

GPU Driver Issue Report - RTX PRO 6000 Blackwell Nodes

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Reported by: sdodl001
Cluster: Waterfield HPC
Note: This report was generated with AI assistance (GitHub Copilot)

Executive Summary

The **RTX PRO 6000 (Blackwell)** GPUs in partitions `rtxp6000flex-1` through `rtxp6000flex-4` are **non-functional** due to a driver compatibility issue. The currently installed proprietary NVIDIA driver does not support the Blackwell architecture GPUs, which require the NVIDIA open-source kernel modules.

Issue Details

Symptoms

- `nvidia-smi` returns "No devices found"
- Jobs allocated to RTX PRO 6000 nodes cannot access GPU
- `/dev/nvidia*` device nodes are not created

Affected Partitions

Partition	GPU Model	Node Pattern	Status
rtxp6000flex-1	RTX PRO 6000 (1 GPU)	wf-g4-standard-48-[1-20]	❌ BROKEN
rtxp6000flex-2	RTX PRO 6000 (2 GPU)	wf-g4-standard-96-[1-12]	❌ BROKEN (presumed)
rtxp6000flex-3	RTX PRO 6000 (4 GPU)	wf-g4-standard-192-[1-8]	❌ BROKEN (presumed)
rtxp6000flex-4	RTX PRO 6000 (8 GPU)	wf-g4-standard-384-[1-4]	❌ BROKEN (presumed)

Working Partitions (Confirmed)

Partition	GPU Model	Status
h100flex-1	H100 80GB HBM3	✅ WORKING
h100flex-2/4/8	H100 80GB HBM3	✅ WORKING (presumed)

Technical Evidence

Tested Node: **wf-g4-standard-48-1**

GPU Hardware (Present):

```
$ lspci -nn | grep -i nvidia
05:00.0 3D controller [0302]: NVIDIA Corporation GB202GL [RTX PRO 6000
Blackwell Server Edition] [10de:2bb5] (rev a1)
```

Driver Version:

```
$ modinfo nvidia | grep version
version:          580.126.09
```

Kernel Error Messages (dmesg):

```
NVRM: The NVIDIA GPU 0000:05:00.0 (PCI ID: 10de:2bb5)
      installed in this system requires use of the NVIDIA open kernel
modules.
NVRM: GPU 0000:05:00.0: RmInitAdapter failed! (0x22:0x56:884)
NVRM: GPU 0000:05:00.0: rm_init_adapter failed, device minor number 0
```

Device Nodes:

```
$ ls /dev/nvidia*
(no output - devices not created)
```

Working Comparison: **wf-a3-highgpu-1g-1** (H100)

GPU Hardware:

```
$ lspci | grep -i nvidia
04:00.0 3D controller: NVIDIA Corporation GH100 [H100 SXM5 80GB] (rev a1)
```

nvidia-smi Output:

```
GPU 0: NVIDIA H100 80GB HBM3 (UUID: GPU-4a21c545-2fd2-adcc-5498-
0e3ef0d1d7d5)
```

Same Driver Version: 580.126.09 - works on H100 (Hopper), fails on RTX PRO 6000 (Blackwell)

Root Cause Analysis

The **NVIDIA GB202GL (Blackwell architecture)** GPU requires the **NVIDIA open-source kernel modules** (`nvidia-open`), not the proprietary modules currently installed.

From NVIDIA documentation:

Starting with Blackwell architecture (GB100 series), NVIDIA GPUs require the use of open-source kernel modules. The proprietary driver does not support these GPUs.

The installed driver (580.126.09) includes both proprietary and open modules, but the system is loading the **proprietary** modules instead of the **open** modules.

Recommended Fix

Option 1: Switch to Open Kernel Modules (Preferred)

```
# On each affected node, switch from proprietary to open modules:
sudo dnf remove nvidia-driver
sudo dnf install nvidia-driver-open

# Or if using DKMS:
sudo dnf install nvidia-open-dkms
```

Option 2: Blacklist Proprietary, Load Open Modules

```
# Add to /etc/modprobe.d/nvidia.conf:
blacklist nvidia
alias nvidia nvidia-open
alias nvidia-uvm nvidia-open-uvm
```

Verification After Fix

```
# Check which module is loaded:
modinfo nvidia | grep -E "filename|version"
# Should show: /lib/modules/.../nvidia-open.ko

# Verify GPU access:
nvidia-smi -L
# Should list GPU
```

Additional Issues Found

B200 Partition Issue

- Job 44 stuck in CONFIGURING state for 24+ hours on wf-a4-highgpu-8g-1
- B200 also uses Blackwell architecture - likely has same driver issue

System Information

Component	Value
Kernel	5.14.0-611.16.1+2.1.el9_7_ciq.x86_64
OS	Rocky Linux 9.7 (CIQ)
Driver	580.126.09 (proprietary)
Required	580.126.09 (open) or newer

References

- [NVIDIA Driver Installation Guide - Open Kernel Modules](#)
- [NVIDIA Open GPU Kernel Modules GitHub](#)
- GPU PCI ID: 10de:2bb5 (GB202GL RTX PRO 6000 Blackwell Server Edition)

Contact

Please contact sdodl001 if additional testing or information is needed.