

ISR 4000 هجوم ىلع ISR-WAAS تيبتت لىلد Series Router

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قم دمق مل

(ISR) ةلم اكتم ل تام دخال هجوم ىلع Cisco ISR-WAAS ل تيبتت لىلد دن تسم ل اءه ف صي هجوم ىلع (vWAAS) ةيره اءال ةع س اول اءا قىب ط ل تام دخال ذى فن ت ن ع ة ر ا ب ع وه Cisco ن Cisco ISR. ةم دم تام دخال

ءب ق ا ر م ج م ا ن ر ب ى ل ا ر ي ش ت ، ق ا ى س ل ا اءه ى ف ة ى و ا ح . IOS-XE ة ى و ا ح ل خ اء ISR-WAAS ر ش ن م ت ى Cisco ة ل س ل س ل ن م ه ج و م ى ل ع ة ى ض ا ر ت ف ا ل اءا ق ى ب ط ل ل ل غ ش ى ذ ل ا ة ى ض ا ر ت ف ا ل اءه ج ا ل ا ISR 4000.

قيساس ال ISR-WAAS تيبتت تاب لطم

ءءو و ة ر ك اء ل ا ة ف ل ت خ م ء ر ا و م ت ا ب ل ط م ى ل ع WAAS ج م ا ر ب ن م ر اء ص ل ك ى و ت ح ى ن ا ن ك م ى ف و ت س ت م ل اءا ، (SSD) ة ب ل ص ل اء ل اءا ى ف ص ا ر ق ا ل اءا ك ر ح م و (CPU) ة ى ز ك ر م ل اء ل اء م ل اءا تيبتت ل اءا نءا اءاطخ اءو د ح ى ت ح و اءا ل اءا ى ف ل ك ا ش م ءو د ح ى ل ل ك ل ذ ى ءو ى ء ق ف ، ت ا ب ل ط م ل اءا

ط ا ب ت ر ا ل ا اءه ى ل ع ن ى و ك ت ل ل ل ى ل ء ء ع ج ا ر م ى ج ر ى :

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

ISR. ز ا ر ط ل ك ل قيساس ال ISR ةم ظن اء م ء ء و ء ر ا و م ل اءا ب ل ط م ل وء ج ل اءه ص خ ل ى

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

ISR-SSD و NIM-SSD نېب قرفال

ماظن NIM-SSD

ليغشتال فاقې نود هليدبت نكمي و ISR جراخ عقي يذال زارطل NIM-SSD دعې

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

قحاتملا (NIM) كبلشلا هجاول قيطم نل تادحول نم قداو يف اهتيتبت متي قيطمن قداو هذو ISR تاهجومل

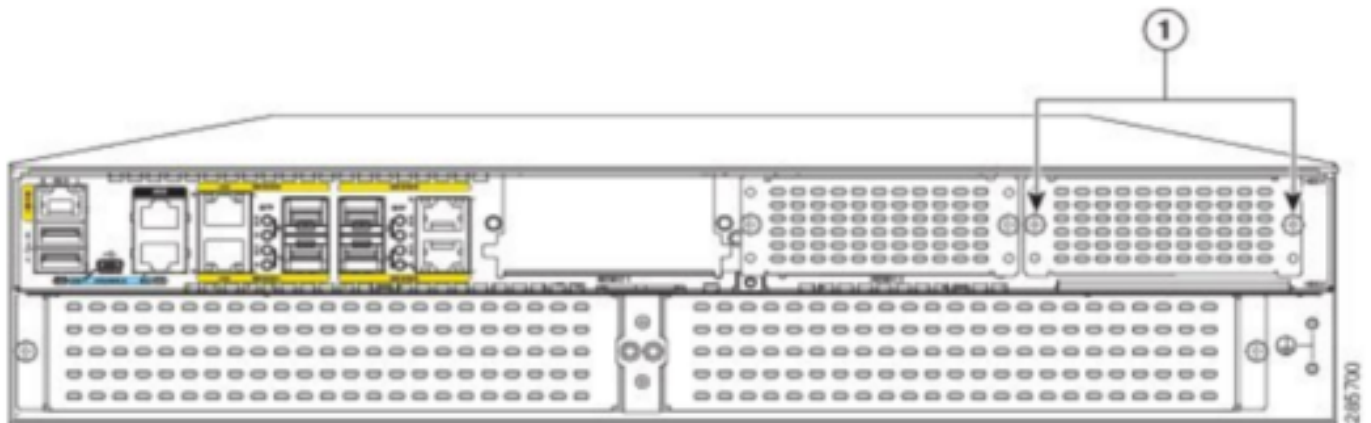
RMA: عفرل اهمادختسا نكمي يتال SSD و NIM-SSD ل (PIDs) تاجت نمل تافرم يه هذو

NIM-SSD(=)NIM Carrier Card for SSD drives

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

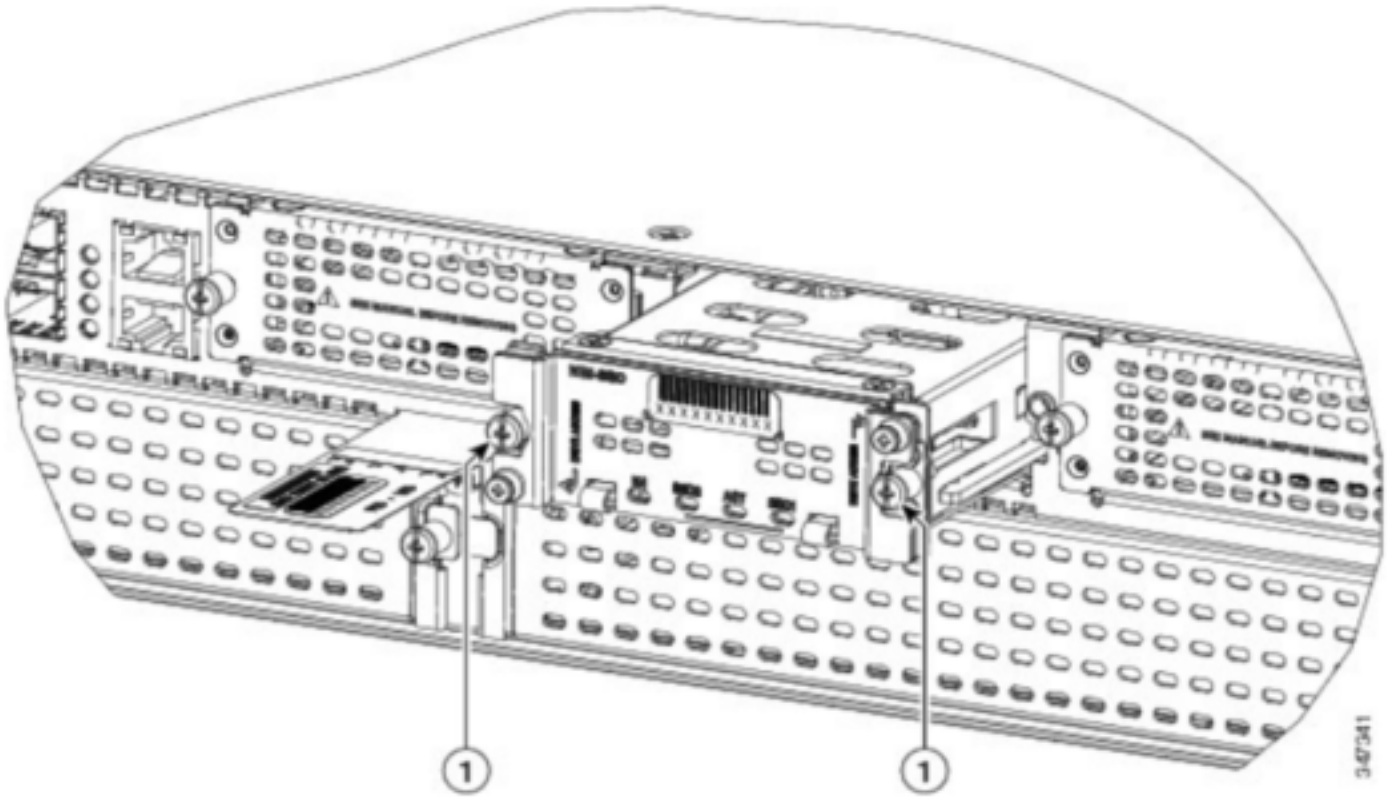
قيلالتا توطخل عبتا، هجومل نم NIM-HDD و NIM-SSD قلازال

وه امك، نېب نجال نم ياىل قريساأل ريماسملا فيفختل Phillips قفم مدختسا 1. قوطخل قروصل هذو في حضورم:



1 Captive screws holding the NIM-SSD to the router

ةروصولا هذه يف حضورم وه امك ،راسملا نم NIM-HDD أو NIM-SSD ةلازاب مق 2. ةوطخلا



1 Captive screws holding the NIM-SSD to the router

ISR-SSD

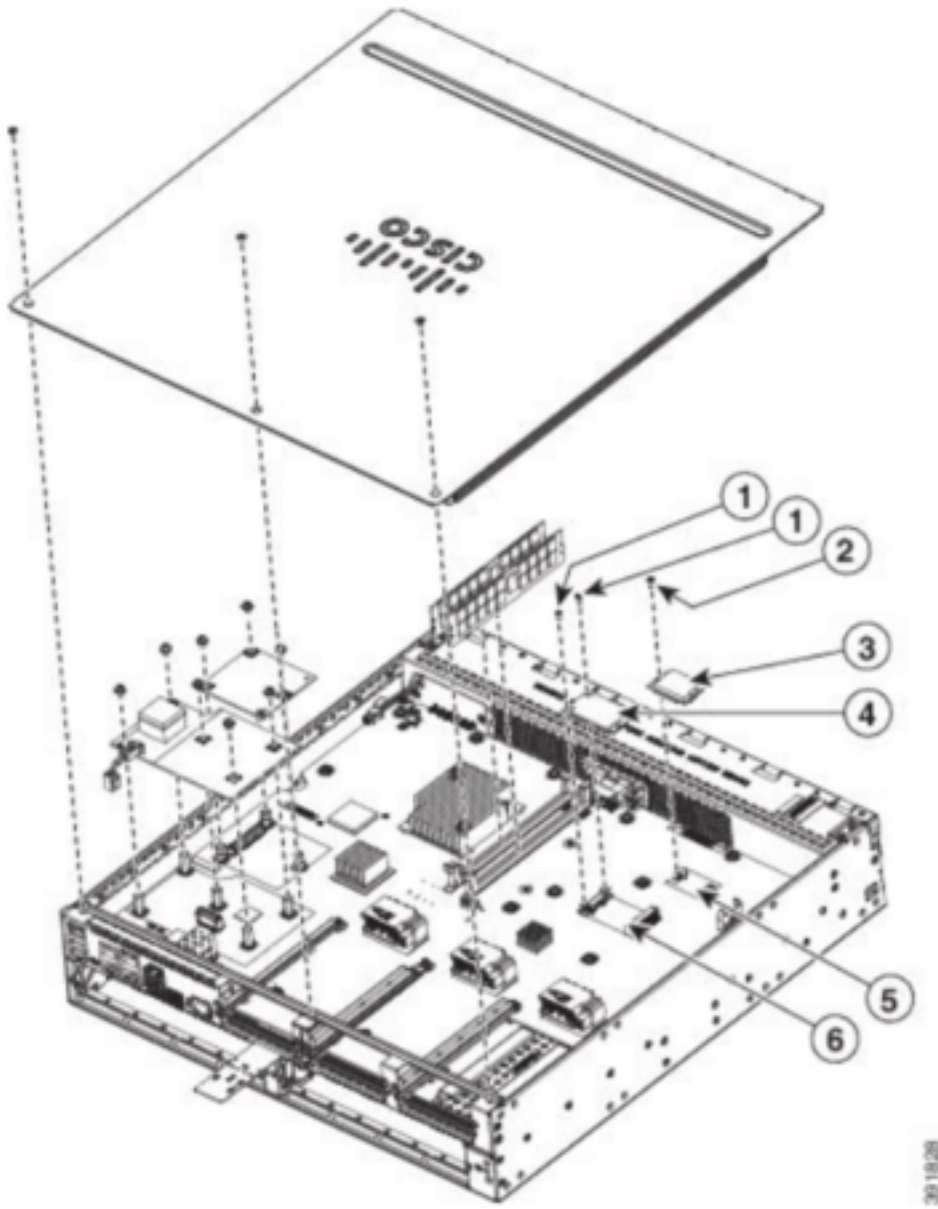
لئغشت فاقيا لىل جاتحت امك ،هجوملا لكه لخد ISR-SSD تئبثت متي ،رخال باناجلا لىلعو ISR-SSD عقوم ديدحتل هءاطغ حتفو هجوملا

لئغشتلا فاقيا نود ISR-SSD لئدبت نكمي ال

RMA: عفري نأ تلمعتسا تنك عئطتسي نأ ISR 4300 sery لىل ISR-SSD لىل PID اذه

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

SSD mSATA : نئزخت زاهجو (ةتقؤملا ةركاذلا) Flash ةركاذ ةقابط عقاوم ةروصولا هذه رهظت



30 18 28

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 تېبىت

ليزنىت ي ف ة لالتال ة وطلال لثمتت ، ISR-WAAS تېبىت تابلطتم عي مج ءا فيتسا درجم ب ي ف ب غرت ي ذل ISR-WAAS رادصا ب صاخال (OVA) "حتوفم ل ة يضارت فالال ة اكاحم ل زا هج" فلم طابترالال اذه نم جم انرب ليزنت كنكم ي . هرشن :

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

: هجوملل ديهمتال ة ركاذى لى فلمال لقن لى لجاتحت ، جم انربال ليزنت درجم ب

```

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#

```

مادختساب ISR-WAAS رشن لة يلاتال تاوطخال عابتا يجرى، هجومال رم اوأ رطس ة هجاو ىل ع EZConfig جمانرب:

1. service WAAS enable رمأل لىغشتب مق .
2. هرشن ي ف ب غرت يذلا WAAS رادصل اقبسم اهلقن مت ي تال ova . ةروص ددح .
3. هرشن ديرت يذلا WAAS فيرعت فلم ددح .
4. IP ISR-WAAS ناوع نيوكتب مق .
5. WAAS ل يزكرمال ري دملاب صاخال IP ناوع نيوكتب مق .

```

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. WAAS ضارعا نيكم ت ديرت شيح هجومال ىل ع (WAN) ةعساو لا ةكبشلا ة هجاو ددح .
7. حجائل تي بثتلا نم ةروصلال يه هذه .ءاهتالال دعب نيوكتلا ظفحب مق .

```

*****
** 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!

```

اهحالص او ISR-WAAS ءاطخأ فاشكتسا

WAAS تيبتت لشف ويرانس

SSD دوچو نم الوأ ققحت كلذل، SSD دوچو مل اذا ISR-WAAS تيبتت لشف.

```

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-TCR4451#

```

ISR-WAAS طيشنت لشف ويرانس

هجوم لادبتسإ دعب طيشنت لشف يرانس، تاهو ويرانس لاضعب يديجل لكيله لشف (SSD) ةبلصل لال لشف صارق لال كرحم تيبثتو.

ISR : هجوم لعلء اطخال هذه ةيؤرنكمي

```
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...

ةيالات تاءارجإل اذاتإ نكمي و افلات تباثل صرقلل نوئي نأ نكمملا نم

```
# show platform hardware subslot <ssd subslot> module device filesystem
```

```
# request platform hardware filesystem harddisk: destroy
```

```
# hw-module subslot 0/5 reload
```

SSD لشف ويرانيس

ةقلعتملا رماوألل ليغشتب موقت امدنعف، ةححص ريغ SSD ةركاذ تناك اذا، تالاحل ضعب ي فءاطخال هذه يرتس، تافللملا ماظنون تباثل صرقلل اب

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

ةيالات تاوطخال ةبجت كنكمي، اهلحل

ةبلصلل ةتباثل صارقألل كرحم عيب ةداعإ لواح 1. ةوطخال

هجوملا ديمت دعأ 2. ةوطخال

ةركاذب دوزملا صارقالا كرحم نييعة ةداعإ وس كيلع امف ، تاوطخلا هذه تلشف اذا . 3 ةوطخلا
(SSD) ةبلص تانوكم نم ةعونصم

ةمچرتل هذه ل و ح

ةلأل تاي نقتل ن مة و مچم مادخت ساب دن تسم ل ا اذ ه Cisco ت مچرت
م ل ا ل ا اء ن ا ع مچ ي ف ن م دخت س م ل ل م عد و ت ح م م ي دقت ل ل ي ر ش ب ل و
ا م ك ة ق ي ق د ن و ك ت ن ل ل ة ل ا ة مچرت ل ل ض ف ا ن ا ة ظ ح ا ل م ي ج ر ي . ة ص ا خ ل ا م ه ت غ ل ب
Cisco ي ل خ ت . ف ر ت ح م مچرت م ا ه م د ق ي ي ت ل ا ة ي ف ا ر ت ح ا ل ا ة مچرت ل ل ع م ل ا ح ل ا و ه
ل ا ا م اء ا د ع و ج ر ل ا ب ي ص و ت و ت ا مچرت ل ل ه ذ ه ة ق د ن ع ا ه ت ي ل و ئ س م Cisco
Systems (ر ف و ت م ط ب ا ر ل ا) ي ل ص ا ل ا ي ز ي ل ج ن ا ل ا دن ت س م ل ا