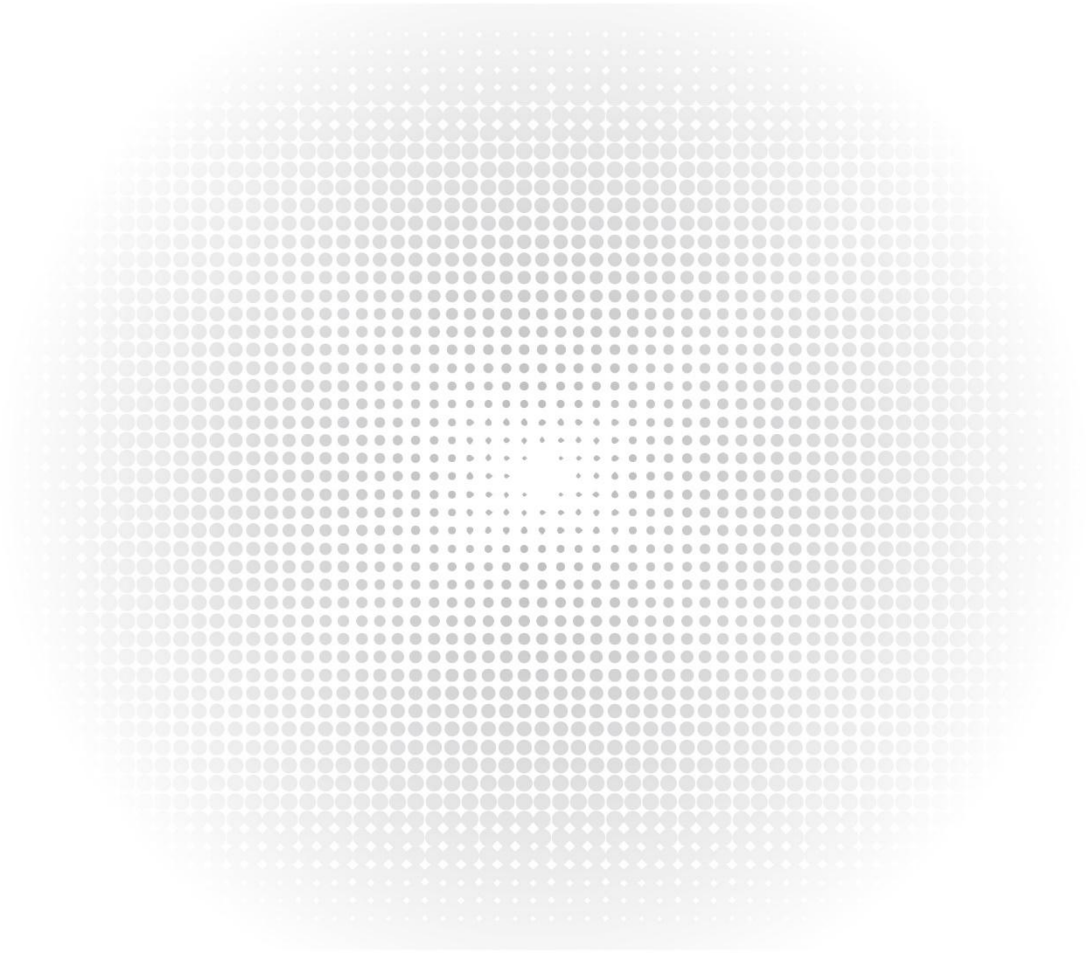
PicOS® Software Installation and Upgrade Guide



Configuration Guide

Content

1 ONIE Version and BIOS/U-Boot Information of Verified Platforms

The ONIE and BIOS/U-Boot Version information of platforms verified in the lab are listed below. The users can find the ONIE version information in the **onie-syseeprom** command output.

Platform	BIOS/U-Boot Version	ONIE Version
AS4610_54P	none	ONIE:/ # onie-syseeprom TlvInfo Header: Id String: TlvInfo Version: 1 Total Length: 159 TLV Name Code Len Value ---------- ---- --- ----- Product Name 0x21 15 4610-54P-O-AC-F Part Number 0x22 13 FP1ZZ5654001A Serial Number 0x23 12 EC1731000333 Base MAC Address 0x24 6 A8:2B:B5:70:43:40 Manufacture Date 0x25 19 08/22/2017 19:30:27 Label Revision 0x27 3 R01 Platform Name 0x28 23 arm-accton_as4610_54-r0 ONIE Version 0x29 13 2016.05.00.04 MAC Addresses 0x2A 2 55 Manufacturer 0x2B 6 Accton Country Code 0x2C 2 TW Vendor Name 0x2D 8 Edgecore Diag Version 0x2E 5 001.9 CRC-32 0xFE 4 0xDABC2397 Checksum is valid.
AS4610_54T	none	ONIE:/ # onie-syseeprom

		TlvInfo Header: Id String: TlvInfo Version: 1 Total Length: 159 TLV Name Code Len Value ---------- ---- --- ----- Product Name 0x21 15 4610-54T-O-AC-F Part Number 0x22 13 F0PEC4654000Z Serial Number 0x23 12 EC1741001625 Base MAC Address 0x24 6 A8:2B:B5:CD:6C:C0 Manufacture Date 0x25 19 10/30/2017 12:56:49 Label Revision 0x27 3 R01 Platform Name 0x28 23 arm-accton_as4610_54-r0 ONIE Version 0x29 13 2016.05.00.04 MAC Addresses 0x2A 2 55 Manufacturer 0x2B 6 Accton Country Code 0x2C 2 TW Vendor Name 0x2D 8 Edgecore Diag Version 0x2E 5 001.9 CRC-32 0xFE 4 0xF40F7512 Checksum is valid.
AS4610_54T_B	none	ONIE:/ # onie-syseeprom TlvInfo Header: Id String: TlvInfo Version: 1 Total Length: 159 TLV Name Code Len Value ---------- ---- --- ----- Product Name 0x21 15 4610-54T-O-AC-B

		Part Number 0x22 13 F0PEC4654003Z Serial Number 0x23 12 EC1631000053 Base MAC Address 0x24 6 C4:39:3A:FF:2D:C0 Manufacture Date 0x25 19 08/05/2016 11:45:43 Label Revision 0x27 3 R0A MAC Addresses 0x2A 2 55 Manufacturer 0x2B 6 Accton Country Code 0x2C 2 TW Vendor Name 0x2D 8 Edgecore Diag Version 0x2E 5 001.7 Platform Name 0x28 23 arm-accton_as4610_54-r0 ONIE Version 0x29 13 2018.02.00.03 CRC-32 0xFE 4 0x9DC28EDF Checksum is valid.
AS4610_30P	none	ONIE:/ # onie-syseeprom TlvInfo Header: Id String: TlvInfo Version: 1 Total Length: 160 TLV Name Code Len Value ---------- ---- --- ----- Product Name 0x21 15 4610-30P-O-AC-F Part Number 0x22 13 F0PEC4630402Z Serial Number 0x23 12 EC1815000436 Base MAC Address 0x24 6 3C:2C:99:89:89:00 Manufacture Date 0x25 19 04/15/2018 23:45:48 Label Revision 0x27 4 R01A Platform Name 0x28 23 arm-accton_as4610_30-r0 ONIE Version 0x29 13 2016.05.00.04

		MAC Addresses 0x2A 2 31 Manufacturer 0x2B 6 Accton Country Code 0x2C 2 TW Vendor Name 0x2D 8 Edgecore Diag Version 0x2E 5 001.9 CRC-32 0xFE 4 0xCD54AF53 Checksum is valid.
AS4610_30T	none	ONIE:/ # onie-syseeprom TlvInfo Header: Id String: TlvInfo Version: 1 Total Length: 160 TLV Name Code Len Value ---------- ---- --- ----- Product Name 0x21 15 4610-30T-O-AC-F Part Number 0x22 13 F0PEC4630001Z Serial Number 0x23 12 EC1806001291 Base MAC Address 0x24 6 3C:2C:99:41:47:E0 Manufacture Date 0x25 19 02/12/2018 23:08:49 Label Revision 0x27 4 R01A Platform Name 0x28 23 arm-accton_as4610_30-r0 ONIE Version 0x29 13 2016.05.00.04 MAC Addresses 0x2A 2 31 Manufacturer 0x2B 6 Accton Country Code 0x2C 2 TW Vendor Name 0x2D 8 Edgecore Diag Version 0x2E 5 001.9 CRC-32 0xFE 4 0x4FF5BAD3 Checksum is valid.

S4048-ON	Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc. BIOS Date: 02/22/2017 02:29:52 Ver: 0ACBZ018	ONIE:/ # onie-syseeprom TlvInfo Header: Id String: TlvInfo Version: 1 Total Length: 149 TLV Name Code Len Value ---------- ---- --- ----- Product Name 0x21 7 S4048ON Part Number 0x22 6 099TJK Serial Number 0x23 20 CN099TJK282985640054 Base MAC Address 0x24 6 34:17:EB:FA:90:C4 Manufacture Date 0x25 19 06/08/2015 20:36:30 Label Revision 0x27 3 A00 MAC Addresses 0x2A 2 256 Manufacturer 0x2B 5 28298 Country Code 0x2C 2 CN Service Tag 0x2F 7 FX4PX42 Vendor Extension 0xFD 6 0x36 0x37 0x34 0x2D 0x46 0x46 Platform Name 0x28 26 x86_64-dell_s4000_c2338-r0 Loader Version 0x29 8 3.21.1.1 CRC-32 0xFE 4 0x7EB3C763 Checksum is valid.
S4128F-ON	Version 2.17.1245. Copyright (C) 2017 American Megatrends, Inc. BIOS Date: 04/26/2017 04:20:58	ONIE:/ # onie-syseeprom TlvInfo Header: Id String: TlvInfo Version: 1 Total Length: 180 TLV Name Code Len Value ---------- ---- --- -----

	Ver: 0ACBZ028	Product Name 0x21 9 S4128F-ON Part Number 0x22 6 02NK09 Serial Number 0x23 20 CN02NK092829886J0109 Base MAC Address 0x24 6 E4:F0:04:DF:67:16 Manufacture Date 0x25 19 06/19/2018 11:32:52 Device Version 0x26 1 1 Label Revision 0x27 3 A02 Platform Name 0x28 30 x86_64-dellemc_s4128f_c2338-r0 ONIE Version 0x29 10 3.33.1.1-4 MAC Addresses 0x2A 2 128 Manufacturer 0x2B 5 28298 Country Code 0x2C 2 CN Vendor Name 0x2D 8 Dell EMC Diag Version 0x2E 10 3.33.3.0-1 Service Tag 0x2F 7 HPPKXC2 Vendor Extension 0xFD 4 0x00 0x00 0x02 0xA2 CRC-32 0xFE 4 0x1A25266A Checksum is valid.
S4148T-ON	Version 2.17.1245. Copyright (C) 2017 American Megatrends, Inc. BIOS Date: 07/06/2017 01:44:00 Ver: 0ACBZ028	ONIE:/ # onie-syseeprom TlvInfo Header: Id String: TlvInfo Version: 1 Total Length: 180 TLV Name Code Len Value ---------- ---- --- ----- Product Name 0x21 9 S4148T-ON Part Number 0x22 6 0JD8R7 Serial Number 0x23 20 CN0JD8R7282987CN0053 Base MAC Address 0x24 6 E4:F0:04:80:EA:CC

		Manufacture Date 0x25 19 12/23/2017 16:32:17 Device Version 0x26 1 1 Label Revision 0x27 3 A01 MAC Addresses 0x2A 2 256 Manufacturer 0x2B 5 28298 Country Code 0x2C 2 CN Vendor Name 0x2D 8 Dell EMC Service Tag 0x2F 7 6SCCXC2 Vendor Extension 0xFD 4 0x00 0x00 0x02 0xA2 Platform Name 0x28 30 x86_64-dellemc_s4148t_c2338-r0 ONIE Version 0x29 10 3.33.1.1-6 Diag Version 0x2E 10 3.33.3.1-6 CRC-32 0xFE 4 0xD89AF6DE Checksum is valid.
S4148F-ON	Version 2.17.1245. Copyright (C) 2017 American Megatrends, Inc. BIOS Date: 12/04/2017 20:42:30 Ver: 0ACBZ028	ONIE:/ # onie-syseeprom TlvInfo Header: Id String: TlvInfo Version: 1 Total Length: 179 TLV Name Code Len Value ---------- ---- --- ----- Product Name 0x21 9 S4148F-ON Part Number 0x22 6 0R2RKC Serial Number 0x23 20 TW0R2RKC2829872D0046 Base MAC Address 0x24 6 14:18:77:18:2C:B8 Manufacture Date 0x25 19 02/13/2017 19:32:31 Device Version 0x26 1 1 Label Revision 0x27 3 X01 MAC Addresses 0x2A 2 256

		Manufacturer 0x2B 5 28298 Country Code 0x2C 2 TW Vendor Name 0x2D 8 DELL EMC Service Tag 0x2F 7 CM31XC2 Vendor Extension 0xFD 4 0x00 0x00 0x02 0xA2 Platform Name 0x28 29 x86_64-dellemc_s4100_c2338-r0 ONIE Version 0x29 10 3.33.1.1-4 Diag Version 0x2E 10 3.33.3.0-1 CRC-32 0xFE 4 0x42273778 Checksum is valid.
AS7712_32X	Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc. BIOS Date: 09/08/2015 11:15:24 Ver:	ONIE:/ # onie-syseeprom TlvInfo Header: Id String: TlvInfo Version: 1 Total Length: 168 TLV Name Code Len Value ---------- ---- --- ----- Manufacture Date 0x25 19 10/28/2015 20:33:51 Label Revision 0x27 4 R0AB Manufacturer 0x2B 6 Accton Country Code 0x2C 2 TW Base MAC Address 0x24 6 CC:37:AB:63:8B:84 Serial Number 0x23 14 771232X1541003 Part Number 0x22 13 FP3ZZ7632014A Product Name 0x21 15 7712-32X-O-AC-F MAC Addresses 0x2A 2 131 Vendor Name 0x2D 8 Edgecore Diag Version 0x2E 7 0.0.5.4 Platform Name 0x28 27 x86_64-accton_as7712_32x-r0

		ONIE Version 0x29 13 2018.11.00.02 CRC-32 0xFE 4 0x9208666A Checksum is valid.
Z9100-ON	Version 2.17.1245. Copyright (C) 2017 American Megatrends, Inc. BIOS Date: 02/22/2017 21:20:05 Ver: 0ACBZ028	ONIE:/ # onie-syseeprom TlvInfo Header: Id String: TlvInfo Version: 1 Total Length: 168 TLV Name Code Len Value ---------- ---- --- ----- Product Name 0x21 8 Z9100-ON Part Number 0x22 6 04HW8N Serial Number 0x23 20 CN04HW8N7793163I0010 Base MAC Address 0x24 6 4C:76:25:E8:D7:C0 Manufacture Date 0x25 19 03/19/2016 12:39:24 Device Version 0x26 1 1 Label Revision 0x27 3 A00 Platform Name 0x28 26 x86_64-dell_z9100_c2538-r0 ONIE Version 0x29 8 3.23.1.3 MAC Addresses 0x2A 2 384 Manufacturer 0x2B 5 77931 Country Code 0x2C 2 CN Vendor Name 0x2D 4 DELL Diag Version 0x2E 6 01_010 Service Tag 0x2F 7 2QWRG02 Vendor Extension 0xFD 7 0x00 0x00 0x02 0xA2 0x2D 0x46 0x46 CRC-32 0xFE 4 0x3B190E49 Checksum is valid.

AS7816_64X	Version 2.19.1269. Copyright (C) 2018 American Megatrends, Inc. BIOS Date: 10/05/2018 08:57:44 Ver: AS7816-64X V36 20181004	ONIE:/ # onie-syseeprom TlvInfo Header: Id String: TlvInfo Version: 1 Total Length: 171 TLV Name Code Len Value ---------- ---- --- ----- Manufacture Date 0x25 19 11/02/2018 16:32:21 Label Revision 0x27 4 R01A Platform Name 0x28 27 x86_64-accton_as7816_64x-r0 Manufacturer 0x2B 6 Accton Country Code 0x2C 2 TW Vendor Name 0x2D 8 Edgecore Product Name 0x21 17 7816-64X-O-AC-F-R Part Number 0x22 13 FP3ZZ7664020A Serial Number 0x23 14 781664X1843004 Base MAC Address 0x24 6 B8:6A:97:73:6A:3E MAC Addresses 0x2A 2 300 ONIE Version 0x29 13 2018.11.00.02 Diag Version 0x2E 8 0.1.0.17 CRC-32 0xFE 4 0x84DD5474 Checksum is valid.
Z9264F-ON	Version 2.19.1266. Copyright (C) 2018 American Megatrends, Inc. BIOS Date: 09/17/2018 21:25:57	ONIE:/ # onie-syseeprom TlvInfo Header: Id String: TlvInfo Version: 1 Total Length: 181 TLV Name Code Len Value ---------- ---- --- -----

	Ver: 0ACHI032	Product Name 0x21 9 Z9264F-ON Part Number 0x22 6 0RWYT4 Serial Number 0x23 20 CN0RWYT4DND008660010 Base MAC Address 0x24 6 20:04:0F:05:D4:97 Manufacture Date 0x25 19 06/06/2018 03:00:21 Device Version 0x26 1 1 Label Revision 0x27 3 A00 Platform Name 0x28 30 x86_64-dellemc_z9264f_c3538-r0 ONIE Version 0x29 10 3.42.1.9-3 MAC Addresses 0x2A 2 640 Manufacturer 0x2B 5 DND00 Country Code 0x2C 2 CN Vendor Name 0x2D 8 Dell EMC Diag Version 0x2E 11 3.00.3.41-1 Service Tag 0x2F 7 20GKXC2 Vendor Extension 0xFD 4 0x00 0x00 0x02 0xA2 CRC-32 0xFE 4 0xD8EFCB81 Checksum is valid. ONIE:/ #
AS5812_54T	Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc. BIOS Date: 08/20/2015 10:55:33 Ver: A02 0820	ONIE:/ # onie-syseeprom TlvInfo Header: Id String: TlvInfo Version: 1 Total Length: 168 TLV Name Code Len Value ---------- ---- --- ----- Manufacture Date 0x25 19 08/11/2016 16:36:46 Diag Version 0x2E 7 1.0.0.5 Label Revision 0x27 4 R01A

		Platform Name 0x28 27 x86_64-accton_as5812_54t-r0 ONIE Version 0x29 13 2015.11.00.01 Manufacturer 0x2B 6 Accton Country Code 0x2C 2 TW Base MAC Address 0x24 6 C4:39:3A:FB:BF:6C Serial Number 0x23 14 581254T1631023 Part Number 0x22 13 FP1ZZ5654031A Product Name 0x21 15 5812-54T-O-AC-F MAC Addresses 0x2A 2 74 Vendor Name 0x2D 8 Edgecore CRC-32 0xFE 4 0xCBA5E40E Checksum is valid.
HPE AL 6921-54X	Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc. BIOS Date: 08/20/2015 10:55:33 Ver:	ONIE:/ # onie-syseeprom TlvInfo Header: Id String: TlvInfo Version: 1 Total Length: 231 TLV Name Code Len Value ---------- ---- --- ----- Manufacture Date 0x25 19 05/24/2016 14:49:30 Diag Version 0x2E 7 1.0.0.3 Label Revision 0x27 4 R01A Platform Name 0x28 27 x86_64-accton_as5812_54x-r0 ONIE Version 0x29 13 2015.11.00.01 Manufacturer 0x2B 6 Accton Country Code 0x2C 2 TW Base MAC Address 0x24 6 E0:07:1B:CB:20:50 Serial Number 0x23 10 TW65JQH009 Part Number 0x22 13 F0P8J5654000A

		Product Name 0x21 64 HPE Altoline 6921 48SFP+ 6QSFP+ x86 ONIE AC Front-to-Back Switch MAC Addresses 0x2A 2 74 Vendor Name 0x2D 26 Hewlett Packard Enterprise CRC-32 0xFE 4 0xADE27C84 Checksum is valid.
AS5712_54X	Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc. BIOS Date: 11/20/2014 10:55:31 Ver:	ONIE:/ # onie-syseeprom TlvInfo Header: Id String: TlvInfo Version: 1 Total Length: 167 TLV Name Code Len Value ---------- ---- --- ----- Manufacture Date 0x25 19 12/18/2014 11:22:02 Diag Version 0x2E 7 2.0.0.7 MAC Addresses 0x2A 2 74 Manufacturer 0x2B 6 Accton Country Code 0x2C 2 TW Vendor Name 0x2D 8 Edgecore Base MAC Address 0x24 6 70:72:CF:B7:65:44 Part Number 0x22 13 FP1ZZ5654001A Serial Number 0x23 14 571254X1419017 Label Revision 0x27 3 R0A Product Name 0x21 15 5712-54X-O-AC-F Platform Name 0x28 27 x86_64-accton_as5712_54x-r0 ONIE Version 0x29 13 2015.11.00.05 CRC-32 0xFE 4 0x37B6E65B Checksum is valid.

N3248PXE-O N	Version 2.19.1266. Copyright (C) 2019 American Megatrends, Inc. BIOS Date: 06/18/2019 23:21:39 Ver: 0ACHI040	ONIE:/ # onie-syseeprom TlvInfo Header: Id String: TlvInfo Version: 1 Total Length: 186 TLV Name Code Len Value ---------- ---- --- ----- Product Name 0x21 11 N3248PXE-ON Part Number 0x22 6 0WYGRV Serial Number 0x23 20 TW0WYGRVDNT0097I0012 Base MAC Address 0x24 6 50:9A:4C:E6:7B:70 Manufacture Date 0x25 19 07/18/2019 17:41:23 Device Version 0x26 1 1 Label Revision 0x27 4 X01A Platform Name 0x28 32 x86_64-dellemc_n3248pxe_c3338-r0 ONIE Version 0x29 10 3.45.1.9-4 MAC Addresses 0x2A 2 128 Manufacturer 0x2B 5 DNT00 Country Code 0x2C 2 TW Vendor Name 0x2D 8 Dell EMC Diag Version 0x2E 11 3.00.3.41-2 Service Tag 0x2F 7 37QFXC2

2 Installing PicOS® on Bare Metal Switches

2.1 Introduction

When using ONIE installer to install PicOS®, the installer reinstalls the software, rebuilds all the PicOS® file system. This can erase the configuration files and system logs from the previous installation.

After a successful ONIE installation of PicOS® 4.x, the system generates multiple system partitions including

PicOS® (partition size: 2G), PicOS®2 (partition size: 2G) and User-Data partitions. Among them, PicOS® and PicOS®2 are two independent system boot partitions. One of them is the active partition on which the running system resides, and the other is the inactive partition. The two-system-boot-partition feature allows the system to revert to a previous version of the installed software package when the it fails to upgrade PicOS® by using upgrade2 command.

The ONIE installer removes all partitions to rebuild a brand new OS only when there is no User-Data partition. However, if there exists a User-Data partition (for example, install a new version 4.0.1 from the old one 4.0.0), the ONIE installer only rewrites the "PicOS®" partition, installs the new installation package to this partition and sets the system on "PicOS®" partition as the default and sole boot system.

User-Data partition is a reserved partition which is not affected by ONIE installer and upgrade unless user manually removes it. User-Data partition uses all the available space left on the disk. Users can use this partition to store files and data.

2.2 Installation Notes and Tools

The installation methods used to install a new PicOS® are traditional installation and nos-boot-mode installation. You can choose a suitable installation method that is convenient and appropriate for your installation environment.

- If you want to install PicOS® through a console port, refer to sections Traditional Installation or Nos-boot-mode Installation.
- If you want to install the PicOS® through a non-console port (through the management port), refer to section Nos-boot-mode Installation.https://csp.pica8.com/picos-releases

- You need to log in through the console port of the switch and perform the ONIE installation.
- Other NOSes including user data will be removed when install PicOS® under ONIE environment.
- When the ONIE installer is used to downgrade the PicOS® version from version 4.x to PicOS® 3.x or lower versions, we first need to use ONIE to uninstall the higher version PicOS® before proceeding with installing PicOS® 3.x or a lower version. On the ARM platform, execute the **onie_uninstaller** command at the ONIE prompt to uninstall the current version PicOS®. On the

x86 platform, select the "**ONIE: Uninstall OS**" option in the GRUB menu to uninstall the current version PicOS®.

- If you enter GRUB rescue mode and the switch has GPT format partition, you can use the following commands to reset the GRUB boot variable to enter ONIE GRUB and then install PicOS®.

  grub rescue> set prefix=(hd0,gpt2)/grub

  grub rescue> set root=(hd0,gpt2)

  grub rescue> insmod normal

  grub rescue> normal

- Do not plug in the USB disk during onie-nos-installer process until ONIE starts up. If you have plugged in the USB disk before the installation operation, ONIE will find the installer on the USB disk when beginning the installation. On AS4610 series switches, when installation is complete, the installer will display: **Please take out the usb disc**, then remove the USB disk within 10 seconds after installation successful, and before machine restarts.

- All X86 platforms share one installation and upgrade package with the name fixed as: **onie-installer-picos-VERSION-x86.bin**, where **VERSION** is the release version. X86 platform are listed below:

  - FS N9550-32D
  - FS N8550-64C
  - FS N5850-48S6Q
  - FS N8550-48B8C
  - FS N8550-32C
  - Edgecore AS4630-54PE
  - Edgecore AS5712-54X
  - Edgecore AS5812-54T
  - Edgecore AS5812-54X
  - Edgecore AS7312-54X

- Edgecore AS7326-56X
- Edgecore AS7712-32X
- Edgecore AS7726-32X
- Edgecore AS7816-64X
- Edgecore AS5835-54X
- Edgecore AS9716-32D
- DELL N3248P-ON
- DELL N3248PXE-ON
- DELL N3224PX-ON
- DELL N3248X-ON
- DELL S4048-ON
- DELL S4148F-ON
- DELL S4148T-ON
- DELL S4128F-ON
- DELL S5224F-ON
- DELL S5296F-ON
- DELL S5212F-ON
- DELL S5248F-ON
- DELL Z9100-ON
- DELL Z9264F-ON
- DELL N3224T-ON
- DELL S4128T-ON

2.2.1 What is ONIE

ONIE (Open Network Install Environment) is an open source project of OCP (Open Compute Project). ONIE provides the environment to install any network operating system on a bare metal network switch. ONIE liberates users from captive pre-installed network operating systems, like the Cisco IOS, and provides them with a choice.

ONIE is a small Linux operating system that comes pre-installed as firmware on bare metal network switches. ONIE acts as an enhanced boot loader, extending the features provided by U-Boot. ONIE is used to install Pica8 PicOS® on compatible switches. The bare metal switches listed in the PICOS Hardware Compatibility List must be pre-loaded with ONIE prior to installing PicOS®.

2.3 Traditional Installation

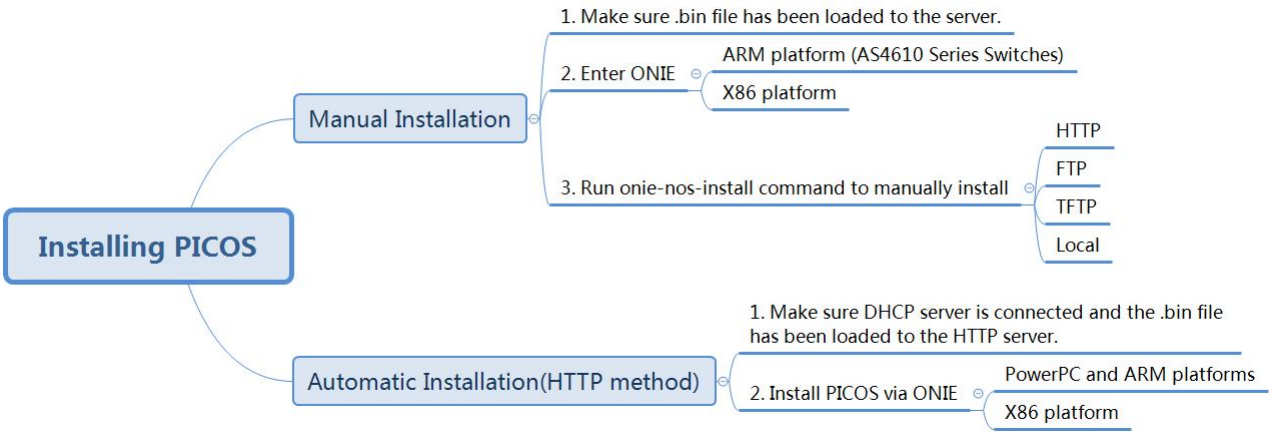
NOTE:

- You need to log in through the console port of the switch and perform the ONIE installation described in this section.
- The installation method described in this section only applies to platforms that have pre-installed ONIE.

2.3.1 Mind Map of Installation Process

Figure1 shows the mind map of PicOS® installation process.

Figure1 Mind Map of PicOS® installation process



2.3.2 Manual Installation Process

The following example describes the installation of PicOS® via manual installation method.

Step1 Make sure that the installation package of **.bin** file has been load to the server (server could be HTTP, TFTP, or an FTP server or the switch local directory depending on the actual installation environment).

Step2 Enter ONIE installation environment. The process is different on the following two types of platforms:

- **ARM Platforms (AS4610 Series Switches)**
- **x86 Platform**

- **ARM Platforms (AS4610 Series Switches)**

a) Verify that the switch is pre-loaded with ONIE, which will be used to load PicOS® on the switch. Power on the switch and interrupt the boot sequence by pressing any key when the following line is shown:

```
Hit any key to stop autoboot:
```

b) User will then reach the U-Boot command prompt indicated by ->. Run the **printenv** command at the U-Boot prompt. If the information displayed contains keywords like **onie_initargs** and **onie_machine**, the switch is pre-loaded with ONIE.

```
LOADER->printenv
active=image1
autoload=no
baudrate=115200
bootcmd=run check_boot_reason;run PicOS_bootcmd;run onie_bootcmd
bootdelay=10
check_boot_reason=if test -n $onie_boot_reason; then setenv onie_bootargs boot_reason=$onie_boot_reason; run onie_bootcmd; fi;
consoledev=ttyS0
dhcp_user-class=arm-accton_as4610_54-r0_uboot
dhcp_vendor-class-identifier=arm-accton_as4610_54-r0
ethact=eth-0
ethaddr=00:18:23:30:E7:8F
fdtaddr=0xc00000
fpboot=setenv bootargs console=${consoledev},${baudrate} maxcpus=2 mem=1024M root=/dev/ram ${mtdparts} ubi.mtd=4 ethaddr=$ethaddr
quiet
gatewayip=192.168.0.1
initrd_high=0x80000000
ipaddr=192.168.0.1
loadaddr=0x70000000
loads_echo=1
```

```
mfg=mfg
mfgdiags=run fpboot ; nand read ${loadaddr} diags ; bootm ${loadaddr}
mfgdiags_recovery=nand read ${loadaddr} diags2 ; nand erase.part diags ; nand write ${loadaddr} diags
mtdids=nand0=nand_iproc.0
mtdparts=mtdparts=nand_iproc.0:1m(uboot),2m(shmoo),1m(nenv),12m(onie),3992m(open),12m(onie2),2m(vpd),6m(sys_eeprom),16m(diags)
,16m(diags2),32m(diags_fs)
netmask=255.255.255.0
nos_bootcmd=true
onie_args=run onie_initargs onie_platformargs
onie_bootcmd=echo Loading Open Network Install Environment ...; echo Platform: $onie_platform ; echo Version : $onie_version ; nand
read  $loadaddr $onie_start 0x00c00000 && run onie_args && bootm ${loadaddr}
onie_dropbear_dss_host_key=begin-base64@600@d#AAAAB3NzaC1kc3MAAACBAIN7HOS7UGtQ+RS9R5Rdim9s4iadCBQ9SEFnHJZ2#ulK15hN2p1BOJ1Mf4qb
/oHFGIt8hvopq157ejsJcSPuR9scXE2aYQO7r1+Ie#1MKoR3HyEFKgPhNUr0qYNiIaWGw2UUXivLUlhjmaPhjItsttb6AezNB6N1ap#TmIeEUse0NQBAAAAFQDndwb
RrSsw6G/W4wd0LJVAjuyq2QAAAIAe/zGPyPNn#UwwV+i+j3l1W9IFhjA/ovXfX7PQtjHB7OJcInSpOA2gXLXHU2kYDkn+ymJQI#8Tn558nLHq64n9hIJzwaQH4ajMi
pBNwqR0WtpPXEaow9InDzjs+qFY0HAcTv#7DMEY9BGiJAUUSSCSFZ9dEYHIWUdk6WIpDUMX4b2ewAAAIB6bC+fHzr+Qaet#GjzynI0tApbzyydXKuIiIH6EDh2QEaP
0E+TSxJ+C4xfyBAp1j0kvj0IYWR2P#H9ur0RaxDaCmKwIQs1gTJh/137Yd+OsqEV3JnrZxlEKk2DmI5c2wrGtl4oUp#XJfc+viahpFeCsGzsqGHHADWNsjlpKt457Q
CuQAAABUAk5406cTH4nZO0qlj#6irYf4WA65E=#====#
onie_dropbear_rsa_host_key=begin-base64@600@r#AAAAB3NzaC1yc2EAAAADAQABAAAAgQCMTqwNhnJpuSLYAdRA/jjm1lyBaJF1#ovs3Hp0G7XkYnY4+JNP
TCYgnmfMQnM83PQncuy89AqehJ2V22LGjpRiqT56K#MRr+hQoSWEbAObRd1azZF45pbxiQaQiQxNzIKbHDDWlGlycXfv8w9ZCElbxj#Ja7bkwmwg9EsBlW0d5u0BQA
AAIAFr0FOyfn0OR1FiatvF624Aorcbl9oV/pc#JRghGfl8SxPihizz4bC7xAPCUkwd9ZHi+M2E6AjhIV69xjFKS0vYuQplvl8G#9R8YsnmP5B45TyLE3dW5V2/g+LQ
ERQdFpRaSsPqEPHSlXPq4XHLGLRFItEBt#ohp41Qm+eA6efsAMIQAAAEEA4Y90xi8N1SuwjRk53fqpP8dC+FPnU850XtC1#cKG0rBt6v9qD+BTxxfE6GEpYM+N0fLy
ECbgBjA2LQF6CG3G15QAAAEEAnz3v#3POrcsMK2LkSNjWzAhzUqOWyOaNlhcvgh+2Xfj2tHyOTpZ09gCm483v1rui9#63uYu4QQurpATrHMcLIjoQ==#====#
onie_initargs=setenv bootargs quiet console=$consoledev,$baudrate
onie_machine=accton_as4610_54
onie_machine_rev=0
onie_platform=arm-accton_as4610_54-r0
onie_platformargs=setenv bootargs $bootargs serial_num=${serial#} ${platformargs} eth_addr=$ethaddr $onie_bootargs $onie_debugargs
onie_recovery=nand read ${loadaddr} onie2 ; nand erase.part onie ; nand write ${loadaddr} onie
onie_rescue=setenv onie_boot_reason rescue && boot
onie_start=onie
onie_sz.b=0x00c00000
onie_uninstall=setenv onie_boot_reason uninstall && boot
onie_update=setenv onie_boot_reason update && boot
onie_vendor_id=27658
onie_version=master-201603091701-dirty
PicOS_bootcmd=usb start;run platformargs;setenv bootargs root=/dev/sda1 rw noinitrd console=$consoledev,$baudrate
rootdelay=10 $mtdparts;ext2load usb 0:1 $loadaddr boot/uImage;bootm $loadaddr
platform=accton_as4610_54
platformargs=mtdparts=nand_iproc.0:1m(uboot),2m(shmoo),1m(nenv),12m(onie),3992m(open),12m(onie2),2m(vpd),6m(sys_eeprom),16m(di
ags),16m(diags2),32m(diags_fs)  maxcpus=2 mem=1024M
ramdiskaddr=0x3000000
serial#=A626P1DL174300014
serverip=192.168.0.10
stderr=serial
```

```
stdin=serial

stdout=serial

ubifscfg=ubi part nand0,4 0x0; ubifsmount fs

ver=U-Boot 2012.10-gcbef171 (Mar 09 2016 - 17:01:14) - ONIE master-201603091701-dirty


Environment size: 3992/65532 bytes
```

c) From U-Boot prompt, boot ONIE in rescue mode.

```
   LOADER-> run onie_rescue
```

- **x86 Platform**

On x86 platform, it uses GRUB menu to install OS via ONIE.

a) Reboot the system, and enter **ONIE** installation environment from the GRUB menu:

```
+----------------------------------------------------------------------------+
| PicOS                                                                      |
|*ONIE                                                                       |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

     Use the ^ and v keys to select which entry is highlighted.

     Press enter to boot the selected OS, `e' to edit the commands

     before booting or `c' for a command-line.
```

b) From GRUB prompt, choose **ONIE**: **Rescue** to Install OS, boot ONIE in rescue mode.

```
                        GNU GRUB  version 2.02~beta2+e4a1fe391

+----------------------------------------------------------------------------+
|*ONIE: Install OS                                                           |
| ONIE: Rescue                                                               |
| ONIE: Uninstall OS                                                         |
| ONIE: Update ONIE                                                          |
| ONIE: Embed ONIE                                                           |
| DIAG: Accton Diagnostic                                                    |
|                                                                            |
|                                                                            |
```

```
|                                                                          |
|                                                                          |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+
```

Step3 Run **onie-nos-install** command as follows to manually install PicOS®.

- **Install via TFTP**

```
ONIE# onie-nos-install tftp://<path to image>/PICOS.bin
```

- **Install via FTP**

When installing via FTP, you need to type **username** and **password** of the FTP server on which the image file is loaded.

```
ONIE# onie-nos-install ftp://username:password@<path to image>/PICOS.bin
```

- **Install via HTTP**

```
ONIE# onie-nos-install http://<path to image>/PICOS.bin
```

- **Install from Local Directory**

a) In **ONIE rescue** mode, copy the image file to the current directory.

```
ONIE# scp username@<path to image>/PICOS.bin .
```

b) Run **onie-nos-install** command to start installation.

```
ONIE# onie-nos-install PICOS.bin
```

For example,

```
ONIE:/ # onie-nos-install onie-installer-picos-4.0.0-8b1219e112-x86.bin
discover: Rescue mode detected. No discover stopped.
ONIE: Executing installer: onie-installer-picos-4.0.0-8b1219e112-x86.bin
Verifying image checksum ... OK.
Preparing image archive ... OK.
  [1]  PICOS L2/L3 (default)
  [2]  PICOS Open vSwitch/OpenFlow
Enter your choice (1,2):1
PICOS L2/L3 is selected.
ONIE installation will overwrite the configuration file of existing system.
```

```
It is recommended to follow the upgrade procedure to upgrade the system.
Press any key to stop the installation...
10 9 8 7 6 5 4 3 2 1 ...
```

The installer runs automatically, before start installation, it will prompt to choose the option to make PicOS® to boot into L2/L3 or OVS mode. If not selected, then PicOS® boots into L2/L3.

After finishing installation, the device reboots automatically, the system then comes up running the new network operating system.

NOTE:

- After the system restarts, you need to enter the username and password, the initial login username is **admin** and password is **pica8**.
- After the username and password are entered, user will be asked to choose a new password for admin. This is the only post installation step after which the PicOS® operating system can be used.

2.3.3 Automatic Installation Process

The automatic installation process uses the DHCP message exchange process to download and install software packages.

Step1 Make sure the switch is connected to DHCP and HTTP servers and the PicOS® installation software package is downloaded to the HTTP server.

a) DHCP server configuration: define the path of the installation package and then start DHCP server service:

```
host pica8-3922 {
hardware ethernet 70:72:cf:12:34:56;
fixed-address 192.168.2.50;
option default-url = "http://192.168.2.42/onie-installer-picos-4.0.0-8b1219e112-x86.bin";
}
```

b) Check if the **.bin** installation file is loaded onto the HTTP server:

```
root@dev:/var/www# ls
index.html onie-installer-powerpc.bin
```

Step2 Install PicOS® via ONIE. The process is different on the following two types of platforms:

- **ARM Platforms (AS4610 Series Switches)**

- **x86 Platform**
- **ARM Platforms (AS4610 Series Switches)**

a) Verify that the switch is pre-loaded with ONIE, which will be used to load PicOS® on the switch. Power on the switch and interrupt the boot sequence by pressing any key when the following line is shown:

```
Hit any key to stop autoboot:
```

b) User will then reach the U-Boot command prompt indicated by ->. Run the **printenv** command at the U-Boot prompt. If the information displayed contains keywords like **onie_initargs** and **onie_machine**, the switch is pre-loaded with ONIE.

```
LOADER-> printenv
active=image1
autoload=no
baudrate=115200
bootcmd=run check_boot_reason;run PicOS_bootcmd;run onie_bootcmd
bootdelay=10
check_boot_reason=if test -n $onie_boot_reason; then setenv onie_bootargs boot_reason=$onie_boot_reason; run onie_bootcmd; fi;
consoledev=ttyS0
dhcp_user-class=arm-accton_as4610_54-r0_uboot
dhcp_vendor-class-identifier=arm-accton_as4610_54-r0
ethact=eth-0
ethaddr=00:18:23:30:E7:8F
fdtaddr=0xc00000
fpboot=setenv bootargs console=${consoledev},${baudrate} maxcpus=2 mem=1024M root=/dev/ram ${mtdparts} ubi.mtd=4 ethaddr=$ethaddr
quiet
gatewayip=192.168.0.1
initrd_high=0x80000000
ipaddr=192.168.0.1
loadaddr=0x70000000
loads_echo=1
mfg=mfg
mfgdiags=run fpboot ; nand read ${loadaddr} diags ; bootm ${loadaddr}
mfgdiags_recovery=nand read ${loadaddr} diags2 ; nand erase.part diags ; nand write ${loadaddr} diags
mtdids=nand0=nand_iproc.0
mtdparts=mtdparts=nand_iproc.0:1m(uboot),2m(shmoo),1m(nenv),12m(onie),3992m(open),12m(onie2),2m(vpd),6m(sys_eeprom),16m(diags)
,16m(diags2),32m(diags_fs)
netmask=255.255.255.0
nos_bootcmd=true
onie_args=run onie_initargs onie_platformargs
onie_bootcmd=echo Loading Open Network Install Environment ...; echo Platform: $onie_platform ; echo Version : $onie_version ; nand
read  $loadaddr $onie_start 0x00c00000 && run onie_args && bootm ${loadaddr}
```

```
onie_dropbear_dss_host_key=begin-base64@600@d#AAAAB3NzaC1kc3MAAACBAIN7HOS7UGtQ+RS9R5Rdim9s4iadCBQ9SEFnHJZ2#ulK15hN2p1BOJ1Mf4qb
/oHFGIt8hvopq157ejsJcSPuR9scXE2aYQO7r1+Ie#1MKoR3HyEFKgPhNUr0qYNiIaWGw2UUXivLUlhjmaPhjItsttb6AezNB6N1ap#TmIeEUse0NQBAAAAFQDndwb
RrSsw6G/W4wd0LJVAjuyq2QAAAIAe/zGPyPNn#UwwV+i+j3l1W9IFhjA/ovXfX7PQtjHB7OJcInSpOA2gXLXHU2kYDkn+ymJQI#8Tn558nLHq64n9hIJzwaQH4ajMi
pBNwqR0WtpPXEaow9InDzjs+qFY0HAcTv#7DMEY9BGiJAUUSSCSFZ9dEYHIWUdk6WIpDUMX4b2ewAAAIB6bC+fHzr+Qaet#GjzynI0tApbzyydXKuIiIH6EDh2QEaP
0E+TSxJ+C4xfyBAp1j0kvj0IYWR2P#H9ur0RaxDaCmKwIQs1gTJh/137Yd+OsqEV3JnrZxlEKk2DmI5c2wrGtl4oUp#XJfc+viahpFeCsGzsqGHHADWNsjlpKt457Q
CuQAAABUAk5406cTH4nZO0qlj#6irYf4WA65E=#====#
onie_dropbear_rsa_host_key=begin-base64@600@r#AAAAB3NzaC1yc2EAAAADAQABAAAAgQCMTqwNhnJpuSLYAdRA/jjm1lyBaJF1#ovs3Hp0G7XkYnY4+JNP
TCYgnmfMQnM83PQncuy89AqehJ2V22LGjpRiqT56K#MRr+hQoSWEbAObRd1azZF45pbxiQaQiQxNzIKbHDDWlGlycXfv8w9ZCElbxj#Ja7bkwmwg9EsBlW0d5u0BQA
AAIAFr0FOyfn0OR1FiatvF624Aorcbl9oV/pc#JRghGfl8SxPihizz4bC7xAPCUkwd9ZHi+M2E6AjhIV69xjFKS0vYuQplvl8G#9R8YsnmP5B45TyLE3dW5V2/g+LQ
ERQdFpRaSsPqEPHSlXPq4XHLGLRFItEBt#ohp41Qm+eA6efsAMIQAAAEEA4Y90xi8N1SuwjRk53fqpP8dC+FPnU850XtC1#cKG0rBt6v9qD+BTxxfE6GEpYM+N0fLy
ECbgBjA2LQF6CG3G15QAAAEEAnz3v#3POrcsMK2LkSNjWzAhzUqOWyOaNlhcvgh+2Xfj2tHyOTpZ09gCm483v1rui9#63uYu4QQurpATrHMcLIjoQ==#====#
onie_initargs=setenv bootargs quiet console=$consoledev,$baudrate
onie_machine=accton_as4610_54
onie_machine_rev=0
onie_platform=arm-accton_as4610_54-r0
onie_platformargs=setenv bootargs $bootargs serial_num=${serial#} ${platformargs} eth_addr=$ethaddr $onie_bootargs $onie_debugargs
onie_recovery=nand read ${loadaddr} onie2 ; nand erase.part onie ; nand write ${loadaddr} onie
onie_rescue=setenv onie_boot_reason rescue && boot
onie_start=onie
onie_sz.b=0x00c00000
onie_uninstall=setenv onie_boot_reason uninstall && boot
onie_update=setenv onie_boot_reason update && boot
onie_vendor_id=27658
onie_version=master-201603091701-dirty
PicOS_bootcmd=usb start;run platformargs;setenv bootargs root=/dev/sda1 rw noinitrd console=$consoledev,$baudrate
rootdelay=10 $mtdparts;ext2load usb 0:1 $loadaddr boot/uImage;bootm $loadaddr
platform=accton_as4610_54
platformargs=mtdparts=nand_iproc.0:1m(uboot),2m(shmoo),1m(nenv),12m(onie),3992m(open),12m(onie2),2m(vpd),6m(sys_eeprom),16m(di
ags),16m(diags2),32m(diags_fs)  maxcpus=2 mem=1024M
ramdiskaddr=0x3000000
serial#=A626P1DL174300014
serverip=192.168.0.10
stderr=serial
stdin=serial
stdout=serial
ubifscfg=ubi part nand0,4 0x0; ubifsmount fs
ver=U-Boot 2012.10-gcbef171 (Mar 09 2016 - 17:01:14) - ONIE master-201603091701-dirty

Environment size: 3992/65532 bytes
```

c) Input command **run onie_bootcmd**, which will automatically install PicOS® on the switch.

```
LOADER -> run onie_bootcmd
Loading Open Network Install Environment ...
Platform: arm-accton_as4610_54-r0
```

```
Version : 2021.09.00.03
WARNING: adjusting available memory to 30000000
## Booting kernel from Legacy Image at 02000000 ...
Image Name: as4610_54x.1.6.1.3
Image Type: ARM Linux Multi-File Image (gzip compressed)
Data Size: 3514311 Bytes = 3.4 MiB
Load Address: 00000000
Entry Point: 00000000
Contents:
Image 0: 2762367 Bytes = 2.6 MiB
Image 1: 733576 Bytes = 716.4 KiB
Image 2: 18351 Bytes = 17.9 KiB
Verifying Checksum ... OK
## Loading init Ramdisk from multi component Legacy Image at 02000000 ...
## Flattened Device Tree from multi component Image at 02000000
Booting using the fdt at 0x02355858
Uncompressing Multi-File Image ... OK
Loading Ramdisk to 2ff4c000, end 2ffff188 ... OK
Loading Device Tree to 03ff8000, end 03fff7ae ... OK
Cannot reserve gpages without hugetlb enabled
setup_arch: bootmem
as4610_54x_setup_arch()
arch: exit

pci 0000:00:00.0: ignoring class b20 (doesn't match header type 01)
sd 0:0:0:0: [sda] No Caching mode page present
sd 0:0:0:0: [sda] Assuming drive cache: write through
sd 0:0:0:0: [sda] No Caching mode page present
sd 0:0:0:0: [sda] Assuming drive cache: write through
sd 0:0:0:0: [sda] No Caching mode page present
sd 0:0:0:0: [sda] Assuming drive cache: write through
ONIE: Using DHCPv4 addr: eth0: 192.168.2.77 / 255.255.255.0
discover: installer mode detected. Running installer.
Please press Enter to activate this console. ONIE: Using DHCPv4 addr: eth0: 192.168.2.77 / 255.255.255.0
ONIE: Starting ONIE Service Discovery
ONIE: Executing installer: http://192.168.2.42/onie-installer-picos-4.0.0-8b1219e112-x86.bin
Verifying image checksum ... OK.
Preparing image archive ... OK.
PicOS installation
.........................................
./var/local/
./var/run
Setup PicOS environment ...
.........................................
```

```
XorPlus login: admin
Password:
You are required to change your password immediately (root enforced)
Changing password for admin.
(current) UNIX password:
Enter new UNIX password:
Retype new UNIX password:
admin@XorPlus$
```

- **x86 Platform**

On x86 platform, it uses GRUB menu to choose install OS via ONIE.

a) Reboot the system, and enter **ONIE** installation environment from the GRUB menu:

```
+----------------------------------------------------------------------------+
| PicOS                                                                      |
|*ONIE                                                                       |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+
     Use the ^ and v keys to select which entry is highlighted.
     Press enter to boot the selected OS, `e' to edit the commands
     before booting or `c' for a command-line.
```

b) From GRUB prompt, choose **ONIE: Rescue** to Install OS, boot ONIE in rescue mode.

```
                         GNU GRUB  version 2.02~beta2+e4a1fe391
+----------------------------------------------------------------------------+
|*ONIE: Install OS                                                           |
| ONIE: Rescue                                                               |
| ONIE: Uninstall OS                                                         |
| ONIE: Update ONIE                                                          |
| ONIE: Embed ONIE                                                           |
| DIAG: Accton Diagnostic                                                    |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
```

```
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+
```

The installer runs and will reboot the system after installation is complete.

NOTE:

- After the system restarts, you need to enter the username and password, the initial login username is **admin** and password is **pica8**.
- After the username and password are entered, user will be asked to choose a new password for admin. This is the only post installation step after which the PicOS® operating system can be used.

2.4 Nos-boot-mode Installation

NOTE:

- The installation method described in this section applies to installation through both the console port and the management port.
- The installation method described in this section only applies to platforms that have pre-installed ONIE.
- For x86 platforms, once you choose **nos-boot-mode** as the install or uninstall mode, please DO NOT manually modify the GRUB Menu options before the system boots into ONIE rescue mode.
- Currently, when choosing **nos-boot-mode** as the install or uninstall mode, it only supports the lower case input of 'yes' or 'y'. Inputs such as 'YES' or 'Y' are not recognized, and if a user types 'YES' or 'Y', the install or uninstall mode will exit.

The installation methods described in Traditional Installation must be performed through the console port. If you want to install the system through a non-console port, you can use the **nos-boot-mode** command described in this section.

Usage of **nos-boot-mode** command:

```
admin@Xorplus$sudo nos-boot-mode
USAGE
   install or uninstall NOS(es)
SYNOPSIS
```

nos-boot-mode [install|uninstall]

DESCRIPTION

install- Install NOS

uninstall- Remove all NOS(es) including PicOS®

When **nos-boot-mode install** command is executed, PicOS® will switch to ONIE install mode automatically, and the user should go on to complete the subsequent ONIE installation process, the detail steps are described below.

When **nos-boot-mode unsinstall** command is executed, the system will remove all NOS(es) including PicOS® from the device. Therefore, it is suggested to use the **nos-boot-mode unsinstall** command with caution.

2.4.1 Manual Installation Process

Step1 Make sure that the installation package of **.bin** file has been loaded to the server (server could be HTTP, TFTP, or an FTP server or the switch local directory depending on the actual installation environment).

Step2 Execute the **nos-boot-mode install** command to enter ONIE installation environment.

```
admin@Xorplus:~$ sudo nos-boot-mode install
```

Step3 Type "**yes**" when the below prompt is shown, which will take the system will to ONIE install mode.

```
Type 'yes' to install NOS!
Type 'no' to exit
[no]/yes:
```

Step4 Run **onie-nos-install** command as follows to manually install PicOS®.

- **Install via TFTP**

```
ONIE# onie-nos-install tftp://<path to image>/PICOS.bin
```

- **Install via FTP**

When installing via FTP, you need to type in the **username** and **password** for the FTP server on which the image file is loaded.

```
ONIE# onie-nos-install ftp://username:password@<path to image>/PICOS.bin
```

- **Install via HTTP**

```
ONIE# onie-nos-install http://<path to image>/PICOS.bin
```

- **Install from Local Directory**

a) In ONIE rescue mode, copy the image file to the current directory.

```
ONIE# scp username@<path to image>/PICOS.bin .
```

b) Run **onie-nos-install** command to start installation.

```
ONIE# onie-nos-install PICOS.bin
```

For example,

```
ONIE:/ # onie-nos-install onie-installer-picos-4.0.0-8b1219e112-x86.bin
discover: Rescue mode detected. No discover stopped.
ONIE: Executing installer: onie-installer-picos-4.0.0-8b1219e112-x86.bin
Verifying image checksum ... OK.
Preparing image archive ... OK.
  [1]  PICOS L2/L3 (default)
  [2]  PICOS Open vSwitch/OpenFlow
Enter your choice (1,2):1
PICOS L2/L3 is selected.
ONIE installation will overwrite the configuration file of existing system.
It is recommended to follow the upgrade procedure to upgrade the system.
Press any key to stop the installation...
10 9 8 7 6 5 4 3 2 1 ...
```

The installer runs automatically, before start installation, it will prompt to choose the option to make PicOS® to boot into L2/L3 or OVS mode. If not selected, then PicOS® boots into L2/L3.

After finishing installation, the device reboots automatically, the system then comes up running the new network operating system.

NOTE:

- After the system restarts, you need to enter the username and password, the initial login username is **admin** and password is **pica8.**.
- After the username and password are entered, user will be asked to choose a new password for admin.

This is the only post installation step after which the PicOS® operating system can be used.

2.4.2 Automated Installation Process

The automatic installation process uses the DHCP message exchange process to download and install software packages.

Step1 Make sure the switch is connected to DHCP and HTTP servers, and the PicOS® installation software package is downloaded to the HTTP server.

a) DHCP server configuration: define the path of the installation package and then start DHCP server service:

```
host pica8-3922 {
hardware ethernet 70:72:cf:12:34:56;
fixed-address 192.168.2.50;
option default-url = "http://192.168.2.42/onie-installer-picos-4.0.0-8b1219e112-x86.bin";
}
```

b) Check if the .**bin** installation file is loaded onto the HTTP server:

```
root@dev:/var/www# ls
index.html onie-installer-powerpc.bin
```

Step2 Execute the **nos-boot-mode install** command to enter ONIE installation environment.

```
admin@Xorplus$ sudo nos-boot-mode install
```

Step3 Type "**yes**" when the below prompt is shown, and the system will automatically complete the installation.

```
Type 'yes' to install NOS!
Type 'no' to exit
[no]/yes:
```

The installer runs automatically and will reboot the system after installation is completed.

NOTE:

- After the system restarts, you need to enter the username and password, the initial login username is **admin** and password is **pica8**.
- After the username and password are entered, user will be asked to choose a new password for admin. This is the only post installation step after which the PicOS® operating system can be used.

2.5 Verifying Version after Installation

After system reboots automatically, the system will come up running the new network operating system.

```
admin@Xorplus> show version
Copyright (C) 2009-2022 Pica8, Inc.
==================================
Hardware Model                : as7312_54x
Linux System Version/Revision    : 4.0.0/8b1219e112
Linux System Released Date       : 5/18/2021
L2/L3 Version/Revision           : 4.0.0/8b1219e112
L2/L3 Released Date             : 5/18/2021
OVS/OF Version/Revision         : 4.0.0/8b1219e112
OVS/OF Released Date           : 5/18/2021
```

2.6 Appendix: Troubleshooting Installation/Upgrade Failure on AS7326-56X

Installation or upgrade failure (for example, the switches cannot boot up after install) may occur on the old AS7326-56X hardware models (revision is R01F and before). When booting PicOS® on AS7326-56X and detect hardware rev R01F, the system will log a warning message to prompt the hardware revision R01F is a pre-production hardware reversion: "This hardware revision R01F is a pre-production hardware rev, PicOS® has applied a work around to work with PicOS®. Support will be provided on a best effort basis".

To work around the issue, first we need to check the "Label Revision". If it is an old hardware model (revision is R01F or before), then, we can perform the following provided solution after installation/upgrade to solve the problem.

2.6.1 Check Label Revision

Under ONIE prompt, run "**onie_syseeprom**" to get the "*Label Revision*".

```
ONIE:/ # onie-syseeprom
TlvInfo Header:
   Id String:    TlvInfo
   Version:      1
   Total Length: 166
TLV Name             Code Len Value
-------------------- ---- --- -----
Manufacture Date     0x25  19 04/27/2019 02:10:06
Label Revision       0x27   4 R01B
Platform Name        0x28  27 x86_64-accton_as7326_56x-r0
```

```
ONIE Version          0x29  13 2018.05.00.05
Manufacturer          0x2B   6 Accton
Diag Version          0x2E   7 0.0.1.0
Base MAC Address      0x24   6 80:A2:35:81:D5:F0
Serial Number         0x23  14 732656X1916012
Country Code          0x2C   2 TW
Part Number           0x22  13 FP4ZZ7656005A
Product Name          0x21  15 7326-56X-O-AC-F
MAC Addresses         0x2A   2 256
Vendor Name           0x2D   6 Accton
CRC-32                0xFE   4 0xC3D3F2DE
Checksum is valid.
ONIE:/ #
```

2.6.2 Solution

You can follow the steps below after installation/upgrade, to fix the problem of installation and upgrade failure on the old AS7326-56X hardware model (revision R01F or before).

Step1 Power cycle the switch.

Step2 From the GRUB menu, choose "**ONIE**" to enter ONIE GRUB menu:

```
+----------------------------------------------------------------------------+
| PicOS                                                                      |
|*ONIE                                                                       |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+
     Use the ^ and v keys to select which entry is highlighted.
     Press enter to boot the selected OS, `e' to edit the commands
     before booting or `c' for a command-line.
```

Step3 From ONIE GRUB menu, choose "**ONIE: Rescue**" to launch ONIE in Rescue mode.

```
                         GNU GRUB  version 2.02~beta2+e4a1fe391
+----------------------------------------------------------------------------+
```

```
| ONIE: Install OS                                                              |
|*ONIE: Rescue                                                                  |
| ONIE: Uninstall OS                                                            |
| ONIE: Update ONIE                                                             |
| ONIE: Embed ONIE                                                              |
| DIAG: Accton Diagnostic                                                       |
|                                                                               |
|                                                                               |
|                                                                               |
|                                                                               |
|                                                                               |
|                                                                               |
+-------------------------------------------------------------------------------+
```

Step4 Press Enter to display the ONIE prompt.

Step5 Mount PicOS® partition with label is "PicOS®".

```
ONIE:/ # blkid
/dev/sda7: LABEL="User-Data" UUID="be63cef8-4560-4c48-ab5a-8f7ced5a950b"
/dev/sda6: LABEL="PicOS2" UUID="f589e53f-4cd1-44ba-8384-f339f4e2b2ac"
/dev/sda5: LABEL="PicOS" UUID="8ca5f7ed-5a15-4a2a-944c-4d8872647bf5"
/dev/sda4: LABEL="PICOS-GRUB" UUID="782a1372-4b66-4783-b920-dab1df8ec6e4"
/dev/sda3: LABEL="ACCTON-DIAG" UUID="3e4117d0-1926-472a-9d9e-08883df83d40"
/dev/sda2: LABEL="ONIE-BOOT" UUID="1a90abd8-f065-4f7a-90a0-af122b8805fa"
ONIE:/ #
ONIE:/ # mount /dev/sda5 /mnt
```

Step6 Execute the following command to modify the I2C access address.

```
ONIE:/ # sed -I "s/0x57/0x56/" /mnt/etc/rc_hw.sh
ONIE:/ # sync
```

Step7 Unmount the PicOS® partition.

```
ONIE:/ # unmount /dev/sda5
```

Step8 Reboot the switch.

```
ONIE:/ # reboot
```

3 Upgrading PicOS® from Version 3.0 or Later Using Upgrade2

3.1 Introduction

NOTE:

- This document **only** applies to PicOS® upgrade from version 3.0 or later version using command **upgrade2**. If you want to upgrade PicOS® from the version before 3.0, use ONIE installation process described in Installing PicOS® on Bare Metal Switches.
- You cannot do a standard upgrade from 3.x to 4.x. This is because 3.x config and 4.x config are not compatible, and PicOS® 4.x will not be able to boot with 3.x config after the upgrade. In order to upgrade from 3.x to 4.x, you MUST convert the configuration to 4.x before upgrade, see section 24248555 in this guide for details.
- This upgrading guide is not available for FS S5810 Series and S5860 Series switches.

PicOS® 4.0.0 and later versions have multiple system partitions including PicOS® (partition size: 2G), PicOS®2(partition size: 2G) and User-Data partitions. Among them, PicOS® and PicOS®2 are two independent system boot partitions. One of them is the active partition on which the running system resides, and the other is the inactive partition. The two-system-boot-partition feature allows the system to revert to a previous version of the installed software package when it fails to upgrade PicOS® by using upgrade2 command.

User-Data partition is a reserved partition which is not affected by ONIE installer and upgrade unless user manually removes it. User-Data partition uses all the available space left on the disk. Users can use this partition to store files and data.

When running upgrade2, the new version PicOS® image will be installed and boot onto the inactive partition automatically. Afterwards, the inactive partition will switch to active partition automatically when the switch boots up normally after the upgrading is finished, while the other partition where the old version resides will become the inactive partition.

Upgrade2 method supports system rollback function. The "**nos-rollback**" command can be used to revert to a previous version of the installed software package. Moreover, if it fails to upgrade, the system can automatically rollback to the old system. This can reduce the network interruption risk due to the failure of system upgrade process and ensure the systems' continuous availability. You can refer to section 24248555 in this page for details.

The system also supports the **upgrade** method for PicOS® version upgrade, you can refer to the document Upgrading PICOS from Version 4.0.0 or Later Using Upgrade Command for details. We recommend using upgrade2 method to upgrade the NOS as it includes system backup and rollback features.

3.2 Preparation before Upgrading

Table 1. Checklist before Upgrading

No.	Checking Items	Checking Standard	Results
1	Checking the Running PicOS® Version	The currently running system software version is lower than the software version to be installed.	
2	Building Upgrade Environment	Build an upgrade environment according to the need.	
3	Getting the Required Upgrade Software	Obtain the required supported upgrade software.	
4	Backing up Important Data	All the important data was backed up.	
5	Converting Configuration to 4.x before Upgrade (when Upgrade from Version 3.x to 4.x)	4.x configuration is generated from 3.x configuration file.	

3.2.1 Checking the Running PicOS® Version

Use the **version** command to check the version of the running system software.

```
admin@Xorplus:~$ version
Copyright (C) 2009-2021 Pica8, Inc.
==================================
Hardware Model                : as7312_54x
Linux System Version/Revision : 4.0.0/4b5f523
Linux System Released Date    : 4/27/2021
L2/L3 Version/Revision        : 4.0.0/4b5f523
L2/L3 Released Date           : 4/27/2021
```

```
OVS/OF Version/Revision       : 4.0.0/4b5f523
OVS/OF Released Date          : 4/27/2021
```

3.2.2 Building Upgrade Environment

Please make sure that you have set up an HTTP, TFTP or FTP protocol upgrading environment, the basic requirements are as follows:

- PC can log in to the device through serial or SSH.
- The communication between the server and the device works well.
- The upgrading file used by the device has already been stored on the server.

3.2.3 Getting the Required Upgrade Software

Please contact Pica8 technical support engineers at the following webpage for the latest version of upgrade software.

https://www.pica8.com/support/

3.2.4 Backing up Important Data

Before upgrading, save the important data, e.g. the configuration file, to the local PC through FTP or TFTP, and then upload it to the switch after the upgrade is completed if needed.

3.2.5 Converting Configuration to 4.x before Upgrade (when Upgrade from Version 3.x to 4.x)

NOTE:

When upgrade PicOS® from version 3.x to 4.x:

- When executing the **upgrade2** command, no other option is supported except the option **image_name**.
- Backup the configuration file before upgrading.
- The OVS configuration for crossflow before the upgrade will be saved and restored automatically after the upgrade.

You cannot do a standard upgrade from 3.x to 4.x. This is because 3.x configuration and 4.x configuration

are not compatible, and PicOS® 4.x will not be able to boot with 3.x configuration after the upgrade.

In order to upgrade from 3.x to 4.x, follow the procedure below to prepare the 4.x configuration file before upgrade:

1. Create directory */pica/config-4.x/*.
2. Contact Pica8 support to convert the 3.x configuration to 4.x configuration in configuration file *pica_startup.boot*.
3. Copy the 4.x configuration file (converted from 3.x configuration file in step 2) into the directory */pica/config-4.x* just created. After upgrading from 3.x to 4.x and after rebooting, PicOS® 4.x will look for the 4.x configuration in */pica/config-4.x*.

After completing these steps, the 4.x configuration file is ready and you can continue with the upgrade process.

If these steps are not performed before upgrade, the system will load the default configuration file of 4.x and the 3.x configuration will not be loaded after upgrade. However, if this happens unexpectly, you can also remedy by loading the 4. x configuration file after upgrade, follow the steps below:

1. Copy the 4.x configuration file *pica_startup.boot* (already converted from 3.x configuration file) into the directory */pica/config/*.
2. Run the **load override** command to load 4. x configuration.

```
admin@PICOS# load override /pica/config/pica_startup.boot
admin@PICOS# Loading config file...
Config file was loaded successfully.
```

3.3 Upgrading Notes

- This upgrade2 guide only applies to PicOS® upgrade from version 4.0.0 or the later versions.
- When using upgrade2 to upgrade PicOS®, you should make sure the "PicOS®2" partition exists.
- When using upgrade2 to upgrade PicOS®, you should make sure the partition type is **GPT**.
- When using upgrade2 to upgrade PicOS®, you should make sure that ONIE is pre-loaded.

- License check is performed for upgrade:
    - If PicOS® has a license installed before the upgrade, the license will be copied and activated after the upgrade. Please check this section for the PICOS Licenses.
    - If there is no license installed prior to upgrade, upgrade2 process can proceed but only the first four ports and the first two uplink ports (if exist) on the newly upgraded system can be used.
    - If the license has expired, it is not allowed to upgrade a major release (e.g. 4.1 to 4.2). However, it will not affect upgrading to a minor release (e.g. 4.1.1 to 4.1.2).
- You can log in to a device through its console port or using SSH. After successful login, you can run commands on the command line interface (CLI) to upgrade the device.
- When using FTP/TFTP to download the image, user should verify that the "binary" mode is being used. If the "binary" transfer mode is not being used, the image might be modified during download, and the upgrade will fail during the MD5 check.
- The image is platform dependent, that is, the image should be consistent with the platform, otherwise the upgrade script will abort.
- An upgrage2.log file in **/cftmp** directory will be created which will contain all the logs related to the upgrade2 process.
- All X86 platforms share one installation and upgrade package with the name fixed as: **onie-installer-picos-VERSION-x86.bin**, where **VERSION** is the release version. X86 platform are listed below:
    - FS N9550-32D
    - FS N8550-64C
    - FS N5850-48S6Q
    - FS N8550-48B8C
    - FS N8550-32C
    - Edgecore AS4630-54PE

- Edgecore AS5712-54X
- Edgecore AS5812-54T
- Edgecore AS5812-54X
- Edgecore AS7312-54X
- Edgecore AS7326-56X
- Edgecore AS7712-32X
- Edgecore AS7726-32X
- Edgecore AS7816-64X
- Edgecore AS5835-54X
- Edgecore AS9716-32D
- DELL N3248P-ON
- DELL N3248PXE-ON
- DELL N3224PX-ON
- DELL N3248X-ON
- DELL S4048-ON
- DELL S4148F-ON
- DELL S4148T-ON
- DELL S4128F-ON
- DELL S5224F-ON
- DELL S5296F-ON
- DELL S5212F-ON
- DELL S5248F-ON
- DELL Z9100-ON
- DELL Z9264F-ON
- DELL N3224T-ON
- DELL S4128T-ON

- In previous 4.x.x versions, PicOS® allows the configuration of route leaking by importing BGP IPv4 routes from one user-defined VRF into another user-defined VRF, for example:

  set protocols bgp vrf vrf1 local-as 1

set protocols bgp vrf vrf1 ipv4-unicast import vrf vrf2

set protocols bgp vrf vrf2 local-as 2

That will cause configuration from PicOS® CLI is not consistent with FRR configuration. Specifically, FRR will add "set protocols bgp local-as 1" (local as number is same as the value in vrf1) to its configuration automatically, which is not in PicOS® CLI.

From version 4.4.0, if "set protocols bgp local-as 1" is not configured, the above configurations are not allowed.

Based on the above reasons, users are required to manually add the command "set protocols bgp local-as 1" (local as number is same as the value in vrf1) before the upgrade, if there's above configuration exists in the pre- upgrade version, thus to ensure that the configuration can be loaded successfully after the upgrade.

3.4 Usage of Upgrade2 Command

```
admin@Xorplus:~$ sudo upgrade2
USAGE
Upgrade system with local new image
SYNOPSIS
upgrade2 [image_name] [factory-default] [use-prev-config] [backup-file=(*.lst)]
DESCRIPTION
image_name - Image with bin format file(*.bin)
factory-default - Recovery configuration to factory default
use-prev-config - Use previous config, and syslog trace
backup-file=(*.lst) - Specify a user defined backup list
```

For PicOS® **go2cli** version, users can run the upgrade2 command under CLI operational mode or configuration mode:

```
admin@Xorplus> upgrade2 image-file xx.bin
Possible completions:
```

```
  <[Enter]>                       Execute this command
  backup-file                     Specify a user defined backup list(*.lst)
  factory-default                 Recovery configuration to factory default
  use-prev-config                 Use previous configuration, and syslog trace

admin@Xorplus# run upgrade2 image-file xx.bin
Possible completions:
  <[Enter]>                       Execute this command
  backup-file                     Specify a user defined backup list(*.lst)
  factory-default                 Recovery configuration to factory default
  use-prev-config                 Use previous configuration, and syslog trace
```

PicOS® upgrade is done via the command "**upgrade2**" in bash (launching a shell script named "upgrade2.sh"). This script will upgrade the image and backup configuration files automatically.

Image name is in the form of **.bin**, which should be copied to the **/cftmp** directory before running upgrade2 command.

The option **factory-default** is used to reset the configuration to factory default when performing upgrade, but it retains the license files from the previous version.

If you want to use the old configuration file in the new version, you can add the **use-prev-config** option when issuing upgrade2 command. The usage of option **use-prev-config** is described in the section Usage of Use-prev-config Option.

If you want to backup a file during upgrade, use **backup-file=(*.lst)** option to define your own backup file list. The usage of **backup-file=(*.lst)** option is described in the section Usage of Backup-file=(*.lst) Option.

3.4.1 Usage of use-prev-config Option

The main function of **use-prev-config** option is to decide whether to load the previous configuration file after a system reboot when performing upgrade2 or rollback to another version. If there is a command line in the old version configuration file that is not supported in the new system, with **use-prev-config** option that command will be skipped and continue loading the remaining configuration.

By default, upgrade2 or rollback is performed without **use-prev-config** option.

The following table describes the usage of **use-prev-config** option when performing upgrade2 or rollback.

	upgrade2 (From old version to new version)	**rollback** (From current version to old version)
with use-prev-config	1. Load the configuration file of old version after system reboot. 2. If there is a command line in the old version configuration file that is not supported in the new system, skip it and continue loading the remaining configuration.	1. Load the configuration file of current version after system reboot. 2. If there is a command line in the current configuration file that is not supported in the old system, skip it and continue loading the remaining configuration.
without use-prev-config	1. Load the configuration file of old version after reboot. 2. If there is a command in the old version configuration file that is not supported in the new system, load default configuration file.	Load the old version configuration file after rebooting.

3.4.2 Usage of Backup-file=(*.lst) Option

During the upgrade process, the switch can automatically back up the following files in the following directories from the previous PicOS® system:

/etc/passwd
/etc/shadow
/etc/group
/etc/gshadow
/etc/resolv.conf
./etc/network/interfaces
/etc/picos/picos_start.conf

/etc/picos/switch-public.key

/etc/picos/pica.lic

/pica/config/pica_startup.boot

/pica/config/pica.conf.01

/pica/config/pica.conf.02

/pica/config/pica.conf.03

/pica/config/pica.conf.04

/pica/config/pica.conf.05

/ovs/ovs-vswitchd.conf.db

/ovs/function.conf.db

/ovs/config/meters

/ovs/config/groups

/ovs/config/flows

/ovs/var/lib/openvswitch/pki/

/var/log/report_diag.log

/var/log/report_diag.log.1

/var/log/report_diag.log.2

/var/log/report_diag.log.3

/var/log/report_diag.log.4

/var/log/report_diag.log.5

/cftmp/upgrade.log

/cftmp/upgrade2.log

/cftmp/auto/

If you want to save user files that are not in the above default backup file list, you need to first create or specify a **.lst** file and then add all those files that need to be backed up to this **.lst** file. You can use the **backup-file=(*.lst)** option to achieve this, where (*.lst) is the user created file with **.lst** format or specify the file path to this file, for example:

```
admin@XorPlus:~$ sudo upgrade2 backup-file=/admin/back_files.lst onie-installer-picos-as7312_54x-4.0.1-cc8d268.bin
```

For example, if you want to backup **/home/admin/a.txt** file during the process, then add **/home/admin/a.txt** to back_files.lst. In this example, **back_files.lst** is a user created file. The user has already added the file to back_files.lst that needs to be saved in the event of power off.

```
admin@XorPlus:~$ sudo upgrade2 backup-file=/admin/back_files.lst onie-installer-picos-as7312_54x-4.0.1-cc8d268.bin
```

The above operations ensure that user can backup their important files with backup-file=(*.lst) option during the upgrade process.

3.5 Upgrade Procedure

The upgrading procedure in this document gives an example of upgrading from PicOS® 4.0.0 to 4.0.1 using **upgrade2** command on AS7312_54X switch.

Step1 Copy the upgrade package (in the form of **.bin**) and the MD5 file to **/cftmp** directory by either FTP, TFTP, HTTP or SCP according to the actual upgrade environment. The following example uses the SCP method.

```
admin@Xorplus:~$ sudo scp pica8@10.10.50.22:/tftp/build/4.0.1/as7312_54x/onie-installer-picos-as7312_54x-4.0.1-cc8d268.bin
/cftmp
admin@Xorplus:~$ sudo scp pica8@10.10.50.22:/tftp/build/4.0.1/as7312_54x/onie-installer-picos-as7312_54x-4.0.1-cc8d268.bin.md5
/cftmp
```

NOTE:

- If management VRF is enabled, and the FTP/TFTP/HTTP/SCP server is connected via the Eth0/1 port, you need to add the string **sudo ip vrf exec mgmt-vrf** before the SCP command when executing the scp operation. The format is as follows:

  admin@Xorplus:~$ sudo ip vrf exec mgmt-vrf scp pica8@10.10.50.22:/tftp/build/4.0.1/as7312_54x/onie-installer-picos-as7312_54x-4.0.1-cc8d268.bin /cftmp

  admin@Xorplus:~$sudo ip vrf exec mgmt-vrf scp pica8@10.10.50.22:/tftp/build/4.0.1/as7312_54x/o

nie-installer-picos-as7312_54x-4.0.1-cc8d268.bin.md5 /cftmp

If **sudo ip vrf exec mgmt-vrf** is not added, find the next hop routing information from the default VRF. For the usage of VRF, refer to the VRF Configuration Guide.

- For PicOS® **go2cli** version, users can run the scp command under CLI operational mode or configuration mode:

  Φ Download a file:

  file scp get remote-file <*remote-file-path*> [**local-file** *local-file-path*] **ip-address** <*ip-address*>:<*port*> [**vrf** <mgmt-vrf | *vrf-name*>]

  Φ Upload a file:

  file scp put local-file <*local-file-path*> [**remote-file** <*remote-file-path*>] **ip-address** <*ip-address*>:<*port*> [**vrf** <mgmt-vrf | *vrf-name*>]

Step2 Execute the **sync** operation.

```
admin@Xorplus:~$ sync
```

Step3 Change directory to **/cftmp.**

```
admin@Xorplus:~$ cd /cftmp
```

Step4 Run **upgrade2** command to begin upgrading.

```
admin@Xorplus:~$ sudo upgrade2 onie-installer-picos-as7312_54x-4.0.1-cc8d268.bin
```

After finishing upgrade, the switch will reboot automatically, the system will come up running the new network operating system.

NOTE:

- For PicOS® **go2cli** version, users can run the upgrade2 command under CLI operational mode or configuration mode.
- It will take 20 - 30 minutes to finish upgrading PicOS®. During the upgrade process, please be patient and do not perform any operation until the upgrade is complete, otherwise, the upgrade may be interrupted.

3.6 Rollback Procedure

The upgrade2 method supports system rollback function. The "**nos-rollback**" command can be used to

revert to a previous version of the installed software package. Moreover, if it fails to upgrade, the system can automatically rollback to the old system.

NOTE:

Usage of **nos-rollback** command:

admin@Xorplus:~$ sudo nos-rollback

USAGE

Rollback to the previous system after next reboot

SYNOPSIS

nos-rollback [use-prev-config]

DESCRIPTION

use-prev-config - Use previous config, and syslog trace

For details about the usage of use-prev-config, please refer to 24248555.

The rollback procedure is as follows:

Step1 Run **nos-rollback** command for manually rollback.

```
admin@Xorplus:~$ sudo nos-rollback
```

Step2 Reboot system manually to finish rollback.

```
admin@Xorplus:~$ sudo reboot
```

You need to manually run reboot command to reboot the system after you have issued "**nos-rollback**" command. After rebooting successfully, the system will come up running the previous version of network operating system.

3.7 Verifying Version after Upgrade

```
admin@Xorplus:~$ version
Copyright (C) 2009-2021 Pica8, Inc.
==================================
Hardware Model                : as7312_54x
Linux System Version/Revision    : 4.0.1/cc8d268
Linux System Released Date       : 5/18/2021
L2/L3 Version/Revision           : 4.0.1/cc8d268
```

```
L2/L3 Released Date             : 5/18/2021
OVS/OF Version/Revision         : 4.0.1/cc8d268
OVS/OF Released Date           : 5/18/2021
```

3.8 Appendix: Troubleshooting Installation/Upgrade Failure on AS7326-56X

Installation or upgrade failure (for example, the switches cannot boot up after install) may occur on the old AS7326-56X hardware models (revision is R01F and before). When booting PicOS® on AS7326-56X and detect hardware rev R01F, the system will log a warning message to prompt the hardware revision R01F is a pre-production hardware reversion: "This hardware revision R01F is a pre-production hardware rev, PicOS® has applied a work around to work with PicOS®. Support will be provided on a best effort basis".

To work around the issue, first we need to check the "Label Revision". If it is an old hardware model (revision is R01F or before), then, we can perform the following provided solution after installation/upgrade to solve the problem.

3.8.1 Check Label Revision

Under ONIE prompt, run "**onie_syseeprom**" to get the "*Label Revision*".

```
ONIE:/ # onie-syseeprom
TlvInfo Header:
   Id String:    TlvInfo
   Version:      1
   Total Length: 166
TLV Name             Code Len Value
-------------------- ---- --- -----
Manufacture Date     0x25  19 04/27/2019 02:10:06
Label Revision       0x27   4 R01B
Platform Name        0x28  27 x86_64-accton_as7326_56x-r0
ONIE Version         0x29  13 2018.05.00.05
Manufacturer         0x2B   6 Accton
Diag Version         0x2E   7 0.0.1.0
Base MAC Address     0x24   6 80:A2:35:81:D5:F0
Serial Number        0x23  14 732656X1916012
Country Code         0x2C   2 TW
Part Number          0x22  13 FP4ZZ7656005A
Product Name         0x21  15 7326-56X-O-AC-F
MAC Addresses        0x2A   2 256
```

```
Vendor Name          0x2D   6 Accton
CRC-32               0xFE   4 0xC3D3F2DE
Checksum is valid.
ONIE:/ #
```

3.8.2 Solution

You can follow the steps below after installation/upgrade, to fix the problem of installation and upgrade failure on the old AS7326-56X hardware model (revision R01F or before).

Step1 Power cycle the switch.

Step2 From the GRUB menu, choose "**ONIE**" to enter ONIE GRUB menu:

```
+----------------------------------------------------------------------------+
| PicOS                                                                      |
|*ONIE                                                                       |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+
     Use the ^ and v keys to select which entry is highlighted.
     Press enter to boot the selected OS, `e' to edit the commands
     before booting or `c' for a command-line.
```

Step3 From ONIE GRUB menu, choose "**ONIE: Rescue"** to launch ONIE in Rescue mode.

```
                        GNU GRUB  version 2.02~beta2+e4a1fe391
+----------------------------------------------------------------------------+
| ONIE: Install OS                                                           |
|*ONIE: Rescue                                                               |
| ONIE: Uninstall OS                                                         |
| ONIE: Update ONIE                                                          |
| ONIE: Embed ONIE                                                           |
| DIAG: Accton Diagnostic                                                    |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
```

```
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+
```

Step4 Press Enter to display the ONIE prompt.

Step5 Mount PicOS® partition with label is "PicOS®".

```
ONIE:/ # blkid
/dev/sda7: LABEL="User-Data" UUID="be63cef8-4560-4c48-ab5a-8f7ced5a950b"
/dev/sda6: LABEL="PicOS2" UUID="f589e53f-4cd1-44ba-8384-f339f4e2b2ac"
/dev/sda5: LABEL="PicOS" UUID="8ca5f7ed-5a15-4a2a-944c-4d8872647bf5"
/dev/sda4: LABEL="PICOS-GRUB" UUID="782a1372-4b66-4783-b920-dab1df8ec6e4"
/dev/sda3: LABEL="ACCTON-DIAG" UUID="3e4117d0-1926-472a-9d9e-08883df83d40"
/dev/sda2: LABEL="ONIE-BOOT" UUID="1a90abd8-f065-4f7a-90a0-af122b8805fa"
ONIE:/ #
ONIE:/ # mount /dev/sda5 /mnt
```

Step6 Execute the following command to modify the I2C access address.

```
ONIE:/ # sed -I "s/0x57/0x56/" /mnt/etc/rc_hw.sh
ONIE:/ # sync
```

Step7 Unmount the PicOS® partition.

```
ONIE:/ # unmount /dev/sda5
```

Step8 Reboot the switch.

```
ONIE:/ # reboot
```

4 Upgrading PicOS® from Version 4.0.0 or Later Using Upgrade Command

NOTE:

- This document ONLY applies to upgrade from version 4.0.0 or the later version using the **upgrade** command. If you want to upgrade PicOS® from the version before 4.0.0, use ONIE installation process described in Installing PICOS on Bare Metal Switches.
- This upgrading guide is not available for FS S5810 Series and S5860 Series switches.

4.1 Partitioning

PicOS® 4.0.0 have multiple system partitions including PicOS® (partition size: 2G), PicOS®2 (partition size: 2G) and User-Data partitions. Among them, PicOS® and PicOS®2 are two independent system boot partitions. One of them is the active partition on which the running system resides, and the other is the inactive partition. The two-system-boot-partition feature allows the system to be reverted to a previous version of the installed software package when it fails to upgrade PicOS®.

User-Data partition is a reserved partition which is not affected by ONIE installer and upgrade unless user manually removes it. User-Data partition uses all the available space left on the disk after installation. Users can use this partition to store files and data.

4.2 Supported Platforms

PicOS® 4.x software requires to run on a high performance device, only the platforms listed in Switch Machine Outline and System Characteristics are supported upgrading to PicOS® 4.x.

4.3 Preparation before Upgrading

NOTE:

If routed interface is configured, before upgrade, make sure that routed interface name and sub-interface name in the configuration file start with the string "**rif-**". Otherwise, upgrade will fail due to configuration error.

Table 1 Checklist before Upgrading

No.	Checking Items	Checking Standard	Results
1	Checking the Running PicOS® Version	The currently running system software version is lower than the software version to be installed	
2	Building Upgrade Environment	Build a different upgrade environment according to the need	
3	Getting the Required Upgrade Software	Obtain the required supported upgrade software	
4	Backing up Important Data	All the important data in Flash is backed up	

	in Flash		
5	Checking Available Flash Space	Flash space is enough to save upgrading package and other files	

Checking the Running PicOS® Version

Use the **version** command to check the version of the running system software.

```
admin@Xorplus:~$ version
Copyright (C) 2009-2021 Pica8, Inc.
==================================
Hardware Model                : as7312_54x
Linux System Version/Revision : 4.0.0/4b5f523
Linux System Released Date    : 4/27/2021
L2/L3 Version/Revision        : 4.0.0/4b5f523
L2/L3 Released Date           : 4/27/2021
OVS/OF Version/Revision       : 4.0.0/4b5f523
OVS/OF Released Date          : 4/27/2021
```

Building Upgrade Environment

Please make sure that you have set up an HTTP, TFTP or FTP protocol upgrading environment, the basic requirements are as follows:

- PC can log in to the device through serial or SSH.
- The communication between the server and the device works well.
- The upgrading file used by the device has already been stored on the server.

Getting the Required Upgrade Software

Please contact Pica8 technical support engineers at the following website for the latest version of upgrade software.

https://www.pica8.com/support/

Backing up Important Data in Flash

Before upgrading, save the important data in Flash to the local PC through FTP or TFTP, and then upload it to the switch after the upgrade is completed.

Checking the Available Flash Space

Use the **df -h** command to check the available flash space for saving the upgrade package.

```
admin@Xorplus:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
```

```
rootfs          1.5G  655M  715M  48% /
/dev/root       1.5G  655M  715M  48% /
tmpfs           199M  192K  199M   1% /run
tmpfs           5.0M     0  5.0M   0% /run/lock
tmpfs            10M     0   10M   0% /dev
tmpfs           398M     0  398M   0% /run/shm
tmpfs            50M   50M     0 100% /tmp
```

4.4 Upgrading Notes

- Downgrade from PicOS® version 4.x to 3.x or to a lower version is NOT supported by using **upgrade** command. You can use ONIE installation when you want to downgrade. For details about ONIE installation, please refer to Installing PICOS on Bare Metal Switches.
- License check is performed for upgrade:
    - If PicOS® has a license installed before the upgrade, the license will be copied and activated after the upgrade. Please check this section for the PICOS Licenses.
    - If there is no license installed prior to upgrade, upgrade2 process can proceed but only the first four ports and the first two uplink ports (if exist) on the newly upgraded system can be used.
    - If the license has expired, it is not allowed to upgrade a major release (e.g. 4.1 to 4.2). However, it will not affect upgrading to a minor release (e.g. 4.1.1 to 4.1.2).
- You can log in to the switch through its console port or using SSH. After successful login, you can run commands on the command line interface (CLI) to upgrade the device.
- When using FTP/TFTP to download the image, user should verify that the "binary" mode is being used. If the "binary" transfer mode is not being used, the image might be modified during download, and the upgrade will fail during the MD5 check.
- When upgrading, the installer checks whether there is a user-data partition. If there exists a User-Data partition, the installer only rewrites the running system boot partition (PicOS®/ PicOS®2) and installs the new installation package to this partition. However, if there is no User-Data partition, the installer removes all the partitions to rebuild a brand new NOS.

- All X86 platforms share one installation and upgrade package with the name fixed as: **onie-installer-picos-VERSION-x86.bin**, where **VERSION** is the release version. X86 platforms are listed below:
    - FS N9550-32D
    - FS N8550-64C
    - FS N5850-48S6Q
    - FS N8550-48B8C
    - FS N8550-32C
    - Edgecore AS4630-54PE
    - Edgecore AS5712-54X
    - Edgecore AS5812-54T
    - Edgecore AS5812-54X
    - Edgecore AS7312-54X
    - Edgecore AS7326-56X
    - Edgecore AS7712-32X
    - Edgecore AS7726-32X
    - Edgecore AS7816-64X
    - Edgecore AS5835-54X
    - Edgecore AS9716-32D
    - DELL N3248P-ON
    - DELL N3248PXE-ON
    - DELL N3224PX-ON
    - DELL N3248X-ON
    - DELL S4048-ON
    - DELL S4148F-ON

- DELL S4148T-ON
- DELL S4128F-ON
- DELL S5224F-ON
- DELL S5296F-ON
- DELL S5212F-ON
- DELL S5248F-ON
- DELL Z9100-ON
- DELL Z9264F-ON
- DELL N3224T-ON
- DELL S4128T-ON

- During the upgrade process, please ensure that the power supply is functioning normally; otherwise, power interruption during the upgrade process could cause unpredictable problems.
- In previous 4.x.x versions, PicOS® allows the configuration of route leaking by importing BGP IPv4 routes from one user-defined VRF into another user-defined VRF, for example:

  set protocols bgp vrf vrf1 local-as 1

  set protocols bgp vrf vrf1 ipv4-unicast import vrf vrf2

  set protocols bgp vrf vrf2 local-as 2

  That will cause configuration from PicOS® CLI is not consistent with FRR configuration. Specifically, FRR will add "set protocols bgp local-as 1" (local as number is same as the value in vrf1) to its configuration automatically, which is not in PicOS® CLI.

  From version 4.4.0, if "set protocols bgp local-as 1" is not configured, the above configurations are not allowed.

Based on the above reasons, users are required to manually add the command "set protocols bgp local-as 1" (local as number is same as the value in vrf1) before the upgrade, if there's above configuration exists in the pre- upgrade version, thus to ensure that the configuration can be loaded successfully after the upgrade.

4.5 Usage of Upgrade Command

```
admin@XorPlus:~$ sudo upgrade

USAGE

Upgrade system with local new image

SYNOPSIS

upgrade [image_name] [factory-default] [backup-file=(*.lst)]

DESCRIPTION

image_name - Image with bin format file(*.bin)

factory-default - Recovery configuration to factory default

backup-file=(*.lst) - Specify a user defined backup list
```

PicOS® upgrade is done via the command "**upgrade**" in bash (launching a shell script named "upgrade.sh"). This script will upgrade the image and back up configuration files automatically.

The format of the upgrade package is ***.bin**.

The option **no-md5-check** is removed from PicOS® 3.7.0 and later versions. If there is an MD5 file in the /cftmp directory, the upgrade script will check package integrity with MD5. Else if there is no MD5 file in the /cftmp directory, then skip the MD5 check step.

The option **factory-default** is used to reset the configuration to factory default when performing upgrade. This option retains the license files from the previous version.

If you want to backup a file during upgrade, use option **backup-file=(*.lst)** to define your own backup file list. The usage of option **backup-file=(*.lst)** is described in the below section.

4.5.1 Usage of Backup-file=(*.lst) Option

During the upgrade process, the switch can automatically back up the following files in the following directories from the previous PicOS® system:

```
/etc/passwd
```

/etc/shadow

/etc/group

/etc/gshadow

/etc/resolv.conf

./etc/network/interfaces

/etc/picos/picos_start.conf

/etc/picos/switch-public.key

/etc/picos/pica.lic

/pica/config/pica_startup.boot

/pica/config/pica.conf.01

/pica/config/pica.conf.02

/pica/config/pica.conf.03

/pica/config/pica.conf.04

/pica/config/pica.conf.05

/ovs/ovs-vswitchd.conf.db

/ovs/function.conf.db

/ovs/config/meters

/ovs/config/groups

/ovs/config/flows

/ovs/var/lib/openvswitch/pki/

/var/log/report_diag.log

/var/log/report_diag.log.1

/var/log/report_diag.log.2

/var/log/report_diag.log.3

```
/var/log/report_diag.log.4
/var/log/report_diag.log.5
/cftmp/upgrade.log
/cftmp/upgrade2.log
/cftmp/auto/
```

If you want to save user files that are not in the above default backup file list, you need to first create or specify a **.lst** file and then add all those files that need to be backed up to this **.lst** file. You can use the **backup-file=(*.lst)** option to achieve this, where (*.lst) is the user created file with **.lst** format or specify the path to this file, for example:

```
admin@XorPlus:~$ sudo upgrade backup-file=/admin/back_files.lst onie-installer-picos-4.0.1-x86.bin
```

For example, if you want to backup /**home/admin/a.txt** file during the process, then add /**home/admin/a.txt** to back_files.lst.In this example, back_files.lst is a user created file. The user has already added the file to back_files.lst that needs to be saved in the event of power off.

```
admin@XorPlus:~$ cat /admin/back_files.lst
 /home/admin/a.txt
```

The above operations ensure that user can backup their important files with **backup-file=(*.lst)** option during the upgrade process.

4.6 Upgrading Procedure

The upgrading procedure in this document gives an example of upgrading AS7312-54X from PicOS® 4.0.0 to 4.0.1.

Step1 Copy the upgrade package (in the form of **.bin**) and the MD5 file to **/cftmp** directory by either FTP, TFTP, HTTP or SCP according to the actual upgrade environment. The following example uses the SCP method.

```
admin@XorPlus:~$ sudo scp pica8@10.10.50.16:/tftp/build/4.0.1/as7312_54x/onie-installer-picos-4.0.1-x86.bin /cftmp
admin@XorPlus:~$ sudo scp pica8@10.10.50.16:/tftp/build/4.0.1/as7312_54x/onie-installer-picos-4.0.1-x86.bin.md5 /cftmp
```

NOTE:

If management VRF is enabled, and the FTP/TFTP/HTTP/SCP server is connected via the Eth0/1 port,

you need to add the string **sudo ip vrf exec mgmt-vrf** before the SCP command when executing the scp operation. The format is as follows:

admin@Xorplus:~$ sudo ip vrf exec mgmt-vrf scp pica8@10.10.50.22:/tftp/build/4.0.1/as7312_54x/onie-installer-picos-as7312_54x-4.0.1-91bb175.bin /cftmp

admin@Xorplus:~$sudo ip vrf exec mgmt-vrf scp pica8@10.10.50.22:/tftp/build/4.0.1/as7312_54x/onie-installer-picos-as7312_54x-4.0.1-91bb175.bin.md5 /cftmp

If **sudo ip vrf exec mgmt-vrf** is not added, find the next hop routing information from the default VRF. For the usage of VRF, refer to the EVPN Multihoming Configuration Guide.

Step3 Execute the **sync** operation.

```
admin@XorPlus:~$ sync
```

Step4 Change directory to /cftmp.

```
admin@XorPlus:~$ cd /cftmp
admin@XorPlus:/cftmp$
```

Step5 Run the **upgrade** command.

```
admin@XorPlus:/cftmp$ sudo upgrade onie-installer-picos-4.0.1-x86.bin
```

After finishing upgrade will reboot automatically, the system will come up running the new network operating system.

4.7 Verifying Version after Upgrading

```
admin@Xorplus:~$ version
Copyright (C) 2009-2021 Pica8, Inc.
==================================
Hardware Model                : as7312_54x
Linux System Version/Revision    : 4.0.1/cc8d268
Linux System Released Date       : 5/18/2021
L2/L3 Version/Revision           : 4.0.1/cc8d268
L2/L3 Released Date             : 5/18/2021
OVS/OF Version/Revision         : 4.0.1/cc8d268
OVS/OF Released Date           : 5/18/2021
```

4.8 Appendix: Troubleshooting Installation/Upgrade Failure on AS7326-56X

Installation or upgrade failure (for example, the switches cannot boot up after install) may occur on the old AS7326-56X hardware models (revision is R01F and before). When booting PicOS® on AS7326-56X and detect hardware rev R01F, the system will log a warning message to prompt the hardware revision R01F is a pre-production hardware reversion: "This hardware revision R01F is a pre-production hardware rev, PicOS® has applied a work around to work with PicOS®. Support will be provided on a best effort basis".

To work around the issue, first we need to check the “Label Revision”. If it is an old hardware model (revision is R01F or before), then, we can perform the following provided solution after installation/upgrade to solve the problem.

4.8.1 Check Label Revision

Under ONIE prompt, run “**onie_syseeprom**” to get the “*Label Revision*”.

```
ONIE:/ # onie-syseeprom
TlvInfo Header:
   Id String:    TlvInfo
   Version:      1
   Total Length: 166
TLV Name             Code Len Value
-------------------- ---- --- -----
Manufacture Date     0x25  19 04/27/2019 02:10:06
Label Revision       0x27   4 R01B
Platform Name        0x28  27 x86_64-accton_as7326_56x-r0
ONIE Version         0x29  13 2018.05.00.05
Manufacturer         0x2B   6 Accton
Diag Version         0x2E   7 0.0.1.0
Base MAC Address     0x24   6 80:A2:35:81:D5:F0
Serial Number        0x23  14 732656X1916012
Country Code         0x2C   2 TW
Part Number          0x22  13 FP4ZZ7656005A
Product Name         0x21  15 7326-56X-O-AC-F
MAC Addresses        0x2A   2 256
Vendor Name          0x2D   6 Accton
CRC-32               0xFE   4 0xC3D3F2DE
Checksum is valid.
ONIE:/ #
```

4.8.2 Solution

You can follow the steps below after installation/upgrade, to fix the problem of installation and upgrade failure on the old AS7326-56X hardware model (revision R01F or before).

Step1 Power cycle the switch.

Step2 From the GRUB menu, choose "**ONIE"** to enter ONIE GRUB menu:

```
+----------------------------------------------------------------------------+
| PicOS                                                                      |
|*ONIE                                                                       |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+
     Use the ^ and v keys to select which entry is highlighted.
     Press enter to boot the selected OS, `e' to edit the commands
     before booting or `c' for a command-line.
```

Step3 From ONIE GRUB menu, choose "**ONIE: Rescue"** to launch ONIE in Rescue mode.

```
                        GNU GRUB  version 2.02~beta2+e4a1fe391
+----------------------------------------------------------------------------+
| ONIE: Install OS                                                           |
|*ONIE: Rescue                                                               |
| ONIE: Uninstall OS                                                         |
| ONIE: Update ONIE                                                          |
| ONIE: Embed ONIE                                                           |
| DIAG: Accton Diagnostic                                                    |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+
```

Step4 Press Enter to display the ONIE prompt.

Step5 Mount PicOS® partition with label is "PicOS®".

```
ONIE:/ # blkid
/dev/sda7: LABEL="User-Data" UUID="be63cef8-4560-4c48-ab5a-8f7ced5a950b"
/dev/sda6: LABEL="PicOS2" UUID="f589e53f-4cd1-44ba-8384-f339f4e2b2ac"
/dev/sda5: LABEL="PicOS" UUID="8ca5f7ed-5a15-4a2a-944c-4d8872647bf5"
/dev/sda4: LABEL="PICOS-GRUB" UUID="782a1372-4b66-4783-b920-dab1df8ec6e4"
/dev/sda3: LABEL="ACCTON-DIAG" UUID="3e4117d0-1926-472a-9d9e-08883df83d40"
/dev/sda2: LABEL="ONIE-BOOT" UUID="1a90abd8-f065-4f7a-90a0-af122b8805fa"
ONIE:/ #
ONIE:/ # mount /dev/sda5 /mnt
```

Step6 Execute the following command to modify the I2C access address.

```
ONIE:/ # sed -I "s/0x57/0x56/" /mnt/etc/rc_hw.sh
ONIE:/ # sync
```

Step7 Unmount the PicOS® partition.

```
ONIE:/ # unmount /dev/sda5
```

Step8 Reboot the switch.

```
ONIE:/ # reboot
```

5 PicOS® Debian Package Upgrade User Guide

5.1 Overview

PicOS® provides five Debian packages from release 3.2 to let users upgrade some of the available components manually, or reinstall PicOS® components in case some of them were broken.

Available PicOS® Debian packages and the dependencies between them are described below:

picos-linux

PicOS® Linux Kernel, drivers and switching ASIC kernel modules

- picos-vasic
    - PicOS® VASIC and line card management libraries and utilities
    - Depends on picos-linux
- picos-xorplus
    - PicOS® Layer 2 and Layer 3 software package
    - Depends on picos-vasic, picos-utils

- picos-ovs
    - PicOS® OVS package
    - “picos-ovs” will have its own lib to access peripherals (such as FAN and PSU and LED) via sysfs
    - Depends on picos-vasic, picos-utils
- picos-utils
    - PicOS® common utilities and configuration files
    - System config files, systemd units
    - Common utility such as ZTP/diag

In this way, we do not need to upgrade the entire PicOS® system if version changes only appear in one or several of the components. This provides an efficient and effective method of upgrading PicOS® system.

NOTE:

Some PicOS® component packages would depend on other parts, so the dependent ones should be installed first if they do not exist on the system.

5.2 How to use

When new releases of PicOS® components have been made available to fix urgent issues, users can get the Debian packages from PicOS® support team.

For example, the package users get might be "picos-xorplus-s4100-3.2.3-9dc8d94.deb" saved in the working directory.

To install the package, the following command is OK:

```
admin@Xorplus:~$ sudo dpkg -i picos-xorplus-s4100-3.2.3-9dc8d94.deb
```

After finishing upgrade, the switch will reboot automatically, the system will come up running the PicOS® operating system with the new PicOS® component.

NOTE:

If certain PicOS® components have been removed from the running Linux system, this operation would

be an installation instead of upgrade. In this case, users need to confirm the model compatibility manually by inputting `Yes` or `Y` at the prompt `Are you sure the model is MODEL (yes/no)?`

5.3 Verifying after Upgrade

We can use the following command to check the status of PicOS® Debian packages after upgrade.

```
admin@Xorplus:~$ dpkg -l | grep picos-
ii  picos-linux
ii  picos-ovs
ii  picos-utils
ii  picos-vasic
ii  picos-xorplus
```

Here two "**i**" represent **normal**, the first one indicates that the package has been installed successfully. The second "**i**" indicates the installation dependencies between the components and configuration operations are successfully completed met.

5.4 Appendix

PicOS® component package uninstall operation is provided as follows.

NOTE:

- Uninstall the PicOS® component packages may cause severe system errors, we strongly recommend not to uninstall any of the PicOS® component package.
- The uninstall operation will uninstall all packages that depend on this package, either directly or indirectly.

```
admin@Xorplus:~$ sudo apt remove picos-utils
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages will be REMOVED:
  picos-utils
0 upgraded, 0 newly installed, 1 to remove and 0 not upgraded.
After this operation, 0 B of additional disk space will be used.
Do you want to continue? [Y/n]
```

6 Installing Debian Packages on PicOS®

PicOS® uses a standard and non-modified Debian Linux distribution. It is very easy to install new packages or software on top of the existing PicOS® packages, using the standard Debian package management system.

Here are some installation examples.

6.1 Installing GCC on PicOS®

NOTE:

If the FTP server is connected via the Eth0/1 port, you need to add the string **sudo ip vrf exec mgmt-vrf** before the apt-get command when executing the apt-get operation.

For example:

admin@Xorplus:~$ sudo ip vrf exec mgmt-vrf apt-get update

If **sudo ip vrf exec mgmt-vrf** is not added, find the next hop routing information from the default VRF. For the usage of VRF, refer to the VRF configuration guide.

Updating the software list on the source server

```
admin@XorPlus$sudo apt-get update
Hit http://ftp.tw.debian.org stable Release.gpg
Hit http://ftp.tw.debian.org stable Release
Hit http://ftp.tw.debian.org stable/main powerpc Packages
Hit http://ftp.tw.debian.org stable/main Translation-en
Reading package lists... Done
admin@XorPlus$
```

Installing new software

```
admin@XorPlus$sudo apt-get install make
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
make-doc
The following NEW packages will be installed:
make
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 399 kB of archives.
After this operation, 1165 kB of additional disk space will be used.
```

```
WARNING: The following packages cannot be authenticated!
make
Authentication warning overridden.
Get:1 http://ftp.tw.debian.org/debian/ stable/main make powerpc 3.81-8.2 [399 kB]
Fetched 399 kB in 6s (64.1 kB/s)
Selecting previously unselected package make.
(Reading database ... 16155 files and directories currently installed.)
Unpacking make (from .../make_3.81-8.2_powerpc.deb) ...
Processing triggers for man-db ...
fopen: Permission denied
Setting up make (3.81-8.2) ...
admin@XorPlus$
admin@XorPlus$sudo apt-get install python
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
file libexpat1 libmagic1 mime-support python-minimal python2.7 python2.7-minimal
Suggested packages:
python-doc python-tk python2.7-doc binutils binfmt-support
The following NEW packages will be installed:
file libexpat1 libmagic1 mime-support python python-minimal python2.7 python2.7-minimal
0 upgraded, 8 newly installed, 0 to remove and 0 not upgraded.
Need to get 5045 kB of archives.
After this operation, 18.3 MB of additional disk space will be used.
Do you want to continue [Y/n]? Y
WARNING: The following packages cannot be authenticated!
libmagic1 libexpat1 file mime-support python2.7-minimal python2.7 python-minimal python
Authentication warning overridden.
Get:1 http://ftp.tw.debian.org/debian/ stable/main libmagic1 powerpc 5.11-2 [201 kB]
Get:2 http://ftp.tw.debian.org/debian/ stable/main libexpat1 powerpc 2.1.0-1 [142 kB]
Get:3 http://ftp.tw.debian.org/debian/ stable/main file powerpc 5.11-2 [51.7 kB]
Get:4 http://ftp.tw.debian.org/debian/ stable/main mime-support all 3.52-1 [35.5 kB]
Get:5 http://ftp.tw.debian.org/debian/ stable/main python2.7-minimal powerpc 2.7.3-6 [1753 kB]
Get:6 http://ftp.tw.debian.org/debian/ stable/main python2.7 powerpc 2.7.3-6 [2639 kB]
Get:7 http://ftp.tw.debian.org/debian/ stable/main python-minimal all 2.7.3-4 [42.6 kB]
Get:8 http://ftp.tw.debian.org/debian/ stable/main python all 2.7.3-4 [180 kB]
Fetched 5045 kB in 18s (267 kB/s)
Selecting previously unselected package libmagic1:powerpc.
(Reading database ... 16189 files and directories currently installed.)
Unpacking libmagic1:powerpc (from .../libmagic1_5.11-2_powerpc.deb) ...
Selecting previously unselected package libexpat1:powerpc.
Unpacking libexpat1:powerpc (from .../libexpat1_2.1.0-1_powerpc.deb) ...
Selecting previously unselected package file.
```

```
Unpacking file (from .../file_5.11-2_powerpc.deb) ...
Selecting previously unselected package mime-support.
Unpacking mime-support (from .../mime-support_3.52-1_all.deb) ...
Selecting previously unselected package python2.7-minimal.
Unpacking python2.7-minimal (from .../python2.7-minimal_2.7.3-6_powerpc.deb) ...
Selecting previously unselected package python2.7.
Unpacking python2.7 (from .../python2.7_2.7.3-6_powerpc.deb) ...
Selecting previously unselected package python-minimal.
Unpacking python-minimal (from .../python-minimal_2.7.3-4_all.deb) ...
Selecting previously unselected package python.
Unpacking python (from .../python_2.7.3-4_all.deb) ...
Processing triggers for man-db ...
fopen: Permission denied
Setting up libmagic1:powerpc (5.11-2) ...
Setting up libexpat1:powerpc (2.1.0-1) ...
Setting up file (5.11-2) ...
Setting up mime-support (3.52-1) ...
Setting up python2.7-minimal (2.7.3-6) ...
Linking and byte-compiling packages for runtime python2.7...
Setting up python2.7 (2.7.3-6) ...
Setting up python-minimal (2.7.3-4) ...
Setting up python (2.7.3-4) ...
admin@XorPlus$
admin@XorPlus$sudo apt-get install g++
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
g+-4.6 libstdc+6-4.6-dev
Suggested packages:
g+-multilib g-4.6-multilib gcc-4.6-doc libstdc6-4.6-dbg libstdc+6-4.6-doc
The following NEW packages will be installed:
g++ g+-4.6 libstdc+6-4.6-dev
0 upgraded, 3 newly installed, 0 to remove and 17 not upgraded.
Need to get 0 B/8383 kB of archives.
After this operation, 24.4 MB of additional disk space will be used.
Do you want to continue [Y/n]? Y
WARNING: The following packages cannot be authenticated!
libstdc+6-4.6-dev g-4.6 g+
Authentication warning overridden.
Selecting previously unselected package libstdc++6-4.6-dev.
(Reading database ... 19555 files and directories currently installed.)
Unpacking libstdc+6-4.6-dev (from .../libstdc+6-4.6-dev_4.6.3-14_powerpc.deb) ...
Selecting previously unselected package g++-4.6.
```

```
Unpacking g+-4.6 (from .../g+-4.6_4.6.3-14_powerpc.deb) ...
Selecting previously unselected package g++.
Unpacking g++ (from .../g++_4%3a4.6.3-8_powerpc.deb) ...
Processing triggers for man-db ...
Setting up libstdc++6-4.6-dev (4.6.3-14) ...
Setting up g++-4.6 (4.6.3-14) ...
Setting up g++ (4:4.6.3-8) ...
update-alternatives: using /usr/bin/g++ to provide /usr/bin/c++ (c++) in auto mode
admin@XorPlus$
```

6.2 Installing Puppet on PicOS®

NOTE:

- You can see an example of Puppet module to manipulate PicOS® configuration on our Github repository:

  https://github.com/Pica8/Configuration-Managers

- If the FTP server is connected via the Eth0/1 port, you need to add the string **sudo ip vrf exec mgmt-vrf** before the apt-get command when executing the apt-get operation.

  For example:

  admin@Xorplus:~$ sudo ip vrf exec mgmt-vrf apt-get update

If **sudo ip vrf exec mgmt-vrf** is not added, find the next hop routing information from the default VRF. For the usage of VRF, refer to the VRF configuration guide.

Step 1 - Use the correct repository for the specific application and CPU on the switch. Pica8 support can help in the choice of repository.

```
admin@Roma$sudo more /etc/apt/sources.list | grep -v "#"
deb http://ftp.debian-ports.org/debian/ unstable main
```

For a typical puppet installation, the latest standard debian repo is advised.

Step 2 - Update the debian packages on PicOS®

```
admin@XorPlus$sudo apt-get update
Hit http://ftp.tw.debian.org stable Release.gpg
Hit http://ftp.tw.debian.org stable Release
Hit http://ftp.tw.debian.org stable/main powerpc Packages
Hit http://ftp.tw.debian.org stable/main Translation-en
Reading package lists... Done
```

```
admin@XorPlus$
```

Step 3 - Install puppet client and configure it

```
sudo apt-get install puppet
```

Look at the puppet documentation to understand how to connect the puppet client to a puppet server. A simple installation would require at least minor modification on the puppet.conf file.

```
more /etc/puppet/puppet.conf
[agent]
server = master.local.pica8.com
```

Step 4 - Verify Puppet installation

```
admin@Roma$sudo puppet agent -t
Notice: Using less secure serialization of reports and query parameters for compatibility
Notice: with older puppet master. To remove this notice, please upgrade your master(s)
Notice: to Puppet 3.3 or newer.
Notice: See http://links.puppetlabs.com/deprecate_yaml_on_network for more information.
Info: Retrieving pluginfacts
Info: Retrieving plugin
Info: Loading facts in /var/lib/puppet/lib/facter/facter_dot_d.rb
Info: Loading facts in /var/lib/puppet/lib/facter/root_home.rb
Info: Loading facts in /var/lib/puppet/lib/facter/puppet_vardir.rb
Info: Loading facts in /var/lib/puppet/lib/facter/pe_version.rb
Info: Loading facts in /var/lib/puppet/lib/facter/instance_id.rb
Info: Caching catalog for Roma
Info: Applying configuration version '1405148228'
Notice: Finished catalog run in 0.35 seconds
```

6.3 Installing Salt on PicOS®

NOTE:

- You can see an example of Salt module to manipulate PicOS® configuration on our Github repository:

  https://github.com/pica8/Configuration-Managers

- If the FTP server is connected via the Eth0/1 port, you need to add the string **sudo ip vrf exec mgmt-vrf** before the apt-get command when executing the apt-get operation.

  For example:

  admin@Xorplus:~$ sudo ip vrf exec mgmt-vrf apt-get update

If **sudo ip vrf exec mgmt-vrf** is not added, find the next hop routing information from the default VRF. For the usage of VRF, refer to the VRF configuration guide.

Step 1 - Use the correct repository for the specific application and CPU on the switch. Pica8 support can help in the choice of repository.

```
$ sudo more /etc/apt/sources.list | grep -v "#"
deb http://ftp.debian-ports.org/debian/ unstable main
```

For a typical salt installation, the latest standard debian repo is advised.

Step 2 - Update the debian packages on PicOS®

```
admin@XorPlus$sudo apt-get update
Hit http://ftp.tw.debian.org stable Release.gpg
Hit http://ftp.tw.debian.org stable Release
Hit http://ftp.tw.debian.org stable/main powerpc Packages
Hit http://ftp.tw.debian.org stable/main Translation-en
Reading package lists... Done
admin@XorPlus$
```

Step 3 - Install salt-common and salt-minion and configure it

```
sudo apt-get install salt-common
sudo apt-get install salt-minion
```

Look at the salt documentation to understand how to connect the salt-minion to a salt-master. A simple installation would need at least minor modification on the minion configuration file.

```
more /etc/salt/minion
# Set the location of the salt master server, if the master server cannot be
# resolved, then the minion will fail to start.
master: salt.example.com
```

7 PicOS® Installation and Upgrade Guide for FS S5810 Series, S3410 Series and S5860 Series Switches

7.1 Upgrading PicOS® for FS S5810 Series, S3410 Series and S5860 Series Switches

7.1.1 Preparation before Upgrading

Table 1 Checklist before Upgrading

No.	Checking Items	Checking Standard	Results
1	Checking the Running PicOS® Version	The currently running system software version is lower than the software version to be installed	
2	Building Upgrade Environment	Build a different upgrade environment to get the upgrade software according to the need	
3	Getting the Required Upgrade Software	Obtain the required supporting upgrade software	
4	Backing up Important Data in Flash	All the important data in Flash is backed up	
5	Checking Available Flash Space	Flash space is enough to save upgrading package and other files	

Checking the Running PicOS® Version

Use the **version** command to check the version of the running system software.

```
admin@PICOS:~$ version
Copyright (C) 2009-2023 Pica8, Inc.
==================================
Base ethernet MAC Address     : 64:9d:99:d7:7d:23
Hardware Model                : S5810-48TS-P
Linux System Version/Revision : 4.3.3.1/4f6f523
Linux System Released Date    : 12/10/2023
L2/L3 Version/Revision        : 4.3.3.1/4f6f523
L2/L3 Released Date           : 12/10/2023
OVS/OF Version/Revision       : 4.3.3.1/4f6f523
OVS/OF Released Date          : 12/10/2023
```

Building Upgrade Environment

Please make sure that you have set up an HTTP, TFTP or FTP protocol upgrading environment to get the upgrade software, the basic requirements are as follows:

- PC can log in to the device through serial or SSH.
- The communication between the server and the device works well.
- The upgrading file used by the device has already been stored on the server.

Getting the Required Upgrade Software

Please contact Pica8 technical support engineers at the following website for the latest version of upgrade software.

http://www.pica8.com/support/customer

Backing up Important Data in Flash

Before upgrading, save the important data (such as the configuration file) in Flash to the local PC through FTP or TFTP, and then upload it to the switch after the upgrade is completed.

> Where is the PicOS® configuration?
>
> OVSDB file
>
> L2/L3 Configuration Files

Checking Available Flash Space

Use the **df** command to check the available flash space.

```
admin@PICOS:~$ df
Filesystem     1K-blocks   Used Available Use% Mounted on
udev              493028      0    493028   0% /dev
overlay           358904  57528    301376  17% /
tmpfs             512720      0    512720   0% /dev/shm
tmpfs             205088   3256    201832   2% /run
tmpfs               5120      0      5120   0% /run/lock
tmpfs              51200    292     50908   1% /tmp
/dev/ubi1_0       402660 208320    189500  53% /mnt/open
```

7.1.2 Upgrading Notes

- The device is not supported to upgrade to a previous version.
- For S5810 Series and S5860 Series switches, you can log in to the device through its console port or using SSH for upgrade.

- For S3410 Series switches, the system upgrade can only be performed through a serial console port connection.
- When using FTP/TFTP to download the image, user should verify that the "binary" mode is being used. If the "binary" transfer mode is not being used, the image can be modified during download, and the upgrade will fail during the md5 check.
- The image is platform dependent, that is, the image_name should be consistent with the platform, otherwise the upgrade script will abort.
- The image file is a **.bin** file, for example S5810-48TS-P-picos-e-4.4.3.2-2f6f578-fs.bin.
- When upgrading, the installer checks whether there is a user-data partition. If there exists a User-Data partition, the installer only rewrites the running system boot partition (PicOS®/ PicOS®2) and installs the new installation package to this partition. However, if there is no User-Data partition, the installer removes all the partitions to rebuild a brand new NOS.
- Upgrade operation via upgrade commands is not allowed on non-default system, you can upgrade PicOS® only on default system. When there are more than one PicOS®, the default system is the one automatically booted into after system reboot.
- During the upgrade process, no power interruption is allowed.

7.1.3 Upgrading Procedure

NOTE:

Usage of **upgrade** command:

admin@PicOS®:~$ sudo upgrade

USAGE

Upgrade system with local new image

SYNOPSIS

upgrade [image_name] [factory-default]

DESCRIPTION

image_name - Image with bin format file(*.bin)

factory-default - Recovery configuration to factory default

- PicOS® upgrade is done via the command "**upgrade**" in bash (launching a shell script named "upgrade.sh"). This script will upgrade the image automatically.
- The file format of the upgrade package is ***.bin**.
- If there is an MD5 file in the /cftmp directory, the upgrade script will check package integrity with MD5. Else if there is no MD5 file in the /cftmp directory, then skip the MD5 check step.
- The option **factory-default** is used to reset the configuration to factory default when performing upgrade. This option retains the license files from the previous version.

The upgrading procedure in this document gives an example of upgrading on S5810-48TS-P from PicOS® 4.4.3.1 to 4.4.3.2.

Step1 Stop PicOS® service before upgrade.

- On FS S5810 Series and S5860 Series switches, use the following command:

```
admin@PICOS:~$ sudo systemctl stop picos
```

- On S3410 Series switches, use the following command:

```
admin@PICOS:~$ sudo /etc/init.d/picos stop
```

Step2 Copy the upgrade package (in the form of **.bin**) and the MD5 file to **/cftmp** directory by either FTP, TFTP, HTTP or SCP according to the actual upgrade environment. The following example uses the SCP method.

```
admin@PICOS:~$ sudo scp pica8@10.10.50.22:/tftp/build/daily/s5810/S5810-48TS-P-picos-e-4.4.3.2-2f6f578-fs.bin  /cftmp
admin@PICOS:~$ sudo scp pica8@10.10.50.22:/tftp/build/daily/s5810/S5810-48TS-P-picos-e-4.4.3.2-2f6f578-fs.bin.md5  /cftmp
```

NOTE:

If management VRF is enabled, and the FTP/TFTP/HTTP/SCP server is connected via the Eth0/1 port, you need to add the string **sudo ip vrf exec mgmt-vrf** before the SCP command when executing the scp operation. The format is as follows:

admin@PicOS®:~$ sudo ip vrf exec mgmt-vrf

scp pica8@10.10.50.22:/tftp/build/s5810/S5810-48TS-P-picos-e-4.4.3.2-2f6f578-fs.bin /cftmp

admin@PicOS®:~$ sudo ip vrf exec mgmt-vrf

scp pica8@10.10.50.22:/tftp/build/s5810/S5810-48TS-P-picos-e-4.4.3.2-2f6f578-fs.bin.md5 /cftmp

If **sudo ip vrf exec mgmt-vrf** is not added, find the next hop routing information from the default VRF.

For the usage of VRF, refer to the VRF Configuration Guide.

Step3 Execute the **sync** operation.

```
admin@PICOS:~$ sync
```

Step4 Change directory to /cftmp.

```
admin@PICOS:~$ cd /cftmp
```

Step5 Run the **upgrade** command.

```
admin@PICOS:~$ sudo upgrade S5810-48TS-P-picos-e-4.4.3.2-2f6f578-fs.bin
```

After finishing upgrade will reboot automatically, the system will come up running the new network operating system.

7.1.4 Verifying Version after Upgrading

```
admin@PICOS:~$ version
Copyright (C) 2009-2023 Pica8, Inc.
===================================
Base ethernet MAC Address     : 64:9d:99:d7:7d:23
Hardware Model                : S5810-48TS-P
Linux System Version/Revision : 4.4.3.2/2f6f578
Linux System Released Date    : 12/15/2023
L2/L3 Version/Revision        : 4.4.3.2/2f6f578
L2/L3 Released Date           : 12/15/2023
OVS/OF Version/Revision       : 4.4.3.2/2f6f578
OVS/OF Released Date          : 12/15/2023
```

7.2 Upgrading PicOS® by Using Upgrade2 for S5860-20SQ/S5860-24XB-U and S3410 Series Switches

7.2.1 Introduction

PicOS® supports **upgrade2** method for system upgrade. There will be two separate systems on the device after the upgrade2 operation: PicOS® and PicOS®2. One of them will be the running system and the other

will stay inactive. PicOS® and PicOS®2 system files and their respective configuration files are located in /***mnt/open/picos***/ of the flash. A list and brief description of these files is as follows.

```
* uImage1.itb
* pica1.sqsh
* config1/backup_files              //User-defined backup files list
* config1/backup.tar.gz                  //Backup of latest.tar.gz
* config1/latest.tar.gz              //The newest configuration files
* uImage2.itb
* pica2.sqsh
* config2/backup_files
* config2/backup.tar.gz
* config2/latest.tar.gz
```

The upgrade2 installer installs the new system into the inactive system's file. The inactive system will be overwritten. After this operation, the new system is the inactive system and then the installer modifies the boot menu to make the newly installed system to be the default boot system. Finally, the system will come up running the new network operating system when boots up normally after the upgrading is finished,.

Upgrade2 method supports system rollback function. The "**nos-rollback**" command can be used to revert to a previous version of the installed software package. Moreover, if it fails to upgrade, the system can automatically rollback to the old system. This can reduce the network interruption risk due to the failure of system upgrade process and ensure the systems' continuous availability. You can refer to section 23823038 for details.

We recommend using upgrade2 method to upgrade the NOS as there are functions of system backup and rollback.

7.2.2 Preparation before Upgrading

Table 1. Checklist before Upgrading

No.	Checking Items	Checking Standard	Results
1	Checking the Running PicOS® Version	The currently running system software version is lower than the software version to be installed.	
2	Building Upgrade Environment	Build an upgrade environment to get the upgrade software according to the need.	
3	Getting the Required Upgrade Software	Obtain the required supporting upgrade software.	
4	Backing up Important Data in Flash	All the important data in Flash is backed up.	

Checking the Running PicOS® Version

Use the **version** command to check the version of the running system software.

```
admin@PICOS# run show version
Copyright (C) 2009-2023 Pica8, Inc.
===================================
Base ethernet MAC Address     : 64:9d:99:d2:04:53
Hardware Model                : S5860-24XB-U
Linux System Version/Revision : 4.3.3.2/4b5f523
Linux System Released Date    : 12/14/2023
L2/L3 Version/Revision        : 4.3.3.2/4b5f523
L2/L3 Released Date           : 12/14/2023
OVS/OF Version/Revision       : 4.3.3.2/4b5f523
OVS/OF Released Date          : 12/14/2023
```

Building Upgrade Environment

Please make sure that you have set up an HTTP, TFTP or FTP protocol upgrading environment to get the upgrade software, the basic requirements are as follows:

- PC can log in to the device through serial.
- The communication between the server and the device works well.
- The upgrading file used by the device has already been stored on the server.

Getting the Required Upgrade Software

Please contact Pica8 technical support engineers at the following website for the latest version of upgrade software.

http://www.pica8.com/support/customer

Backing up Important Data in Flash

Before upgrading, save the important data in Flash to the local PC through FTP or TFTP, and then upload it to the switch after the upgrade is completed.

7.2.3 Upgrading Notes

- Downgrade to an earlier version is NOT supported by using upgrade2 command.
- For S5810 Series and S5860 Series switches, you can log in to the device through its console port or using SSH for upgrade.
- For S3410 Series switches, the system upgrade can only be performed through a serial console port connection.
- When using FTP/TFTP to download the image, user should verify that the "binary" mode is being used. If the "binary" transfer mode is not being used, the image can be modified during download, and the upgrade will fail during the md5 check.
- The image file is a **.bin** file, for example S5860-24XB-U-picos-e-4.4.3.2-2f6f578-fs.bin.
- The image is platform dependent, that is, the image_name should be consistent with the platform, otherwise the upgrade script will abort.

7.2.4 Upgrading Procedure

The upgrading procedure in this document gives an example of upgrading on S5860-24XB-U from PicOS® 3.1.0 to 3.1.1 using **upgrade2** command.

NOTE:

Usage of **upgrade2** command:

USAGE

Upgrade system with local new image

SYNOPSIS

upgrade2 [image_name] [factory-default]

DESCRIPTION

image_name - Image with bin format file(*.bin)

factory-default - Recovery configuration to factory default

PicOS® upgrade is done via the command "**upgrade2**" in bash (launching a shell script named "upgrade2.sh"). This script will upgrade the image and back up configuration files automatically.

Image name is in the form of **.bin** from version 3.1.0, which should be copied to the /cftmp directory before running upgrade2 command.

The **no-md5-check** option is removed from PicOS® 3.1.0. If there is an MD5 file in the /cftmp directory, the upgrade script will check package integrity with MD5. Else if there is no MD5 file in the /cftmp directory, then skip the MD5 check step.

The option **factory-default** is used to reset the configuration to factory default when performing upgrade, but it retains the license files from the previous version.

Upgrade2 Procedure

Step1 Stop PicOS® service before upgrade.

- On FS S5810 Series and S5860 Series switches, use the following command:

```
admin@PICOS:~$ sudo systemctl stop picos
```

- On S3410 Series switches, use the following command:

```
admin@PICOS:~$ sudo /etc/init.d/picos stop
```

Step2 Copy the upgrade package (in the form of .**bin**) and the MD5 file to /**cftmp** directory by either FTP, TFTP, HTTP or SCP according to the actual upgrade environment. The following example uses the SCP method.

```
admin@PICOS:~$ sudo scp pica8@10.10.50.22:/tftp/build/daily/S5860-24XB-U/S5860-24XB-U-picos-e-4.4.3.2-2f6f578-fs.bin  /cftmp
admin@PICOS:~$ sudo scp pica8@10.10.50.22:/tftp/build/daily/S5860-24XB-U/S5860-24XB-U-picos-e-4.4.3.2-2f6f578-fs.bin.md5  /cftmp
```

NOTE:

If management VRF is enabled, and the FTP/TFTP/HTTP/SCP server is connected via the Eth0/1 port, you need to add the string **sudo ip vrf exec mgmt-vrf** before the SCP command when executing the scp operation. The format is as follows:

admin@PicOS®:~$ sudo ip vrf exec mgmt-vrf

scp pica8@10.10.50.22:/tftp/build/4.4.3.2/S5860-24XB-U/S5860-24XB-U-picos-e-4.4.3.2-2f6f578-fs.bin /cftmp

admin@PicOS®:~$ sudo ip vrf exec mgmt-vrf

scp pica8@10.10.50.22:/tftp/build/4.4.3.2/S5860-24XB-U/S5860-24XB-U-picos-e-4.4.3.2-2f6f578-fs.bin.md5 /cftmp

If **sudo ip vrf exec mgmt-vrf** is not added, find the next hop routing information from the default VRF. For the usage of VRF, refer to the /wiki/spaces/PicOS44sp/pages/4295225.

Step3 Execute the **sync** operation.

```
admin@PICOS:~$ sync
```

Step4 Change directory to /cftmp.

```
admin@PICOS:~$ cd /cftmp
```

Step5 Run **upgrade2** command to begin upgrading.

```
admin@PICOS:~$ sudo upgrade2 S5860-24XB-U-picos-e-4.4.3.2-2f6f578-fs.bin
```

After finishing upgrade, the switch will reboot automatically, the system will come up running the new network operating system.

NOTE:

It will take 20 - 30 minutes to finish upgrading PicOS®. During the upgrade process, please be patient and do not perform any operation until the upgrade is complete, otherwise, the upgrade may be interrupted.

7.2.5 Rollback Procedure

The upgrade2 method supports system rollback function. The "**nos-rollback**" command can be used to revert to a previous version of the installed software package. Moreover, if it fails to upgrade, the system can automatically rollback to the old system.

NOTE:

Usage of **nos-rollback** command:

admin@PicOS®:~$ sudo nos-rollback

USAGE

Rollback to the previous system after next reboot

SYNOPSIS

nos-rollback

The rollback procedure is as follows:

Step1 Run **nos-rollback** command for manually rollback.

```
admin@PICOS:~$ sudo nos-rollback
```

Step2 Reboot system manually to finish rollback.

```
admin@PICOS:~$ sudo reboot
```

You need to manually reboot the system after issued "**nos-rollback**" command and the system switching takes effect. After rebooting successfully, the system will come up running the previous version of network operating system.

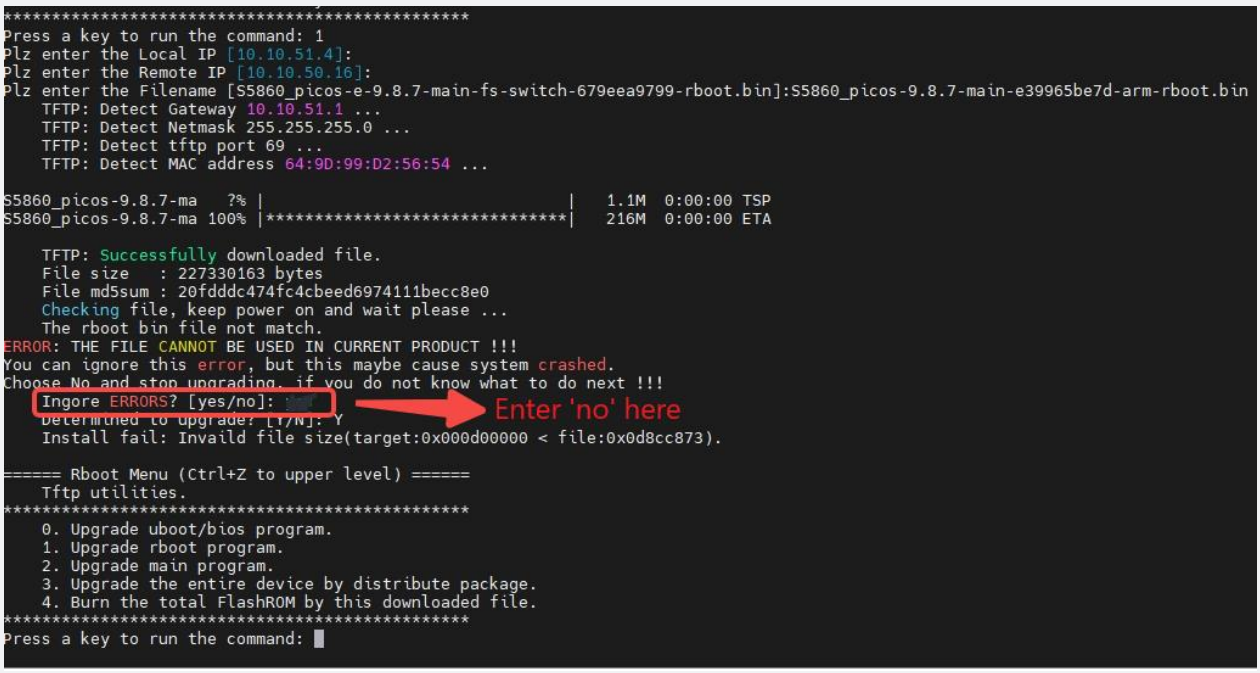
7.2.6 Verifying Version after Upgrading

```
admin@PICOS# run show version
Copyright (C) 2009-2023 Pica8, Inc.
===================================
Base ethernet MAC Address     : 64:9d:99:d2:04:53
Hardware Model                : S5860-24XB-U
Linux System Version/Revision : 4.3.3.3/4c5a643
Linux System Released Date    : 12/26/2023
L2/L3 Version/Revision        : 4.3.3.3/4c5a643
L2/L3 Released Date           : 12/26/2023
OVS/OF Version/Revision       : 4.3.3.3/4c5a643
OVS/OF Released Date          : 12/26/2023
```

7.3 Installing PicOS® for FS S5810 and S5860 Series Switches

Caution:

When an incorrect installation file is detected, the system will display the error message "Ignore ERRORS? [YES/NO]:". Users need to enter "no" to prevent the system from using the incorrect installation file for system installation. Do NOT enter "yes", or the system will proceed with the incorrect installation file, which may cause a system crash.



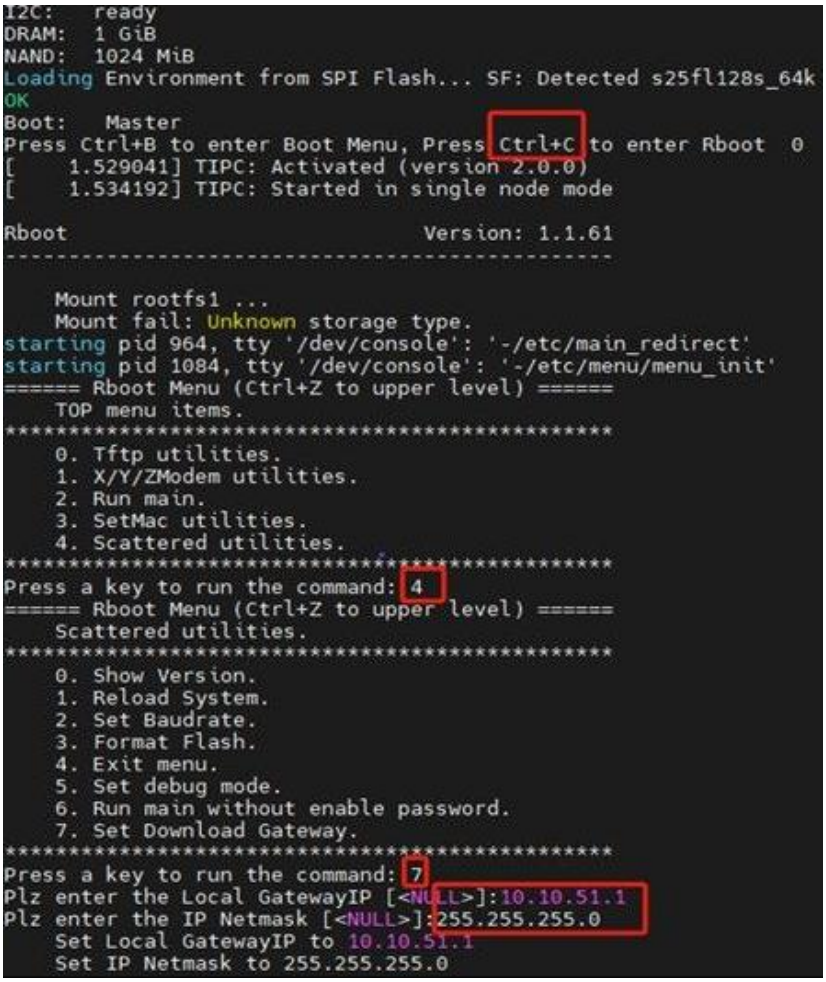

```
**********************************************
Press a key to run the command: 1
Plz enter the Local IP [10.10.51.4]:
Plz enter the Remote IP [10.10.50.16]:
Plz enter the Filename [S5860_picos-e-9.8.7-main-fs-switch-679eea9799-rboot.bin]:S5860_picos-9.8.7-main-e39965be7d-arm-rboot.bin
    TFTP: Detect Gateway 10.10.51.1 ...
    TFTP: Detect Netmask 255.255.255.0 ...
    TFTP: Detect tftp port 69 ...
    TFTP: Detect MAC address 64:9D:99:D2:56:54 ...

S5860_picos-9.8.7-ma   ?% |                                |   1.1M  0:00:00 TSP
S5860_picos-9.8.7-ma 100% |********************************|   216M  0:00:00 ETA

    TFTP: Successfully downloaded file.
    File size   : 227330163 bytes
    File md5sum : 20fdddc474fc4cbeed6974111becc8e0
    Checking file, keep power on and wait please ...
    The rboot bin file not match.
ERROR: THE FILE CANNOT BE USED IN CURRENT PRODUCT !!!
You can ignore this error, but this maybe cause system crashed.
Choose No and stop upgrading, if you do not know what to do next !!!
    Ingore ERRORS? [yes/no]:
    Determined to upgrade? [Y/N]: Y
    Install fail: Invaild file size(target:0x000d00000 < file:0x0d8cc873).

====== Rboot Menu (Ctrl+Z to upper level) ======
    Tftp utilities.
**********************************************
    0. Upgrade uboot/bios program.
    1. Upgrade rboot program.
    2. Upgrade main program.
    3. Upgrade the entire device by distribute package.
    4. Burn the total FlashROM by this downloaded file.
**********************************************
Press a key to run the command:
```

PicOS® system can be installed under the Rboot menu through TFTP protocol for FS S5810 and S5860 Series switches. The following steps describe the installation procedure.

Step 1 Power off and on to force restarting the switch, then press **Ctrl+C** to enter Rboot menu.

Step 2 (Optional) If the TFTP server and the switch are in the different network segment, configure the gateway address first (if they are in the same network segment, no need to do this step).

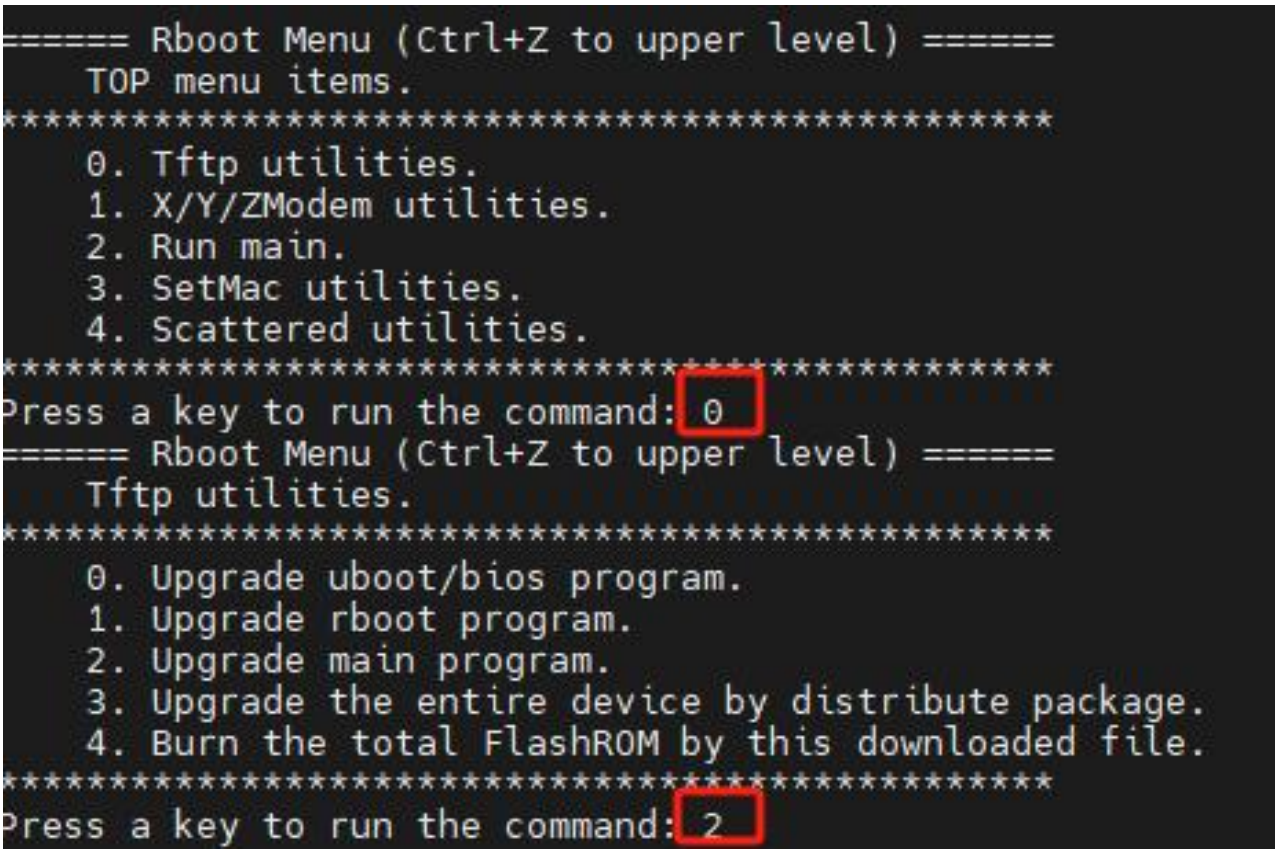
a) Enter **4** in the Rboot menu to access the Scattered *utilities* menu.



b) Enter **7** to set the gateway IP and IP netmask.

c) Then, press **Ctrl+Z** to go back to the Rboot menu.

Step 3 In Rboot menu, enter **0** to access *Tftp utilities* menu, and then enter **2** to perform TFTP upgrade.



Step 4 Use TFTP protocol to download the installation files, and then install PicOS®.

a) Configure the TFTP parameters. **Local IP** is the management interface IP of the switch, **Remote IP** is the IP of the TFTP server, **Filename** is the installation image directory and name located on the TFTP server.

b) After downloaded the installation image successfully, you need to input **Y** manually, then the system will automatically start system installation process.

```
====== Rboot Menu (Ctrl+Z to upper level) ======
    Tftp utilities.
**********************************************
    0. Upgrade uboot/bios program.
    1. Upgrade rboot program.
    2. Upgrade main program.
    3. Upgrade the entire device by distribute package.
    4. Burn the total FlashROM by this downloaded file.
**********************************************
Press a key to run the command: 2
Plz enter the Local IP [10.1051.159]:10.10.51.159
Plz enter the Remote IP [10.10.50.22]:10.10.50.22
Plz enter the Filename [/build/daily/s5860/S5860_picos-9.8.7-main-d38d52a8d9-arm-rboot.bin]:/build/daily/s5860/S5860_picos-9.8.7
-main-d38d52a8d9-arm-rboot.bin
    TFTP: Detect Gateway 10.10.51.1 ...
    TFTP: Detect Netmask 255.255.255.0 ...
    TFTP: Detect tftp port 69 ...
    TFTP: Detect MAC address 64:9D:99:D2:04:52 ...

/build/daily/s5860/S 100% |*****************************|   216M  0:00:00 ETA

    TFTP: Successfully downloaded file.
    File size   : 227306574 bytes
    File md5sum : 6ea400605c649f934b9b3ca276a7f8f1
    Checking file, keep power on and wait please ...
    Determined to upgrade? [Y/N]: Y
    Rootfs found: rootfs.sqsh
    Uboot  found: uboot-1.bin
    Rboot  found: rboot-1.bin
    Extract package....
    Mount rootfs file system ...
    Install rootfs files to Flash ...
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
    Install main success.
    Extract uboot from main...
    Checking file, keep power on and wait please ...
    Upgrade Master boot.
    The upgrade version is lower than or the same as the master boot version.
    Extract rboot from main...
    Checking file, keep power on and wait please ...
    The upgrade version is lower than or the same as the rboot version.
    Upgrade main(or uboot/rboot) finish.
    Success (or upgrade nothing due to version is same).
```

Wait a few minutes before the installation process is completed. When **Success** is displayed, it indicates that the installation process is successfully completed.

Step 5 Press **Ctrl+Z** to go back to the Rboot menu, then type **2** to reboot the switch.

```
====== Rboot Menu (Ctrl+Z to upper level) ======
    TOP menu items.
**************************************************
    0. Tftp utilities.
    1. X/Y/ZModem utilities.
    2. Run main.
    3. SetMac utilities.
    4. Scattered utilities.
**************************************************
Press a key to run the command: 2

[  811.880655] reboot: Restarting system
```

Then the device reboots and comes up running the new network operating system.

Users need to enter the username and password after the system restarts, the initial login username is admin and password is pica8. Then users will be asked to set a new password for admin. This is the only

post installation step after which the PicOS® operating system can be used.

7.4 Installing PicOS® for FS S3410 Series Switches

PicOS® system can be installed under the Uboot menu through TFTP protocol for FS S3410 Series switches. The following steps describe the installation procedure.

Step 1 Power off and on to force restarting the switch, then press **Ctrl+C** to enter Uboot menu.

Step 2 Enter **0** and then **1** in the Uboot menu to perform the installation process.

```
Press Ctrl+C to enter Boot Menu
Net:   eth-0
Entering simple UI....


====== BootLoader Menu("Ctrl+Z" to upper level) ======
    TOP menu items.
***********************************************
    0. Tftp utilities.
    1. XModem utilities.
    2. Run main.
    3. SetMac utilities.
    4. Scattered utilities.
    5. Set Module Serial
***********************************************
Press a key to run the command: 0

====== BootLoader Menu("Ctrl+Z" to upper level) ======
    Tftp utilities.
***********************************************
    0. Upgrade bootloader.
    1. Upgrade kernel and rootfs by install package.
    2. Upgrade factory and main by install package.
    3. Down to memory and jump to run.
***********************************************
Press a key to run the command: 1
```

Step 3 Use TFTP protocol to download the installation files, and then install PicOS®.

a) Configure the TFTP parameters. **Local IP** is the management interface IP of the switch, **Remote IP** is the IP of the TFTP server, **Filename** is the installation image directory and name located on the TFTP server.

```
Plz enter the Local IP:[10.10.51.99]:
Plz enter the Remote IP:[10.10.50.16]
Plz enter the Filename:[s3410-main1.bin]: s3410-main2.bin
Plz enter the Local GatewayIP:[10.10.51.1]:
Plz enter the Local IP Netmask:[255.255.255.0]:
Erasing Nand...
Erasing at 0x4e0000 -- 100% complete.
Writing to Nand... #done
Auto-update from TFTP: trying update file 's3410-main2.bin'
Using eth-0 device
TFTP from server 10.10.50.16; our IP address is 10.10.51.99; sending through gateway 10.10.51.1
Filename 's3410-main2.bin'.
Load address: 0x82000000
Loading: ###################################################################
```

b) After downloaded the installation image successfully, you need to input **Y** manually, then the system will automatically start system installation process.

c) Wait a few minutes before the installation process is completed. When **Success** is displayed, it indicates that the installation process is successfully completed.

Step 4 Press **Ctrl+Z** to go back to the Uboot menu, then type **2** to reboot the switch.

```
====== BootLoader Menu("Ctrl+Z" to upper level) ======
    TOP menu items.
**********************************************
    0. Tftp utilities.
    1. XModem utilities.
    2. Run main.
    3. SetMac utilities.
    4. Scattered utilities.
    5. Set Module Serial
**********************************************
Press a key to run the command: 2
```

Then the device reboots and comes up running the new network operating system.

Users need to enter the username and password after the system restarts, the initial login username is admin and password is pica8. Then users will be asked to set a new password for admin. This is the only post installation step after which the PicOS® operating system can be used.