

Financial Institution Implements Microsoft Azure Stack HCI Solution for Banking Services

Bank of Maldives retires its SAN and transitions to a Microsoft software-defined infrastructure



The Challenge



- Phase out three-tier SAN and consolidate infrastructure
- Improve SQL Server performance for lower latency transactions
- Increase firewall security and protect from ransomware attacks
- Add a secondary data center and improve QoS
- Implement a backup strategy that protects from ransomware and offers high availability for SQL Server workloads at the transactional level
- Update networking

The Company

Bank of Maldives (BML) is the leading financial institution in Maldives. It is a full-service bank engaging across the complete spectrum of personal, SME and corporate financial services. With 293,000 customers, it touches almost every citizen and business in Maldives through its extensive network of branches, agents, relationship managers and online banking facilities. BML plays a pivotal role as an engine of growth for the local economy.



IT Challenge: Retire legacy SANs, improve transaction speeds, increase storage capacity, overhaul backup strategy, increase security, and update networking

As BML expanded its internet, mobile and ATM banking services across the islands, it needed to refresh its older SAN infrastructure, increase performance, add more storage in its primary data center, and update its networking infrastructure. Instead of replacing its infrastructure with more SANs, BML wanted to embrace newer technologies that could deliver highly scalable, low-latency, high-capacity storage solutions and support high-speed networking.

For BML, a low-latency solution was critical to power its transactional SQL Server workloads and banking applications. BML also needed to improve security and detect suspicious activity at the microsecond level, reducing fraud.

As BML made its financial services more widely available, it planned to open a second data center closer to its new business centers and move some of its SQL Server and application workloads from the primary data center to reduce latency and increase performance.

The bank also needed to overhaul its backup strategy and disaster recovery (DR) site to provide protection against natural disasters and improve security from ransomware attacks with seamless recovery for its SQL servers at the transactional level for an uninterrupted customer experience.

During the refresh, BML also planned to update its networking infrastructure.

The Solution



- DataON Hybrid Cloud solutions for Microsoft Azure Stack HCI for both data centers and DR site
- Intel® Optane™ SSD and persistent memory (PMEM) technologies
- NVIDIA Networking (Mellanox)

The Solution: DataON solutions for Azure Stack HCI with Intel® Optane™ SSD and NVMe flash

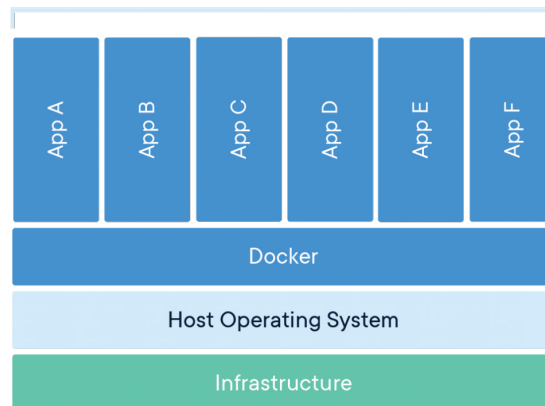
BML sought to move away from traditional SAN technology and its limited scalability. BML is a Microsoft shop and saw the benefits of a hyper-converged infrastructure (HCI) and Azure Stack HCI.

BML first worked with DataON in 2012, when it purchased several JBODs for additional data center storage. The bank was impressed with DataON for its responsive sales and support team, white glove service, and Microsoft expertise. Once again, BML turned to DataON for a Microsoft-based solution for its data center refresh.

Azure Stack HCI was alluring to the bank because it included virtualization, software-defined storage, software-defined networking, and Azure services on Microsoft-validated, industry-standard hardware. BML could consolidate its infrastructure and affordably scale out by simply adding nodes as its storage and compute demands increased.

Azure Stack HCI also supports the latest technology such as 2nd Generation Intel® Xeon® Scalable processors, NVMe flash, and Intel® Optane™ SSD and persistent memory (PMEM) technologies. It also supports RDMA networking, which could deliver the low latency BML needed to improve bank transaction times and provide better security and quality of service (QoS) to its customers.

Containerized Applications



The Results

By implementing a DataON solution for Azure Stack HCI, BML phased out its three-tier SAN and successfully consolidated its infrastructure. It effectively reduced latency, increased SQL Server and general application performance, and expanded capacity in its primary data center. Faster transactions at business centers, point-of-sale payment gateways and ATM processing time improved QoS and increased overall customer satisfaction.

“DataON technical support’s diligence, and motivation, have been a source of inspiration for the rest of our team.”

Mohamed Musthafa, Technical Support Specialist, Bank of Maldives



The Result



- Consolidated infrastructure with Azure Stack HCI solution
- Increased SQL and backup performance with Azure Stack HCI solutions including Intel® DC P4610 NVMe and Intel® Optane™ SSD flash and low-latency networking
- Provided high availability using SQL Server Availability Groups, delivering seamless recovery at the transactional level if primary server goes down at DR site
- Distributed workloads to new secondary data center for greater reach and better service across islands
- Increased security from malicious actors with Azure Stack HCI
- Deployed a new DR system designed to protect against ransomware attacks with “air gapped” backups
- Received DataON turnkey support, helping Bank of Maldives quickly deploy its servers

Mohamed Musthafa, Technical Support Specialist, Bank of Maldives, and the Bank of Maldives IT Department team applauded DataON's dedication to its server deployment project.

“We are very appreciative of the endless hours that the DataON team has spent working on this project”, said Musthafa. “The professionalism that they have shown has impressed our entire team immensely. DataON technical support’s diligence and motivation, have been a source of inspiration for the rest of our team.”

CSV FS	IOPS	Reads	Writes	BW (MB/s)	Read	Write	Read Lat (ms)	Write	Read QAvg	Write
Total	2,571,680	2,571,346	334	10,533	10,524	10				
BoM-n1	820,782	820,596	186	3,359	3,357	2	0.132	0.548	108.462	0.102
BoM-n2	880,837	880,742	95	3,607	3,603	4	0.131	0.581	115.427	0.055
BoM-n3	870,061	870,008	53	3,567	3,564	3	0.134	0.755	116.971	0.040

Performance Report (Random 4K, 8 threads, 8 outstanding, 100% read)

CSV FS	IOPS	Reads	Writes	BW (MB/s)	Read	Write	Read Lat (ms)	Write	Read QAvg	Write
Total	406,959	2,483	404,476	1,659	2	1,657				
BoM-n1	133,725	1,894	131,831	542	1	540	0.002	7.263	0.003	957.526
BoM-n2	131,541	589	130,952	537		537	0.002	7.200	0.001	942.991
BoM-n3	141,693		141,693	581		581	0.000	6.707	0.000	950.288

Performance Report (Random 4K, 8 threads, 8 outstanding, 100% write)

CSV FS	IOPS	Reads	Writes	BW (MB/s)	Read	Write	Read Lat (ms)	Write	Read QAvg	Write
Total	1,128,147	790,070	338,077	4,620	3,234	1,386				
BoM-n1	366,443	256,717	109,726	1,499	1,050	450	0.151	0.629	38.685	69.037
BoM-n2	400,924	280,946	119,978	1,643	1,151	492	0.144	1.754	40.359	210.382
BoM-n3	360,780	252,408	108,372	1,478	1,034	444	0.137	2.696	34.553	292.067

Performance Report (Random 4K, 4 threads, 8 outstanding, 70% read, 30% write)

CSV FS	IOPS	Reads	Writes	BW (MB/s)	Read	Write	Read Lat (ms)	Write	Read QAvg	Write
Total	75,533	75,512	21	17,468	17,467	1				
BoM-n1	25,836	25,828	8	12,430	12,430		1.277	0.367	32.972	0.003
BoM-n2	25,230	25,218	12	12,622	12,622		1.304	0.392	32.877	0.005
BoM-n3	24,467	24,466	1	12,416	12,416		1.355	0.424	33.132	0.000

Performance Report (Sequential 512k, 1 thread, 1 outstanding, 100% write)



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About DataON

DataON is a hybrid cloud computing company focused on delivering Microsoft Azure Stack HCI, on-premises storage systems, intelligent edge appliances, and cloud-based Microsoft Azure Services. Our company is helping enterprises and customers who have made the “Microsoft choice” to modernize their IT with Microsoft applications, virtualizations, and data protection through a complete and turnkey experience. With over 850 HCI clusters and 150PB of storage deployed, DataON enterprise-level solutions are designed to provide the highest level of performance, manageability, and security offered. DataON is a Microsoft Gold Partner, Microsoft Cloud Service Provider (CSP), and an Intel Platinum Partner.