



NATO Communications and Information Agency

FMN for Coalition Operations

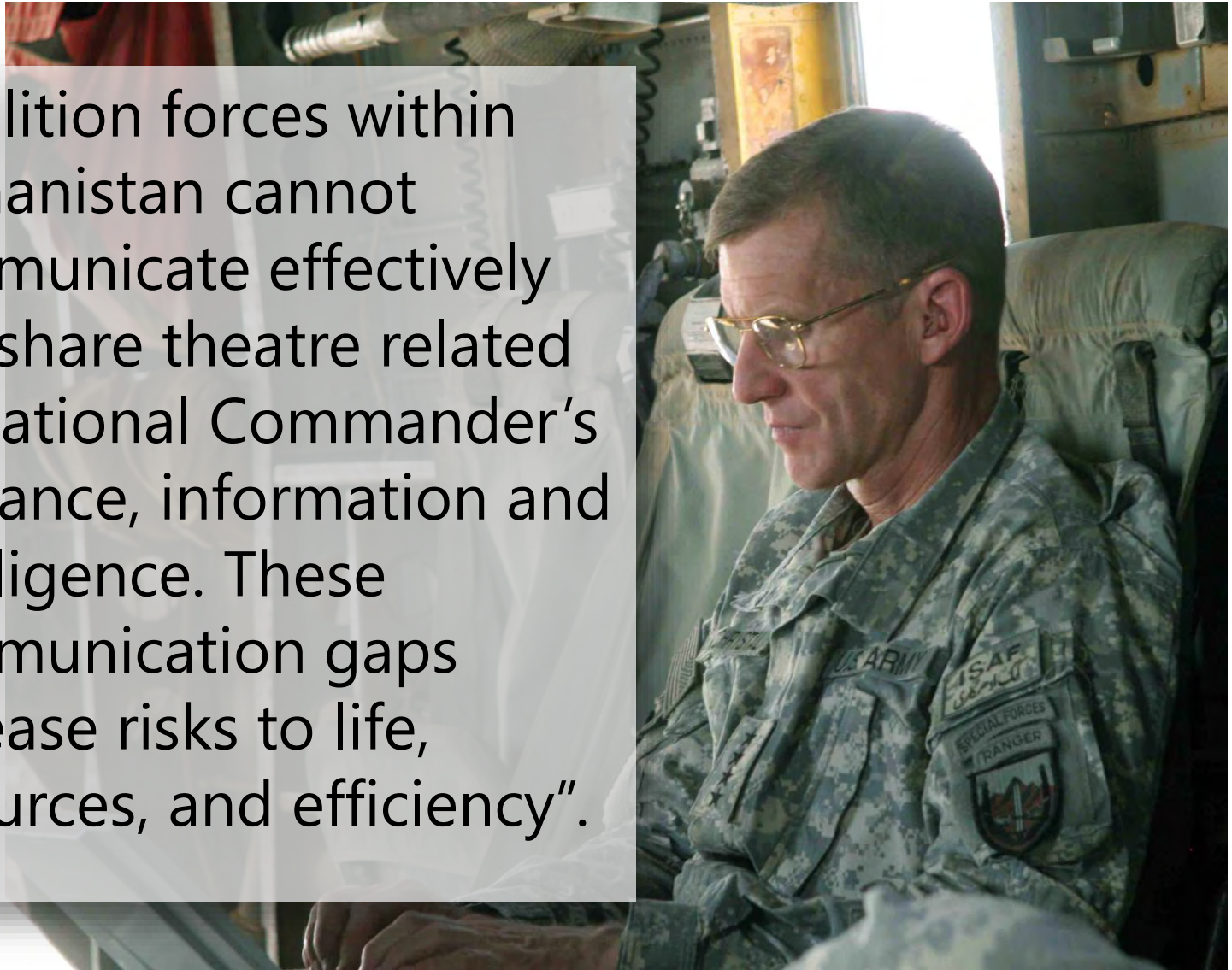
AFCEA – Bonn, DEU– 22-23 June 2016

Detlef Janezic,
Service Strategy Directorate,
Chief Service Engineering & Architecture Branch



The Afghanistan Challenge

“Coalition forces within Afghanistan cannot communicate effectively and share theatre related operational Commander’s guidance, information and intelligence. These communication gaps increase risks to life, resources, and efficiency”.

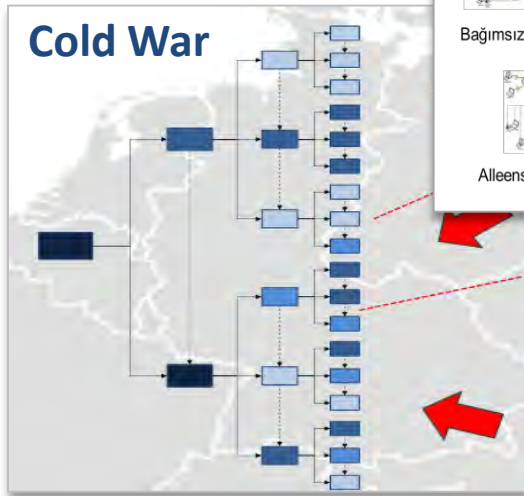


COMISAF, General McChrystal

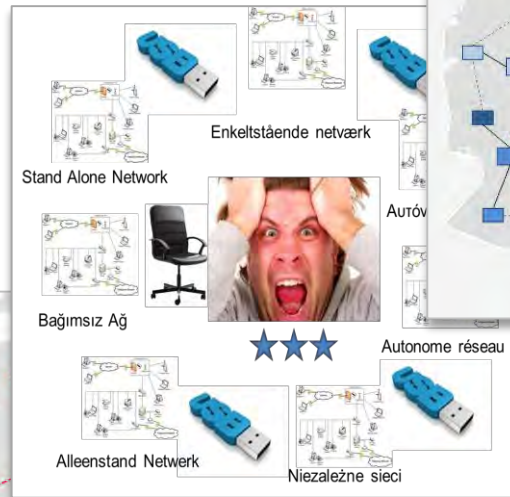
NATO's Mission Network Concepts



Large national
land warfighting
formations
(Corps)
STANAG 5048



1949 - 1995



1995 - 2010



Afghanistan
Mission Network

2010 - 2017... ?



2015 - 2030

Smaller
multinational joint
formations
conducting
comprehensive
missions
(Brigade/Division)

Alliance Political and Strategic Context

“[Allies] have doubled the size of the NRF, making it more ready and more capable, and established a high readiness Joint Task Force, able to move within a matter of days. ... and increased our exercises three-fold,...

First, we must modernize our deterrence,

- with better intelligence and early warning,
- a **better integration for our land, sea and air forces,** and
- **significantly better cyber defence”**



Secretary General, Jens Stoltenberg

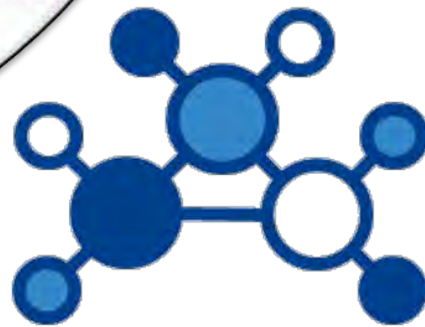
The FMN

*Connecting forces in a federated mission environment **at any time, in a short period of time and at an optimised level of interoperability***

Facilitated by:



*A coordinated approach and the commitment of FMN Affiliates **to create, maintain and evolve capabilities** enabling federated mission networking*



Federated Mission Networking

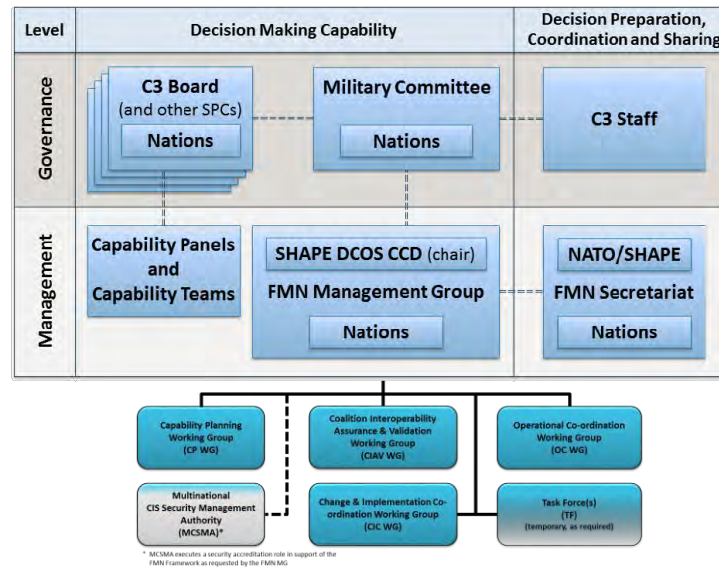
Better command and control and decision-making with improved information-sharing

Managed by:



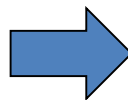
Effective and efficient mission networking based on common management, processes, activities, technology, standards, education and training

NATO Federated Mission Networking Implementation Plan (NFIP)



Vol I: Overview + Governance & Management: Nations' Triple Hatted Role in FMN

Vol II: Federation and the FMN Capability Process



The 'Plan'

Vol III: NATO Standing FMN Capabilities

Federated Operational Readiness Track



- Provide NATO a common funded FMN compliant standing networking capability constantly ready to be deployed and to meet the operational requirements to accomplish a mission



- Enable NATO standing networking & national capabilities to be permanently able to federate in the best manner

The Concept of FMN



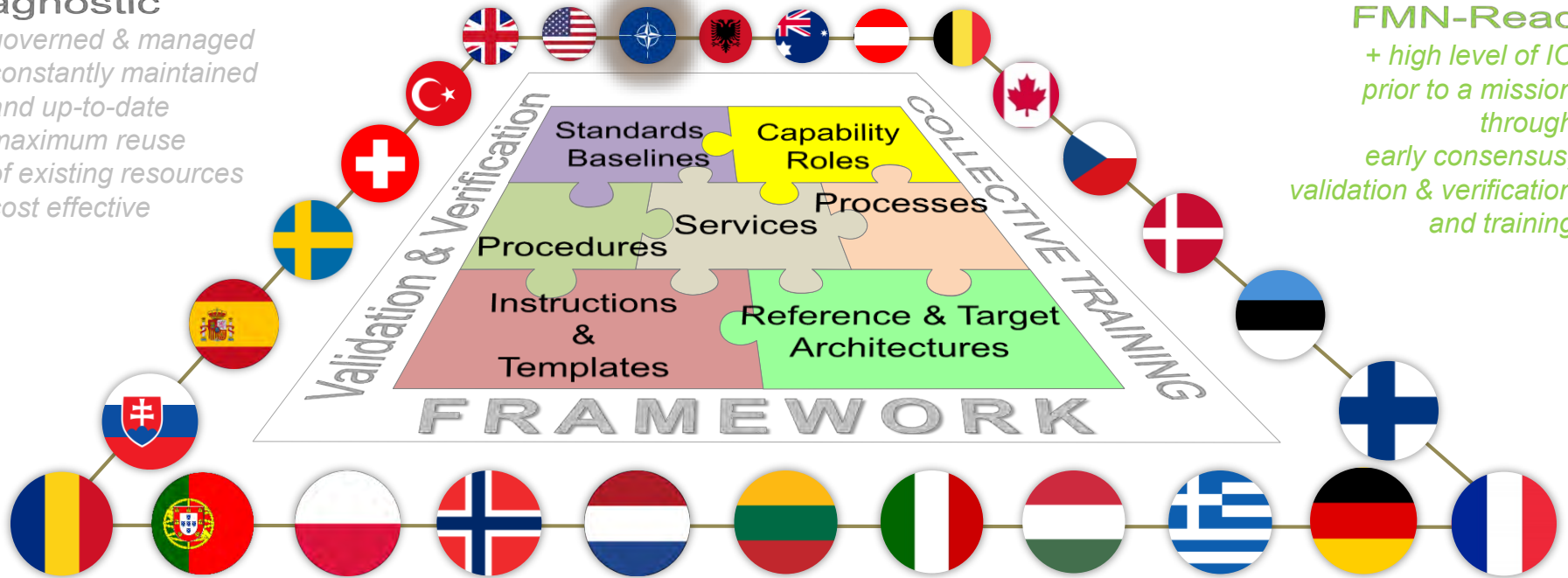
- managed
 - agile
 - flexible
 - scalable
- episodic**
agnostic

- governed & managed
- constantly maintained and up-to-date
- maximum reuse of existing resources
- cost effective

- + significantly shorter mission preparation with less IO issues
 - + working together with all coalition partners on Mission
- SECRET networks**

MISSION NETWORKS

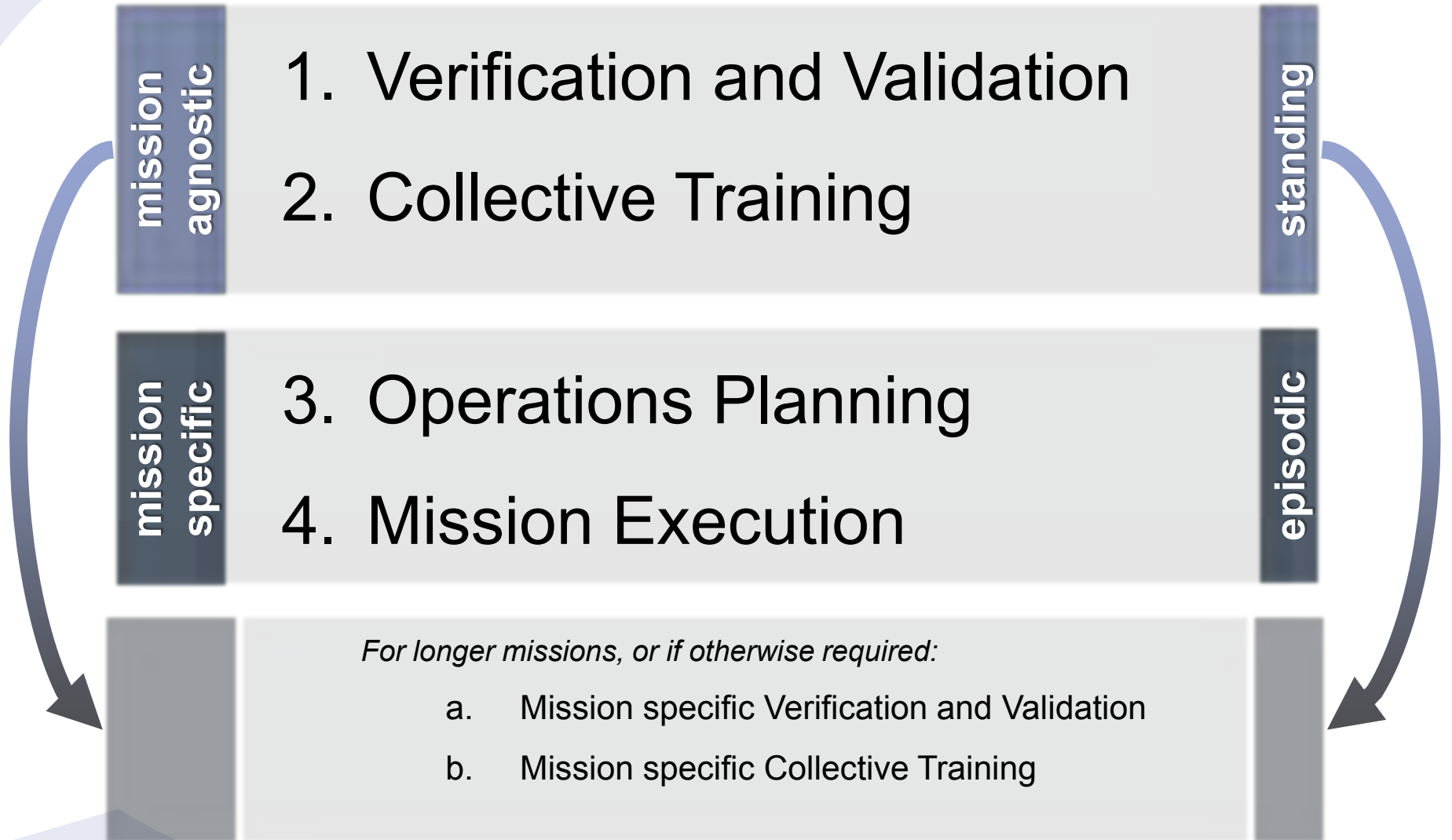
Mission-Ready FORCES



FMN-Ready
+ high level of IO prior to a mission through early consensus, validation & verification and training

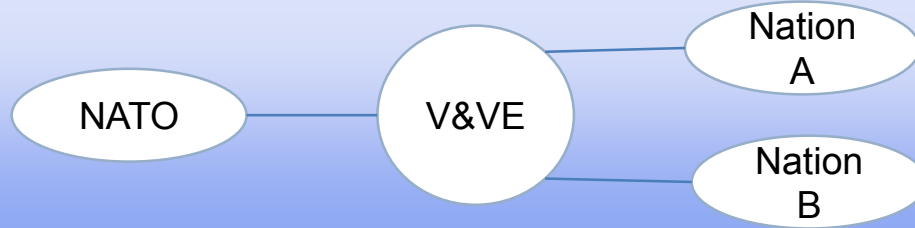
GOVERNANCE & MANAGEMENT

Environments of the FMN Capability

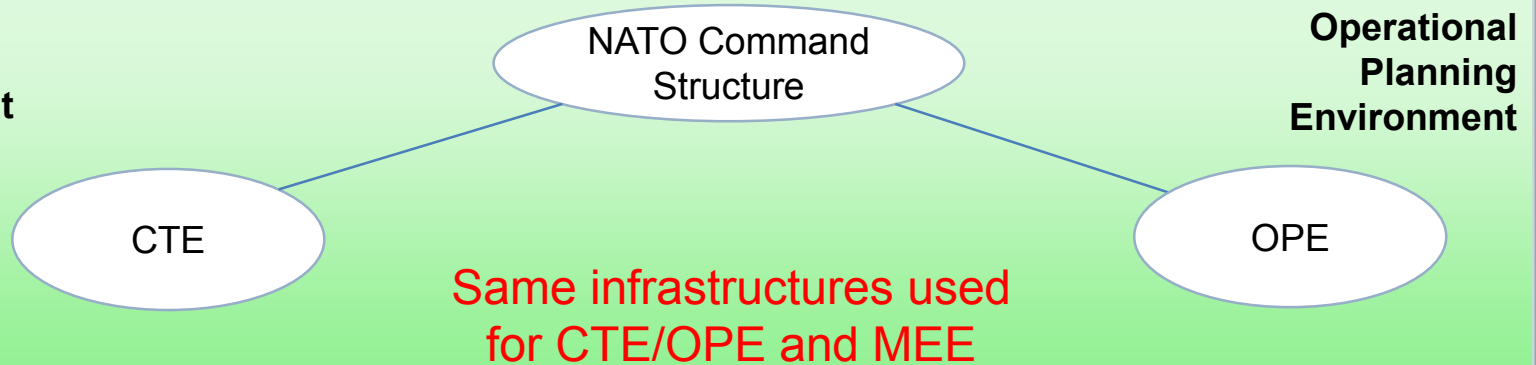


FMN Environments

Verification & Validation Environment

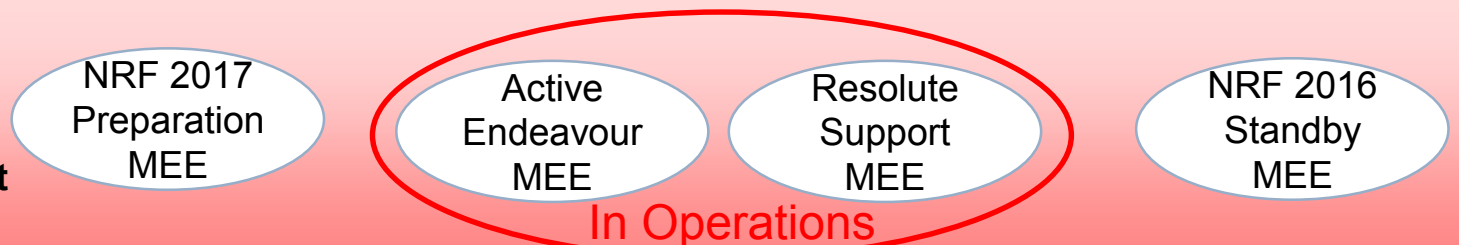


Collective Training Environment



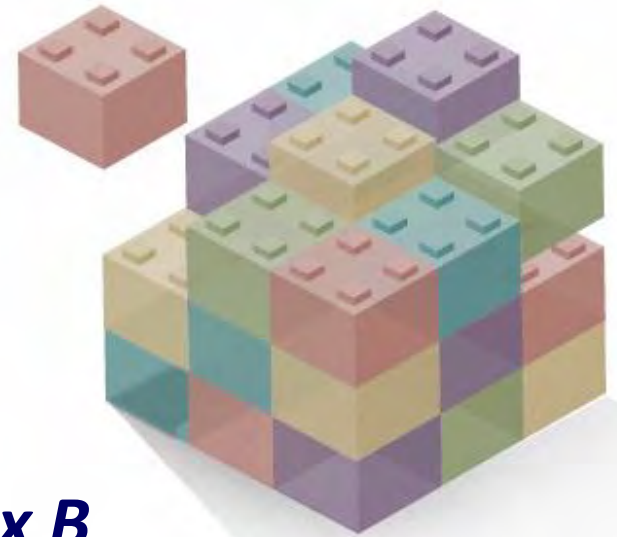
Operational Planning Environment

Mission Execution Environment



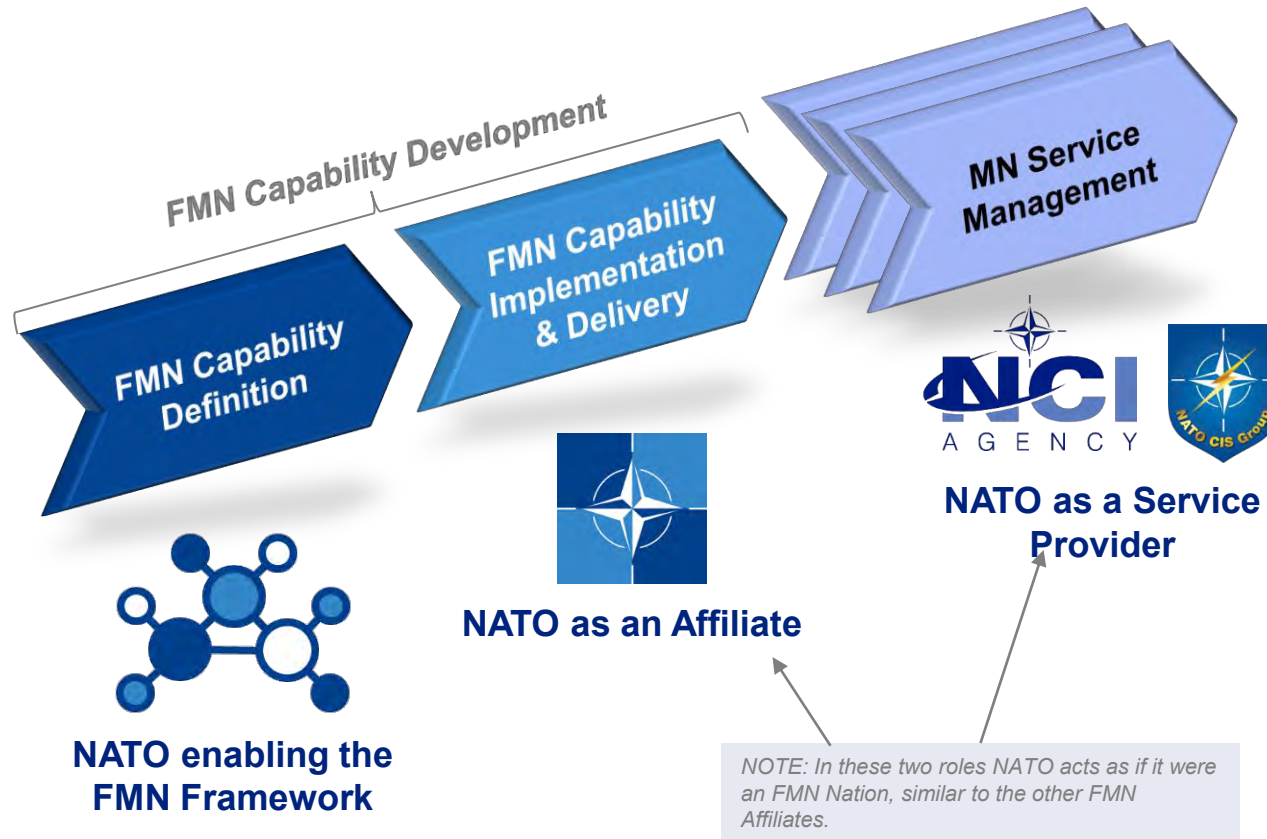
FMN Capability

A FMN Capability enables to connect forces in a federated mission environment at any time, in a short period of time and at an optimised level of interoperability *NFIP Vol 1 Annex B*



The sum of all the capabilities offered by all FMN Affiliates that are required to manage and exploit Federated Mission Networking

NATO's FMN Perspectives



The three FMN Perspectives

Within Federated Mission Networking responsibilities of each NATO body needs to be addressed individually for:

A. FMN Framework activities

▶ e.g. support to collective FMN Capability Development or managing pre-agreed naming and addressing

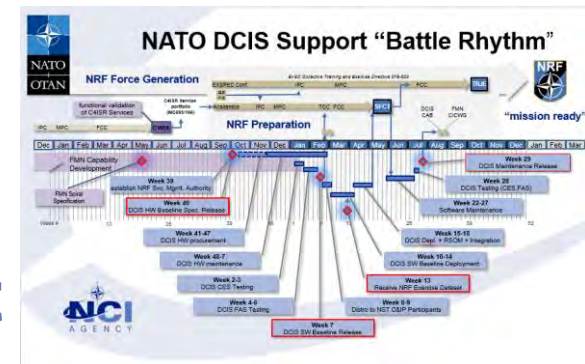


B. NATO as an Affiliate activities

▶ e.g. DCIS system upgrades and internal changes to ICT Service Management

C. Mission Network management

▶ e.g. ICT Service Management across the entire life-cycle of the Mission Network, such as DCIS for NRF 17

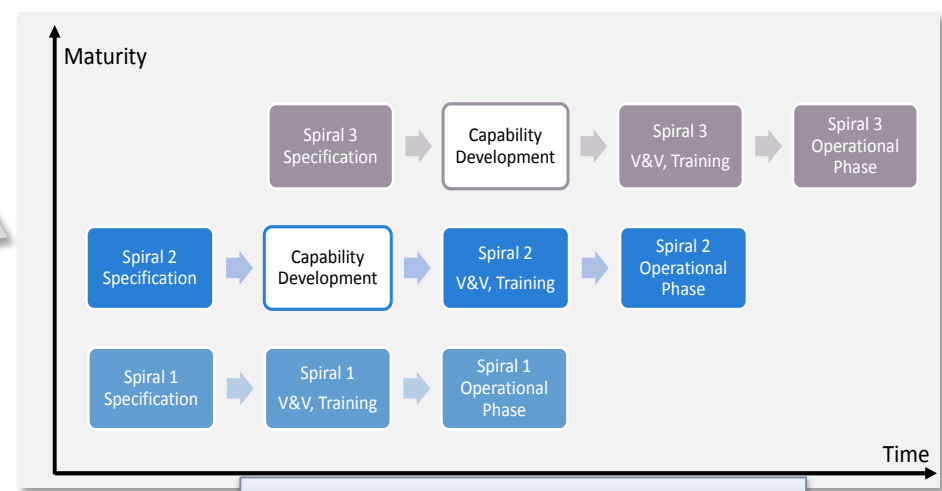
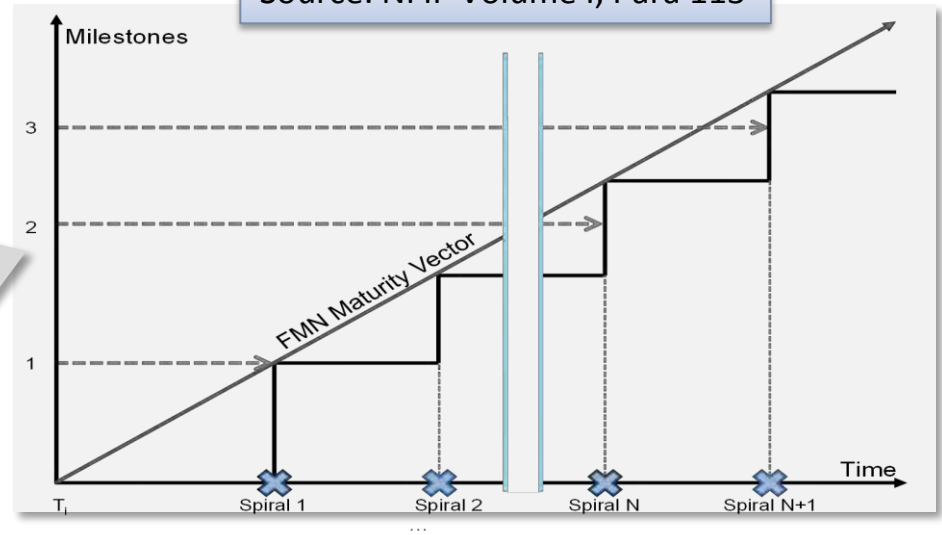


FMN Capability Development



annual (1 year cycle)	biennial (2 year cycle)	quadrennial (4 year cycle)
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Source: NFIP Volume I, Para 113



Based on: NFIP Volume I, Para 116

FMN Spiral Roadmap (Service Scope)

Spiral 1.x

Human-to-Human Services

- Informal Messaging
- Text-based Collaboration
- Audio-based Collaboration
- Video-based Collaboration
- Web Hosting

Enabling Services

- Communications
- Domain Naming
- Distributed Time Authentication
- Directory Synchronization

Agreed

Spiral 2.x

Functional Services

- Situational Awareness
- JISR Information Sharing
- MEDEVAC

Human-to-Human Services

- Unified Audio and Video

Enabling Services

- Security Markings

Under Development

Spiral 3.x

Functional Services

- Air Tasking
- Collection Management
- Logistics
- Medical

Human-to-Human Services

- Calendaring and Scheduling

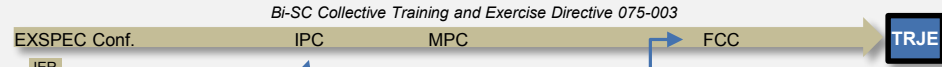
Enabling Services

- Security Labelling
- Distributed Search
- App Store
- Cloud (IaaS)

Planned

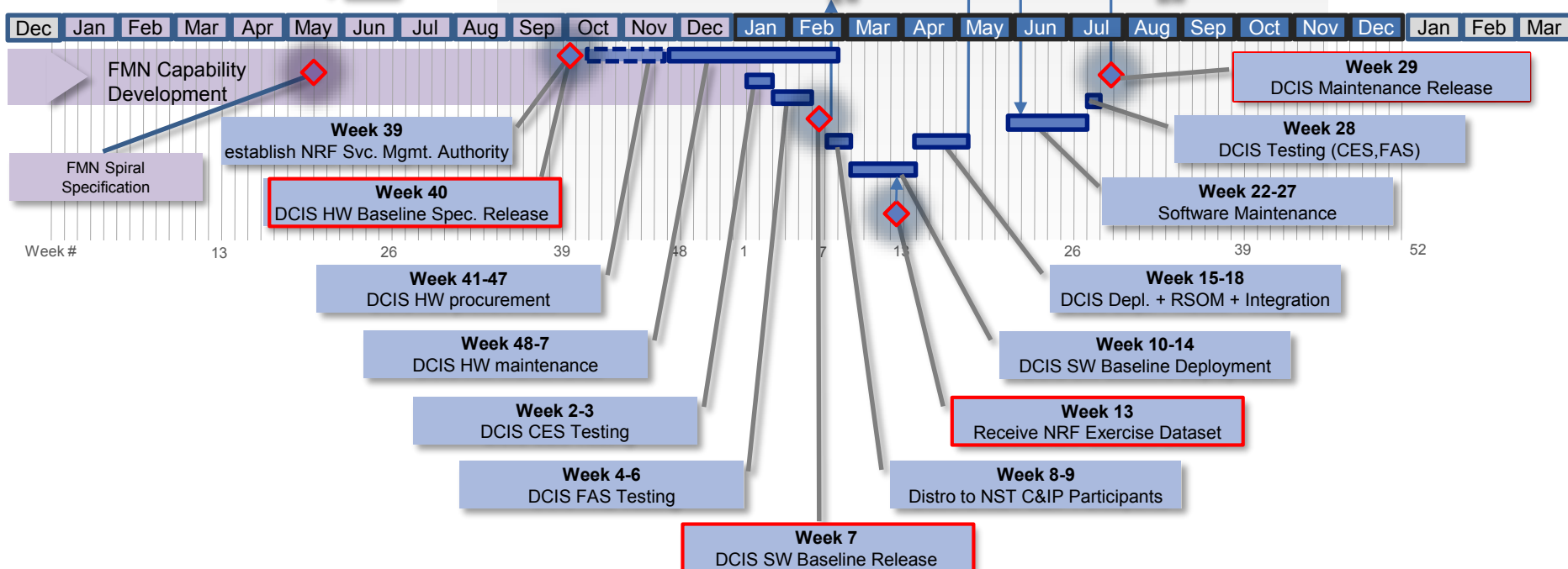
NRF Battle Rhythm within FMN

NRF Force Generation



“mission ready”

NRF Preparation



NCI Agency support activities and milestones

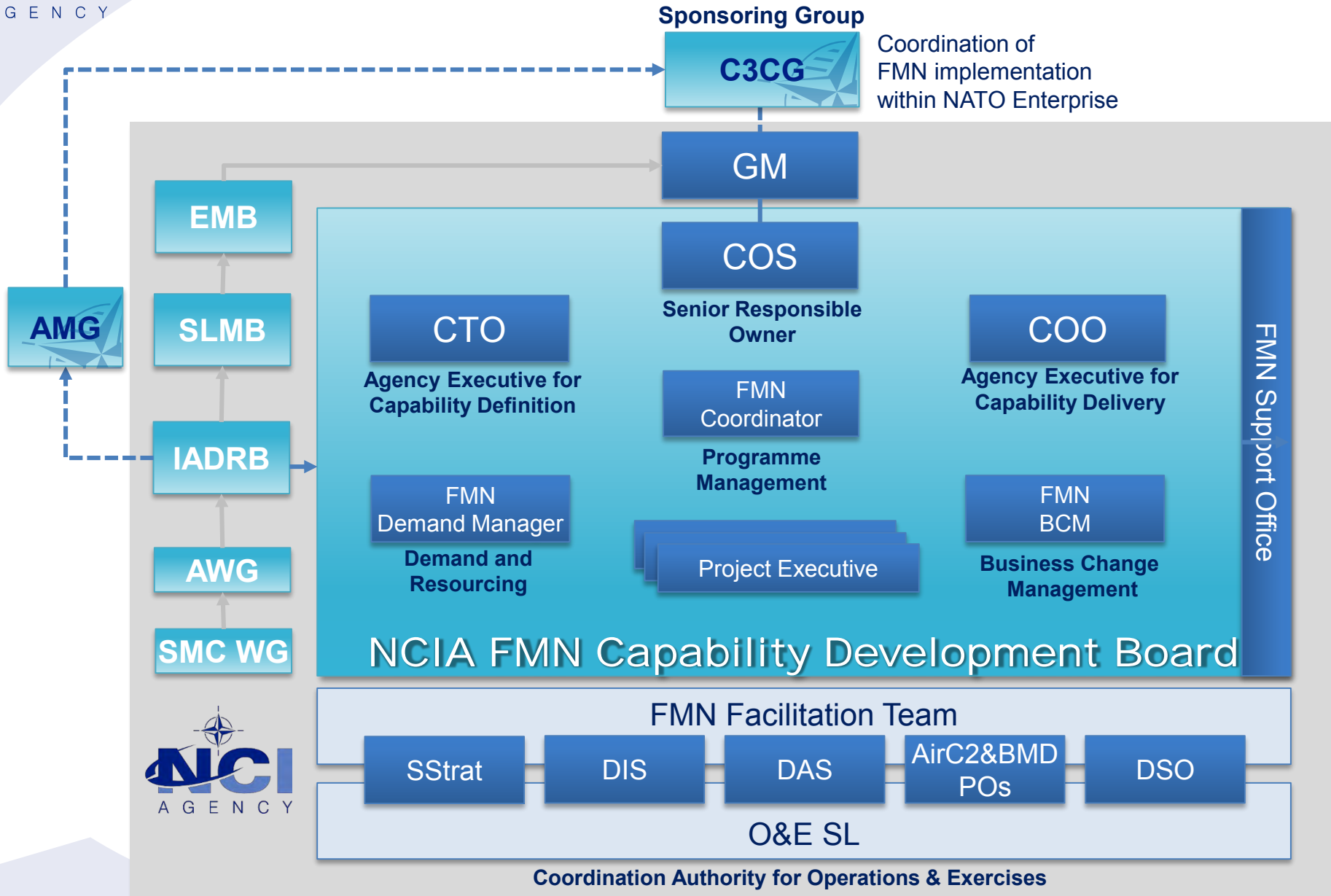
Service Change Management Directive 06.03.02
 Release Management Directive 06.02.01
 - Identification of Software Assets Tech Instr 06.03.01
 Deployment Management Directive 06.03.01
 Test, Verification and Validation Directive 06.03.04

Programmatic Approach for FMN

FMN Capability Delivery within NATO is driven by:

- ▶ the '**FMN Vision**' and strategic action plan as set out in the NFIP;
- ▶ the need for '**compliance**' of the NATO Enterprise with FMN Spiral Specifications;
- ▶ the need to '**manage change**' and '**realise benefits**' of FMN in-sync with the operational NRF Battle-Rhythm; and
- ▶ the requirement to bring together for '**cohesion**' and/or '**management efficiency**' a number of existing projects and activities.
- ▶ '**Maximize re-use**' of existing structures and organisations.

NCI Agency's Approach to FMN Support



The “combat cloud concept”

“The future combat system is not an aircraft, it is a C4ISR [system] with the cloud ID and platforms that are either piloted or unpiloted. We will have to be able to link on this. This is what we have to be able to build for the future, but we have to start it now.”

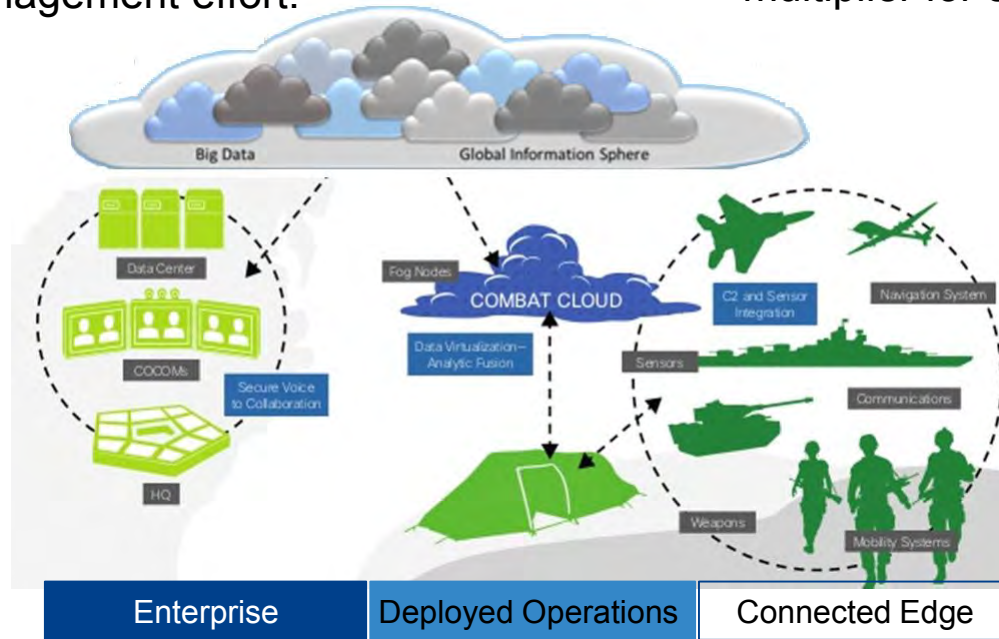


Supreme Allied Commander Transformation, General Mercier

Cloud Concepts

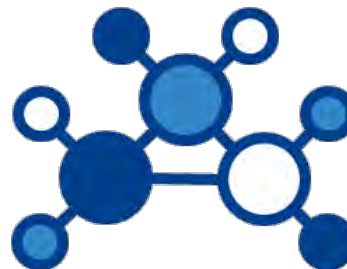
“**Cloud computing**” is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort.

“**Combat cloud**” is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of sensors, navigation systems, weapon platforms and C2 functions that could act as a force multiplier for shrinking forces.

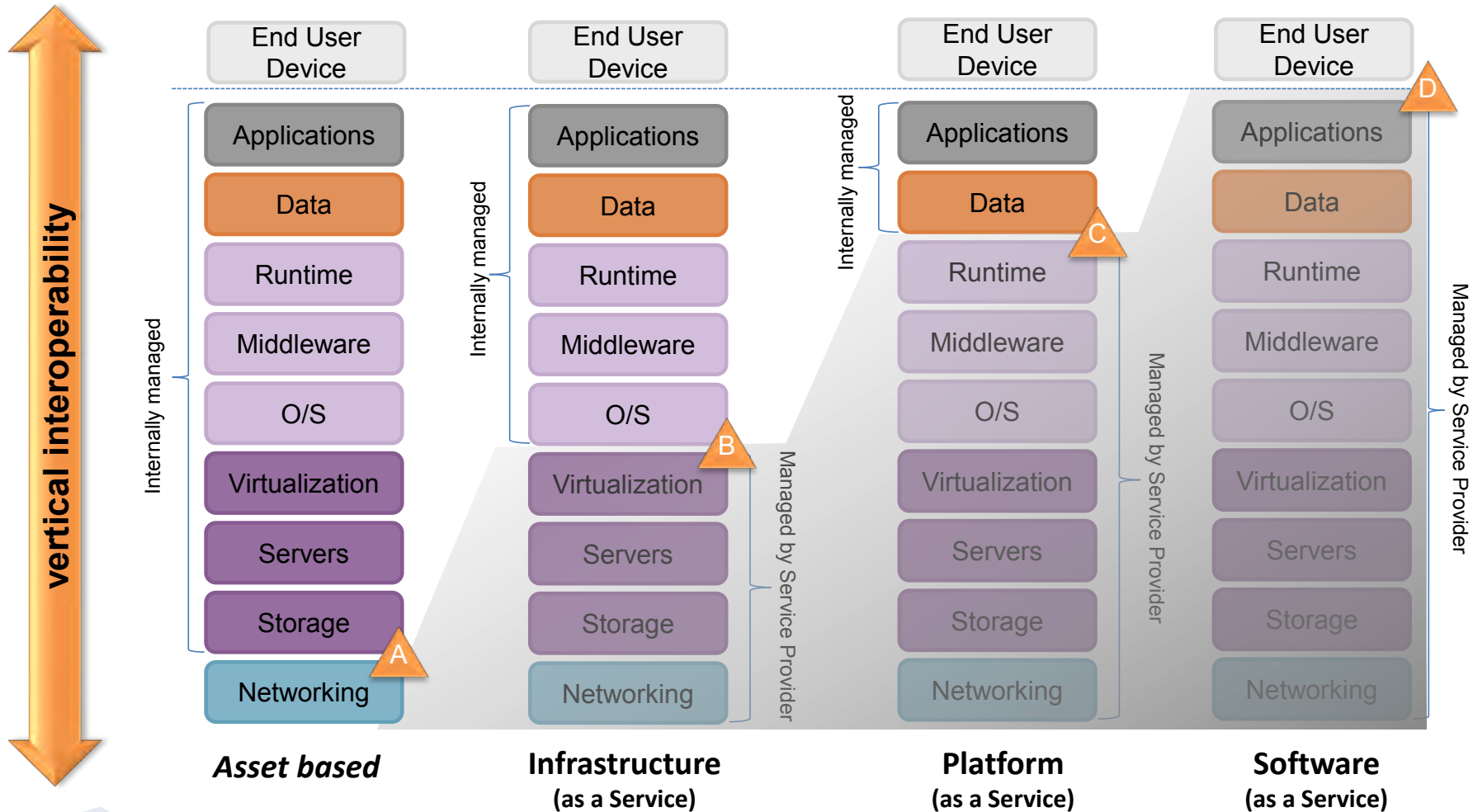


requires the availability of high-capacity global interoperable networks

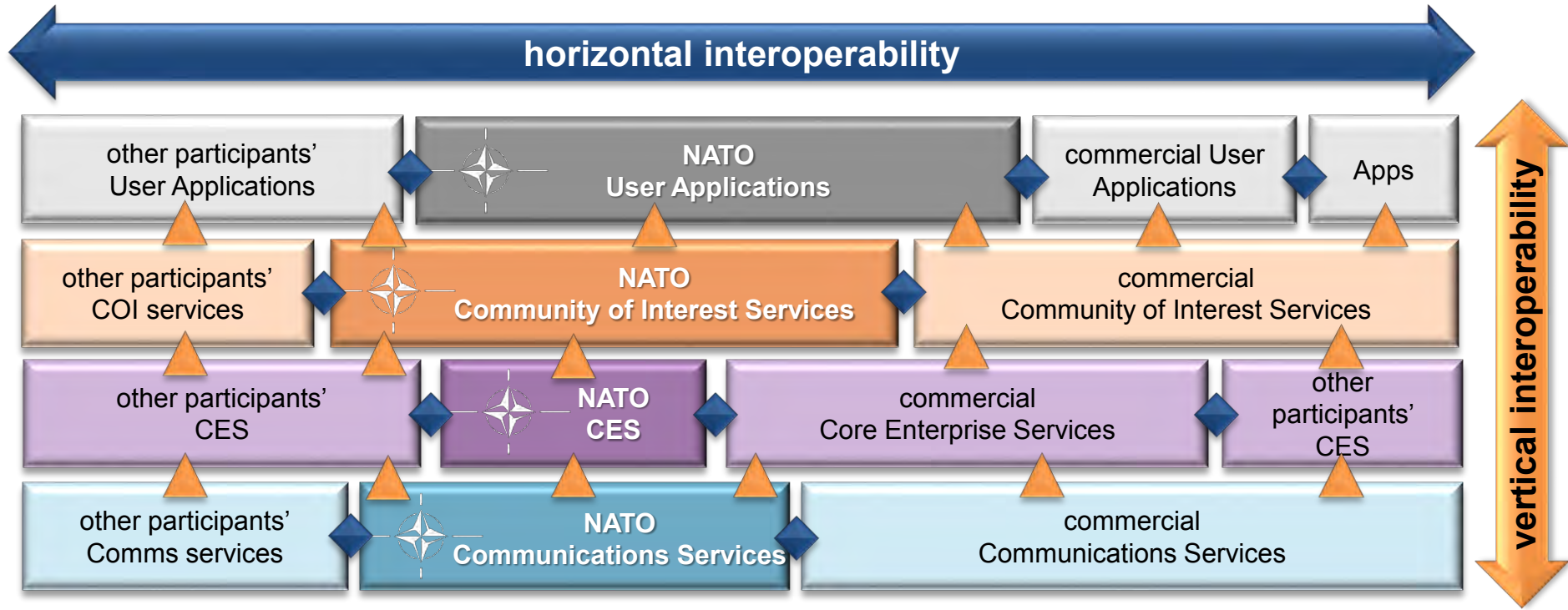
requires the availability of secure, federated mission networks



FMN Vision: Intra-cloud interoperability



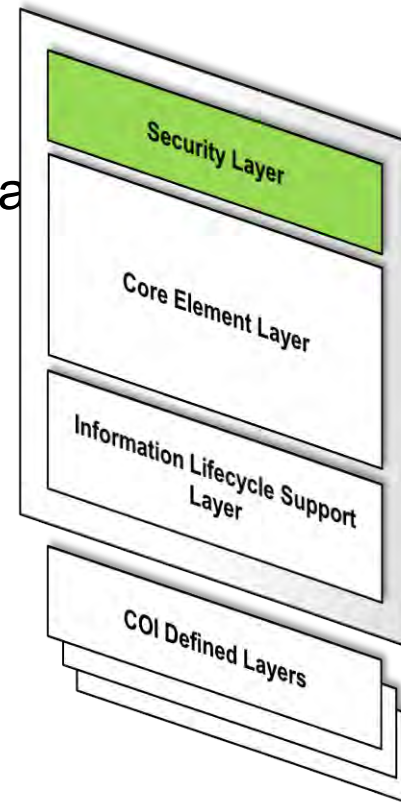
Objective: enable open Plug & Play Architectures



▲ vertical service interoperability point
◆ horizontal service interoperability point

Confidentiality Labelling & Binding

- Standards Development
 - STANAG/ADatP 4774: Confidentiality Labelling
 - STANAG/ADatP 4778: Binding mechanism



Industry support to (FMN) Architecture Development?

- FMN is about interoperability, open architecture and alignment of capability development between FMN Affiliates
 - Some nations as well as NATO itself will most likely use commercial partners for providing services in support of deployed operations.
- ▶ **Industry involvement in defining FMN related architectures and building blocks (ABBs) to ensure that industry understands FMN requirements and can offer potential solution building blocks (SBBs).**
 - ▶ **Need for a joint forum for federation/enterprise architecture collaboration**

Industry support to Interoperability Verification?

- NATO and other FMN Affiliates are setting up a federated Coalition Verification and Validation Environment (CV2E). Prime focus: end-to-end operational interoperability validation of solution architectures
- NATO and Nations rely on industry and independent test labs to certify solutions to conform to respective FMN interoperability standards and profiles.
- Many solutions can already be certified by existing conformance testing and certification programs,

▶ **there is a lack of these programs for special military and security standards.**

Collaboration Opportunities with Industry (1/2)

- Use of hybrid cloud – use of commercial IaaS, PaaS and SaaS under the assumption that public cloud offerings are security hardened and accredited
- Common and reusable Interoperability Standards and Profiles (e.g. STANAG/ADatP 4774/4778)
- Definition of common, interoperable, reusable Architecture Building Blocks (ABB) in the area of C4ISR
- Common Solution Building Blocks (SBBs) towards the goal of exchangeable micro-services

Collaboration Opportunities with Industry (2/2)

- Improved collaboration in the area of interoperability verification resulting in e.g. standardized test processes, criteria and reusable sets of test cases
- Open Source and provision of related Managed Services
- Business Intelligence
- Use of Machine Learning and Cognitive Analytics
- E2E integration of SM&C and Cyber Defence services

