

“

“The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn.”

”

Alvin Toffler

Observations on Network Centric Defense or Should it be Net-centric Defense

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**Terry Morgan
Net-Centric Defense Strategist
Cisco Systems, Inc.**

A Net-centric Warfare Strategy

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Net-centric warfare is an operational design that leverages the networking capability of a military force to ...

- **Mass the effects of geographically dispersed air, ground and sea forces in a more responsive, accurate and lethal manner**
- **Execute operations at a decisive speed and tempo**
- **Shape the battlefield**
- **Maximize coalition combat power**
- **Prevent the enemy from executing certain courses of action**

Net-centric Attributes

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- **Data is published and its structure and content is maintained by an authoritative source**
- **Data is technically accessible**
- **Data availability is limited only by policy**
- **The network is trusted**
- **Information is data that is elevated by context**
- **All users have the power to establish their context and gather data**
- **All users have the power to make sense of all data gathered**

Rich Information as a Principle of War

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Maneuver, mass, surprise, firepower, and logistics ... have been the coins of the military realm. But in the Information Age, information is transforming both the concepts of mass and maneuver, redefining firepower, and greatly simplifying logistics. **Information** can, in effect, be directly **substituted in the “manufacture” of each of these capabilities.** A massing of effects (without the physical movement).

The US Concept -- Power on the Edge

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- To make information available on a global secure robust network that people depend on and trust.
- ... The fellow on the point of the spear needs to know that there is something on the other side of the hill with a turret and a gun pointing out of it. He needs to know that now, not in 72 hours when the results of the analysis get completed. We need to make sense of the data.
- **Beyond terabits is pedabits. We need to be thinking about dealing with exobits — 10^{18}**

Dr. Linton Wells
Principle Deputy, ASD C3I

What is to be connected for Net-Centric Defense ?

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- **Municipal functions -- Bases, Camps & Port Facilities**
- **Multi-national industrial function -- Procurement, warehousing & transportation of supplies**
- **Training, Doctrine and Education Functions -- Basic and Advanced Technical and Professional Education**
- **Telecommunications functions -- nationwide and global voice and data connectivity**
- **War Fighting Function**

C4ISTAR

Weapons systems

The Lines Are Blurring

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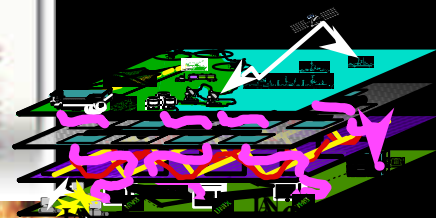
Government



Business



Information



Defense



Critical Infrastructure Protection an Element of National Defense

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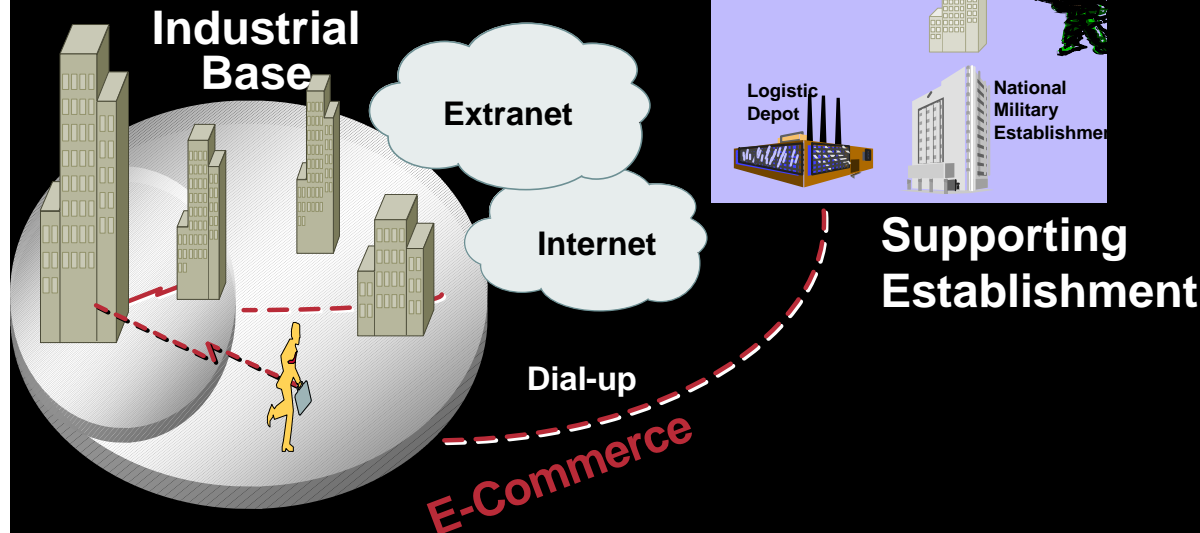
Net-Centric Connectivity



**Civilian Executive &
Civil Government**

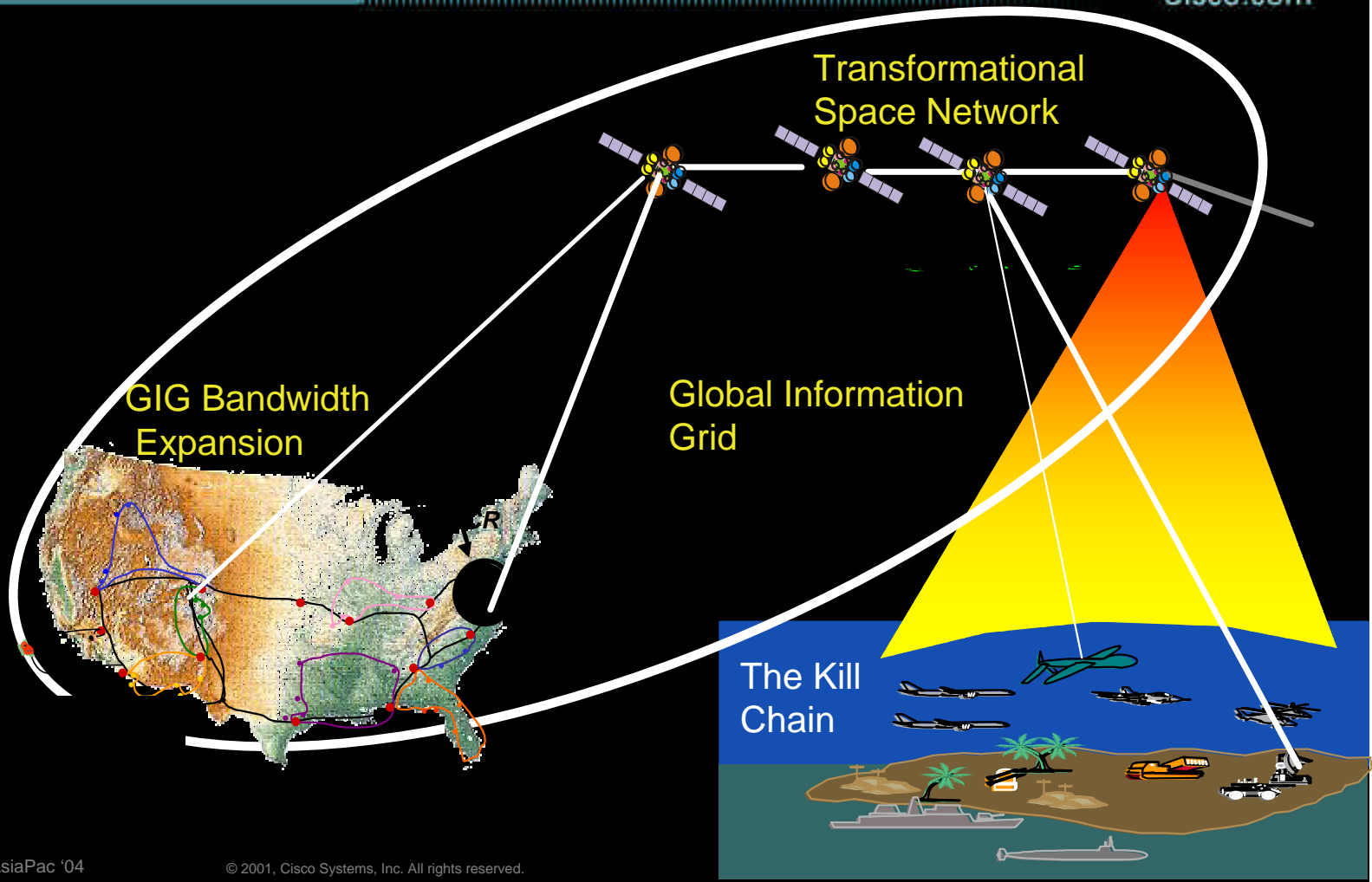


Area of Operations



How you do this must be in the context of your Nation's National Strategy and Geography

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Command and Control

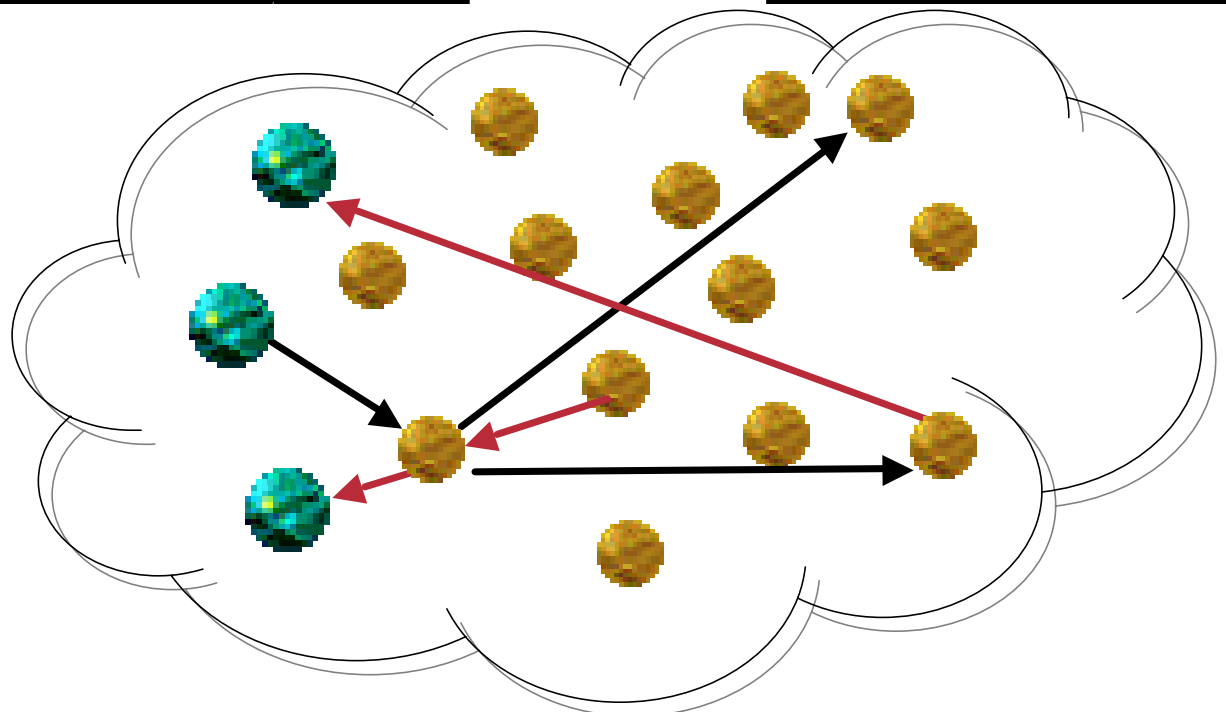
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- **The purpose of the C2 system is to provide the commander the ability to make the most out of the situation.**
- **The output is not just the commander's decision.**
- **The C2 system provides the commander's perception of the situation and his intent for accomplishing the actions.**

Evolution of Command and Control

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Net-Centric World



Post, Query, Receive and Send Information as required

What a Fighter Pilot Wants from that Network

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When Air Force chief information officer John Gilligan recently asked Keys what he thought of the service's portal, the fighter pilot responded that "it sucks."

"That's a technical pilot term," Keys joked. But he added that **he would like the Air Force portal to have "dot-com speed, flexibility and familiarity with [military] secure global access,"** and provided a list of requests that included:

- * An integrated system as good as Yahoo Inc's system.**
- * Personalization features as good as Amazon.com.**
- * An Air Force-wide search engine as good as Google.**
- * File-sharing as good as Roxio Inc.'s Napster or Sherman Networks' Kazaa.**
- * Instant messaging as good as America Online Inc.'s program.**

"And I want it all to plug into our legacy systems," he said. "I'm a man of few wants."

Navigation tools, weapons systems and information integration, particularly in intelligence, surveillance and reconnaissance assets, were the keys to successful joint operations in Iraq, but it still takes too long to "put steel on the target," he said.

Lt. Gen. Ronald Keys, DC/s Air and Space Operations, USAF

Federal computer Week, 29 June 2003

In Asymmetric Warfare . . .

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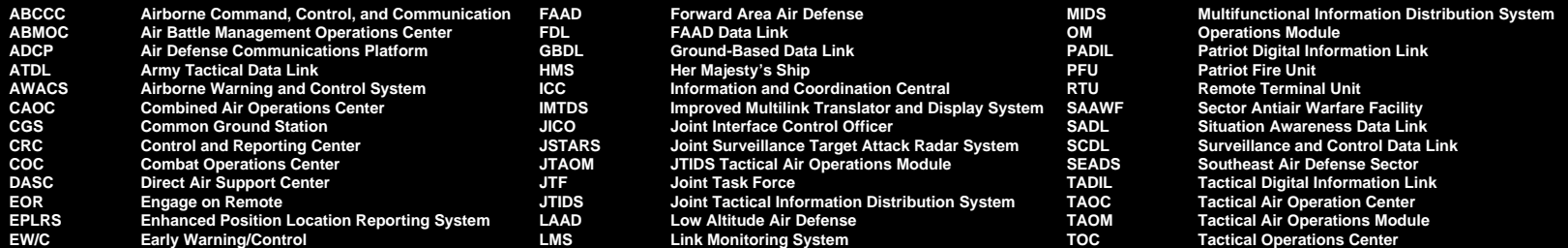
the actions of one warrior with access to the right information can have not only tactical impact but also operational and strategic impact



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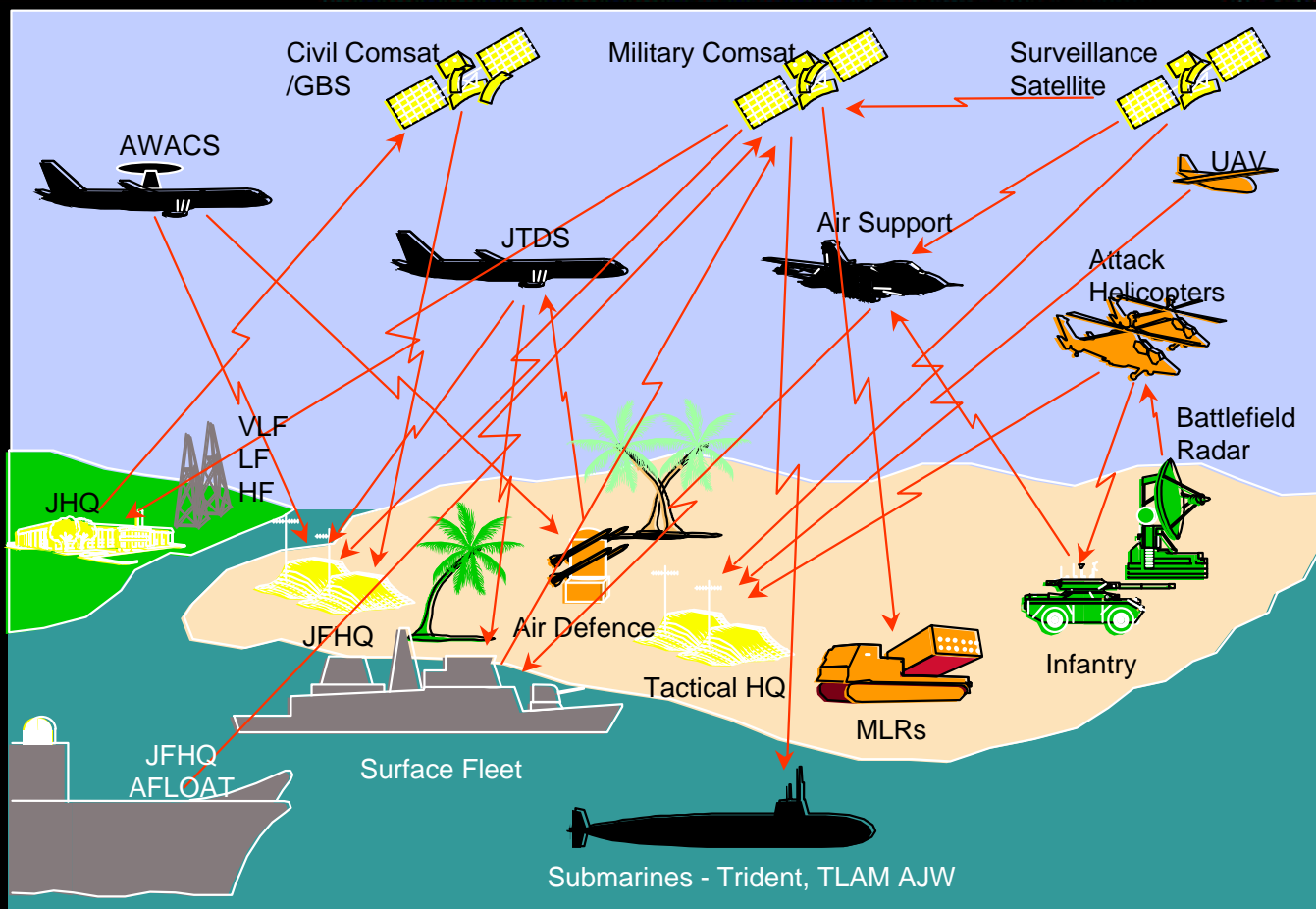


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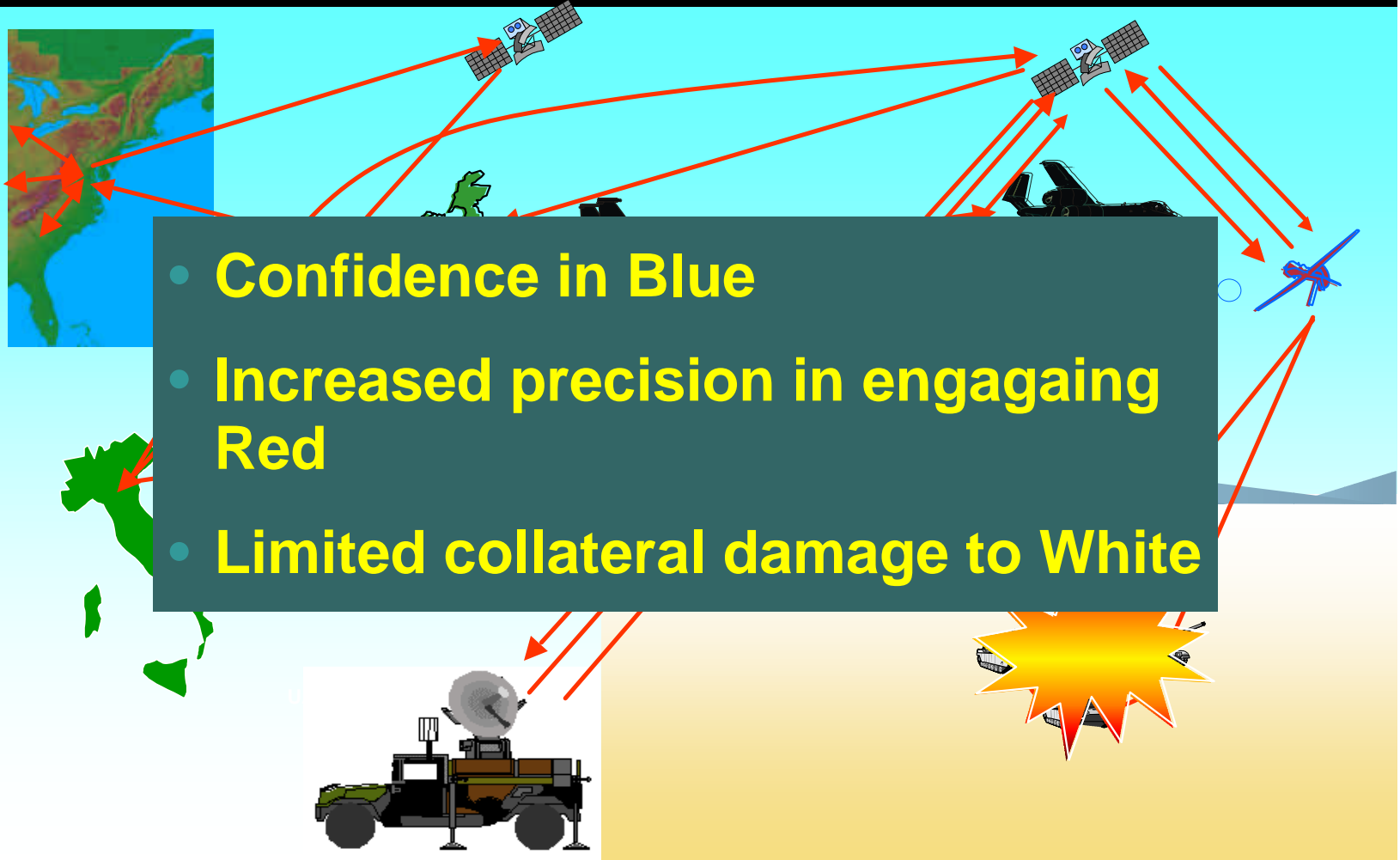
Connectivity is one Thing

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Its doing it with a purpose that counts

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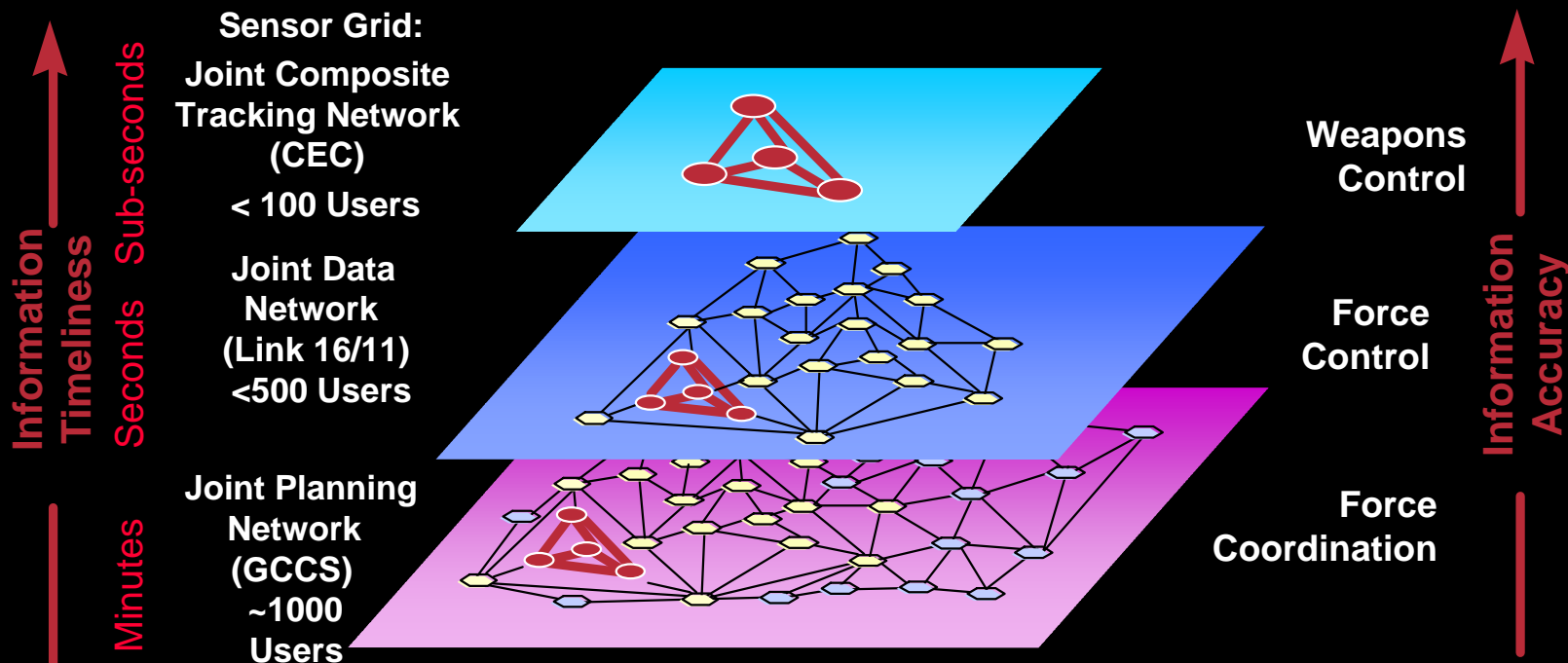
Information Grid

Increased Velocity of Information

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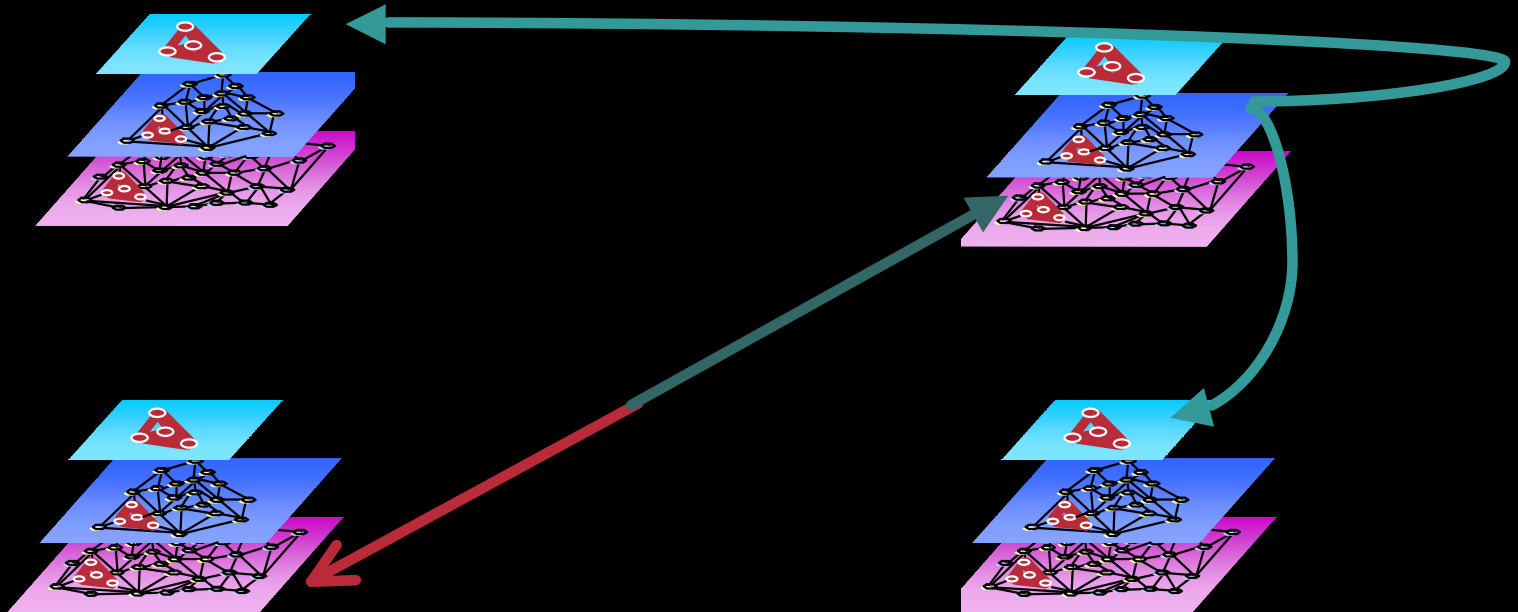
Sensor / Awareness

Shooter / Transaction



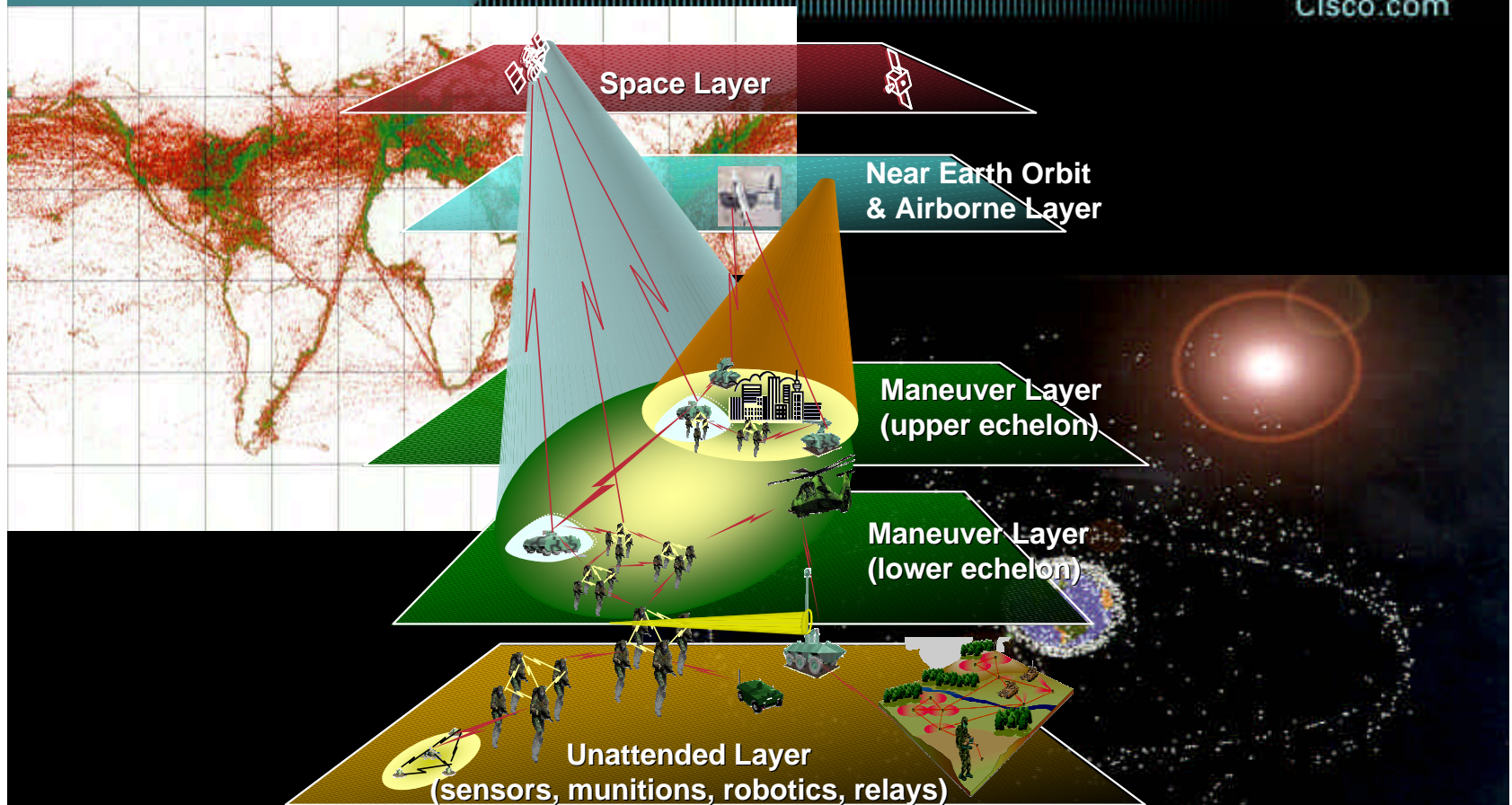
Joint and Coalition Information Grid Interoperability

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One Network In The AOR

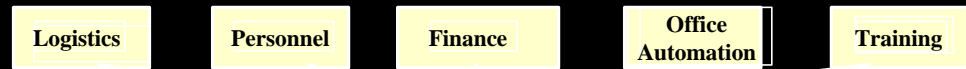
Cisco.com



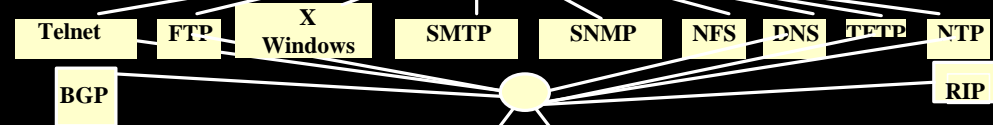
IP Centric is a requirement to become Net Centric

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Layer 6/7: Applications



Layer 5: Session



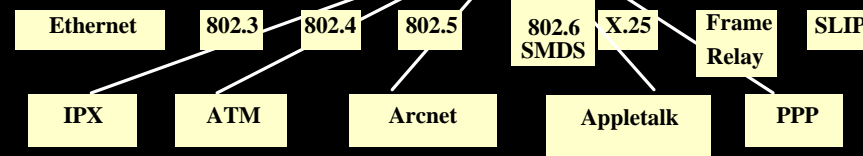
Layer 4: Transport



Layer 3: Network



Layer 2 & 1:
Data Link & Physical



The Strategic, Operational and Tactical End States

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-- Creating a Joint Common Operational Picture
that can be USER Defined (UDOP)

**'The total set of information, in
whatever form, which is a
managed and validated view of
the history, current situation
and future plans for all
components of an operation'**

A JOINT COMMON OPERATIONS **PICTURE**

To include Voice, Video and
Radio Integration



Global Hawk
communications using



Network Services “Value Add”

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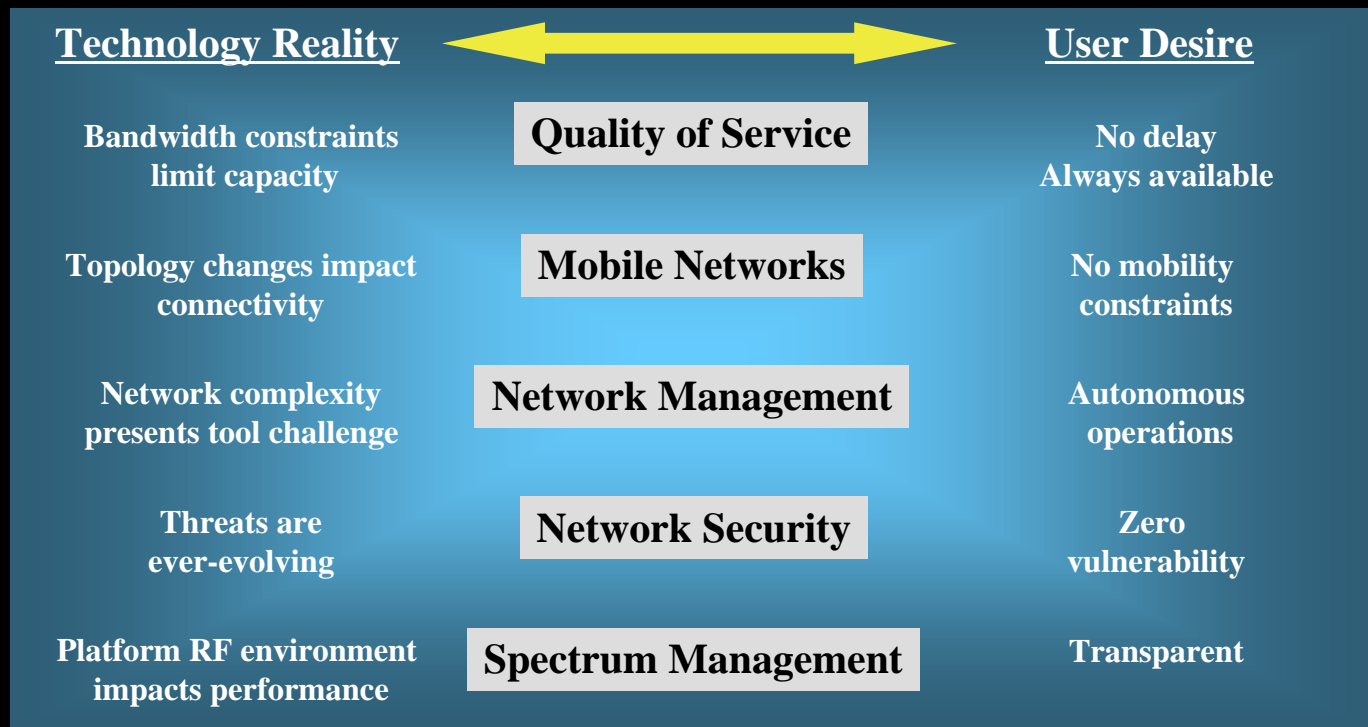


**National/Alliance/Coalition
Information
Grid**

Technology Challenges of Net-Centric Defense

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Design architecture for technology evolution
Manage risk through incremental capability delivery



Standards versus Standardization

It's all in the asking

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“Currently, the pace of technology in the electronics sector is an obsolescence of Defence harness this pace so that no cost – Open Systems are vital if we are to achieve the

Commercial Technology

What makes COTS equipment so attractive?

- Reduced product initial and ongoing development costs
- Economies of Scale
- **Interoperability**
- Experience in using technology to develop competitive advantage
- Reduced technology lag
enabling feature-rich equipment to be procured today and be replaced with improved, more technologically advanced equipment as necessary.
- Greater flexibility at the design state



1.5 Open

Method	
Standards	Use of standards
Widely used products	Use of standard products
Porting	Modification of software to run on different hardware
Virtual machine	Running software in a virtual environment
Wrappers	Software that acts as a bridge between different systems
Emulation	Software that mimics the behavior of hardware
Model Driven Architecture	Use of a common model to drive the development of different systems

Commercial support for POSIX varies. To be POSIX *conformant* requires certification testing of the operating system and hardware platform to a suite of tests. POSIX is established as a set of optional features, this allows vendors to implement portions of the POSIX standards and still be *compliant* to POSIX. Compliance only requires vendors to state which options are not implemented.

OPEN ARCHITECTURE COMPUTING ENVIRONMENT
TECHNOLOGIES AND STANDARDS
US Navy

* Primarily addresses portability across operating system and middleware products; modern processors are largely (but not completely) abstracted by OS & MW. Thus, portability at OS & MW level supports processor & hardware independence.

Although all of these techniques may be used at times, the primary OA techniques for attaining long term isolation are use of standards and application porting...

US Navy OPEN ARCHITECTURE COMPUTING ENVIRONMENT DESIGN GUIDANCE

From Theory to Practice

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Japanese & English

Collaboration Folders

Configurable Web Parts

IM Translation

Japanese & English

Microsoft Messenger - 会話
アドレス帳: 編集 | 表示 | 検索 | 操作 | ヘルプ |
現在: Microsoft (Microsoft@sourcefire.com) |
sourcefire.com |
インスタントメッセージの会話で、パスワードやクレジットカードの番号を公開しないでください。
CINCSDFLTDEMO1 の発言:
Can you post C2 Systems Status?
Microsoft の発言:
Yes, it was just sent over from CINCSDFLT Comm
CINCSDFLTDEMO1 の発言:
roger that
Microsoft の発言:
TADIL-A is 30 min time late and they are looking into it
最後のメッセージは 2003/11/13 19:01 に送信しました。

The reality of COTS

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- Changing world, changing militaries
- Military systems is
- es...different



Know what

Know how

If the appl
supplier



The Operational Art

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- Operational art is **the ability to envision the actions required to achieve a strategic end state** by using the available forces, time, space and resources to create advantageous position from which to enter a series of meaningful battles.
- A **Campaign** is a series of military **actions undertaken over a period of time** to achieve a specific objective within a given region.
- A **Battle** is a series of **related tactical engagements**

The Network Campaign

Not so unlike a military campaign

Cisco.com

The use of time, funding, intellectual capital (people), intellectual property, process, and technology to create an order of magnitude change in competitive advantage by using information and its availability as a strategic resource throughout the Defense establishment and, as necessary, for use by the government and defense trading partners.

US ASDC3I Goal -- Power to the Edge

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“Lead the Information Age Transformation of the DoD by building the foundation for network centric operations through policy, program oversight, resource allocation and the provision of value add Services.”

- Making information available on a network that people depend on and trust;
- Populating the network with new, dynamic sources of information to defeat the enemy;
- Denying the enemy information advantages and exploiting weaknesses.

Napoleon on Time vs. Space

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“

The definition of strategy is the employment of both time and space. I am less avaricious of space, as once lost it may always be regained, whereas time lost never.

”

Napoleon

CISCO SYSTEMS



EMPOWERING THE
INTERNET GENERATIONSM

A idea that was set 450 years ago . . .

Cisco.com

“

And one should bear in mind that **there is nothing more difficult to execute, nor more dangerous to administer than to introduce a new system of things**; for he who introduces it **has all those who profit from the old system as his enemies**, and he **has only lukewarm allies in all those who might profit from the new system.**

”

Machiavelli