[1] A. Bavier, L. Peterson, J. Brassil, R. McGeer, D. Reed, P. Sharma, P. Yalagandula, A. Henderson, L. Roberts, S. Schwab, R. Thomas, E. Wu, B. Mark, B. Zhao, and A. Joseph. Increasing TCP throughput with an enhanced internet control plane. In *Military Communications Conference (MILCOM)*, pages 1-7, October 2006. [bib | DOI]

CHART seeks to improve the performance of operational DoD Internets through the introduction of an intelligent network overlay. TCP performance-particularly between CONUS and forward-deployed components located in combat theaters-can be severely degraded due to high loss rates and long latencies. The lack of current information about network conditions in the core NIPR-net/SIPRnet further compounds the problem, because end hosts lack the data required to make intelligent routing decisions. Deploying CHART'S enhanced control plane improves measurement and monitoring of unreliable communication links to provide current network state information to routers implemented in both software and hardware, enabling intelligent routing around faulty links. We describe the design of software and hardware routers sharing a common network 'sensing' infrastructure, the implementation of end-to-end quality of service via flow state aware routers, and a new network-aware TCP/IP stack for Linux end systems. Performance test results demonstrate that bulk file transfer throughput can be increased by as much as an order of magnitude in networks with severely impaired communication links

Keywords: Internet, Linux, quality of service, routing protocols, transport protocolsCHART, CONUS, Internet control plane, Linux end system, TCP performance, file transfer, high-throughput adaptive resilient transport control, intelligent routing, quality of service, transport control protocol

[2] R. Carl, K. Swanson, J. Bonney, and B. Trent. Transport protocols in the tactical network environment. In *The IEEE Aerospace Conference*, pages 1-9, March 2007. [bib | DOI]

The shift to network centric warfare highlights the deficiencies of existing reliable transport protocols in tactical network environments. Existing transports are designed upon a set of assumptions that are violated by noisy, wireless tactical networks where end-to-end encryption and authentication must be maintained. Protocols such as TCP that are designed for low-corruptive-loss environments provide abysmal performance when deployed in tactical network environments. TCP adaptations that address corruptive loss rates generally violate tactical-network security requirements. As part of a DARPA-funded effort to dramatically improve reliable-transport performance in tactical network environments, Architecture Technology Corporation (ATC) has analyzed the tactical network environment and has examined the behavior of various reliable transport protocols within such environments.

Keywords: military communication, telecommunication network reliability, transport protocolsTCP, architecture technology corporation, corruptive loss rates, network centric warfare, reliable transport protocols, tactical network environment, transport protocols, wireless tactical networks

[3] E. Guttman. Autoconfiguration for IP networking: enabling local communication. *IEEE Internet Computing*, 5(3):81-86, May/June 2001. [bib | DOI]

IP hosts and network infrastructure have historically been difficult to configure, but emerging networking protocols promise to enable hosts to establish IP networks without prior configuration or network services. Even very simple devices with few computing resources will be able to communicate via standard protocols wherever they are attached. Current IETF (Internet Engineering Task Force) standardization efforts, such as those in the Zeroconf Working Group, aim to make this form of networking simple and inexpensive. In this tutorial, I examine the background, current status and future prospects for zero-configuration networking

Keywords: Internet, computer network management, local area networks, transport protocolsIETF Zeroconf Working Group, IETF standardization efforts, IP hosts, IP network infrastructure, IP networking, Internet Engineering Task Force, Internet Protocol, autoconfiguration, computing resources, local communication, networking protocols, zero-configuration networking

[4] B. L. Mark, S. Zhang, R. McGeer, J. Brassil, P. Sharma, and P. Yalagandula. Performance of an adaptive routing overlay under dynamic link impairments. In *Military Communications Conference (MILCOM)*, pages 1-7, October 2007. [bib | DOI]

We propose an adaptive software routing overlay to improve the performance of TCP/IP-based internets over links with dynamic impairments. The routing overlay adaptively distributes traffic over a set of alternative paths based on real-time link status information provided by a system of network sensors. The routing overlay also provides explicit rate feedback to rate-aware TCP clients, allowing them to achieve higher throughputs than legacy clients under static link loss and delay impairments. We present performance results from a collection of Emulab experiments on simple network topologies with dynamic link impairments. The results show that the adaptive routing overlay achieves significantly higher bulk file transfer throughput than legacy systems in the presence of link impairments. Sensor-based adaptive routing provides substantial gains in TCP throughput even for legacy TCP clients. When rate-aware TCP clients are used, the performance gain of the adaptive routing overlay with respect to legacy systems improves dramatically.
