Superior Products Through Innovation

COTS, Subversions, and the Foreign Supply Chain issues for DoD Systems

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There is no perfect security!!!
Only levels of Trust or Assurance!

C-I-A Triad

- **Confidentiality** - secret or private information remains that way
- **Integrity** - refers to the completeness, correctness, and trustworthiness of the information
- **Availability** - authorized persons (entities) may access the information in a timely manner

Safety and Security have I and A in common!

Must have solid balance between C-I-A

- Traditional IT Information Assurance (IA) tends to Overemphasize ”C” at the expense of ”I” and ”A”
Common Criteria (ISO/IEC 15408)

- Common Criteria the only multinational agreed sharing mechanism for Computer / Software Security
  - Common security requirements definition (Protection Profiles)
  - Common evaluation scheme (CCEVS)
  - Product based (COTS) flavor

- Component Requirements defined by:
  - Functional Requirements
  - Assurance Requirements

- Evaluation Assurance Levels 1 through 7

- Must know what the Protection Profile specifics
National Policy Governing the Acquisition of Information Assurance (IA) and IA-Enabled Information Technology (IT) Products

IA shall be considered as a requirement for all systems used to enter, process, store, display, or transmit national security information.

Effective 1 July 2002, the acquisition of all COTS IA and IA-enabled IT products
  – Limited only to those evaluated and validated via NIAP or FIPS
  – Initially interpreted to mean Desktop IT Centric Systems

Latest direction includes DoD Platforms

“The appropriate certification routing for Commercial Products for use in DoD systems is through a NIAP lab under Common Criteria. NSA does not certify products, the NIAP labs do.”,  July 2004

-- Mike Fleming, Deputy Director IAD

“ NO WAIVERS!” : DHS-OSD Software Assurance Workshop, Oct 3, 2005

-- Daniel Wolf, Director IAD,

Microsoft and SELINUX

- Both OS’s claim NIAP evaluations
- Controlled Access Protection Profile (EAL-3)
- Windows Server 2003 and Windows XP
  - ALC assurances to EAL-4+
- SELINUX – same.

- The “CATCH”.
  - The profile does not address the processing nodes on a network.
  - Neither Security Target addresses the network vulnerabilities
COTS SW Supply Chain Issues (Real Examples)

- **Foreign Nationals with access to product SW at supplier**
  - Foreign national with prior connections to a foreign intelligence service at a trusted unclassified SW supplier

- **Foreign sourced code incorporated into another product**
  - Purchased display processor driver SW from a domestic source and discovered it was actually sourced from a foreign country

- **Foreign sourced Intellectual Property (IP) embedded into SW or firmware**
  - Purchased FPGA IP components from domestic supplier and subsequently learned that they were sourced from a foreign country

- **Foreign sourced HW and SW that was purchased from another foreign source**
  - Purchased Nokia Checkpoint firewall appliances only to learn they were an indigenous Israeli design purchased by Nokia
Open Source Software – Pedigree of Developers

- **Subversion**
  - System subversion is ‘... the covert and methodical undermining of internal and external controls over a system lifetime to allow unauthorized or undetected access to system resources and/or information.’ - (Myers 1980).

- **Naval Post Graduate School Study¹** (e.g. LINUX)
  - Traditional techniques will NOT find nation-state funded adversaries.
    - Source Code Inspection
    - Security Test and Evaluation
    - GOOGLE – “security thousand eyes source code”

- **Must be able to find “What is it NOT supposed to do?”**
  - Need Requirements and Design Documents
  - Documents HAVE to be maintained w.r.t. the fielded implementation
  - Full Traceability to the Documents
  - Validate the trusted development process employed

- **Substantial TCO for high robustness safety/security in OSS³**
  - “Free is not Exactly Inexpensive”

¹[http://cisr.nps.edu/downloads/04paper_subversion.pdf](http://cisr.nps.edu/downloads/04paper_subversion.pdf)
²[http://www.nsa.gov/selinux/info/faq.cfm](http://www.nsa.gov/selinux/info/faq.cfm)
Summary

- Security is a “buyer beware”!
  - *Understand the CCEVS process and PP assurances*

- Not all companies and software products come from sources friendly to a given country!

- Open Source can be a real nightmare at higher security robustness levels totally obviating any “benefit” from its initial cost!