The Cyberspace Domain and Its Challenges to Space Systems Architecture

A “Birds of a Feather” Session

Frank Belz  The Aerospace Corporation [Moderator]
Nick Combs  EMC Federal
Josh Haines  MIT Lincoln Labs
Daryl Hild  MITRE

GSAW 2010
3 March 2010
Agenda

5:30  Panelist Introductions and presentations [1:00]

6:30  Q&A with panelists [:30]

7:00  Break [:15]

7:15  Moderated discussion among all participants
What is the Cyberspace Domain? Why do we care?

• Cyberspace Domain: Interdependent distributed infrastructure of sensor, computer and network, hardware and software and transmission media that collects, carries, stores, transforms and uses information

• The Cyberspace Domain is essential to effect operations in land, maritime, air and space domains

• Mission success must be achieved even when under Cyber attack

• Asymmetric battlespace: advantage goes to the offense today and for the foreseeable future

• Achieving and maintaining supremacy in Cyberspace is very challenging
Evolving to Cyberspace Operations

Physical and Cyber Security

Network Operations (NETOPS)
CN Exploitation
CN Attack

Cyber Operations

Rules of Engagement
International Laws of Warfare
Strategy, Tactics, Techniques
Operational Art, Doctrine

Network Security
Defense in Depth
System Restoration

Computer Security

Physical Security
Emission Security (EMSEC)
Communication Security (COMSEC)
Transmission Security (TRANSEC)

COTS IA Products

Computer Network (CN) Defense
Intrusion Event Detection Methods
Intrusion Inference and Response

Deception

Concept of Operation
Cyber Command and Control
Cyberspace Mobility
Materiel Support

Mainframe computing
Distributed computing
Personal computing
Web-based computing
Peer-to-peer
Cloud computing

Distributed data and control Internet
Publish/subscribe Global Information Grid (GIG)
Service-Oriented Architecture
Architecture

Client/server Arpanet

Transmit Security (TRANSEC)

Distributed computing

21st Century

0126-09

20th Century

Today
Space Cyber Spans All Space Segments

- Space protection (in space)
- • Cyber operations

- Space protection (on ground)
- • Cyber operations

- Space protection (on user platforms)
- • Cyber operations

Launch Segment

Ground Control Segment

User Segment

Cyber operations

GIG

AEROSPACE
Speakers

• Nick Combs, Chief Technology Officer, EMC Federal
  – Access Control & Security in Virtualized & Cloud Systems

• Josh Haines, Ass't Group Leader, MIT Lincoln Labs
  – Cyber Mission Survivability

• Daryl Hild, MITRE
  – Mission, Systems, Information, & Cyber Assurance
Backup Charts
Space Cyber Emphasis

Traditional Domains are characterized by kinetic activity

Cyberspace Domain is embedded in traditional domains, but is characterized by “virtual activity”

Threats against NSS assets and information may involve any/all domains

Gen. Kehler: “…look at the intersection of Cyberspace and Space Domains”
Thank you