GIGAOM

Private 5G

NETWORK & EDGE

GigaOm CxO Decision Brief: Private 5G

Solution Overview

Betacom offers a fast, reliable, low-latency, secure private wireless service that supports large environments with more clients per access point than traditional Wi-Fi. Private wireless offers improved reliability, stability, throughput, and lower latency that is a huge benefit for Industrial IoT, as Wi-Fi often lacks in those areas for organizations moving into the Industrial Internet of Things (IIoT) arena.

Urgency

Betacom merits **immediate consideration for businesses** that rely on wireless connectivity for new wireless automation projects but struggle with poor wireless network performance—most notably, enterprises that cannot afford downtime due to connectivity interference because **productivity is measured in seconds and margins are thin.**

Benefits

Private 5G is best in large facilities with many IIoT devices deployed to improve operational efficiency.

Benefits include:
Increased bandwidth for modern automation applications

Reliable wireless connectivity for business-critical use cases

Low latency to adjust application performance based on real-time network analytics

In addition, Betacom's Airgap Protection monitoring and control architecture mitigates the risk of wireless network cyber attacks on Wi-Fi networks

Impact

Private 5G reduces the cost of support with traditional Wi-Fi in IIoT environments. It lowers costs by providing more reliable connections while generating fewer tickets, resulting in increased reliability and bandwidth from the private wireless network.

Risk

The technology is fundamentally understood, and the risk is very low, limiting issues to poor site surveys or incorrect solution specifications. Leveraging a service provider to deliver the private wireless solution can further reduce risk, sharing the responsibility for maintenance, support, and performance with a partner that is already an expert in the technology.

01 Solution Value
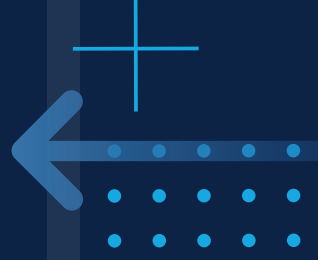
PRIVATE 5G IS A DEPLOYMENT of fifth-generation cellular wireless technology, ideally delivered by a solution provider that gives you a fast, reliable, low-latency wireless environment, purpose-built with IIoT in mind and layered with additional security features and monitoring capabilities when compared to traditional Wi-Fi technologies.

Every public spectrum has the same inherent issue: at some point, saturation of the radio frequencies impacts performance. Before cell phones became the default form of communication, we used handheld radios for onsite communication. When that public frequency became congested, the solution was to license private frequencies and run dedicated radios tuned to a specific channel for your organization. Wi-Fi faces a similar issue. In a controlled environment, Wi-Fi is great, but once control is lost and the environment gets weighed down by more devices running more sophisticated applications, things start to fall apart. To solve this problem, private 5G employs a dedicated spectrum and advanced security features to provide a highly controlled and reliable network for your most critical services.

With private 5G, you need less equipment to support large warehouse or factory environments with dozens, hundreds, or sometimes even thousands of connected devices. The downside to private 5G is twofold. First, since 5G is still nascent, there are very few industrial systems with 5G built-in, which means you need additional hardware to connect each device to the network. Second, you need to understand the legal restrictions on running private 5G. You cannot buy hardware from your preferred network vendor; connect it to your network infrastructure and turn it on. Instead, you can engage three ways: Buy the service from a mobile network operator (expensive), buy CBRS radios from a vendor (they come with access to the spectrum, but the enterprise needs to hire resources to install and manage the network), or buy the all-inclusive service from a private network service provider for a monthly fee.

The Betacom solution mitigates these problems. Since you consume 5G as a service, it manages your licensing and hardware requirements for you. Betacom has been around for decades as a provider and installer of networking infrastructure for large cellular companies, so it know the business. As the market began moving to 5G, it recognized both the challenges and opportunities, developing solutions to address them directly.

02 Urgency & Risk
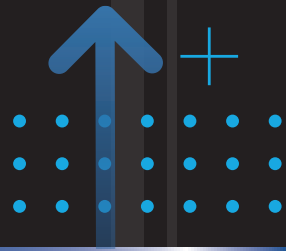
Urgency

If you are embarking on an initiative to improve the productivity and efficiency of your business, then private 5G is something you should evaluate. In order to get the expected return on your automation investment, you need wireless connectivity to simply work in every corner of the premises. Examples include streaming machine data using AI, where the application's latency is incredibly important for automated decision-making, implementing machine vision to improve safety and product quality where consistent high bandwidth is required, or deploying autonomous mobile robots to streamline operations. In all three use cases, private 5G provides solid, more secure wireless infrastructure that dramatically decreases downtime and increases operational efficiency.

Risk

The risk of deploying private 5G networks is very low. The technology is fully standardized and globally proven in mobile networks and is considered a fundamental enabler of the Industry 4.0 revolution. Most risks come from undefined use cases, poor site surveys, incorrect solution specifications, untrained staff, or security vulnerabilities. All of these are compensated for by selecting the right solution partner. 5G technology has specific requirements that existing technology teams may not clearly comprehend, so invest the time to understand what you want to achieve with private 5G to support your business and have a clear goal for the future.

> **"The primary risk from 5G comes from incorrect implementation, resulting in security or integration risks."**

The primary risk from 5G comes from incorrect implementation, resulting in security or integration risks. You can mitigate this concern by selecting the right partner, ideally, an institution with a proven track record that understands how to maximize the value of your 5G investment based on the needs and challenges of your business.
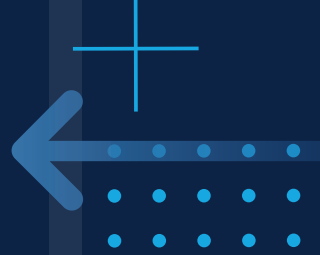
03 Benefits

5G AS A SERVICE (5GAAS) has several benefits over Wi-Fi and public 5G, including the fact that it is a private network owned and controlled by the organization. Among benefits to consider:

- Comes with a dedicated spectrum that does not incur license or bandwidth usage charges

- Affords all the security benefits inherent in the 5G specification, deployed on your premises, providing greater control and privacy

- Addresses reliability concerns for modern automation, where traditional Wi-Fi falls short

- Enables low-latency wireless for real-time applications

- Is simple to deploy and does not require hiring resources familiar with 5G configuration and management

- Ensures your traffic is never contested by a neighboring network, unlike the shared spectrum of Wi-Fi, giving you a consistent experience that Wi-Fi cannot match

Betacom augments these benefits with its Airgap Protection, a monitoring and control security architecture designed to mitigate the risk of attacks targeting wireless networks and infrastructure.

Ease of engagement and consumption is a core benefit. Betacom is simple to consume and available in the channel, so your existing vendor relationships make procurement easy.
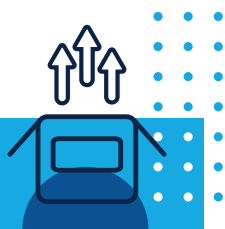
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04 Best Practices
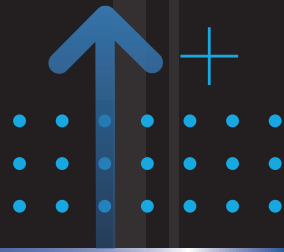
To get the most out of your 5G investment, you need to know upfront the requirements of your organization. Among best practices to consider:

- **Know what's critical to the business:** Understand where automation with robust connectivity can positively impact the bottom line. Identify which applications require maximum security, high-speed bandwidth, low latency, and mobility. Document current as well as future use cases so your network solution will perform now and scale for the future.

Carefully weigh your security risk. Do you fully understand potential threats and how to mitigate them?

- **Do it yourself or outsource:** Determine if you have 4G/5G expertise in-house to plan, design, install, and manage the network. Do you have the time and resources to train and keep your team current on new technology? Would a managed service provider be able to handle the build and ongoing management at a price you can afford? How do the costs and long-term risks compare?

- **Double down on security:** Carefully weigh your security risk. Do you fully understand potential threats and how to mitigate them? Will your data stay inside your premises or be exposed to the internet? How will security be monitored? Will you have periodic threat assessments? Can you or your solution provider detect and respond to threats before they cause serious issues?

- **Plan your investment:** Determine up-front and ongoing investment budgets and compare pricing models. Are you interested in a CapEx or OpEx model, or do you want the flexibility of both? Will you pay for access to your own data? Will a private network provider offer transparent pricing without hidden fees or sudden hikes? What will be the costs of staffing resources, monitoring, and maintenance?

05 Organizational Impact

Organizational Impact

There are two places we see organizational impact. The first is in technology. Private 5G networks reduce the support effort required to address connectivity challenges, channel saturation, and all other associated troubleshooting faced by Wi-Fi. Couple this with fewer access points, dramatically lowering your cost and maintenance requirements.

The second place private 5G will have a major impact is in the operations side of the house. The value of IIoT enabled by 5G allows businesses to deploy connected shop floors that deliver significant efficiency improvements and lower costs by providing live data for just-in-time manufacturing, production line efficiency, and predictive maintenance that mitigates unplanned outages due to equipment failure.

For organizations struggling with workforce supply issues, these efficiencies can compensate for worker shortages by improving the efficiency of the floor, reducing the number of people needed, and optimizing assignments to gain maximum benefit from the workers you do have. IIoT also provides the speed of insight necessary to determine where and when you will gain maximum advantage from your existing workforce and aid in better planning for workforce growth. You may find that the workforce you thought you needed isn't what you need at all. Having the data from your connected enterprise will allow you to validate these decisions and improve your strategic planning.

People Impact

There are no significant issues to affect staff beyond those you would expect with any other technology deployment. As you engage a partner in this scenario, you will lower the overall impact. Fewer tickets and less troubleshooting means a reduced load on your help desk, onsite support, and network engineering teams. These benefits can help businesses hard-pressed by skilled labor shortages, which make hiring and retaining IT staff difficult.

Also, integrating third-party support is simple and imposes a minor delay. We recommend some basic training on 5G for people tasked with supporting the wireless side of the network, as well as those who provide support for business units relying on the data from devices on the 5G network.

06 Cost Analysis
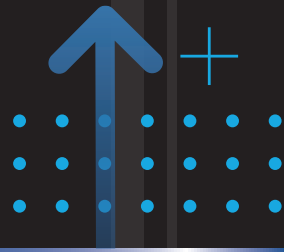
WE WORKED WITH BETACOM TO PERFORM a basic cost analysis using a large warehouse as a sample study and compared the 5GaaS pricing to standard 802.11 wireless costs. We made some assumptions using best practices as advised by the WAP manufacturer. Betacom's service includes management of the technology, so we factored a loaded employee at one-third utilization in the costs. The Betacom solution includes the network stack (wired and wireless) to support the 5G deployment. However, due to variances in pricing, it does not cover the cost of wireless or 5G connectivity for end-device connectivity.

Compared to Wi-Fi, the annual cost for private 5G came out nearly equal. There are a lot of variables in these calculations, but this shows that the cost of private 5G is very competitive with Wi-Fi and should not be an impediment to investigating the solution. It is important to note that we do not have a good way to calculate the security layer that Betacom provides with their solution in a way that is comparable to the wireless solution, so consider that cost as part of your evaluation when considering private 5G.

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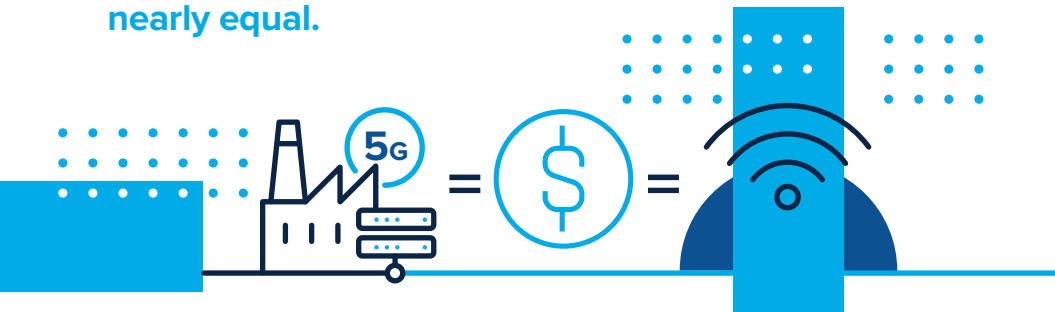
07 Solution Timeline
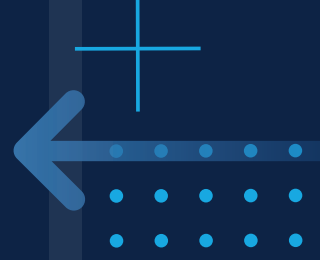
WHEN CONSIDERING A PRIVATE 5G SOLUTION, it is important for organizations to take a forward-looking approach that addresses current needs and anticipates future use cases. One private wireless network, properly designed, can cover multiple IIoT applications well into the future. As ever, careful planning is critical to success.

Plan, Test, Deploy

The planning phase of private 5G is by far the most critical. Ensuring your partner is a certified expert in deploying and managing 5G networks is essential for success. We do not recommend a "virtual survey," which we saw in some traditional Wi-Fi deployments, as the environmental considerations may be significant for 5G.

> **When testing, focus on density above all else. It will show the greatest areas of concern in your deployment.**

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Deployment should be very straightforward but will vary depending on the number and size of locations, as with traditional Wi-Fi. The number of access points required for private 5G, however, are much lower than with Wi-Fi.

Future Considerations

When looking at the future of private 5G, consider what your business will look like in three to five years. This technology enables a density of sensors you may not have considered without requiring the management overhead that a less reliable and performant network would demand. Start thinking about the art of the possible: AI-driven perimeter surveillance with high-definition cameras, automated storage and retrieval systems, machine vision for quality control and worker safety–new automation solutions are coming to the market every day, and they require highly reliable connectivity to deliver a full return on your investment. Private 5G can support these and more. Imagine how your business could benefit from additional data to drive insights that provide continuous operational improvement. Leverage private 5G to power these changes.

08 Analyst's Take
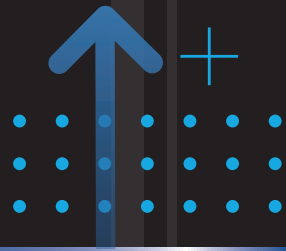
5G IS POTENTIALLY ONE OF THE MOST disruptive technologies of the decade. It enables networks designed to manage the data demands for billions of devices, something we never imagined with prior network technologies. Layered onto that is the increased focus on security integrated into the 5G stack, reducing attack vectors and blast radius.

Private 5G brings all those advantages to individual businesses and allows companies to do things they could not do previously. In the past, you had the option of running wire to every device, paying per byte on a public 4G/5G network, or (most commonly) running these devices on your congested Wi-Fi network.

Betacom has a long history of building out public and private networks, making it an experienced private 5G partner in a space where finding experience is challenging. Betacom's pricing is easy to understand and offers a complete, end-to-end solution, making its channel engagement easy to navigate.
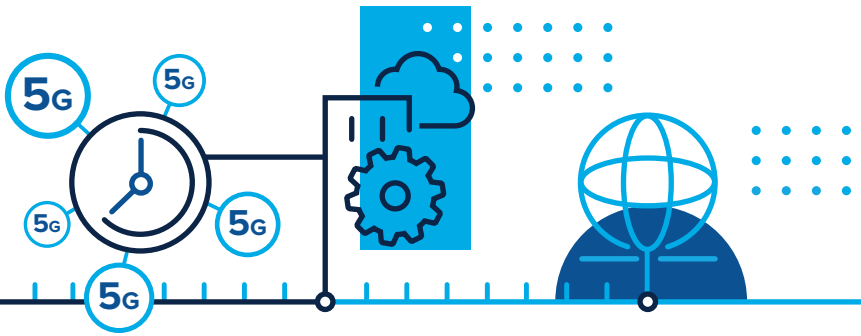
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09 About Howard Holton

HOWARD HOLTON IS AN ANALYST AT GIGAOM. He has worked in IT for three decades, the last half in executive leadership, as a CIO and CTO. He has been an engineer, an architect, and a leader in telecom, health care, automotive, retail, legal, and technology.

In the last decade, Howard focused on cloud technology and economics, data analytics, and digital transformation. As CTO of Hitachi Vantara, he spent his time developing digital transformation, IT, and data strategies for Fortune 1000 companies and global governments.

His years at Rheem Manufacturing, Hitachi Vantara, and others provided the experience that helped him develop a mind for leadership—the successful execution of vision and culture to inspire. Successful leadership is all about maximizing your team's potential, as Howard has demonstrated over the course of his career.

Howard is also a technologist at heart; passionate about how data science and new technologies can be used to accelerate time-to-market and better serve the customer, now and in the future. Howard has been a trusted advisor and agent of change to a number of organizations, bringing vision and successful execution to internal and external customers alike.

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GigaOm works directly with enterprises both inside and outside of the IT organization to apply proven research and methodologies designed to avoid pitfalls and roadblocks while balancing risk and innovation. Research methodologies include but are not limited to adoption and benchmarking surveys, use cases, interviews, ROI/TCO, market landscapes, strategic trends, and technical benchmarks. Our analysts possess 20+ years of experience advising a spectrum of clients from early adopters to mainstream enterprises.
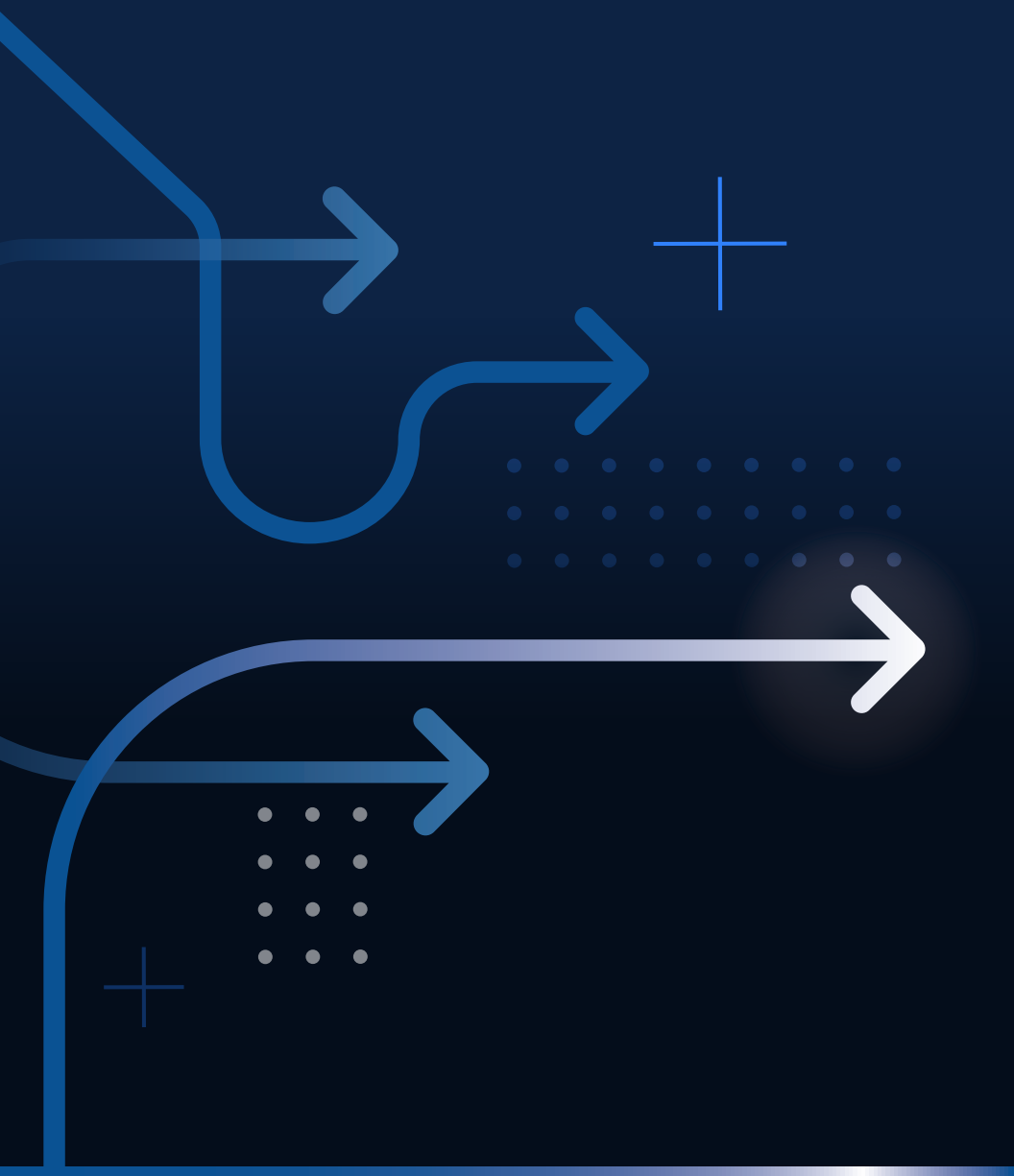
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