

## CHARON-VAX/XM and /XM PLUS for Windows

Product version 4.8

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### DESCRIPTION

Stromasys **CHARON-VAX/XM** and **CHARON-VAX/XM PLUS** are members of 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 its virtual equivalent running on an x86-64 compatible standard computer system. CHARON-VAX creates the virtual replica of the original DEC VAX hardware, allowing the VAX/VMS operating system and all software that is running in that environment to remain working as always in their existing, binary form. No or 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 that ran on these controllers (DECnet, TCP/IP, LAT) will run over virtualized network link.

### STORAGE

CHARON-VAX/XM (PLUS) provides support for the following VAX storage device types: (T)MSCP, DSSI and SCSI. CHARON translates 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 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 VAX/VMS data. CHARON-VAX/XM requires a minimum of 2 GB host memory; CHARON-VAX/XM PLUS requires 3 GB.

The CHARON-VAX device drivers for external PCI to QBUS adapter, an FPGA Cesium board, and some serial interfaces require Windows 7 32 bit and cannot be used on other versions. Those devices also cannot be used on hypervisors like VMware

### OPERATING SYSTEM REQUIREMENTS

Microsoft Windows Server 2008 R2 and 2012 R2 Standard and Enterprise (SP1) Editions 64 bit, Microsoft Windows 7, 8.1, and 10 Professional and Enterprise Editions 32 bit and 64 bit on top of a physical host, VMware ESXi 5.5 or 6.x, and Microsoft Hyper-V.

### 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 an Intel Core 7<sup>th</sup> generation (3.0 GHz) based system, the PLUS version virtual CPU delivers approximately 125 VUPS, where standard version provides about one quarter of it. For the reference, the original hardware VAX CPU provided 1 VUP (MicroVAX II) up to 38 VUPS (VAX3100-96), therefore VAX virtualization will deliver a major performance increase.

### CHARON APPLICATION PROGRAM INTERFACE (CHAPI)

CHAPI is an open API to emulated QBUS bus, thus available for QBUS based emulators. It allows creation of emulated QBUS devices, and connects emulated peripherals which are designed as external C++ modules to the emulator kernel. CHAPI library functions provide standard device elements like registers, interrupt logic, etc.

### SYSTEM MAINTENANCE

Once installed and configured, CHARON system will behave like the original VAX system, and can be treated like VAX. Guest OS and applications operating procedures will remain the same, and it's advised not to treat the system as a Windows box, despite the fact it runs on a Windows 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-VAX 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 license, configuring hosting hardware resources for CHARON needs, etc. The following functional applications are invoked from CHARON VM manager:

- **HASP License Details** for viewing CHARON license(s)
- **License Update Tool** for updating CHARON license
- **Sentinel Admin Control Center** for license management
- **Network Control Center** for managing CHARON network drivers and settings
- **Device Check** for providing configuration assistance for directly connected host devices
- **Virtual Disk Tool** for creating empty disk image files (.vdisk)

The following command line utilities are also available:

- **Virtual Disk Tool** for creating empty disk image files (.disk)
- **MTD** for transferring data between physical tapes and CHARON tape container files
- **HOSTprint** for redirecting an emulated QBUS LPV11 device (parallel port) output to a Windows local or network printer

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 save mode when virtual VAX CPU is idle
- **Slowdown VMS utility**: for slowing down CHARON virtual CPU to match hardware VAX performance level
- **Shutdown VMS utility** for orderly shutdown CHARON after VMS



## VIRTUALIZED HARDWARE

	VAX 4000-106	VAX 3100-96	VAX 4000-90	MicroVAX, VAXserver, VAXstation 3600/3900	MicroVAX II
<b>Virtualized VAX CPU</b>	KA54-A	KA56-A	KA49-A	KA650-A/B KA655-A/B	KA630-A
<b>Earliest VMS version</b>	5.5-2 (5.5-2H4 if second SCSI adapter is used)			4.5	
<b>Max. virtual VAX memory</b>	128 MB				16 MB
<b>QBUS subsystem</b>	Yes <sup>1) 3)</sup>	No		Yes <sup>1) 3)</sup>	
<b>DSSI subsystem</b>	Yes (HSD50)	No			
<b>SCSI subsystem</b>	2 controllers (1 controller only in 4000-90), each support 7 SCSI IDs. Each SCSI ID could be used with up to 8 LUNs			No	
<b>Emulated VAX disks</b>	Container files; Local, iSCSI and SAN partitions; physical SCSI disks			Container files; Local, iSCSI and SAN partitions	
<b>Emulated VAX tapes</b>	Container files, Windows tape drives, physical SCSI tape drives				
<b>Network</b>	Up to 5 Ethernet controllers in total including a built-in SGEC and QBUS controllers	1 build-in Ethernet controller SGEC	2 Ethernet controllers: built-in SGEC and TurboChannel PMAD-AA	Up to 4 QBUS Ethernet controllers	1 QBUS Ethernet controller
<b>Network performance</b>	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.				
<b>VAX/VMS clustering</b>	NI cluster or Shared Disk Cluster with DSSI or MSCP controllers	NI Cluster		NI cluster or Shared Disk Cluster with emulated MSCP controllers	No
<b>Asynchronous Serial Lines</b>	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
<b>Graphics subsystem</b>	No		Dummy graphics for VMS to accept D type licenses <sup>2)</sup>	Dummy VCB02 for VMS to accept D type licenses <sup>2)</sup>	No

<sup>1)</sup> 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

<sup>2)</sup> An X-Windows emulator on a MS Windows or a Linux system can be used to display graphics provided by an X Client running on CHARON

<sup>3)</sup> a 3<sup>rd</sup> party PCI to QBUS adapter can be ordered to connect a physical QBUS basket to CHARON-VAX

**Each virtual VAX model follows the characteristics of its VAX hardware equivalent, requiring 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	CHARON-VAX/XM	CHARON-VAX/XM PLUS
Perpetual runtime license	CHVX-021-PD	CHVX-221-PD
One year license	CHVX-021-YD	CHVX-221-YD
720 hour backup license	CHVX-021-KD	CHVX-221-KD
Annual GOLD support (9*5)	CHVX-021-UD	CHVX-221-UD
Annual PLATINUM support (24*7)	CHVX-021-TD	CHVX-221-TD

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