



Evolución de la infraestructura para un mundo digital

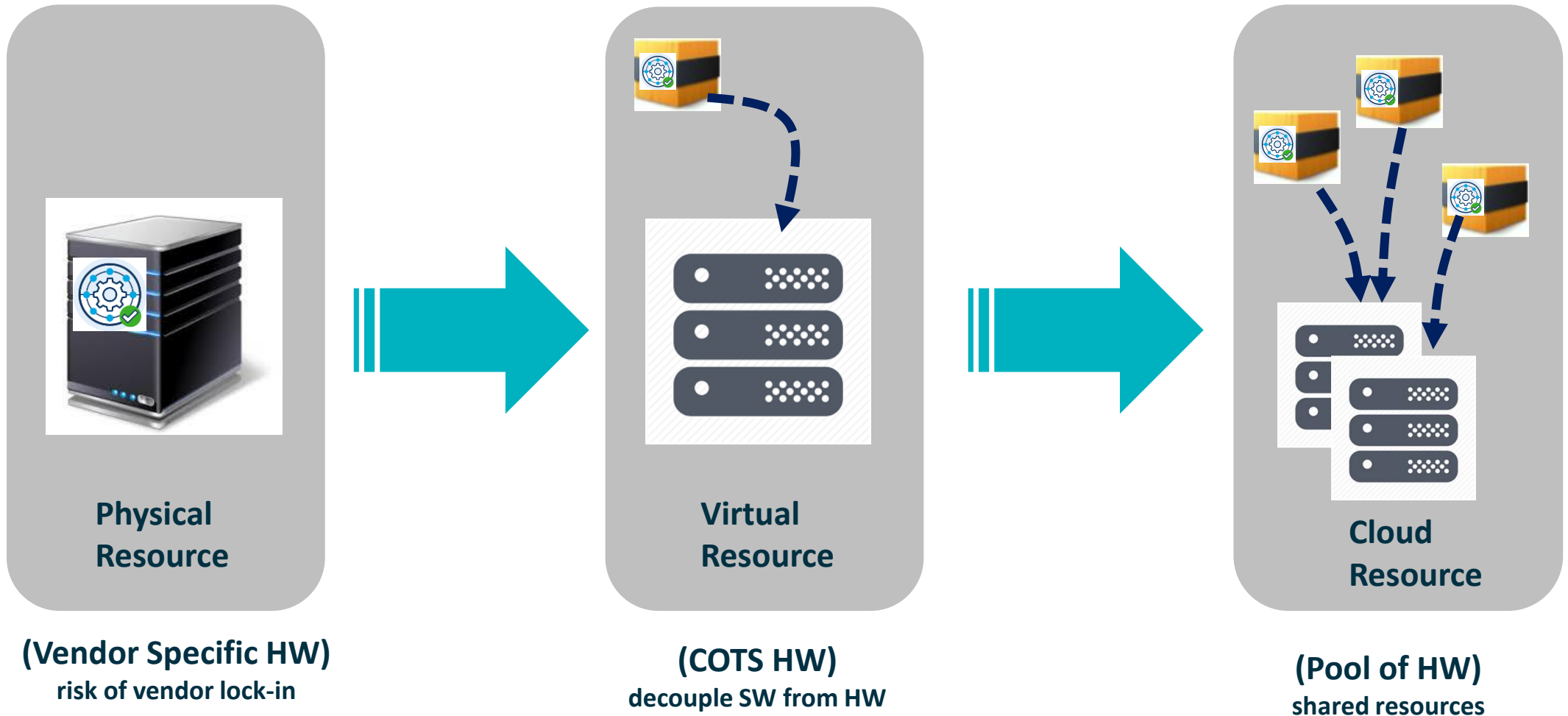
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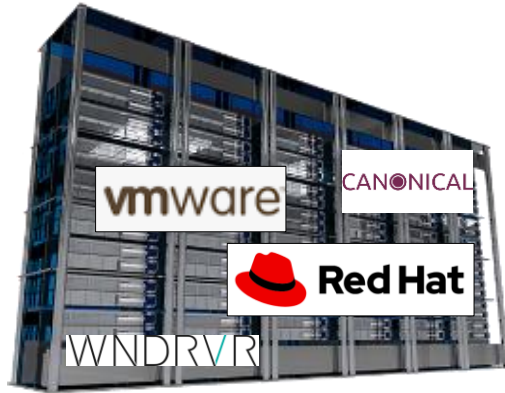
Evolution of infrastructure (Virtualization & Cloudification)

The Operator's infrastructure entails the computing resources (i.e.: physical servers and storage) hosting the different applications (services, network and management systems).



Different views of the concept of cloud

CLOUD $\neq$ PUBLIC CLOUD



On-Premises Private Cloud

- Traditional virtualization providers
- Newcomers (born cloud-native)



Hyperscalers on premises Private Cloud

- Google GDCE
- AWS outposts
- Azure for Operators



Public Cloud

- Regional deployments
- Hyperscalers

- High throughput requirements
- Low latency requirements
- Data privacy requirements: keep sensible data at hand, stored locally

- Agility: quick deployment of infrastructure to enable capabilities faster or test environments
- Only pay for compute processing actually used and not for equipment installed
- Absorption of traffic peaks / divert traffic excess

The infrastructure must accommodate the new services enabled by 5/6G and EDGE

Main characteristics

- ☐ **On demand Timing** *(when I want it)*
- ☐ **On demand Location** *(where I want it)*
- ☐ **On demand Requirements** *(how I want it)*

The Multicloud infrastructure

The Multicloud infrastructure is the set of virtualization environments where computing resources (i.e.: physical servers, networks and storage) are shared by multiple workloads running the functionality required by the Operator

MULTI-SITE

Distributed topology

HYBRID

public & private

MULTI-VENDOR

vendor agnostic

Characteristics of the Multicloud infrastructure

Main requirements satisfied

- ❑ On demand Timing (*dynamic deployment*) MULTI-SITE
- ❑ On demand Location (*distributed topology*) MULTI-SITE HYBRID
- ❑ On demand Requirements (*support different workloads*) MULTI-VENDOR
- ❑ Efficiency (*best site for each workload*) MULTI-SITE HYBRID MULTI-VENDOR

Managing a multicloud environment

WORKLOAD PLACEMENT

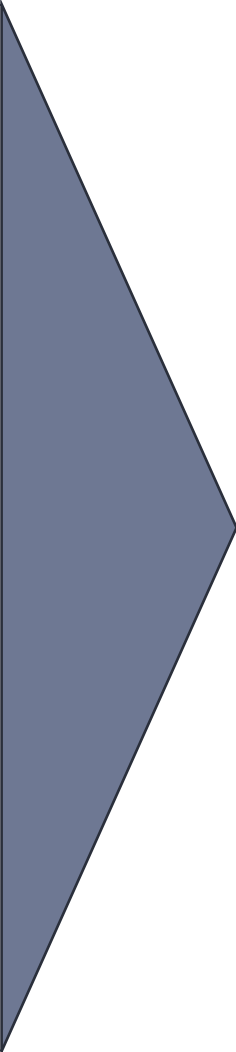
- The decision on what cloud site is the right one will depend on each application

WORKLOAD OPERATION

- Infra must be available at all time, and resources optimised, selfoperated and up to date

WORKLOAD PORTABILITY

- The decision on the right cloud may change through time and operation



**The
cloud native
Infrastructure**

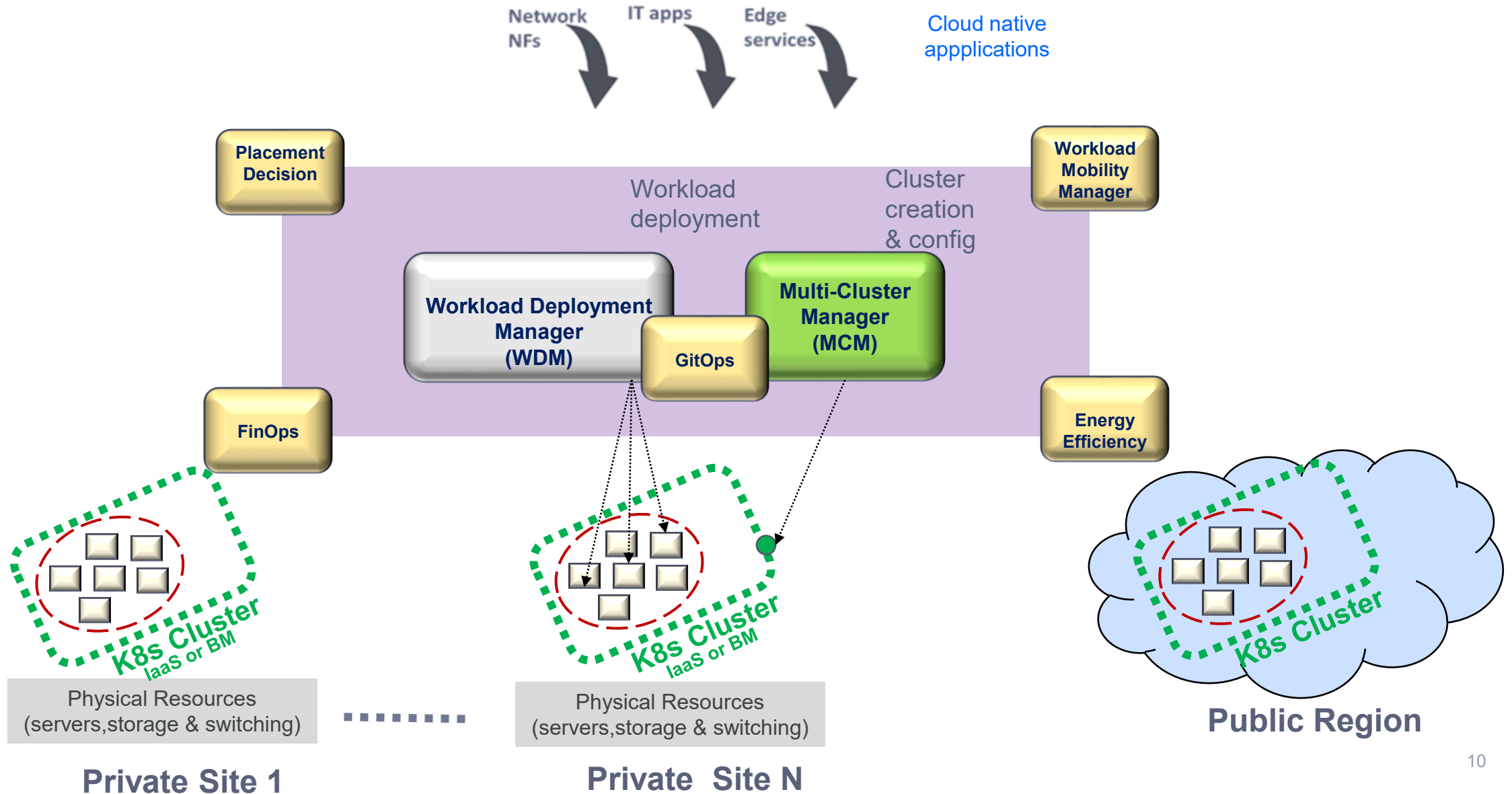
(use of opensource
technology such as
kubernetes)

Characteristics of the cloud native Infrastructure

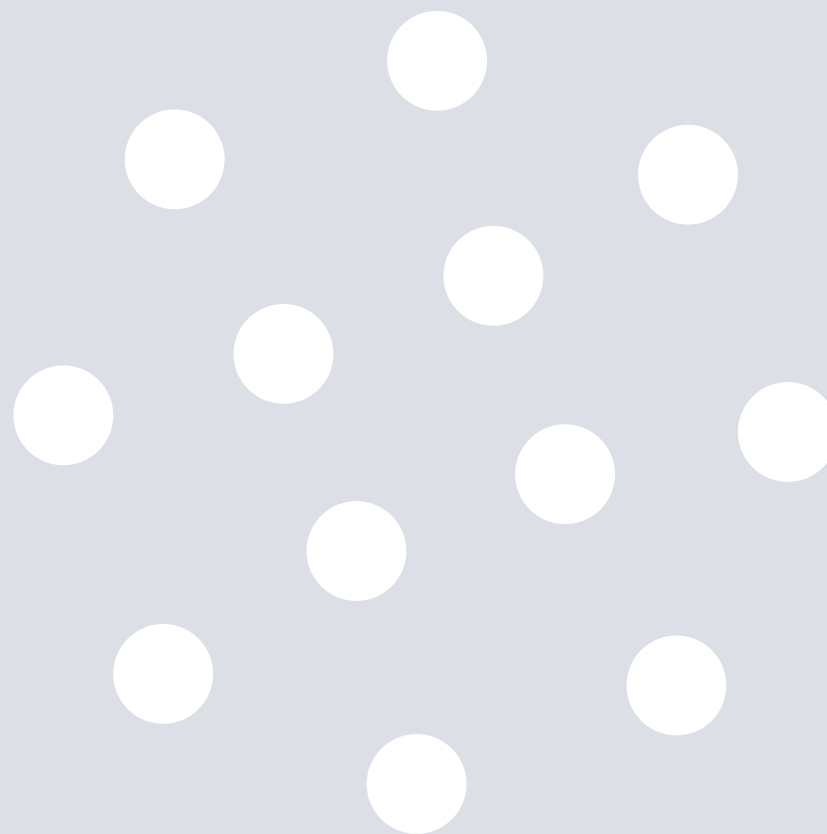
- ✓ on demand activation (and removal)
- ✓ scalability (shared pool of resources)
- ✓ elasticity (up & down)
- ✓ intent based (declarative, reconciliation)
- ✓ portability of workloads between sites
- ✓ use standard & opensource (e.g.: k8s)

- ❑ The infrastructure that hosts the software for network functions and applications to serve customers is evolving using softwarization, cloudification and containerization technologies.
- ❑ In a **multisite** environment, the different infrastructure sites need to incorporate the features required to host the different applications.
- ❑ To build an infrastructure that enables new services in an efficient way
 - promote workloads that **are cloud-native** and support portability between private and public clouds
 - not to have a predefined % of public or private allocation but dynamic as far as possible so that **workloads are deployed anywhere at anytime** to optimize the infrastructure resources
 - promote development of tools for **multicloud management** (orchestration, automation to deploy, intent-based, self-provision...)
 - **Use IA** to assist in the management of cloud-native infrastructures

Telco cloud native architecture for a multicloud environment



Take aways



Take aways

- ☐ **Services are changing and infrastructure must evolve**
- ☐ **Be Cloud Native from design (allow mobility/portability)**
- ☐ **Design intent-based**
- ☐ **Use standards (& open source)**

Thank you

