Troubleshooting OIR Events on 3600 Series Routers

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Introduction

Online Insertion and Removal (OIR) of network modules is not supported on Cisco 3620 and 3640 routers. A drop in output voltage from the power supply is reported as an OIR event. Such events on the 3620 and 3640 typically indicate a hardware problem. Although the 3660 does have (limited) support for OIR, spurious OIR events that occur without the physical insertion or removal of a network module can also indicate a problem with the hardware.

This document explains how to troubleshoot these OIR events.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

The information in this document is based on the software and hardware versions below.

- Cisco 3600 Series Router
- All Cisco IOS® software versions

The information presented in this document was created from devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If you are working in a live network, ensure that you understand the potential impact of any command before using it.

Conventions

For more information on document conventions, see the Cisco Technical Tips Conventions.

Possible Causes

There are several possible causes for a spurious OIR event on 3600 hardware:

- A mis−seated network module
- A power supply problem
- A network module hardware failure
- A chassis slot/backplane failure

Troubleshooting

Try reseating the network modules. The 3600 series is very sensitive to misaligned module/backplane connections. If reseating the modules has no effect, and if the problem is not related to a flaky power supply or power supply/mainboard connection, the information reported in the OIR interrupt message:

```
%OIRINT: OIR Event has occurred oir_ctrl 5000 oir_stat F02
```

may help you to narrow down the cause of the interrupt. This can reduce or eliminate the downtime associated with removing or swapping modules in an effort to isolate the problem module or slot.

In the above message, we're interested in the oir_stat value. The oir_stat is defined in the source code as a 16−bit value in the 3600 mainboard register structure. oir_stat values are interpreted using the following definitions from the source code:

```
/*
 * Port Module OIR status register bits
 */
#define PM0_SIG_VLD  0x0001
#define PM1_SIG_VLD  0x0002
#define PM2_SIG_VLD  0x0004
#define PM3_SIG_VLD  0x0008
#define PM0_5V_PCI   0x0010
#define PM1_5V_PCI   0x0020
#define PM2_5V_PCI   0x0040
#define PM3_5V_PCI   0x0080
#define PM0_33V_PCI  0x0100
#define PM1_33V_PCI  0x0200
#define PM2_33V_PCI  0x0400
#define PM3_33V_PCI  0x0800
#define PM0_INST     0x1000
#define PM1_INST     0x2000
#define PM2_INST     0x4000
#define PM3_INST     0x8000
```

In other words, the 16 bits of oir_stat are divided into four nibbles (4−bit quantities). Each nibble corresponds to one type of status information (module installed, 5V PCI, 33V PCI, module signal valid). Each bit within each nibble indicates the status for each module slot: bits 0, 1, 2, and 3 (counting from the right) correspond to slots 0, 1, 2, and 3 on the router. (Only bit positions for slots 0 and 1 are relevant on the 3620). In the example %OIRINT message above, the oir_stat is reported as F02, that is, the hex value 0x0F02. Converting to binary, you get:

```
INST  P33V   P5V    SIG_VLD
  0000  1111   0000   0010
     0     F      0      2
```

We're mainly interested in the INST and SIG_VLD indications. The INST bits indicate whether the router thinks a module is installed in the associated slot: A "0" bit means installed, a "1" bit means not installed. The

SIG_VLD bits indicate whether the associated module is "installed and online". A " 0" bit means yes (signal is valid), and a "1" bit means no. From the source code, you see:

```
/*
  * the signals valid bit settles last, so this is the safest bit
  * to check
  * 0 means the PM is present and valid; 1 if not present
  */
```

So, oir_stat = 0x0F02 indicates that the router thinks all four slots have modules installed, but that the signal for the module in slot 1 is not valid. In this case, it would be a good idea to investigate the module in slot 1 or the slot itself as a possible problem cause.

Notes on the Cisco 3660

The information above applies to the Cisco 3620 and 3640 routers. Because the 3660 has two additional slots, the OIR status is reported a bit differently:

```
%OIRINT: oir_ctrl (hex value) oir_status: low = (hex value) high = (hex value)
```

The "low" value indicates the status for slots 1−4 (as with the 3640), and the "high" value indicates the status for slots 5−6.

Power Supply Problem

Power supplies may fail completely at one time, or they may degenerate over time. When a power supply fails completely, the symptom and solution is clear. A degenerating power supply on the 3620 and 3640 may be observed by the following error message:

```
%OIRINT: OIR Event has occurred oir_ctrl 10 oir_stat CFCC
```

OIR is *not* supported on the 3620 and 3640 routers, but this error message is an indicator of a power supply voltage drop. If you encounter this message, followed by a router reload, you should contact your Cisco partner or reseller to request a replacement for the hardware component that is causing the issue. If you have a support service agreement directly with Cisco, use the TAC Service Request Tool (registered customers only) to create a TAC service request for a hardware replacement.

Related Information

- **Hardware Troubleshooting for the Cisco 3600 Series Router**
- **Cisco 3600 Series Router Product Support Pages**
- **Technical Support − Cisco Systems**

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