



ICP Iskratel Cloud Platform

Geografsko razpršeno privatno oblačno okolje namenjeno kritičnim aplikacijam

MakeIT Conf

Orehar, Jun 2022

ISKRATEL
S&T Group

Iskratel Digital Solutions portfolio



Management and Orchestration

Operational
Communications

Business
Comms

Lawful
Interception

System
112

Safe &
Smart City

Digitalisation
Industry Data mgmt

vIMS

[communications]

IIoT platform

[data]

SHAPÉ

Private networks [pLTE/5G]

[connectivity]



Iskratel Cloud Platform

[central & edge & fog]



Iskratel end-to-end solutions

Evolution from **Virtualization** to Intelligent **Cloud Native Platform**

2019 →

ICP – Iskratel Cloud Platform

- Cloud Native platform based on ETSI NFV Openstack Wallby release,
- containers support with K8s
- Cloud Operations Server for central Control and Management of the platform



2014 → 2019

CSP – Cloud Service Platform

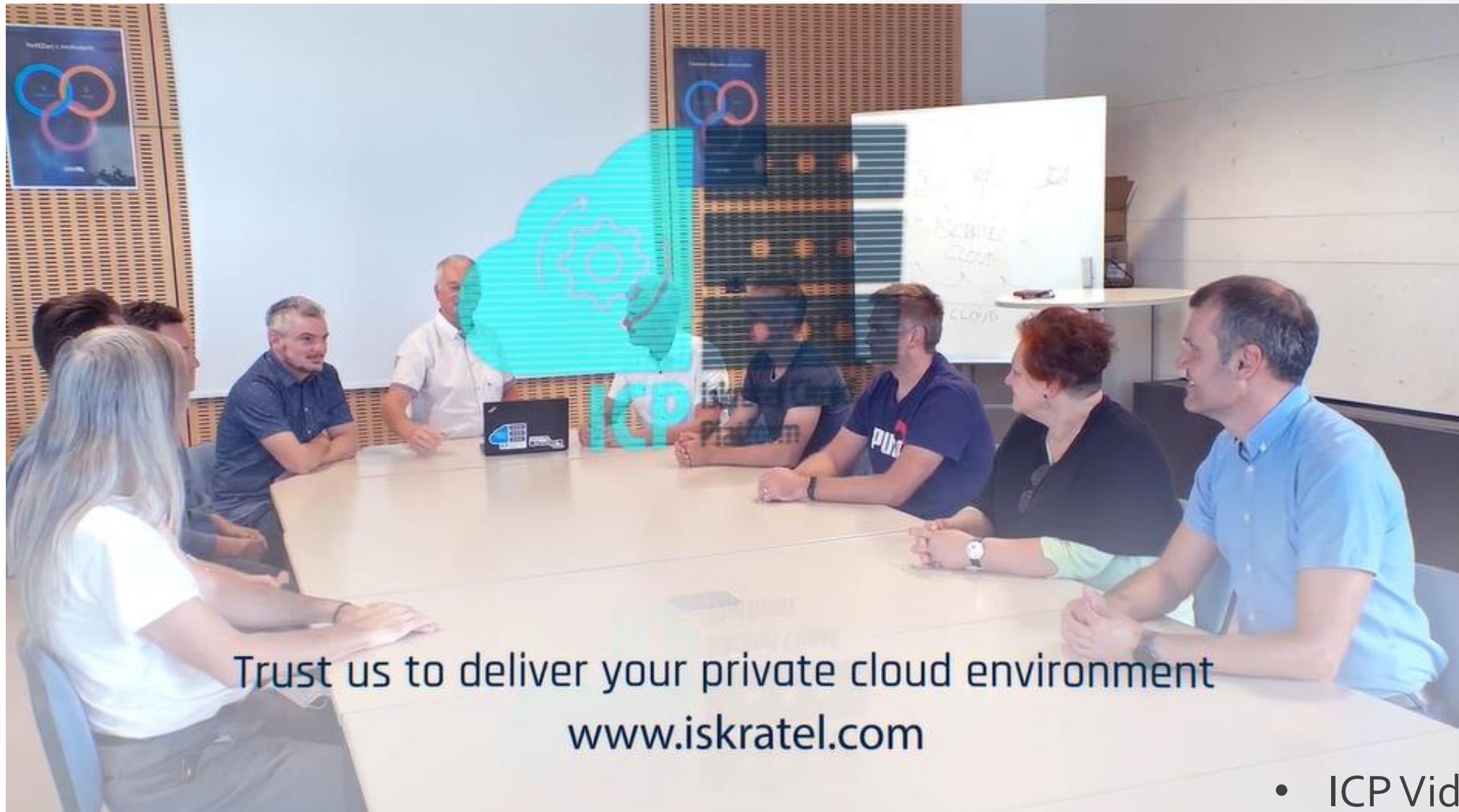
- ETSI NFV OpenStack/KVM platform based on Liberty
- Ocata release on VMs with
- MANO Orchestrator based on OpenBaton

2010 →

Virtualization platform

- KVM virtualization platform based on opensource with Iskratel VGP/VHP automation packages
- Standalone, HA, GEO setup
- used for MNS, IT applications, vCS, IMS Edge...

ICP Video



Trust us to deliver your private cloud environment
www.iskratel.com

- ICP Video

<https://vimeo.com/629100147>

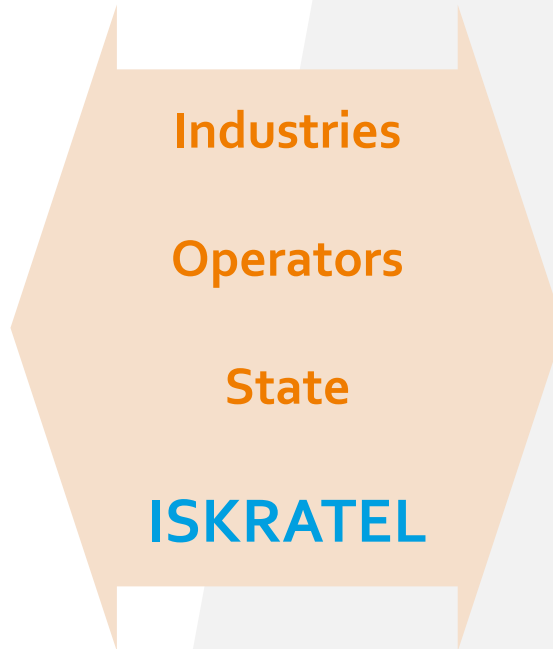
Challenges of today's society and industries



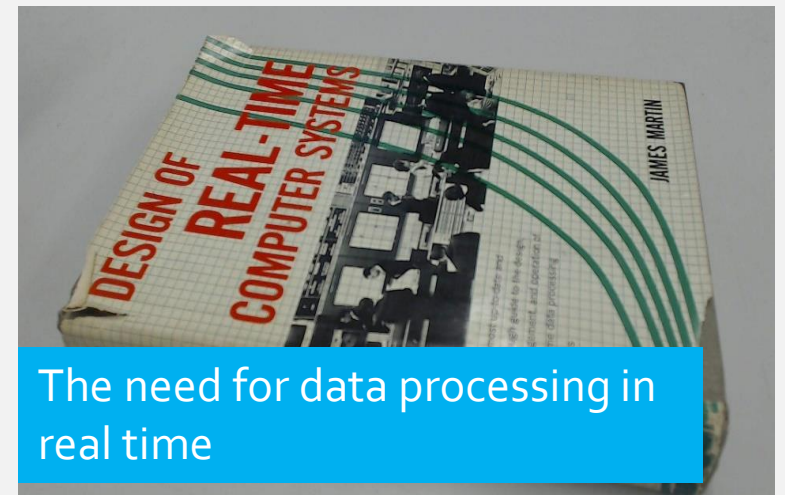
Digital process transformation for higher productivity



Industries with distributed infrastructure



Increasing amounts of data



The need for data processing in real time

Solution #1



~~Public cloud~~



Solution #2

~~National/Europe Cloud~~



Flexibility and *availability*

The right solution



Geographically dispersed Private Cloud



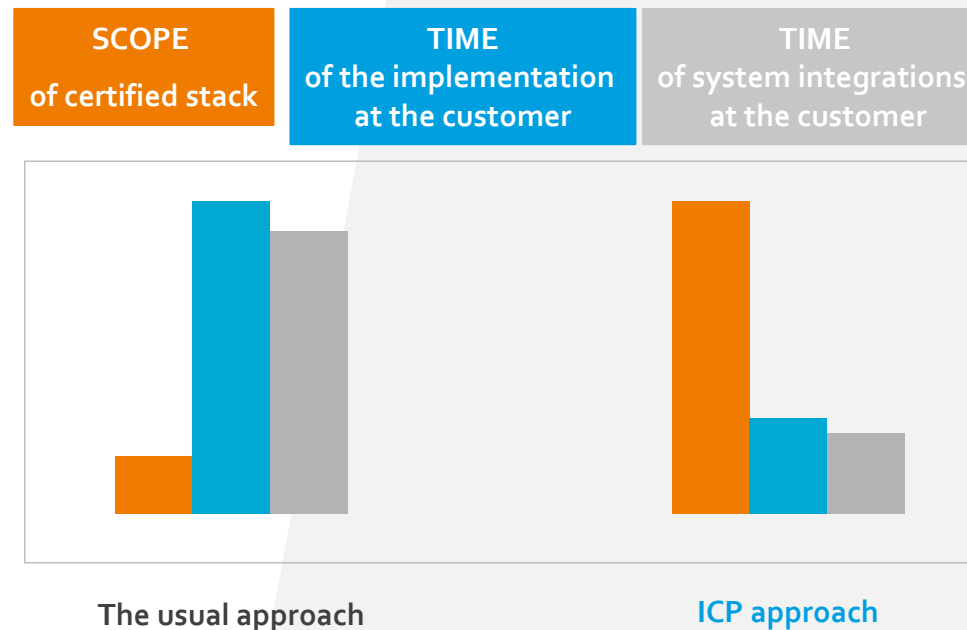
approach **EVA**

EVA approach with ICP solution

Edge Cloud support - small remote locations

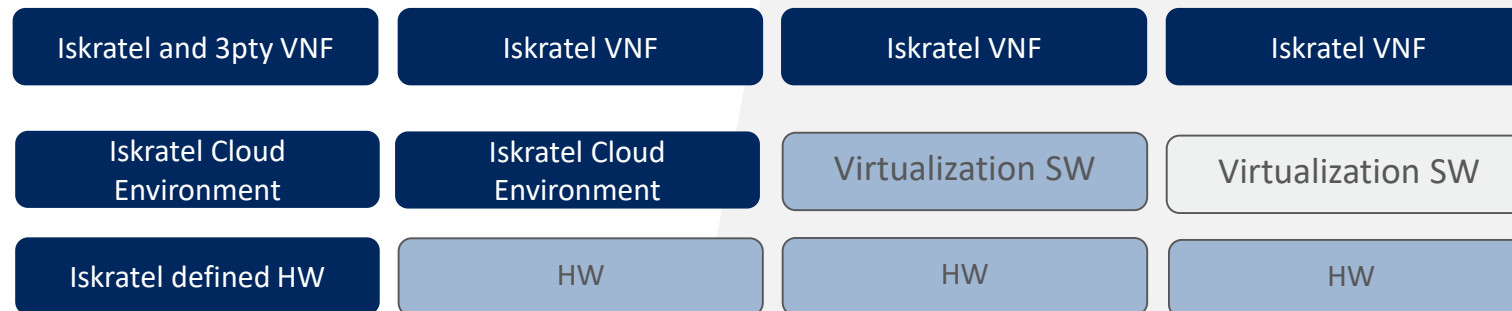
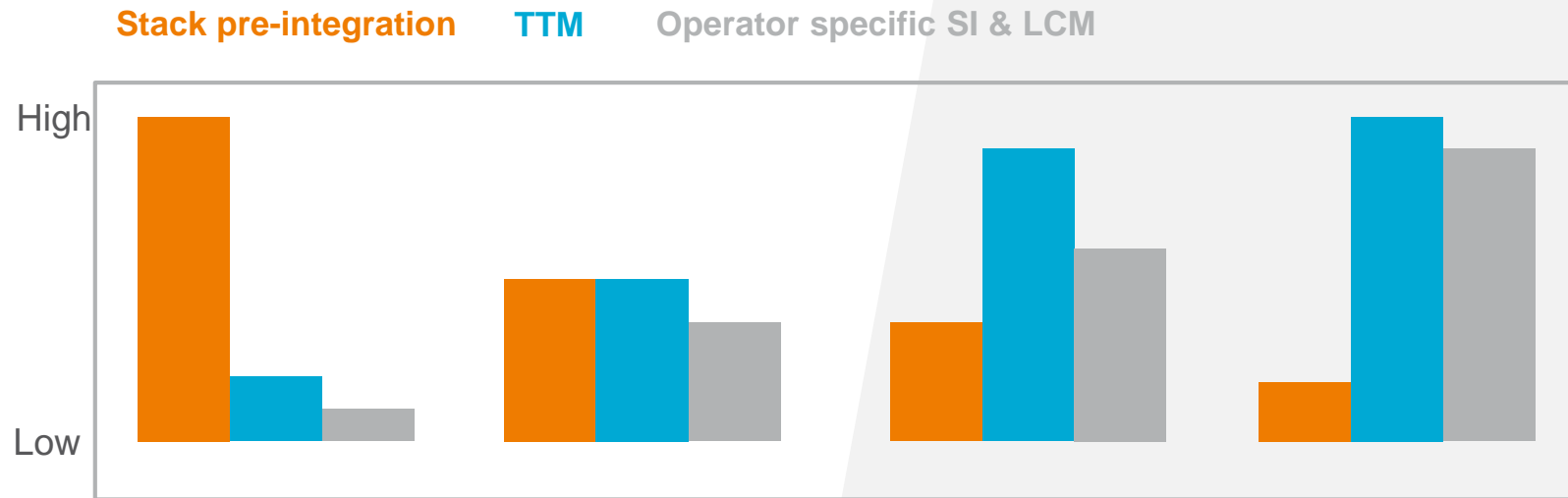
Verified Stack - simple installation and upgrades

Automation with central operation and management



ICP Verified stack

It is all about the automation, simplification and security



ICP
Certified stack

Partners ecosystem



Designed and developed in collaboration between **Iskratel**, **open-source communities** and **various** opensource companies...



... and **research institutions**:

- Faculty of Computer and Information Science Ljubljana,
- Fraunhofer-Institut für Offene Kommunikationssysteme FOKUS Berlin,
- Faculty of Electrical Engineering and Computer Science, University of Maribor



Iskratel is with ICP active member of **EU Cloud Infrastructure initiative: IPCEI - CIS**

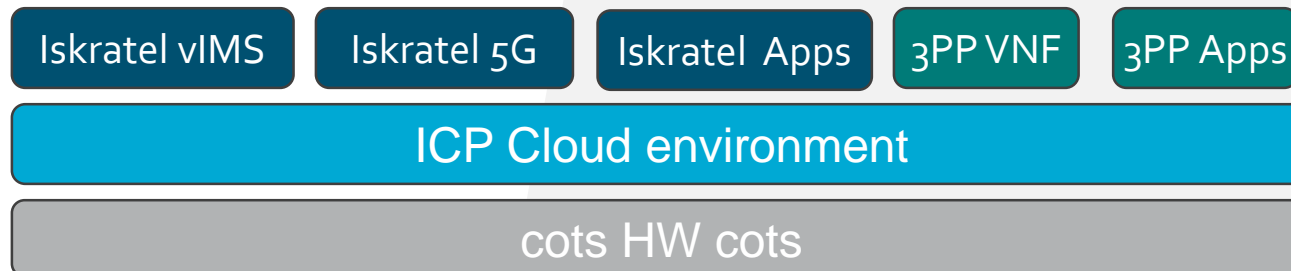
(Important Project of Common European Interest - Next Generation Cloud Infrastructure and Services)



General purpose **Private** cloud platform

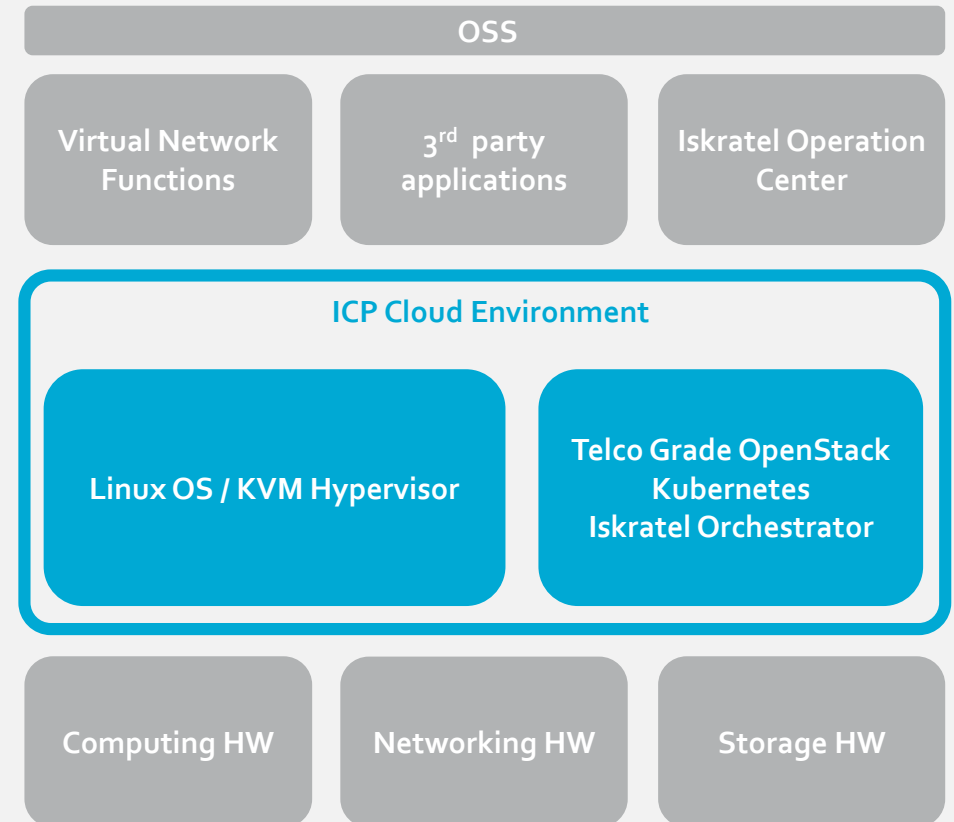
ICP solution

- Applications on common ETSI NFV platform
- Flexible delivery models
- Complete set of Iskratel vIMS and 5G solutions
- Open to 3rd party applications and solutions
- **ICP Localization**



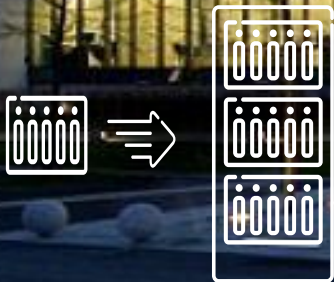
ICP key Features

- **ETSI NFV standard** compliant
- Software Defined Infrastructure based on open-source **OpenStack**
- Infrastructure **Automation** and **Orchestration**
- Infrastructure **Lifecycle** Management
- **MANO Orchestrator** for Life Cycle Management of hosted Applications
- **Container** support with **Kubernetes**
- **Accelerated** Network
- **Resource** Management
- **High Availability** features
- End-to-end **security**
- ICP in **Geographically** dispersed Cloud Environment



ICP solution - Automation & Simplification

Scale fast



Optimized footprint



Easy to integrate



Target: 1 day from installation to apps. basic call / access

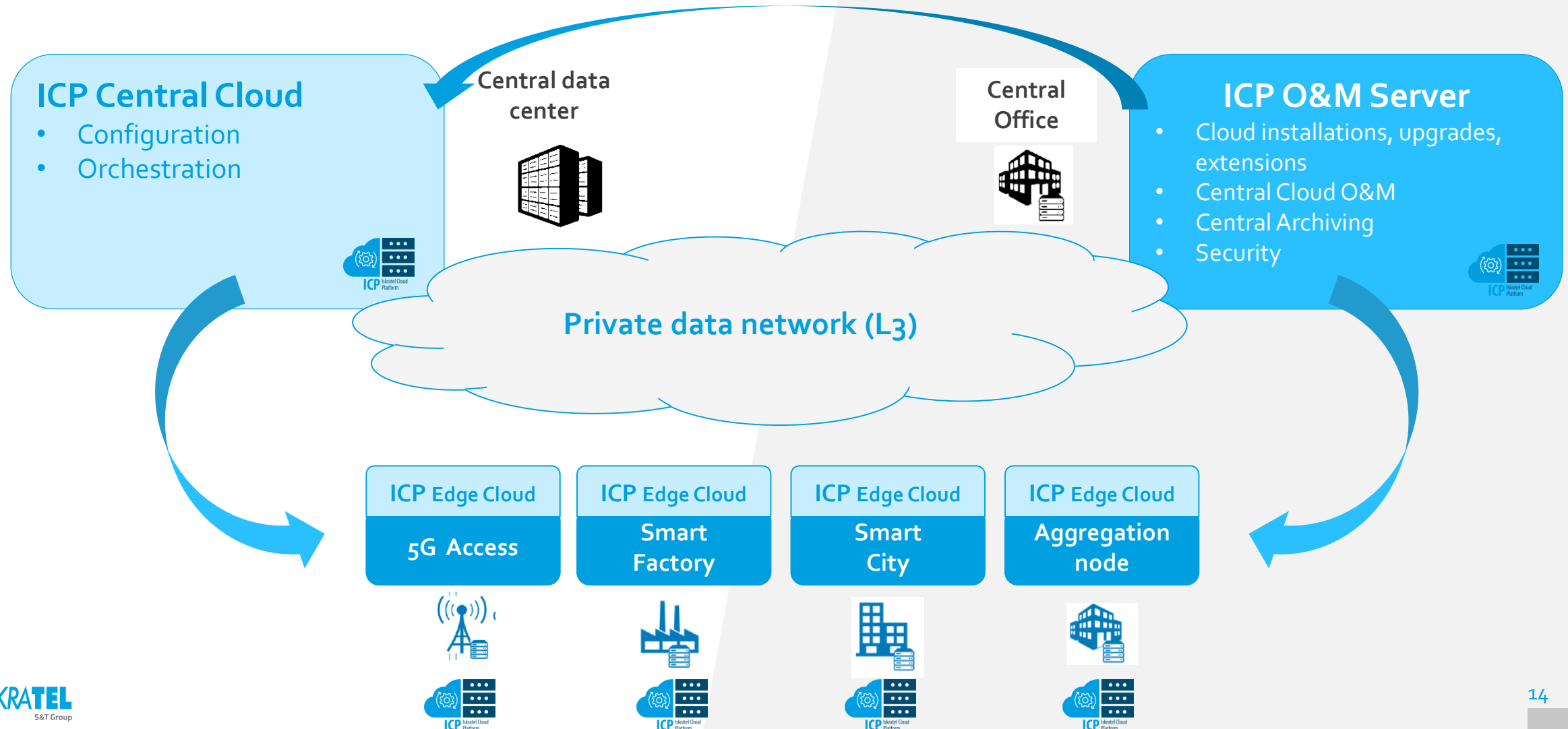


Optimized TCO



Geographically dispersed private Cloud Environment

Railways, Highways, Oil & Gas, Power distribution, Operators...

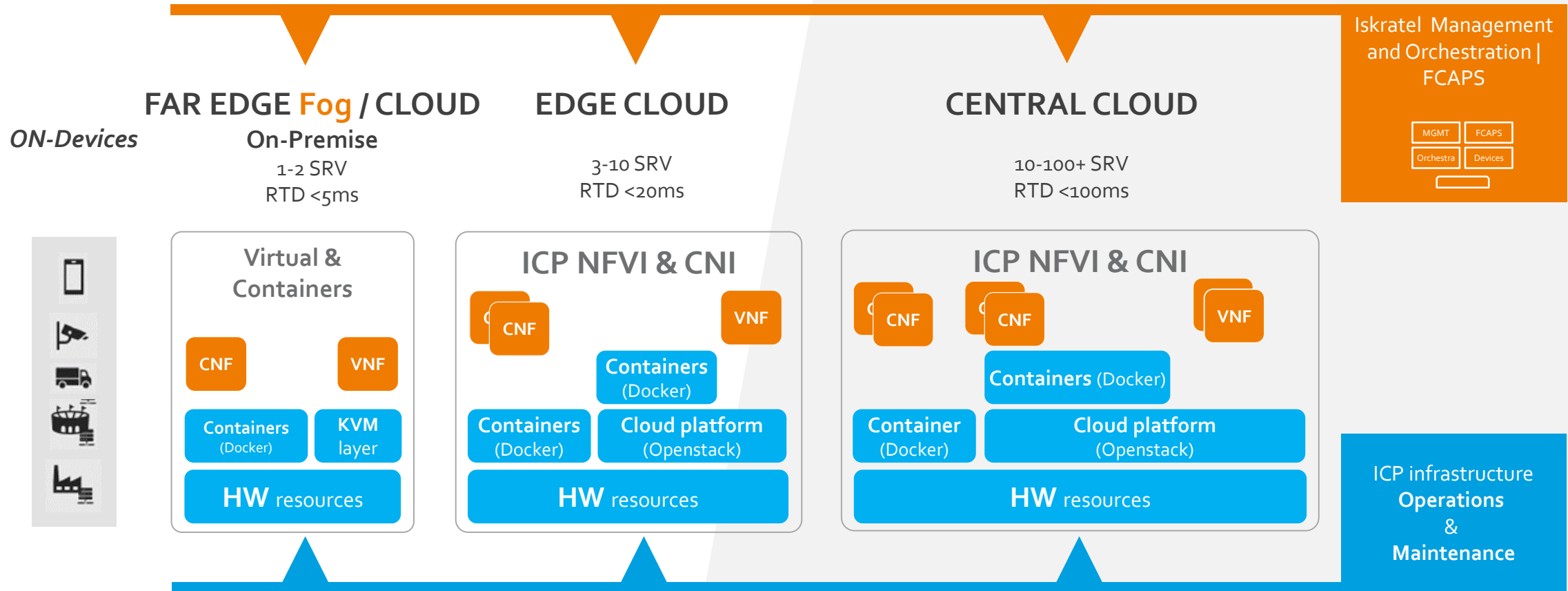


ICP innovation achieved a Golden award Slovenian Regional Chamber of Commerce

Enormous data volume, connectivity, and remote locations pose major challenges. Iskratel Cloud Platform creates several private clouds on remote locations, which brings the computing power closer to the user, automates operation and shortens processing time. Services are provided locally, thus no data is leaving the secure environment of the company. Added value is represented by centralised control, management, and automation. The system is extremely compact, easily upgradeable, without operational interruptions. With private clouds, users ensure their own control over strategic/critical infrastructure, constant service availability, best data security, and simplified integration of new applications.



Cloud Native ICP Architecture



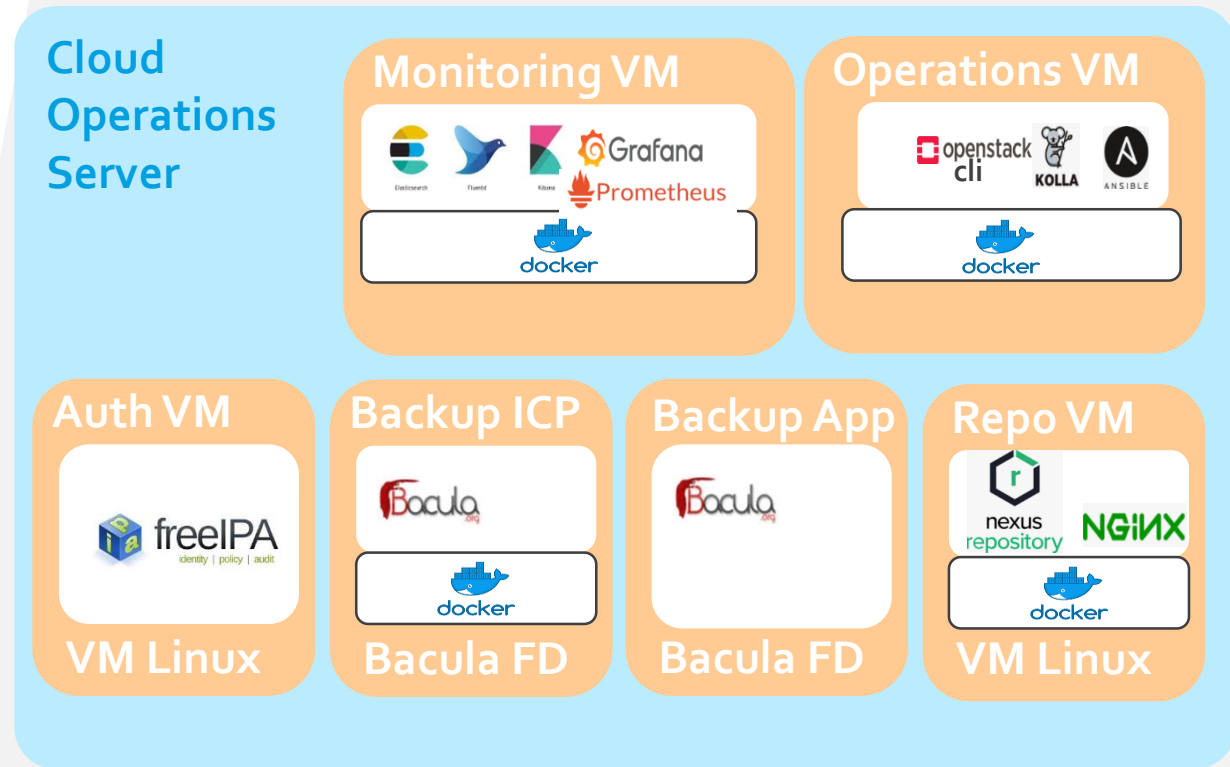
CNF - Cloud-native Network Function
 VNF - Virtual network functions
 CNI - Container Network Interface
 VIM - Virtualized Infrastructure Manager

Cloud Operations Server

COS, single, HA, GEO mode and available for multi-cloud configuration monitoring supervision

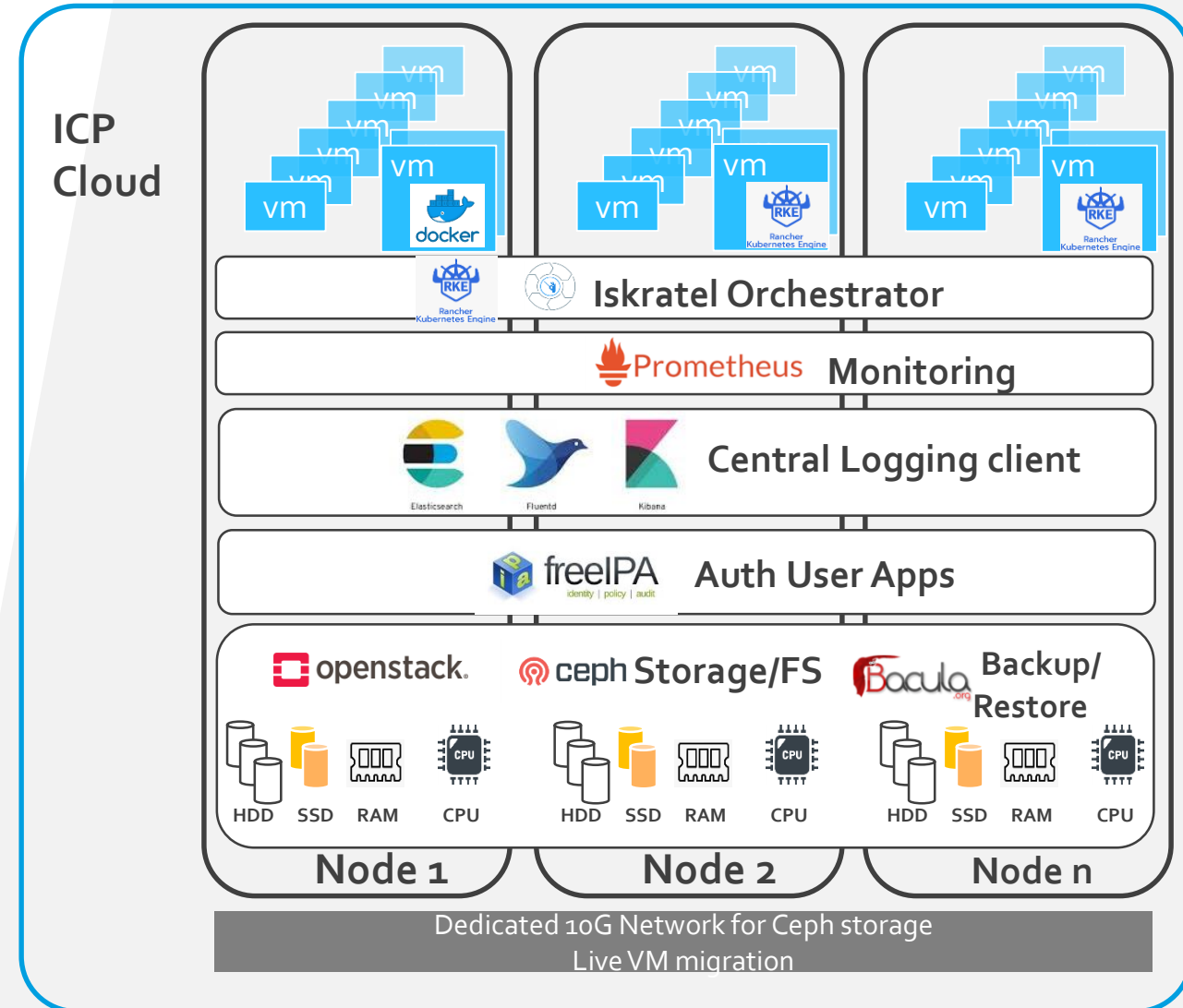
The purpose of COS sever:

- **O&M for the multi-cloud geographical dispersed environment**
 - Installing/Upgrading for IaaS Cloud
 - Scale/Heal Cloud
 - Add/remove HW node
 - Hosting Repo server for all SW
- **Central location for all additional services that we offer in addition to cloud infrastructure**
 - ICP Central Authentication with freeIPA
 - ICP Central Logging collection with analysis for IaaS
 - ICP Central Monitoring of IaaS
 - ICP Central Backup System for IaaS and applications



Architecture - High Availability

- Scalable to 100+ COTS servers (from 3 for HA)
- Operating system:
 - **Openstack Wallaby** release container based on Ubuntu 20.04 Linux, Hypervisor KVM
- Dedicated 10G storage network for Cinder block storage
- Platform software live upgradable
- Backup/Restore support via Bacula SW
- Central Authentication with FreeIPA
- Central logging with EFK stack, Monitoring
- ETSI NFV compliant Iskratel Orchestrator
- Container support with docker
- Kubernetes Orchestrator support

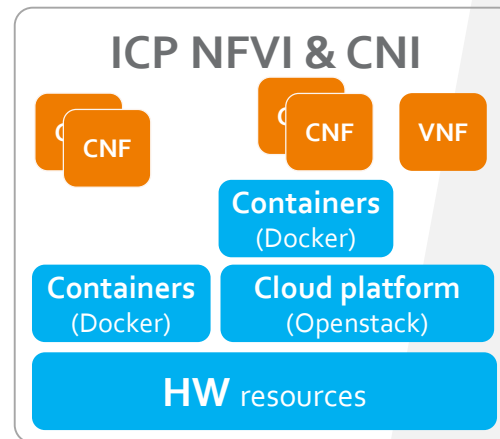


Geographically Dispersed Cloud Setup use case

- Cloud Operation O&M server
- Controller/Compute Cloud HW nodes
- Hyperconverged infrastructure (HCI)
- Kubernetes Support
- Additional services:
 - External SDS storage
 - Central Authentication
 - Central Backup
 - Central Monitoring/Logging

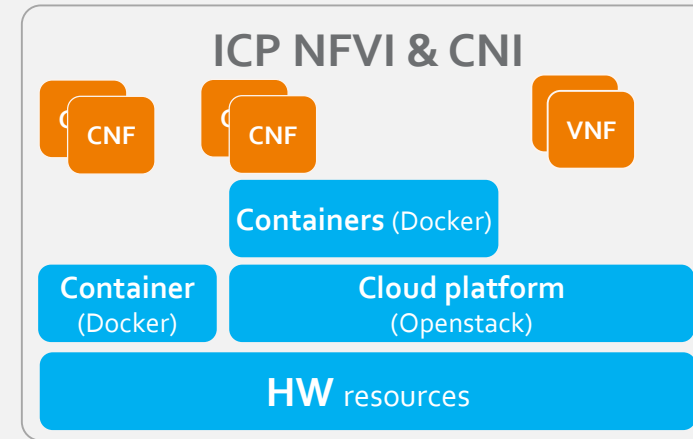
EDGE CLOUD

3-10 SRV
RTD <20ms

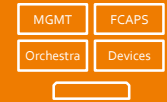


CENTRAL CLOUD

10-100+ SRV
RTD <100ms



Iskratel Management and Orchestration | FCAPS



ICP infrastructure Operations & Maintenance

Reference: One of the Europe biggest railway system

Cloudification of critical infrastructure

Basis for new services and introduction of next-generation communications and connectivity

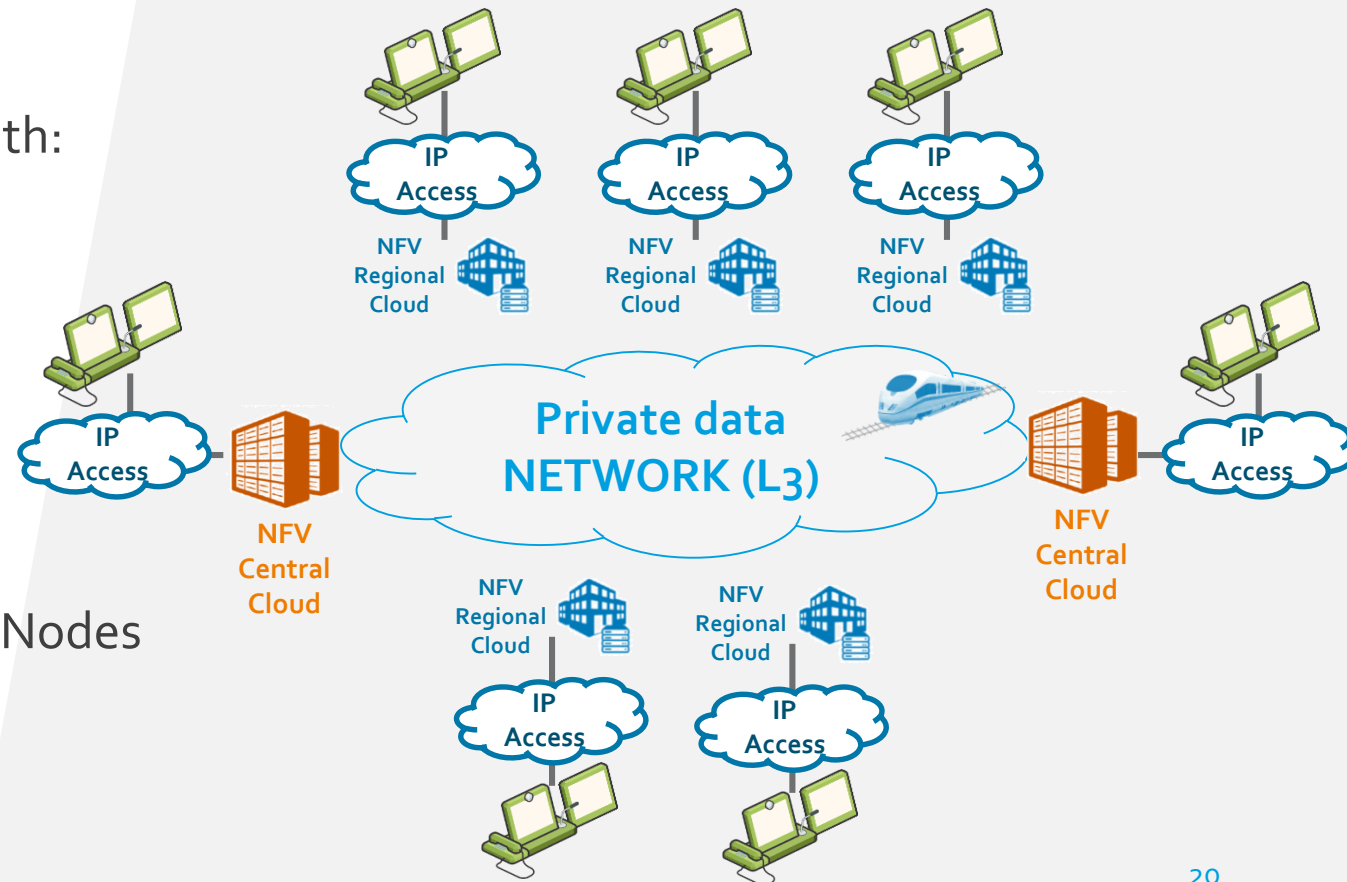
ICP Cloud platform is spread over **7 locations**.

2 central locations on a common infrastructure with:

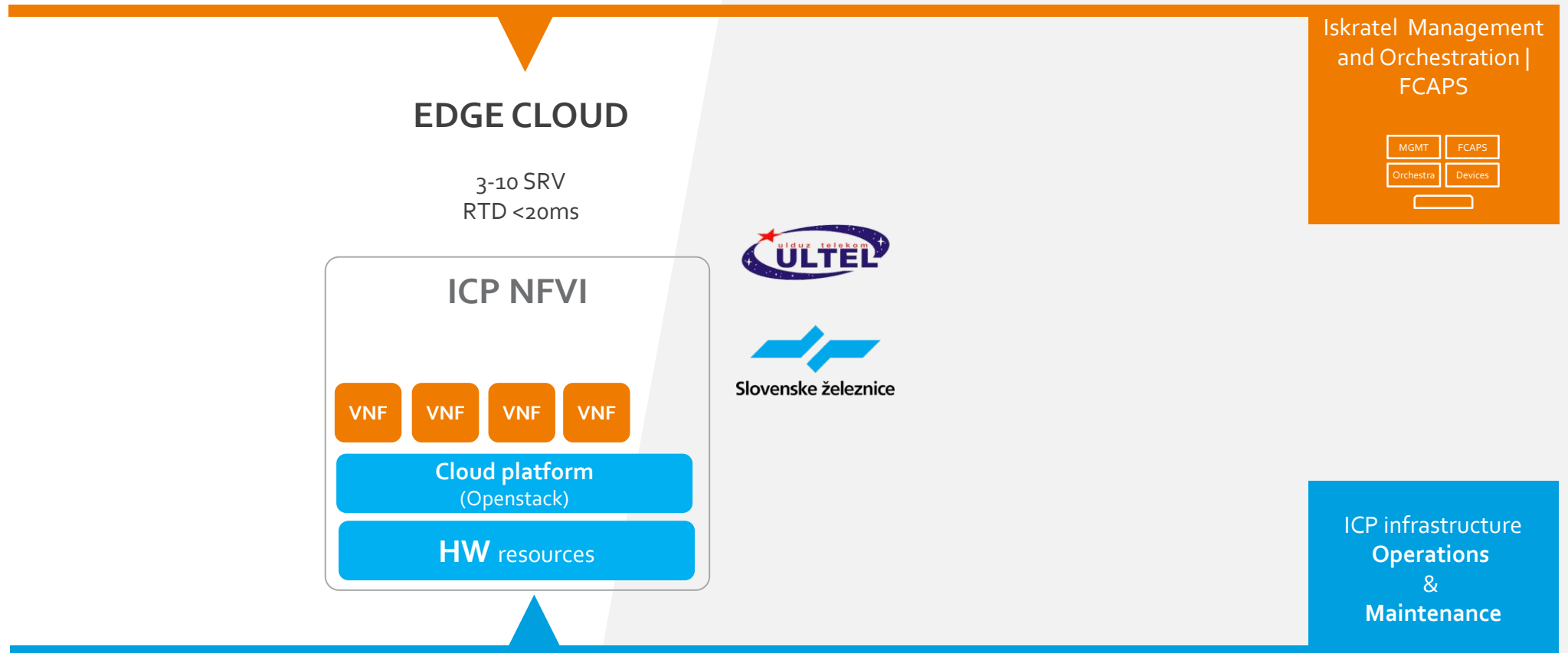
- 2 GEO locations with few dozens of HW servers for Cloud Nodes
- location-specific central services and
- location-specific central applications

5 regional fully autonomous locations:

- 5x Cloud Edge setup of HW servers for Cloud Nodes



Edge/Small Cloud Setup use case



vIMS on ICP platform (ETSI NFV view)

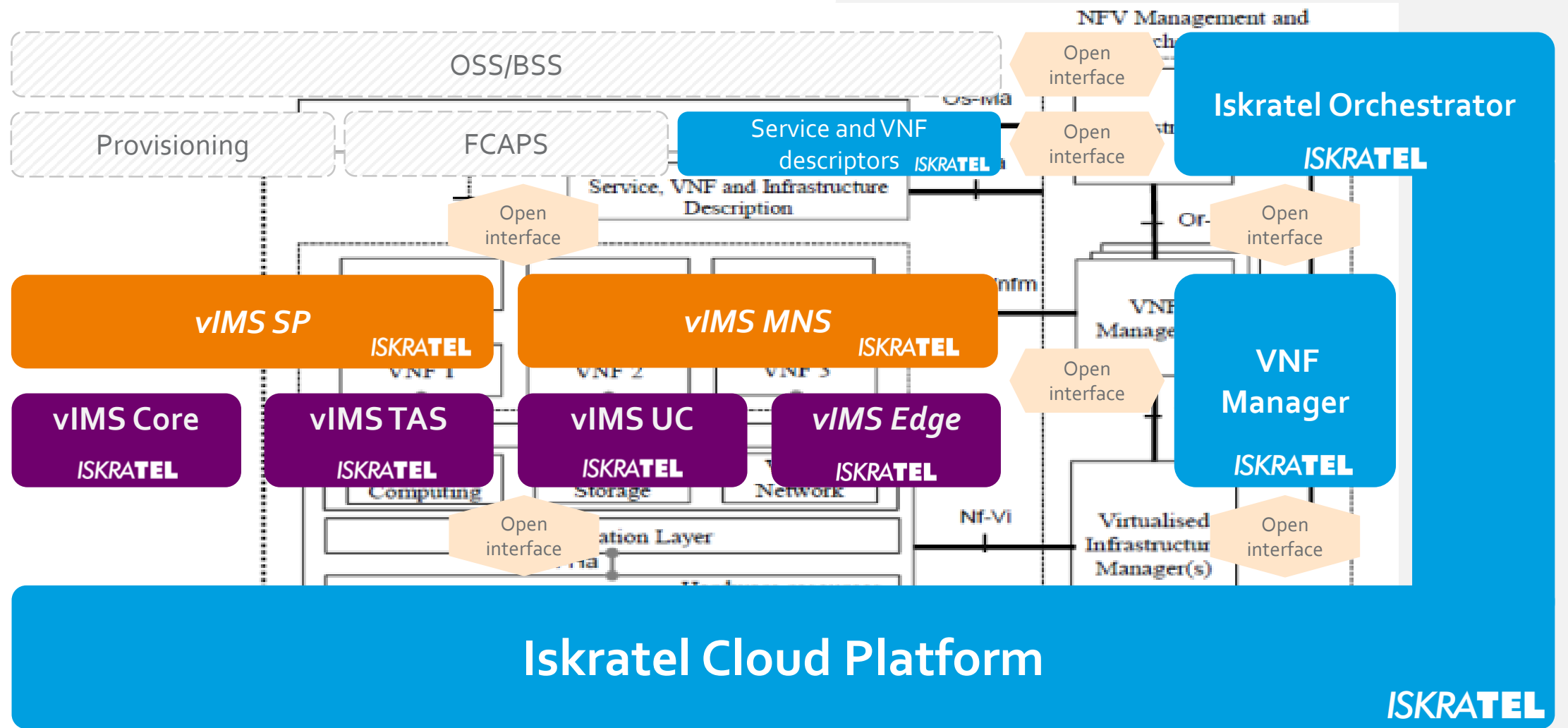
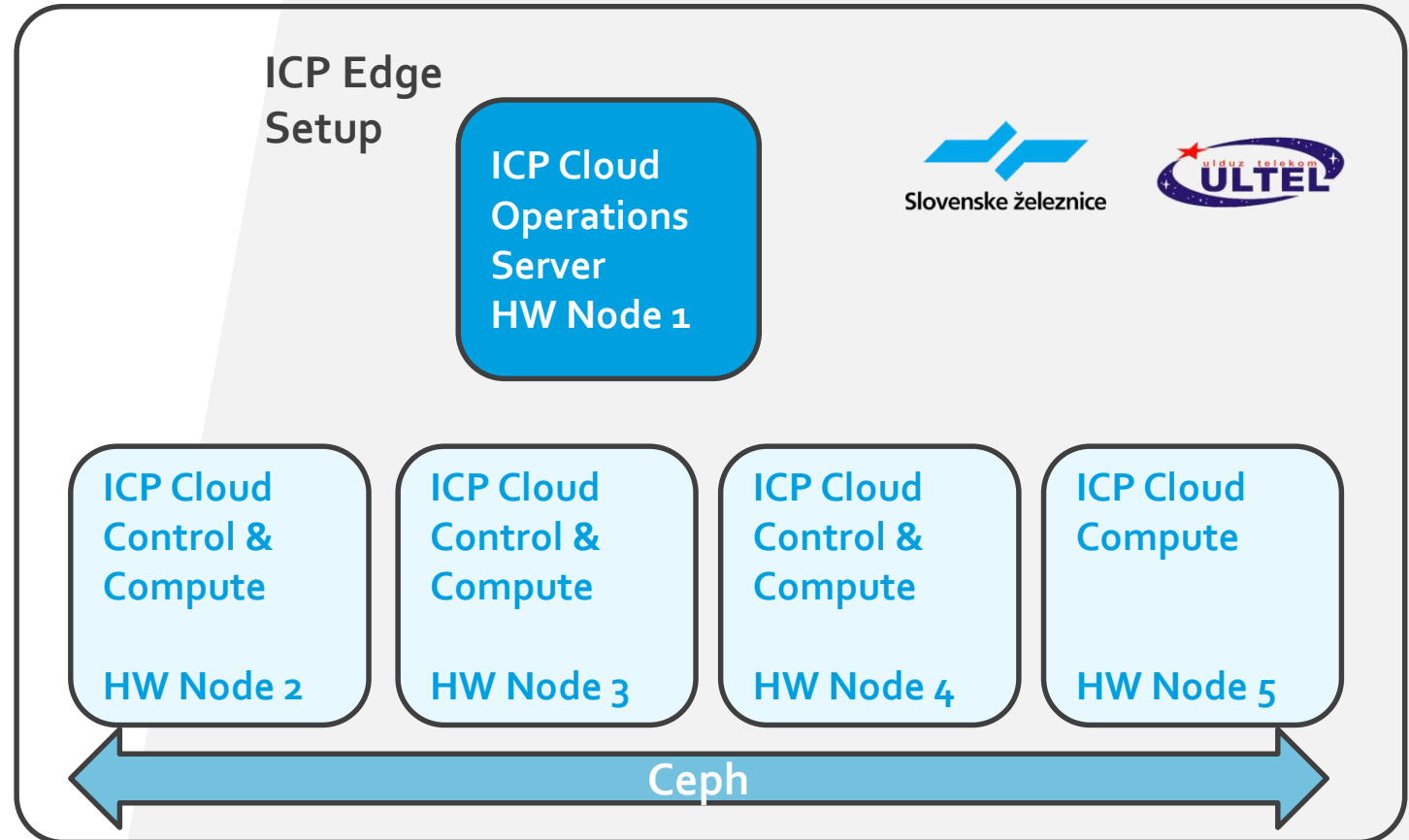


Figure 4: NFV reference architectural framework

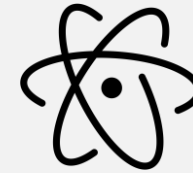
Reference: Tier 2/3 Telco Operators, smaller Railways

ICP Private Edge Cloud:

- Cloud Operational O&M server
- ICP Cloud on Hyperconverged infrastructure (HCI) that combines all the elements of a traditional data center:
 - storage
 - compute
 - networking
 - management



Far Edge Atom setup

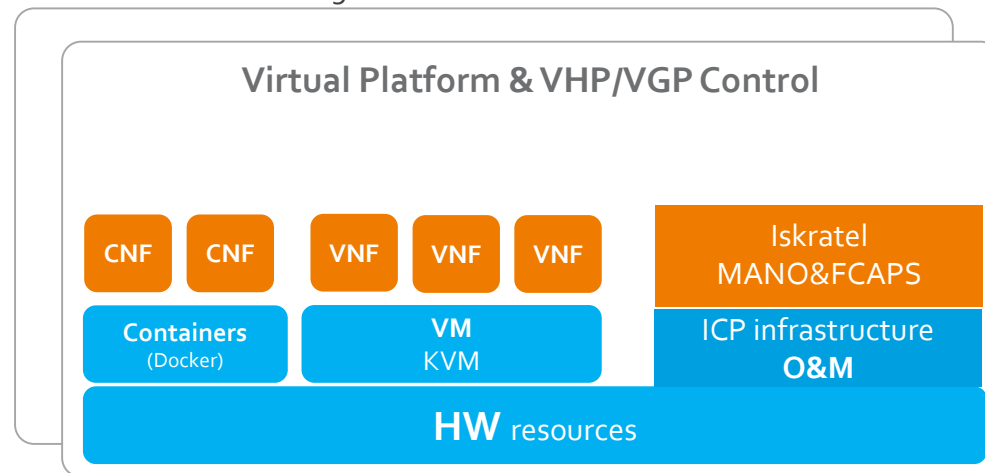


FAR EDGE Atom

On-Premise

1-2 SRV

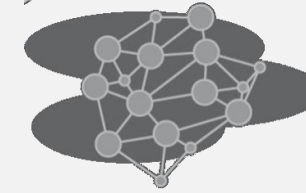
RTD <5ms



Far Edge Atom setup:

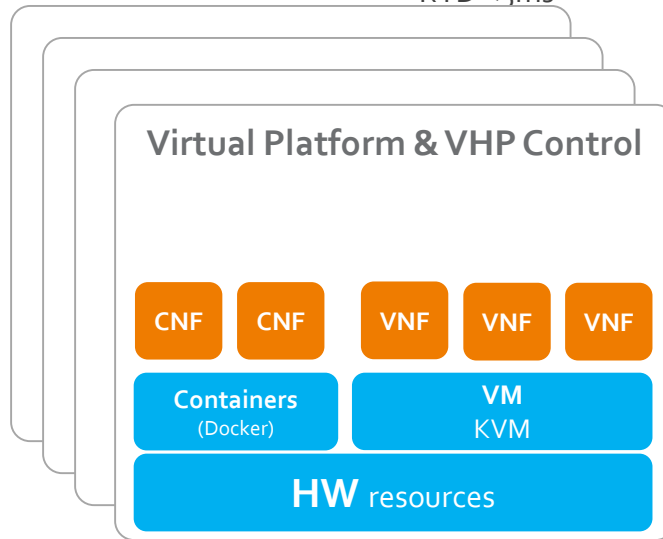
- Virtualization platform based on Ubuntu with KVM
- Upgraded VHP/VGP automation tools
- Kubernetes Support
- 1-2 nodes

Far Edge Fog setup



FAR EDGE Fog 10-100+ Atom sites

On-Premise
10-100X 1-2 SRV
RTD <5ms



Iskratel Management and Orchestration | FCAPS



Far Edge Fog setup:

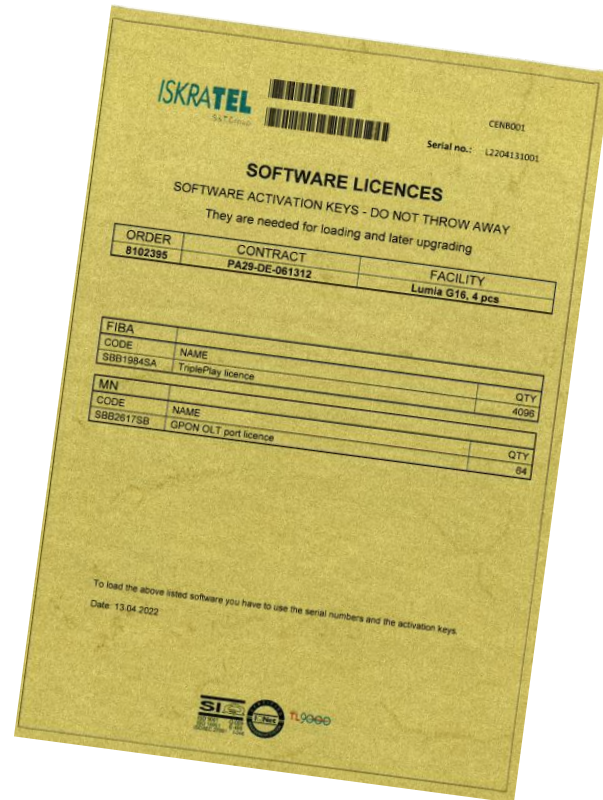
- Virtualization platform based on Ubuntu with KVM
- Upgraded VHP/VGP automation tools
- Central MANO/FCAPS
- Central O&M
- Kubernetes Support
- 10-100+ Atom sites

ICP infrastructure Operations & Maintenance

ICP Product protection

Transfer of copyright to licensed software code

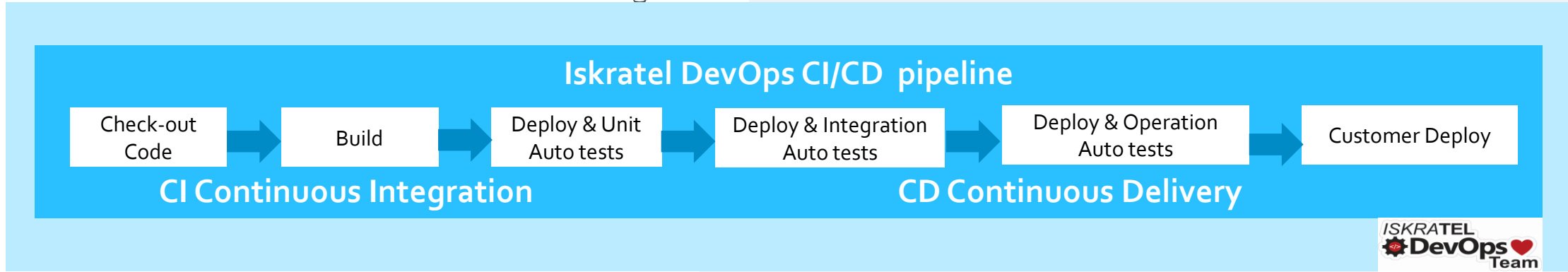
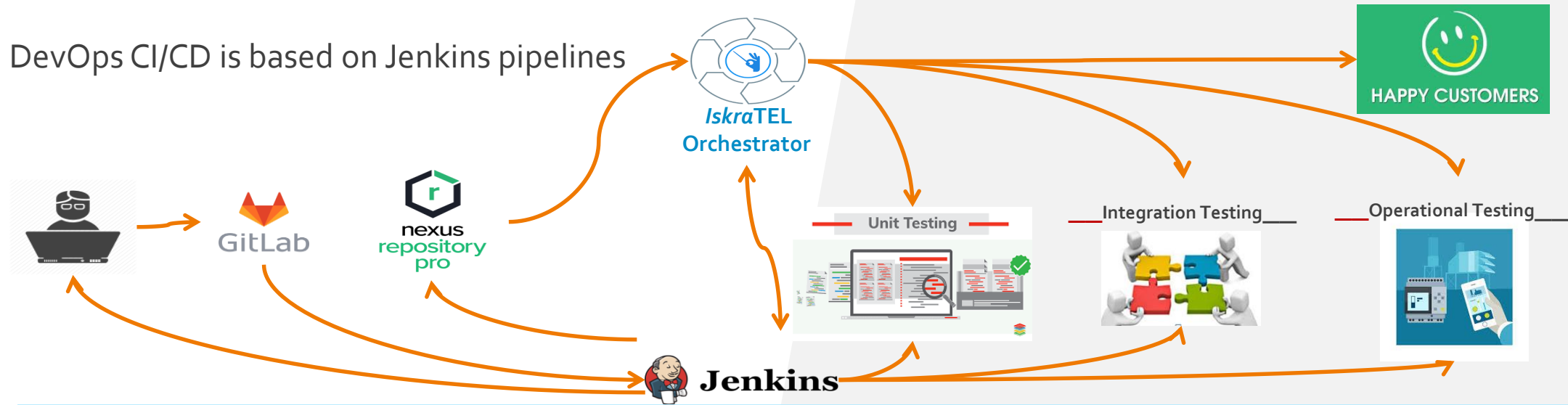
Trademark protection and graphic logo for ICP solution



Iskratel DevOps CI/CD on ICP

– Iskratel development, verification and operations are carried out in accordance with the Agile methodology.

– DevOps CI/CD is based on Jenkins pipelines



ICP References

4 commercial and 20 pilot Cloud projects



Over 1000 virtualization platform (Atom/Fog) installations

Thank You for Your Attention



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