



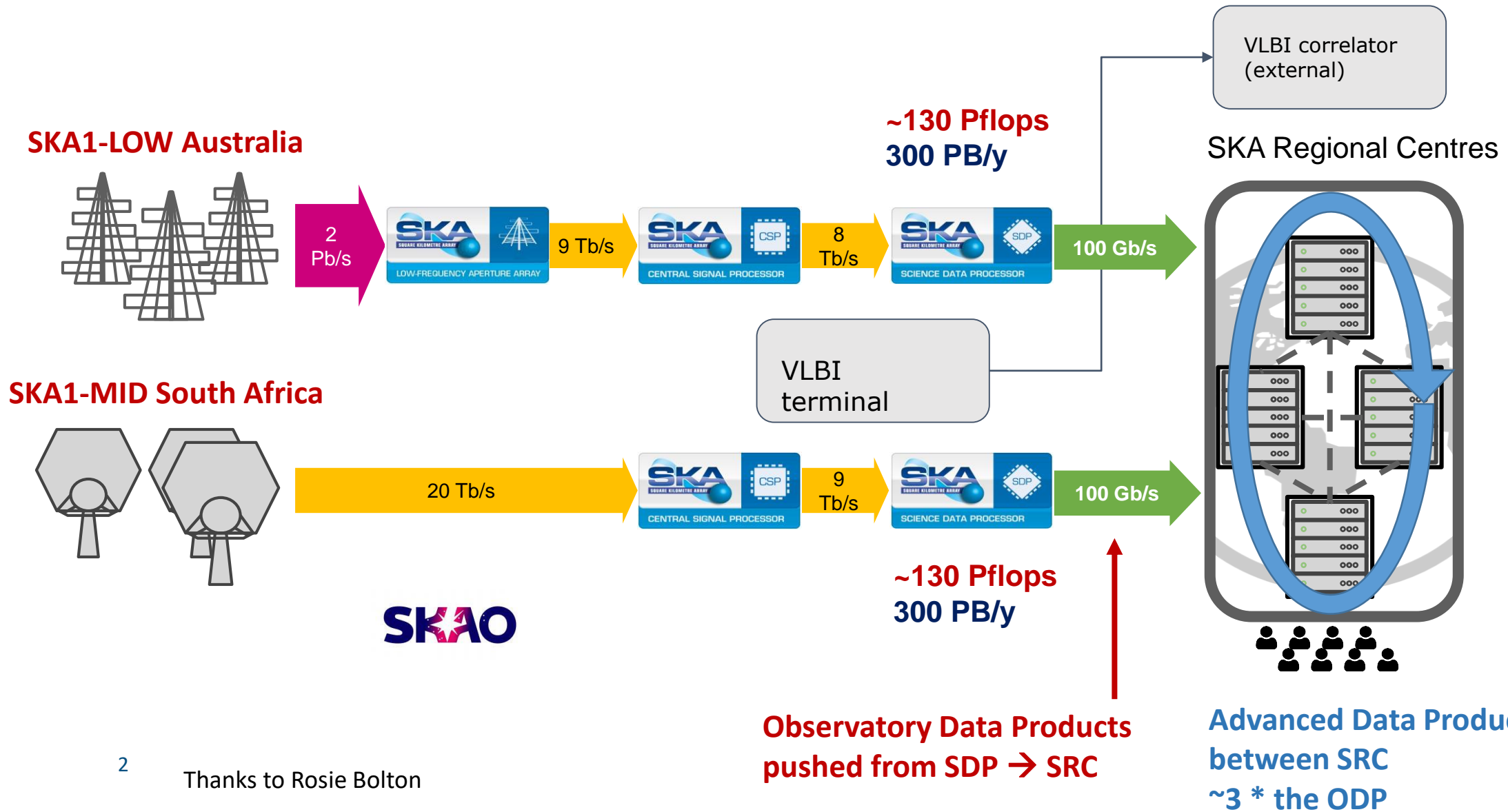
Global Connectivity for SKA

Richard Hughes-Jones

CERN Meeting
October 2022

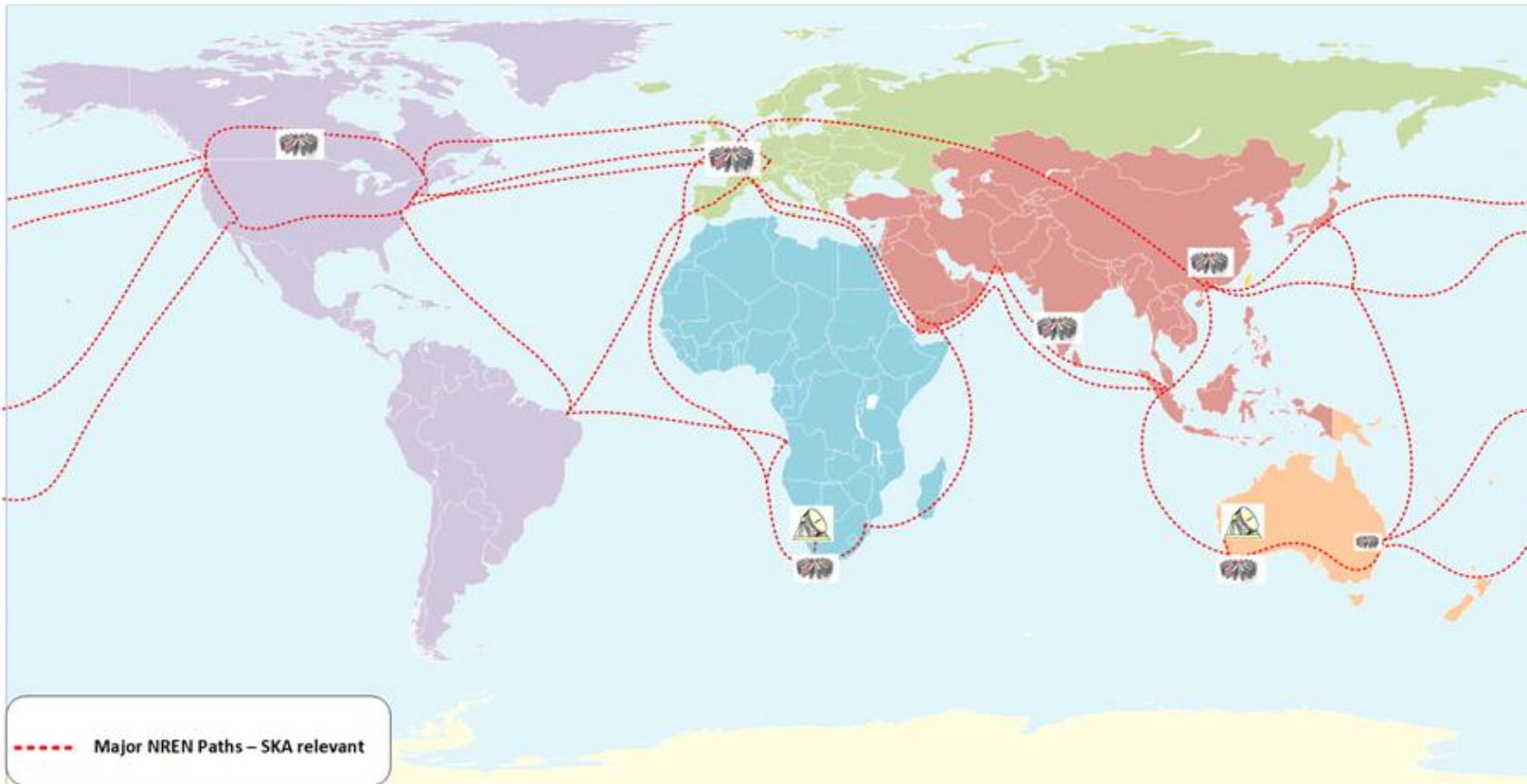
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SKA Phase1 Data Flows



Fibre and Cable Systems and major NREN paths

- The current (2020) intercontinental fibre cable systems used by the international research and education community.
- Document produced for the SKA Regional Centres Coordination Group



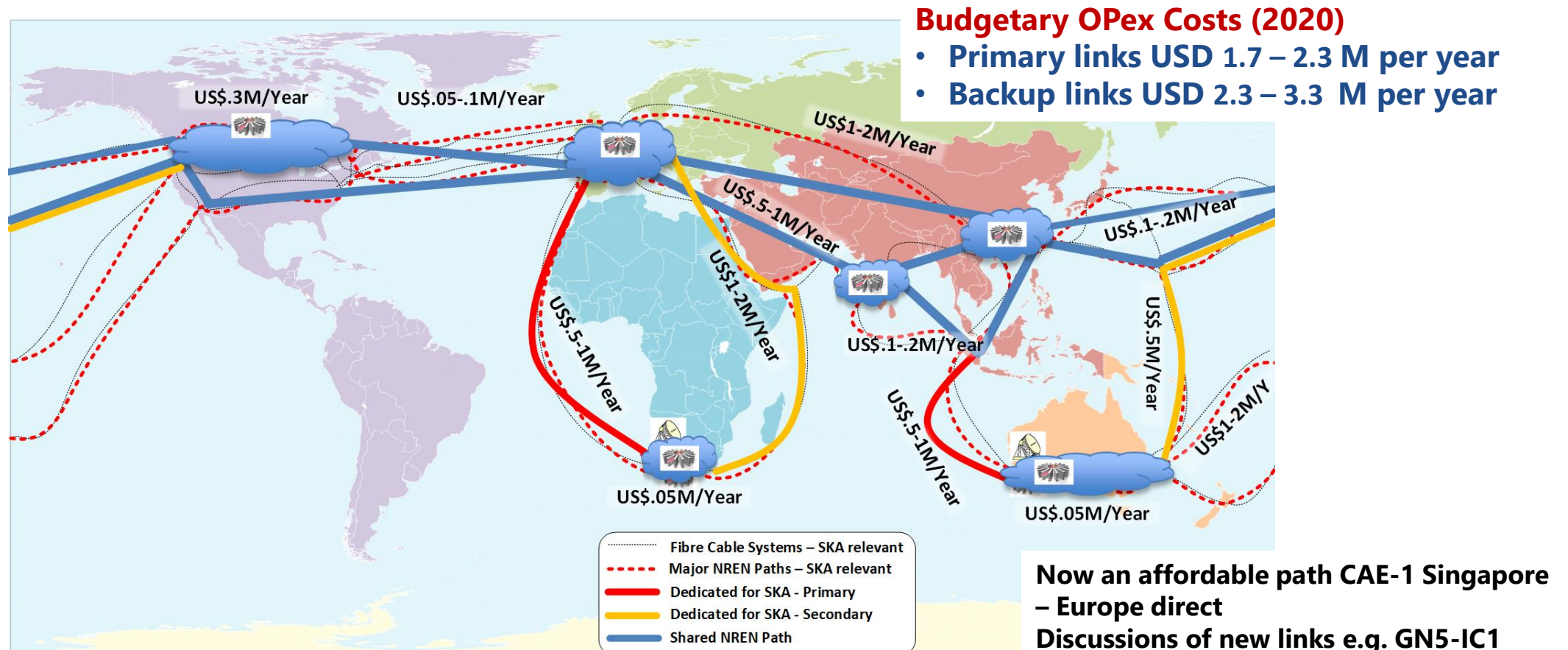
GLOBAL AND NATIONAL NETWORK COSTS FOR SKA SCIENCE

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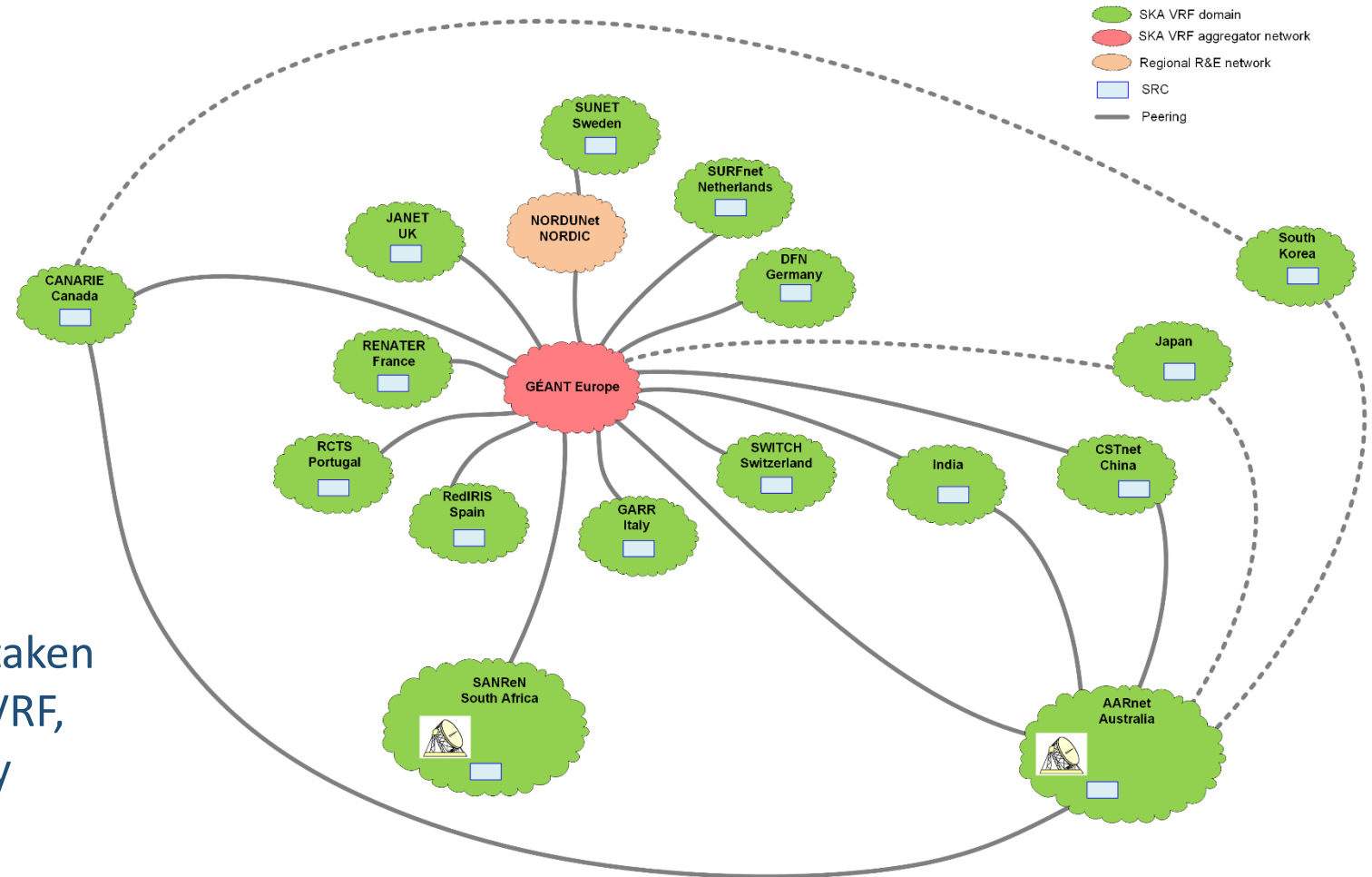
Global Network & Paths of Interest to SKA

- Dedicated Primary (**red lines**) & Backup links (**yellow lines**) from both telescopes
- Use of the shared academic network (**blue lines**).
- 1 PetaByte/day pushed by SDP from each Telescope → 100 Gigabit/s
- Costs based on 10 to 15 year IRU per 100 Gbit circuit projected to 2025 prices



Global Network Architecture for SKA

- Global VRF based overlay with peering linked over the shared academic network
- Isolation of SKA traffic from other users
- Easier for NRENs to implement the routing, policies and monitoring
- SKA traffic can be engineered
 - Use specific paths & routes
- Layer 3 routing provides isolation
 - any network configuration issues
 - strictly limits broadcast storms
- Layer 3 will re-route traffic as long as there is an alternative network path
- Configuration actions have to be undertaken by the NREN and a Site to join the SKA VRF, which provides an extra layer of security
- Sites may need source based routing



Network Considerations for a SRC Site

- Need for high performance Data Transport Node hardware
 - Tuned for RTT ~300 ms
 - Network – disk transfer rate ~20 Gbit/s
- Flexible but secure ACLs and high performance DMZ connected to the VRF
- Separate SKA data & Campus LAN traffic
- Uncongested site access link
- Site may need source based routing
- Use of different prefixes / multi home servers

