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SOLUTION BRIEF

SUPERMICRO INTELLIGENT RETAIL EDGE

EXECUTIVE SUMMARY

Technology disruption in the Retail industry and the rise of e-commerce continues to put tremendous pressure on brick-and-mortar retailers. In the past, technology at the store level was primarily focused on improving store operations with backend systems such as inventory management and supply chain, PoS, and security/loss prevention. However, there is an opportunity for retailers to combine their physical presence with innovative technologies to create unique and valuable experiences for their customers. Organizations that will adopt technologies such as artificial intelligence, machine learning, virtual and augmented reality, analytics, and digital signage will be able to deliver immersive experiences, better services, and greater efficiencies for consumers.

The foundation of these new capabilities is a technology platform that is flexible to adapt to new applications, simple to deploy and manage, autonomous at any scale, optimized and cost-compatible with the retail edge. Supermicro's Intelligent Retail Edge is the next-generation platform that enables retailers to simplify and automate the delivery and management of applications, data, networking, and infrastructure across their distributed locations in a flexible, reliable and secure manner.

CHALLENGES FACING TODAY'S RETAIL

In order to capitalize on the potential of new technologies to transform the store experience, retailers will need to significantly upgrade their in-store computing power to run new applications. Due to bandwidth and latency constraints, as well as the need to be able to act on information in near real-time, it is not possible to leverage centralized and distant cloud computing systems. New sensors and video systems generate more data than can effectively and economically be sent over the network, and Artificial Intelligence (AI) requires more processing power than current in-store systems provide.

Running workloads at the edge requires different economics, architecture, and philosophy versus the cloud or core datacenter. Cloud and datacenter leverage technologies designed to manage thousands of nodes and containers within the same physical environment. The Edge requires a solution which is designed for its unique distributed computing requirements - where instead of dealing with a few very large clusters, Edge Computing is built on small clusters that are right-sized and right priced to fit the new generation of retail applications. This is a fundamentally different architectural challenge.

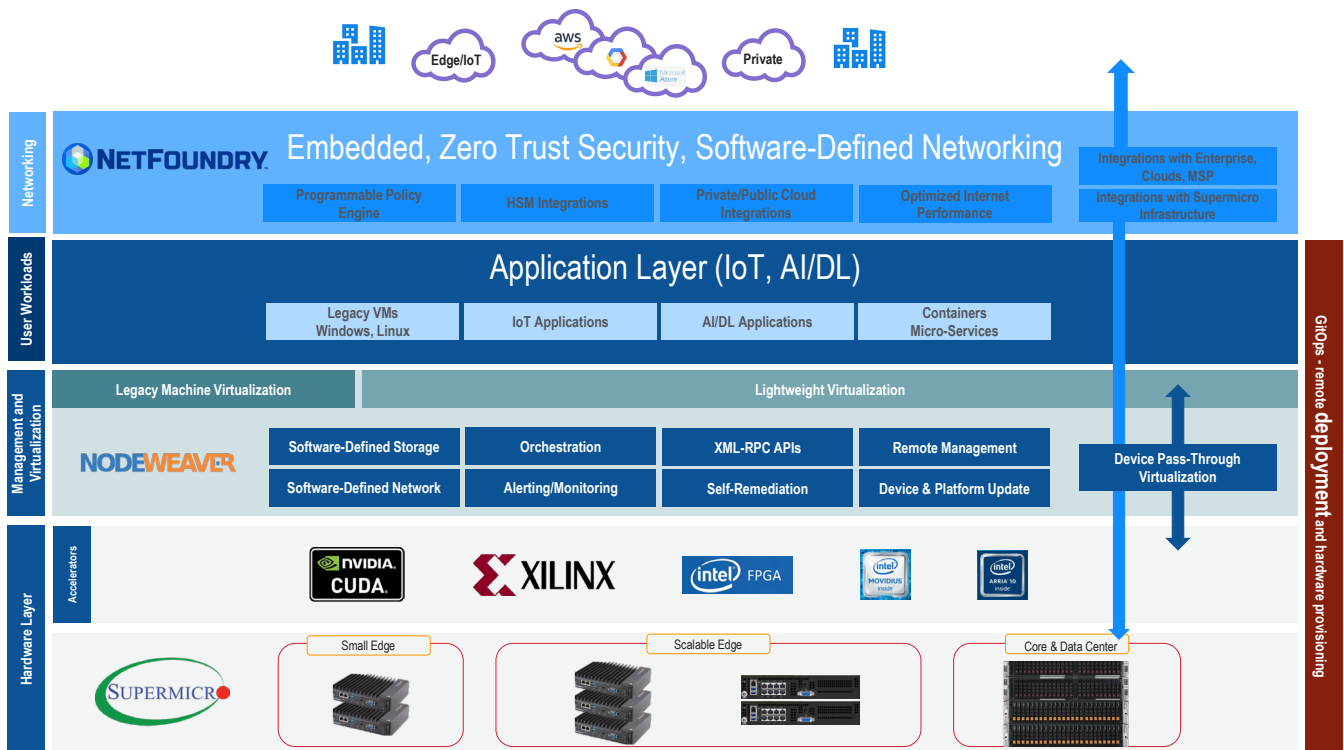


Figure 1. The Supermicro Retail Edge stack consists of 4 key layers: (1) Hardware Infrastructure layer (2) Management and Orchestration layer (3) Application layer, and (4) Secure Networking layer

THE SUPERMICRO INTELLIGENT RETAIL EDGE DIFFERENCE

Supermicro's Intelligent Retail Edge platform developed in collaboration with NodeWeaver and NetFoundry, is a complete edge computing platform which provides a reliable, flexible, and secure infrastructure solution for retailers, restaurants, hotels and others.

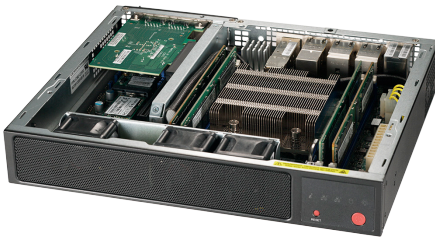


Figure 2. Supermicro Intelligent Edge Server
E300-9D-4CN8TP



Figure 4. Supermicro Intelligent Edge Server
E100-9W-H

- **Low-touch fleet installation:** Initial site configuration and application customization and startup can be performed by a technician without IT skills. Ship, connect to the network, and power on to start the self-configuration process.
- **Lightweight:** Specifically developed for smaller environments, the Intelligent Retail Edge platform achieves feature and function parity with datacenter-grade hyperconverged infrastructure (HCI) solutions in a much smaller compute footprint, making it ideal for in-store deployment.
- **Hardware agnostic:** Heterogeneous clusters are fully supported, even across different CPU generations and families. It is an extensible platform that is neutral to applications and autonomous at any scale, and designed to run any application, anywhere, non-stop and continually self-optimized with no human interaction. This modular approach allows for hardware to be phased-in incrementally, and enables customers to achieve operational and supply chain flexibility and cost savings.
- **Reliability and scalability:** The solution delivers highly available server clusters, allowing servers to be clustered together over the Ethernet network to form "nano-clouds". Applications are automatically load-balanced across all servers in the cluster, all storage is automatically replicated to different systems in the cluster, and virtual machines restart automatically in the event of a server outage. The criticality of these local applications increases the need for high-reliability of these in-store systems.
- **Application support:** Support for both current and future applications that may require specialized hardware accelerators such as GPU, TPU and VPU. Existing PoS applications can be virtualized to extend longevity and increase availability. Virtual machines (VMs), containers, and/or serverless applications are all supported and NodeWeaver Marketplaces supports automated custom application configuration and deployment.
- **Maintenance features:** New components (hard drives, network connections) and systems are automatically detected, added and load-leveled, and clusters can be seamlessly composed of different servers – even different chip families – to support optimal expansion and non-disruptive hardware refreshes. There is no need to stock identical systems for spares, simply replace failed systems with the latest available hardware. Automatic, non-disruptive firmware updates ensure secure non-stop operation with no system administrator involvement.
- **Management features:** Most management tasks are fully autonomous. Applications are autonomically optimized across available resources. Create application service stacks to automatically start and elastically scale related in-store applications. Choice of management interfaces: local or remote web-based GUI, or programmatic via the API.
- **Cost appropriate:** Dramatic lly reduces cost of ownership by simplifying operations and reducing the need for IT expertise or human intervention.

NETWORK SECURITY & OPTIMIZATION FOR THE RETAIL EDGE

Secure, high performance, global networks are key when dealing with hundreds or thousands of geographically distributed sites. Customer and PoS data must be secured and protected at all costs both in the physical retail location as well as when transmitted across the network to transaction processors and to head office/retail corporate data centers.



Figure 3. Supermicro Intelligent Edge Server
1019D-16C-FHN13TP

Omni-channel retailing requires networking to securely connect their sites to private data centers, regional branches, public clouds and SaaS providers. Not to mention a myriad of real time 3rd-party transaction processing systems. In addition, reliable, high performance networking is a foundational requirement for successfully operating latency-sensitive edge compute applications such as Artificial Intelligence (AI) powered voice recognition and video inferencing. Network performance is critical for data throughput originating in intensive edge applications such as computer vision and Augmented Reality (AR) applications. Legacy VPN and MPLS solutions can't deal with the complexities and configuration-intensive aspects of this new reality.

Supermicro's Intelligent Retail Edge platform provides simple, easy to deploy Network-as-a-Service (NaaS) connectivity between globally distributed sites. When powered by NetFoundry NaaS services, the platform can securely and reliably manage global software defined networks (SDN) with the performance of private networks. The resultant networking delivers exceptional performance, Zero Trust security, agility and simplicity.

- **Performance** - NetFoundry's dynamic routing across internet fabric minimizes latency and loss providing the performance and reliability of private networks that enhances application delivery globally making employees, partners, and suppliers more productive with a better user experience.
- **Zero Trust** – NetFoundry's Zero Trust security implementations are helping organizations to proactively protect their applications, data and infrastructure from all threats.
- **Agility** – NetFoundry's cloud-based network orchestration tools deliver the agility of global networks delivered as-a-service to meet need of today's digital retail businesses
- **Simplicity** - Eliminate high cost dedicated VPN circuits with easy to manage application-driven software-defined-networks

CRITICALITY & SCALE OF DISTRIBUTED RETAIL EDGE

Critical local Edge compute (low latency, data compliance, & efficiency) combined with a cloud or multi-cloud back-ends is the norm, not the exception with distributed edge. Supermicro, NodeWeaver and NetFoundry offer agile, simple, and performant mesh networks connecting edge and cloud for optimal workload processing. Management is simplified using a single pane of glass, efficiency and error-resistance is maximized with zero-touch deployment, and orchestration and change control is simplified through APIs and integration with common DevOps tools.

THE SUPERMICRO ADVANTAGE

Supermicro provides the building block platforms for Retail Edge computing solutions. Enabling an infrastructure focused on next generation applications from customer premises, to network edge to data center enables customer a broad option-based hardware structure.

In addition, Supermicro has a broad ecosystem of software infrastructure providers that can provide best in class performance hardware to software infrastructure layers. Partners such as, NodeWeaver and Intel provide the common architecture for customer to implement edge computing solutions.

One of the missions of Supermicro Edge Hardware is to make the latest server technologies accessible to the market as soon as possible, so that our customers can roll out their services in a timely manner on the latest generation of hardware.

These systems provide flexible I/O to the backend network infrastructure, and enable the maximum system memory capacity.



ABOUT SUPER MICRO COMPUTER, INC.

Supermicro® (NASDAQ: SMCI), the leading innovator in high-performance, high-efficiency server technology is a premier provider of advanced server Building Block Solutions® for Data Center, Cloud Computing, Enterprise IT, Hadoop/Big Data, HPC and Embedded Systems worldwide. Supermicro is committed to protecting the environment through its "We Keep IT Green®" initiative and provides customers with the most energy-efficient, environmentally-friendly solutions available on the market.

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