

SOFTWARE PRODUCT DESCRIPTION

Charon-AXP for Windows

Product version 4.12

Document version 1



DESCRIPTION

Stromasys Charon-AXP provides cross-platform hardware virtualization.

The product family is designed to replace the following DEC AlphaServer computer systems:

- AlphaServer 400, 1000, 1000A
- AlphaServer 800, 1200, 2000, 4000
- AlphaServer 2100, 4100
- AlphaServer DS10, DS15, DS20, DS25
- AlphaServer ES40, ES45, ES47
- AlphaServer GS80, GS60, ES80, GS140, GS160, 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 depends on CPU performance delivered by the host hardware and 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 Windows filesystem or physical LUNs attached locally or remotely by iSCSI, SAN, or NAS.

GPIB

Charon-AXP provides emulation of DEC IEP11 PCI GPIB adapters. Multiple emulated DEC IEP11 adapters are supported. To connect to a physical GPIB, Charon-AXP uses a Charon PCI PassThrough driver and a National Instruments PCI/PCIe GPIB board. Each emulated DEC IEP11 adapter requires a dedicated NI PCI/PCIe GPIB board. The use of drivers and runtime software provided by NI is not supported.

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 Windows is delivered with the **Charon Virtual Machines Manager**, a single-window application which consolidates all Charon management tasks: creating and configuring Charon instances, managing Charon licenses, configuring host hardware resources for Charon needs, etc. The following applications are invoked from Charon VM manager:

- **HASP License Details, License Update Tool, and Sentinel Admin Control Center** for Charon license management
- **Network Control Center** for managing Charon network drivers and settings
- **Device Check** for configuring directly connected host devices
- **Virtual Disk Tool** for creating empty disk image files (.vdisk)

The following utilities are available in command line mode:

- **Virtual Disk Tool** for creating empty disk image files (.vdisk)
- **MTD** for transferring data between physical tapes and Charon tape container files, and for converting virtual tape formats between Charon-AXP variants

The **Charon Windows Toolkit** consists of several utilities. They assist with **license management, automated license expiration checks/alerts, clean Charon instance shutdown** to ensure that VMS or Tru64 had been shut down before stopping Charon, **log file** monitoring and clean-up.

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

Host system requirements

	Microsoft Windows Server (64 bit)	Microsoft Windows (64 bit)	Physical host or Hypervisor
Host operating system (on-premises or on AWS, Azure, OCI, and GCP clouds)	2008 R2 (SP1) *, 2012 R2 *, 2016, 2019, and 2022 (Standard, Datacenter)	Microsoft Windows 7 SP1 Professional, Ultimate * Microsoft Windows 8.1 Professional * Microsoft Windows 10 Professional, Enterprise Microsoft Windows 11 Professional, Enterprise	VMware ESXi 5.5–8.0; Microsoft Hyper-V; KVM
Host CPU / RAM	Number of host system CPU cores ≥ 2 * (number of emulated AXP CPU cores); host RAM = (4 GB + AXP RAM) per emulated AXP instance		
Recommended hardware	HPE Proliant G11 servers or their equivalent; Intel Xeon (Gold or Platinum CPUs); Intel core 12th generation CPUs or above; AMD EPYC 4th generation processors for servers or Ryzen latest generation for workstations; frequency 3 GHz and above		
* Charon can be installed and will run, but Microsoft Windows versions are EOL and are not recommended for deployment.			



VIRTUALIZED HARDWARE AND SUPPORTED GUEST OPERATING SYSTEMS

Per model characteristics

Charon product	Emulated AlphaServer model	Alpha CPUs (base / maximum)	Emulated RAM	Available virtual PCI slots	Supported guest operating systems	
Charon-AXP/400 ¹⁾	AlphaServer 400	1/1	Up to 1 GB	3	OpenVMS 6.2-1H3 to OpenVMS 8.4; Digital UNIX 3.2 to 4.0E; Tru64 UNIX 4.0F to 5.1B (also known as Compaq or HP Tru64 UNIX)	
	AlphaServer 1000 / 1000A			3 / 7		
Charon-AXP/2000 ²⁾	AlphaServer 800	1/1	Up to 8 GB	4		
	AlphaServer 1200	1/2		6		
	AlphaServer 2000		Up to 2 GB	3		
	AlphaServer 4000		16			
Charon-AXP/4100	AlphaServer 2100	1 or 2 / 4	Up to 32 GB	3		
	AlphaServer 2100			8		
Charon-AXP/DS10	DS10, DS15	1 / 1	Up to 32 GB	4		OpenVMS 7.1-2 to OpenVMS 8.4; Tru64 UNIX 4.0F – 5.1B (also known as Compaq or HP Tru64 UNIX)
Charon-AXP/DS20	DS20, DS25	1 / 2	Up to 32 GB	6		
Charon-AXP/ES40	ES40, ES45, ES47	1 / 4	Up to 32 GB	10		
Charon-AXP/GS80	GS60, GS80, ES80	1 / 8	Up to 64 GB	27		OpenVMS 7.2-1H1 to OpenVMS 8.4, Tru64 UNIX 4.0G – 5.1B (also known as Compaq or HP Tru64 UNIX)
Charon-AXP/GS160	GS140, GS160	1 / 16	Up to 128 GB	27		
Charon-AXP/GS320	GS320, GS1280	1 / 32	Up to 256 GB	27		

¹⁾ Virtual CPU performance level 50%

²⁾ Charon-AXP/2000 includes Charon-AXP/400 models; Charon-AXP/4100 includes Charon-AXP/400 and Charon-AXP/2000 models

Common emulated hardware characteristics

Storage adapter support	Emulated PCI SCSI KZPBA adapters; emulated PCI FC KGPSA adapters; up to 120 storage units (disks, tapes, and CD/DVD) supported simultaneously; emulated Acer Labs 1543C IDE/ATAPI controller (only virtual IDE CD/DVD devices; only AS400/2000/4000)
Disk storage support	Virtual disk images on a local and remote Windows file system (.vdisk container files); Logical and Physical SCSI disks; iSCSI disks; SAN attached storage volumes (\\.\PhysicalDriveX and \\.\DevID devices)
Tape storage support	Virtual tape images on a local and remote Windows file system (.vtape container files); physical SCSI tape drives (\\.\TapeX or \\.\SCSI devices)
CDROM / Floppy disk support	Virtual CD/DVDs images a local and remote Windows file system (.iso container files); physical CD/DVD drives (\\.\CdRomX devices) / Physical floppy drive 1.44 MB (\\.\A: device)
Ethernet network support	Emulated PCI DEC 21x4x adapters: DE435, DE450, DE500AA, and DE500BA; 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 Windows supported FC HBA adapters in Presentation mode / FDDI connection with physical DEFPA adapter
Console / Serial lines	OPA0 console attached to a Windows terminal emulator, a physical serial port (COMxx: device), or a TCP/IP socket
Console / Graphics	Emulated DEC ZLXp-E2 graphics adapter (PBXGA) with virtual display 1280x1024 resolution
GPIB controller	Support for multiple emulated DEC IEP11 adapters



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Ordering information ¹⁾

License Name	Product Code	Description	Applicable models
5-year AXP Base license	P1-AXP-BASE-5y	1 emulated AXP CPU (5-year license term)	All AXP models
Tier 2 AXP upgrade (base license required)	P1-AXP-TIE2-5y	Max. 2 emulated CPUs (5-year license term)	Charon-AXP-4100, Charon-AXP/DS20, Charon-AXP/ES40, Charon-AXP/GS80, Charon-AXP/GS160, Charon-AXP/GS320
Tier 3 AXP upgrade (previous tier required)	P1-AXP-TIE3-5y	Max. 4 emulated CPUs (5-year license term)	Charon-AXP-4100, Charon-AXP/ES40, Charon-AXP/GS80, Charon-AXP/GS160, Charon-AXP/GS320
Tier 4 AXP upgrade (previous tier required)	P1-AXP-TIE4-5y	Max. 8 emulated CPUs (5-year license term)	Charon-AXP/GS80, Charon-AXP/GS160, Charon-AXP/GS320
Tier 5 AXP upgrade (previous tier required)	P1-AXP-TIE5-5y	Max. 16 emulated CPUs (5-year license term)	Charon-AXP/GS160, Charon-AXP/GS320
Tier 6 AXP upgrade (previous tier required)	P1-AXP-TIE6-5y	Max. 32 emulated CPUs (5-year license term)	Charon-AXP/GS320
Gold support annual subscription ²⁾	For base license: P1-AXP-GSBA-1y; for tier 2: P1-AXP-GST2-1y; for tier 3 and above: P1-AXP-GSTX-1y		
Platinum support annual subscription ²⁾	For base license: P1-AXP-PSBA-1y; for tier 2: P1-AXP-PST2-1y; for tier 3 and above: P1-AXP-PSTX-1y		

¹⁾ Please contact the Stromasys Sales team for Charon licensing details and commercial discussions.
²⁾ Please refer to the Charon Service Descriptions for GOLD and PLATINUM terms, conditions, and SLAs.