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**Title**

WideBand Corporation: Modular, Rapid, Common Hardware-in-the-loop Framework Development

**Description and Anticipated Benefits**

Fast, accurate testing and simulation is critical to the Department of Defense's ability to develop and produce the weapon systems. Latency issues in current hardware-in-the-loop (HWIL) testing environments can invalidate tests, wasting resources and potentially delaying release of weapon systems.

**WLLN TOPOLOGY**

WideBand Low Latency Networking (WLLN) consists of multiple nodes connected together through a central network Concentrator. The Concentrator accepts data packets from each node and combines the packets into concentrated data streams known as WideCast channels. These WideCast channels are then made available to every node on the WideBand network. Each node has the responsibility to examine network headers and accept only the data packets they are interested in.

This architecture makes it unnecessary for the Concentrator to wait for the receipt and decoding of a destination network address before beginning the process of forwarding data. This results in two key benefits. First, the port-to-port latency of the Concentrator can be very low. If the design goal of 20ns can be reached, it will be roughly equivalent to the latency added by a 4 meter cable. Second, the complexity of the Concentrator as the central switching device can be greatly reduced. This means that it will require little or no configuration and management in order to operate with optimal performance.

The Concentrator is designed to operate independent of a specific network protocol. However, because of the

ease of use and overall market acceptance of Ethernet, it has been selected as the suggested network protocol to be supported by nodes on the WideBand network. In fact, standard 10GbE devices should be able to connect directly to a single WideCast channel and enjoy some of the benefits of WLLN.

#### WIDECAST CHANNELS

It is a well known issue that bursty traffic on a network will cause latency and jitter for streaming data that shares the same bandwidth. Complex QoS rules are only a partial solution because they can only dampen variations in latency caused by other traffic. This is why the WideCast channels are implemented physically independent of each other. The most latency critical and bandwidth intensive data streams can be put on their own WideCast channels for the best possible performance.

#### WIDEBAND FOR HWIL ENVIRONMENTS

In the Hardware-in-the-Loop test environment, it is critical to have a communication core architecture with high speed, minimal latency, and low jitter. By utilizing WideBand as the Core technology, several key factors can be useful to improve testing results:

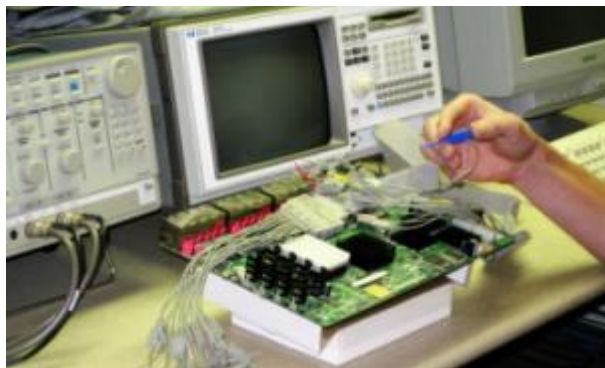
- Data Rate – 40 Gbps full-duplex (80 Gbps total) over four channels on each link
- Latency – Minimal end-to-end delay using immediate forwarding characteristics
- Traffic Separation – Traffic jitter can be reduced using WideCast channels

#### COMPANY PROFILE

WideBand Corporation is the leading US based manufacturer of high performance, low latency network solutions. Nano-latency networking technology is considered to be the next major step in technology that will make a visual impact on network performance. Market segments to be impacted by the new technology include streaming audio/video, situational awareness acquisition and the development of firing solutions. In these time critical applications, delays in data transmission caused by each active network element in the system can result in serious consequences. Nano-latency products promise to make meaningful improvements in performance for these mission critical applications. WideBand Corporation is the industry leader in this new emerging technology with two foundation patents and a series of high performance products already commercially developed.

WideBand specializes in solving tough networking problems with customized hardware solutions, providing reliable, supportable platforms for mission critical applications. WideBand Low Latency Networking (WLLN) is setting a new standard in Nano-latency data communications and enabling response times heretofore unprecedented in the industry. WideBand also has close alliances with industry security leader GoldKey, which provides hardware-based authentication and encryption technology for sensitive data transmission and storage to WideBand networking products. Customers include the Fortune 500, the US Military, Universities, and many others.

More information is available at <http://www.wband.com>



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