CLOUD COMPUTING AND TELECOMMUNICATIONS: BUSINESS OPPORTUNITIES, TECHNOLOGIES AND EXPERIMENTAL SETUP

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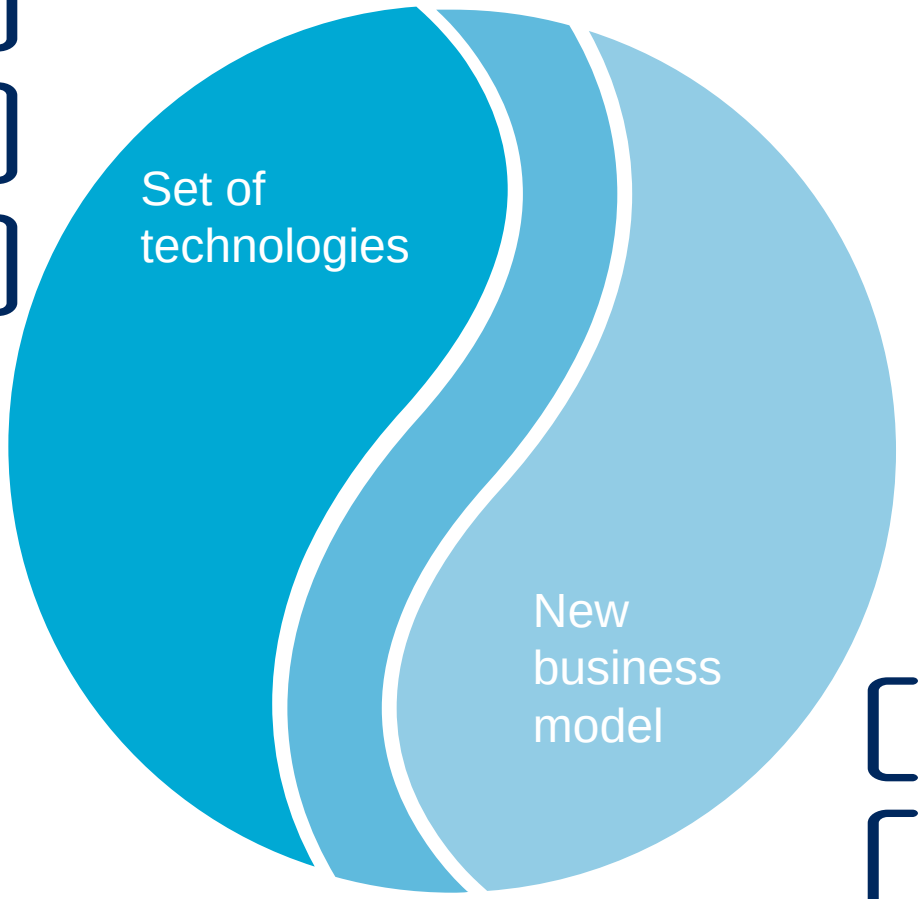
Ericsson

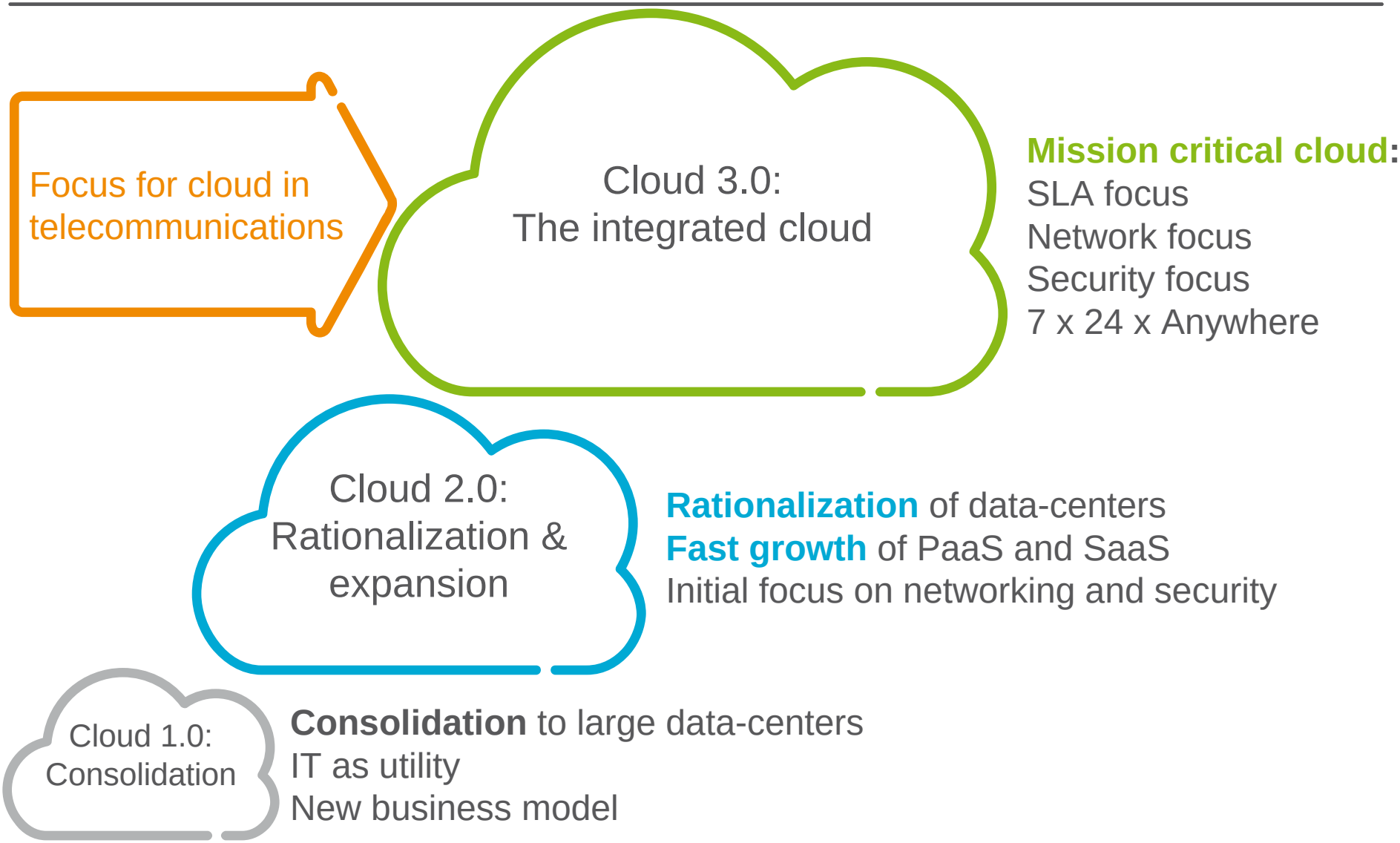
THE TWO FACES OF CLOUD COMPUTING

- Elasticity
- Automation
- Virtualization

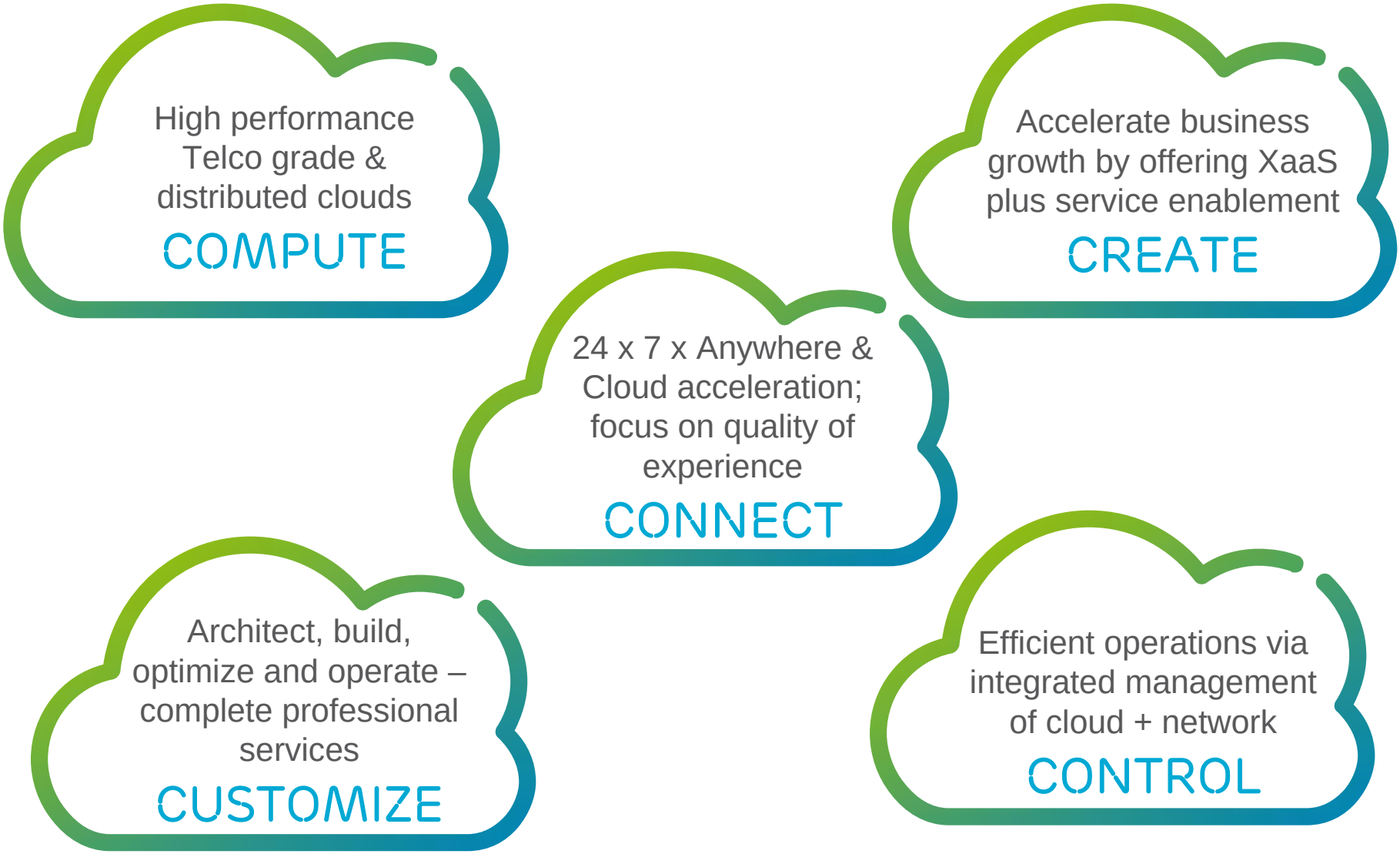


- CAPEX to OPEX
- Self-service
- Utility charging

THE NEXT WAVE OF CLOUD COMPUTING



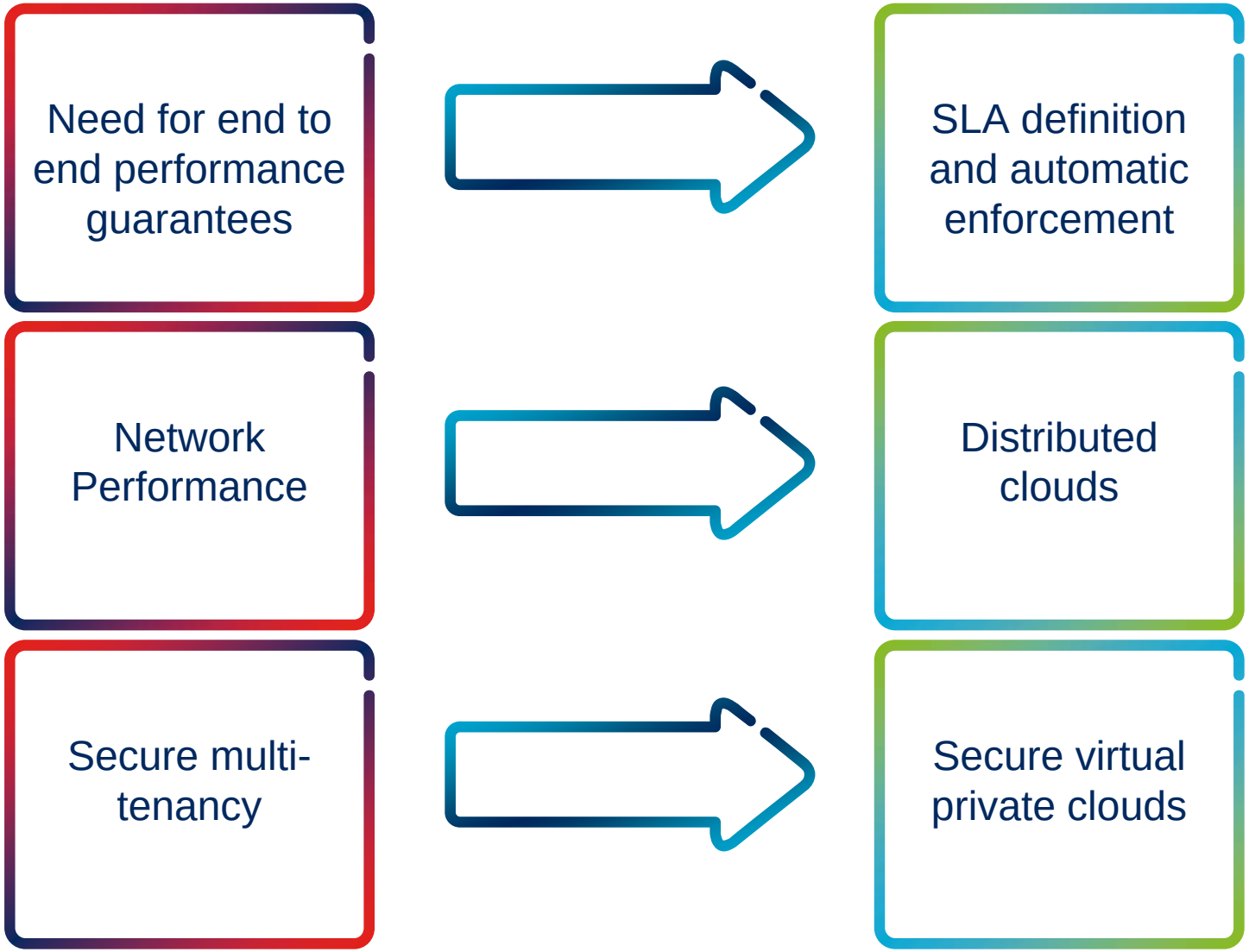
ERICSSON PROPOSAL



TELECOM SOFTWARE AS A SERVICE
COMPARISON OF BUSINESS MODELS

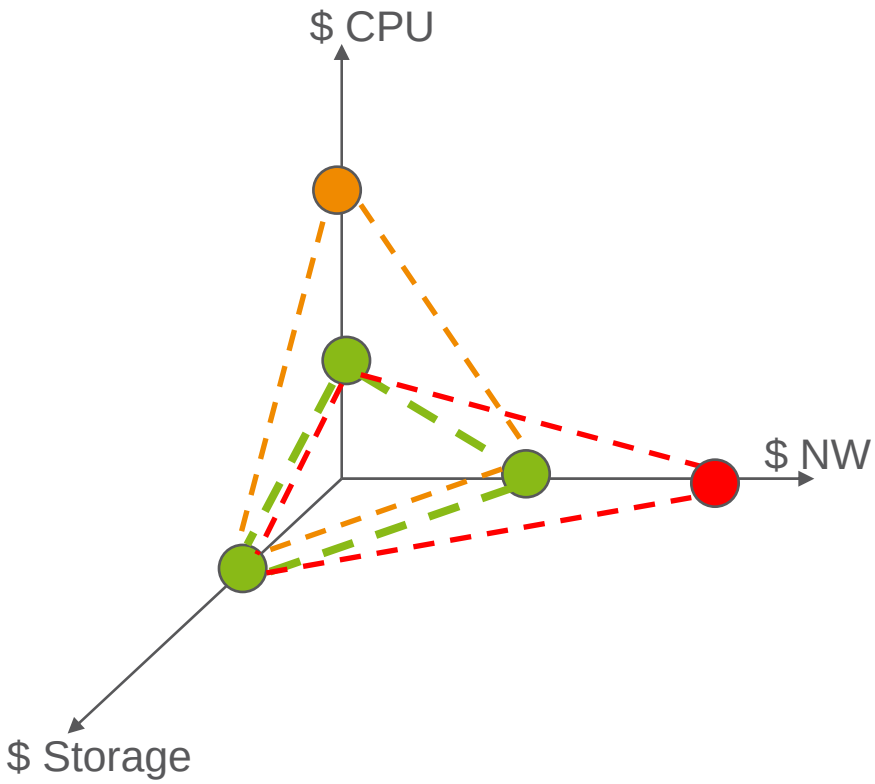
	Product Sales	**Hosting**	**Software as a Service**
Billing	Upfront	Upfront & usage based	**Usage based**
Location	On premises	Dedicated Datacenter	**Shared data center**
Management	Customer	Managed service	**Managed service**
Capacity	Customer responsibility	Managed capacity, customer pre-Planning	**Elastic, no customer pre-planning necessary**
Offering	Customized	Customized	**Standardized, customized through configuration**

CHALLENGES OF TELECOM SAAS

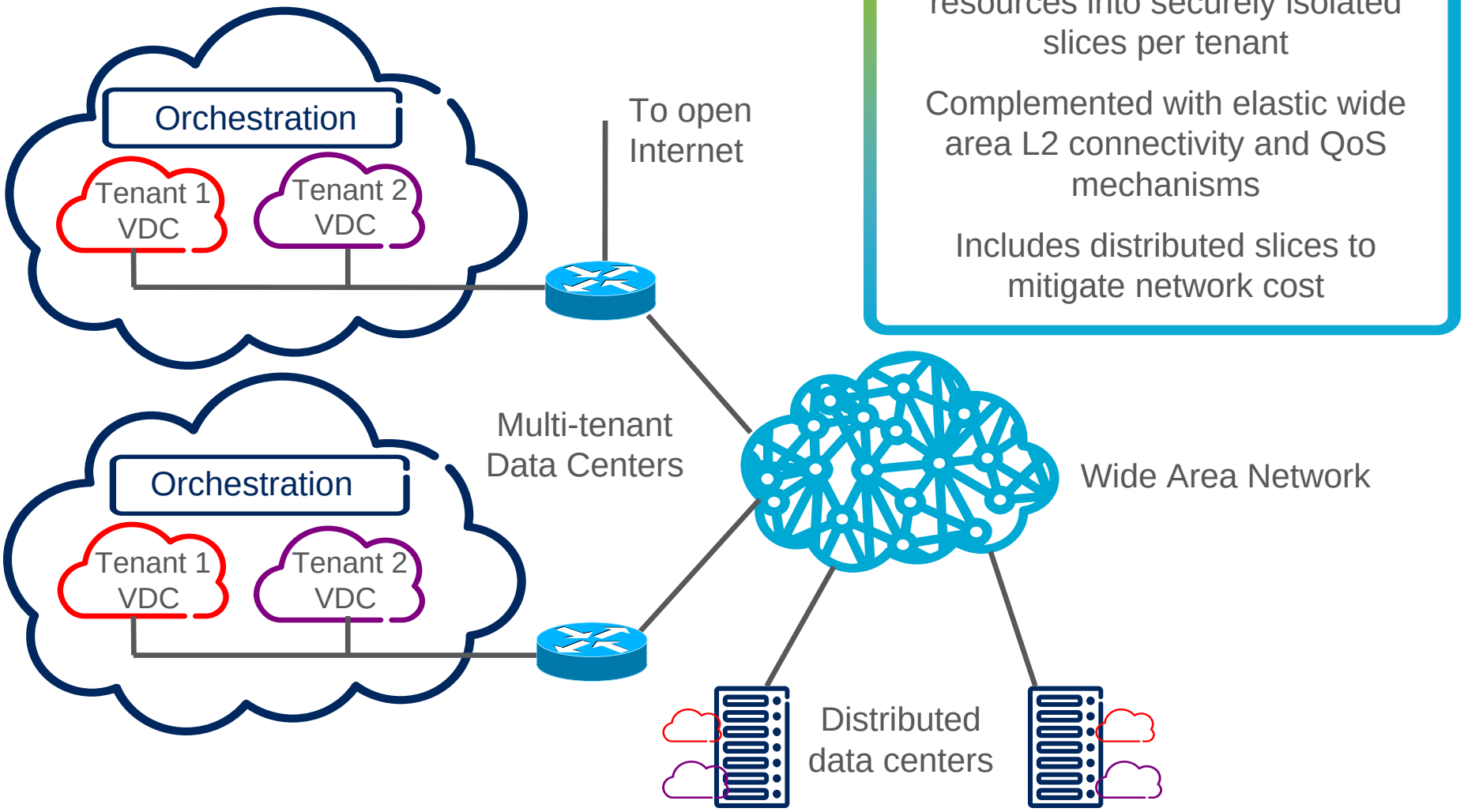


NETWORK PERFORMANCE: THE CONST CONJECTURE

- Similar to Brewer's CAP Theorem
  - You can't have Consistency, Availability and Partition tolerance at the same time
- For clouds:
  - It is impossible to optimize the cost of Computation, Networking and Storage at the same time – at least one of these will be sub-optimal
- Simple and intuitive – yet far reaching consequences
- Foundation for all the efforts into
  - Distributed clouds
  - Distributed storage
  - Network as a Service



THE CONCEPT OF DISTRIBUTED VIRTUAL PRIVATE CLOUD

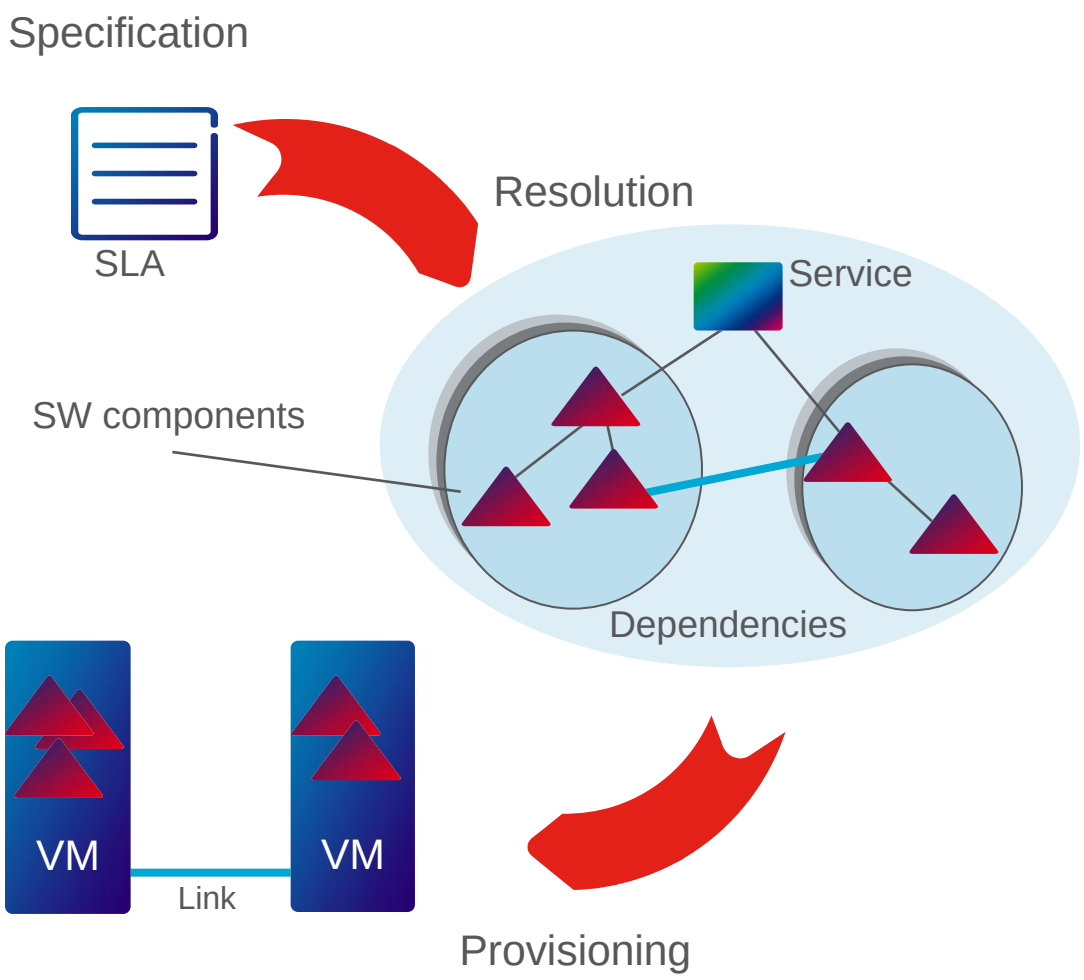


VPC – partitioning of IaaS resources into securely isolated slices per tenant

Complemented with elastic wide area L2 connectivity and QoS mechanisms

Includes distributed slices to mitigate network cost

SLA MANAGEMENT



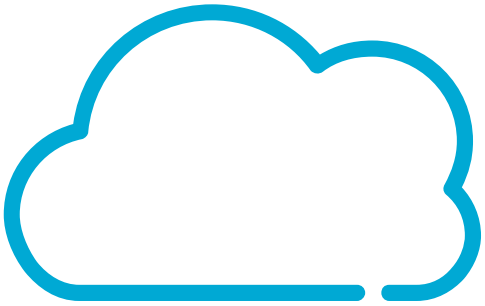
- SLA specification de-coupled from functional implementation of services
- Aggregation classes identify how SLA parameters contribute to the goals on the parent level
- Types of aggregations
  - Exact matching (location, protocols)
  - Additive (delay, memory, processing)
  - Multiplicative (availability)
  - Max-min (throughput)

ELASTIC NETWORKING

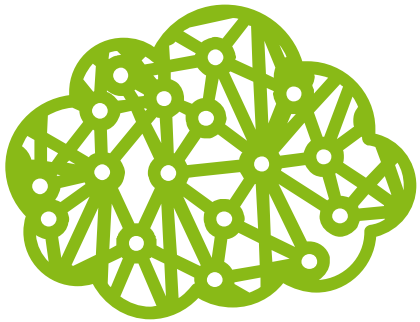
Common OSS/BSS functions

Service + Cloud + Network Orchestration

Cloud Resource Management | Network Resource Management



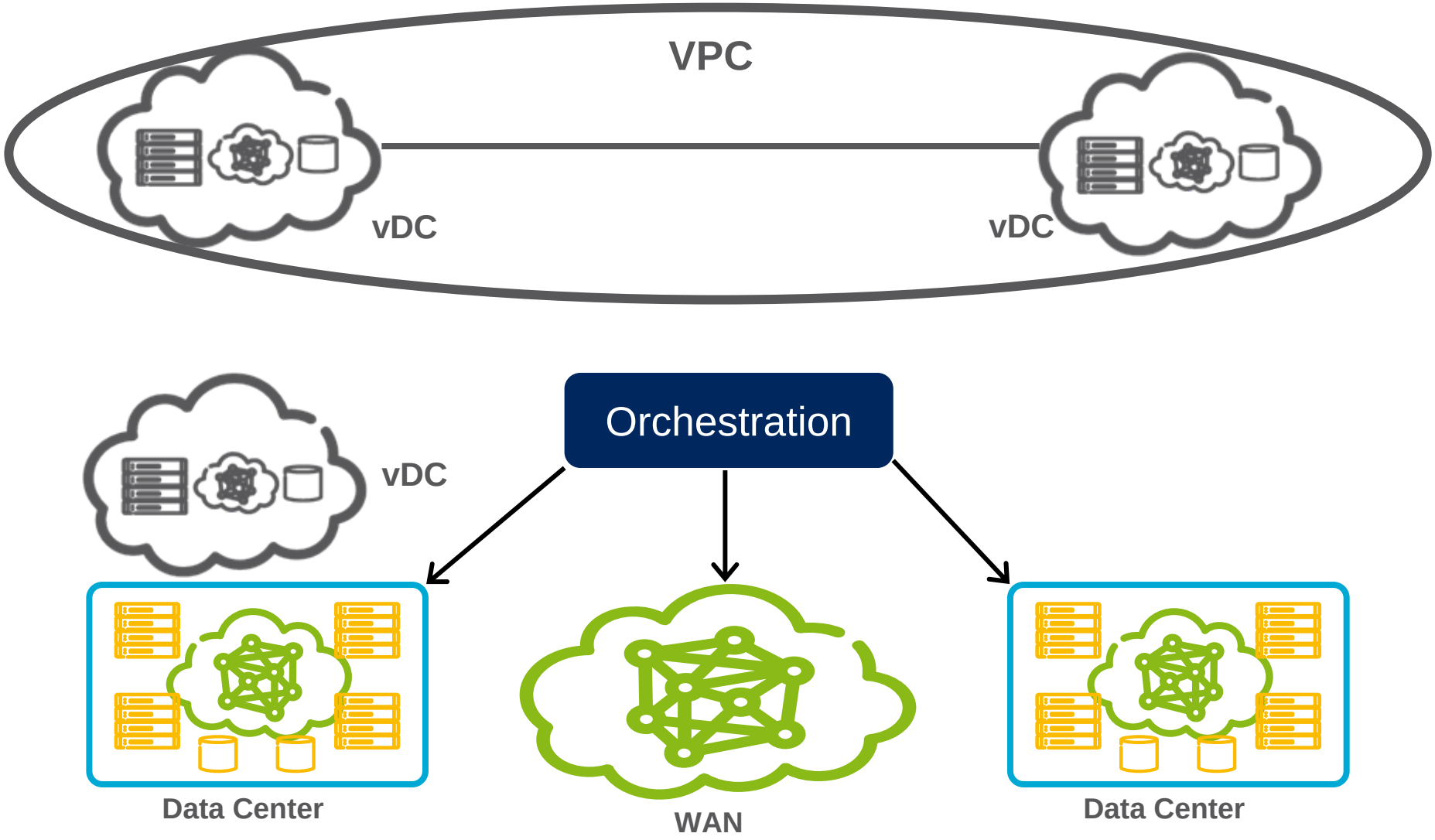
Cloud infrastructure



Network

- Integrated management of network and cloud resources
  - Similar elasticity and dynamicity
- Multiple available technologies (MPLS, optical networks, IP overlays) require an abstraction layer + plug-in architecture
- QoS attributes enhanced, on-demand wide area network provisioning
- Associated with a local virtual network per VDC in each data center

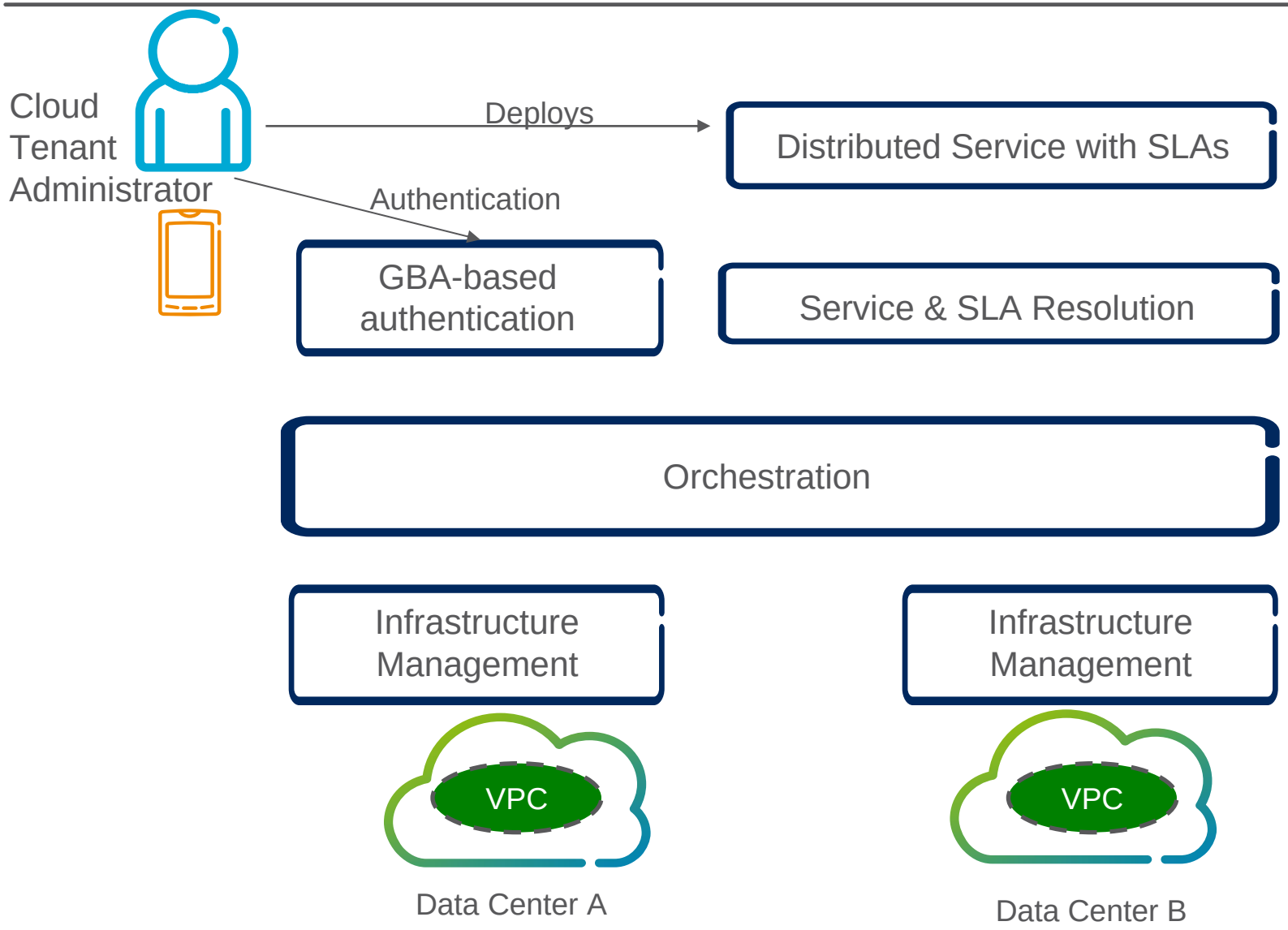
ELASTIC NETWORKING & VPC



ENHANCED TELECOM-BASED CLOUD SECURITY KEY FINDINGS

- USIM based authentication can be re-used in the cloud context
- Applicable to any cloud, based on federated identity solutions
- Proven scalability enables large-scale deployments
- Network location: reliable basis for distributed cloud allocation

FUNCTIONAL ARCHITECTURE



OPENSTACK: BIRD'S EYE VIEW

NOVA

Manage virtualized compute resources in the data center

SWIFT

Build scalable, redundant object storage using standardized servers

GLANCE

Manage a virtualized disk image database

New

KEYSTONE

Authentication and Authorization

QUANTUM

Manage virtualized network resources in the data center

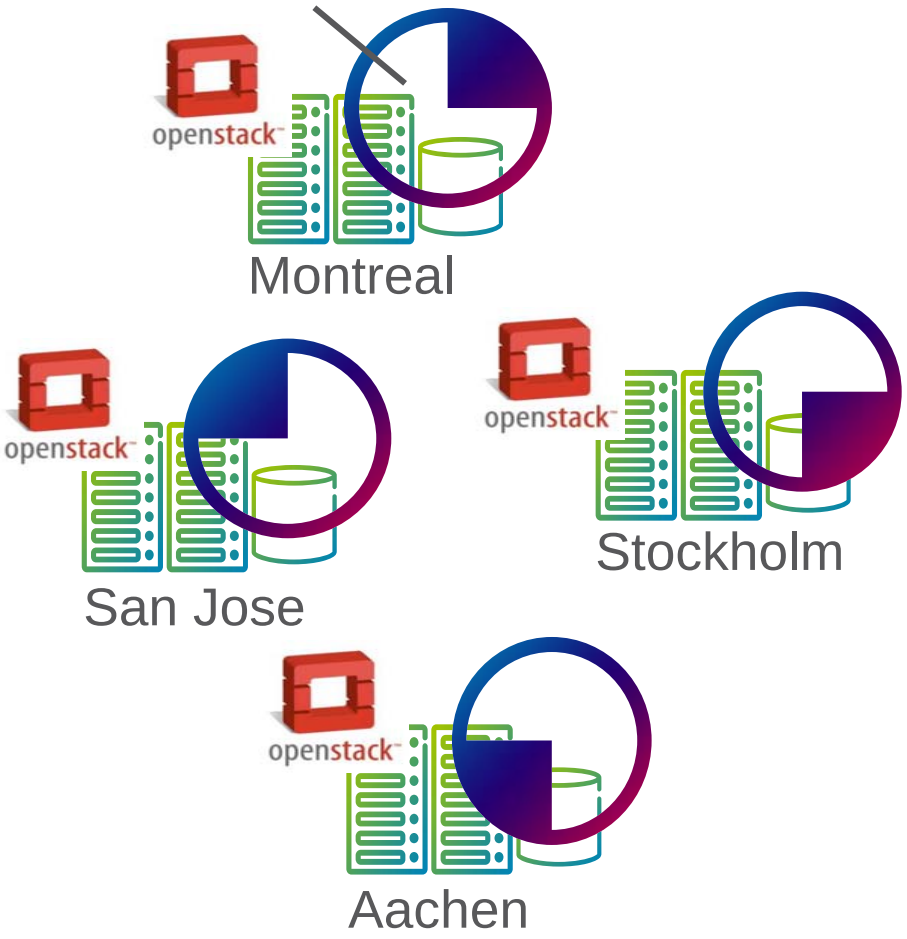
New

Elastic Networking

Manage virtualized wide-area connectivity

EXPERIMENTAL SETUP

Slicing Virtual DC (VDCs)



- First distributed virtual DC manager solution based on OpenStack
- Integrated elastic network management based on Ericsson router products
  - Integrated with OpenStack
- SIM-based and OpenID-based authentication
  - Integrated with OpenStack

SUMMARY

- Cloud models in telecommunications require new technologies
- VPC, SLA management, elastic networking, distribution: key technologies
- Telecom security is suitable for re-use in the cloud context
- Implementation of distributed VPC, elastic networking, SIM-based security on OpenStack

THANK YOU!

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