Protecting the Defense Procurement Cyber Supply Chain: The U.S. Experience

David P. Fidler
James Louis Calamaras Professor
Indiana University Maurer School of Law, USA

Defense Procurement in the Age of Cyber:
Recalibrating Government and Contractor Responsibilities
Riga, Latvia
28-30 May 2014
Overview of presentation

- Describe US perspective on the “cyber supply chain” problem facing defense procurement
- Outline how this problem has been, and is being, addressed in U.S. policy and law
- Focus on new U.S. Department of Defense (DOD) regulations on protecting the supply chain that change DOD/contractor and contractor/sub-contractor relationships
- Identify challenges facing present and future U.S. efforts to address cyber supply chain problems
US perspective on the cyber supply chain problem

- Sub-contractor
- Prime contractor
- DOD

Globalization of the cyber technology supply chain

Defense dependence on cyber technologies

Cyber-ization of the supply chain

Intensified cyber threats (crime, espionage, military)

China’s rise as cyber tech manufacturer & great power
Globalization of the cyber supply chain

Figure 1: Potential Origins of Common Suppliers for Laptop Components

<table>
<thead>
<tr>
<th>Component</th>
<th>Location of facilities potentially used by suppliers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid crystal display</td>
<td>China, Czech Republic, Japan, Poland, Singapore, Slovak Republic, South Korea, Taiwan</td>
</tr>
<tr>
<td>Memory</td>
<td>China, Israel, Italy, Japan, Malaysia, Philippines, Puerto Rico, Singapore, South Korea, Taiwan, United States</td>
</tr>
<tr>
<td>Processor</td>
<td>Canada, China, Costa Rica, Ireland, Israel, Malaysia, Singapore, United States, Vietnam</td>
</tr>
<tr>
<td>Motherboard</td>
<td>Taiwan</td>
</tr>
<tr>
<td>Hard disk drive</td>
<td>China, Ireland, Japan, Malaysia, Philippines, Singapore, Thailand, United States</td>
</tr>
</tbody>
</table>

Source: GAO analysis of public information.
Along with the rest of the U.S. government, the Department of Defense (DoD) depends on cyberspace to function. It is difficult to overstate this reliance; DoD operates over 15,000 networks and seven million computing devices across hundreds of installations in dozens of countries around the globe. DoD uses cyberspace to enable its military, intelligence, and business operations, including the movement of personnel and material and the command and control of the full spectrum of military operations.
Cyber-ization and supply chain protection

Dependence on cyber technologies

Supply chain protection challenges

Supply chain globalization

Classified

Unclassified
Cyber crime and supply chains: Rich target set, weak law enforcement

- Sub-contractor
- Prime contractor
- DOD

Cyber criminal
- Attribution
- Jurisdiction
- Capabilities

National law

International law
- Extradition & MLATs
- Convention on Cybercrime
Cyber espionage: Supply chain as fair game under international politics and law

Economic espionage

- Private-sector enterprises

Classical espionage

- Defense contractors & sub-contractors
- Defense ministries
Military cyber operations: Supply-chain participants in the cross-hairs

Espionage/covert ops → Use of force → "Attack" → Armed conflict → Espionage/covert ops

Supply-chain participants → Use of force → "Attack" → Armed conflict → Supply-chain participants

Supply-chain participants → Use of force → "Attack" → Armed conflict → Supply-chain participants
The Chinese cyber threat
Cyber supply chain risks

Sub-contractor → Prime contractor → DOD

Counterfeit products → Cyber intrusions → Cyber products with vulnerabilities → Foreign-domestic transactions (e.g., FDI, supply contracts)
Counterfeit products as a supply chain risk

The Navy Bought Fake Chinese Microchips That Could Have Disarmed U.S. Missiles

ROBERT JOHNSON | 9:22 AM | 76,270 | 135

Last year, the U.S. Navy bought 59,000 microchips for use in everything from missiles to transponders and all of them turned out to be counterfeits from China.

*Wired* reports the chips weren't only low-quality fakes, they had been made with a "back-door" and could have been remotely shut down at any time.

If left undiscovered the result could have rendered useless U.S. missiles and killed the signal from aircraft that tells everyone whether it's friend or foe.
DOD Trusted Foundry Program
Cyber intrusions as a supply chain risk

Targeting U.S. Technologies
A Trend Analysis of Cleared Industry Reporting

East Asia and the Pacific collectors relied on suspicious network activity (SNA) as their foremost method of operation (MO) for attempting to obtain illegal or unauthorized access to sensitive or classified information resident in the U.S. cleared industrial base, even more so in FY12 than in FY11.

The expansion of East Asia and the Pacific cyber operations is readily observable, including in those directed against U.S. cleared industry. This growth is evident in the 1,443 percent increase in reported East Asia and the Pacific-attributed SNA between fiscal year 2009 (FY09) and FY12.
§ 236.1 Purpose.

Cyber threats to DIB unclassified information systems represent an unacceptable risk of compromise of DoD information and pose an imminent threat to U.S. national security and economic security interests. DoD’s voluntary DIB CS/IA program enhances and supplements DIB participants’ capabilities to safeguard DoD information that resides on, or transits, DIB unclassified information systems.
Recommendation 30

We recommend that the National Security Council staff should manage an interagency process to review on a regular basis the activities of the US Government regarding attacks that exploit a previously unknown vulnerability in a computer application or system. These are often called “Zero Day” attacks because developers have had zero days to address and patch the vulnerability. US policy should generally move to ensure that Zero Days are quickly blocked, so that the underlying vulnerabilities are patched on US Government and other networks. In rare instances, US policy may briefly authorize using a Zero Day for high priority intelligence collection, following senior, interagency review involving all appropriate departments.
CFIUS opposition to Huawei acquisitions

Sale of 3Com to Huawei is derailed by U.S. security concerns
By Steven R. Weisman
Published: Thursday, February 21, 2008

Huawei Said to Lose Out on U.S. Assets Despite Higher Offers
By Serena Saitto and Jeffrey McCracken
Aug 3, 2010 12:57 AM ET

ASIAN BUSINESS NEWS
Huawei Drops U.S. Deal Amid Opposition
By SHAYNDI RAICE And ANDREW DOWELL
Updated Feb. 22, 2011 12:01 a.m. ET
DOD action on cyber intrusions: Safeguarding unclassified controlled technical information

Requirements:

- **Sub-contractor**
  - Requires contractors to flow down these requirements to all sub-contractors

- **Prime contractor**
  - Requires contractors with access to, or that store, “controlled technical information” to implement IT network security standards

- **DOD**
  - Requires contractors to report cyber incidents involving IT networks to DOD within 72 hours

Defense Federal Acquisition Regulation Supplement: Safeguarding Unclassified Controlled Technical Information (DFARS Case 2011-D039), Nov. 18, 2013
DOD action on supply chain protection: Requirements on supply chain risk

Defense Federal Acquisition Regulation Supplement: Requirements Relating to Supply Chain Risk (DFARS Case 2012-D050) [Interim Rule], Nov. 18, 2013

- DOD can apply the exclusion authority to contractor dealings with sub-contractors
- Exclusion applies to DOD prime contractors
- Authorizes DOD to exclude supply sources for IT technology in procurement relating to sensitive national security systems
DOD action on detection and avoidance of counterfeit electronic parts

Defense Federal Acquisition Regulation Supplement: Detection and Avoidance of Counterfeit Electronic Parts (DFARS Case 2012-D055), May 6, 2014

Contractors must flow down requirements to sub-contractors, including those providing COTS electronic parts.

Requires contractors to have systems to detect and avoid counterfeit electronic parts that use risk-based criteria, including use of original manufacturers.

DOD procurement subject to these rules, and DOD can use requirements to review contract compliance.
Legal dynamics for the supply chain

INTENSIFICATION OF LEGAL ACTIVITY ACROSS CODE & CONTRACTS

Code law
- Statutes
- Regulations
  - Defense Federal Acquisition Regulations Supplement (DFARS)

Contract law
- Government-prime contractor
  - Contract requirements flow-down
- Prime contractor-sub-contractor
  - Contract requirements flow-down

INTENSIFICATION OF LEGAL ACTIVITY AT EVERY LEVEL
Conclusion: Looking ahead at DOD/USG efforts to protect the cyber supply chain

- Key patterns:
  - Strengthen cybersecurity in procurement by balancing prescriptive rules (e.g., DFARS) with risk-based strategies (e.g., DOD shift to using NIST standards)
  - Create more harmonization across federal procurement to reduce “patchwork” of cybersecurity procurement policies and rules (e.g., Executive Order 13636 & DOD/GSA joint report)
  - Expanded and intensified role for, and impact of, law through the entire cyber supply chain (statutes → regulations → contracts → sub-contracts)
- Uncertainty about how new rules and strategies will affect the market for defense procurement (e.g., large contractors win; mid- to small-sized contractors struggle)
- How these developments affect USG/DOD interactions with foreign companies and governments is not clear
- More cybersecurity regulations for defense procurement and federal government procurement more generally are coming . . .