NIEM MILOPS

STAKEHOLDER ENGAGEMENT

Wednesday, 10 August 2022

| Time	Topic	Presenter
1000-1005	Opening Remarks	Miss Beth Smalley
1005-1015	USMTF Update	Mr. Rodney McCoy
1015-1025	NTAC Update	Mr. Thomas Carlson
1025-1035	NBAC Update	Mr. Kamran Atri
1035-1050	NCDF CWIX 22	Mr. Mark Dotson
1050-1055	Open Discussion	All
1055-1100	Closing Remarks	Miss Beth Smalley

OPENING REMARKS / INTRODUCTIONS
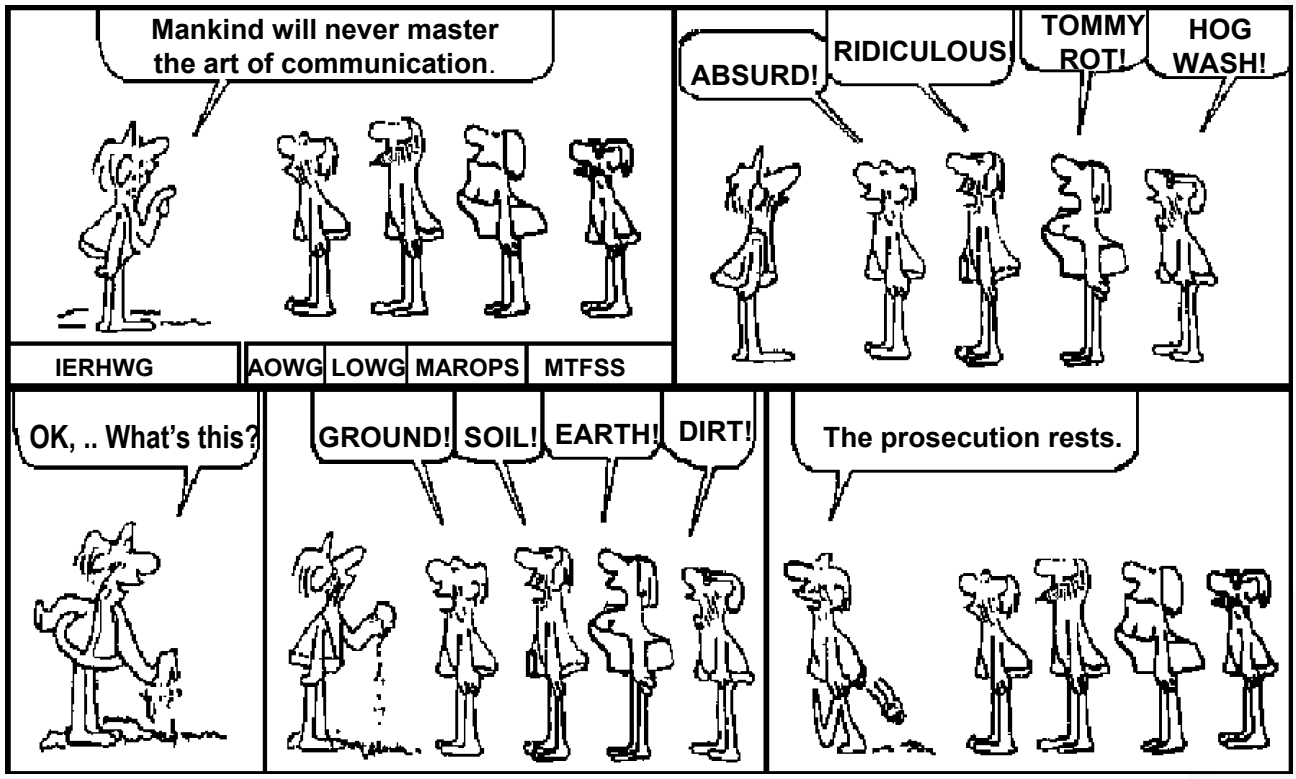
Beth Smalley

USMTF UPDATE

Rodney McCoy

UNITED STATES MESSAGE TEXT FORMAT UPDATE
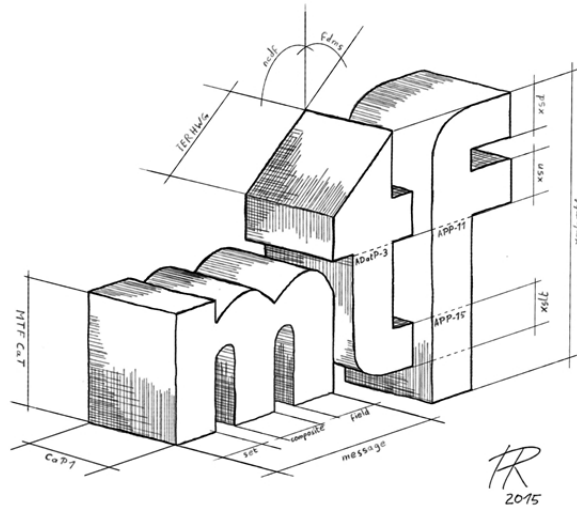
Rodney McCoy

JS J6

Data and Standards Division

MilOps Voting Member to the NBAC

⟨ N I E M ⟩

USMTF HIGHLIGHTS FOR MILOPS

- USMTF CCB 22-2 Met With Kessel Run Developers
  - Explained NIEM Update to KR Developers
  - Currently updating NIEM conformance in US; parallel effort in NATO
- KR concerned about not seeing a demand signal for NIEM-Conformant schemas
  - Coming from Joint Airspace Community and the Joint Fires Community
    - Both asking to see upgrades to USMTF
    - Both communities interested in NIEM Conformant messages
  - KR amenable to using our NIEM conformant schemas
- Way Forward
  - DISA and JS J6 Meeting weekly
  - GTRI and Riverside collaborating
    - CCB principals also invited to attend
  - Expect ICPs 8-10 (Sets, Segments, and Message Sequencing) to be submitted Aug 22; pursuing the goal of adding this content to MOMS 5.2 and MilOps 6.0
    - MOMS Cutoff Mid-October
    - MilOps Cutoff Mid-February (2023)
  - Recommend JS/J6 take lead on Mil-Std 6040 rewrite once conformance ICPs are completed
    - Messages (CY22)
    - Segments CY22)
    - Sets (CY22)

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NTAC UPDATE

Thomas Carlson

CURRENT ACTIVITIES

- Common Model Format (CMF)
  - Multiple technology support (XML, JSON, RDF, ...)
  - Provide open-source CMF tools for developers
- NIEM 6 Architecture improvements
  - Metadata the most recent decision
  - Easier ones next
- These are interrelated topics
  - Changes to one impact the other and vice versa
- Face-2-Face coming up
  - Next week

UPDATE

NIEM COMMON MODEL FORMAT (CMF)

- Goal: Technology independence for data models
  - Before: Data models are represented as XML Schema documents
  - After: Data models are represented in the *Common Model Format (CMF)*
  - Unshackling NIEM from XML Schema's eccentricities
- Benefits
  - The NIEM model (core & domains) can be used by developers working with many data formats (JSON, RDF, etc.), and not just XML
  - A single message model can support many message formats
  - A NIEM message in one format can be translated into some other formats (XML to JSON, JSON to XML, etc.)

CMF STATUS AND 2022 WORK PLAN

- Refine the metamodel / CMF as tool development proceeds
  - Iterative, one informs the other and vice versa
  - **Metadata decisions made**
    - **Allow metadata to be included in-line with an object's properties**
    - **Drop several things from SimpleObjectAttributeGroup: relationshipMetadata, id, ref, uri**
    - **Allow augmentations in metadata**   UPDATE
    - **Drop several things from AugmentationType: Id, ref, uri, icism**
    - **Add NDR instance rule saying you can only have one augmentation per namespace**
- Developing free, open-source metamodel / CMF tools
- Working now:
  - Metamodel / CMF drafts
  - Convert NIEM-based XML schema to CMF
  - Convert CMF to NIEM XML schema documents
- Planned for rest of 2022:
  - Convert CMF to/from other formats: RDFS+OWL, JSON Schema, UML
- Other technologies, eventually: Google Protocol Buffer, Apache Avro, YAML, etc.

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NIEM MESSAGE SPECIFICATIONS

- **Currently on deck for upcoming NTAC Face-to-Face** ← UPDATE
- Simplified next generation of IEPDs
  - Convention over configuration
  - Simple cases made simple, while complex cases still supported
- *Guidance for NIEM Message Specifications* in preparation now
  - A "how-to" guide, not a technical specification
  - Formal specification to follow, if needed
  - **Draft outline being fleshed out**
  - **Message Spec package formats being ironed out** ← UPDATE

NIEM 6 ARCHITECTURE

- Major architectural changes happen only with a major release
- Next major release is NIEM 6.0 in 2023 (if so directed)
- Several significant changes in the works:
  - Replace XML Schema with CMF as the NIEM model representation
  - Simplify or replace metadata attributes
  - Handle ordered, repeated properties (replace @sequenceID)
  - Currently 14 other proposals
- For each proposal: consider, test, consult NBAC
- Looking good for a NIEM 6.0 release

NIEM TRAINING UPDATE

2022-05-11

TRAINING PROGRAM

- Monthly live training continues
  - May is sold out
- Recorded the full training
  - Will be available at some point for hybrid training
    - Video + live instructor on-call for questions
  - Will also be available as standalone online training
- Fireside Chat
  - Thursday at 1300-1500 (tomorrow)
  - For folks who have taken the course to ask follow-up questions
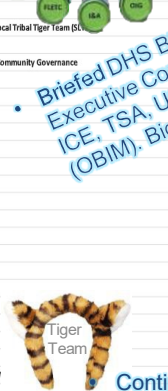 - There will be no actual fire

NBAC UPDATE

Kamran Atri

NBAC Action Tracker

NBAC NEAR TERM OBJECTIVES

- Participate in NTAC/NBAC Joint Meeting 1-3 PM 17 Aug @ GTRI Rosslyn, VA
- Plan & Conduct NBAC Annual Meeting 18-19 Aug 22 @ GTRI Rosslyn, VA
- Draft NIEM OPEN new governance document
- Draft NIEM OPEN domain onboarding document
- In conjunction with NTAC, draft NIEM OPEN release process
- Planning & support for ESC transition and PGB Kickoff, Oct 22
- Continue 5.2 release support
- Continue with NIEM OPEN POA&M
- Continue with NIEM outreach

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NATIONAL INFORMATION EXCHANGE MODEL
NIEM.gov

NBAC LONG RANGE PRIORITIES

- ## Continue Maturing
  - IP Domain, IHS Domain, L&D Domain …
  - Action Tracker, Manage releases, Advance NIEM Adoption, Support Domain Growth, Improve NIEM implementation,
  - Tiger teams, NIEM Community Governance, 2022 Work Plan
  - NBAC OASIS Transition
    - Update NBAC Charter, SOP compliant

- ## Leveraging Tiger Teams
  - Internationalization (continue discussion with NTAC and how best to approach internationalization)
  - USA State, Local, & Tribal (Onboarding Canada SLTT)

- ## Ensure NIEM Data Model Maturation

16

〈 NIEM 〉

NATIONAL INFORMATION EXCHANGE MODEL
NIEM.gov

QUESTIONS
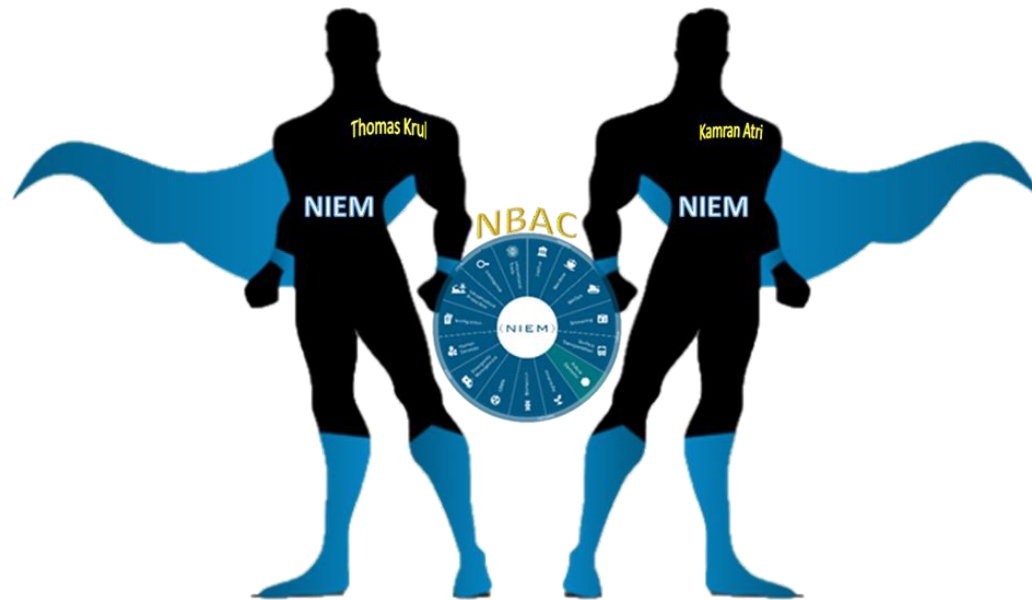
thomas.krul@FORCES.GC.CA   katri@A4SAFE.COM

17

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NATIONAL INFORMATION EXCHANGE MODEL
NIEM.gov

NCDF CWIX 22

Mark Dotson

NCDF CWIX 2022

(Coalition Warrior Interoperability eXploration, eXperimentation, eXamination, eXercise)

NATO Core Data Framework (NCDF)
Data Lake

Today's briefing

- NCDF and NCDF Data Lake

- NCDF at CWIX 2022

- NCDF CWIX 2022 Assessment

- JS J6 Data Lake Update

- Next Steps

Two Key Concepts

NATO Core Data Framework (NCDF):

Enables better interoperability that cuts across existing COIs and data stovepipes for the NATO Enterprise, the Alliance and coalitions partners

Data Lake:

Leveraging NCDF, a pool of CJTF-level commonly tagged data to support multi-domain C2 and operations

NIEM in NATO

NATO Core Data Framework Overview

NIEM for NATO

NCDF is a **framework** of standards, specifications, tools, policies.

NCDF components include
- Agreed Semantic Reference Model (SRM);
- XML Naming and Design Rules (XNDR);
- Standards Transformation Framework (STF);
- Information Exchange Patterns (IEPs).

NCDF purpose is to improve data and information interoperability in the Alliance and with mission partners.

NATO Core Data Framework

Best Practices

STF and other tools

IEP and Guidelines

Naming & Design Rules

Semantic Reference Model

STANAG

Metadata

Information Exchange Requirements → Information Exchange Specifications
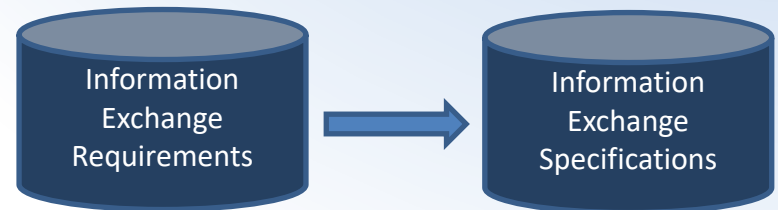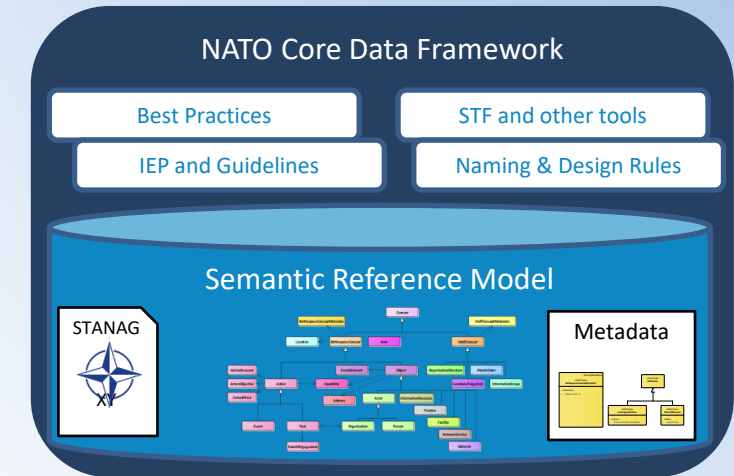
CWIX 2022 Survival Guide

CWIX 2022 Facts & Figures

- Largest NATO CIS Interoperability Event.
- **Over 1250** participants and observers from **43** nations.
- **18** focus areas of e**X**ploration, e**X**perimentation, e**X**amination and e**X**ercises.
- **340** current and future capabilities tested across **7** classified and unclassified networks.
- More than **12,000** testing events addressing **142** interoperability objectives.

Federated Mission Networking (FMN)

- **37 national and NATO affiliates** developing, verifying and validating instructions and concepts necessary for **mission networks in support of federated operations**.
- **Procedural Instructions (PI) and Service (technical) Instructions (SI)** are organized **in time-bound spiral specifications**.
- **PIs and SIs** articulate how to use **hundreds of NATO and non-NATO standards** to achieve **people, process and technology interoperability**.
- Affiliates are using **Spiral 3** for missions and operations (such as the NRF), are implementing **Spiral 4** and finalizing the design of **Spiral 5**.

Simplified System Architecture

Data	Must be standardized to be exchanged, shared, exploited and appreciated.
Community of Interest Services	Communities specific services such as logistics, medical, maritime, etc.
Core Services	Generic services, such as email and chat, used by all communities.
Communications Services	For the interconnection of systems.

Digital Transformation

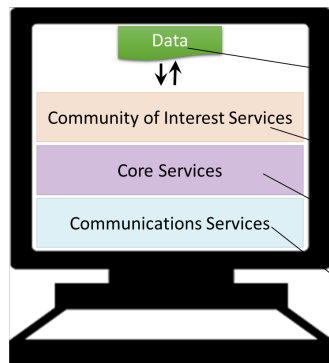- Alliance's future successes will rely on the **power of data** and the **interconnectivity of its forces**.
- Requirement to collect, secure, curate, process and exploit **data at an unprecedented rate** for all **military** and **political** levels.
- A digital Alliance is needed for **Multi-Domain Operations (MDO)** to orchestrate military activities across all domains and environments.
- Digital Transformation affects **organizations**, **processes**, **people**, **mindset**, **data** and **capabilities**.
- **CWIX** already contributes to a digital Alliance.

CWIX 2022 NCDF Data Lake Video

information superiority by Cross-CoI interoperability
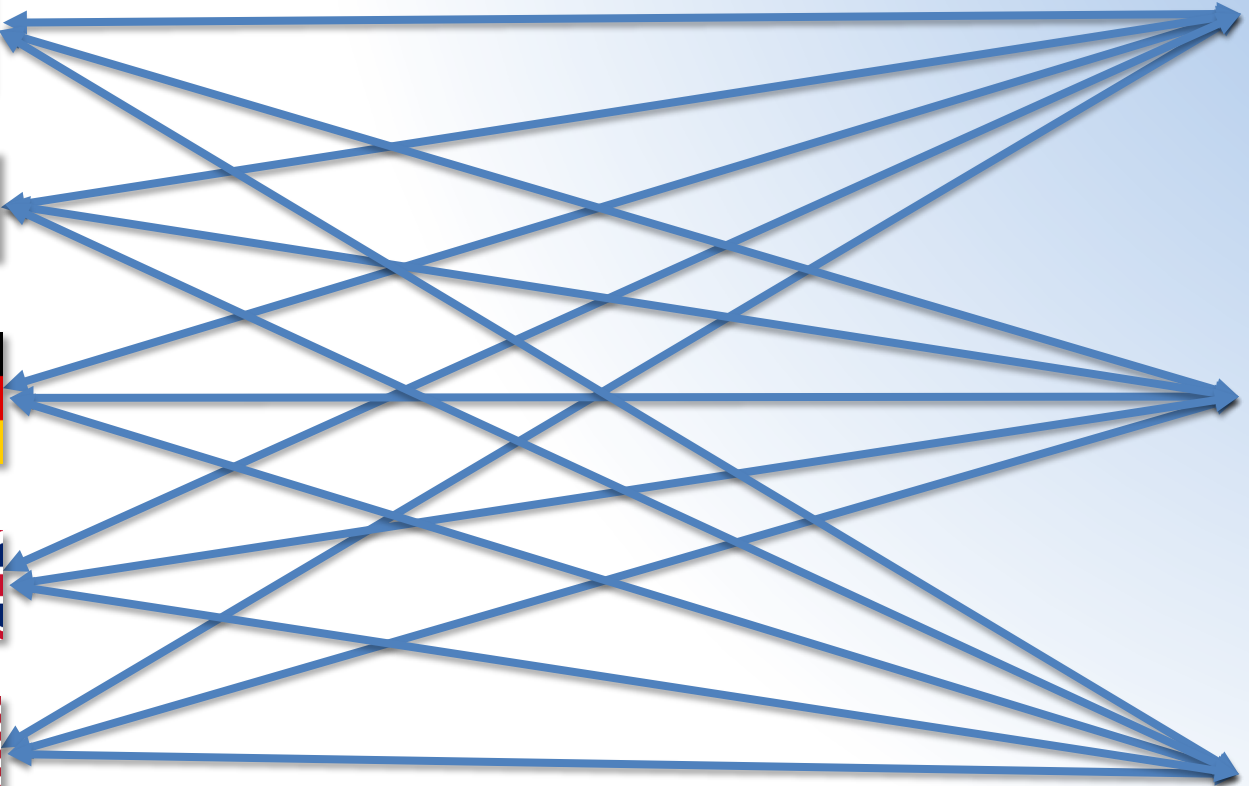
System 1 (GIS)

System 2 (Data Analysis)

System 3 (other…)

and more…

NATO Core Data Framework (NCDF)

information superiority by Cross-CoI interoperability

and more…
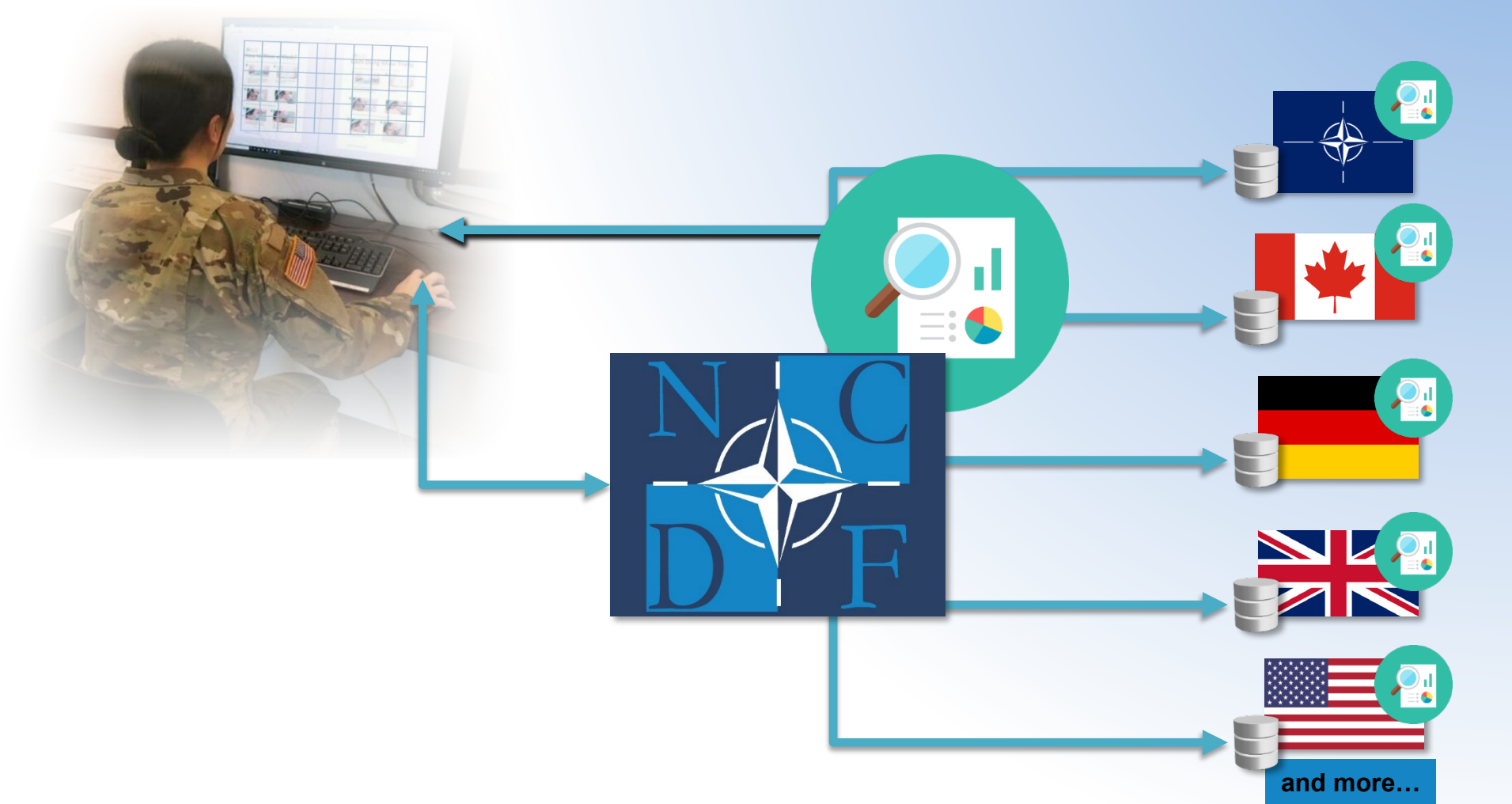
Overview of NCDF at CWIX '22

NCDF CWIX Partners / Systems

- NATO AirC2IS
- NATO CoreGIS
- NATO ICC
- NATO iGEOSIT
- NATO INTCORE
- NATO JCHAT
- NATO LOGFAS
- NATO MCCIS
- NATO MEDICS
- NATO NCOP
- NATO NEC CCIS
- NATO NIRIS
- CAN DCS SDS
- DEU DFSLw
- DEU MExS
- DEU X-COI DataPool
- ESP 5G DEFENCE
- ESP MDSIE
- EU EUCCIS
- FIN SEALION
- NLD VitalsIQ
- NOR GEOMETOC
- POL BMS JASMINE
- POL HMS JASMINE
- POL FENIKS
- ROU InCOP
- TUR MCCIS
- USA GCCS-J

- ## NCDF Data Lake Goals for CWIX 2022

  - Verify FMN Spiral 5 Service Instructions for Cross-Community of Interest Information Sharing
  - Test search and retrieval patterns
  - Test ability of NCDF Data Lake to handle different data types, formats, protocols
  - Experiment with security, search, and discovery metadata
  - Explore how cross COI information sharing enhances decision-making
  - Introduce/experiment with Data Lake user interface (Lake Diver)

- ## Partners

  - **Focus Areas (11):** AIR, Data Centric Security (DCS), Future Core Services (FCS), GEO-METOC, JISR, LAND, LOGMED, Maritime, Modeling & Simulation, Multi-Lateral Interoperability Programmer (MIP), OPCMD
  - **Nations (11):** CAN, DEU, EU, FIN, NATO, NLD, NOR, POL, ROU, TUR, US
  - **Content:** JISR/SA, Medical (e.g. disease reports, planning, MTF status, decontamination), Geospatial (e.g. hazard predictions), BSOs/tracks, force protection, LOG (e.g. facilities, consumable reports, transportation alerts, exclusion zones), CBRN, ACO, ATO, free text (dynamic chat), air bases, white shipping
  - **Data formats:** Coalition Shared Database (JISR), CSV, KML, Link-16, MIP, ADatP-3, MTF, NCDF, NVG, OTH-G, native XML, XMPP, unstructured data

NCDF Key Achievements

- Exchanges with 11 of 18 Focus Areas and broad set of content/data types

- **Validated API** for the NCDF Data Lake

- **Synchronization of four data lake** nodes (NCIA, DEU (2), ESP)

- **Demonstrated cross-operational domain information sharing**

- **Demonstrated strength and weaknesses of SRM** in facilitating cross-community info sharing

- **Use of Persistent Testing Environment** (NATO Software Factory) for risk reduction

- **Demonstrated value of Lake Diver User Interface** data search/discovery ("shopping for data")

NCDF Data Lake Architecture

Example Authoritative Data Providers

- Maritime CCIS
- Message Exchange Service
- SEALION
- PROMIEN
- MENTOR
- DCS SDS

- JCHAT
- NATO CORE GIS
- LOGFAS
- GCCS-J

Transformation Service (INT-CORE)

Example Data Consumers

- NATO MEDICAL
- MEDICS
- AIR C2IS
- EUCCIS
- GEOMETOC
- POL BMS JASMINE

Lake Diver (Search UI)

Data Lake Interface

NCDF Data Lake

NCIA Data Lake – Integration Core

Data Lake Sharing

- DEU - X-COI IES
- DEU - DFSLw 1
- ESP - MDSIE

Use Case 1

Maritime Domain:
NAVSITREP information in the ADatP-3 MTF Gold format will come into the NCDF Data Lake, after being transformed by the INT-CORE transformation service. Information from the NCDF Data Lake will be consumed by C2 systems retrieved and translated to COI formats by the INT-CORE transformation service.

Use Case 2

CBRN Domain:
CBRN messages are provided in ADatP3 MTF format by national systems PROMIEN and MENTOR, in ADatP3 MTF format, and translated by the INT-CORE transformation service, for inclusion in the NCDF Data Lake.
Systems can retrieve that information from the Data Lake, in any format (including NVG overlays), through web-services, after being translated by the INT-CORE transformation service.

System Key

- NATO Systems
- National Systems
- Data Lake User Interface
- NCDF Data Lake Access
- Data Lake Nodes

Lake Diver

NCDF Data Lake Searchable User Interface (MVP)

NATO UNCLASSIFIED

Access the NCDF Data Lake with an intuitive, user-friendly interface.

- Discover, search and validate data exchanged between NATO Enterprise, Allies, and Partners.
- Improve situational awareness by retrieving data and automating workflows
- Easily used by different types of users
- Accessible to many communities of interest.

Current Status: MVP in Development, to be delivered in July 2022
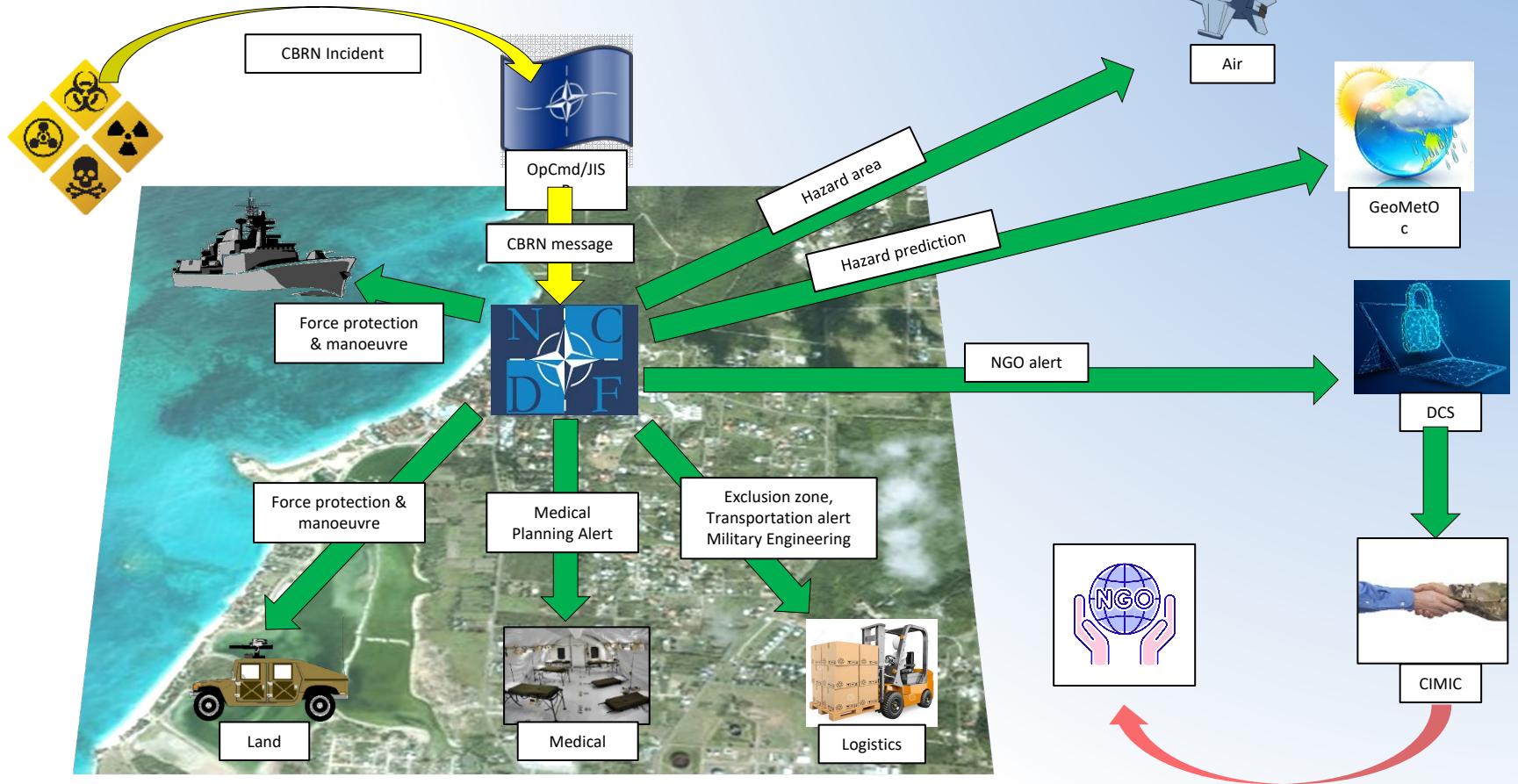**Beneficiary:** US JS J6 and Nations
Sponsor: ACT Federated Interoperability

Use Case 2: CBRN Incident

NATO UNCLASSIFIED REL to GEO / MAR / NZL / SWE / UKR / EU EEAS

information superiority by Cross-CoI interoperability

NCDF Test Case Results

Full Assessment Report to follow!

Chart legend:
- **Planned Test Cases** (blue): 103
- **Not Tested** (grey): 15
- **Test Cases Tested** (orange): 88
- **Success** (green): 64
- **Limited Success** (yellow): 16
- **Interoperability Issue** (red): 8
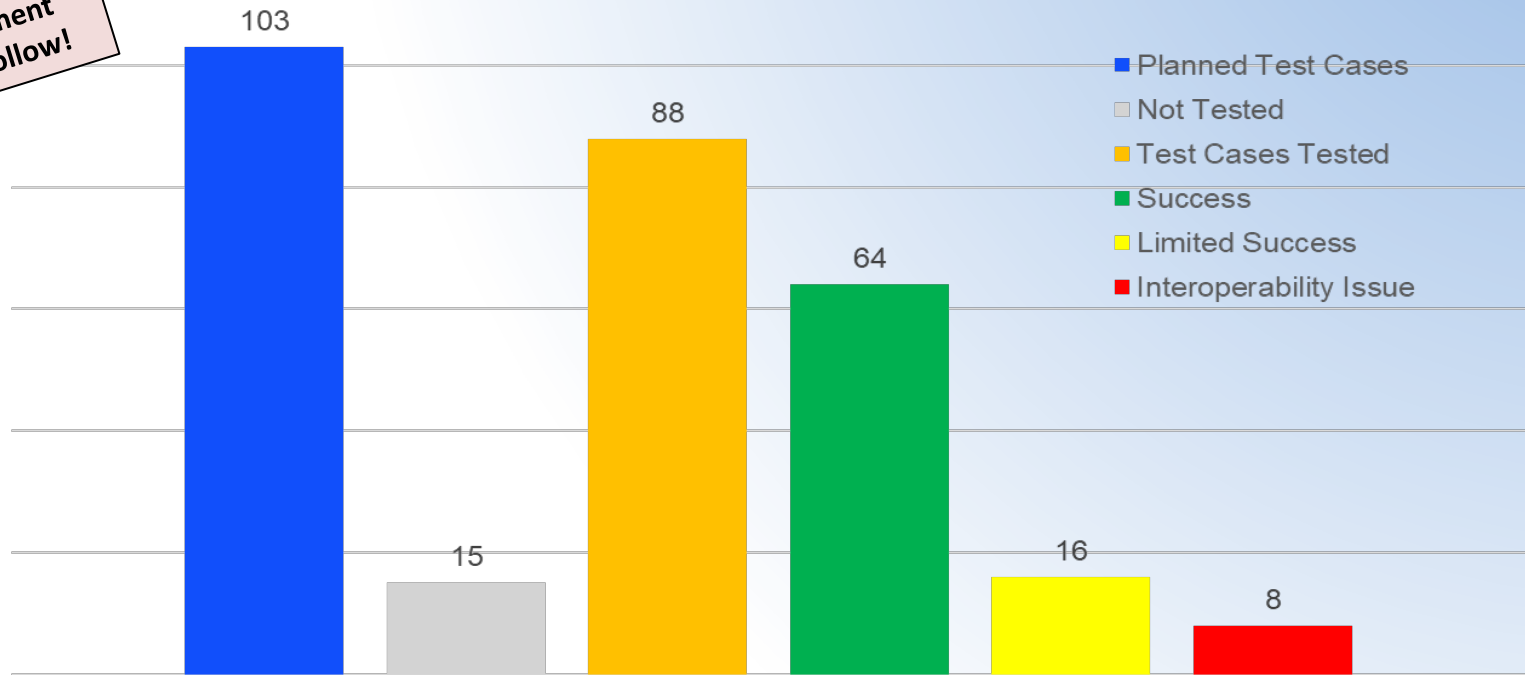
103 Test Cases were planned; however, 15 were not tested due to time constraints
- 73 % (64 of 88) of the completed Test Cases were rated at "SUCCESS"
- 19% (16 of 88) of the completed Test Cases were rated at "LIMITED SUCCESS"
- 9% (8 of 88) of the completed Test Cases were rated with "INTEROPERABILITY ISSUES"

Quick Look Assessment: Needed NCDF Data Lake Improvement Areas

To be added to the NCDF away ahead action plan!

☐ **Fully define Data Lake input/output** to ensure 100% data transformation

☐ **Validate Data Lake BSO presentation**

☐ **Define and publish business rules** in advance to improve schema implementation

☐ **Validation of schema** should be more rigorous to ensure it is correctly formatted for ingestion

☐ **Further improve Lake Diver** to improve search capability and map functionality

NCDF and Data Lake Way Ahead

	2023	2024	2025
NCDF	• Updated Naming & Design Rules (NDR) • **NCDF STANAG ratification** with STANAG Related documents (SRD)	• **Multi-model SRM environment** • Improved NCDF tooling • Data Lake IEPD repository	• **NCDF Governance in place** • Partner with NATO Data Catalog
NCDF Data Lake	• **CWIX 2023** • Enhanced Data Lake assessment • **US data lake instance** • NATO Data Exploitation integration • Additional data sources (e.g. cyber, space, FFT, JISR) • data-centric security (DCS) tests • Improved Lake Diver • Business rules validation • IEPD development/governance	• **CWIX 2024** • Enhanced US data lake • Next version Lake Diver • Risk mitigation at Bold Quest • **FMN Spiral 6 Cross-COI Procedural Instruction (PI)**	• **CWIX 2025** • Enhanced US data lake • **FMN Spiral 6 multi-data lake planning** • **NATO exercise Steadfast Cobalt** • **NATO Multi-Domain Operations participation in Bold Quest**

Red = critical path activity

information superiority by Cross-CoI interoperability

OPEN DISCUSSION / CLOSING REMARKS

Next Meeting Wednesday September 14, 2022 @ 1000

Closing Remarks

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