

XID Errors

Release 620

NVIDIA Corporation

Nov 11, 2026

Contents

1 Introduction **3**
1.1 What is an Xid Message . . . 3
1.2 What is an SXid Message . . . 3
1.3 How to Use Xid Messages . . . 3

2 Working with Xid Errors **5**
2.1 Viewing Xid Messages . . . 5
2.2 Tools that Provide Additional Information about Xid Errors . . . 5
2.3 Analyzing Xid Errors . . . 6

3 Analyzing Xid Errors with the Xid Catalog **7**
3.1 Step 1: Determine Xid Code . . . 70
3.2 Step 2: Review Xid Classification from the Xid Catalog . . . 70
3.3 Step 3: Determine Data Center and Investigatory Actions . . . 70
3.4 Step 4: Determine Resolution Steps . . . 71

4 Notices **73**
4.1 Trademarks . . . 74

This document explains what Xid messages are, and is intended to assist system administrators, developers, and FAEs in understanding the meaning behind these messages as an aid in analyzing and resolving GPU-related problems.

Chapter 1. Introduction

1.1. What is an Xid Message

The Xid message is an error report from the NVIDIA driver that is printed to the operating system's kernel log or event log. Xid messages indicate that a general GPU error occurred, most often due to the driver programming the GPU incorrectly or to corruption of the commands sent to the GPU. The messages can be indicative of a hardware problem, an NVIDIA software problem, or a user application problem.

These messages provide diagnostic information that can be used by both users and NVIDIA to aid in debugging reported problems.

The meaning of each message is consistent across driver versions.

1.2. What is an SXid Message

NVIDIA drivers for NVSwitch report error conditions relating to NVSwitch hardware in kernel logs through a similar mechanism to Xids. These "Switch Xids," or SXids and guidelines for their usage are documented separately in the Fabric Manager User Guide.

Note

SXid messages apply only to Hopper and earlier generation GPUs.

1.3. How to Use Xid Messages

Xid messages are intended to be used as debugging guides. Because many problems can have multiple possible root causes, it's not always feasible to understand each issue from the Xid value alone.

For example, an Xid error might indicate that a user program tried to access invalid memory. But in theory, memory corruption due to PCIE or frame buffer ("FB") problems could corrupt any command and thus cause almost any error. Generally, the Xid classifications listed below should be used as a starting point for further investigation of each problem.

The GPU Debug Guidelines manual provides additional guidance for debugging GPU problems, including advice for interpreting Xids and provides guidance for next steps to handle common Xids.

Chapter 2. Working with Xid Errors

2.1. Viewing Xid Messages

Under Linux, the Xid error messages are logged in the kernel log buffer, and depending on Linux distribution these are typically logged to journal and flushed to files, such as `/var/log/messages` or `/var/log/syslog`.

Grep for "NVRM: Xid" to find all the Xid messages.

The following is an example of a Xid string:

```
[...] NVRM: GPU at 0000:03:00: GPU-b850f46d-d5ea-c752-ddf3-c4453e44d3f7
[...] NVRM: Xid (0000:03:00): 14, Channel 00000001
```

- The first Xid in the log file is preceded by a line that contains the GPU GUID and device IDs.

  In the above example:

  - "GPU-b850f46d-d5ea-c752-ddf3-c4453e44d3f7" is the GUID, a globally unique, immutable identifier for each GPU.
- Each subsequent Xid line contains the device ID, the Xid error, and information about the Xid.

  In the above example:

  - "0000:03:00" is the PCI Express bus, device, and function ID.
  - "14" is the Xid error identifier.
  - "Channel 00000001" is data specific to that Xid error.

2.2. Tools that Provide Additional Information about Xid Errors

NVIDIA provides three additional tools that may be helpful when dealing with Xid errors.

- **nvidia-smi** is a command-line program that installs with the NVIDIA driver. It reports basic monitoring and configuration data about each GPU in the system. `nvidia-smi` can list ECC error counts (Xid 48), indicate if a power cable is unplugged (Xid 54), or provide any applicable GPU Recovery Action (Xid 154), among other things. Please see the `nvidia-smi` main page for more information. Run `nvidia-smi -q` for basic output.

- **NVIDIA Data Center GPU Manager (DCGM)** is a suite of tools for managing and monitoring NVIDIA datacenter GPUs in cluster environments. It includes active health monitoring, comprehensive diagnostics, system alerts, and governance policies including power and clock management. DCGM diagnostics is a health checking tool that can check for basic GPU health, including the presence of ECC errors, PCIe problems, bandwidth issues, and general problems with running CUDA programs.

  DCGM is documented and downloadable at https://developer.nvidia.com/dcgm

- **nvidia-bug-report.sh** is a script that installs with the NVIDIA driver. It collects debug logs and command outputs from the system, including kernel logs and logs collected by the NVIDIA driver itself. The command should be run as root:

  ```
  sudo nvidia-bug-report.sh
  ```

  The output of this tool is a single compressed text file, `nvidia-bug-report.log.gz`, that can be included when reporting problems to NVIDIA.

  `nvidia-bug-report.sh` will typically run quickly, but in rare cases may run slowly. Allow up to one hour for it to complete. If the command remains hung, run the command with additional arguments as:

  ```
  nvidia-bug-report.sh --safe-mode --extra-system-data
  ```

  This will collect alternative logs, in such a way that it should avoid common causes of hangs during debug collection.

2.3. Analyzing Xid Errors

The following table lists the recommended actions to take for various issues encountered.

Issue	Recommended Action
Suspected User Programming Issues	Run the debugger tools. Refer to the Compute Sanitizer "memcheck" tool and CUDA-GDB documentation.
Suspected Hardware Problems	Contact the hardware vendor. They can run through their hardware diagnostic process.
Suspected Driver Problems	File a bug with NVIDIA, including output of the command `nvidia-bug-report.sh`. Refer to the document GPU Debug Guidelines for guidance on gathering additional information to provide to NVIDIA and troubleshooting common Xid causes.

Chapter 3. Analyzing Xid Errors with the Xid Catalog

On Volta and older GPUs, see Xid and SXid Errors with the Xid Catalog for older GPUs.

For Ampere and newer GPUs (including PCIe form-factor GPUs), a catalog of possible Xid events is available in the graphs below. You can also download the spreadsheet below:

`Xid Catalog Reference`

Xids

Table 1: Xids

Type (XID)	Code	Mnemc	De-scrip-tion	Ap-plies to A100	Ap-plies to H100	Ap-plies to B100	Ap-plies to GB200	Reso-lution Bucket (Im-me-diate Ac-tion)	Reso-lution Bucket (In-ves-tiga-tory Ac-tion)	Xid 154 link-age	Trig-ger Con-di-tions
XID	1	RO-BUST_(	Un-used	NO	NO	NO	NO	CON-TACT_S			N/A; Un-used
XID	2	RO-BUST_(	Un-used	NO	NO	NO	NO	CON-TACT_S			N/A; Un-used
XID	3	RO-BUST_(	Un-used	NO	NO	NO	NO	CON-TACT_S			N/A; Un-used
XID	4	RO-BUST_(	Un-used	NO	NO	NO	NO	CON-TACT_S			N/A; Un-used

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	5	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	6	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	7	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	8	ROBUST_C	GPU stopped processing	YES	YES	YES	YES	RESTAR	CONTACT_S		
XID	9	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	10	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	11	ROBUST_C	Invalid or corrupted push buffer stream	YES	YES	YES	YES	RESTAR	CHECK		
XID	12	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	13	ROBUST_C / ROBUST_C	Graphics Engine Exception	YES	YES	YES	YES	RESTAR	WORKFLOW_		This event is logged for general user application faults. Typically this is an out-of-bounds error where the user has walked past the end of an array, but could also be an illegal instruction, illegal register, or other case. In rare cases, it's possible for a

Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	14	ROBUST_C	Unused	YES	YES	YES	YES	IGNORE	CONTACT_S		Fake or injected error from userspace
XID	15	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	16	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S	CONTACT_S		N/A; Unused
XID	17	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	18	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	19	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	20	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	21	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	22	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	23	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	24	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused

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Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	25	ROBUST_C	Invalid or illegal push buffer stream	YES	YES	YES	YES	RESTAR	CHECK		
XID	26	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	27	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	28	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	29	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	30	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused

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Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	31	ROBUST_	GPU memory page fault	YES	YES	YES	YES	RESTAR	WORKFLOW_		This event is logged when a fault is reported by the MMU, such as when an illegal address access is made by an applicable unit on the chip. Typically these are application-level bugs, but can also be driver bugs or hardware bugs. When this

Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	32	ROBUST_	Invalid or corrupted push buffer stream	YES	YES	YES	YES	RESTAR	CHECK		This event is logged when a fault is reported by the DMA controller which manages the communication stream between the NVIDIA driver and the GPU over the PCI-E bus. These failures primarily involve quality issues on PCI, and are gen-

Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	33	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	34	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	35	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	36	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	37	ROBUST_C	Driver firmwa error	YES	YES	YES	YES	IGNORE	CHECK		
XID	38	ROBUST_C	Driver firmwa error	YES	YES	YES	YES	IGNORE	CONTACT_S		
XID	39	ROBUST_C	Copy Engine Exception	YES	YES	YES	YES	RESTAR	CONTACT_S		
XID	40	ROBUST_C	Copy Engine Exception	YES	YES	YES	YES	RESTAR	CONTACT_S		
XID	41	ROBUST_C	Copy Engine Exception	YES	YES	YES	YES	RESTAR	CONTACT_S		

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	42	ROBUST_(	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	43	ROBUST_C	GPU stopped processing	YES	YES	YES	YES	IGNORE	CONTACT_S		This event is logged when a user application hits a software induced fault and must terminate. The GPU remains in a healthy state. In most cases, this is not indicative of a driver bug but rather a user application error.

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	44	ROBUST_(	Graphics Engine fault during context switch	YES	YES	YES	YES	IGNORE	CONTACT_S		

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	45	ROBUST_C	Preemptive cleanup due to previous errors – Most likely to see when running multiple cuda applications and hitting a DBE	YES	YES	YES	YES	WORKFLOW_	Solo: RESTAR Not Solo: IGNORE (follow other Xid)		This event is logged when the user application aborts and the kernel driver tears down the GPU application running on the GPU. Control-C, GPU resets, sigkill are all examples where the application is aborted and this event is created. In many cases,

Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	46	ROBUST_C	GPU stopped processing	YES	YES	YES	YES	RESET_GP	CONTACT_S		
XID	47	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	48	ROBUST_	Double Bit ECC Error	YES	YES	YES	YES	WORKFLOW_	WORKFLOW_	CUDA 12.7; GPU driver R565	This event is logged when the GPU detects that an uncorrectable error occurs on the GPU. This is also reported back to the user application. A GPU reset or node reboot is needed to clear this error. The tool nvidia-smi can provide a

Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	49	SILENT	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	50	SILENT	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	51	SILENT	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	52	SILENT	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	53	SILENT	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	54	SILENT	Auxiliary power is not connected to the GPU board	YES	YES	YES	NO	CHECK	CONTACT_S		
XID	55	SILENT	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	56	DISPLAY_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	57	FB_LIN	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	58	FB_MEI	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	59	PMU_E	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	60	ROBUST_(	Video processor exception	YES	YES	YES	YES	RESTAF	INVESTIGATE_S		
XID	61	PMU_B	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	62	PMU_H	Internal microcontrol halt (newer drivers)	YES	YES	YES	YES	RESET_GF	CONTACT_S	CUDA 12.7; GPU driver R565	

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Table 1 – continued from previous page

Type (XID)	Code	Mnemc	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	63	INFOROM	GPU memory remapping event	YES	YES	YES	YES	IGNORE	IGNORE	CUDA 12.7; GPU driver R565	These events are logged when the GPU handles ECC memory errors on the GPU. On GPUs that support row remapping, starting with NVIDIA® Ampere architecture GPUs, these events provide details on row remapper activity. For more

Table 1 – continued from previous page

Type (XID)	Code	Mnemc	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	64	INFOROM	GPU memory remapping failure	YES	YES	YES	YES	RESET_GF	CONTACT_S	CUDA 12.7; GPU driver R565	These events are logged when the GPU handles ECC memory errors on the GPU. On GPUs that support row remapping, starting with NVIDIA® Ampere architecture GPUs, these events provide details on row remapper activity. For more

Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	65	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	66	ROBUST_C	Illegal access by driver	YES	YES	YES	YES	IGNORE	INVESTIGATE_S		
XID	67	ROBUST_C	Illegal access by driver	YES	YES	YES	YES	IGNORE	CONTACT_S		
XID	68	ROBUST_C	NVDEC Exception	YES	YES	YES	YES	RESTAR	CONTACT_S		
XID	69	ROBUST_C	Graphics Engine class error	YES	YES	YES	YES	RESTAR	CHECK		
XID	70	ROBUST_C	CE3: Unknown Error	YES	YES	YES	YES	RESTAR	CONTACT_S		
XID	71	ROBUST_C	CE4: Unknown Error	YES	YES	YES	YES	RESTAR	CONTACT_S		
XID	72	ROBUST_C	CE5: Unknown Error	YES	YES	YES	YES	RESTAR	CONTACT_S		

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	73	ROBUST_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	74	NVLINK	NVLINK Error	YES	YES	NO	NO	WORKFLOW_I	CONTACT_S	CUDA 12.7; GPU driver R565	This event is logged when the GPU detects that a problem with a connection from the GPU to another GPU or NVSwitch over NVLink. A GPU reset or node reboot is needed to clear this error. This event may indicate a hardware failure with

Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	75	ROBUST_C	CE6: Unknown Error	YES	YES	YES	YES	RESTAR	CONTACT_S		
XID	76	ROBUST_C	CE7: Unknown Error	YES	YES	YES	YES	RESTAR	CONTACT_S		
XID	77	ROBUST_C	CE8: Unknown Error	YES	YES	YES	YES	RESTAR	CONTACT_S		
XID	78	VGPU_S	vGPU Start Error	YES	YES	YES	YES	UPDATE_S	UPDATE_S		

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	79	ROBUST_(	GPU has fallen off the bus	YES	YES	YES	YES	RESTAF	CONTACT_S	CUDA 12.7; GPU driver R565	This event is logged when the GPU driver attempts to access the GPU over its PCI Express connection and finds that the GPU is not accessible. This event is often caused by hardware failures on the PCI Express link caus-

Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	80	PB-DMA_P	Corrupted data sent to GPU	YES	YES	NO	NO	RESTAF	CHECK		
XID	81	RO-BUST_(	Unused	NO	NO	NO	NO	CON-TACT_S			N/A; Unused
XID	82	RO-BUST_(	NVJPG(Error	YES	YES	YES	YES	RESTAF	CON-TACT_S		
XID	83	RO-BUST_(	NVDEC Error	YES	YES	YES	YES	RESTAF	CON-TACT_S		
XID	84	RO-BUST_(	NVDEC Error	YES	YES	YES	YES	RESTAF	CON-TACT_S		
XID	85	RO-BUST_(	CE9: Unknown Error	YES	YES	YES	YES	RESTAF	CON-TACT_S		
XID	86	RO-BUST_(	OFA Exception	YES	YES	YES	YES	RESTAF	CON-TACT_S		
XID	87	NVTELE TRY_DF	Unused	NO	NO	NO	NO	CON-TACT_S			N/A; Unused
XID	88	RO-BUST_(	NVDEC Error	YES	YES	YES	YES	RESTAF	CON-TACT_S		
XID	89	RO-BUST_(	NVDEC Error	YES	YES	YES	YES	RESTAF	CON-TACT_S		
XID	90	LTC_ER	Unused	NO	NO	NO	NO	CON-TACT_S			N/A; Unused

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	91	RESERVE	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	92	EXCESSIVE_SI	High single-bit ECC error rate	YES	YES	YES	YES	IGNORE	CONTACT_S		

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	93	INFOROM	Non-fatal violation of provisioned InfoROM wear limit	YES	NO	NO	NO	IGNORE	CONTACT_S		This event is logged when the GPU driver fails to update the InfoROM due to violation of the provisioned InfoROM wear limit that was set for the GPU using NVFlash using nvflash –=elsessionstart. In most cases this is not indicative of a driver or flash

Table 1 – continued from previous page

Type (XID)	Code	Mnemc	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	94	ROBUST_C	Contained memory error	YES	YES	YES	YES	RESTAF	IGNORE (sympathetic)	CUDA 12.7; GPU driver R565	These events (94/95) are logged when GPU drivers handle errors in GPUs that support error containment, starting with NVIDIA A100 GPUs. For Xid 94, these errors are contained to one application, and the application that encountered this error

Table 1 – continued from previous page

Type (XID)	Code	Mnemc	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	95	ROBUST_(	Uncontained memory error	YES	YES	YES	YES	RESET_GF	IGNORE (sympathetic)	CUDA 12.7; GPU driver R565	These events (94/95) are logged when GPU drivers handle errors in GPUs that support error containment, starting with NVIDIA® A100 GPUs. For Xid 95, these errors affect multiple applications, and the affected GPU must be reset before ap-

Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	96	ROBUST_C	NVDEC Error	NO	YES	YES	YES	RESTAR	CONTACT_S		
XID	97	ROBUST_C	NVDEC Error	NO	YES	YES	YES	RESTAR	CONTACT_S		
XID	98	ROBUST_C	NVDEC Error	NO	YES	YES	YES	RESTAR	CONTACT_S		
XID	99	ROBUST_C	NVJPG Error	NO	YES	YES	YES	RESTAR	CONTACT_S		
XID	100	ROBUST_C	NVJPG2 Error	NO	YES	YES	YES	RESTAR	CONTACT_S		
XID	101	ROBUST_C	NVJPG3 Error	NO	YES	YES	YES	RESTAR	CONTACT_S		
XID	102	ROBUST_C	NVJPG4 Error	NO	YES	YES	YES	RESTAR	CONTACT_S		
XID	103	ROBUST_C	NVJPG5 Error	NO	YES	YES	YES	RESTAR	CONTACT_S		
XID	104	ROBUST_C	NVJPG6 Error	NO	YES	YES	YES	RESTAR	CONTACT_S		
XID	105	ROBUST_C	NVJPG7 Error	NO	YES	YES	YES	RESTAR	CONTACT_S		
XID	106	SMBPB	SMBPB Test Message	YES	YES	YES	YES	IGNORE	IGNORE		
XID	107	SMBPB	SMBPB Test Message Silent	YES	YES	YES	YES	IGNORE	IGNORE		
XID	108	NVLINK	Unused	YES	YES	YES	YES	IGNORE	XID_13		N/A; Unused

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Table 1 – continued from previous page

Type (XID)	Code	Mnemc	De-scrip-tion	Ap-plies to A100	Ap-plies to H100	Ap-plies to B100	Ap-plies to GB200	Reso-lution Bucket (Im-me-diate Ac-tion)	Reso-lution Bucket (In-ves-tiga-tory Ac-tion)	Xid 154 link-age	Trig-ger Con-di-tions
XID	109	RO-BUST_(	Con-text Switch Time-out Error	YES	YES	YES	YES	RE-SET_GF	CON-TACT_S	CUDA 12.7; GPU driver R570	

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	110	SEC_FA	Security Fault Error	NO	YES	YES	YES	RESET_GF	INVESTIGATE_S	CUDA 12.7; GPU driver R565	This event should be uncommon unless there is a hardware failure. To recover, revert any recent system hardware modifications and cold reset the system. If this fails to correct the issue, contact your hardware vendor for

Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	111	BUNDLE_EF	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	112	DISP_S	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	113	DP_LT_	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	114	HEAD_I	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	115	CORE_(	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	116	WINDOW_C	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	117	CURSOR_CI	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	118	HEAD_I	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	119	GSP_RF	GSP RPC Timeout	YES	YES	YES	YES	RESET_GF	INVESTIGATE_S		These events (119/120) may be logged when an error occurs in code running on the GSP core of the GPU and/or a timeout occurs while waiting for the GSP core of the GPU to respond to an RPC message. A GPU reset or node power cycle

Table 1 – continued from previous page

Type (XID)	Code	Mnemc	De-scrip-tion	Ap-plies to A100	Ap-plies to H100	Ap-plies to B100	Ap-plies to GB200	Reso-lution Bucket (Im-me-diate Ac-tion)	Reso-lution Bucket (In-ves-tiga-tory Ac-tion)	Xid 154 link-age	Trig-ger Con-di-tions
XID	120	GSP_EF	GSP Error	YES	YES	YES	YES	RE-SET_GF	IN-VES-TI-GATE_S	CUDA 12.7; GPU driver R565	These events (119/120) may be logged when an error oc-curs in code run-ning on the GSP core of the GPU and/or a time-out oc-curs while wait-ing for the GSP core of the GPU to re-spond to an RPC mes-sage. A GPU reset or node power cycle

Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	121	C2C_EF	C2C Error	NO	NO	NO	YES	IGNORE	CONTACT_S		This event may occur when the GPU driver has observed corrected errors on the C2C NVLink connection to a Grace CPU. These errors are corrected by the system and have no operational impact. Resetting the GPU at an available

Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	122	SPI_PM	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	123	SPI_PM	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	124	SPI_PM	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	125	INFOROM	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	126	ROBUST_C	CE10: Unknown Error	NO	NO	YES	YES	RESTAR	CONTACT_S		
XID	127	ROBUST_C	CE11: Unknown Error	NO	NO	YES	YES	RESTAR	CONTACT_S		
XID	128	ROBUST_C	CE12: Unknown Error	NO	NO	YES	YES	RESTAR	CONTACT_S		
XID	129	ROBUST_C	CE13: Unknown Error	NO	NO	YES	YES	RESTAR	CONTACT_S		
XID	130	ROBUST_C	CE14: Unknown Error	NO	NO	YES	YES	RESTAR	CONTACT_S		
XID	131	ROBUST_C	CE15: Unknown Error	NO	NO	YES	YES	RESTAR	CONTACT_S		

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	132	ROBUST_C	CE16: Unknown Error	NO	NO	YES	YES	RESTAR	CONTACT_S		
XID	133	ROBUST_C	CE17: Unknown Error	NO	NO	YES	YES	RESTAR	CONTACT_S		
XID	134	ROBUST_C	CE18: Unknown Error	NO	NO	YES	YES	RESTAR	CONTACT_S		
XID	135	ROBUST_C	CE19: Unknown Error	NO	NO	YES	YES	RESTAR	CONTACT_S		
XID	136	ALI_TRA	Link Training Failed	NO	YES	NO	NO	RESET_GP	INVESTIGATE_L	CUDA 12.7; GPU driver R565	

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	137	NVLINK	NVLink Privilege Error	YES	YES	YES	YES	IGNORE	XID_13		This event is logged when a fault is reported by the remote MMU, such as when an illegal NVLink peer-to-peer access is made by an applicable unit on the chip. Typically these are application-level bugs, but can also be driver bugs or hard-

Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	138	ROBUST_(	Unused	NO	NO	NO	NO	CONTACT_S			N/A; Unused
XID	139	ROBUST_(	OFA1 Error	NO	NO	YES	YES	RESTAF	CONTACT_S		

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	140	UNRECOVERABLE_E	ECC Unrecovered Error	YES	YES	YES	YES	RESET_GF	CONTACT_S		This event may occur when the GPU driver has observed uncorrectable errors in GPU memory, in such a way as to interrupt the GPU driver's ability to mark the pages for dynamic page offlining or row remapping. Reset the GPU, and if the problem

Table 1 – continued from previous page

Type (XID)	Code	Mnemc	De-scrip-tion	Ap-plies to A100	Ap-plies to H100	Ap-plies to B100	Ap-plies to GB200	Reso-lution Bucket (Im-me-diate Ac-tion)	Reso-lution Bucket (In-ves-tiga-tory Ac-tion)	Xid 154 link-age	Trig-ger Con-di-tions
XID	141	RO-BUST_C	CUDA Fast Path Error	NO	YES	YES	YES	IG-NORE	CON-TACT_S		
XID	142	RO-BUST_C	NVENC Error	NO	NO	NO	YES	CON-TACT_S			
XID	143	GPU_IN	GPU Ini-tial-iza-tion Error	NO	YES	YES	YES	RE-SET_GF	CON-TACT_S	CUDA 12.9; GPU driver R575	
XID	144	NVLINK	NVLINK SAW Error	NO	NO	YES	YES	WORK-FLOW_I	WORK-FLOW_I	CUDA 12.7; GPU driver R565	
XID	145	NVLINK	NVLINK RLW Error	NO	NO	YES	YES	WORK-FLOW_I	WORK-FLOW_I	CUDA 12.7; GPU driver R565	
XID	146	NVLINK	NVLINK TLW Error	NO	NO	YES	YES	WORK-FLOW_I	WORK-FLOW_I	CUDA 12.7; GPU driver R565	
XID	147	NVLINK	NVLINK TREX Error	NO	NO	YES	YES	WORK-FLOW_I	WORK-FLOW_I	CUDA 12.7; GPU driver R565	
XID	148	NVLINK	NVLINK NVLPW Error	NO	NO	YES	YES	WORK-FLOW_I	WORK-FLOW_I	CUDA 12.7; GPU driver R565	

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	149	NVLINK	NVLINK NETIR Error	NO	NO	YES	YES	WORK-FLOW_I	WORK-FLOW_I	CUDA 12.7; GPU driver R565	
XID	150	NVLINK	NVLINK MSE Error	NO	NO	YES	YES	WORK-FLOW_I	WORK-FLOW_I	CUDA 12.7; GPU driver R565	
XID	151	RO-BUST_C	Key rotation Error	NO	YES	YES	YES	RESTAF	CON-TACT_S		
XID	152	RO-BUST_C	DLA SMMU Error	NO	NO	NO	NO	IG-NORE	CON-TACT_S		
XID	153	RO-BUST_C	DLA time-out Error	NO	NO	NO	NO	IG-NORE	CON-TACT_S		

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	154	GPU_RI	GPU Recovery Action Change	YES	YES	YES	YES	XID_15	N/A Informational only regarding another Xid		"Xid 154 will be seen in conjunction with other Xids and summarizes the recovery action required for other Xids. The string will be similar to ""Xid 154 GPU recovery action changed from 0x0 (None) to 0x2 (Node Reboot Required)"" where the ex-

Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	155	NVLINK	NVLINK SW Defined Error	NO	NO	YES	YES	RESET_GP	INVESTIGATE_S	CUDA 12.7; GPU driver R565	Link down events which are flagged as "intentional" (including transitions to SLEEP) will trigger this Xid
XID	156	RESOURC	Resource Retirement Event	NO	YES	YES	YES	RESET_GP	IGNORE	CUDA 12.7; GPU driver R565	

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	157	RESOURC	Resource Retirement Failure	NO	YES	YES	YES	IGNORE	CONTACT_S		No possible repairs are possible due to lack of resources. You may still run workloads or Apps, but may experience the same Xid again.
XID	158	GPU_FA	GPU Fatal Timeout	YES	YES	YES	YES	RESET_GF	CONTACT_S	yes; support with Xid introduction	

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	159	ROBUST_C	CHI Non-Data Error	NO	NO	YES	YES	CHECK	SYMPATHETIC	yes; support with Xid introduction	May be seen on any C2C link-connected GPU.
XID	160	CHANNEL_RE	Channel Retirement Event	NO	NO	YES	YES	IGNORE	INVESTIGATE_S	CUDA 12.9; GPU driver R575	
XID	161	CHANNEL_RE	Channel Retirement Failure	NO	NO	YES	YES	IGNORE	INVESTIGATE_S	CUDA 12.9; GPU driver R575	
XID	162	PSHC_I	Power Smoothing HW Circuitry capability reengaged	NO	NO	YES	YES				

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	163	PSHC_I	Power Smoothing HW Circuitry capability disengaged	NO	NO	YES	YES				No GPU reset required. If power smoothing functionality is desired, the customer needs to resolve the thermal events. If disabled due to timeout, reload the driver or reset the GPU.

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Table 1 – continued from previous page

Type (XID)	Code	Mnemc	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	164	PSHC_I	Power Smoothing HW Circuitry low lifetime reache	NO	NO	YES	YES				Monitor power swings and expect to replace GPUs if power smoothing is desired. Power smoothing functionality will be disabled soon. Investigate if power swings are acceptable, and if not, take action.

continues on next page

Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	165	PSHC_	Power Smoothing HW Circuitry lifetime exhauste	NO	NO	YES	YES				Replace GPUs if power swings are not acceptable, and power smoothing is desired. Power smoothing will be disabled by the driver and power swings will occur. Analyze datacenter infrastructure to ensure ability to absorb power swings.

continues on next page

Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	166	NVLINK	CC traffic seen prior to link properly being configured for encrypted traffic	NO	NO	YES	YES				Applicable to CC (confidential computing) mode only.
XID	167	PCIE_F/	PCIE_F/	NO	YES	YES	YES				

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Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	168	REDUCED	Errors found in WPR (write protected region)	YES	YES	YES	YES				Should only be seen when ECC is disabled. Either ECC should be enabled (to enable row-remapping) or boot reattempted with shifted WPR.
XID	169	SEC2_H	Internal microcontrol halt	NO	YES	YES	YES				

continues on next page

Table 1 – continued from previous page

Type (XID)	Code	Mnemo	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory Action)	Xid 154 linkage	Trigger Conditions
XID	170	NVLINK	Interrupt seen in CC mode	NO	NO	YES	YES				Applicable to CC (confidential computing) mode only.
XID	171	UNCORRECTAE	Additional to Xid 48 providing more details on particulars of fault to differentiate DRAM/	YES	YES	YES	YES				

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Table 1 – continued from previous page

Type (XID)	Code	Mnemc	De-scrip-tion	Ap-plies to A100	Ap-plies to H100	Ap-plies to B100	Ap-plies to GB200	Reso-lution Bucket (Im-me-diate Ac-tion)	Reso-lution Bucket (In-ves-tiga-tory Ac-tion)	Xid 154 link-age	Trig-ger Con-di-tions
XID	172	UN-COR-RECTAE	Addi-tional to Xid 48 pro-viding more de-tails on par-ticu-lars of fault to dif-feren-tiate DRAM/	YES	YES	YES	YES				

Xid 144-150 Decode

Xid	Subcode V1(<R575)/V2(>=R575) V1(<R575): IntrInfo[9:5] V2(>=R575):IntrInfo[6:0]	(V1(<R575)) IntrInfo d
144	SAW_MVB	——000000———-0000
144	SAW_MVB	——000000———-0000
144	SAW_MVB	——000000———-0000
144	SAW_MVB	——000000———-0000
144	SAW_MVB	——000000———-0000
144	SAW_MVB	——000000———-0000
145	RLW_CTRL	——000000———-0001
145	RLW_REMAP	——000000———-0010
145	RLW_REMAP	——000000———-0010

Xid	Subcode V1(<R575)/V2(>=R575) V1(<R575): IntrInfo[9:5] V2(>=R575):IntrInfo[6:0]	(V1(<R575)) IntrInfo d
145	RLW_REMAP	——000000———-001
145	RLW_REMAP	——000000———-001
145	RLW_REMAP	——000000———-001
145	RLW_REMAP	——000000———-001
145	RLW_REMAP	——000000———-001
145	RLW_REMAP	——000000———-001
145	RLW_REMAP	——000000———-001
145	RLW_REMAP	——000000———-001
145	RLW_REMAP	——000000———-001
145	RLW_RSPCOL	——000000———-001
145	RLW_RSPCOL	——000000———-001
145	RLW_RSPCOL	——000000———-001
145	RLW_RXPIPE	——000000———-0001
145	RLW_RXPIPE	——000000———-0001
145	RLW_RXPIPE	——000000———-0001
145	RLW_RXPIPE	——000000———-001
145	RLW_RXPIPE	——000000———-001
145	RLW_SRC_TRACK	——000000———-001
145	RLW_SRC_TRACK	——000000———-001
145	RLW_SRC_TRACK	——000000———-001
145	RLW_SRC_TRACK	——000000———-001
145	RLW_SRC_TRACK	——000000———-001
145	RLW_SRC_TRACK	——000000———-001
145	RLW_SRC_TRACK	——000000———-001
145	RLW_TAGSTATE	——000000———-0100
145	RLW_TAGSTATE	——000000———-0100
145	RLW_TAGSTATE	——000000———-0100
145	RLW_TAGSTATE	——000000———-0100
145	RLW_TAGSTATE	——000000———-0100
145	RLW_TAGSTATE	——000000———-0100
146	TLW_CTRL	——000000———-0100
146	TLW_CTRL	——000000———-0100
146	TLW_CTRL	——000000———-0100

Xid	Subcode V1(<R575)/V2(>=R575) V1(<R575): IntrInfo[9:5] V2(>=R575):IntrInfo[6:0]	(V1(<R575)) IntrInfo d
146	TLW_CTRL	——000000———-0100
146	TLW_RX/TLW_RX_PIPE0	——000000———-0101
146	TLW_RX/TLW_RX_PIPE0	——000000———-0101
146	TLW_RX/TLW_RX_PIPE0	——000000———-0101
146	TLW_RX/TLW_RX_PIPE0	——000000———-0101
146	TLW_RX/TLW_RX_PIPE1	——000000———-0101
146	TLW_RX/TLW_RX_PIPE1	——000000———-0101
146	TLW_RX/TLW_RX_PIPE1	——000000———-0101
146	TLW_RX/TLW_RX_PIPE1	——000000———-0101
146	TLW_TX/TLW_TX_PIPE0	——000000———-0101
146	TLW_TX/TLW_TX_PIPE0	——000000———-0101
146	TLW_TX/TLW_TX_PIPE0	——000000———-0101
146	TLW_TX/TLW_TX_PIPE0	——000000———-0101
146	TLW_TX/TLW_TX_PIPE1	——000000———-0101
146	TLW_TX/TLW_TX_PIPE1	——000000———-0101
146	TLW_TX/TLW_TX_PIPE1	——000000———-0101
146	TLW_TX/TLW_TX_PIPE1	——000000———-0101
147	TREX	——000000———-0110
147	TREX	——000000———-0110
148	NVLPW_CTRL/NVLPW	——000000———-0000
149	NETIR/NETIR_INT	——000000———-0000
149	NETIR_LINK_EVT/NETIR_LINK_DOWN	——000000———-0111
149	NETIR_LINK_EVT/NETIR_LINK_DOWN	——000001———-0111
149	NETIR_LINK_EVT/NETIR_LINK_DOWN	——000010———-0111
149	NETIR_LINK_EVT/NETIR_LINK_DOWN	——000100———-0111
149	NETIR_LINK_EVT/NETIR_LINK_DOWN	——001010———-0111
149	NETIR_LINK_EVT/NETIR_LINK_DOWN	——001111———-0111
149	NETIR_LINK_EVT/NETIR_LINK_DOWN	——010000———-0111
149	NETIR_LINK_EVT/NETIR_LINK_DOWN	——010001———-0111
149	NETIR_LINK_EVT/NETIR_LINK_DOWN	——010010———-0111
149	NETIR_LINK_EVT/NETIR_LINK_DOWN	——010101———-0111
149	NETIR_LINK_EVT/NETIR_LINK_DOWN	——010110———-0111
149	NETIR_LINK_EVT/NETIR_LINK_DOWN	——100000———-0111

Xid	Subcode V1(<R575)/V2(>=R575) V1(<R575): IntrInfo[9:5] V2(>=R575):IntrInfo[6:0]	(V1(<R575)) IntrInfo d
149	NETIR_LINK_EVT/NETIR_LINK_DOWN	——100001———011
149	NETIR_LINK_EVT/NETIR_LINK_DOWN	——100010———011
149	NETIR_LINK_EVT/NETIR_LINK_DOWN	——100011———011
149	NETIR_LINK_EVT/NETIR_LINK_DOWN	——100100———011
149	NETIR_LINK_EVT/NETIR_LINK_DOWN	——100101———011
149	NETIR_LINK_EVT/NETIR_LINK_DOWN	——100110———011
149	NETIR_LINK_EVT/NETIR_LINK_DOWN	——101000———011
149	NETIR_LINK_EVT/NETIR_LINK_DOWN	——101010———011
149	NETIR_LINK_EVT/NETIR_LINK_DOWN	——101011———011
149	NETIR_BER_EVENT	——000000———-1000
149	NETIR_BER_EVENT	——000000———-1000
149	NETIR_BER_EVENT	——000000———-1000
149	NETIR_BER_EVENT	——000000———-1000
149	NETIR_MFDE_EVENT	——000000———-100
149	NETIR_MFDE_EVENT	——000000———-100
149	NETIR_MFDE_EVENT	——000000———-100
149	NETIR_MFDE_EVENT	——000000———-100
149	NETIR_MFDE_EVENT	——000000———-100
150	MSE Degraded	——000000———-0000
150	MSE_WATCHDOG	——000000———-0000

Resolution Buckets

Table 3: Resolution Buckets

Guidance Class	Resolution Action
CONTACT_SUPPORT	Please contact your support organization for further investigation.
RESTART_APP	The application should be restarted RESET_GPU or RESTART_BM is not deemed necessary.
IGNORE	No Action required
WORKFLOW_XID_45	Solo: RESTART_FM Not Solo: IGNORE (follow guidance in other Xid)

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Table 3 – continued from previous page

Guidance Class	Resolution Action
RESET_GPU	Refer to https://docs.nvidia.com/deploy/gpu-debug-guidelines/index.html for GPU Reset capabilities & limitations RESTART_BM is not deemed necessary.
WORKFLOW_XID_48	Data Center Recovery Action Solo: RESET_GPU w/ 63 or 64: DRAIN_AND_RESET Investagatory Action Solo: RUN_FIELDDIAG Not Solo: String in error would tell us what unit was impacted. FB: follow Xid63/64 guidance All other SRAM: check SRAM Error Threshold flag (nvidia-smi <sram_threshold_exceeded> or NSM Msg Type 0x3, Cmd Code 0x7D, bit 0. If set RUN_FIELDDIAG
CHECK_MECHANICALS	Check to ensure that device seating and all applicable connections to it are secure.

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Table 3 – continued from previous page

Guidance Class	Resolution Action
WORKFLOW_NVLINK_ERR	Extract the hex strings from the Xid error message. Note that there should be seven fields in the Xid. Unused fields would expect to be 0x0 rather than a full DWORD of 0's. The first, third, fourth and fifth registers are valid for Hopper-based products. Evaluate the populate(d) registers. If bits other than those specifically outlined below are seen, please report a bug. First register: Bit 0, 23, 30: Can be safely ignored. Bits 1, 20: These are generally sympathetic or secondary errors. If seen with other bits set or other Xid/SXid, please follow the resolution for those. If seen solo, please report a bug. Bits 4 or 5: Likely HW issue with ECC/Parity –> If seen more than 2 times on the same link, report a bug. Bits 8, 9, 12, 16, 17, 24, 28: Could possibly be a HW issue: Check link mechanical connections and re-seat if a field resolution is required. Run diags if issue persists. If the issue persist, and diagnostics has passed please report a bug. Bits 21 or 22: Marginal channel SI issue. If other errors accompany this Xid, follow the resolution for those first. Otherwise, check link mechanical connections. Run Field Diags and report a bug. Bits 27, 29: If seen repeatedly, please report a bug. Third register: Bits 0, 1, 2, 6: Likely HW issue with ECC/Parity –> If seen more than 2 times on the same link, report a bug. Bit 13: Not expected to be seen in production. If seen, please report a bug. Bits 16, 19: If seen repeatedly, please run Field Diags and report a bug Bits 17, 18: If seen repeatedly, please report a bug. Fourth register: Bits 16, 17: These are generally sympathetic or secondary errors. If seen with other bits set or other Xid/SXid, please follow the resolution for those. If seen solo, please report a bug. Bit 18: These are generally sympathetic or secondary errors, though a reset of the fabric is required. If seen with other bits set or other Xid/SXid, please follow the resolution for those. If seen solo, please report a bug. Fifth register: Bits 18, 19, 21, 22, 24, 25, 27, 28: Likely HW issue with ECC/Parity –> If seen more than 2 times on the same link, report a bug. Bits 20, 23, 26, 29: These errors represent a threshold of ECC errors being exceeded. There was no uncorrectable error at this time. Continue operation. If desired, Field Diags can be run to check for link integrity.

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Table 3 – continued from previous page

Guidance Class	Resolution Action
UPDATE_SWFW	Update Firmware and Software to latest versions XID 78: basic issues will keep vGPU functionality from being able to operate; must resolve to progress 1. Guest driver version is incompatible with the host driver * In this case error string should be “Guest driver is incompatible with host driver” 2. This vGPU type is not compatible with the guest OS type/GPU type. For example, user is trying to use a compute profile on an old Maxwell GPU on windows guest. * In this case error string should be “vGPU type is not supported”
RESTART_BM	Restart bare metal, system should be restarted
WORKFLOW_NVLINK5_ERR	Please see the “XID 144-150 Decode” (was “Customer Doc 144-150”)tab for further guidance in evaluating these Xids. These errors need decoding of XID message as follows to determine the resolution action: Format of the XID error message: Xid (PCI:0000:BB:DF): <Xid Number> <sub component> <fatal vs nonfatal> <Crosscontain> <injected> <link> (<intrInfo> <errorStatus> <errorDebugData[0]> <errorDebugData[1]> <errorDebugData[2]> <errorDebugData[3]> <errorDebugData[4]>) From the above message, <intrInfo>, <errorStatus> must be decoded and evaluated using “XID 144-150 Decode” to derive the final resolution.
RESTART_VM	VM owning the affected GPU must be restarted RESET_GPU or RESTART_BM is not deemed necessary.
XID_154	Follow XID 154 reported guidance
CHECK_UVM	If UVM/vGPU is being utilized, RESET_GPU; otherwise IGNORE
CHECK_APP/CUDA	Issue likely caused by an application passing bad data or utilizing incorrect methods in communications with GPU. Some errors will contain PID that can be used to identify source of the problem. If determined to be a driver issue then REPORT_ISSUE

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Table 3 – continued from previous page

Guidance Class	Resolution Action
WORKFLOW_XID_13	Repeat TPC and GPC, diff SMs: RUN_DCGMEUD (possible HW issue); if pass RUN_FIELDDIAGS Repeat TPC and GPC, single SM: RUN_DCGMEUD (possible HW issue); if pass RUN_FIELDDIAGS Solo, no burst: CHECK_APP/CUDA Not Repeat TPC and GPC: CHECK_APP/CUDA Non-prod environment: CHECK_APP/CUDA If known good APP and Solo: REPORT_ISSUE
WORKFLOW_XID_31	Multiple runs needed to establish pattern Repeat MMU faults to same GPU (via PCI-ID): RUN_DCGMEUD (possible HW issue); if pass RUN_FIELDDIAGS Repeat MMU faults to diff GPU (via PCI-ID): CHECK_APP/CUDA Solo, no burst: CHECK_APP/CUDA If known good APP: REPORT_ISSUE
Solo: RESTART_FM Not Solo: IGNORE (follow other Xid)	Solo: RESTART_FM Not Solo: IGNORE (follow other Xid)
INVESTIGATE_SW	There is a problem with either user or NVIDIA software that needs to be investigated further. In many cases the user software may be making calls to illegal areas, poorly structured commands or other issues. This may also be a problem with NVIDIA software in which case an issue should be reported. In many cases there may be a PID that could be tracked back to the offending, originating entity.
IGNORE (sympathetic)	This is a sympathetic error that is expected to be seen with other conditions. Resolution for the other errors should be undertaken first. If this error was seen independently or all other resolutions aren't sufffficient then REPORT_ISSUE.
XID_137_FLOW	This event is logged when a fault is reported by the remote MMU, such as when an illegal NVLink peer-to-peer access is made by an applicable unit on the chip. Typically these are application-level bugs. When this event is logged, NVIDIA recommends the following: • Run the application in cuda-gdb or cuda-memcheck • Note: The cuda-memcheck tool instruments the running application and reports which line of code performed the illegal read. or • Run the application with CUDA_DEVICE_WAITS_ON_EXCEPTION=1 and then attach later with cuda-gdb File a bug if the previous two come back inconclusive to eliminate other possible causes.

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Table 3 – continued from previous page

Guidance Class	Resolution Action
INVESTIGATE_LINK_SI	Refer to GB200 Resiliency Service Flow for appropriate Access or Trunk link telemetry and investigation methods.
N/A Informational only regarding another Xid	Other issues need to be addressed. This Xid in informational only and is always expected to be seen with another Xid requiring a recovery action.
INVESTIGATE_SW_USER	Investigate SW or user initiated if unexpected
SYMPATHETIC_REPORT_SOLO	This is a sympathetic error that is expected to be seen with other conditions. Resolution for the other errors should be undertaken first. If this error was seen independently or all other resolutions aren't suffficient then REPORT_ISSUE.
XID_154_EVAL	If an XID 154 is seen along with this error, take that action. If no XID 154 present, RESTART_APP
CHECK_NVLINK_FAILURE_FLOW	Check telemetry to see if the any link went down in the partition within that last 30 seconds. If so, this Xid can be ignored as it was likely a by-product of the other conditions which should be investigated. If no link down indication is present, REPORT_ISSUE.
REPORT_ISSUE (if seen >1 per day)	REPORT_ISSUE (if seen >1 per day)
INVESTIGATE_SW_USER_LINK_SI	Investigate software or user intervention if not expected; additionally, follow INVESTGATE_LINK_SI if needed
INVESTIGATE_PEER_DEVICE	A peer device experience the issue as decoded in the Xid144-150 table (Xid 149 in particular). Based upon the note column: Received_TS1: will be seen when peer link down reason is unknown Peer_side_down_to_sleep_state: investigate peer software and users if unexpected Peer_side_down_to_disable_state: investigate peer software and users if unexpected Peer_side_down_to_disable_and_port_lock: investigate peer software and users if unexpected Peer_side_down_due_to_thermal_event: check switch cooling Peer_side_down_due_to_force_event: investigate peer software and users if unexpected Peer_side_down_due_to_reset_event: investigate peer software and users if unexpected
INVESTIGATE_HOST	Check other logs as this is likely a secondary indicator of some action or fault (may be OOB).

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Table 3 – continued from previous page

Guidance Class	Resolution Action
INVESTIGATE_LINK_SI_AND_CABLES	A more general fault that could be cable, temperature, transceiver or seating condition. Refer to GB200 Resiliency Service Flow for appropriate Access or Trunk link telemetry and investigation methods.
INVESTIGATE_SW_USER	Investigate SW or user initiated if unexpected

Customer User Guide

Table 4: Customer User Guide

Sheet Name	Column Name	Description
XIDs	Type XID	Identifies Xid entries
	Code	The Xid number
	Mnemonic	String to identify the condition.
	Description	More descriptive identifier for the condition (“Unused” could mean Code is deprecated or V100 or earlier)
	Applies to <project>	Signifies if the Code is supported on this particular product.
	Resolution Bucket (Immediate Action)	Intended to reflect the action that is immediately needed in order to recover the system and get it back into service.
	Resolution Bucket (Investigatory Action)	Intended to reflect the action that is needed to investigate the fault further to try and avoid the condition occurring again. This may require FieldDiags (to check for HW issues), investigation of SI, software investigation or other steps.
	Xid 154 linkage	Represents if the Code is also expected to trigger an Xid 154 condition representing the derived Data Center resolution.
	Trigger Conditions	Description of when this condition may be seen or more details on possible actions to undertake.
XID 144-150 Decode	Xid	Xid number associated with the particular row. Each Xid represents a function of NVLink operation.
	Subcode	The subsystem of the NVLink function. This is also presented in plain text in the Xid message (ex: NETIR_LINK_EVT) If the text string differs between revisions, then the two entries will be divided by a “/” (V1(<R575)/V2(>=R575)). This field is encoded in the following IntrInfo bits: V1(<R575): IntrInfo[9:5] V2(>=R575):IntrInfo[6:0].
	(V1(<R575)) IntrInfo decode for Data Center Recovery Action	Bitmask of IntrInfo for V1 messages. IntrInfo is the first register presented in the parentheses. Requires conversion of hexadecimal value to binary and applying the mask below. “-” bits are for optional user decode.
	(V2(>=R575)) IntrInfo decode for Data Center Recovery Action	Bitmask of IntrInfo for V2 messages. IntrInfo is the first register presented in the parentheses. Requires conversion of hexadecimal value to binary and applying the mask below. “-” bits are for optional user decode.
	Error Status (hex)	Error Status value represented by the second register presented in the parentheses.
	Resolution Bucket (Immediate Action)	Intended to reflect the action that is immediately needed in order to recover the system and get it back into service.

This catalog provides a detailed reference on each possible Xid, and provides information on the cause of the Xid, and actions to take. You can also download the reference guide as a spreadsheet here.

The catalog is presented as a spreadsheet, with several sheets of information.

For a given Xid, use the following procedure to walk through the correct actions to take in handling the Xid.

3.1. Step 1: Determine Xid Code

Determine the Xid Code from the Xid Message.

Each Xid message contains a single code, following a colon after the GPU identifier. In the following examples, the Xid Codes are 14, 22013 and 79 respectively.

```
[...] NVRM: Xid (0000:03:00): 14, Channel 00000001
[...] NVRM: Xid (PCI:0000:5a:00): 79, GPU has fallen off the bus.
```

3.2. Step 2: Review Xid Classification from the Xid Catalog

In the Xid Catalog, open the “Xids” sheet and find the row with a matching “Code” to the Xid Code from Step 1.

For example, for Xid 79:



	A	B	C	D	E	F	G	H	I	J
1	Type (XID/SXID)	Code	Mnemonic	Description	Applies to A100	Applies to H100	Applies to B100	Applies to GB200	Resolution Bucket (Immediate Action)	Resolution Bucket (Investigatory A
2	XID	1	ROBUST_CHANNEL_FIFO_ERROR_FIFO_METHOD	Unused	NO	NO	NO	NO	CONTACT_SUPPORT	
3	XID	2	ROBUST_CHANNEL_FIFO_ERROR_SW_METHOD	Unused	NO	NO	NO	NO	CONTACT_SUPPORT	

For each row, the catalog provides a brief description of the Xid in the “Description” column, as well as applicability to different revisions of GPU in the “Applies to” columns.

Note that some Xid codes are deprecated on more recent GPU models. These Xids are listed as “Unused” for the description, indicating they may be deprecated and applicable to V100 or earlier GPUs.

3.3. Step 3: Determine Data Center and Investigatory Actions

The Xid Catalog provides two different actions for handling an Xid.

Immediate Action:

The “Resolution Bucket - Immediate Action” column in the Xid Catalog provides an immediate action that should be performed to recover a system after an Xid is observed. This is intended as an automatable action that administrators can perform to recover the system from Xid error, and ready the system for new applications.

This action can be performed as automated recovery after an Xid.

Investigatory Action:

The data center action is intended to recover the system, but in some cases, where there is a persistent failure, the Xid will reoccur, requiring a more detailed investigation to the cause of the issue, and will help to further identify if there are underlying hardware, firmware or software failures that need longer term actions to correct the issue.

If the issue reoccurs, or is not expected, the Investigatory Action column provides guidance on actions to take to investigate the issue.

3.4. Step 4: Determine Resolution Steps

Both the **Data Center Action** and **Investigatory Action** columns provide a short summary **Resolution Bucket** that summarizes common actions to take that may be shared by different types of Xid codes. The actual steps to take for these actions are defined on the **Fault Resolution Buckets** worksheet.

For example, if data center action indicates a fault resolution bucket is “RESET_GPU,”” the row for RESET_GPU in the Fault Resolution Bucket spreadsheet provides guidance on exact actions to take.

1	Fault Resolution Bucket	Resolution Action
5	RESET_GPU	Refer https://docs.nvidia.com/deploy/gpu-debug-guidelines/index.html for GPU Reset capabilities & limitations If SXID-14001, 14002,14014, 14018, 24007, 24008, 24009, 24010 then all GPUs in partition will need to be reset.

Similarly, the resolution steps for investigatory actions are presented on the same worksheet.

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