MulteFire takes wireless deeper into the enterprise

New business models, more use cases, greater efficiency

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MulteFire expands the role of wireless in the enterprise

Wireless has become the default access mode:

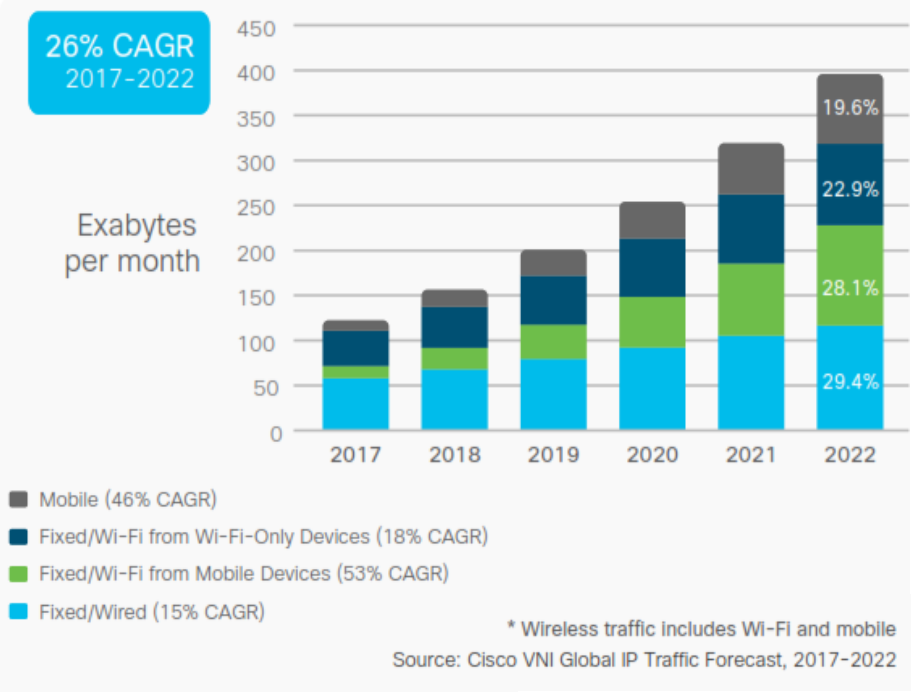
- Voice and data
- Indoor and outdoor
- Phones and laptops, IoT

Wireless connectivity is creating a pervasive blanket

- Horizontally: Connect to the internet
- Vertically: Deeper in the home, in the enterprise

MulteFire fits the enterprise needs

- Private networks or neutral host, no relationships with operators
- Works alongside Wi-Fi and LTE



MulteFire capabilities that matter to the enterprise

Air interface	Ease of deployment and operation	Capacity	Data rates	Latency
Coverage	Mobility	Interference management	Traffic management	Dependability
Security and safety	Authentication	Voice	Positioning	Edge computing
Network slicing	NB-IoT	eMTC	Number of connections	Evolution to 5G

New standalone business models

Private networks

Ownership: Enterprise

Deployment and operations: Enterprise, neutral host, integrator

Targets and revenue opportunities:

- Customers internal to the enterprise
- Visitor access
- Mobile operators and subscribers

Benefits to the enterprise over private networks:

- Customized and optimized to meet the enterprise specific requirements
- Greater control over network deployment, performance and operations
- Access to the network gated by the enterprise
- Timing and funding set by the enterprise

Neutral-host networks

Ownership: Neutral host or enterprise

Deployment and operations: Neutral host

Targets and revenue opportunities:

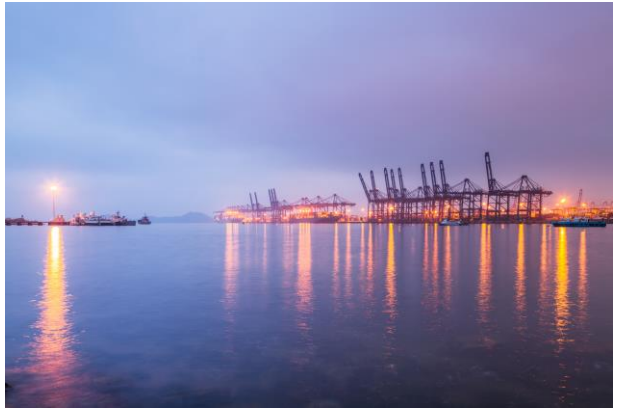
- Mobile operators and other service providers, enterprise and its staff and connected devices
- Tenants
- IoT services
- Visitor access

Benefits to the enterprise over private networks:

- Less direct involvement in network deployment and operations
- Lower burden on enterprise resources
- Easier establishment of roaming relationship with mobile operators and other service providers

Moving beyond use cases: diversity will close the business case

- MulteFire can support many enterprise use cases, in many verticals
  - Their value to the enterprise is straightforward
  - But it is hard to build a business case for MulteFire (or any other technology) on a single use case
- A robust business case requires multiple use cases within the enterprise premises
  - Diversity of requirements among use cases increases utilization of network resources
  - Synergy increases value of individual use cases
  - MulteFire helps the enterprise to manage and optimize use case performance in a holistic way



MulteFire capabilities contribute to many use cases (1)

Enhanced Mobile Broadband (eMBB): Capacity and data rates

- Video security and surveillance; VR/AR, 360° or 4K video (training, marketing, sales, entertainment); drones

URLLC: Latency, jitter

- AGV, AR/VR, and robotic control; applications using haptic control/vestibular-reflex; power management

Coverage

- Airport / airplane communications; field monitoring, fertilization, pesticide application, harvesting, stock tracking in agriculture

Mobility

- Remote management of forklifts, cranes, lifters, conveyors, industrial trucks, and assets within the enterprise premises, e.g. for AVG, tracking, routing, navigation, fleet management

Security

- Applications in the healthcare (e.g., protection of patients) financial, or military verticals

Dependability: Reliability, availability, maintainability, safety and integrity

- Power generation and distribution, automated manufacturing and robotics, vehicles and healthcare have very tight dependability requirements; in healthcare, patient monitoring

MulteFire capabilities contribute to many use cases (2)

IoT optimization: NB-IoT and eMTC

- Narrowband environmental or utilities monitoring and control, sensors and actuators; narrowband IoT devices that require (e.g., wearable devices for healthcare staff and patients) and/or mobility (e.g., asset tracking)

Authentication

- SIM authentication and non-SIM-based authentication to connect IoT devices directly to enterprise networks

Positioning

- Robotics, tracking, routing, asset tracking; employee tracking, security, and safety; management of travel venues

Voice

- PBX replacement; wearables; human-machine interfaces; voice continuity with public networks

Local processing: Edge computing

- Predictive maintenance, diagnostics, logistics, building monitoring and control (e.g., power, heat, security), fire/fault/outage detection, employee access control (e.g., using biometrics or face recognition) and, in general, any application that relies on local information and operates on local infrastructure benefit from edge computing
- Analysis of video inputs (e.g., from surveillance cameras) for mission-critical applications, vehicle control, AV/VR and all URLLC applications may require edge computing to meet the latency requirements

Network slicing

- Coexistence of URLLC and less latency-sensitive applications, e.g., in a hospital or manufacturing plant

MulteFire as a pillar of the fourth industrial revolution: Impact on the enterprise

Introduce end-to-end automation

Manage increasing complexity of processes

Create a flexible environment

Improve quality of products and services

Reduce use of resources

Improve safety and security

Reduce costs

Increase productivity

Sustainable use of resources

Improve performance

Increase customer satisfaction and service

Improve health outcomes

Customize and optimize the wireless infrastructure

Strengthen staff relations

Source: schankz/Shutterstock

Q&A

About Senza Fili

Senza Fili provides advisory support on wireless technologies and services. At Senza Fili we have in-depth expertise in financial modeling, market forecasts and research, strategy, business plan support, and due diligence. Our client base is international and spans the entire value chain: clients include wireline, fixed wireless, and mobile operators, enterprises and other vertical players, vendors, system integrators, investors, regulators, and industry associations. We provide a bridge between technologies and services, helping our clients assess established and emerging technologies, use these technologies to support new or existing services, and build solid, profitable business models. Independent advice, a strong quantitative orientation, and an international perspective are the hallmarks of our work. For additional information, visit www.senzafiliconsulting.com, or contact us at info@senzafiliconsulting.com

Monica Paolini, PhD, founded Senza Fili in 2003. She is an expert in wireless technologies, and has helped clients worldwide to understand technology and customer requirements, evaluate business plan opportunities, market their services and products, and estimate the market size and revenue opportunity of new and established wireless technologies. She frequently gives presentations at conferences, and she has written many reports and articles on wireless technologies and services. She has a PhD in cognitive science from the University of California, San Diego (US), an MBA from the University of Oxford (UK), and a BA/MA in philosophy from the University of Bologna (Italy). You can contact Monica at monica.paolini@senzafiliconsulting.com