



## Private networks in military, defence and aerospace: providing stability and transformation

Most wireless networks built for military uses today are fit for purpose for military grade voice communications, but as the industry looks to evolve toward more digital applications; private networks offer a unique connectivity solution. This article highlights global trends of investment, key benefits of private networks for the aerospace & defence industry and key use cases.

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## Large global investments in private 5G networks for military, aerospace & defence

Across the world, national ministries of defence are seeking the support of operators to digitally transform their operations through the deployment of private networks:

- **The US military** has been recorded as one of the biggest enterprise customers of private 5G networks; having committed to \$600 million to 5G deployments including many private network deployments.
- More recently, **Spain** has launched several tenders amounting to €50 million to install private 5G networks for the military to provide enhanced communication capabilities and real-time monitoring of defence operations.
- In collaboration with the Norwegian Defence Materiel Agency, **Telia** has developed a private 5G networks, including a network slice of Norway's national 5G network, to provide the Armed Forces with secure and reliable connectivity.

Many of the same reasons that make private networks attractive to industry apply to aerospace and defence. Just like industrial operations, military operations benefit from many applications that require secure and reliable connectivity, tailored to specific requirements, provided by private networks. In particular, the high speed, ultra-low latency and reliability provided by private 5G allows military customers to revolutionise their operations beyond the existing connectivity solutions in place. Implementing new defence applications, allow armed forces to increase their overall efficiency and reduce their response time for mission-critical operations.

## Why private networks for aerospace & defence?

The adoption of private networks, over other connectivity solutions, within the aerospace and defence industry is driven by several of its unique benefits:

- **Mission-critical reliable connectivity:** Due to the mission criticality of military operations, reliability is of utmost importance to ensure seamless connectivity. Aerospace and defence operations often takes place in remote locations, lacking public network coverage, and challenging mixed environments. More traditional connectivity solutions such as Wi-Fi and Public 5G cannot meet the expectations of the mixed indoor and outdoor campuses that military bases often encompass, such as warehouses, aircrafts, and battlefields.
- **Enhanced security:** The aerospace and defence sector deals with highly sensitive information and critical communication that demands the highest level of security. Whilst there are different architecture models of private networks, all private networks through its dedicated network elements provides an exclusive access to a subset of individuals. A 'true' private network with an isolated on-site architecture forms the most secure option of private networks, and the additional technical capabilities of 5G create additional security for end-users.
- **Guaranteed bandwidth and low latency:** The high-speed connectivity, enabled by the high bandwidth and low latency of private networks facilitates the rapid transmission of large volumes of data. This is especially important for the aerospace & defence industry which manages a large number of complex machines across vast military bases. The high speeds afforded by private networks, especially private 5G, streamlines mission critical operations and can reduce response time to emergencies.

## Key use cases for private networks in aerospace & defence

### Push-to-X communications

Push-to-X refers to immediate, secure, and efficient voice or video communication for military personnel, offering several advantages. This includes real-time communications, including support for group

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communications, Group communications is also supported, enabling military units, teams, or commanders to form specific talk groups or channels for efficient communication within designated groups while minimizing the risk of information overload. PTX communications can also be integrated into hands-free devices like headsets or wearable devices, enabling soldiers to maintain mobility and operational efficiency while staying connected.

### **Security and surveillance: Video ingest and analytics**

Private networks provide a dedicated platform for deploying high-definition cameras, sensors, and monitoring equipment across military installations, bases, or border areas. These surveillance systems capture real-time video feeds enabling effective situational awareness, threat detection, and rapid response capabilities for enhanced military security.

### **Maintenance and repair: IoT, data analytics and/or AR**

Private networks enable connectivity and communication between maintenance teams, command centres, and field personnel, facilitating real-time reporting, troubleshooting, and collaboration. Maintenance personnel can access digital maintenance manuals, diagnostic tools, and remote support to maintain military vehicles and equipment. Private networks also support the deployment of IoT devices and sensors for predictive maintenance. Taking all of this in consideration, a private network can enable multiple capabilities to enhance maintenance workflows, reduces costs, and improves overall operational readiness and effectiveness for military forces.

### **AR/VR for simulation training**

AR/VR technologies can be leveraged to provide defence personnel enhanced and realistic immersive experiences of training scenarios. AR/VR can simulate complex and high-risk situations to train armed forces more effectively, provided in a safe environment. AR/VR requires ultra-low latency and high bandwidth to reliably transmit the experience for the training exercises.

### **Drone inspection**

Drones can be used to inspect large complex environments, such as military bases, to monitor operations, conduct aerial surveillance and assess potential threats. Drone inspection enables more greater situational awareness for armed forces and reduces the human risk involved with otherwise manual and potentially dangerous inspections. High-definition video feed captured by the drones must be transmitted to ground control operators in real time, requiring high-bandwidth. Private networks also facilitate greater security to ensure protection of the sensitive data.

### **Smart warehouse management:**

Military environments host a wide range of inventory, equipment and vehicles that move across the complex defence base. Automating and managing the logistics and assets is critical for armed forces to remain mission-ready. Real-time monitoring provides visibility of the position and usage of these assets and vehicles by collecting data from sensors to optimise overall logistics management. Tasks include storage, safe keeping and tracking of supplies and equipment, visibility of stock readiness and some maintenance of equipment, similar to normal commercial warehouses but have more of a nomadic nature.

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