



**MAVENIR**<sup>™</sup>  
Trust the Future

# FCC Open RAN Showcase

July 2021



# Building the Future of Networks with Cloud-Native Software

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- > Virtualizing networks and transitioning to 5G
- > Embracing disruptive and innovative technology and business models
- > Enabling adoption of cloud-native, web-scale technologies
- > Delivering service agility, flexibility, and velocity
- > Driving NFV evolution to achieve web-scale economics
- > Offering solutions to increase and protect revenue and reduce costs
- > Integrating analytics and artificial intelligence (AI) across the network for optimization

# Who is Mavenir?



One Network. Any Cloud. All Software.

Mavenir is building the future of networks and is a pioneer in advanced technology, focusing on the vision of a single, software-based automated network that runs on any cloud.

As the industry's only end-to-end, cloud-native network software provider, Mavenir is focused on transforming the way the world connects. Our services accelerate software network transformation for 250+ CSPs in over 120 countries, which serve more than 50% of the world's subscribers.

“Mavenir is transforming itself into the closest vendor that can take Huawei’s spot to challenge Ericsson and Nokia”



THE STÉPHANE TÉRAL PERSPECTIVE



Source: LightCounting THE STÉPHANE TÉRAL PERSPECTIVE 2021



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# Global Reach and Centers of Excellence

Over 4,600 Employees Supporting 250+ Customers in 120 Countries Across 6 Continents

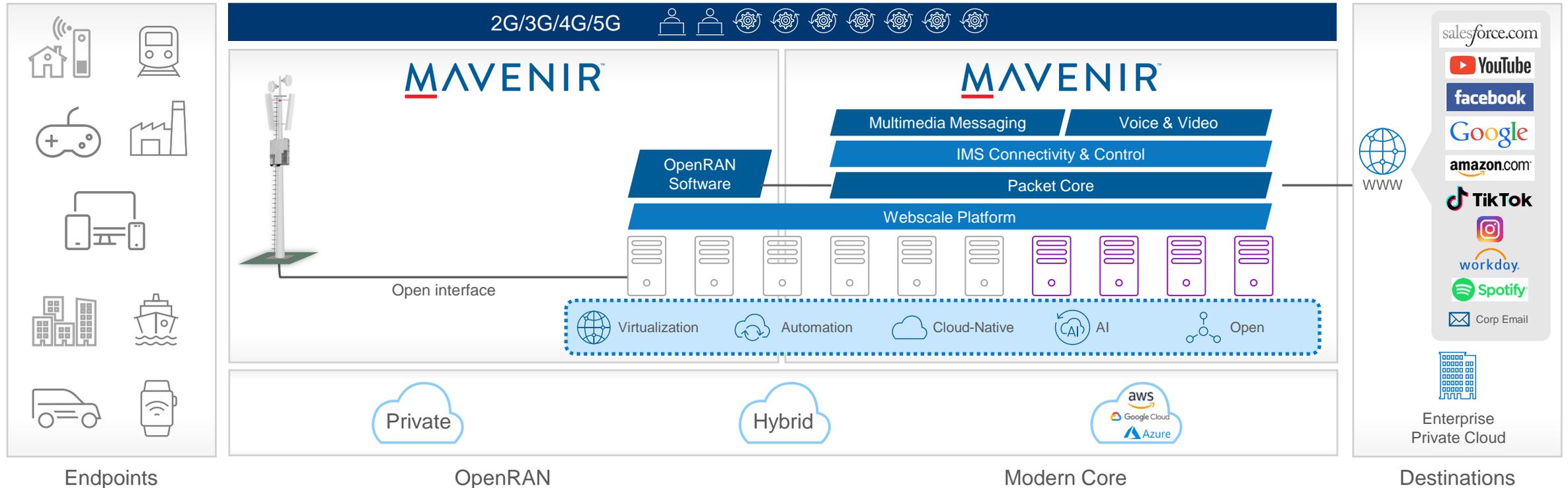


# Software-Driven Approach Significantly Reduces Cost and Increases Flexibility

- ✓ Automated / software driven 
- ✓ Virtualized applications on commercial-off-the-shelf hardware 
- ✓ Public, private or hybrid cloud 
- ✓ Efficient resource utilization 



- > Low total cost of ownership
- > Flexible / unlimited scaling
- > Ready for 5G



# End-to-End Product Portfolio Across the 5G Network Infrastructure Stack

## Digital Enablement

### Network Slice Management and Orchestration

**MΛVcore™**

- Converged Packet Core
- Voice & Video
- Multimedia Messaging
- IMS
- OTT Client

**MΛVapps™**

- Security – Spam / Fraud
- Monetization

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**MΛVbiz™**

- RBM
- Contact Center
- UCC

**MΛVair™**

- RAN / Open RAN
- MEC

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**MΛVedge™**

- CBRS/OnGo Networks
- Private Networks

### Mavenir Webscale Platform (MWP) for Containers and NFV Deployment with Integrated AI and Analytics

**MΛVscale™**

Mavenir Telco Cloud Integration Layer

PaaS (Platform as a Service)	<b>CLOUD NATIVE COMPUTING FOUNDATION</b>	VNF Manager
CaaS (Container as a Service)	<b>Kubernetes</b>	<b>openstack.</b>

## Mavenir - Only Industry End-to-End Network Software Provider

# Converged Packet Core

Leverage Mavenir's end-to-end, fully-containerized packet core portfolio for a flexible, cost-effective journey to 5G with multi-generational support for all G's to modernize existing mobile networks while evolving to 5G.

## Highlights

- **Deutsche Telekom** — Fully containerized, web-scale technologies for 5G standalone and 5G/4G combo core
- **Mugler** — 5G Core as the foundation for end-to-end 5G private networks
- **Vodafone Idea** — Cloud-native packet core across 18 different locations in India with total throughput capacity of 1.8Tbps
- **Telefónica** — Teams with Mavenir, and AWS using Mavenir's packet core solution and AWS's cloud infrastructure
- Mavenir wins **Best 5G Core** at 5G World

- A 100% cloud-native, 100% containerized, 100% multi-generational support
- Covers the complete stack of mobile technologies – 2G/3G/4G/5G
- Granular stateless microservice architecture allowing for carrier-grade resiliency, healing and scaling
- Industry leading containerized user plane with 524Gbps throughput on a single server
- Thin network slicing that requires minimal resources and delivers an optimized footprint

Current Mavenir customers include:



# Cloud-Native IMS

Trust Mavenir's fully cloud-native IMS to evolve all workloads and modernize operations to automated, CI/CD, containerized environments, in both private and public clouds, as transformation to 5G becomes a reality.

## Highlights

- **T-Mobile CZ and Slovak Telekom** — uses next-generation NFV-based harmonized IMS
- **Turkcell** — Transforms its LTE and 5G Voice Network
- **Deutsche Telekom** — Next-Generation IMS (NIMS)
- **DISH** — Cloud-Native Voice, Data and Messaging Services Software for Nationwide 5G Network
- **Mavenir** wins award for **innovation** in delivering fully containerized, cloud-native IMS at the 5G MENA awards

- Leadership in IMS cloud transformation — #1 in NFV IMS
- Deployable in Kubernetes clouds — as stateless microservices in containers
- Facilitates hybrid cloud strategies — deploy in private or public clouds
- Purpose built for CI/CD pipelines — to automate delivery for new services and software
- 5G and VoNR — proven partner for transformation, using a web-scale, fully cloud-native platform

Current Mavenir customers include:



# Open Virtualized RAN

World's first fully containerized, Open Virtualized RAN Split 7.2 architecture leveraging open interfaces, virtualization and web-scale containerization expected to deliver nearly 40% savings in TCO over 5 years. (RRU, CU and DU) Source: Senza Fili 2021

## Highlights

- First live commercial Open vRAN deployment achieved with Axiata and Mavenir
- Selected by Orange for 5G standalone Open RAN Experimental End-to-End Cloud Network in France
- Collaborated with Deutsche Telekom for a Live 5G Open RAN mMIMO Deployment at O-RAN Town in Germany
- Partnering with MTN Group to deploy Open RAN across Africa
- Successful Launch of UK's SmartRAN Open Network Interoperability Centre (SONIC) Labs
- Opened **development centre** for Open RAN radio software in UK
- Multiple awards for **Best Open RAN** Technology (5G World, 5G MENA, Layer123, and Small Cell Forum)

- World's first full containerized, Open, Virtualized RAN
- Pioneer in Open RAN network architecture
- Solution can be deployed on private, hybrid and public cloud
- Solution supports 5G massive mMIMO
- Supports 2G/4G/5G architectures

*Current Mavenir customers include:*



# AI and Analytics

Mavenir's Artificial Intelligence (AI) and Analytics Solutions use advanced AI and machine learning (ML) algorithms to provide actionable intelligence and address real-world challenges faced by network operators.

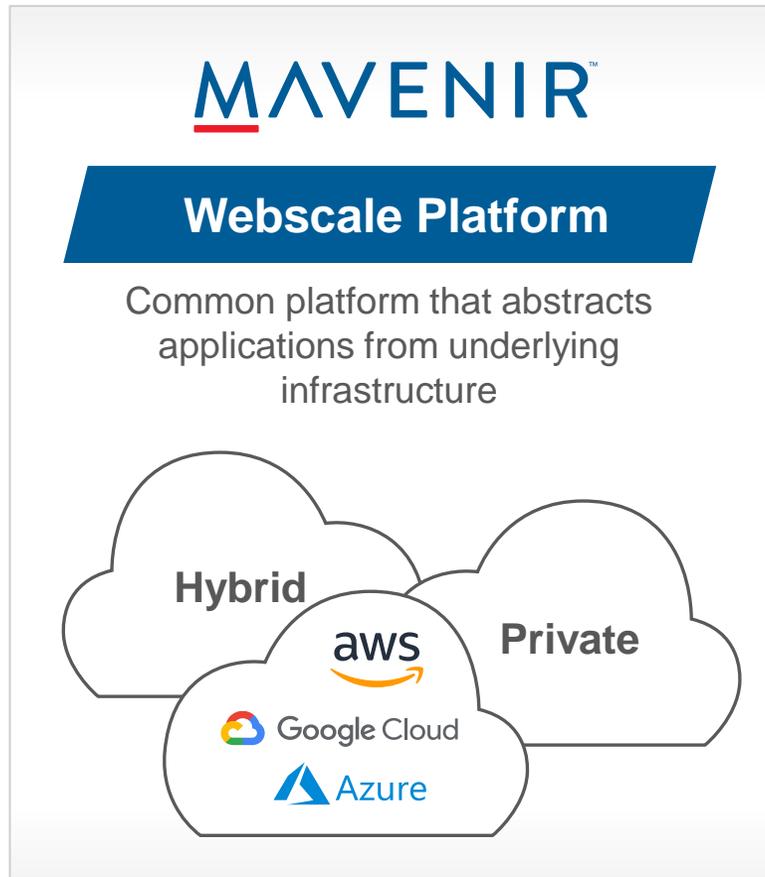
## Highlights

- Demonstrated reduced reporting time from hours to minutes with **Airtel**
  - Streamlined data collection and enhance reporting capabilities for **Deutsche Telekom**
  - Centralized monitoring of network to enhance performance for **Telefónica**
  - Detected anomalies for security compliance for Tier1 CSP
- Open platform featuring standards-compliant interfaces and procedures
  - Vendor independent solution can work on any vendor's RAN and Core
  - Comprehensive coverage for all telco domains and network functions
  - Hyperconverged Edge stack with fully integrated and tested hardware and software
  - Over 10 years of experience delivering actionable intelligence for the world's largest networks

Current Mavenir customers include:



# Mavenir's Webscale Platform Enables Seamless Cloud Deployment



## Key Values of Mavenir Webscale Platform

- ✓ No single hyperscale cloud vendor dependency
- ✓ One resource efficient, low latency cloud platform for RAN, edge and central deployments
- ✓ Easy portability across multi-cloud
- ✓ Centralized multi-cloud management
- ✓ Simplified DevOps
- ✓ Assured redundancy by multi-cloud deployments
- ✓ Save costs by utilizing variable dynamic pricing utilizing intelligent dynamic scaling
- ✓ Advantage of using different efficient services across different cloud vendors

# Mavenir Open RAN Partners

## 10+ Radio Partners



Today

## CU/DU Server / HW Partners



Today

## Cloud Platforms



Today

# Mavenir Open RAN Radio Portfolio



Product Category	3GPP Frequency	Availability
Remote Radio Unit	B5	Available
Remote Radio Unit	n71	Available
Remote Radio Unit	B48/n48	Available
Remote Radio Unit	n78	Available
Small Cell Indoor Radio	B48/n48	Available
Remote Radio Unit	B25	Q3 2021

Product Category	3GPP Frequency	Availability
mmWave Outdoor	n258	Q4 2021
Remote Radio Unit	B12	Q4 2021
Remote Radio Unit	B24	Q4 2021
Remote Radio Unit	B41	Q4 2021
Massive MIMO	n77	Q4 2021
Massive MIMO	n48	Q1 2022

Includes 3<sup>rd</sup> Party Radios

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# Open RAN Savings - 36% TCO savings (Avg)

FCC Layer	LOW PRICE	HIGH PRICE	AVG PRICE	Nokia Example	Mavenir Example
	Proprietary	Proprietary	Proprietary	Proprietary	Open RAN
Access Layer	\$100	\$159	\$129	\$125	\$125
Distribution Layer - 50 eNodeBs	\$4,461	\$8,288	\$6,375	\$4,762	\$1,507
Distribution Layer - Site Material	\$1,535	\$4,888	\$3,211	\$2,600	\$905
Core Layer - EPC	\$1,347	\$2,776	\$2,062	\$2,000	\$1,347
Core Layer IMS	\$2,174	\$3,404	\$2,789	\$2,500	\$2,174
Software Layer - EMS/RAN licensing	\$900	\$2,160	\$1,530	\$1,050	\$0
Services Layer - Per Site deployment	\$6,118	\$14,016	\$10,067	\$6,966	\$4,650
Services Layer - Miscellaneous	\$408	\$1,009	\$709	\$595	\$408

Pricing from Widely Report and Preliminary Cost Catalog (3/25/21) with 40% difference on Open RAN Correction  
 Columns 1 thru 5 Data provided by Nokia at RWA conference Dallas (6/30/2021)

Total	\$17,043	\$36,700	\$26,872	\$20,598	\$11,116
Annual Support/Maintenance	\$399	\$719	\$559	\$470	\$275
7% RAN, 10% Core					
5 Year total	\$1,993	\$3,594	\$2,794	\$2,350	\$1,373
Total CAPEX + OPEX	\$19,036	\$40,294	\$29,666	\$22,948	\$12,489
Open RAN Savings	\$6,547				\$10,459
	34%				46%

# Open vRAN Performances

View from Typical Requirements to Mavenir Actual Measurements

KPI	Target Average	Target Worst Case	Mavenir Average	Mavenir Worst Case
VOLTE CSSR	$\geq 99.80\%$	$\geq 98.65\%$	99.95%	99.41%
VOLTE DCR	$\geq 0.26\%$	$\leq 0.92\%$	0.30%	0.58%
Data CSSR	$\geq 99.60\%$	$\geq 98.55\%$	99.45%	98.45%
Data DCR	$\leq 0.30\%$	$\leq 0.94\%$	0.18%	0.27%
Availability	$\geq 99.70\%$	$\geq 98.60\%$	99.75%	99.07%

\* Targets are taken from most stringent among several RFP/RFIs around the world

\*\* Mavenir data are averaged across multiple days and weeks from several sites in different countries (Worst case includes some pre-optimization)

# System Test: Performance and Stability

- Call model scenarios are run to stress system with number of users and long duration
- Number of users are loaded based on scenario and customer configuration. Common configuration used in lab test -
  - 100 Active users, 200 connected users per cell
  - 200 active users and 320 connected users per cell
- Duration of test varies for each scenario. We aim to achieve 24hr+ stability with loaded scenarios at least.
- At the end of each long execution, KPIs are monitored and compared for performance assessment

# Mavenir's End-to-End System Integration Services

Mavenir provides end-to-end system integration services across multiple technologies

Over 1000+ highly trained engineers across the globe, multiple Centers of Excellence, NOC's and labs

Program Management, Design, Plan, Build, Deploy, Test and Handover, Cloud Buildout, NFV and Virtualization Deployments, Migrations

Infosys

DELL

Goodman Networks

KGP Co

NEC

MUGLER  
TELCO NETWORKS.

GDT

NTT DATA



Thank **You**



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