SOFTWARE PRODUCT DESCRIPTION

# Charon-VAX/XK PLUS and /XL PLUS for Linux

Product version 4.12

Document version 2

## DESCRIPTION

Stromasys **Charon-VAX/XK PLUS and Charon-VAX/XL PLUS** are members of the Charon-VAX cross-platform hardware virtualization product family. They are designed to replace **VAXserver, VAXstation, and MicroVAX models 3600 and 3900; VAX 3100-98; VAX 4000-108; VAX 4000-700 and 4000-705; and VAX 6000-310** systems by their virtual equivalents running on an x86-64 compatible standard computer system. Charon-VAX creates a virtual replica of the original DEC VAX hardware, allowing the VAX/VMS operating system and all software running in that environment to continue to work as before in their existing, binary form. No or only minimal configuration changes to the original software (operating system, layered products, and applications), operational procedures, and management are required.

## NETWORK

Charon-VAX virtualizes the Ethernet controllers present in the original VAX hardware. Any protocol supported on these controllers (DECnet, TCP/IP, LAT) will work on the virtualized network link. The network performance depends on CPU performance delivered by the host hardware and design limitations of the guest OS.

## STORAGE

Charon-VAX/XK/XL (PLUS) provides support for the following VAX storage device types: (T)MSCP, DSSI and SCSI. Charon translates the VAX storage to 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.

## HOST SYSTEM REQUIREMENTS

A physical system or virtual appliance with a dual-core CPU (Intel Xeon Gold and Platinum CPUs, Intel core 12th generation CPUs or above, AMD EPYC 4th generation processors for servers, or Ryzen latest generation for workstations 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 VAX/VMS data. Charon-VAX/XL requires a minimum of 3 GB host memory; Charon-VAX/XK PLUS and /XL PLUS require 4 GB.

## HOST OPERATING SYSTEM REQUIREMENTS

| | |
|---|---|
| Host operating system (on-premises or on AWS, Azure, OCI, and GCP clouds) | Red Hat Enterprise Linux (RHEL) and Oracle Linux with RHEL compatible kernel 7.x to 9.2<br>Rocky Linux 8.x and 9.2<br>CentOS 7.x<br>(64-bit versions only) |
| Hypervisor | VMware ESXi 5.5 – 8.0; Microsoft Hyper-V; KVM |

## PERFORMANCE

Charon-VAX is available in a standard and a PLUS version. The PLUS version includes Advanced CPU Emulation (ACE) providing 4 – 6 times better CPU performance compared to the Standard product. On a system based on Intel Core 7$^{th}$ generation (3.0 GHz) CPUs, the PLUS version virtual CPU delivers approximately 125 VUPS, the standard version provides about a quarter of this number. For reference: the original hardware VAX CPU provided from 1 VUP (MicroVAX II) up to 38 VUPS (VAX3100-96). Therefore, the VAX virtualization will deliver a major performance improvement.

## SYSTEM MAINTENANCE

Once installed and configured, Charon system behaves like the original VAX system, and can be treated as a VAX. 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

Charon-VAX for Linux supports VE licensing and Sentinel HASP licenses. A valid license should be permanently available to Charon in the form of a local or network attached USB HASP license dongle, or a VE or HASP 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. VE licensing and HASP licensing cannot be combined for one emulator instance.

## 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-VAX 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. Multiple aliases allow a direct access to some of the menu options for a better experience: vmstart, vmstop, vmconsole, vmlog, etc.
- **hasp_srm_view** displays the content of Charon-VAX licenses
- **ncu** ("Network Control Utility") is used to dedicate a host network interface to Charon-VAX, 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
- **Power consumption optimization (IDLE) VMS utility** for implementing energy saving mode when a virtual VAX CPU is idle
- **Slowdown VMS utility** for slowing down Charon virtual CPU to match hardware VAX performance level
- **Shutdown VMS utility** for an orderly shutdown (Charon after VMS)

## VIRTUALIZED HARDWARE

| | VAX 4000-108 | VAX 3100-98 | VAX 3600/3900 | VAX 4700/4705 | VAX 6310 |
|---|---|---|---|---|---|
| **Virtualized VAX CPU** | KA54-A | KA56-A | KA650-A/B / KA655-A/B | KA692-A/KA694-A | KA-62B |
| **Earliest VMS version** | 5.5-2 (5.5-2H4 if second SCSI adapter is used) | | 4.5 | 5.5-2 | 5.5-2 |
| **Max. virtual VAX memory** | XK PLUS: 256 MB; XL and XL PLUS: 512 MB | | | | |
| **XMI and BI subsystems** | No | | | No | Yes (KDB50) |
| **QBUS subsystem** | Yes [1)] | No | Yes [1)] | Yes [1)] | No |
| **UNIBUS subsystem** | No | | | No | Yes (TUK50) |
| **DSSI subsystem** | Yes (HSD50) | No | No | YES (two built-in PAA/PAB and two optional PAC/PAD DSSI adapters, HSD50 storage controller) | No |
| **SCSI subsystem** | 2 controllers, each supports 7 SCSI IDs. Each SCSI ID could be used with up to 8 LUNs | | No | No | No |
| **Emulated VAX disks:** | Container files; local, iSCSI and SAN partitions; physical SCSI disks | | Container files; local, iSCSI and SAN partitions | Container files; local disk drives, iSCSI and SAN partitions | Container files; local, iSCSI and SAN partitions |
| **Emulated VAX tapes:** | Container files, physical SCSI tape drives | | | | |
| **Network** | Up to 5 Ethernet controllers in total including a built-in SGEC and QBUS controllers: DEQNA, DELQA, DESQA | 1 built-in Ethernet controller SGEC | Up to 4 QBUS Ethernet controllers: DEQNA, DELQA DESQA | Up to 5 Ethernet controllers in total including a built-in SGEC and QBUS controllers: DEQNA, DELQA, DESQA | Multiple BI DEBNI Ethernet controllers (limited by number of available virtual bus slots) |
| **Network performance** | Standard version supports 10 Mbps connections; PLUS version supports 100 Mbps connections. PLUS version could be used with 1 Gbps connections provided it is tested in advance. | | | | |
| **VAX/VMS clustering** | NI or Shared Disk Cluster with emulated MSCP or DSSI controllers | NI Cluster | NI cluster or Shared Disk Cluster with emulated MSCP controllers | NI or Shared Disk Cluster with emulated MSCP or DSSI controllers | NI Cluster |
| **Asynchronous serial lines** | QUART (4 lines), CXA16, CXB16, CXY08, DHQ11, DHV11, DHW42-AA, -BA, -CA | QUART (4 lines), DHW42-AA, -BA, -CA | UART, CXA16, CXB16, CXY08, DHQ11, DHV11 | CXA16, CXB16, CXY08, DHQ11, DHV11 | UART |
| **Graphics subsystem** | No | No | Dummy VCB_02 can be loaded in order to force VMS to accept D type licenses [2)] | No | No |

[1)] Configurable QBUS components are the MSCP disk controller RQDX3, the TMSCP tape controller TQK50, the serial line controllers as above and the Ethernet controllers DEQNA, DELQA and DESQA. MSCP disk emulation is the preferred storage device emulation in case of heavy disk I/O.

[2)] An X-Windows emulator on an MS Windows or a Linux system can be used to display graphics provided by an X Client running on Charon

**Each virtual VAX model follows the characteristics of its VAX hardware equivalent. It requires the corresponding level of license units and supports the peripherals particular to that VAX model. The virtual VAX does not include diagnostic and maintenance modes or delays to simulate mechanical device behavior.**

## Ordering Information [1)]

| License Name | Product Code | Description |
|---|---|---|
| **Charon-VAX/XK+** | P1-VAX-XKPA-5y | 3000, 4000, 6310. 1 accelerated VAX CPU, 256MB RAM (5-year license term) |
| **Charon-VAX/XL+** | P1-VAX-XLPA-5y | 3000, 4000, 6310. 1 accelerated VAX CPU, 512MB RAM (5-year license term) |
| **Gold support annual subscription [2)]** | For XK+: P1-VAX-XKPG-1y; for XL+: P1-VAX-XLPG-1y | |
| **Platinum support annual subscription [2)]** | For XK+: P1-VAX-XKPP-1y; for XL+: P1-VAX-XLPP-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.