open-e JovianDSS

AIC F2026-01-G5 JBOF Platform

Certification Report

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1. Introduction

AIC F2026-01-G5 NVMe JBOF Platform is a high-availability 2U enclosure supporting up to **26 hot-swap Gen5 U.2 dual-port drives**. The platform is based on the Broadcom **89144 PCIe Gen5 switch bridge board** and supports up to 8 dual controllers with **8x PCIe Gen5 x16 slots**, designed for low-latency and high-performance applications, including **NVMe over Fabrics**.

It offers full redundancy with hot-swap power supplies, cooling fans, and tool-less tray design to simplify maintenance and ensure continuous operation.

This certification report outlines the testing and verification of the AIC F2026-01-G5 with **Open-E JovianDSS, a ZFS-based data storage solution** providing enterprise-grade reliability, high availability, and data protection features such as integrity verification, compression, and deduplication.

The goal of this report is to present the certification results and highlight the benefits of using AIC F2026-01-G5 with Open-E JovianDSS. Functional tests were performed in the following configurations to validate full compatibility:

- **Single-Node**
- **High Availability Shared Storage Cluster**

2. Tested Device Description

During the certification process, an **AIC F2026-01-G5 NVMe JBOF Platform** was tested. A detailed description can be found in Table 1.

Table 1. JBOF specifications

Product name	AIC F2026-01-G5 NVMe JBOF
Rack size	2U
Drive number and form factor	26x U.2 NVMe Gen5 Dual Port
Fabric adapter slots	up to 8 x PCIe Gen5 x16 slots
Drive interface	U.2 NVMe
Fabric adapters	Broadcom PEX 89144 PCIe Gen5 Switch
Power supply	2x 3200W 80+ Titanium, 1+1 hot-swap redundant
Front panel LED indicators	Yes
BMC	Yes
Dimensions (H x W x D)	88 x 438 x 750 mm

3. Test Environment Description

Hardware specifications for environments used during certification testing are included in the following tables. The configuration described in Table 2 was used for the Single-Node and High Availability Shared Storage test.

Table 2. Hardware specifications for Single-Node and HA Shared Storage Cluster tests

NodeA

System name	AIC EB202-CP
Motherboard	AIC CAPELLA
CPU	1x AMD EPYC 9015 8-Core Processor
RAM	128 GB - 8x 16GB Micron DDR5 4800MT/s
Disks in JBOF	10 x Phison Pascari SSD X200P 1.92TB XX208H021T92P322T0410
System	Open-E JovianDSS up32 b61683

NodeB

System name	AIC Vega-MB
Motherboard	AIC MB-DPSR02
CPU	1x Intel Xeon Gold 5420+ 28-Core Processor
RAM	128 GB - 8x 16GB Micron DDR5 4800MT/s
Disks in JBOF	10 x Phison Pascari SSD X200P 1.92TB XX208H021T92P322T0410
System	Open-E JovianDSS Up32 b61683

4. Functional and Stability Tests

To ensure the proper operation of the tested device when used with Open-E JovianDSS software, functional testing was done for both the Single-Node and High Availability Shared Storage cluster configurations. The performed tests, along with their results, are described in Tables 3 and 4, respectively.

4.1. Functional and Stability Test Results

Table 3. Single-Node functional tests

Tested functionality	Result
ZFS Functions and various Zpool configurations	passed
Disk failure simulation and replacement functionality	passed
Hot-plug / hot-swap and scalability functionality	passed
NVMe MPIO functionality	passed
Disk health monitoring functionality	passed
Disk activity statistics functionality	passed
Drive identification functionality	upcoming*
Failure recovery (power outage, cable disconnection)	passed
NVMe disk partitioning	passed
BMC System	passed

*Support for LED drive identification is not available in Open-E JovianDSS Up32 for this hardware; integration is planned for upcoming software updates.

Table 4. HA Shared Storage cluster functional and stability tests

Tested functional and non-functional aspects	Result
Manual Failover	passed
Automatic Failover triggered after network failure	passed
Automatic Failover triggered after system shutdown	passed
Automatic Failover triggered after system reboot	passed
Automatic Failover triggered after system power-off	passed
Automatic Failover triggered after I/O failure	passed
System stability under load over extended period of time	passed

4.2. Functional and Stability Test Conclusions

Due to the above test results, Open-E confirms full compatibility with Open-E JovianDSS data storage software. The information provided by Tables 3 and 4 points to all the testing scenarios for the JBOF features. The AIC F2026-01-G5 NVMe JBOF Platform with Open-E JovianDSS confirmed its ability to protect data and efficiently recover in case of failures.

5.   Performance Tests

The following performance tests were intended to ensure that the AIC F2026-01-G5 NVMe JBOF can be used as an efficient enclosure for the data storage devices:

- Mixed Random IO Performance
- Random Read IO Performance
- Random Write IO Performance
- Sequential Read MB/s Performance
- Sequential Write MB/s Performance

The performance tests were conducted for the Single-Node scenario only.

Open-E JovianDSS was configured in the Single-Node architecture using the storage parameters described in Table 5. The Fio testing tool was run locally on the Open-E JovianDSS system, as described in Table 6, for every test profile listed in Table 7.

Table 5. Storage configuration for Single-Node performance test

Zpool redundancy	Single group
ZFS zvol block size	64K
ZFS Zvol sync	always
Zvol compression	lz4
Zvol provisioning	thin
Zvol size	200 GB

Table 6. Fio parameters used for Single-Node performance test

Version	3.35
IOengine	libaio
Direct IO	Yes
Ramp time	30s
Runtime	90s
Direct IO	Yes
Threads Count	1, 4, 8, 16
Queue Depth	1, 16, 64, 128

Table 7. Test profiles description for Single-Node performance test

| Test profiles	IO pattern	Read to write %	Block size
Mixed	random	70/30	4 kB
Random read	random	100/0	4 kB
Random write	random	0/100	4 kB
Sequential read	sequential	100/0	1 MB
Sequential write	sequential	0/100	1 MB

5.1. Performance Test Results

The charts below present the following performance results:

- Mixed Random IO Performance
- Random Read IO Performance
- Random Write IO Performance
- Sequential Read MB/s Performance
- Sequential Write MB/s Performance

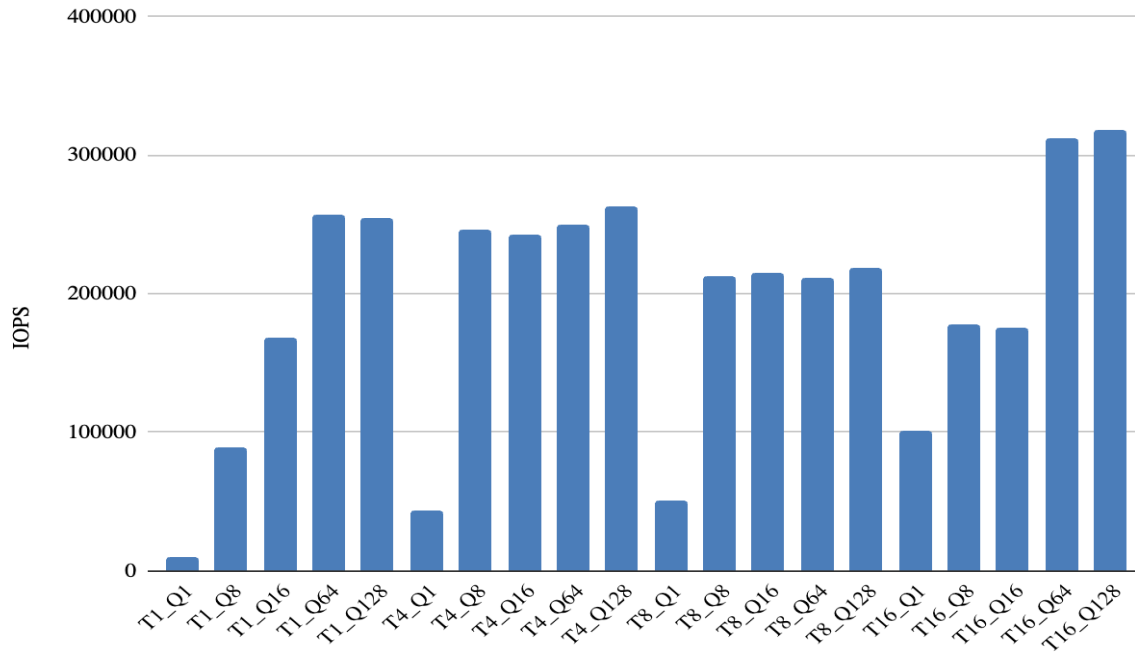### MIXED RANDOM

Single node local test
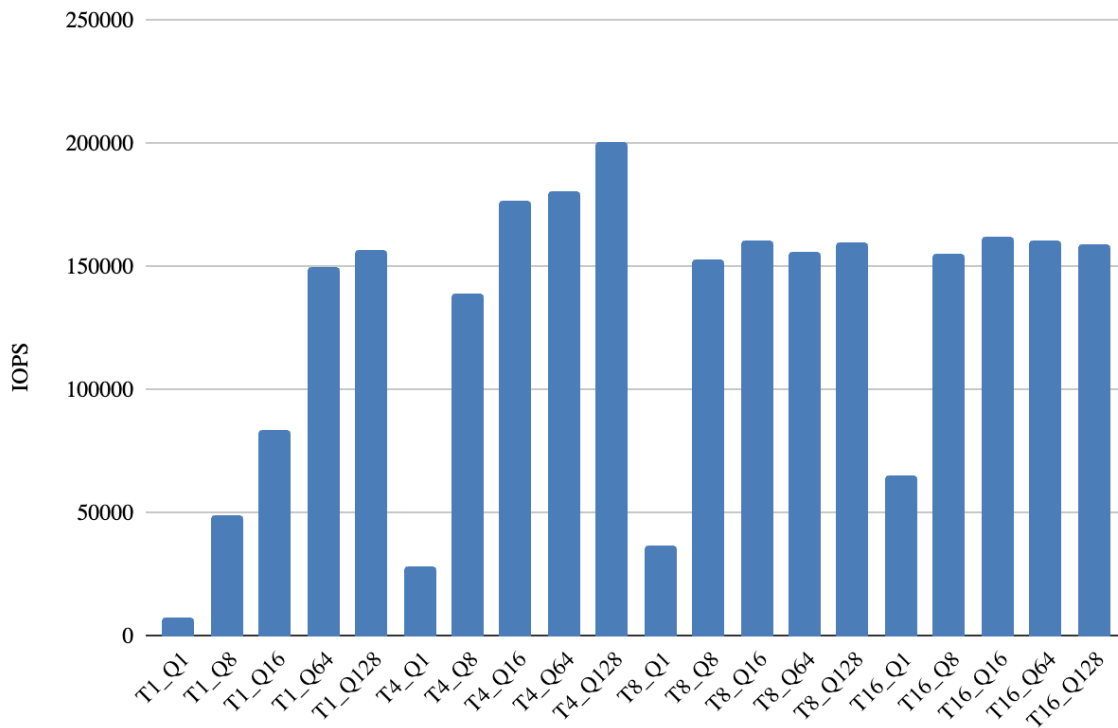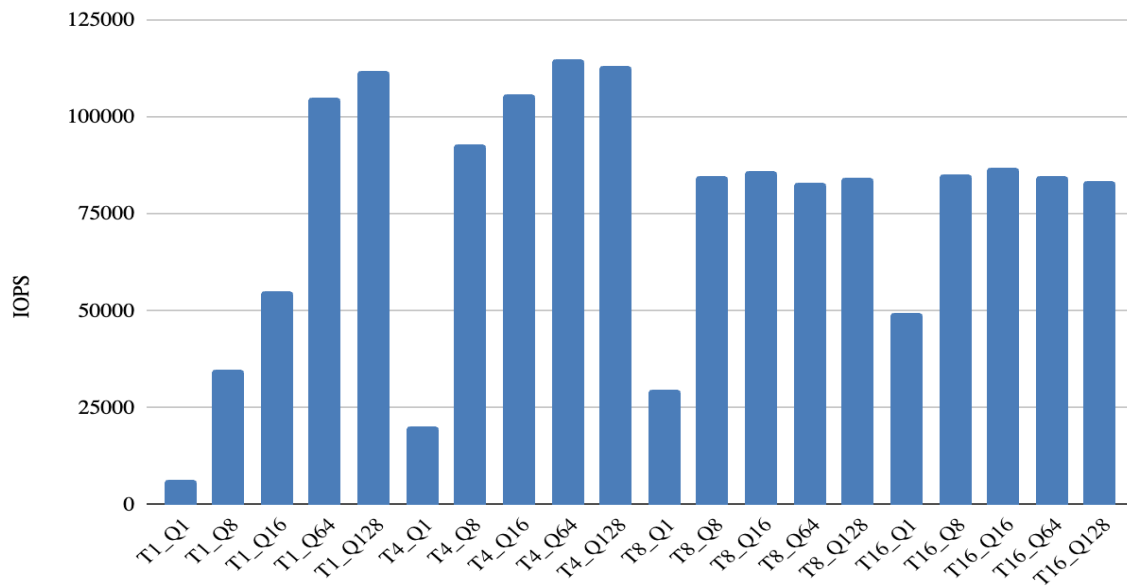
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RANDOM READ
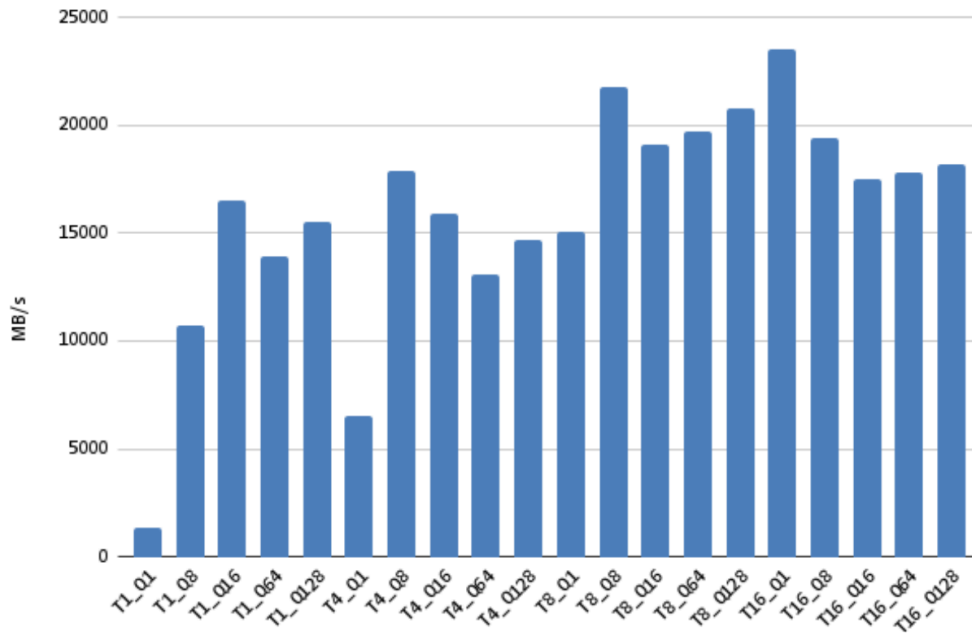Single node local test

RANDOM WRITE
Single node local test

SEQ READ

Single node local test

SEQ WRITE
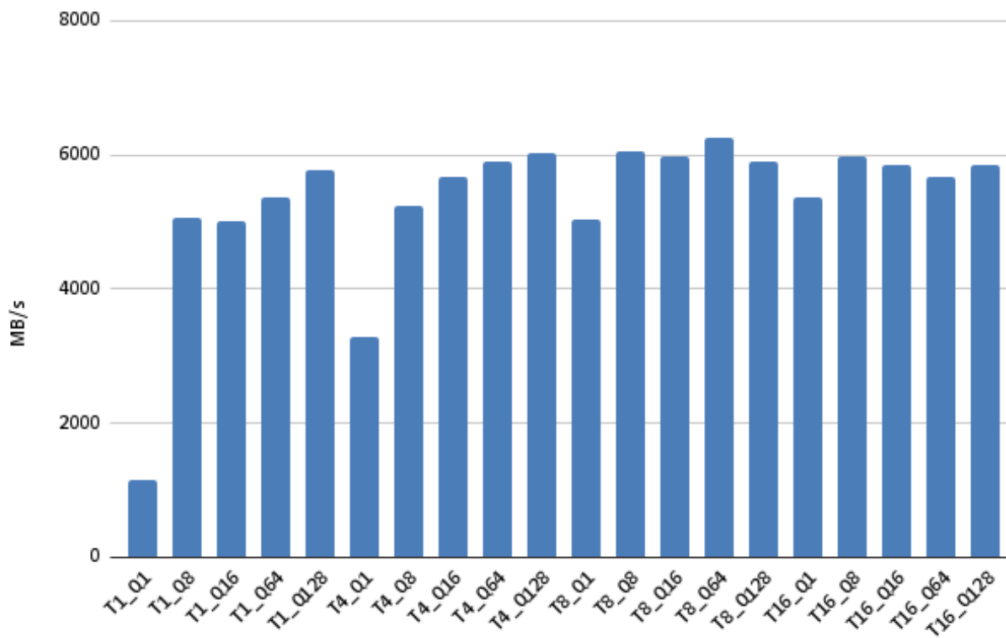
Single node local test

5.2.   Performance Test Conclusions

The AIC F2026-01-G5 NVMe JBOF Platform can be seamlessly integrated with Open-E JovianDSS software. Both hardware and software worked harmoniously, ensuring data storage system stability and consistency.

During in-system performance assessments using Open-E JovianDSS, the Fio tool conducted sequential read tests and achieved a throughput of approximately 15 GB/s. The sequential write tests reached a peak throughput of around 5 GB/s, which is satisfactory for most operations.

The software fully harnesses the device's performance during storage device operations, affirming the system's efficacy in resource utilization. **These findings demonstrate the advantages of the AIC F2026-01-G5 NVMe JBOF and Open-E JovianDSS solution in various scenarios and configurations.**

6.   Certification Summary

Open-E is pleased to announce that the **AIC F2026-01-G5 NVMe JBOF Platform** has completed the certification process with **Open-E JovianDSS** software. All tests confirmed full compatibility, stability, and functionality of the system in both Single-Node and High-Availability cluster configurations.

The AIC F2026-01-G5 demonstrated excellent integration with Open-E JovianDSS, proving to be a highly efficient, robust, and enterprise-ready solution for modern data-center environments.

It's advanced **Broadcom PEX 89144 PCIe Gen5 switch architecture**, together with support for up to **26 hot-swap U.2 dual-port NVMe drives**, delivers outstanding throughput and ultra-low latency.

The **dual-controller design**, redundant **3200 W Titanium-rated power supplies**, and **comprehensive BMC management** ensure continuous availability, simplified maintenance, and rapid recovery in case of any hardware failures.

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From a technical and operational standpoint, the AIC F2026-01-G5 offers exceptional performance scalability, making it an ideal platform for workloads that demand massive parallel data access and fault tolerance.

The system's **tool-less tray design** and **modular hot-swap construction** simplify on-site servicing and minimize downtime, which is especially important in enterprise environments where system reliability is critical.

Based on the successful completion of certification testing, **Open-E recommends the AIC F2026-01-G5 NVMe JBOF Platform** for a wide range of applications, including but not limited to:

- **Virtualization and containerized environments** - ensuring consistent low-latency storage for multiple virtual workloads.

- **Artificial Intelligence and Machine Learning** - providing the bandwidth and parallelism required for AI training and inferencing.

- **Research and Development** - supporting complex, data-intensive simulations and analytics.

- **High-Performance Computing (HPC)** - enabling rapid access to large datasets with minimal latency.

- **Cloud and Edge Deployments** - offering scalable and fault-tolerant storage infrastructure.

- **Testing and validation environments** - delivering predictable performance and easy serviceability.

After passing all certification procedures, **Open-E** adds the **AIC F2026-01-G5 NVMe JBOF Platform** to its **Hardware Certification List** and officially grants it the **"Certified by Open-E"** status, confirming that the solution meets the highest standards of performance, reliability, and interoperability required for professional data-storage systems.