



Optimization and Licensing Assessments

Empower your organization to make data-driven migration decisions for Windows workloads

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CORE QUESTION

**How do Windows Workloads fit into
my cloud migration strategy?**

Objectives



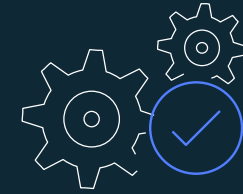
WHAT ARE THE TECHNICAL CHALLENGES?

What are the most important considerations for Windows workloads in AWS?



HOW ARE THESE SOLVED BY AN OLA?

What do I get from going through the assessment and how do I use it?



WHAT IS THE PROCESS TO RUN AN OLA?

How do I get started and what is required?

Agenda

HOW DO LICENSES AFFECT CLOUD MIGRATION?

Why run windows workloads in AWS?

What are the licensing implications?

Why is this important?

How does it work?

HOW DOES AN OLA TIE IT ALL TOGETHER?

Customer example

What is the framework to tie challenges to solutions?

What optimizations are available?

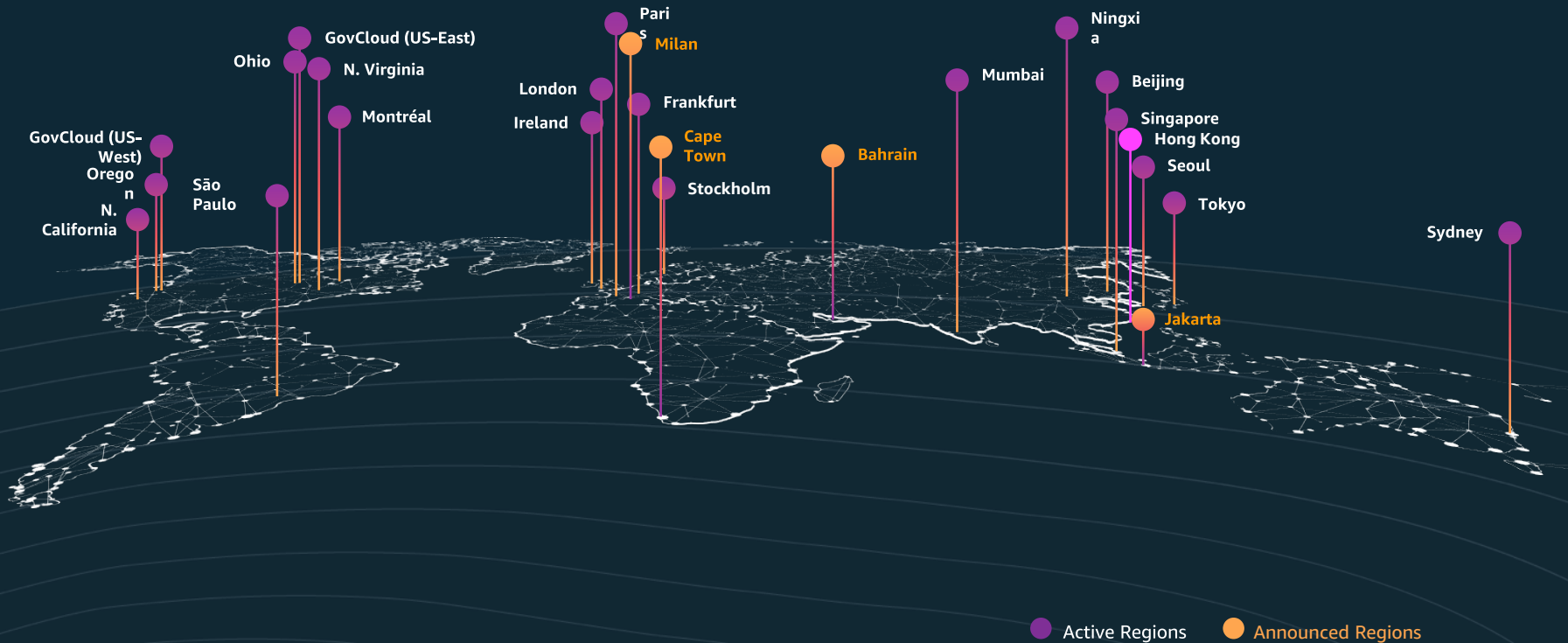
HOW DO I GET STARTED?

Is an OLA the right next step for my organization?

How do I get started?

Reliable & Secure

THE NEXT LARGEST CLOUD PROVIDER HAD 7X MORE DOWNTIME HOURS THAN AWS IN 2018



2x

Number of regions with multiple Availability Zones

210

Security, compliance, and governance key features, 40 more than Azure



“If you’re running Windows with other workloads or are thinking about future integrations with advanced analytics or machine learning you’d be crazy not to consider AWS.”

WINDOWS ON AWS CUSTOMER



Windows Licensing on AWS

What are the most important considerations?

Software Assurance: Purchased from Microsoft, includes License Mobility

License Mobility: Benefit that allows customers to bring SQL Server licenses

- You can bring your own licenses (BYOL) for Microsoft products, subject to product terms
- AWS offers license included instances, so you can purchase and use AWS instances with licensing provided

Key Takeaway

The licenses you own will impact what and how you deploy on AWS.

Windows Licensing on AWS

Why does this matter?

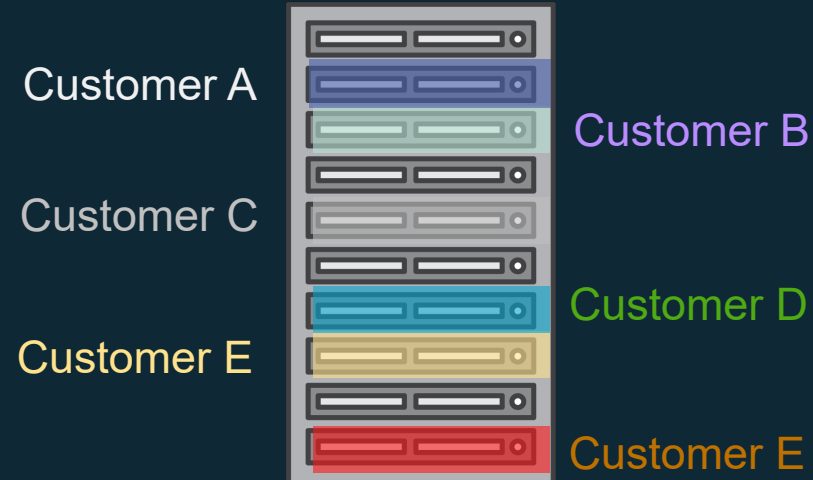
Modeling out the monthly on-demand cost of one c5.xlarge Amazon EC2 instance in the US East Region:

- Windows Server + SQL Server Enterprise: \$1357/month
- Windows Server + SQL Server Standard: \$610/month
- Windows Server Only: \$259/month

Key Takeaway

Licensing costs are a significant part of cloud total cost of ownership.

Shared Tenancy Instances



Multi-tenant servers host instances for multiple customers

AWS determines which host instances run on

You **pay per-instance**

Example: Microsoft SQL Server 2012

Dedicated Hosts



Customer A

Single-tenant servers host instances dedicated to ***one AWS account***

Launch instances to same physical server through targeted ***placement***

You ***pay per-host, per-hour***

Example: Windows Server 2008

Dedicated Instances



Customer A

Single-tenant servers host instances dedicated to **one AWS account**

AWS determines which host instances run on

You **pay per-instance** + hourly fee per region

Example: Microsoft Developer Network (MSDN)

Introducing the Optimization and Licensing Assessment

- Framework including tooling and expert guidance to migrate Windows Workloads
- No cost to create and no obligation after an OLA
- Final product is cost modeling and instance recommendations for your Windows workloads
- Delivered in coordination with AWS or Third-Parties
- Average delivery cycle from beginning to end is 6-8 weeks

3 YR Standard RI/Instance Savings Plan

Windows Server & SQL Server Included)

AWS Modeling Parameters

Location: US East (N. Virginia)

- Instances:**
- 3 Year
 - Standard Reserved
 - All Upfront payment

Modeling:

- TSO Right Sizing

- Licensing:**
- Windows licenses included
 - SQL licenses included

Currency:

- USD annually

Savings Plan Rate Estimate:

- \$248.15 Commit / Hour

TSO Right Sized ?  **\$2,934,900.6**

	Upfront	Monthly
 1,220 Matched In Compute Instances	\$7,467,518.00	\$0.00
 371,440 GB Matched	\$0.00	\$37,144.00
 312 Cores of AWS Provided MS SQL Enterprise	--	--
138 Cores of AWS Provided MS SQL Standard	--	--
8 Cores of AWS Provided MS SQL Web	--	--

While this doesn't take into account the cost of change, migration tools, and services, software is to provide a directional business case based on your actual data.

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3YR Standard RI/Instance Savings Plan

Windows Server Included, SQL Server BYOL

AWS Modeling Parameters

Location: US East (N. Virginia)

- Instances:
- 3 Year
 - Standard Reserved
 - All Upfront payment





Modeling: • TSO Right Sizing

- Windows licenses included

Licensing: • BYOL SQL Server @ \$3300/core (Ent) and \$1100/core (Std)

Currency: • USD annually

Savings Plan Rate Estimate: • \$127.91 Commit / Hour

TSO Right Sized	Uplift	Monthly	Monthly
 915 Matches to Compute Instances	\$2,301,406.00	\$0.00	\$0.00
 305 OS Ignored	---	---	---
 276 GB Matched	\$0.00	\$20,550	\$20,550
 94,808 GB Ignored	---	---	---
 232 Core of BYOL MS SQL Enterprise	---	---	\$63,800
 120 Core of BYOL MS SQL Standard	---	---	\$11,200
 16 Core of AWS Provided MS SQL Web	---	---	---
 80 Cores disabled	---	---	---

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While this doesn't take into account the cost of change, migration tools, and service our software is to provide a directional business case based on your actual data.



How does the OLA work?

Collect



Determine prospective workloads to optimize, and collect utilization data for the underlying workloads.

Analyze



Analyze the data to model cost and licensing optimization scenarios.

Plan



Review the results and build your business case or start a migration proof of concept.

How does the OLA work?

Collect



Determine prospective workloads to optimize, and collect utilization data for the underlying workloads.

- **Using AWS or Third-Party tooling**
- **Server-level utilization data**
- **Software edition and version**

OR

- **Provide your own data export**

Sample Data Export

Infrastructure	# of Cores	Peak CPU Utilization (%)	Average CPU Utilization (%)	Provisioned RAM (GB)	Peak RAM Utilization (%)	Average RAM Utilization (%)	Time In-Use (%)	OS Family	OS Details
VMware VM	1	70.70%	45.70%	6	95.15%	80.41%	100.00%	Windows	Windows Server 2016 (64-bit)
VMware VM	4	14.94%	7.56%	4	93.98%	80.04%	71.88%	RHEL	RHEL (64-bit)
VMware VM	1	2.00%	2.00%	6	94.62%	80.25%	0.00%	Windows	Windows Server 2019 (64-bit)
Unknown	4	71.39%	46.00%	15	94.04%	80.23%	100.00%	Windows	Windows Server 2012 (64-bit)
VMware VM	2	15.39%	7.69%	6	93.69%	79.85%	72.40%	RHEL	RHEL (64-bit)
VMware VM	1	70.68%	45.64%	4	93.98%	80.20%	100.00%	RHEL	RHEL (64-bit)
VMware VM	1	71.33%	45.45%	4	93.33%	79.87%	100.00%	Linux	Ubuntu (32-bit)
Unknown	4	2.00%	2.00%	15	94.20%	80.17%	0.00%	Windows	Windows Server 2012 (64-bit)
Bare-Metal	8	14.41%	7.24%	64	93.91%	79.94%	69.27%	Windows	Windows Server 2003 (64-bit)
VMware VM	4	13.64%	6.99%	6	94.50%	80.30%	72.40%	Linux	Debian (64-bit)
Bare-Metal	8	71.11%	45.51%	32	94.85%	80.73%	100.00%	Windows	Windows Server 2016 (64-bit)
VMware VM	4	14.94%	7.64%	6	94.61%	80.27%	75.00%	Windows	Windows Server 2016 (64-bit)
Bare-Metal	32	15.00%	7.68%	32	92.98%	79.92%	75.00%	Windows	Windows Server 2008 R2 (64-bit)
VMware VM	4	14.18%	7.03%	4	93.23%	79.68%	67.71%	Windows	Windows Server 2019 (64-bit)
VMware VM	1	71.25%	45.55%	4	94.21%	79.74%	100.00%	Linux	Debian (64-bit)
Bare-Metal	4	14.63%	7.26%	128	93.66%	80.17%	64.06%	Windows	Windows Server 2016 (64-bit)
VMware VM	1	14.77%	7.30%	4	94.22%	80.20%	68.23%	Windows	Windows Server 2008 (32-bit)
VMware VM	1	72.18%	46.17%	6	94.28%	80.21%	100.00%	Linux	Ubuntu (32-bit)
VMware VM	4	71.28%	45.91%	6	94.25%	80.15%	100.00%	Linux	SUSE Linux Enterprise Server (64-bit)
VMware VM	2	14.52%	7.21%	4	93.76%	80.16%	69.27%	Linux	Ubuntu (32-bit)
VMware VM	1	2.00%	2.00%	4	94.64%	80.43%	0.00%	Windows	Windows Server 2019 (64-bit)
VMware VM	1	71.70%	45.86%	4	94.32%	80.13%	100.00%	Linux	Ubuntu (32-bit)
VMware VM	4	70.78%	45.49%	4	94.01%	80.24%	100.00%	Windows	Windows Server 2019 (64-bit)
VMware VM	1	2.00%	2.00%	4	93.86%	80.12%	0.00%	Windows	Windows Server 2019 (64-bit)

How does the OLA work?

Analyze



Analyze the data to model cost and licensing optimization scenarios.

- Tooling creates right-sized instance recommendations
- Optimize the number of cores per instance
- Model combination of on-demand or commitment options

How does the OLA work?

Plan



Review the results and build your business case or start a migration proof of concept.

- **Build a business case using cost models**
- **Start planning your migration by building your first move group for a proof-of-concept**

Next Steps

- Compile existing environmental data for your Windows Workloads
- Complete the Contact Us form or discuss OLA with your Account Manager
- Reach out to aws-ola@amazon.com with any additional questions

Thank you!
Questions?