

Amdocs Mobile Private Network – AR/VR Experience Solution

Amdocs MPN on AWS provides
low latency for captivating
AR/VR experiences



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Introduction

Augmented and virtual reality applications provide a novel method for exploring historical sites, enabling users to interact with images, videos and 3D models that immerse them in the past and convey the story of the location they are visiting. Yet such activities demand a wireless connection with a high data transfer rate and low latency, with content being distributed and consumed close to the data source.

Amdocs AR/VR Experience answers this need by providing reliable low latency communication by integrating 5G RAN, 5G SA core and AWS Hybrid Edge for high-speed outdoor wireless connectivity and quicker content delivery. The implementation process begins with initial consulting and design, followed by integration of all components, including radio, core and the cloud environment. Subsequently, the application is deployed on the AR/VR devices with content rendered and distributed at the edge, while exhaustive quality assurance testing is conducted on the private network. Throughout, Amdocs assumes end-to-end accountability, ensuring customers can provide the enthralling experiences users expect.

Amdocs AR/ VR Experience Overview

The requirements and connectivity challenges faced by communications & media service providers for coverage, capacity, reliability and control have evolved significantly. They now demand advanced communication capabilities that surpass what traditional public networks can offer. Private networks present an opportunity for these players to capitalize on their network investments, generating additional revenue streams from existing enterprise customers through new use cases. However, deploying a private network is a complex process that demands a diverse range of skill sets, network components and technologies.

Amdocs provides comprehensive accountability by overseeing all components of the private network, encompassing RAN, [cloud-core deployed on AWS](#), [AWS hybrid edge](#) infrastructure and services, security, applications, as well as deployment and operations services. Our value-driven approach starts with obtaining a deep understanding of the enterprise's business goals, allowing us to design highly effective solutions that leverage AWS Services and Edge Compute to achieve optimal results. In addition, by utilizing Opex-based AWS pricing for services and carefully selecting the most suitable network equipment and software vendor solutions, we ensure maximum return on investment.

Our robust network products are further enhanced by our extensive partner ecosystem, which includes industry-leading providers, start-ups and skilled solution architects well-versed in diverse use cases, cloud, edge, radio spectrum and security. Additionally, we carefully assess the most suitable approach for managing sensitive data, whether on-premises AWS Edge or in the AWS Cloud.

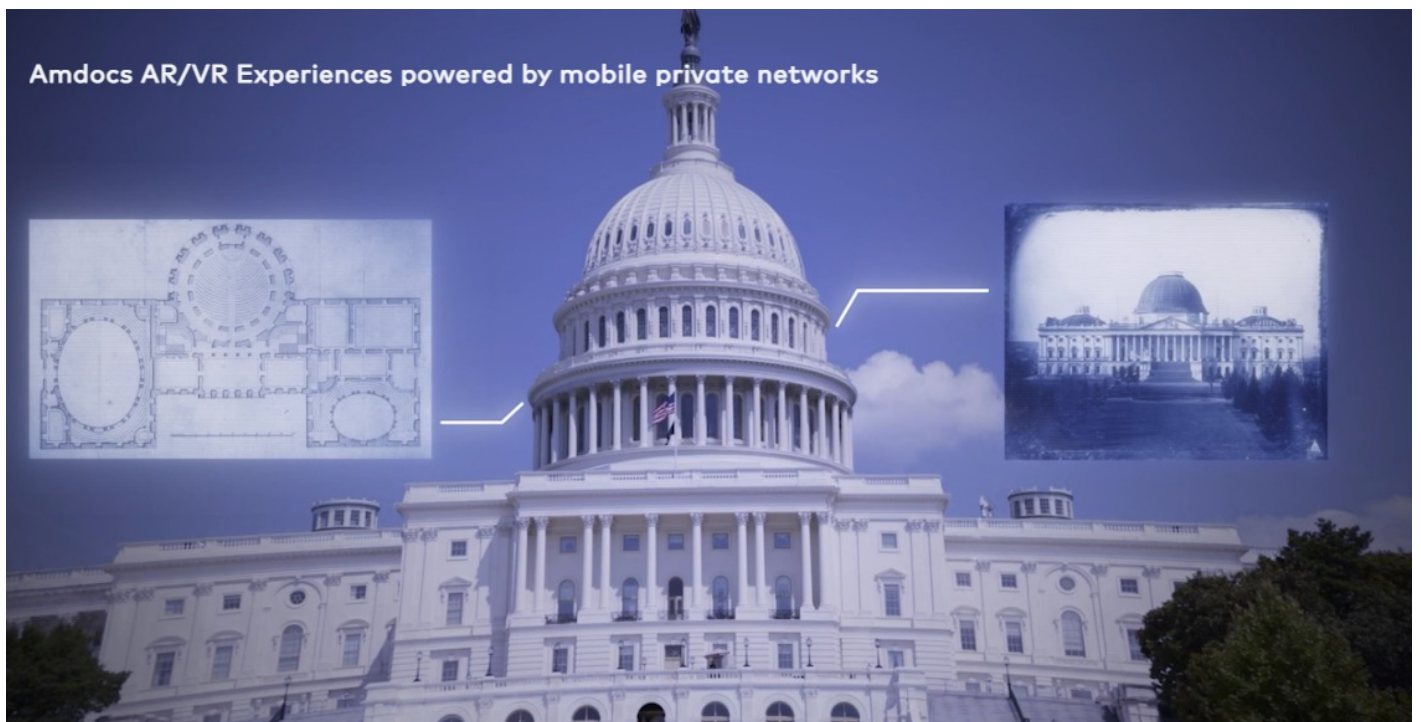
Solution ecosystem

- Network equipment: radio access network and core network functions
- Application and ISV: ISV solutions, such as AR/VR content rendering and end-user application
- Edge solution: [AWS Outposts Servers](#) for customer-premise or remote data storage and streaming
- Security: end-to-end protection against external attacks
- [Integrated Private Wireless on AWS](#): infrastructure and cloud solutions to support deployed private networks



Use case example: Washington, DC landmark

Customer requirements

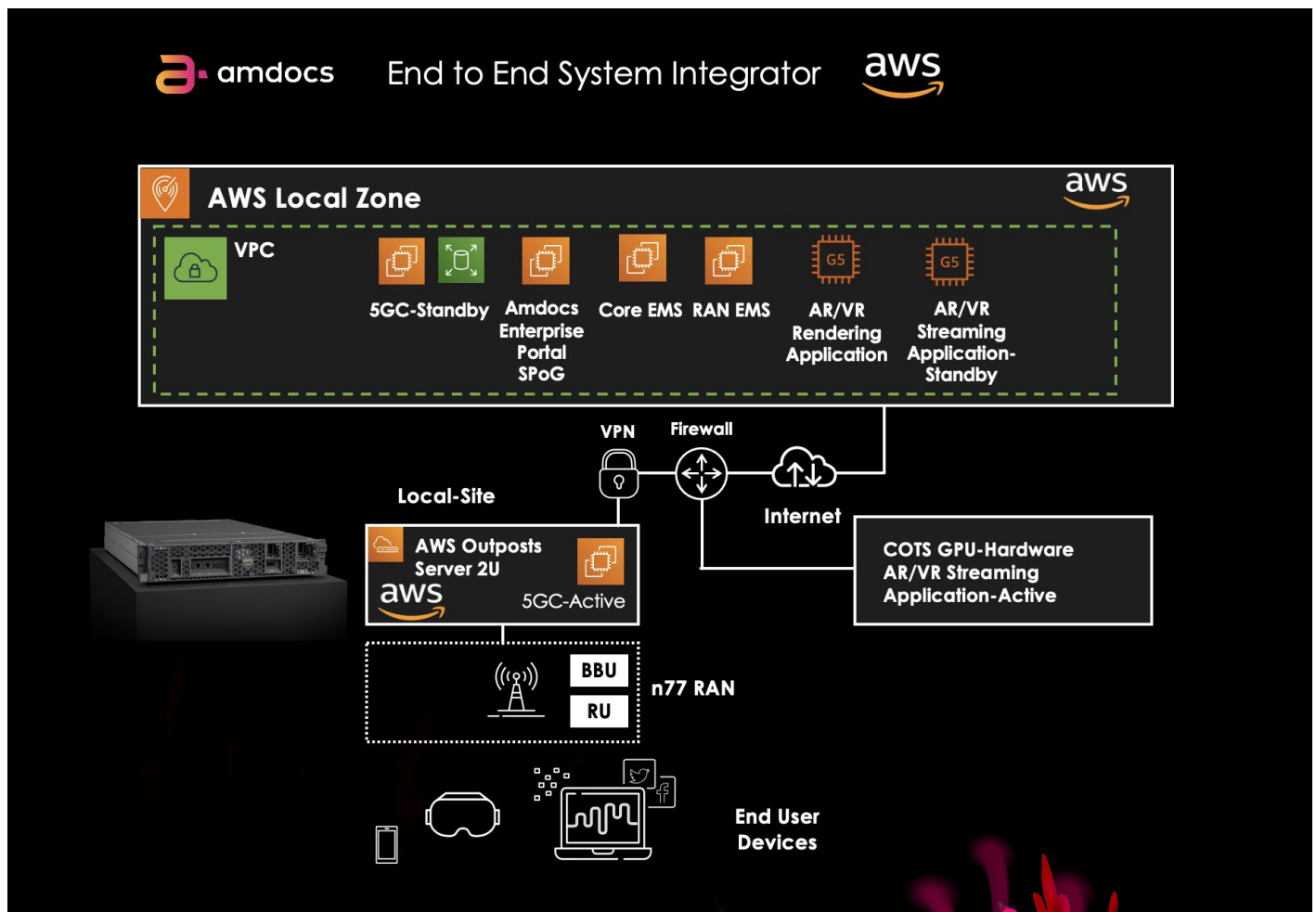


As a use case, consider the example of the National Mall and Memorial Parks, which manages this renowned historical landmark in Washington DC. The organization's objective is to provide its visitors with captivating, augmented reality experiences that immerse them in the site's rich history. To achieve this, the AR/VR application must meet the following specifications:

- The AR application must be able to capture images of the landmark's surrounding environment
- The AR/VR devices must be capable of accommodating a high volume of concurrent users
- Reliable wireless high-speed connectivity is required both indoors and outdoors
- AR/VR applications demand a wireless internet connection with data rates ranging from 10 to 50 Mbps, along with sub-20ms latency.

Solution overview

To address such challenges, Amdocs has developed a comprehensive reference architecture for deploying a tailored private mobile network specifically tailored to the AR/VR use case. At its core, it includes essential network components, including 5G RAN, 5G SA Core, AWS hybrid edge infrastructure and services, Amdocs Private Network Management (SPOG) and Amdocs End-to-End Private Network Services. In addition, Amdocs provides pre-deployment radio planning services, comprehensive deployment support, efficient project management and streamlined post-deployment operations.



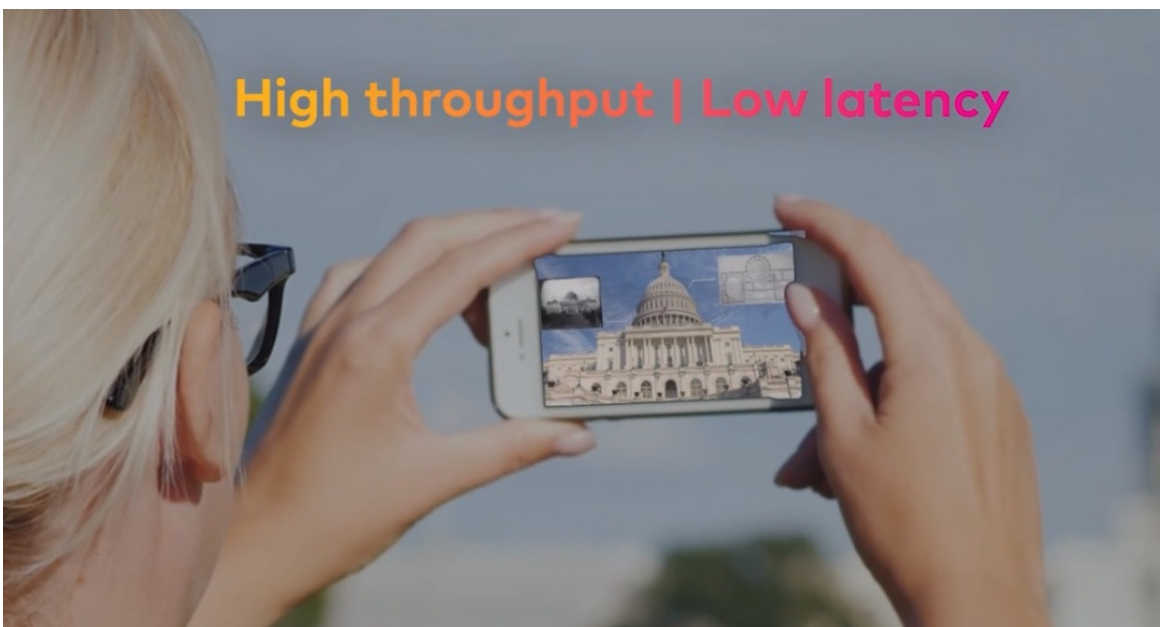
VR user equipment

The solution utilizes 5G equipped VR goggles (e.g. [DVPR Ultra 4K](#)).



AR user equipment

The solution utilizes 5G mobile handsets or tablets to visualize the overlay of the landmark view.



SPOG (Single Pane of Glass)

Amdocs provides a seamless SPOG experience to enterprise and service provider NOC teams. This all-in-one mobile private network management visualization solution fully caters to the unified network visibility requirements across all involved network domains, encompassing physical and virtual networks, LTE/5G network functions, transport, Wi-Fi elements, IoT devices and applications. Moreover, it includes configuration, fault and performance management functions.



Amdocs Private Network Management Portal

End to End Visibility and transparency with a single pane of glass view

Centralized multi-vendor dashboard providing a Single Pane of Glass view of all enterprises

Role based access profiles for different users (Enterprises vs CSP), (RAN/Core vs Infra/Devices)

Workflow Overview and Management of all network elements, devices and applications

The laptop screen shows a detailed view of the SPOG dashboard, including a network topology diagram, various performance charts, and the Amdocs logo with the tagline 'make it amazing'.

Network analytics and trends for NOC teams.

Advanced AI/ML rules for predictive analytics

IoT Device & Connectivity management

Device/SIM management for any device connected to the network

Capabilities for Policy Management, Charging and Network Exposure

Amdocs Deployment automation and AI-enabled Operations enhances Enterprise experience and improves operational efficiency

Amdocs End-to-End Private Network Services

As system integrator, Amdocs plays a crucial role in scaling private network deployments and seamlessly integrating all network architecture elements in multi-vendor implementations. This includes effectively addressing network complexities in multi-vendor software and hardware integration scenarios.

SI services approach

Our approach to deployment and system integration prioritizes increased automation and process simplification, reducing the time to introduce new services and technologies to the market. To address deployment challenges, we integrate and configure the necessary wireless network components (RAN, core) and leverage our proven network services to assist with the design, construction and eventual operation of network solutions. For operational challenges, we function as a single point of contact, eliminating the need to coordinate with multiple vendors for a variety of malfunctions. This includes determining the fundamental cause from an end-to-end perspective across all network domains and resolving any issues directly with the vendors.

Integration process

Our approach to integration utilizes remote expert engineering resources who collaborate with the site construction and installation vendor during the build process. This collaborative effort ensures swift resolution of any issues arising from site construction while deployment is still underway. Meanwhile, our integration platform facilitates seamless connections between the construction and installation team and our remote engineers, enabling evaluation of site installation, remote configuration of radio equipment, and prompt resolution of installation problems or faulty hardware issues. This enables systems integrators to reduce the number of field-based integration specialists, ensuring timely and cost-effective network integration compared to conventional methods.



Throughout the entire process, Amdocs System Integration Services provides data input, scripting, commissioning, network audit and project management – actively supporting a more rapid and reliable network deployment.

System integration activities encompass the following:

- Integration of different RAN solutions from vendors such as Nokia, Ericsson, Huawei, Samsung, Airspan, Baicells and others with either Amdocs' provided core or the customer's existing core
- Planning & design
- Mast installation
- Interoperable testing
- Onboarding RAN/CORE/NMS/transmission & IoT vendors
- Lab & field-based trials
- Automating & executing network test procedures with interoperability
- E2E, performance and feature testing
- Project management

Unlocking the future with Amdocs AR/VR Experience

In today's business landscape, where secure and efficient connectivity is paramount, businesses or service providers recognize the uniquely compelling opportunity to offer their customers augmented reality experiences, allowing them to rediscover history and heritage in immersive ways. With Amdocs AR/VR Experience, service providers are empowered to pursue ambitious MPN initiatives by seamlessly integrating multiple RAN & IoT vendors. This ensures not only quality deployment but also comprehensive management and monitoring of the entire solution, achieved through natural collaboration with hyperscale providers to guarantee consistent availability of solution components. Through these enhanced operations, service providers can achieve unparalleled efficiency and success, positioning themselves at the forefront of innovation.





Amdocs helps those who build the future to make it amazing. With our market-leading portfolio of software products and services, we unlock our customers' innovative potential, empowering them to provide next-generation communication and media experiences for both the individual end user and large enterprise customers. Our approximately 30,000 employees around the globe are here to accelerate service providers' migration to the cloud, enable them to differentiate in the 5G era, and digitalize and automate their operations.

Listed on the NASDAQ Global Select Market, Amdocs had revenue of \$4.58 billion in fiscal 2022.

For more information, visit Amdocs at www.amdocs.com