为什么vManage无法在设备上安装安全应用容器？

目录

简介

本文档介绍在设备模板中使用安全策略时安全应用容器安装的问题，以及如何解决此问题。

问题

用户无法将设备模板与安全策略连接，安全策略要求在vManage上安装安全应用容器并出现此错误：

```
Failed to install 1/1 Security App container (app-hosting-UTD-Snort-Feature-aarch64_be-
1.0.8_SV2.9.11.1_XE16.10). Failed to enabled iox: null
05 Apr 2019 11:46:09 AM IST
[5-Apr-2019 6:16:09 UTC] Total number of Security App containers to be installed: 1. Security
App containers to be installed are following: [app-hosting-UTD-Snort-Feature-aarch64_be-
1.0.8_SV2.9.11.1_XE16.10]
[5-Apr-2019 6:16:09 UTC] Started 1/1 Security app container (app-hosting-UTD-Snort-Feature-
aarch64_be-1.0.8_SV2.9.11.1_XE16.10) installation
[5-Apr-2019 6:16:10 UTC] Checking if iox is enabled on device
[5-Apr-2019 6:16:18 UTC] Failed to install 1/1 Security App container (app-hosting-UTD-Snort-
Feature-aarch64_be-1.0.8_SV2.9.11.1_XE16.10).
Failed to enabled iox: null
```

在vManage控制器上的/var/log/nms/vmanage-server.log上，可以看到以下错误：

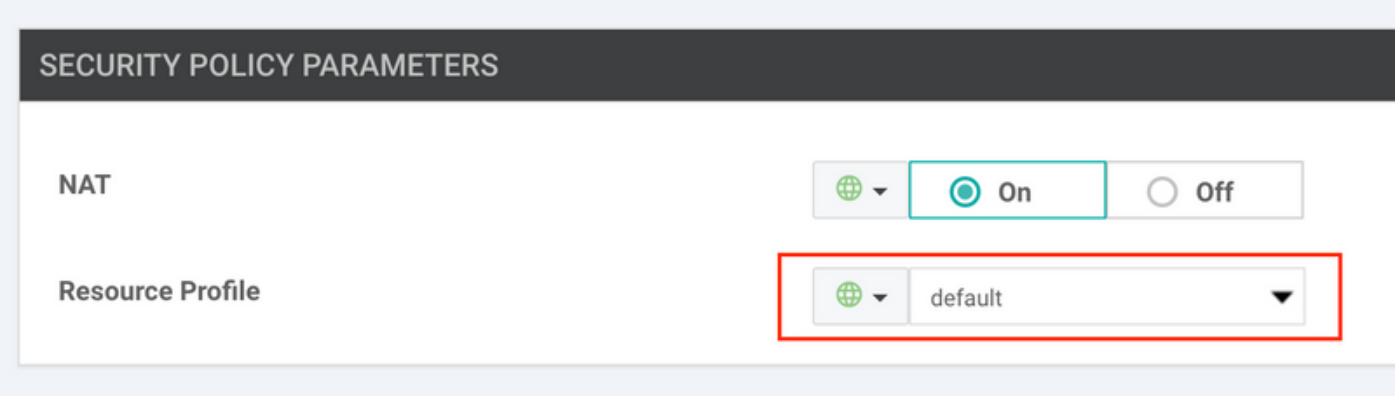
```
05-Apr-2019 08:41:54,488 UTC ERROR [vManage] [AppHostingTemplateProcessor] (device-action-
lxc_install-10) |default| Error while enabling iox on device-C1111X-8P-FGL230513Y0-1.1.1.1: rpc-
reply error: <rpc-reply xmlns="urn:ietf:params:xml:ns:netconf:base:1.0"
xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="5">
  <rpc-error>
    <error-type>application</error-type>
    <error-tag>invalid-value</error-tag>
    <error-severity>error</error-severity>
    <error-message unknown:lang="en">inconsistent value: Device refused one or more
commands</error-message>
    <error-info>
      <severity xmlns=" http://cisco.com/yang/cisco-ia">error_cli</severity>;
      <detail xmlns=" http://cisco.com/yang/cisco-ia">;
        <bad-cli>
          <bad-command>iox</bad-command>
          <error-location>1</error-location>
```

```
          <parser-response/>        </bad-cli>
      </detail>
    </error-info>
  </rpc-error>
</rpc-reply>

at com.tailf.jnc.NetconfSession.recv_rpc_reply_ok(Unknown Source) [JNC-1.2.jar:]
at com.tailf.jnc.NetconfSession.recv_rpc_reply_ok(Unknown Source) [JNC-1.2.jar:]
at com.tailf.jnc.NetconfSession.commit(Unknown Source) [JNC-1.2.jar:]
at
com.viptela.vmanage.server.device.common.NetConfClient.commitAndUnlock(NetConfClient.java:458)
[classes:]
at
com.viptela.vmanage.server.deviceaction.processor.config.AppHostingTemplateProcessor.checkAndEna
bleIox(AppHostingTemplateProcessor.java:358) [classes:]
at
com.viptela.vmanage.server.deviceaction.processor.config.AppHostingTemplateProcessor.preTemplate
PushCheck(AppHostingTemplateProcessor.java:173) [classes:]
at
com.viptela.vmanage.server.deviceaction.processor.service.lxc.LxcInstallActionProcessor$LxcInsta
llActionWorker.startMaintenanceDeviceActions(LxcInstallActionProcessor.java:340) [classes:]
at
com.viptela.vmanage.server.deviceaction.DefaultActionWorker.startDeviceAction(DefaultActionWorke
r.java:82) [classes:]
at
com.viptela.vmanage.server.deviceaction.AbstractActionWorker.call(AbstractActionWorker.java:117)
[classes:]
at
com.viptela.vmanage.server.deviceaction.AbstractActionWorker.call(AbstractActionWorker.java:35)
[classes:]
at java.util.concurrent.FutureTask.run(FutureTask.java:266) [rt.jar:1.8.0_162]
at java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1149)
[rt.jar:1.8.0_162]
at java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:624)
[rt.jar:1.8.0_162]
at java.lang.Thread.run(Thread.java:748) [rt.jar:1.8.0_162]

05-Apr-2019 08:41:54,496 UTC ERROR [vManage] [LxcInstallActionProcessor] (device-action-
lxc_install-10) |default| On device C1111X-8P-FGL230513Y0-1.1.1.1, Failed to install 1/1
Security App container (app-hosting-UTD-Snort-Feature-aarch64_be-1.0.8_SV2.9.11.1_XE16.10).
Failed to enabled iox: null
05-Apr-2019 08:41:54,524 UTC INFO  [vManage] [DeviceActionStatusDAO] (device-action-lxc_install-
10) |default| End task lxc_install
05-Apr-2019 08:41:54,533 UTC INFO  [vManage] [DeviceActionStatusDAO] (device-action-lxc_install-
10) |default| Publish client event: ACTIVITY
05-Apr-2019 08:41:54,533 UTC INFO  [vManage] [DeviceActionStatusDAO] (device-action-lxc_install-
10) |default| Publish client event: DEVICE_ACTION
```

如上所示，有些信息不甚详细的消息“Failed to enabled iox:在两个输出中均显示“null”，这有时意味着内存量不足以用于连接到设备的所选安全应用托管配置文件。

解决方案

由于怀疑存在安全应用托管配置文件导致的内存问题，因此会检查该配置文件，然后发现使用了默认配置文件。



与已知在设**备内**存不足时会导致故障的高配置相比。

下一步，检查了设备本身的内存消耗，发现带有8Gb RAM的C1111X路由器只有约1Gb的可用内存(请注**意Free**):

```
cEdge10#show memory platform
  Virtual memory    : 11512180736
  Pages resident    : 730200
  Major page faults: 2501
  Minor page faults: 114581800

  Architecture      : aarch64_be
  Memory (kB)
    Physical        : 3758804
    Total           : 3758804
    Used            : 2620884
    Free            : 1137920
    Active          : 2191472
    Inactive        : 807536
    Inact-dirty     : 0
    Inact-clean     : 0
    Dirty           : 0
    AnonPages       : 1473636
    Bounce          : 0
    Cached          : 1212660
    Commit Limit    : 1813864
    Committed As    : 3224504
    High Total      : 0
    High Free       : 0
    Low Total       : 3758804
    Low Free        : 1137920
    Mapped          : 416524
    NFS Unstable    : 0
    Page Tables     : 17160
    Slab            : 170624
    Writeback       : 0

  Swap (kB)
    Total           : 0
    Used            : 0
    Free            : 0
    Cached          : 0

  Buffers (kB)      : 312844

  Load Average
    1-Min           : 0.60
    5-Min           : 0.66
```

```
    15-Min         : 0.86
```

同时，从show version输**出中**，确认设备有8Gb的RAM(注意物**理内存**):

```
cisco C1111X-8P (1RU) processor with 1453914K/6147K bytes of memory.
Processor board ID FGL230513Y0
1 Virtual Ethernet interface
10 Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
8388608K bytes of physical memory.
6336511K bytes of flash memory at bootflash:.
```

内存不足是无法安装安全应用容器的原因，因此ROMmon版本被检查，因为IOS-XE SD-WAN支持的平台存在最低的ROMmon要求。此版本在设备上找到：

```
cEdge10#show platform | b Firmware
Slot      CPLD Version        Firmware Version
--------- ------------------- ---------------------------------------
0         17100501            16.8(1r)
R0        17100501            16.8(1r)
F0        17100501            16.8(1r)
```

当您运行16.10.2软件时，根据发行说明，ROMmon最低要求版本为16.9(1r)，因此ROMmon已升级，并且已再次检查空闲内存：

```
cEdge10#sh memory platform
  Virtual memory   : 11516805120
  Pages resident   : 708276
  Major page faults: 2303
  Minor page faults: 1705306

  Architecture     : aarch64_be
  Memory (kB)
    Physical       : 8143440
    Total          : 8143440
    Used           : 2571908
    Free           : 5571532
    Active         : 2213868
    Inactive       : 1128140
    Inact-dirty    : 0
    Inact-clean    : 0
    Dirty          : 8
    AnonPages      : 1410328
    Bounce         : 0
    Cached         : 1619664
    Commit Limit   : 4006184
    Committed As   : 3136948
    High Total     : 0
    High Free      : 0
    Low Total      : 8143440
    Low Free       : 5571532
    Mapped         : 397692
    NFS Unstable   : 0
    Page Tables    : 17216
    Slab           : 158776
    Writeback      : 0
```

从上述输出中，请注意空闲和物理内存（相应大于5Gb和8Gb）。

此安全应用容器安装再次触发后，设备模板已分离并再次连接，并且显示有关成功安装的消息：

```
%IOSXE-5-PLATFORM: R0/0: VCONFD_NOTIFIER: Install status: cc761b3b-cb3b-4070-81de-9b842fd68b27
download-start. Message Downloading http://10.10.10.100:8080/software/package/lxc/app-
hosting_UTD-Snort-Feature-x86_64_1.0.8_SV2.9.11.1_XE16.10_secapp-
ucmk9.16.10.2.1.0.8_SV2.9.11.1_XE16.10.x86_64.tar?deviceId=10.10.10.10
%Cisco-SDWAN-cEdge10-action_notifier-6-INFO-1400002: R0/0: VCONFD_NOTIFIER: Notification:
4/5/2019 09:54:4 system-software-install-status severity-level:minor host-name:cEdge10 system-
ip:10.10.10.10 status:download-start install-id:cc761b3b-cb3b-4070-81de-9b842fd68b27
message:Downloading http://10.10.10.100:8080/software/package/lxc/app-hosting_UTD-Snort-Feature-
x86_64_1.0.8_SV2.9.11.1_XE16.10_secapp-
ucmk9.16.10.2.1.0.8_SV2.9.11.1_XE16.10.x86_64.tar?deviceId=10.10.10.10
%IOSXE-5-PLATFORM: R0/0: VCONFD_NOTIFIER: Install status: cc761b3b-cb3b-4070-81de-9b842fd68b27
download-complete. Message Downloaded app image to /bootflash/.UTD_IMAGES/app-hosting_UTD-Snort-
Feature-x86_64_1.0.8_SV2.9.11.1_XE16.10_secapp-ucmk9.16.10.2.1.0.8_SV2.9.11.1_XE16.10.x86_64.tar
%Cisco-SDWAN-cEdge10-action_notifier-6-INFO-1400002: R0/0: VCONFD_NOTIFIER: Notification:
4/5/2019 09:54:5 system-software-install-status severity-level:minor host-name:cEdge10 system-
ip:10.10.10.10 status:download-complete install-id:cc761b3b-cb3b-4070-81de-9b842fd68b27
message:Downloaded app image to /bootflash/.UTD_IMAGES/app-hosting_UTD-Snort-Feature-
x86_64_1.0.8_SV2.9.11.1_XE16.10_secapp-ucmk9.16.10.2.1.0.8_SV2.9.11.1_XE16.10.x86_64.tar
%IOSXE-5-PLATFORM: R0/0: VCONFD_NOTIFIER: Install status: 9fd36cd6-f601-4fac-a5b0-1a36f06ba18a
verification-complete. Message NOOP
%Cisco-SDWAN-cEdge10-action_notifier-6-INFO-1400002: R0/0: VCONFD_NOTIFIER: Notification:
4/5/2019 9:54:5 system-software-install-status severity-level:minor host-name:cEdge10 system-
ip:10.10.10.10 status:verification-complete install-id:cc761b3b-cb3b-4070-81de-9b842fd68b27
message:NOOP
%VMAN-5-PACKAGE_SIGNING_LEVEL_ON_INSTALL: R0/0: vman: Package 'iox-
utd_1.0.8_SV2.9.11.1_XE16.10.tar' for service container 'utd' is 'Cisco signed', signing level
cached on original install is 'Cisco signed'
%VIRT_SERVICE-5-INSTALL_STATE: Successfully installed virtual service utd
%IOSXE-5-PLATFORM: R0/0: VCONFD_NOTIFIER: Install status: cc761b3b-cb3b-4070-81de-9b842fd68b27
install-start. Message Success, App state: DEPLOYED
%Cisco-SDWAN-cEdge10-action_notifier-6-INFO-1400002: R0/0: VCONFD_NOTIFIER: Notification:
4/5/2019 09:54:5 system-software-install-status severity-level:minor host-name:ISR-4331 system-
ip:10.10.10.10 status:install-start install-id:cc761b3b-cb3b-4070-81de-9b842fd68b27
message:Success, App state: DEPLOYED
```

从vManage端可以看到安装的成功：

```
[6-Apr-2019 12:38:13 CEST] Total number of Security App containers to be installed: 1. Security
App containers to be installed are following: [app-hosting-UTD-Snort-Feature-x86_64-
1.0.8_SV2.9.11.1_XE16.10]
[6-Apr-2019 12:38:13 CEST] Started 1/1 Security app container (app-hosting-UTD-Snort-Feature-
x86_64-1.0.8_SV2.9.11.1_XE16.10) installation
[6-Apr-2019 12:38:14 CEST] Checking if iox is enabled on device
[6-Apr-2019 12:38:17 CEST] Waiting for iox to be enabled on device
[6-Apr-2019 12:40:05 CEST] iox enable
[6-Apr-2019 12:40:05 CEST] Iox enabled on device
[6-Apr-2019 12:40:11 CEST] Security App container image: app-hosting_UTD-Snort-Feature-
x86_64_1.0.8_SV2.9.11.1_XE16.10_secapp-ucmk9.16.10.2.1.0.8_SV2.9.11.1_XE16.10.x86_64.tar
[6-Apr-2019 12:40:19 CEST] Connection Instance: 0, Color: biz-internet
[6-Apr-2019 12:40:19 CEST] Downloading http://10.10.10.100:8080/software/package/lxc/app-
hosting_UTD-Snort-Feature-x86_64_1.0.8_SV2.9.11.1_XE16.10_secapp-
ucmk9.16.10.2.1.0.8_SV2.9.11.1_XE16.10.x86_64.tar?deviceId=10.10.10.10
[6-Apr-2019 12:56:45 CEST] Downloaded app image to /bootflash/.UTD_IMAGES/app-hosting_UTD-Snort-
Feature-x86_64_1.0.8_SV2.9.11.1_XE16.10_secapp-ucmk9.16.10.2.1.0.8_SV2.9.11.1_XE16.10.x86_64.tar
[6-Apr-2019 12:56:48 CEST]
[6-Apr-2019 12:57:19 CEST] Success, App state: DEPLOYED
[6-Apr-2019 12:57:27 CEST] utd installed successfully
Current state is deployed

[6-Apr-2019 12:57:27 CEST] app-hosting-UTD-Snort-Feature-x86_64 installed in DEPLOYED state
[6-Apr-2019 12:57:27 CEST] Finished 1/1 Security app container (app-hosting-UTD-Snort-Feature-
x86_64-1.0.8_SV2.9.11.1_XE16.10) installation
```

参考

- https://sdwan-docs.cisco.com/Product_Documentation/vManage_Help/Release_18.4/Security/Configuring_SD-WAN_Security/Configuring_the_Security_Virtual_Image_for_IPS%2F%2FIDS_and_URL_Filtering
- https://sdwan-docs.cisco.com/Product_Documentation/Software_Features/Release_18.4/Release_Notes/Release_Notes_for_IOS_XE_SD-WAN_Release_16.10_and_SD-WAN_Release_18.4#ROMmon_Requirements_Matrix