# MoSMB for Ezmeral

## Advanced SMB Gateway for HPE Ezmeral Data Fabric (MapR Data Platform)

**MoSMB FOR EZMERAL IS A FULLY TESTED, END-TO-END SOLUTION THAT DELIVERS AN SMBv3 GATEWAY SOLUTION TO ENABLE FILE SHARING FOR HPE DATA FABRIC AT SCALE ON ANY INFRASTRUCTURE—ON-PREMISES, IN MULTIPLE PUBLIC CLOUDS, OR AT THE EDGE.**
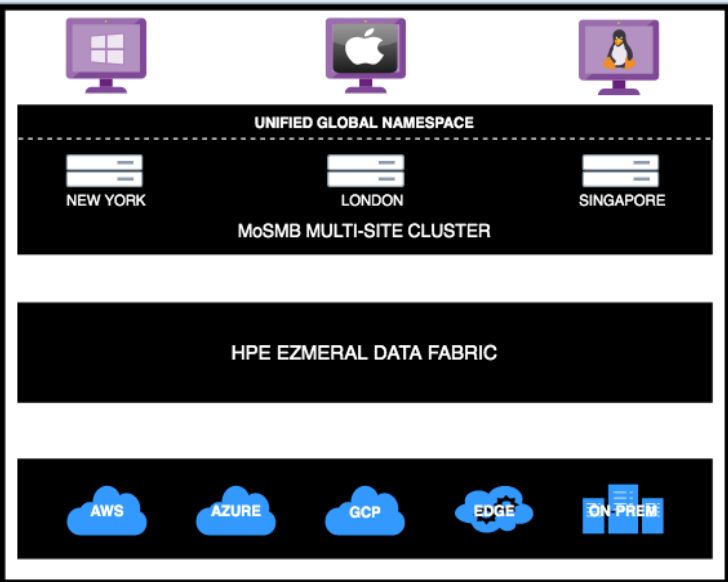
| EXECUTIVE SUMMARY | HIGHLIGHTS |
|---|---|
| MoSMB is an SMB2/SMB3 user mode server designed to run critical enterprise workloads. It is built to be feature-rich, highly compliant and secure SMB protocol server.<br><br>With a 64-bit architecture, a single MoSMB server can easily handle tens of billions of files and scale to multiple petabytes. MoSMB is also architected such that it is relatively constraint-free and can utilize the underlying platform's capabilities and resources to the utmost for maximum performance and scalability.<br><br>By leveraging MoSMB, HPE Data Fabric users can support SMB file access with a dramatically reduced time to go live by using tested, prescriptive reference architecture as a baseline.<br><br>With MoSMB for Ezmeral, users can have the peace of mind and confidence that the solution behaves as expected in a real-world production environment. | ▪ A detailed reference architecture to deploy a high-performance, highly available and scalable SMB3 file access solution supporting up to 100's of concurrent individual user sessions.<br><br>▪ Reference architecture designed by subject matter experts and verified through in-house solution testing, which uses a detailed framework to validate the solution from both a protocol and an application perspective<br><br>▪ The reference architecture includes integration of the authentication, storage, clustering, networking and related components.<br><br>▪ MoSMB solution validation lab subjects the integrated solution to extensive testing using both simulation and live elements to ensure comprehensive validation. |

| Enterprise-Grade Features | High Performance |
|---|---|
| • Single Global Namespace<br>• Authentication & Authorization<br>• Signing & Encryption<br>• Unified locking across clusters<br>• SMB Change Notify | • SMB performance features: ODX, SMB Direct(RDMA), Multichannel<br>• Single server throughput:<br>  ~90 Gbps (RDMA)<br>  ~80 Gbps (TCP) |

| High Availability | Security |
|---|---|
| • Persistent & Durable Handles<br>• AP & AA clusters<br>• Transparent Failover<br>• Witness Server | • AD Kerberos & NTLMv2<br>  Local Authentication<br>• POSIX & Windows ACLs<br>• Linux User-ID Mapping<br>• AES-128-CCM & AES-128-GCM<br>  ciphers |

| High Scalability | Feature Rich |
|---|---|
| • Lightweight & not resource hungry<br>• Scalable Capacity & Performance<br>• Scale-up & Scale-out | • SMB 2/3 features<br>• Highly compliant<br>• Windows, macOS & Linux clients |



**TABLE 1: MoSMB Advantage**      **FIGURE 1: MoSMB for Ezmeral Architecture**

MoSMB offers a rich feature set to support a number of use cases in varied environments. The key features of MoSMB are listed below.

| Feature | Benefit |
|---|---|
| MS SMB 2.*, 3.0 Protocol Compliance | MoSMB has a high level of compliance with Microsoft SMB protocol which makes it well suited for multiple use cases in varied environments. |
| Supports VFS filesystems | MoSMB can provide SMB file access to any POSIX compliant file system and is validated against MapR FS, CephFS, LustreFS, GlusterFS, Ext4, XFS, ZFS. |
| Supports S3 Object Store interface | MoSMB can support any S3 compatible object store backend. MoSMB-S3 is validated against AWS-S3, Minio, Scality, ActiveScale, Wasabi, Caringo. |
| Single Global Name Space | MoSMB supports a single global namespace across multiple domains and sites allowing a unified view and access of data across multiple edge, on-premises, and cloud environments without being aware of the actual physical location. |
| Distributed Locking | MoSMB supports distributed locking across cluster nodes to prevent data inconsistency due to concurrent access of the same data |
| Signing & Encryption | Ensures secure file access over the network. Prevents eavesdropping and man-in-the-middle attacks |
| Enterprise-grade Authentication | Enterprise grade authentication using Active Directory and Kerberos & NTLMv2-based authentication for local users. |
| Multiple authorization mechanisms | MoSMB offers a choice of Windows ACLs (DACLs) and basic POSIX ACLs for authorization. MoSMB also supports Linux UserID Mapping to map SMB identities to UNIX identities so that authorization rules are enforced as per the underlying filesystem. |
| Durable & Persistent handles v1/v2 | Enables SMB connections transparent failover in active-active cluster solution |
| Transparent failover & continuous availability using Witness Protocol | Witness Protocol works with MoSMB to detect failure and failover transparently so that client applications work seamlessly. |
| Scale-up architecture | MoSMB is architected for IO performance scaling in terms of IOPs and throughput by scaling up CPU and/or RAM |
| Active-Active Scale-out architecture | MoSMB also supports active-active scale-out file cluster resulting in increased band-width, zero down-time, load-balancing of smb connections, planned & unplanned migrations. |
| SMB Multi-Channel | Increased throughput and network fault tolerance, automatic & dynamic discovery |
| SMB Direct | MoSMB leverages the networking offload capability of SMB Direct (RDMA) to free up CPU thereby supporting the most demanding use cases which are both compute and IO intensive like real-time video analytics. |
| Offloaded Data Transfer | MoSMB supports ODX feature to speed up 'copy and move' operations |
| SMB Change Notify | SMB Change Notification allows SMB clients to keep up with file and directory changes without having to constantly refresh their view. |
| Multiple Linux OS flavors | Currently MoSMB offers a choice of Linux OS including RHEL 7.*, 8.*, CentOS 7.*, 8.*, Ubuntu 14.04, 16.04, 18.04, 20.04, Debian 10 and SLES 12.3. |
| Heterogeneous client environment | MoSMB supports a heterogeneous environment consisting of Windows, macOS and Linux clients. |

**TABLE 2: MoSMB FEATURE SET**

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