Wharfedale Whitepaper | January 2018

SAP HANA on Public Cloud (Azure)

Benefits and advantages of utilizing HANA on Microsoft's Azure Public Cloud.

SAP HANA on Public Cloud (Azure)

Overview

SAP HANA is a large-scale, in-memory database platform that accelerates business processes with next generation analytics that deliver real time data to business users thereby enabling them to make decisions with a competitive edge. With the ability to handle structured and unstructured data including complex data sets, organizations can identify critical trends and make optimal business decisions faster and more efficiently. In this whitepaper, we will look at why public cloud in general is a great choice for deploying HANA, review which HANA products are certified for use on Azure and explore multiple options of deploying HANA on Azure.

Why public cloud for HANA

For companies that are in the process of undergoing digital transformation, SAP HANA has proved to be a critical platform for data management and analytics. The ability to quickly deploy the platform and optimize its use is a critical task for IT. Public cloud providers like Azure enable organizations to realize this benefit.

The advantages of using the public cloud for these workloads include:

• *Quicker Deployments*

The time required to setup the infrastructure required for HANA deployment is much less than the traditional model of procuring the HANA certified hardware, racking, stacking and connecting all the components. The time to value is much faster when deployed in cloud. Using DevOps tools or PowerShell, networking and security related components like load balancers, firewalls etc. can be created much faster.

• *Reduced Upfront costs*

Reduce high up-front costs for IT assets as well as flexibility to including IT staffing and operations.

• *Elasticity*

Public clouds provide the capability of scale-on-demand for HANA instances with relatively little effort and in a much shorter duration of time. Enhanced flexibility is an important capability that reduces the challenge of capacity planning for analytics workloads. *The* SAP *HANA* workloads can be scaled up to 20 TB for OLTP and 60 TB for OLAP on Azure.

• *Flexible Environments*

The wide geographic availability of the Public cloud services provides greater choice in terms of implementing disaster recovery solutions for HANA landscapes.

SAP HANA products certified for use on Azure

The following table depicts the different SAP HANA products that are certified for use on Azure:

SAP Product	Supported OS	Azure Offerings
SAP HANA Developer Edition (including the HANA client software comprised of SQLODBC, ODBO-Windows only, ODBC, JDBC drivers, HANA studio, and HANA database)	Red Hat Enterprise Linux, SUSE Linux Enterprise	D-Series VM family
Business One on HANA	SUSE Linux Enterprise	DS14_v2
SAP S/4 HANA	Red Hat Enterprise Linux, SUSE Linux Enterprise	Controlled Availability for GS5, SAP HANA on Azure (Large instances)

SAP Product	Supported OS	Azure Offerings
Suite on HANA, OLTP	Red Hat Enterprise Linux, SUSE Linux Enterprise	GS5 for single node deployments for non-production scenarios, SAP HANA on Azure (Large instances)
HANA Enterprise for BW, OLAP	Red Hat Enterprise Linux, SUSE Linux Enterprise	GS5 for single node deployments, SAP HANA on Azure (Large instances)
SAP BW/4 HANA	Red Hat Enterprise Linux, SUSE Linux Enterprise	GS5 for single node deployments, SAP HANA on Azure (Large instances)

The following SAP notes have more detailed information related to certifications

- SAP Note 2316233 - SAP HANA on Microsoft Azure (Large Instances) covering HANA Large Instances regarding SAP HANA support.
- SAP HANA certified IaaS platforms for SAP HANA support for native Azure VMs.

Deployment Options

There are primarily three options to deploy HANA on Azure.

- HANA on Azure VMs
- HANA on Azure Large Instances
- Deployment using SAP Cloud Appliance Library into Azure

The following sections provide a brief overview of each option.

HANA on Azure VMs

For SAP workloads that leverage SAP HANA, there are multiple Azure Virtual Machine options available that differ in number of CPU and size of memory (448 GB to 4 TB). As of January 2018, Azure VMs are certified by SAP for SAP HANA for scale-up configurations only. Scale-out configurations on Azure VMs with SAP HANA workloads are not yet supported. The following operating systems are supported to deploy SAP HANA on Azure VMs:

- SUSE Linux Enterprise Server 12.x
- Red Hat Enterprise Linux 7.2

The overall high-level process of deploying HANA on Azure VMs involves the following steps

❖ Sizing

Sizing for HANA is one of the first steps that needs to be performed as part of any HANA deployment. SAP provides a number of reports that run on your existing SAP systems. If the database is going to be moved to HANA, these reports check the data and calculate memory requirements for the HANA instance. For greenfield implementations, SAP Quick Sizer can be used to calculate memory requirements.

Once the details of sizing are finalized, you need to plan the design for connectivity options to the HANA VMs, followed by picking the right Azure instance to match the requirement and the type of storage that needs to be assigned to the VM.

❖ Connectivity to Azure virtual machines

There are two basic methods for connecting into Azure VMs:

- Connect through the internet and public endpoints on a Jump VM or on the VM that is running SAP HANA.
- Connect using site-to-site VPN connection or using dedicated private connection between Azure datacenter and on-premise infrastructure (Azure ExpressRoute).

❖ Select the Azure VM type

The SAP documentation for IAAS provides the list of Azure VM types that can be used for production scenarios. For non-production scenarios, the VM types that are listed in the SAP note #1928533 can be used.

❖ Select Azure Storage type

Azure provides two types of storage that are suitable for Azure VMs that are running SAP HANA:

- Azure Standard Storage

Azure Standard storage disks are typically assigned for the Application server VMs to host the /sapmnt and the SAP binaries

- Azure Premium Storage

Azure Premium Storage disks (SSDs) are recommended to be used for HANA data volume, HANA log volume, /usr/sap, /hana/shared and /root volume on the database server.

HANA on Large Instances

❖ Sizing

Sizing SAP HANA on Large Instances is not that different from sizing HANA on Azure VMs. SAP provides a number of reports that run on your existing SAP systems. If the database is going to be moved to HANA, these reports check the data and calculate memory requirements for the HANA instance. For greenfield implementations, SAP Quick Sizer can be used to calculate memory requirements.

Azure offers the possibility to run and deploy SAP HANA on bare-metal servers that are dedicated to a specific customer in addition to providing Azure Virtual Machines for the purpose of deploying and running SAP HANA. This dedicated infrastructure is HANA TDI certified. The different server sizes that are available range from units with 72 CPUs and 768 GB memory to units that have 960 CPUs and 20 TB memory. The SAP application layer or workload middle-ware layer can still be hosted in native Azure Virtual Machines in this scenario.

So, the SAP HANA on Azure (Large Instances) solution has the SAP application layer residing in Azure VMs and the database layer residing on SAP TDI configured hardware located in a Large Instances in the same Azure Region that is connected to Azure IaaS.

The process for getting these large instances provisioned is very different compared to provisioning the Azure virtual VMs. Customer needs to provide specific details about the environment to Microsoft. These details include providing specific IP address ranges to

Microsoft, (Azure VNet Address spaces, Address range for ExpressRoute=P2P connectivity, Server IP Pool address range) in addition to other details like subscription ID, Azure deployment region, and host specific details like hostname, HANA SID, user id, group id etc. for each large instance.

Once this information is provided, Microsoft provisions SAP HANA on Azure (Large Instances) and provides information required to link customer's Azure VNets to HANA Large Instances and to access the HANA Large Instance units.

There are some differences between running SAP HANA on HANA Large Instances and SAP HANA running on Azure VMs deployed in Azure.

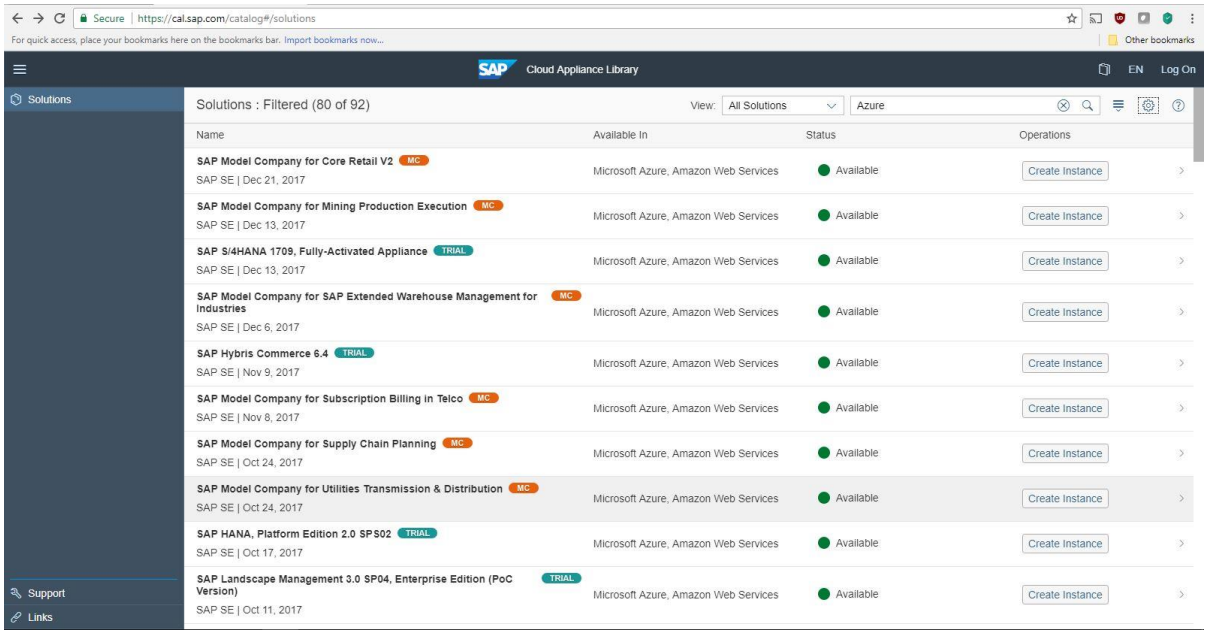
- SAP HANA on Azure (Large Instances) is deployed on bare-metal servers without virtualization eliminating the overhead associated with virtualization.
- The SAP HANA on Azure (Large Instances) server is dedicated to a specific customer, unlike Azure VMs where the underlying hardware may be shared.
- The processor types chosen for SAP HANA on Azure (Large Instances) are the highest performing of the Intel E7v3 and E7v4 processor line unlike Azure, where host processor types are selected for the best price/performance ratio.

SAP Cloud Appliance Library

SAP Cloud Appliance Library (SAP CAL) provides an online repository of latest, pre-configured SAP solutions that can be instantly consumed in the cloud. It's intended to be used for test, demo, trial and development systems. SAP Cloud Appliance Library is an option if there is a requirement to provision a SAP HANA instance or S/4HANA, or BW/4HANA system deployed in very fast time. The customer needs to provide the details of Azure subscription and an SAP user that can be registered with SAP Cloud Appliance Library.

Note:
SAP CAL uses H-series VMs of Azure to deploy some of the SAP HANA based solutions. The vCPU quotas for H-series VMs need to be verified prior to deploying any VMs in Azure for Cloud Appliance Library.

Once an account is created in SAP CAL, it should be associated with customer's azure subscription so that it can deploy appliances into customer's Azure subscription using Resource Manager deployment model. A solution can be deployed from the Solutions page of the SAP CAL.



Conclusion

Each of the options described in the above sections address a specific business requirement and it is this flexibility offered by Azure that makes it an ideal platform to deploy HANA.

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