ClearPath MCP Bronze and Silver
Thinking Outside the “Box” – MCP Goes Virtual

Announcement Webinar

April 27, 2016
Agenda

• The future is here – Brian Herkalo
• ClearPath MCP Bronze and Silver – Trudy Whitener
• Additional Technical Information - Steve Koss
• ClearPath Forward Services - Umashankar Saketharaman
The future is here

Brian Herkalo
Addressing the Challenges of the Future

ClearPath Software Series

...because [IT]'s a different world out there

Unisys Takes Flagship ClearPath MCP Software Virtual with Hardware-Independent Version

Powerful operating environment runs on popular VMware without dedicated system hardware, simplifying clients' use of IT resources and enabling cost reduction

BLUE BELL, Pa., April 27, 2016 – Unisys Corporation (NYSE: UIS) today announced a hardware-independent version of its ClearPath® MCP operating environment software. The rollout marks the first time that Unisys has offered one of its flagship ClearPath operating environments independently of a ClearPath Forward™ large-system platform.

The new version of the premier MCP operating environment is designed to provide a production-ready, entry-level instance of the full software stack running on any Intel x86 server under VMware ESXi™ or a client-chosen system conforming to a reference specification.

This unprecedented move enables Unisys ClearPath Forward Libra system clients to deploy their critical MCP application workloads using Intel x86-based infrastructure of their choice without the potential need to incur capital and maintenance costs for additional hardware.
ClearPath MCP Long Term Road Map

**Transitioning to the future**

Directional content and subject to change!

**ClearPath MCP Completens to Software Edition**

- **2020**
  - Complete move to Software only ClearPath environments
  - ClearPath Forward environments
    - The entire ClearPath product line is software deployable

- **2018**
  - Client fabric hosted anywhere
  - ClearPath Forward Hybrid Systems
    - Client fabric, Public or Private cloud, location agnostic

- **2015-16**
  - ClearPath begins the transition to Software Editions
  - Introducing Software Edition environments
    - MCP & OS 2200 Express – targeting academia and skills!
    - MCP Bronze & Silver - SW only replacements for entry platforms

- **2015**
  - Complete move to Intel
  - ClearPath Forward platforms surpass performance of all CMOS based systems

- **2014**
  - Introduction of the Fabric
    - New business models
  - ClearPath Dorado and Libra systems include a high speed highly secure Private cloud

- **2008**
  - ClearPath move to Intel
  - Delivering the first all Intel based ClearPath platform

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ClearPath Software Series
- March to the Future

2016
MCP Bronze & Silver Editions
Libra entry level range
- Client choice of platform
- Industry Virtualization
- Replaces the Libra 470

2017
Targeting Libra mid-range

2018-2020
Targeting all Libra
Entry → Premium High End

2015
MCP Developer Studio Personal Edition
- s-Par Partition

2015
MCP Express
FREE download
- Addressing skills
- Academic Community

2016
MCP Developer Studio
- Replacing the LX program
ClearPath MCP Bronze and Silver

Trudy Whitener
Today’s Reality
Pressure on IT to Deliver Business Value While Adhering to Industry Standards

What are the challenges?

“Our company has standardized on specific hardware vendors and operating platforms.”

“We need to maximize the investments that we have already made.”

“I need to retain the business logic in my applications while modernizing IT.”

“I need to pay attention to total IT costs and ensure the ROI of my IT investments.”

“How do I ensure I have the resources to maintain my enterprise applications and operations for the long term?”

ClearPath MCP Software Series – Thinking Outside the “Box” – MCP Goes Virtual
Agenda

• Benefits of software centric offerings
• Available versions of ClearPath MCP
• Migration paths
• Reference architecture
• Options
Benefits of ClearPath Software Series

- Lower Business Risks
- Gain Flexibility
- Reduce Costs
ClearPath MCP Entry Level Transformation

Building on Intel-based x86 Reference Architecture

- ClearPath MCP Silver
- ClearPath MCP Bronze
- ClearPath MCP Express
- ClearPath MCP Dev Studio
  - Libra 470 Series
  - Libra 460 Series
  - Libra 450 Series
  - Libra 400 Series

Software Generation

- 4th Generation
- 3rd Generation
- 2nd Generation
- 1st Release

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### ClearPath Software Series Versions

<table>
<thead>
<tr>
<th>Workload</th>
<th>Express</th>
<th>Developer Studio</th>
<th>Bronze</th>
<th>Silver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>Development</td>
<td>Production</td>
<td>Production</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MCP Processors</th>
<th>1</th>
<th>1 or 2</th>
<th>1</th>
<th>1 or 2</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Deployment</th>
<th>Reference Architecture</th>
<th>Forward Fabric or Reference Architecture</th>
<th>Reference Architecture &amp; Virtualization</th>
<th>Reference Architecture &amp; Virtualization</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Memory (max.)</th>
<th>4GW</th>
<th>4GW</th>
<th>4GW</th>
<th>4GW</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Use Case</th>
<th>Education and Training</th>
<th>Developer Environment</th>
<th>User-Based Production</th>
<th>Entry Level Capacity Based Production</th>
</tr>
</thead>
</table>
## ClearPath MCP Bronze and Silver Key Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>ClearPath MCP Bronze</th>
<th>ClearPath MCP Silver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Licensing/pricing metric</td>
<td>Concurrent users</td>
<td>Capacity (maximum number of virtual CPMs)</td>
</tr>
<tr>
<td>Maximum number of MCP Central Processing Modules (CPMs)</td>
<td>1</td>
<td>1 or 2</td>
</tr>
<tr>
<td>General Purpose workload available</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>AB Suite/EAE workload available</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Dedicated BC/DR workload available</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Migration path for clients having</td>
<td>Libra 4x0 with user-based licensing</td>
<td>Libra 4x0 with capacity-based licensing</td>
</tr>
<tr>
<td>Tape Drives Supported</td>
<td>Bare metal, only</td>
<td>Bare metal, only</td>
</tr>
<tr>
<td>DVD Drives Supported</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>DVD Drives Supported</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
## Migration Paths for Existing Entry Level Libra 4x0 Servers (User Based)

<table>
<thead>
<tr>
<th>Primary Use Case</th>
<th>Current</th>
<th>Migration Path</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Workload Type</td>
<td>License Model</td>
</tr>
<tr>
<td>Production and/or Dev/test</td>
<td>General Purpose</td>
<td>Concurrent users</td>
</tr>
<tr>
<td>DR + Other work</td>
<td>General Purpose</td>
<td>Concurrent users – 8+</td>
</tr>
<tr>
<td>Dedicated DR</td>
<td>General Purpose</td>
<td>Concurrent users - 8</td>
</tr>
<tr>
<td></td>
<td>VMware DR/HA tools (3rd party products)</td>
<td></td>
</tr>
</tbody>
</table>
# Migration Paths for Existing Midrange Libra 4xx Operating Environment Migration (Capacity Based)

## Primary Use Case

<table>
<thead>
<tr>
<th>Primary Use Case</th>
<th>Current</th>
<th>Migration Path</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Workload Type</td>
<td>MCP Environment</td>
</tr>
<tr>
<td><strong>Production and/or Dev/test</strong></td>
<td>General Purpose</td>
<td>ClearPath MCP Silver</td>
</tr>
<tr>
<td><strong>AB Suite/ EAE Prod and/or Dev/test</strong></td>
<td>AB Suite</td>
<td>ClearPath MCP Silver</td>
</tr>
<tr>
<td><strong>Dev/test</strong></td>
<td>Dev/test</td>
<td>MCP Developer Studio</td>
</tr>
<tr>
<td><strong>Dedicated DR</strong></td>
<td>DR</td>
<td>ClearPath MCP Silver</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VMware DR/HA tools (3rd party products)</td>
</tr>
<tr>
<td><strong>DR + Other Work</strong></td>
<td>GP, AB Suite, or Dev/test</td>
<td>ClearPath MCP Silver</td>
</tr>
<tr>
<td><strong>Dedicated DR + Automated Failover</strong></td>
<td>Warm BC</td>
<td>ClearPath MCP Silver</td>
</tr>
</tbody>
</table>
## Reference Architecture Host Environments

<table>
<thead>
<tr>
<th>Unisys Model</th>
<th>Dell Model Equivalent</th>
<th>Dell Generation</th>
<th>Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES3000 3530T G5</td>
<td>T630</td>
<td>13G</td>
<td>5U</td>
</tr>
<tr>
<td>ES3000 3560R G5</td>
<td>R730</td>
<td>13G</td>
<td>2U</td>
</tr>
</tbody>
</table>
Reference Architecture Host Environments

ES3000 Model 3530T Enterprise Server

- 5U
- Processor: **E5-2667 v3 3.2GHz, 8C (135W)** or **E5-2667 v4 3.2GHz, 8C (135W)**
- Memory: 4GW (MCP), 64GB total
- Disk:
  - Minimum: 2 x 600GB drives, Raid 1
  - Additional drives optional
- HBA (0-3)
  - Emulex LPe12002B (2x8Gb)
  - Emulex LPe15004
  - Emulex LPe16002B (2x16Gb)
- HCA (0-1)
  - Mellanox IB (2x56Gb)
- NIC (0-3)
  - Intel I350-T4 (4x1Gb)
  - Intel X520-SR2 (2x10Gb optical)
  - Intel X540-T2 (2x10Gb copper)
- Internal tape support for LTO 6
- Drive backplane
  - 16- and 32-bay backplanes
Reference Operating Environments

Requirements – Bare Metal and Hypervisor

- x86 Server
- Microsoft Windows Server 2012 R2

Options

- VMware ESXi 5.5 or 6.0
- Additional hypervisors will be added to the Reference Architecture
- Other hypervisors may work
Hypervisor Configuration Considerations

• Only Logical Disks are supported. VSS is not supported on hypervisor-based systems.

• Features not supported when using a hypervisor:
  • Disk Encryption
  • MCP TapeStack
  • Tape Encryption

• No tape or optical devices are supported on hypervisor based systems.
Hypervisor Configuration Considerations

• ClearPath MCP cannot be cloned a virtual environment
• Many attributes are only checked by the MCP Firmware during installation
• Live Migration could encounter performance issues for large MCP Memory configurations
• ePortal requires a dedicated NIC assigned for using ePortal
# ClearPath MCP Bronze Configuration Requirements

<table>
<thead>
<tr>
<th>Host Environments Allowed</th>
<th>MCP CPMs</th>
<th>MCP Memory</th>
<th>MCP Disk Types</th>
<th>Tape Eligible?</th>
<th>DVD Eligible?</th>
<th>Windows OS Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bare Metal</td>
<td>1</td>
<td>64MW to 4GW</td>
<td>Logical Disk or VSS1/VSS2</td>
<td>Yes</td>
<td>No</td>
<td>Windows 2012 R2</td>
</tr>
<tr>
<td>VMware</td>
<td>1</td>
<td>64MW to 4GW</td>
<td>Logical Disk</td>
<td>No</td>
<td>No</td>
<td>Windows 2012 R2</td>
</tr>
</tbody>
</table>
# ClearPath MCP Silver Configuration Requirements

<table>
<thead>
<tr>
<th>Host Environments Allowed</th>
<th>MCP CPMs</th>
<th>MCP Memory</th>
<th>MCP Disk Types</th>
<th>Tape Eligible?</th>
<th>DVD Eligible?</th>
<th>Windows OS Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bare Metal</td>
<td>1 or 2</td>
<td>64MW to 4GW</td>
<td>Logical Disk or VSS1/VSS2</td>
<td>Yes</td>
<td>No</td>
<td>Windows 2012 R2</td>
</tr>
<tr>
<td>VMware</td>
<td>1 or 2</td>
<td>64MW to 4GW</td>
<td>Logical Disk</td>
<td>No</td>
<td>No</td>
<td>Windows 2012 R2</td>
</tr>
</tbody>
</table>
ClearPath Software Series deployed on Bare Metal

For bare metal installations, the installation of unsupported software components alongside of MCP might adversely impact performance and operations.
ClearPath Software Series deployed on VMware

- Application Workload
  - MCP OS
  - MCP Firmware
  - Windows
  - VMware / Hypervisor environment
  - Platform, NICs, HBAs

- Unisys MCP Bronze or Silver software
- Unisys ES3000 or 3rd party software
- Unisys ES3000 or 3rd party hardware
Additional Technical Information

Steve Koss
ClearPath Software Series

• A set of deliverables that mark the transition of ClearPath from hardware platform centric to Software Only Solutions deployable on reference architectures and industry virtualization technologies

• **NO MIPS!** – Performance is not stated, measured or monitored

• MCP Developer Studio (2015)
  – MCP development images deployable in s-Par partitions within a ClearPath Forward fabric

• MCP & OS 2200 Express (2016)
  – No charge download from Unisys.com addressing the academic, hobbyist and client skill expansion segments.

• **ClearPath MCP Bronze & Silver** (2016)
  – Deployable on a reference architecture and/or industry standard *virtualization

* Deployment on Microsoft Hyper-V available at a later date
ClearPath Bronze & Silver Advantages
Architectural Direction Maintains ClearPath Values

- Security
- Core Integrated Stack
- High-Volume Transaction Processing
- Enterprise Class system and mind-set
  - Resilient IO Subsystem
    - Data Integrity is Priority 1
    - Disk Integrity is maintained after Power or Memory Failures
    - Write-Through Caching only
  - Rapid Update and Upgrade Times
- Take advantage of Intel Xeon and it’s investment and market dominance
Software-Defined Data Center (SDDC)
Putting It All Together in the Modern “All x86” Data Center

• Components
  – Intel x86 (Xeon) Server Farm
  – Server Virtualization (e.g. VMware)
  – SDS – Software Defined Storage [External (SAN-Based) Storage]
  – SDN – Software Defined Networking – Network Virtualization
  – Management and Automation Software
    • Integrated Disaster Recovery Replication and Tooling
    • Common Backup and Archiving System
Highlights

• **Software Only Solution**
  – Based on Intel® Xeon®
    • $5+ Billion Annual Investment

• **VMware ESXi Support (vSphere Hypervisor)**

• **You Control the Performance**
  – Based on Generation and Speed of Intel Processor Used, Core, Memory, etc.
  – Ability to change underlying platform at anytime to meet your business need

• **Integrates with the rest or your infrastructure**
  – Backup and Disaster Recovery Tooling

• **Improved Maintainability**
  – Automated Reporting (Call Home)
Advantages and Cost Savings Benefits

• Use your existing hardware or purchase new
  – Configure only the resources you need. (Processors / Memory, etc.)

• High Availability supported via vMotion.

• License can be used in conjunction with VMware DR Tooling
  – Zerto or other similar tools (Veeam, VMware SRM+VR)
  – No added software charge for DR and DR testing with this tooling.
Differences and Details

- Reference Architecture Specification is Supplied
- Internet based software delivery
- No CD / DVD / Tape Support (for VMware deployment)
  - Backup is via WRAP or Logical Disk (.asd file) Copies
- Software Only - Support from Unisys
  - Automatic Call Home to Unisys for MCP issues
- Logical Disk only (no VSS1 or VSS2 support)
Advantages

• System Operations and Management nearly the same as previous systems

• Continue to use all tools and processes
  – Batch programs / Workflow (WFL)
  – Customized programs
  – Security methodology
  – Monitoring, management, and forecasting

• True Enterprise Class Environment
  – Resilient Disk Cache
  – Mandatory fixes are rare
  – Tooling needed for operations is packaged and integrated

• Designed for the Future
  – Common Infrastructure (Intel) across all environments
ClearPath Forward Services

Umashankar Saketharaman
ClearPath Forward Services Portfolio

An integrated and holistic set of ClearPath Forward service offerings

- Application Enrichment Services
- Product Implementation Services
- Managed Services

Market-oriented approach
Product Implementation Services

ClearPath MCP Bronze/Silver Implementation Service

What we offer:

- Installation of the desired ClearPath MCP operating environment onto the platform of your own choice
- Facilitate the connections of ClearPath MCP to any peripheral devices that you may have or want to install
- Tuning of the ClearPath MCP environment to take best advantage of your chosen platform

Product Implementation Service is all about implementing and/or migrating to ClearPath Forward operating systems software, products and tools

Includes planning, configuration, installation, testing, documentation/training services for:

- Application modernization products
- Development environment products
- System management tools
- Other new products (e.g. software-only OS)
ClearPath MCP Bronze/Silver Implementation Steps

Prerequisites
• Refer to the ClearPath Software Series Compatibility Guide for guidance on the configuration requirements
• Install a client-supplied Windows Server 2012 R2 OS
• If using VMware, create a Windows Server 2012 R2 Virtual Machine on the ESXi Host on which ClearPath MCP Bronze/Silver is to be installed

Installation Steps

 Extract the installation package and double click MIM.exe to begin installation
 MIM installation log tracks the progress of the installation
  o C:\Users\<username>\AppData\Roaming\Unisys\Installation\Install\mim.log
  o Useful in troubleshooting a problem, should one arise during installation
 Select location for MCP Disk Image & Diagnostic files
  o Selected folders must not use Windows file encryption or compression
  o Dedicated folder for Diagnostics is strongly recommended
 After the MCP firmware installation completes, the desktop will have the MCP console icon

Note: Unisys is currently offering Implementation service for:
• Bare-metal environment
• VMware environment

Custom Oder File
• Contains information unique to a ClearPath MCP Bronze/Silver order:
  • Manufacturing Control Number (MCN)
  • Software Control Number (SCN)
  • License entitlement
    • One ClearPath MCP Bronze/Silver can be activated per order
• Provided on a separate DVD and as an attachment to the Welcome Email

Pre Installation
• Verify networking is functional on Windows guest
• Copy the installation package to Windows environment where MCP Bronze/Silver is to be installed
  • Copy contents of DVD to the C: drive of the guest
• Copy Custom Order Data file to the COD folder of the installation package
  • Copy to C:\Unisys\Installation\COD folder

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Why Unisys?

• Installation by Unisys MCP software-only products skilled, knowledgeable consultants
  • Helps client successfully implement the solutions
  • Maximize the value of the investment
  • Address their critical business needs efficiently

• Same great service, delivered by the experts. Unisys has been doing this for decades.

• Unisys can help clients to tune their ClearPath MCP system for the hardware environment chosen by them
  (Note: Unisys does not guarantee performance with this offering)

• Engaging with Unisys implementation service allows client’s IT resources to stay focused on their core tasks and priorities

• Unisys performs verification prior to installation to ensure that all implementation prerequisites are met to avoid any business disruptions

Unisys ClearPath Forward services helps in greater business agility and reduced TCO
THANK YOU