

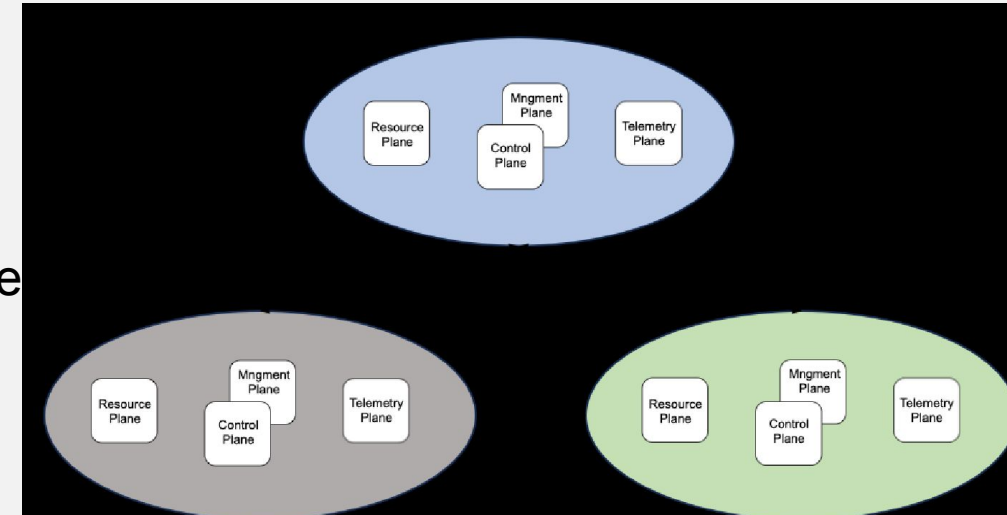
A Multiplane Architecture Proposal for the Quantum Internet

draft-lopez-qirg-qi-multiplane-arch

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As a Reminder: Why and How an Architecture Framework

- Provide a reference for further protocol and interface definition
 - Not a set of protocols or interfaces per se
 - But a way to describe and evaluate them in a consistent manner
- *An exclusively Quantum Internet is neither feasible nor desirable*
 - Working in the direction of an Internet with quantum capabilities
- Apply the operational experience with (reasonably large) QKD infrastructures
 - Interfacing applications, service semantics, and the interaction with classical networks
- Leverage SDN concepts
 - The CLAS architecture (RFC 8597)
 - Structured around strata, with a regular set of planes
 - Integration of the interplay with (shared) infrastructure
 - General trends
 - Cloud-nativeness
 - Zero-touch management
 - Intent



Structure

- Technology foundations
 - QKD experience
 - Interfacing with classical networks
 - *Applying Network Virtualization Principles*
 - Introducing the CLAS architecture
- Framework architecture proposal
 - CLAS strata for quantum networks
 - Principles for the identification of interfaces and protocols
 - An introduction to synthetic environments
- Closing matters
 - Security considerations
 - . . .

As Work Goes on

- Validate the framework with a synthetic environment under development
 - As essential means: <https://quditto.io/>
 - Given the issues with devices, scale...
 - Not strictly an NDT
 - Integration with classical networks
 - Mesh of synthetic and real elements
 - We planned to include initial results in a -03 version
 - What depends on the publication of a paper
 - Executing first experiments
 - Collaboration with other interested teams
- TBP so far
 - A better term for “quantum forwarding”?
 - Mapping existing interface/protocol proposals onto the framework
 - Security considerations
- Address recent comments

