

Flexible Distributed Control

Enabling

Distributed Edge Operations
&
Joint Mission Planning and Execution

National Defense Industrial Association
5th Annual Disruptive Technologies Conference National Information
04 September 2008

Dr. Terry Pierce (Captain, USN, Retired)
Special Advisor for Disruptive Innovations DHS S&T
Director USAFA Center of Innovation

Mr. J.D. Stanley
IBSG Public Sector CTO
Cisco

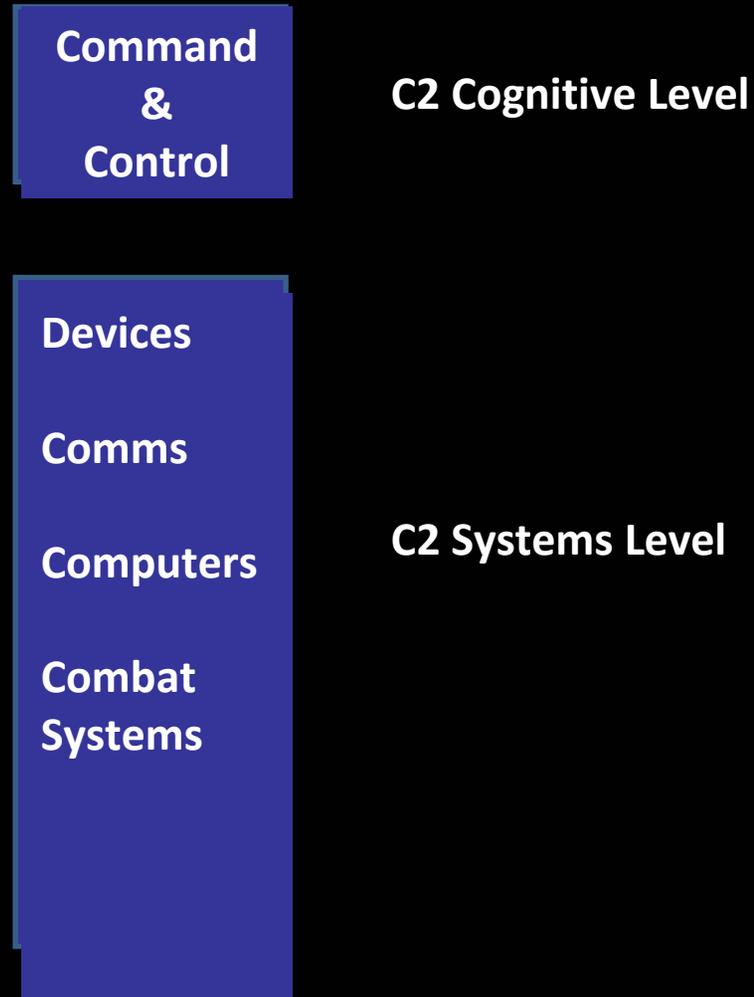
Introduction

- Who we are and why we are here...
- For complete background on this evolving concept of operations please refer to:
 - Dr. Terry Pierce's Flexible Distributed Control paper dated 4 September 2008

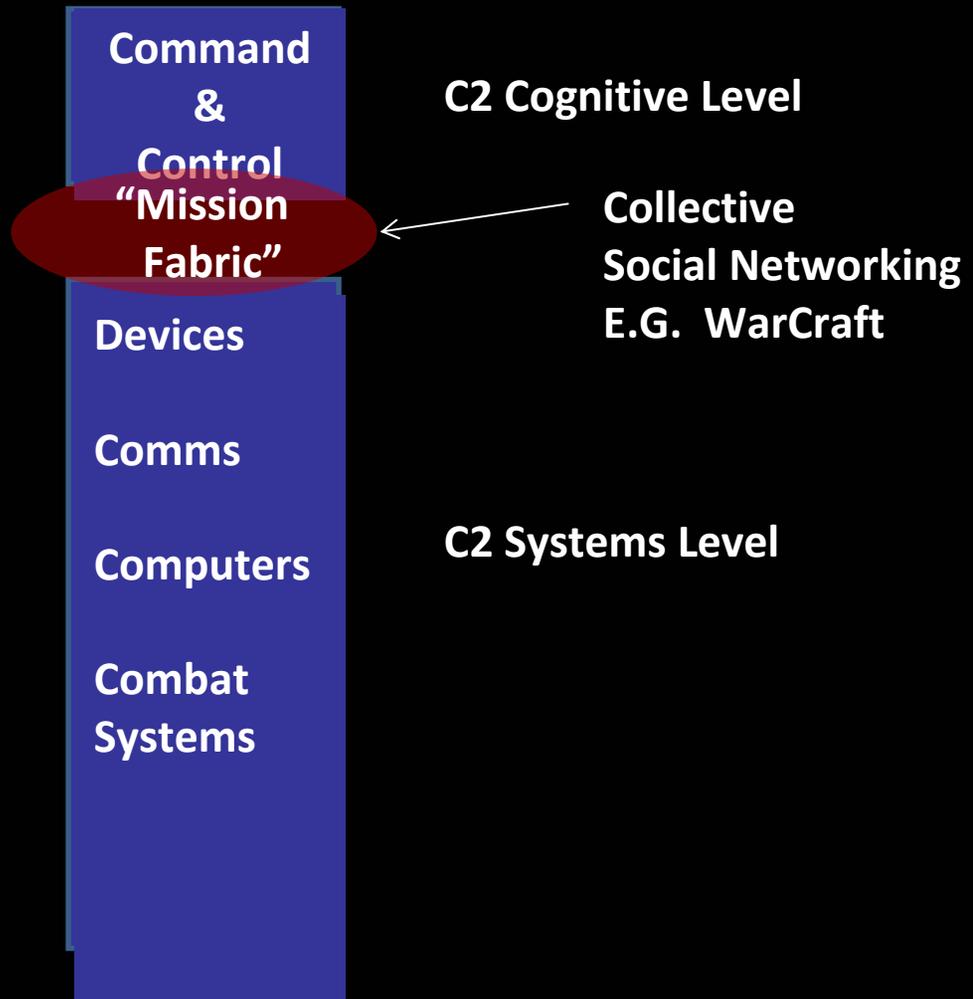
Introduction to Flexible Distributed Control

- **Key Question – How does DoD and DHS harness the virtues of consumer social networks, which virtually eliminate group coordinating costs and encourage self-organization, but operate in a non-secure environment and are difficult to command and control?**
- **Answer – Create an instantaneous means to distribute and modulate control of the pervasive flow of information in the digital network – *Flexible Distributed Control*. Put simply, Flexible Distributed Control is the ability to focus and align social networks in a secure environment.**

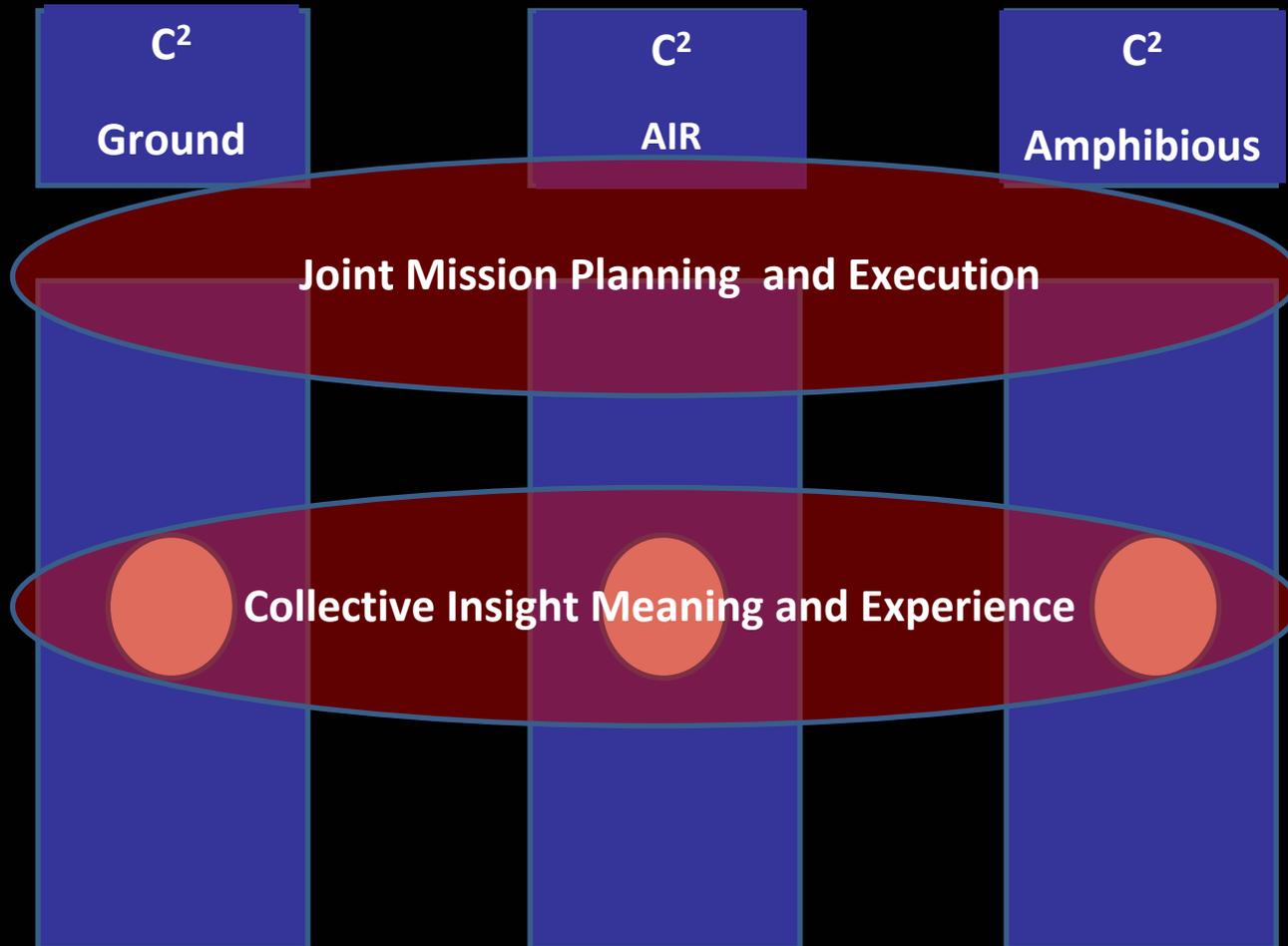
Traditional, Separate Force C² & Force Application



Traditional, Separate Force C² & Force Application



Mission Fabric Across Distributed Operations



Disruptive Innovation Analogy

Incremental Improvement Approach – Battleship warfare



Current IT models represent incremental improvement like the building of bigger guns

Disruptive Innovation Approach – Carrier warfare



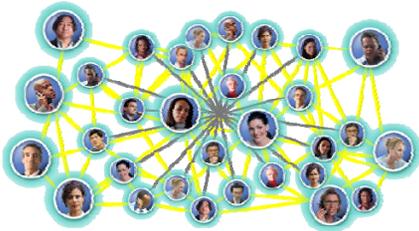
Digital Swarming represents the 21st Century building of the USS Langley

Source: Dr. Pierce (DHS/NPS) & J.D. Stanley (Cisco) presentation to Admiral Willard and Pacific Fleet 2008

Human Networking Trends

Social Evolution through Systemization of the Human Network

The internet is not a network of computers,



It is a network of people



User Participants

Social Networks

Programmability

Mashups

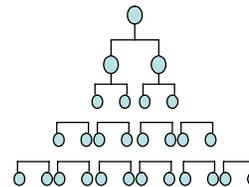
The Evolving Social Network Operational Structure – Swarming Collectives

Structured

tools exist today – creating disruptive effects
(Wikipedia, MySpace, iPhone)

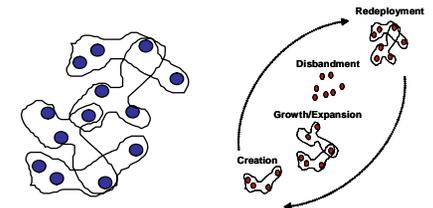
Fluid

Hierarchical



- Command and direction
- Rigid Communication lines
- Slow and hard to change
- Limited decision making authority
- Single focus, not free to contribute

Digital Swarming



- Aligned distributed decision making
- Immersive communication & decisions
- Collective awareness & intelligence
- Collaborative & versatile risk sharing
- Service provisioning, even beyond focus

- Follow Me Content - content follows the people, process, and products
- People subscribe to people - social connections and expert location
- Immersive Interactions – proximity, geospacial, context/semantic

Cisco Confidential

Copyright © 2007 Cisco Systems, Inc. All rights reserved.

Cisco Company Confidential – Covered under NDA

Source: Dr. Pierce (DHS/NPS) & J.D. Stanley (Cisco) presentation to Admiral Willard and Pacific Fleet 2008

Source: Dr. Pierce (DHS/NPS) & J.D. Stanley (Cisco) presentation to Admiral Willard and Pacific Fleet 2008

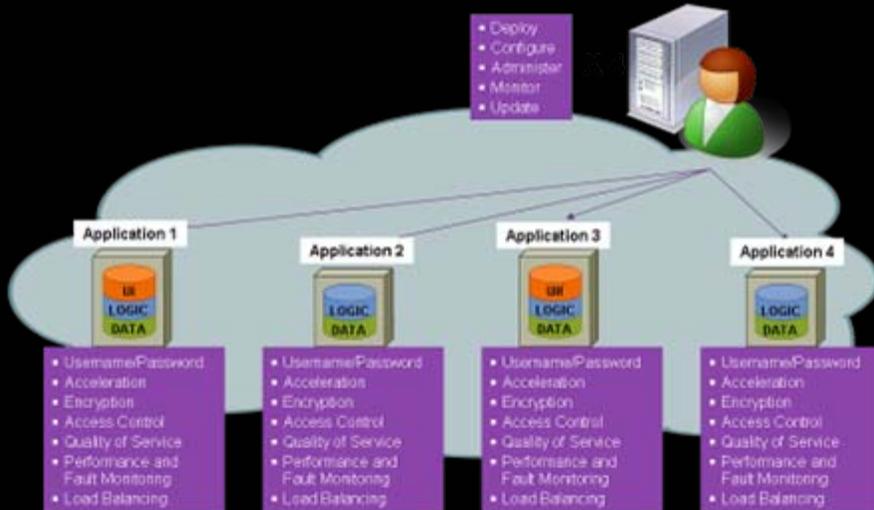
Source: Cisco IBSG

Emerging Capabilities Evolving IT

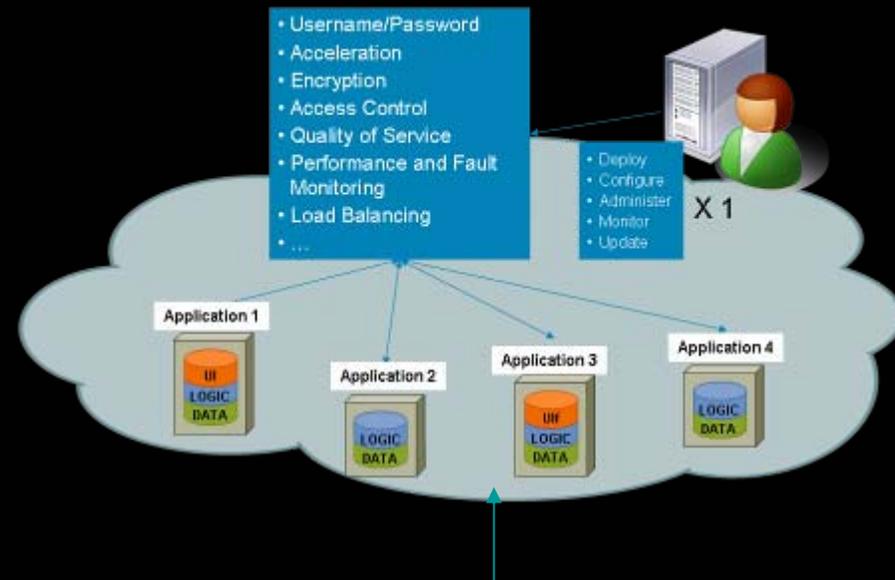
We've inherited application centric information, communication, and technology enterprise/mission environments where logic is duplicated throughout 30+ years of applications – witnessed through proliferation of silos, fusion complications, and lack of human subjectivity/context



Logic Redundancy Adds Complexity



Diffused Logic Reduce Complexity



Emergent Social Networking platforms are provisioning services that empower diffused logic environments – allowing dynamic unpacking of existing services and rapid reassembly – accelerating decision space fusion, and more importantly individual experiences into collective experiences

Source: Dr. Pierce (DHS/NPS) & J.D. Stanley (Cisco) presentation to Admiral Willard and Pacific Fleet 2008

Clinton Global Initiative Demonstration

Personal Travel Assistant

Rich and immersive data access and utilization through mash ups of sensors, video, fused data, social networks, and other content

Click to collaborative with co-workers, transportation authority, and others.

Interact with assistant for planning day and improving upon day to day travel experiences overcoming disruptions, and ensuring productivity.

Integrated decision support environment across, urban environment, partners, businesses, and service providers that allows

Integration of Avatars

Speech to text/text to speech, automated integration,

Integration of Existing Applications

Integration of Decision Support tools

BI, Simulation, etc

Integration of Presence

Geospatial, Connectivity, etc

Integration of Content Aggregation

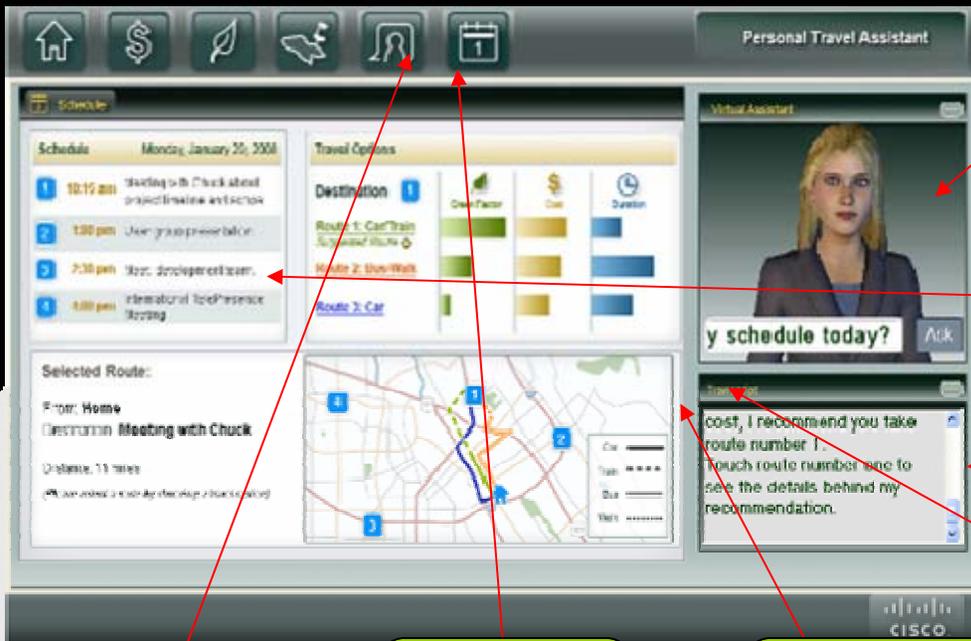
XML, Video, Sensors, RFID

Integration of Collaboration

TelePresence, Web, Video, Voice

Integration of Unified Communications

VoIP, IM, radios, mobile, etc



www.connectedurbandevlopment.org

Open Standards-based Emergent Capabilities in Digital Fabrics to Enhance Service Provisioning – *Illustrative example of the potential services discussed within Digital Swarming framework*

- Key Points:**
- Integrates Legacy
 - Converges insights
 - Reduces Complexity
 - Enhances SOA
 - Provisions meaning/context



Trusted Social Networking



Distributed and Borderless Operations

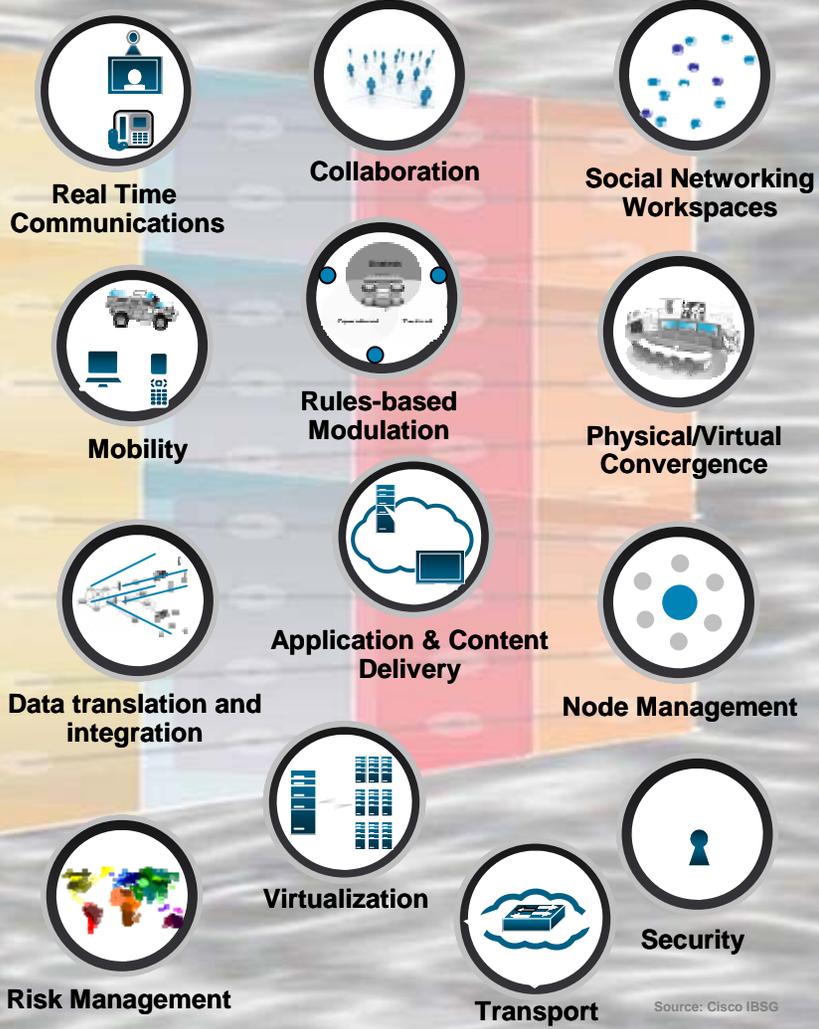


Power of Collectives

- Applications**
- Commercial Applications
 - Internally Developed
 - Software as a Service (SaaS)
 - Composite Apps/SOA
 - Social Network Widgets
 - Special Purpose
 - Embedded Apps

- Common and Consistent Services**
- Collaboration
 - Decision Support
 - Follow Me Content
 - End-to-End Flows
 - Policy Modulation
 - Immersive Spaces
 - Risk Management

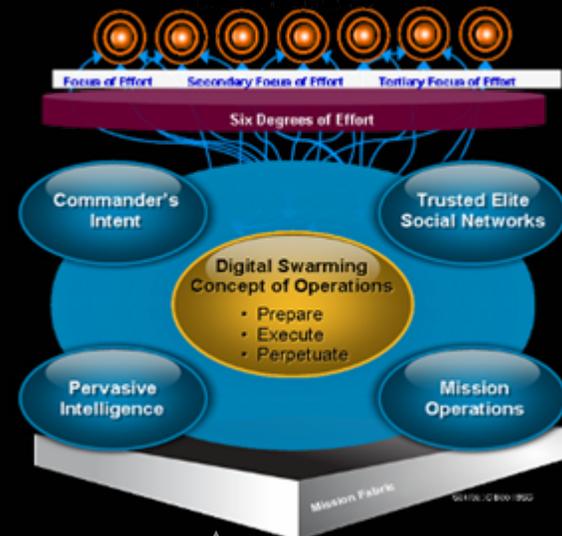
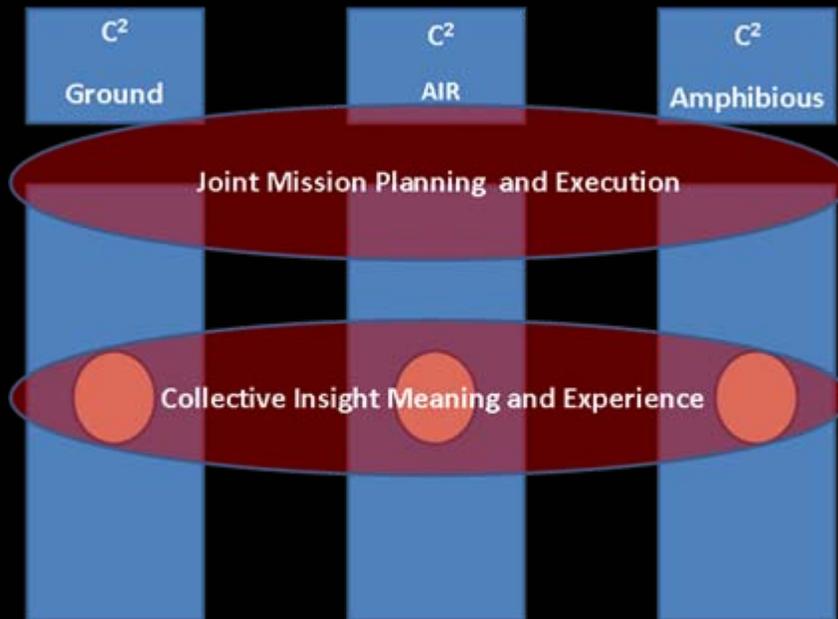
Distributed Services



Source: Cisco IBSG Digital Swarming derivative on Fabrics

Source: Cisco IBSG

Harnessing the power of the collective in a secure way



Source: Dr. Pierce (DHS/NPS) & J.D. Stanley (Cisco) presentation to Admiral Willard and Pacific Fleet 2008

Thank you for your time!