



CWIX – Communications Focus Area

WInnComm-Europe 2019

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 **Fraunhofer**

FKIE

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What is CWIX?

Coalition Warrior Interoperability eXploration, eXperimentation, eXamination, eXercise

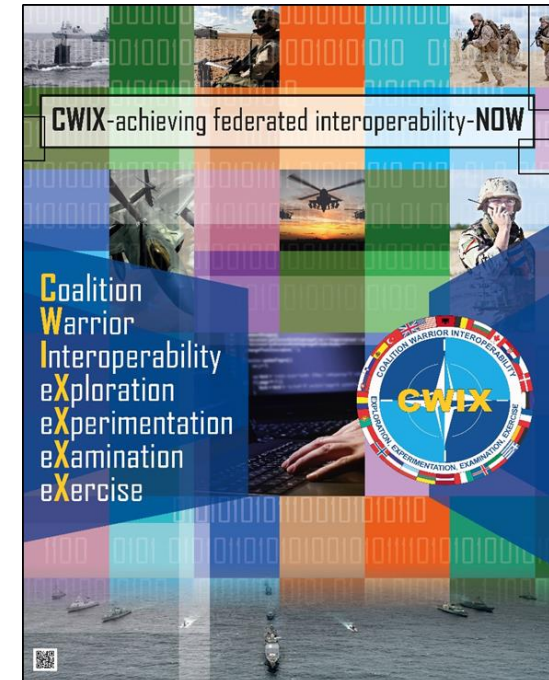
- CWIX, is the greatest test of NATO's interoperability and a key step in the interoperability process.
- CWIX enables *'day zero' interoperable forces*, and supports *'interoperability by design'*.
- CWIX provides commanders with confidence that people, processes and technology are fit for purpose.
- CWIX improves the exchange of information and situational awareness to speed up decision making.
- CWIX supports Alliance partners and other organizations to improve interoperability to support NATO missions.





What are the 4 CWIX 'X's

- Scientists **eXplore** emerging interoperability standards and solutions through collaborative innovation activities
- Engineers **eXperiment** with new interoperability standards and solutions to assess their suitability for implementation
- Capability testers **eXamine** interoperability between fielded and emerging capabilities
- Operational users **eXercise** capabilities and test interoperability using a relevant vignette



eXplore

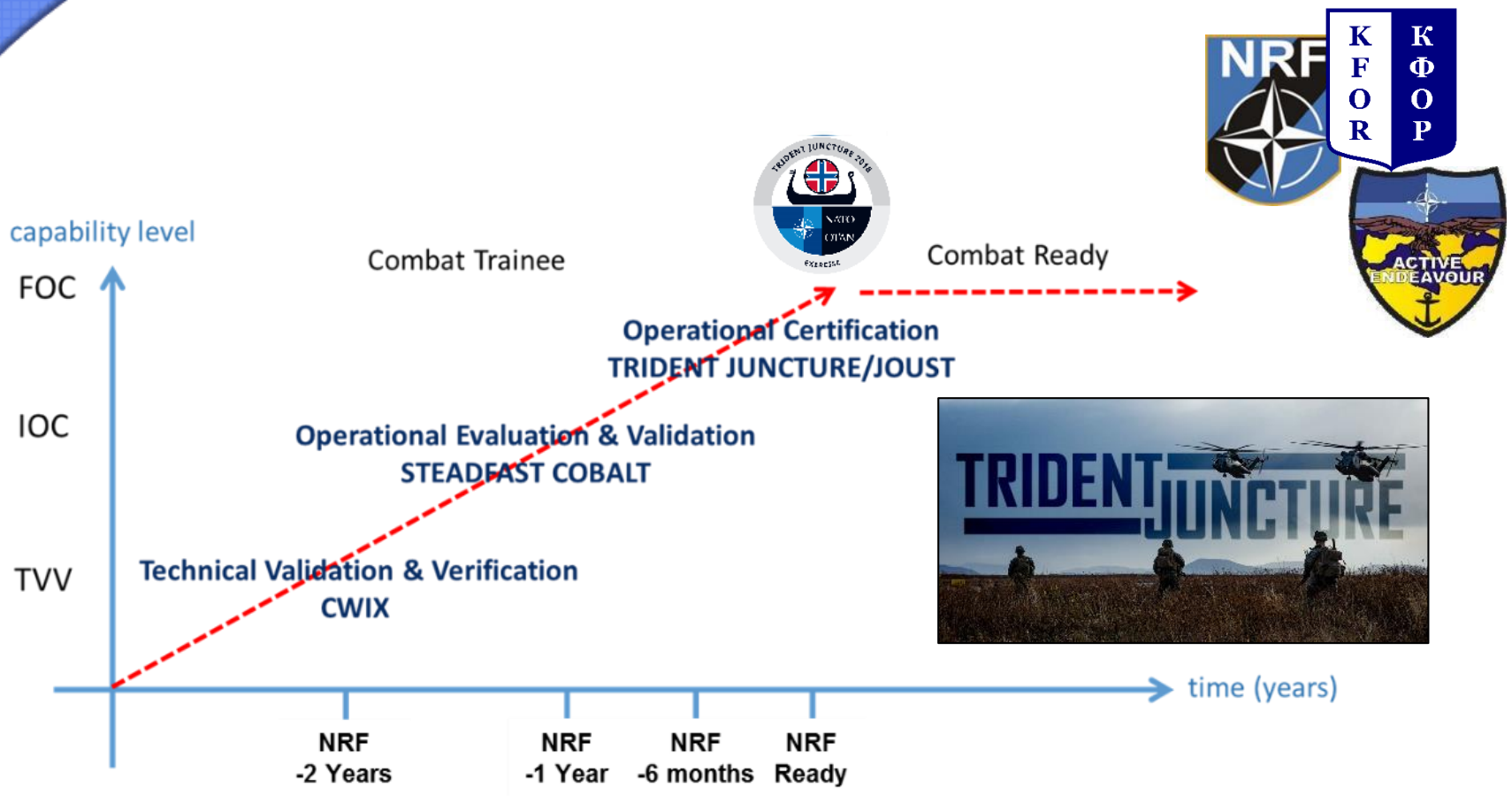
eXperiment

eXamine

eXercise



Operational Relevance?





Federated Mission Networking (FMN)

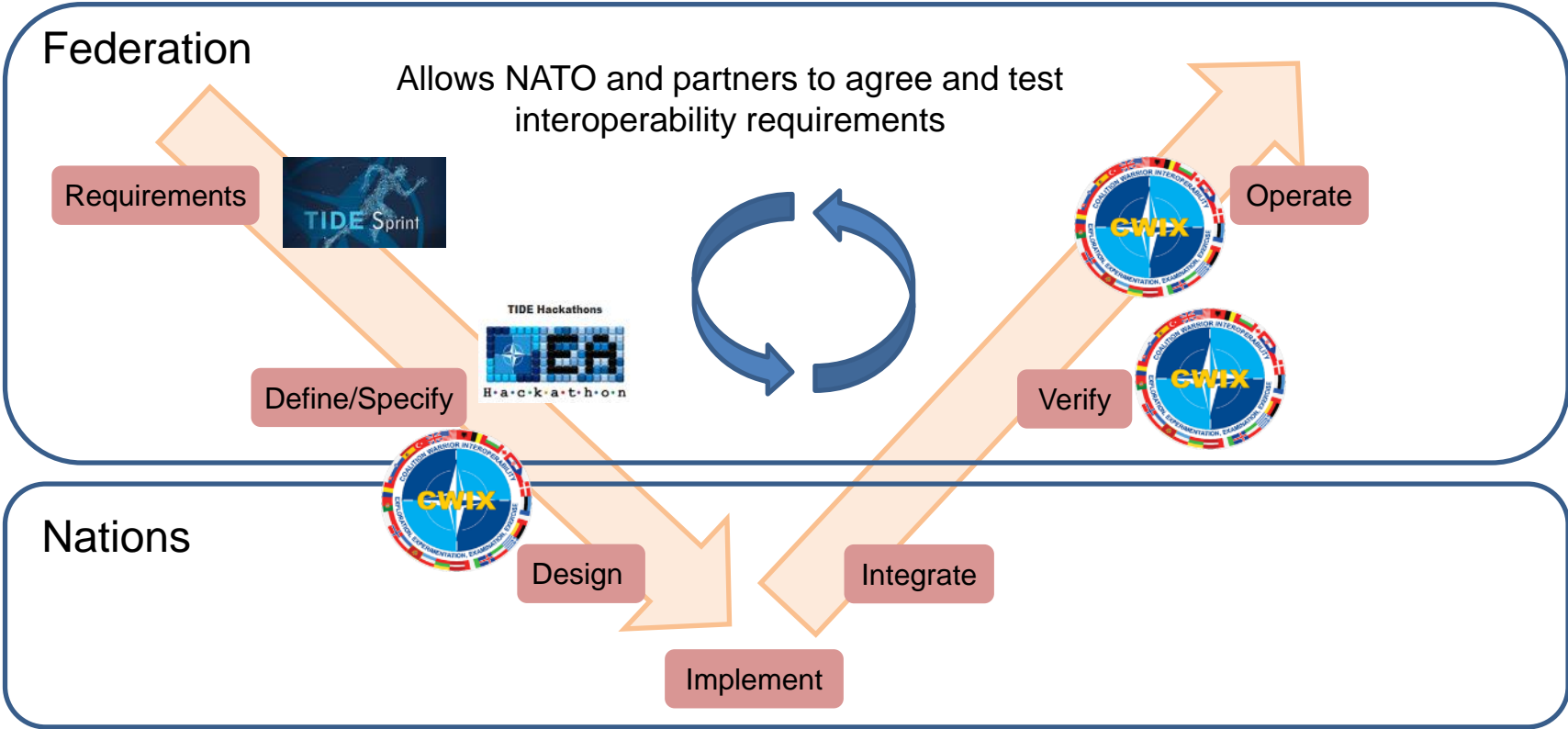
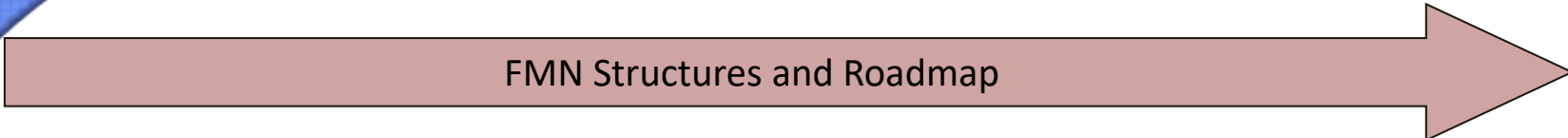
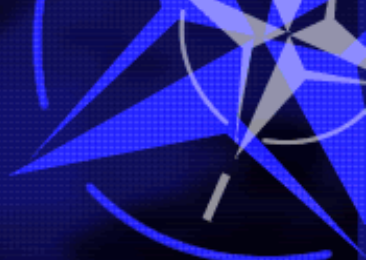
- Institutionalize a federated approach in future mission based on AMN lessons learned
- CWIX 2019 supports FMN affiliates by providing an environment for:
 - Confirming spiral 2 specifications
 - Verifying and Validating spiral 2 and 3 specifications
 - Experimenting with spiral 4 specifications
 - Identifying requirements for spiral 5+



- Today's FMN Vision: **Day Zero Interoperable Forces**
 - Part 1 (Current): Operate Together: Exploit our Strategic Advantage
 - Part 2 (Future): Adapt Together: Effectively Transform Capabilities to Maintain our Edge
- Strategic FMN Goals for Capability Development
 - Short Range: Optimization of Current Mission Environments
 - Intermediate Range: Adaptation of Existing Capabilities
 - Long Range: **Interoperability by Design**



The Interoperability Continuum





CWIX 2019 Focus Areas

OP CMD

Land

MAR

AIR

Cyber

🇩🇪	Communications				
🇩🇪	Cyber	A	L	M	O
🇩🇪	DCS	I	A	A	R
🇩🇪	FFT	F	R	D	I
🇩🇪	FMN Core Services			T	A
🇩🇪	Future Core Services			T	A
🇩🇪	GeoMetOc			E	O
🇩🇪	JISR			N	A
🇩🇪	LogM&T/Mod			A	L
🇩🇪	MIP			C	M
🇩🇪	Modelling & Simulation			M	D
🇩🇪	TDL				



Comms

GEOMETOC

LOG

FMN CS

DCS

JISR

M&S

FCS

FFT

MIP

TDL

FMN Exercise



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Why Communications as Focus Area at CWIX:

Precondition:

- First spirals of FMN are focused on static / strategic networks
- Applications were only tested on wired networks

New requirements:

- Spiral 4+ of FMN include the tactical edge and mobility
- Interoperability standards for tactical networks are needed
- Applications over radio networks face severe challenges

Conclusion

- A COMMS FA at CWIX is
 - ideal for bridging the gaps between network and applications
 - good environment for more disruptive communication experiments



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Impressions from CWIX 2018



VIP-Day

**Admiral Nielson, Deputy
Supreme Allied Commander Transformation**



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Statistics – Substantial Growth

16 Capability Configurations
7 Alliance & Partner nations

CWIX 2017

Main Participants

16 Capabilities	#	Status	Involved in Tests in Communications
BEL-NBWF-TacWF@CWIX 2017	271	Final	4
DEU-BGIS-GIMobile@CWIX 2017	198	Final	0
DEU-C2 Land Ops Mobile Tech Test SitaWare@CWIX 2017	127	Final	5
DEU-FIST-TacRouter@CWIX 2017	184	Final	22

Main Nations



44 Capability Configurations
13 Alliance & Partner nations

CWIX 2018

Main Participants

41 Capabilities	#	Status	Involved in Tests in Communications
BEL-NBWF@CWIX 2018	176	Planning Draft	0
DEU-COMMS-FMN-SP3@CWIX 2018	304	Initial Draft	0
DEU-DEU-TACTICS-TSI@CWIX 2018	180	Initial Draft	0
DEU-FIST-TacRouter@CWIX 2018	124	Initial Draft	0
DEU-FIST-	126	Initial Draft	0

Main Nations



CWIX 2019

> 60 Capability Configurations
14 Alliance & Partner nations

Description
Comms Focus Area



Capability Configuration	Nation	Capability Lead	Status	Test Cases
CC-099 DEU TacRouter	Germany	Jonathan Kirchhoff	Initial Draft	0
CC-100 DEU TacRadio	Germany	Jonathan Kirchhoff	Initial Draft	0
CC-101 DEU FLIP-	Germany	Marc Adria	Initial	0

Objective	Title	Capabilities	Test Cases
Objective 9 @ Comms Focus Area	Validate FMN Spiral 4 Service Instructions for the use of public networks, including the Internet, as a network transport mechanism.	0	0



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Objective

Technical Objectives

- 1 Test **interoperability of waveforms** including on the air interface to facilitate multinational missions (NBWF, ESSOR, ...)
- 2 Test the **integration of radios** into a heterogeneous tactical network.
- 3 Test the **coalition routing** interoperability in a mobile tactical environment (tactical router).
- 4 Test the **application and middleware over tactical radio networks**, including interfaces for network awareness and Quality of Service.
- 5 Test **security** architectures and mechanisms.
- 6 Test **management systems** for networks and security mechanisms.

Objective

Programm-/Initiative-related Objectives

- 7 Test coalition interoperability in the context of **NATO Response Force (NRF)** including fielded and near-fielded systems, e.g. VJTF (Very High Readiness Joint Task Forces).
- 8 Validate **FMN Spiral 3** Service Instructions for **Protected Core** Networking and Communications.
- 9 Validate **FMN Spiral 4** Service Instructions for **Protected Core** Networking and Communications.
- 10 Validate **FMN Spiral 4** Procedural and Service Instructions for the **Tactical Edge**.
- 11 Explore relevant technologies for **FMN Spiral 5+** for the use of **public networks, including the Internet, as a network transport mechanism**.
- 12 Explore relevant technologies for **FMN Spiral 5+** for allowing semi-automated information exchange (informal messaging, web hosting) between the federation and the public Internet in support of **Civilian-Military information sharing**
- 13 Explore relevant technologies for **FMN Spiral 5+** for enhancing network architecture to support information sharing with **force elements 'on the move'**.



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#	Objective	Expl	Expe	Exa	Exer	Capabilities
Technical Objectives						
1	Interoperability of waveforms	X	X	X		NBWF: CC-241-NOR, CC-265-BEL, CC-248-POL, CC-266-ITA; (FRA) ESSOR HDR: CC-077-FIN, CC-266-ITA, (FRA) MARLIN: CC-346-TUR, CC-324-POL ANW2C: CC-188-ROU
2	Integration of radios	X	X			STANAG 5634: CC-188-ROU DLEP: CC-100-POL Other: CC-188-ROU
3	Coalition routing tactical	X	X			Flat Coalition: CC-220-POL, CC-226-ITA; CC-366-POL; CC-188-ROU Overlay Coalition Domain: CC-099-DEU; CC-129-NLD
4	Application and middleware over tactical radio networks	X	X			STANAG 4677: CC-130-NLD, CC-241-NOR, CC-272-DEU, CC-209-ESP VMF: CC-209-ESP, CC-211-ESP, CC-213-ESP VoIP: CC-077-FIN, CC-099-DEU; CC-274-DEU NetJSON Extension: CC-073-DEU XMPP/JChat: CC-304-US Tactical Middleware: CC-274-DEU, CC-241-NOR, CC-220-POL; CC-334-GEO
5	Security architectures and mechanisms.		X	X		SCIP P2P: CC-237-POL, CC-240-POL, CC-246-POL (see also radiusz AWIN) SCIP P2MP: CC-215-ESP, CC-237-POL, CC-268-POL, CC-240-POL, CC-246-POL NINE: CC-275-ITA, CC-215-ESP, CC-217-ESP STaCIS: CC-215-ESP, CC-237-POL PCN: see Objective 8 PKI: CC-267-DEU Data Diode: CC-219-ESP Other: CC-099-DEU, CC-100-DEU
6	Management systems	X	X	X	X	Other: CC-075-DEU, CC-099-DEU

e.g. NATO NBWF
ESSOR HDR WF
MARLIN

e.g. DLEP,
STANAG 5634

e.g. OLSRv2,
Tactical Router
Multi Domain

e.g. VoIP, XMPP/Chat
BFT, Tactical Middleware
Network Awareness
Dismounted Soldier

e.g. SCIP,
NINE, STaCIS,
PCN



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CC-131
NLD_FMN_COMMS_FWDPCP_43
VW Amarok

CC-099 DEU TacRouter
VW Amarok

CC-099 DEU TacRouter
VW Amarok

CC-010 POL-BMS JASMINE
LandRover

CC104-DEU-AC2IS
Mercedes 2to gl

CC104-DEU-AC2IS
T6 Widder

CC104-DEU-AC2IS
T6 Widder

Flexible Cable Conducts
are required for CC
connectivity within tent

Radio
Integration,
Coalition
Routing
&
Network
Awareness

Waveform
Interoperability
& Integration

Security

Integrated
C2IS

COMMS unclass tent

Dismounted
Soldier

PCN

35 m

1*32A CCE Socket



Questions ???

