Statement of Dr. Stuart H. Starr

It should be noted that the findings and recommendations in the studies cited in this testimony represent the work of individual researchers and do not necessarily represent the view of the National Defense University, the Center of Technology and National Security Policy, or the Department of Defense.

Mr. Chairman, distinguished Committee members, ladies and gentlemen. I am pleased to have the opportunity today to address this Sub-Committee on the important topic of actions to enhance the use of commercial Information Technology (IT) in Department of Defense (DoD) systems. To explore that issue, the Center for Technology and National Security Policy (CTNSP), National Defense University (NDU), has pursued an aggressive IT study program over the past four years. We have conducted a structured set of nearly forty (40) coordinated activities that has leveraged the insights developed by the most creative members of government, industry, academia, and think tanks. I would like to submit for the record, a report that we have generated at CTNSP that summarizes the individual activities and captures the major findings and recommendations from those efforts (Reference 1).

Today, I would like to highlight key insights that we have derived from those efforts. As a foundation, I will set the stage by discussing the key attributes of commercial IT products. I will then identify six broad obstacles that impede DoD's ability to capture IT capabilities developed outside the traditional defense acquisition process. In order to overcome those obstacles, I will then identify a multi-step approach that leads to the adoption of a balanced package of initiatives. I will then conclude my remarks by identifying additional activities that are currently underway in CTNSP to redress residual issues.

A. Setting the Stage

The IT sector is one of the most dynamic elements in the world economy. It is characterized by extraordinary creativity, broad product diversity, and compressed time to market. Based on CTNSP's many IT-related studies, it is concluded that the successful injection of IT is critical if DoD is to accomplish the broad spectrum of missions that it must perform and maintain the technological lead that it enjoys against current and projected adversaries. However, it is becoming apparent that much IT technological innovation is occurring outside the DoD acquisition process. Thus, if DoD can not exploit commercial IT effectively, it will miss major opportunities to capitalize on those technological innovations. This is particularly troublesome because existing and potential adversaries (e.g., global terrorist organizations, transnational criminals) have full access to the IT technological innovations that are emerging from commercial industry.

From DoD's perspective, Commercial-off-the-Shelf (COTS) products represent an important subset of commercial IT. If DoD is able to exploit COTS products effectively, it has the potential to acquire systems, more rapidly, with fewer resources. However, if these benefits are to be realized by DoD, it is important to identify key IT products early in their life-cycle. Early identification provides the opportunity to add features that are vital to the DoD at reasonable cost while the product is still malleable. As a caveat, however, note that if a COTS product is modified during a DoD acquisition, it is generally not covered by warranties and may not be compatible with future versions of the commercial product.

B. Major Obstacles

Six broad classes of obstacles have been identified that impede DoD's ability to capture IT capabilities developed outside the traditional defense acquisition process. These obstacles revolve around the facts that DoD constitutes a market for commercial IT products that is **non-attractive, non-transparent, non-agile, non-dominant, and isolating**. Furthermore, DoD's ability to tap commercial IT is limited by the attitudes of the prime contractors and Lead System Integrators (LSIs) that acquire major defense systems. Each of these obstacles is identified and discussed below.

1. Non-Attractive. As part of CTNSP's IT activities, we sponsored a survey of commercial IT firms that infrequently do business with DoD (Reference 2). In that survey, the firms that currently do not business with DoD cited the following major reasons for their reluctance to enter the DoD market:

- "They don't know what they want"
- "The application/bid process takes too long"
- "DoD only deals with large companies"
- "Our products are not needed by DoD"
- "We do not want to work with DoD"
- "There are too many barriers to the bid process"

Similarly, DoD conducted a study to identify why commercial IT firms are reluctant to do business with DoD (Reference 3). That study concluded that non-traditional defense firms are reluctant to enter the defense market because of intellectual property rights (IPR) issues (e.g., small firms are extremely reluctant to cede IPR to the Government); the long development times associated with defense procurements; and the onerous cost accounting, auditing, and oversight requirements levied by the Government.

2. Non-Transparent. In the CTNSP-sponsored survey cited above (Reference 2), current DoD contractors explained why they perceive the current DoD policies, processes, and procedures to be opaque.

- They noted that the process is too difficult, too slow, and too confusing.
- They decried the limited information that is available to small business.
- They noted the lack of opportunity for firms that have not won prior contracts.
- They observed that it is desirable to ease the security clearance process.
- They stated that the current DoD acquisition process is an exclusionary one.
- They complained that they lacked clear information about Government contracting.

3. Non-Agile. The planning, programming, budgeting, execution (PPBE) system requires the participants to predict technology transitions 18 to 24 months in advance. However, the program manager community cannot always predict the pace of innovation two years in advance and funding may not be available for fast-moving projects that are ready for transition. Consequently, a desirable science and technology (S&T) project may stall for 18 to 24 months, waiting for funding. This gap is often referred to as the "valley of death".

4. Non-Dominant. In the 1960s, the DoD was the dominant player in the IT market place. However, that situation has changed dramatically over the last decade. As noted in the Manager's Guide to Technology Transfers in an Evolutionary Acquisition Environment (Reference 3), "DoD is unable to acquire IPR for commercially developed technology, as it has done for defense-funded technologies in the past, because DoD's financial involvement will be limited and its demand is not dominant compared with the worldwide commercial market."

5. Isolating Market. Rhetorically, the DoD R&D community employs the mantra: "adopt, adapt, and develop" (i.e., first try to adopt commercial technology; if that is inadequate, try to adapt commercial technology to meet military needs; if that fails, develop military-unique solutions). Although that mantra is quite reasonable, there is a tendency to focus on the reasons why adopt or adapt are inappropriate and to jump to the development of military-unique solutions. In reality, the commercial sector is beginning to develop significant IT capabilities for the commercial sector that are more readily extensible to the military sector.

6. Primes/LSIs. During the course of ancillary studies (Reference 4), the roles of primes and LSIs were assessed with respect to the adoption/adaptation of commercial IT. Three specific issues were identified that suggest that primes and LSIs may be a potential obstacle in this area. First, prime contractors may have a natural tendency to prefer internal technology because they can see the design and make it work. Second, prime contractors may have conflicting objectives about adopting technology from an outside provider. This can range from something as intangible as the "not invented here" syndrome to more tangible issues, such as displacing the prime contractor's revenue base. In addition, primes may also be concerned about complex issues, such as problems with the timeliness and compatibility of technologies built by outside organizations. However, it should be noted that many LSIs make extensive use of commercial IT in their programs.

C. Recommended Actions

To overcome these obstacles, CTNSP has identified a balanced mix of initiatives for DoD to pursue (Reference 5):

1. Enhance communications/organization. To enhance communications, “technology prospectors” should be created to conduct more focused searches and facilitate the injection of COTS products into DoD systems. Web portals should be created to coordinate the use of commercial IT and “acquisition guides” should be provided to smaller companies to help them navigate the DoD acquisition process. Consistent with those recommendations, a new organization has been created at JFCOM. That organization, known as the Office for Research & Technology Applications (ORTA), has taken preliminary steps to coordinate the use of commercial IT and support these activities. However, it is lacking in adequate resources and authorities to fully pursue those activities.

2. Increase resource flexibility. Provide Combatant Commands (COCOMs) the ability to generate procurements using a joint task force (JTF) for COCOMs (perhaps led by JFCOM and NORTHCOM), building on the limited acquisition authority model provided to JFCOM by USD(AT&L) (Reference 6). The precise organizational relationship for the JTF should be decided by DoD; however, one option might be to place it under the Joint Staff. The Defense Security Cooperation Agency (DSCA) model for procurement should be emulated vice the creation of a new major acquisition group. A bridging fund should be created to support the acquisition of key commercial IT products.

3. Reduce acquisition barriers. Meaningful measures could include changing DoD rules on IPR and increasing thresholds for applying a simplified acquisition process. In addition, other transaction authority (OTA) should be adopted as the approach for commercial IT R&D and procurement.

4. Promote cultural change. This is a difficult task that might begin with increasing DoD education and training for commercial IT development and procurement, providing incentives for program managers and LSIs to use COTS, and adapting GAO-recommended best practices to acquire commercial-component business systems. The Defense Acquisition University (DAU) and the Industrial College of the Armed Forces (ICAF) could play a major role in the area of community education.

5. Review testing. Evaluate expanding Underwriter Laboratory-style testbeds (for product evaluation) and expanding operational testbeds to evaluate the impact of the technology on mission effectiveness. This role could be played by a Systems Engineering and Integration (SE&I) organization that would deal with broad system-of-system issues. This organization might be resident at the Defense Information Systems Agency (DISA) with strong COCOM participation.

6. Adopt requirements for specific missions. Explore opportunities for commercial IT to support specific missions such as stabilization and reconstruction operations (SRO) and homeland security. These opportunities are discussed below.

D. On-Going Activities

There are several on-going activities at CTNSP that are addressing residual barriers to the effective use of commercial IT in DoD systems. These include the creative use of commercial IT to enhance SRO, the development of a theory of cyberpower, the challenges that the US faces in the evolution of the Internet, and role of the US government in the governance of R&D.

1. Employing Commercial IT to Enhance SRO. CTNSP is exploring opportunities to employ commercial IT to enhance SRO. To shed light on this major challenge, CTNSP has recently developed two key products. First, it has produced a policy paper entitled "I-Power: The Information Revolution and Stability Operations" (Reference 7). This paper includes a discussion of an information and communications technology (ICT) business model to guide the coordinated activities of the many participants in an SRO. Versions of this paper have been presented to several COCOMs, and it is serving to provide the framework for a serious dialogue on the issue. Second, working in partnership with the staff of the ASD(NII), "A Primer on ICT Support for Civil-Military Coordination in S&R and Disaster Relief Operations" has been completed (Reference 8). It characterizes the existing ICT architecture, formulates options to ameliorate ICT shortfalls, and captures community best practices. Both products are living documents that must be expanded and evolved to guide the changes in this critical area.

2. A Theory of Cyberpower. CTNSP is conducting a study of cyberpower to help understand the consequences of developments in cyber infrastructure, content, and institutions on the balance of power with potential adversaries of the US. In the absence of such a framework, the US potentially will pursue fragmented, ill-coordinated cyber initiatives in the technical, operational, legal, governance, and policy domains. The results of this study will serve to provide the intellectual underpinnings for coherent actions in this vital area. In particular, it will provide a framework in which to explore the appropriate balance between government and commercial actions in areas such as critical infrastructure protection.

3. Evolution of the Internet. CTNSP staff members have begun to focus on the challenges that the US faces in the evolution of the Internet. From technical and operational perspectives, these involve the actions that the U.S. must undertake to reduce the vulnerabilities of the Internet to adversary actions. From a governance perspective, new mechanisms are required to ensure that the Internet needs of other nations are addressed without compromising the national interests of the US.

4. Role of the US Government in the governance for R&D. Recently, staff members at CTNSP issued a report entitled, "The S&T Innovation Conundrum" (Reference 9). That report distinguished between two distinct phases in S&T innovation. These two phases can be captured by the descriptors "prospecting" (during which period no functional capability is generally produced) and "mining" (where rapid technical progress resulting in significant new functional capability is possible with the application of adequate financial and human capital). It is argued that the proper role for the government in R&D is to ensure the health of the "prospecting" phase of R&D. This role is crucial for long-term economic growth and military power, but it is not going to get done by the private sector. In order for the government to play this role successfully, it is vital that it be staffed with world class scientists and engineers.

E. Summary

It is widely recognized in the defense community that advances in IT are the key to transforming the military from an industrial age, platform-oriented force to an information age, net centric force. In support of that understanding, the IT program at

CTNSP has created an extraordinary intellectual reservoir that can help DoD navigate that transformation effectively and efficiently. The cumulative value of the CTNSP work has been to support four objectives: clarify the nature of the IT problem that DoD faces; identify the needs of the users of this technology; identify and recommend actions to enhance the injection of commercial IT into DoD systems; and explore innovative ways of employing IT to enhance the effectiveness of future US Government operations.

The IT program at CTNSP is notable for two key features. First, it has enlisted a multi-disciplinary set of the most knowledgeable and experienced members of the technology and national security policy communities. These complementary views have served to clarify the major technical issues and to explore the impact of those issues on national security. Second, it has resulted in the generation and dissemination of a broad set of peer-reviewed products that have shaped the discourse on this critical area in the defense community.

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