



Total Cost of Ownership When is the Cloud Right for you?





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Cloud Has Come of Age





Have at least one application or a portion of our computing infrastructure in the cloud (for example, CRM, application development and testing and disaster recovery) Plan to use cloud-based applications and/or computing infrastructure via the cloud within the next 12 months Plan to use cloud-based applications and/or computing infrastructure via the cloud within 1 to 3 years

Q. What are your organization's plans with regard to utilizing computing infrastructure or applications via the cloud?

> The Evolution of Cloud Needs

For CIOs, it is no longer a question about whether or not cloud is something they should be doing, but how quickly they can get there and how much of their IT estate could and should be shifted off-premise.





- Better, Faster, Cheaper Cost Optimizing Compute with Amazon EC2 Fleet
- Achieving Business Value with AWS
- Building a Better Business Case for Cloud Migrations
- How to Optimize TCO by Bringing Microsoft Licenses to AWS
- Running Lean Architectures: How to Optimize for Cost Efficiency







Total cost of ownership is a financial estimate to determine the direct and indirect costs of a product or system.

AWS recommends covering these 5 categories when evaluating Cloud vs. on premise:

- Server
- Storage
- Network
- IT Labor
- Facilities





A new client came to us with a request to develop a complete overhaul for one of their systems, starting with, should we move to the cloud? The system was ~20 years old!



Or should we leverage the assets and know-how we've built up from our legacy system?

*Analysis performed in mid-2018. Prices and service names may have changed

Problem Domain Details

- Legacy software is used to estimate, sell, and design widgets
 - Steel used is the overwhelming cost driver
 - Detailed structural analysis determines amount of steel to be used
 - Widgets have minimum, standards-based constraints
 - Legacy analysis generates extremely conservative build requirements
 - A new algorithm was created that results in a competitive advantage
 - Can't integrate it with the old software without massive rework
 - Cumbersome to have engineers work on jobs from other locations
- Legacy software interacts with other custom software
- Designers and Engineers often use additional software to design widgets

Step 1: Know your constraints

Key factors we took into account for the re-design:

- 1. Only internal employees would use the system
- 2. Users are scattered across the U.S. including remote areas
- 3. Part of the system needs to run locally on the users machine
- 4. Reliability was important, the system should run regardless of network stability
- 5. Back-ups and recoverability were highlighted as being important
- 6. Deployment would occur in phases requiring some interaction with the legacy system
- 7. ~1,000 users over 7 sites

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User Workstation













Four Deployment Options

- Distributed on-premises system (servers at all locations)
 - Current/legacy deployment
 - Have infrastructure in place for this solution, but scaling will be costly
 - Synchronization of disparate data difficult, costly to maintain infrastructure.
- Centralized on-premises system
 - Would need to re-align current assets
 - Can share job data amongst all sites easily
 - Maintaining high-availability and scalability is challenging
- Put it in the cloud
 - Much greater flexibility to manage infrastructure capacity
 - High availability systems easier to set up than on self-managed hardware
 - Current/legacy systems need to interact
 - Some sites have poor connectivity
- Hybrid cloud
 - Only move part of the system to the cloud



Centralized On Prem Cost Breakdown

Server —	 Domain Services Server Hardware Large number of processor cores to support design engine Use Microsoft's implementation of Network Load Balancing Utilization of VMs and/or software containers Suggested server specifications and cost (\$11,000)
	QA / Staging Server Hardware
	One node can host all components
	 Suggested server specification and costs (\$3,100)
	Remote deployment
	 Suggested server specification and costs (\$18,500)
Storage —	Database Server Hardware
	 I/O speed is key
	Database software
	Clustering
	Log shipping
	 Suggested server specifications and costs (\$16,000 for an individual instance, \$37,500 for a two node cluster)

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Centralized On Prem Cost Breakdown

What about Network Costs, IT Labor and Facilities?





Cloud Cost Breakdown

Server Costs

- Use Amazon EC2 Container Service
- AWS Elastic Beanstalk for deploying, managing, and scaling systems
- Elastic Load Balancing
- Suggested specifications and cost (\$26,700 / year)
- AWS Directory Service for Microsoft Active Directory
- Suggested specification and costs (\$3,514 / year)

QA / Staging Server

- Can be utilized on an as-needed basis.
- Suggested setup cost (\$1 / hour)

Remote Location Deployment

- Local hardware likely still needed
- Suggested server specification and costs (\$18,500)



Cloud Cost Breakdown

Storage

- Amazon RDS for SQL Server
 - License either included or can be bought
- No need for clustering
- Synchronization
- Suggested specifications and costs (\$10,920 / year)



Cloud Cost Breakdown

Back-ups

- Amazon Glacier
- Costs (\$0.004/G plus \$0.05 per 1000 requests plus bandwidth)





On Premise		
Three domain servers	\$33,000	
Docker	\$1,500/year	
Three database servers	\$53,500	
QA staging server	\$3,100	
Remote location server	\$18,500	
Total over 5 years	\$115,600	

Cloud	
Two domain services in different regions	\$54,900/year
Two database deployments	\$22,000/year
Identity management server	\$3,500/year
QA staging services	\$1,000/year
Backups	\$3,000/year
Remote location server (physical)	\$18,500
Total over 5 years	\$440,500

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On Premise





- Interactions with on premise components
- Availability in remote areas
- Security
- In house expertise
- Physical resources already on hand





- Copy of this presentation: <u>https://info.sep.com/2019indycloudconf</u>
- Link to more in depth info on this analysis: <u>http://www.sep.com/sep-blog/2019/04/10/TCO</u>
- AWS Business Professional online training for TCO: https://www.aws.training/learningobject/curriculum?id=10743









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