

White Paper

The Advantages of Lanner HTCA over
ATCA platforms

Lanner



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Abstract

The trend of extending Ethernet networks beyond familiar LAN has led Internet service providers to deliver Carrier Ethernet services to Enterprises, businesses and residential end-users. The growing ubiquity of Ethernet technology goes hand in hand with cloud computing to fully transform to the next-generation computing and communication model. It has pushed service providers worldwide to migrate their existing network infrastructure and the internetworking equipment.

Lanner Electronics, a premier provider of tailored, high-capacity carrier telecommunication platforms, is announcing its HTCA (*Hybrid Telecommunications Computing Architecture*) hardware platform to carrier and enterprise customers. Our HTCA platforms have advantages over the prevalent ACTA infrastructure in cost efficiency, customization options, and compactness while also maintaining comparable reliability, availability, and serviceability.

Introduction

In the cloud computing era, ever-increasing bandwidth demands to quickly present and process data from a web of interconnected data sources will increase the need for more powerful and efficient server systems. Major shifts in usage patterns and the emergence of packet-based systems represent more opportunities for generating substantial revenue growth in Ethernet services provision in the Wide Area Network (WAN) and Metropolitan Area Network (MAN) segments.

Lanner Electronics, a world-renowned leader of manufacturing server grade network appliances, would like to introduce its FX series products for telecommunications platform. The FX series is targeted to a service provider's point of presence edge or the metropolitan network edge. As such, it is certified to NEBS level 3 and IEC 60068-2-3 and has been fully-tested with an Intel-based CPU for controller plane integrated with an NPU- or RISC-based packet accelerator geared for exceptional throughput. These platforms build a strong hardware foundation for the emerging Carrier Ethernet, cloud computing and Internet data center segments.

Advanced Telecom Computing Architecture (ATCA) vs. Lanner HTCA Platform

The Lanner HTCA platform features consolidation of control and packet processing while incorporating major fault resilience capabilities in overall system design. Not only does it leverage the ATCA's concept of modularized design, but it supersedes ATCA in the following areas:

Flexible midplane for modularized mainboards powered by multi-purpose CPU

Just like the ATCA backplane, the midplane provides point-to-point connections between the boards and does not use a data base. In addition, our HTCA platform claims to be a future-proof open architecture by adopting a flexible midplane which can connect an unlimited number of processor boards. The midplane of Lanner HTCA platform is flexible for customization based on the proposed functionalities of the mainboards and the number and interconnectivity of the I/O blades.

Looking forward, with the rapid emergence of new functionalities such as digital signal processing for communication and security acceleration on the standards-based chipset, more powerful and yet compact systems can be expected.

Higher port density with I/O blades for front Ethernet connectivity or network processing

The total amount of the system's network bandwidth effectively defines the total system throughput. One of our principle design concepts is to efficiently utilize each module's capacity to maximize the total network capacity. The Lanner network appliance can accommodate 3 modular Ethernet boards in its 19-inch rack mountable system whereas a 19-inch ATCA system will occupy at least one slot (or two slots with redundancy in a high availability environment) to be the base and fabric interface and management module. With up to three swappable blades, the FX-7000 series can be configured with up to 36x GbE network ports or 12x 10GbE ports in an array of SFP or copper combinations.

The front swappable I/O modules of the system come with a locking injector/ejector handle to allow easy maintenance and accessibility. The handle also has a manual retention latch to prevent improper insertion and accidental withdrawal. The interface is commonly PCIe Gigabit Ethernet, but can also be XAUI or XLAUI for even higher connection speeds as the system is capable of delivering even higher power per slot in the future. Our advanced field-serviceable designs allow for modules to be upgraded without replacing the system infrastructure.

Fast path for delivering data packets between the mainboards

FX-7220 adopts a transparent middle plane. This architecturally advanced middle plane allows line-rate, non-blocking switching on all ports.

When a packet enters the system through the receiving ports, it doesn't need to undergo any routing protocol through the base and fabric interfaces of the backplane. Instead, these multi-purpose mainboards can directly communicate with each other at the data link layer. The path for sending the packet between the packet processing blade and the controller blade or blades is best optimized in this architecture.

Purposely built for empowering next-generation intelligent network

In order to effectively manage traffic and service delivery for next-generation intelligent networks, a platform must fulfill the demand to integrate new features conveniently.

With a preset goal of lowering overall cost and future operating expense and transforming the user experience when designing these hardware platforms, addition of new features such as high-end unified network security can be conveniently integrated into the system. This is accomplished by utilizing the latest Intel® Crystal Forest chipset for security acceleration. Other functionalities for application delivery for a wide range of service domains such as DNS application firewall, global server load balancing and WAN edge aggregation can attain the best packet processing power by leveraging Intel® DPDK software to boost performance.

RAS-compliant system with the advantage of price/performance ratio

Reliability: The system's reliability is unparalleled, allowing the replacement and corruption reporting of broken LAN modules without shutting down the system. Besides the hot-swappable Ethernet module, the server features a redundant power supply as well as modular fans that are also replaceable while the system is running. The system is also NEBS level 3 and IEC 60068-2-3 certified.

Availability: The FX-7220 can be configured with up to 36x GbE or 12x 10GbE network ports in multiple arrays of SFP or copper combinations. Our carrier-class reliable system employs a complete and comprehensive solution of uninterrupted network connectivity based on our revolutionary Generation 3 bypass. Furthermore, the system's field replaceable units allow for an uncomplicated method to exchange or upgrade modules. When such service takes place, other Ethernet modules can still continue with their data communication processes unaffectedly to achieve the highest possible network uptime.

Serviceability and manageability: The redundant features of power supply, hot-swappable hard disk, system fan, and Ethernet module all contribute to the system's serviceability. Failure events will be reported via visual indicators on the front panel access or the audible alarm next to the power supply unit.

Early detection of faults is accomplished with standard, out-of-band management, referred to as Intelligent Platform Management (IPMI), which monitors local hardware information such as temperature, fan speed, and voltage. The purpose of out-of-band management is to assure proper operation of the whole system even when one system is not up and running. The IPMI software implements IPMI 2.0 and allows for video redirection and remote monitoring using KVM over LAN or local console.

Together, the high availability and the aforementioned advantageous features mean that our HTCA system is a true open platform designed for fast integration and verification for telecommunication deployment in mission-critical network locations. We will discuss the area that our HTCA system can best serve the telecommunication services.

Applications

Carrier Ethernet

With the advancement of physical media and rapid growing of transmission speed, Ethernet services have been carried across wide area networks using new technologies such as Ethernet over SDH/SONET, Ethernet over MPLS, and Ethernet over Carrier Ethernet Transport to expand Ethernet service in a carrier network. Recognizing this provision, the Metro Ethernet Forum (MEF) defines five attributes of the carrier Ethernet that distinguish it from familiar LAN based Ethernet: Standardized Services, Scalability, Reliability, Service Management, and Quality of Service. Our HTCA system helps streamline realization and adherence to these standards in implementing Carrier Ethernet applications – such applications may include virtual Private Lines (EVPL) for E-Line service and Multipoint L2 VPNs for E-LAN service.

Cloud computing

Lanner HTCA system's high-quality, multi-purpose design concept to build a carrier communication platform offers customers the ability to develop and build web services or cloud infrastructures. More specifically, Our FX series of platforms has proven time-to-market and application-ready advantages to our customers in the following areas: application delivery controllers, network security gateways, traffic managers, SDN (Software-defined network) controllers, and Service Level Agreement (SLA) monitoring. The capabilities of the FX series can also be extended to support the deployment in service and application platforms such as IP Media servers, media gateways and soft-switches.

Cloud computing requires several key elements in designing and building a resilient and robust system; all of these elements are dedicated to providing a safe and reliable operating environment for computing equipment. Redundancy, failover protection, and out-of-band management are the most critical among them. These features are coordinated in both system design and software development to speed time-to-market and ensure trouble-free operation at the site.

Lanner Electronics is a market leader in this product field, with our dedicated carrier telecommunication platform that excels in all aspects of power envelope, bandwidth, performance and management features.

Conclusion

Our FX series platform was designed to help Carrier Ethernet service providers profitably migrate their customers from existing TDM/PDH and Frame Relay services to next-generation multi-services operated in a Gigabit/10 Gigabit metro Ethernet environment. By integrating high performance control plane processing (e.g. Edge-to-edge service level enforcement and Quality of Service) and packet switching capability, this carrier-class performance platform offers network providers a solid platform on which to build their services. And because of our flexible

midplane architecture and field-serviceable Ethernet modules, the Lanner FX series platform is engineered for telecommunications with an eye to future-proofing and upgradability.

About the Lanner FX Series:

Lanner Electronics has a proven record of manufacturing and designing time-to-market and high-performance server platforms for telecommunication services and cloud infrastructures. For more information on our representative FX-7000 series platform, the FX-7220, visit Lanner website at: http://www.lannerinc.com/x86_Network_Appliances/FX-7220