



Joint Program Executive Office Joint Tactical Radio System

JTRS Spectrum Update



23 July 2012
Mr. Greg Rassatt
JTRS Director
International
Programs

JPEO JTRS

Report Documentation Page

Form Approved
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE 23 JUL 2012		2. REPORT TYPE		3. DATES COVERED 00-00-2012 to 00-00-2012	
4. TITLE AND SUBTITLE JTRS Spectrum Update				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Joint Program Executive Office, Joint Tactical Radio System, 33000 Nixie Way, San Diego, CA, 92147-5110				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES Presented at the Pacific Spectrum Management Conference, July 23-26, 2012, at Camp H.M. Smith, HI					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	unclassified	unclassified	Same as Report (SAR)	16	



Strategic Shift

“We are at an important turning point that would have required us to make a strategic shift under any circumstances.”

“The military will be smaller and leaner, but it will be agile, flexible, ready, and technologically advanced.”

“We will protect and prioritize key investment in technology and new capabilities, as well as our capacity to grow, adapt and mobilize as needed.”

“We are continuing the initiative to improve the Department’s buying power by seeking greater efficiency and productivity in the acquisition of goods and services.”

*The Honorable Leon E. Panetta, Secretary of Defense
Statement to Senate Appropriations Committee - Defense, 13 June 2012*

JPEO JTRS is Transitioning into the DoD’s Joint Tactical Networking Center



JTRS Capability is Being Delivered Today



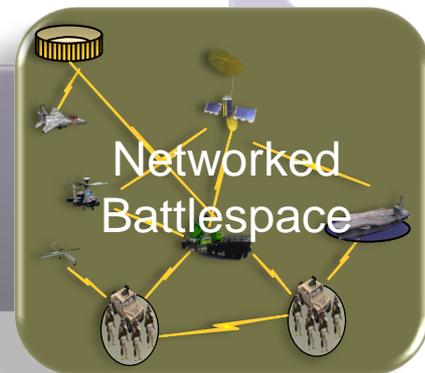
Production/ Fielding

- HMS MS C LRIP1: 6,250 RR and 100 MP
- HMS MS C LRIP2: 13,077 RR
- 2 MIDS JTRS (LP&F) Decisions totaling 83 radios (on F/A-18E/F, RC-135, and E-8C)
- MIDS JTRS Full Production & Fielding (FP&F)



Upcoming Procurement Opportunities:

- MNVR NDI RFP Release
- HMS MP LRIP #2
- COALWNW NDI RFP Release



Developmental Testing

- HMS Rifleman Radio and Manpack in NIE 12.2 and 13.1
- JENM in NIE 12.1, 12.2, and 13.1



Operational Evaluation

- HMS RR Combat Evaluation in Afghanistan
- MIDS JTRS FP&F & IOC





JTRS Radios - Combat Proven

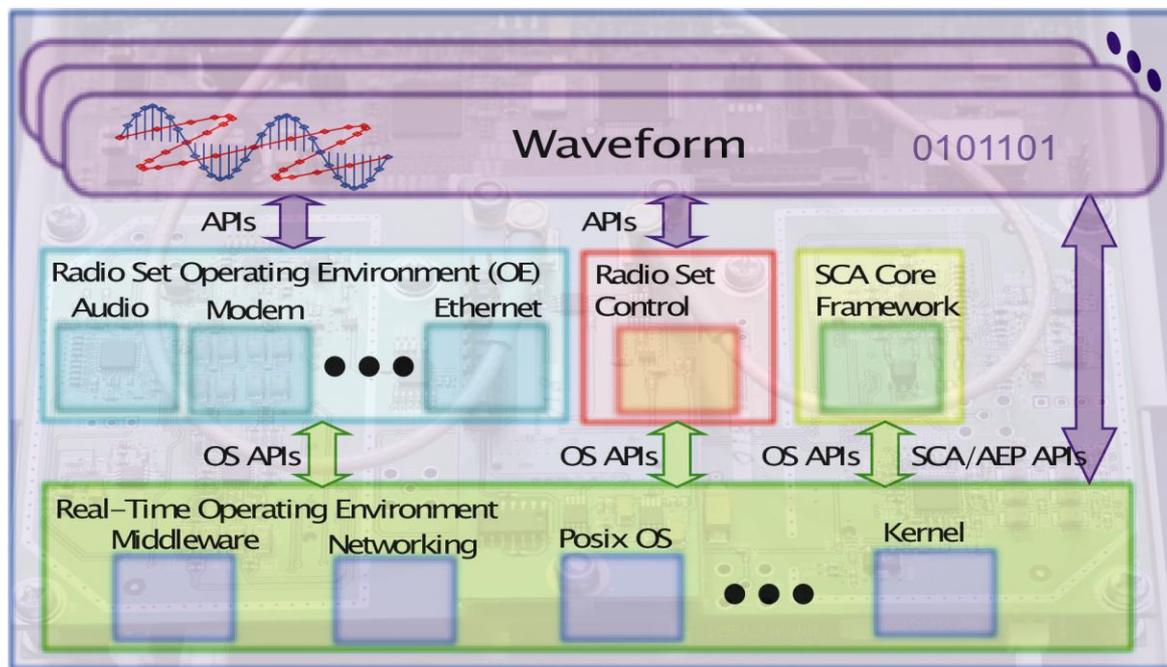


- ▶ Rifleman Radio deployed to Afghanistan with elements of the 75th Ranger Regiment, the first combat use of a JTRS radio
- ▶ Coupled with the GD300 end user device, platoons reported effective, reliable comms inside buildings and through/around walls
- ▶ Rifleman Radio and SRW improved command and control of the Rangers' combat operations

Rifleman Radio proves networked communications and situational awareness can improve mission effectiveness in combat



Open Architecture and Standards for Software-Defined Radios



SCA-Based Radio Architecture

- The Software Communications Architecture (SCA) and JTRS Standards provide a Linux-like reusability and portability for waveform software.
- Like Linux, the software does not require common hardware and binaries, but instead is recompiled and ported to each specific radio set.
- SCA is Waveform/Network Centric. iPhone and Android are presentation-centric. The SCA enables waveforms and can connect to other applications.



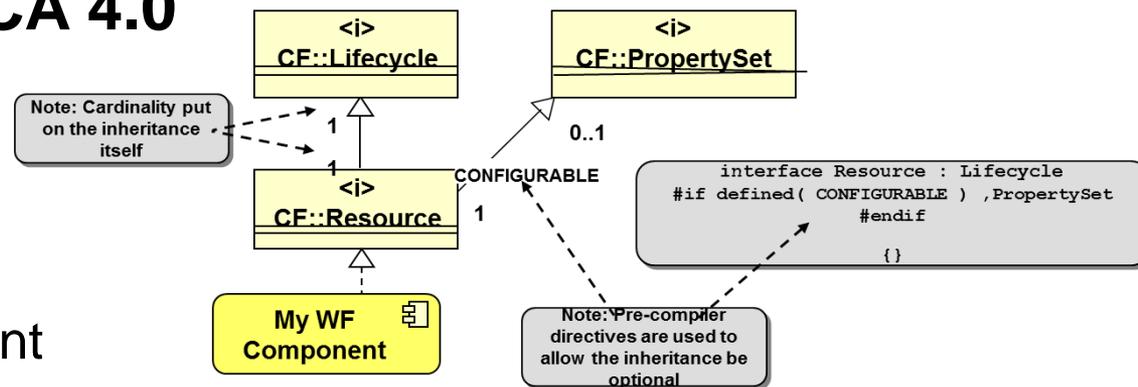
SCA 4.0 – A Substantial Improvement for Software Defined Radios

- The SCA 4.0, previously known as SCA Next, is a significant advancement in software architecture.
- The new standard was developed through international participation, receiving contributions from dozens of individuals and companies.
- Aside from incorporating the latest design patterns and strategies, new technology was invented for SCA 4.0



What We Expect from SCA 4.0

- Longer Battery Life
- Faster Boot Times
- Lower Cost Radios
- Faster Software Development
- Innovation to the Warfighter



An SCA 4.0 Invention – Conditional Inheritance



Open Standards Under Control of JTRS

▶ Goal

- Establish JTRS standards that promote reusability, portability, and interoperability.

Since 2007, 21 public standards have been produced

▶ Objectives

- Establish Baseline Specifications and Standards for the JTRS Enterprise
- Maintain, Manage and Guide the Evolution of JTRS Standards and Specifications
- Support Application/Waveform (WF) and Operating Environment (OE) Testing for the JPEO JTRS based on the JTRS Standards
- Provide Compliance Certification Recommendations to the JPEO JTRS

▶ Accomplishments

- Open JTRS Standards include:
 - Application Program Interfaces (APIs)
 - Other Standards such as the Software Communications Architecture (SCA), JTRS Platform Adapter Interface Specification
- Additional Resources and Guidance:
 - UML & XML Models for SCA 4.0
 - JTRS Portability Guidelines

7 Radio Device APIs



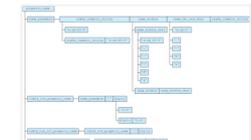
2 Radio Service APIs



10 Primitive APIs



2 Additional Specifications (SCA, & JTRS Platform Adapter)





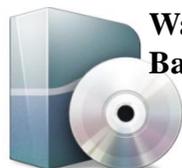
JTRS Standards Supporting Coalition Objectives

- ▶ JTRS maintains a partnership in standards with an international standards body, the Wireless Innovation Forum (WINNF)
 - JTRS Standards are used and implemented in platforms across the coalition forces.
- ▶ The WINNF Standards compliment the public domain JTRS Standards
 - International Radio Security Services (IRSS) API, Transceiver API
- ▶ JTRS has 21 standards available in the public domain.

JTRS Standards Public Website



JTRS Standards



Waveform Baseline

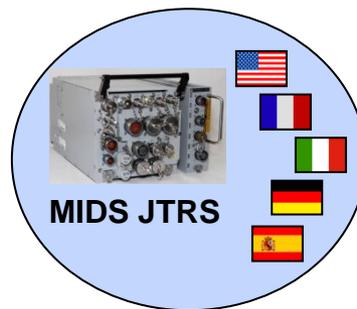
WINNF Standards



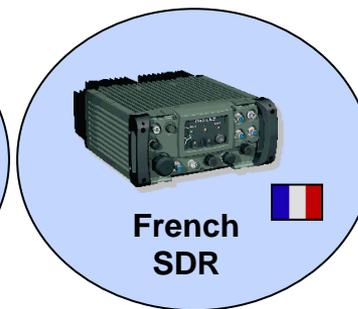
Waveform Baseline



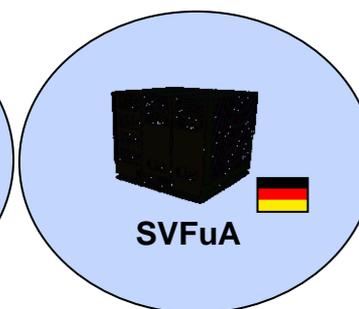
Waveform Baseline



MIDS JTRS



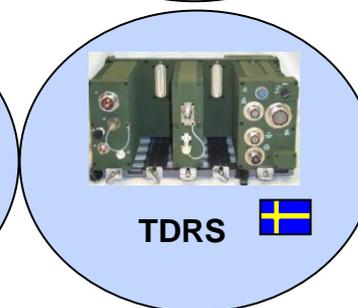
French SDR



SVFuA



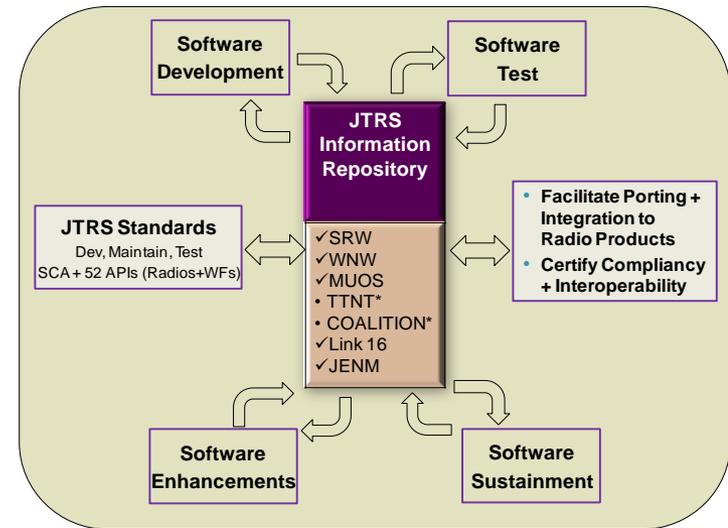
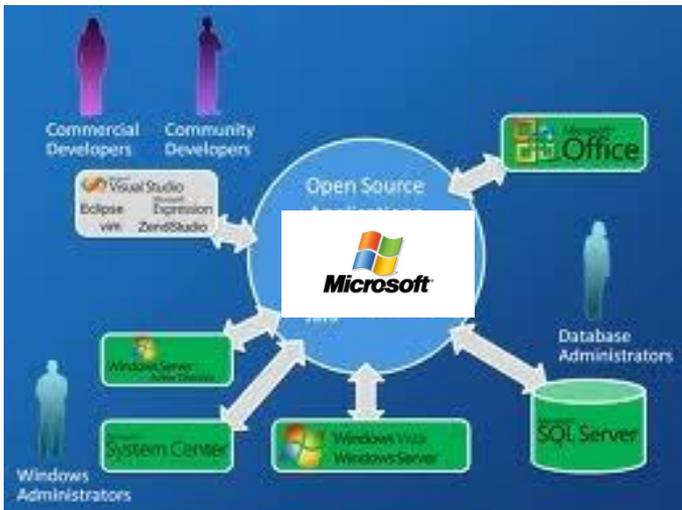
Combat Net Radio



TDRS



Analogy to Commercial IT: Common Software – Multiple Hardware Vendors

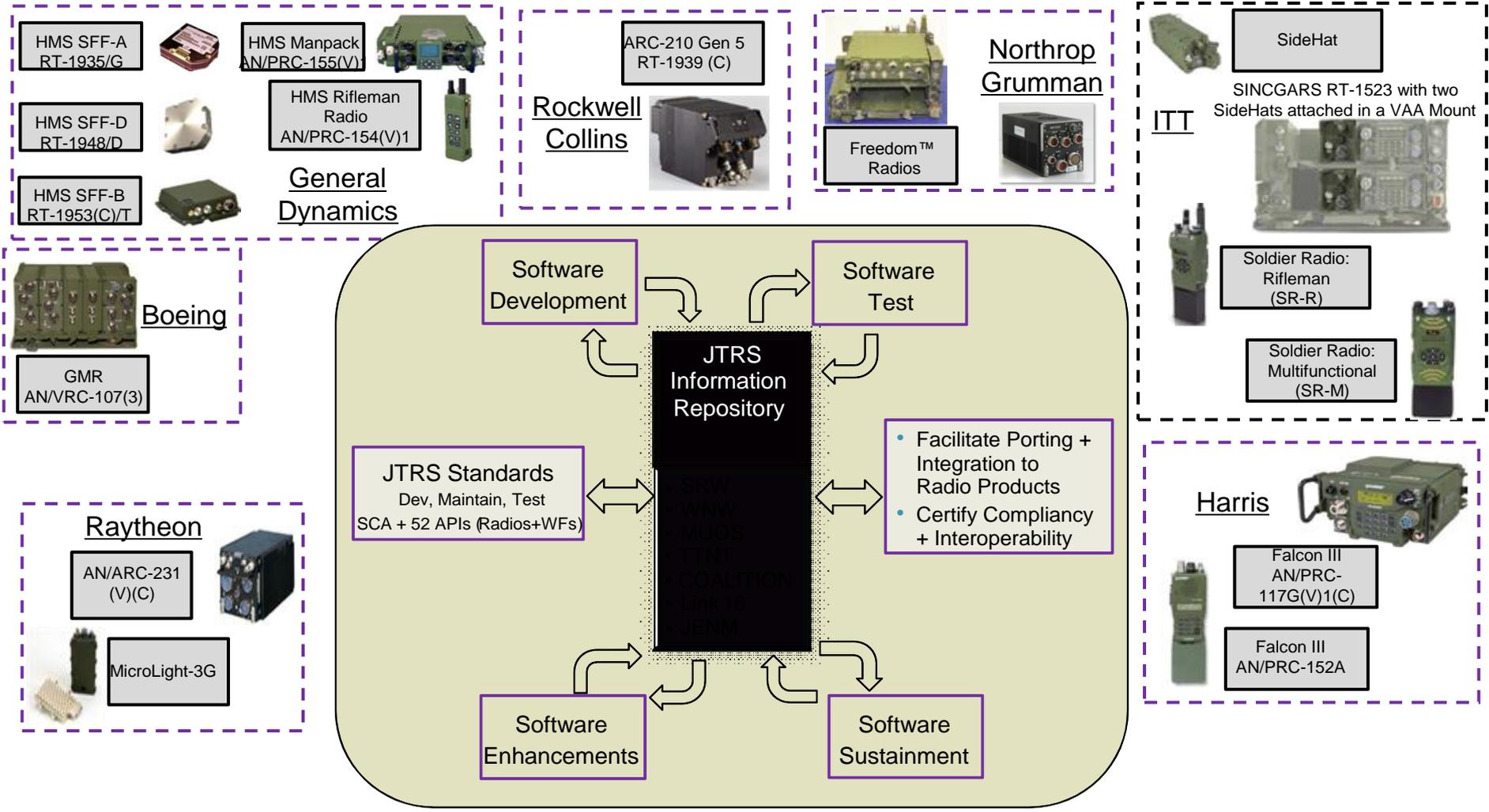


- ✓ Common standards across multiple hardware environments – works across all PCs
- ✓ Developer owned IP rights of software
- ✓ Competition across hardware instantiations
- ✓ Engineered for upgradeability and software enhancements

- ✓ Common software standards across multiple hardware networking radios – interoperable!
- ✓ Government owned IP rights for software
- ✓ Promotes competition across hardware instantiations
- ✓ Engineered for upgradeability and software enhancements



Demonstrated Value Today: Interoperable SRW Network



We are performing these essential tasks today: sustaining joint tactical network applications, conducting quick look interoperability tests, qualifying vendors for major integration test events!

Distribution Statement A - Approved for public release, distribution is unlimited (16 July 2012).



JTNC Vision and Mission

Vision

Affordable, Interoperable, and Secure Tactical Wireless Networking in support of Service, Multi-Service/Joint and Coalition forces.

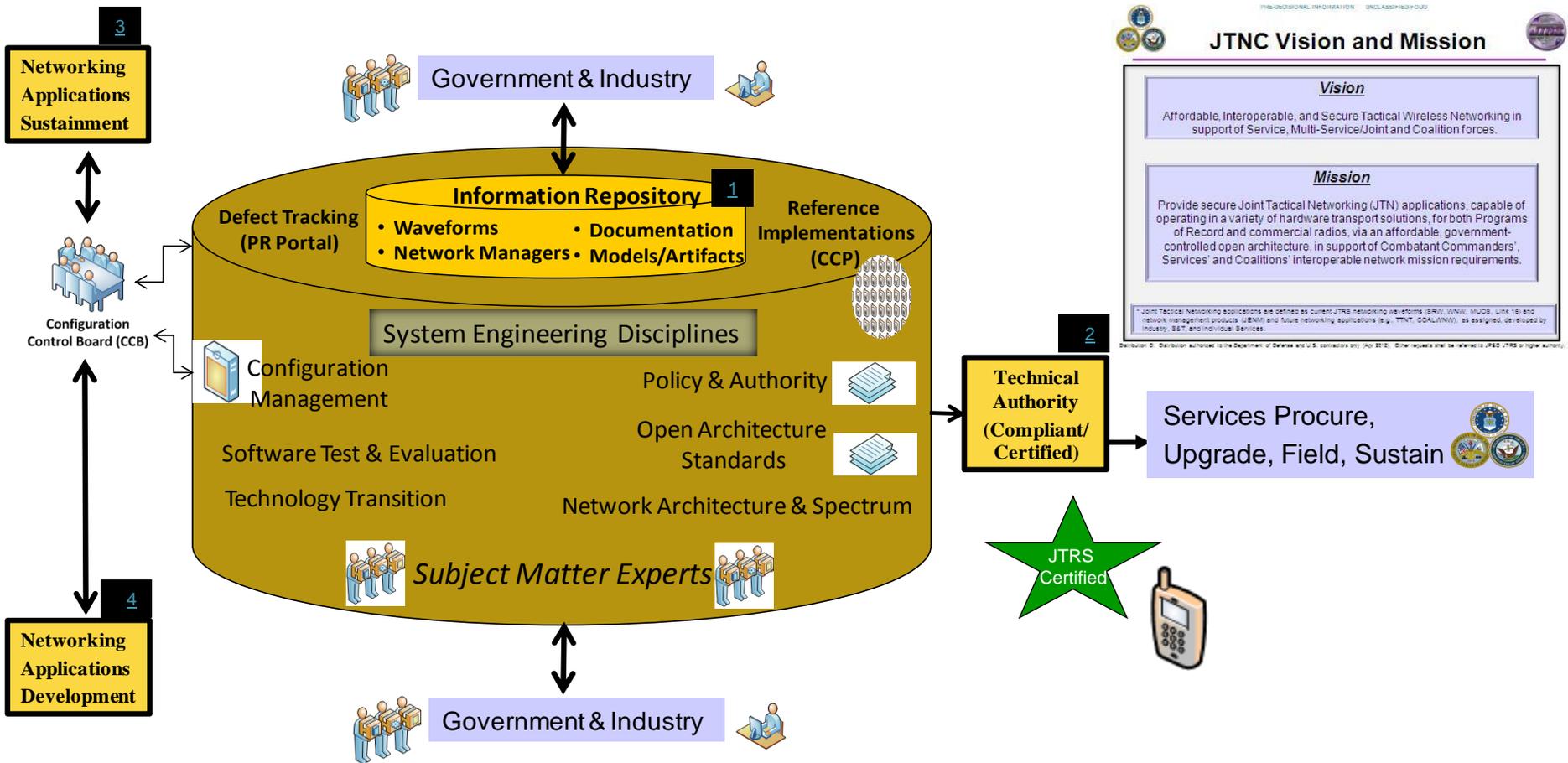
Mission

Provide secure Joint Tactical Networking (JTN) applications, capable of operating in a variety of hardware transport solutions, for both Programs of Record and commercial radios, via an affordable, government-controlled open architecture, in support of Combatant Commanders', Services' and Coalitions' interoperable network mission requirements.

* Joint Tactical Networking applications are defined as current JTRS networking waveforms (SRW, WNW, MUOS, Link-16) and network management products (JENM) and future networking applications (e.g., TTNT, COALWNW), as assigned, developed by industry, S&T, and individual Services.



Achieving the JTNC Mission



UNCLASSIFIED//FOR OFFICIAL USE ONLY

JTNC Vision and Mission

Vision

Affordable, Interoperable, and Secure Tactical Wireless Networking in support of Service, Multi-Service/Joint and Coalition forces.

Mission

Provide secure Joint Tactical Networking (JTN) applications, capable of operating in a variety of hardware transport solutions, for both Programs of Record and commercial radios, via an affordable, government-controlled open architecture, in support of Combatant Commanders' Services' and Coalitions' interoperable network mission requirements.

* Joint Tactical Networking applications are defined as current JTRS networking waveforms (BRW, WNW), MUDB, Link-16 and network management products (JENM) and future networking applications (e.g. TTNT, COAL/WNW), as assigned, developed by Industry, S&T and Individual Services.

- Preserving intellectual capital and control of open standards and software (*leverage*)
- Sustain & enhance current and future tactical networking applications (*responsive*)

- Lowering barriers to entry for industry (*access*)
- Increasing the competitive landscape (*qualify*)
- Assuring joint interoperable and secure tactical wireless networking (*certify*)



JTRS Products Capabilities Matrix

Competitive Acquisition
Continues

Army Manages Production

Navy Manages Production

JTRS ORD 3.2/3.2.1 Increment 1 Threshold Capabilities with POM-10, PR-11, POM-12 Additions & JROCM & ADM Documentation (26 September 2011 v25) TopVue No. 9879		JTRS Threshold Capabilities									
		CSCHR		HMS				GMR	MIDS JTRS	AMF	
		JEM*	Falcon III*	Type 2 Encryption		Type 1 Encryption					
Joint Capability JTRS Radios are capable of additional waveforms beyond Increment 1		Handheld & Vehicle AN/PRC-148(V)4	Handheld & Vehicle AN/PRC-152(V)1	Rifleman Radio AN/PRC-154(V)1	SFF-A RT-1935/G	SFF-D RT-1948/D	SFF-B RT-1953(C)/T	Manpack AN/PRC-155(V)1	AN/VRC-107(3)	AN/USQ-190(V): 1 to 4 (C)	JROC VALIDATION REQUIRED
Channels per Radio		1	1	1	1	1	2	2		4	
Transformational	Joint Networking (WNW, SRW and JAN-TE are reserved for U.S. only.)		-	-	-	-	-	-	WNW	-	
			-	-	SRW(3)	SRW(3)	SRW(3)	SRW(4)	SRW(4)	-	
			-	-	-	-	-	-	-	JAN-TE(5)	
			-	-	-	-	-	-	MUOS	-	
Enterprise Manager		-	-	JENM	JENM	JENM	JENM	JENM(2)	JENM	-	
Enterprise Svcs (R&R)		-	-	-	-	-	ENS	ENS	ENS	-	
Legacy	Ground/Air/ Maritime LOS/BLOS	LOS Voice & Data	SINC	SINC	-	-	-	SINC	SINC	SINC	
		LOS Voice VHF	VHF FM	VHF FM	-	-	-	-	VHF FM	-	
		LOS Voice UHF	UHF AM/FM	UHF AM/FM	-	-	-	-	UHF AM/FM	-	
		BLOS SATCOM	IW Ph 1	DAMA/IW Ph 1	-	-	-	-	DAMA	DAMA	
	BLOS Non-SATCOM		-	-	-	-	-	-	HF	HF	
	Tactical Data Link (TDL)		-	-	-	-	-	-	-	-	
	Tactical Voice (e.g. CAS)		HQ II	HQ II	-	-	-	-	HQ II	-	
	Air Traffic Control		-	-	-	-	-	-	ATC	-	
Coalition Interoperability		-	-	-	-	-	-	Bowman VHF	-		
Homeland Defense (Low-Band P-25)		P25(P2P)	P25(P2P)	-	-	-	-	-	-		

Legend
Transformational
Ground/Air/Maritime LOS/BLOS
Tactical/Specialty
Coalition
Other

- Notes:
- Link- 16 Information Assurance Upgrade and Frequency Remap.
 - An Updated JENM is implemented to provision MUOS Waveform.
 - Using Type 2 Encryption.
 - Capable of using Type 1 & 2 Encryption.
 - Initial capability funded by U.S. Navy

NDI procurement process ongoing, draft RFP released

NDI procurement process under evaluation

*In Production.



JENM Increment-1 Core Requirements

Cyber Hardened (UIC & DIACAP Compliant)

Planning – Provide users the capability to allocate network resources based on Commanders intent (BCT, BN, CO)

- Import communications plan (data products) to ease the burden of network planning
- Provide operational displays and automation to assist the network planner

Configuration - Provide configuration files to install the network

- Support all TNE platforms running WNW, SRW and MUOS
- Interface to Common Load Device

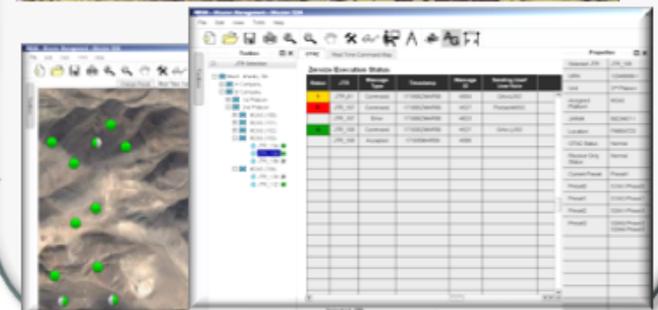
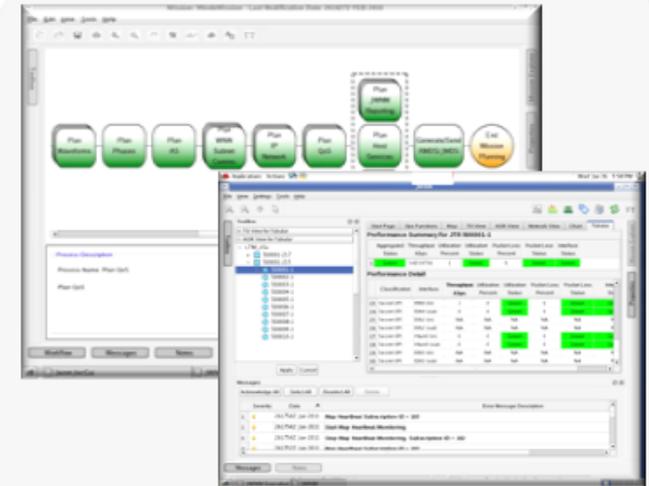
Monitoring - Provide a single integrated Common Operational Picture of transport networks

- Network performance, fault, and topology views
- Provide reports to assess health/status of the network

Control - Provide ability to troubleshoot and reconfigure the network

- Uses performance/fault statistics to help modify/reconfigure the network
- Change presets, re-key, chat, OTAZ

Integrated JTRS NM





Spectrum Certification Status

DD1494 Status Matrix (12 June 2012_v1)		JTRS Form Factors							
		HMS				GMR	MIDS JTRS	AMF	
Nomenclature		 AN/PRC-154(V)1	 SFF-A RT-1935/G	 SFF-D RT-1948/D	 SFF-B RT-1953(C)/T	 AN/PRC-155(V)1	 AN/VRC- 107(3)	 AN/USQ-190(V): 1 to 4 (C)	 NDI
No. Channels		1	1	1	2	2	4	4	
JF-12 Serial No.		9678/2			9726		9042/2	7064	Pending
NTIA DD-1494 Certification Status		Stage-4 Approved Awaiting Final Signature			Stage-3 Approved Awaiting Final signature		Stage-2 Approved Stage-3 Awaiting comments	Stage-4 Approved	PENDING ACQUISITION & SOURCE SELECTION DECISIONS
Host Nation Supportability	CENTCOM	Stage-4 Supportable Comments received			Stage-3 Supportable Comments received		Stage-3 Supportable Comments received	Stage-4 Host Nation coordination package submitted for COCOM review	
	EUCOM	Stage-4 Released for Comments			Stage-3 Released for Comments		Stage-3 Spectrum Supportability Comments in progress		
	PACOM	Stage-4 Supportable Comments received			Stage-3 Supportable Comments received		Stage-3 Supportable Comments received		



Summary

- ▶ JPEO JTRS is Transitioning into the DoD's ***Joint Tactical Networking Center (JTNC)***
 - **Software:** Sustaining joint tactical network applications (waveforms) & Net Manager: conducting quick look interoperability tests: and qualifying vendors for major integration test events
 - **Hardware:** JTRS products delivered by the services
- ▶ JPEO JTRS will continue to provide support for all spectrum matters until the transition occurs. Post transition:
 - Army: HMS, GMR (MNVR), AMF
 - Navy: MIDS JTRS