

Increased Network Tolerance to Cyber Attacks through DTN

NDP Research – Tech Note

September 2010 – Rev A

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Tech Note Number	NDP-TN-102
Problem	As the network edge extends further away from fixed infrastructures, IP-based networks can become ineffective due to end-to-end connectivity and acknowledgment expectations. This problem affects terrestrially networks with highly mobile assets and directional communications, and space assets especially as we extend past Earth orbits to Lunar and Martian assets. Delay (or Disruption) Tolerant Networking (DTN), though still experimental, is designed to better handle the dynamic nature and intermittent connectivity of network nodes. Many opportunities exist to mature DTN and to apply DTN to solve current problems in networking.
Opportunity	An information system under a cyber attack exhibits many of the problems that DTN is intended to address. Individual nodes or connections may be nonfunctional or dysfunctional as a result of the attack. Some nodes could be functional, but compromised. The availability of nodes or connections may change frequently. All of these symptoms of a cyber attack are design considerations for DTN. We suggest research toward the identification and demonstration of the mitigation of cyber attacks by routing critical data using DTN.
Core Technology	The opportunity leverages advanced networking protocols, traffic management algorithms, and routing algorithms to provide robust, attack resistant networks for mission critical data.
Benefit	Fall-back to DTN for mission critical data improves usefulness of systems under cyber attack, providing an advantage to our warfighters.
Market	DoD for hardening of weapons systems and C4ISR systems.
Technology	2. Technology concept and/or application formulated.
Readiness Level	
Keywords	cybersecurity, self-healing networks, DTN.

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