

The Telemetry Feature of Vertically Integrated High Resilience (VIHR) SSDs

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Telemetry Applications

Online Monitoring

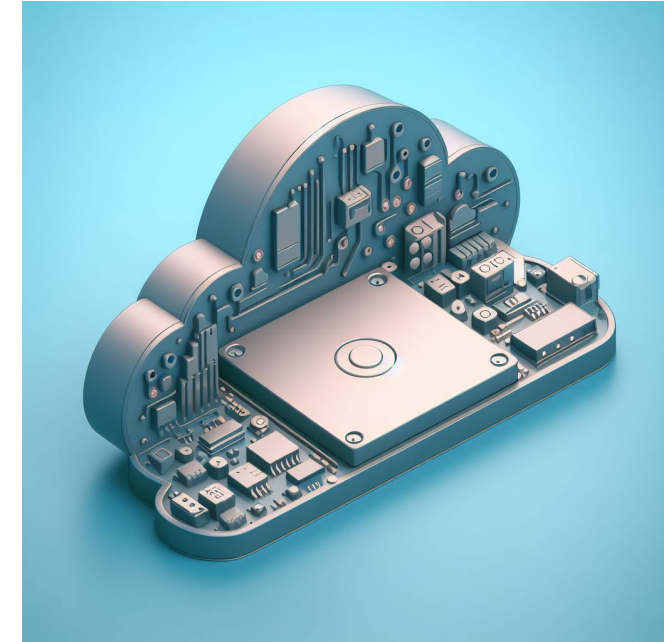
- Fault Prediction
- Fault Detection
- Preventative Actions

Offline Repair

- Stress Testing
- Diagnose Failures
- Mitigation

Root Cause Analysis

- Identify bugs
- ML Labeling
- Remediation



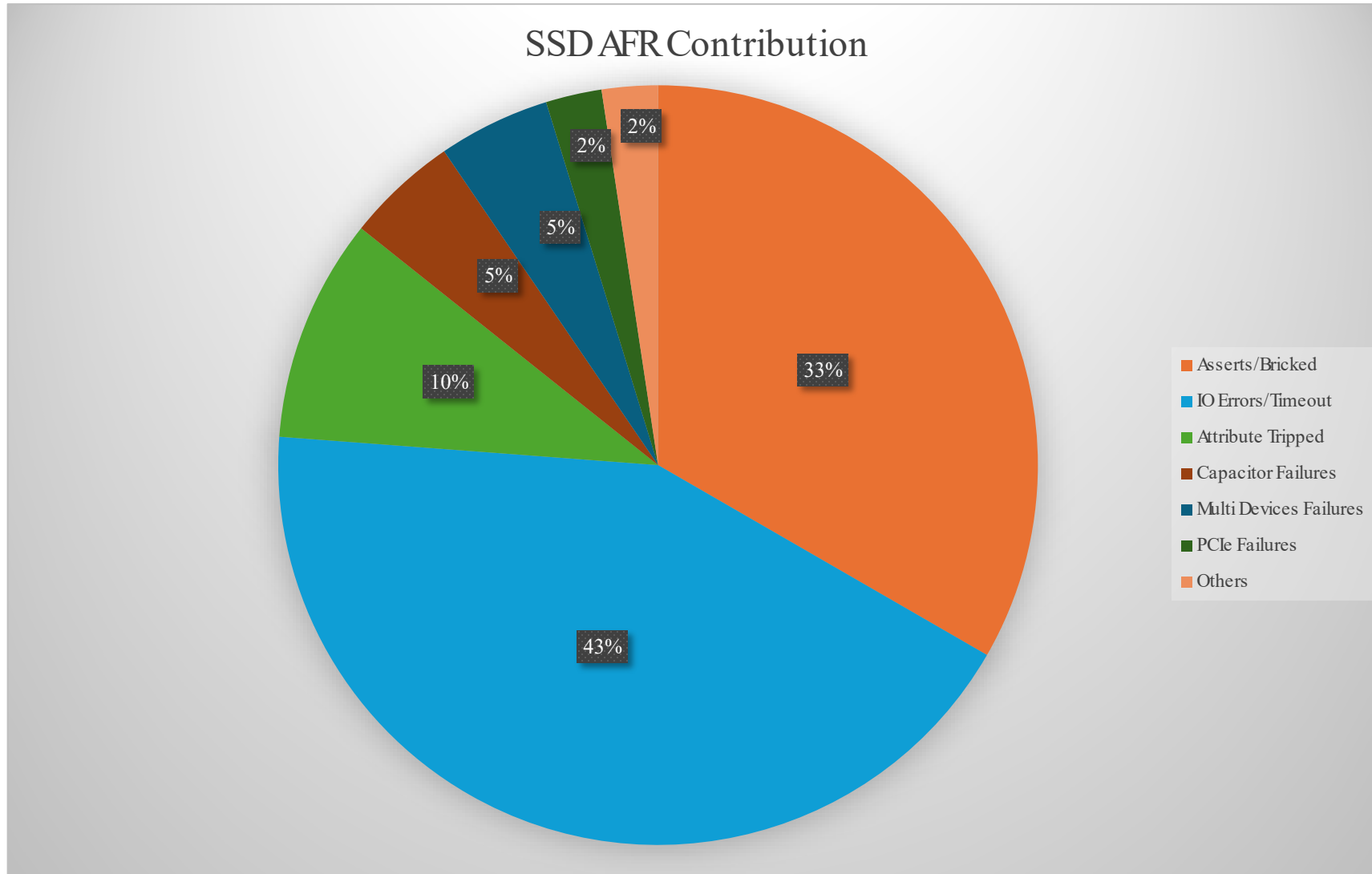
Scan for
OCP v2.5
Spec



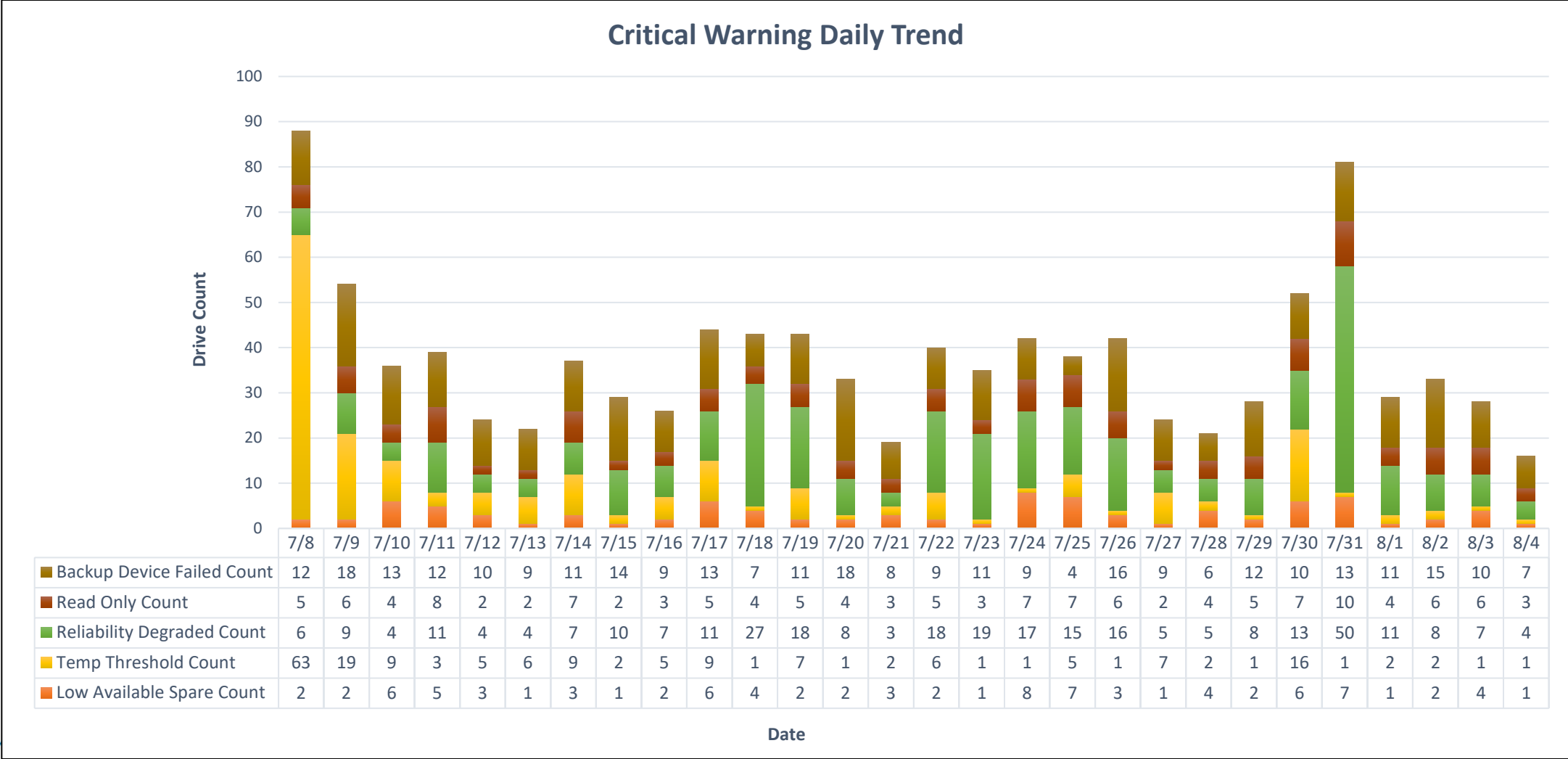
SSD Telemetry Cycles in Azure



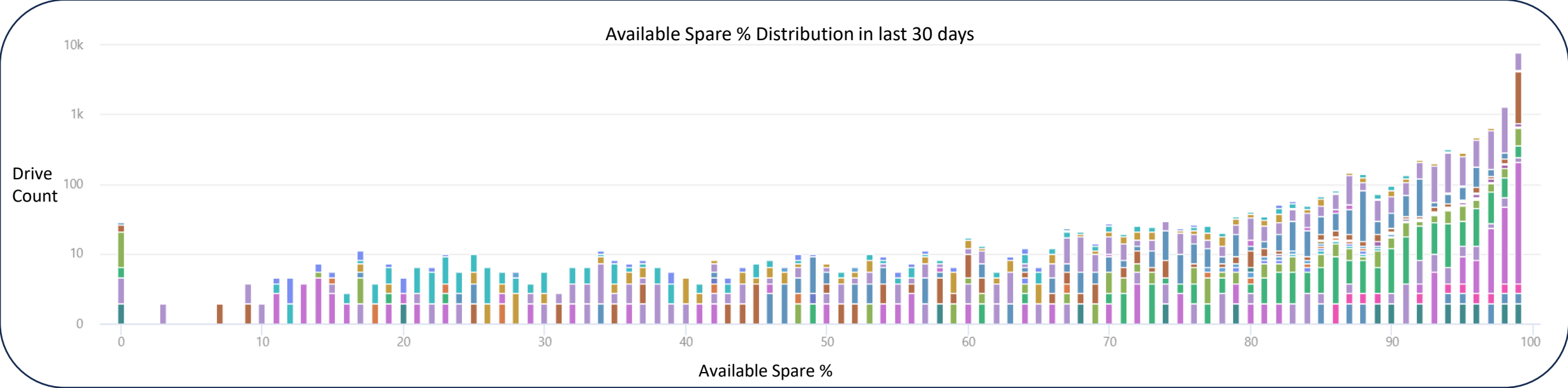
Distribution of SSD Failures in Azure



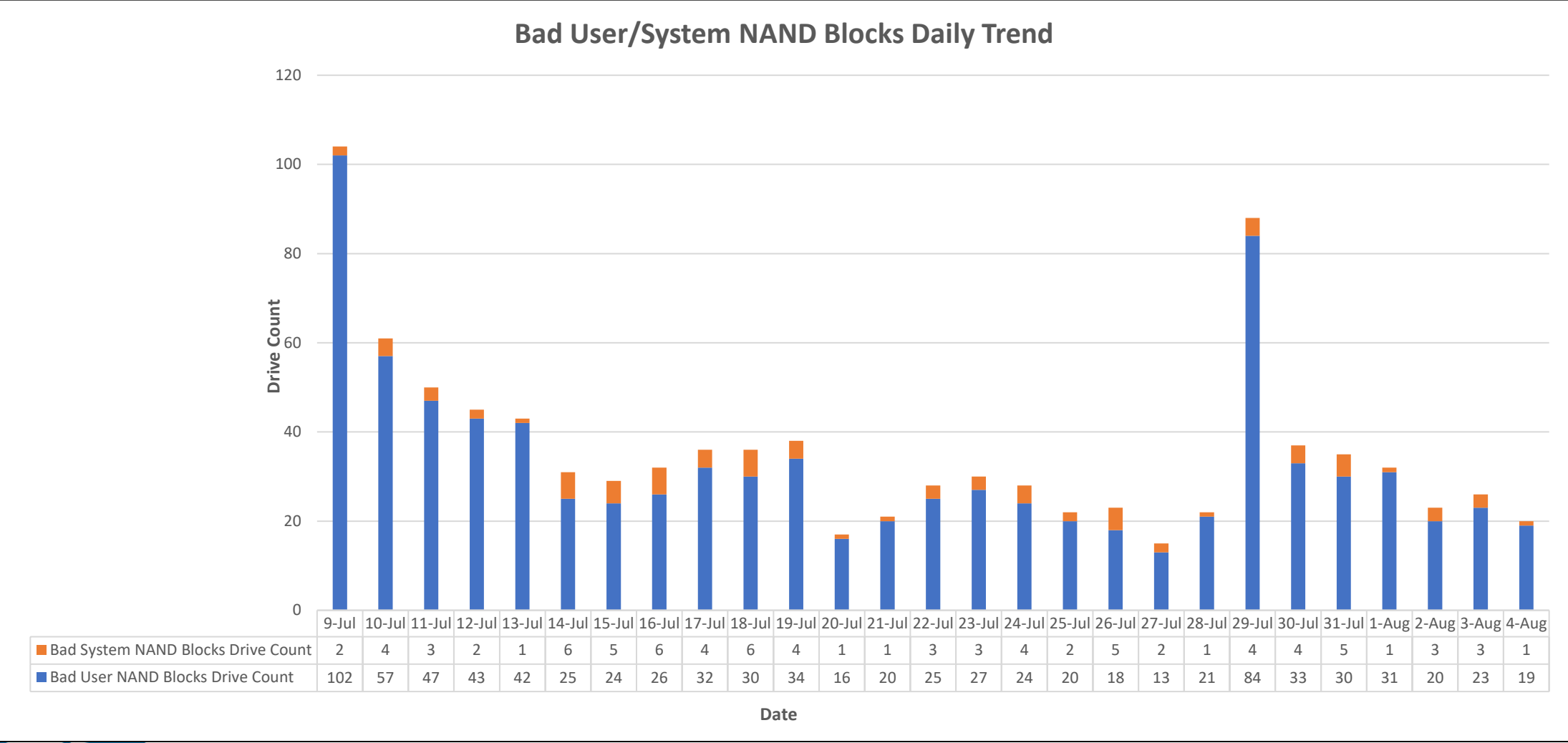
Critical Warning Daily Trend in Azure



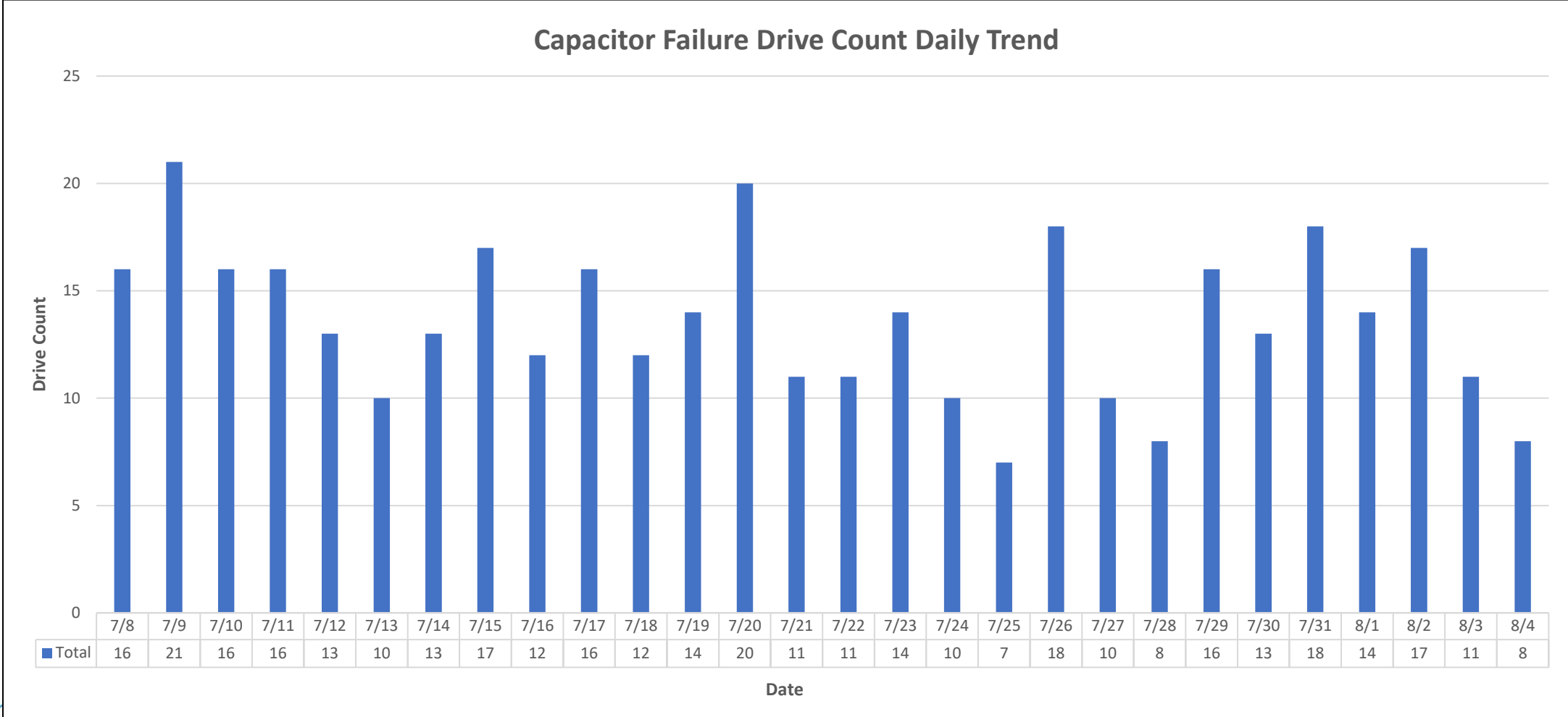
Available Spare % Distribution in Azure



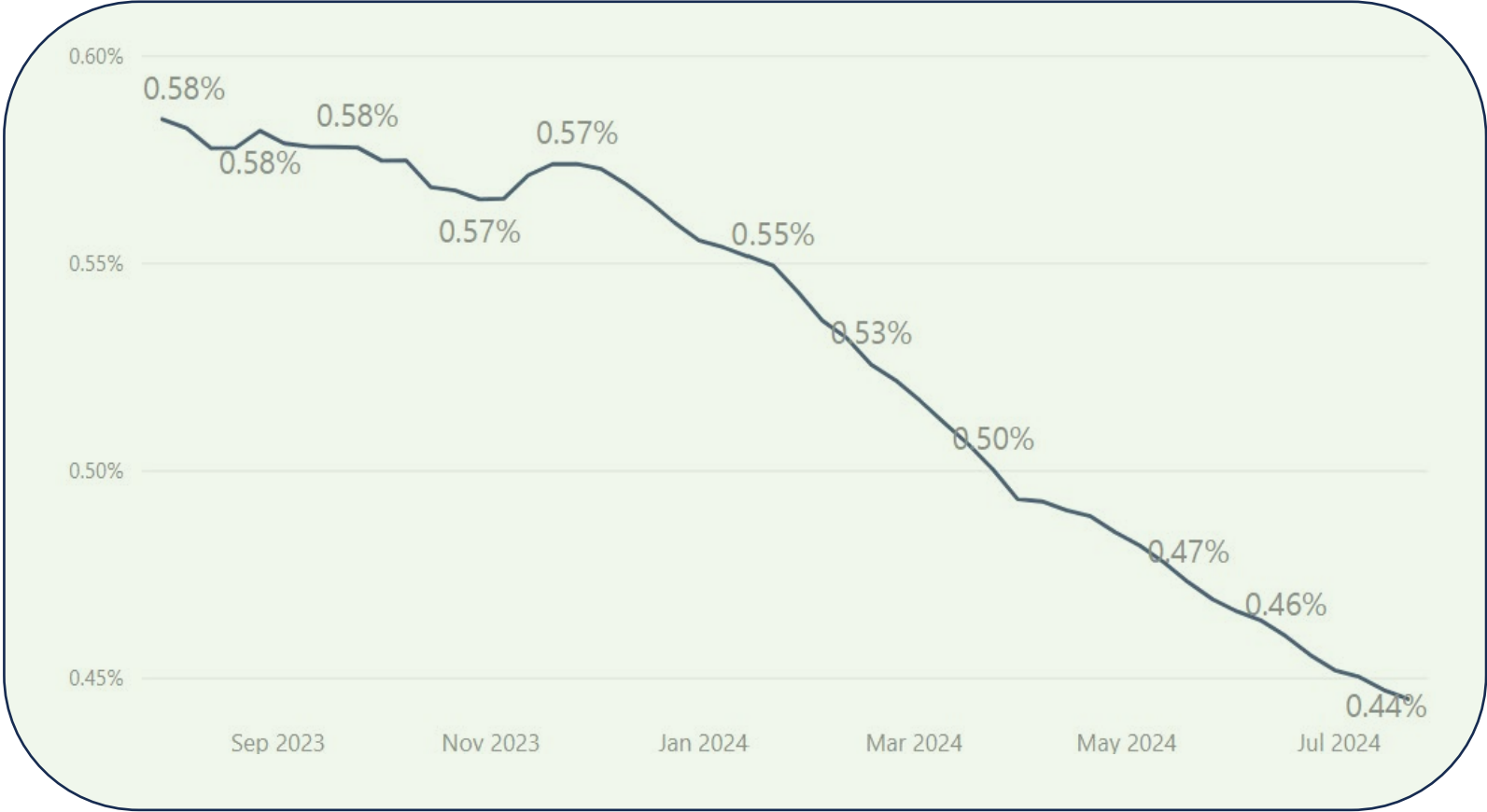
Bad User/System NAND Blocks Daily Trend in Azure



Capacitor Failure Daily Trend in Azure

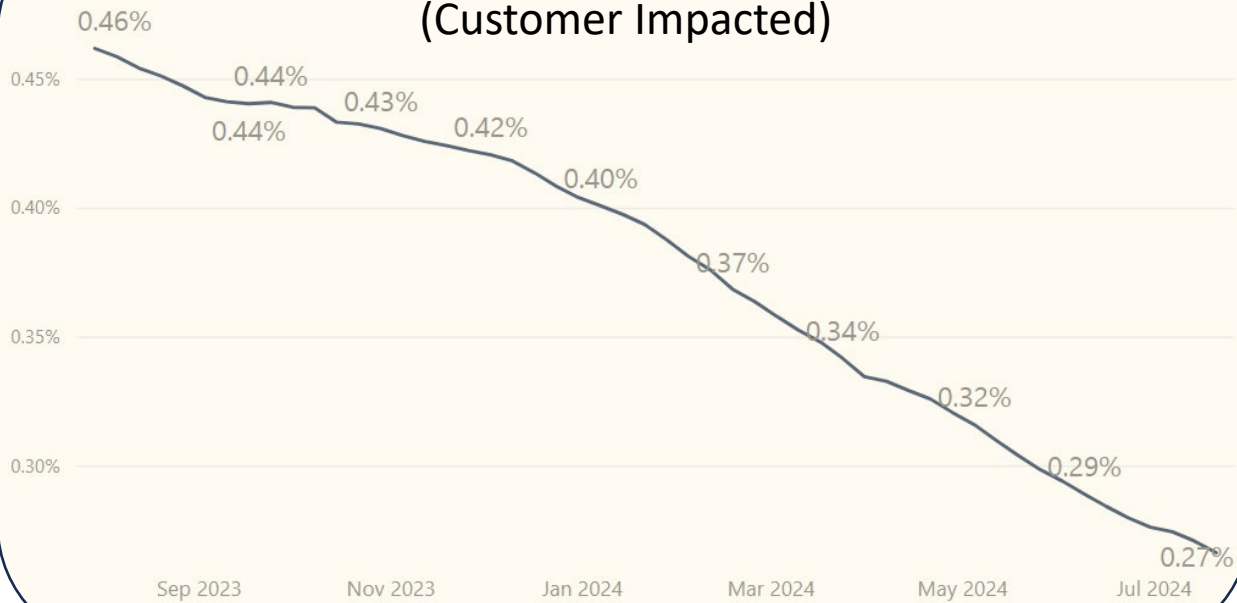


AFR Trend of SSDs in Azure



AFR of Reactive vs Proactive SSD Repairs in Azure

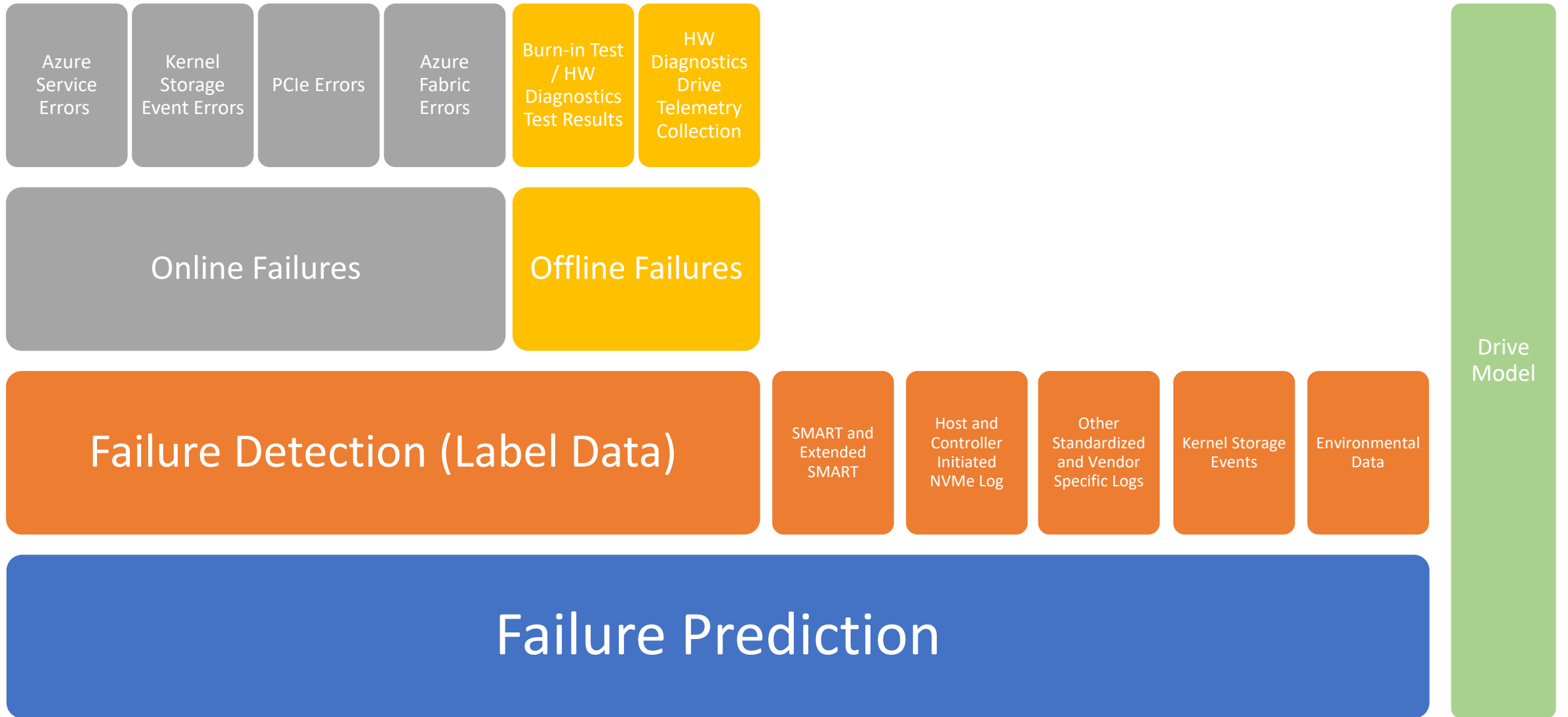
AFR of Reactive SSD Repairs (Customer Impacted)



AFR of Proactive SSD Repairs (Customer Impact Prevented)



Failure Prevention Through Telemetry

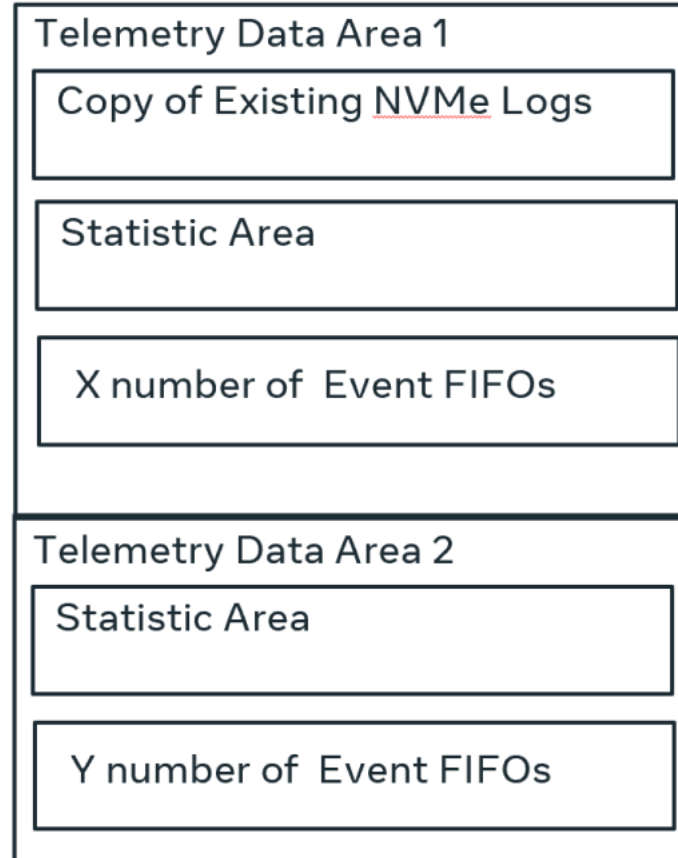


Future Directions

Support following new telemetry requirements in OCP 2.5:

- Log Page Requirements (Section 4.8)
 - C6h – Hardware Component Log
 - C7h – TCG Configuration Log
 - C9h – String Log

- Host and Controller Initiated Telemetry Logs (Section 4.9)



OPEN
Compute Project

Datacenter NVMe[®] SSD Specification

Version 2.5 (09282023)

