Background. The Navy Marine Corps Intranet (NMCI) project includes "thin clients" as a possible computing platform (CLIN0001). Despite the potential savings in acquisition and maintenance, acceptance of thin-client computing has met with general customer reluctance because of:

- Worries about application processing scalability
- Uncertainty about network throughput performance
- Lack of peripheral support (i.e. DVD, CDROM, cameras, printers, etc.)
- Concerns about centralized single points of failure.

Syzygy Technologies, Inc. has been researching **an alternative to "thin clients" that combines the system administrative savings of network-centric computing while still using the CPU processing power of a traditional PC.** Called the Diskless Integrated Stateless Client (DISC), the resulting architecture can address all the concerns for potential NMCI thin client users.

Syzygy has enhanced the current SPAWAR Systems Center, San Diego (SSC SD) Network-Centric Computing (NCC) technology to offer a cost effective, yet extremely flexible approach to equipping, administering, securing, and managing Navy networks, servers, and client computers.

Introduction. The standard model for most Navy computer installations is a Client-Server architecture using a personal computer or workstation client with a pre-loaded Operating System and application software. Commercial Total Cost of Ownership (TCO) estimates for *each* commercial personal computer range from $2,500 to $12,000 per year – ignoring the cost of the initial hardware.

The NMCI program is standardizing, and implementing centralized administration and management of Navy and Marine Corps network and computer resources specifically to reduce TCO. One rule of thumb for industry client-server system administration is one administrator for every 50-100 workstations. Because a typical command center may employ hundreds of computers, these costs in personnel, time, and budget dollars are significant and continuous. The commercial sector is discovering that Network-Centric Computing, using thin clients, can expand the number of clients per system administrator as much as ten-fold or 500 machines per administrator.

The DISC Network-Centric Computing architecture presents an opportunity to:

- Demonstrate a new, extremely flexible family of co-existing DISC-configured computers (PCs, laptops, tablets).
- Prototype low cost, high performance DISC architectures through integration of COTS components.
- Provide a technology path to extend the useful life of legacy PCs.
- Demonstrate a persistent "Mobile Desktop" smart card-based user mobility when accessing all types of LAN clients.
- Develop and demonstrate "stateless" PC clients, laptop and tablet clients using commercial hardware – including wireless versions.
- Show how these "stateless" clients can be immediately declassified, replaced, moved, and re-used by a new user at a different security level.
- Prototype mobile, secure, wireless "stateless" tablet computer clients.

Syzygy Technologies, Inc. has supported SSC SD Code 242 Navy network-centric, thin client research and development for over four years. This technology has been demonstrated in the SSC-SD NCC lab, onboard the USS Coronado command ship, and at other DoD command centers as part of exercises and R&D demonstrations (JWID and FBE).

Purpose. This abstract is a response by Syzygy to the Navy and Marine Corps Intranet Symposium Call for Papers and Presentations. Syzygy has developed a Beta prototype of what we have called the Flexible Network Centric Architecture (FNCA) using the DISC technology. *We propose to host a breakout session at the NMCI Symposium to demonstrate several innovative and cost saving approaches for the Next Generation NMCI.*

The proposed Breakout Session will introduce a network-centric architecture that:

- Provides a flexible range of client capabilities (ultra-thin to fat), yet is hardware vendor independent.
- Enables users to positively identify themselves with smart card log-in technology.
- Supports secure network-based multi-security levels for wired and wireless thin clients.
- Provides users the ability to re-establish their desktop on any type of client across a LAN.

- Supports dramatic reductions in TCO by centralized administration of Operating Systems (OS), software applications, and database files.
- Provides DISC desktop, laptop and tablet computers that can be rapidly re-configured and re-used at a new security level, different location, in a new work group, or by a new user.

Discussion. Upgrades in either hardware or software for thousands of PC users can be a system administrator's nightmare. New application software, vendor security patches, or upgrades have to be "pushed" to, or manually installed in each client. Distribution of the incorrect software or patches requires administrative changes to each and every client computer. Using DISC, OS changes, new application software, or patches to existing user software are made once at the server level.

Syzygy has demonstrated that a balance of centralized OS and application management, and local computer client processing of compute intensive applications (multi-media, imagery, graphics design) can be achieved. **Thousands of Navy PCs can be converted to operate within this architecture – extending their use by years.** Personal computers have their place with power users. The DISC C4ISR architecture preserves a role for them, but provides *new choices for cost savings using a family of thin clients – where they make sense.*

The DISC hybrid thin client technology can work with legacy NMCI and IT-21 systems, and is highly flexible and configurable. It provides a path for the Navy to significantly reduce the cost of installation, configuration, administration and maintenance of large networked computer architectures.