

Scaling private 5G: the role of A3 (Analytics, Automation and AI)

Integrating Analytics, Automation, and AI (A3) into private networks can streamline deployment, reduce costs, and make networks more scalable. We highlight the value A3 brings to both customers and supply-side players in enabling faster, more efficient network management and addressing long-term trends such as network slicing and hybrid networks.

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Introduction

As industries increasingly embrace private networks to drive innovation and improve operational efficiency, challenges around planning, deployment, and management have surfaced. Customising private networks to meet specific site constraints and industry demands is a time-consuming, resource-intensive process that has hampered large-scale adoption.

However, the integration of A3—Analytics, Automation, and AI—offers a way forward. These technologies streamline network processes, reducing the need for human intervention and accelerating network deployment, particularly for enterprises that may lack significant technical resources. A3 promises not only to improve the technical performance of private networks but also to bring down costs, making them more accessible and scalable.

Why A3 is essential for private networks

Customisation needs

Private networks are not one-size-fits-all. Each deployment must be carefully tailored to the environment in which it operates, whether that's a factory floor, a healthcare facility, or a logistics hub. Unique requirements, such as signal interference, layout complexities, and specific operational goals, demand highly customised network configurations.

Accommodating this level of customisation currently requires significant manual effort, extending deployment cycles and inflating costs. For many enterprises, especially small to mid-sized ones, these costs and complexities make private networks unattainable. These issues are particularly acute when scaling networks across multiple sites, where the need for repetition compounds delays and costs.

Enter A3: A customisable solution

Enter A3—Analytics, Automation, and AI. By applying these technologies, enterprises can streamline the entire network lifecycle from planning to ongoing management. A3 reduces the amount of time and technical expertise required to deploy and manage private networks, making them not only more efficient but also more affordable. The result is a faster, more scalable solution that removes many of the barriers currently limiting private network adoption.

Analytics

AI-driven insights enable businesses to continuously monitor their networks, predict potential issues, and allocate resources more effectively. These insights help enterprises manage network loads, optimise performance, and minimise the costly risk of downtime.

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Automation

Many of the manual tasks involved in setting up and maintaining private networks—such as configuring base stations, testing network performance, and troubleshooting—can be automated. This reduces the need for specialised network engineers and accelerates deployment. Automation also enables self-healing networks that can detect and resolve issues without human intervention.

Artificial intelligence

AI-powered tools can support real-time decision-making by dynamically adjusting network parameters based on traffic loads, user demands, and environmental conditions. This is particularly beneficial for industries like manufacturing, where split-second adjustments can prevent disruptions and keep operations running smoothly.

Technology enablers for A3 in private networks

A number of technology advancements will enable the widespread adoption of A3 in private networks:

1. AI-based planning and RF tools

AI tools that simulate radio frequency environments will help optimise base station placement and coverage. Digital twins, for example, allow operators to virtually model and test network configurations before deployment, reducing setup time and improving accuracy.

2. Automation in network testing and validation

Automated testing processes will replace manual interventions, ensuring faster and more reliable network configuration. Preconfigured templates and zero-touch provisioning tools will significantly reduce the customisation effort needed for each deployment.

3. Service assurance

AI-powered service orchestration platforms will enable real-time monitoring, order management, and SLA compliance. These tools provide operators and customers with enhanced visibility and control over network performance, making it easier to meet diverse requirements across different industries.

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A3 has a role for private networks today and in the future

As private network technology itself evolves, from dedicated private 5G models through to hybrid and network slicing models in the future, A3 will bring simplicity in the design, deployment and operation of these advanced private networks. In doing so, A3 will bring speed, efficiency, reduced effort and greater assurance to customers.

You can read more about different private network deployment models here.

Short-term outlook (12-24 months)

In the near future, A3 will enhance dedicated private network deployments, making them faster to plan and deploy. These deployments, which are currently the most common model, stand to benefit significantly from automated configuration and testing processes, making the networks more accessible to enterprises with limited technical expertise or budgets.

Medium and long-term outlook (2-5 years)

Over the next few years, hybrid private networks—networks that use both public and private infrastructure—are expected to gain prominence. These networks introduce new complexities, and A3 will be essential for managing the heterogeneous nature of such deployments. Service providers will need advanced orchestration tools to manage the physical and virtual elements of these networks across diverse environments.

Long-term outlook (3+ years)

Network slicing, which allows operators to create multiple virtual networks over a single physical infrastructure, presents a long-term opportunity for private networks. Each slice can be customised for different use cases, such as enhanced mobile broadband, IoT, or ultra-reliable low-latency communications. However, managing these slices across multiple customers is highly complex.

A3 will be crucial to the commercial viability of network slicing at scale. AI tools will dynamically manage the lifecycle of network slices, ensuring that resources are allocated efficiently and that each slice performs optimally for its intended use. Automation will enable operators to offer a full spectrum of private network solutions, opening up new revenue streams while reducing operational complexity.

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Conclusion

The integration of A3—Analytics, Automation, and AI—into private networks represents a transformative opportunity for both enterprise customers and supply-side providers. By streamlining planning, deployment, and management processes, A3 will make private networks faster, more scalable, and more cost-effective. To fully capitalise on this potential, telcos, vendors, and enterprises must prioritise the development of AI-enabled solutions, ensuring that private networks remain at the forefront of technological innovation.

To find out more about A3 in private networks, read our full report here.

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