SOFTWARE PRODUCT DESCRIPTION

CHARON-PAR 3.0

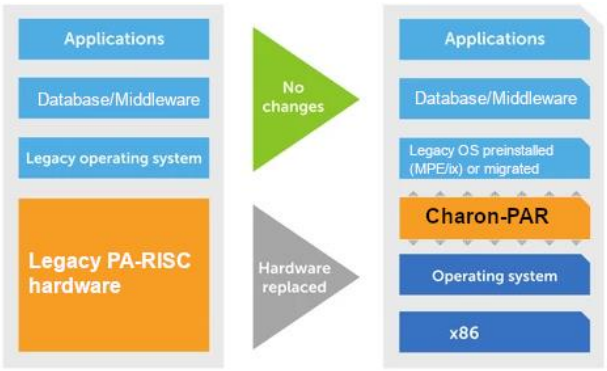
Document version 2

DESCRIPTION

Charon-PAR is a hardware virtualization layer running under Linux on industry standard servers. It emulates a range of historic PA-RISC hardware systems and allows existing users of such systems to move to modern Intel-based server hardware.

Modern software operating systems contain a hardware abstraction layer (HAL). The HAL creates a software layer on top of the hardware to "virtualize" the functionality of the hardware components. The Charon-PAR products are essentially HALs of the complete legacy hardware, including their PCI-based I/O devices. They are precise models of the legacy hardware, and contain modules which emulate the legacy hardware CPUs, console subsystem, buses and I/O adapters, disks and tapes.

The installation of Charon-PAR on a general-purpose host platform provides an exact model of the historic PA-RISC hardware. On this 'virtual' system you install your legacy operating system and the associated applications, just as though you were using the original hardware. In most cases, no changes of the software are required. The Charon-PAR emulated systems run the same binary code and the same I/O drivers as the original hardware. This is illustrated in this image:



Naming conventions: The Charon-PAR product covers the emulation of different hardware families. The following terms are used to differentiate between the different emulated hardware families:

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

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 by the guest operating system. Storage devices can be mapped to container files or physical disks or tapes. Generic physical SCSI storage devices are also possible.

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 serial ports based on the Cobra Core 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 should be permanently available to Charon in the form of a local or network attached USB HASP license dongle, or a 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.

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	64-bit versions of RHEL and CentOS: 7.x starting with 7.4, and 8.x
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)
Supported hypervisor	VMware ESXi 5.5 and 6.x up to 6.7

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.
- **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** model supports the following HP-UX version as guest operating system:
  - HP-UX 9.07, 10.20, and 11.00

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	Expan-sion 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

(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.

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 an 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

Product	**No. of CPUs**	**Perpetual License / Additional CPU**	**Gold/Platinum support; Gold/Platinum extra CPU**	**Gold/Platinum annual subscription; Gold/Platinum extra CPU**
CHPA9-64-L1	1	CHPA9-64-L1-IP	CHPA9-64-L1-IU / CHPA9-64-L1-IT	CHPA9-64-L1-ICG / CHPA9-64-L1-ICP
CHPA9-64-L2	1-2	CHPA9-64-L2-IP / CHPA9-64-ADDON-CPU-CPUIP	CHPA9-64-L2-IU / CHPA9-64-L2-IT; CHPA9-64-L2-CPUIU / CHPA9-64-L2-CPUIT	CHPA9-64-L2-ICG / CHPA9-64-L2-ICP
CHPA9-64-L3 (2)	1-4	CHPA9-64-L[3,4,5]-IP / CHPA9-64-ADDON-CPU-CPUIP	CHPA9-64-L[3,4,5]-IU / CHPA9-64-L[3,4,5]-IT; CHPA9-64-L[3,4,5]-CPUIU / CHPA9-64-L[3,4,5]-CPUIT	CHPA9-64-L[3,4,5]-ICG / CHPA9-64-L[3,4,5]-ICP; CHPA9-64-ASG-EXTRA CPU L[3,4,5]-CPUIU / CHPA9-64-ASP-EXTRA CPU L[3,4,5]-CPUIT
CHPA9-64-L4 (2)	1-8			
CHPA9-64-L5 (2)	1-128			
CHPA9-32-L1	1	CHPA9-32-L1-IP	CHPA9-32-L1-IP / CHPA9-32-L1-IT	CHPA9-32-L1-ICG / CHPA9-32-L1-ICP
CHPA3-A40	1	CHPA3-A40-IP	CHPA3-A40-IU / CHPA3-A40-IT	CHPA3-A40-ICG / CHPA3-A40-ICP
CHPA3-A41	1	CHPA3-A41-IP	CHPA3-A41-IU / CHPA3-A41-IT	CHPA3-A41-ICG / CHPA3-A41-ICP
CHPA3-A5X	1-2	CHPA3-A5X-IP / CHPA3-LEXTRA CPU A5X-CPUIP	CHPA3-A5X-IU / CHPA3-A5X-IT; CHPA3-A5X-CPUIU / CHPA3-A5X-CPUIT	CHPA3-A5X-ICG / CHPA3-A5X-ICP; CHPA3-ASG-LEXTRA CPU A5X-CPUIU / CHPA3-ASP-LEXTRA CPU A5X-CPUIT
CHPA3-N4X	1-4, 6, or 8	CHPA3-N4X-IP / CHPA3-LEXTRA CPU N4X-CPUIP	CHPA3-N4X-IU / CHPA3-N4X-IT; CHPA3-N4X-CPUIU / CHPA3-N4X-CPUIT	CHPA3-N4X-ICG / CHPA3-N4X-ICP; CHPA3-ASG-LEXTRA CPU N4X-CPUIU / CHPA3-ASP-LEXTRA CPU N4X-CPUIT
Implementation Service	CHPA9-SERV-IMP-SP CHPA3-SERV-IMP-SP			

(2) Please replace the placeholder [3,4,5] with the correct level. Sample part number after replacement: CHPA9-64-L4-IP. Please check the availability of Level 5 configurations for your model with your Sales contact.