Troubleshoot Cisco Catalyst IR1101 Rugged Router Upgrade Failure

Introduction

This document describes the process to diagnose and resolve the issues when a Cisco Catalyst IR1101 Rugged Router upgrade fails due to insufficient storage capacity.

Prerequisites

WAN Edge Router

Requirements

We recommend that you know these topics:

- Cisco Catalyst Software-Defined Wide Area Network (SD-WAN)

- Cisco Catalyst IOS® XE Command Line Interface (CLI)

For information on Cisco Catalyst IOS XE SD-WAN upgrade information, see Upgrade Cisco IOS XE SD-WAN Router with the Use of CLI or vManage (Catalyst SD-WAN Manager)

Components Used

This document is based on these software and hardware versions:

- Router IR1101

- All Software Versions

- Router in controller mode

The information in this document was created from the devices in a specific lab environment. All the devices used in this document started with a clear (default) configuration. If your network is live, ensure you understand any command's potential impact.

Conditions

- Unable to upgrade the router model IR1101 (for ex: to 17.12.x and above).

- When you encounter the errors given below:

```
Not enough space under bootflash for image download and package expansion on image
installation. Required space: 1207202432 Available space: 659275776. Image installation
 failed. Not enough space in SD-WAN installer filesystem. Please remove one of the
installed images and try again. SD-WAN installer filesystem size - 396672 Kilobytes,
Available space - 196986 Kilobytes, Required space - 243602 Kilobytes.
```

- When the upgrade fails as shown in these logs:

```
IR1101-2#$1101-universalk9.BLD_V1712_THROTTLE_LATEST_20230702_143029.SSA.bin
install_add: START Tue Jul 04 14:33:54 UTC 2023
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install_add: Adding IMG
[1] R0 Downloading (null)
[1] R0 Downloading (null)
[1] R0 FAILED: /flash requires 699781 KB of free space, but only 688128 KB is available
FAILED: install_add
/flash1/ir1101-universalk9.BLD_V1712_THROTTLE_LATEST_20230702_143029.SSA.bin Tue Jul
04 14:34:15 UTC 2023
```

- When only one version is installed.

  Use the **show sdwan software** command for verification.

  Example:

```
Device#show sdwan software
VERSION ACTIVE DEFAULT PREVIOUS CONFIRMED TIMESTAMP
--------------------------------------------------------------------------------
17.11.01.0.1324 true true false auto 2024-09-11T07:33:39-00:00
Total Space:387M Used Space:155M Available Space:227M
```

Troubleshoot

1. Delete unnecessary files using this command:

```
delete /force /recursive bootflash:/<directory>/<file ext>
```

   You can also delete the next list of files. They are internal logs created for troubleshooting purposes. However, delete them if you are sure there is no other investigation in progress.

```
bootflash:/vmanage-admin/*.tar.gz bootflash:/core/*.core.gz bootflash:/core/*.tar.gz
bootflash:/syslog/* bootflash:/tracelogs/* bootflash:/crashinfo_*
```

Example:

```
delete /force /recursive bootflash:/tracelog/* delete /force /recursive bootflash:/
vmanage-admin/*.tar.gz
```

Warning: Do not delete these files, as they are critical for the router's functionality.

```
bootflash:/.sdwaninstaller bootflash:/.sdwaninstallerfs bootflash:/.cdb_backup folder
bootflash:/sdwan folder bootflash:/*pkg bootflash:/*.conf.
```

2. Perform a reboot. It helps to release bootflash memory as shown in the example.

Caution: Control plane and Data plane flaps during reboot.

```
*** Before Reboot ***
edge#show sdwan software
VERSION ACTIVE DEFAULT PREVIOUS CONFIRMED TIMESTAMP
--------------------------------------------------------------------------------
17.11.01.0.1324 true true false auto 2024-09-11T07:33:39-00:00
Total Space:387M Used Space:191M Available Space:192M >>> Here
edge#
*** Rebooting edge
edge#reload
Proceed with reload? [confirm]Connection to 192.168.1.6 closed by remote host.
*** After Reboot ***
edge#show sdwan software
VERSION ACTIVE DEFAULT PREVIOUS CONFIRMED TIMESTAMP
--------------------------------------------------------------------------------
17.11.01.0.1324 true true false auto 2024-09-11T07:33:39-00:00
Total Space:387M Used Space:190M Available Space:193M >>>> Here
```

Workaround

Apply the following resolutions if previous actions did not work to upgrade the router IR1101.

Issue 1

If the upgrade issue is related to the error 'Not enough space under bootflash', use the resolution given here.

Resolution

Step 1. Enable IOx.

```
Config-transaction iox commit end
```

Step 2. Run the next command to move the IOx log from bootflash to flash.

```
app-hosting move system techsupport to flash:
```

Step 3. Disable IOx.

```
Config-transaction no iox commit end
```

Step 4. Proceed to upgrade.

```
request platform software sdwan software install bootflash:<version.bin> request platform
software sdwan software activate <IOS version>
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```

```
request platform software sdwan software upgrade-confirm request platform software sdwan
software set-default <IOS version>
```

Tip: For software upgrade using vManage, see Upgrade SD-WAN cEdge Router with the Use of CLI or vManage

Issue 2

If the upgrade issue is related to this error 'Not enough space in SD-WAN installer filesystem', use the resolution given here.

Resolution

Step 1. Log in to the shell.

Step 2. Go to .sdwaninstaller/images directory. Use the Linux commands to find and remove old files.

```
cd /bootflash/.sdwaninstaller/images ls -l rm -rf <old file>
```

Step 3. Exit from the shell with Linux command.

```
Exit
```

Step 4. Proceed to upgrade.

```
request platform software sdwan software install bootflash:<version.bin> request platform
software sdwan software activate <IOS version> request platform software sdwan software
upgrade-confirm request platform software sdwan software set-default <IOS version>
```

Tip: For software upgrade using vManage, see Upgrade SD-WAN cEdge Router with the Use of CLI or vManage

Examples

Before Clean Up

```
*Sep 10 12:21:29.612: %INSTALL-5-INSTALL_START_INFO: R0/0: install_mgr: Started install add
 bootflash:ir1101-universalk9.17.12.01a.SPA.bin
*Sep 10 12:21:31.318: %IOSXE-5-PLATFORM: R0/0: download-start: Downloading
bootflash:ir1101-universalk9.17.12.01a.SPA.bin startedinstall_add: START Tue Sep 10 12:21:29
 UTC 2024
install_add: Adding IMG
[1] R0 Downloading (null)
[1] R0 Downloading (null)
*Sep 10 12:21:37.134: %IOSXE-5-PLATFORM: R0/0: download-complete: All installed versions:
17.16.01.0.137;17.11.01.0.1324;
*Sep 10 12:21:38.365: %IOSXE-5-PLATFORM: R0/0: install-start: Received installation request
 for software version(5-tuple): 17.12.01a.0.118 [1] R0 FAILED: /flash requires 700435 KB
of free space, but only 564852 KB is available
FAILED: install_add /flash1/ir1101-universalk9.17.12.01a.SPA.bin Tue Sep 10 12:21:49 UTC
2024
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*Sep 10 12:21:49.043: %IOSXE-5-PLATFORM: R0/0: install-fail: /flash requires 700435 KB of
free space, but only 564852 KB is available
Sparrow-1#
*Sep 10 12:21:49.066: %INSTALL-3-OPERATION_ERROR_MESSAGE: R0/0: install_mgr: Failed to
install add package flash:/ir1101-universalk9.17.12.01a.SPA.bin, Error: /flash requires
700435 KB of free space, but only 564852 KB is available
```

```
*Sep 10 12:22:46.330: %IOSXE-3-PLATFORM: R0/0: cpp_cp: QFP:0.0 Thread:000
TS:00000002058317666600 %IPSEC-3-REPLAY_ERROR: IPSec SA receives anti-replay error, DP
Handle 9, src_addr 172.16.0.149, dest_addr 172.16.0.150, SPI 0x101
*Sep 10 12:22:52.235: %DMI-5-AUTH_PASSED: R0/0: dmiauthd: User 'vmanage-admin' authenticated
 successfully from 1.1.1.1:57610 for netconf over ssh. External groups:
```

Verify

```
edge#show sdwan software
VERSION ACTIVE DEFAULT PREVIOUS CONFIRMED TIMESTAMP
--------------------------------------------------------------------------------
17.11.01.0.1324 true true false auto 2024-09-11T07:33:39-00:00
Total Space:387M Used Space:190M Available Space:193M >>> Here
```

Clean Old Files from sdwaninstaller

```
[edge:/]$ cd /bootflash/.sdwaninstaller/images
[edge:/bootflash/.sdwaninstaller/images]$ ls -l
total 2
drwxr-xr-x. 3 root root 1024 Oct 3 2019 SR_BOOT=usb0:c1100-ucmk9.16.9.3.SPA.bin
drwxr-xr-x. 3 root root 1024 Sep 23 13:33 c1100-universalk9.17.03.04a.SPA.bin
[edge:/bootflash/.sdwaninstaller/images]$ rm -rf SR_BOOT=usb0:c1100-ucmk9.16.9.3.SPA.bin
[edge:/bootflash/.sdwaninstaller/images]$ ls -l
total 1
drwxr-xr-x. 3 root root 1024 Sep 23 13:33 c1100-universalk9.17.03.04a.SPA.bin
[edge:/bootflash/.sdwaninstaller/images]$ exit
exit
Session log harddisk:tracelogs/system_shell_R0-0.18547_0.20220923134926.bin closed
```

Verify

```
edge#show sdwan software
VERSION ACTIVE DEFAULT PREVIOUS CONFIRMED TIMESTAMP
--------------------------------------------------------------------------------
17.11.01.0.1324 true true false auto 2024-09-11T07:33:39-00:00
Total Space:387M Used Space:120M Available Space:262M >>>> Space increased
```

After Clean-Up Upgrade is Successful

```
upgraded to 17.12.01prd6
=========================
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[12-Jul-2023 9:41:13 UTC] Software Install action submitted for execution
[12-Jul-2023 9:41:15 UTC] Executing device action Software Install
[12-Jul-2023 9:41:15 UTC] Installing and activating software image
[12-Jul-2023 9:41:18 UTC] Current active partition: 17.12.01.0.1457
[12-Jul-2023 9:41:18 UTC] Upgrade Requested for SW image
/root/ir1101-universalk9.17.12.01prd6.SPA.bin from remote server TFTP
[12-Jul-2023 9:41:22 UTC] Configured upgrade confirm timer is 15 minutes
[12-Jul-2023 9:41:22 UTC] Using VPN: 0 Protocol: SCP to download the software image.
[12-Jul-2023 9:41:22 UTC] Software Image ir1101-universalk9.17.12.01prd6.SPA.bin
[12-Jul-2023 9:41:22 UTC] Sending requested upgrade action to the device
[12-Jul-2023 9:41:22 UTC] Software image download once started may take upto 60 minutes
[12-Jul-2023 9:41:26 UTC] [in_progress] Started Pre-Upgrade Check: Pre-Upgrade Checks for
'Download and Upgrade' workflow
[12-Jul-2023 9:41:49 UTC] [success] Image Validity Check: Image is compatible with the
platform
[12-Jul-2023 9:41:49 UTC] [success] Image compatibility with controller: Image
controller-version 20.12 is compatible with vManage version 20.13
```

```
[12-Jul-2023 9:41:49 UTC] [success] Disk Space Check: Disk has enough space to install the
 new image
[12-Jul-2023 9:41:49 UTC] [success] SDWAN Installer Space Check: SDWAN installer has
sufficient space
[12-Jul-2023 9:41:49 UTC] [success] System Load Check: System has healthy CPU levels
[12-Jul-2023 9:41:49 UTC] [success] Memory Usage Check: System has healthy Memory levels
[12-Jul-2023 9:41:49 UTC] [success] Config-register Check: Autoboot is enabled
[12-Jul-2023 9:41:49 UTC] [success] Control-connection status Check: Control-connection to
 vManage is UP
[12-Jul-2023 9:41:49 UTC] [success] Finished Pre-Upgrade Check: Proceeding with the requested
 workflow
[12-Jul-2023 9:41:51 UTC] Device: Downloading
scp://XXXXX:XXXXX@15.1.20.2:22/root/ir1101-universalk9.17.12.01prd6.SPA.bin started
[12-Jul-2023 9:45:27 UTC] Device: All installed versions: 17.12.01.0.1457;
[12-Jul-2023 9:45:32 UTC] Device: Received installation request for software version(5-tuple):
 17.12.01.0.1463
[12-Jul-2023 9:52:32 UTC] Device: Installed 17.12.01.0.1463
[12-Jul-2023 9:52:35 UTC] Device: Reloading the device to activate 17.12.01.0.1463
[12-Jul-2023 10:02:37 UTC] Device: Post upgrade check sucessfull. Current active partition
 is 17.12.01.0.1463
[12-Jul-2023 10:02:56 UTC] Device: Successfully applied upgrade-confirm
[12-Jul-2023 10:02:58 UTC] Software Install complete
```

Caveat

Possible problems during the upgrade via vManage GUI.

Not enough space

Fix

Check the bootflash and remove any unused images. You can delete all the packages and files using these commands:

```
delete /force /recursive bootflash:/img*.bin
delete /force /recursive bootflash:/.EXPAND*
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delete /force /recursive bootflash:/admintech_trace
delete /force /recursive bootflash:/admintech
delete /force /recursive bootflash:/collated_log*
delete /force /recursive bootflash:/license_evlog/*.log
delete /force /recursive bootflash:/sdavc/*
delete /force /recursive bootflash:/vmanage-admin/*.tar.gz
delete /force /recursive bootflash:/core/*.tar.gz
delete /force /recursive bootflash:/core/*.core.gz
delete /force /recursive bootflash:/core/*core.flat.gz
delete /force /recursive bootflash:/syslog/*
delete /force /recursive bootflash:/crashinfo_*
delete /force /recursive bootflash:/tracelogs/*
```

You can boot from a USB drive, remove all images from the bootflash, copy the bin file to the bootflash, and then reboot the system.

Note When the router is in controller mode, all IOS-XE commands related to packages are non-functional.

Note Changing the boot variable through CLI is also disabled in controller mode. To make changes, you can switch the device to autonomous mode, perform the upgrade, and then revert it to controller mode.

The image is already present in the router

You can verify whether the version is already present using the vManage GUI or by running the show sdwan software command.

Fix

Remove the unused images via the vManage GUI or with the **request platform software sdwan software remove <name>** command.

When there are more than three images in the router

You can verify whether the version is already present using the vManage GUI or by running the **show sdwan software** command.

Fix

Remove the unused images via the vManage GUI or with the **request platform software sdwan software remove <name>** command.

Revision History

Table 1:

Revision	Publish Date	Comments
1.0	16-Jan-2025	Initial Release

Related Information

- Upgrade SD-WAN cEdge Router with the Use of CLI or vManage
- Cisco Technical Support & Downloads