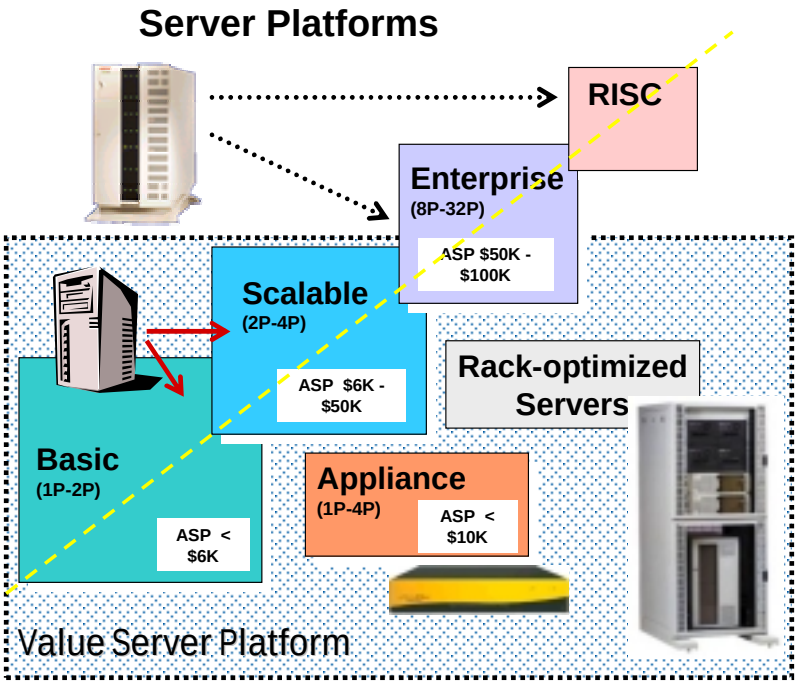
VIA VPX I/O Expansion Technology

Introduction

The growth of the Internet into our businesses, homes, and lives has placed a tremendous burden upon the server market. Traditionally, the addition of large RISC based servers to existing server clusters was utilized to help support the massive growth of connected users. In recent years, however, the lower cost and competitive performance of x86 based servers has revolutionized the market. In place of a single, extremely expensive RISC based server, many smaller x86 based servers would be placed in a single rack. Not only was this approach cheaper, but it allowed a level of redundancy never experienced before.

Recent Internet usage growth has pushed this trend to the extreme, with the installed base of x86 servers going up while cost continues to fall. x86 based server manufacturers are finding themselves using largely desktop components in order to stay competitive on cost. This is creating a whole new breed of mainstream servers, or what VIA refers to as the Value Server Platform.



Enabling the Value Server Platform: V-MAP and VPX

The VIA Modular Architecture Platform (V-MAP) allows Motherboard Manufacturers, OEMs, and System Integrators to support numerous technologies with a single unified chipset architecture. The key to V-MAP is numerous pin-compatible North and South Bridges, which enable different technologies to be supported on a single system design. This enables OEMs and SIs to save costs and speed up time to

market by offering systems covering a full spectrum of system price points based on a single motherboard platform.

VPX takes the concept of modularity a step further, allowing different I/O standards to be supported by a V-MAP compatible chipset. VPX is a technology that converts the AGP port of V-MAP compatible chipsets into a general-purpose I/O port. Various VPX controllers can be attached to this general-purpose I/O port, enabling support for existing and future I/O technologies. As these new technologies (such as PCI-X, Infiniband, and 3GIO) penetrate the mainstream, VPX solutions will become available to seamlessly integrate support for these technologies into the VIA Modular Architecture Platform.

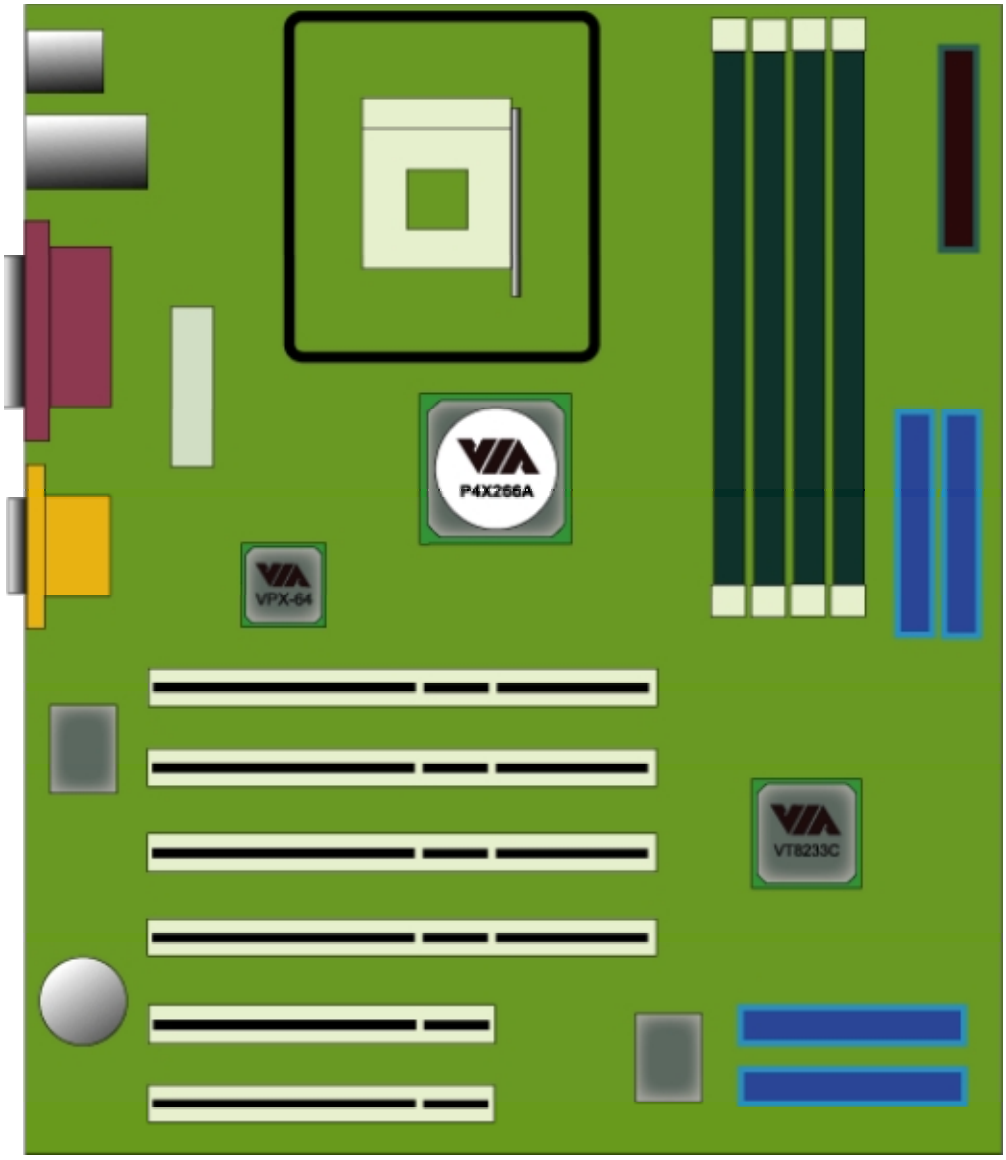
VPX Modular I/O Technology allows the use of proven and ubiquitous VIA Apollo V-MAP compatible desktop chipsets in value servers, such as the VIA Apollo P4X266A and VIA Apollo Pro266T. This reduces design and production costs, as unified platforms are available for mobile, desktop, and server markets.

VPX-64: High bandwidth PCI64 for value servers
The first of the VPX range of modular I/O devices is the VPX-64 (model number VT8101), which supports up to 4 64bit/66MHz PCI slots, each capable of transferring up to 533MB/s. 64bit PCI is commonly used for devices that require high bandwidth, such as SCSI adapters, Fibre Channel, and Gigabit Ethernet. VPX-64 also supports up to six traditional 32bit/33MHz PCI devices, allowing VPX-64 equipped system designs to support no less than 10 PCI devices, and up to 12 in total. VPX-64 is available in a 27x27mm, 265 pin PGA package.

VPX-64 Implementation

VPX-64 interfaces directly to the dual mode AGP/XIP port present in existing V-MAP compatible chipsets, including the Apollo P4X266, Apollo P4X266A, and Apollo Pro266T. When combined with VPX-64, VIA V-MAP chipsets can be integrated in a wide range of value and mainstream server environments. Common applications for Value Server Platform devices include E-mail and web servers, database servers, file and print servers, and server appliance applications.

Since VPX-64 takes advantage of the high-bandwidth AGP/XIP interface, an AGP graphics card cannot be installed in a board supporting VPX-64. However, AGP is a little used technology in the VSP market space. Future iterations of VPX Modular I/O Expansion Technology will allow ‘cascading’ of VPX devices, as well as AGP ports enabling support for multiple I/O standards.



Typical VPX enabled motherboard featuring the VIA Apollo P4X266A chipset

VPX-64 is also highly effective in a server blade environment, where graphics are not necessary and high bandwidth interconnects are crucial. VPX-64 makes an ideal complement to the VIA Apollo Pro266T chipset and the VIA C3 processor, which provide excellent integer performance while requiring the minimum in power and cooling requirements.

Another use for the versatile VPX-64 is extending a system's complement of 32bit PCI slots. When combined with the integrated PCI controller in V-MAP compatible South Bridges, VPX-64 equipped systems are able to support up to twelve PCI slots.

When used in conjunction with the VPX-64 I/O expansion chip, the VIA Apollo Pro266T enables a new breed of entry level 2P servers. With support for up to 4GB of

ECC DDR-SDRAM; up to two Intel® Pentium® III-S 1.26GHz processors; and, with VPX-64, four 64bit PCI slots, the VIA Apollo Pro266T is the world's most capable P6 server chipset, while still retaining VIA's cost effective price structure and world class reliability.

Likewise, the VIA Apollo P4X266/P4X266A, when combined with VPX-64, offers a very attractive entry level Intel® Pentium® 4 based server platform. Certain server applications, such as streaming video and audio, benefit greatly from the VIA Apollo P4X266/P4X266A's incredible memory bandwidth.

Conclusion

As an integral component of the VIA Modular Architecture Platform, VPX I/O Expansion Technology allow existing high-performance and proven VIA Apollo chipsets to comprise the new Value Server Platform. The first VPX compatible solution, VPX-64, brings new levels of scalability, performance, and value to entry level servers through the use of high bandwidth 64bit PCI. Future iterations of VPX technology will further extend the capability of the Value Server Platform, as new I/O technologies continue to increase server performance and flexibility.