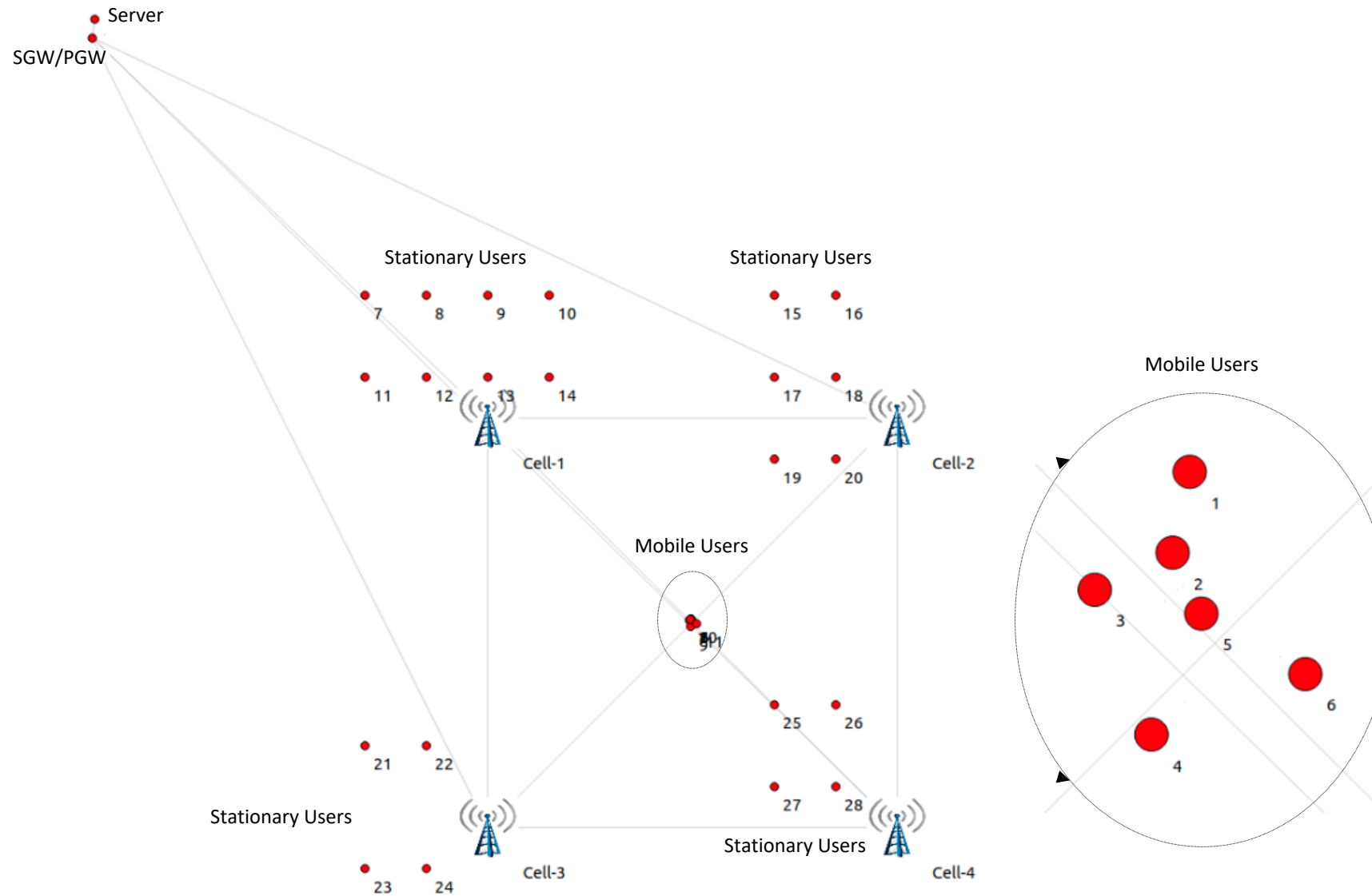
■ Our NS-3 Implementation:

- Based on LTE's Self-Organizing Network (SON) feature.
 - Cell load dependent adjustment of 'cell offset' for controlling cell range.
 - A3 event triggered handovers.
- QoE considerations in selection of handover target cell.
 - Takes into account the signal strength (RSRP) and cell loading for each candidate cell.

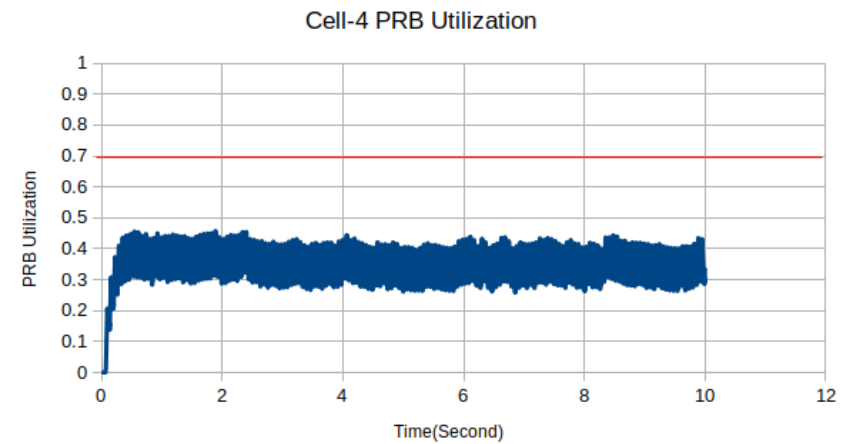
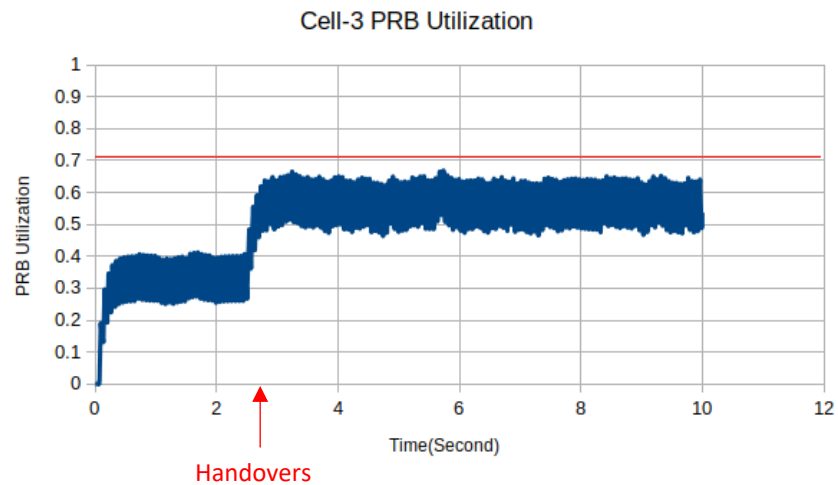
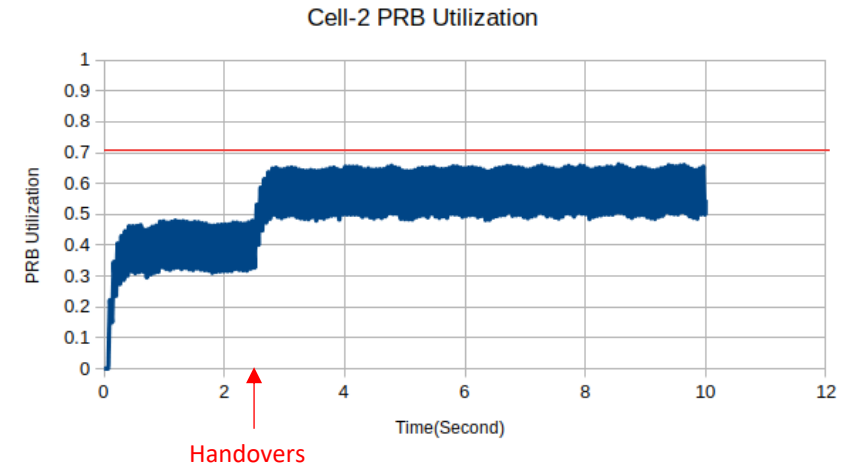
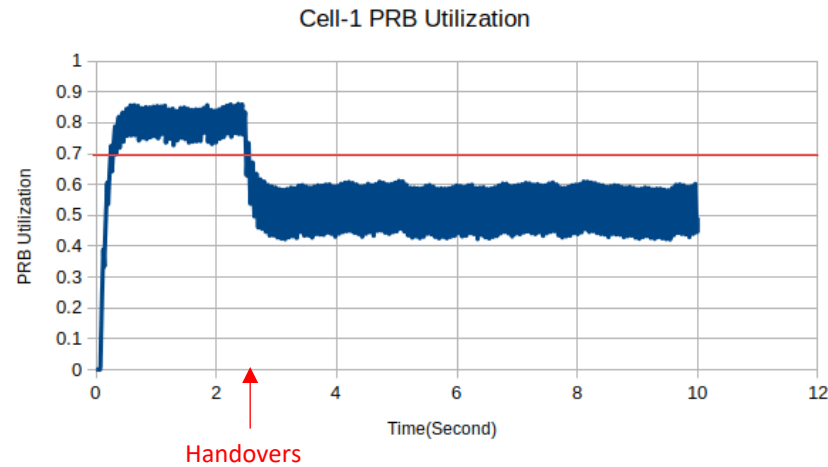
■ Future cellular networks:

- Will be based on open and disaggregated RAN functions with decoupled control/user plane.
- O-RAN defines RAN Intelligence Controller (RIC) framework to enable Radio Resource Management (RRM) functions in a centralized manner.

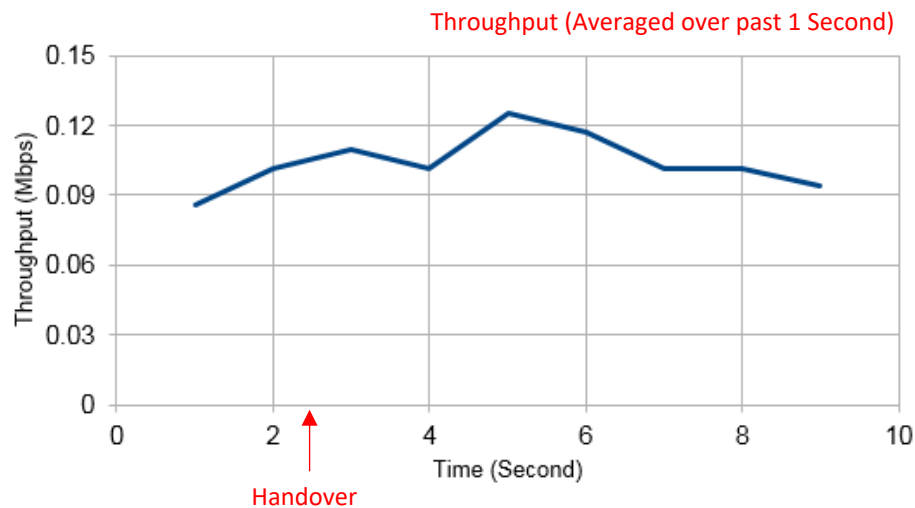
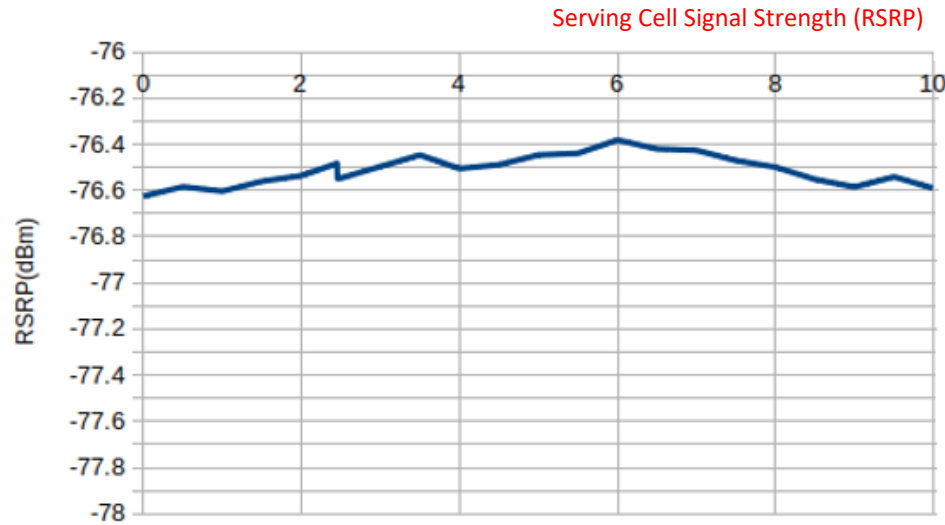
NS-3 LTE Simulation Scenario



Cell Loading Vs. Time



Metrics for a User Undergoing MLB Handover



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.

