

5G EXCHANGE (5GEX) - MULTI-DOMAIN ORCHESTRATION FOR SOFTWARE DEFINED INFRASTRUCTURES

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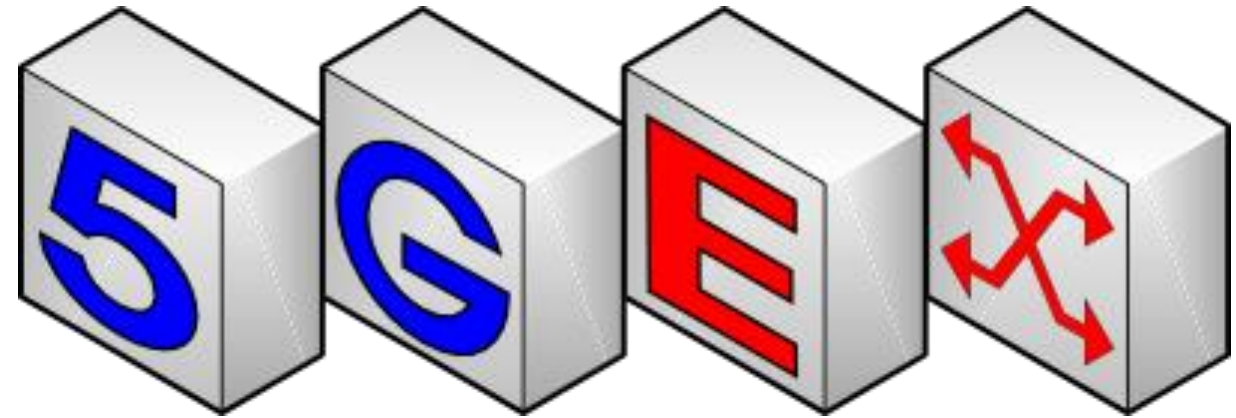
KPIs:

Reducing the average service creation time cycle from 90 hours to 90 minutes.

European availability of a competitive industrial offer for 5G systems and technologies

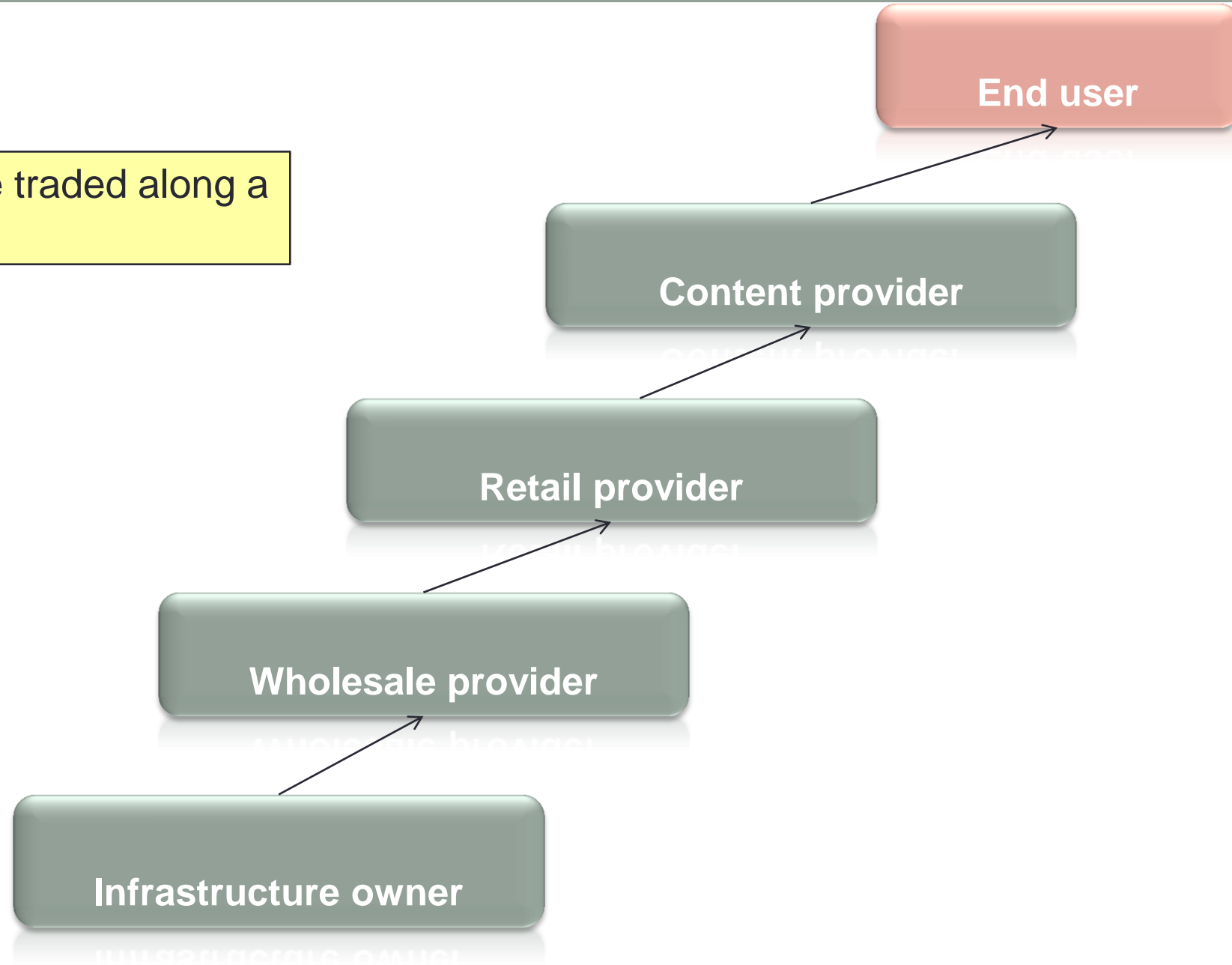
Outline

- Vision and basic concept
- 5GEx for 5G
- The 5GEx's approach and mission
- Expected outcome
 - The sandbox 5G exchange
- Project Fact sheet



Vision

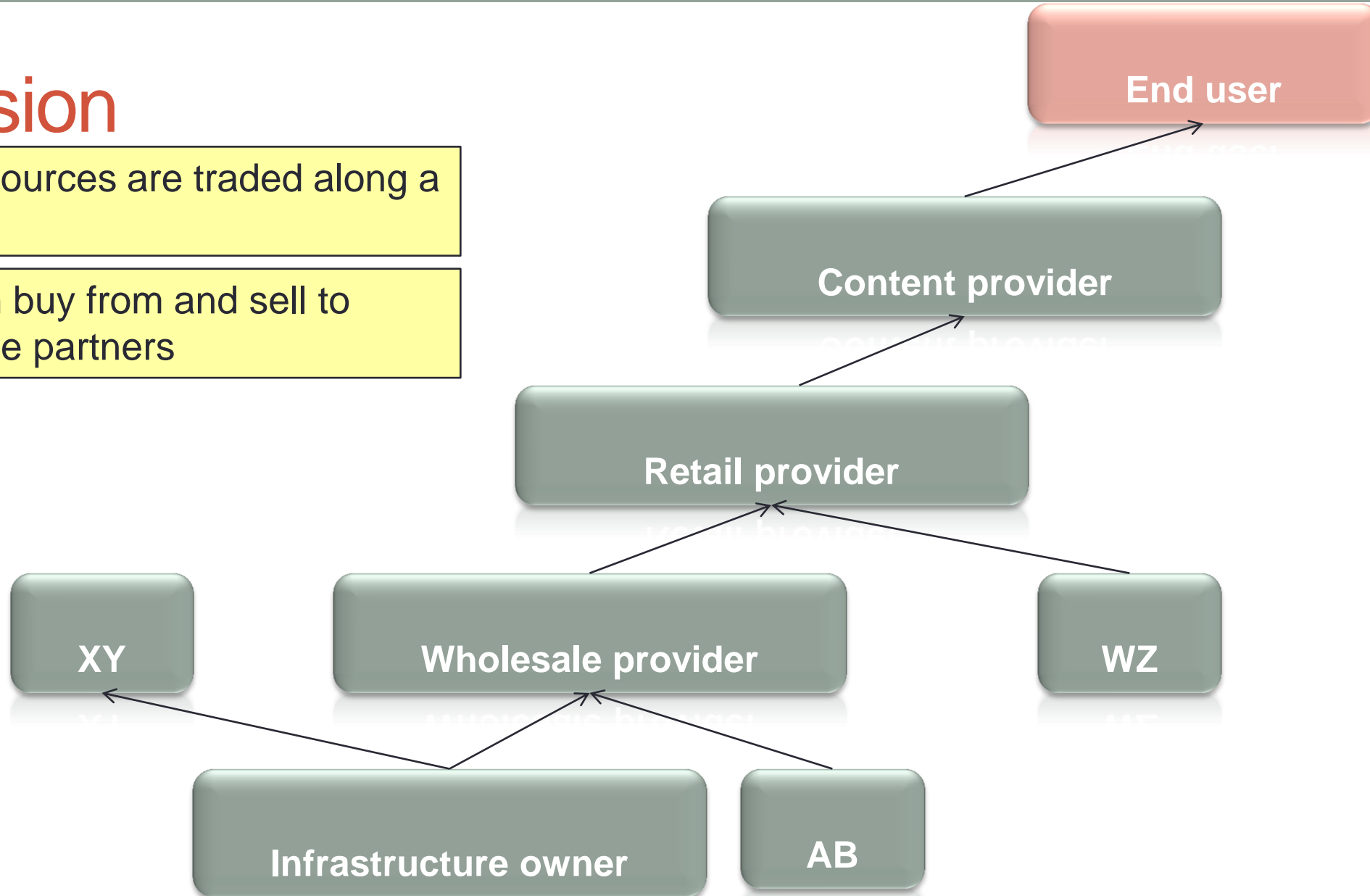
1. Resources are traded along a chain.



Vision

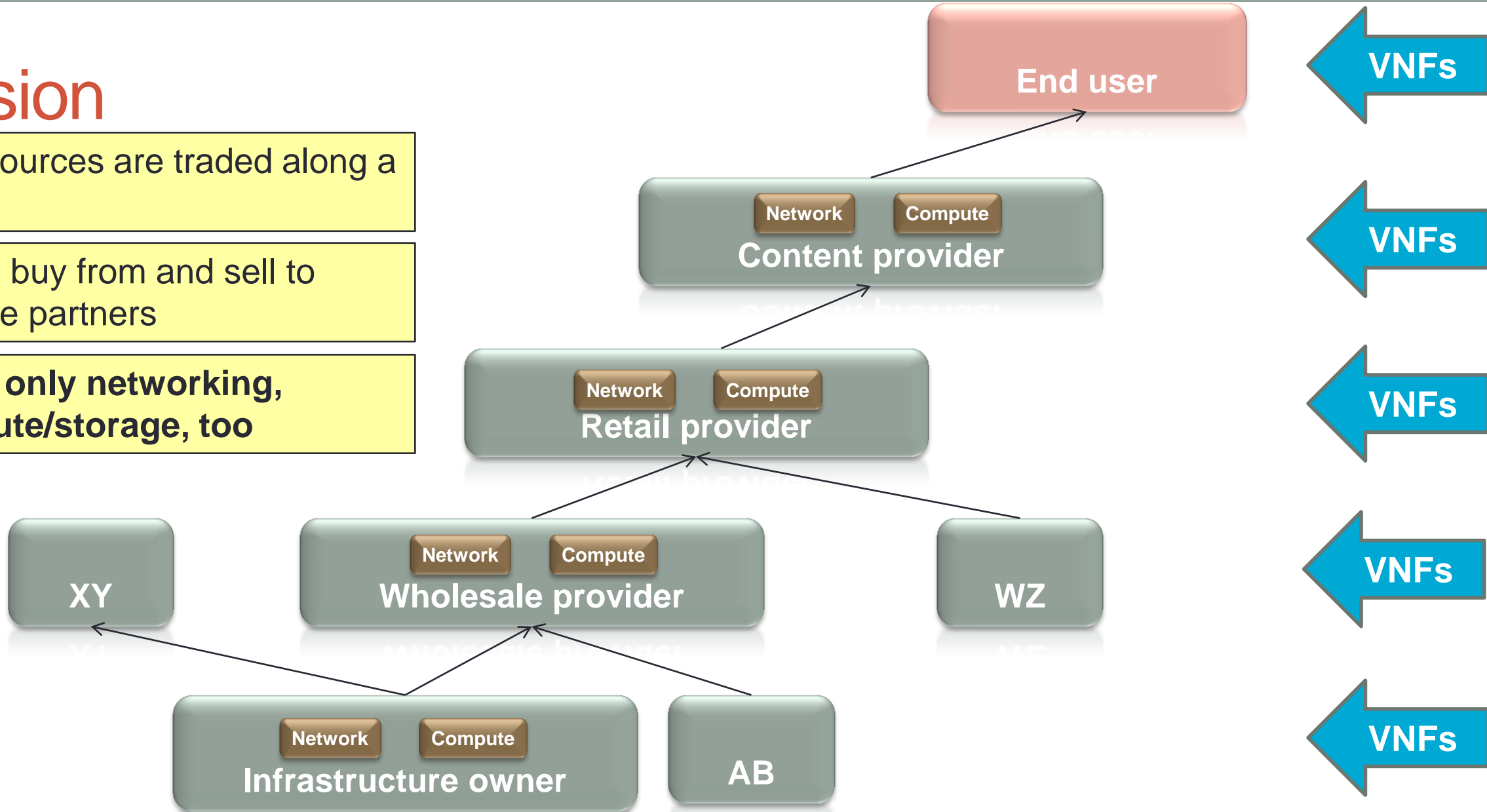
1. Resources are traded along a chain.

2. Can buy from and sell to multiple partners

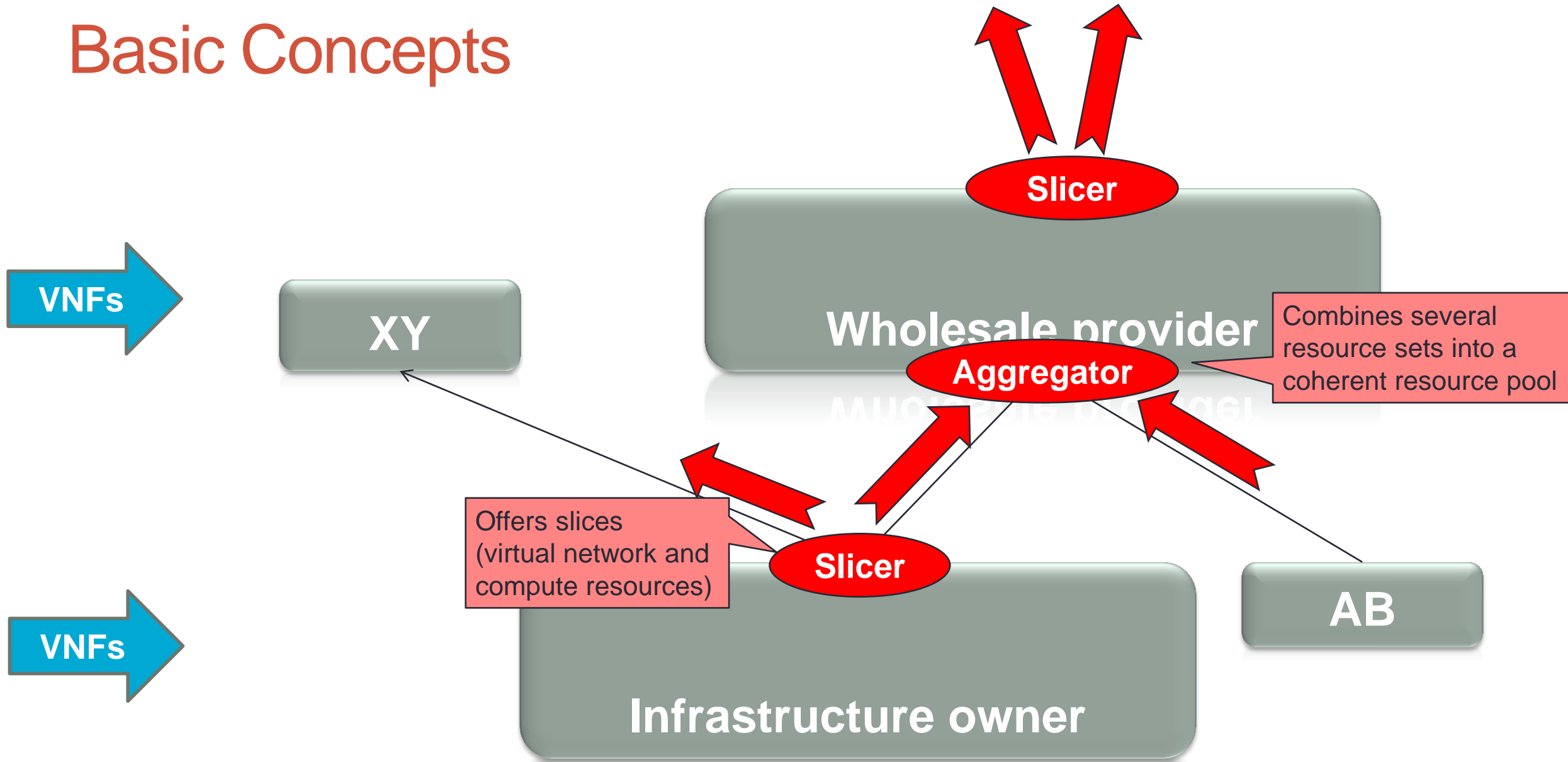


Vision

- 1. Resources are traded along a chain.
- 2. Can buy from and sell to multiple partners
- 3. Not only networking, compute/storage, too



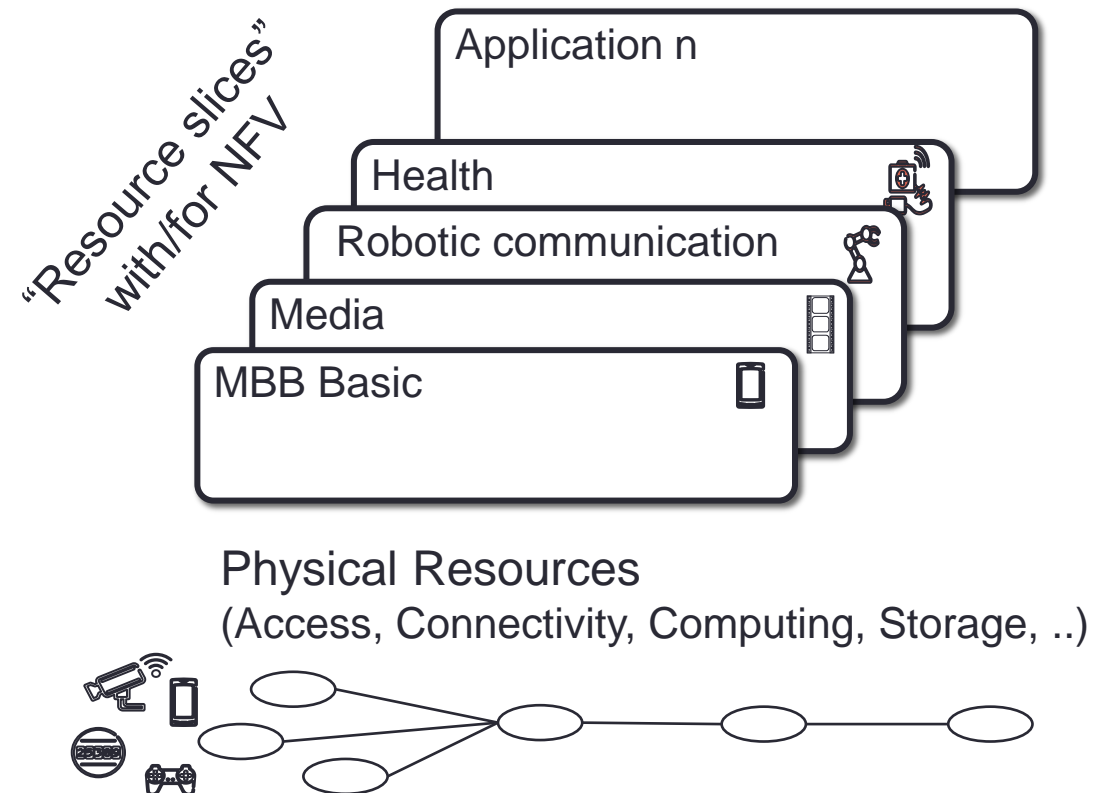
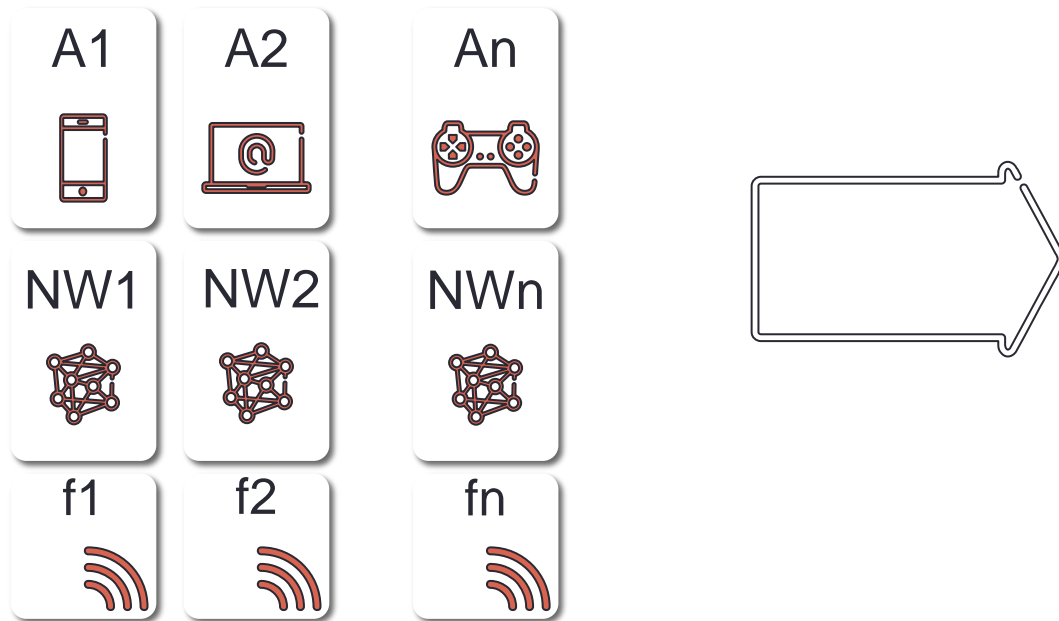
Basic Concepts



5GEx in 5G: One Network – Multiple Industries

From dedicated physical networks and resources for different applications...

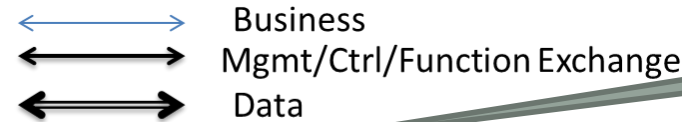
...to a “network factory” where **resources are traded** and new architectures are “manufactured by SW”



The 5GEx concept, approach and mission

Market fragmentation

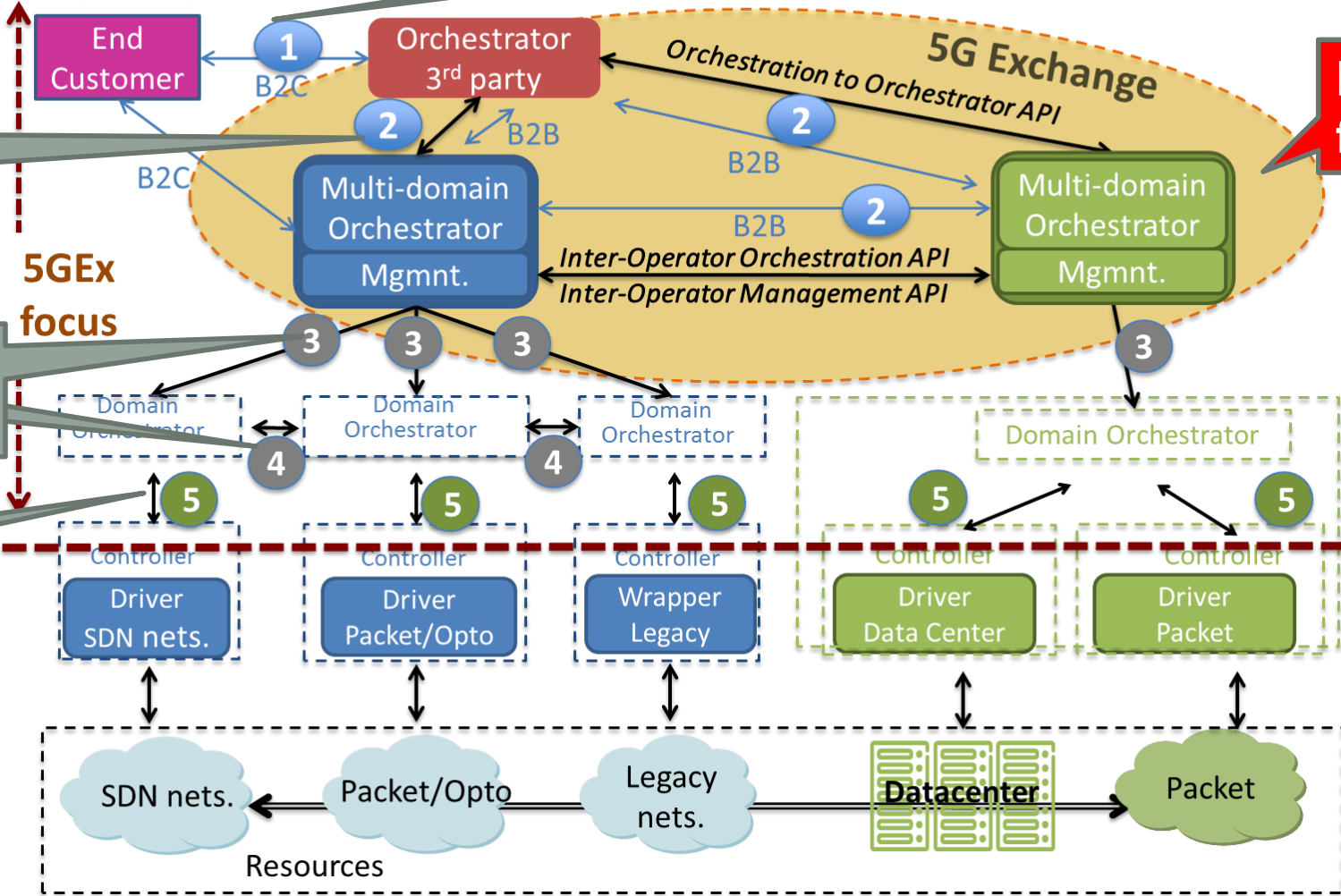
Technology fragmentation



(1) Business to Customer

(2) inter-operator orchestration API

Need new functionality



(3)(4) Domain orchestrator APIs

(5) Controller APIs

Mission: unified European infrastructure services market

Expected outcome

- Design and specify architecture, mechanisms, algorithms and enablers for **automated and fast provisioning** of infrastructure services in a multi-domain/multi-operator 5G environment
- Define and validate the novel 5GEx business layer, including the **business information model**, economic and market mechanisms that promote efficiency of multi-domain services
- **Build** a working end-to-end system and deploy a proof of concept prototype
- **Sandbox Exchange** - validate by experimenting with selected use cases
- Contribute to the relevant **standard** forums and **Open Source** communities

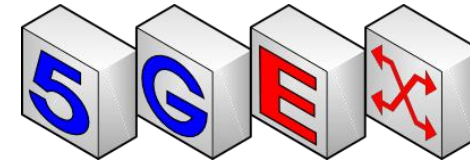
The 5GEx Sandbox Exchange

- Set of testbeds from **operators** integrated
 - to complement existing peering functions with additional **buyer-fulfiller** functions
 - Focus on
 - determining the feasibility of end-to-end multi-domain orchestration,
 - assessing carrier-grade quality, and
 - verifying technological choices.
- **Ambition:**
to influence how to interconnect 5G-PPP testbeds



The 5GEx Project

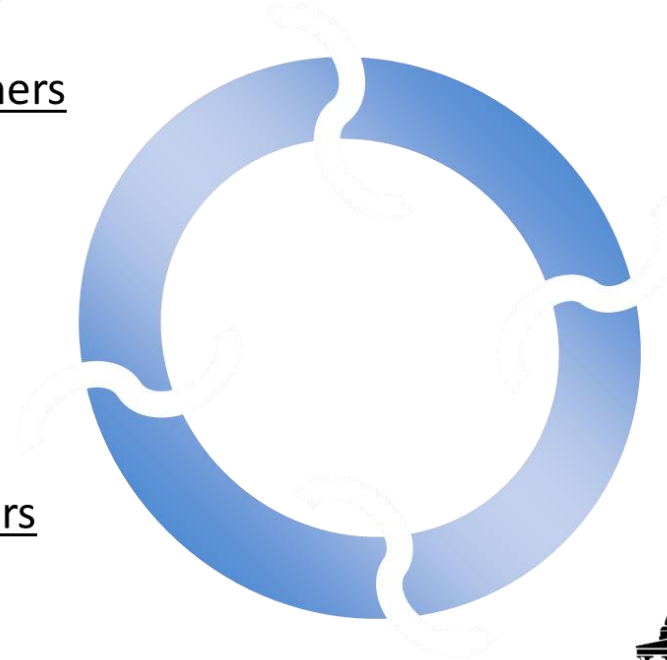
- 5GEx: 5G Exchange
 - EC Contribution: 7.921.095 €
 - Duration: **Oct., 2015** – Mar., 2018
 - Effort: 1039 PMs
- | | |
|--------------------|---------------|
| • Ericsson HU (PM) | • HWDU |
| • UC3M (TM) | • KTH |
| • ATOS | • ORANGE |
| • AUER | • REDZINC |
| • BISDN | • Ericsson IT |
| • BME | • TI |
| • DT | • TID |
| • EICT | • TNO |
| • HP | • UCL |



Operator partners



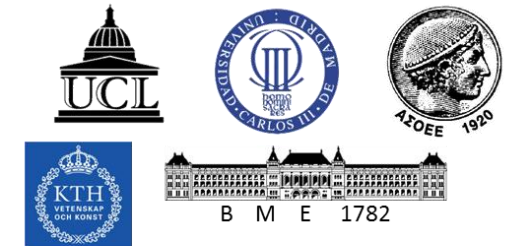
Vendor partners



SME partners

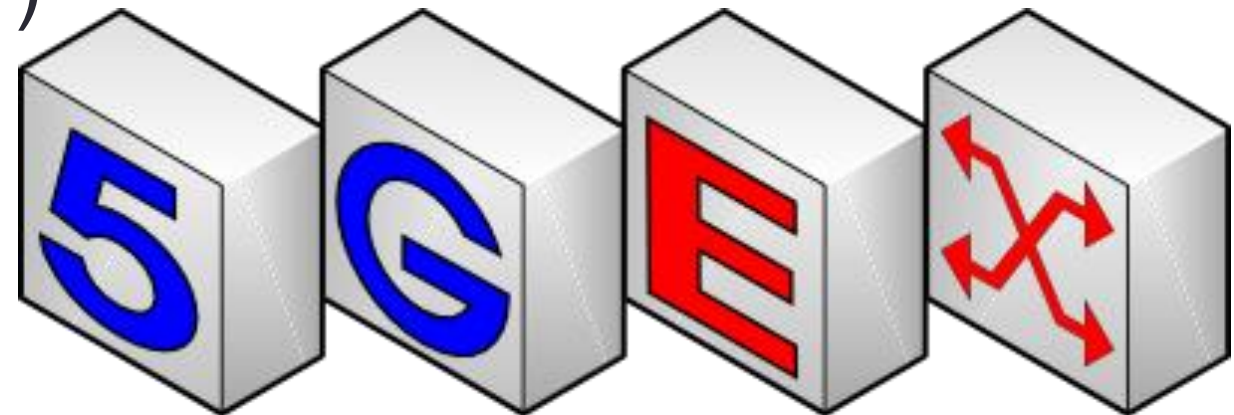


Academic partners



Summary

- In multi-level, multi-domain, multi-technology environments
- we will enable resource slicing, trading and control
- for
 - value added functions (NFV)
 - e2e applications and
 - verticals.



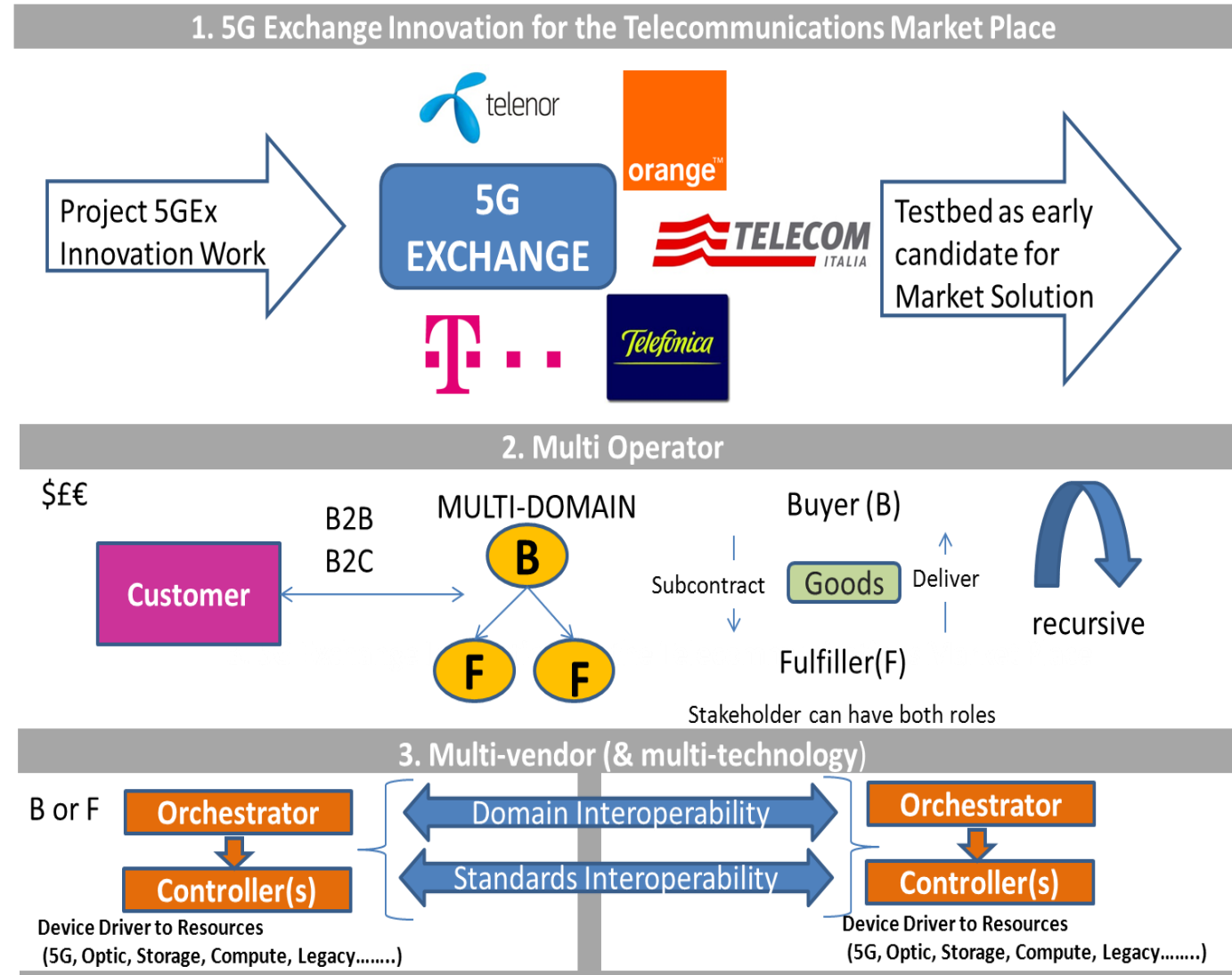
BACKUP SLIDES

Next steps

- Project starting date: 01/October/2015
- Initial focus will be on
 - Refinement of use cases
 - Initial setup and assessment of local testbeds
 - Initial interconnection of testbeds: building the sandbox
 - Release project software on a 6-month cycle basis

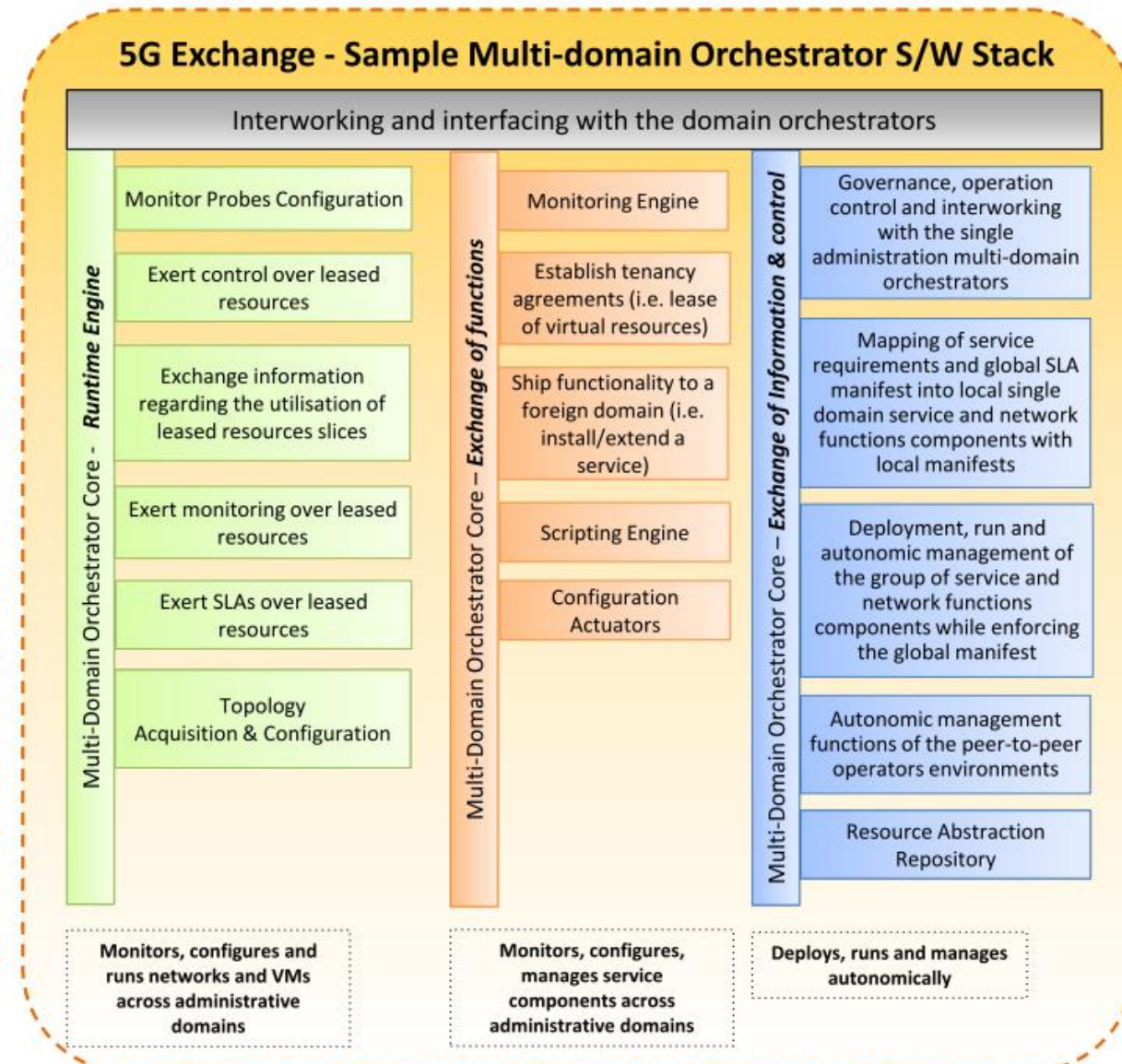
The 5GEx Techno - Economic Model

- Multi-operator wholesale relationships
- Multi-vendor / Multi-technology interoperability
- Physical Resources



The 5GEx Architecture

- Multi-domain orchestrator. Three main new components:
 - Runtime Engine:** manages networks and Virtual Machines across domains
 - Exchange of Functions:** manages service components across domains
 - Exchange of Information and Control:** enforces interworking, SLAs, mapping and autonomic management of service and network functions



Some use cases

Category	Use Case
Connectivity	Network creation across multiple optical domains
	Multi-technology Connectivity Service Provisioning
	Packet services Multi-domain
Network as a Service (NaaS)	Multi-domain mobile backhauling
	Multi-domain network sharing
	Network slicing
Network + Storage + Compute as a Service	Deployment Content Delivery service across several domains
	Multi-operator IaaS