How to Optimize Software Maintenance Costs When Adopting IaaS Computing Services

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Initiatives: Cloud and Edge Infrastructure

I&O leaders are adopting cloud consumption models based on a desire to control IaaS cloud service costs. This research helps them optimize software maintenance costs when using on-demand, committed usage and BYOL models.

Overview

Key Findings

- Infrastructure and operations (I&O) leaders focus on initiatives that optimize IaaS computing infrastructure service costs, missing opportunities to address maintenance costs for operating system software that runs on IaaS infrastructure.

- The multiple hardware infrastructure and software configuration alternatives for IaaS instances make it extremely difficult for I&O leaders to select the best configurations that optimize cloud costs.

- Unlike on-premises infrastructure, cloud instances with the identical numbers of CPUs can result in very different software maintenance charges, making it difficult for I&O leaders to compare bring your own license (BYOL) models to maximize cloud infrastructure ROI.

Recommendations

I&O leaders focused on cloud and edge infrastructure should:

- Maximize ROI on IaaS instances by differentiating between the software maintenance properties of on-demand, committed and BYOL models.

- Optimize software maintenance costs by standardizing software maintenance consumption metrics to enable more accurate cost estimates.

- Target high-return opportunities by focusing on cloud instances with high software maintenance to computing infrastructure cost ratios.

Introduction
Nearly one-third of respondents in Gartner’s 2020 study on public cloud migration using lift and shift as their primary migration strategy expect the impact of their migration strategies to increase the total cost of operating IT infrastructure. Many organizations try to optimize these costs by purchasing reserved compute instances in the cloud (see IaaS Cloud Contracting: Comparing Amazon Web Services, Microsoft Azure and Google Cloud Platform), which commits them to a continuous year or several years of use in exchange for a discounted price per hour.

However, when assessing the benefits of this approach, some organizations neglect to estimate their total cost per instance per hour, which includes not only the compute instance, but also all licenses for any software running inside that instance and maintenance for that software. Because in-guest software and software maintenance costs may be calculated differently from compute instance hours, buying reserved instance capacity in one- or three-year blocks can result in higher total cost of ownership (TCO).

How can I&O leaders determine which public cloud IaaS option will result in the lowest TCO per instance over time? This research helps I&O leaders save money by accurately estimating the instance TCO and optimizing compute instance purchasing.

Analysis

Differentiate the Adoption Models’ Software Maintenance Properties

From a software maintenance cost perspective, organizations that adopt cloud IaaS services can generally follow on-demand, committed or BYOL models (see Figure 1):
On-demand model: Also known as “pay as you go” (PAYG). In this model, the cloud infrastructure and platform services (CIPS) provide the infrastructure where the software runs, the right to use the software license, and its maintenance and support.

Committed model: Commonly known as “reserved instances.” The CIPS provide the infrastructure where the software runs, the right to use the software license, and its maintenance and support. However, this model includes a commitment to a continuous year or several years of use in exchange for a discounted price per hour for the IaaS instance.

BYOL model: This model allows organizations to use their current software entitlement on CIPS infrastructure for both on-demand and committed models. Because the CIPS don’t provide the software license or the support of that software, the IaaS instance price is limited to the compute instance. According to Gartner’s 2020 Cloud End-User Buying Behavior Survey, \(^2\) half of the

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Source: Gartner
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Many workloads deployed on IaaS instances don’t need to run 24 hours per day. On-demand models allow for scheduling resources to be powered on when necessary and powered off when idle. Although this is impractical or impossible for most production environments, many nonproduction environments may be scheduled in this way.

When organizations consider using BYOL, they are porting their on-premises software licenses and maintenance to IaaS compute instances. However, the properties of on-premises software differ from the software embedded in IaaS instances.

**Properties of Software Maintenance on IaaS Instances**

- There is no software license acquisition price. The IaaS instance price includes the software maintenance embedded in it.

- For on-demand models, the IaaS instance is commonly charged hourly and is proportional to the use of the service. The service includes the compute instance and the software maintenance. The software maintenance charge starts when your instance is in the “running” state and ends when you terminate the instance. That means that the more you use the instance, the more your software maintenance costs increase.

- Organizations must account for the cost of any in-guest software that is still being purchased “on-demand” and running on a reserved instance that is running 100% of the time, because there is a commitment for a full year of use.

- The price of an on-demand model instance may change based on CIPS provider policies. Also, there is no transparency on how instance price is divided into compute infrastructure and software embedded, so the software maintenance may change, too.

- Committed models (like reserved instances) follow a monthly fixed payment independent of how the instance is used. However, if the instance price is fixed to a three-year committed model, the software maintenance cost is fixed for three years, too. This may be an attractive option compared with the annual increase of software maintenance on-premises.

- The type of processor technology, memory and input/output (I/O) capabilities or the type of instance model (PAYG, reserved or spot instance) shows how instances with the same number of vCPUs, even from the same CIPS provider, can have different maintenance software prices. So the cost per vCPU per hour of embedded software maintenance is not standard across instances in the same CIPS. There could be scenarios in which using BYOL with a standard vCPU-per-hour cost may result in better cost optimization.

**Standardize Software Maintenance Consumption Metrics**
After I&O leaders have identified the type of IaaS instance they need and how their workloads will use IaaS computing resources, they must determine which consumption model can best optimize software maintenance costs. This requires a standard unit of consumption against which to evaluate each model. This metric should be based on price per vCPU per hour consumed and differentiated between compute instance and software maintenance.

To create this, I&O leaders considering on-demand models, committed models and BYOL options as part of their cloud cost optimization initiatives must identify:

- The cloud provider and region where they will deploy their IaaS instances
- The type and size (based on the number of vCPUs) of the IaaS instances they will manage, as software maintenance is not solely dependent on the number of vCPUs
- The time they expect to use these IaaS instances (hours, days, months, years)

Before deciding to use the BYOL option, I&O leaders must calculate the current and future cost per vCPU per hour of their software maintenance and compare it with the cost per vCPU per hour of the software maintenance embedded in IaaS instances. When current on-premises licenses are more than five years old, yearly maintenance increases dramatically and negatively impacts the cost per vCPU-per-hour metric, making BYOL a less attractive option. In these cases, I&O leaders should consider using on-premises licenses for other purposes, canceling them or negotiating other options with their providers.

**Target High-Return Opportunities**

Organizations miss the opportunity to optimize software maintenance costs when they assume that the portion of cloud costs related to software maintenance is fixed, dependent on the software vendor or based solely on the number of vCPUs their IaaS instances are using.

CIPS don’t provide a direct way to identify which portion of the cost is related to the compute instance and which is related to the embedded software maintenance. An initial source of data to get these values could come from the Gartner Cloud Decisions Pricing Analysis Tool (see Cloud Decisions’ Cloud Compare: Perform Real-Time IaaS Pricing and Performance Analysis), which is updated monthly, or by enabling and disabling BYOL options from CIPS public calculators (see Note 1).

Committed models can introduce attractive discounts for the compute instance, but those discounts are not applied to software maintenance. Only the weight of the operating system software maintenance component in the total price of an IaaS instance can vary from 10% to more than 50%. These costs typically make up about 30% to 40% of the price and, therefore, must be a key focus of cost optimization initiatives. Target high-return opportunities by focusing on cloud instances where software maintenance exceeds 30% of total instance costs.

I&O leaders must answer the question, “What number of hours makes an on-demand model more cost-effective than a committed one?” To get this answer, I&O leaders must:
- Cluster IaaS instances by expected usage time. A production workload would be running 24 hours, 365 days per year, but a nonproduction environment probably runs eight hours on working days and, in these cases, BYOL is wasted when instances are not enabled and delivering value.

- Calculate their current on-premises software maintenance costs standardized in the metric cost per vCPU per hour. Reflect just the software maintenance fee and avoid including labor costs in this calculation.

- Estimate the software maintenance cost per vCPU per hour for their candidate instances and compare with their current on-premises software maintenance costs.

- Build analytical models to identify the number of usage hours that makes the on-demand or the committed model better, enabling and disabling BYOL options. Reflect the annual variation in IaaS instance prices introduced by CIPS pricing policies and the increase of on-premises software maintenance and support.

See Tool: Savings Calculator for On-Demand and Committed IaaS Instances to help build these analytical models and, based on the expected usage of instances, to determine which on-demand or committed model is more efficient.

Evidence

1 Gartner’s 2020 Public Cloud Initiatives Study. This study was conducted online from 16 September through 3 November 2020 with 400 I&O leaders with public cloud migration strategies from the U.S. (n = 208) and the U.K. (n = 192) to explore public cloud migration strategies, challenges and benefits, including TCO.

Respondents’ organizations had an annual revenue of at least $500 million or over 1,000 employees for public-sector organizations — with over half with annual revenue of more than $5 billion. All respondents were at organizations currently engaged in public cloud migration activities and were at a level of involvement to accurately depict budgeting and strategies.

Disclaimer: Results are representative of the respondent base of the survey, and not necessarily projectable to the market as a whole.

2 Gartner’s 2020 Cloud End-User Buying Behavior Survey. Half of the organizations use BYOL models to optimize their software maintenance costs, and 80% of them have been audited in regard to BYOL in their cloud environment. This survey was conducted to understand how technology leaders approach buying, renewing and using cloud technology.

The research was conducted online from July 2020 through August 2020 among 850 respondents from midsize and larger ($100 million-plus in revenue) organizations in the U.S., Canada, the U.K., Germany, Australia, and India. Industries surveyed include energy, financial services, government, healthcare,
insurance, manufacturing, retail and utilities. All organizations were required to currently have cloud deployed.

Respondents are involved, either as decision makers or decision advisors, in new purchases, contract renewals or contract reviews for one of the following cloud types in the past three years: public cloud infrastructure (IaaS), public cloud platform (PaaS), public cloud software (SaaS), private cloud infrastructure, hybrid cloud infrastructure or multicloud infrastructure. Respondents were also required to work in IT-focused roles, with a small subset of procurement respondents.

The study was developed collaboratively by Gartner analysts and the Primary Research Team. Disclaimer: Results of this study do not represent global findings or the market as a whole, but reflect sentiment of the respondents and companies surveyed.

Example of software maintenance cost of Windows Server licenses for instances with 2 vCPUs in Azure (see Figure 2). Gray bars are the cost of the IaaS hardware infrastructure. Blue bars are the cost of software maintenance. The figure shows how instances with the same number of vCPUs have different software maintenance costs.
Figure 2: Sample of Azure Instances With 2 vCPU Compute Infrastructure vs. Software Maintenance

Sample of Azure Instances With 2 vCPU Compute Infrastructure vs. Software Maintenance

4 Example of IaaS instance prices, comparing the cost of the infrastructure and the cost of software maintenance (see Figure 3). Infrastructure and software maintenance cost of an Microsoft Azure IaaS instance with Windows Server as the operating system is depicted. The blue bar shows the cost proportion of the software maintenance of Windows Server. The gray bar shows the cost proportion of the infrastructure of the IaaS instance where the Windows Server operating system runs. Analysis was made among multiple IaaS instances from the Ohio Azure Region (November 2020).
Figure 3: Sample of Azure Instances With 4 and 8 vCPU Cost Ratio of Compute Infrastructure vs. Software Maintenance

Sample of Azure Instances With 4 and 8 vCPU Cost Ratio of Compute Infrastructure vs. Software Maintenance

Note 1: CIPS Calculators
- Amazon Web Services
- Azure
- Google Cloud Platform (GCP)
- Oracle Cloud Infrastructure (OCI)

Recommended by the Author

Tool: Savings Calculator for On-Demand and Committed IaaS Instances

Changes to Microsoft Server Rules in Dedicated Cloud Environments Require Immediate Attention
IaaS Cloud Contracting: Comparing Amazon Web Services, Microsoft Azure and Google Cloud Platform

How to Understand Cloud DBMS Pricing Models

How to Identify Solutions for Managing Costs in Public Cloud IaaS

How to Manage and Optimize Costs of Public Cloud IaaS and PaaS

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