



## CLOUDPHYSICS ANALYTICS OVERVIEW

# Thriving in the Cloud: Rightsize to Compare Costs of Running VMs in Public vs. Private Cloud

### The challenges of calculating a cost model

Migrating your Virtual Machine (VM) workloads to the cloud can save a great deal of money. However, evaluating whether migration will actually accomplish that requires an accurate understanding of your current costs. To make the best migration decision for your data center, you need the ability to compare the costs of running applications in the cloud with keeping them on-premises.

Developing an accurate cost model for comparison is difficult without knowing each VM's actual resource requirements. Choosing which VM workloads to migrate and calculating savings is equally challenging.

In order to determine whether it makes sense to migrate specific workloads, your on-premises workload costs must reflect complex factors such as peaks and lows of resource consumption, performance, and scaling. You need granular information about daily resource usage based on long-term metrics and analysis. That means knowledge of workloads rightsized to peak, 99th, or 95th percentile, along with other key metrics.

### The Cost Calculator for Private Cloud is the gold standard for rightsizing

Rightsizing is the process of ensuring that each VM has adequate resources to do its job—but is not overprovisioned with more costly CPU, storage or other resources than it needs.

The CloudPhysics Cost Calculator for Private Cloud solves the challenge of assigning cost to selected workloads and enables an accurate comparison of public versus private cloud costs. The Calculator uses actual customer workload performance and configuration data to arrive at the true cost of running workloads in the private cloud.

By placing costs at the physical layers of the data center, you can extrapolate costs based on consumed resources and configurations in the environment. The Calculator uses advanced analytics and precise trending patterns of workloads to ensure the accuracy of all resource costs. Rightsizing empowers you to represent the cost of each workload as a portion of the environment and compare costs of each on-prem workload to the cloud-based model.

### Key Benefits

- Builds a baseline to compare private and public cloud solutions
- Keeps you up-to-date with current inventory
- Allows each VM's resources to be conformed with its functional needs
- Enables quick, data-driven decisions
- Eliminates relying on guesses or precedents
- Uses granular, current data from your own data center
- Reveals comparative costs of each VM both on premises and in the cloud
- Shows VM costs when rightsized to various percentile usage levels

## Rightsizing is vital to successful cloud planning

Only rightsizing each and every VM can answer whether you save money by moving workloads to the public cloud or are better off keeping them on-prem. Virtual data center administrators often configure VMs “conservatively,” meaning that they allot more resources than those VMs actually need in order to ensure reliable performance and service level agreements (SLAs). However, these overprovisioned VMs, when used as a measure to size public cloud equivalents, can vastly overstate the OpEx costs of moving your on-prem workloads and running them in the cloud.

## Public Cloud or Private? Making the best choice calls for accurate costing

Costs are usually calculated in terms of capital expenditures (CapEx) such as physical assets, software licenses, and environmental resources. These contrast with operational expenditures (OpEx), including support, unplanned downtime, maintenance windows, and labor. CapEx and OpEx can be distributed over assets and workloads to arrive at a cost per workload. This amount gives you a basis to compare migrating your workloads to keeping them on premises.

## The influence of cloud provider incentives and credits

Organizations must also factor in the incentives and credits from major cloud providers against the daily operational costs of their own private cloud. With so many VMs overprovisioned, you need accurate analysis of what these workloads actually consume. This true figure is crucial to ensuring that migration makes financial sense.

Now you can use your environment’s current configurations and utilization patterns to size workloads accurately, based on peak, 99th percentile, and 95th percentiles of resource utilization. These metrics let you scale workloads to the optimal size to meet your daily needs. Armed with true workload costs, you can confidently compare public versus private cloud advantages. The Calculator ensures that your public cloud instances will be an ideal fit, which can lower costs substantially.

## Key Capabilities and Features

The Cost Calculator for Private Cloud profiles VM workloads with fine granularity and without bias by showing and comparing as-configured resources with rightsizer-adjusted configuration and utilization data from each VM on a fine-grained basis. It then develops multiple scenarios of rightsized configuration cost for both on-premise and public cloud hosting options.

The Cost Calculator for Private Cloud and Cloud Comparison Calculator is your “go-to” tool for arriving at unbiased answers to the question: “What will it cost to run my VMs on premises, compared to the cloud?” The Calculator:

- **Delivers granular accuracy**, with usage data updated every 20 seconds and no roundings or rollups, using CloudPhysics’ proprietary data collection engine.
- **Keeps resource utilization information forever**, so it’s easily available for comparison at a click, with no samples ever discarded.
- **Calculates the resources each VM needs** for real-world function, using easily readable histogram-based scenarios to analyze workloads. You know costs instantly for on-target comparisons.
- **Offers more user options** with multi-cloud applicability, thanks to its unbiased, vendor-neutral analysis capabilities.
- **Eliminates guesswork or estimates** with verifiable, data-based recommendations.
- **Deploys quickly and easily** with its SaaS delivery model, for continuous updating, scenario-building, automated discovery, quick slice-and-dice, and mapping of on-premises intelligence to the cloud.
- **Benefits all levels in the organization:** CIOs and VPs of IT gain objective, data-driven answers to cost-savings questions, while IT admins gain work/effort/time efficiency.

## Cost Calculator for Private Cloud

The screenshot displays the CloudPhysics Private Cloud Cost Calculator interface. The top navigation bar includes 'CloudPhysics', a search bar, and menu items like 'Dashboard', 'Card Deck', 'Card Builder', 'Card Store', 'CloudPhysics', and 'Premium Trial'. Below the navigation, there are tabs for 'Infrastructure Planning', 'Performance Troubleshooting', 'Storage Space Management', and 'Health Checks'. The main content area is titled 'Private Cloud Cost Calculator' and shows 200 results. On the left, there are filters for 'Infrastructure Scope', 'vCenter', 'Datacenter', 'Cluster', and 'Data Store'. The central configuration area includes sections for 'Host/Storage Details', 'Hypervisor Details', '3rd Party Licenses', and 'Environmental Costs'. A summary box on the right shows 'Total Costs as Configured' at \$3,400,209 Per Year and 'Consumed Cost after Adjustment' at \$2,778,948 Per Year. At the bottom, a table lists 1179 VMs with columns for VM Name, vCPU, vCPU Peak Usage, vCPU 99th %ile Usage, vCPU 95th %ile Usage, vRAM, vRAM Peak Usage, and VMCost.

VM Name	vCPU	vCPU Peak Usage	vCPU 99th %ile Usage	vCPU 95th %ile Usage	vRAM	vRAM Peak Usage	VMCost
VM001-DBProd	8	57%	57%	57%	20.00 GB	57%	\$4,511.00
VM002-WebDev	2	34%	34%	34%	4.00 GB	34%	\$2,293.00
VM003-WebProd	2	56%	56%	56%	4.00 GB	56%	\$2,008.00
VM004-AppProd	4	13%	13%	13%	8.00 GB	13%	\$2,293.00
VM005-AppDev	4	75%	75%	75%	8.00 GB	75%	\$2,410.00
VM006-AppTest	4	34%	34%	34%	8.00 GB	34%	\$3,180.00
VM007-MiddleTest	4	45%	45%	45%	4.00 GB	45%	\$3,317.00
VM008-MiddleProd	4	76%	76%	76%	6.00 GB	76%	\$3,400.00
VM009-MiddleDev	4	23%	23%	23%	4.00 GB	23%	\$3,350.00

# Cost Comparison: Private vs. Public Cloud

The screenshot displays the CloudPhysics Cost Calculator interface. The main section is titled "Cost Comparison for Private-Public Cloud". It features a "Calculate" section with three columns: "Resource cost as Configured", "Rightsize using Peak vCPU and Peak vRAM usage", and "Rightsize using 95th% vCPU and 95th% vRAM...".

Category	Private Cloud	Public Cloud	Private Cloud	Public Cloud	Private Cloud	Public Cloud
<b>On Premise</b> (1179 VMs)	\$3,400,209	\$0	\$3,400,209	\$0	\$3,400,209	\$0
Total	<b>\$3,400,209</b> Per Year		<b>\$3,400,209</b> Per Year		<b>\$3,400,209</b> Per Year	
Savings	\$0		\$621,260		\$880,223	
<b>Microsoft Azure</b> (476 VMs   400 Supported)	\$2,143,022	\$3,644,239	\$1,293,101	\$1,352,731	\$738,555	\$1,221,998
Total	<b>\$5,687,261</b> Per Year		<b>\$2,645,872</b> Per Year		<b>\$1,960,553</b> Per Year	
Savings	<b>(\$2,287,052)</b>		\$754,337		\$1,439,656	
<b>AWS</b> (452 VMs   401 Supported)	\$2,048,112	\$3,720,392	\$1,321,052	\$1,318,104	\$1,200,418	\$727,154
Total	<b>\$5,769,504</b> Per Year		<b>\$2,639,106</b> Per Year		<b>\$1,927,573</b> Per Year	
Savings	<b>(\$2,427,218)</b>		\$761,103		\$1,472,636	

Below the comparison table, there is a summary: "1179 VMs from 2 of 3 vCenters | 3 of 195 Hosts | 13 of 25 Datastores". A detailed table follows, listing individual VMs with their vCPU, vCPU Peak Usage, vCPU 95th %ile Usage, vCPU 95th %ile Usage, vRAM, vRAM Peak Usage, and VMCost.

VM Name	vCPU	vCPU Peak Usage	vCPU Peak Usage	vCPU 95th %ile Usage	vCPU 95th %ile Usage	vRAM	vRAM Peak Usage	VMCost
VM001-DBProd	8	57%	57%	57%	57%	20.00 GB	57%	\$4,511.00
VM002-WebDev	2	34%	34%	34%	34%	4.00 GB	34%	\$2,293.00
VM003-WebProd	2	56%	56%	56%	56%	4.00 GB	56%	\$2,008.00
VM004-AppProd	4	13%	13%	13%	13%	8.00 GB	13%	\$2,293.00
VM005-AppDev	4	75%	75%	75%	75%	8.00 GB	75%	\$2,410.00
VM006-AppTest	4	34%	34%	34%	34%	8.00 GB	34%	\$3,180.00
VM007-MiddleTest	4	45%	45%	45%	45%	4.00 GB	45%	\$3,317.00
VM008-MiddleProd	4	76%	76%	76%	76%	6.00 GB	76%	\$3,400.00
VM009-MiddleDev	4	23%	23%	23%	23%	4.00 GB	23%	\$3,350.00
VM010-DBDev	6	34%	34%	34%	34%	12.00 GB	34%	\$4,005.00

Rely on the CloudPhysics Cost Calculator for Private Cloud for a baseline of costs per workload that trends monthly, quarterly, and annually as your environment grows and changes. Deep performance and configuration capabilities let you make apples-to-apples workload comparisons and develop your ideal migration strategy.

## About CloudPhysics

CloudPhysics provides data-driven insights for smarter IT, delivering unprecedented data center analytics to a broad range of users. CloudPhysics' agile, scalable SaaS solution continuously analyzes customer environments and leverages collective intelligence to yield actionable results that optimize performance, lower costs, reduce risk, and enable smarter business decisions. Headquartered in Santa Clara, CA, CloudPhysics serves thousands of end users worldwide across major industries and supports a robust partner network. For more information, [www.cloudphysics.com](http://www.cloudphysics.com)