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Information Associations for Multi-Domain Applications
Addressing Data Utility in Segregated Networks

John Shield, Samuel Chenoweth (presenter), Patrick Prendergast, Mark Beaumont, Chris North and Brad Hopkins
Need for Domain Segregation: Defence

Increasing classification: stronger protection required
Need for Domain Segregation: Corporate

- Internet
  - Outer Firewall
  - Public Web Server
  - Inner Firewall
  - Internal Server
  - Internal LAN
  - LAN devices
Software Segregation Provides Weak Security
Strong Security Demands Network Segregation

SECRET Domain

PROTECTED Domain

UNCLASSIFIED Domain

Air Gap

Air Gap
Network Segregation Limits Utility

How ?!?
Network Segregation Workaround: “Sneakernet”

SECRET: Plans for Aardvark Class submarine…
Network Segregation Workaround: Data Diode

SECRET Domain

PROTECTED Domain

UNCLASSIFIED Domain

Air Gap

Data Diode

Information flow to higher domains only
Network Segregation Workaround: Trustworthy Gateway

SECRET Domain

UNCLASSIFIED Domain

Trustworthy Gateway

Tightly controlled information flows in both directions
Our New Solution:
Information Associations

Operation Canid:
Budget = $2.3M

Operation Maven:
Budget = $4.1M

Data Fusion Device

Operation Canid:
Announced budget = $2.3M
Black ops budget = $1.2M
Actual Total budget = $3.5M

Operation Maven:
Announced budget = $4.1M
Black ops budget = $1.8M
Actual Total budget = $5.9M
Visual Information Association

Cross Domain Desktop Compositor

Operation Manatee

Operation Manatee
Visual Information Association - Coordination

Cross Domain Desktop Compositor

Operation Manatee

Synch Message
Multi-Domain Graphical Interface Library

Unclassified Domain

Coalition Domain

Mission Domain

Video merged from all domains
Link Information Association

Link information association creation

Link information association usage
Link Example: Cross Domain Files

- **Project A:** Social media data mining techniques...
- **Project Albatross:** Lone wolf terrorist detection...
- **Requisition Op B:** Purchase materiel (budget: $3.5M)...
- **Requisition for Operation Bethany:** Purchase 7 type AEQ74-Z rockets...

**Synch message:**
Delete file

Unique identifier distribution at file creation time
Link Example: Cross Domain Hyperlinks
Conclusion

• Information associations are a powerful tool for providing cross domain utility on segregated networks, with only limited cross domain data transfers required.

• Our multi-domain graphical interface library and military map application demonstrates the value of visual information associations.

• Our cross domain links implementation shows the utility of link information associations.