

ClearPath Connection

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ClearPath Growth: An Architecture for the Future

By Ann Thureen, Vice President, ClearPath OS 2200 Development, Unisys Technology, Consulting, and Integration Solutions (TCIS)



It's an exciting time for the ClearPath program. We just announced the details of a major new launch – one that can best be summed up by the word “growth.” In light of these new advancements, I wanted to take some time to expand on the idea of growth and explain what it means to the ClearPath program in the areas of technology, specialty engines, and people.

Technology Growth – The Beat Goes On

All ClearPath mainframes are founded on a robust base of technologies that help the platform deliver a distinct competitive advantage, as we've demonstrated with our latest deliveries. But that doesn't mean we're resting on our laurels. As always, we remain committed to renewing and advancing that technology on an ongoing basis to give you increased performance, tighter integration with contemporary computing environments, and simplified configuration and management processes.

One way we continue to advance technology is through functional partitioning, which is another way to say “split it into pieces.” We are examining individual elements of the underlying ClearPath system – looking for ways to optimize and improve each one. The results of this approach have been seen in such advances as our specialty engines (which optimize performance and management of Java, web enablement, and cryptographic processing) and the recent breakthroughs we've made in how I/O is handled.

As we functionally partitioned the architecture, we identified a need to take better advantage of the growing number of processors and cores on Next-Generation Architecture ClearPath servers. The result is the advent of intra-system virtualization, which is enabling the new Secure Partitioning (sPar) capability. With sPar, specific functions like specialty engines become an even more tightly integrated part of the ClearPath server platform, because they utilize designated cores instead of a separate appliance. We are not only simplifying the product, but guaranteeing the isolation and security of these separate functions. For an in-depth look at all that sPar can do, be sure to check out this issue's Tech Corner article.

We're also exploring new opportunities to accelerate performance. For example, we've been able to speed up the firmware that enables ClearPath operating environments to run transparently on Intel® processor-based platforms, and move code to native execution and translate it at the binary level. All of these lead to faster systems in the future. The development languages and development tools are another area we continue to expand with new languages such as PHP and enhancements to the *Eclipse*™ Integrated Development Environment (IDE).

The end result of this technological growth? It's opened up new ways for us to extend the range of our systems, offer different deployment options, and expand the capabilities of the ClearPath product line. For example, we plan to broaden our clustering range, give you the option to perform test and development in the cloud, and add new specialty engines – all while maintaining our commitment to a mission-critical system that is reliable, secure, and easy to manage. And by giving you a host of contemporary capabilities, we're helping you use new skills and attract recent college grads and younger talent. >>

Specialty Engines – Extending the ClearPath Architecture

Our specialty engines provide a means of hosting specific functions of the ClearPath system via an integrated server, which is designed exclusively for a unique task, as a transparent extension of the native platform. This results in better performance at a lower cost – without requiring you to perform specialized administration functions or worry about the mission-critical aspects of this function.

The recent growth in our specialty engines illustrates another element of the ClearPath architectural evolution. Innovations like ClearPath ePortal and ClearPath JProcessor facilitate application enrichment via the use of mobile technology or service-oriented architecture (SOA) initiatives. Given the positive impact our specialty engines have had since their introductions, we have made it a point of focus to continually reevaluate, augment, and extend their capabilities to address evolving business needs – and release new ones as appropriate.

People – The Power Behind the Architecture

While all of this technological growth is certainly impressive, it would fall flat if it wasn't supported by some of the industry's best and brightest minds. As such, we are expanding our workforce to include a more effective mix of onshore and offshore personnel. At the same time, we're stepping up our on-campus recruiting efforts to more aggressively pursue younger talent and complement the graduates we've hired this year. And we're helping these new faces make an immediate impact by giving them access to familiar technologies like Java and PHP.

Though this youth movement is certainly refreshing, we can't overlook the value of experience. So, to ensure that our youngest employees learn the lessons that can only come through a lifetime in the industry, we're mentoring them with the help of our knowledgeable "brain trust." Add to this our expanded employee training programs, and the future looks very bright for the people who will shape ClearPath systems for years to come.

As the recent improvements and updates have shown, we remain deeply committed to evolving and advancing the ClearPath platform. We've introduced more new ClearPath platforms and technologies in the last two years than in any time in our history, and we are accelerating our rate of innovation over the next three years. It's an exciting time for ClearPath, and we look forward to providing new capabilities that enable your organization to address both current and future business needs.

New Libra 4100 Series: A Major Step in Next-Gen Architecture



Please join us in welcoming the ClearPath Libra 4100 Series of servers to the ClearPath MCP family, starting with the new Intel® processor-based Libra 4180 and Libra 4190 servers. Enterprise-class, mid-range mainframes, the Libra 4180 and 4190 servers demonstrate Unisys strong commitment to the ClearPath MCP Next-Generation Server Architecture and introduce the *revolutionary new Secure Partitioning (sPar) capability*. sPar provides multiple, concurrent operating environments within a single platform, thus allowing these servers to run MCP and other application workloads, such as dedicated ClearPath ePortal and MCP JProcessor specialty engines. To learn more about the ground-breaking technology behind sPar, be sure to check out this issue's Tech Corner article.

The new platforms deliver these capabilities – as well as the high levels of security, availability, and reliability you've come to expect from the ClearPath line – by way of two distinct business models:

- The **Libra 4180 servers** offer a *traditional* licensing model and provide additional flexibility in the form of Capacity on Demand options that deliver the agility needed to manage dynamically changing workloads – like temporary spikes in demand, as well as short- and long-term uses. This model offers performance that ranges from 50 to 1,750 MIPS.
- The **Libra 4190 servers** leverage Unisys *metering* technology to help you establish pay-for-use business models that ease capacity planning and keep cost predictable – while providing the flexibility to tap into additional processing power when needed. The Libra 4190 delivers performance of 30 to 1,225 MIPS, with a 1,750 MIPS ceiling.

The characteristics of these new servers represent an approximate *50% gain in single-thread performance* over existing models, and an *increase in single-image performance of well over 100%* compared to the Libra 4000 servers. In addition, we've updated the architecture of these models to support contemporary I/O connections, including *4 and 8 Gb Fibre Channel connections and 1 and 10 Gb Ethernet connections*.

And of course, like all new MCP-based ClearPath models, the Libra 4180 and 4190 servers offer code and data compatibility, enabling you to carry forward existing applications without any recompiling.

Please visit Unisys.com to learn more about these innovative new platforms.

An Expert's Take on the Future of ClearPath

Jim Thompson, vice president of ClearPath Engineering, has a unique perspective on the importance of the new Libra 4100 Series of servers, and what it means for the future of the platform.

To read more of Jim's thoughts about all things ClearPath, be sure to visit [his blog](#).

New Entry-level and Mid-range ClearPath Dorado Servers

We are pleased to announce the availability of three new entries in the Intel® processor-based ClearPath Dorado 4100 Series of mainframes – the entry-level Dorado 4150 and the mid-range Dorado 4180 and Dorado 4190 servers. These systems show Unisys commitment to expanding the capabilities of the Next-Generation Server Architecture to meet the needs of ClearPath OS 2200 customers.

ClearPath Dorado 4150 Server

This new entry-level mainframe offers a *100% increase in memory and 15% increase in single-thread processor performance* over the ClearPath Dorado 4050. It combines Unisys metering technology and enterprise-class power in an entry-level system with performance of 10 to 42 MIPS, and a 60 MIPS ceiling.

ClearPath Dorado 4180 and 4190 Servers

These mid-range platforms also offer a significant performance boost, with a *100% increase in memory, a 15% increase in single-thread processor performance, and a 167% and 102% increase, respectively, in single-image performance* when compared with previous models.

In addition, they've been enhanced to include *10 Gb Ethernet I/O connections* and the ability to serve as *hosts in clustered XTC configurations*.

Dorado 4180 servers have a traditional licensing model and provide additional flexibility in the form of Capacity on Demand options that deliver the agility needed to manage dynamically changing workloads – like temporary spikes in demand, as well as short- and long-term uses. This model offers performance that ranges from 50 to 1,600 MIPS.

Dorado 4190 servers leverage Unisys metering technology to help you establish a pay-for-use business model that eases capacity planning and keeps cost predictable – while providing the flexibility to tap into additional processing power when needed. The Dorado 4190 delivers performance of 30 to 1,150 MIPS, with a 1,600 MIPS ceiling.

Finally, the Dorado 4180 and 4190 servers feature a dual-partition option that can move MIPS between partitions with equal workload types, and high availability (HA) options that provide the extra layer of flexibility and resiliency mission-critical environments demand. High availability models include the Dorado 4180-HA and 4190-HA servers, which utilize a dual-partition design – one active, one standby – to enable a quick failover should the production side be compromised in any way.

And of course, like all new Dorado mainframes running the OS 2200 operating environment, the Dorado 4150, 4180, and 4190 servers offer code and data compatibility, enabling you to carry forward existing applications on supported software releases without any recompiling work.

Please visit Unisys.com to learn more about these new servers, as well as others in the ClearPath Dorado family.



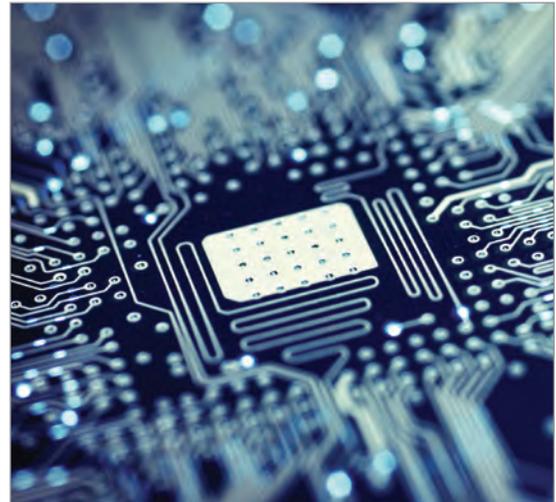
Tech Corner: Unisys Secure Partitioning Overview

By Steve Thompson, ClearPath MCP Engineering Program Manager, Unisys TCIS

Executive Overview

Advances in hardware technologies have resulted in significant increases in platform capacity – trends that Unisys expects to continue for the foreseeable future. As such, we have made a significant R&D investment in developing a new, state-of-the-art technology, known as Unisys Secure Partitioning (sPar), which takes full advantage of these platform capacity trends.

sPar is an innovative, new virtualization technology that has been architected, designed, and developed to deliver a predictable, secure, mission-critical, scalable, distributed operating environment on an Intel® Xeon® x64 (multi-core) platform. sPar has been released with the Next-Generation Architecture [ClearPath Libra 4100 mainframe](#), which is discussed elsewhere in this issue of ClearPath Connection.



Industry-available commodity hypervisors are generally designed to solve server sprawl and tend to be optimized to maximize hardware utilization. The resulting solution solves a real business problem. However, the levels of predictability that traditional mainframe users expect are not achieved because this approach uses a shared resource strategy.

The Unisys Secure Partitioning vision, strategy, and plan are different – because sPar is optimized for maximum hardware isolation. As such, it provides operating environment isolation and delivers all of the predictability attributes described above.

We have consistently demonstrated an understanding of the system methods, processes, and algorithms required to deliver a predictable, scalable, secure, mission-critical operating environment. The sPar technology builds on our ClearPath heritage and is a key technology for delivering on the Next-Generation Architecture vision, strategy, and plan for the future.

Platform Trends

Long ago (in technology terms), hardware capacity per square centimeter was limited by hardware-related processes, tools, and technologies. As a result, resources and the associated operating environments were subdivided and isolated along physical platform boundaries. Security and predictability were achieved because physical platform resources (i.e., processors, memory, and I/O) were not shared by multiple operating environments. This methodology is known as hardware partitioning.

Fast forward to today, where hardware-related processes, tools, and technologies have improved significantly, allowing engineers to develop a sustainable, cost-effective methodology to deliver more hardware capacity per square centimeter than ever before. Computer vendors and consumers, software engineers, and others, are challenged to figure out how to leverage this capacity in a meaningful way that solves real business problems. >>

Our response is a significant R&D investment in the development of sPar, which takes full advantage of these platform capacity trends. Unlike current industry-available virtualization technologies, sPar does not share hardware resources. Rather, it delivers multiple, isolated, secure, reliable, and predictable operating environments on a single Intel® processor-based hardware platform – attributes that are more consistent with those achieved using hardware partitioning.

Hardware Platform Partitioning Methods

There are several methods of subdividing a server. Two of the more commonly known are *Hardware Partitioning* and *Hypervisors*.

1. *Hardware Partitioning* subdivides a hardware platform into multiple physical partitions that can be operated, powered, and cooled independently. Resources are coarsely subdivided (e.g., physical boards, modules, chassis, etc.) and not shared by multiple partitions. Hardware platform partition isolation is configured by software and controlled in hardware, i.e. in silicon. The advantages of this method are isolation, security, and predictability. And, a disadvantage is the price/cost per physical partition.
2. *Hypervisors* use a layer of software or firmware to subdivide hardware resources into multiple virtual partitions that can be operated independently, but do not have independent power and cooling. Platform resources are allocated at a finer granularity (e.g., processor cores or fractions of a processor core) and are generally shared by multiple virtual partitions. Virtual partition isolation is configured by the hypervisor and controlled by the hypervisor and/or the hardware (e.g., Intel® Virtual Technology (VT)). The advantages of hypervisors are a fine-grained resource allocation and the ability to share hardware resources, which result in improved price/cost per virtual partition. The disadvantages of hypervisors include a reduction in virtual partition isolation, security, and predictability.

Industry-Available Hypervisors

Designed to solve server sprawl, industry-available hypervisors consolidate multiple Microsoft® Windows® and/or Linux® physical servers with low utilization characteristics onto one highly utilized physical platform by creating multiple virtual partitions, one for each operating environment. The goal is to reduce the number of physical systems to be purchased and managed, shrink energy costs, improve “green” attributes, and so on. The tradeoff for using a shared platform resource methodology is a reduction of virtual partition isolation, security, and predictability. Note, virtual partition management (i.e., Windows and/or Linux operating environments) is still required.

Unisys Secure Partitioning

Unlike industry-available hypervisors that execute on Intel® Xeon platforms, sPar is optimized for partition isolation, security, and predictability. It implements a set of algorithms that subdivide an Intel® Xeon processor-based ClearPath platform into multiple partitions or operating environments so that hardware resources are not shared between them. The goal is reduce the number of physical platforms to be purchased and managed, lower energy costs, and improve “green” attributes – without sacrificing operating environment isolation, security, and predictability. sPar is a hypervisor that delivers virtual partition attributes that are more consistent with the attributes delivered using hardware partitioning.

sPar is a Type 1 hypervisor that leverages Intel® VT to create and monitor multiple operating environments (Type 1 hypervisors run directly on the hardware platform). It is implemented as a thin layer of firmware with very low overhead. >>

During power up, the sPar firmware creates multiple operating environments based on a system configuration file known as a System Profile. sPar configures the Intel® VT hardware for each individual operating environment – with unique and dedicated processors, memory, and I/O hardware resources for each operating environment. The resulting operating environments are completely isolated from one another, ensuring secure and predictable performance.

For example, ClearPath Libra 4100 servers feature sPar with a System Profile that defines a distributed ClearPath MCP operating environment, which includes a Core MCP operating environment, two ClearPath MCP JProcessor specialty engines, and one ClearPath ePortal (1 ePortal Controller and 4 WebPMs) specialty engine.

Once established, sPar monitors the operating environments, including interrupts and exceptions, to ensure proper operation, continued isolation, and error containment. sPar also provides timer services and a secure, reliable, and high-performance method for inter-operating-environment communication.

Unisys Research & Development

Unisys has consistently demonstrated that it understands the system methods, processes, and algorithms required to deliver a predictable, scalable, secure, and mission-critical operating environment – and the sPar technology is a derivative of this heritage. sPar was architected, designed, and developed using knowledge, skills, and experience acquired during the last several decades, making it a key technology for delivering on the ClearPath Server vision, strategy, and plan for the years ahead.

Think Outside the Box (#3 in a series...)

Flexible leasing solutions help solve unique business challenges. Here's another example...

Situation:

After winning a large outsourcing contract that would last a minimum of five years and nearly double its processing requirements, a major healthcare service provider needed to obtain a new, higher-capacity ClearPath mainframe – and, at the same time, keep the price per metered MIP as low as possible. To further complicate the financial requirements, the new contract would take three years to be fully active – meaning the outsourcer needed a way to align costs to the gradual growth in its revenue stream as the conversion progressed.

Solution:

The healthcare service provider financed the solution through Unisys Leasing Worldwide, which structured a "step lease" based upon expected usage of metered MIPS over the outsourcing contract. Payments started at a low level for the first year, then increased in line with expected revenue in the second year – and finally stepped up a third time to a fixed payment for the remainder of the contract.

Result:

The healthcare service provider was able to contract with Unisys for the ClearPath computing power it needed, at the lowest price per MIP. And, it benefits from an innovative payment structure that aligns with revenue as the new client conversion progresses.

To create your own leasing success story, contact your Unisys sales representative or a Unisys leasing rep.

Unisys Disk Library for Mainframe: Simplifying Data Storage



As the mainframe continues to solidify its position as the go-to platform for performance-driven, mission-critical environments, the need to preserve the data being processed each day remains an important – and complex – task. Securing information continues to be a challenge due to the fact that many mainframe shops rely on physical tape systems as their primary backup and archive storage option. Whenever physical tape processes are used, it creates concerns about backup and job processing performance, the reliability, availability, and manageability of tape media, and disaster recovery (DR) capabilities.

In light of these challenges, we've partnered with EMC® to offer a solution that modernizes the traditional tape infrastructure – Unisys Disk Library for Mainframe (DLm). Designed for ClearPath Dorado servers featuring the recently announced FICON tape connection channels, DLm combines virtual tape emulation (VTE) with disk-based storage to optimize read and write operations, while working seamlessly with your existing tape management system. The solution includes built-in remote replication capabilities that enable you to replicate information from a production site DLm to a recovery site DLm for DR purposes. And DLm also gives you access to Unisys proven tape assessment and implementation services, which ensure an accurately sized and configured solution.

Available in two models – the DLm120 and DLm960 – the solution is built with the scalability to accommodate evolving throughput and storage needs as follows:

- DLm120 starts with one VTE and 9.5 TB of usable capacity, and offers a maximum of two VTEs and 47.5 TB
- DLm960 offers a baseline of one VTE and 28.5 TB of usable capacity, and can scale to a total of six VTEs and 1.2 petabytes of capacity

Both models help to ensure information availability by having no single point of failure. Since each VTE can access all available tape volumes, the failure of one VTE will not compromise your ability to retrieve data. And, DLm protects its disk drives with a RAID 6 setup that includes 12 active drives and two parity drives.

Unisys DLm delivers many advantages over traditional tape approaches, enabling you to:

- Eliminate manual intervention and physical movement of tape cartridges
- Protect your investment by adopting tape management processes that work seamlessly with existing applications
- Reduce job processing windows by reallocating data to DLm at disk speeds
- Extend DR capabilities to tape workloads via offsite replication
- Scale as needed, without increasing management complexity
- Leverage the worldwide reach of Unisys and EMC services and support

To learn more about Unisys DLm, please contact your Unisys account executive.

Resources and Calendar

The list below contains information to help you stay up to date on all the latest news and announcements in the ClearPath world.

- [New Dorado Series servers announcement](#)
- [New Libra Series servers announcement](#)
- [Bill Maclean's launch day blog entry](#)
- [Jim Thompson's blog homepage](#)
- [ClearPath Cloud Development and Test video](#)
- [ClearPath Innovation Webcast Series](#)
- [ClearPath and Smart Devices video](#)
- [ClearPath instructional videos on YouTube](#)
- [sPar discussion at Wikibon](#)
- [ClearPath launch coverage in PC World](#)
- [sPar write-up in CTO Edge](#)
- [Unisys Consumerization of IT homepage](#)
- [Unisys Security Index](#)

Check our calendar for the latest information about upcoming events.

What	Where	When
UNITE Annual Technology Conference	Hyatt Regency Orange County , Anaheim, CA	May 22-25, 2011
ClearPath Innovation Webinar Series	Online	Check the webinar homepage for details

Have You Seen *Developing Agility*?

Issues of *Developing Agility*, a quarterly newsletter for Unisys Agile Business Suite and Enterprise Application Environment customers, are available for download in the [Publishing](#) section of the Unisys web site.



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