

Requirements of Computing in network

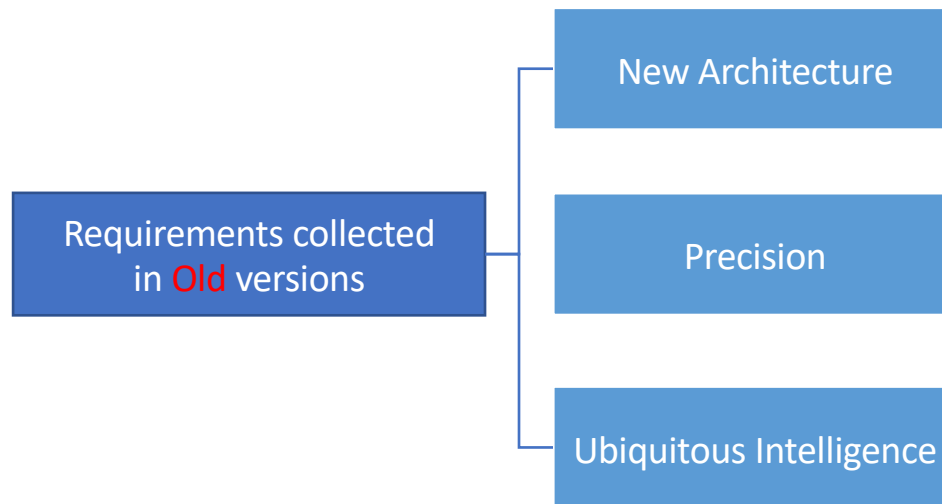
draft-liu-coinrg-requirement-01

P. Liu, China Mobile

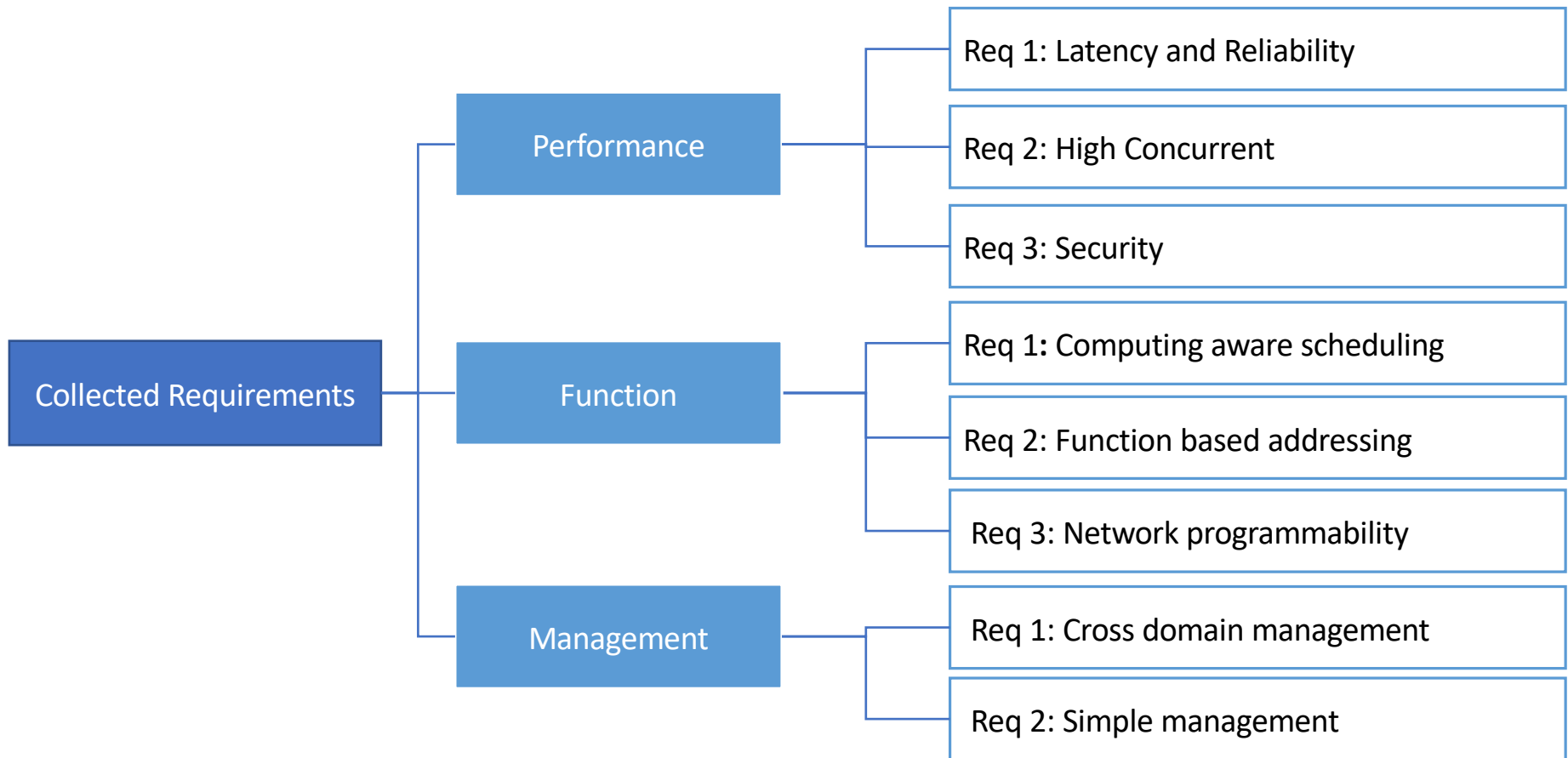
L. Geng, China Mobile

Major Changes from IETF 105

- [?] More requirements have been collected
- [?] Categorized requirements into performance、function、management.

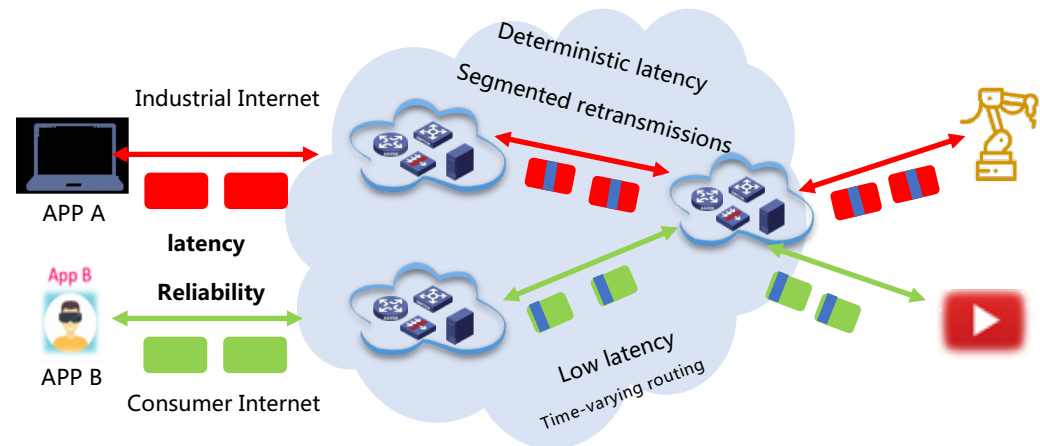


Collected Requirements in Latest version



Performance Requirement 1- Latency and Reliability

- Depend on service' s demand
- Latency:
 - From "In Time" to "On Time" , the latency is not necessary the lower the better
- Reliability :
 - Transmission path: Time-varying routing, found the link time-varying regularity based on AI, predicting the network performance trend
 - Packet loss rate: segmented retransmissions, the content is cached and enhanced



Performance Requirement 2- High concurrency

The number of computing nodes increases, and there may be a lot of parallel computing between nodes. With the trend of interconnection of everything in the future, it will bring great challenges to the network connection.

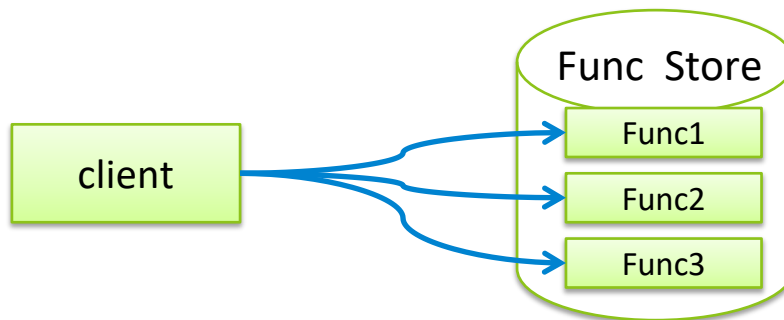
Performance Requirement 3- Security

With the evolution of network capability, multi domain networks may not only be able to communicate with each other, they may need to analyze each other, which will bring security problems.

Function Requirement 1-computing aware scheduling

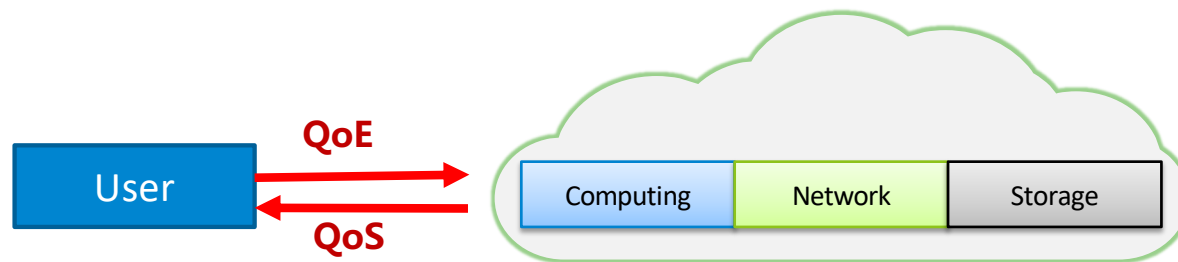
- According to business requests, dynamic computing power matching is carried out not only based on network status, but also considering the computing resources to achieve optimal user experience, and network utilization.
- Computing status and the resource' s measurement are seen as another dimension
- Computing resource information is exposed

Function Requirement 2-function based addressing



- The application components deconstructed on the server side are distributed on the cloud platform, and the business logic in the server is transferred to the client side.
- Client only needs to care about the computing function itself, not the computing resources such as server, virtual machine, container and so on, so as to realize the function as a service.

Function Requirement 3- network programmability



Information transmitted by network to users

Network resources (topology, path, link quality, etc.)
Computing resources (CPU/GPU, storage, memory, etc.)

Information transmitted by users to network

Network requirements (bandwidth, latency, jitter)
Computing Requirements (CPU/GPU, Storage, Memory)

- The network should configure parameters according to users' needs, and users can transfer requirements based on network capabilities, which could effectively support future application.

Management Requirement 1- Cross domain management

Should guarantee the end-to-end network management to meet the needs of different network topology, performance and function, which involves cross domain network management.

Management Requirement 2- Simple management

Scheduling and cooperation among different network domains, different operators and different users are very complex problems.

An effective management system is still needed to make the network capability and computing capability to cooperate with each other, and distribute the computing power reasonably.

Next steps

- More analysis about the requirement's proper definition according to different scenarios
- Off-line discussion about related technologies

Comments?

Thank you!