



Opportunities and Challenges of Joint Edge and Fog Orchestration

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Where are we now in the edge and the fog?

ETSI Network Function Virtualization (NFV)

- Virtualization capabilities into mobile operator networks
- Decouple the network functions from the underlying hardware
- Dynamically deploy network services

ETSI Multi-access Edge Computing (MEC)

- Computing capabilities close to the end users
- Hosting environment at the network edge with low latency and high bandwidth
- Real-time access to radio network information





OpenFog consortium

- Computing, storage, control and networking functions closer to the users along a cloud-to-things continuum
- Collaborative usage of a multitude of devices
- Non-stationary and volatile devices are considered

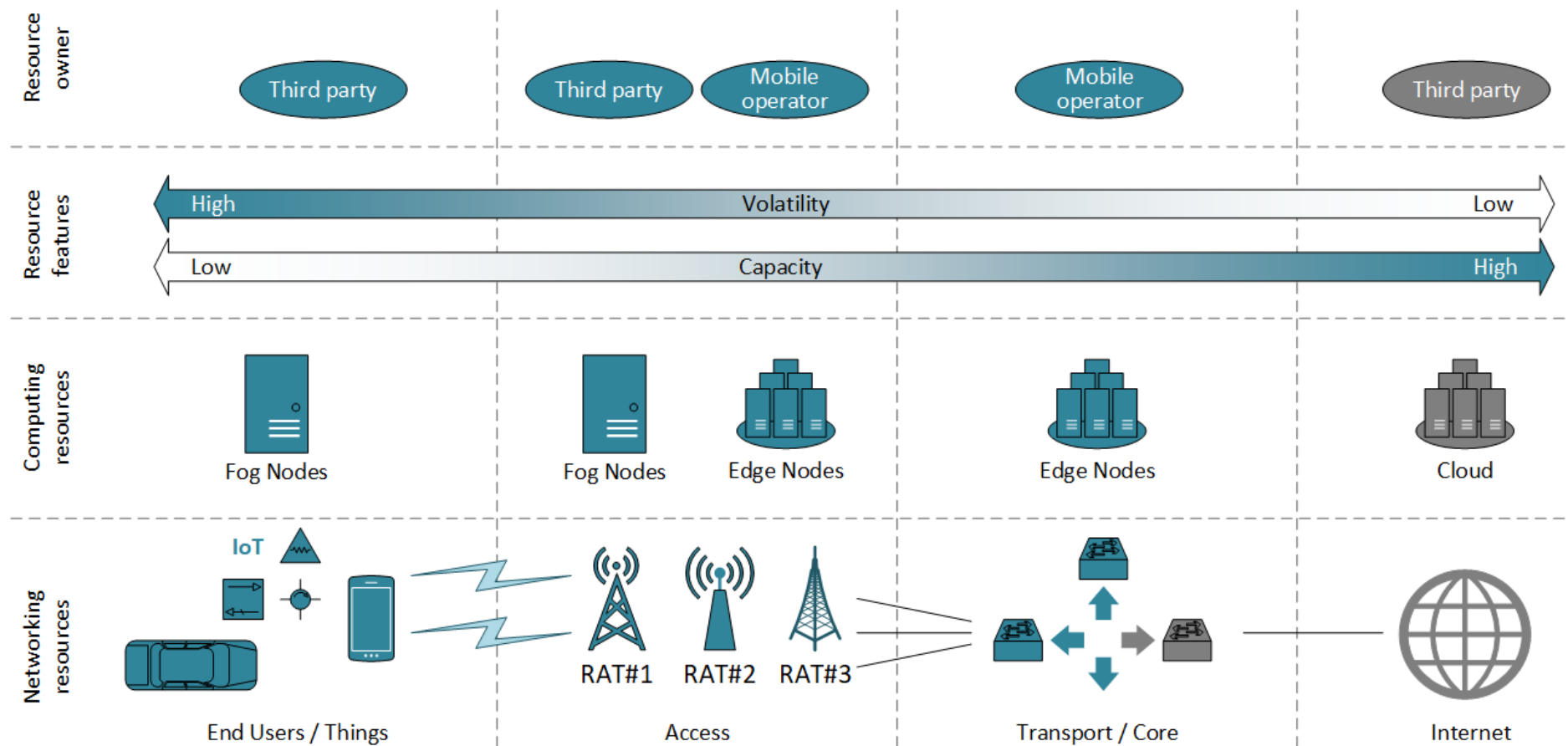
Mobile operator centric

Enterprise centric

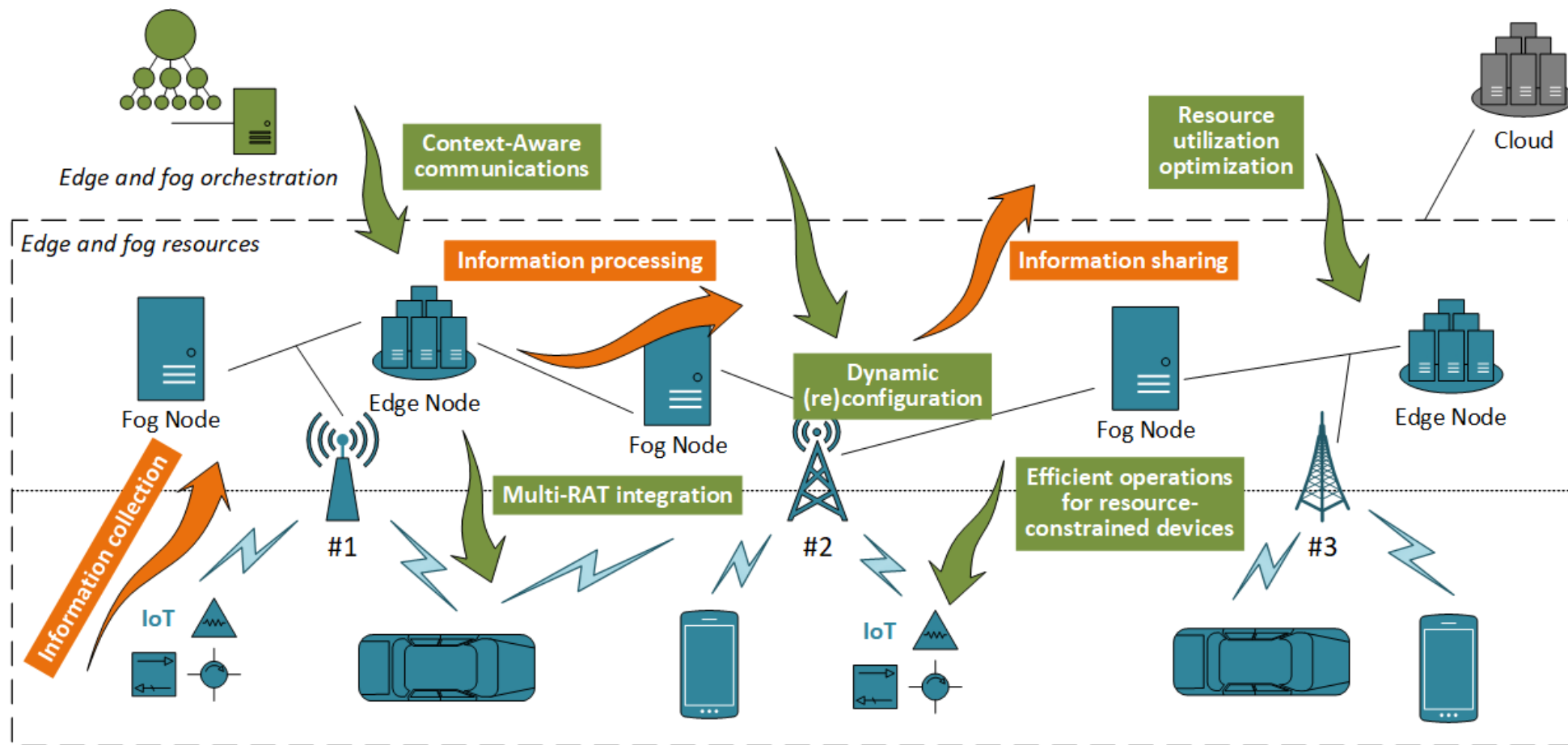
Edge and Fog synergies and commonalities

-  Edge and Fog bring networking and computing capabilities closer to the user
-  Edge and Fog are stand-alone domains that require separate deployments eventually contending for the same physical resources (e.g., spectrum)
-  Poor usage of Edge and Fog resources due to the lack of integration
-  Reduced cost-effectiveness because of the multiple separate physical deployments

Edge and Fog resources and characteristics

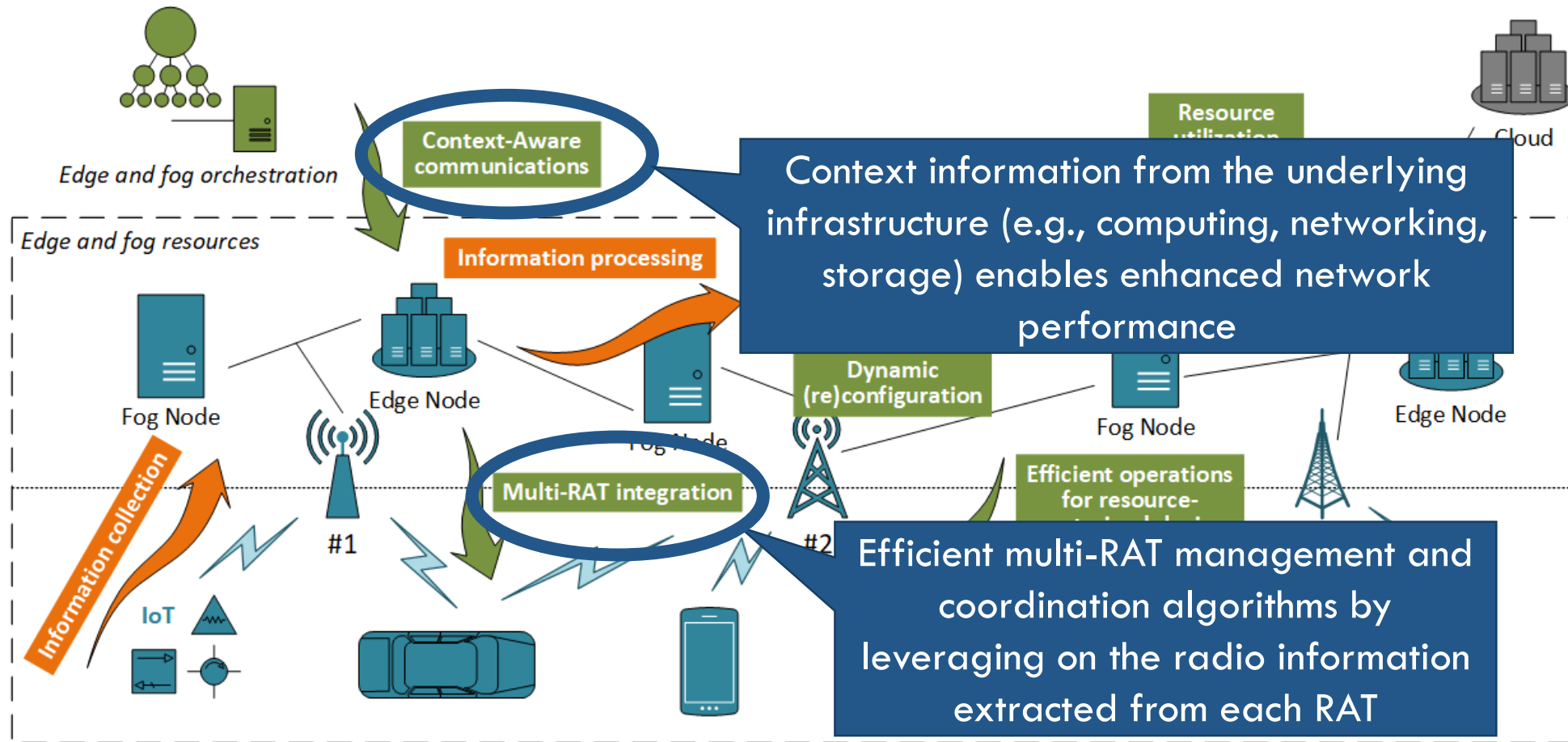


Edge and Fog joint orchestration opportunities



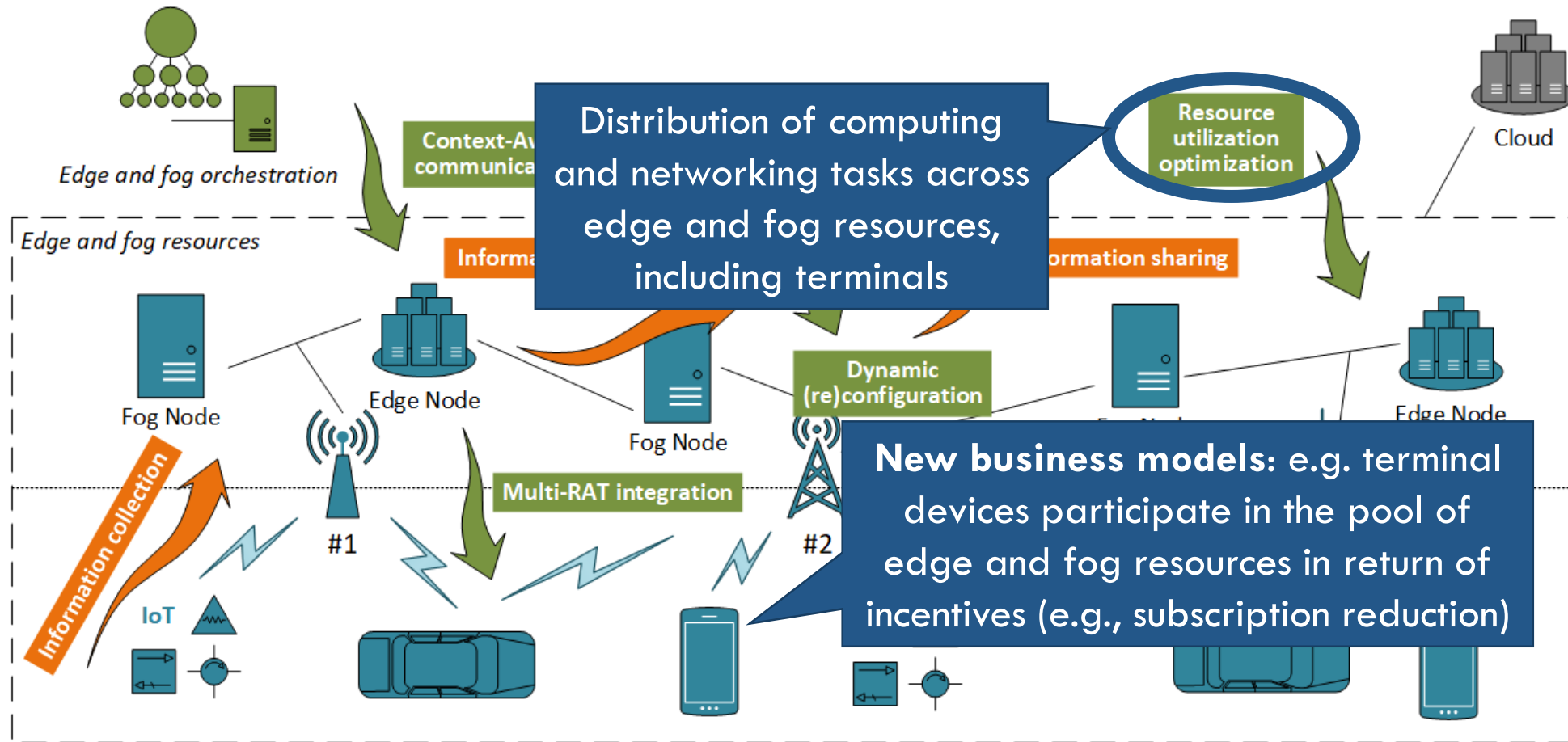
Edge and Fog joint orchestration opportunities

Context-aware communications



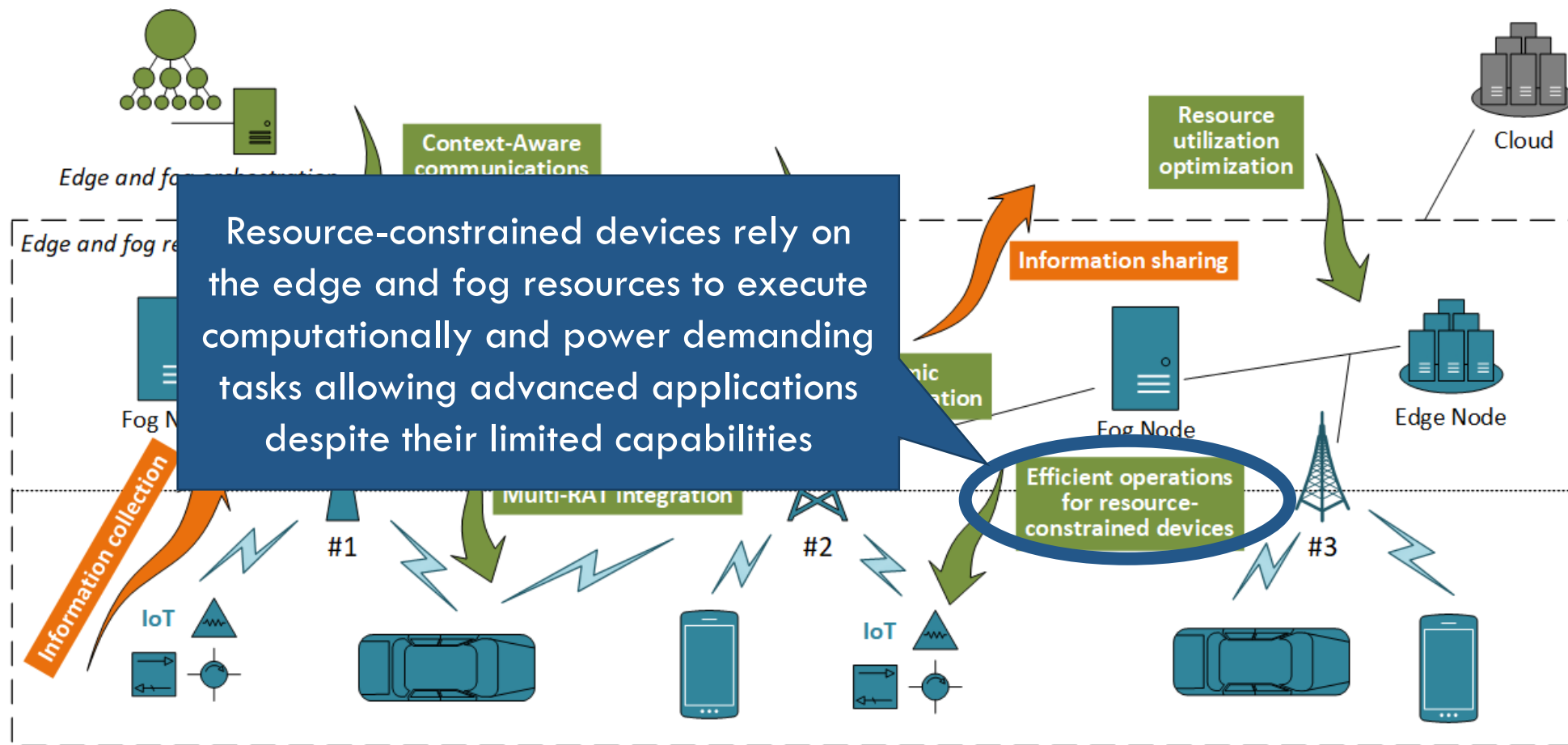
Edge and Fog joint orchestration opportunities

Resource utilization enhancement



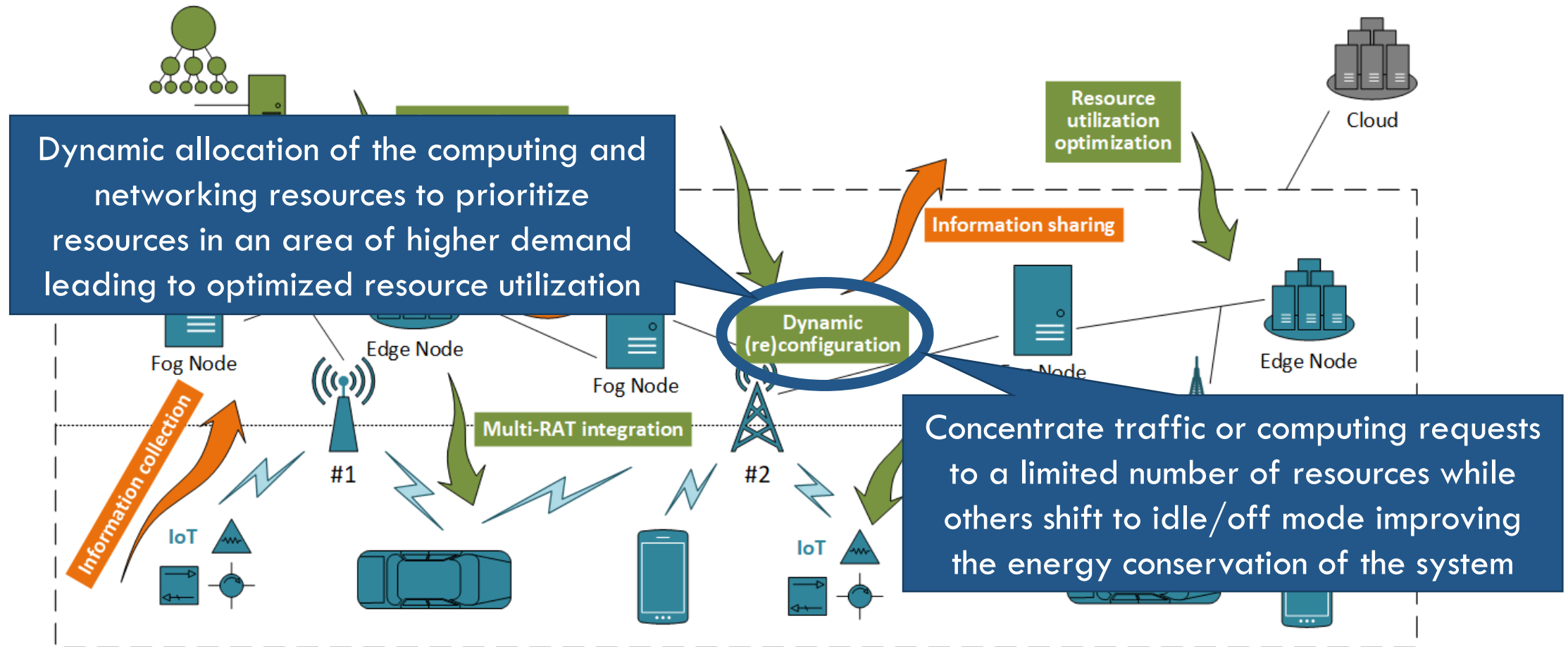
Edge and Fog joint orchestration opportunities

Efficient operation for resource-constrained devices



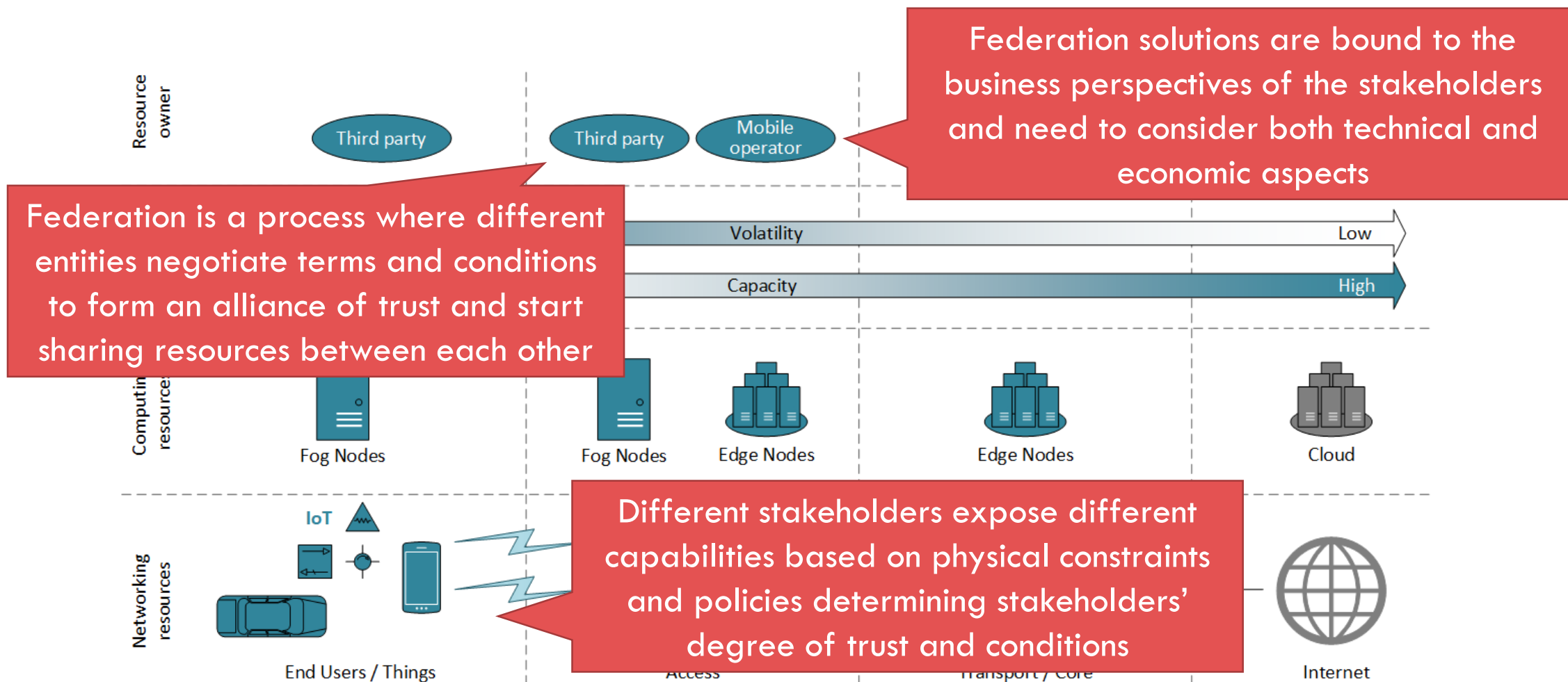
Edge and Fog joint orchestration opportunities

Flexible and scalable functionalities



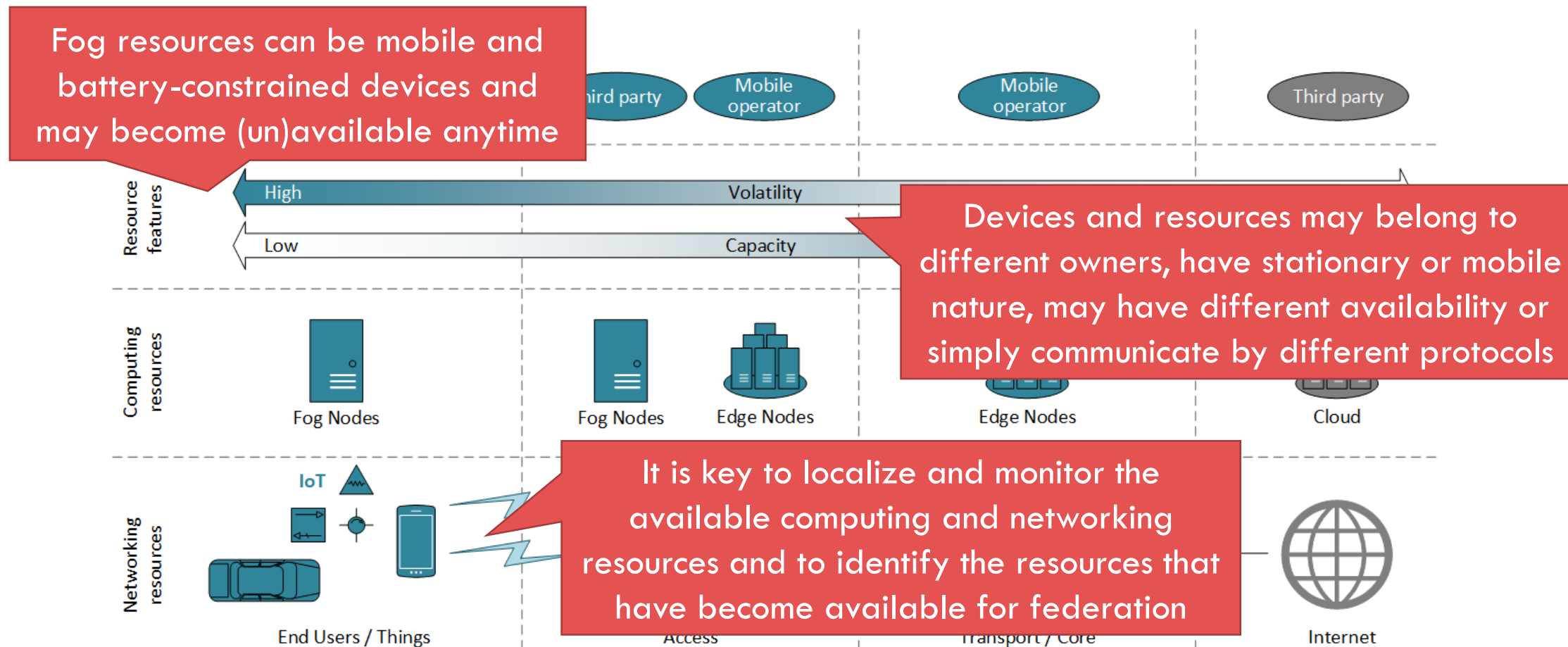
Edge and Fog joint orchestration challenges

Federation mechanisms



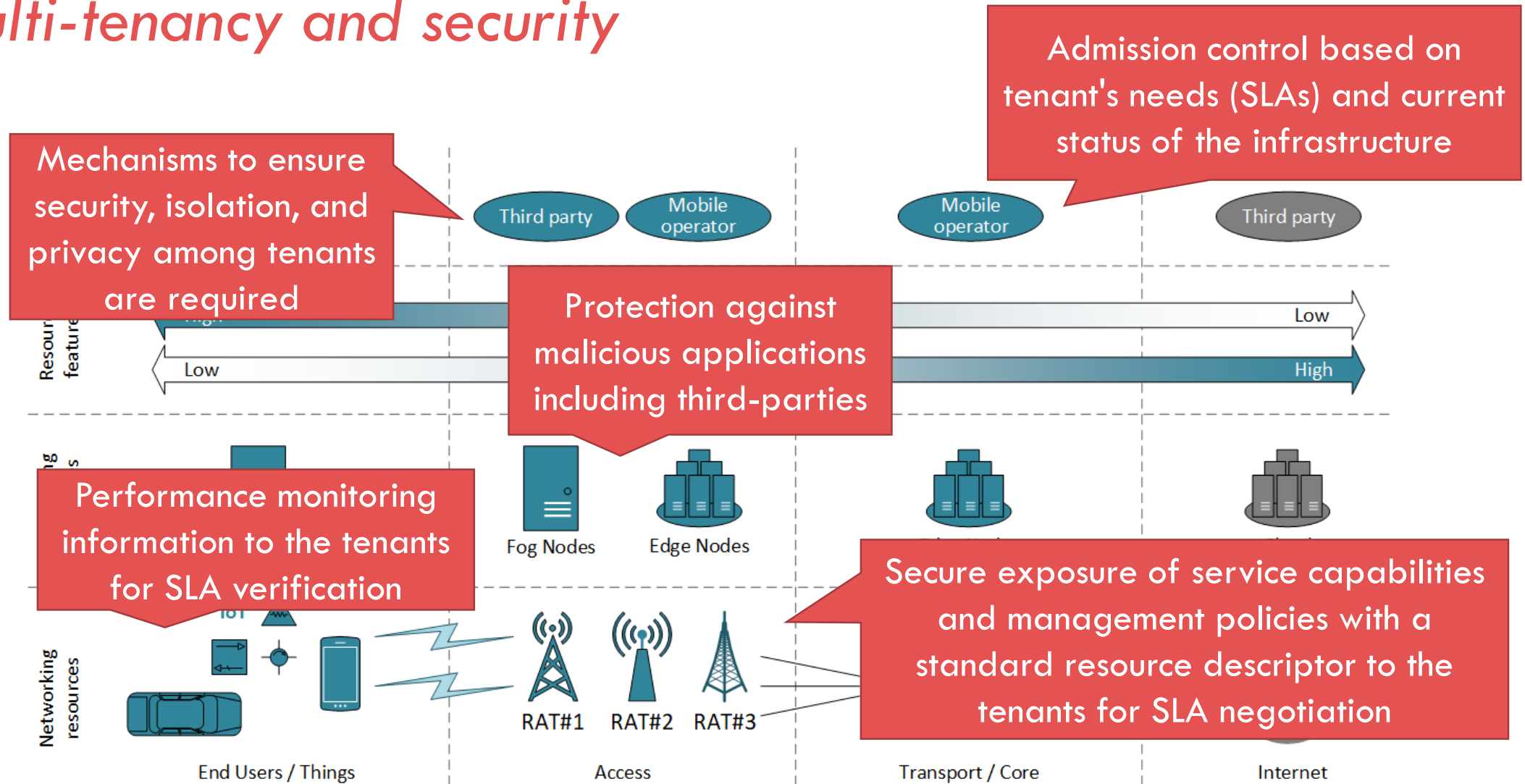
Edge and Fog joint orchestration challenges

Dynamic discovery of resources



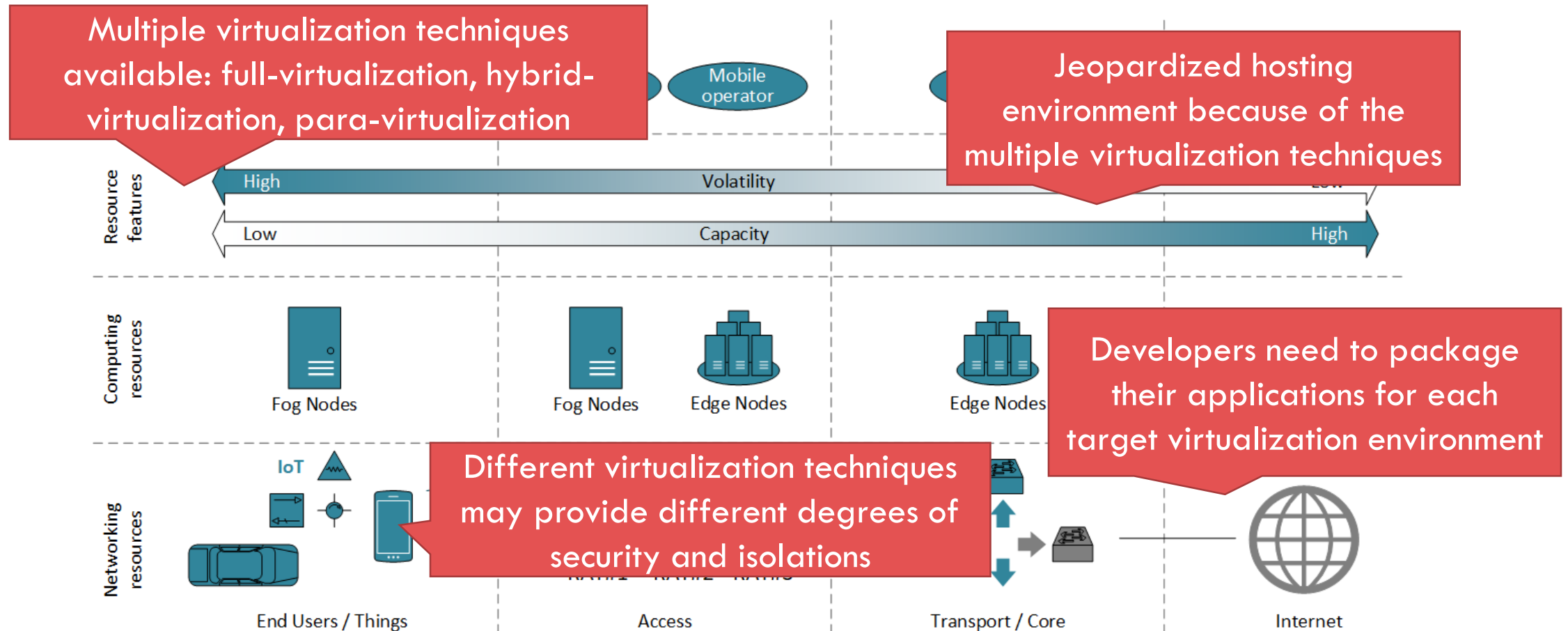
Edge and Fog joint orchestration challenges

Multi-tenancy and security



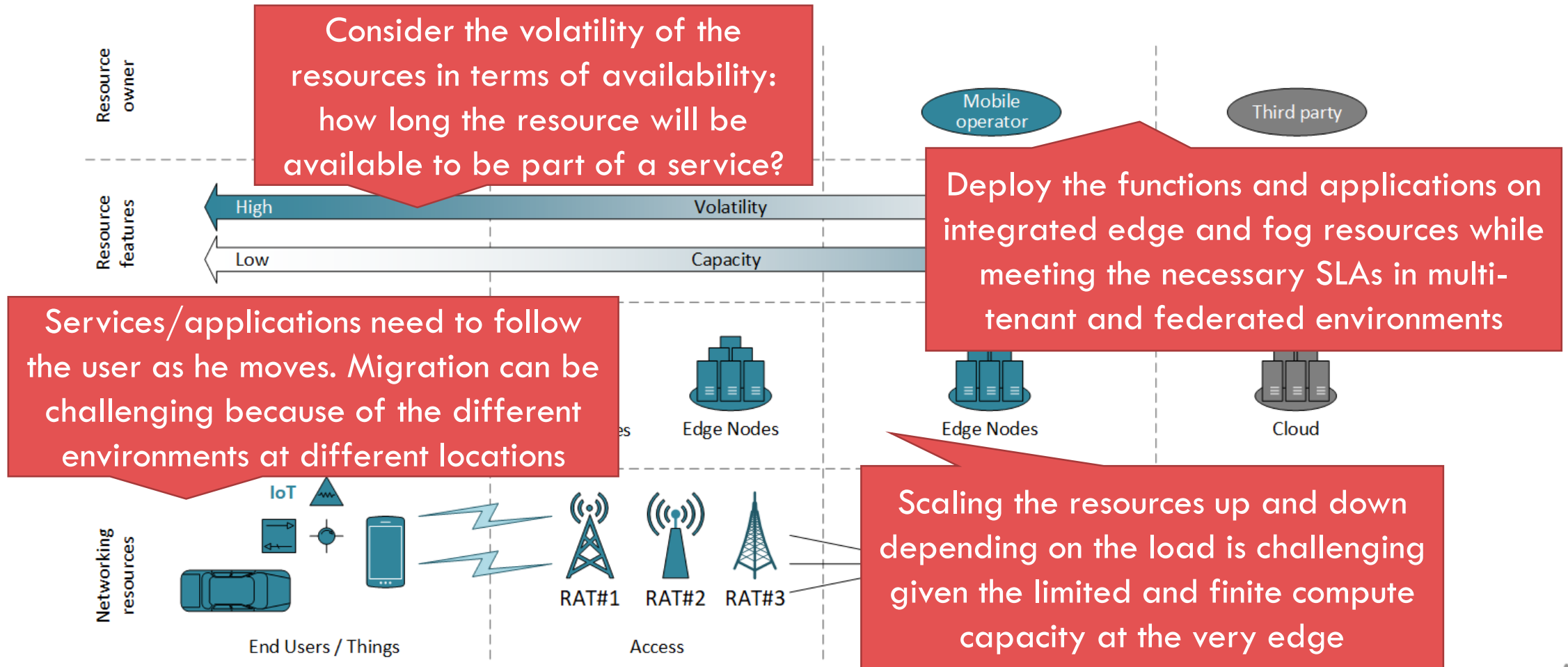
Edge and Fog joint orchestration challenges

Multi-virtualization technology coexistence



Edge and Fog joint orchestration challenges

Dynamic functions and applications placement





Questions?



Consortium partners and acknowledgment



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