

CHARON-AXP/DS10, /DS20, /ES40, /GS80, /GS160, and /GS320 for Linux

Product version 4.8

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DESCRIPTION

Stromasys **CHARON-AXP/DS/ES/GS** are members of 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

Most of the original Alpha hardware is virtualized by CHARON-AXP. It runs the original Alpha binary code, including operating systems OpenVMS and Tru64 UNIX, the layered products, and applications, which remaining working as always. Very few changes might be required to the original software (operating system, layered products, or applications). The Tru64 kernel might require a rebuild.

NETWORK

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

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.

PCI PASSTHROUGH

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

HOST SYSTEM REQUIREMENTS

A physical system or virtual appliance with multi core CPUs (Intel Xeon v4 E3, E5, and E7 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. CHARON-AXP requires a minimum of 2 GB host RAM (base) plus 2 GB in addition to the amount of AXP RAM per emulated AXP.

PERFORMANCE

SPEC2000 test running on Tru64 5.1B on CHARON-AXP emulating AlphaServer ES45 delivers about **SPEC2000 INT 700** and **SPEC2000 FP 525 per CPU** on an HP ProLiant DL380 G9 server equipped with Intel Xeon v4 E5-2643 3.4 GHz CPU. 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, CHARON system will behave like the original Alpha system, and can be treated like Alpha. Guest OS and applications operating procedures will remain the same, and it's advised not to treat the system as a Linux box, despite the fact it runs on a Linux kernel. Hosting OS does not require maintenance or patching; it can be cut off the network completely.

LICENSE PROTECTION

A valid license should be permanently available to CHARON. It can be represented by a local or network attached USB HASP license dongle, or a Software License. The license preserves customer specific parameters and allows remote electronic updates. USB dongle enables rapid change of host systems as the CHARON executable itself can be installed on multiple systems for disaster recovery purposes. License flexibility allows 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 hosting hardware resources for CHARON needs, synchronized host and guest OS shutdown, etc. The following functional 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 content of CHARON-AXP license
- **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 save mode when virtual AXP CPU is idle



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					
Fiber 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 DEFFPA 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 Passthrough serial line controller PBXDA (8 serial lines)					
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	Linux Red Hat Enterprise (RHEL) 6.5 and above; RHEL 7.x, and CentOS 7.x (32 bit or 64 bit) on top of a physical host or VMware ESXi 5.5 and 6.x
Host CPU/RAM	Amount of host system CPU cores $\geq 2 * (\text{amount of emulated AXP CPU cores})$; Host RAM = 2 GB + (2 GB + AXP RAM) per emulated AXP) minimum
Recommended Hardware	HP ProLiant G9 servers; Intel Xeon v4 E3, E5 and E7 CPUs; Intel Core 7 th generation CPUs; CPU frequency 3 GHz and above

Ordering information

Perpetual license	CHAXP-801IP	CHAXP-802IP	CHAXP-804IP	CHAXP-808IP	CHAXP-809IP	CHAXP-909IP
Annual license	CHAXP-801IY	CHAXP-802IY	CHAXP-804IY	CHAXP-808IY	CHAXP-809IY	CHAXP-909IY
Annual GOLD Support (9*5)	CHAXP-801IU	CHAXP-802IU	CHAXP-804IU	CHAXP-808IU	CHAXP-809IU	CHAXP-909IU
Annual PLATINUM Support (24*7)	CHAXP-801IT	CHAXP-802IT	CHAXP-804IT	CHAXP-808IT	CHAXP-809IT	CHAXP-909IT
Backup license	CHAXP-801IK	CHAXP-802IK	CHAXP-804IK	CHAXP-808IK	CHAXP-809IK	CHAXP-909IK
Additional CPU	N/A	CHAXP-CPUIP	CHAXP-CPUIP	CHAXP-CPUIP	CHAXP-CPUIP	CHAXP-CPUIP

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