

# Deploying OpenLab 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 utilize cloud providers to deploy their analytical systems. 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 an overview for customers interested in moving their analytical data systems 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 PostgreSQL	AWS S3	Azure VM
OpenLab ECM XT	✓	✓	✓	✓

Legend: ✓ = supported

- English only support
- AWS China and Azure are not supported

### Definitions:

AWS = Amazon Web Services

AWS RDS = AWS Relational Database Service (managed DB)

EC2 = Amazon Elastic Compute Cloud (Virtual Machine in AWS)

S3 = Simple Storage Service (unstructured data)

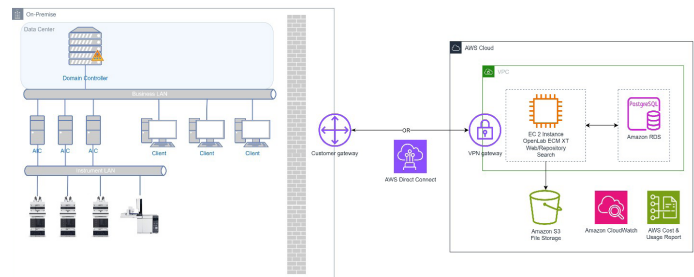
VM= Virtual Machine

## Hybrid Private Cloud Infrastructure

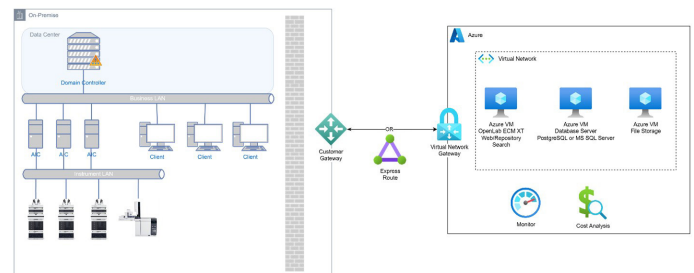
When deploying an analytical data system in a customer's cloud infrastructure, the deployment must be in a hybrid model where some of the components (e.g., acquisition) must be installed on-premises while other components (e.g., server and storage) can be installed in the cloud infrastructure. The following section describes the networking recommendations for connecting the on-premises resources to the cloud resource.

### 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 with OpenLab Server/ECM XT.



Example for Azure Hybrid Private Cloud Model configuration for OpenLab CDS with OpenLab Server/ECM XT.

### Virtual Private Cloud (VPC) recommendations:

This section describes the customer's environmental setup, and it is their responsibility to design and implement a VPC that meets the requirements of the analytical data system.

Recommended IaaS deployment configuration for base configuration is listed below. It must be scaled accordingly as recommended in the 'OpenLab Server and ECM XT Hardware and Software Requirements guide'.

	Instance/VM Type	Database	Storage
AWS	General Purpose	PostgreSQL (RDS) SQL Server (EC2 Instance)	S3
Azure	D-Series	PostgreSQL (VM) SQL Server (VM)	VM

Example for AWS cloud configuration for All-in-one OpenLab CDS + OpenLab Server/ECM XT application server: m7a.2xlarge (m7a EC2 instance, 2xlarge – S3 storage + capacity), 1 Gbps network within VPC.

## 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 Requirements and Supported Instruments guide(s) specific to your data system of interest.

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.

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.

### 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

\*Also applicable for Microsoft Azure

## 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 customers deploying OpenLab Server/ECM XT in the standard cloud configuration.

## Other considerations

### Recommended Agilent software versions for cloud deployment

- OpenLab ECM XT v2.6 or higher

### 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.

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