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Automated Deployment of Private 5G Networks

with Cumucore and FusionLayer Xverse

A White Paper by FusionLayer Inc.

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1. Introduction

Private 5G is a dedicated, high-performance cellular network designed for exclusive use by enterprises, industries, or government entities. Unlike public 5G networks operated by telecom providers, private 5G offers enhanced security, reliability, and customization, allowing organizations to tailor connectivity to their needs. It supports ultra-low latency, high-speed data transfer, and massive device connectivity, making it ideal for smart manufacturing, healthcare, logistics, and critical infrastructure applications.

By deploying private 5G, businesses gain greater control over their network operations, allowing them to optimize connectivity, security, and performance. This enhanced control improves efficiency, enabling faster data transfer, reduced latency, and seamless communication between devices and systems. Private 5G unlocks advanced use cases such as IoT, automation, and edge computing, empowering industries to implement smart technologies, optimize workflows, and drive innovation.

Deploying private 5G at remote sites presents several challenges, including high deployment costs, backhaul limitations, and limited access to skilled personnel. Managing and securing the network in isolated areas also requires expertise in 5G technology, cybersecurity, and remote monitoring, which may not be readily available. The high cost of specialized equipment and ongoing maintenance can make private 5G less economically viable for smaller operations.

Credit: Microsoft Designer, 2025

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2. Cumucore Private 5G

Cumucore Private 5G is a cutting-edge mobile networking solution designed to provide enterprises with secure, high-performance, and scalable connectivity. Cumucore's private 5G offers dedicated bandwidth, low latency, and enhanced security, unlike traditional public networks, making it ideal for industries requiring reliable and mission-critical communication. Its flexible architecture allows seamless integration with existing enterprise IT infrastructure, enabling businesses to build customized networks tailored to their operational needs.

With a focus on edge computing and bringing mobility into OT networks, Cumucore Private 5G enhances industrial IoT, robotics, and AI-driven applications. It enables real-time data processing at the network edge, reducing dependency on Ethernet cables, centralized cloud services and improving efficiency in remote or high-demand environments. This capability is particularly beneficial for sectors such as manufacturing, logistics, healthcare, and smart cities, where high-speed, low-latency communication is essential.

Deploying Cumucore Private 5G provides organizations complete control over their network, ensuring data sovereignty and reducing reliance on third-party telecom providers. Its cost-effective deployment model supports various spectrum options, including licensed, unlicensed, and shared spectrum, giving enterprises flexibility in managing connectivity. By leveraging Cumucore's advanced 5G technology, businesses can future-proof their operations, enhance security, and drive innovation across various industries.

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3. Automated Private 5G Deployment at Remote Sites

With extensive experience in Private 5G deployments, Cumucore identified key challenges associated with deploying Private 5G at remote sites. While these edge computing facilities often include data center infrastructure such as virtualization platforms, existing racks and cabling, and connectivity to the public Internet, they typically lack onsite specialists capable of installing and configuring the Private 5G core network and the base stations required for network setup. Cumucore explored technical solutions for automation and remote deployment to address these challenges.

FusionLayer Xverse is a hosted service that automates onboarding new physical devices running at the network edge. With its secure design that enables onboarding over the public Internet, Supermicro customers can use Xverse to deploy new applications and services on Supermicro devices within minutes. By leveraging Xverse, enterprises managing large IoT fleets and other edge computing use cases can significantly reduce their time-to-production from weeks to minutes while cutting deployment costs by over 90%.

By migrating to FusionLayer Xverse for managing the onboarding and deployment of edge computing infrastructure, customers can simplify edge cloud and IoT fleet management with:

- Secure onboarding of new devices at remote sites

- Simple drag-and-drop deployment of services and applications

- Full lifecycle management, including observability and updates

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4. Proof-of-Concept Testing

To validate the effectiveness of FusionLayer Xverse, Cumucore partnered with Supermicro and FusionLayer to conduct Proof-of-Concept (PoC) testing on the automated deployment of its Private 5G network. The PoC environment included:

1. A FusionLayer Xverse system running on a managed platform in Germany.

2. Cumucore Private 5G software components that had been onboarded to the Xverse service catalog.

3. Supermicro AS-1115S-FWTR edge devices with pre-installed SZTP clients operating at Supermicro test labs in the Netherlands.

Before testing, the FusionLayer engineering team configured Xverse to automate Cumucore Private 5G software installation and configuration. To establish connectivity, remote site devices must be connected to a VLAN with public Internet access.

The PoC test plan followed a two-step approach:

1. **Boot up a new Supermicro device at the remote site.** At system startup, the device securely connects to the Xverse service over the public Internet for automatic onboarding.

2. **Automated deployment of Cumucore Private 5G.** After secure instantiation, Cumucore Private 5G software is deployed on the remote Supermicro device via a simple drag-and-drop action in the Xverse service catalog. Once initiated, FusionLayer Xverse automatically uploads, installs, and configures the software on a zero-touch basis.

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5. Results

As a result of the PoC test, FusionLayer Xverse, running in Germany, successfully onboarded a new Supermicro device booted in the Netherlands and deployed Cumucore Private 5G core on the remote device in under two minutes. According to Cumucore, this set a new world record for the fastest deployment and activation of a Private 5G core at a remote site.

6. Conclusion

The automated deployment of Cumucore Private 5G using FusionLayer Xverse represents a breakthrough in reducing the complexity, cost, and time associated with setting up private 5G networks at remote sites. By leveraging advanced automation, enterprises can achieve faster deployment times, improve operational efficiency, and scale their networks with minimal human intervention. This collaboration between Cumucore, FusionLayer, and Supermicro demonstrates the potential of automation in accelerating digital transformation across industries reliant on secure, high-performance private 5G networks.

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About FusionLayer

FusionLayer is a network automation and management platform that streamlines the provisioning, orchestration, and security of modern IT and telecom networks. It provides advanced IP Address Management (IPAM), DNS, and network automation solutions, enabling organizations to efficiently manage complex, multi-cloud, and edge computing environments. By automating network infrastructure, FusionLayer reduces manual errors, enhances security, and ensures real-time visibility and control, making it a crucial tool for enterprises and service providers seeking to scale their digital operations with agility and reliability.

About Cumucore

Cumucore is a provider of private 5G solutions designed to deliver secure, high-performance, and scalable mobile connectivity for enterprises and industries. Its cloud-native 5G core network enables organizations to deploy dedicated wireless networks with low latency, high reliability, and full control over data and operations. With a focus on automation, edge computing, and IoT integration, Cumucore's solutions support a wide range of applications, including smart manufacturing, logistics, healthcare, and defense, helping businesses enhance efficiency, security, and digital transformation.