

SRC Virtualization



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SRC Virtualization

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Juniper Networks hardware and software products are Year 2000 compliant. Junos OS has no known time-related limitations through the year 2038. However, the NTP application is known to have some difficulty in the year 2036.

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About the Documentation

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Documentation and Release Notes

To obtain the most current version of all Juniper Networks® technical documentation, see the product documentation page on the Juniper Networks website at <https://www.juniper.net/documentation/>.







If the information in the latest release notes differs from the information in the documentation, follow the product Release Notes.

Juniper Networks Books publishes books by Juniper Networks engineers and subject matter experts. These books go beyond the technical documentation to explore the nuances of network architecture, deployment, and administration. The current list can be viewed at <https://www.juniper.net/books>.

Documentation Conventions

Table 1 on page viii defines notice icons used in this guide.

Table 1: Notice Icons

Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.
	Tip	Indicates helpful information.
	Best practice	Alerts you to a recommended use or implementation.

Documentation Conventions

[Table 1 on page viii](#) defines the notice icons used in this guide. [Table 3 on page ix](#) defines text conventions used throughout this documentation.

Table 2: Notice Icons







Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.
	Tip	Indicates helpful information.
	Best practice	Alerts you to a recommended use or implementation.

Table 3: Text Conventions

Convention	Description	Examples
Bold text like this	<ul style="list-style-type: none"> Represents keywords, scripts, and tools in text. Represents a GUI element that the user selects, clicks, checks, or clears. 	<ul style="list-style-type: none"> Specify the keyword exp-msg. Run the install.sh script. Use the pkgadd tool. To cancel the configuration, click Cancel.
Bold text like this	Represents text that the user must type.	user@host# set cache-entry-age <i>cache-entry-age</i>
Fixed-width text like this	Represents information as displayed on your terminal's screen, such as CLI commands in output displays.	<pre> nic-locators { login { resolution { resolver-name /realms/ login/A1; key-type LoginName; value-type SaeId; } } } </pre>
Regular sans serif typeface	<ul style="list-style-type: none"> Represents configuration statements. Indicates SRC CLI commands and options in text. Represents examples in procedures. Represents URLs. 	<ul style="list-style-type: none"> system ldap server{ stand-alone; Use the request sae modify device failover command with the force option user@host# ... https://www.juniper.net/techpubs/software/management/sdx/api-index.html

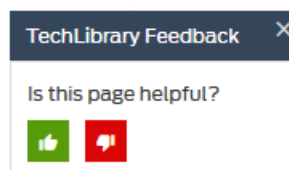
Table 3: Text Conventions (continued)

<i>Italic sans serif typeface</i>	Represents variables in SRC CLI commands.	<code>user@host# set local-address local-address</code>
Angle brackets	In text descriptions, indicate optional keywords or variables.	Another runtime variable is <gfwif>.
Key name	Indicates the name of a key on the keyboard.	Press Enter.
Key names linked with a plus sign (+)	Indicates that you must press two or more keys simultaneously.	Press Ctrl + b.
<i>Italic typeface</i>	<ul style="list-style-type: none"> Emphasizes words. Identifies book names. Identifies distinguished names. Identifies files, directories, and paths in text but not in command examples. 	<ul style="list-style-type: none"> There are two levels of access: <i>user</i> and <i>privileged</i>. <i>SRC-PE Getting Started Guide</i>. <i>o=Users, o=UMC</i> The <i>/etc/default.properties</i> file.
Backslash	At the end of a line, indicates that the text wraps to the next line.	<code>Plugin.radiusAcct-1.class=\ net.juniper.smgmt.sae.plugin\ RadiusTrackingPluginEvent</code>
Words separated by the symbol	Represent a choice to select one keyword or variable to the left or right of this symbol. (The keyword or variable may be either optional or required.)	<code>diagnostic line</code>

Documentation Feedback

We encourage you to provide feedback so that we can improve our documentation. You can use either of the following methods:

- Online feedback system—Click TechLibrary Feedback, on the lower right of any page on the [Juniper Networks TechLibrary](#) site, and do one of the following:



- Click the thumbs-up icon if the information on the page was helpful to you.
- Click the thumbs-down icon if the information on the page was not helpful to you or if you have suggestions for improvement, and use the pop-up form to provide feedback.
- E-mail—Send your comments to techpubs-comments@juniper.net. Include the document or topic name, URL or page number, and software version (if applicable).

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active Juniper Care or Partner Support Services support contract, or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at <https://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf>.
- Product warranties—For product warranty information, visit <https://www.juniper.net/support/warranty/>.
- JTAC hours of operation—The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

Self-Help Online Tools and Resources

For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: <https://www.juniper.net/customers/support/>
- Search for known bugs: <https://prsearch.juniper.net/>
- Find product documentation: <https://www.juniper.net/documentation/>
- Find solutions and answer questions using our Knowledge Base: <https://kb.juniper.net/>
- Download the latest versions of software and review release notes: <https://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications: <https://kb.juniper.net/InfoCenter/>
- Join and participate in the Juniper Networks Community Forum: <https://www.juniper.net/company/communities/>
- Create a service request online: <https://myjuniper.juniper.net>

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: <https://entitlementsearch.juniper.net/entitlementsearch/>

Creating a Service Request with JTAC

You can create a service request with JTAC on the Web or by telephone.

- Visit <https://myjuniper.juniper.net>.
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, see <https://support.juniper.net/support/requesting-support/>.

PART 1

Overview

- [Virtualization Overview on page 3](#)

CHAPTER 1

Virtualization Overview

- [Virtualized SRC Software Overview on page 3](#)
- [System Requirements for a Virtualized SRC Software on page 3](#)

Virtualized SRC Software Overview

You can deploy the SRC software as a virtual machine and manage SRC functionalities. The virtualized SRC software can be created through an iso, qcow2, or vmdk image.



NOTE: All hardware-specific commands (such as show disk status) display an appropriate error message when executed in a virtualized SRC software. Virtualized SRC software does not support hardware-related alarms or traps (such as diskFailure).

The SRC software installation is currently supported and tested over the VMware Workstation 12 Player, VMware Workstation 12 Pro, VMware ESXi 5.5.0, 6.0, and 6.5, and Kernel-based Virtual Machine (KVM) hypervisor on CentOS 7.6.

The SRC software does not have any hypervisor management tool. You can make use of the existing tools such as virsh and virt-manager, VMware vSphere client, and VMware Workstation Player.

Related Documentation

- [SRC Product Description](#)
- [Creating a Virtualized SRC Instance on page 9](#)
- [System Requirements for a Virtualized SRC Software on page 3](#)

System Requirements for a Virtualized SRC Software

The system requirements for a virtualized SRC software are:



NOTE: We recommend you to allocate CPU cores, RAM, and hard disk space as same as that of C Series Controllers to attain better performance.

- [Hard Disk Requirement on page 4](#)
- [Memory Requirements on page 4](#)
- [CPU Requirements on page 5](#)

Hard Disk Requirement

The qcow2 image and vmdk image (of subtype monolithicSparse) grow in size up to 250 GB when used on a virtual machine, so you must have more than 250 GB of disk space in the host operating system if you use the qcow2 or vmdk image.

If you are using an SRC iso image, we recommend you to have around 250 GB of disk space allocated to the virtualized SRC software to have enough space for system and component logs.

Memory Requirements

[Table 4 on page 4](#) lists the default heap size allocated for SRC components on a virtualized SRC software.

Table 4: Heap Allocation for SRC Components on a Virtualized SRC Software

SRC Component	Default Heap Size on Virtualized SRC Software	Heap Size Adjustable or Not
SRC ACP	64 MB	Yes
SNMP agent	160 MB	No
Web application server	616 MB	No
CLI	200 MB	No
Diameter server	600 MB	No
External subscriber monitor	160 MB	Yes
3GPP Gateway	200 MB	No
IMS Services Gateway	200 MB	No
License server	1 GB or smaller than one-fourth of physical memory	No
NIC	128 MB	Yes
SAE	70% of free memory	Yes

Table 4: Heap Allocation for SRC Components on a Virtualized SRC Software (continued)

SRC Component	Default Heap Size on Virtualized SRC Software	Heap Size Adjustable or Not
C-Web interface	200 MB	No



NOTE: In a virtualized SRC software, the default heap size is set only for the Java components and not for the non-Java components such as redirect server.

The memory requirements of the virtualized SRC software based on the default heap size allocation are:

- At least 2927 MB of memory is required for all Java components other than the SAE and license server.
- Subscriber management capacity of the virtualized SRC software depends on the heap size of the SAE. We recommend you to allocate enough heap size for SAE.
- 1 GB of memory is required for the license server.

CPU Requirements

You must allocate a minimum of one CPU core for a virtualized SRC software. You can allocate CPU cores same as that of C Series Controller to attain better performance. The CPU cores available in C Series Controllers are:

- C2000—4
- C3000—8
- C5000—24

Related Documentation

- [Virtualized SRC Software Overview on page 3](#)

PART 2

Administration

- [Virtualized SRC on page 9](#)

CHAPTER 2

Virtualized SRC

- [Creating a Virtualized SRC Instance on page 9](#)

Creating a Virtualized SRC Instance

You can create a virtualized SRC instance by using the iso, qcow2, or vmdk image.



NOTE: We recommend you to create a virtualized SRC instance by using the qcow2 image.

- [Creating a Virtualized SRC Instance Using qcow2 Image on page 9](#)
- [Creating a Virtualized SRC Instance Using iso Image on page 11](#)
- [Creating a Virtualized SRC Instance Using the vmdk Image on page 13](#)

Creating a Virtualized SRC Instance Using qcow2 Image

To create a virtualized SRC instance on the KVM hypervisor by using the qcow2 image:

1. Download the qcow2.gz image from <https://www.juniper.net/support/downloads/?p=src#sw> and place it on the host operating system.
2. Unzip the image on the host operating system.

```
gunzip name.qcow2.gz
```

3. Download the SDK+AppSupport+Demos+Samples.tar.gz file from <https://www.juniper.net/support/downloads/?p=src#sw> and place it on the host operating system.
4. Untar the file to use the create_vm.py script for creating a virtualized SRC instance.

```
tar -xvzf SDK+AppSupport+Demos+Samples.tar.gz
```

5. Execute the create_vm.py script from the path where the SDK+AppSupport+Demos+Samples.tar.gz is extracted.

```
# $cd <sdk_root_folder>/SDK/vSRC/  
# $./create_vm.py
```



NOTE: The create_vm.py script is not supported for VMware virtual machine creation. To create a virtualized SRC instance on VMware hypervisor, use the iso or vmdk image.

The script requests various details for creating the virtualized SRC instance.

6. Enter the requested details. The details requested by the script are:
 - Name for the virtualized SRC instance
 - Number of CPUs to be allocated for the virtualized SRC instance
 - Memory (in megabytes) to be allocated for the virtualized SRC instance
 - Network configuration details:
 - Number of interfaces to be configured
 - Media access control (MAC) address for each interface. You can enter MAC address or allow the script to create the MAC address automatically.
 - Networking mode for each interface. The supported modes are:
 - Direct host device mapping with bridge mode—Use this mode if multiple network interfaces have to be shared with a host device (for example, eth0 for CentOS 6 and enpX/ensX for CentOS 7). This mode is ideal for hosting multiple virtualized SRC instances with multiple interfaces. This is the default mode.
 - Direct host device mapping with passthrough mode—In this mode, one-to-one mapping is done between the host device network interface and virtualized SRC instance's network interface. You can use this mode when only one virtualized SRC instance is hosted in the server.
 - Shared bridge mapping (bridge has to be manually configured)—In this mode, you have to manually configure the bridge and provide the shared bridge name as an input. This mode provides flexibility to have more complex networking.
 - Path of the qcow2 image file

The script creates an xml file with the name of the virtualized SRC instance and creates the virtualized SRC instance by using the **virsh** command. The xml file contains one serial console configuration and one vnc console configuration.



NOTE: You must have the virsh management tool in the host operating system for the script to successfully create the virtualized SRC instance.

7. Log in to the virtualized SRC instance through any hypervisor management tool and set up the initial configuration for the SRC software. For information about the initial configuration, see your *C Series Controller Hardware Guide*.

Creating a Virtualized SRC Instance Using iso Image

To create a virtualized SRC instance on VMware and KVM hypervisors by using the iso image:

1. Download the iso image from <https://www.juniper.net/support/downloads/?p=src#sw> and place it in the host operating system.
2. Start installing the iso image in the virtual machine by using the hypervisor management tool (such as virt-manager, virsh, VMware vSphere client, and VMware Workstation Player). The virtual machine boots from the iso image and prints the following message:

```
Welcome to SRC PE Software Installation.

WARNING: This system recovery software replaces all data and software
on the system disk image. As a result, any data, including data
previously in the snapshot partition, is lost.

After you run the system installation software, the virtual image
contains the SRC software, including the SRC operating system,
but no configuration data.

To continue, press <TAB> and choose the installation type.

To enable serial console enter following after choosing the
Installation type :
"console=tty0 console=tty50, 9600

To cancel this operation, power off the system and remove
the iso image.
boot:
  AUTO Manual rescue
boot:
```

3. At the boot prompt, type the installation option.
 - If the typed option is AUTO, the disk space is partitioned automatically and the packages are installed. The following hard disk partition scheme is used:
 - /—8.5 GB
 - /var—50 percent of remaining hard disk space
 - 50 percent of remaining hard disk space can be used for storing snapshots

- If the typed option is Manual, you can define the partition scheme and other general settings (such as language) through the displayed dialog boxes to install the SRC software.



NOTE: You cannot create snapshot or restore snapshot with custom partition scheme. We recommend you to use the `virsh snapshot-create` command on KVM hypervisor and use the Snapshot option in the VMware Workstation Pro or VMware ESXi hypervisor to maintain snapshots of disk image.

4. After the successful installation, reboot the virtual machine.



NOTE: On VMware, CentOS 7 and later versions use different schemes for naming network interfaces, for example, `enpX`, `ensX`, and `enoX`. SRC works only with the traditional naming `ethX`. So, it is mandatory to rename the interfaces from `ensX`, `enpX`, or `enoX` to `ethX` and persist interface names with the corresponding MAC addresses. After the software installation is complete, the interface renaming script is executed for renaming the interfaces.

5. (Only for VMware) After the interface renaming script is executed, configure the corresponding MAC address for each network interface (for example, `eth0`, `eth1`). After verifying the configuration of MAC addresses, reboot the C Series Controller for the changes to take effect.
6. After the virtual machine reboots, set up the initial configuration. For information about the initial configuration, see your *C Series Controller Hardware Guide*.



NOTE: The default username and password for grub menu are “root” and “password”, respectively. You can change the default password by executing the `grub2-setpassword` command in shell mode.

Creating a Virtualized SRC Instance Using the vmdk Image

Virtual Machine Disk (vmdk) is a file format that describes containers for virtual hard disk drives to be used in VMware virtual machines. The vmdk image shipped with the SRC software is of the `monolithicSparse` type, and the image has been tested with `monolithicSparse` and `monolithicFlat` types. If you are using VMware ESXi, either the iso image or the vmdk image of `monolithicFlat` type must be used. To convert the `monolithicSparse` type to the `MonolithicFlat` type, you can use one of the following commands:

- **`qemu-img convert -f vmdk vmdk-file-name-MonolithicSparse -O vmdk output-flat-file-name -o subformat={ monolithicFlat }`**

You must execute this command in a Linux machine by installing the **qemu-img** tool, and then the output flat file needs to be transferred to the ESXi server.

- **`vmkfstools -i MonolithicSparse-file-name output-flat-file-name`**

This command can be executed in the ESXi server itself.



NOTE: While using the **qemu-img** or **vmkfstools** command, the output flat file name should not contain the suffix “-flat.vmdk”.



NOTE: The SRC software installation is currently supported and tested over the VMware Workstation 12 Player, VMware Workstation 12 Pro, and VMware ESXi 5.5.0, 6.0, and 6.5.

To create a virtualized SRC instance on VMware hypervisor by using the vmdk image:

1. Download the vmdk image from <https://www.juniper.net/support/downloads/?p=src#sw> and place it in the host operating system.
2. Using VMware vSphere client or VMware workstation player, create a new virtual machine with custom configurations (RAM, CPU, network, and so on). Provide the path of the downloaded vmdk image in the Virtual Disk section.



NOTE: The following settings have been tested by Juniper Networks:

- Network Connection—Bridged Networking
- I/O Controller Type—LSI Logic
- Virtual Disk Type—SCSI
- OS—CentOS (64-bit)

3. Power on the virtual machine to start the SRC software.
4. After the virtual machine boots, set up the initial configuration. For information about the initial configuration, see your *C Series Controller Hardware Guide*.



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NOTE: You cannot create snapshot or restore snapshot with custom partition scheme. We recommend you to use the **Snapshot** option in the VMware Workstation Pro or VMware ESXi to maintain snapshots of disk image.

The virtual machine gets paused while creating snapshots. We recommend you to disable the Juniper Networks database (jdb component) and components involved in service activities during snapshot creation.

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**Related
Documentation**

- [Virtualized SRC Software Overview on page 3](#)