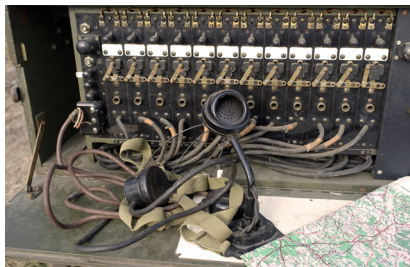


Network enabled capabilities for modern military engagements



Mission-critical networks

- Easy to deploy
- Fast connection set-up
- Friendly maintenance

Core values for customers and primes

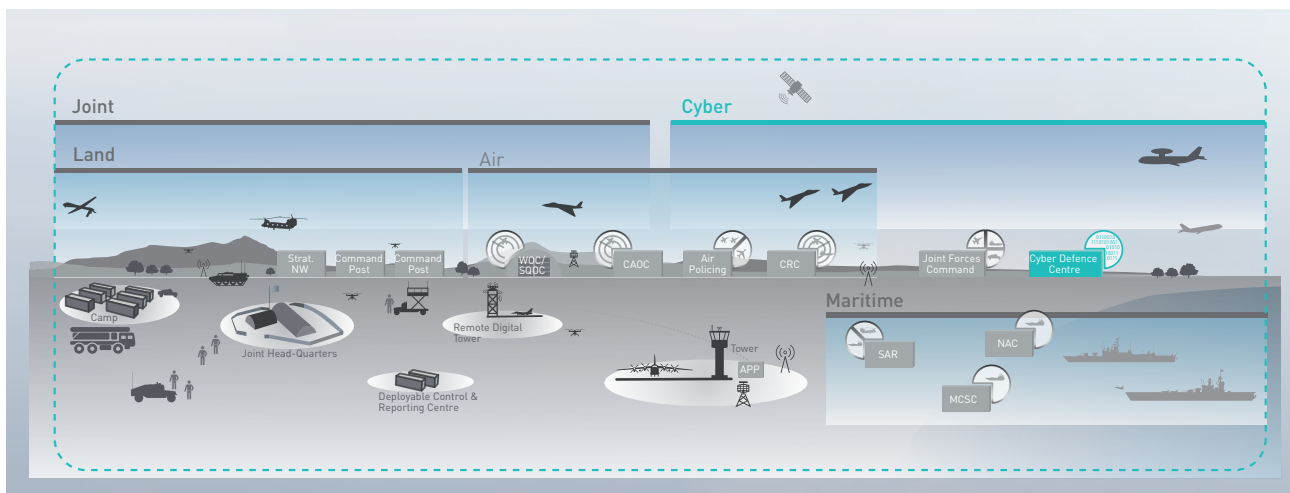
- Brown-out detection
- Matching network performance and application needs
- Proactively prevent failures
- Deterministic prioritisation
- Increased end-to-end service availability
- Brokering between defence-specific applications and non defence-specific network infrastructure

Modern standard IP-based networks are designed such that many different applications can use the same infrastructure. This brings great economic benefits to corporates, since they can focus their investments on a single network infrastructure. On the other hand, all those applications are served equally, in a best effort manner. Those networks do not distinguish between safety-critical and non-safety critical voice and data communication.

Large scale networks with a large variance of connectivity and application schemes, such as the network required for DND Canada, are very demanding on itself, but a defence context makes it even more challenging because of the following reasons:

- Diversity of partner networks and communities of interest
- Lack of bandwidth in remote network segments
- Harsh environmental conditions and hostile influences
- Many applications which are mission critical need to be supported

Frequentis NetBroker is an intelligent monitoring & control software, that uses real time network performance information to adapt the routing of each application class. It understands each application needs and optimises the traffic routing through the heterogenous available networks. Through pre-configured applications' needs and mitigation scenarios, NetBroker delivers a deterministic network routing behaviour. Based on active network probing and trend analysis of different network performance indicators, NetBroker reroutes applications traffic from one network segment that does not fulfil the applications requirements anymore to another network segment before a total network outage occurs. This significantly increases the quality of the end-to-end services.



Solution benefits for different vendors

- Redundancy
- Safety

Use case

- DoD
- Cyber defence center
- Joint forces command

Bridging technology

NetBroker is built on top of the Open Network Operating System (ONOS) supported by a growing number of carriers and network companies, including AT&T, Cisco, Nokia, Huawei, Google and Fujitsu, among others

Mission-critical infrastructures are migrating and converging towards IP networks all over the world. Frequentis follows this trend for long over a decade in Defence, Air Traffic Management, Public Safety, Public Transport and Maritime.

Converging networks towards IP allows to reduce OPEX and CAPEX by utilising the same infrastructure for all applications.

These come with additional limitations

- Applications compete for the same network capabilities
- Unclear demarcation between applications and networks – technically as well as organisationally

Therefore, only migrating the technology will lead to negative performance impact, since IP is not designed with mission-critical applications in mind. The effect is a non-deterministic behaviour.

To create a logical layer between the converged IP network and all applications to tackle to above listed limitations of a classical commercial IP network, Frequentis introduces the NetBroker.

It is an open standards-based software defined networking (SDN) controller tailored for air traffic management (ATM) networks. Combining real-time performance information from the network with application needs and pre-defined mitigation scenarios, it enables converged networks serving all applications – from safety-critical to administrative. It fills the technical gap between conventional IP networks and the very specific and heterogeneous requirements of different ATM applications.

It ensures deterministic and pre-defined behaviour, defines rules of competition among the applications and allows for implementing operational mission-concepts in pre-defined network configurations (scenarios) by means of software-defined technology.

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