“DRaaS”
Business Continuity with LoadMaster

Reference Architecture

VERSION: 1.0

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1 Introduction

Microsoft's Azure cloud is designed to provide reliable on-demand access to applications and services. With presence in multiple regions and Availability sets where multiple VMs are typically served by a load balancer it is possible to architect scalable, resilient services.

However, when it comes to deploying complex infrastructure, KEMP LoadMaster can augment native Azure capabilities with comprehensive integrated features which can reduce the operational cost and risk that goes with use of PowerShell to configure the various load balancing and traffic management features in Azure. LoadMaster can add value and ensure ease of deployment at all levels from a single service to an enterprise's global presence.

With this in mind, LoadMaster can form a key element when designing a Disaster Recovery strategy. As an example, in Microsoft's DRaaS offering, Azure Site Recovery, can manage availability across hybrid environments by replicating Hyper-V virtual machines from on-premises to the Azure cloud

1.1 Document Purpose

This document discusses how LoadMaster can enhance application availability in environments where uninterrupted business operation is essential.

1.2 Intended Audience

This document applies to:

- Cloud and Network Architects
- System Administrators.
- Line-of-Business Management

2 Safeguarding Business Operation with LoadMaster

While many people think of a data center outage as being the most catastrophic event that could happen to their business. Cost of downtime for a busy ecommerce site can run into hundreds of dollars a minute, not counting the damage to a company's reputation.

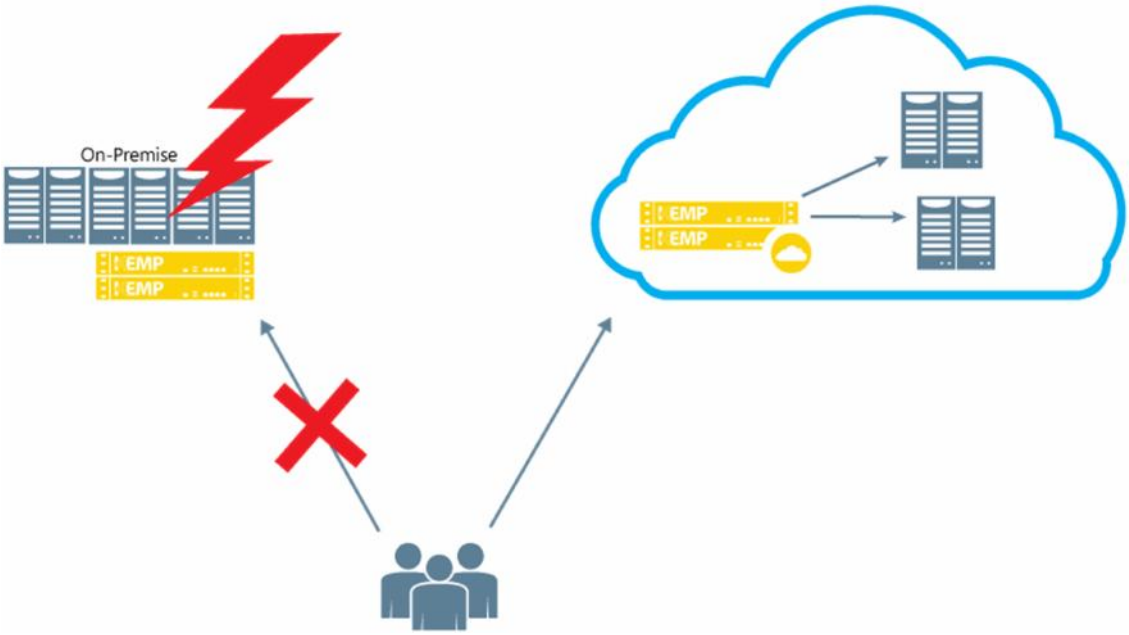

Fig. 1

But this is just one example of events that could happen – and that could be prevented by building on sound foundations.

There are many other factors to take into account when designing infrastructure for resilience. Many third party solutions exist today that address the needs of a comprehensive solution, dealing with topics such as storage replication and network connectivity. Being closely tied to the applications, LoadMaster can form part of complete availability solution by reducing risk at the application layer. The following sections explore this in more detail.

3 LoadMaster availability features

LoadMaster can run on-premises as a VM or appliance, and also offers the same rich set of tightly integrated features in the Azure cloud. When moving workloads to the cloud or extending infrastructure across multiple regions having the same setoff interfaces makes deployment much easier as there is no need to learn different tools or scripting methods.

To start with, LoadMaster offers load balancing capabilities, and provides not just a broad set of algorithms, but also provides sophisticated health checking features. This ensures all the components of a complex service can be monitored and dependencies managed to ensure the service remains viable should certain parts fail.

A further benefit of load balancing is that additional real servers can be attached to add capacity, and these resources could exist both on-premises and in the cloud. This technique means capacity can be added on demand to match peaks in usage. Real servers can also be taken out of service – for hardware or software maintenance or even as a quarantine measure should a system have been compromised. All these capabilities contribute to maintaining service availability.

Both in the cloud and on-premises, a pair of LoadMasters can be configured to provide high availability for the workloads they service. This is the recommended deployment for any service that must provide a high uptime guarantee.

Providing protection for applications against security threats is also critical to any business operating on the internet, and given the different application deployment models in the cloud this gives rise to the concept of pervasive security. Cloud architectures can be very different to the closed, static, well-protected environment of the traditional data center. Multi-tier applications could be running in a hybrid model, and components could even reside in different cloud regions, so security features such as application firewalling and secure VPN tunnels can play a part in protecting data in transit. In addition, having appropriate levels of authentication and user access controls is also vital, and with a growing trend toward containers and microservices, it can be appropriate to apply these controls on a per instance basis. This need is reinforced by the dynamic nature of cloud services where those instances can be spun up or down based on demand. Having these features available in Loadmaster, where the ADC can easily be associated with an application – at the component level if needed – is a huge advantage when it comes to building well protected, and therefore more available, cloud services.

3.1 LoadMaster and Site Recovery

In the multicloud, design for availability can build on the examples above to integrate applications supported by LoadMaster into a globally distributed infrastructure. DraaS is touted as the answer but there is no one simple answer, especially when applications are considered. Keeping individual applications available as described above is a good start, but as resources are increasingly deployed in the cloud, more is needed. So far, individual LoadMaster instances have been described, but in the cloud it is expected that many instances will be deployed, often dynamically, to service the particular needs of a wide range of applications. To address this need KEMP provides two frameworks designed to deploy and manage multiple LoadMasters at cloud scale.

Cost is also a consideration – having a fully redundant hot standby for failover is expensive, and where cloud is used to host a redundant site means paying to keep virtual machines running when they are doing no useful work.

	Active-Active	Passive/Hot Standby
Compute resources	Fully utilized	Half utilized
Network Bandwidth	Fully utilized	Partially utilized
Storage	Live data everywhere	Requires synchronization
Operational	Easy to maintain all assets	Complex maintenance
Resilience method	“Cloud Balancing”, use GSLB, “clone and go” to scale up	Automatic, but setup and test is complex

Table 1

As noted earlier, this might be the solution for a major outage, but there are a number of scenarios listed below that should be considered:

1. Application Failure
2. VM (or related server) failure
3. Loss of an entire availability group/rack
4. Loss of entire data centre or network connectivity

While a single LoadMaster instance can be managed and monitored through its web user interface, this approach does not scale to the needs of the cloud. This is where the KEMP 360 framework, with its ability to deploy, manage and monitor multiple LoadMasters provides the visibility and control needed to address the first three scenarios. Assuming two or more sites are

available, failure of a software instance or set of services can be handled by health checking and use of autoscaling services or scripting to bring additional capacity on line. This is effectively an active-active scenario for the workload in question.

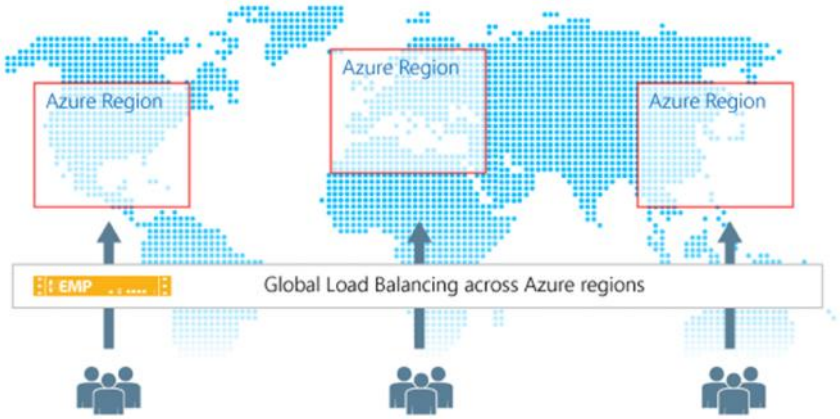

Fig. 2

Finally, LoadMaster GEO provides Global Server Load Balancing capability. This adds another dimension to resiliency in the cloud, especially where services are made available across multiple regions. Should a region become inaccessible for any reason, policy in the GEO instance will route traffic to the nearest available region.

From a simple application to global infrastructure in the multicloud, products and services from KEMP provide easy to deploy, cost-effective solutions to help keep businesses running.

References

Additional supporting documents can be found at http://kemptechnologies.com/loadmaster-documentation. The following items in the feature description section address the example above and also provide additional information on configuration for virtual services, security and content switching.

- LoadMaster for Azure
- HA for Azure
- LoadMaster GEO
- KEMP360 Central
- KEMP360 Vision

Document History

Date	Change	Reason for Change	Version	Resp.
Mar 2016	Initial release	First version	1.0	CB

