NATO Communications and Information Agency

Cyber Defence Technical Information Sharing in a Multinational Environment

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What is Smart Defence?

'It is a renewed culture of cooperation that encourages Allies to cooperate in ***developing****,* ***acquiring*** *and* ***maintaining*** *military capabilities to undertake the Alliance's essential core tasks agreed in the new NATO strategic concept.'*

'That means ***pooling*** *and* ***sharing*** *capabilities,* ***setting priorities*** *and* ***coordinating efforts*** *better.'*

What is the MN CD2?

- A smart defence project, the Multi-National Cyber Defence Capability Development:
  - consists of 4 nations (Canada, Romania, the Netherlands and Norway) with participation from Finland
  - is pursuing several Work Packages (WPs) related to the growth of Cyber Defence capabilities
  - is supported by the NATO Communication and Information Agency or NCI Agency





MULTINATIONAL
MN CD2 - Cyber Defence Capability Development

MN CD2 Values

- Nations want to improve their cyber defences capabilities by working together
- Nations want to leverage their investment by exploiting common funded activities and capabilities to the fullest

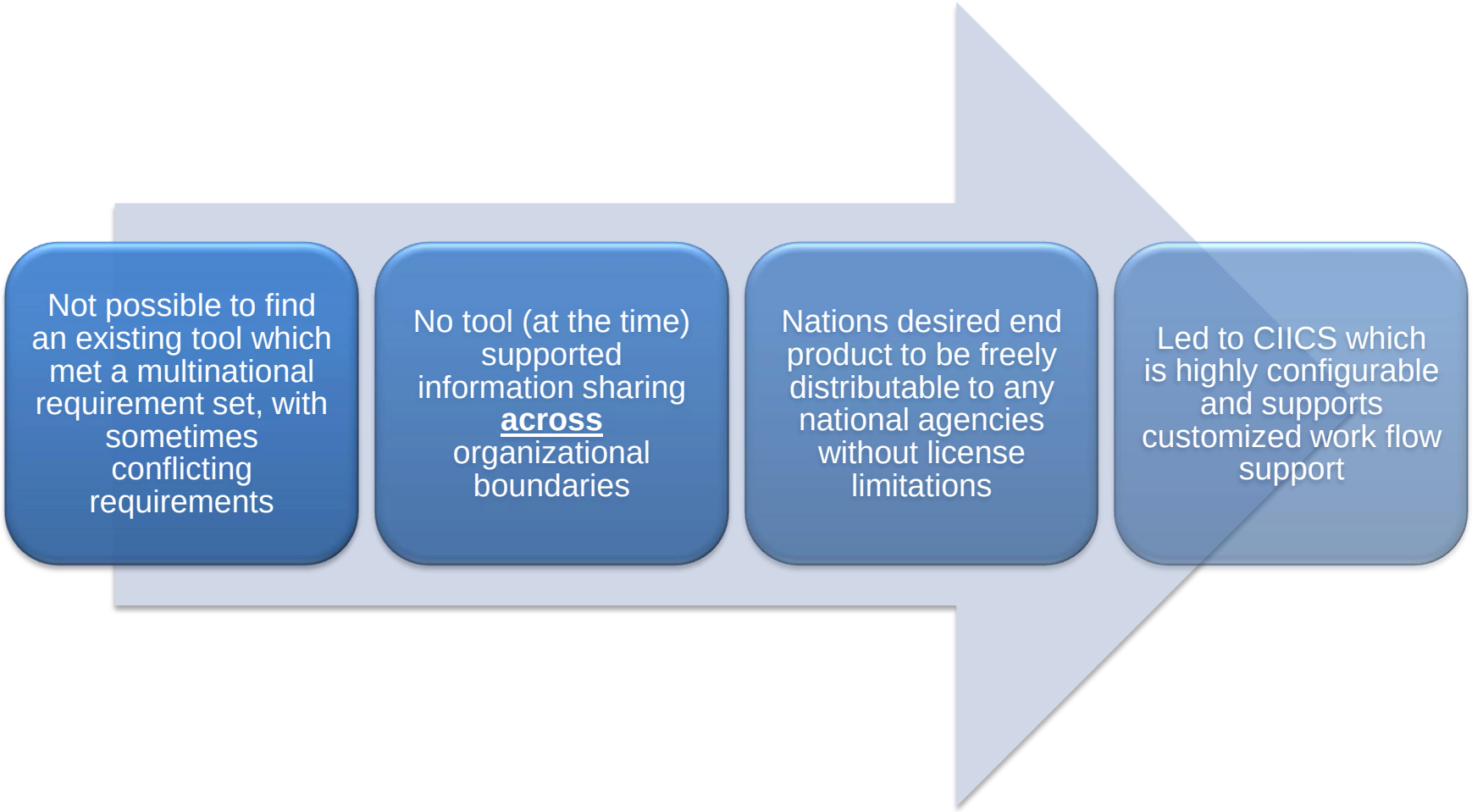
Cyber Defence Technical Information Sharing

- Subset of MN CD2 nations: CAN, ROU, NLD & FIN
- Developed “CIICS”; the Cyber Information and Incident Coordination System
- Now, working together to establish the NATO CIICS Federation; community for sharing cyber defence technical information in trusted environment

What is CIICS ?

- Pronounced “kicks” – it is a web based application used for CD information sharing and incident management, both within organizations and across organizational boundaries
  - Or within nations and across national boundaries
- CIICS is comprised of two major subsystems:
  - Ticket Management Subsystem (TMS)
  - Information Sharing Subsystem (ISS)
- CIICS implements STIX for structured sharing of data

Why We Didn't Choose an Existing Tool



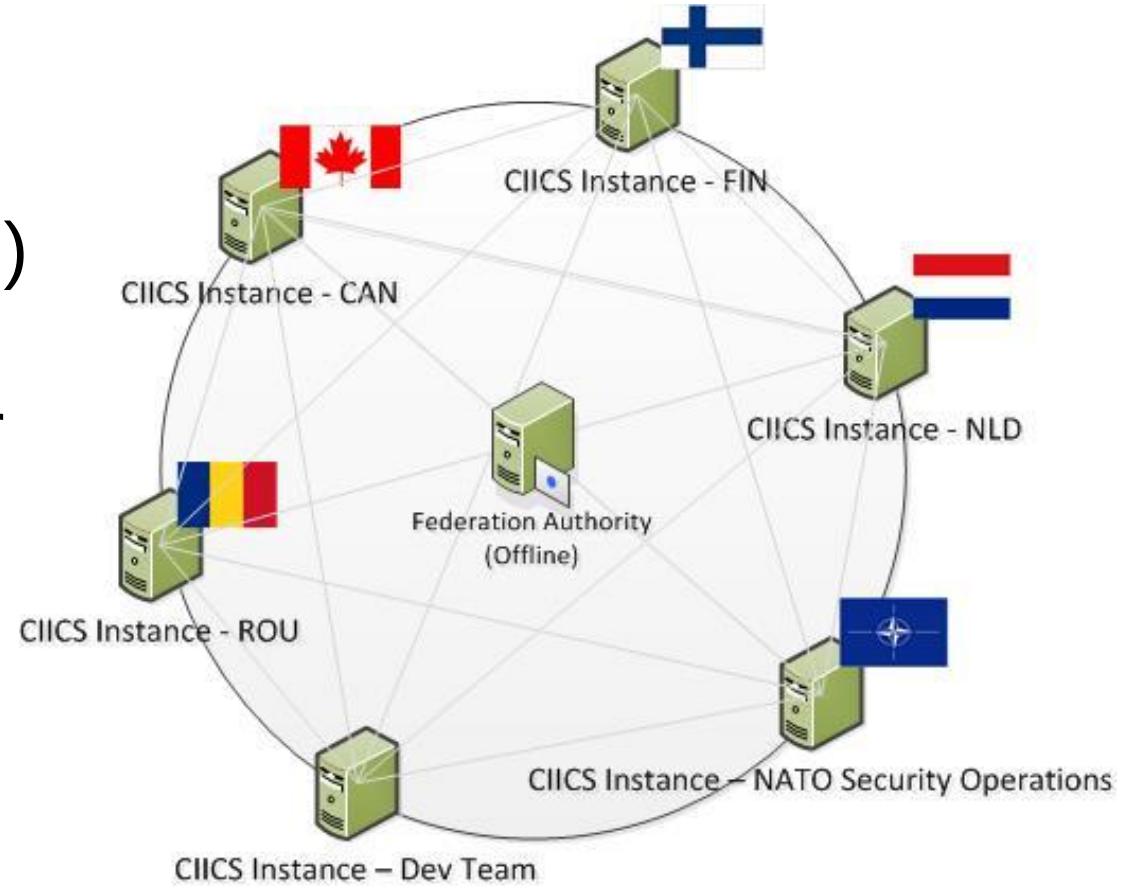
What is the NATO CIICS Federation?

- Newly created federation, originated by the three CIICS sponsoring nations: Canada, Romania and the Netherlands
  - NCI Agency presently acting as software custodian on behalf of the federation

- Trusted community to share CD information and, as desired, data on past or present incidents
- Federation is governed by the CIICS Support Board (CSB) with representation from MN CD2 participating nations and the NCI Agency

NATO CIICS Federation Architecture

- CIICS is a hybrid architecture with centralized (offline) governance and direct peer to peer sharing



CIICS Sharing Models

- Ticket Management Subsystem allows for either local only or joint sharing; governed by Role Based Access Control (RBAC)
  - TMS data considered sensitive, thus, finer access controls in place to access data
  - Default is local tickets unless explicitly shared via Joint Coordination Ticket
- Information Sharing Subsystem:
  - Wiki style (unstructured) repository
    - Communities of Interest for users either local or federation wide; based on public, protected or private communities
  - Reference library (structured, based on STIX)
    - Fully visible and accessible to all users in federation

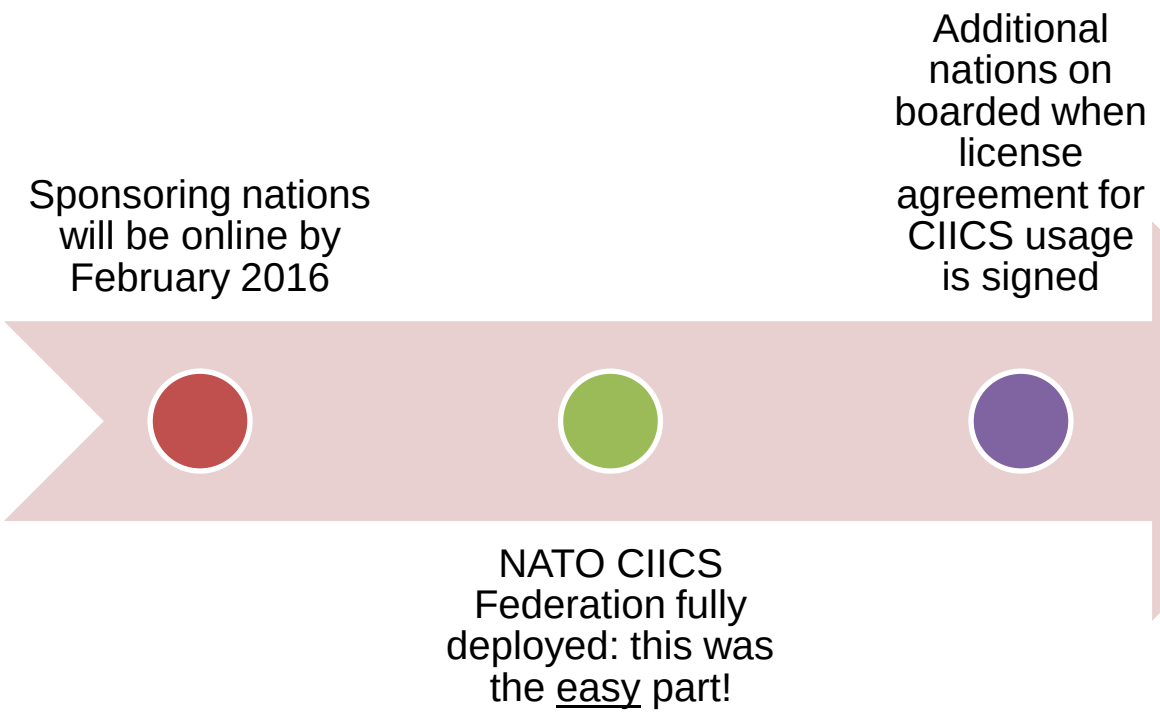
Primary Objectives of the NATO CIICS Federation

- Primary objective: to promulgate timely, generic CD technical information to assist national and military Computer Emergency Response Teams (CERTs) to:
  - identify new and/or zero day threats in a timely manner; and
  - Identify relationships between what may first appear as isolated events
- Enable responders to jointly coordinate response to attacks targeted against multiple nations

Derived Objectives of the NATO CIICS Federation

- Knowledge base growth to aid in incident mitigation by quickly reviewing historical incidents with similar characteristics
- Enable responders to solicit other experts for inputs and/or suggestions
- Enable analysts to identify trends and facilitate post attack analysis

NATO CIICS Federation Timeline



Then what? … how do you encourage collaboration from users who traditionally work in a "need to know" environment?

New users will attempt to consume before contribute

Information Sharing Challenges (1)

- In the unclassified environment:
  - Overcoming user fear of accidentally sharing sensitive or classified information within the unclassified domain
    - As a result, users will withhold information unless absolutely certain of sensitivity
  - Preventing users from over sharing; focus on quality over quantity and encourage sharing of valuable data, not just stuff you find on the Internet

Information Sharing Challenges (2)

- In a multinational environment:
  - National Memorandums of Understanding (MOUs) do not cover information sharing at a technical level for Cyber Defence, nor do bilateral agreements or treaties for cooperation
  - Users do not know one another, collaboration must occur based on inherent trust
    - Not easy to plan face to face meetings due to large distances and high turn over of military staff make the establishment of personal relationships difficult
  - Users must agree on a common language (English); understanding of terms/definitions is not consistent

Review Using DOTMLPF-I

- **Doctrine**: customizable workflow for national incident workflows, national policy for inter-national CD sharing
- **Organization**: inherited by CERT team structure
- **Training**: documentation and training provided to nations in a “train the trainer” fashion, if requested, for CIICS deployment and features
- **Material**: hardware & operating system requirements to operate CIICS outlined
- **Leadership & Education**: CERT leadership guidance on incident management and CD information sharing; agency recommendations on guidelines
- **Personnel**: availability of CERT staff national responsibility
- **Facilities**: physical resources and location a national responsibility
- **Integration**: developed in the tool itself

Assumption Look-back

All aspects of the DOTMLPF-I had been addressed with the exception of multinational CD information sharing policies

Discovered that national policies for information sharing in multinational environments is non-existent or immature

- This was further shown as a NATO-wide limitation via Cyber Coalition 2015 exercises

Major Gap Identified! Guidelines and procedures for information sharing in a multinational environment must be developed!

- Organizations require self-assessment to ensure they possess the capabilities to effectively participate in community; this can be done using recommendations provided by NCI Agency.

Fallout

- Despite a well designed and created product, the primary objectives of the NATO CIICS Federation would not be fully met without the necessary CD information sharing guidelines and procedures
- CIICS development concluded successfully (on time, on budget) but…

A tool is only the enabler; how the tool is used dictates whether it is truly successful and user accepted!

Remediation

- Identify legal requirements to enable information exchange between nations and implement appropriate paperwork, as necessary (multilateral agreements, MOUs, etc.)
- **Doc**ument Terms of Use (TOU) for unclassified information sharing
  - Nations responsible to transform TOU into policy!
- Train **Leaders** to implement policy and leverage technical features to support it
- Consider classified information sharing environment and advantages / disadvantages

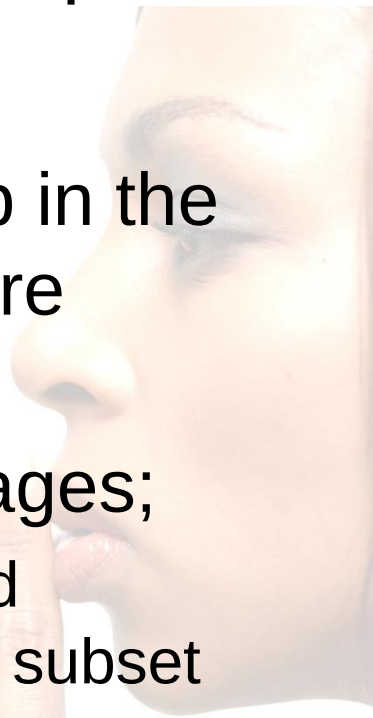
Legal Requirements for Information Sharing

- We already have a CIICS License Agreement governing use of the tool
- Need to decide if Non Disclosure Agreements (NDAs) or Memorandums of Understanding (MOUs) are required
- Require CIICS Terms of Use for agreement by all participants!

Terms of Use for CIICS

- Developing the CIICS Terms of Use (TOU) for Unclassified Information Sharing
  - Include guidelines for how to become an active information contributor by identifying national roles/responsibilities, as well as recommendations for national guidelines
    - E.g. focus on the intrusion attempt, not whether it was successful or not, zero out low order bits in the IP to hide network subnet

Classified Information Sharing Group



- Establishing an information sharing group in the classified environment requires much more planning and strategy
- Unique set of advantages and disadvantages;
  - longer to establish due to security checks and accreditation for tools with potentially smaller subset of users
  - may result in higher quality threat intelligence (non repudiation) that is actionable faster

Expected Outcomes

- With a TOU released, nations should have a better understanding of **what** needs to be shared, **when** it should be shared and with **who**
- Still cannot force users to share; leap of faith that a culture shift will occur with proper guidance and leadership

Who Can Join the Federation?

- Membership is open to NATO Nations and Partner Nations, as well as other nations on a case by case basis, at the discretion of the CSB
- Commercial / industry partners can also join the federation with CSB approval
- A nation does not need to join the MN CD2 in order to join the federation

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Capability Development

Questions

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