



*For FCC Open RAN Solutions Showcase
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IBM: System Integrator

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Professional Services for Open RAN

83%

of world's largest CSPs and Media companies are IBM clients

>50%

world's telecommunications IT infrastructure are managed by IBM Services

1.5B

Watson accessible by Telco and Media customers

220

Red Hat deployments at Telcos, globally

16K

of the largest telecom and media companies in the world depend on IBM Security

20

Client centers globally, including cognitive automation centers

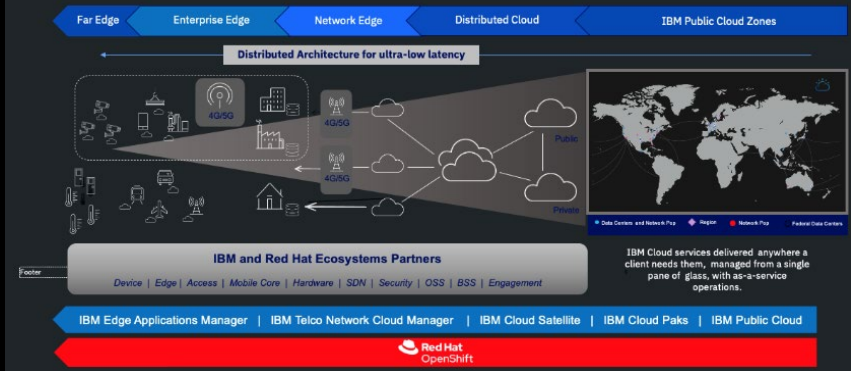
25+

Telecom client-ready SHOW ME demonstrations, a result of proof of concepts and innovation

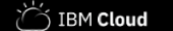


IBM Cloud for Telecommunications

IBM Cloud for Telecommunications Industry

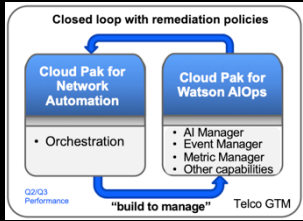


IBM Cloud for Telecommunications ecosystem partners



Network Modernization			Digital Engagement		Technology Platform and Open Source Partners
5G Access ALTIOSTAR MAVENIR NOKIA SAMSUNG Telco Edge ADVA altran kataloam portworx ROBIN SAMSUNG	5G Mobile Core affirmed cisco MAVENIR metaswitch NOKIA SAMSUNG travelping Load Balancer JUNIPER SAMSUNG turbotomic	Software Defined Networking JUNIPER Compute / Hardware cisco DELL Technologies EQUINIX Hewlett Packard Enterprise Lenovo NetApp NOKIA	Operations Support System (OSS) Enghouse Interactive sinefa Osprent Security cisco NETSCOUT paloalto SAMSUNG SevOne THALES Zerto	Business Support Systems (BSS) Enghouse Interactive MATRIXIX MOVIOUS Customer Care assima dubber NUANCE	intel DLF NETWORKING O-RAN ALLIANCE Red Hat tmforum

IBM Capabilities for Telecom Networks – Core and Access Layers



RedHat

Product Subscriptions

- Enterprise Linux
- OpenStack
- OpenShift
- Ansible
- Advanced Cluster Manager

Red Hat Professional Services

Software

Cloud Pak For Network Automation

- Multi-domain Orchestration

Cloud Pak For Watson AIOps

- AI Manager
- Event Manager
- Metric Manager
- Topology
- Other capabilities

Professional Lab Services

SI Services

Systems Integration Services for Core, RAN and 5G Mobile Edge

Product Deployment Services

- MANO
- CI/CD & DevOps
- Service Assurance

Operate VNF Factory

- XNF Onboarding
- Hybrid Network Services

Operations and Maintenance

Infrastructure Services

Physical Infrastructure for Core, RAN and 5G Mobile Edge

- Compute
- Storage
- Network

Virtual Infrastructure Design, Build, Deploy

- OpenStack
- OpenShift

Operations and Maintenance

Partner Ecosystem

Vendors in various domains including:

- Core
- RAN
- Mobile Edge
- Transport
- SDN
- OSS/BSS

Selected XNF Vendors:

- Altiostar
- Cisco
- Nokia
- Ericsson
- Metaswitch
- Juniper
- Affirmed Networks
- Mavenir

Professional Services for Open RAN

Governance

Organization and Process Change Management

**RAN Spectrum
Advisory
Services**

Network Build Services

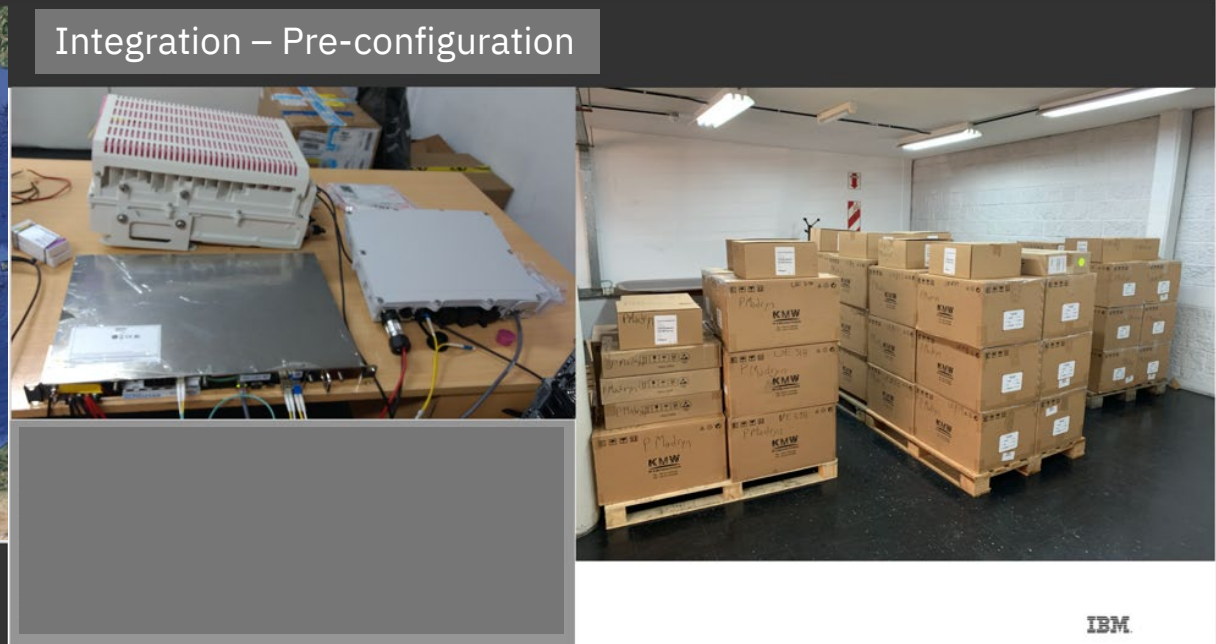
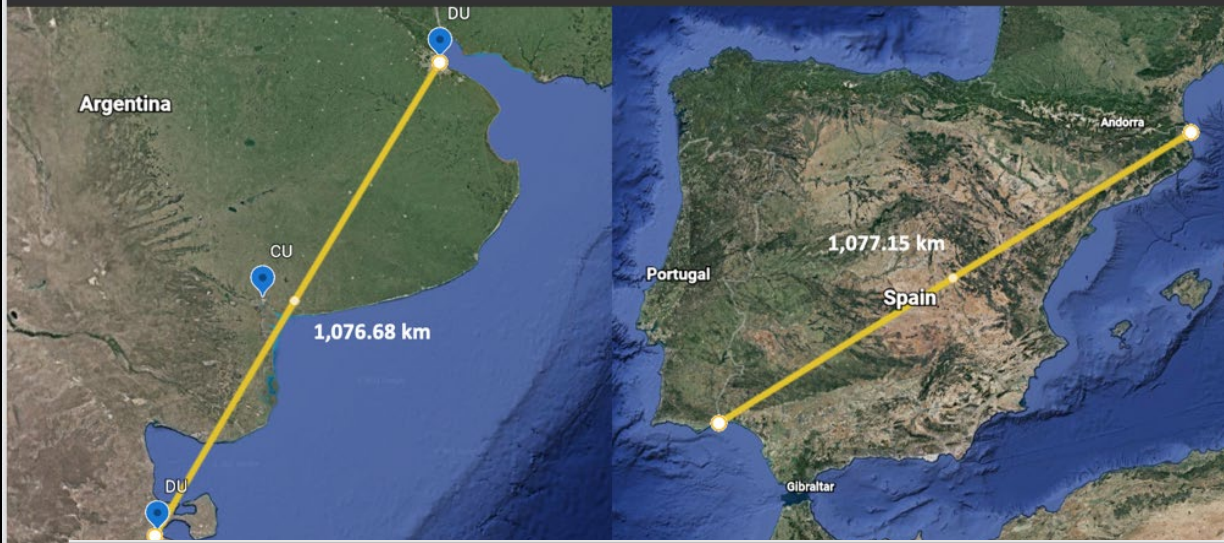
Core/Edge Site Build & Integration Services	Capacity Management Services
RAN Site Build & Integration Services	RAN Optimization Services
RAN Site Modernization Services	RAN OPEX Management Services

Partner Ecosystem



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Many other vendors; including compute, storage, radios, etc

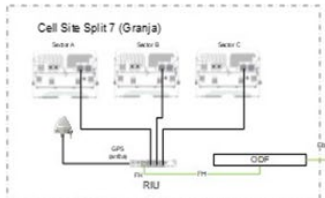
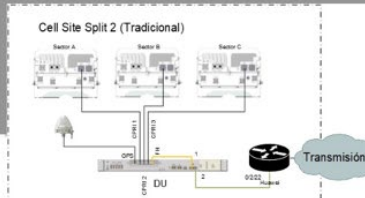
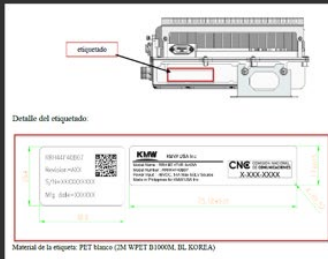
Open RAN deployment in South America



Integration – Nodes & fronthaul

- Radios Gigatera (KMW) 4T4R
- Server Kontron ME110 + RIM
- RIU: Radio Interface Unit
- Antena GPS Rosenberger
- Módulos SFPs.
- Splitters PLC
- Cables de cobre y fibra óptica.
- Múltiples accesorios
- Materiales eléctricos y PAT
- Instalación física de nodos (Local)
- Configuración VNFs y puesta en funcionamiento (México)

RRU, nuevo modelo. No estaba homologada en ningún país. Se preparó y presentó la carpeta técnica ante ENACOM. Demoras época de vacaciones, luego cuarentena por COVID.



Critical success factors in a multi-vendor SI environment

A multi-vendor system integration environment poses challenges that go beyond the technology

The dynamicity of the environment calls for continuous risk assessment, continuous validation and course correction

A strict governance and design authority are required to be successful in delivering, managing the technology and the vendors



