

OpenLab CDS Deployment in the Cloud

Introduction

Over the past few years Infrastructure-as-a-Service (IaaS) platforms have reached across the technology adoption chasm and gained acceptance as a technology for many enterprise IT departments, Agilent's customers are increasingly willing to install their CDS applications in one of the big three leading cloud platform providers. AWS, Azure, Google Cloud. The willingness across organizations to move to a cloud platform is typically driven by IT expertise and business drivers to centralize services and reduce capital expenditure. When corporations move to a cloud platform, it enables them to outsource more of the routine maintenance of traditional datacenter type operations to a cloud provider, as well as move the cost of operation from a capital expense to an operating expense.

Intended use of this document

This document serves as guidance for customers interested in moving their OpenLab CDS system to a cloud service provider. The reader should be familiar with the cloud solutions offered by Amazon and Microsoft.

- Amazon Web Services (AWS)
- Microsoft Azure

Supported Cloud Configuration

The following Agilent software and IaaS vendors have been tested by Agilent. The information provided in this document is based on the configurations shown in the table below.

	AWS EC2	AWS RDS*	AWS S3+ Storage Gateway	Azure VM	Azure File Storage	Azure SQL (managed)
OpenLab CDS with OpenLab ECM XT	✓	✓	✓	✓	✓	✗

Legend: ✓ = supported ✗ = not supported

*only with PostgreSQL, not with MS SQL. AWS RDS does not provide "SA" role with MS SQL

Note: AWS RDS is supported with PostgreSQL or MS SQL

- Azure SQL (managed) is not supported
- English Only support
- No supportability for AWS China and Azure China
- Native Azure Active Directory (AAD) is not supported, only in hybrid mode as CDS requires LDAP

Definitions:

AWS = Amazon Web Services

AWS RDS = AWS Relational Database Service (managed DB)

S3 = Simple Storage Service (unstructured data)

Storage Gateway = AWS service for Server Managed Block (SMB) for S3 Storage

VM= Virtual Machine

File Storage = Azure supported SMB storage

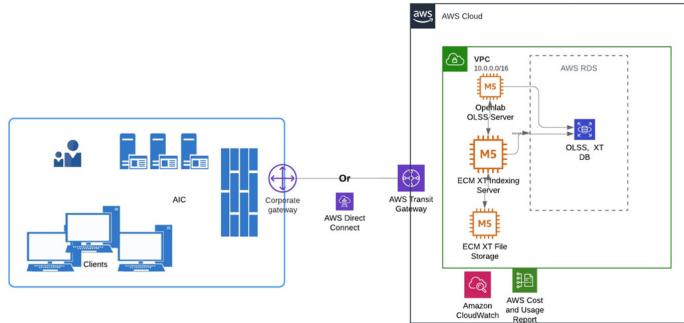
Azure SQL (managed) = Azure managed database service.

Hybrid Private Cloud Infrastructure Guidance

When deploying OpenLab CDS in a customer's cloud infrastructure, the deployment must be in a hybrid model where some of the CDS components must be installed on-premises while other components can be installed in the cloud infrastructure. The following section will describe the networking recommendations for connecting the on-premises resources to the cloud resource. It will also describe the recommendation for the cloud resources.

Network connectivity types from on-premises resources to cloud resources

There are two options to connect on-premises resource to cloud resource privately: 1) Virtual Private network (VPN) or 2) Cloud Specific private connection. A customer can choose which method is best suited for them based on cost and performance that would meet their needs.



Example for AWS Hybrid Private Cloud Model configuration for OpenLab CDS

Virtual Private Cloud (VPC) recommendations:

This section describes the customers environmental setup and it is their responsibility to design and implement a VPC that meets the CDS requirements. Agilent should verify prior to installation that the VPC meets the requirements as outlined in the OpenLab CDS Requirements and Supported Instruments guide. Additionally, the customer should also plan for and deploy a test/dev instance. For customers in a compliance environment, they should also deploy a QA instance.

Recommended IaaS deployment configuration for base configuration. It must be scaled accordingly as recommended in the OpenLab CDS installation guide.

	Instance	DB	Storage
AWS	M5a2XL	EC2 or AWS RDS (XT only)	S3
Azure	Dav8/Dav4	Azure SQL (VM)	Azure File Storage

An example AWS cloud configuration for All-in-one CDS+ECM XT application server: M5a.2xlarge (M5a.2xlarge instance, 2xLarge – S3 storage + capacity), 1 Gbps network within VPC

On-premises resources

AIC must be installed on-premises, but it is possible to virtualize and host on a VM stack. The VM stack should not be operating at >50% capacity. CDS Clients can be installed on-premises (virtualized or physical) or as a thin client in the cloud. Agilent does not have a recommendation for thin client virtualization in the cloud.

Network performance and network ports

Networking characteristics and its performance has a direct impact on overall system performance. This section describes the required network performance. The required ports are listed in the OpenLab CDS Requirements and Supported Instruments guide.

Network Performance Characteristics: Example for AWS

	On-Prem to IaaS*	EC2 to S3	EC2 to EC2
Bandwidth	1 Gbps	1 Gbps	1 Gbps
Throughput	~45 Mbps	N/A	N/A
Latency	30-80ms	<10ms	<10
% Packet Loss	0%	0%	0%

*Also applicable for Microsoft Azure

While latency is an important factor and has an impact on effective bandwidth (throughput), throughput is a key parameter that will determine the overall system performance.

Note: When configuring EC2 instance types in AWS, it is recommended to take advantage of AWS' Elastic Network Adaptor (ENA) to maximize throughput and low latency while minimizing load on the host processor, in particularly for systems with multiple vCPU.

Other considerations

- Azure Active Directory (AAD) is not supported (only in hybrid mode)
- English only support
- AWS China and Azure China is not supported
- If virtualizing AIC or clients on-premises, the VM host should not be at >50% utilization

Recommended Agilent software versions for cloud deployment

- OpenLab CDS v2.6 or newer with OpenLab Server/XT
- OpenLab CDS v2.6 or newer with OpenLab v3.6 or newer

Additional considerations

Application performance (such as loading large data sets, or initial application launch) can be impacted by cloud architecture design. Your Agilent representative can provide further guidance on your OpenLab cloud configuration.

Contingency plan

It is recommended that the customer should have a backup application VM server, or failover clients (workstations) in case of network outage and for troubleshooting purposes.

Summary

Understanding the available cloud options and planning your cloud deployment is necessary to fully realize the benefits of a cloud environment. Similarly choosing the right software vendor who can provide detailed requirements and post installation configuration information paves the way to a successful move to the cloud. Agilent offers standard installation services and SMAs for documented cloud configurations.

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