



## Software Packaging on the Router

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## Software Package Modes

The router can be booted using any of the following:

- **Consolidated**—A single software image containing a full collection of software packages. This mode provides a simplified installation and can be stored in the bootflash, a TFTP server, or a network server.
- **Sub-package**—One or more sub-images extracted from the consolidated image. This mode provides optimized memory usage and requires that you store files in the bootflash directory.



**Note**

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In-Service Software Upgrade (ISSU) is supported only on sub-package on the router.

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## Understanding Cisco ASR 900 Series Router Software Packages

*Table 1: Individual Sub-Packages*

| Sub-Package | Purpose                                       |
|-------------|---|
| RPBase      | Route Switch Processor (RSP) operating system |

| Sub-Package | Purpose  |
|-------------|--|
| RPControl   | Control plane processes between IOS process and the rest of the platform.  |
| RPAccess    | Handles security features including Secure Socket Layer (SSL) and Secure Shell (SSH)   |
| RPIOS       | Cisco IOS kernel, which is where IOS features are stored and run.<br><b>Note</b> Each consolidated image has a unique RPIOS package. |
| FP Pkg      | Controls FP daemons.   |
| IO Pkg      | Controls input/output driver daemons.  |
| LC Base     | Controls basic kernel functions including runtime, initialization scripts, and chassis control daemons.                              |

## Provisioning Files

Provisioning files manage the boot process when the router is configured to boot in sub-packages. The provisioning file manages the bootup of each individual sub-package. Provisioning files are extracted automatically when individual sub-package files are extracted from a consolidated package. Provisioning files are not necessary for running the router using the complete consolidated package.

## File Systems on the Router

*Table 2: File Systems*

| File System     | Description  |
|-----------------|--|
| bootflash:      | The boot flash memory file system on the active RSP.   |
| cns:            | The Cisco Networking Services file directory.  |
| nvrn:           | Router NVRAM. You can copy the startup configuration to NVRAM or from NVRAM.   |
| stby-bootflash: | The boot flash memory file system on the standby RSP.  |
| stby-harddisk:  | The hard disk file system on the standby RSP.  |
| stby-usb0:      | The Universal Serial Bus (USB) flash drive file systems on the standby RSP.<br><b>Note</b> stby-usb1: is an internal port. |
| system:         | The system memory file system, which includes the running configuration.   |
| tar:            | The archive file system.   |

| File System | Description  |
|-------------|--|
| tmpsys:     | The temporary system files file system.  |
| usb0:       | The Universal Serial Bus (USB) flash drive file systems on the active RSP.<br><b>Note</b> usb1: is an internal port. |

If you see a file system not listed in the above table, enter the ? help option or see the **copy** command reference for additional information on that file system.

## System Requirements

### RP Memory Recommendations

*Table 3: Memory Recommendations for the Cisco ASR 903 RSP2 Module - Consolidated Package Image*

| Platform            | Image Name                                     | Software Image                   | Individual Sub-package Contents            | DRAM Memory     |
|---------------------|--|----------------------------------|--|-----------------|
| ASR 903 RSP2 Module | Cisco ASR 903 Series RSP2 UNIVERSAL W/O CRYPTO | asr900rsp2-universal.version.bin | asr900rsp2-rpbase.version.pkg              | 4 GB (RSP2-128) |
|                     |  |                                  | asr900rsp2-rpcontrol.version.pkg           |                 |
|                     |  |                                  | asr900rsp2-rpaccess.version.pkg            |                 |
|                     |  |                                  | asr900rsp2-rpios-universal.version.pkg     |                 |
|                     |  |                                  | asr900rsp2-espbase.version.pkg             |                 |
|                     |  |                                  | asr900rsp2-sipbase.version.pkg             |                 |
|                     |  |                                  | asr900rsp2-sipsa.version.pkg               |                 |
|                     |  |                                  | asr900rsp2-packages-universal.version.conf |                 |
|                     |  |                                  | packages.conf                              |                 |

| Platform            | Image Name                              | Software Image                              | Individual Sub-package Contents               | DRAM Memory     |
|---------------------|---|---|---|-----------------|
| ASR 903 RSP2 Module | Cisco ASR 903 Series RSP2 UNIVERSAL NPE | asr900rsp2-universalk9_npe.<br>version .bin | asr900-hw-programmables.version . pkg         | 4 GB (RSP2-128) |
|                     |   |   | asr900rsp2-espbase.version .pkg               | 4 GB (RSP2-64)  |
|                     |   |   | asr900rsp2-packages-universalk9.version .pkg  |                 |
|                     |   |   | asr900sp2-rpaccess.version .pkg               |                 |
|                     |   |   | asr900rsp2-rpbase.version .pkg                |                 |
|                     |   |   | asr900rsp2-rpcontrol.version .pkg             |                 |
|                     |   |   | asr900rsp2-rpios-universalk9_npe.version .pkg |                 |
|                     |   |   | asr900rsp2-sipbase.version .pkg               |                 |
|                     |   |   | asr900rsp2-sipspa.version .pkg                |                 |
|                     |   | packages.conf                               |   |                 |

**Table 4: Memory Recommendations for the Cisco ASR 900 RSP3 Module - Consolidated Package Image**

| Platform            | Image Name                                     | Software Image                    | Individual Sub-package Contents            | DRAM Memory     |
|---------------------|--|-----------------------------------|--|-----------------|
| ASR 900 RSP3 Module | Cisco ASR 900 Series RSP3 UNIVERSAL W/O CRYPTO | asr900rsp3-universal.version .bin | asr900rsp3-rpbase.version .pkg             | 8 GB (RSP3-400) |
|                     |  |                                   | asr900rsp3-rpcontrol.version .pkg          |                 |
|                     |  |                                   | asr900rsp3-rpaccess.version .pkg           |                 |
|                     |  |                                   | asr900rsp3-rpios-universal.version .pkg    |                 |
|                     |  |                                   | asr900rsp3-espbase.version .pkg            |                 |
|                     |  |                                   | asr900rsp3-sipbase.version .pkg            |                 |
|                     |  |                                   | asr900rsp3-sipspa.version .pkg             |                 |
|                     |  |                                   | asr900rsp3-packages-universal.version.conf |                 |
|                     |  |                                   | packages.conf                              |                 |

| Platform            | Image Name                              | Software Image                              | Individual Sub-package Contents               | DRAM Memory     |
|---------------------|---|---|---|-----------------|
| ASR 900 RSP3 Module | Cisco ASR 900 Series RSP3 UNIVERSAL NPE | asr900rsp3-universalk9_npe.<br>version .bin | asr900-hw-programmables.version .pkg          | 8 GB (RSP3-400) |
|                     |   |   | asr900rsp3-espbase.version .pkg               |                 |
|                     |   |   | asr900rsp3-packages-universalk9.version .pkg  |                 |
|                     |   |   | asr900rsp3-rpaccess.version .pkg              |                 |
|                     |   |   | asr900rsp3-rpbase.version .pkg                |                 |
|                     |   |   | asr900rsp3-rpcontrol.version .pkg             |                 |
|                     |   |   | asr900rsp3-rpios-universalk9_npe.version .pkg |                 |
|                     |   |   | asr900rsp3-sipbase.version .pkg               |                 |
|                     |   |   | asr900rsp3-sipspace.version .pkg              |                 |
|                     |   |   | packages.conf                                 |                 |

## Autogenerated Files and Directories



### Caution

Any autogenerated file in the bootflash: directory should not be deleted, renamed, moved, or altered in any way unless directed by customer support; altering these files can have unpredictable consequences for system performance.

**Table 5: Autogenerated Files**

| File or Directory    | Description  |
|----------------------|--|
| crashinfo files      | A crashinfo file may appear in the bootflash: file system. Crashinfo files are useful for tuning and troubleshooting, but are not related to router operations: you can erase them without impacting the router's performance. |
| core files           | The bootflash/core directory is the storage area for .core files.<br><b>Warning</b> Do not erase or move the core directory.   |
| lost+found directory | This directory is created on bootup if a system check is performed. Its appearance is completely normal and does not indicate any issues with the router.  |

| File or Directory | Description  |
|-------------------|--|
| tracelogs files   | <p>The storage area for trace files is bootflash/tracelogs.</p> <p>Trace files are useful for troubleshooting; you can access trace files using diagnostic mode to gather information related to the IOS failure.</p> <p><b>Warning</b> Do not erase or move the tracelog directory.</p> |

## Additional References

### Related Documents

| Related Topic                        | Document Title   |
|--------------------------------------|--|
| Cisco IOS master command list        | <a href="#">Cisco IOS Master Command List</a> , All Releases |
| Cisco IOS High Availability commands | <i>Cisco IOS High Availability Command Reference</i>         |

### Standards

| Standard  | Title |
|---|-------|
| No new or modified standards are supported, and support for existing standards has not been modified. | --    |

### MIBs

| MIB  | MIBs Link  |
|--|--|
| <p>No new or modified MIBs are supported, and support for existing MIBs has not been modified.</p> <p>Cisco ASR 900 Series Aggregation Services Routers MIB Specifications Guide</p> | <p>To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a></p> <p><a href="#">Cisco ASR 900 Series Aggregation Services Routers MIB Specifications Guide</a></p> |

### RFCs

| RFC   | Title |
|---|-------|
| No new or modified RFCs are supported, and support for existing RFCs has not been modified. | --    |

**Technical Assistance**

| Description  | Link   |
|--|--|
| <p>The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.</p> | <p><a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a></p> |

