



ClearPath Forward System

Secure, Scalable and Cost-Effective Enterprise Fabric Based Computing Platform

Product Information Sheet

Business IT Challenges

Deploying technology is more difficult than ever with more options. Different delivery models, virtualization technologies, public and private clouds, and heterogeneous environments must collaborate and integrate today's datacenter. IT departments must find the best possible technologies to their specific requirements.

IT departments are reorganizing to move more innovation oriented structures. This shift in culture focuses budgets on initiatives that have direct impact on business.

IT departments have to enable business to respond to changing market dynamics. At the same time they need to provide security and reliability especially for the critical business applications. And all this needs to be done as fast as possible.

While flexibility is a requirement, so is doing more with less. IT departments are becoming centers of business innovation to drive revenue growth.

The Solution

ClearPath Forward™ systems are Intel x86 based platforms and provide highly-scalable, agile, fabric-based infrastructure designed to provide the predictable performance and security for your Windows and Linux applications. ClearPath Forward benefits come from decades of Unisys expertise in critical IT.

ClearPath Forward delivers a tightly integrated fabric based infrastructure which includes:

- Unisys secure partitioning (s-Par®) software
- Intel Xeon based platforms
- Interconnect software with high-speed InfiniBand media
- Unified fabric management and automation with ClearPath Forward Fabric Management
- Support for industry leading hypervisor and cloud technologies

These capabilities provide for enterprise-class security, simplification, predictable performance, virtually unlimited enormous scalability, and the potential for faster time-to-value by integrating existing environments on the high-speed ClearPath Forward fabric.

ClearPath Forward Capabilities:

- *s-Par software* allows ClearPath Forward Intel – based servers to be divided into a number of partitions, each of which is separated from the others for security, with its own dedicated resources. The dedication of resources aids security and provides for predictable performance. A ClearPath Forward node enables clients to define software blades or physical servers within physical servers.
- *Secure Fabrics* provide for secure, dedicated and predictable data channels to control the flow of information without the security limitations of traditional network infrastructure.
- *ClearPath Forward Fabric Management (FFM)* provides a simplified, highly available unified system management environment using a cloud-like catalogue-based graphical user interface with role based controls.
- *VMware® Coexistence* provides a choice for enterprise environments which utilize VMware virtualization technologies. The high-speed Interconnect and other benefits of a ClearPath Forward fabric can be leveraged by configuring the fabric to span VMware virtual machines as well as Forward partitions.
- *VMware vCenter integration* enables ClearPath Forward partitions to be managed and monitored in VMware vCenter to simplify the datacenter experience.
- *Windows and Linux Operating System Images.* ClearPath Forward provides a choice of hardened and or pre-configured Linux & Windows operating system blueprints for faster time to deployment, simplified cloning, and maintenance.
- *Docker compatibility* increases system density for applications supporting ClearPath Forward on Linux operating environments.
- *High levels of automation* for commissioning operating systems and managing runtime operation enhances resilience and availability, and helps reduce operational costs. Clients have the ability to use a boot volume residing on external storage in a high availability situation to recover a partition after a platform failure. This feature offers a procedure to create Windows and Linux partition boot volumes on external storage.
- *The Interconnect* is a combination of media agnostic software, hardware media – InfiniBand, and firmware interlinking the fabric nodes and the partitions within them. The Interconnect hides the underlying connection technology from the applications and operating systems in the partitions.
- *Option for Unisys Stealth™* innovative software-based security helps eliminate the threat of a cyber-attack before it becomes one. Stealth increases enterprise-wide data protection by making communication endpoints undetectable to unauthorized users and securing data-in-motion across any network.

ClearPath Forward Platforms

ClearPath Forward platforms are available for independent Windows and Linux workload support; or as part of a larger infrastructure which includes Unisys MCP and OS 2200 processing environments. For more information on these capabilities refer to Unisys ClearPath Forward Libra and Unisys ClearPath Forward Dorado server sections in Unisys.com.

ClearPath Forward Benefits:

Lowered TCO: The ClearPath Forward packaging is designed to reduce the overall cost of infrastructure by lowering hardware and operational costs compared to equivalent UNIX systems by leveraging industry standard x86 technology. The design of the fabric based infrastructure helps flatten the cost of networking equipment and external switches and promotes the reduction of personnel expenses, system integration costs, support, and maintenance costs¹.

Increased Agility: The fabric-based infrastructure enhances agility by enabling for rapid creation of distributed applications and enabling the use of IT appliances in partitions. You can leverage the integrated management tools to provision to public, private and business critical cloud environments with reduced effort.

Enhanced Security: s-Par software enables segregation of applications through dedicated computing resources. s-Par was designed to reduce the risk of security vulnerabilities such as data or memory leaks between applications. High levels of isolation and hardening of operating systems help reduce the risk of security breaches. The delivery and commissioning processes, such as blueprints and factory integration, also help reduce security risks.

The option of Unisys Stealth increases security for standard and cloud environments, protects critical applications by confining the servers, conceals endpoints in a communities of interest (COIs) hidden from the outside, and leverages proprietary encryption techniques to protect data in motion during data transmission.

Predictable Performance: The partitions delivered by s-Par software provide enhanced security and deterministic behavior by dedicating processor, memory, IO and other resources to the partition. This delivers predictable system performance and higher system reliability for applications.

High Availability: The controlled commissioning processes are designed to reduce the chance of errors leading to instability. Networks of platforms linked by the Interconnect provide distributed resilience. Policy-driven autonomic management and automation can help reduce the consequences of any failure.

Improved ROI: The underlying ClearPath Forward architecture future proof's your IT investment. As the latest networking, computing, and storage technology is released, you may quickly integrate into the ClearPath Forward fabric. Organizational initiatives frequently change. Without a flexible architecture your organization IT cannot be agile while enabling innovation from the lines of business.

¹. Savings calculated based on standard IBM 770 midrange solution versus comparable *ClearPath Forward* solution. Estimates based on Unisys engineering models. Actual benefits may vary dependent on specific client implementations.

ClearPath Forward – Technical Specifications

Key Attributes		ClearPath Forward Software	
ClearPath Forward	Enhanced Security for Partitioning	Unisys Secure Partitioning s-Pa [®] – Enabling isolation through dedicated resources	
	Systems Management	ClearPath Forward™ Fabric Manager is a single pane of glass platform management solution which provides a web browser-based management user interface to the fabric. This user interface enables you to manage every enterprise partitionable platform and partition in the fabric and integrate, as required, with 3 rd party/higher level system and cloud managers. Fabric Manager includes commissioning software, scripts, and the ability to create hardened operating system blueprints and gold images	
	Remote Management System	Embedded Remote Management interface provides server-level management that monitors, reports, and controls power consumption at the processor, memory, and system level	
	Operating Systems for your Enterprise	<ul style="list-style-type: none"> • Microsoft® Windows Server® 2012 R2 / 2012 / 2008 R2 SP1x64 • SUSE® Linux Enterprise Server 12 • Red Hat® Enterprise Linux® 6.6 / 7.1 	
	Enhanced Security Option	Unisys Stealth™ (optional) – Conceals communication endpoints while protecting sensitive data in motion	
		ClearPath Forward Fabric Characteristics	
	ClearPath Forward Fabric Scalability	A ClearPath Forward fabric contains up to 32 physical platforms which can be a variety of Partitionable (PEPP) and Non-Partitionable (NEPP) Enterprise Platforms	
	Platform Partitioning	Each ClearPath Forward Enterprise Partition Platform (EPP) can have up to 30 secure, dedicated partitions depending on the client's processor, internal storage, memory, and interconnect requirements	
	Fabric Processing	ClearPath Forward is a flexible x86 architecture featuring platforms with processing power from single processor/socket Intel E5 to Dual processor/socket to Quad processor/socket Intel E7 with various processor speed selections	
	Fabric Interconnect	ClearPath Forward Interconnect consists of high bandwidth 56Gbs InfiniBand based networking technology	
	Fabric Storage	ClearPath Forward offers flexible choices of high capacity hard disk drives, high speed solid state disk drives, and FIPS compliant self-encrypting drives for internal storage requirements. For interfacing to external storage arrays, customers have the choice of dual-port and quad-port 8GB Fiber Channel adapters as well as network adapters for NAS and iSCSI connectivity	
	Industry Compliance	Compliant with all relevant industry certifications and guidelines, including 80 PLUS, Climate Savers and <i>ENERGY STAR</i>	

Operational Attributes		
Environmental specifications (temperature, humidity, altitude de-rating)	Continuous operation	10°C to 35°C (50°F to 95°F) at 10% to 80% relative humidity with 26°C (78.8°F) maximum dew point (maximum wet bulb temperature). De-rate maximum allowable dry bulb temperature at 1°C per 300m above 950m (1°F per 547 ft above 3117 ft).
	Storage	-40°C to 65°C (-40°F to 149°F) with a maximum temperature gradation of 20°C per hour at 5% to 95% relative humidity at a maximum wet bulb temperature of 33°C (91°F); atmosphere must be non-condensing at all times.
Maximum Heat Dissipation		Platform/configuration dependent
Cabinet	External Metrics	H 203.2 cm (80 in), W 60.64 cm (23.875 in), D 118.11 cm (46.5 in)
	Chassis Total Weight (max)	Platform/configuration dependent
Power	Supply Voltage	200-240 VAC
	Current Consumption	EPP/NEPP: Platform/configuration dependent
	Frequency	50-60Hz
Cooling		N+1 fan redundancy allows continuous operation with one fan failure in the unit.
Altitude	Operating / Storage	-15.2m to 3,048m (-50 ft to 10,000 ft) / -15.2m to 10,600m (-50 ft to 35,000 ft).
Airborne contaminant level		Class G1 or lower as defined by ISA-S71.04-1985
Thermal and Acoustics		Thermal management delivers high performance for the right amount of cooling to components at the lowest fan speeds across a wide range of ambient temperatures from 10°C to 35°C (50°F to 95°F).
Availability		Hot-plug, redundant power supplies; hot-plug drive bays; Dual internal SD Support; hot-plug, redundant fan; ECC memory, extended thermal support; ENERGY STAR® compliant, extended power range; Switch agnostic partitioning (SWAP).
Remote Management		Embedded Remote Management interface provides server-level management that monitors, reports, and controls power consumption at the processor, memory, and system level.
Industry Compliance		Compliant with all relevant industry certifications and guidelines, including 80 PLUS, Climate Savers and ENERGY STAR.

		Fabric Management Platform (FMP)
System Management Hardware	Form Factor	1U rack mount
	Sockets / Processors / Chipset	1 – Intel® Xeon® processor E5-2407v2 2.4GHz 4C (80W)
	Internal Interconnect	QPI 6.4GT/s
	Memory	1 – 16GB, Low Volt, Single Rank x4, 1600MHz RDIMMs
	Internal Storage	3 – 300GB, 10K RPM, 2.5" SAS, 6Gbps Hot-plug
	RAID Controller	H310
	Power	Dual Hot-plug Redundant Power Supply (1+1), 350W

		Unisys ClearPath Forward 1-Socket Architecture
Platform Hardware	Cabinet	42U rack
	Form Factor	1U rack mount per server
	Sockets / Processors	One socket, Intel® Xeon® E5 2407 v2 Processor 4C 2.40GHz
	Cache	25MB
	Internal Interconnect	Intel QuickPath Interconnect (QPI) links at up to 8.0 GT/s
	Memory	16 GB Standard DDR3 DIMMs 1600 MHz LV DR x4; up to 96GB supported
	Drive Controller	H310 (Internal)
	Hard Drive Bays	8 – 2.5" hot swap drive bays
	Internal Storage Options	Up to maximum of 8 2.5" SAS HDDs, SED or SSD
	Optical Drive	1 – DVD +/- RW SATA
	Built-in Network Interfaces	Intel® X540 Dual Port 10GbE BASE-T (FCoE enabled) and Intel I350 Dual Port 1GbE BASE-T LOM ports.
	I/O Slots	2 --- PCIe Gen3 slots: 1 --- Mellanox® Connect - X® – 3 VPI Dual Port 56Gb/s InfiniBand HCA 3 – Up to 1 --- Intel i350 Quad-Port 1GbE Copper Network Interface Card Up to 1 --- Intel X540 Dual-Port 10GbE Copper Network Interface Card Up to 1 --- Intel X520 Dual-Port 10GbE Optical Network Interface Card Up to 1 --- Emulex LPe12002 Dual Port 8Gb Fibre Channel HBA Up to 1 --- Emulex LPe15004 Quad Port 8Gb Fibre Channel HBA
	Power Supplies	Dual hot-plug auto-ranging 350W Redundant Power Supplies.
	Remote Management System	Embedded Remote Management interface provides server-level management that monitors, reports, and controls power consumption at the processor, memory, and system level.
Systems Management	Unisys Single Pane of Glass Platform Management IPMI Compliant System Identification front/rear buttons and LED OpenManage.	
Physical Specifications	Chassis dimensions: 64.23 cm (25.29") D x 48.2cm (18.98") W x 4.29cm (1.69") H Weight: 19.3 Kg (42.55 lb.) ReadyRails racking solution.	

		Unisys ClearPath Forward 2-Socket Architectures
Platform Hardware	Cabinet	42U rack
	Form Factor	2U rack mount per server
	Sockets / Processors	Two sockets, Intel® Xeon® Processors: E5-2667 v3 8C 3.2Ghz, E5-2690 v3 12C 2.6Ghz, or E5-2698 v3 16C 2.3Ghz with Hyper Threading & Turbo support (135W).
	Cache	Up to 50MB
	Internal Interconnect	2 – Intel QuickPath Interconnect (QPI) links at up to 8.0 GT/s
	Memory	up to 384GB supporting 16GB DDR3 DIMMs 1600 MHz LV DR x4
	Drive Controller	PERC H730 (Internal)
	Hard Drive Bays	16 – 2.5” hot swap drive bays
	Internal Storage Options	Up to maximum of 16 2.5” SAS HDDs, SED or SSD
	Built-in Network Interfaces	Intel® X540 Dual Port 10GbE BASE-T (FCoE enabled) and Intel I350 Dual Port 1GbE BASE-T LOM ports.
	I/O Slots	7 --- PCIe Gen3 slots total 1 --- Mellanox® Connect - X® – 3 VPI Dual Port 56Gb/s InfiniBand HCA 3 – Up to 6 --- Intel i350 Quad-Port 1GbE Copper Network Interface Card Up to 6 --- Intel X540 Dual-Port 10GbE Copper Network Interface Card Up to 6 --- Intel X520 Dual-Port 10GbE Optical Network Interface Card Up to 6 --- Emulex LPe12002 Dual Port 8Gb Fibre Channel HBA Up to 6 --- Emulex LPe15004 Quad Port 8Gb Fibre Channel HBA
	Power Supplies	Dual hot-plug auto-ranging Platinum+ Efficiency 1100W Redundant Power Supplies.
	Remote Management System	Embedded Remote Management interface provides server-level management that monitors, reports, and controls power consumption at the processor, memory, and system level.
	Systems Management	Unisys Single Pane of Glass Platform Management IPMI 2.0 Compliant System Identification front/rear buttons and LED OpenManage.
Physical Specifications	Chassis dimensions: 68.40cm (26.92”) D x 44.40cm (17.49”) W x 8.74cm (3.44”) H Weight: 31.4 kg (69.23 lb.) ReadyRails racking solution.	

		Unisys ClearPath Forward 4-Socket Architectures
Platform Hardware	Cabinet	42U rack
	Form Factor	4U rack mount per server
	Sockets / Processors	Four sockets, Intel® Xeon® Processor: E7-4850 v2 12C 2.3G Hz, or E7-4890 v2, 15C 2.5GHz with Hyper Threading and Turbo support (105W, 135W).
	Cache	Up to 37.5MB
	Internal Interconnect	Intel QuickPath Interconnect (QPI) links at up to 8.0 GT/s
	Memory	256 GB Default; supporting up to 3TB of memory (96 DIMMs)
	Drive Controller	H730 (Internal)
	Hard Drive Bays	24 – 2.5” hot swap drive bays
	Internal Storage Options	Up to maximum of 24 2.5” SAS HDDs, SED or SSD
	Built-in Network Interfaces	Intel® X540 Dual Port 10GbE BASE-T (FCoE enabled) and Intel I350 Dual Port 1GbE BASE-T LOM ports.
	I/O Slots	10 --- PCIe Gen3 slots: Support up to 9 slots 1 --- Mellanox® Connect - X® – 3 VPI Dual Port 56Gb/s InfiniBand HCA 3 – Up to 8 --- Intel i350 Quad-Port 1GbE Copper Network Interface Card Up to 8 --- Intel X540 Dual-Port 10GbE Copper Network Interface Card Up to 8 --- Intel X520 Dual-Port 10GbE Optical Network Interface Card Up to 8 --- Emulex LPe12002 Dual Port 8Gb Fibre Channel HBA Up to 8 --- Emulex LPe15004 Quad Port 8Gb Fibre Channel HBA
	Power Supplies	Dual/Quad hot-plug auto-ranging Platinum+ Efficiency 1100W Redundant Power Supplies.
	Remote Management System	Embedded Remote Management interface provides server-level management that monitors, reports, and controls power consumption at the processor, memory, and system level.
	Systems Management	Unisys Single Pane of Glass Platform Management IPMI 2.0 Compliant System Identification front/rear buttons and LED OpenManage.
Physical Specifications	Chassis dimensions: 80.23 cm (31.59”) D x 48.2 cm (18.98”) W x 17.26 cm (6.8”) H Weight: 59 kg (130.07 lb.) ReadyRails racking solution.	

For detailed list of operational attributes visit:

<http://public.support.unisys.com/public/pdws/default.aspx?release=forward3.1&pla=ps&nav=ps>

For more information visit www.unisys.com

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