Processor Board Trends to Look for in 2003

By Stewart Dewar, Product Marketing Manager

As it does each year, the *VMEbus Systems* Buyer's Guide illustrates the tremendous breadth of technology available in the VME format. In the past year, the VMEbus community has seen a stream of innovative new products on many fronts. Processor frequencies, a popular measure of technological progress, now range up to 1 GHz and beyond for two of the major processor architectures, Pentium and PowerPC, with others to follow. The range of processors is greater than ever, ranging from mature 68K architecture to mainstream Pentium/x86, PowerPC, and SPARC offerings to more specialized products offering MIPS, StrongARM, and others.

The success of VME is underpinned by open standards that ensure interoperability in a multi-vendor environment. The VME International Trade Association (VITA) continues to develop new standards that enable VME manufacturers and users to exploit advances in component technologies. Examples include VITA 31/31.1, which provides an optimized P0 pin-out mapping for high-speed serial interfaces such as Gigabit Ethernet, and VITA 39, which defines a backward-compatible change to the PMC specification allowing it to function in PCI-X mode. New standards like these are critical to the future success of the VME industry.

The major development that the VME community has begun to deal with – and will doubtless be engaged with for some time – is how to weave serial switch-fabric technology into VME systems. StarFabric has seen early acceptance in VME systems as a PMC add-on technology, in part on the strength that the 622 Mbits/sec StarFabric signals can operate reliably over standard VME64x and CompactPCI connector types and through standard CAT5 cabling. PMCs provide users with StarFabric data pipes with a theoretical throughput of up to 1 Gbyte/sec – a rate that in practice means actual throughput will be limited by the internal architecture of the base card. However, the holy grail is the incorporation of a means to carry the chorus of serial switch fabrics which signal at 2.5 Gbits/sec and beyond – the primary ones of interest being Serial RapidIO, PCI Express, InfiniBand, and 10 Gigabit Ethernet.

To that end, the VITA 41 initiative aims to define a modified VMEbus standard incorporating a P0 connector different from the existing 2mm 95-way P0 connector that's part of the VME64x connector set. The new connector has electrical characteristics that allow it to carry signals of up to 10 Gbits/sec – which as a serial switch-fabric interface running over the new P0 connector can move bulk data between adjacent cards (possibly aided by a switch card) or to nearby systems. The traditional VMEbus interface on VITA 41-compliant cards would be used to communicate real-time control data, either to other VITA 41 cards or to VME64x cards in a mixed backplane environment. Proposed VITA 41 standards allow users to take advantage of the enormous data throughput achieved with switch-fabric interfaces (250 Mbytes/sec per signal pair at 2.5 Gbits/sec) while preserving investments in existing VMEbus hardware, software, and know-how.

Of course, establishing a physical interconnection scheme capable of carrying a serial switch fabric is only part of the solution. Which switch fabric to carry? To date, all backplane standardization initiatives targeting switch fabrics, such as VITA 34, PICMG 3.0, and most recently, VITA 41, allow for a family of subsidiary standards that define the backplane mapping for different switch fabrics. Yet a given system needs to be based on a specific fabric and market forces will work to produce one de facto standard. The bus war that will begin in 2003 is over which serial switch fabric will become the standard adjunct bus for VME. For users in defense/aerospace sensor data processing and medical imaging who look to be early adopters of switch fabrics as adjuncts to VME, 2003 promises to be an interesting time.

Nowhere is VME more dominant than in defense/aerospace applications. Here constant product evolution is the order of the day. For the harsher environment applications where PowerPC solutions are used extensively, processor boards with Motorola's MPC7410 processor are the current norm with single, dual, and quad-processor options available. In 2003, users can look forward to availability of high-performance processor boards based on Motorola's PPC7455 AltiVec-enabled G4 processor.

The spaced-constrained environment typical of harsh-environment defense/aerospace computing puts a premium on highly integrated boards. These boards bump up against the number of available I/O pins, even with the current VME64x 5-row P1 and P2 connectors and a 95-pin P0 connector. Look for vendors to offer more pin-outs as the inherent I/O capability that can be placed on the board outstrips pin availability. The growing imperative to add a serial switch fabric adjunct bus will only increase this challenge. While VITA 41 will address the needs of less I/O-constrained applications, will there need to be a "VITA 4X" standard more appropriate to defense/aerospace embedded computing? Time will tell.

Overall, this year's Buyer's Guide shows that manufacturers are evolving their products to offer VME users new technology benefits on one of the longest surviving and successful bus standards in history – the VMEbus.

If your company is not included in our Buyer's Guide, please let us know. E-mail your data sheet to sales@opensystems-publishing.com.

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Processors

Company	Web Site	680X0	Alpha	Celeron	Coldfire	i960	K5/K6	MIPS	Other	Pentium	PowerPC	Socket 370	Socket 7	SPARC	Special Purpose	x86	Video
Acquisition Technology B.V.	www.acq.nl	•							•								
Acroamatics Telemetry Systems	www.acroamatics.com														•		
ACTIS Computer	www.actis-computer.com										•						
Adaptive Solutions, Inc.	www.adaptsol.com								•								
Aeon Systems, Inc.	www.aeons.com		•														
Aerotech World Trade Ltd.	www.aerotechusa.com	•															
Aitech Defense Systems, Inc.	www.rugged.com	•									•						
American ELTEC, Inc.	www.eltec.de	•								•		•					
Annapolis Micro Systems, Inc.	www.annapmicro.com														•		
AppTech, Inc.	www.apptechin.com	•			•												
Artesyn Communication Products, Inc.	www.artesyncp.com	•									•						
ATM Computer GmbH	www.atm-computer.de	•															
BI RA Systems, Inc.	www.bira.com								•								
BVM Ltd.	www.bvmltd.co.uk	•															
BWI	www.bwi.com	•															
Communications Automation Corporation	www.cacdsp.com								•								
Computer Modules, Inc.	www.compmod.com			•						•							
Concurrent Technologies, Inc.	www.gocct.com	•		•						•	•						
Creative Electronic Systems	www.ces.ch										•						
DENSAN Systems, Inc.	www.densan.com	•						•	•	•	•						
DNA Computing Solutions	www.dna-cs.com										•						
Dy 4 Systems	www.dy4.com										•						
Dynatem, Inc.	www.dynatem.com	•							•	•	•						
EKF-ELECTRONIK GmbH	www.ekf.de	•															
ELTEK Electronik AG	www.eltec.de										•						
Force Computers, Inc.	www.forcecomputers.com		•								•			•			
General Micro Systems, Inc.	www.gms4sbc.com	•								•	•						•
Harris Computer	www.ht.com.au										•						
Instrumentation Technology Systems	www.itsamerica.com																•
Interactive Circuits & Systems Ltd. (ICS)	www.icselect.com								•								
ISP Technologies	www.isptechinc.com										•						
Janz Automations Systeme AG	www.janzag.de	•								•							
Kontron	www.kontron.com	•							•	•	•						
MAX Technologies, Inc.	www.maxt.com								•								
Maxwell Technologies	www.maxwell.com															•	
Men Mikro Elektronik GmbH	www.menmicro.com	•							•		•						
Mercury Computer Systems, Inc.	www.mc.com										•						
Microsys GmbH	www.microsys.de										•						
Momentum Computer, Inc.	www.momenco.com										•			•			
Motorola Computer Group	www.motorola.com/computers	•							•		•						
N.A.T. GmbH	www.nateurope.com										•						
Octec Ltd.	www.octec.com																•
Omnibyte Corporation	www.omnibyte.com	•									•						
Orion Technologies Inc.	www.otisolutions.com										•						
Ovation Systems Ltd.	www.ovation.co.uk/index.html															•	
Pentek, Inc.	www.pentek.com	•								•	•						
Philips Automation Systems	www.phillips-origen.com	•														•	
Primagraphics	www.primago.co.uk																•
RadiSys Corporation	www.radisys.com									•						•	
Radstone Technology Corporation	www.radstone.co.uk										•						
Sanritz Automation	www.sanritz.co.jp						•										
SBS Technologies, Inc.	www.sbs.com			•						•	•	•	•				
SEAKR Engineering, Inc.	www.seakr.com										•						
SKY Computers, Inc.	www.skycomputers.com					•					•						
Space Electronics (Maxwell Technologies, Inc.)	www.maxwell.com													•			

Processors

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Spectrum Signal Processing	www.spectrumsignal.com								•								
Sun Microsystems, Inc.	www.sun.com													•			
Synergy Microsystems, Inc.	www.synergymicro.com	•									•						
Technobox, Inc.	www.technobox.com										•					•	
Technoland, Inc.	www.technoland.com									•							
TEKELEC Systems	www.tekelec.com								•								
Thales Computers	www.thalescomputers.com	•								•	•						
Themis Computer	www.themis.com													•			
Titan Corporation	www.titan.com								•							•	
Transtech DSP	www.transtech-dsp.com										•						
Tundra Semiconductor Corporation	www.tundra.com	•															
VISTA Controls Corporation, a Curtiss-Wright company	www.vistacontrols.com										•	•					
VMIC	www.vmic.com	•		•						•		•					
Voiceboard Corporation	www.voiceboard.com										•						
Xycom Automation	www.xycom.com			•			•			•						•	

PROCESSORS – PENTIUM

PROCESSORS – POWERPC