Towards Service Assurance in a Multi-Tenant 5G Mobile Network Architecture
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Project Overview
Investigate end-to-end service assurance aspect of 5G network slicing

- Characterization of 5G service performance bottlenecks
- Agile & lightweight measurement framework for 5G service assurance
- Learning based 5G network optimization framework

Essentially about understanding factors influencing 5G service quality; and devising ways to dynamically monitor and control them

Project Related Publications

PliMon System for Efficient Monitoring of Softwarized Mobile Networks
Two Key Ideas:
- Time-varying behaviour of VNFs and their features can be exploited to reduce monitoring overhead with little effect on accuracy
- Adaptively sampling: only a subset of measurement features normally monitored and rest can be on demand

PliMon Case Studies
- Metric Monitoring Frequency Adaptation
- Multi-Tier Adaptive Monitoring

Use Case: Multi-Operator Indoor Mobile Access via Infrastructure & Spectrum Sharing
- Neutral-host acts as infrastructure provider, also manages shared spectrum
- Operators (tenants) can be traditional or non-traditional

Managing access to shared spectrum in indoor neutral-host environment
1. Efficient matching of tenants’ demand with spectrum supply
2. Enable service differentiation among competing tenants to incentivize their participation
3. Support neutral-host cost recovery and revenue goal
4. Practically realizable system architecture

Two Key Ideas:
1. Dynamic pricing of shared spectrum an effective control mechanism to meet first 3 requirements
2. Cloud RAN (C-RAN) like architecture well-suited for indoor neutral-host small cell environment

Iris Shared Spectrum Management System for Indoor Neutral-Host Small Cells
- Powered by a deep reinforcement learning based dynamic pricing mechanism
- Cloud RAN like system architecture enabled by Orion, FlexRAN and RAN functional split
  - Combines edge cloud infrastructure with densely deployed radio heads

Prototype 5G Testbed at Edinburgh

PliMon Case Studies
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