Addressing Today’s Military Challenges with Nexium Defence Cloud Edge
Executive Summary

Today’s militaries need increasingly flexible capability to respond to a range of situations, from high-intensity conflict to grey zone countermeasures and humanitarian assistance.

To achieve their goals, militaries must leverage joint operations and coalition partnerships, working together across a secure, cloud-enabled digital backbone.

To handle the added complexity, modern defence organisations are increasingly migrating their in-theatre and workplace operations to Defence Clouds. An effective Defence Cloud can help overcome the Mission Challenges of decisiveness, interoperability and agility; as well as the Persistent Challenges of SWaP (Size, Weight and Power), communications, resiliency, user context, cybersecurity and financial constraints.

With the right solution, the results are clear, secure channels that grant forces access to the information they need, when and where they need it.

Thales Nexium Defence Cloud Edge

Thales Nexium Defence Cloud Edge (NDC Edge) is a response to the growing trend of militaries around the world migrating their in-theatre Information Communications Technology (ICT) operations to a Defence Cloud.

The trend towards Defence Clouds is expected to continue at pace. Nexium Defence Cloud is a holistic and comprehensive approach to delivering a Defence Cloud. This solution spans all domains, from the headquarters to the tactical edge, aiming to overcome the inherent challenges associated with the harnessing and sharing of data in the military context. The targeted capabilities are more agile in their deployment, more interoperable in their use and deliver a more decisive impact on the battlefield.
Nexium Defence Cloud Edge

NDC Edge delivers a flexible Warfighting Cloud that overcomes military challenges to seamlessly cooperate with multiple coalition Mission Networks in pursuit of shared outcomes.

The NDC Edge capability empowers warfighters to be more effective whilst facilitating an overall reduction in the lifecycle cost of Deployed ICT. The capability draws on Thales’ engagement in: a long pedigree of supporting ADF military operations across the globe; the recent development of the Nexium Defence Cloud; and close collaboration with key technology partners Microsoft and Dell.

Mission Network
The Mission Network represents the collection of partner capabilities brought together for a clearly defined coalition mission with clear objectives.

Warfighting Cloud
The Warfighting Cloud delivers a collection of hybrid Defence Clouds, under a single nation’s control, that contributes to one or more concurrent missions through interoperability with Mission Networks.

Mission Connection
Mission Connection delivers a mission ready Federated Force Element (FFE), fully integrated into the Warfighting Cloud and complete with operational information.

Orchestration
Orchestration rapidly combines available capabilities from the Repositories to deliver the NDC Edge platform.

Repositories
The Repositories deliver a set of certified and accredited capabilities that can be combined and deployed for a mission at short notice.

Key:
- WARFIGHTING APPLICATIONS
- PLATFORM SERVICES
- COMPUTE & STORAGE
- NETWORKS & GATEWAYS
- FIXED
- MOBILE
- DEPLOYED
What are the current Military Challenges?

Militaries encounter several types of challenges when deploying ICT operations.

1. **Mission Challenges**
   - Mission Challenges can inhibit operational success. However, overcoming these challenges is possible with a considered approach to the deployment of today’s technology.

2. **Persistent Challenges**
   - Persistent Challenges are non-negotiable for any military operation and must be factored into any attempt to overcome Mission Challenges.

3. **Financial Challenges**
   - Financial Challenges are a fact of life for any nation’s military and limit the available options to address Mission and Persistent Challenges. A consistent approach to ICT deployment can help minimise Financial Challenges.
How does NDC Edge overcome the Military Challenges?

NDC Edge uses state-of-the-art technology to successfully overcome today’s Mission Challenges while addressing both Persistent and Financial Challenges.

Mission Challenges

**Decisiveness**
Through improved local Decisiveness, NDC Edge brings the military closer to realising the decentralised control paradigm. The delivery of increased local compute power supports advanced Artificial Intelligence (AI) and Machine Learning (ML) capabilities all the way to the tactical edge and enables effective operation in D-DIL environments.

**Interoperability**
Smooth communication and information sharing between domains and coalition partners will continue to be essential. The compliance of NDC Edge with Federated Mission Networking (FMN) specifications ensures interoperability within and between nations.

**Agility**
The Agility delivered by NDC Edge provides a competitive advantage through the proactive control of forces. A Federated Force Element (FFE) can proactively transition between centralised or decentralised relationship models to optimise force integration for the operating environment and mission.

Financial Challenges

A consumption-based cost model that reflects the number of Users and their duration of use is a game changer for the Australian Defence Force.

The Nexium Defence Cloud approach provides reduced acquisition costs and more predictable support costs associated with Availability, Usability and Reusability.

The cost improvements are driven primarily through:

- standardised software and hardware platforms across defence;
- a consumption based cost model; and
- software and hardware provided as consumable commodities.
Persistent Challenges

The Nexium Defence Cloud approach addresses the collective trade-offs in relation to Persistent Challenges in different ways at each type of FFEs as illustrated below.

<table>
<thead>
<tr>
<th>PERSISTENT CHALLENGES</th>
<th>LEVEL</th>
<th>Fixed</th>
<th>Deployed</th>
<th>Mobile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size, weight and power</td>
<td></td>
<td>Optimised for cost effectiveness</td>
<td>Optimised for transit</td>
<td>Optimised for continuous operation in combat operations</td>
</tr>
<tr>
<td>Communications</td>
<td></td>
<td>Secure overlay network</td>
<td>Minimise unnecessary communications</td>
<td>Autonomous decision making</td>
</tr>
<tr>
<td>Cyber Security</td>
<td></td>
<td>Requires physically secure location</td>
<td>Ability to support theatre wide zero trust security architecture</td>
<td>Zero touch, persistent authentication</td>
</tr>
<tr>
<td>Resilience</td>
<td></td>
<td>Benefits from Native Cloud Services</td>
<td>Limited benefit from Native Cloud Services</td>
<td>Inter-Node resilience</td>
</tr>
<tr>
<td>Environmental</td>
<td></td>
<td>Benefits from installation location</td>
<td>Fully protected from the elements during transit</td>
<td>Designed for continuous operation in extreme conditions</td>
</tr>
<tr>
<td>User</td>
<td></td>
<td>Reflective of Standard Information Environment</td>
<td>Similar look and feel between domains</td>
<td>Minimal, high-impact system interaction</td>
</tr>
</tbody>
</table>

HQ | Main Theatre Post | Command Post | Mobile Vehicles and Service on the Move
Use Cases

Use Case: Collaborative Combat

_challenge:
During a mission, the warfighter needs to choose the appropriate weapon to use between multiple information-sharing platforms and coordinate nearby FFEs to avoid collateral damage. It needs to be interoperable between sensor and effector systems and provide processing power to provide decision support.

_solution:
NDC Edge provides:
- Interoperability between sensor and effector systems
- Interoperability across domains and coalition partners
- Processing power to provide decision support

_outcome:
AI platforms provide a clear view of enemy context and intent. The ability to run simulations on course of action based on Effector capabilities and current locations.

Use Case: Reconnaissance Mission

_challenge:
Capture intelligence in remote environments and pass this information to headquarters for analysis.

_solution:
Enable personnel to capture, package and securely transmit video, photos, and documents that can be combined from various streams in D-DIL environments.

_outcome:
- Provide a rapid update to all nodes of potential threats or friendly movement and make quicker, more intelligent decisions
- Delivering actionable intelligence in real time
- Present analysed information to decision makers in meaningful ways
**Challenge:**
During a mission, it’s critical that the correct information is made available to people in a timely manner.

**Solution:**
- Rapidly deploy a work area to be able to automate and manage the flow of information.
- Compile, authorise and release information to various appropriate military roles.

**Outcome:**
Ensure the right people have the right, easy-to-use information at the right time, throughout the execution of a mission to ensure adherence to the daily battle rhythm.

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**Challenge:**
How does defence enable timely decisions with secure multifactor access for mission control systems, sensitive information, use of sensors and effectors when in deployed theatre.

**Solution:**
Enable continuous user authentication by establishing Zero Trust Multifactor Authentication using wearable devices.

**Outcome:**
Allow users to transparently log in securely and more efficiently into any system, sites and equipment for timely OODA, by identifying the user as the password.
Partnering with industry leaders

The Australian Defence Force can achieve its goals of supporting the Warfighter through a strong partnership with industry and adopting current advancements in ICT capability. The combined partnership of Thales, Microsoft and Dell will help Defence maintain evergreen systems and information advantage:

**Thales:** A world leader in many areas of defence systems, including a strong pedigree of delivering and supporting deployed ICT systems for the ADF

**Microsoft:** A multi-national technology company and one of the world’s leading cloud providers, offering a broad portfolio of cloud, software, electronics, computing, synthetics, and related services

**Dell Technologies:** A world leader in compute and storage solutions with hardware underpinning many of the ADFs legacy deployed assets.

Visit thalesgroup.com/ndcedge for more information