

GUEST EDITORIAL

Woes of CompactPCI

By Shane McKinney



Shane McKinney is in the engineering group of Alliance Systems and is responsible for CompactPCI engineering and integration. Shane can be contacted at shane.mckinney@alliancesystems.com.

As with any new technology, there is an inevitable window of time between its proprietary beginning and when it becomes the prevailing standard which turns a technology into a growth market. CompactPCI finds itself approaching this window where most manufacturers, software vendors, and users can only agree 70% of the time for 70% of the standards. The many obstacles and challenges of being a CompactPCI provider can include issues with operating system support, device driver compatibility, applications, standards compliance testing, and marketing to name a few. There are still many CompactPCI manufacturers willing to design their own solutions and hope that they can either create a niche market or leverage their design into a PICMG CompactPCI specification. This situation is one of many problems that create challenges for CompactPCI integrators, application software vendors, telephony blade manufacturers, and customers. These groups and many others find themselves on the front line of leading (bleeding) edge CompactPCI technology.

The real world

A forward-looking organization made up of the most influential computing technology companies wants to expand their market for new technology, and so they form a standards groups with the grand purpose of creating a platform of total interoperability with market acceptance and growth in mind. Industry proponents and manufactures adhere to the specifications clearly defined by the organization. Engineers and programmers easily code applications that seamlessly inter-operate with leading operating systems and third party card device drivers for use with the new standard. In theory, all this synergistic activity attracts companies ready to invest heavily into turnkey systems that are in demand. That may be the vision, but in actuality the real process bears little resemblance to the ideal. In reality, technology facilitators are necessary to complete the vision; they are the ones who are willing to make the technology work.

Alliance Systems is a leading integrator in the growing high availability market. This has prepared Alliance Systems for the

considerable challenges involved in helping to make a new technology like CompactPCI work in the Computer Telephony market. CompactPCI is developing rapidly in response to an ever growing need to make computers more reliable, higher capacity, and achieve greater scalability. This has been the wish of the CT industry for years and CompactPCI seems perfectly positioned to fill the need. However, it takes more than a standards body and a few industry leaders to turn a technology into a lucrative market. One group in the CompactPCI community that has perhaps the greatest impact on the end product is the value-added integrator. Integrators are the glue that holds platform manufacturers, OS vendors, and DSP card manufacturers (i.e. Dialogic/Intel, NMS, AudioCodes) together while supporting software companies and their applications. Because of the many obstacles in implementing a complex solution in the real world, successful integration is essential to CompactPCI's success.

What follows is a summary of the most visible woes.

Operating systems

Knowing what operating system to choose depends on many factors such as performance, device driver support, CompactPCI platform support (high availability), and application requirements. In the industrial PC market, the OS for which the application was coded, compiled, and tested was usually the only major concern in choosing the platform. In CompactPCI, there

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are other issues, e.g. high availability. The PICMG 2.1 specification defines hot swap in CompactPCI. But what about hot-swap CPU's for HA (high availability) architecture? HA in CompactPCI is generally accepted as a pseudonym for a redundant system CPU architecture where automatic CPU fail-over can occur based upon a defined set of alarms. This action is mostly transparent to the application, thus greatly increasing MTBI (Mean Time Between Interruption) of the application.

The promise of five 9's of redundancy (99.999%) and beyond is a critical feature in selling CompactPCI over the mass adoption and low cost of Industrial PC solutions. Also, in addition to advanced (and currently proprietary) hardware requirements, high availability has a software component in the Operating System. This situation may increase time to market for products stemming from uncertainty between software developers and CompactPCI platform vendors as to what OS to choose. Other CompactPCI configurations can include multiple CPU's arranged in a cluster or as peripheral processors, which may also alter software requirements.

Device drivers

Device drivers for computer telephony components have a huge impact on an integrator's ability to offer CTI solutions to the CompactPCI market. Specification compliance between manufacturers is essential towards the adoption of CompactPCI in any market just as the adoption of PCI has been for industrial PCs. There have been Computer Telephony companies slow to develop comprehensive CompactPCI support into their product line. This non-compliance between vendors and technologies will further confuse the software developer when deciding what to choose in a CompactPCI platform. If CompactPCI is the future of Computer Telephony and industrial computing in general, vendors must make every effort to achieve and maintain the latest standards defined by the industry.

Applications

Vaporware is an issue in CompactPCI as software engineers cook up exciting but untested code that cannot be relied upon as a finished product. Other times, companies announce the emergence of a solutions based on CompactPCI but with no customers lined up to buy it. Because of CompactPCI's standards-based architecture, the time to market for applications should be reduced. Software vendors may feel pressure to accelerate product releases, thus reducing the number of CompactPCI platforms upon which they will develop. Since many CompactPCI hardware suppliers may only casually conform to some specifications, multiple platform testing needs to occur at some level to insure the greatest level of compatibility. Software vendors or integrators should make an effort to select CompactPCI platforms that most closely conform to the core approved CompactPCI specifications. The inevitable failure of some software vendors as they become associated with CompactPCI and immature technologies such as high availability may enhance the industry perception of CompactPCI as a not-ready-for-prime-time platform.

Standards

PICMG is the standards body that arbitrates which CompactPCI specifications will be adopted and published as a standard. Of course, this organization is made up of industry suppliers who believe in the CompactPCI standard. But many members are also competitors who have an interest in what standards are adopted, what technology will be left as user definable, and how closely each competitor's proprietary solution ends up being to the implemented standard. For example, one company may stand to lose valuable research and development time if their implementation of PICMG 2.6 (IP Backplane for CompactPCI) is radically different from the eventual adopted standard. How

long should they wait on specification adoption to offer that solution to their customers? Might this company just decide to keep their technology intact and sell it as a proprietary solution rather than change it? If other companies decide to follow, what use would having a standard be anyway? A possible danger is that the market might not be loyal to companies that utilize CompactPCI standards, but rather to particular companies and their proprietary product that works and was ready prior to PICMG publishing a standard for a similar technology. This example underlines the more basic questions that many manufacturers, software makers, integrators, and end users have about CompactPCI standards:

- Who decides what's important?
- How do they do it?
- What is the future of (insert pending standard here, e.g. high availability)?

This type of uncertainty has rendered other standards organizations ineffective with an example being JEDEC and their latest efforts to develop industry specifications for newer generations of SDRAM.

Testing

Testing is a key component to validating the expectations of CompactPCI's reliability. Sales organizations will quote four, five, or more 9's of reliability but how are these figures arrived at? There are ways to determine component level MTBF (Mean Time Before Failure) based on accelerated test methodology but customers just want to know how long they can expect their application to run. Verifying availability, reliability, and serviceability are typically the most overlooked aspects to the PC industry and they will certainly be an issue to contend with as CompactPCI continues to challenge the traditional PBX and other equipment in CT. Test standards for switches? Well since they were developed internally by each company with their own proprietary technology, test methodology and functionality verification were tailor made for a few specific configurations. When the PC industry began to take hold of the CT market, testing and verification became a more difficult prospect as the multitude of PC configurations made finding PC standards based test solutions scarce. Large PC vendors could develop test verification for individual configurations due to their high volume but, in general, most value added integrators don't have the resources to produce comprehensive test and verification solutions for individual industrial PC applications. This may also be an issue in CompactPCI as more players get into the game to create an "off the shelf" approach to CompactPCI components; test and verification solutions for CompactPCI systems will become scarce. CompactPCI system vendors must be diligent in finding best of breed CompactPCI platform components and encourage those manufactures to provide test and verification software or hardware so that the industry will have a better opportunity to create testing solutions. Only then will consumers be given evidence that their applications will stay up 99.999% of the time using a CompactPCI platform.

Marketing

CompactPCI marketing has a difficult task of being both a new technology, trying to sell customers on the potential of a new

platform as well as serving the traditional role of presenting their company's story and the specifics of their solutions. For better or worse, individual marketing departments in the CompactPCI community have perhaps the greatest impact on the consumer's perception of CompactPCI. Their technical knowledge and communication strategy will create a lasting impression in the minds of CTI technicians and CTO's who are contemplating the move from private branch exchange switches or industrial PCs to CompactPCI. The message of the benefits of CompactPCI should include the following:

- The advantages of open, standards based architecture in creating a solution that can be widely adopted by multiple vendors will insure interoperability, greater configuration options, improved testing and verification, quicker time to market, mass market appeal and competitive pricing
- The increase in system reliability (MTBF and MTBI) with applications such as high availability and quicker repair time (MTBR) with front loading hot-swap components
- Scalable platforms for multiple applications, densities, configurations (e.g. resource sharing applications like CPU clustering)

In the trenches

The most difficult role in the emergence of CompactPCI belongs to the integrators. These are companies that are all at once: VAR's, consultants, distributors, services and technical support organizations, and whatever else is necessary to create a channel for integrated systems. Software vendors need integrators because they don't want to be in the hardware business. Hardware manufacturers need integrators because they may not want to go out and locate, test, and sell applications that work on their systems. Software companies need integrators because they want a turnkey solution and a single point of contact for sales and support. Integration can involve all of the woes of CompactPCI in a single effort and require a unique group of individuals to overcome obstacles in the trenches of CompactPCI. Some examples include:

- Skilled engineers must learn many new technologies and installation procedures during the production of integrated systems
- Technical engineers are relied upon for system design, product evaluation, and specification confirmation while

working with CompactPCI blade manufactures as both consumer advocate and product test engineers

- System engineers will often work with application designers debugging or beta testing code and developing verification processes for complete solutions
- Members of technical support organizations who must often troubleshoot issues based on "bleeding edge" technology while the technical service organizations are asked to produce accurate manuals, technical documentation, and relevant training on a wide range of subjects surrounding the industry.
- Marketing departments that must be technically savvy while maintaining a healthy imagination in communicating the future vision of a CTI market that could exceed 6 billion dollars by 2004
- Finally, an experienced sales organization that can balance the end user's desire with the reality of what is possible completes the complex biology of the CompactPCI integration company

If these companies do not succeed in bringing together the many groups involved in creating a viable CompactPCI product, then many of the strengths of CompactPCI will be lost. Only if the model succeeds and CompactPCI is widely adopted will it become the force for which it was designed: the ultimate computing platform.

For more information, contact:

Alliance Systems, Inc.

3001 Summit Avenue, Suite 400

Plano, TX 75074

Tel: 972-633-3400 • Fax: 972-633-3499

Web site: www.alliancesystems.com.

Alliance Systems, Inc. is a global leader in providing communication infrastructure solutions for traditional, and next-generation networks. The Company designs, develops, and manufactures communication platform products that enable voice communication applications such as network signaling, switching, unified messaging and Voice over Internet Protocol (VoIP). In addition, the Company provides service solutions including consultation, implementation, training, after-sales support, maintenance, and warranty options for its entire line of products.