DESCRIPTION

Stromasys Charon-AXP/DS/ES/GS are members of the Charon-AXP cross-platform hardware virtualization product family. They are designed to replace the following DEC AlphaServer computer systems:

Charon-AXP product	Hardware to replace
Charon-AXP/DS10	AlphaServer DS10, DS15
Charon-AXP/DS20	AlphaServer DS20, DS25
Charon-AXP/ES40	AlphaServer ES40, ES45, ES47
Charon-AXP/GS80	AlphaServer GS80, GS60, ES80
Charon-AXP/GS160	AlphaServer GS140, GS160
Charon-AXP/GS320	AlphaServer GS320, GS1280

Charon-AXP emulates most of the original Alpha-specific hardware. It runs the original Alpha binary code, including the operating systems OpenVMS and Tru64 UNIX, the layered products, and applications, which all continue to work as before. A small number of changes to the original software (operating system, layered products, or applications) may be required. The Tru64 kernel may have to be rebuilt.

NETWORK

Charon-AXP virtualizes the 10/100 Mbps Ethernet controllers of the DEC 21x4x and Intel 8255x families, ensuring support of any AlphaServer installation. Any protocol supported on a physical Alpha Ethernet link (DECnet, TCP/IP, and LAT) will work on a virtualized Charon link. The Charon network adapter is recognized by the operating system as a 10/100 Mbps link, but since the adapter is virtualized, it may exceed that speed when connected to a 1 Gbps / 10 Gbps adapter in the host system. The network performance also depends on design limitations of the guest OS (VMS or Tru64).

STORAGE

Charon-AXP provides support for Alpha disk, tape, and CD/DVD storage devices via virtual KZPBA SCSI and KGPSA FC adapters, translating them into any modern technology (SCSI, SATA, SAS) by means of virtual disk images on a Linux filesystem or physical LUNs attached locally or remotely by iSCSI, SAN, or NAS.

PCI PASSTHROUGH

Emulex FC adapters compatible with the original AlphaServer hardware (FC KGPSA) and serial line PBXDA adapters can be used by Charon-AXP to provide direct access to SAN infrastructures and serial lines, equivalent to the physical Alpha access. Using PCI Passthrough enables up to 50% disk I/O performance improvement compared to using virtual storage controllers. It is recommended for high performance configurations with access to SAN infrastructures.

HOST SYSTEM REQUIREMENTS

A physical system or virtual appliance with multi-core CPUs (Intel Xeon Gold and Platinum CPUs with a clock frequency of 3GHz and above are recommended), dedicated Ethernet adapters, an optional USB port for the license key, and enough disk space to keep the OpenVMS or Tru64 data. For every emulated AXP CPU, Charon must have exclusive access to at least 2 CPU cores on the host system. For each emulated Alpha system, Charon-AXP requires at least 2 GB of RAM plus the amount of RAM assigned to the emulated Alpha system.

PERFORMANCE

SPEC2000 tests running on Tru64 5.1B on Charon-AXP emulating an AlphaServer ES45 deliver about **SINT2000 867** and **SFP2000 678** on a system with Intel Xeon Gold 6137 3.9GHz CPUs. Charon-AXP benefits from the newer, faster hardware, offering equal or better performance compared to most Alpha systems. The constant improvements Stromasys makes to the Charon products, together with rapidly developing faster hardware, will further shift the balance in favor of cross-platform virtualization. Full SPEC2000 data for all physical Alpha systems can be accessed online at https://www.spec.org/cpu2000/.

SYSTEM MAINTENANCE

Once installed and configured, the Charon system behaves like the original Alpha system, and can be treated as an Alpha. Guest OS and applications operating procedures remain the same. The host operating system does not require a network connection and regular patching after the installation. See user's guide for requirements regarding any updates to the host OS.

LICENSE PROTECTION

A valid license should be permanently available to Charon in the form of a local or network attached USB HASP license dongle, or a Software License. The license contains customer specific parameters and allows remote electronic updates. USB dongles enable a rapid switch-over to another host system as the Charon executable itself can be installed on multiple systems for disaster recovery purposes. Flexible licensing options allow combining multiple instances of different Charon products on a single host system.

DISTRIBUTION

Charon Release notes, User manuals and Software Product Descriptions are available for download from the Stromasys Product Documentation and Knowledge Base web pages. Downloading installation kits and patches requires a partner account or credentials provided by Stromasys on an individual basis.

CHARON UTILITIES

Charon-AXP on Linux is delivered with the **Charon Linux Toolkit** which consolidates all Charon management tasks: creating and configuring Charon instances, monitoring and managing Charon licenses and logs, configuring host hardware resources for Charon needs, synchronized host and guest OS shutdown, etc. The following applications are invoked from the Charon Linux Toolkit:

- **menu** is a text based interactive menu system for setting up / configuring / monitoring / managing Charon instances
- **hasp_srm_view** displays the content of Charon-AXP licenses
- **ncu** ("Network Control Utility") is used to dedicate a host network interface to Charon-AXP, to release it back to the host, and to manage Charon virtual interfaces (TAPs)

The following command line utilities are also available:

- **mkdskcmd** is used to create empty disk images and extend existing disk images
- **mtd** for transferring data between physical tapes and Charon tape container files

Stromasys Charon Guest Utilities for OpenVMS version 6.1 and above are supplied on a disk image to provide the following functionality:

- **Tape Utilities Package** for manipulating virtual tape images and managing a virtual SCSI tape changer
- **VMS bypass driver** for emulating DU/DR/DG/DQ/DI disk devices
  - **Power consumption optimization (IDLE)** VMS utility for implementing energy saving mode when a virtual AXP CPU is idle

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VIRTUALIZED HARDWARE

Charon product	Charon-AXP/DS10	Charon-AXP/DS20	Charon-AXP/ES40	Charon-AXP/GS80	Charon-AXP/GS160	Charon-AXP/GS320
Emulated AlphaServer model	DS10, DS15	DS20, DS25	ES40, ES45, ES47	GS60, GS80, ES80	GS140, GS160	GS320, GS1280
Alpha CPUs (base / maximum)	1 / 1	1 / 2	2 / 4	4 / 8	8 / 16	16 / 32
Emulated RAM	Up to 32 GB	Up to 32 GB	Up to 32 GB	Up to 64 GB	Up to 128 GB	Up to 256 GB
Available virtual PCI slots	4	6	10	27	27	27
Storage adapter support	Emulated PCI SCSI KZPBA adapters (2 preloaded for DS20, DS25; 1 preloaded for GS series); emulated PCI FC KGPSA adapters; up to 120 storage units (disks, tapes, and CD/DVD) supported simultaneously; emulated Acer Labs 1543C IDE/ATAPI controller (1 preloaded; only virtual IDE CD/DVD devices)					
Disk storage support	**Virtual** disk images on a local and remote Linux file system (.vdisk container files); **Logical and Physical** SCSI disks (/dev/sdN) and partitions (/dev/sdNL); iSCSI disks; SAN attached storage volumes identified by WWID (/dev/id)					
Tape storage support	**Virtual** tape images on a local and remote Linux file system (.vtape container files); **physical** SCSI tape drives (/dev/sgN devices)					
CDROM / Floppy disk support	Virtual CD/DVDs images a local and remote Linux file system (.iso container files); physical CD/DVD drives (/dev/cdrom, /dev/srN devices) / Floppy not supported					
Ethernet network support	Emulated PCI DEC 21x4x adapters: DE435, DE450, DE500AA, and DE500BA (2 DEC 21143 controllers preloaded for DS10, DS15; 1 preloaded for DS25); emulated PCI Intel 82558 10/100 Mbps adapters: DE602 and DE602AA					
Fibre Channel / FDDI support	Direct connection to SAN with physical KGPSA or compatible FC EMULEX HBA adapters (up to 8 Gbps) in Passthrough mode; direct connection to SAN with Linux supported FC HBA adapters in Presentation mode / No FDDI physical DEFPA adapter support					
Console / Serial lines	OPA0 console attached to a Windows terminal emulator, a physical serial port (COMxx: device), or a TCP/IP socket / PCI Pass Through serial line controller PBXDA (8 serial lines)					
Console / Graphics	Emulated DEC ZLXp-E2 graphics adapter (PBXGA) with virtual display 1280x1024 resolution					
Supported operating systems	OpenVMS 7.1-2 – OpenVMS 8.4, Tru64 UNIX 4.0F – 5.1B (also known as Compaq or HP Tru64 UNIX)			OpenVMS 7.2-1H1 – OpenVMS 8.4, Tru64 UNIX 4.0G – 5.1B (also known as Compaq or HP Tru64 UNIX)		

Host system requirements

Host operating system	Red Hat Enterprise Linux (RHEL) 6.5 – 7.5 (64 bit); CentOS 7.x (64 bit); Oracle Linux (Unbreakable Enterprise Kernel (UEK) Release 4; and Red Hat Compatible Kernel)
Hypervisor	VMware ESXi 5.5 – 6.7; Microsoft Hyper-V on Windows Server 2012 R2 and 2016; Oracle VM 3.4.5
Host CPU / RAM	Number of host system CPU cores ≥ 2 * (number of emulated AXP CPU cores); host RAM = (2 GB + AXP RAM) per emulated AXP instance
Recommended hardware	HP ProLiant G10 servers or their equivalent; Intel Xeon Gold or Platinum CPUs; Intel Core 8th generation CPUs; with frequency 3 GHz and above

Ordering information

	Charon-AXP/DS10	Charon-AXP/DS20	Charon-AXP/ES40	Charon-AXP/GS80	Charon-AXP/GS160	Charon-AXP/GS320
Perpetual license[1]	CHAXP-801IP	CHAXP-802IP	CHAXP-804IP	CHAXP-808IP	CHAXP-809IP	CHAXP-909IP
Annual license [1]	CHAXP-801IY	CHAXP-802IY	CHAXP-804IY	CHAXP-808IY	CHAXP-809IY	CHAXP-909IY
Annual GOLD / PLATINUM support [2]	CHAXP-801IU / CHAXP-801IT	CHAXP-802IU / CHAXP-802IT	CHAXP-804IU / CHAXP-804IT	CHAXP-808IU / CHAXP-808IT	CHAXP-809IU / CHAXP-809IT	CHAXP-909IU / CHAXP-909IT
Annual GOLD / PLATINUM subscription [1]	CHAXP-801ICG / CHAXP-801ICP	CHAXP-802ICG / CHAXP-802ICP	CHAXP-804ICG / CHAXP-804ICP	CHAXP-808ICG / CHAXP-808ICP	CHAXP-809ICG / CHAXP-809ICP	CHAXP-909ICG / CHAXP-909ICP
Backup license [1]	CHAXP-801IK	CHAXP-802IK	CHAXP-804IK	CHAXP-808IK	CHAXP-809IK	CHAXP-909IK
Additional CPU [1]	N/A	CHAXP-CPUIP	CHAXP-CPUIP	CHAXP-CPUIP	CHAXP-CPUIP	CHAXP-CPUIP

[1] Please contact Stromasys Sales team for Charon licensing details
[2] Please refer to Charon Service Descriptions for GOLD and PLATINUM terms, conditions, and SLAs

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