

# ISR 4000系列路由器上的ISR-WAAS安装指南

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## 简介

本文档介绍思科集成多业务路由器(ISR)上Cisco ISR-WAAS的安装指南。它是在Cisco ISR上实施虚拟广域应用服务(vWAAS)。

ISR-WAAS部署在IOS-XE容器内。此情景中的容器是指在Cisco ISR 4000系列路由器上运行虚拟化应用程序的虚拟机监控程序。

## ISR-WAAS安装必备条件

每个WAAS软件版本可能具有不同的资源要求(内存、CPU和固态硬盘(SSD))，如果您不满足要求，则可能导致性能问题，甚至在安装过程中出错。

请通过以下链接查看配置指南：

<https://www.cisco.com/c/en/us/support/routers/virtual-wide-area-application-services-vwaas/products-installation-and-configuration-guides-list.html>

下表汇总了每种ISR型号的资源需求和支持的ISR平台。

ISR-WAAS Model	CPUs	Memory	Disk Storage	Supported ISR Platform
ISR-WAAS-200 (for WAAS 5.x and 6.2.1)	1	3 GB	151 GB	ISR-4321
ISR-WAAS-200 (for WAAS 6.2.3x and later)	1	4 GB	151 GB	ISR-4321
ISR-WAAS-750	2	4 GB	151 GB	ISR-4351, ISR-4331, ISR-4431, ISR-4451
ISR-WAAS-1300	4	6 GB	151 GB	ISR-4431, ISR-4451
ISR-WAAS-2500	6	8 GB	338 GB	ISR-4451

# NIM-SSD和ISR-SSD的区别

## NIM-SSD

NIM-SSD是位于ISR外部且可热插拔的ISR。

```
NAME: "NIM subslot 0/3", DESCR: "NIM SSD Module"  
PID: NIM-SSD , VID: V01, SN: F0C1915299D
```

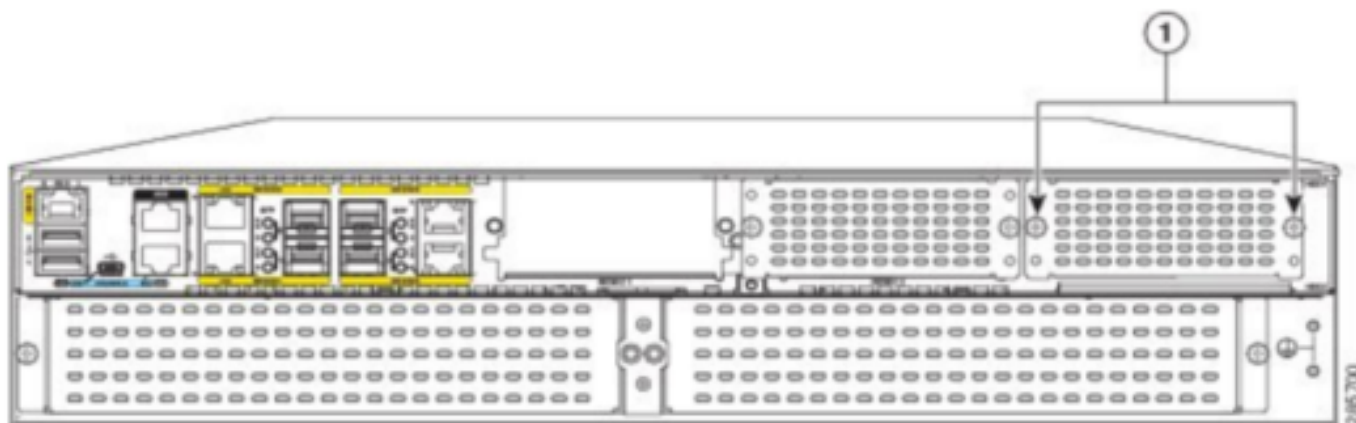
这是安装在ISR路由器的一个可用网络接口模块(NIM)中的模块。

以下是NIM-SSD和SSD的产品标识符(PID)，可用于提高RMA:

NIM-SSD(=)NIM Carrier Card for SSD drives  
SSD-SATA-200G(=)200 GB, SATA Solid State Disk for NIM-SSD

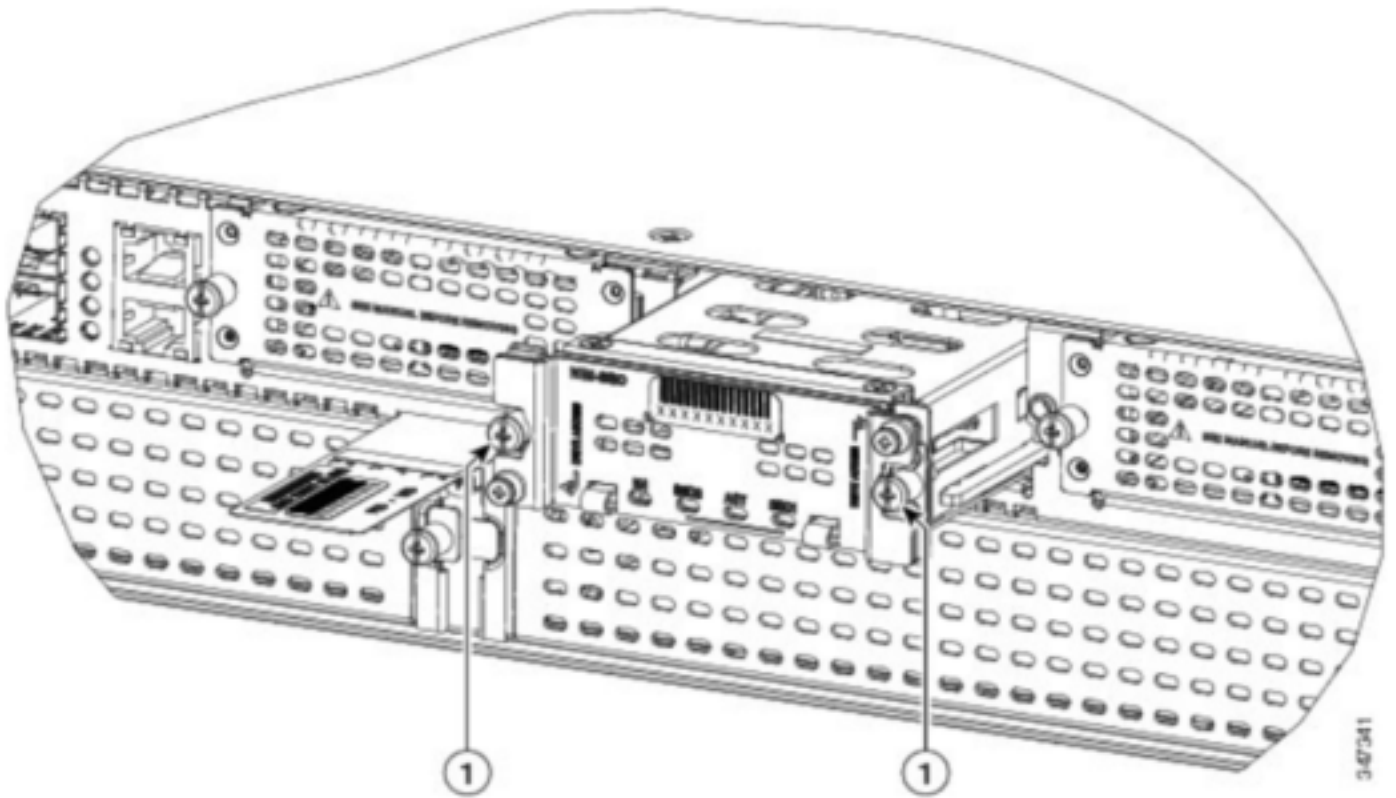
要从路由器中移除NIM-SSD或NIM-HDD，请执行以下步骤：

步骤1.使用十字螺丝刀拧松两侧的紧固螺钉，如下图所示：



1 Captive screws holding the NIM-SSD to the router

步骤2.从路由中删除NIM-SSD或NIM-HDD，如下图所示：



1 Captive screws holding the NIM-SSD to the router

## ISR-SSD

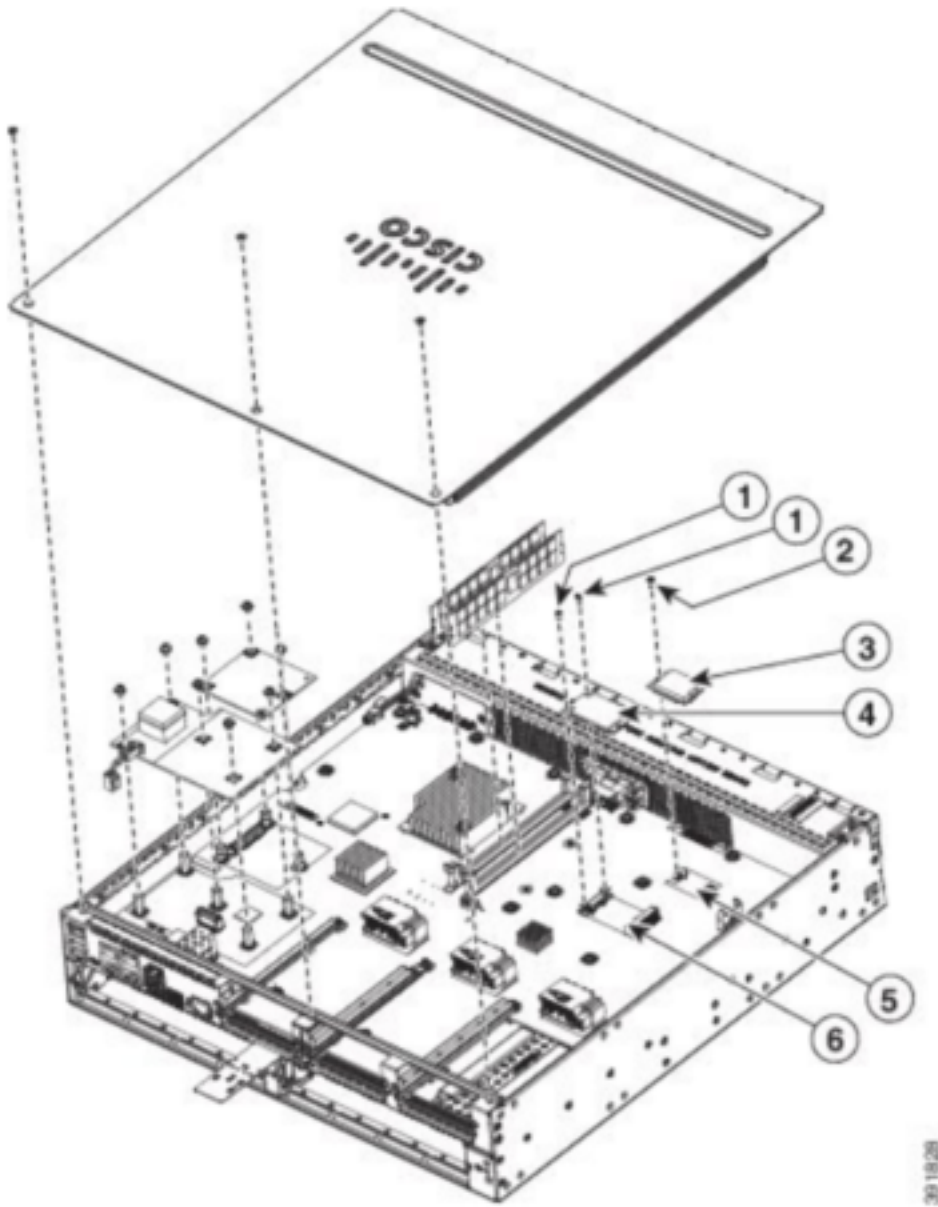
另一方面，ISR-SSD安装在路由器机箱内，您需要关闭路由器电源，打开其盖以定位ISR-SSD。

ISR-SSD不可热插拔。

这是ISR 4300系列上ISR-SSD的PID，可用于提高RMA:

SSD-MSATA-200G(=)200 GB, mSATA Solid State Disk

下图显示闪存卡和SSD mSATA存储设备位置：



1	Supplied screw	2	Supplied screw
3	Flash memory card	4	SSD mSATA storage device
5	Flash memory card connector	6	SSD mSATA connector

## ISR-WAAS安装

满足ISR-WAAS安装的所有要求后，下一步是下载要部署的ISR-WAAS版本的开放式虚拟化设备(OVA)文件。您可以从以下链接下载软件：

<https://software.cisco.com/download/home/280484571/type/280836712>

下载软件后，您需要将文件传输到路由器的bootflash:

```

BR1-ISR4451#dir bootflash: | in .ova
81929  -rw-      986142720   Feb 1 2016 18:21:13 +12:00  ISR-WAAS-5.5.5a.9.ova
540682 -rw-      1057904640  May 10 2018 16:55:58 +11:00  ISR-WAAS-6.4.1a.6.ova
147457 -rw-      1002700800  Aug 20 2018 16:27:43 +11:00  ISR-WAAS-6.2.3e.45.ova
278534 -rw-      1009551360  Aug 8 2018 17:56:57 +11:00  ISR-WAAS-6.2.3d.68.ova
BR1-ISR4451#

```

在路由器CLI上，请按照以下步骤使用EZConfig程序部署ISR-WAAS:

1. 运行Service WAAS enable命令。
2. 为要部署的WAAS版本选择之前传输的.ova映像。
3. 选择要部署的WAAS配置文件。
4. 配置ISR-WAAS IP地址。
5. 配置WAAS中央管理器IP地址。

```

BR1-ISR4451#service waas enable
*****
**** Entering WAAS service interactive mode. ****
**** You will be asked a series of questions, and your answers ****
**** will be used to modify this device's configuration to ****
**** enable a WAAS Service on this router. ****
*****
Continue? [y]: y
At any time: ? for help, CTRL-C to exit.
Select a WAAS image to install:
1. bootflash:/ISR-WAAS-5.5.5a.9.ova
2. bootflash:/ISR-WAAS-6.4.1a.6.ova
3. bootflash:/ISR-WAAS-6.2.3e.45.ova
4. bootflash:/ISR-WAAS-6.2.3d.68.ova
5. Enter your own image
Select option [3]: 3
Extracting profiles from bootflash:/ISR-WAAS-6.2.3e.45.ova, this may take a couple of minutes ...
These are the available profiles
1. ISR-WAAS-2500
2. ISR-WAAS-1300
3. ISR-WAAS-750
Select option [1]: 3
An internal IP interface and subnet is required to deploy a WAAS service on this router.
This internal subnet must contain two usable IP addresses that can route and communicate with the WAAS Central Manager (WCM).
The following ip address type supported for ISR-WAAS
1) ipv4
2) ipv6
Select ip address type (1 or 2):1
Enter the IPV4 address to be configured on the WAAS service: 10.66.86.44
The following ip address type supported for Host on Router
1) ipv4
2) ipv6
Select ip address type (1 or 2):1
The following ip address type for WCM
1) ipv4
2) ipv6
Select ip address type (1 or 2):1
Enter the IP address of the WAAS Central Manager (WCM): 10.66.86.106

```

6. 在要启用WAAS拦截的路由器上选择广域网(WAN)接口。
7. 完成后保存配置。这是成功安装的映像。

```

*****
** Configuration Summary: **
*****
a) WAAS Image and Profile Size:
  bootflash:/ISR-WAAS-6.2.3e.45.ova (1002700800) bytes
  ISR-WAAS-750

b) Router IP/mask:
  Using ip unnumbered from interface GigabitEthernet0/0/2

  WAAS Service IP:
  10.66.86.44

c) WAAS Central Manager:
  10.66.86.106

d) Router WAN Interfaces:
  GigabitEthernet0/0/0

Choose one of the letter from 'a-d' to edit, 'v' to view config script, 's' to apply config [s]: s
The configuration will be applied and the status of the WAAS service will be displayed after deployment

Installing bootflash:/ISR-WAAS-6.2.3e.45.ova

Installing!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!

% Activating virtual-service 'AUTOWAAS', this might take a few minutes. Use 'show virtual-service list' for progress.

System is attempting to deploy and activate WAAS image, this may take up to 10 minutes
activating!!!!!!!!!!

Waiting for WAAS application to be at a stage to accept WCM IP configuration.

Waiting!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
management services enabled

WAAS service activated!
Note:Please issue "copy running-config startup-config" command to save changes!

```

## 排除ISR-WAAS故障

### WAAS安装失败场景

如果没有SSD，ISR-WAAS安装将失败，因此，首先检查SSD是否存在。

```

GigabitEthernet0/1/0 unassigned YES unset down down
GigabitEthernet0/1/1 unassigned YES unset down down
GigabitEthernet0/1/2 unassigned YES unset down down
GigabitEthernet0/1/3 unassigned YES unset down down
ucse1/0/0 10.66.86.34 YES unset administratively down down
ucse1/0/1 unassigned YES NVRAM administratively down down
GigabitEthernet0 unassigned YES NVRAM administratively down down
Dialer0 unassigned YES unset up up
Dialer1 unassigned YES unset up up
Loopback200 unassigned YES unset up up
Tunnel0 10.66.86.61 YES unset up up
VirtualPortGroup31 10.66.86.41 YES unset down down
Vlan1 unassigned YES NVRAM administratively down down
Enter a WAN interface to enable WAAS interception (blank to skip) []: GigabitEthernet0/0/0
Enter additional WAN interface (blank to finish) []:
*****
** Configuration Summary: **
*****
a) WAAS Image and Profile Size:
  bootflash:/ISR-WAAS-6.2.3e.45.ova (1002700800) bytes
  ISR-WAAS-750

b) Router IP/mask:
  Using ip unnumbered from interface GigabitEthernet0/0/2
  WAAS Service IP:
  10.66.86.44

c) WAAS Central Manager:
  10.66.86.106

d) Router WAN Interfaces:
  GigabitEthernet0/0/0

Choose one of the letter from 'a-d' to edit, 'v' to view config script, 's' to apply config [s]: s
The configuration will be applied and the status of the WAAS service will be displayed after deployment
installation failure decision to exit
R01-ISR4451#

```

## ISR-WAAS激活失败场景

在某些情况下，在更换路由器并将SSD安装到新机箱后，ISR-WAAS将无法激活。

在ISR路由器上可以看到以下错误：

```
09/16 11:44:08.946 [vman]: [31298]: (note): VM (AUTOWAAS) State Transition: next_state:
LIFECYCLE_DEACTIVATE

09/16 11:44:17.613 [vman]: [31298]: (ERR): Loading of machine definition (/vol/harddisk/virtual-
instance/AUTOWAAS/ISR4331X.xml) failed

09/16 11:44:17.613 [vman]: [31298]: (ERR): Failed to load machine definition

09/16 11:44:17.613 [vman]: [31298]: (note): Setting failure response (1)

09/16 11:44:17.613 [vman]: [31298]: (ERR): Virtual Service failure
log[AUTOWAAS]::Validation::Package validation::Failed to process package-def file::File
'/vol/harddisk/virtual-instance/AUTOWAAS/ISR4331X.xml'

09/16 11:44:17.613 [errmsg]: [31298]: (ERR): %VMAN-3-PROCESS_PKG_DEF: Virtual
Service[AUTOWAAS]::Validation::Package validation::Failed to process package-def file::File
'/vol/harddisk/virtual-instance/AUTOWAAS/ISR4331X.xml'

09/16 11:44:17.613 [vman]: [31298]: (note): VM (AUTOWAAS) State Transition: next_state:
LIFECYCLE_WAIT_ACTIVATE

09/16 11:44:17.613 [vman]: [31298]: (note): IF MTU message received:

09/16 11:44:17.613 [vman]: [31298]: (ERR): Invalid bridge ID or the bridge(31) has not been
created yet

09/16 11:44:17.614 [vman]: [31298]: (ERR): Failed to set DP IF mtu for DP bridge 31

09/16 11:44:17.614 [vman]: [31298]: (note): vman IF MTU message processed

09/16 11:44:24.725 [vman]: [31298]: (note): Get local RP location rp/0/0

09/16 11:44:27.758 [vman]: [31298]: (note): Get local RP location rp/0/0

09/16 11:44:27.759 [vman]: [31298]: (note): Get local RP location rp/0/0

09/16 11:44:27.772 [vman]: [31298]: (note): Get local RP location rp/0/0

09/16 11:44:27.779 [vman]: [31298]: (note): Get local RP location rp/0/0

09/16 11:44:27.779 [vman]: [31298]: (note): Successfully removed VM init ctx for VM [AUTOWAAS]

09/16 11:44:27.780 [vman]: [31298]: (note): Per-VM message marshalled successfully into
persistent DB

09/16 11:44:27.780 [vman]: [31298]: (note): Successfully reset per-VM mac address binding into
TDL msg

09/16 11:44:28.063 [vman]: [31298]: (ERR): vman_libvirt_err: code=1

09/16 11:44:28.063 [vman]: [31298]: (ERR): internal error '/usr/sbin/lvremove -f
/dev/lvm_raid/vdc.AUTOWAAS' exited with non-zero status 5 and signal 0: /dev/harddisk1: read
failed after 0 of 4096 at 21474770944: Input/output error

/dev/harddisk1: read failed after 0 of 4096 at 21474828288: Input/output error
```

```
/dev/harddisk1: read failed after 0 of 4096 at 0: Input/output error
/dev/harddisk1: read failed after 0 of 4096 at 4096: Input/output error
/dev/dm-1: read failed after 0 of 4096 at 4429119488: Input/output error
/dev/dm-1: read failed after 0 of 4096 at 4429176832: Input/output error
/dev/dm-1: read failed after 0 of 4096 at 0: Input/output error
/dev/dm-1: read failed after 0 of 4096 at 4096: Input/output error
/dev/dm-2: read failed after 0 of 4096 at 11072897024: Input/output error
/dev/dm-2: read failed after 0 of 4096 at 11072954368: Input/output error
/dev/dm-2: read failed after 0 of 4096 at 0: Input/output error
/dev/dm-2: read failed after 0 of 4096 at 4096: Input/output error
/dev/dm-3: read failed after 0 of 4096 at 1630

09/16 11:44:28.063 [vman]: [31298]: (ERR): Failed to delete volume vdc.AUTOWAAS in pool
virt_strg_pool_vg

09/16 11:44:28.241 [vman]: [31298]: (ERR): vman_libvirt_err: code=1

09/16 11:44:28.241 [vman]: [31298]: (ERR): internal error '/usr/sbin/lvremove -f
/dev/lvm_raid/vdb.AUTOWAAS' exited with non-zero status 5 and signal 0: /dev/harddisk1: read
failed after 0 of 4096 at 0: Input/output error

/dev/dm-1: read failed after 0 of 4096 at 0: Input/output error
/dev/dm-2: read failed after 0 of 4096 at 0: Input/output error
/dev/dm-3: read failed after 0 of 4096 at 0: Input/output error
/dev/harddisk1: read failed after 0 of 4096 at 21474770944: Input/output error
/dev/harddisk1: read failed after 0 of 4096 at 21474828288: Input/output error
/dev/harddisk1: read failed after 0 of 4096 at 4096: Input/output error
/dev/dm-1: read failed after 0 of 4096 at 4429119488: Input/output error
/dev/dm-1: read failed after 0 of 4096 at 4429176832: Input/output error
/dev/dm-1: read failed after 0 of 4096 at 4096: Input/output error
/dev/dm-2: read failed after 0 of 4096 at 11072897024: Input/output error
/dev/dm-2: read failed after 0 of 4096 at 11072954368: Input/output error
/dev/dm-2: read failed after 0 of 4096 at 4096: I

09/16 11:44:28.241 [vman]: [31298]: (ERR): Failed to delete volume vdb.AUTOWAAS in pool
virt_strg_pool_vg

09/16 11:44:28.418 [vman]: [31298]: (ERR): vman_libvirt_err: code=1

09/16 11:44:28.418 [vman]: [31298]: (ERR): internal error '/usr/sbin/lvremove -f
/dev/lvm_raid/vda.AUTOWAAS' exited with non-zero status 5 and signal 0: /dev/harddisk1: read
failed after 0 of 4096 at 0: Input/output error
```



```
/dev/dm-1: read failed after 0 of 4096 at 0: Input/output error
/dev/dm-2: read failed after 0 of 4096 at 0: Input/output error
/dev/dm-3: read failed after 0 of 4096 at 0: Input/output error
/dev/harddisk1: read failed after 0 of 4096 at 21474770944: Input/output error
/dev/harddisk1: read failed after 0 of 4096 at 21474828288: Input/output error
/dev/harddisk1: read failed after 0 of 4096 at 4096: Input/output error
/dev/dm-1: read failed after 0 of 4096 at 4429119488: Input/output error
/dev/dm-1: read failed after 0 of 4096 at 4429176832: Input/output error
/dev/dm-1: read failed after 0 of 4096 at 4096: Input/output error
/dev/dm-2: read failed after 0 of 4096 at 11072897024: Input/output error
/dev/dm-2: read failed after 0 of 4096 at 11072954368: Input/output error
/dev/dm-2: read failed after 0 of 4096 at 4096: I

09/16 11:44:28.418 [vman]: [31298]: (ERR): Failed to delete volume vda.AUTOWAAS in pool
virt_strg_pool_vg

09/16 11:44:28.420 [vman]: [31298]: (note): Found orphaned volume(vda.AUTOWAAS) in
pool(virt_strg_pool_vg). Deleting...
```

硬盘可能已损坏，可以采取以下操作：

```
# show platform hardware subslot <ssd subslot> module device filesystem
# request platform hardware filesystem harddisk: destroy
# hw-module subslot 0/5 reload
```

## SSD故障场景

在某些情况下，如果SSD出现故障，当您运行与硬盘和文件系统相关的命令时，您会看到这些错误。

```
"request platform hardware filesystem harddisk: destroy"
%This operation can take some time, please be patient
%Harddisk not present. Destroy filesystem aborted.
```

要解决此问题，您可以尝试以下步骤：

步骤1.尝试重新拔插SSD。

步骤2.重新启动路由器。

步骤3.如果这些步骤失败，只需RMA SSD。