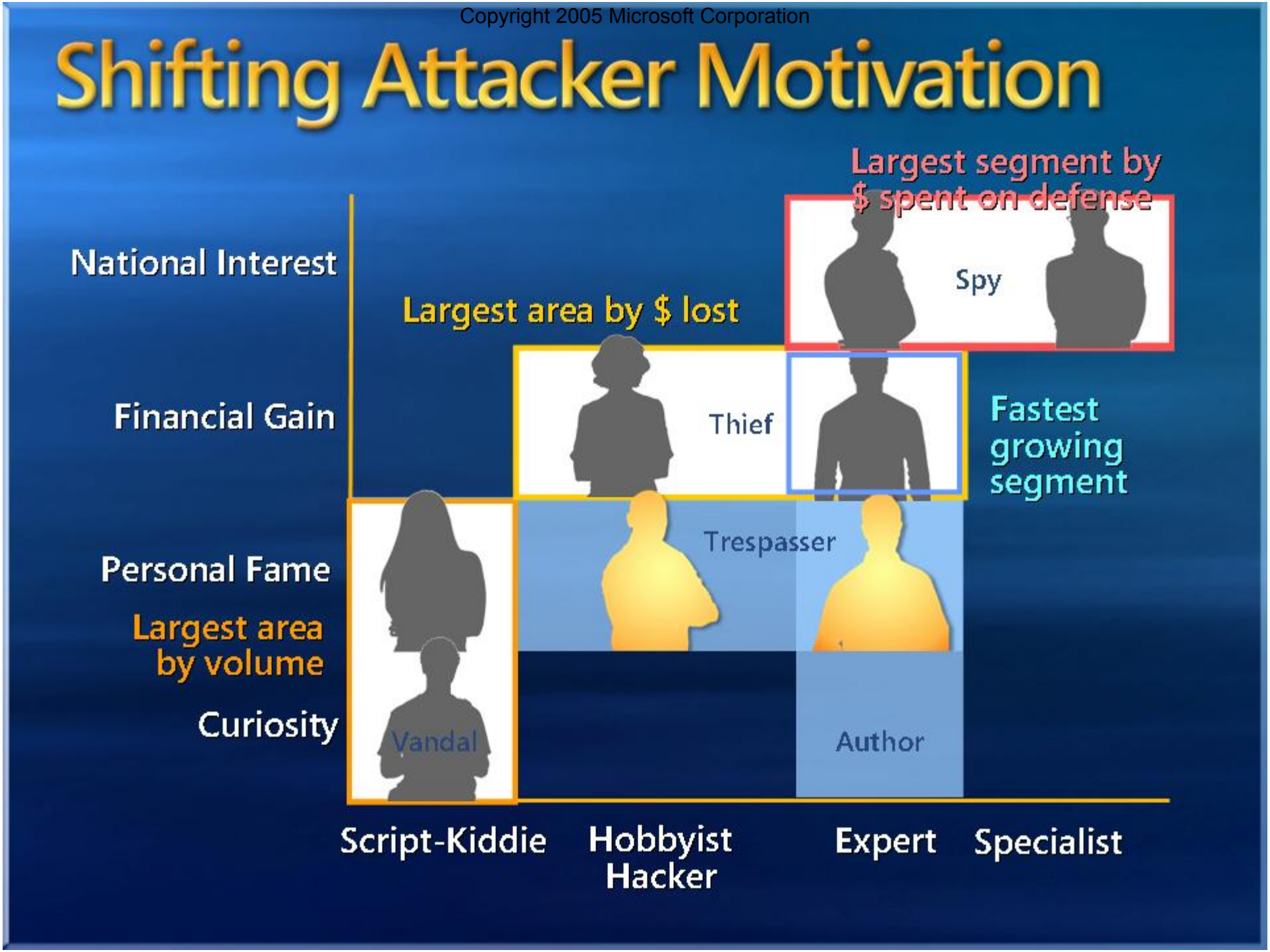
2005 High Confidence Software & Systems Keynote

Craig Mundie
Chief Technology Officer
Senior Vice President
Advanced Strategies and Policy
Microsoft Corporation

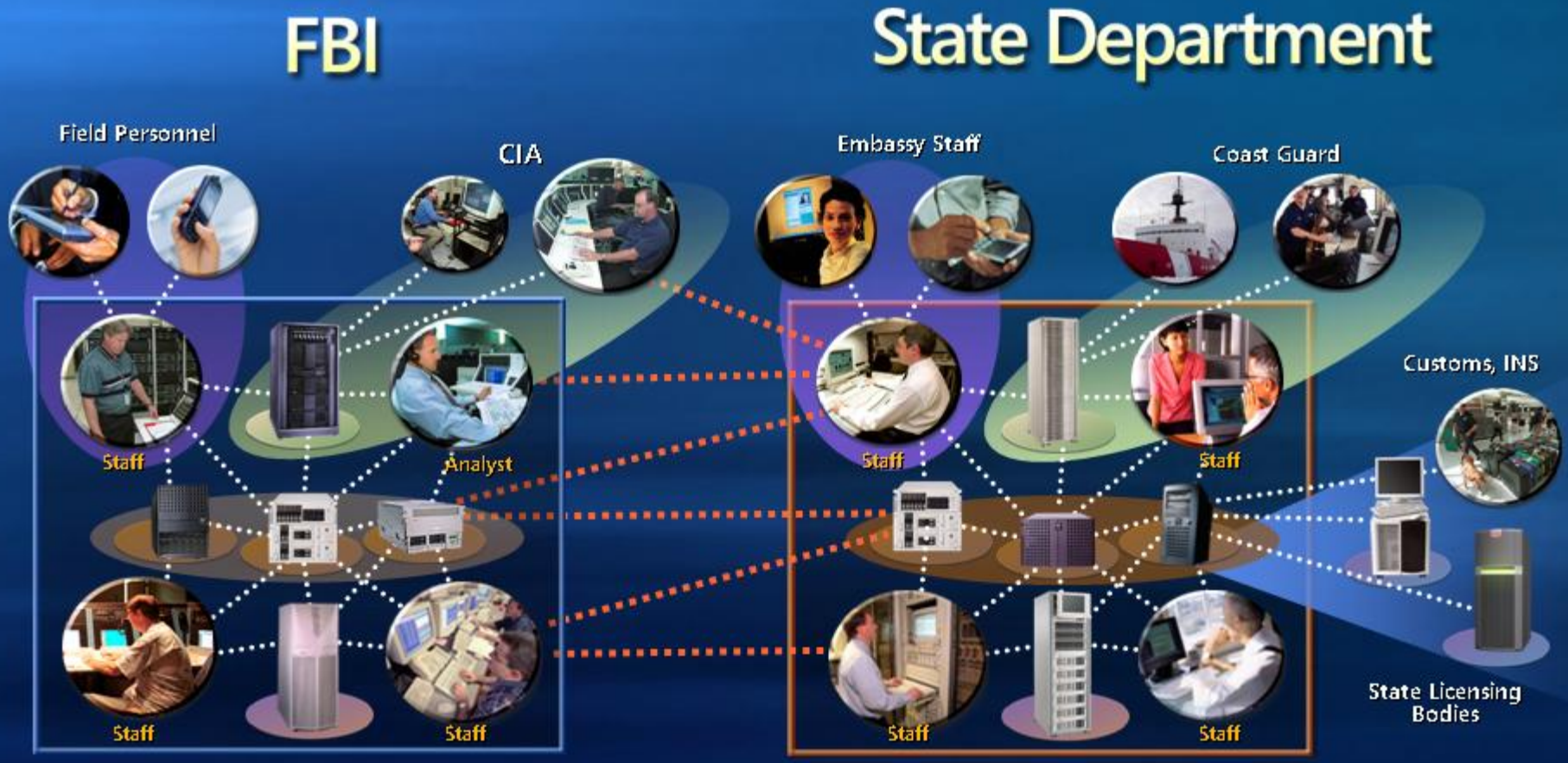
New Realities

- Modern Societies are critically dependent on computing and telecommunications
- Same Terms → New Meanings
  - WMD
    - Weapons of Mass Disruption
  - Proliferation
    - Connected devices and software
  - Critical Infrastructure Protection
    - Protecting the Internet and devices attached to it

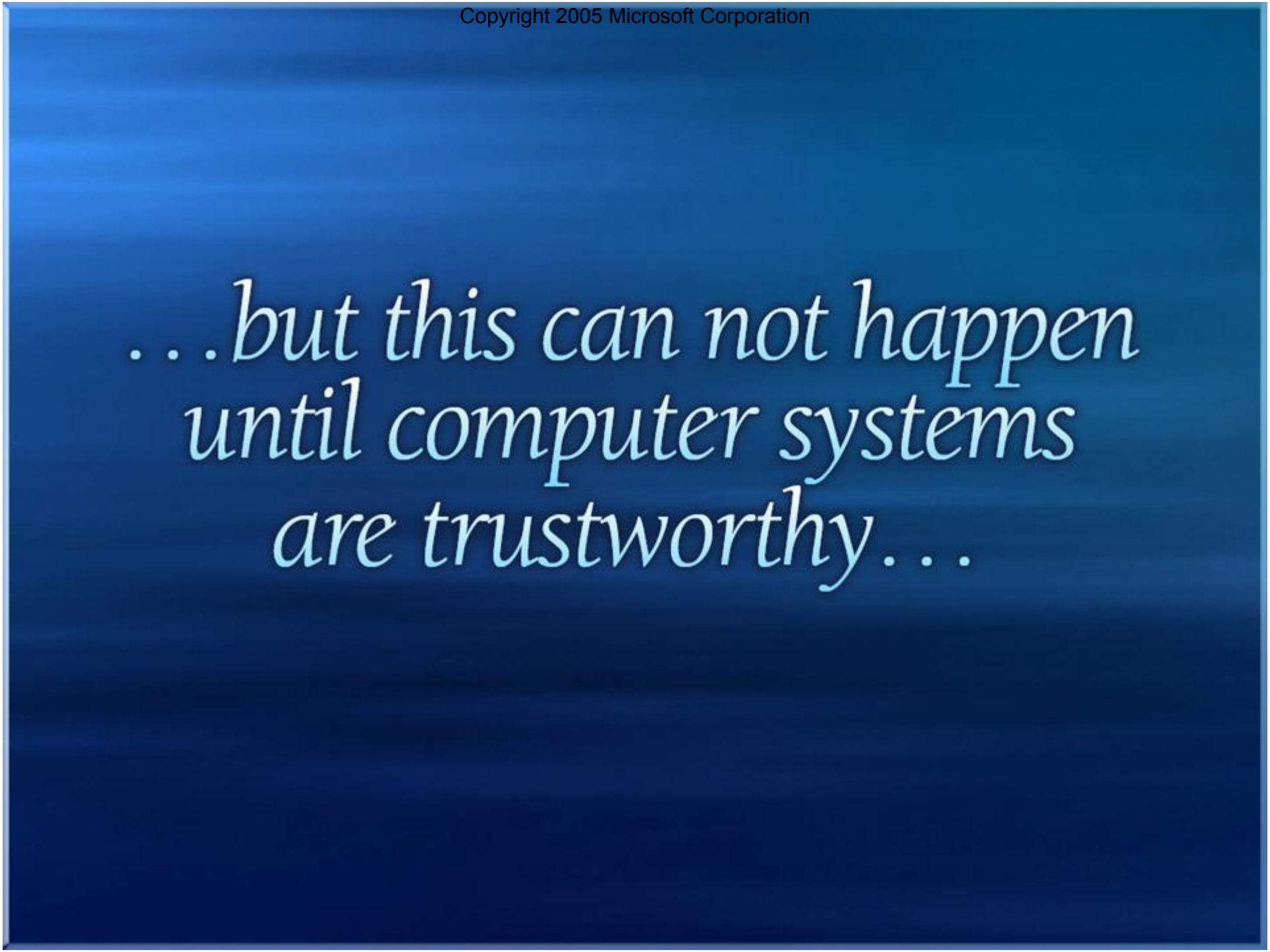
Shifting Attacker Motivation



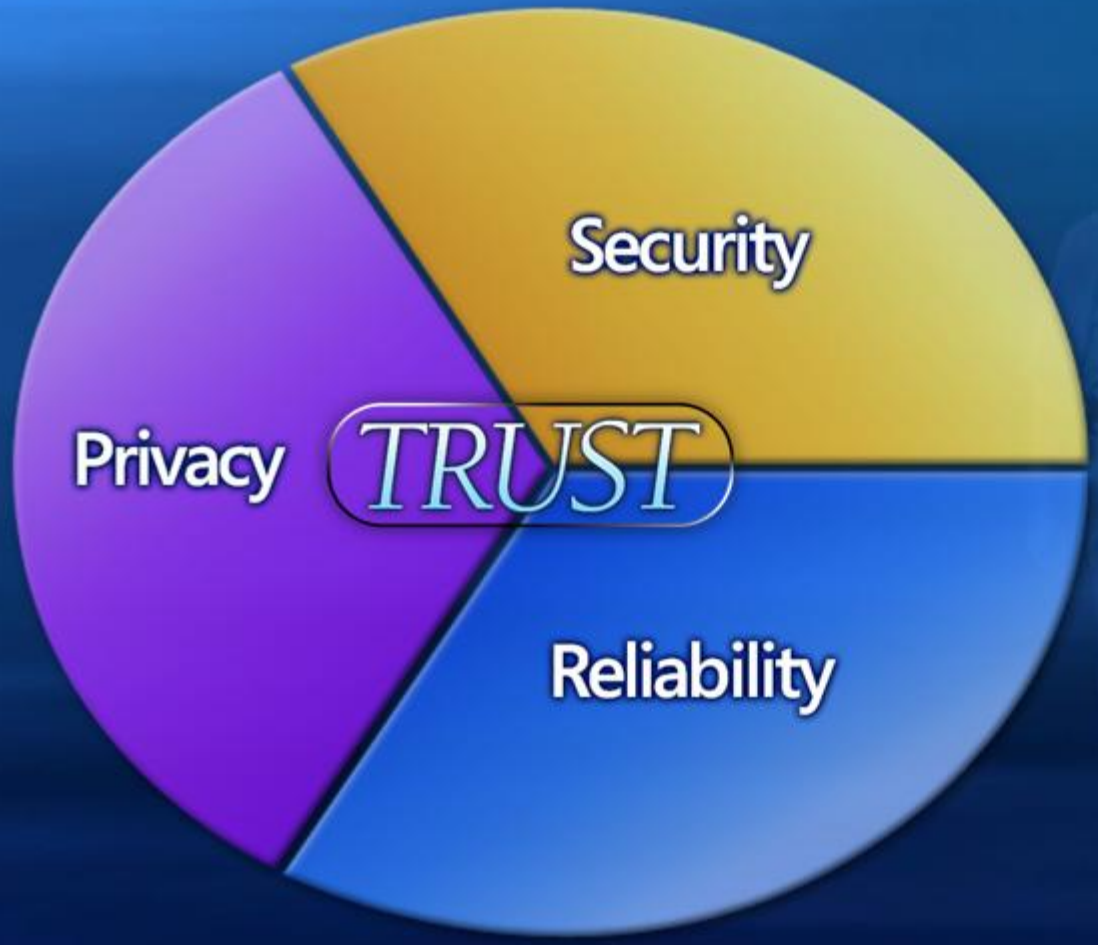
The Dream



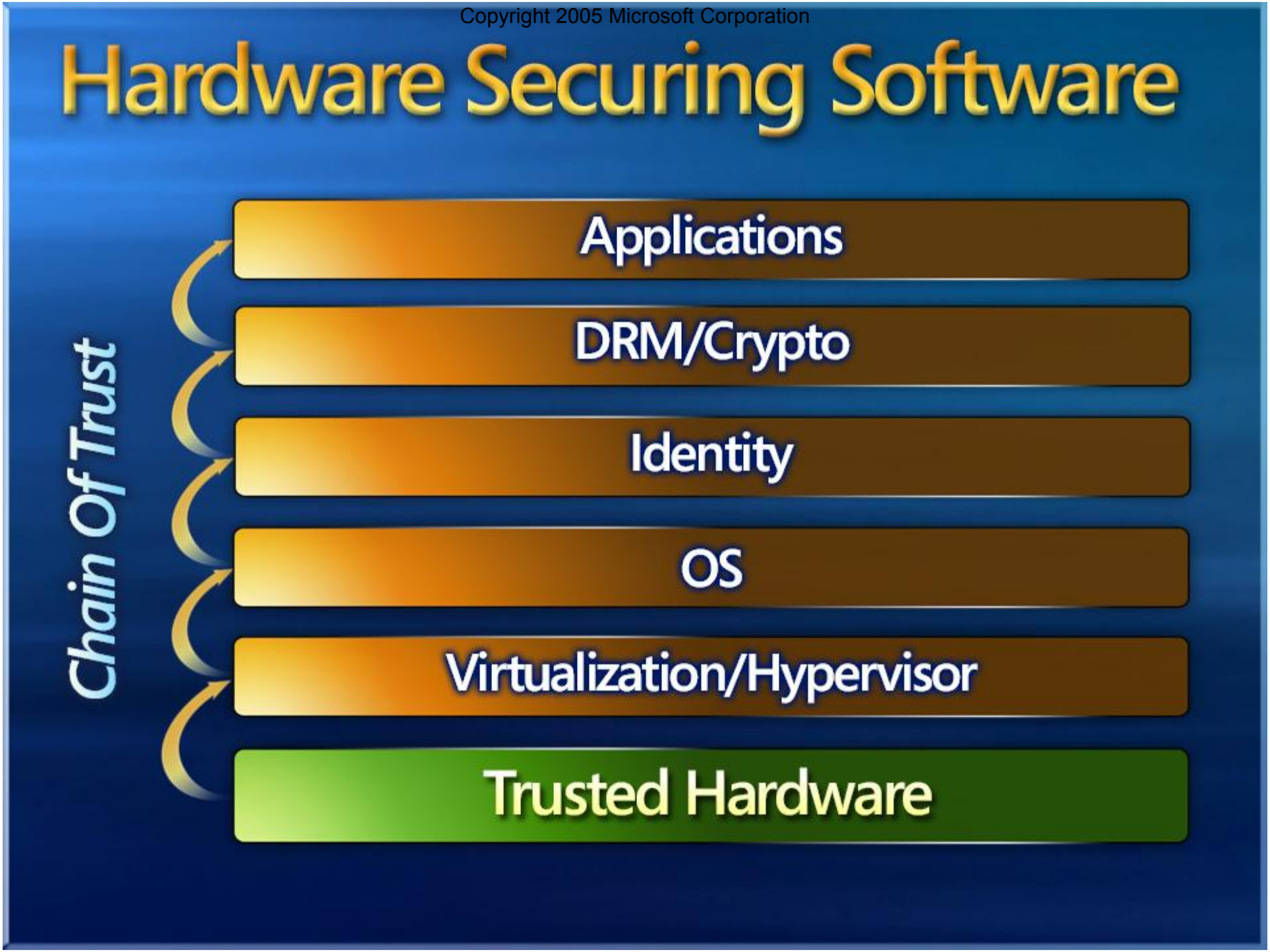
Secure, private, reliable, and granular data interoperability across organizational boundaries at the edge of the network



High Confidence Systems



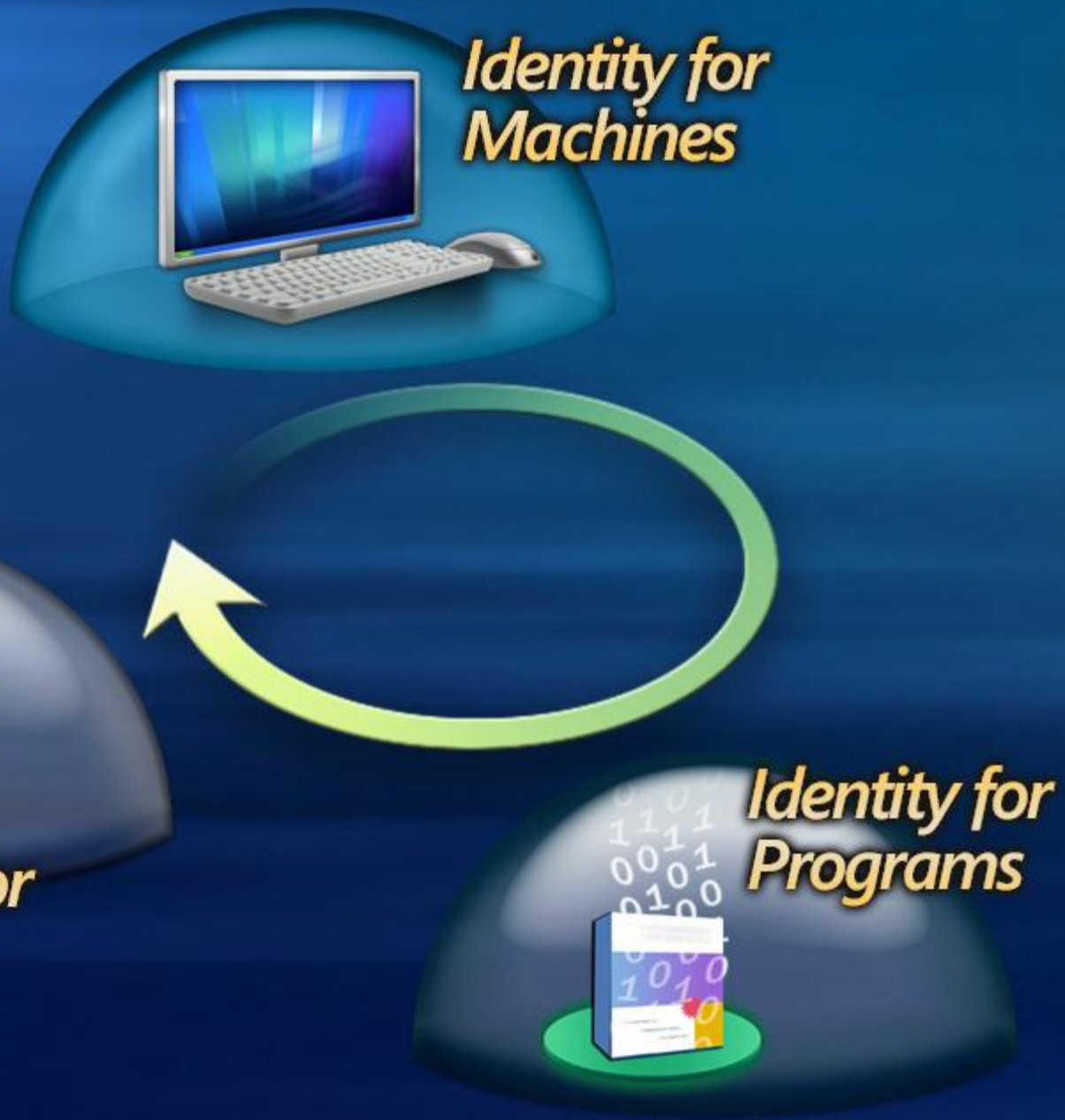
Hardware Securing Software



NGSCB Product Roadmap

Identity

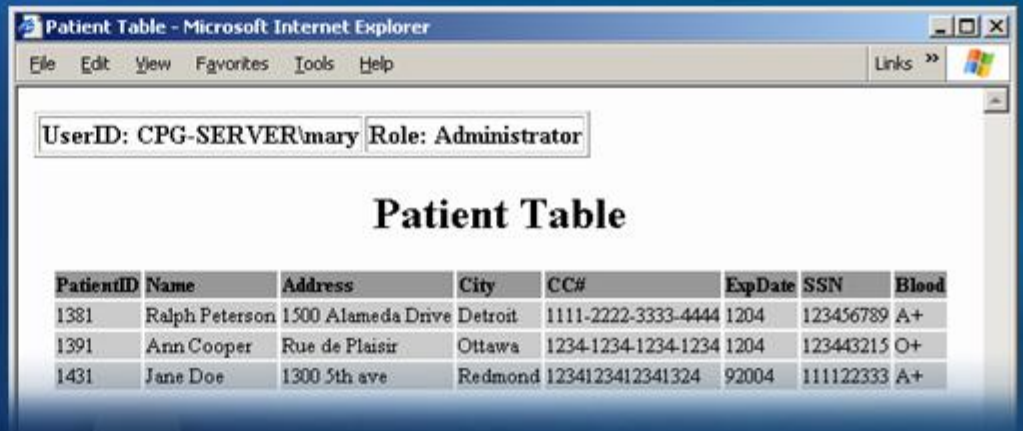
- Identity for:
  - Trust
  - Access



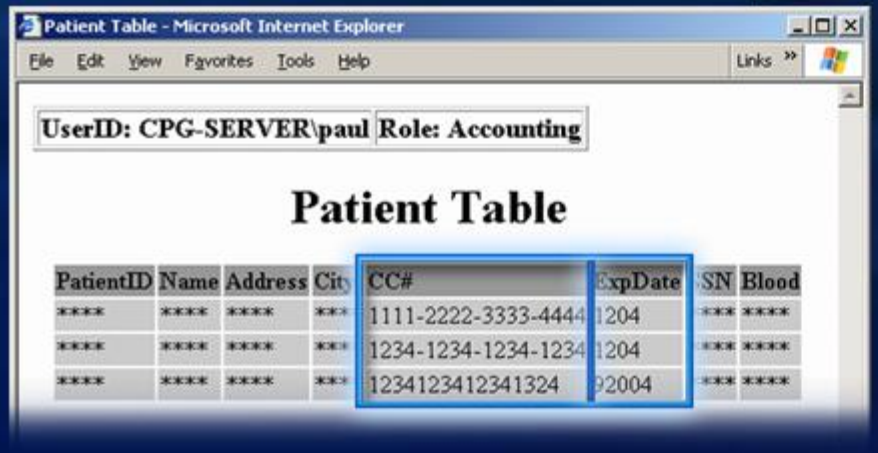
Privacy

- No privacy without security
- Global information flows forcing a rethink of Privacy
- Role-based access control:

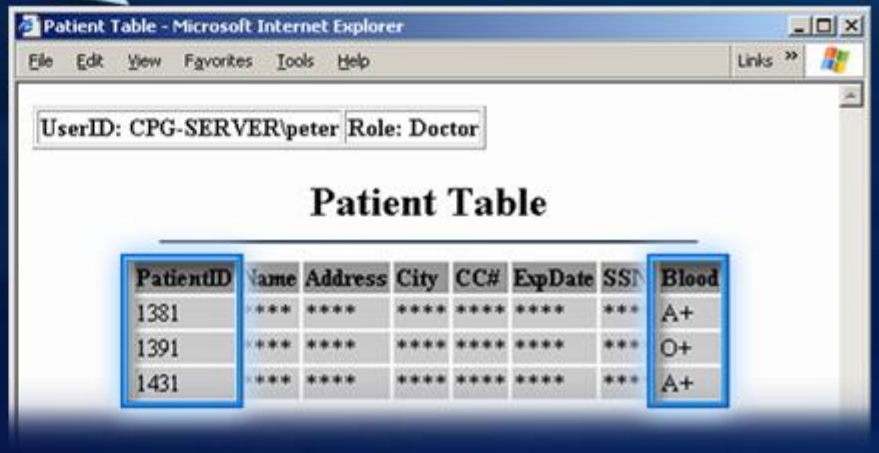
role: ADMINISTRATOR
access: All Access



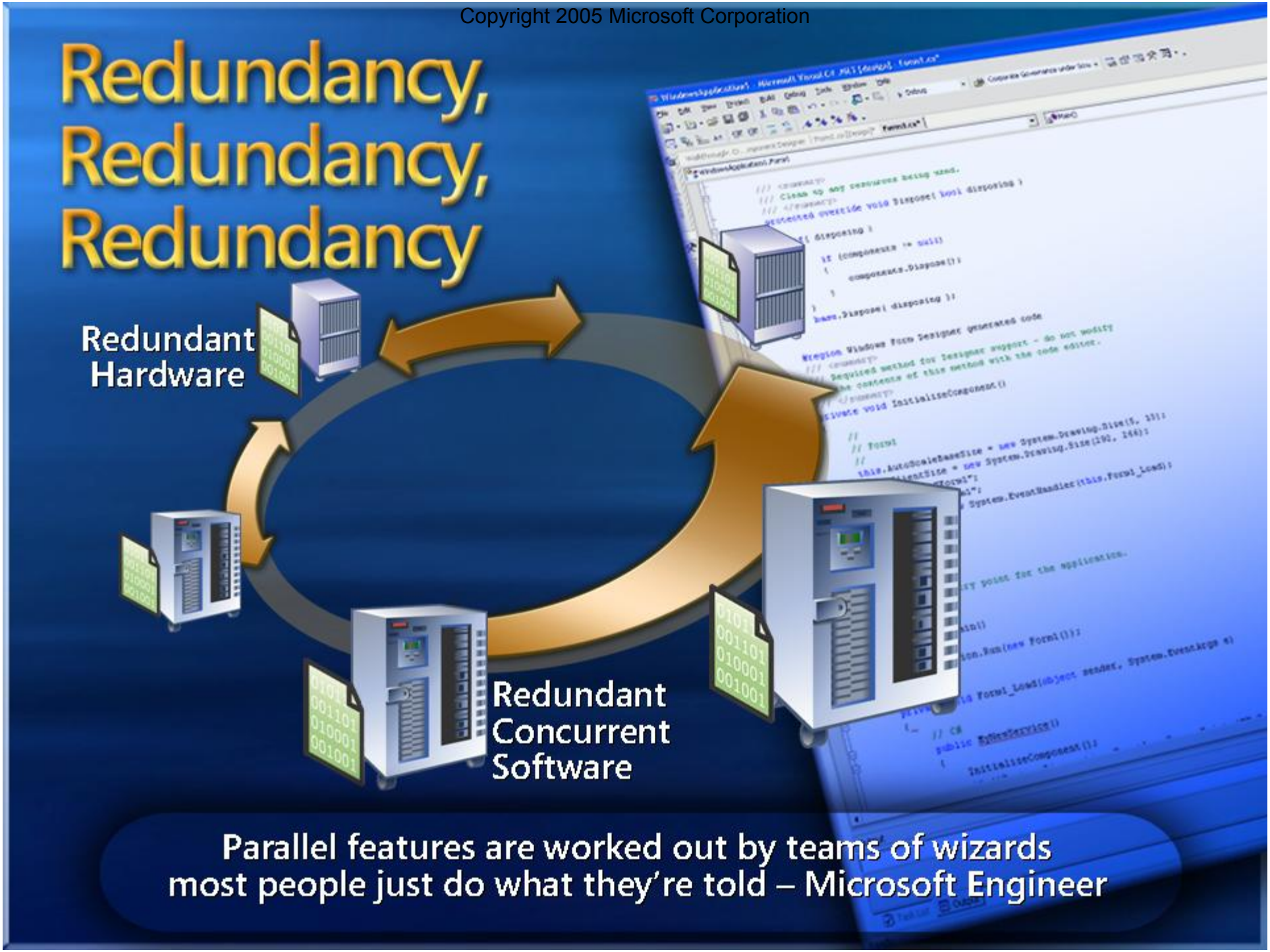
role: ACCOUNTANT
access: Restricted To Financial Information



role: DOCTOR
access: Restricted To Medical Information



Redundancy, Redundancy, Redundancy

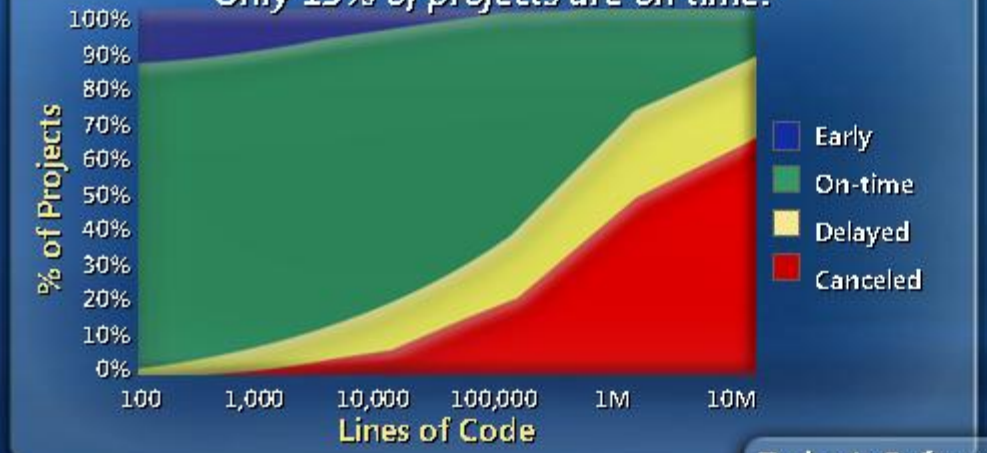


Parallel features are worked out by teams of wizards
most people just do what they're told – Microsoft Engineer

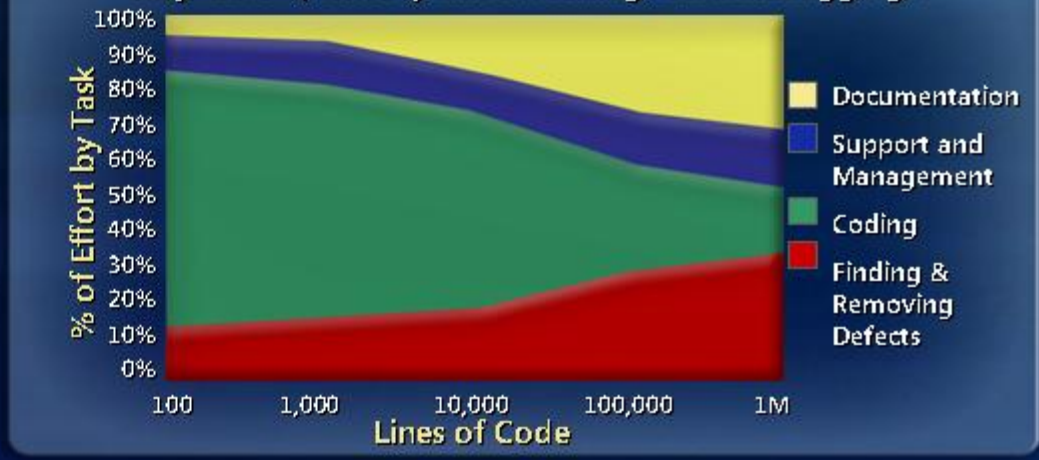
Complexity

Complexity of developing, testing, and supporting large scale software systems continues to escalate

Today's Software Development Process (Large Projects): Only 13% of projects are on time!



Today's Software Development Process (Medium/Large Projects): Only 18% of time spent on coding, 35% debugging!



Source:
Capers Jones, Estimating Software Costs, pg. 140
Capers Jones, Patterns of Software Systems Failure & Success

Going Forward

Dealing effectively with concurrency and complexity to build reliability

Verifiable composability + Protocol-oriented programming

- Loosely-coupled
- Asynchronous
- Concurrent
- Composable
- Decentralized
- Resilient Systems

Power At The Edge

Rich peers and the virtual middle

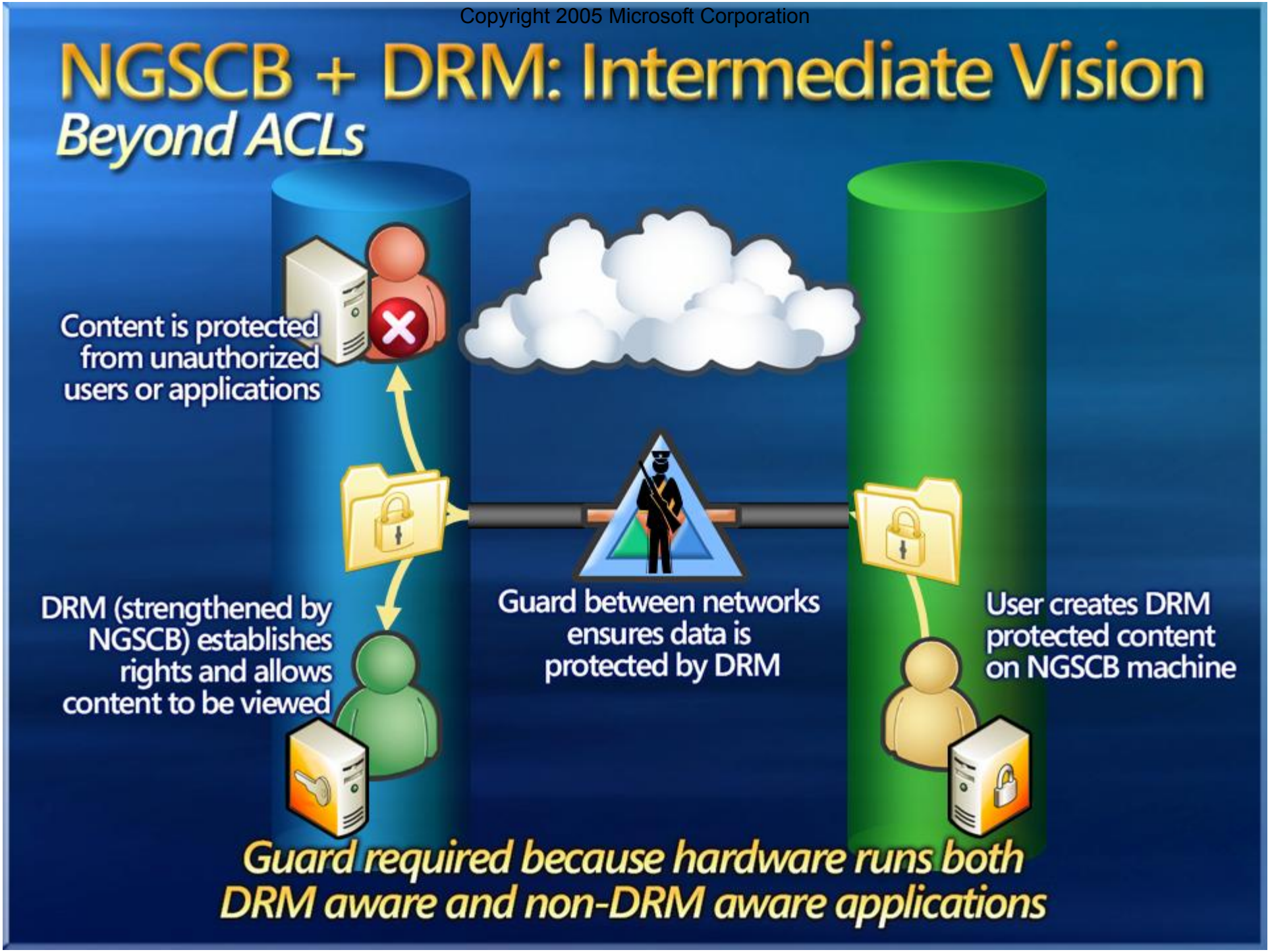
WS-I
WEB SERVICES INTEROPERABILITY ORGANIZATION

We (the DoD) need to pay a great deal more attention to supporting peer-to-peer relationships and information exchanges that transcend individual systems and organizations. Doing these things will empower the edge of the organization and enable us to change the way we approach everything we do.

John Stenbit – Power to the Edge (Forward)

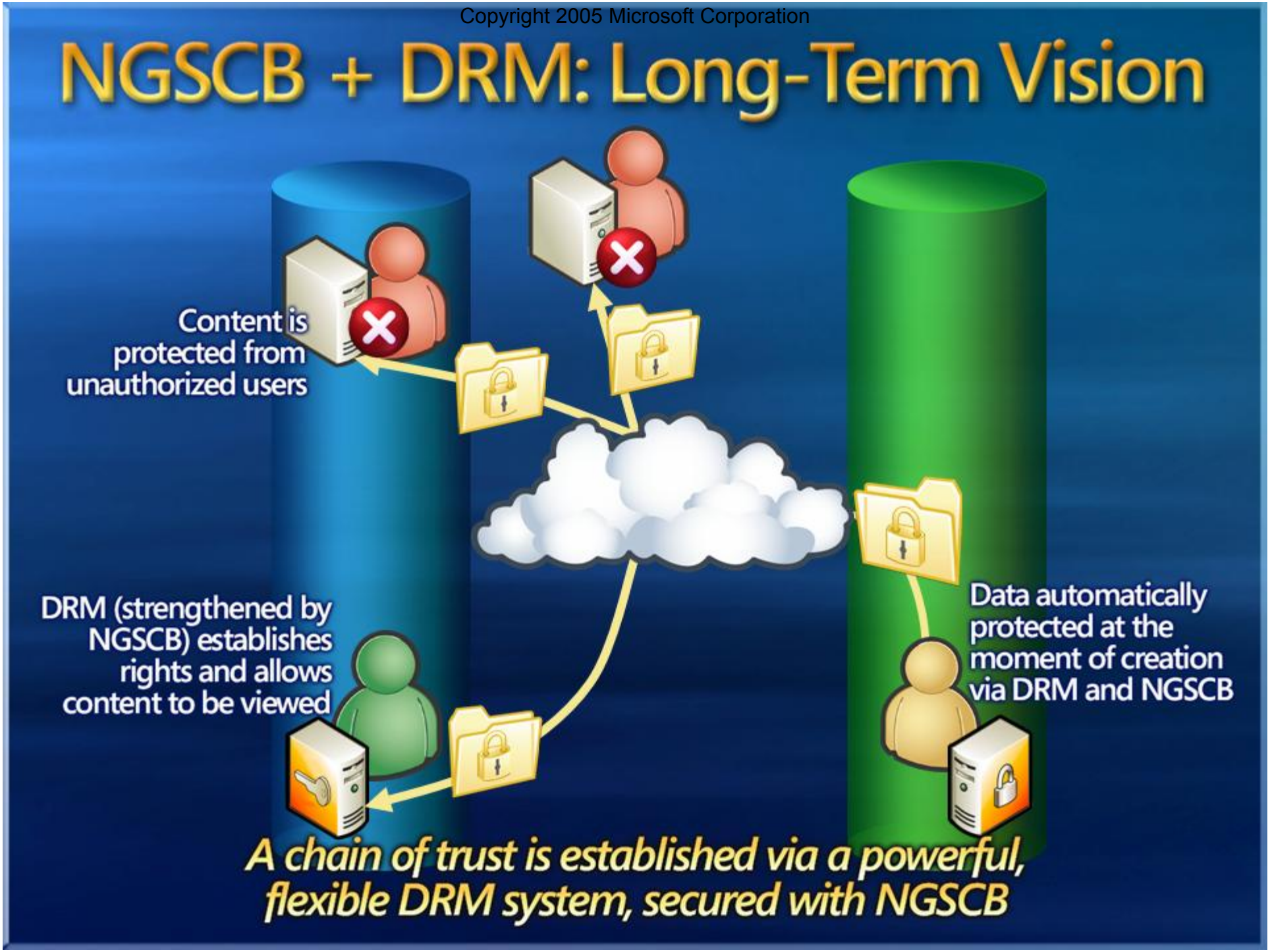
NGSCB + DRM: Intermediate Vision

Beyond ACLs



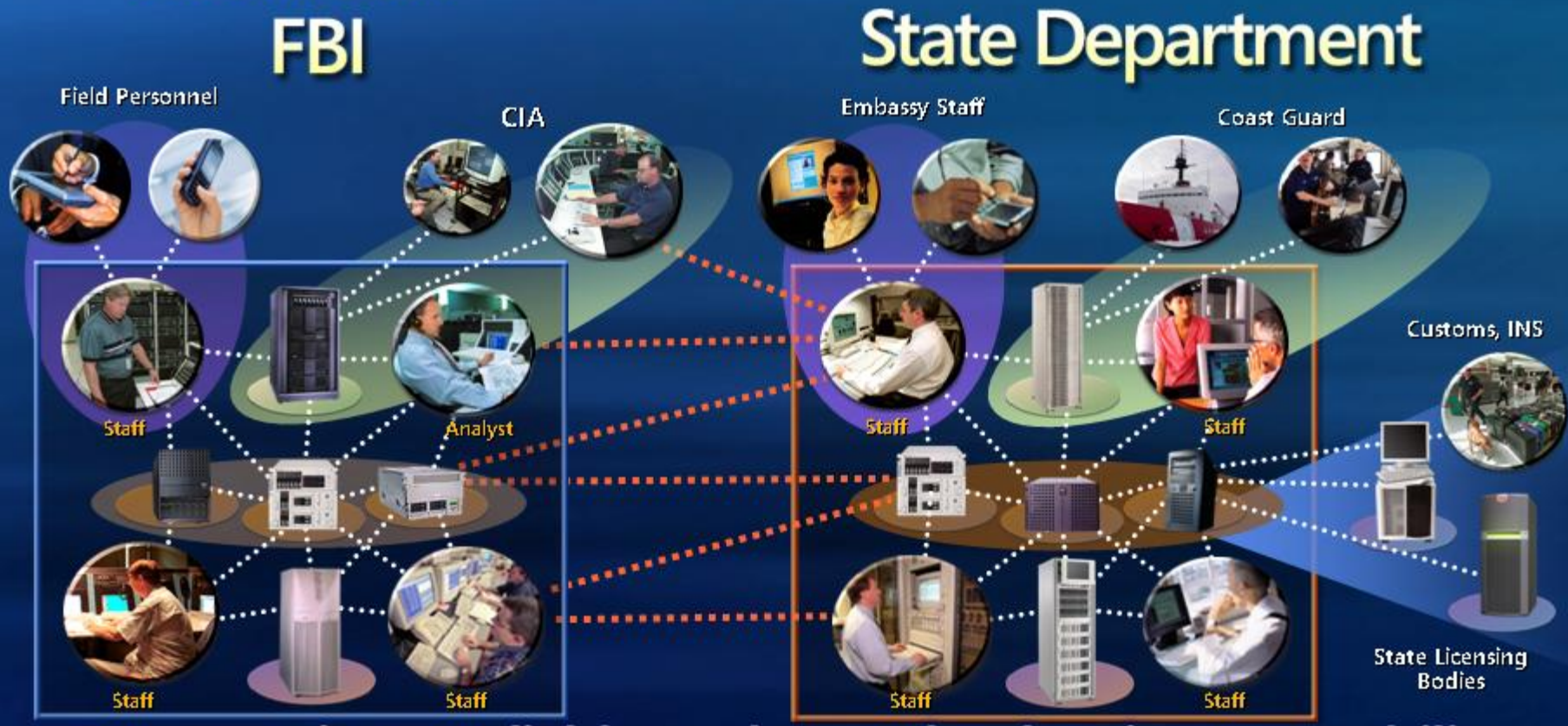
Guard required because hardware runs both DRM aware and non-DRM aware applications

NGSCB + DRM: Long-Term Vision



It Gets Better From Here

- *Today:* complex software auditing and air gaps
- *Tomorrow...*



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discussion