

Charon-VAX/VM and /VM PLUS for Linux

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DESCRIPTION

Stromasys **Charon-VAX/VM** and **Charon-VAX/VM PLUS** are members of the Charon-VAX cross-platform hardware virtualization product family. They are designed to replace **MicroVAX II; VAXserver, VAXstation, and MicroVAX models 3600 and 3900; VAX 3100-96; VAX 4000-106; and VAXstation 4000-90** 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/VM (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 Linux 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/VM requires a minimum of 2 GB host RAM; Charon-VAX/VM PLUS requires 3 GB RAM.

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 Rocky Linux 8.x and 9.2 CentOS 7.x and CentOS Stream 9 (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 7th 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:

- **mkdiskcmd** 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 4000-106	VAX 3100-96	VAX 4000-90	VAXserver, VAXstation, MicroVAX 3600/3900	MicroVAX II
Virtualized VAX CPU	KA54-A	KA56-A	KA49-A	KA650-A/B KA655-A/B	KA630-A
Earliest VMS version	5.5-2 (5.5-2H4 if second SCSI adapter is used)			4.5	
Max. virtual VAX memory	128 MB				16 MB
QBUS subsystem	Yes ¹⁾	No		Yes ¹⁾	
DSSI subsystem	Yes (HSD50)	No			
SCSI subsystem	2 controllers (1 controller only in 4000-90), each supports 7 SCSI IDs. Each SCSI ID could be used with up to 8 LUNs			No	
Emulated VAX disks	Container files; local, iSCSI and SAN partitions; physical SCSI disks			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	1 built-in Ethernet controller SGEC	2 Ethernet controllers: built-in SGEC and TurboChannel PMAD-AA	Up to 4 QBUS Ethernet controllers	1 QBUS Ethernet controller
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 cluster or Shared Disk Cluster with virtual DSSI or MSCP controllers	NI Cluster		NI cluster or Shared Disk Cluster with virtual MSCP controllers	No
Asynchronous serial lines	QUART (4 lines), CXA16, CXB16, CXY08, DHQ11, DHV11, DHW42-AA, -BA, -CA	QUART (4 lines), DHW42-AA, -BA, -CA	QUART (4 lines)	UART, CXA16, CXB16, CXY08, DHQ11, DHV11	UART, CXA16, CXB16, CXY08, DHQ11, DHV11
Graphics subsystem	No		Built-in dummy graphics for VMS to accept D type licenses ²⁾	Dummy VCB02 for VMS to accept D type licenses ²⁾	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 delays to simulate mechanical device behavior, diagnostic, and maintenance modes.

Ordering Information ¹⁾

License Name	Product Code	Description
Charon-VAX/XM	P1-VAX-XM0A-5y	MicroVAX II, 3000, 4000. 1 VAX CPU (no acceleration), 128MB RAM (5-year license term)
Charon-VAX/XM+	P1-VAX-XMPA-5y	MicroVAX II, 3000, 4000. 1 accelerated VAX CPU, 128MB RAM (5-year license term)
Gold support annual subscription ²⁾	For XM: P1-VAX-XM0G-1y; for XM+: P1-VAX-XMPG-1y	
Platinum support annual subscription ²⁾	For XM: P1-VAX-XM0P-1y; for XM+: P1-VAX-XMPP-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.