TACTICAL CORE
by blackned

Digital Superiority in the Battlespace



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Digitalisation of the Armed Forces Determines Success in the Battlespace

The more up-to-date the situation display is, the more precisely the order can be carried out.

Especially in the forward battlefield, communication is crucial. Current events surrounding the Russian war of aggression against Ukraine have shown how important the networked and secure transmission of quickly available information is. It provides the decisive advantage in combat. This is where blackned comes in. We create solutions for the digitalization and networking of existing and new information and communication systems. In this way, we achieve effective interoperability with the existing digital and analogue radio technologies, but also the integration of new procurements.

Act Effectively & Quickly in the Forward Battlespace



Effective and secure communication on the battlefield plays a pivotal role in the success of military operations. However, traditional hierarchical communication and information systems have often led to critical situation information being inaccessible at various levels of action and during crucial times. To overcome these limitations, a comprehensive digitalisation approach is necessary.

One of the main challenges in implementing such a solution is the presence of outdated equipment that wasn't originally designed to accommodate digitalisation. While newer equipment is better suited for this purpose, the constant movement of soldiers and weapon systems on the battlefield adds another layer of complexity.

To address these challenges and establish a highly mobile and efficient system, the installation of a tactical network and connectivity platform is the key. This network fulfills all the necessary requirements for seamless data and communication flow. By doing so, it enables real-time access to crucial information at the frontline, significantly enhancing shared situational awareness across all levels of command. Ultimately, this improvement in communication fosters increased combat and striking power together with decreased vulnerability.

In conclusion, the adoption of a comprehensive digitalisation strategy, along with the deployment of a tactical network and connectivity platform, is essential in achieving secure and efficient battlefield communication, which directly contributes to the overall success of military operations.

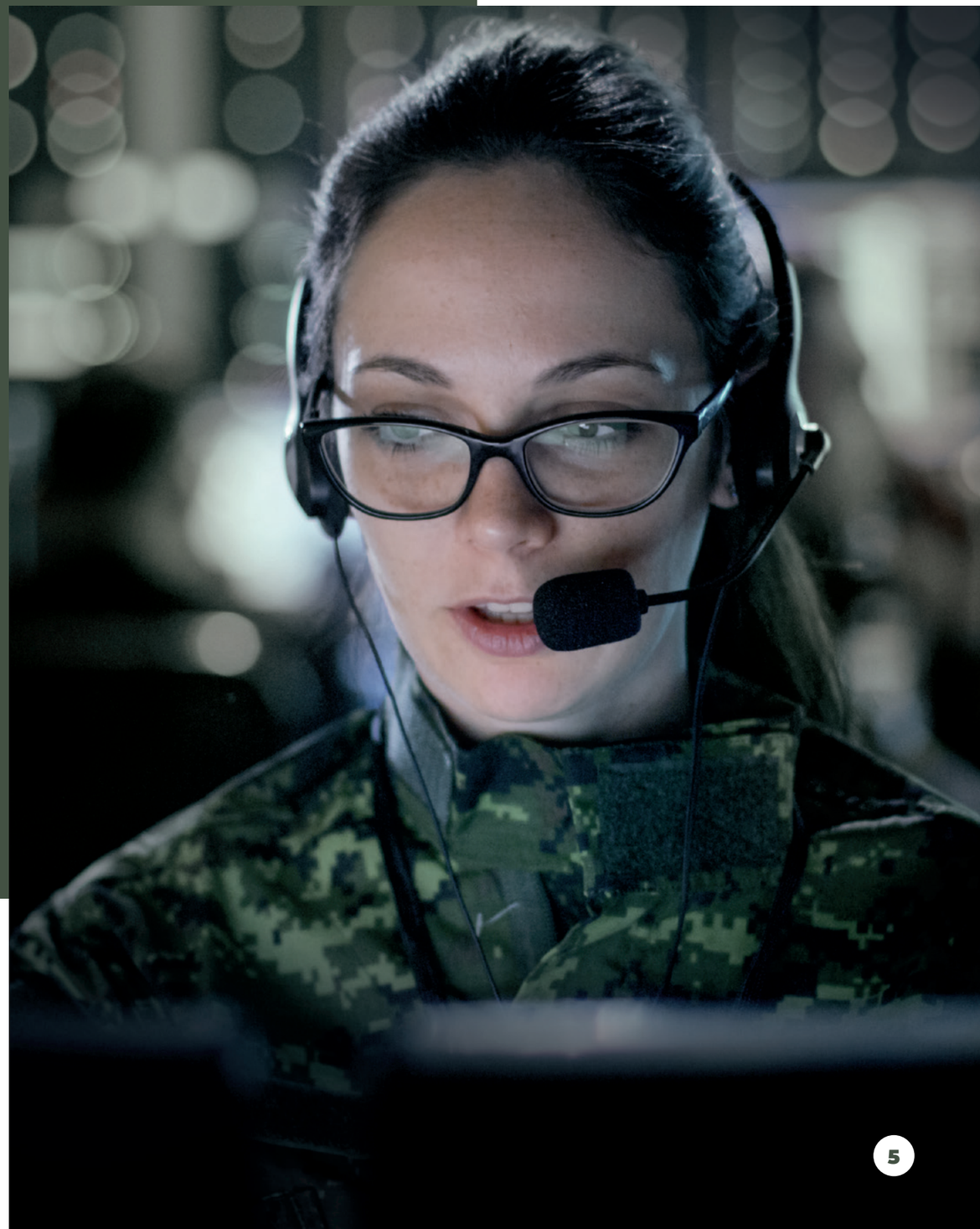
Time advantage through faster communication can save lives.



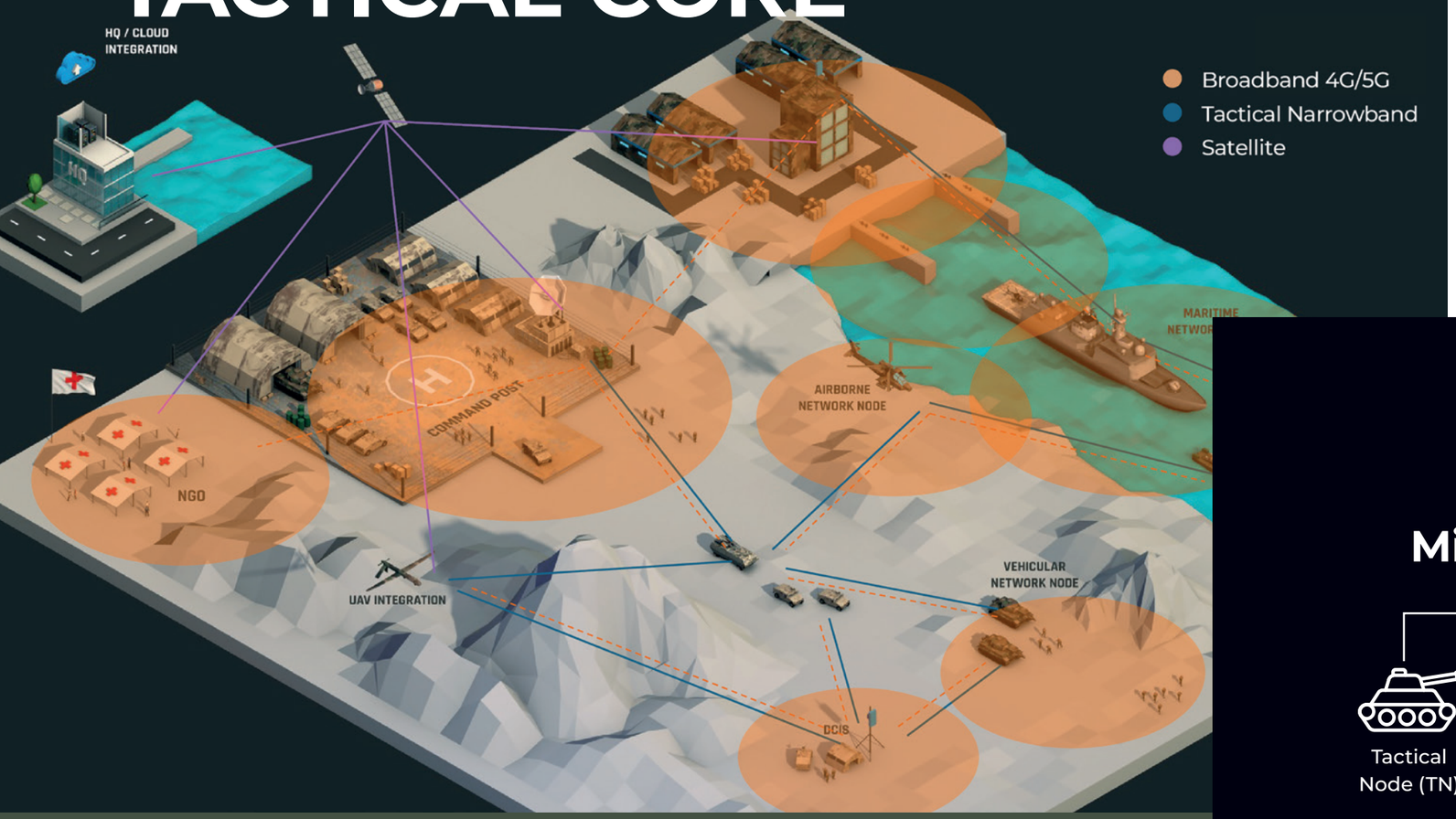
Digital Superiority in the Battlespace

TACTICAL CORE serves as a multitool that breaks down manufacturing silos, integrates existing systems and enables future technologies in the process. It provides a highly secure, dynamic and self-organising infrastructure for future-proof, critical and secure communication and data exchange at the tactical edge. The XONITOR software is the monitoring and management tool, RIDUX is the middleware that aggregates different transport networks into a common communication network.

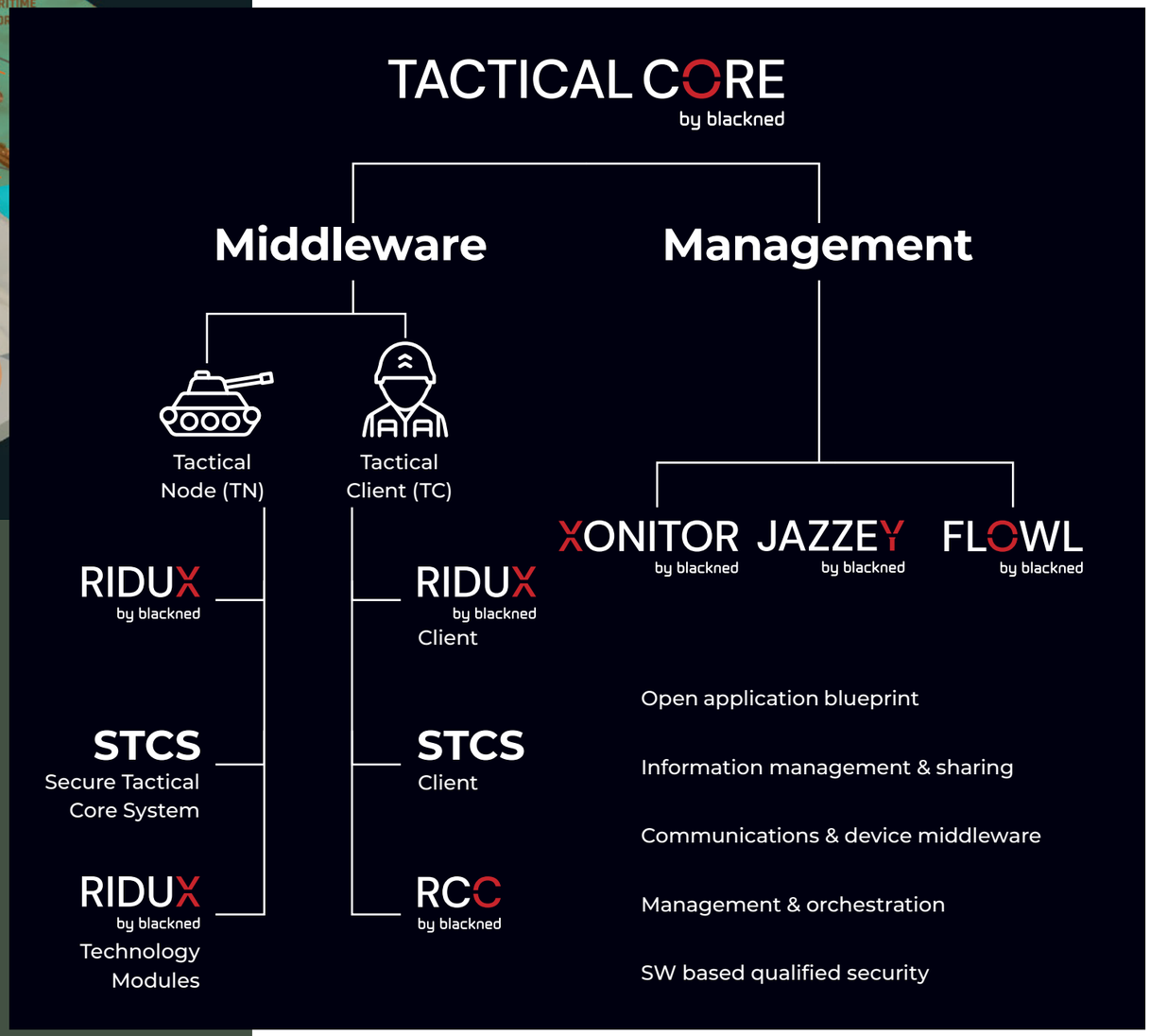
TACTICAL CORE gives you the edge in time, mobility, reliability and security in the battlespace.



TACTICAL CORE



TACTICAL CORE includes several software products developed in-house by blackned. One of the main components is RIDUX, a tactical middleware powerhouse divided into the Node and Client components, both equipped with our robust security solution STCS. RIDUX is complemented by XONITOR, our network monitoring and management solution. This functional branch is supplemented by FLOWL, our efficient ITSM system, and JAZZEY, the RPA solution equipped with E-2-E monitoring capabilities.

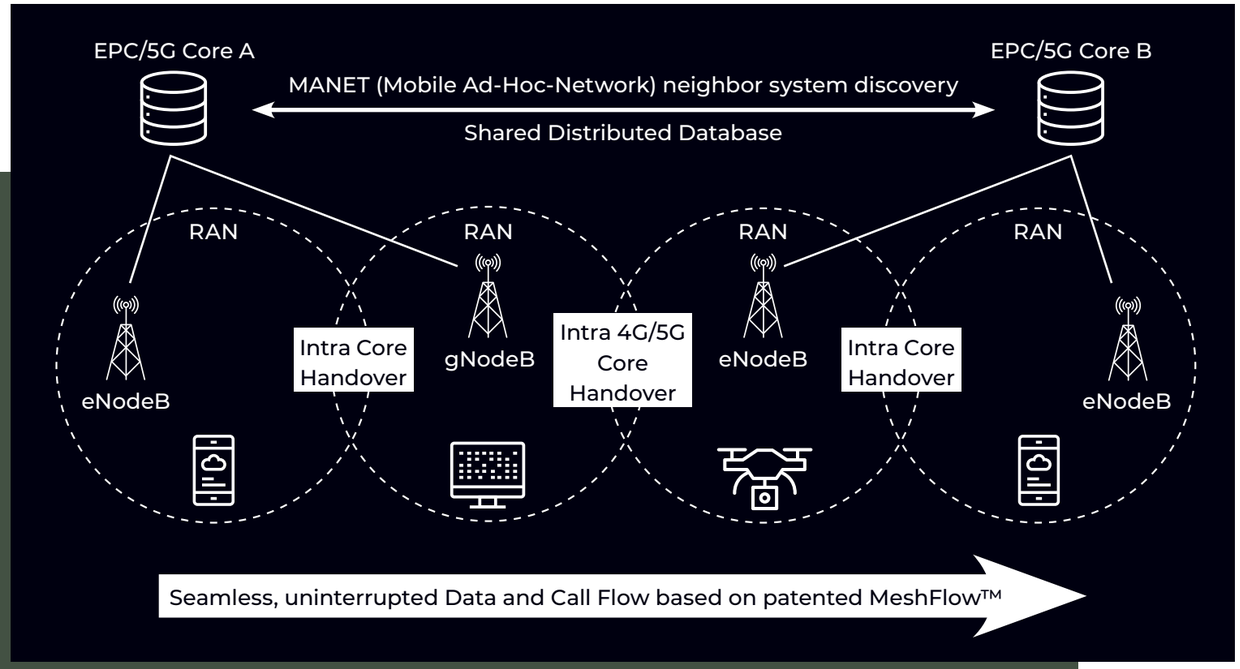




Mobility

The Challenge

Battlefield missions are very dynamic, communication nodes and soldiers are moving fast and randomly, making advanced network planning impossible.



The Network Follows the Mission

TACTICAL CORE is designed to enable a dynamic, self-organizing and self-healing network of networks.

Patented Connectivity-Enabling MeshFlow™

Patented MeshFlow enables seamless connectivity even when soldiers dynamically move from one service area to another.

Autodiscovery and Neighbour Detection

Each node automatically detects and identifies neighbouring nodes and provides one common communication compound and shared information space.



Reliability

The Challenge

A modern, IP-enabled and secure communications and information network at the tactical levels requires a reliable and stable network environment.

Network of Networks

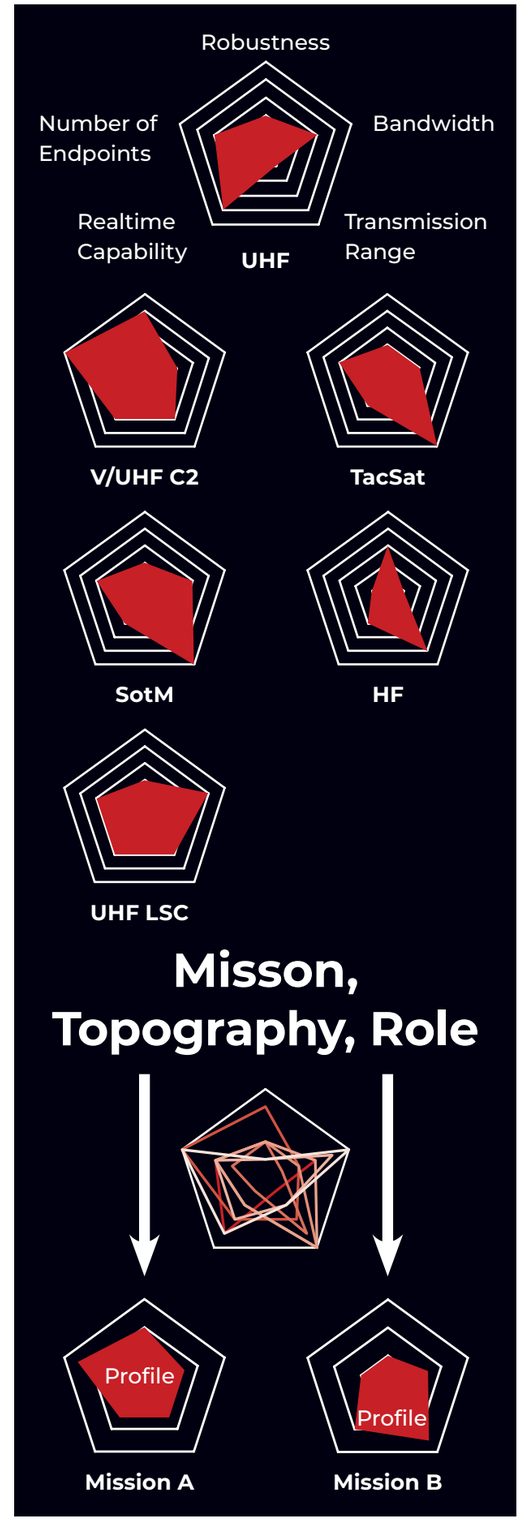
Each Node offers a full set of service functions, including embedded services such as PTT, PTV, location services and information storage autonomously or in compound.

Decentralized Architecture

The entire network is built on a decentralized architecture, there is no hierarchical structure or single point of failure in the network. Each node acts as backup for others.

Tactical Routing

The embedded tactical routing algorithm ensures that all available bandwidth is being utilized and automatically routes traffic through alternative waveforms if a transmission media becomes compromised or unavailable.





Security

The Challenge

Securing access to the tactical information and communications network is challenging because the environment is constantly changing, multiple domains are required, there is no persistent central connection, and a variety of proprietary security solutions exist.

Group Key Exchange

The security architecture includes group key exchanges at the tactical edge, allowing authentication without the need of central authentication.

Secure Element

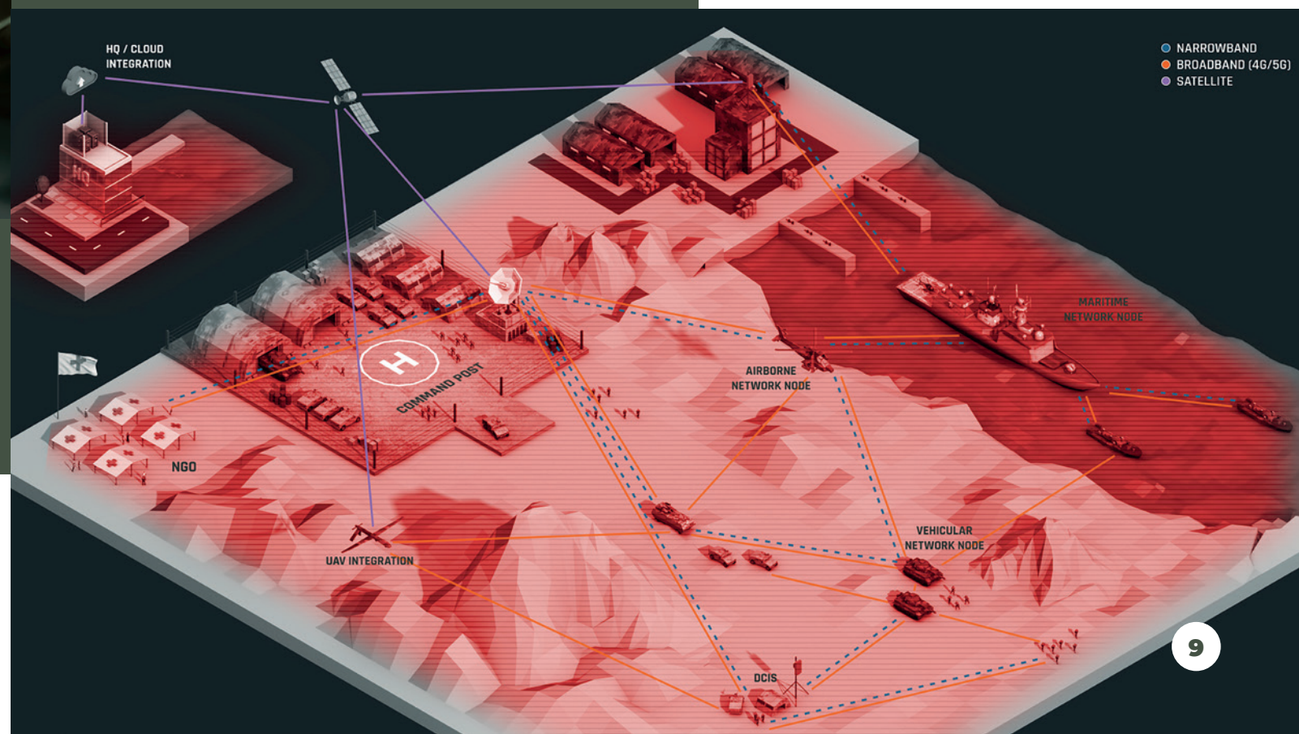
Each node or client in the network requires a custom build secure crypto element, which allows access to classified domains.

Multi-domain

TACTICAL CORE enables multiple security domains, allowing simultaneous use of a common infrastructure for classified and even unclassified communication and information exchange.

BSI

Certified to NATO RESTRICTED



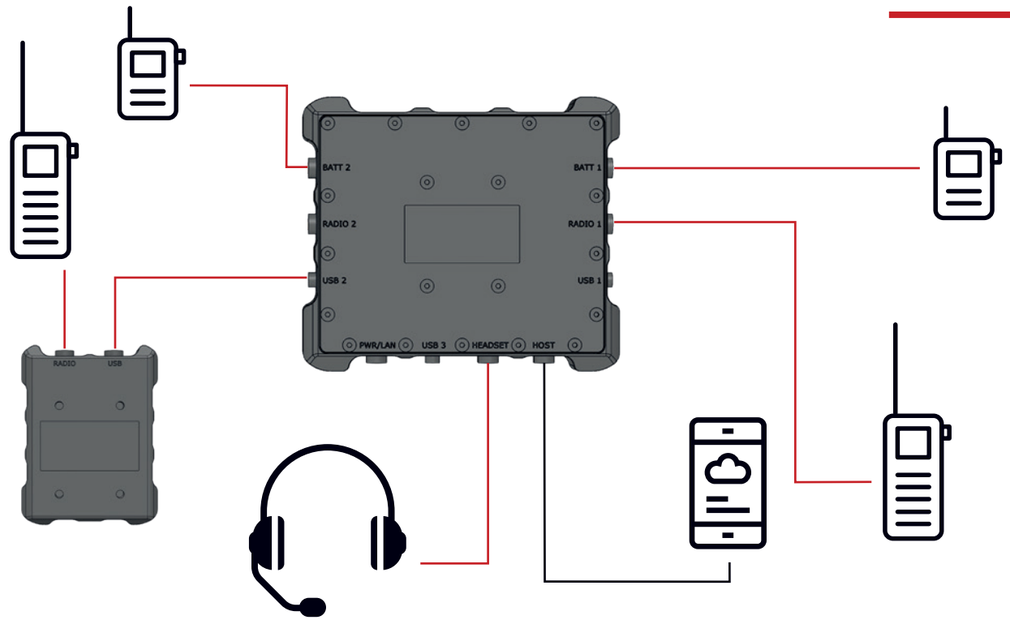


Interoperability

The Challenge

Armed forces' communications equipment varies widely, even within the same country. Technology ranges from narrowband VHF, UHF, SAT to modern cellular broadband, with vendor-specific and proprietary solutions limiting interoperability.

The Solution



Digital and Analogue Radio Integration

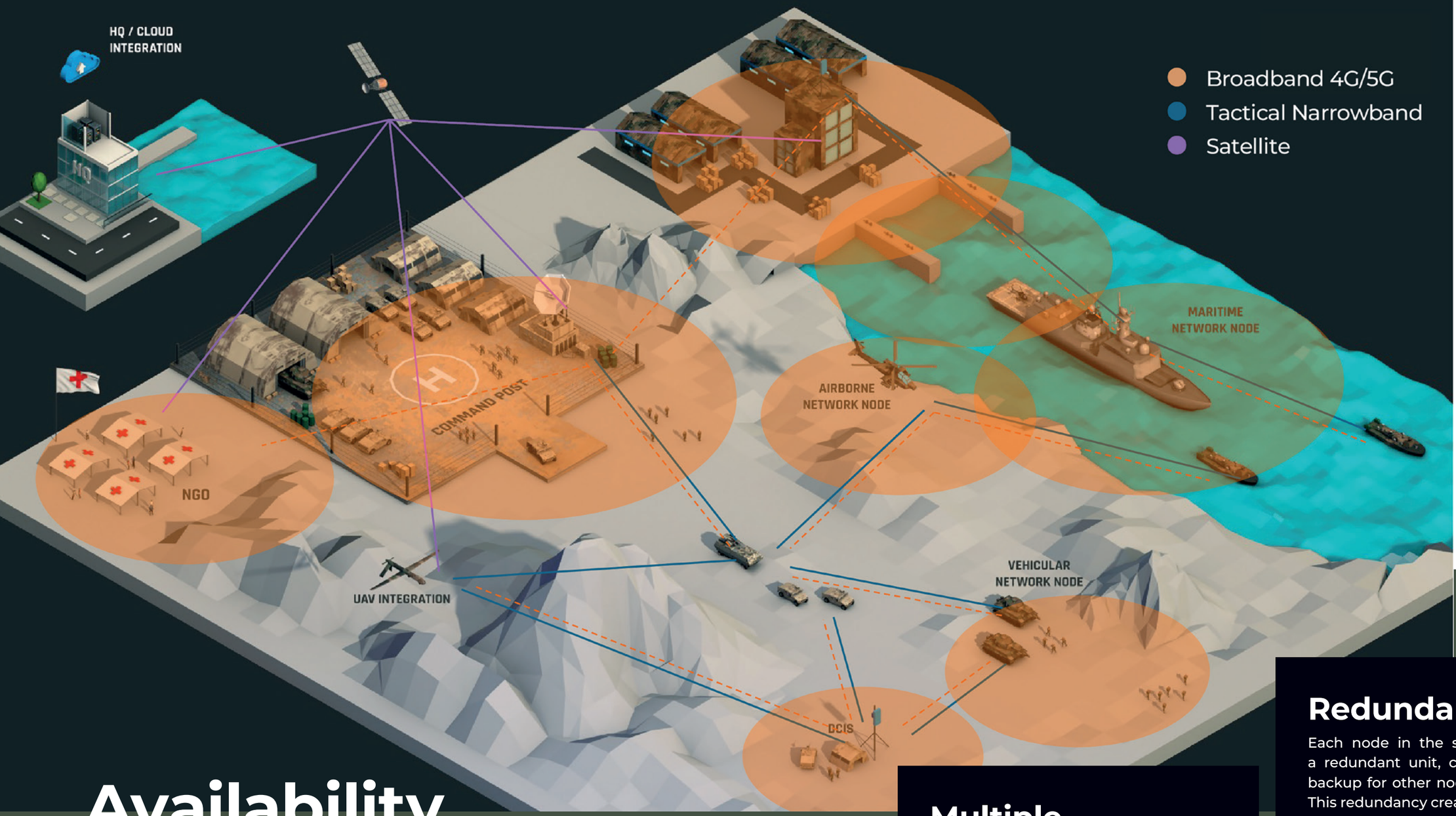
Digital radios are integrated using IP interfaces and managed through radio demons offering one single pane of glass. Devices with analogue interfaces are integrated using the TACTICAL CORE Personal Radio Adapter (PRA).

Unified End-to-End Connectivity

All information and communication is transparently available, all the way down to the dismounted soldier through multiple connected transmission media.

Multi-vendor/Multi-technology/ Multi-blueprint

TACTICAL CORE integrates and operates simultaneously with all available radio technologies and vendors (VHF, UHF, SATCOM, 4G, 5G...) and is hardware agnostic.



Availability

The Challenge

Tactical edge networks are typically constraint by radio coverage range, loss of connectivity, jamming by red forces and other barriers, which ultimately lead to loss or degradation of services and information availability.

Multiple Backbone and Access Media

TACTICAL CORE uses multiple backbone and access technologies simultaneously and switches automatically and dynamically between them, depending on the actual demand of the application, quality of service and availability of resources.

Redundant

Each node in the system functions as a redundant unit, capable of acting as backup for other nodes within its range. This redundancy creates a dynamic mesh network of interconnected networks, eliminating any central point of failure.

Autonomous

Each node provides a full set of essential services autonomously, even in an isolated environment.

Usability

The Challenge

The continuous integration of additional information, devices, technologies, and systems within a network brings about a substantial increase in complexity. As a consequence, operating and maintaining such a complex network, particularly during critical missions, poses significant challenges.

The Solution

Single Pane of Glass

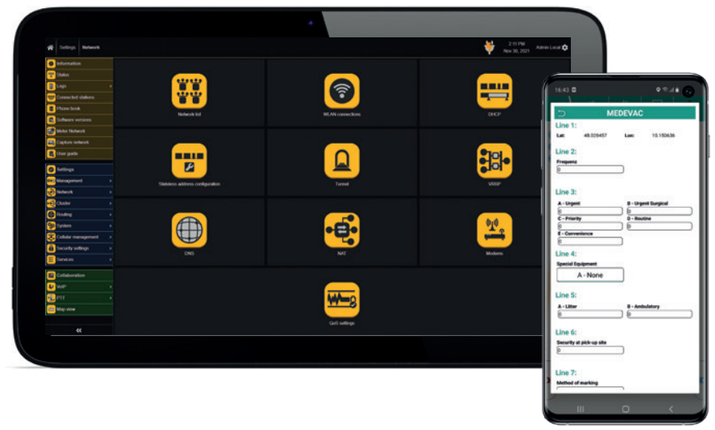
All nodes and their connected devices are efficiently managed through a unified and user-friendly interface. This intuitive management interface provides a „single pane of glass,“ enabling seamless management of multiple nodes, even when they are heterogeneous in nature.

Simplified and Rapidly Deployable

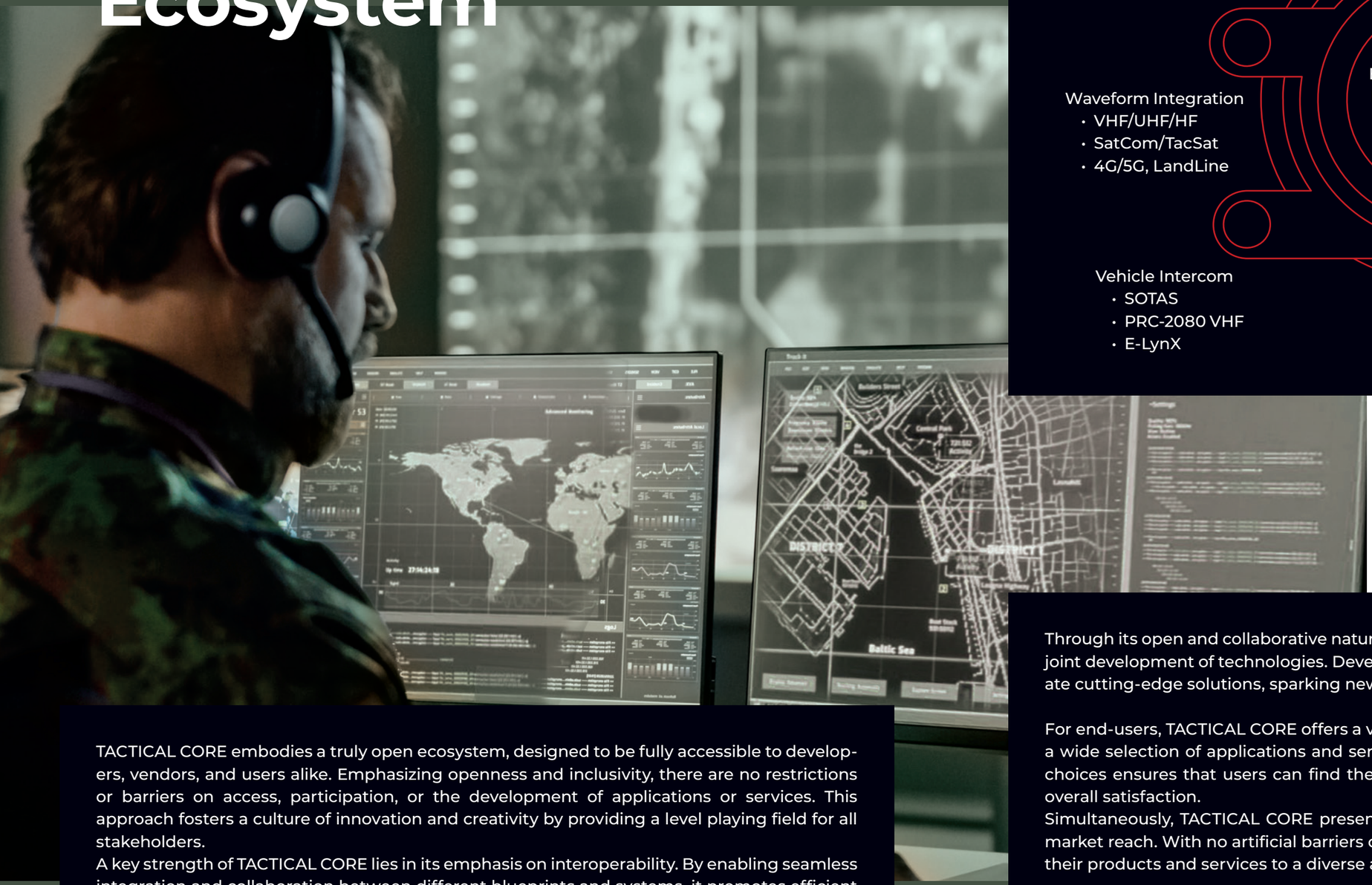
All products of TACTICAL CORE have been designed to be operated and maintained by non professionals. A tactical node is easy to setup and deployable within minutes.

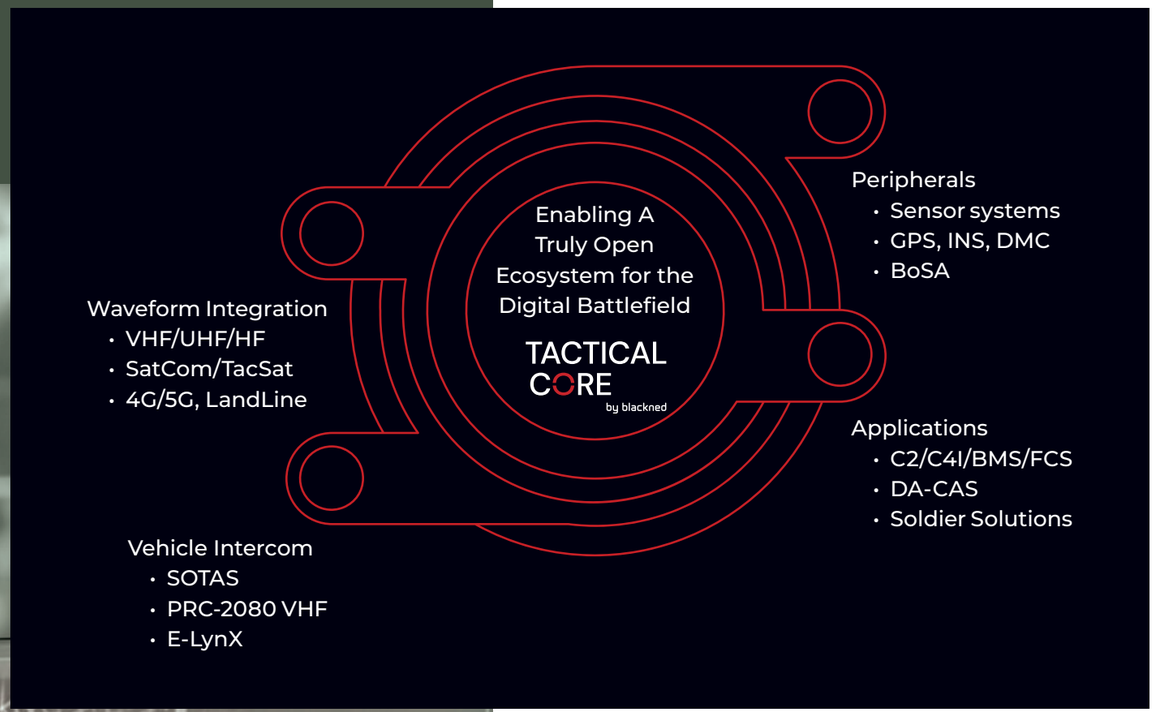
End-user Validated

We prioritize continuous software validation by actively involving actual end-users in real deployment scenarios. The valuable inputs and feedback received from these users play a pivotal role in shaping our usability roadmap.



Truly Open Ecosystem



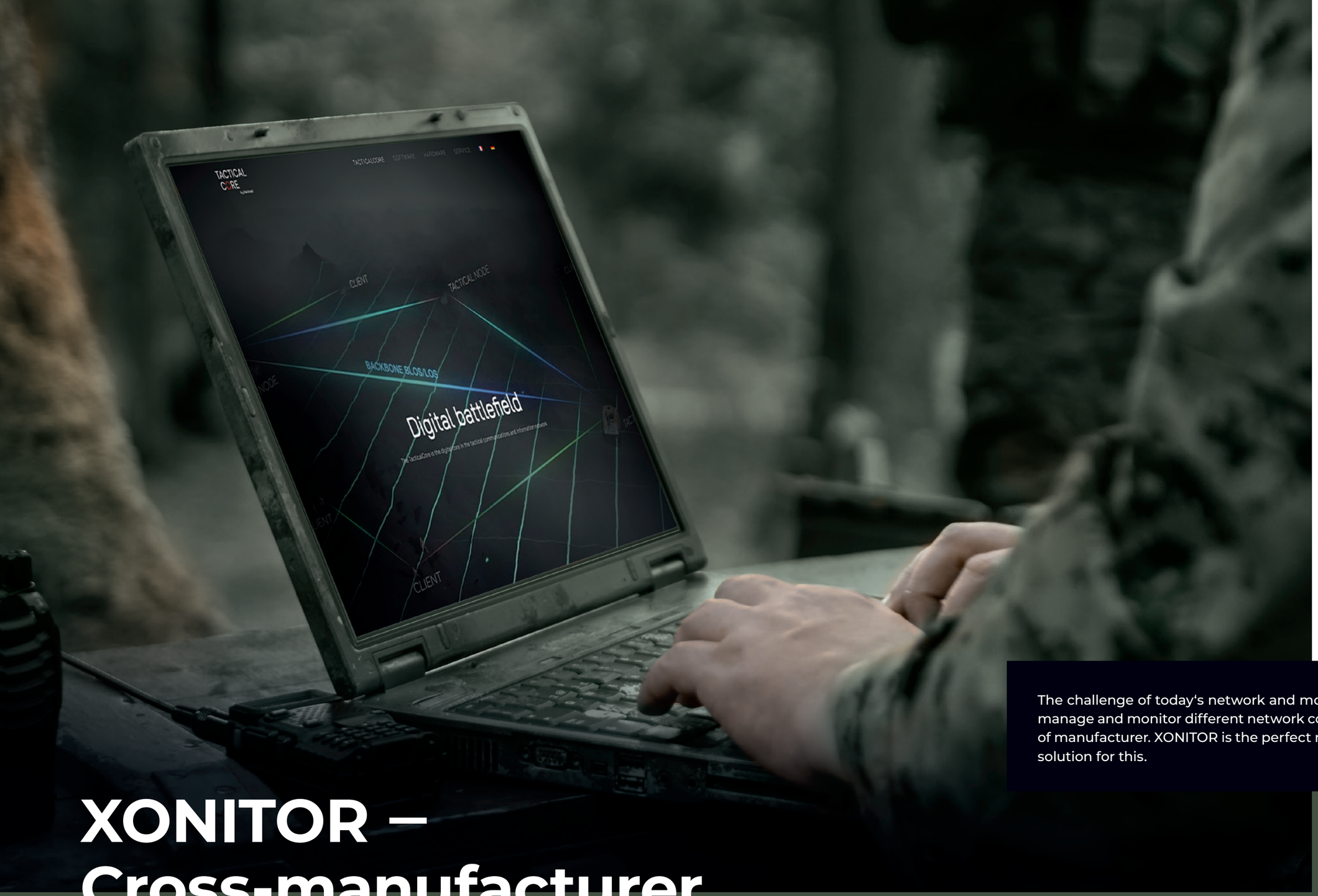


TACTICAL CORE embodies a truly open ecosystem, designed to be fully accessible to developers, vendors, and users alike. Emphasizing openness and inclusivity, there are no restrictions or barriers on access, participation, or the development of applications or services. This approach fosters a culture of innovation and creativity by providing a level playing field for all stakeholders.
A key strength of TACTICAL CORE lies in its emphasis on interoperability. By enabling seamless integration and collaboration between different blueprints and systems, it promotes efficient communication and synergy among various technologies. This interoperability ensures that users can benefit from a diverse range of applications and services, leading to enhanced user experiences.

Through its open and collaborative nature, TACTICAL CORE encourages knowledge sharing and joint development of technologies. Developers can leverage existing resources and tools to create cutting-edge solutions, sparking new ideas and driving progress in the field.

For end-users, TACTICAL CORE offers a vast array of options, empowering them to choose from a wide selection of applications and services that suit their specific needs. This abundance of choices ensures that users can find the solutions that best fit their requirements, enhancing overall satisfaction.
Simultaneously, TACTICAL CORE presents a valuable opportunity for vendors to expand their market reach. With no artificial barriers or exclusive access restrictions, vendors can freely offer their products and services to a diverse and receptive audience.

Above all, TACTICAL CORE represents a commitment to openness, fairness, and equal opportunities. By providing an accessible blueprint for collaboration and development, it seeks to create an environment where all stakeholders can thrive and contribute to the advancement of technology and innovation.



The challenge of today‘s network and monitoring systems is to manage and monitor different network components regardless of manufacturer. XONITOR is the perfect network management solution for this.

XONITOR – Cross-manufacturer Resilience of all Digital Functions

XONITOR helps to ensure the optimal function of the TACTICAL CORE network at all times.



RIDUX – the High Quality Middleware

RIDUX serves as a versatile middleware that facilitates seamless networking of all devices, including older ones, to establish a unified digital space for efficient communication and data exchange. Developed and continuously improved by blackned, RIDUX prioritizes constant engagement with end-users, particularly soldiers, to integrate their real-world experiences from the field.

The primary focus of RIDUX revolves around achieving the utmost reliability, security, and mobility in communications and data transmission. It achieves this by offering flexible connection paths through radio links, wired, or satellite, enabling dynamic networking even in fast-moving scenarios. By combining mobile communication technologies, RIDUX ensures adaptability and responsiveness to various operational needs.

A standout feature of RIDUX lies in its ability to rapidly deploy an LTE and 5G network with maximum security at any location. This capability ensures a high-quality and secure communication infrastructure, allowing for efficient data exchange and collaboration.

RIDUX ensures continuous communication right up to the front lines.



Fighting Soldiers Trust Their RCC

The prowess of TACTICAL CORE shines through in its remarkable RIDUX Collaboration Client (RCC). Serving as the dedicated smartphone application for TACTICAL CORE users, RCC empowers soldiers, whether dismounted or situated within an infantry fighting vehicle, to access critical information in real time. This user-friendly application ensures that soldiers have all the necessary data readily available at their fingertips.

RCC‘s exceptional functionality goes beyond digital communication, enabling seamless integration with analog radios. By digitizing and distributing the signals through the network, RCC bridges the gap between modern digital capabilities and the continued use of analog radios, providing a comprehensive and unified communication experience.





Skynode – the Connection of Unmanned Systems to TACTICAL CORE

In cooperation with Auterion

Efficiently integrated mission control in TACTICAL CORE with Auterion

The significance of Unmanned Aircraft Systems (UAS), commonly known as drones, is rapidly escalating, as evident from their crucial role in events like the ongoing war in Ukraine. Leveraging our partnership with Auterion, we can seamlessly incorporate these UAS into the TACTICAL CORE network, enhancing the system with their unique capabilities.

The integration of UAS as nodes within the TACTICAL CORE network amplifies its functionalities, encompassing a wide range of operations from reconnaissance and surveillance to logistical support services. This symbiotic relationship between the drones and the network empowers TACTICAL CORE to extend its reach and fortify its security.





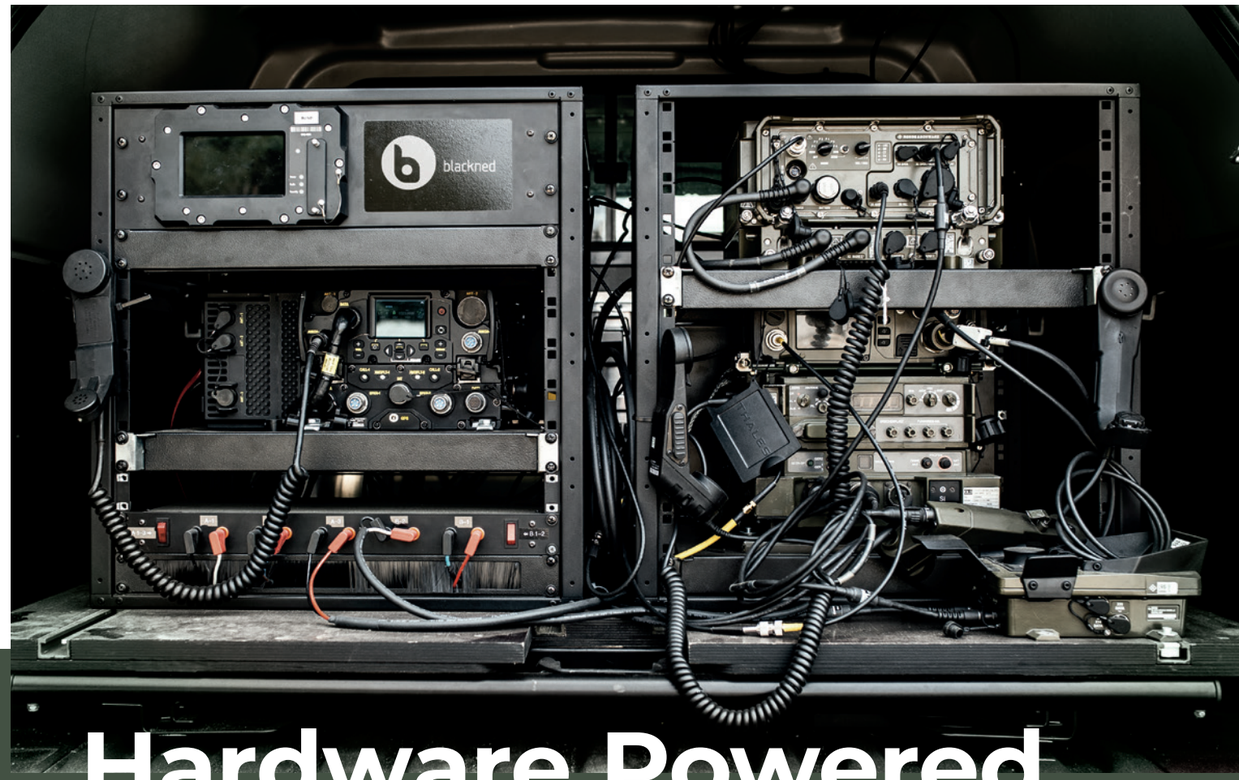
PBH (Personal Body Hub)



PRA (Personal Radio Adapter)



Micro network KNW 2



Hardware Powered by TACTICAL CORE

TACTICAL CORE from blackned empowers you with true independence. Unlike traditional „silo solutions," blackned's network fosters a manufacturer-independent, seamless, and interoperable networking of diverse components. Achieving this level of integration necessitates not only a robust middleware but also bespoke hardware modules.

To fulfill this requirement, blackned took the initiative to develop a series of innovative components that bridge existing development gaps in the market. These cutting-edge hardware modules form an integral part of TACTICAL CORE ecosystem, complementing the middleware to create a comprehensive and cohesive solution.

By combining the middleware's prowess with the specialized hardware components, blackned ensures a unified and adaptable networking infrastructure that breaks free from vendor lock-ins and offers maximum flexibility to users.



Laying Capability is Indispensable

The prospect of potential conflict requires rapid deployment capability without compromising communications integrity. This is the only means to address the challenges ahead and defines a fundamental objective of blackned.

Soldier

Airborne

Seagoing

Vehicular

Base

Manpack

Rackmount

Container

Our modular, deployable systems ensure internationally deployable, protected communication.