DESCRIPTION

Charon-SSP is a member of Charon cross-platform hardware virtualization product family that creates a virtual replica of sun4m, sun4u or sun4v SPARC family members on a standard x86-64 computer system running Linux on top of physical hardware, or a Hypervisor. Charon-SSP lets users of end-of-life SPARC servers/stations continue to use their applications without any changes while lowering operational costs and energy consumption. Multiple instances can run on a single x86-64 standard host or existing virtualization infrastructure providing the benefits of consolidation as well as easy management and maintenance of these legacy systems.

Charon-SSP provides the following virtualized SPARC models:

- *Charon-SSP/4M*: based on the SPARC-V8 32-Bit processor specifications, MBUS for processor/memory interconnection and SBUS for IO peripherals.
- *Charon-SSP/4U*: based on the SPARC-V9 64-bit processor specifications, UPA bus for processor/memory interconnection and PCI bus for IO peripherals.
- *Charon-SSP/4U+*: same as /4U, uses Intel VT-x /EPT or AMD-v/NPT to offload SPARC MMU operations to hardware. The host system must run on physical hardware and use a supported Linux kernel.
- *Charon-SSP/4V*: based on the SPARC-V9 64-bit processor specifications and the sun4v hypervisor architecture. Each emulator instance supports one LDom. Solaris kernel zones are not supported.
- *Charon-SSP/4V+*: same as /4V, uses Intel VT-x /EPT or AMD-v/NPT to offload SPARC MMU operations to hardware. The host system must run on physical hardware and use a supported Linux kernel.

NETWORK

Charon-SSP maps one host physical Ethernet adapter for each emulated NIC. Alternatively, it can bridge a physical Ethernet adapter with a number of tap devices to allow communication between Charon-SSP instances and the Linux host while multiplexing traffic across the physical Ethernet adapter for external communication. All Solaris network protocols are supported transparently as well as Solaris IP multipathing and Solaris VNICs. Network booting and JumpStart installation are supported for Solaris 2.4 to Solaris 10 (non-cloud installations).

GRAPHIC ENVIRONMENT

Solaris CDE, OpenWindow desktop and Java Desktop graphics environment are supported on Charon-SSP using a nested X11 server running on the host. Native graphics (Charon-SSP/4M/4U (+) only) are implemented via emulated CGTHREE, CGSIX and RageXL framebuffers with resolutions ranging from 800x600 to 1600x1280 pixels. In conjunction with the Charon Manager, the graphics emulation supports local and remote displays. Dual monitor configurations are supported on these framebuffers for larger virtual desktops.

AUDIO

DBRI2 + CS4215 mmcodec virtualized components provide 8-bit/16-bit mono/stereo sound in u-Law, a-Law, linear formats. Remote audio supported on Linux / PulseAudio server. Available on Charon-SSP/4M/4U (+) only.

STORAGE

Charon-SSP provides virtualization for SCSI controllers and peripherals as follows:

- Virtual disks and tapes as container files residing on host file systems
- Raw partitions
- Physical disks / tapes.
- iSCSI targets

In addition, Charon-SSP/4V supports VDS virtual and physical disk and CD-ROM devices, Charon-SSP/4M supports floppy disks.

POWER SAVING

Charon-SSP provides a feature to reduce CPU power consumption on the Linux host when the Solaris OS is idle. This feature can be enabled using the following options:

- *Balanced*: uses processor power saving instructions to disable pipeline and reduce energy consumption.
- *Power save*: this option uses CPU thread suspension on Solaris IDLE condition to reduce host CPU usage.

MANAGEMENT

The *Charon Manager for Charon-SSP* is a graphical user interface for creating, configuring, starting and stopping instances of virtual SPARC systems. It also provides access to the virtual consoles and log files as well as host management tools. For example, tools to create virtual disk/tape/floppy devices, view and update HASP licenses, display host system information, create and delete virtual networks, manage/start/stop X11 servers, and adjust the console configuration.

The *Charon-SSP CLI* provides debugging commands for Stromasys and some management commands for end-users to adjust the settings of a running emulator. In addition, several *tools* are available to create and import emulator configurations from the command-line or from custom scripts.

PERFORMANCE

Charon-SSP supports a 2-level dynamic instruction translation engine (Client JIT and Server JIT) for Charon-SSP/4U and /4V. Charon-SSP/4V(+) delivers the same level of performance as /4U(+). The table shows a virtual SPARC CPU test run under Solaris 10 on Charon-SSP/4U/4V(+) with Server JIT configuration, on a HP Proliant DL380 Gen 10 @3.0GHz Intel CPU.

		SSP/4U	SSP/4U+	SSP/4V	SSP/4V+
CPU2000	INT	*1012*	*1491*		
	FP	*1238*	*1951*		
CPU2006	INT			*191*	*265*
	FP			*160*	*217*

DISTRIBUTION

Charon-SSP is distributed as:

- Baremetal: installation ISO image that contains host operating system, Charon-SSP, additional packages, and the Baremetal GUI.
- RPM packages: Charon-SSP packages for Oracle Linux, Red Hat, Rocky Linux, and CentOS.
- Cloud-specific images containing a customized Linux version and the Charon-SSP software (at time of writing AWS, OCI, Azure, GCP). Depending on the cloud platform, the images can be Automatic Licensing (AL) images (Stromasys-operated license server or customer-operated AutoVE license server) or Virtual Environment (VE) images (customer-operated Virtual Environment License Server). The VE license functionality is also available on IBM and Nutanix clouds, VMware, and physical servers via conventional RPM package installation.

VIRTUALIZED HARDWARE AND GUEST OPERATING SYSTEMS

	Charon-SSP/4M (32 bit)	Charon-SSP/4U (+) [3] (64 bit)	Charon-SSP/4V (+) [3] (64-bit)
Number of SPARC CPUs (Type, Min/Max)	SPARC V8 1/4	SPARC V9 1/24	SPARC V9 1/128
Emulated RAM	64MB to 512MB	1GB to 128GB	1GB to 1024GB
Bus type: Slots	SBUS: 12 slots	PCI: 16 slots	PCI (slots n/a)
SCSI controllers	1	2	2
Max. number of SCSI target IDs [4]	7	30	30
Disks supported	physical/partition/vdisk	physical/partition/vdisk	physical/partition/vdisk
CD/DVD support [1]	physical/ISO image	physical/ISO image	physical/ISO image
Tape support [1]	physical/vtape	physical/vtape	physical/vtape
Ethernet controllers	2	19	8
Serial ports [1]	10	34	17 (incl. vconsole)
Graphics support [5]	CGTHREE, CGSIX	RAGE XL, CGSIX	—
VDS storage devices	—	—	120 [1]
Audio	DBRIe+CS4215 codec	DBRIe+CS4215 codec	—
PCI pass-through [1]	—	NI IEEE488 GPIB Digi Serial Adapter	—
USB ports [1]	—	1	1
Floppy drive [1]	1	1	—
Parallel ports [1]	1	—	—
Guest OS support	SunOS 4.1.3/4.1.4 Solaris 2.3 to Solaris 9	Solaris 2.5.1 to Solaris 10	Solaris 10 [2] to Solaris 11.4

[1] **Restrictions for cloud environments:** no physical CD-ROM, physical tape, PCI pass-through, floppy, parallel port, or USB support; only 2 built-in serial ports.

[2] Please refer to the Charon-SSP user's guide for more detail regarding the exact Solaris update levels required (different Solaris update levels are required for the different 4V emulated hardware models).

[3] Charon-SSP/4U+/4V+ are only supported on physical hardware running a Linux kernel supported by Stromasys. Please refer to the Charon-SSP user's guide for more detail.

[4] The numbers show the max. number of SCSI target IDs. Each SCSI target ID can have up to 8 LUNs. Therefore, the overall number of SCSI devices can be larger than the number of target IDs. The exact number depends on the emulated hardware, the guest operating system version, and the SCSI devices used.

[5] In addition to graphics hardware emulation, many guest system graphical applications can be displayed on an X11 nested server.

HOST REQUIREMENTS

Host characteristic	Description
Operating system	64-bit versions 7.0 to 7.9 of Oracle Linux, Red Hat Enterprise Linux, and CentOS. 64-bit versions 8.1 to 8.6 of Oracle Linux, Red Hat Enterprise Linux, and Rocky Linux 64-bit version 9.0 of Oracle Linux, Red Hat Enterprise Linux, and Rocky Linux Charon-SSP Baremetal and cloud-specific images include the required host operating system
Number of host cores	At least 2 (3 for Server JIT) + number of emulated processors per virtual SPARC VM. [1]
Memory size	At least 6GB (10GB for Server JIT) + amount of emulated memory per virtual SPARC VM. [1]
Recommended hardware	Intel Server based on Haswell v3 processors or later, or Desktop Core I7 (CPU frequency at least 3.0GHz). AMD processors of the same or higher performance.
Supported hypervisors	VMware ESXi 6.5 and above, Xen, Microsoft Hyper-V, Linux KVM; (hypervisors not supported for Charon-SSP/4U+/4V+) [2]

[1] Minimum requirements. Please refer to the Charon-SSP user's guide for more detail, and contact your Stromasys representative for workload-dependent sizing guidance.

[2] Hyper-V: local HASP license dongles not supported.

CHARON-SSP PRODUCTS AND PART NUMBERS

This section is not applicable to cloud-based Charon-SSP AL instances (automatic or AutoVE mode). They are licensed based on the selected shape/instance type.

Charon-SSP product	Emulated CPU type	CPU / RAM limitations	GOLD annual subscription [2]	PLATINUM annual subscription [2]	Evaluation license [2]	Backup / Spare license [2]
Charon-SSP/4M	V8	4 / 512MB	CHSSP-4M-ICG	CHSSP-4M-ICP	CHSSP-4M-IV	CHSSP-4M-IK / CHSSP-4M-IS
Charon-SSP/4U LL	V9	1 / 1GB	CHSSP-4ULL-ICG	CHSSP-4ULL-ICP	CHSSP- 4ULL-IV	CHSSP- 4ULL-IK / CHSSP- 4ULL-IS
Charon-SSP/4U ML	V9	12 / 64GB	CHSSP-4UML-ICG	CHSSP-4UML-ICP	CHSSP- 4UML-IV	CHSSP- 4UML-IK / CHSSP- 4UML-IS
Charon-SSP/4U HL	V9	24 / 128GB	CHSSP-4UHL-ICG	CHSSP-4UHL-ICP	CHSSP- 4UHL-IV	CHSSP- 4UHL-IK / CHSSP- 4UHL-IS
Charon-SSP/4U+ LL	V9 (+)[1]	1 / 1GB	CHSSP-4U+LL-ICG	CHSSP-4U+LL-ICP	CHSSP- 4U+LL-IV	CHSSP- 4U+LL-IK / CHSSP- 4U+LL-IS
Charon-SSP/4U+ ML	V9 (+)[1]	12 / 64GB	CHSSP-4U+ML-ICG	CHSSP-4U+ML-ICP	CHSSP- 4U+ML-IV	CHSSP- 4U+ML-IK / CHSSP- 4U+ML-IS
Charon-SSP/4U+ HL	V9 (+)[1]	24 / 128GB	CHSSP-4U+HL-ICG	CHSSP-4U+HL-ICP	CHSSP- 4U+HL-IV	CHSSP- 4U+HL-IK / CHSSP- 4U+HL-IS
Charon-SSP/4V LL	V9	4 / 128GB	CHSSP-4VLL-ICG	CHSSP-4VLL-ICP	CHSSP-4VLL-IV	CHSSP- 4VLL-IK / CHSSP- 4VLL-IS
Charon-SSP/4V ML	V9	32 / 1TB	CHSSP-4VML-ICG	CHSSP-4VML-ICP	CHSSP-4VML-IV	CHSSP- 4VML-IK / CHSSP- 4VML-IS
Charon-SSP/4V HL	V9	128 / 1TB	CHSSP-4VHL-ICG	CHSSP-4VHL-ICP	CHSSP-4VHL-IV	CHSSP- 4VHL-IK / CHSSP- 4VHL-IS
Charon-SSP/4V+ LL	V9 (+)[1]	4 / 128GB	CHSSP-4V+LL-ICG	CHSSP-4V+LL-ICP	CHSSP-4V+LL-IV	CHSSP- 4V+LL-IK / CHSSP- 4V+LL-IS
Charon-SSP/4V+ ML	V9 (+)[1]	32 / 1TB	CHSSP-4V+ML-ICG	CHSSP-4V+ML-ICP	CHSSP-4V+ML-IV	CHSSP- 4V+ML-IK / CHSSP- 4V+ML-IS
Charon-SSP/4V+ HL	V9 (+)[1]	128 / 1TB	CHSSP-4V+HL-ICG	CHSSP-4V+HL-ICP	CHSSP-4V+HL-IV	CHSSP- 4V+HL-IK / CHSSP- 4V+HL-IS

[1] Accelerated by offloading part of the emulated CPU workload onto hosting hardware

[2] Please contact the Stromasys Sales team for Charon licensing details

[3] Please refer to Charon Service Descriptions for GOLD and PLATINUM terms, conditions, and SLAs

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