



MFA[™]

Unlicensed Spectrum for 5G Private Networks? The Answer is Yes!

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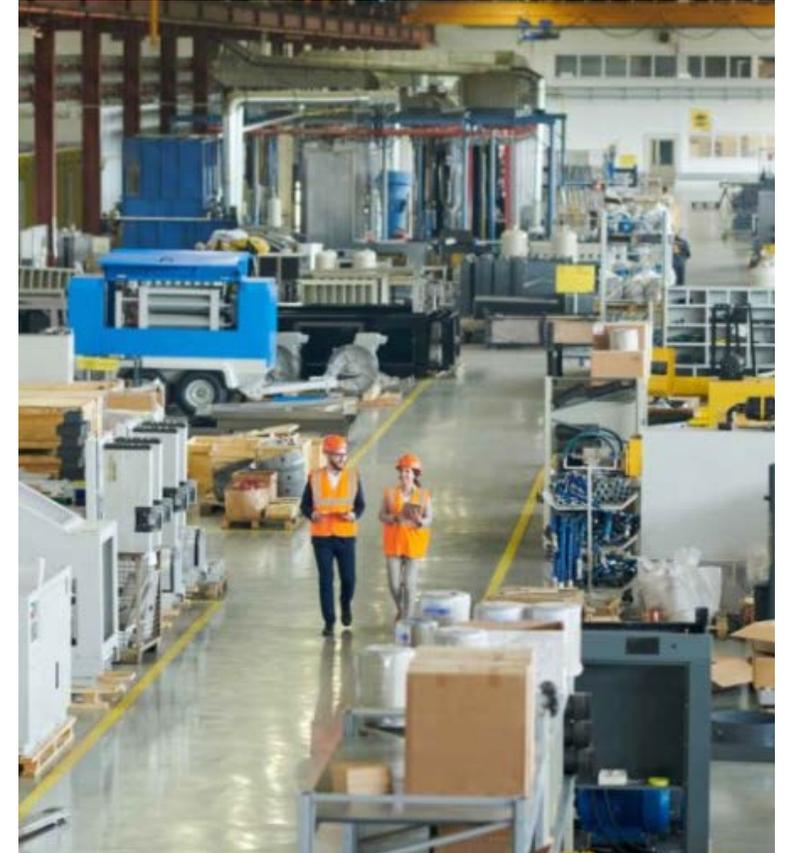
The private 5G opportunity: industrial manufacturing

Pain Point:

- Costly infrastructure maintenance & loss of production due to machine downtime
- Rigid production layout due to fixed line connections
- High costs associated with cabling new production sites and replacing damaged cables
- Lack of real-time analytics possibilities
- Personnel safety concerns

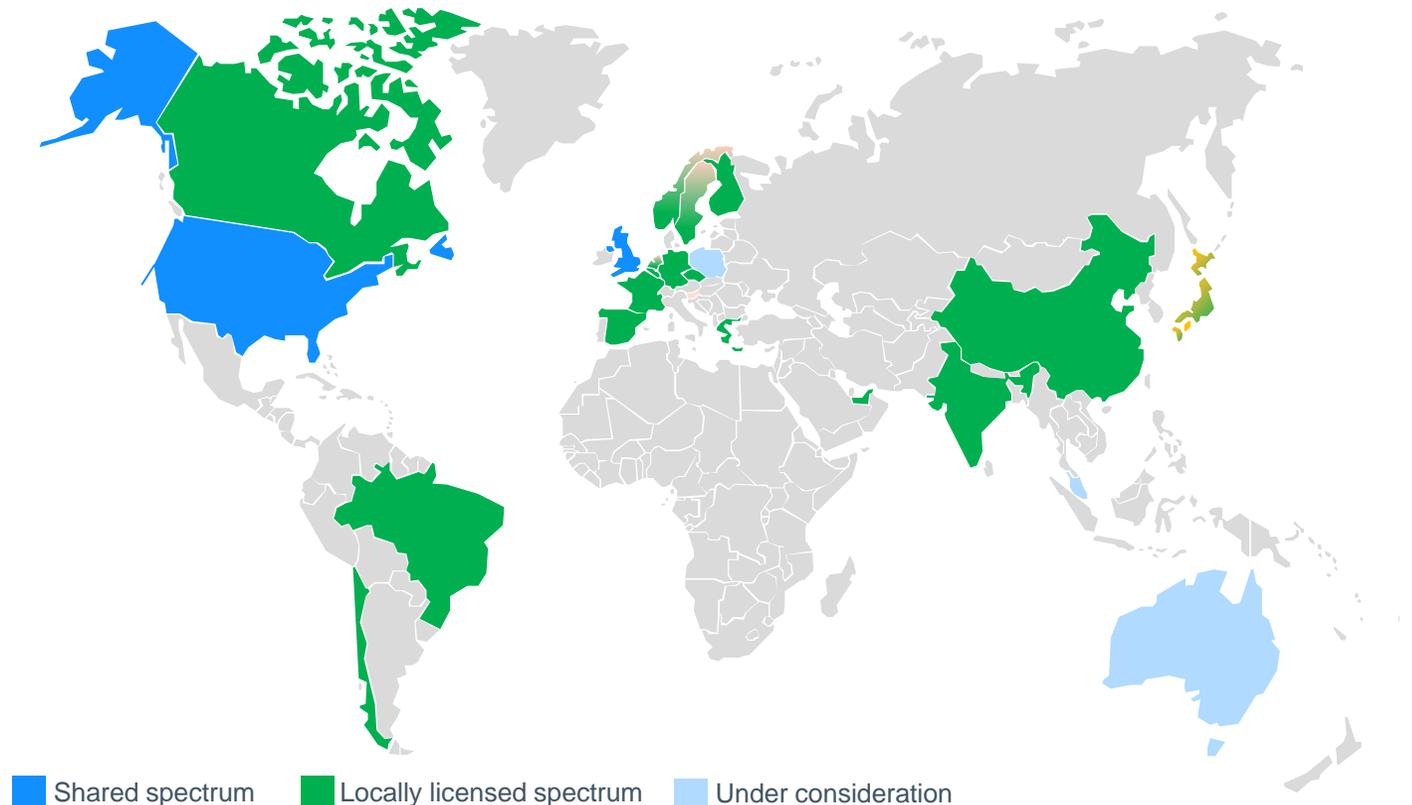
Private 5G Opportunity:

- Enable flexible factory layout by mobilizing production assets
- Minimize production standstill resulting from unplanned machine downtime by enabling predictive and preventative maintenance
- Profit from a mobile workforce equipped with the latest AR/VR devices



The unlicensed spectrum opportunity

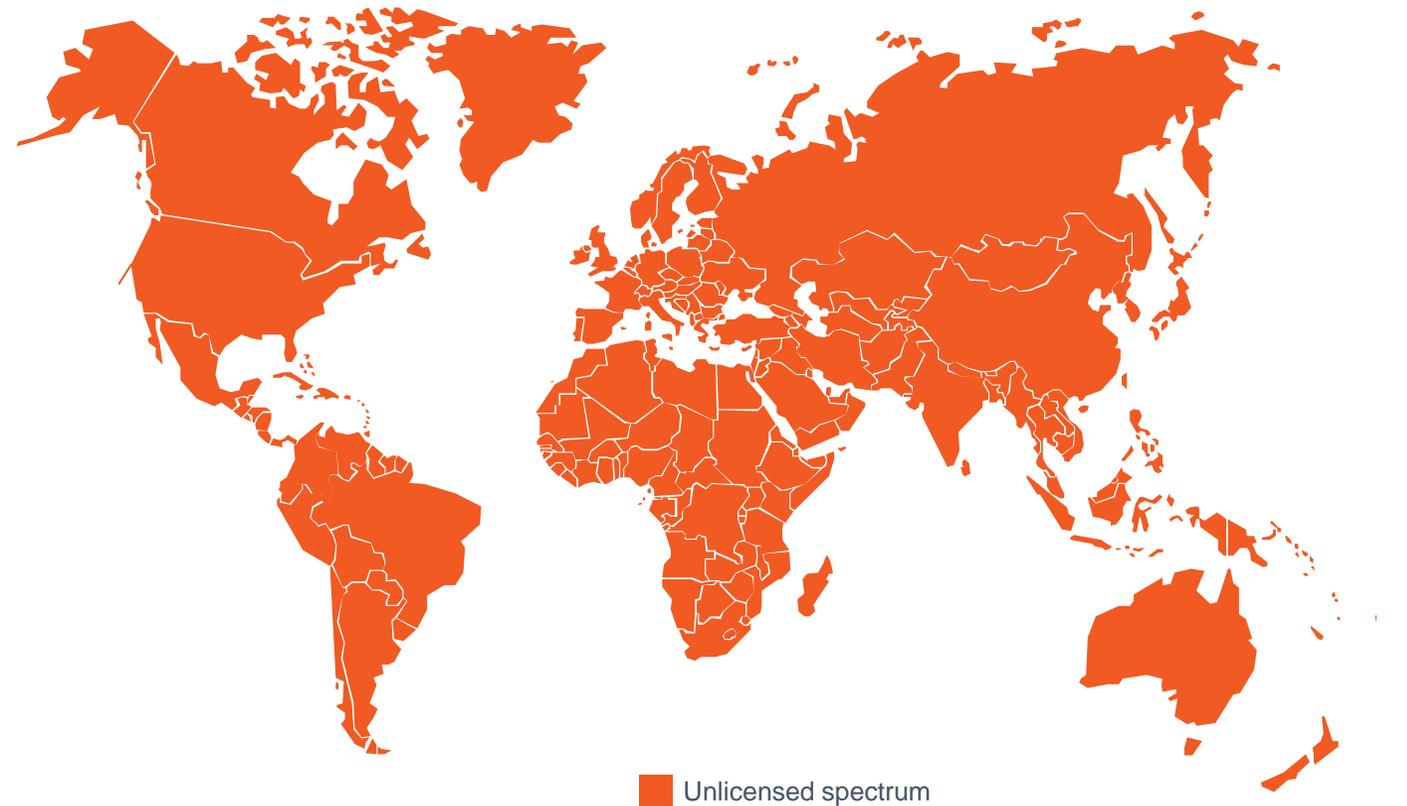
- Different initiatives to broaden enterprise access to mobile network spectrum:
 - Spectrum sharing between public authorities & enterprises (e.g., CBRS)
 - Spectrum sharing between CSPs & enterprises (e.g., spectrum sharing in the UK)
 - Spectrum sharing on the 1.9 GHz band (e.g., Japan)
 - Locally licensing spectrum for Enterprises (e.g., 3.6 – 3.7 GHz in GER)
- **5 GHz unlicensed spectrum available globally today**



Source: ABI Research

The unlicensed spectrum opportunity

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The role of MFA

- MFA (MulteFire Alliance) is an international organization that is championing the global industry adoption of private cellular networks using MFA-defined MulteFire specifications for LTE and Uni5G technology blueprints for 5G.
- With Uni5G or MulteFire, enterprises can deploy their own optimized, reliable and secure private network in unlicensed spectrum or complement their existing private network deployment in locally licensed or shared spectrum.

Support
technology
standardization
and
evangelization

Build out new
use cases and
business models,
such as private
IIoT networks

Enable a robust
ecosystem of
certified
interoperable
devices

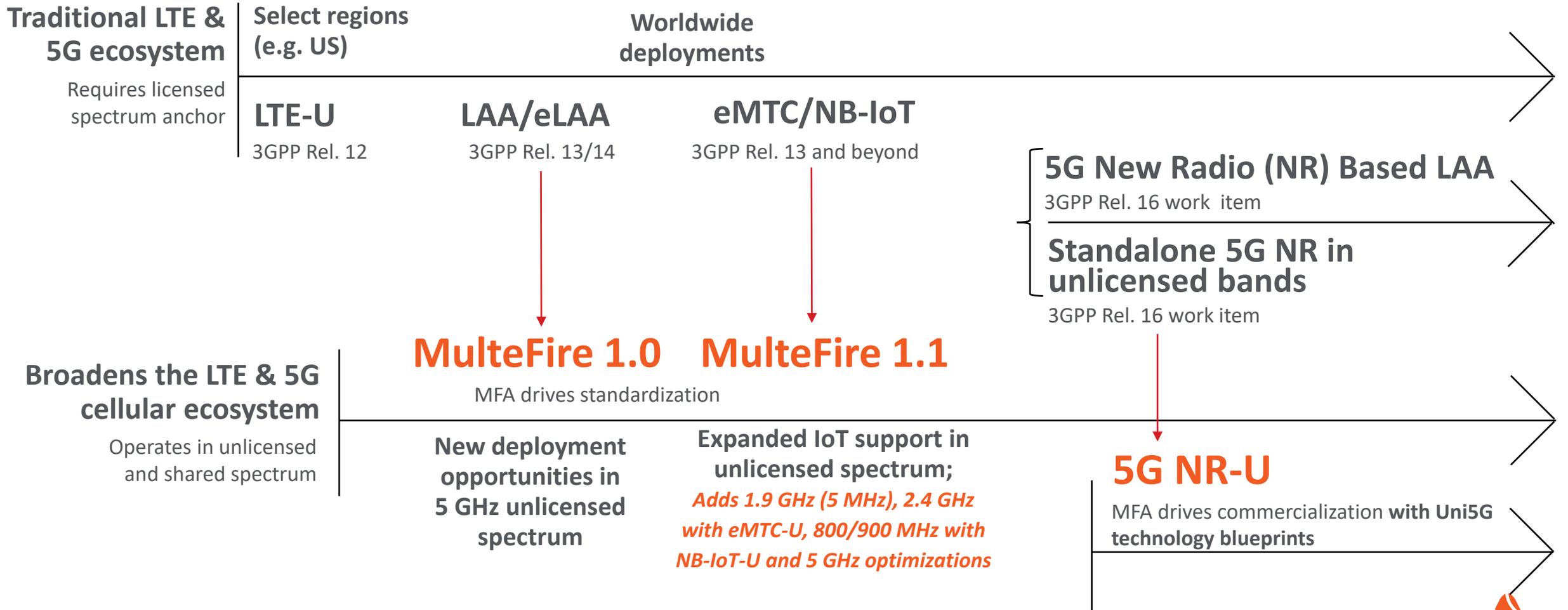


Introducing MulteFire and Uni5G

- **MulteFire** is a **4G/LTE-based technology** that **operates standalone in unlicensed or shared spectrum**, enabling industry verticals to deploy their own private wireless network with Wi-Fi-like deployment simplicity and LTE-like performance.
- **Uni5G** is a **technology blueprint** that leverages 3GPP 5G standards to define **profiling and classification requirements**, enabling industry verticals to efficiently deploy their own optimized, reliable and **secure 5G private network** in unlicensed spectrum.



MFA roadmap



MulteFire-based or Private Network for Industrial IoT

Employee
access



Automated Guided
Vehicle (AGV)



Security
camera



Operator
access



Shipment
arriving



Intelligent Edge
connectivity +
computing



Industrial

Factories, warehouses,
power plants, logistics,
refineries

MulteFire 1.0 certification

- Ensures that MulteFire devices are interoperable and conform to the MulteFire 1.0 specification
 - Tests eNodeB devices and UEs
- The program has certified Nokia's small cell and customer premise equipment (CPE) as the first MulteFire 1.0 compliant devices
- DEKRA Malaga has been named the first Authorized Test Lab for the certification program
- MulteFire certified devices can enable Industry 4.0 use cases in unlicensed spectrum today

Summary

- Private 5G will be an important enabler for enterprise digitalization
 - Unlicensed spectrum provides global connectivity for different production sites and enables industry verticals in countries with no spectrum liberalization initiatives
 - 5G and MulteFire operating in unlicensed spectrum offer industry verticals an alternative opportunity to deploy their own private network and complements existing deployments in locally licensed or shared spectrum
- MFA enables an interoperable ecosystem for private cellular networks
 - Delivering Uni5G technology blueprints that will outline the 5G NR profiling and classification requirements that enable industry verticals to efficiently deploy their own 5G private network
 - Certifying MulteFire enabled devices so industry verticals can deploy their own private network in unlicensed spectrum today

