The Battle in the VME Backplane Arena

By Justin Moll

The VME arena will set the stage for some interesting battles this year. During the telecom heyday, several backplane vendors virtually abandoned the VME and COTS/military worlds to aggressively chase the high-growth markets. Now that the party is over, several have been scrambling to hop back in the VME fray. Many in the embedded computing industry are realizing the stability of servicing architectures like VME and its inherent rewards. This is good news for the end customers. We are bound to see more competition, more choice, and some price pressure – at least for the near term. But, high-growth pressures and stock valuations based on growth will push companies towards more aggressive markets when the economy comes back and a hot market emerges.

As stable and seemingly mundane as the VME market is, the community has done a solid job in keeping up with performance demands. It helps that VME has traditionally been dominant in military/aerospace and industrial control applications, where lightning speed is not often a major consideration. However, VME does service to a lesser degree medical, communications, and other applications. In general, the shared bus technologies are struggling to keep up with the bandwidth demands in these areas. Where can we expect the VMEbus to remain strong for the next few years and where will the new technologies be needed the most?

Let's look at the industries where VME has a stronghold. There is not a dire outcry in industrial control and instrumentation applications for significant bandwidth increases at this time. There are inherent reliability advantages in the new switched fabrics that can benefit nearly all applications, but from a cost and compatibility standpoint, many VME applications are doing just fine – for now. Several control applications in military/aerospace also are not screaming for bandwidth. Those that need higher performance have taken advantage of shared-bus upgrades. Advances like the VME64x increased backplane performance (which is the traditional bottleneck in the system) from 80 Mbytes/sec to 160 Mbytes/sec, and the VME320, which is fully compatible to the ANSI/VITA 1.1-1997 specification of VME64x, has hit rates of nearly 700 Mbytes/sec with two edge source synchronous transfer (2eSST) technology.

Of course, there are communications-based along with other applications in military/aerospace that have run out of bandwidth with VME. For these applications, the technologies that are open standards, build upon existing (or well-known) technologies, and preserve hardware and software investments have a strong chance of doing well. Technologies like StarFabric in its compatibility with CompactPCI (and now VME with VITA 41.5), the VME320, and Raceway have all helped boost bandwidth. The VME Renaissance continues to push VME into higher performance. With Motorola's Tempe chip for the 2eSST protocol and the VXS backplane (VITA 41), there is a continuing drive to preserve VME investments while boosting performance. The VXS backplane will allow fabrics such as StarFabric (and in the future PCI Express Advanced Switching), InfiniBand, and RapidIO to run across the P0 portion of a new VME64x-type backplane. The standard VME64x parallel bus can run across P1 and P2, with new switch cards running the fabric across the P0 high-speed plane. Gigabit Ethernet over VME64x (VITA 31.1) may also be intriguing to the industry.

As processing power increases, systems will need to dissipate more heat caused by higher and higher wattage. They will need to do so in smaller amounts of space, leaving less room for conventional cooling techniques. VITA 34 is an effort to develop a high-performance system in a range of applications. The new 220mm x 4U and 8U (and maybe now 6U) cards may be encased in metal, which allows advanced shielding and provides a housing for liquid cooling. In the future, liquid cooling may be the most feasible way to dissipate tremendous heat build-up. By focusing on issues like hot-swappability, system management, etc., the VME world is positioning itself to be conducive to communications applications. So, when the industry bounces back, perhaps those backplane/chassis vendors won't have to leave the VME community again to chase the hot markets.

Justin Moll *is the Marketing Manager for Bustronic and Manager of Public Relations for Elma.*

For more information, Justin can be contacted at:

Bustronic/Elma
Tel: 510-490-7388
E-mail: jmoll@bustronic.com
Web site: www.bustronic.com

Reprinted from ***VMEbus Systems*** */ April 2003*