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# An Update on the Convergence of MOD and NATO Architecture Frameworks

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# Aim and Overview

- To provide an insight into:
  - MOD CTO's plans for MODAF
  - How Team ENSURE are supporting the convergence of MODAF and NAF as a step towards a UAF

- Overview:
  - Background on why this is being done
  - What NAF version 4.0 will look like
  - Development of the MODAF Ontological Data Exchange Mechanism (MODEM) as the under-pinning Meta Model for NAF version 4.0
  - Re-structuring the Viewpoints
  - Standardisation activities

# MOD Chief Technology Officer's Architecture Team

Provides the enablers that help assure that MOD business and operational information systems are:

- Aligned with Strategy
- Compliant with Policy
- Coherent with Architecture

Enablers include the MOD Architecture Framework (MODAF), Defence Information Reference Model (DIRM), and the architectural approach to use them.

# Why MODAF and NATO Architecture Framework (NAF) Convergence is Important to MOD

- To support alliance interoperability by providing a consistent way of describing fielded national capabilities:
  - Currently MODAF and NAF are similar, but not fully aligned
  - Convergence would better enable us to ensure "coherence of architectures"
- MODAF is a description framework – it does not have it's own methodology
  - NAF version 4.0 will have a core methodology based on best practice
- Enabling re-use:
  - Easier identification of NATO systems and applications that can fulfil MOD Requirements
- First Step towards a Unified Architecture Framework that will ultimately include US DoDAF and Canadian DNDAF
- Pooling of limited technical resources for framework development
  - Until now, it has been a "Long Game of Leapfrog"

# A Long Game of Leapfrog

- 1996 - US DoD C4ISR Architecture Framework
- 2003 - DoD Architecture Framework (DoDAF) version 1.0
- 2005 - UK MOD Architecture Framework (MODAF) version 1.0
- 2007 - NATO Architecture Framework (NAF) v3.0; **&**
  - DoDAF v1.5: **&**
  - MODAF v 1.1
- 2008 - MODAF version 1.2
- 2009 - NAF v 3.1
- 2010 - MODAF v1.2.004
- 2012 - DoDAF v 2.0

**Plus**

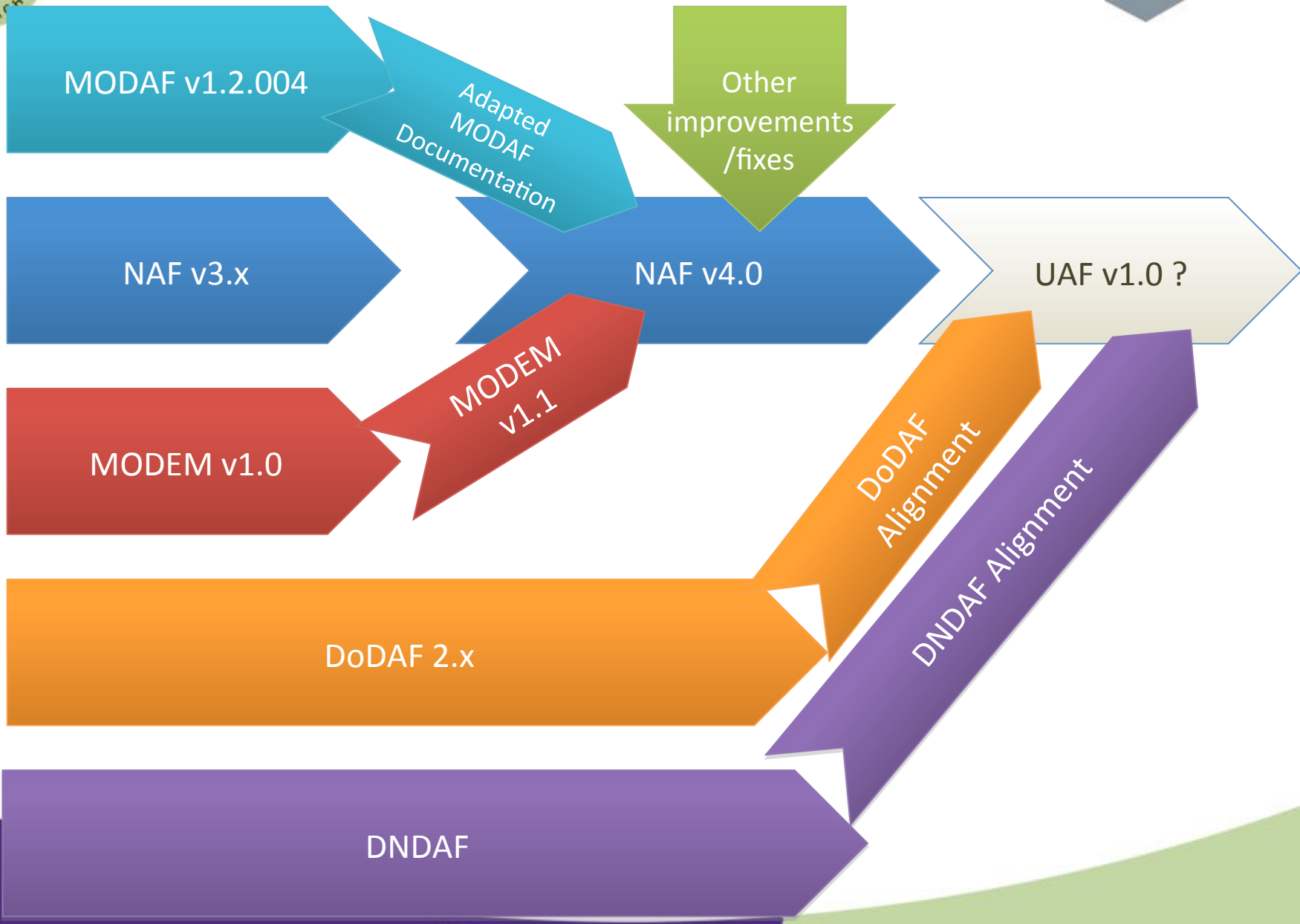
2009 - International Defence Enterprise Architecture Specification (IDEAS)

2012 - MODAF Ontological Data Exchange Mechanism (MODEM)

# Proposed Strategy

- UK to migrate from MODAF to NAF at the earliest opportunity
- Develop new draft meta model for NAF based on MODEM and additions offered by other Nations
- Information paper to accompany the migration, explaining implications
- Resolve some historical issues with the view structure (Grid Approach)
- Publish the new meta model

# What We're Proposing



# What NAF will look like

# MODEM & NAF MM Translation Work: Comparison Criteria

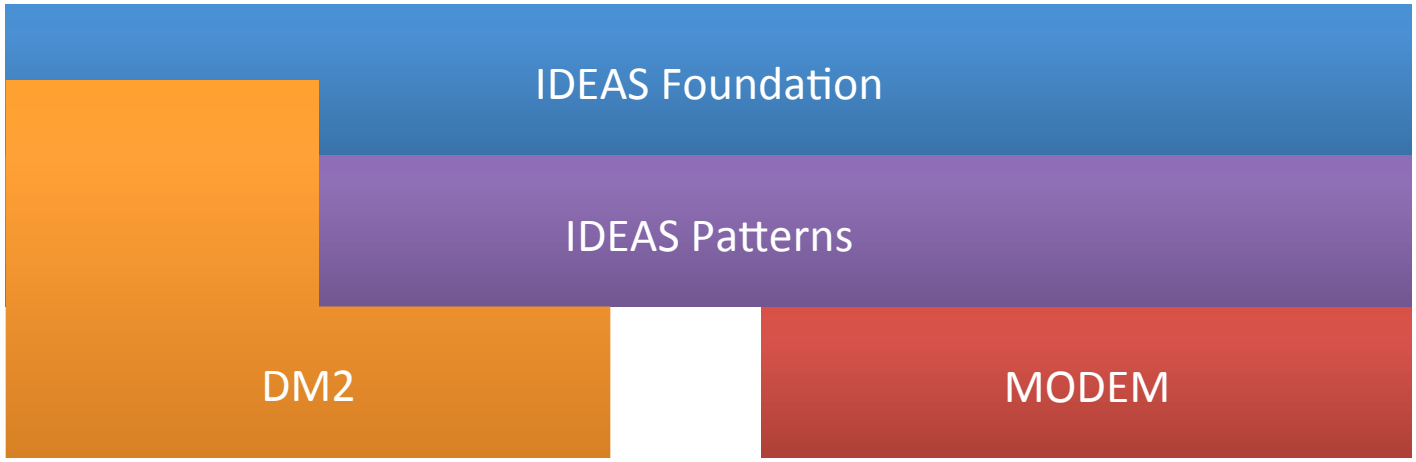
- What is the impact on tools of replacing NMM with MODEM?
- What is the impact on existing NAF architectures of replacing NMM with MODEM?
- What are the consequences to UK MOD of moving to NAF (updated with MODEM)?
- What improvements / corrections are required in NAF?
- What, if any, changes are required to MODEM to fit with NAF?

# NAF Meta-Model

- M3 & NMM identical (though versions sometimes lag - current NMM one minor revision behind)
- Meta-Model based on UML Meta-Model
  - …which gives you a UML Profile
  - …now adopted by OMG UPDM (90% the same as M3/ NMM)
- Proposal is to replace M3/NMM with a meta-model based on IDEAS Foundation
  - i.e. MODEM

# MODEM

- The new meta-model for MODAF
- Re-engineered from M3/NMM
- Based on IDEAS Foundation (as is DM2)
- Developed by Swedish Armed Forces and UK MOD
- First step towards a unified framework

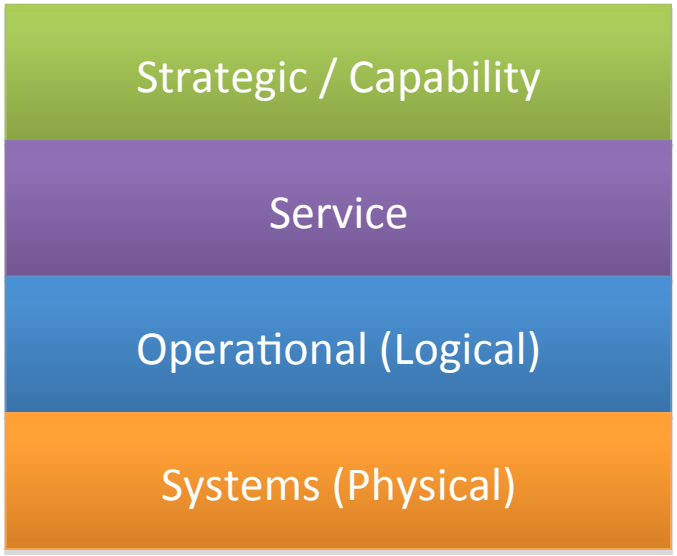


# High Level Impact Analysis

| Architect used:<br>Tool based on: | Chapter 4 | Chapter 5 (NMM) |
|---|---|---|
| Chapter 4 | Significant compatibility issues. Architectures and tools likely to require re-work. [R] | Tool will have to be re-developed. Architect is likely to have produced a non-compliant (NMM) architecture without even knowing. [A] |
| Chapter 5 (NMM) | Tools should have hopefully kept the architect on the straight-and-narrow. May still need some re-work to architectures. | Any issues likely to be cosmetic or syntactic. [G] |

# NAF Does Have Levels of Abstraction

- NAF is based on levels of specificity:




Statements of overall enterprise capability, as well as individual military capabilities

Commoditised specifications of capability, along with the contracts / interfaces

Implementation-neutral specification of overall operational requirement

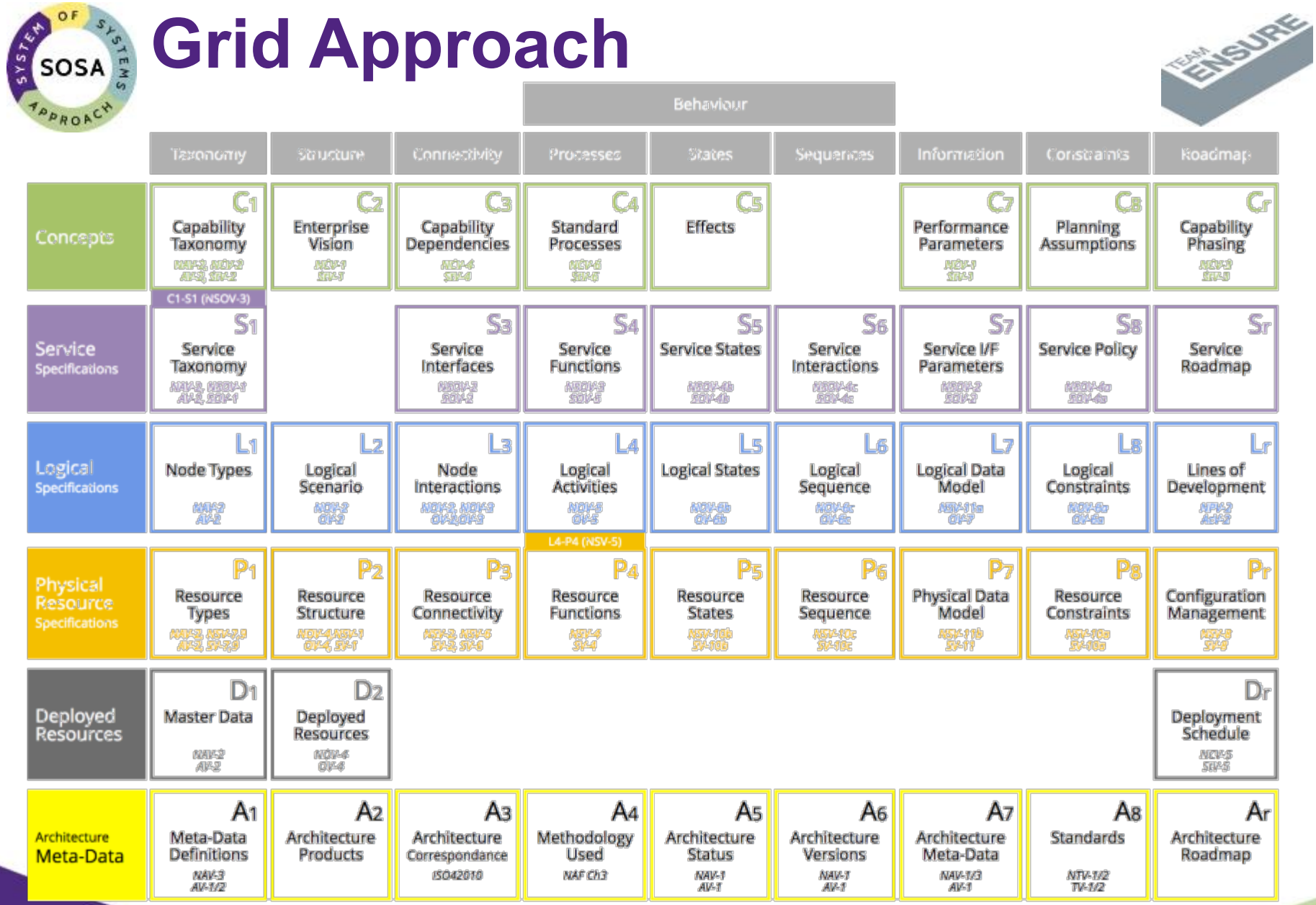
Configurations of resources (inc. human) that deliver the capabilities and operational requirements

- The names are misleading though…


# So Let's Fix it


- The merger of MODAF and NAF (with MODEM) is the perfect opportunity to sort this mess out
- The re-organisation is just about discovery and navigation
  - We still have the same views
  - We just give them sensible names
  - …and show where there are common model types

# Grid Approach





# http://nafdocs.org

# Standardisation Activities

# NATO Architecture Framework

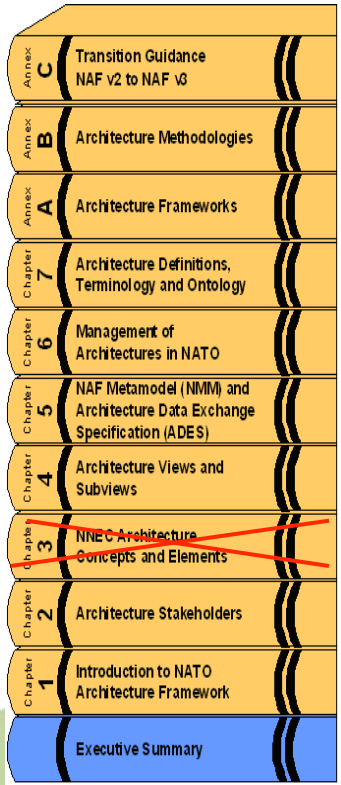
Late 2012 / Early 2013 a number of observations were made

- NAF is actually “dormant”
  - NAF used by NATO (BiSC AIS, AMN), Nations, EDA, Eurocontrol, e.a.
  - v.3.1 (2009 Chap. 5 update) left it in an inconsistent state
  - In 2010 some changes were proposed, but never taken forward

- Nations want NATO to take ownership of NAF including Governance and Configuration Management

- Nations are prepared to support convergence to a Unified Architecture Framework
  - Including the use of MODEM as a Chap. 5 replacement
    - Funding available (offer by UK, with supported from FRA, SWE and CHE)
  - Updating other Chapters for coherence
  - Go through a continuous review process under the auspices of the Architecture Capability Team

- References:
  - ANNEX 1 TO AC/322-D(2007)0048
  - ANNEX 1 TO AC/322(SC/1-WG/1)N(2009)0005-ADD2

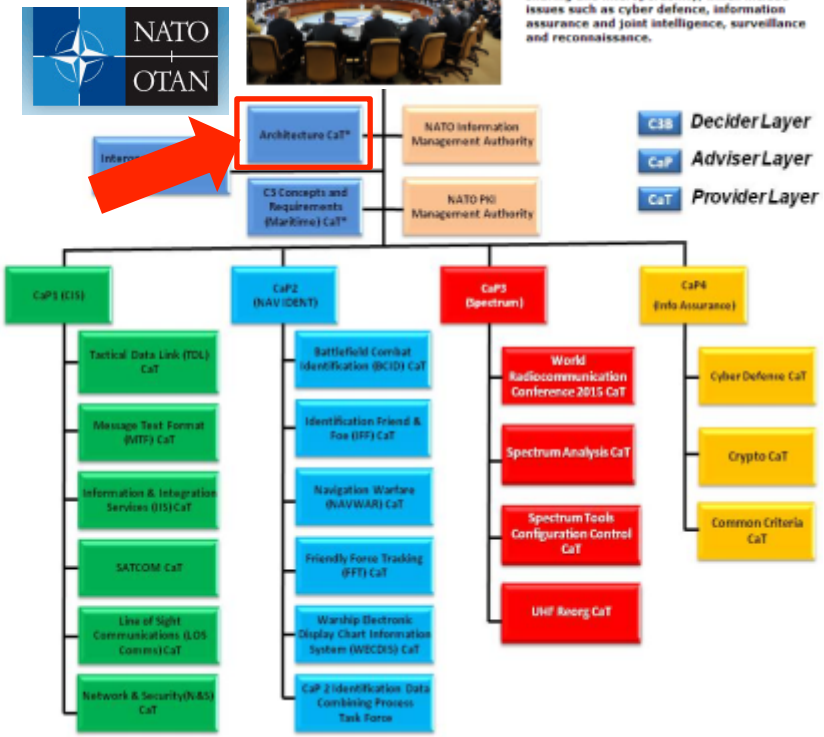


# Who leads in NATO?

**Multi-national Policy**

## Consultation, Command and Control Board (C3B)

NATO's C3 Board is the senior multinational policy body in the area of Consultation Command and Control (C3), reporting to and advising the North Atlantic Council and Defense Planning Committee on all C3 policy matters. C3 focus areas are information sharing and interoperability, which include issues such as cyber defence, information assurance and joint intelligence, surveillance and reconnaissance.




**Military structure**

- The Military Committee

## International Military Staff

The International Military Staff (IMS) is the executive body of the Military Committee, NATO's senior military authority.

It is responsible for preparing the assessments, evaluations and reports on all NATO military matters, which form the basis of discussion and decisions in the Military Committee (MC). The IMS also ensures that decisions and policies on military matters taken by the North Atlantic Council (NAC) and the MC are implemented by the appropriate NATO military bodies.

- Plans and Policy Division
- Operations Division
- Intelligence Division
- Cooperation and Regional Security Division
- Logistics, Armaments and Resources Division
- NATO Situation Centre
- Financial Controller
- NATO HQ Consultation, Control and Communications Staff (HQC3)
- Partner Country Representation
- NATO Training Group
- Committee on women in the NATO Forces
- NATO Military Audiovisual Working Group

# It will take time …

C3B Architecture CaT
Providing Insight And Commonality

| Covering STANAG | Time / Who | Multinational Document | Time/ Who | Std Rel Doc | Time/ Who | Handbook | Time/ Who |
|---|---|---|---|---|---|---|---|
| Main | Creation UK /end Mar 14 Promulgation Arch CaT Lead | Ch 1 Introduction | UK | Commands' and Nations' Specific Main | | Management | TBC |
| | | Ch 2 Methodology | FRA/ Sep '14 | Annexes - SUI (National Adoptions) | End '14 | | |
| | | Ch 3 Viewpoint / Views | UK – SWE /TBC (spring '14) | - UK AMN, EA for ICT, GEAR, SOSA | UK | | |
| | | Ch 4 Meta-model (inc. element descriptions) | UK – SWE /end '13 | | | | |
| | | Glossary of Terms | UK | | | | |

RATIFied STANDARDS

via

C3B

S&T organization

***STANAG***
***A Arch P***
***SRD***

RATIFICATION DRAFTS

# Publication

- Goal is tighter integration with view documentation
  - Ensures consistency
  - Helps implementation
  - Meta-model extract in each view section
- Web based versions for use and development
  - Using SVG if possible
  - Enabling future linking into diagrams
- Also provide complete meta-model
- Conventional standards to meet NATO formalities
- Good to go!

# What does this mean for MOD and the wider community?

## Roadmap

- Seeking NATO Arch CaT endorsement Spain Mar ’14
- Working drafts Jun ’14 for nations’ approval
- Submit final draft standards before Sep ‘14
- Wider stakeholder engagement throughout ‘14:
  - Wider MOD community
  - Wider UK defence industry
  - OGDs
- Formal transition from MODAF to NAF before end 2014 anticipated through JFC CTO and DA4TQ (DE&S D Tech) Policy Change