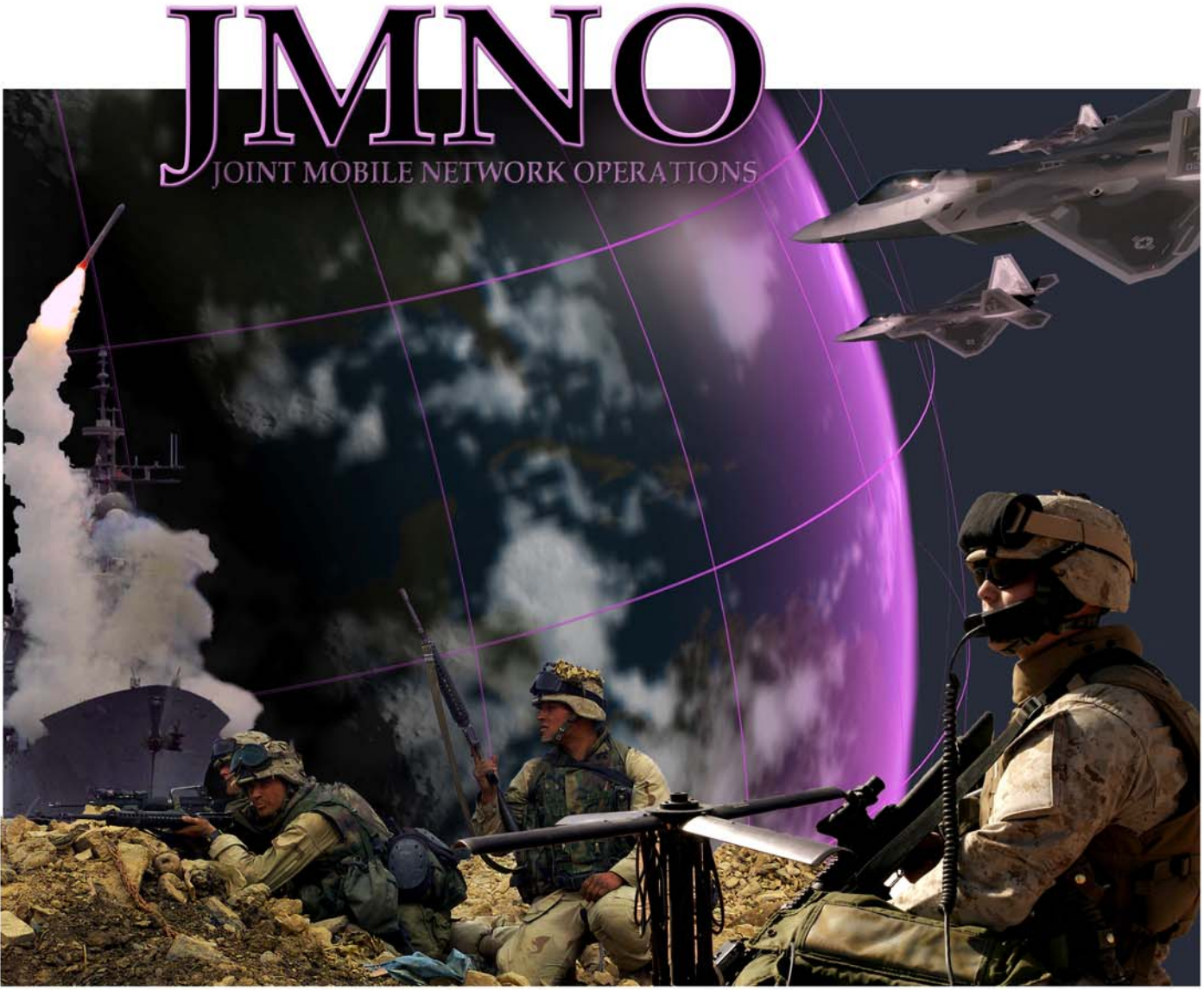


JOINT MOBILE NETWORK OPERATIONS

NDIA Introduction Brief

Mar 2007

UNCLASSIFIED

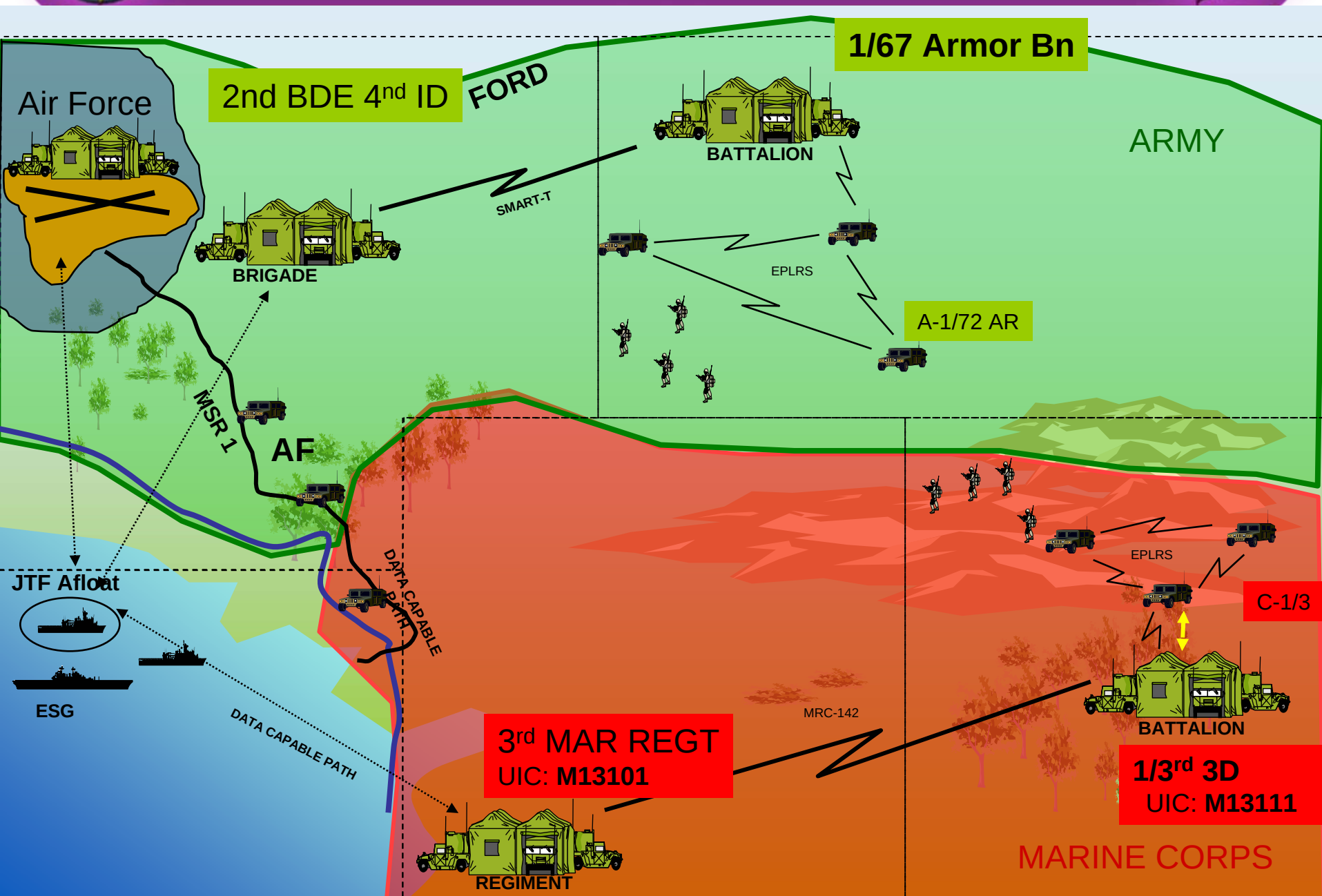
Col James Fritz, USMC
Joint Test Director
james.fritz@usmc.mil

Col Ed Mitchell, USMCR
Deputy Joint Test Director
Edmund.Mitchell@jmno.net

Mr. J.D. Wilson GS-15
Technical Director
jeffery.d.wilson@usmc.mil

Dr. George Nobles
Senior Program Manager
george.nobles@jmno.net

Battlespace Assumptions



Bottom Line Up Front

- **JMNO's evaluation of mobile network operations** began looking at how Services connect to each other to achieve Net-centricity
  - **Services 'generally' DON'T plan for inter-Service communications** links at tactical level below HHQ
  - Transmissions between units within close proximity (within miles) **traditionally use 'out of theatre' bandwidth-constrained links to connect**
  - **Initial findings suggest use of "lateral links" between tactical nodes** will enable passing of critical warfighter applications between tactical Service units
- **JMNO initial recommendation**: Build Joint TTPs that provide a preset plan for routing any Service IP data to any other Services' networks
  - **Create "Lateral Link Nodes"** to laterally connect Service Networks
  - **Create "Multi-Service Distribution Nodes"** to connect three or more Lateral Link Nodes.
- **Expected results of JMNO JTTPs**:
  - Provide the JTF Commander "**net-centricity**" without breaking the Service TOC networks.
  - **Less time to coordinate network capability** for Joint Force Task Organizations (hours vice months)
  - Greater flexibility for maneuver units, it will **provide a way to stay connected when beyond the range of HHQ data radios**

JMNO Problem Statement

The lack of joint tactics, techniques, and procedures (TTP) limit the forces' ability to access information resources and network services when crossing network boundaries

Issue 1 – Network-to-network connectivity

What is the level of network interoperability achieved between different Services at the tactical level by implementing JMNO-developed mobile NetOps joint TTPs?

Issue 2 – User cross-network support

To what extent do JMNO-developed mobile NetOps joint TTPs enable a tactical user to access information resources and network services via a different Service's (host) network?

JMNO Purpose & Objectives

Purpose: To develop and assess joint TTPs to improve forces' ability to access information and network services while crossing Service IP network boundaries

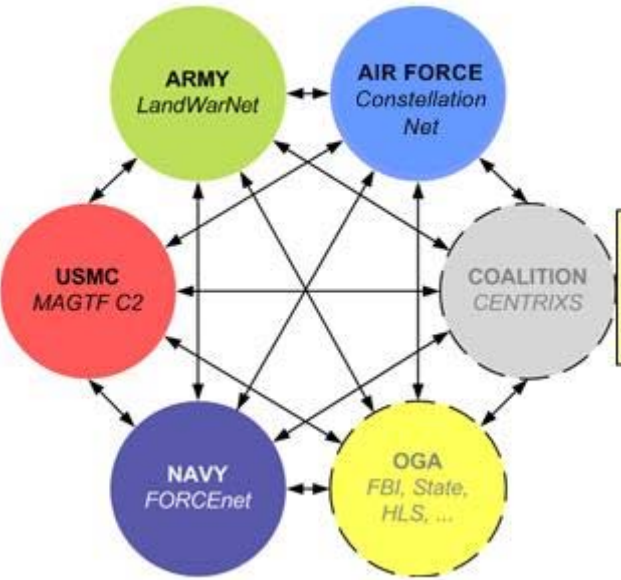
- Improve mobile network access and maintain current performance by identifying and developing joint doctrine and recommending DOTMLPF changes
- Enhance user-connectivity to their Service's (home network's) information resources while maneuvering through the battlespace
- Enable interoperability and Information Assurance (IA) between different Services' networks
- Maintain Quality of Service across network boundaries

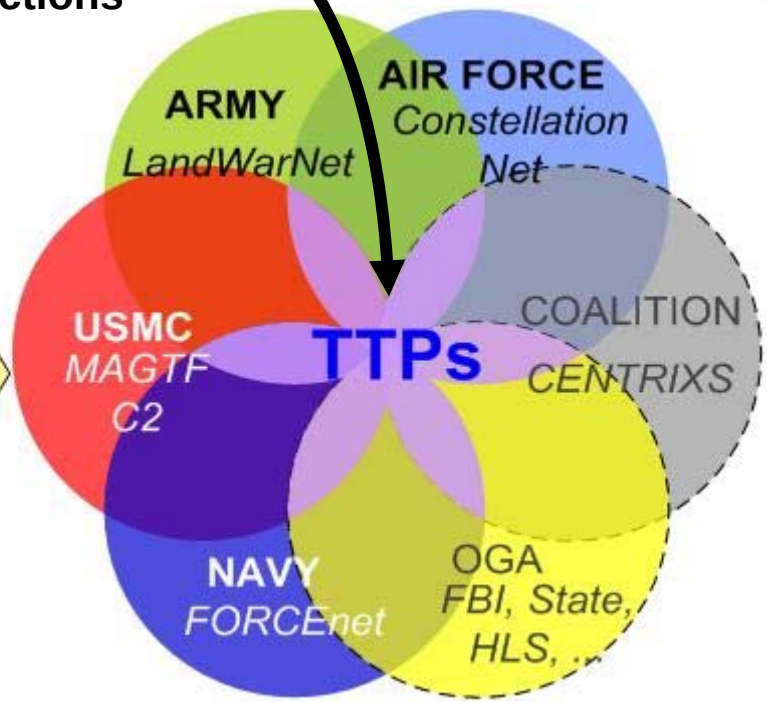
End State: Seamless and transparent IP connectivity for current and future users

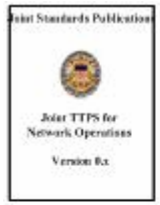
Plan of Attack

Joint Standards and Procedures allow access through a Joint "Purple Zone"

- **Separate and multiple "bi-lateral" connections**
- **Negotiation time about 6 months**







Joint TTP
Standards Handbooks
For Network Operations

Standardized
Annexes
Across
COCOMS

Coordinated
TTPs between
DoD and
OGA/Coalitions

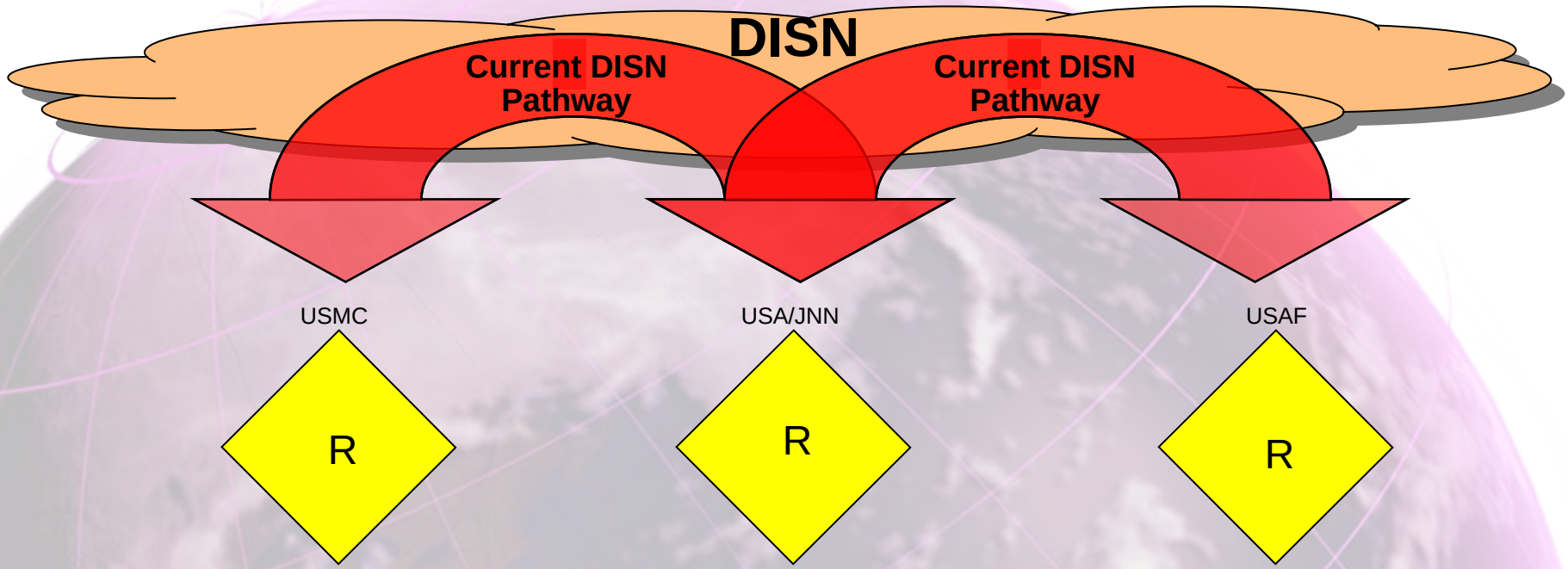
Basic Premises:

- **Will not change Service (OGA or Coalition) internal networks**
- **No specific materiel solutions**

Possible CJCS
Manual or
Instructions

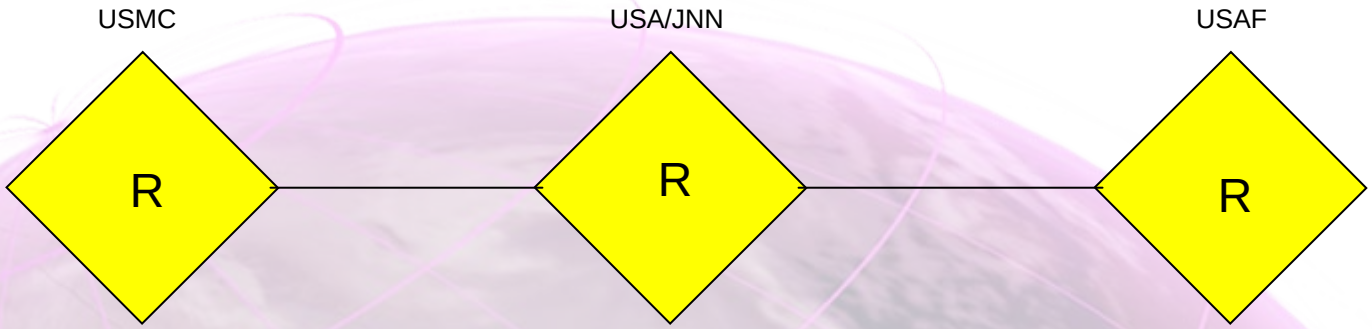
Test Article (USMC-USA-USAF)

(Router Configuration)



Test Article

(Router Configuration)



interface Serial0/1
description Interface to MCTSSA
bandwidth 1024
ip address 199.112.187.41
255.255.255.252
no ip proxy-arp
ip route-cache flow
ip ospf cost 1000
max-reserved-bandwidth 100
service-policy output
SerialAggregate

Port Configuration

router eigrp 1775
redistribute static
redistribute ospf 21 metric 1500 100 250 10 1200
passive-interface FastEthernet0/0
passive-interface FastEthernet0/1
redistribute eigrp 5819
(done on 11/7/06 to for AFFOR to talk to MCTSSA through JNN)
network 144.104.0.0
network 199.112.187.0
no auto-summary
!

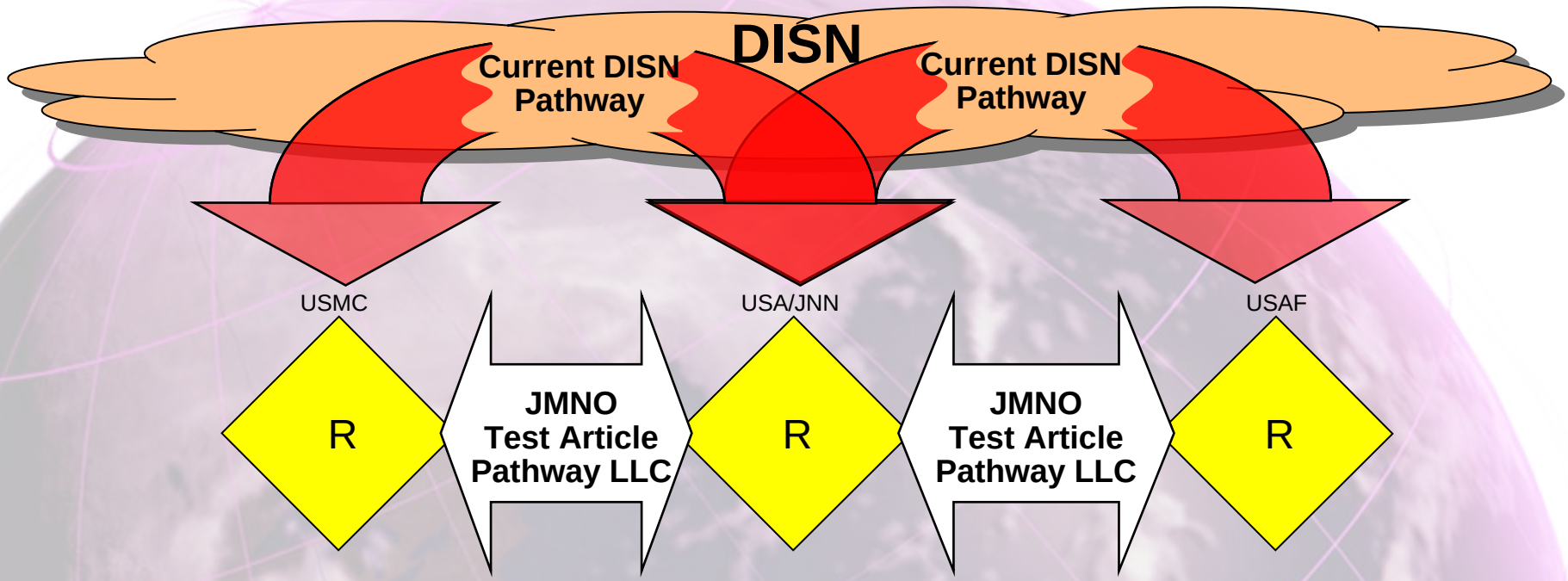
Routing Protocol

router ospf 21
log-adjacency-changes
redistribute eigrp 5819 metric 100 subnets
redistribute eigrp 1775 metric 100 subnets
network 144.104.246.144 0.0.0.7 area 0
network 144.104.246.193 0.0.0.0 area 0
default-information originate

Routing Protocol

Test Article (USMC-USA-USAF)

(Router Configuration)



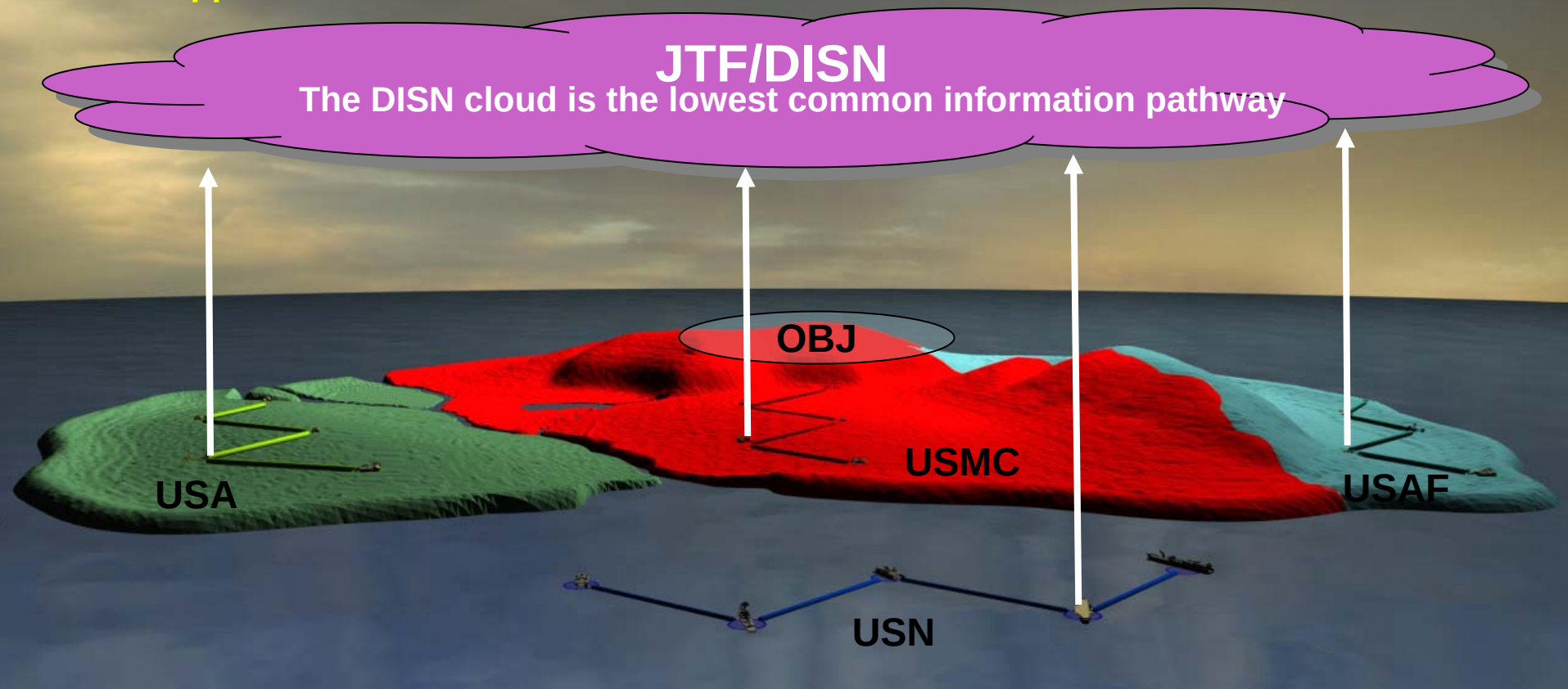
JMNO installed a Lateral Link Configuration (LLC)
To routers within the Service's communications nodes.

More Volume: LLC Improvement – Throughput:
HTTP 94%.

Faster Traffic: LLC Improvement - Latency:
HTTP 49%.

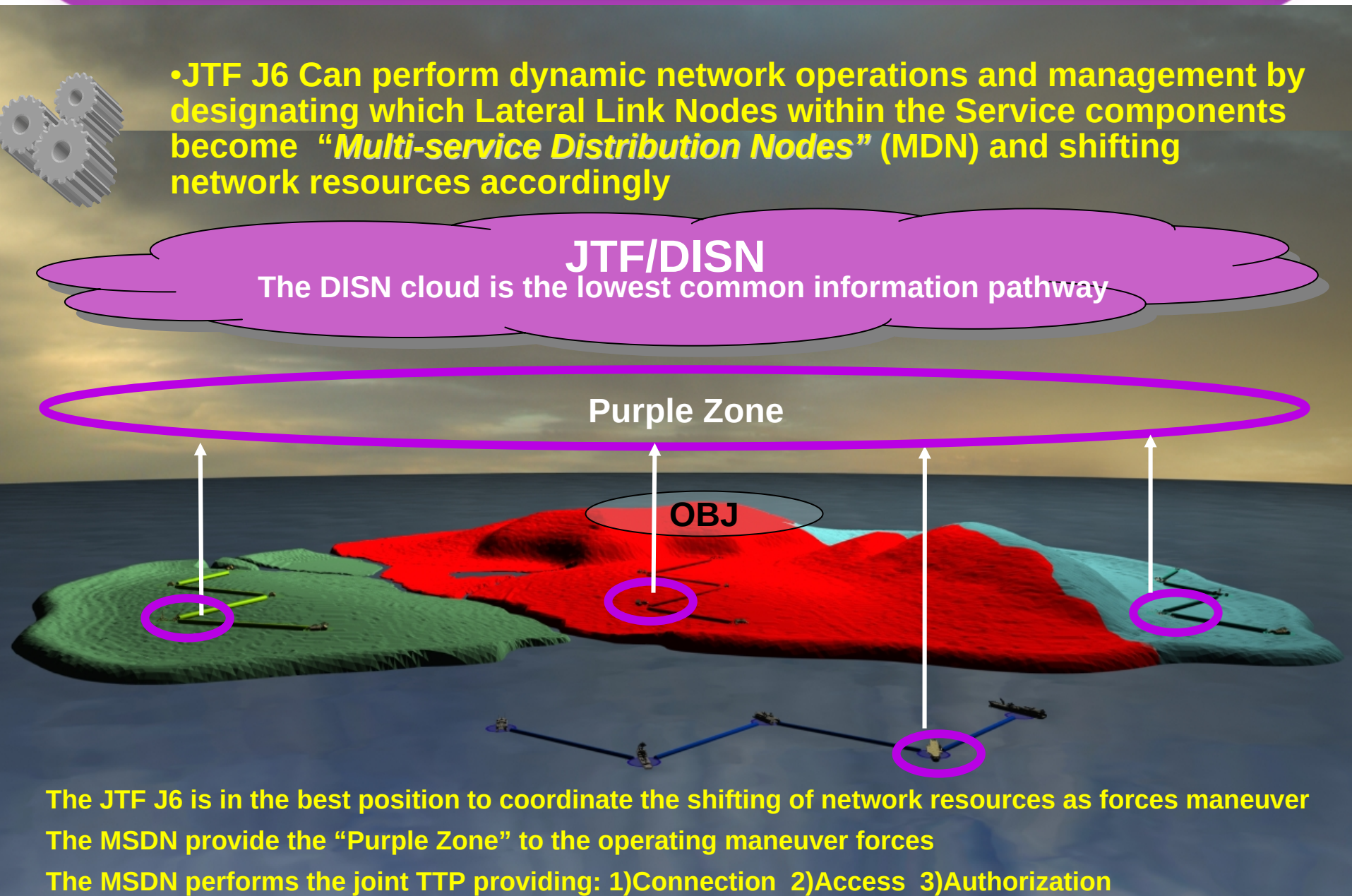
Current Joint Connectivity

- JMNO's Evaluation of mobile network operations:
  - Began looking at how Services connect to each other to achieve Net-centricity
  - Services don't plan for inter-Service communications links at tactical level
  - Even units within close proximity (miles) use bandwidth-constrained links out of theater to connect
  - Initial findings suggest use of lateral links improves passing of critical warfighter applications between Joint tactical units



JMNO "*Tactic*"

- JTF J6 Can perform dynamic network operations and management by designating which Lateral Link Nodes within the Service components become "***Multi-service Distribution Nodes***" (MDN) and shifting network resources accordingly



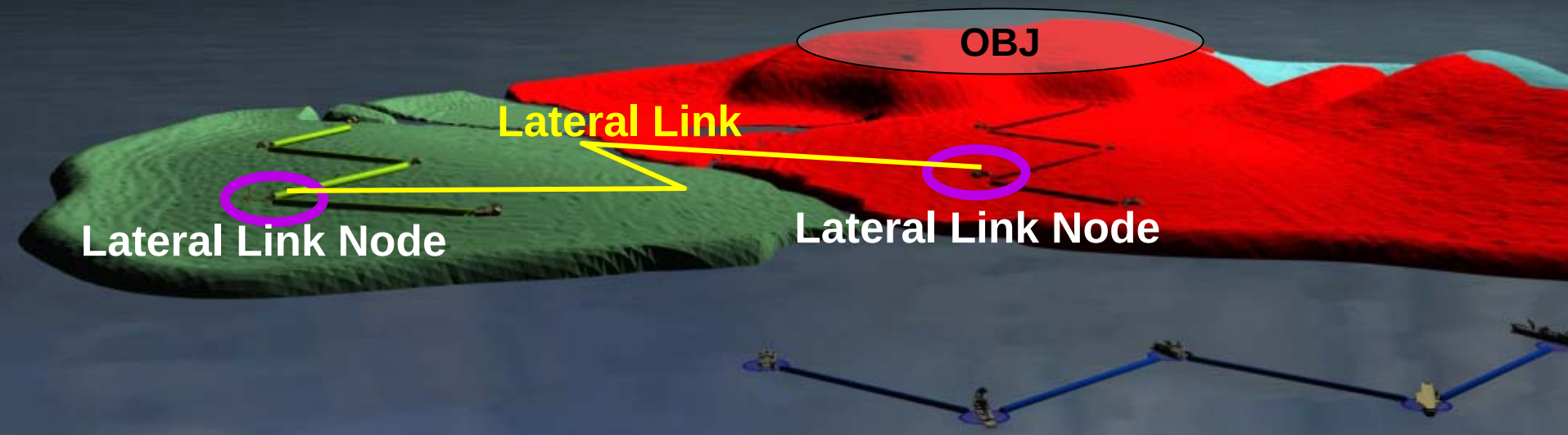
The JTF J6 is in the best position to coordinate the shifting of network resources as forces maneuver

The MSDN provide the "Purple Zone" to the operating maneuver forces

The MSDN performs the joint TTP providing: 1)Connection 2)Access 3)Authorization

JMNO "*Technique*"

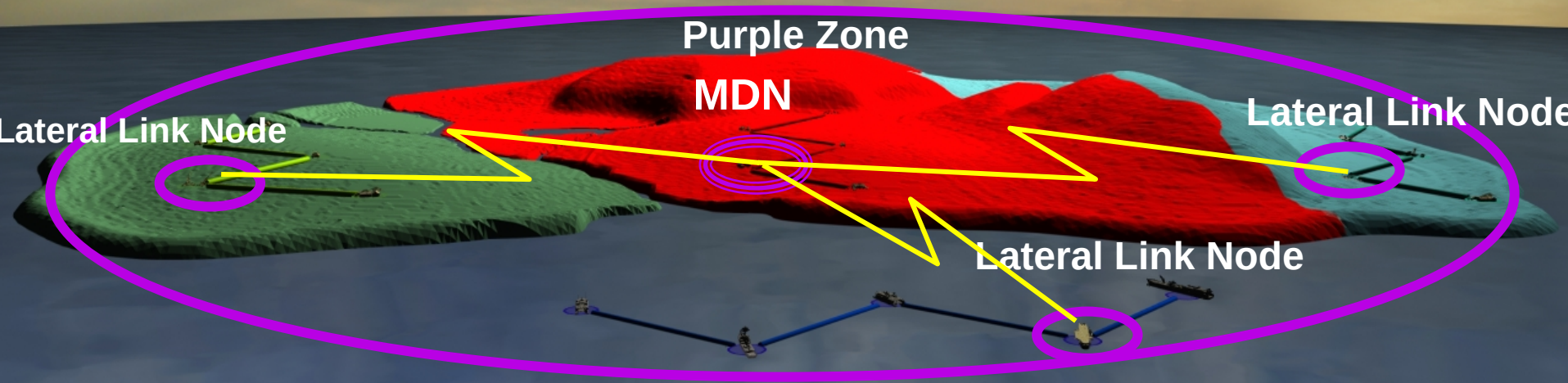
- JTF J6 and Service Components:
  1. Designate *Lateral Link Nodes* within their commands
  2. Establish physical Joint Lateral Link



Lateral Link Node: A communications node within a service that acts as an IP traffic gateway to and from other Armed Services Lateral Link Nodes via a JMNO lateral link.

JMNO "*Technique*"

- JTF J6 and Service Components:
  1. Assign *Lateral Link Nodes* within their commands
  2. Establish physical Joint Lateral Link
  3. Assign *Multi-service Distribution Nodes (MDN)*
     - Based on JTF mission, terrain, available equipment, and commander's intent

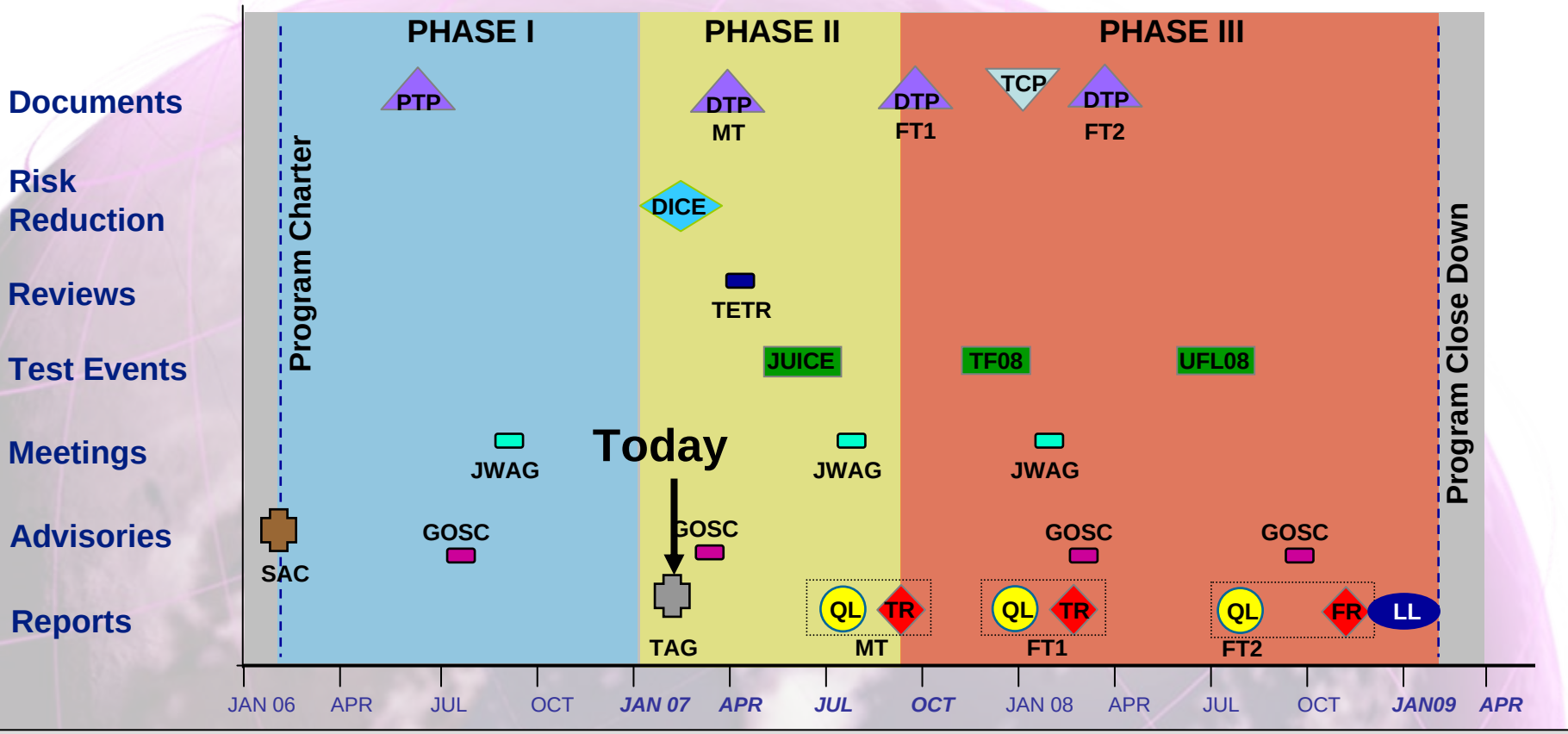


Multi-service Distribution Node *(MDN)*: A Lateral Link Node with the additional function of passing IP traffic from one Service to another via a series JMNO lateral links. Employment of MDN provides a "Purple Zone" capability.

JMNO Background

- JMNO was chartered on February 15, 2006 by OSD
- 3 year / ~$15 million joint effort
  - First USMC-led Joint Test and Evaluation
- JMNO is a Non-Materiel solution
  - Deliverable is a joint tactics, techniques, and procedures document that solves protocol challenges for Mobile Networking in joint maneuver warfare.
- Will provide a preset plan for joining any service's units to any other service's network(s)
  - Less time to coordinate network capability for Joint Force Task Organizations (hours vice months)
  - Will provide a way to stay connected when beyond the range of HHQ data radios
- JMNO GOSC Chartered 13 Jul 06
  - Chaired by RADM Hight (JTF-GNO)
- JMNO JWAG met 28-30 Aug 2006
  - Formed collaborative working groups
- JMNO lab discovery 16Oct – 9 Nov
  - Verified lateral link connectivity configurations between USA & USMC and USA & USAF equipment strings to document in the initial JMNO TTP

JMNO Schedule



PTP = Program Test Plan
DTP = Detailed Test Plan
TR = Test Report
MT = Mini-Test
FT = Field Test
QL = Quick-Look Report
LL = Lessons Learned Report
FR = Final Report
SAC = Senior Advisory Committee
RR = Risk Reduction
TAB = Technical Advisory Board
GOSC = General Officer Steering Committee
TAG = Technical Advisory Group
TCP = Test Closedown Plan
JWAG = Joint Warfighter Advisory Group
TF = Terminal Fury
TETR = Test Event Technical Review
UFL = Ulchi-Focus Lens
DICE = DoD Interoperability Communications Exercise
JUICE = Joint Users Interoperability Communications Exercise