

Successful Migrations Start with Hard Data

Executive Summary

What's the best—and most cost-effective—path to transformation? How can a business case be made? Planning for cloud migration can be challenging, especially given the multitude of parameters that need to be evaluated on a per-instance basis, and the millions of possible permutations of what, when and how to migrate.

Arriving at the right conclusions requires precisely informed, data-driven decisions. But too often, hard data is lacking—located in siloed, disparate locations, if it's accessible at all. Organizations struggle to mine through massive amounts of data across thousands of instances, typically resorting to static tools like Excel to identify the best instance size for the job, understand its cost and make a business case for change.

The TSO Logic platform provides the industry's most accurate data-driven recommendations for rightsizing and right-costing workloads across multiple environments, including the cloud. Using powerful, patented algorithms and analytics capabilities, it ingests millions of data points from customers' existing environments to statistically model and algorithmically profile compute patterns to determine the best fit. Then, drawing on TSO Logic's close collaboration with Intel and major cloud providers, it recommends the best fit and most cost-efficient placement for each workload from hundreds of thousands of possible combinations in Microsoft Azure cloud.

By turning hard data about their environment and cloud options into validated decisions, customers can build the strongest business case to fast-track migration. They can give their migration partners the blueprint to deliver immediate bottom-line results. And, they can be sure that their workloads are always running in the best place at the right time — based on actual performance, utilization and cost.

Inside the TSO Logic Platform

The TSO Logic platform ingests multiple sources of data to deliver actionable analytics and optimize workload placement across multiple environments. Based on algorithmic analysis of an organization's current utilization and costs, it identifies the type of Azure VM and configuration best suited to meet the requirements of any given workload.

Customers can run cost simulations and custom scenarios for matching, rightsizing and optimizing their workloads, either locally or in the cloud, against the constraints of cost, space or power. They get real-time, data-driven recommendations based on up-to-the-minute pricing and compute type availability from Azure. By replacing guesswork with hard data and statistical analysis, they can plan and migrate with confidence while realizing significant cost savings.

Organizations can use the TSO Logic platform through a short-term (typically six-week) engagement called TSO Match as a Service or on an ongoing basis. In both cases, the process involves four basic steps: data collection, directional costing, analyzing migration scenarios and modeling cost differences.

❖ 1. Data Ingestion

The TSO Logic platform communicates with existing data center systems to ingest millions of data points about the environment. It uses data gathering and discovery tools that are common within most enterprises, including VMware's vSphere, Microsoft Hyper-V, WMI, SNMP, SSH, RISC Networks, New Relic and many others. In cases where organizations already use an OS metrics database such as Nagios, the platform can pull data from these systems using protocols that are already enabled.

Data ingestion also includes bare metal and ad hoc instances—standalone assets that often aren't being monitored by existing systems but that are still essential to get a true picture of current utilization and total cost of ownership (TCO). And, unlike cloud planning tools that require customers to roll out software agents to every node in their environment—requiring a massive operational effort—the TSO Logic platform is entirely agent-less, ingesting information from existing data streams already in the environment.

❖ 2. Directional Costing

Out of the box, the TSO Logic platform provides benchmark directional costing of current compute and storage—accounting for the age, generation and size of current hardware. This costing data is based on our reference library developed in partnership with Intel, or via ingesting actual cost data from web APIs or partners that specialize in financial IT management. Using patented same-linking algorithms, the platform captures the topological relationships between resources and business areas, so organizations can understand their environment in a multitude of ways. What is our total cost of ownership for our data center? How much does our disaster recovery environment cost right now? How much does our live environment cost? How closely do currently provisioned resources match utilization?

Organizations can run “pivots”—viewing their IT assets by drilling down into different areas. They can calculate costs for specific environments, applications, hardware platforms and even resources associated with each environment, such as departmental managers and application. (Figures 1 and 2). For each pivot, customers can see how many operating systems that area represents, on which platforms they’re running, how much memory and storage they consume and their annual cost to operate. This type of information can be extremely difficult to capture in modern data centers with shared resources. For many customers, this is the first time they’ve ever seen a holistic view of their utilization and costs.

Figure 1. Pivot: Viewing IT assets by Virtualization

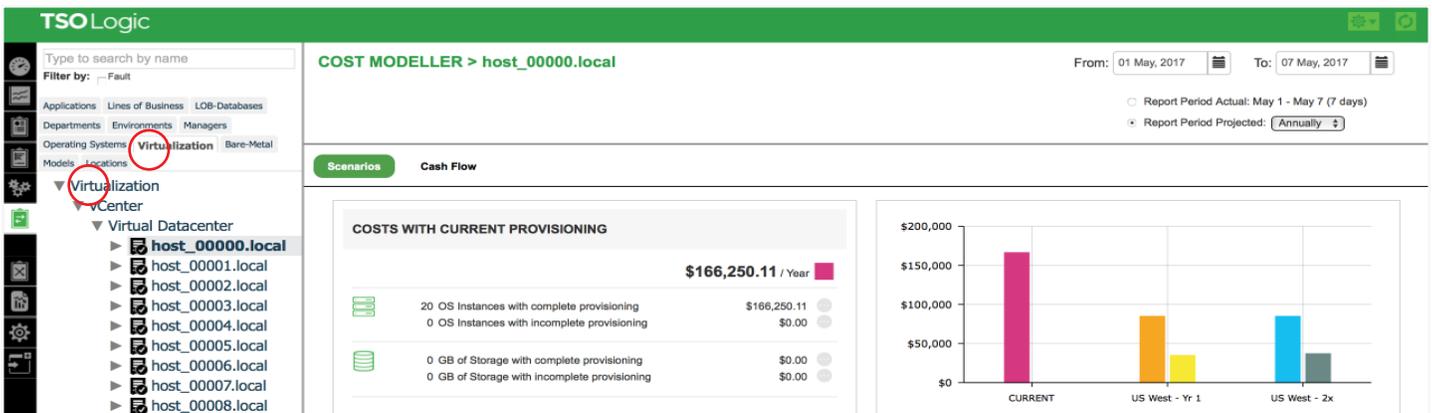
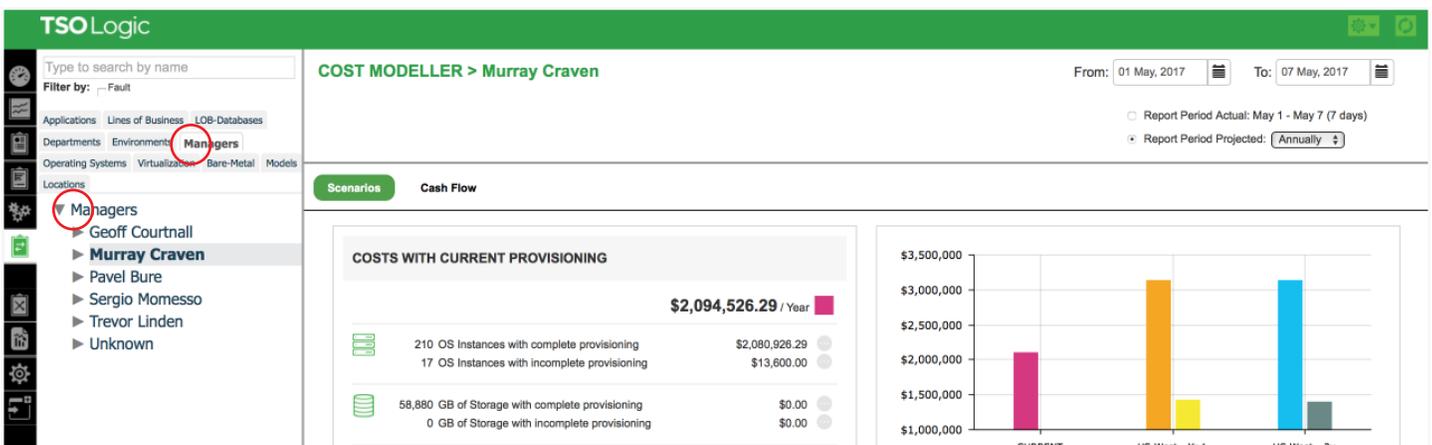


Figure 2. Pivot: Viewing IT assets by Managers



❖ 3. Analyzing Migration Scenarios

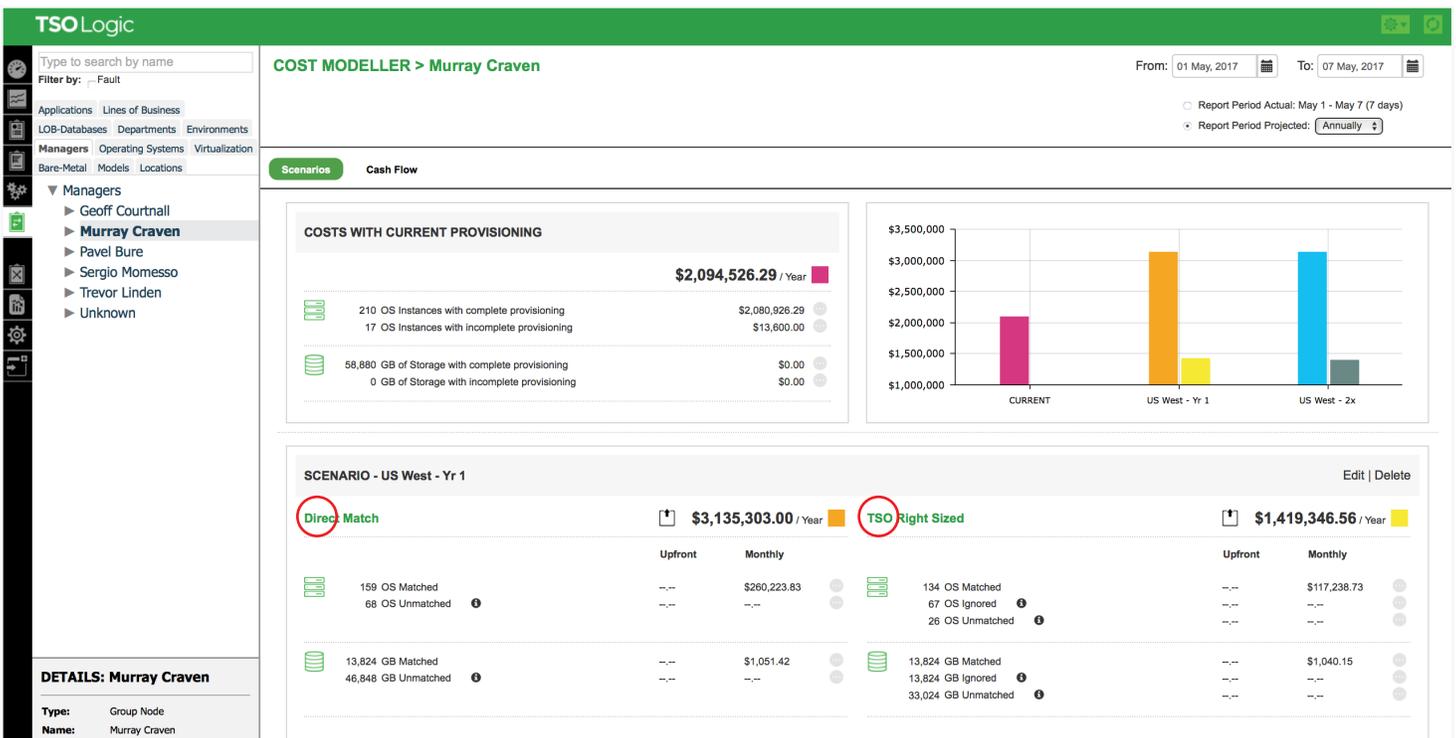
With benchmark directional costing in hand, organizations can then create “what if” scenarios to calculate costs if those instances stay the same, move to the cloud or are migrated to newer, more efficient hardware on premise. Customers can create scenario cards for any business-level pivot they choose. Each scenario captures current provisioning costs and compares them with recommended alternatives in newer-generation hardware or the cloud.

Figure 3 shows a sample scenario analyzing the costs of moving one element of a live environment to Azure. Today, this company manager is running 210 OS instances to support this business group, consuming 58.8 Terrabytes of storage, at a cost of \$2.1M

per year. Using the TSO Logic platform, the customer can see what their costs would be moving those instances to Azure. The scenario shows two cost calculations:

- **Direct Match:** A “like for like” migration deploying those resources in the cloud exactly as they’re provisioned on premise. For example if you have a large server provisioned on premise we will find the most direct match to that server in the cloud regardless of its actual utilization.
- **TSO Right Sized:** Recommended cost-optimized options based on historical utilization of those resources and the lowest-cost Azure pricing plan to support those workloads.

Figure 3. Migration Scenario Analysis

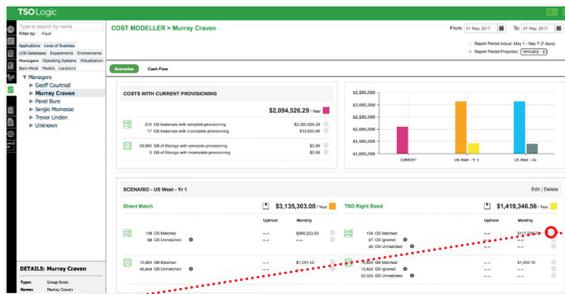


A coarse-grained analysis on a spreadsheet might lead this customer to believe that migrating these instances to the cloud would be more expensive. But based on accurate costing information and TSO Logic recommendations for the optimal Azure pricing plan based on real-world utilization, the customer could run those resources in the cloud for less than half the cost of current provisioning.

Customers can click the OSs matched and drill down into each individual instance to see details of historical utilization and cost. They can even configure how aggressively the TSO Right Size algorithm runs—for example, building in additional processor or memory overhead above historical utilization patterns, or removing assets that are no longer running active workloads. Each time the customer pivots to look at costs and utilization in a new way, all the numbers recalculate themselves on the fly, in seconds.

All of the VM and optimal instance size details can be shared between the TSO Logic Platform and cloud migration platforms such as cloud endure. This is done via TSO Motion which will be detailed in a follow-on paper.

Figure 4. Instance Selection - new window from "134 OS Matched" under TSO Rightsized from Figure 3.



OS - Right Sized Match - US West - Yr 1

Name	Product	Software	Days On	Period Cost
Bare_00974	Standard_D14 VM (Windows)	N/A	N/A	\$18,492.36
Bare_00987	Standard_H16m VM (Windows)	N/A	N/A	\$37,764.36
Bare_01014	Standard_H16m VM	N/A	N/A	\$22,784.76
Bare_01015	Standard_G5 VM (Windows)	N/A	N/A	\$84,534.00
Bare_01040	Standard_D14_v2 VM	N/A	N/A	\$12,982.32
Bare_01043	Standard_H16m VM (Windows)	N/A	N/A	\$37,764.36
Bare_01064	Standard_D14_v2 VM	N/A	N/A	\$12,982.32
Bare_01066	Standard_H16m VM (Windows)	N/A	N/A	\$37,764.36
Bare_01189	Standard_G4 VM (Windows)	N/A	N/A	\$46,953.60

❖ 4. Modeling Multiyear Cost Differences

As the final step in the TSO Logic process, customers can start building time-series multiyear cost models to benchmark each migration scenario they're considering (Figure 4). So, for example, a customer may initially want to do a direct match (migrating a set of existing resources to Azure as is),

and then in year two, move some of those instances to right-sized resources that reflect true historical utilization without over-provisioning. They can see cash flow and savings projections over the next several years.

Figure 5. Cash Flow Analysis



These parameters are highly configurable, so customers can incorporate fixed or per-OS labor costs for the migration, credits and discounts they may have received, and any other costs or incentives the customer

anticipates. Ultimately, these projections can serve as hard numbers to back the customer's business case for migration and help them decide where it makes most sense to begin.

The TSO Logic Advantage

Using the TSO Logic Platform, customers can:

- **Eliminate guesswork:** When most organizations begin migration planning, they typically have, at best, a spreadsheet showing a single moment in time. They can't capture an accurate picture of the resources that each environment and business area is actually consuming—much less quantify the TCO of aging hardware or over-provisioned resources. TSO Logic provides hard data about current resources, directly tied to business-level users associated with them, matched with real-world TCO of various cloud and on-premise migration options. Customers can begin migration planning with accurate information and make evidence-based decisions.
- **Understand true TCO:** Even when data centers use chargeback models, they are typically coarse-grained, abstracting the cost of the hardware but obscuring the true TCO of shared resources. If an organization has invested in expensive new hardware that's being underutilized, for example, or one group has workloads that fluctuate wildly over time, those nuances are rarely captured in the data. TSO Logic's patented algorithms capture the true TCO of data center resources based on what each user or environment is actually consuming, drawing on a minimum of several weeks of analysis—or longer when used on an ongoing basis. As users' workloads grow larger or smaller, or move to more or less expensive hardware on premises or in the cloud, TSO Logic can provide continuous, accurate tracking of TCO over time.
- **Get hard data, not opinions:** An organization's operations team may be extremely skilled, but they also likely bring strong opinions about data center resources and migration planning. The TSO Logic platform removes guesswork from the equation, providing hard data for everyone to see and allowing organizations to make evidence-based, machine-driven decisions.
- **View accurate, real-time Azure pricing information:** TSO Logic rightsizing algorithms and TCO projections are derived through close partnerships with Intel and Microsoft to understand the current capabilities and pricing of all processors and platforms on premises or in the cloud. If TSO Logic recommends that a given workload could run more efficiently on a specific Azure virtual instance, it's based on a fine-grained analysis of that machine's operating system, processor and memory, matched to the that workload's real-world historical utilization and optimized for cost. And all data presented about Azure and Azure Stack is based on up-to-date information provided and validated by Microsoft.

Fast-Track Cloud Migration Planning

The value that organizations expect from cloud migration has long been based on the ability to dynamically consume cloud resources while paying only for what you actually use. But if customers don't have a clear picture of current costs and utilization, or if they're attempting to manually explore thousands of combinations of potential cloud options, how can they build a business case they believe in?

TSO Logic provides customers with clear, data-driven insights into their existing data center and hard numbers to quantify the value of any prospective migration. Using patented algorithms and powerful analytics capabilities, organizations can accurately assess their current resource needs and compare them with thousands of potential outcomes—both in the cloud and on-premise—in an agnostic, machine-driven fashion. They can quickly find the best fit with fine-grained instance and pricing details. They can craft an evidence-based business case for change and move forward with confidence.

To learn more, contact your Microsoft Azure account representative or visit:

www.tsologic.com/azure

TSO Logic
ANALYTICS-DRIVEN INSIGHTS TO
DRIVE SMARTER MIGRATIONS

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TSO Logic delivers analytics and algorithmic decisions for transforming enterprise compute. The platform provides unprecedented visibility into IT compute and application delivery, plus actionable analytics for improving performance, cutting costs, and transforming environments into ideal future states.

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