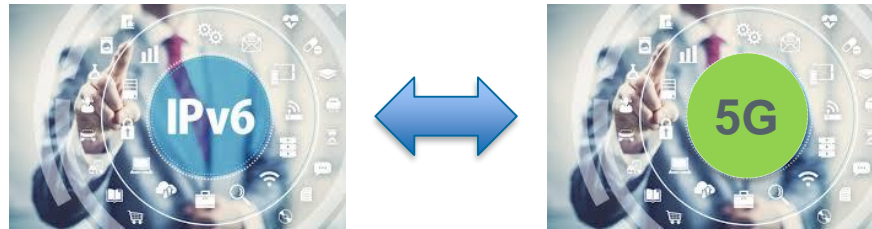


When IPv6 Meets 5G

Ning Wang, University of Surrey

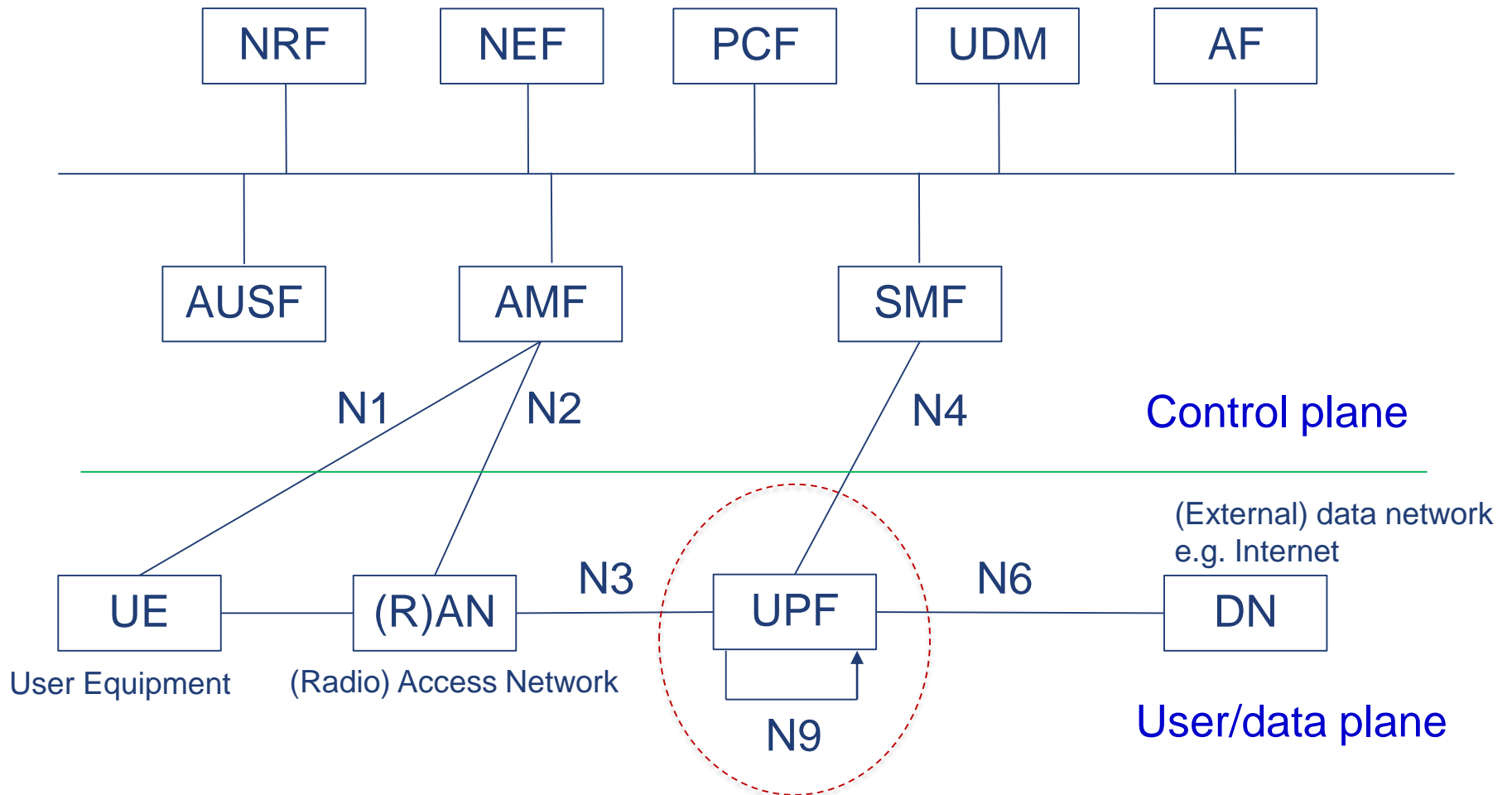


When IPv6 Meets 5G



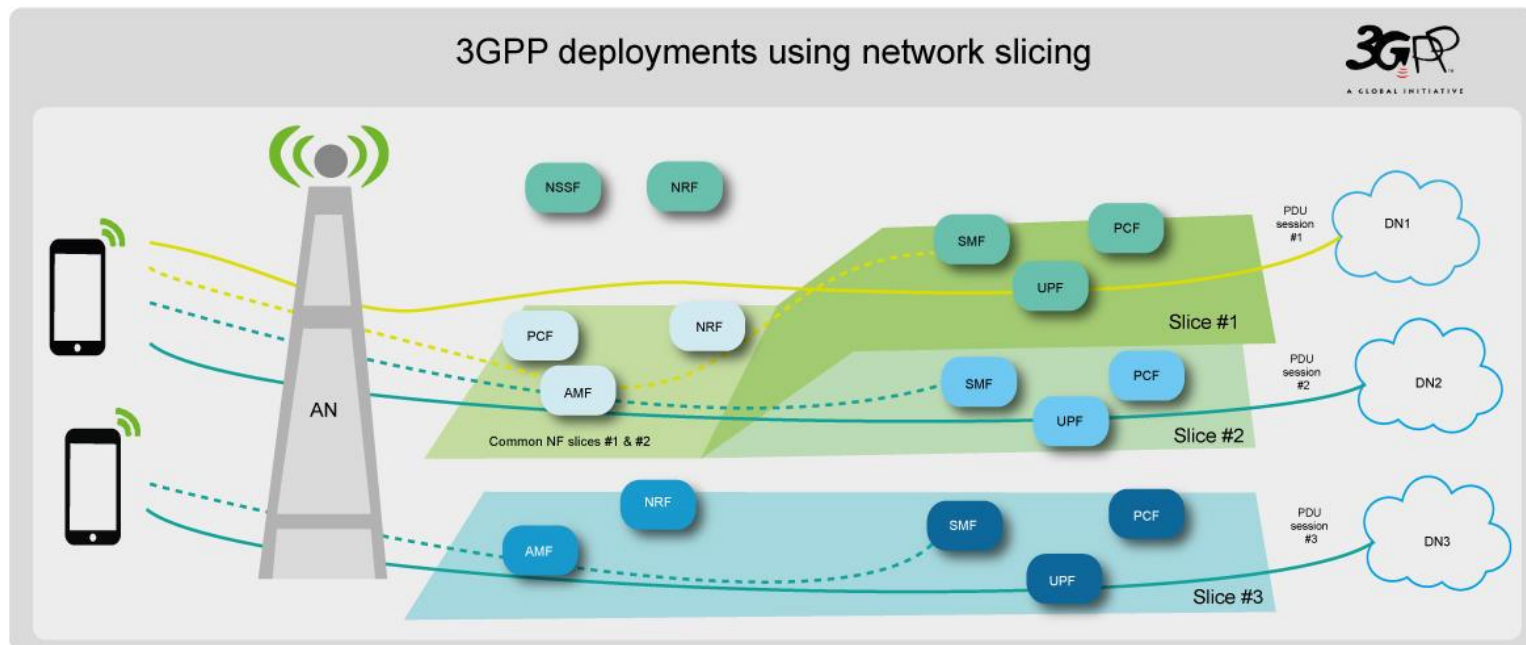
- IPv6 – IP address space scalability, to include more semantics in IPv6 packet headers
- 5G – Much more diverse application services including mobile broadband, ultra-reliable and low latency, **massive IoT**
- 5G sees increasing importance of bracing IPv6 when mobile networks are interconnected with the public Internet that has already seen wide IPv6 deployment
- IPv6 also enables advanced networking techniques such as IPv6 segment routing (SR) and service function chaining (SFC), both will see their development in 5G core networks in the future

A Glance of 5G Service Based Architecture

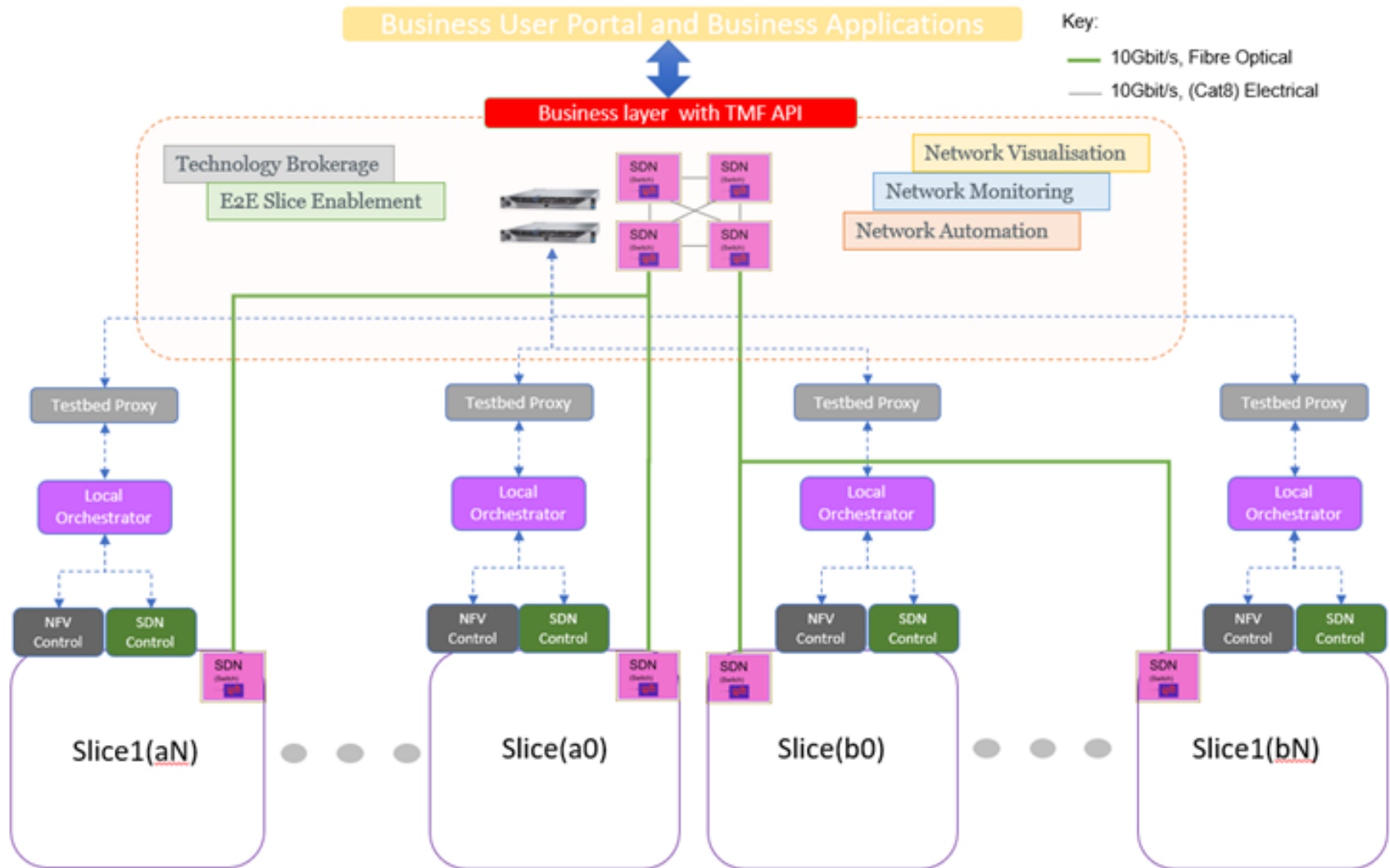


Network Slicing (NS) in 5G

- **5G slicing** enables the operator to provide multiple tailored virtual slices based on the same physical network to different client groups, including customers, MVNOs and commercial organisations
- 5G NS can be in terms of:
 - Service performance support (eMBB, URLLC, MMTTC...)
 - Application of different technologies / protocols / network functions



Network Slicing Framework

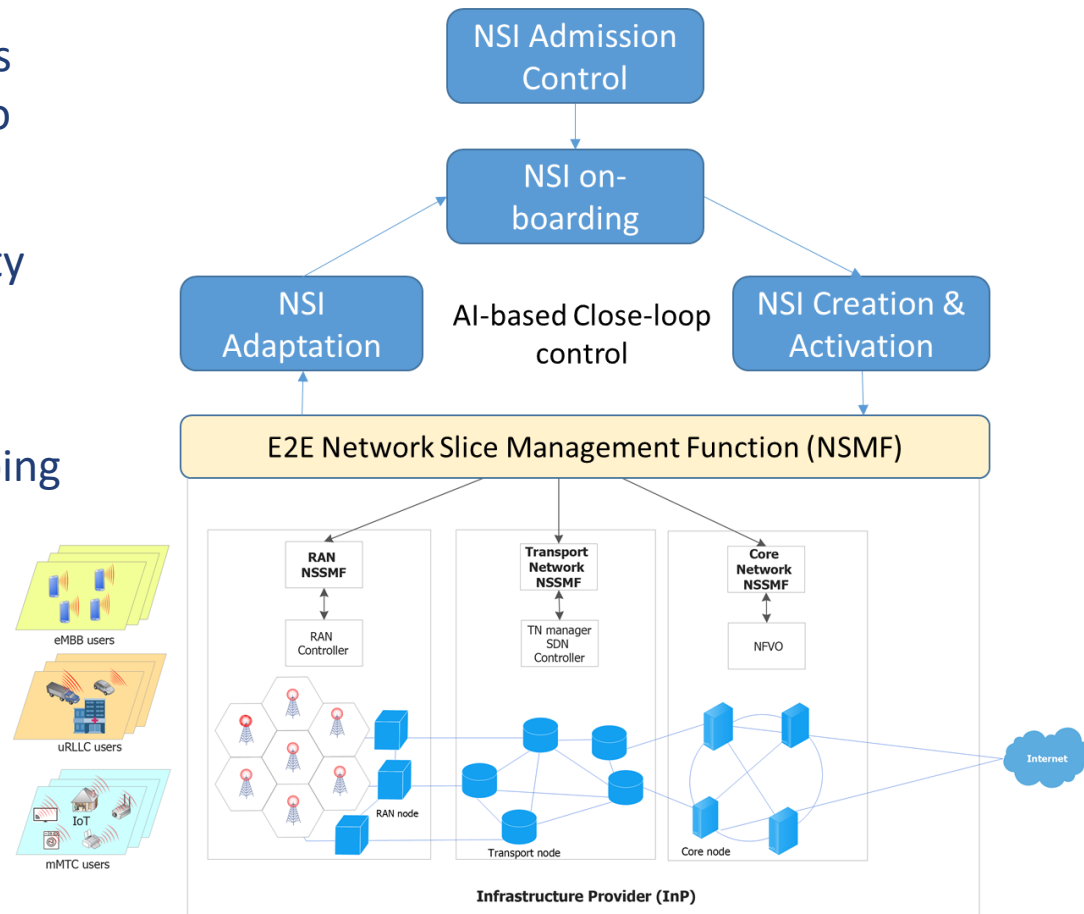


Network Slicing Framework

The Intelligent Network Slicing Agent (INSA)

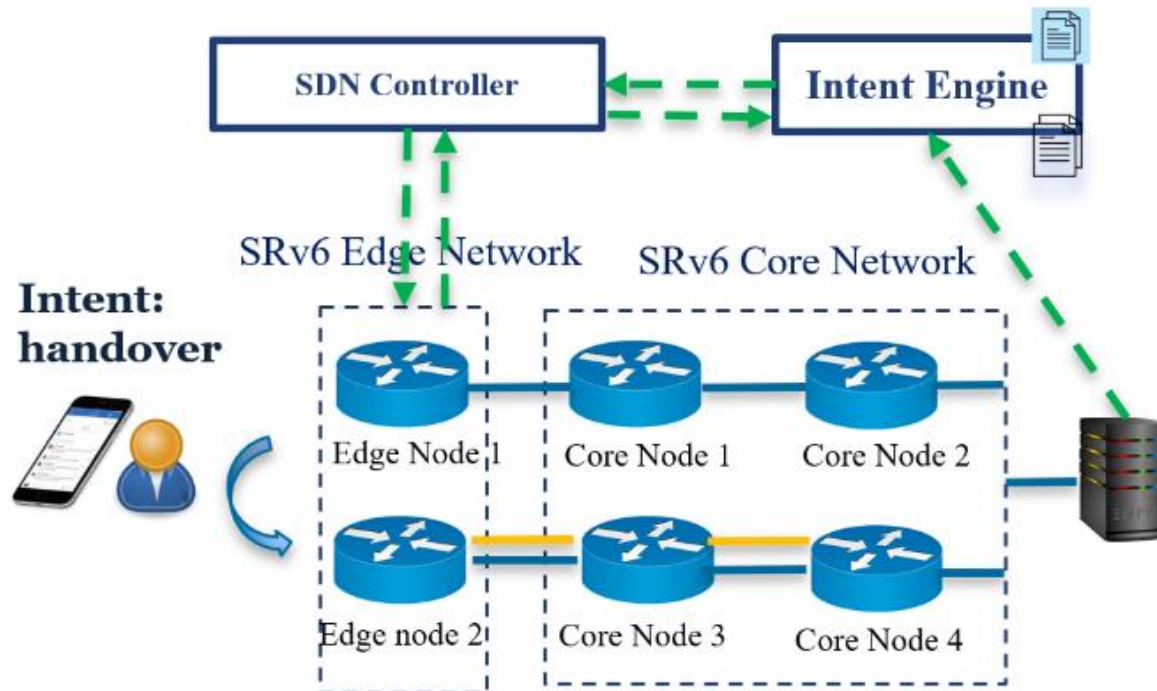
Based on network and service dynamics the INSA provides real-time decisions to the E2E slice MANO regarding:

1. Network Slice Instance (NSI) feasibility check: determining whether the NSI requirements can be satisfied.
2. NSI preparation / on-boarding: mapping VNFs and virtual links onto suitable physical nodes and links.
3. NSI creation / activation: allocating required resources to the NSI and activating it.
4. NSI modification: resource scaling up/down based on traffic changes.



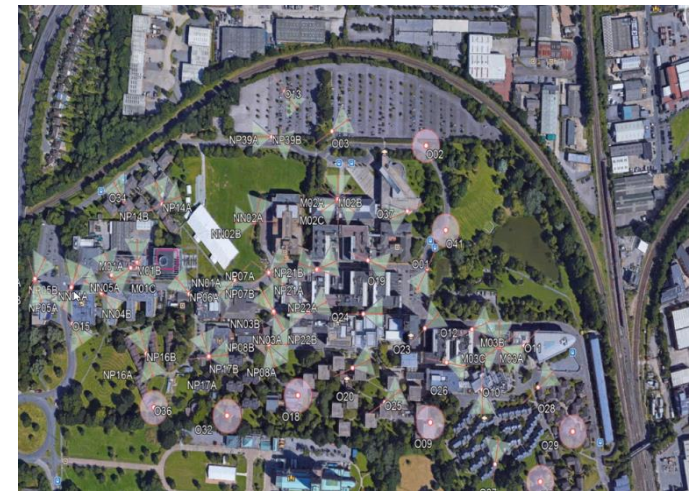
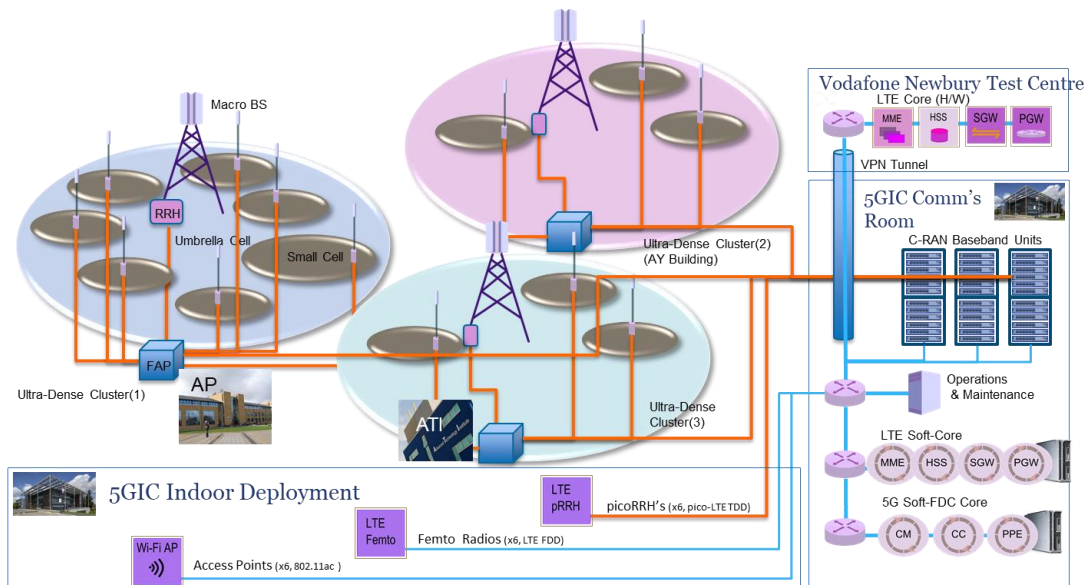
Intent-based Network Management based on SRv6

- Content service provider (CSP) to express intent/requirements
 - User QoE assurance** in both stationary and mobile modes
- Intent engine compiles intent into instructions passed onto SDN controller for actual network configuration
- Platform based on **SRV6** that enables **dynamic service function (re-)chaining**



Surrey 5G Infrastructure

- **Independently developed 5G core network and its management system**
- 60+ base stations including 10+ 5G RRHs
- Integrated with **GEO satellite backhaul** to connect remote mobile sites
- Support core **network slicing**
- **Plan to support IPv6** near future



Key Research Issues

- Efficient traffic measurement within each 5G network slice
 - Passive and active
 - Measurement as a network function
- Verification of user intent fulfilment (QoS/QoE) based on SRv6
- Enabling autonomic network management based on measured traffic behaviour
- Interconnecting with other IPv6-based fixed infrastructures



Thank You!