Industrial & Outdoor Wi-Fi Trends

FEBRUARY 9, 2022
AGENDA

Industry 4.0 Use cases
- AR/VR/XR
- Location & Tracking
- Real time interaction (AMR)

Wireless
- Less cabling
- Flexibility
- Lower cost

Requirements
- Coverage
- Reliability
- Latency
- Jitter

Technologies
- Private LTE/5G
- Wi-Fi 6-7
WIRELESS FOR INDUSTRY 4.0

Source: Broadband Wireless Alliance
WIRELESS for the “LAST HOP”

ADVANTAGES

- Flexible
- Faster to deploy
- Less cabling-less costs
- Access Anywhere

CHALLENGES

- Challenging RF environment: concrete, metal, moving parts, dust, columns,…
- High number and variety of devices
- Hand off between access points
- Mission critical applications not tolerating minimum downtime
REQUIREMENTS

- High bandwidth
- Wide connectivity area for fleet maintenance
- In-house logistics for manufacturing
- Augmented reality
- Remote access and maintenance
- Process automation - plant asset management
- Process automation - monitoring
- Human remote control of automation equipment
- Communication between controls
- Process automation - closed loop control
- Mobile control panels with security functions
- Mobile robots
- Motion control

- High density
- Massive wireless sensor networks

- Low latency
Wi-Fi or Private LTE?

PRIVATE CBRS/LTE/5G

- CBRS mostly GAA spectrum
- Maintaining and optimizing an LTE network is more difficult than a Wi-Fi network.
- CBRS device ecosystem itself is still limited (198 devices)
- Roaming issues
- Non-SIM devices
- 5G network slicing will require a 5G standalone (SA) core and SA devices.
- Unclear whether network slicing is scalable

Wi-Fi Developments

- Wi-Fi 6 and 6E- Wi-Fi 6 brings improvements over Wi-Fi 5
- Wi-Fi becoming more deterministic with TSN IEEE 802.1AS -2020 & 802.1Qbv
- Wi-Fi QoS Management by the Wi-Fi Alliance
- Multi-link operation (MLO)
- AFC for outdoor
5G and Wi-Fi 6 have complementary uses

Which next-generation networking technology, 5G or Wi-Fi 6, does your organization prefer to use for each of the following scenarios?

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Prefer 5G</th>
<th>Prefer Wi-Fi 6</th>
<th>No preference</th>
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</thead>
<tbody>
<tr>
<td>Indoor use cases</td>
<td>25%</td>
<td>53%</td>
<td>22%</td>
</tr>
<tr>
<td>On-campus environment</td>
<td>28%</td>
<td>50%</td>
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<tr>
<td>Fixed use cases</td>
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<td>Outdoor use cases</td>
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<td>21%</td>
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<tr>
<td>Off-campus environment</td>
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<tr>
<td>Mobile use cases</td>
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<td>28%</td>
<td>17%</td>
</tr>
</tbody>
</table>

Wireless preferences of global networking executives for various use cases

Notes: N = 437 global networking executives. Not showing small percentages of “Don't know” responses.

https://tinyurl.com/ybkw2ww5
Thank You!

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