Building a Consolidated Infrastructure for Mission-Critical Applications

Unisys chooses Intel® Xeon® processors to help its _Forward!_™ platform deliver predictable performance, scalability, and security

Across industries, organizations have frequently relied on proprietary UNIX* platforms for running mission-critical applications ranging from transactional databases to enterprise resource planning (ERP). While UNIX platforms can offer strong performance, scalability, availability, and security, they are also costly to buy and operate. Moving to Linux* or Microsoft Windows* environments can help significantly reduce costs. But when making a change, organizations must be sure they are not jeopardizing the capabilities of their previous environment.

The _Forward!_™ by Unisys* platform, based on the Intel® Xeon® processor E5 and E7 families, is designed to help organizations realize the cost-saving benefits of Linux and Windows while delivering the predictable performance, security, reliability, and scalability required for demanding applications. A fabric-based platform, _Forward!_ brings together hardware and software with high-speed network technology so organizations can run ERP, cloud computing, big data analytics, or any other mission-critical applications within a consolidated, cost-effective infrastructure. Unisys has developed multiple configurations, with multiple Intel® processor options, to meet precise requirements for UNIX-to-Linux migrations, SAP* migrations, data center consolidations, and other projects.

Implementing Secure Partitions

Forward! integrates hardware, software, and networking in a virtualized infrastructure that uses Unisys Secure Partitioning* (s-Par™) technology. s-Par allows organizations to run multiple operating system instances simultaneously on the same platform while securely isolating the environments from one another in distinct containers.

s-Par technology capitalizes on Intel® Virtualization Technology (Intel® VT) built into the Intel Xeon processor E5 and E7 families to enforce policies for the containers. For example, Intel® VT for Directed I/O (Intel VT®-d) provides isolation of and control over I/O device access. s-Par also relies on Single Root I/O Virtualization (SR-IOV) technology built into the Intel® Ethernet Gigabit Server Adapters used by _Forward!_ to allow the Ethernet port to appear as multiple, distinct physical devices for the virtualized environment. These and other built-in virtualization technologies enable _Forward!_ to keep containers isolated from one another in a consolidated environment.

Moving Beyond Traditional Virtualization

Together, Unisys s-Par™ technology and Intel® VT create a virtualized environment that delivers more consistent, reliable performance and more robust security than commodity virtualization solutions. Traditional hypervisors enable multiple applications to draw from a pool of process, memory, and I/O resources. While that approach works well for many applications, it can result in inconsistent performance that is not tolerable for mission-critical applications. *Forward!*™ creates isolated containers with distinct resources so mission-critical applications can maintain consistent, reliable performance. Those containers also help provide compliance with security and information assurance regulations. With s-Par technology and Intel VT, *Forward!* can facilitate infrastructure consolidation without the issues typically associated with commodity virtualization.

Delivering Robust, Predictable Performance

From ERP to big data analytics, mission-critical applications require robust and predictable performance. *Forward!* delivers strong performance with Intel Xeon processors:

- **The Intel Xeon processor E7 family** provides ideal performance for the most data-demanding workloads, with improved scalability along with increased memory and I/O capacity. The Intel Xeon processor E7 family lets organizations support large databases and run more applications in a consolidated infrastructure.

- **The Intel Xeon processor E5 family** is at the heart of an agile, efficient data center, ready to support secure private clouds, quickly crunch big data, and extend data center investments through energy efficiency.

Technologies built into both Intel Xeon processor families help maximize performance and sustain efficiency for both single- and multi-threaded applications. For example, Intel® Turbo Boost Technology 2.0 boosts the processor frequency when needed to deliver increased performance while maintaining power efficiency. For multi-threaded applications, Intel® Hyper-Threading Technology (Intel® HT Technology) enables multiple threads to run efficiently on each core.

Tightening Security

Security is often a top concern for organizations migrating from UNIX environments or building new environments for their mission-critical applications. Unisys s-Par technology plays a key role in securing the *Forward!* platform. Unlike hypervisor solutions, which share resources among virtual machines, s-Par technology dedicates resources to each container. Data cannot leak from one container to another unless administrators specifically enable connections between containers.

In addition, Unisys Stealth™ technology protects systems by creating secure "communities" that are restricted to particular devices and users. No resources outside the community can access the system components.

Unisys uses security technologies built into Intel® processors to further enhance security. For example, *Forward!* takes advantage of Intel® Advanced Encryption Standard New Instructions (Intel® AES-NI) to help accelerate data encryption without affecting application performance.

Bolstering Reliability

Preserving the integrity of data and maintaining uptime are crucial for mission-critical applications. The Intel Xeon processor E7 family provides a wide array of advanced reliability, availability, and serviceability (RAS) capabilities to help mission-critical applications run without interruption. Continuous self-monitoring and self-healing features ranging from Error Correction Code (ECC) and memory thermal throttling capabilities to memory mirroring and Machine Check Architecture (MCA) logging are designed to protect data, increase system availability, and minimize planned downtime.

Improving Scalability

Fluctuating demands for mission-critical workloads require a highly scalable infrastructure. Organizations need ways to address short-term demand spikes while maintaining high performance. At the same time, they need the flexibility to expand the infrastructure to support changing business needs.

By using s-Par technology and capitalizing on the powerful capabilities of Intel Xeon processors, *Forward!* can maintain outstanding, predictable performance while accommodating short-term changes in demand levels. *Forward!* also allows expansion within the system: selecting a model with the Intel Xeon processor E7 family enables scalability up to four sockets. High core counts, high memory capacity, and large I/O bandwidth of this processor family allow organizations to support very large databases.

For larger, longer-term business changes, *Forward!* also has the flexibility for expansion. The interconnect supports applications and data distributed across several servers and *Forward!* systems.

Deploying a Mission-Critical Infrastructure

The *Forward!* platform with Intel Xeon processors offers organizations the infrastructure they need to achieve predictable performance, reliability, security, and scalability for mission-critical applications. Whether they are implementing a new cloud environment, deploying big data analytics, migrating an SAP application from UNIX, or consolidating data center resources, *Forward!* with Intel Xeon processors can help control costs without sacrifice.

Capitalizing on *Forward!* for Multiple Use Cases

UNIX to Linux Migration
The *Forward!*™ by Unisys* fabric delivers the UNIX* experience in a Linux* environment running on Intel® Xeon® processors. With *Forward!*, organizations gain the performance, reliability, security, and scalability of a UNIX environment with a more cost-effective, industry-standard infrastructure. The *Forward!* fabric virtualizes resources, creating secure, isolated partitions with dedicated resources for improved and predictable application performance while also reducing the total cost of ownership.

SAP Migration
The *Forward!* by Unisys fabric based on Intel Xeon processors can accommodate the most demanding environments, including SAP* and Oracle Database* implementations. *Forward!* maintains reliable performance even as demand fluctuates. Secure partitions help ensure that data does not leak from one container to the next. Performance of SAP ERP workloads is enhanced through high-speed interconnects across multiple nodes and secure partitions.

Data Center Consolidation
The *Forward!* by Unisys fabric supports mission-critical applications on a consolidated infrastructure that can help significantly reduce power, cooling, and real estate costs. Intel Xeon processors provide the robust performance, large-scale memory capacity, and high I/O bandwidth to support multiple applications in a virtualized environment. Unisys secure partitioning technology helps ensure each application is completely secure and isolated in its own container.

Learn more

***Forward!* by Unisys:**
unisys.com/unisys/theme/index.jsp?id=1120000970026610202

Intel Xeon processor E7 family:
intel.com/content/www/us/en/processors/xeon/xeon-processor-e7-family.html

Intel Xeon processor E5 family:
intel.com/content/www/us/en/processors/xeon/xeon-processor-5000-sequence.html

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