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DEFINING THE FUTURE

Joint C2 Interoperability
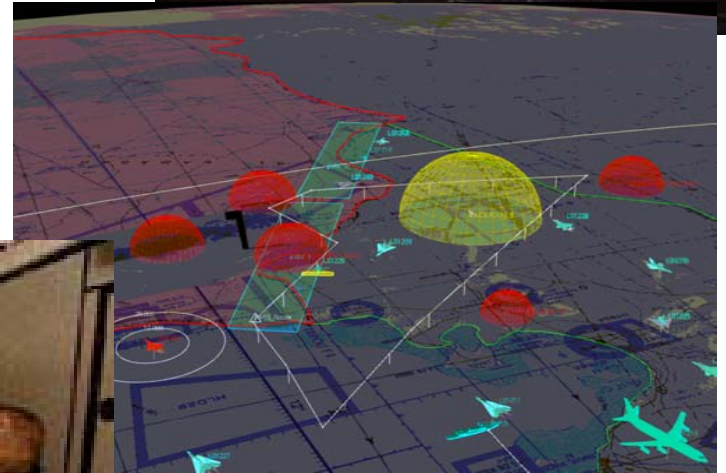# &
Network Centric Operations

March 23, 2005

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Agenda

- Network Centric Warfare

- Command and Control Transition

- Northrop Grumman Initiatives

- Summary

Net-Centric Warfare

"An Information Superiority-Enabled Concept of Operations That Generates Increased Combat Power by Networking Sensors, Decision Makers, and Shooters to Achieve Shared Awareness. Increased Speed of Command, Higher Tempo of Operations, Greater Lethality, Increased Survivability and a Degree of Self-synchronization."
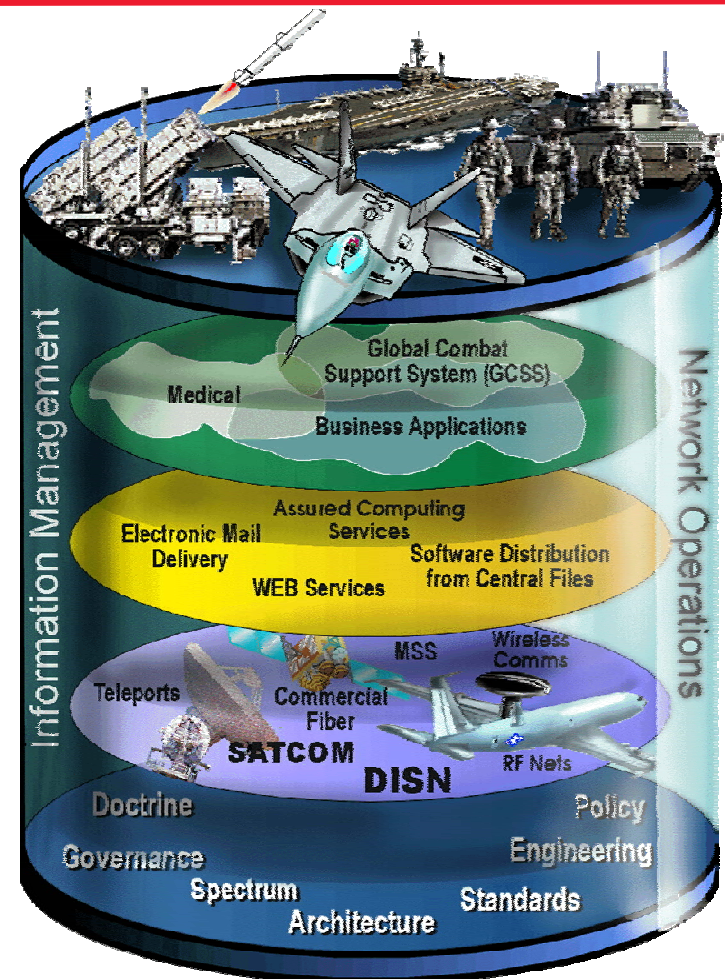

Network Centric Warfare
Developing and Leveraging
Information Superiority
2nd Edition

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Fundamental Changes Are Required

- **Acquisition**
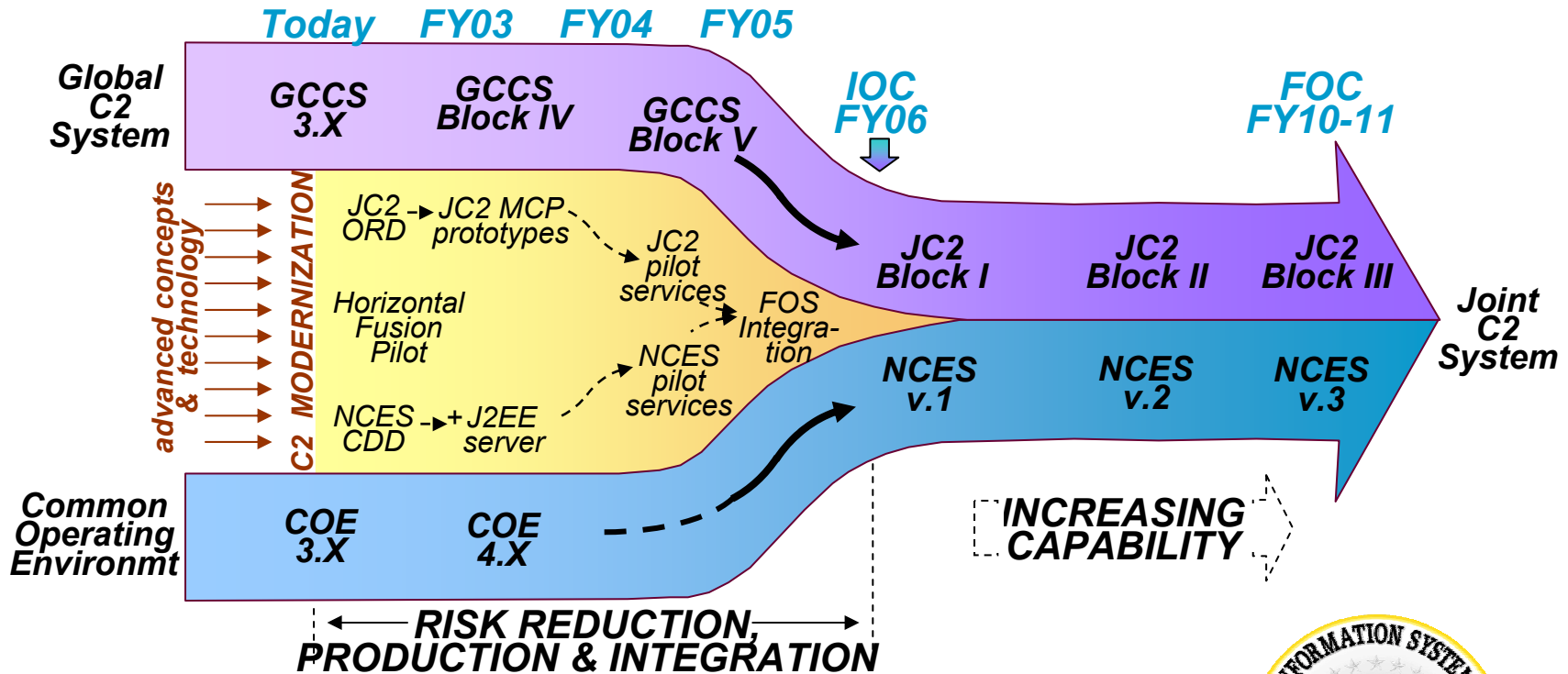 - Spiral Development
  - Rapid Fielding
  - Leveraged Investments
- **Operational**
  - Increased Automation
  - Comprehensive Mission Planning
  - Speed of Decision
- **Technologies**
  - Service Oriented Architectures
  - Improved Processing
  - Adaptive Communications
  - Unparalleled Connectivity
- **Cultural**
  - Adaptation to Changes
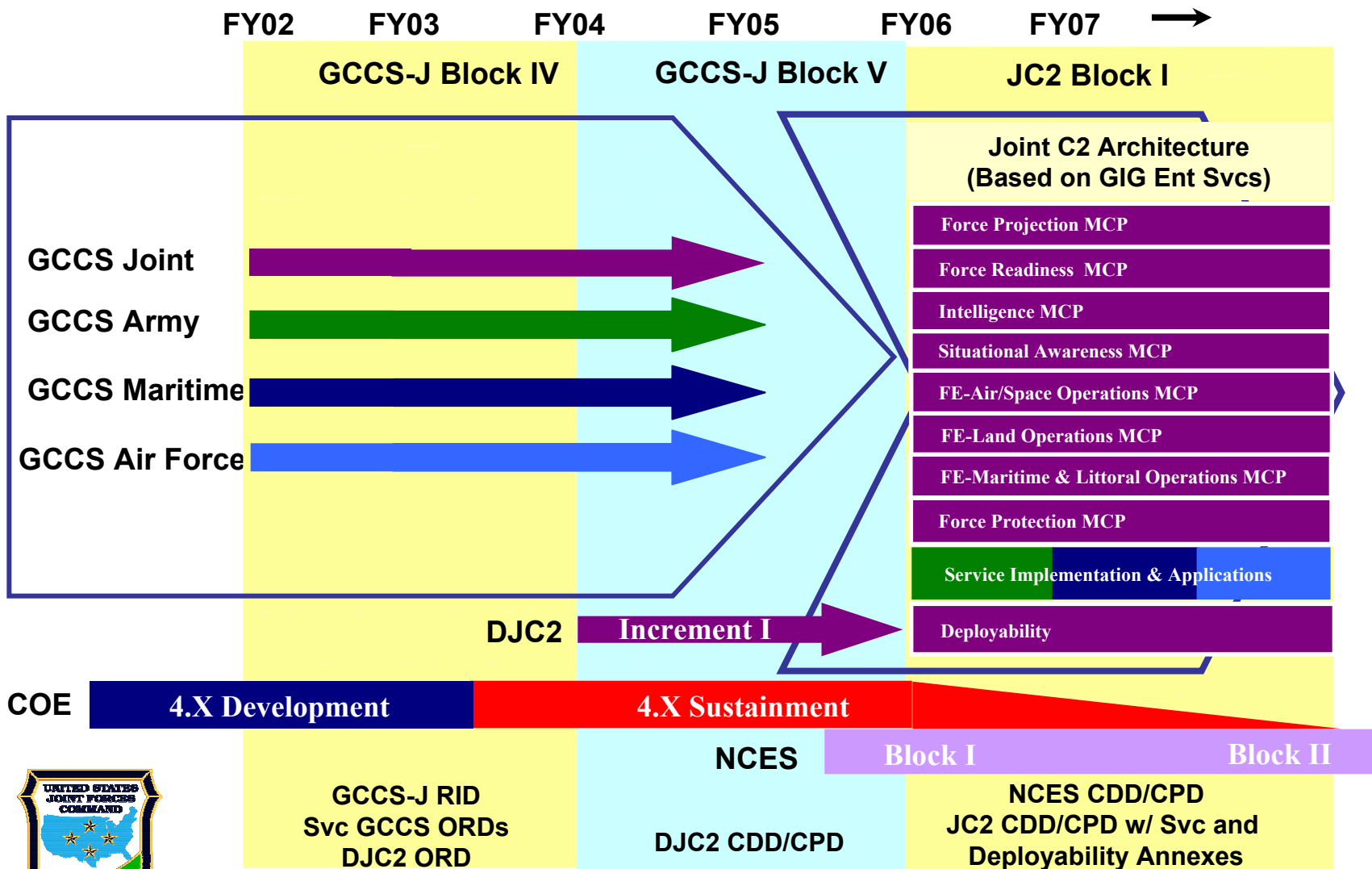

C2's First Step To Net-Centricity is JC2 / NCES

DISA's Transformation to JC2

Today   FY03   FY04   FY05

Global C2 System

GCCS 3.X

GCCS Block IV

GCCS Block V

IOC FY06

FOC FY10-11

advanced concepts & technology

C2 MODERNIZATION

JC2 ORD → JC2 MCP prototypes

JC2 pilot services

Horizontal Fusion Pilot

FOS Integra-tion

NCES CDD → + J2EE server

NCES pilot services

JC2 Block I

JC2 Block II

JC2 Block III

NCES v.1

NCES v.2

NCES v.3

Joint C2 System

Common Operating Environmt

COE 3.X

COE 4.X

INCREASING CAPABILITY

RISK REDUCTION, PRODUCTION & INTEGRATION

- Prototype the functionality of Mission Capability Packages
- Work out interfaces between MCPs
- Work out interfaces with NCES core services
- Develop C2&I-specific net-centric services
- Pilot MCPs with GCCS Block V in operational context
- Integrate final versions with production NCES v.1

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JFCOM's Transformation to JC2

FY02	FY03	FY04	FY05	FY06	FY07

GCCS-J Block IV | **GCCS-J Block V** | **JC2 Block I**

**Joint C2 Architecture
(Based on GIG Ent Svcs)**

- Force Projection MCP
- Force Readiness MCP
- Intelligence MCP
- Situational Awareness MCP
- FE-Air/Space Operations MCP
- FE-Land Operations MCP
- FE-Maritime & Littoral Operations MCP
- Force Protection MCP
- Service Implementation & Applications
- Deployability

GCCS Joint

GCCS Army

GCCS Maritime

GCCS Air Force

DJC2 Increment I

COE   4.X Development   4.X Sustainment

NCES   Block I   Block II

**GCCS-J RID
Svc GCCS ORDs
DJC2 ORD**

DJC2 CDD/CPD

**NCES CDD/CPD
JC2 CDD/CPD w/ Svc and
Deployability Annexes**

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The JC2/NCES Net Centric

Global Information Grid (GIG)

Shared Data Sources

- Force-level Planning
- Force Readiness
- SA Tracks
- Force Protection
- Joint IPB
- Targeting
- ISR Management
- Geo-Spacial

C2 and I Specific Network Centric Enterprise Services

C2 message parsing Data Fusion COP distribution Decision Support Etc.

API

JC2 Mission Capability Packages

- Force Employment Air/Space Operations
- Situational Awareness
- Force Projection
- Force Readiness
- Intelligence
- Force Employment Maritime & Littoral
- Force Protection
- Force Employment Land Operations

API

Application Programming Interface (API)

API **API**

| ESM | Discovery | Messaging | Collaboration | Mediation | Storage | IA/Security | Application | User Assistant |

Network Centric Enterprise Services (NCES)

Adherence to Standards is Fundamental

- Net-Ready Key Performance Parameter Requires Compliance With:
  - Net-Centric Operations and Warfare (NCOW) Reference Model
    - Net-Centric Data Strategy
    - Net-Centric Checklist
  - Applicable Global Information Grid (GIG) Key Interface Profiles (KIP)
  - DoD Information Assurance Requirements
  - Supporting Integrated Architecture Products
  - Joint Technical Architecture

Government Standards Are Being Identified

Net-Centric Operations and Warfare (NCOW) Reference Model Operational Concept Graphic (OV-1a)

Describes the **Activities Required to Establish, Use, Operate, and Manage the Net-centric Enterprise Information Environment** to Include: the Generic User-Interface, the Intelligent-assistant Capabilities, the Net-centric Service Capabilities (Core Services, Community of Interest (COI) Services, and Environment Control Services), and the Enterprise Management Components. It Also Describes a Selected Set of Key Standards That Will Be Needed As the NCOW Capabilities of the GIG Are Realized.

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Spiral Development is the Approach

"A Desired Capability Is Identified, but the End-state Requirements Are Not Known at Program Initiation. Requirements Are Refined Through Demonstration, Risk-management, and Continuous User Feedback. Each Increment Provides the Best Possible Capability, but Requirements for Future Increments Depend on User Feedback and Technology Maturation." (DoD 5000.1)
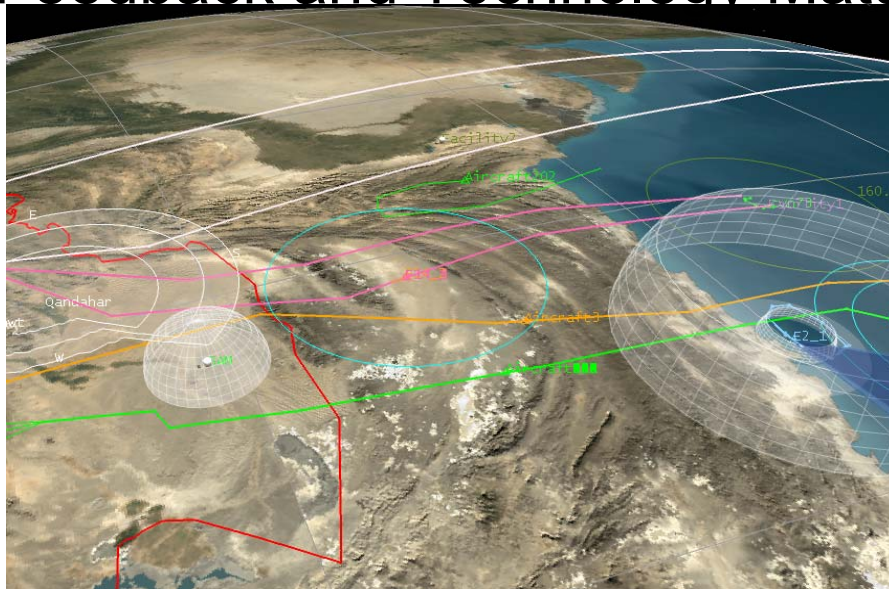
Rapid Delivery of an N% Solution Provides Adaptability to changes in Requirements and Technologies on an Affordable Basis
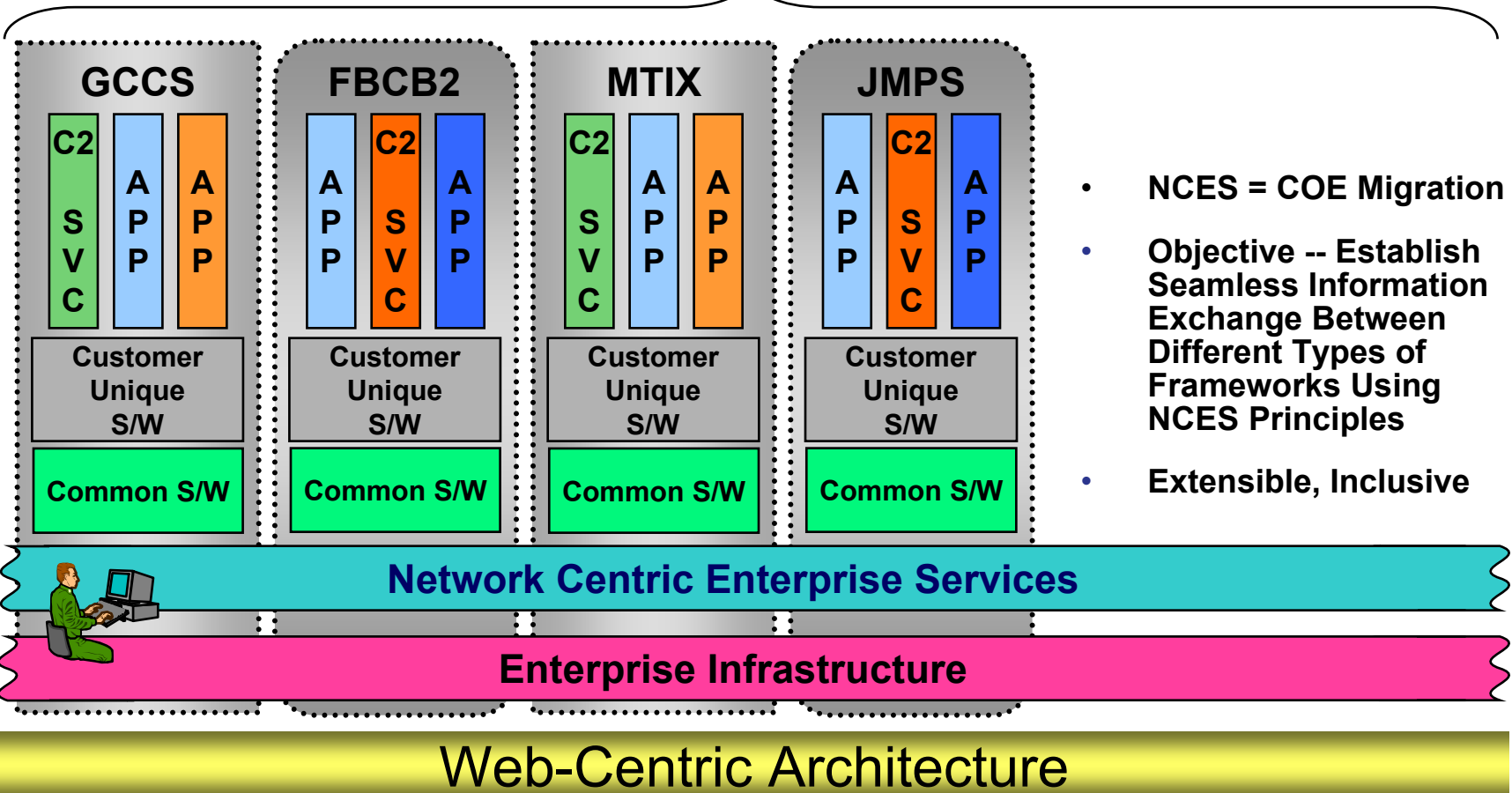
NCC Pilot is the Spiral Development Engine for C2

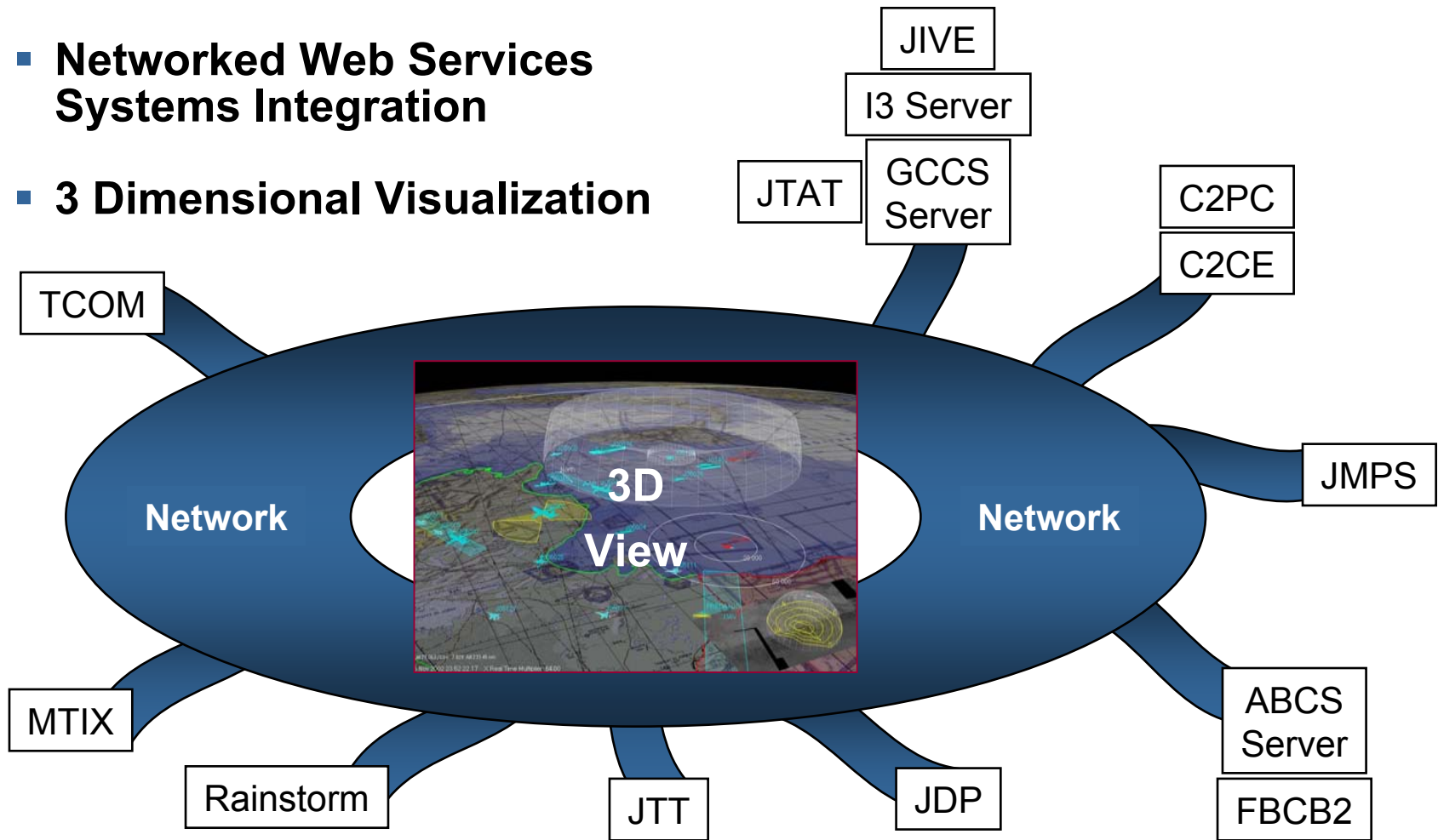NORTHROP GRUMMAN

NGC Frameworks Initiative – Closing the Seams

Addressing the Issues of a Service Oriented Architecture

Network Nodes

GCCS	FBCB2	MTIX	JMPS
C2 SVC · APP · APP	APP · C2 SVC · APP	C2 SVC · APP · APP	APP · C2 SVC · APP
Customer Unique S/W	Customer Unique S/W	Customer Unique S/W	Customer Unique S/W
Common S/W	Common S/W	Common S/W	Common S/W

Network Centric Enterprise Services

Enterprise Infrastructure

Web-Centric Architecture

- **NCES = COE Migration**

- **Objective -- Establish Seamless Information Exchange Between Different Types of Frameworks Using NCES Principles**

- **Extensible, Inclusive**

Current C2 Frameworks Configuration

- **Networked Web Services Systems Integration**

- **3 Dimensional Visualization**

JIVE

I3 Server

JTAT

GCCS Server

C2PC

C2CE

TCOM

3D View

Network

Network

JMPS

MTIX

Rainstorm

JTT

JDP

ABCS Server

FBCB2

Seamless Data Exchange Independent of Platform or Operating System

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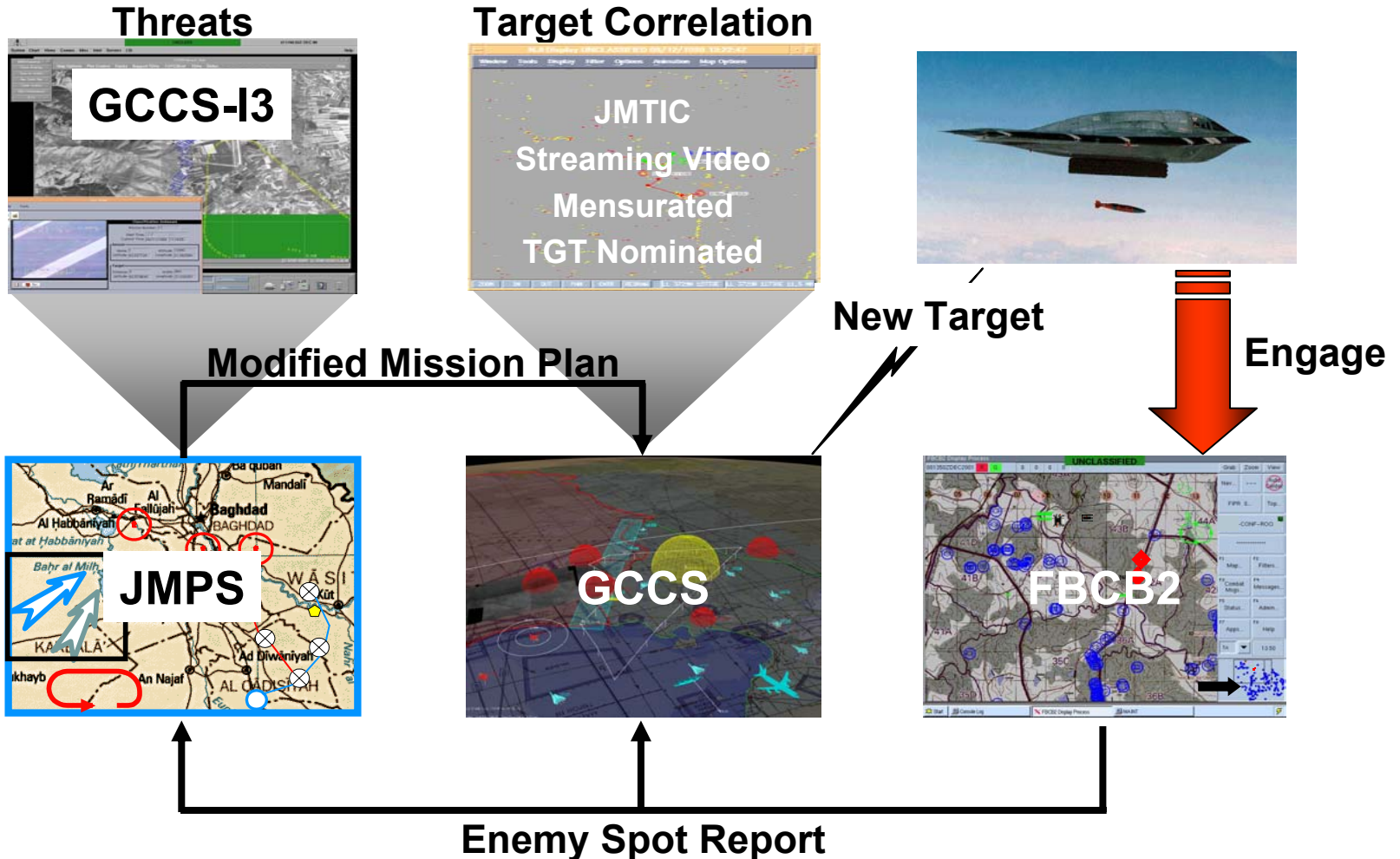# *Service Oriented Architectures*

- **Enables Machine to Machine Interfaces**

- **Provides Rapid Addition of Capabilities**
  - **GCCS-M to AIS Interface Delivered in 30 Days**
    - **Very affordable**
  - **Exercised in Trident Warrior 04**
  - **Participating in Trident Warrior 05**

- **Leverages Current Investments**
  - **Provides Fielded Systems Another Level of Interoperability**

Rapid, Affordable Addition of Capability for Fielded Systems

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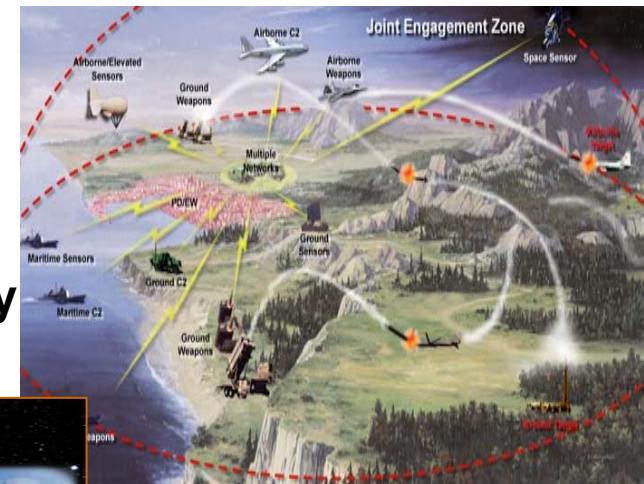# Product is "Integration at the Next Higher Level"

Dynamic Re-Planning

Threats

GCCS-I3

Target Correlation

JMTIC
Streaming Video
Mensurated
TGT Nominated

Modified Mission Plan

New Target

Engage

JMPS

GCCS

FBCB2

Enemy Spot Report

Summary

- **Movement is in the Right Direction**
  - **Continue Definition of Standards**
  - **Spiral Development is the Correct Path**
    - **Incremental improvements**
  - **Continue to Improve Acquisition approach**
- **Technology is Ready**
  - **Service Oriented Architectures Can Leverage Current Investments**
  - **Machine to Machine Interfaces to Rapidly Add Capabilities are Attainable**

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Innovative Possibilities