GSMA

IoT WebTalk

Getting to Smart: Deploying & Operating
5G IoT FOR INDUSTRY 4.0

Tuesday, 18 January 2022 | 09:00 EDT | 14:00 GMT | 15:00 CET

SPEAKERS

Anne Stephan
Vice President Mobile
Network Testing
Rohde & Schwarz

Fawad Noory
Senior Director, Private
Network, CEaaS
KORE Wireless

Stephane Gervais
Executive VP Strategic
Innovation
LACROIX Group

Jo Gilbert
Technical Director &
Manufacturing Lead
GSMA

AGENDA

|		
5 minutes	**Welcome Introduction**	**Jo Gilbert**, Technical Director & Manufacturing Lead, **GSMA**
15 minutes	**5G IoT for manufacturing: from testing to IoT Continuum proposition**	**Stephane Gervais**, Executive VP Strategic Innovation, **LACROIX Group**
15 minutes	**Are manufacturers hesitant to move to 5G? From trials to testing in brownfield vs greenfield environments**	**Fawad Noory**, Senior Director, Private Network, CEaaS, **KORE Wireless**
15 minutes	**How network testing ensures 5G private network performance**	**Anne Stephan**, Vice President Mobile Network Testing, **Rohde & Schwarz**
10 minutes	**Audience Q&A**	Moderator: **Jo Gilbert**, Technical Director & Manufacturing Lead, **GSMA**

5G IoT Manufacturing Forum

A **global community** which aims to

- pinpoint manufacturers' **challenges and opportunities,**
- identify how 5G IoT can address these, and
- encourage the sharing of **best practices**

Manufacturers

Network Operators
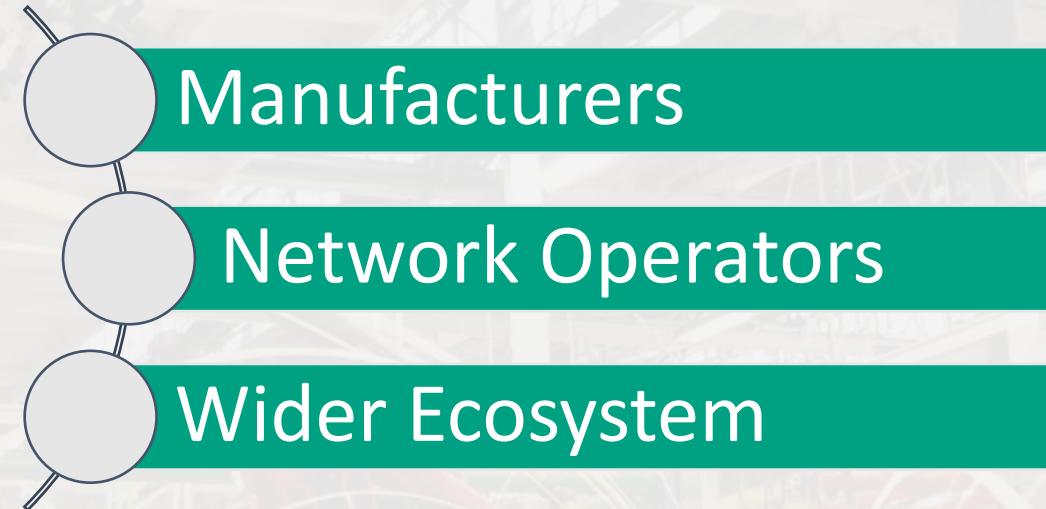
Wider Ecosystem

To **educate**, **support** and **advance global adoption** of 5G IoT by the manufacturing industry and wider industrial sectors.

Topics

- Use Cases and Benefits

- Private Networks

- Ecosystem and Roles

- Edge Computing

- Security

- Spectrum

- AGV/AMR/Robots

www.gsma.com/iot/manufacturing

Sessions

- Advanced Analytics and Robotics for 5G IoT in Manufacturing

- Private & Dedicated Networks in Industry 4.0
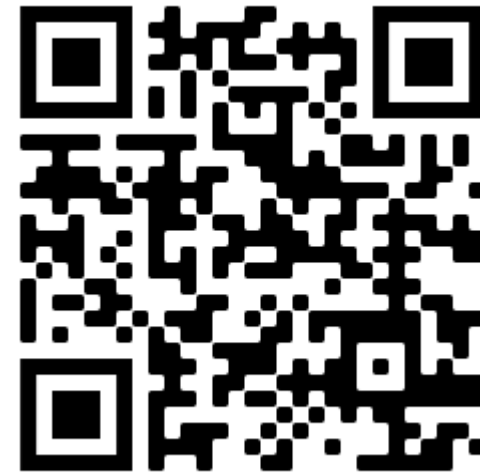
- Kickstarting 5G for Manufacturing

https://www.gsma.com/iot/gsma_events/mwc22-manufacturing-summit/

Find out more:

www.gsma.com/iot/manufacturing

manufacturing@gsma.com

MWC22: https://www.gsma.com/iot/gsma_events/mwc22-manufacturing-summit/

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LACROIX

5G IoT for manufacturing: from testing to IoT Continuum proposition

Stephane Gervais
Executive VP Strategic Innovation

Become a global leader in industrial IoT solutions & electronic equipment for critical applications

MARKET POSITIONING

For manufacturers

For road systems infrastructure operators

For utilities infrastructure operators

Electronics activity
Deliver end-to-end solutions from design to manufacturing

City activity
Optimize & secure mobility of all road users

Environment activity
Manage & optimize the performance of water & energy networks

EXPERTISE

Smart sensors & actuators

Device management & Cybersecurity

Lighting

Connected devices - IoT

Smart power

AI & Computer vision

Smart lighting

Road Safety

Traffic management

Smart Water

Smart Grids

Heating, Ventilation, Air Conditioning (HVAC)

LACROIX

Symbiose: Building the new 4.0 electronic factory in France

Industrial innovation   Sustainable and environmental innovation   Social innovation

Symbiose: Smart Industry
From vision to action

Deploying automation & digitization tools wherever impactful

Digitized processes	Automated production
Cobots	3D printers
Augmented Reality	IoT platform
IT Architecture	CRM & SRM

€25 million investment

6 SMT lines

18 partners

Saint-Pierre-Montlimart
Old factory

- 450 people*
- 68M€ revenue*
- 12 000 sqm area

*2019

Beaupréau-en-Mauges
New factory – Symbiose

- 450 people*
- 100M€ revenue*
- 19 000 sqm area

*2027

5G - Selected Use Cases

Energy monitoring and controlling of the whole factory

Operators supported by augmented reality

Co-innovation Project with

Automatic Optical Inspection

Secured & real-time monitoring of the factory

Wireless, secured and real-time factory (LAN to WAN)

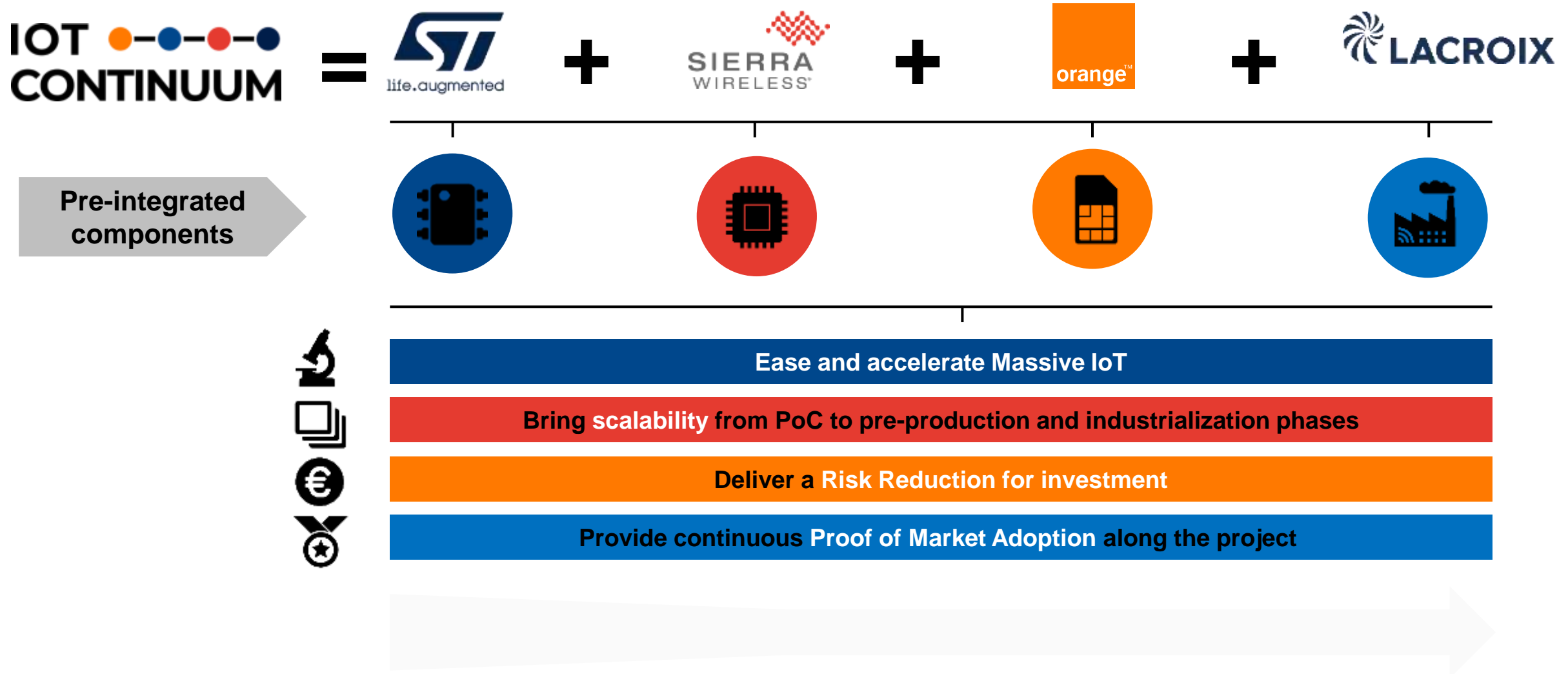**Dynamically guiding AGV (Automated Guided Vehicle)**

- Enable **Flexibility / Adaptability** with **mobility** (wireless,)

- **Speed** (decision, increasing components and material flow...)

- Higher **reliability** (quality, security, redundancy...)

- Increased and flowless information for **optimum decision** (digital twin, decision based on data...)

- "Dynamic automatization" for **best efficiency**

- **Sustainable factory** (carbon emission, energy, water and consumption, maintenance...)

- More value added for our **colleagues/operators**

- Transform the **full value chain** (forecast, ordering...)

- European electronic manufacturing **boosting reshoring / near shoring**

- **Hybrid 5G network** is the best fit for our needs

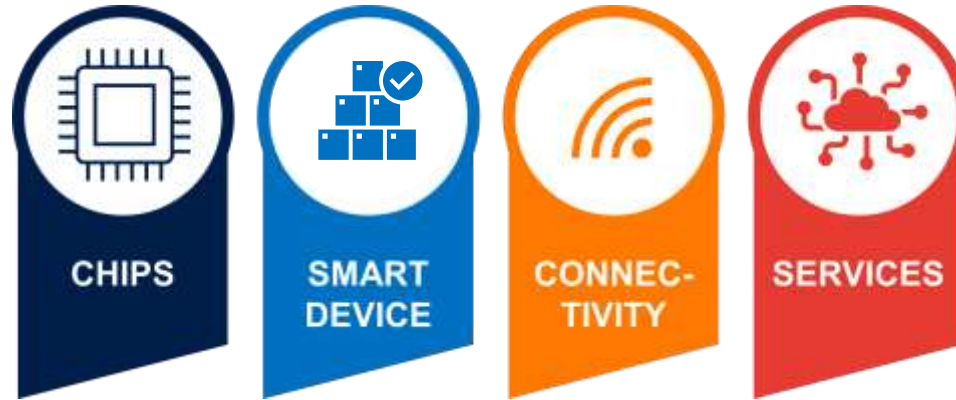- Very challenging to go from 5G IoT device prototyping to deployment

IoT Continuum for 5G :
Continuity Throughout Prototyping to Industrialization & Deployment

IOT CONTINUUM = **ST** life.augmented **+** **SIERRA WIRELESS** **+** **orange**™ **+** **LACROIX**

Pre-integrated components

Ease and accelerate Massive IoT

Bring scalability from PoC to pre-production and industrialization phases

Deliver a Risk Reduction for investment

Provide continuous Proof of Market Adoption along the project

IoT Continuum: Practical Outcome in Numbers

VALUE CHAIN

CHIPS | SMART DEVICE | CONNEC-TIVITY | SERVICES

ST life.augmented — SIERRA WIRELESS — LACROIX — orange™

Reduce DIY cost by **> 60%**

Reduce development time by **8-15 months**

Reduce time to margin **> 10 months**

PROJECT PHASES

1 START with prototypes <10 pcs
Start
Test & Learn approach
~1-10 days

2 PROVE the value <100 pcs
Prove
Check viability & benefits
~4-12 weeks

3 DEPLOY on industrial scale >1000 pcs
Deploy & Scale
Roll-out efficiently with predictive costs
~12-24 weeks

PoC Proof of concept → MVP Minimum viable product → Scale-up Toward industrialization

*The Total Economic Impact™ of Sierra Wireless Octave

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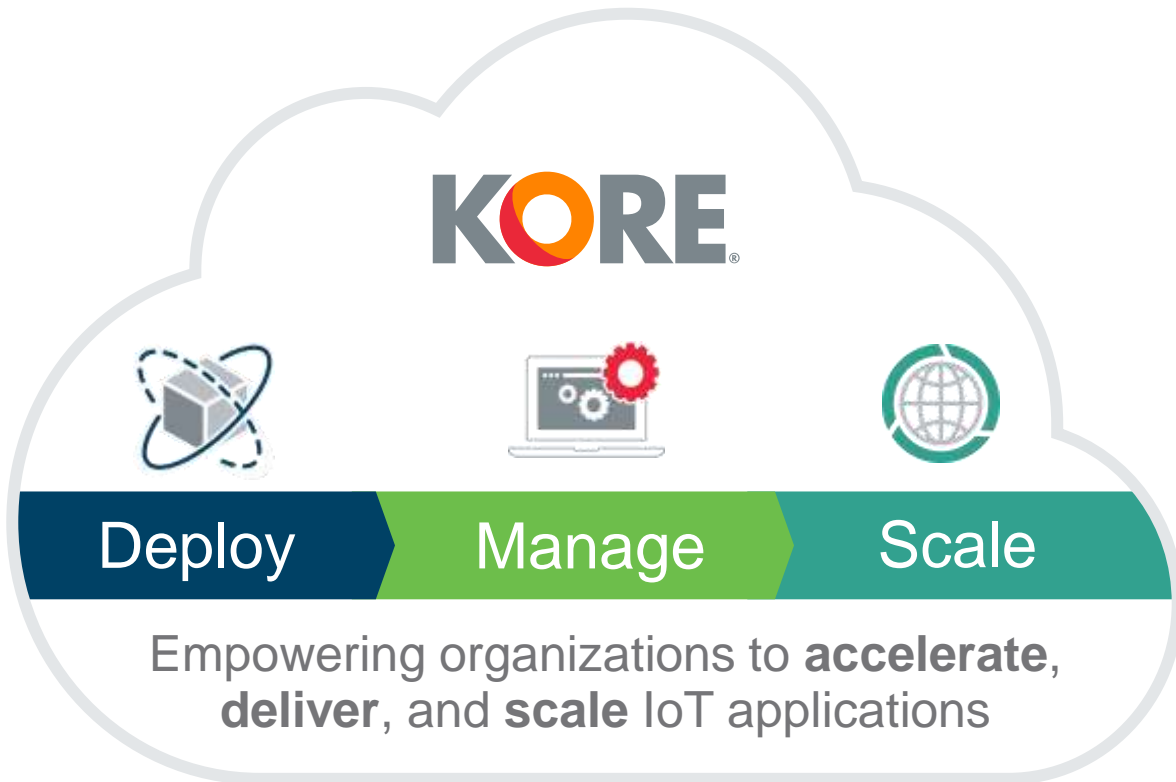# Private Networks and the Next Industrial Revolution

Presenter: Fawad Noory, KORE Senior Director, Private Network, CEaaS

January 18, 2022

Global Leader in IoT

Enabling Faster Time-to-Market and Scaling of IoT Applications

KORE®

Deploy | Manage | Scale

Empowering organizations to **accelerate**, **deliver**, and **scale** IoT applications

190 Countries Covered;
8 Global Data Centers

3,600+ Customers

12M+ Devices Managed

KORE®

The Next Industrial Revolution is Arriving

INDUSTRIAL REVOLUTION
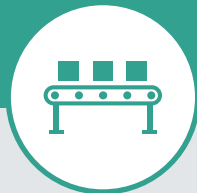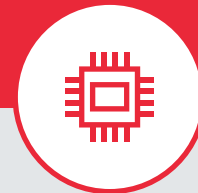TRANSFORMING INDUSTRIES AND INNOVATION

INDUSTRY 1.0

INDUSTRY 2.0

INDUSTRY 3.0

INDUSTRY 4.0

1784

1870

1969

TODAY

Private Network Disrupting Industries

Today's World

- Industrial networks are predominantly wired setup, and in some areas, Wi-Fi is also utilized.

- Current systems are built to operate in a ruggedized environment to achieve higher reliability and longevity.
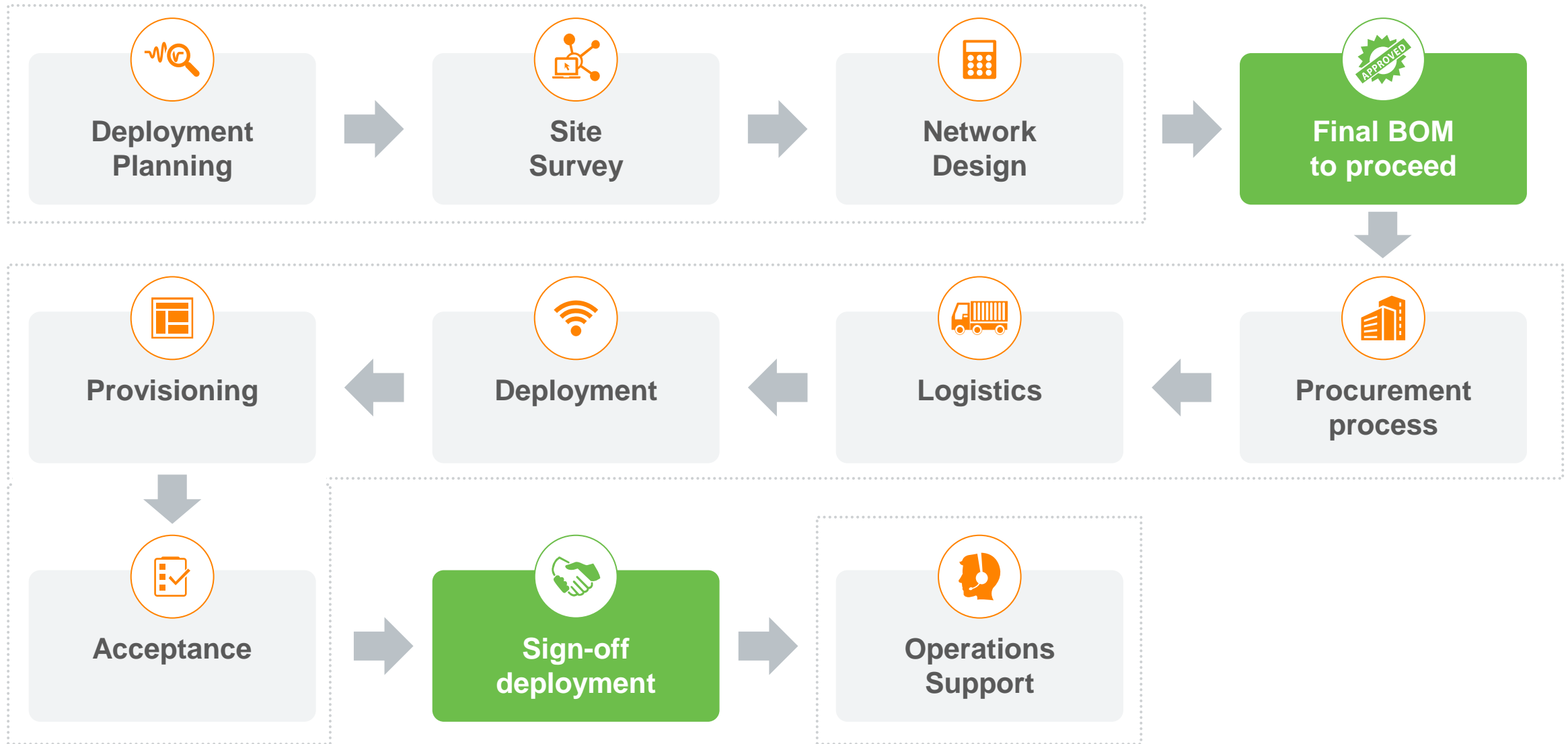
Tomorrow's World

- For companies who want to participate in Industry 4.0, a 5G network is likely in their future.

- Manufacturers require 5G capabilities to implement the transformative applications that drive smart factories, digital transformation, and the Internet of Things (IoT).

- 5G is as easy to deploy as Wi-Fi.

KORE

The Path to Private Network Adoption

Deployment Planning → Site Survey → Network Design → Final BOM to proceed → Procurement process → Logistics → Deployment → Provisioning → Acceptance → Sign-off deployment → Operations Support

Private Network Industrial Applications

A snapshot of use cases benefitting from private network infrastructure

Not exhaustive

	Large volume of mobile equipment	Geographic dispersion of assets	Machine process criticality	Data throughput capabilities
Industrial use case examples	Automated guided vehicles and modular production units	Real-time tracking of products, devices, and sensors	High-precision tools and condition controlling	Augmented and mixed reality (maintenance digital twin)
Need	**Flexibility**	**Control**	**Time criticality**	**Information sharing**
Latency	● ● ●	● ●	● ● ●	● ●
Coverage	● ●	● ● ●	●	●
Data throughput	●	●	● ●	● ● ●
MMTC	●	● ● ●	● ●	●
Reliability	● ●	●	● ● ●	● ●
Security and safety (decentralized edge computing)				
Sector examples	Logistics, warehousing	Airports, seaport, shipyards, mine premises	Chemical processing plants	Manufacturing and assembly halls

Requirement: Low ●   to High ● ● ●

KORE

Industrial Revolution 4.0 Outcomes

Data-driven design

Learnings from systems or machine operations are fed back into the design of these assets and the underlying components and subsystems

⊘ Outcome

Cost-and time-optimized design and more predictable operations

Data-as-a-service

On-demand access to relevant, real-time data streams in easy-to-use formats for aggregation and analysis

⊘ Outcome

Enhanced understanding of customers and operation

Real-time visibility

Live monitoring of assets, production, and operations to proactivity identify and resolve issues

⊘ Outcome

Reduce downtime and improved productivity and output

Predictive maintenance

Real-time machine performance data is correlated with contextual datasets to determine optimal and individualized maintenance cycles

⊘ Outcome

Substantial economic benefits in both operations and supply chain

Inventory planning

Demand sensing leverages real-time internal, business, and external data to enable more accurate inventory levels and replenishment planning

⊘ Outcome

A more agile company, optimizing resources and leading to higher return on investment

5G + Industrial Revolution 4.0 Outcomes

Outcome
Cost-and time-optimized design and more predictable operations

Outcome
Enhanced understanding of customers and operation

Outcome
Reduce downtime and improved productivity and output

Outcome
Substantial economic benefits in both operations and supply chain

Outcome
A more agile company, optimizing resources and leading to higher return on investment

Trusted Partner
KNOW Telecom industry and can guide navigate to select the right path

Technology
Select the right technology partner and technology solution which can achieve the desire outcome

Clear ROI
Set forth stringent requirement on identifying and quantifying clear Return on Investment.

It's a Journey
From top management to technician on the shop floor, level set the understanding and understand it's a journey.

Continuous Improvements
Demand continuous improvement and track progress.

The Enterprise Private Network Opportunity

Mitigating challenges, avoiding hurdles, and maximizing ROI

Download our eBook to learn more about:

- The market landscape for private networks
- The various spectrums and how to choose
- Key insights for implementation

Visit the link below to download the eBook

https://bit.ly/3K03o9a

*This link will also be sent in a follow up email from GSMA

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HOW NETWORK TESTING ENSURES 5G PRIVATE NETWORK PERFORMANCE

Anne Stephan
Vice President Mobile Network Testing
Rohde & Schwarz

ROHDE&SCHWARZ

Make ideas real

DRIVEN BY CONNECTION.
Shaping the future of communications, information & security

Our T&M equipment ensures that wireless networks and devices perform as required

Our network & cybersecurity solutions make networked working and learning safe

Our measurement solutions drive industrial development and production

How network testing ensures 5G private network performance   www.rohde-schwarz.com

5G enables business-/mission-critical use cases with private networks

Manufacturing

Warehouse

Mining

Ports

Critical Infrastructure

Oil / Gaz

Industrial use cases in Germany

Volkswagen recruits Nokia for private 5G network at flagship factory in Wolfsburg

Bosch puts first 5G campus network into operation

Siemens to bundle radio, core, devices into full 5G system for 'blue collar' Industry 4.0

Deutsche Telekom implements campus network for the Port of Hamburg

Improve quality and performance in the network lifecycle

SmartMonitor

SmartBenchmarker QualiPoc Android R&S®Freerider 4

SmartAnalytics

R&S®TSME6 R&S®TSMA6

Network Monitoring

Network Engineering

Quality Benchmarking

Analytics & Reporting

Interference hunting

Managed services

Network Optimization

Operations & Installation

R&S®ROMES4 QualiPoc Android R&S®TSMA6 R&S®TSME6

R&S®TSMA6 R&S®FPH 31GHz R&S®FSH

R&S®MNT100 & PR200 R&S®MobileLocator

R&S®5G STS R&S®FPH QualiPoc Android

How network testing ensures 5G private network performance   www.rohde-schwarz.com

Network Performance Score

Highway Test campaign
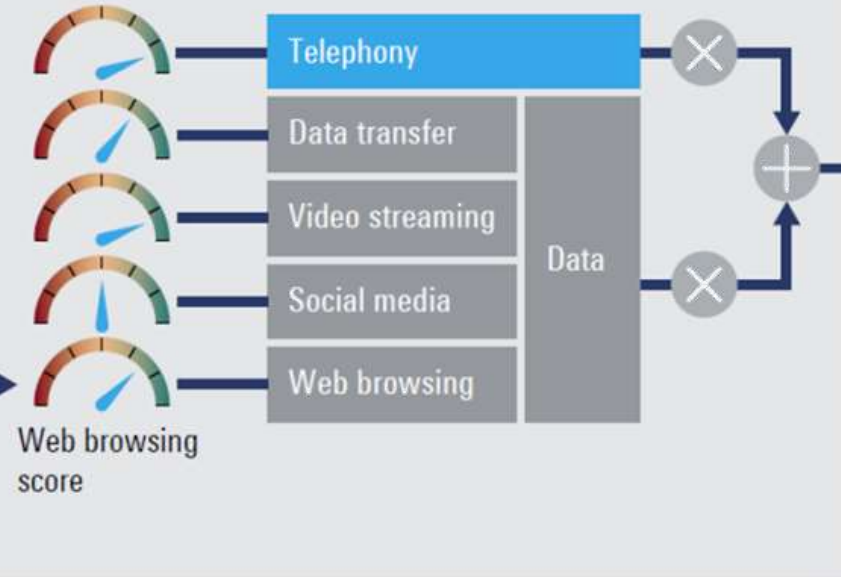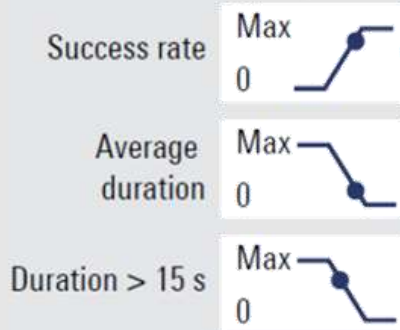
- ► **Technology-agnostic and transparent**
- ► **Makes different networks/countries/regions comparable**

Challenges of wireless communication in a factory

Industry-grade housing

Interference

Multi-path environment

Harsh radio environment

How network testing ensures 5G private network performance

www.rohde-schwarz.com
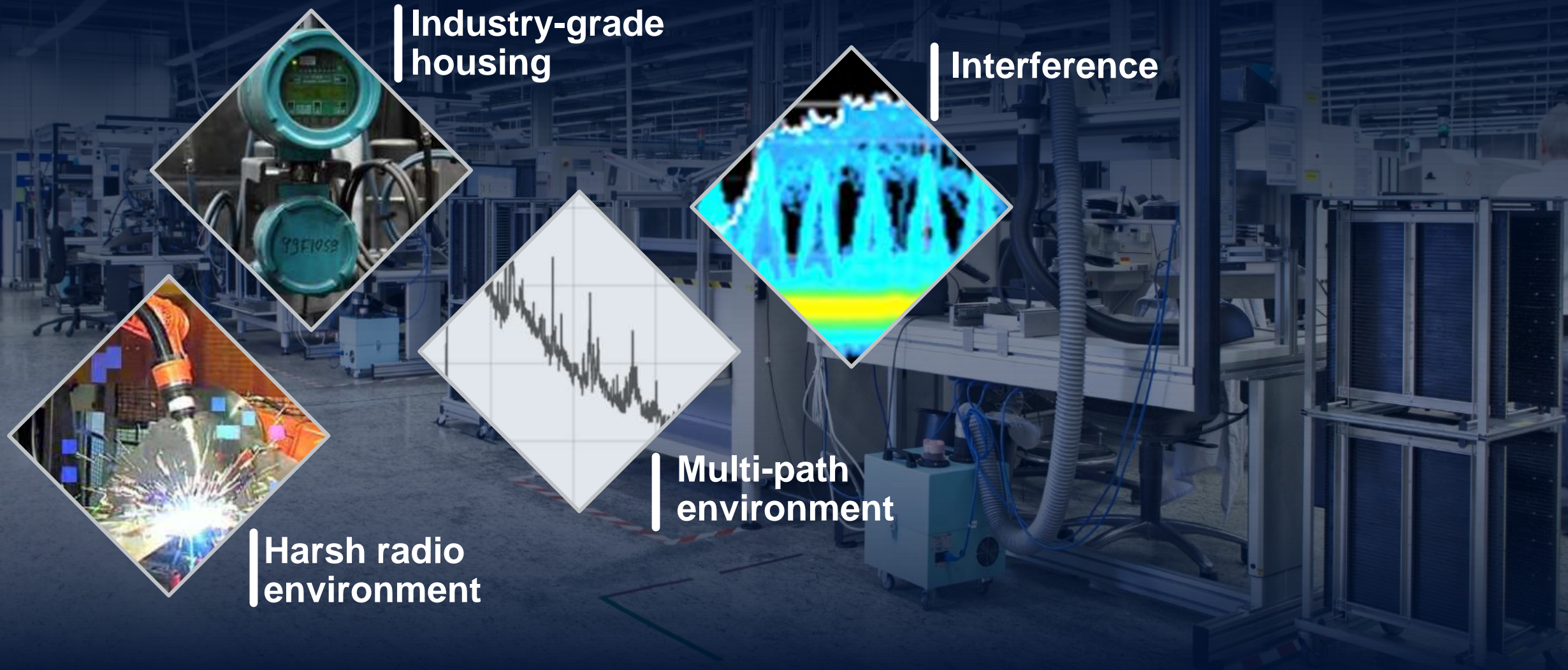
The magic triangle of communication in critical infrastructures

Latency

Reliability
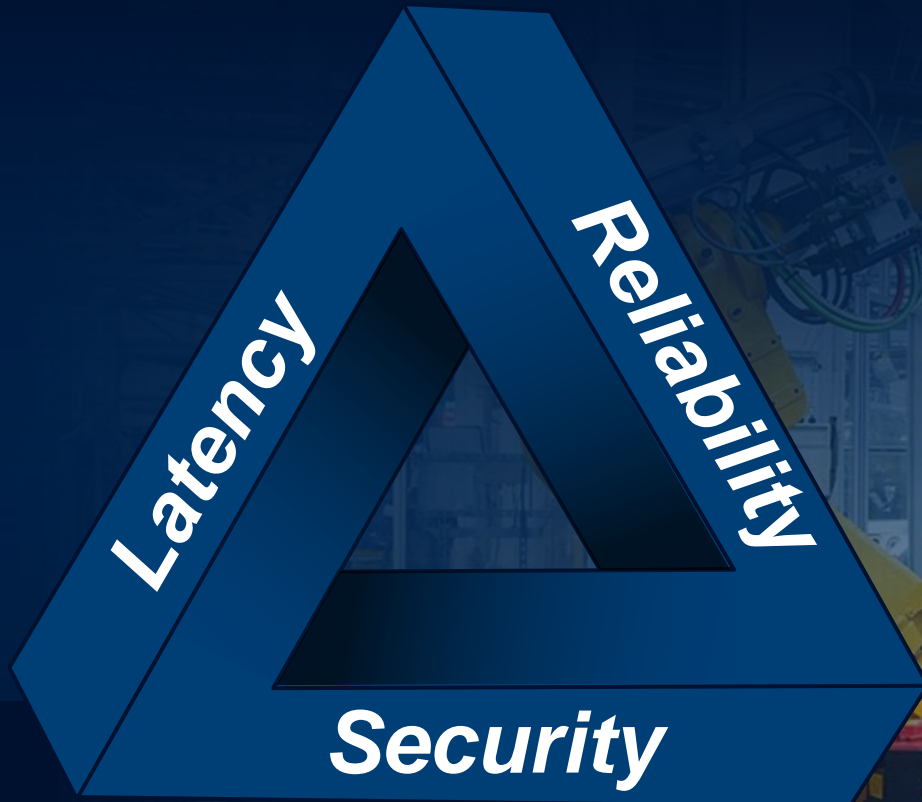
Security

► Security is a must!

► Reliability is essential

► Strongest latency requirements apply for specific applications (e.g. AGV)

► Network testing ensures the expected quality

► **Different level of Quality is required in various dimensions compared to public networks**

How to ensure network performance in a factory
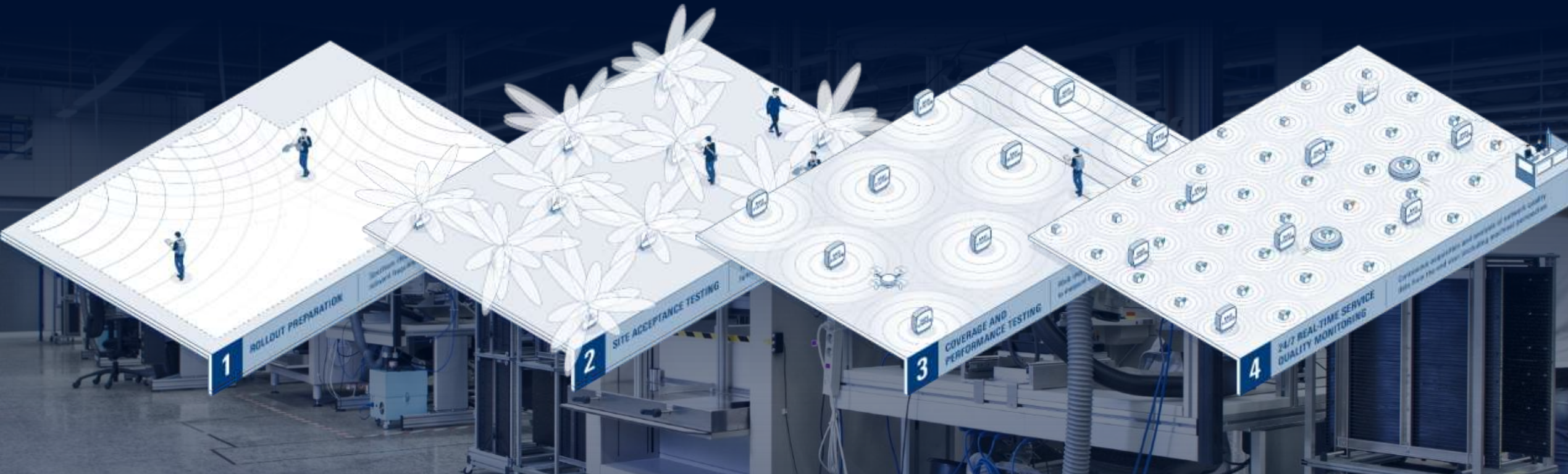
• **Spectrum Clearance** • **Interference Hunting**	• **Functional Testing** • **OTA RF signal verification** • **Signal Decoding**	• **Network optimization** • **5G Performance Test** • **Connectivity Test**	• **Real-time QoE monitoring** • **Data Analytics with ML** • **Data Collection**

5G - QoE in a smart factory environment

5G use cases become interactive and real-time

► AR/VR – trend towards VR

► Collaborating robots (cobots)

► Automated Guided Vehicles (AGV)
(low latency)

► Service assurance becomes more critical

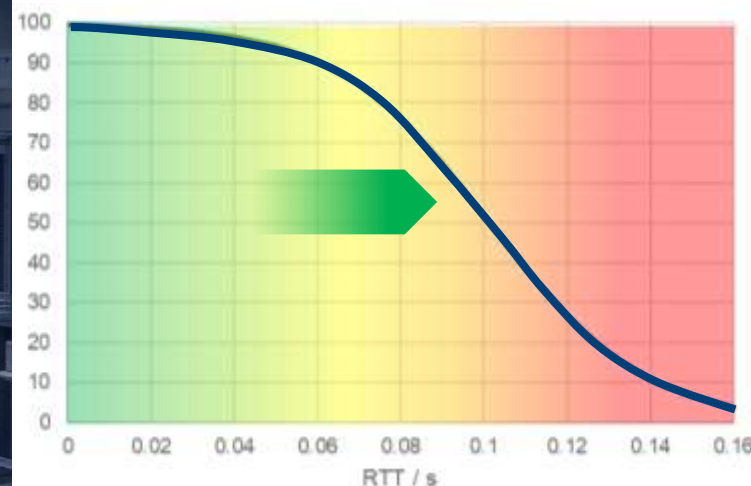► **Additional network test needed to score the quality of interactive use cases**

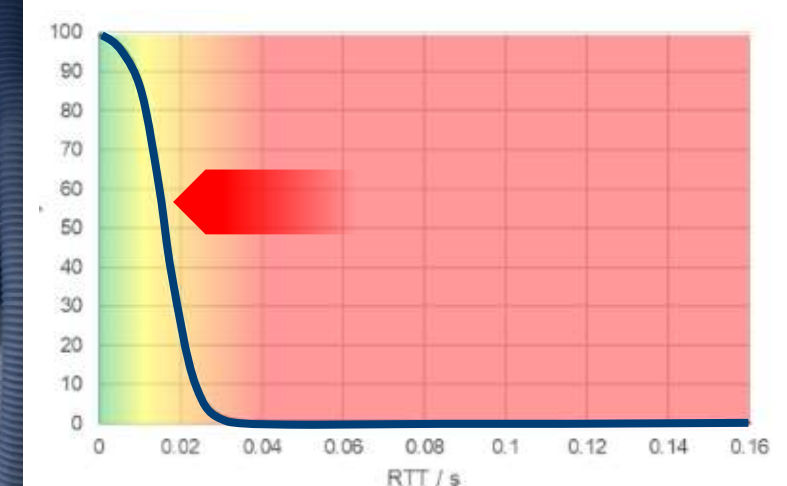# Interactivity Test = Bitrate + Latency + Continuity

Interactivity Score: **e-Gaming real time**

Packet loss
Delay variation

Perfect | Tolerable | Critical | Fail

RTT / s
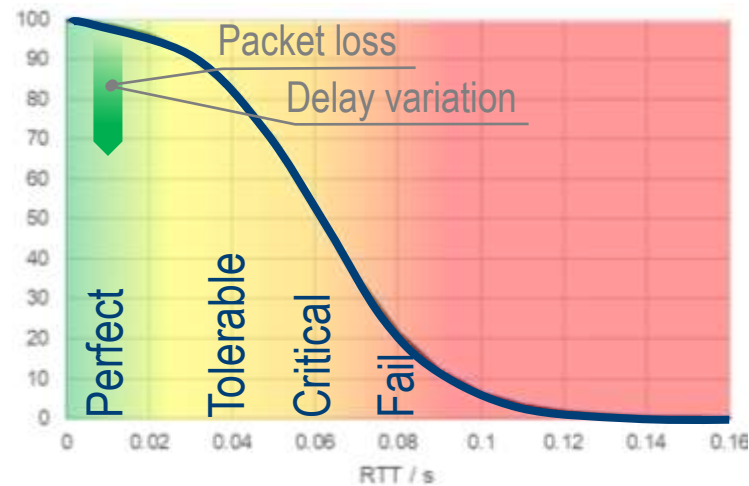
Interactivity Score: **VR retail shopping**

RTT / s

Interactivity Score: **Robot control**

RTT / s

► **A generic model for interactive applications (human + machine)**

Mobile network testing solutions for every use case on the factory floor

Rollout preparation	Site acceptance testing	Coverage & performance testing	24/7 real-time service quality monitoring
Spectrum clearance and interference hunting	Functional tests, RF analysis & signal decoding of new base stations	Ensure connectivity and Quality of Experience (QoE) by regular walk tests	Continuous analysis of network quality data from end-user (machine) perspective

R&S®FPH

R&S®5G STS

R&S®TSMx6

R&S®SmartMonitor
R&S®SmartAnalytics

Building secure wireless networks in a factory starts with building & operating reliable networks

factory automation with private 5G

- Spectrum clearance
- Deployment and acceptance
- Operation and trouble shooting

Rohde & Schwarz installs and tests 5G campus network in its production facility

Thank you very much

ROHDE&SCHWARZ

Make ideas real

Rohde & Schwarz

THANK YOU FOR ATTENDING!

GSMA 5G IoT for Manufacturing

https://www.gsma.com/iot/manufacturing/

GSMA IoT on LinkedIn

http://gsma.at/iot

GSMA 5G IoT for Manufacturing Industry Resources

https://www.gsma.com/iot/manufacturing/resources/

GSMA IoT Newsletter

https://www.gsma.com/iot/newsletter/

GSMA IoT Marketing Group

https://www.gsma.com/iot/iot-marketing-group/