Troubleshoot DSP (PVDM) Issue on Voice Gateway

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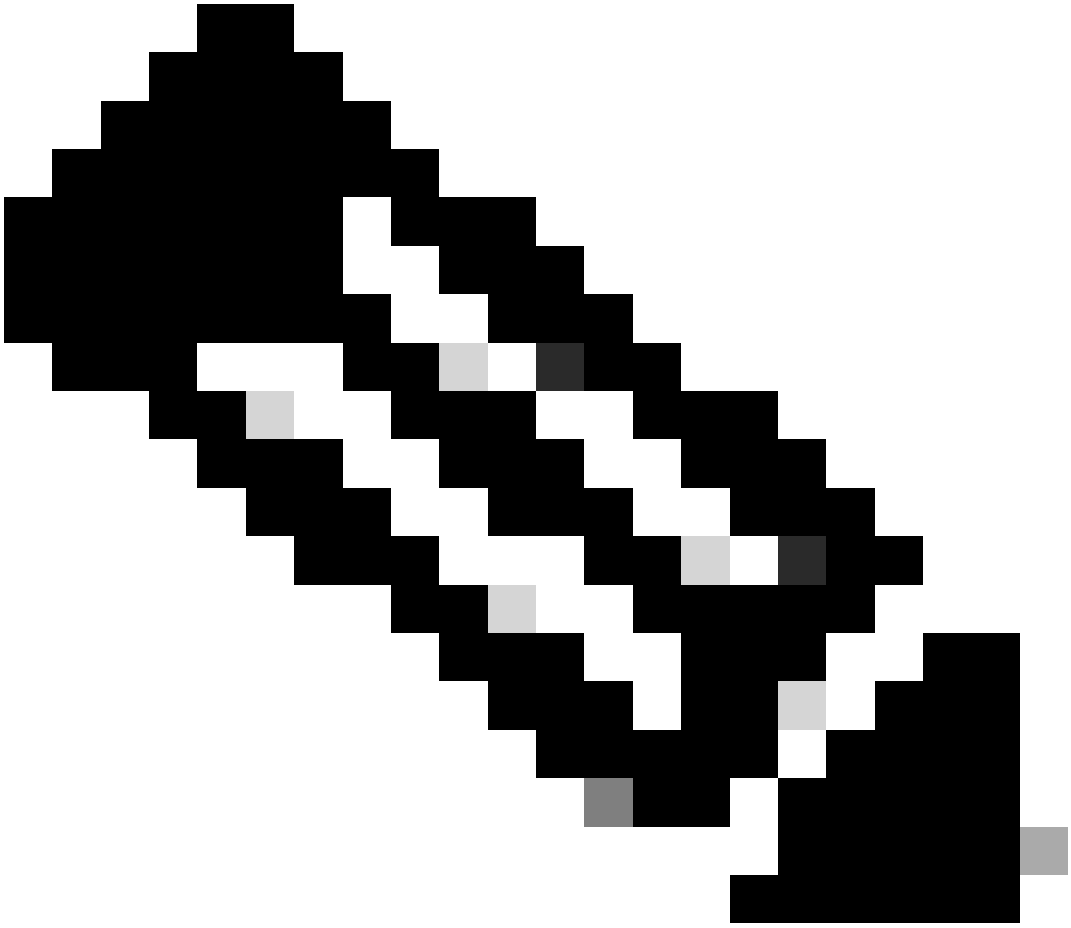
Introduction

This document describes solutions to common PVDM Card issues and provides methods to determine whether the issue is hardware-related or not.

Troubleshoot

Types of Packet Voice Digital Signal Processor Modules (PVDMs)

Supported Cisco Routers	Type of PVDM
28xx,38xx	PVDM2
29xx,39xx	PVDM2 and PVDM3
ISR 4Ks	PVDM4 and SM-X
C8300	PVDM4 , NIM-PVDM and SM-X



Note: PVDMs can be installed on the motherboard for ISR G1 and ISR G2.

For ISR 4K, PVDM can be installed on the motherboard and NIM slots.

For C8300, PVDM can be installed on NIM slots.

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1. **Show voice dsp group** all is the first command that everyone uses to check the state of a Digital Signal Processor (DSP).
2. **UP** is a good state.
3. **FAIL** and **APP_DOWNLOADING** are the bad states which one must be concerned about.

DSP is not in **UP** State.

1. Collect the output of the **show voice dsp group all** command.

```
A[redacted]1A01#sh voice dsp group all
DSP groups on slot 0/2 slot id 2
dsp 1:
  State: APP_DNLDING, firmware: 0.0.0
  Max signal/voice channel: 64/64
  Max credits: 960, Voice credits: 960, Video credits: 0
  num_of_sig_chnls_allocated: 16
  Transcoding channels allocated: 0
  Group: FLEX_GROUP_VOICE, complexity: FLEX
    Shared credits: 960, reserved credits: 0
    Signaling channels allocated: 16
    Voice channels allocated: 0
    Credits used (rounded-up): 0
  Slot: 0/2
  Device idx: 0
  Dsp Type: SP2700
```

```
DSP groups on slot 0/3 slot id 3
dsp 1:
  State: UP, firmware: 47.2.3
  Max signal/voice channel: 8/8
  Max credits: 120, Voice credits: 120, Video credits: 0
  num_of_sig_chnls_allocated: 6
  Transcoding channels allocated: 0
  Group: FLEX_GROUP_VOICE, complexity: FLEX
    Shared credits: 120, reserved credits: 0
    Signaling channels allocated: 6
    Voice channels allocated: 0
    Credits used (rounded-up): 0
  Slot: 0/3
  Device idx: 0
  Dsp Type: DM8147
```

2. A soft reset can be performed if DSPs are in a bad state. Enter the **test dsp device <slot> <dsp-id> reset** command for ISR **G1(28xx, 38xx)** and **G2(29xx, 39xx)**. For ISR **4Ks**, use **hw-module subslot x/y reload**.

```
AR[redacted]1#hw-module subslot 0/2 reload
```

3. Check the PVDM slot from the inventory by applying the command **Show inventory**.

If the **show inventory** output shows this information, it signifies that the **PVDM card** is installed on the **motherboard**.

NAME: "PVDM subslot 0/4", DESCR: "PVDM4-32 Voice DSP Module"

PID: PVDM4-32 , VID: V02, SN: FOC13YYXXAVD

Once the **PVDM card** is placed on the **NIM**, the show inventory command indicates:

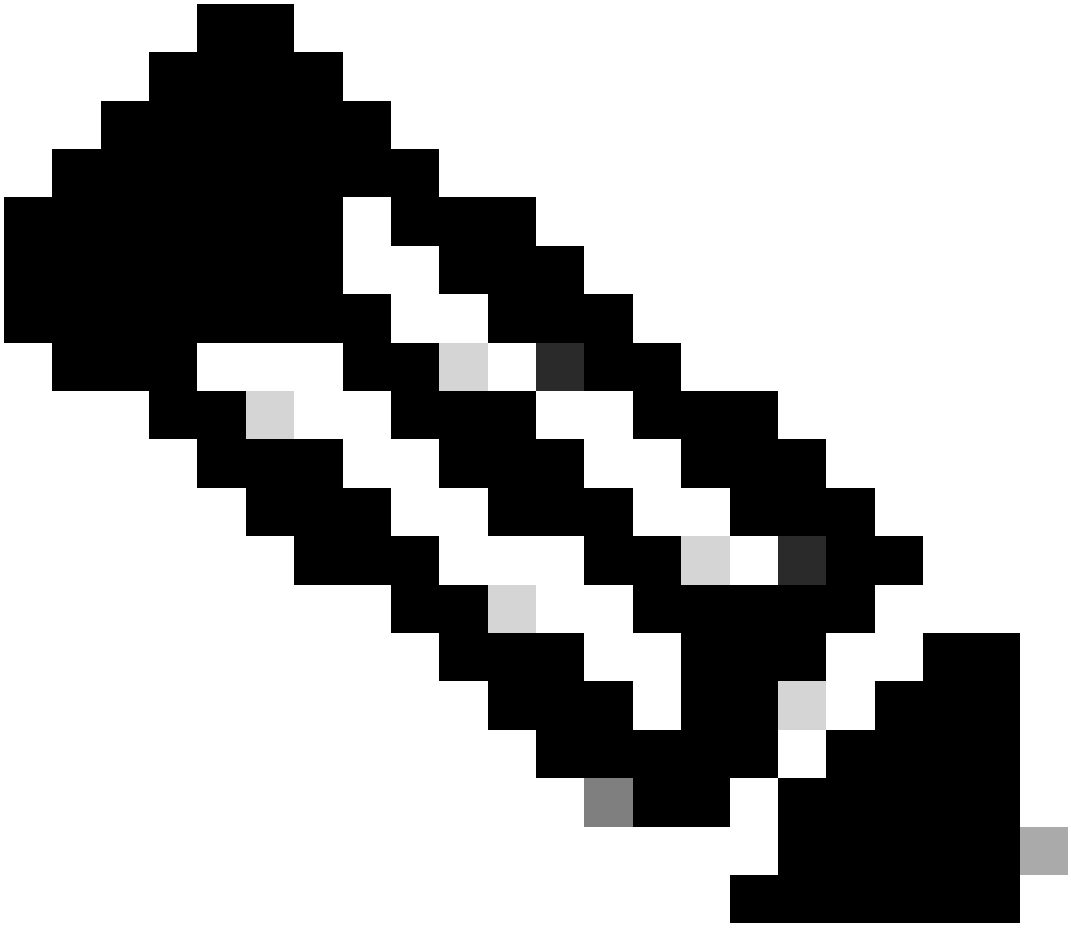
NAME: "subslot 0/1 **db module 0**", DESCR: "PVDM4-128 Voice DSP Module"

PID: PVDM4-128 , VID: V01, SN: FOC1YYXXBLL

```
NAME: "subslot 0/2 db module 0", DESCR: "PVDM4-64 Voice DSP Module"
PID: PVDM4-64          , VID: V02  , SN: FOC2[redacted]4KXU
```

4. If the DSPs do not return to a UP state, RESEAT of PVDM card can be considered.

RESEAT means: Turning off the router, **unplug** the PVDM card, and **plug** it back in and then power on the router. It has to be done during **off-hours**.



Note: PVDM4 installed on NIM are hot swappable but the router must me shut down to insert or remove PVDM4 on the motherboard.

5. If one of the DSPs fails and cannot be recovered when you use any of these methods, enter the **test dsp device <slot#> <DSP_ID> remove (G1/G2)** and **hw-module subslot x/y stop (ISR 4K/8K)** commands in order to minimize the impact of DSPs that go into a DOWN state. This command will remove the particular DSP from participation and the router would not consider it for processing any calls or media resource activities.

Scenario: Suppose if you got DSP issue in Production hours. If you do not remove the particular subslot, call processed by those slot is affected. In order to avoid this it is removed from taking and making the calls, not processing them.

6. If the steps mentioned in this article do not resolve the issue, Return material authorize (**RMA**) any DSP that does not return to a UP state.