# National Security Panel

# Progress Report


## Robert Kahn and Ken Kennedy


**May 11, 2001**

# Panel Members

- Co-Chairs
  - Bob Kahn
  - Ken Kennedy
- PITAC Members
  - Vint Cerf
  - Dave Cooper
  - Bo Ewald
  - Jim Gray
  - Steve Wallach
- Other Members
  - Charles Herzfeld
  - Shankar Sastry
- Ex-Officio
  - Irving Wladawsky-Berger
  - Raj Reddy

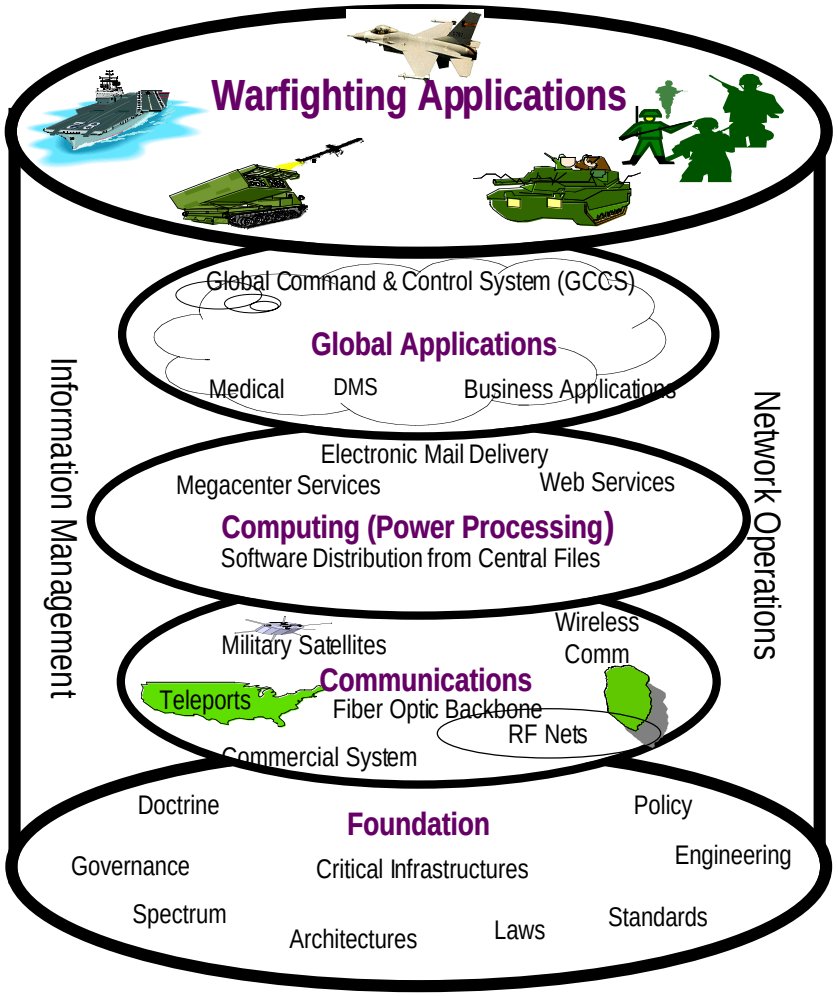
# Panel Charter

*Develop a long-range information technology-research strategy and rationale to improve the national security of the United States.*

# Process

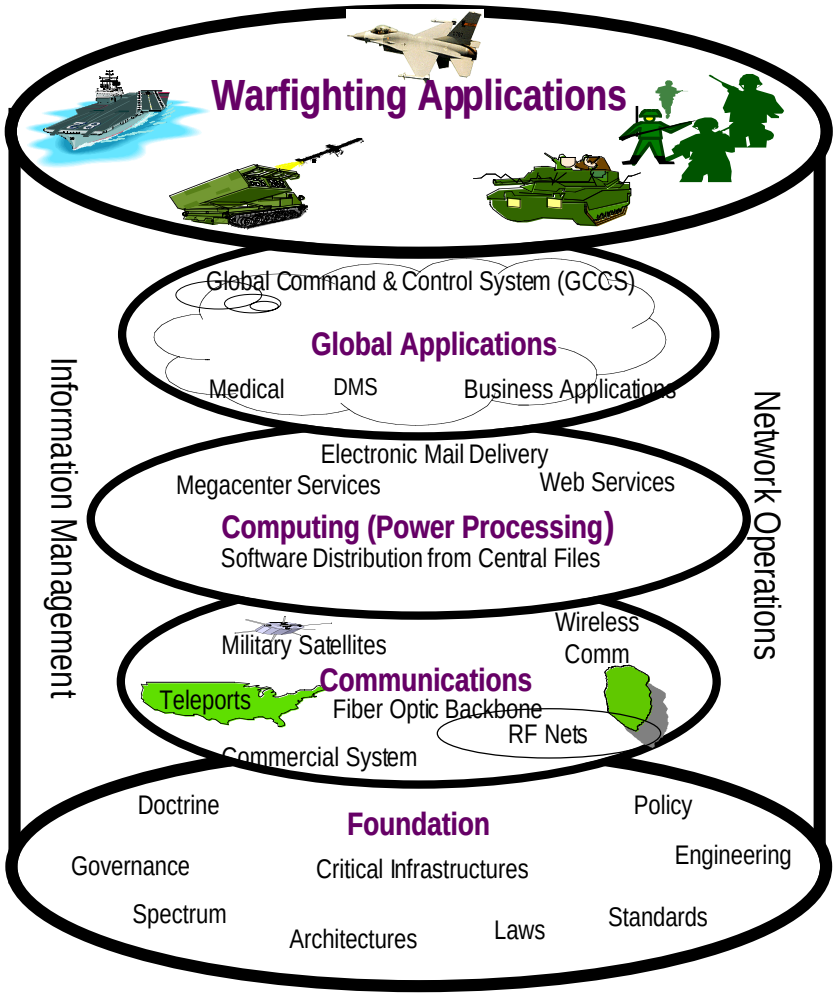
- Started with teleconference 12/2000
- Met 1/5/2001, 2/7/2001, 4/11/2001, 5/10/2001
- Briefings by OASD(C3I), NSA, NSC, DARPA - others planned
- Brainstormed, categorized, and focused on future technologies
  - Developing matrix: technologies x applications
  - Developing Interim Recommendations
- Seeking advice from administration, military, agencies, FBI, etc.
- Establishing liaison with DSB S&T summer study
- Planning summer meeting(s)
- Planning final report for later in the year

# Information View of Warfare

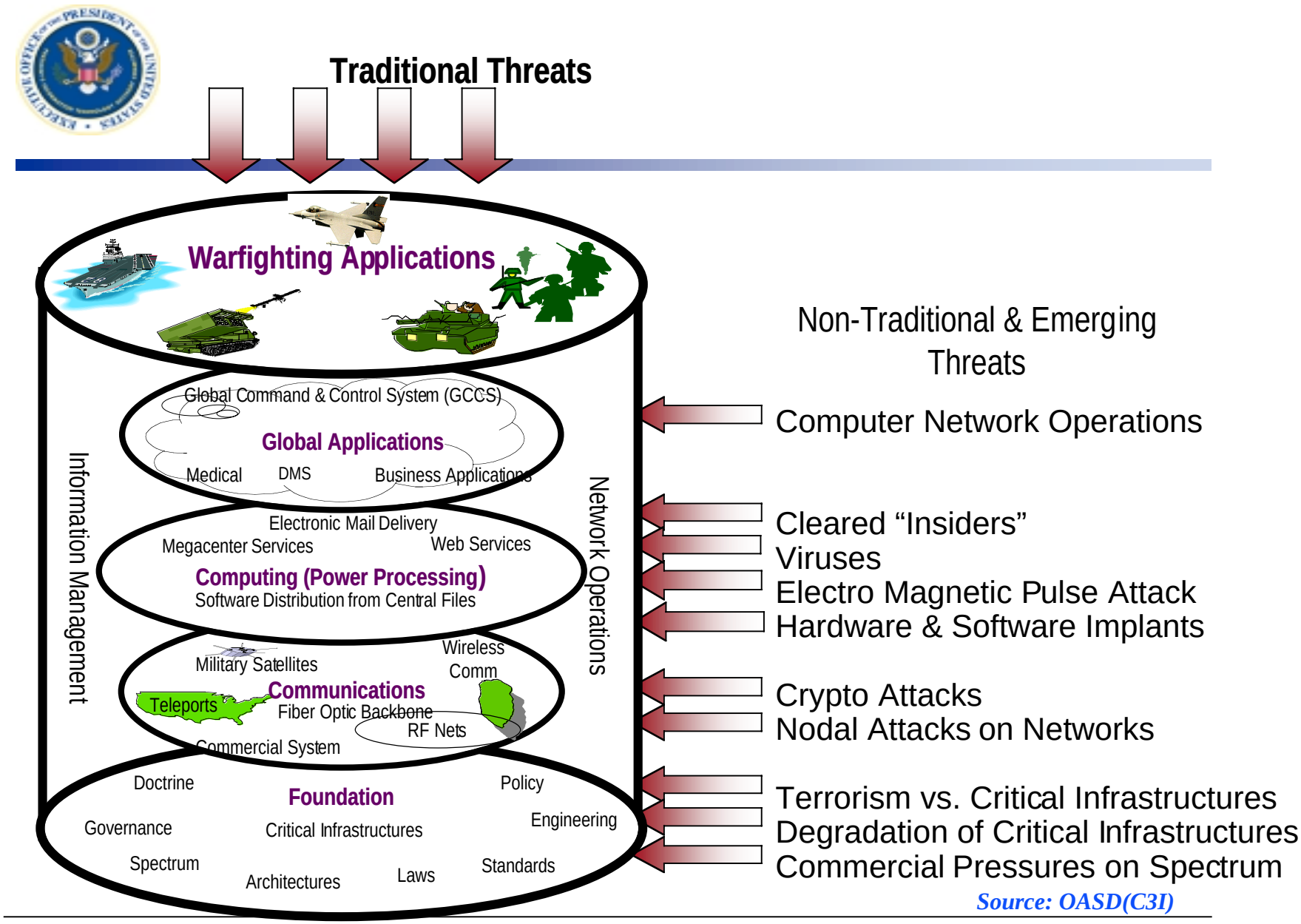



***Source: OASD(C3I)***

# Traditional Threats




*Source: OASD(C3I)*




*Source: OASD(C3I)*

# Categories

- Cyber-crisis Management
  - Assured Survival, Infrastructure visibility, Rapid response - threats, attacks
- Autonomous Systems
  - Unmanned Weapons, Sensing, and Surveillance, Robotics, Agent Systems
  - Diagnostic & Post Mortem Analysis, Automated Planning
- Networked Intelligence Gathering & Assessment
  - Defense systems, open sources, integrated language & image analysis
  - Event detection, characterization, tracking
- Distributed Decision Making & Coordination
  - Collaborating groups of Distributed Experts, Problem Solving, Advice
  - Large Scale Information Management, Knowledge Organization
- Computer-based Education and Training
- Managing Legacy Systems on a continuing basis

# Cyber-crisis Management

- Autonomic Infrastructure—self-aware, self-repairing, self-healing
- Assured Survival, back-up strategies, hacker-proof
- Codification and record of security-critical knowledge—people, processes, information
- Self-authenticating and rapidly defined information and types—no authentication authority; dynamic, community-based standards
- Developing ultra-reliable systems—error avoidance, correct aggregation, automated optimization
- Including networks, computers and end applications
- Ensuring overall system security—including people and systems

# Autonomous Systems

- Unmanned entities - vehicles, weapons, sensing & surveillance
- Offensive and defensive functions, fighting automonous systems
- Keeping humans safely away from dangerous situation
- Access to key information resources
  - Real-time digital earth—1 meter resolution
  - Instrumentation, visibility, assessment of the target environment
- Recognizing threats and counterthreats; taking appropriate action
- Task-specific teaching and instructing
- Self-constructing systems with field diagnostics & repair

# Networked Intelligence Gathering & Assessment

- Large Scale Information Management & Analysis
- Defense Systems, Others systems, open source
- Structuring of unstructured data
- Language translation, image processing, speech understanding
- Rapid, accurate, distributed analysis & Reporting
- Automated Metadata generation
- Validation and dis-information detection

# Computer-based Education and Training

- Codification of critical defense system information
- User interfaces, critical components, repair techniques
- On-line, with text, graphics, video and audio output
- Speech input from user; direct system input
- Simulators, models of operation, block diagrams
- Multiple levels of granularity
- Military plans and operations - generic and specific

# Managing Legacy Systems on a continuing basis

- Developing easily accessible system description techniques
- Upgrading & enhancing Legacy systems
- Integrating new systems with Legacy Systems, hybrid approaches
- Developing effective emulation technologies
- Replacing Obsolete parts in existing systems
- DoD use of commercial information technology standards