SOFTWARE PRODUCT DESCRIPTION

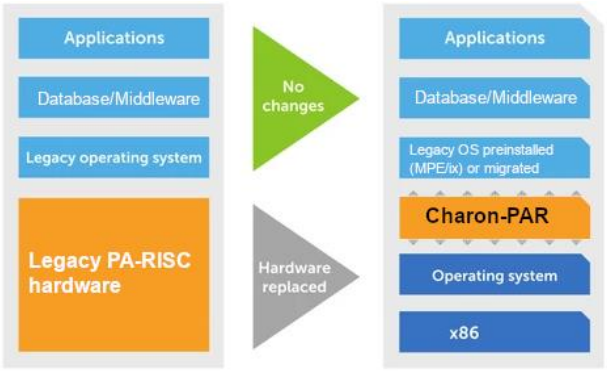
CHARON-PAR 3.0

Document version 6

DESCRIPTION

Charon-PAR is an innovative hardware virtualization layer designed to run seamlessly under Linux on industry-standard servers. Developed specifically for users of legacy PA-RISC hardware systems, Charon-PAR empowers businesses to migrate effortlessly to modern x86-x64 based server hardware. By leveraging the power of a software layer known as the Hardware Abstraction Layer (HAL), Charon-PAR brings virtualization to the forefront of modern software operating systems. Our product serves as a precise model, effectively emulating the complete legacy hardware, including PCI-based I/O devices. With meticulously crafted modules, Charon-PAR flawlessly replicates legacy hardware components such as CPUs, console subsystems, buses and I/O adapters, disks, and tapes.

Installing Charon-PAR on a general-purpose host platform enables users to experience an exact replica of the historic PA-RISC hardware environment. Just like working with the original hardware, you can effortlessly install your legacy operating system and associated applications on this virtual system. In most cases, there is no need to modify your software, as Charon-PAR emulated systems support the same binary code and I/O drivers as the original hardware. This seamless compatibility ensures a smooth transition and maximizes the utility of your existing software investments.



To distinguish between the emulated hardware families, Charon-PAR employs clear naming conventions. The following designations differentiate between the various emulated hardware families:

- Charon-PAR/PA3: emulates legacy PA-RISC systems for running MPE/iX
- Charon-PAR/PA9-64: emulates legacy 64-bit PA-RISC systems for running HP-UX
- Charon-PAR/PA9-32: emulates legacy 32-bit PA-RISC systems for running HP-UX

Charon-PAR allows to effortlessly bridge the gap between legacy PA-RISC hardware and modern Intel-based servers. Experience the benefits of increased performance, scalability, and cost efficiency while preserving the functionality and compatibility of your cherished legacy systems.

NETWORK

Charon-PAR emulates the DEC 21143-PD (Charon-PAR/PA9-64), the DEC 21143 (Charon-PAR/PA3) and the Cobra Core LAN (Charon-PAR/PA9-32) adapters. 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. As an alternative to being mapped to a physical host NIC, an emulated network interface can be mapped to a TAP (virtual bridge) interface.

STORAGE

Charon-PAR models emulate one or more SCSI controllers that are recognized by the guest operation system as an LSI 53C8xx, LSI 53C7xx, or LSI 53C1xxx controller. Storage devices can be mapped to container files or physical disks or tapes. Generic physical SCSI storage devices are also supported.

SERIAL AND PARALLEL PORTS

Charon-PAR, by default, emulates two serial ports based on the DIVA serial PCI card (Charon-PAR/PA9-64 and Charon-PAR/PA3). Optionally (on Charon-PAR/PA9-64), two additional serial ports and a parallel port can be added by configuring an emulated SuperIO PCI module. Charon-PAR/PA9-32 emulates 2 built-in serial ports based on the emulated model's RS-232 hardware. Serial ports can be connected with a physical serial port or they can be connected to a TCP port (raw or using the telnet protocol).

LICENSE PROTECTION

A valid license must be permanently available to Charon in the form of a local or network attached USB HASP license dongle, or a Software License. A Software License can be a HASP or a VE (Virtual Environment license). The license contains customer specific parameters and allows remote electronic updates. HASP licenses are a proven, flexible solution for on-premises installations. VE licenses are optimized for cloud installations.

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.

HOST REQUIREMENTS

Characteristic	Description
Operating system	Version 7.x (64-bit) of RHEL, Oracle Linux, and CentOS starting with ver. 7.4. Version 8.x (64-bit) of RHEL, Oracle Linux, and Rocky Linux. Version 9.x (64-bit) of RHEL, Oracle Linux, and Rocky Linux
Recommended hardware	Intel x86-64 hardware platform; at least 3GHz; 3.4GHz or higher recommended; CPU features SSE 4.2 and FMA required
Number of cores	At least one CPU core for the host operating system, and at least 2 cores per emulated CPU (3 cores for future advanced DIT)
Memory size	4GB RAM plus 1.1 times the emulated RAM size (at least 24GB RAM for N4000 models). Additional memory required for I/O buffering and other Linux processes.
Supported hypervisor	VMware ESXi 5.5, 6.x, and 7.x (1)

(1) Should another hypervisor be required, please contact your Stromasys representative.

GUEST OPERATING SYSTEM SUPPORT

Charon-PAR provides several virtual hardware families that support the following guest operating systems:

- **Charon-PAR/PA3**: supports the following guest operating system: MPE/iX 7.5 which is provided with the emulator. Customer's earlier version may be migrated if needed.
- **Charon-PAR/PA9-64 and Charon-PAR/PA9-32**: PA9-64 emulates 64-bit models, PA9-32 emulates 32-bit models.
  The currently implemented **64-bit** models support the following HP-UX versions as guest operating systems:
  - HP-UX 11v1 (11.11), 11v2 (11.23), and – rp34xx and rp44xx only – 11v3 (11.31)
  - In addition, emulated systems configured with 360 and 440 MHz CPUs can also run HP-UX 11.00 (e.g., rp2400-1-360, rp2400-1-440, rp7400-1-440)

  The currently implemented **32-bit** models support the following HP-UX version as guest operating system:
  - Model 720: HP-UX 9.05, 9.07, 10.20, and 11.00
  - Model B132L: HP-UX 10.20, 11.00, and 11v1 (11.11)

CHARON-PAR EMULATED HARDWARE OVERVIEW

The following tables provide an overview of the available emulated models at the time of writing**. If your hardware is not listed, please contact Stromasys to discuss your requirements and possible solutions.**

Charon-PAR/PA9-64 (64-bit models)

Model	Max. RAM	# of CPUs	CPU Freq. in MHz	SCSI controllers	Ethernet controllers	Serial / parallel ports	Expansion slots
rp2400	2GB	1	360, 440	Dual SCSI-2 controller (LSI 53C8xx) and Dual SCSI-3 LVD controller (LSI 53C8xx)	DEC 21143-PD Tulip 10/100 Mbit/s	Diva serial PCI card (2 ports) and **optional** Super-IO with 2 serial and one parallel port	2
rp2430			550, 650				
rp2405			650				
rp2450	8GB	1-2	360, 440, 550				4
rp2470			650, 750				
rp2405			650				
rp5400	8GB	1-2	360, 440, 550				6
rp5450	16GB	1-4	360, 440, 550				10
rp5430	8GB	1-2	360, 440, 550, 650. 750, 875				6
rp5470	16GB	1-4	550, 650. 750, 875				10
rp7400 (2)	32GB	1-8	360, 440, 550, 650. 750				12
rp3410[+] (1)	6GB	1-2	800, 1000	Dual SCSI-3 LVD controller (LSI 53C1010)			6
rp3440[+] (1, 2)	32GB	1-4	800, 1000				
rp4410[+] (1)	128GB	1-4	800, 1000				
rp4440[+] (1, 2)	128GB	1-8	800, 1000				

Charon-PAR/PA9-32 (32-bit models)							
Model	**Max. RAM**	**# of CPUs**	**CPU Freq. in MHz**	**SCSI controllers**	**Ethernet controllers**	**Serial / parallel ports**	**Expansion slots**
720	256MB	1	50	Cobra Core SCSI (53C7xx)	Cobra Core LAN (802.3)	2 Cobra Core RS-232	0
B132L [3]	2GB	1	180	LSI 53C710	Intel 82596)	2	0

[1] The +-versions emulate PA-8800 CPUs, the non-plus versions PA-8900 CPUs.

[2] The marked models may also be available in "oversized" versions up to 128 CPUs (rp7400 up to 64 CPUs) and 512GB RAM. Please check the availability for your model with your Sales representative.

[3] The marked models may also be available in "oversized" versions up to 16 CPUs. Please check the availability for your model with your Sales representative.

Charon-PAR/PA3							
Model	**Max. RAM**	**# of CPUs**	**CPU Freq. in MHz**	**SCSI controllers**	**Ethernet controllers**	**Serial line cards**	**Expansion slots**
A400	2GB	1	110, 150	Dual SCSI-2 controller (LSI 53C8xx) and Dual SCSI-3 LVD controller (LSI 53C8xx)	DEC 21143 Tulip 10/100 Mbit/s	Diva serial PCI card (2 ports)	2
A500	8GB	1-2	140, 200				4
N4000	16GB	1-4, 6, or 8	220, 330, 380, 440. 500, 550, 750				12

Please note: the actual number of configurable emulated models is higher than number of models shown in the tables above. This is due to the configurable model names being constructed as a combination of base model names plus number of CPUs plus CPU frequency.

- Charon-PAR/PA9-64 model name syntax*: <base-model-name>-<number-of-cpus>-<clock-speed>*
  Example: rp2470-2-750 stands for a rp2470 model with two 750-MHz CPUs.
- Charon-PAR/PA3 model name syntax: *<base-model-name>-<100-times-number-of-cpus>-<clock-speed>*
  Example: A400-100-110 is a single-CPU A400 system running at 110 MHz.

CHARON-PAR PRODUCTS AND PART NUMBERS

	Charon-PAR/PA9	
5-year PA9 base license	P1-PA9-BASE-5y	Required for all PA9 models for HP-UX (5-year license term)
Tier 1 PA9 upgrade (base license required)	P1-PA9-TIE1-5y	Max. 4 emulated PA-RISC CPUs (5-year license term)
Tier 2 PA9 upgrade (previous tier required)	P1-PA9-TIE2-5y	Max. 16 emulated PA-RISC CPUs (5-year license term)
Tier 3 PA9 upgrade (previous tier required)	P1-PA9-TIE3-5y	Max. 32 emulated PA-RISC CPUs (5-year license term)
Tier 4 PA9 upgrade (previous tier required)	P1-PA9-TIE4-5y	Max. 128 emulated PA-RISC CPUs (5-year license term)
Gold support annual subscription	For base license: P1-PA9-GSBA-1y; for tier license: P1-PA9-GSTX-1y	
Platinum support annual subscription	For base license: P1-PA9-PSBA-1y; for tier license: P1-PA9-PSTX-1y	
	Charon-PAR/PA3	
5-year PA3 base license	P1-PA3-BASE-5y	Required for all PA3 models for MPE/iX (5-year license term)
Additional PA3 CPU (base license required)	P1-PA3-CPU1-5y	Adds one emulated PA3 CPU (5-year license term)
Gold support annual subscription	For base license: P1-PA3-GSBA-1y; for additional CPU license: P1-PA3-GSTX-1y	
Platinum support annual subscription	For base license: P1-PA3-PSBA-1y, for additional CPU license: P1-PA3-PSTX-1y	

Please contact the Stromasys Sales team for Charon licensing details and commercial discussions.