

# GPFS Troubleshooting & Daily Operations

Hands-On Technical Training for HPC at Keysight

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# Agenda / Index

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1. Daily Operations Overview	Understand the normal state to detect failures
2. Storage Backend Troubleshooting	Investigating NetApp and LUN-related issues
3. Network Fabric Diagnostics	Ethernet, Infiniband, and Omni-Path failures
4. GPFS Services (CES, NFS/CIFS)	Diagnosing shared access issues
5. Quota & Fileset Issues	Space problems and user error resolution
6. Node Management Scenarios	Adding/Removing nodes, license handling
7. Log-Based Troubleshooting	Using logs and event history to identify root causes.
8. Q&A and Wra-Up	Open discussion and review

# Module 1: Daily Operations

## Node Status & Health Checks



# Node Status & Health Checks


Objective	Command
View full cluster status	<code>mmgetstate -av</code>
View node health summary	<code>mmhealth node show</code>
Check node health history	<code>mmhealth node eventlog</code>
Identify GPFS roles & license	<code>mmlscluster, mmlsconfig</code>



*Goal: Identify if all nodes are active, and spot nodes in unknown or degraded state.*

# Module 2: Storage Backend Troubleshooting

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-  Purpose:
- Introduce how to troubleshoot issues related to **storage backend**, especially LUNs and NetApp (E2800/E2812), as used in your GPFS cluster.

# Detecting LUN failures, storage disconnections, and SAN issues

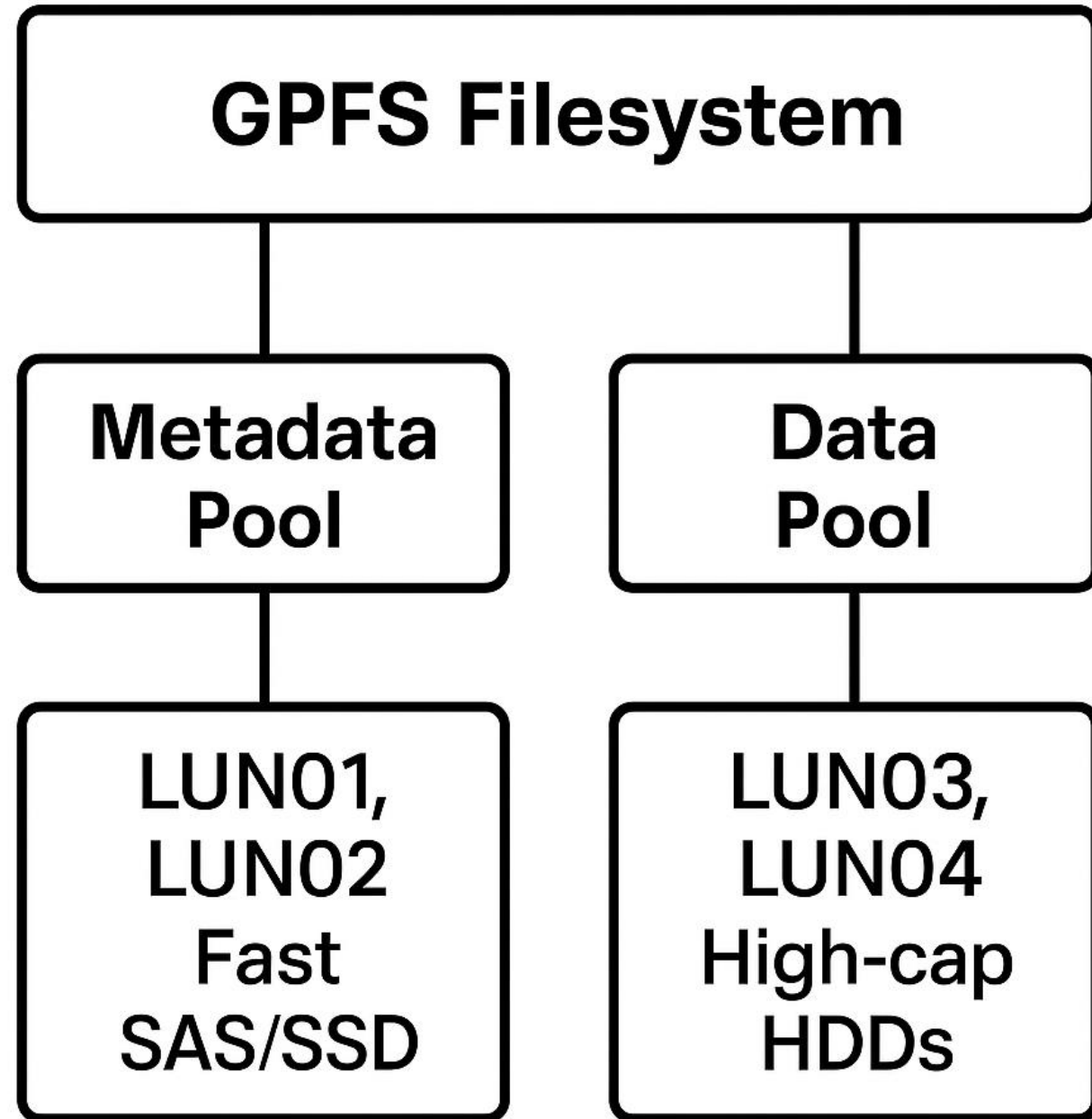
Check	Command	Use Case
List Disks by Filesystem	<code>mmlsfs -d</code>	View Disk State in GPFS
To verify disk state and identity offline or missing disks	<code>mmlsdisk gpfs</code>	Which LUNs (NSDs) are metadata vs data
Check web GUI also	<a href="https://bruclu015-e2800b.vbr.is.keysight.com/sm/en-US/#/home">https://bruclu015-e2800b.vbr.is.keysight.com/sm/en-US/#/home</a> <a href="https://bruclu015-e2812a.vbr.is.keysight.com/sm/en-US/#/home">https://bruclu015-e2812a.vbr.is.keysight.com/sm/en-US/#/home</a>	to verify any error in the hardware or checking the respective log in the UI
Check Physical Path (Optional)	<code>multipath -ll</code> <code>lsblk</code>	Check the disks attached in the Netapp SAN

# **Module 3: Network Diagnostics – InfiniBand & Omni-Path**

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# Metadata / Data Pool

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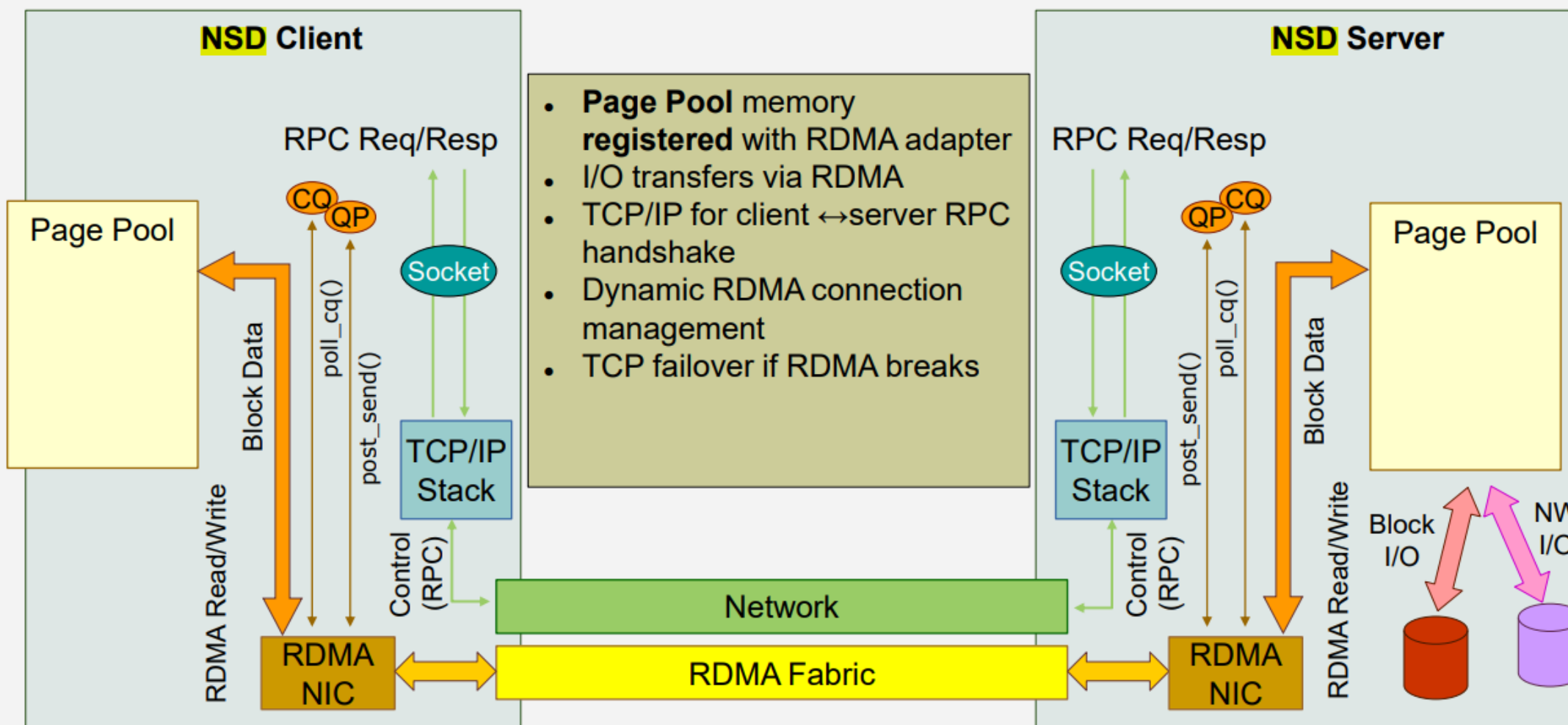
# Main commands

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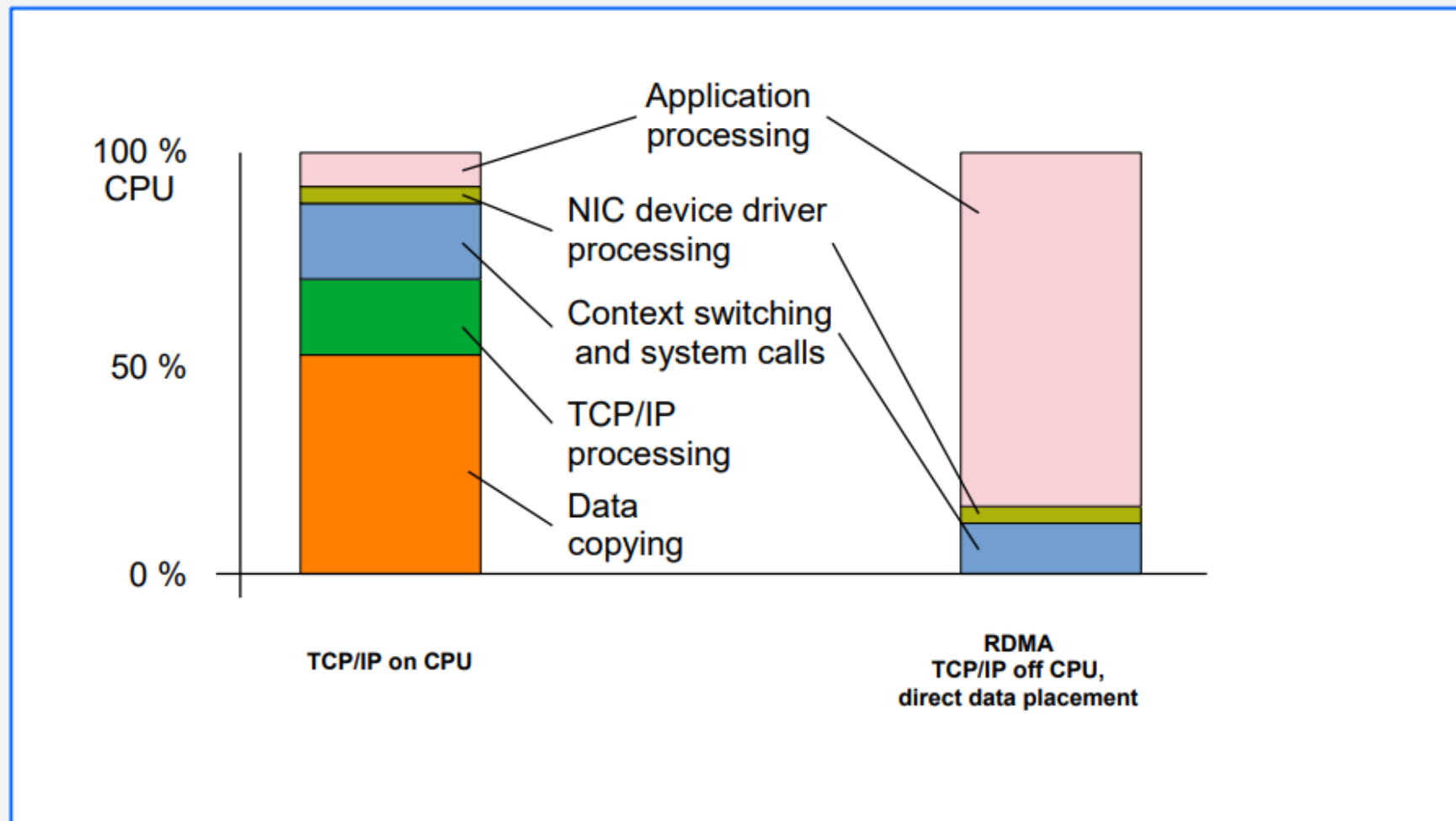
Check	Command	Use Case
IB adapter status	<code>ibstat</code>	Verify IB card is up and active
IB ping to a node	<code>ibping &lt;hostname&gt;</code>	Test Infiniband-level connectivity
Omni-Path adapter info	<code>opainfo</code>	Show OPA HFI devices and port state
Show OPA HFI devices and port state	<code>ibnetdiscover</code> or <code>opaquery</code>	Visualize IB/OPA fabric connectivity



## Spectrum Scale I/O Model with RDMA I/O (verbsRdma = yes)



# RDMA - What does it gain?



Sample data, may vary by use case



# Module 4: CES Services

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NFS, CIFS & Shared Access  
Troubleshooting



Learn how to verify and troubleshoot file sharing from GPFS via NFS/CIFS

Component	Command	Purpose
CES Node List	<code>nmces node list</code>	Show CES-enabled nodes
Address List	<code>nmces address list</code>	See floating IPs used by CES
CES Services	<code>nmces service list</code>	Show if NFS/CIFS/S3 are running
NFS Exports	<code>nmnfs export list</code>	Check active NFS exports
Config Check	<code>mmlsconfig</code>	<code>grep ces</code>

# Main commands

# **Module 5: Quota & Fileset Troubleshooting**

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# Main commands

Check	Command	Use Case
List quota by user	<code>mmquota -u &lt;user&gt; --block-size auto</code>	View usage and limits per user
List quota by group	<code>mmquota -g &lt;group&gt; --block-size auto</code>	View usage and limits per group
Fileset-level quota	<code>mmquota -j scratch-mstr gpfs</code>	View quotas for each fileset
Fileset config	<code>mmfs gpfs -Q</code>	Show if quotas are enabled and where
Edit quota (admin only)	<code>mmrepquota -u &lt;user&gt;</code>	Set/modify quota limits
Quota report summary	<code>mmrepquota -u -v gpfs -block-size auto</code>	Full report of all quotas by user

# Module 6: Node Management Scenarios

Action	Command	Purpose
List all nodes	<code>mm lsnodeclass</code>	View all nodes in each group from GPFS
Check node state	<code>mm getstate -a</code>	Show current GPFS state of all nodes
Add a new node	<code>mm addnode &lt;nodename&gt;</code>	Add one or more nodes to the cluster
Remove a node	<code>mm delnode &lt;nodename&gt;</code>	Remove a node safely
Rebalance quorum	<code>mm chnode -quorum-manager &lt;nodename&gt;</code>	Set or change quorum/manager nodes
View node licenses	<code>mm lslicense</code>	Check GPFS licenses per node






# Module 7: Log-Based Troubleshooting

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# How to check specific GPFS Logs

Log location	What to look for:	Purpose:
<code>/var/adm/ras/mmfs.log.latest</code>	mmfsd errors, quorum, disk issues	Main GPFS log file
<code>/var/adm/ras/mmfs.log*</code>	Older rotated logs (e.g. .1, .2.gz)	Look for past incidents
<code>/var/adm/ras/log.smbd</code> <code>/var/adm/ras/log.winbindd</code>	 Samba/Winbind CES logs (very relevant for NFS/SMB debug)	
<code>/var/adm/ras/mmsysmonitor*.log</code>	 System monitoring logs (CPU, memory trends, alerts)	
<code>/var/adm/ras/mmwatch.log</code>	 Monitors CES-related services and GPFS runtime health checks	