

# New-Generation Applied Computing Solutions For the Communications Market

Application Benefits of the Omnix™ Product Family  
by ICS Advent

During the past few years, the communications market requirements for “applied computing” solutions have been steadily evolving toward an increasing emphasis on cost-effective, highly configurable, standards-based solutions, which can be readily adapted for a wide range of specific applications. With over fifteen years of experience in the industrial computing market, ICS Advent has taken the lead to comprehensively address all of these evolving market needs by developing an entirely new set of powerful applied computing solutions known as the Omnix product family.

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*The Omnix family of applied computing solutions has been proactively developed from-the-ground-up to meet the current and evolving demands of key market segments, including the specific needs of telephony, Internet and other communications market requirements.*

## Overview

During the past few years, the communications market requirements for “applied computing” solutions have been steadily evolving toward an increasing emphasis on cost-effective, highly configurable, standards-based solutions, which can be readily adapted for a wide range of specific applications.

For many years now, specialized industrial computing platforms have provided attractive opportunities by leveraging the escalating performance and cost advantages of mainstream PC-driven technologies within robust, flexible architectures that break beyond the constraints of motherboard-oriented PC systems. For example, use of separate dedicated backplanes has allowed for economical configuration of communications systems with much more extensive I/O than could be possible within the limited slots on a monolithic motherboard system. Similarly, the availability of rugged, rack-mountable chassis designs with optimized power and cooling capabilities have enabled OEMs and corporate users to cost-effectively deploy highly reliable, densely-populated systems for use in many specialized business-critical arenas.

However, the continued evolution of more demanding communications-oriented applications is steadily creating new and more challenging market requirements for tomorrow’s applied computing systems. With over fifteen years of experience in the industrial computing market, ICS Advent has taken the lead to comprehensively address all of these evolving market needs by developing an entirely new set of powerful applied computing solutions known as the Omnix™ product family.

## Communications Market Requirements

### Evolutionary & Revolutionary Market Drivers

The communications industry represents one of the hottest and most rapidly changing arenas for the creative deployment of applied computing capabilities. At the same time, much of the emphasis within communications deployments must also be on reliability and backward compatibility with legacy systems.

On one front, the unprecedented global growth of the Internet has given birth to a whole new industry in which Internet Service Providers (ISPs) need to deploy thousands of high-reliability, compact, and low-cost systems to host and serve their clients’ Web content. In addition, the rapid proliferation of the Internet into new business-to-consumer and business-to-business applications is driving the need for dedicated high-reliability transaction-processing and database servers that are tightly integrated within the Web hosting environment. In order to succeed in the extremely competitive Internet industry, ISPs need to be able to rapidly deploy new systems and services within densely populated rack arrays, while ensuring uninterrupted uptime and responsiveness for their customers.

In the telecommunications arena, the use of next-generation Computer Telephony Integration (CTI) technologies continue to extend the opportunities for enhancing traditional telephone services with advanced features, such as voice-activated call centers, voice-to-email systems, etc. In addition, overall datacom and telecom infrastructures are also being fundamentally transformed by the movement toward seamless convergence of services (data, voice, and video) over common networks, which is driving the need for packing even more functionality into applied computing systems.

## Configuration Flexibility

Because applications within the communications arena often require a blending of both leading edge and legacy applications, it can be quite important for applied computing platforms to flexibly accommodate a variety of different cards and bus requirements. For example, re-hosting of a mature legacy telephony application might require mostly ISA slots while the deployment of newer Internet or CTI applications might require a higher number of PCI slots. In order to seamlessly support on-going evolutionary trends in the communications market, next-generation applied computing solutions, such as the Omnix family, need to allow system designers to flexibly specify the exact slot configurations that meet their application requirements. In addition, tomorrow's applied computing platforms need to condense the available board slots into space-saving chassis configurations that provide system builders with the ability to pack maximum performance and functionality into every equipment rack.

## Reliability & Maintainability

Another critical requirement for virtually all communications oriented systems is the importance of high reliability continuous operation. Many carrier-class communications environments already make use of system-level redundancy and clustering techniques to provide "six-nines" capabilities exemplified by 99.9999% uptime performance. While six-nines uptime is not necessarily required for ISP systems or CTI platforms, it has set an expectation for providing a high level of continuous uptime. From the standpoint of next-generation applied computing platforms, the need for robust uptime can be served through such factors as built-in power supply redundancy, remote fault monitoring and stringent cooling system design. In addition, the ability to hot-swap key components, such as power supply modules and cooling fans, can be a key factor for conducting system maintenance without disrupting on-going operations.

## Environmental Considerations

Environmental factors are also an important consideration in the deployment of any communications oriented application. Conformance with the Network Equipment Building System (NEBS) is of key importance for ensuring that applied computing platforms meet stringent requirements for temperature, humidity, altitude, shock, vibration, EMI emissions and fire resistance. Support for 48VDC power inputs is also important because traditional telephony applications typically distribute power within racks at this level for safety and fire prevention reasons. In addition, achievement of Bellcore's standards for earthquake resistance up to the Zone 4 level is another key indicator of a system's environmental robustness.

## Keeping Pace with Dynamically Changing Requirements

Scalability and expandability are also keys to successful communications system deployments. With the pace of change and growth now running on "Internet time" throughout the communications industry, service providers have to be able to rapidly configure new systems and put them to immediate use without disrupting existing operations. In some cases, this may require using incremental building blocks by deploying each complete server within a compact 1U or 2U rack unit. For other requirements, it may mean efficiently combining many line cards, modems or DSL cards within a larger 4U, 5U or 6U rack system. The important

## **Applied Computing**

*Applied Computing describes classes of dedicated or fixed-function devices that are becoming connected, often via Internet Protocol (IP)-based networks or the Internet itself. Some examples of these applications include voice/data communications, transaction processing and wireless remote access. The industry relevant factor is the trend toward more processing power and greater connectivity. Applied computing applications collect, communicate and control the data within the corporate computing environment, which is then stored and manipulated into information by enterprise PCs and servers.*



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## Glossary of Terms

Call center - A central place where customer and other telephone calls are handled by an organization, usually with some amount of computer automation.

Convergence - In information technology, convergence is a term for the combining of personal computers, telecommunication, and television into a user experience that is accessible to everyone.

CTI - (computer-telephony integration) - The use of computers to manage telephone calls. The term is used in describing the computerized services of call centers, such as those that direct your phone call to the right department at a business you're calling. It's also sometimes used to describe the ability to use your personal computer to initiate and manage phone calls (in which case you can think of your computer as your personal call center).

thing from a service provider's perspective is to have the flexibility to adapt system deployments to their specific requirements rather than having to subjugate their requirements to fit within a limited number of configuration choices.

## Key Requirements Summary

In summary, depending upon the specific applications requirements, the following key characteristics can be of critical importance in communications systems:

- Flexibility to configure custom-tailored numbers and types of card slots
- Ability to maximize functionality per each unit of rack space used
- Conformance with NEBS, Bellcore and other industry-accepted standards
- High reliability and uptime for continuous operation requirements
- Cost-effective support through hot-swap maintainability and remote status monitoring
- A high degree of scalability and expandability

## Omnix Applied-Computing Solutions for Communications

The Omnix family of applied computing solutions has been proactively developed from-the-ground-up to meet the current and evolving demands of key market segments, including the specific needs of telephony, Internet and other communications market requirements.

## Broad Range of Products

To provide communications OEMs and corporate customers with optimal flexibility for tailoring system configurations to specific performance, cost, functionality and rack space requirements, the Omnix family offers a full range of chassis alternatives. These include 1U, 2U, 4U, 5U and 6U rack units, with additional options for either short or long configurations. Whether the targeted application requires ganging together many individual servers (such as hosting platforms for ISP clients) or deploying large banks of I/O (such as DSL or modem arrays), the Omnix family allows system builders to select the optimal fit to meet their needs.

## Modular Building-block Configuration Flexibility

In addition to providing a full range of chassis options, the Omnix architecture also makes extensive use of modular design concepts to support cost-effective tailoring of every system to specific application requirements. These innovations enable customers to flexibly select the optimal number and type of backplane slots and power supply output levels required for each unique applied computing application, thereby avoiding the constraints of having too little capacity and/or the expense of having to buy too much. Some of the key modular concepts in the Omnix architecture are:

- Modular backplane segments that allow flexible configuration of different numbers of ISA, PCI and PCI64 card slots for optimal system design without wasted slots
- Modular power supply assemblies that support efficient tailoring of power output levels and power redundancy strategies to meet specific system requirements, with provisions for remote power monitoring and hot-swap of individual power modules
- Modular fan assemblies that allow cooling capacities to be tailored to actual system configurations and support maintainability through remote monitoring and hot-swap capabilities

## Design for Reliability

With its completely new system architecture, the Omnix family also has been designed from-the-ground-up to meet the stringent reliability and environmental demands of communications markets. All Omnix chassis make use of state-of-the-art unitized card cage designs to minimize the impacts of shock and vibration, with excellent results that exceed accepted industry specifications. In addition, the internal cooling and airflow characteristics for every Omnix system have been extensively modeled and simulated using sophisticated Computational Fluid Dynamics (CFD) software to deliver robust thermal management up to ambient temperatures of 55 °C.

## Quick-response Build-to-Order Capabilities

Another major advantage to the Omnix system architecture is the ability to significantly reduce customer delivery times across a wide range of system configuration choices. Because of the extensive use of modular designs, shared part numbers and common subassemblies across the entire Omnix product family, ICS Advent is able to more efficiently manage production inventories, forecasts and manufacturing processes to assure optimal responsiveness to specific customer orders.

## Future-Proof Extensible Architectures

In addition, the inherently modular and flexible design methods used in the Omnix family have also laid the foundation for both quickly creating custom configurations and for extending the standard product lines to embrace new technologies as they emerge. This ability to leverage existing system deployments while cost-effectively responding to new challenges will be an increasingly critical factor for ICS Advent's customers in order to stay abreast of continuously evolving communications market requirements.

## Glossary of Terms *cont.*

I/O - (input/output), pronounced "eye-oh," - Any operation, program, or device that transfers data to or from a computer. Typical I/O devices are printers, hard disks, keyboards, and mice.

ISP - (Internet service provider) A company that provides individuals and other companies access to the Internet and other related services such as Web site building and hosting. An ISP has the equipment and the telecommunication line access required to have points-of-presence on the Internet for the geographic area served.

Modular - Constructed with standardized units or dimensions for flexibility and variety of use.

