

ROI: Storage Performance Validation

Determining the financial benefits of deploying
Load Dynamix

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Introduction

Load Dynamix offers advanced workload modeling and storage infrastructure performance validation solutions. Our products provide critical insight to help our customers optimize the performance, reliability, and cost-effectiveness of their storage systems. Load Dynamix enables the accurate emulation of production application workloads at extreme scale to help you characterize storage system behavior and find storage system limits before being deployed in production. Load Dynamix saves organizations a significant amount of money and improves IT operational efficiency.

Given today's budget realities, all IT purchases must be clearly shown to result in a positive return on investment. The purpose of this document is to provide guidelines for estimating the Return on Investment for deploying Load Dynamix in a typical datacenter pre-production test environment. We have tried not to suggest broad, unsubstantiated, sweeping generalizations like "you'll pay for your solution in 6 months". Instead, we've suggested specific, concrete problems and solutions that you can relate to your own experiences. Not all examples herein will apply to every IT shop as needs vary across different organizations. The reader is encouraged to select the subset of problems and benefits that most closely applies to his/her data storage environment.

The primary economic benefits of Load Dynamix come from three areas: (1) operations efficiency, (2) storage cost optimization, and (3) risk mitigation, which allows you to innovate faster. We discuss the definitions and how to calculate the financial benefits of each of these below.



Operations Efficiency: empowering a low-cost and highly efficient storage testing process

- Eliminate buying, provisioning and maintaining load generating servers and VMware licenses as one Load Dynamix 2U appliance generates the load of 10-20 servers and hundreds of VMs,
- Save valuable people resources and time by implementing a consistent, standardized testing methodology. Easier, more comprehensive and repeatable testing often yields minimum productivity gains of 50%, and
- Re-assign valuable storage engineering resources away from the cumbersome and time consuming testing tasks such as test development and scripting.

“ Load Dynamix is like Iometer on steroids! I can test 5 different storage arrays simultaneously, configure a base workload and test it, and then change the attributes and test again. I'm so much more efficient using Load Dynamix – I'll never go back to freeware tools again.”

Todd Gleason, Manager
Firehost

**Optimize
Storage Cost**



Storage Cost Optimization

- Eliminate over or under-provisioning by aligning workload performance requirements to purchasing decisions,
- Determine which workloads require solid state storage, which ones to remain on HDDs, and which are best on hybrid storage systems, and
- Test the performance effects of a wide variety of cost-saving configuration changes such as protocols, tiers, data compression, network optimization, etc. – all without affecting your production users.

**Mitigate Risk /
Innovate
Faster**



Risk Mitigation

- Avoid performance related outages by finding and fixing problems in pre-production,
- Know all performance limits and the impact of infrastructure changes like storage virtualization, firmware upgrades, and even application changes, before going live,
- Spend less time reacting to problems & more time on supporting growth initiatives,
- Attain the freedom to innovate with the latest storage technologies without the fear of unpredictable performance,
- Accelerate innovation by reducing project lengths and growing revenues by testing and validating 10X more projects per engineer/year,
- Prevent production slowdowns and outages so that your business will increase revenues by avoiding lost sales from dissatisfied customers.

“ We can now assess the hottest storage technologies like SSDs, caching, tiering, and de-dupe, against our full production requirements, faster and more accurately than ever before. Load Dynamix puts us in the driver's seat when it comes to our storage roadmap and our cost structure.”

Justin Richardson,
Storage Engineer
Go Daddy

“ Load Dynamix made it easy to migrate to a private cloud. We were able to determine real-world behavior and save money. It doesn't get better than that!”

System Operations Director
Ellie Mae

There are many different ways to financially justify IT infrastructure investments, including return on investment (ROI), payback period, internal rate of return, etc. In many cases, you may have to obtain funding for purchase from an executive committee and you will need comprehensive data to help substantiate your technology choices. The ROI concepts discussed in this white paper permit in-depth analysis of common scenarios to arrive at the expected ROI for a Load Dynamix purchase. With this guidance, and with the assistance of your Load Dynamix Account Manager, you will have the data required to build the required business case.

We encourage you to examine this paper, and tell us what you think. Your comments may help improve the value of this analysis for others. Please contact us at: marketing@loaddynamix.com.

Financial Impact of Operations Efficiency

Improved engineer productivity

Before deploying modern test methodologies using Load Dynamix, our customers routinely report that their test architects and engineers spend nearly 80% of their time configuring the test environment and setting up tests and only 20% actually running tests. These numbers are reversed when using Load Dynamix. And after the tests are complete, there is the work needed to compile and analyze the output. With Load Dynamix, there's no need to assemble data from multiple sources; everything is available from a single pane of glass. Load Dynamix users save immensely from being able to do more actual tests per week and by using these newly freed up personnel resources for other projects. For this calculation, you'll need to know your burdened cost per storage engineer and the number of FTEs currently engaged in storage testing and QA. Our current customers often suggest a productivity improvement in excess of 50%. We suggest you use the following equation:

Calculation

$$\begin{array}{r} \text{Annual loaded cost of a FTE storage engineer} \\ \times \text{Number of FTE storage engineers} \\ \times \text{\% productivity improvement} \\ \hline = \text{Annual savings from productivity gain} \end{array}$$

Example Calculation

$$\begin{array}{r} \text{\$200K Annual loaded cost of a FTE storage engineer} \\ \times \text{2 Number of FTE storage engineers} \\ \times \text{50\% \% productivity improvement} \\ \hline = \text{\$200K Annual savings from productivity gain} \end{array}$$

Reduced test lab infrastructure costs

To emulate your production application workloads, you may have to drive an I/O profile that simulates hundreds or many thousands of clients. This may include a large CAPEX purchase and also involve significant provisioning tasks with hosts, VMs, and networking, including all the configuration, support, maintenance, and troubleshooting that goes with a large server farm.

Calculation

$$\begin{array}{l} \text{Avoidance of yearly spend on load generating servers, VMs, networking, maintenance} \\ + \text{ Avoidance of admin cost for procuring, provisioning, maintaining lab} \\ \text{---} \\ \text{(\% of FTE x fully loaded average yearly labor cost)} \\ = \text{ Net annual savings of lab infrastructure costs} \end{array}$$

Example Calculation

$$\begin{array}{l} \text{\$200K Avoidance of yearly spend on load generating servers, VMs, networking,} \\ \text{maintenance.} \\ + \text{ \$100K Avoidance of admin cost for procuring, provisioning, maintaining lab} \\ \text{---} \\ \text{(\% of FTE x fully loaded average yearly labor cost)} \\ = \text{ \$300K Net annual savings of lab infrastructure costs} \end{array}$$

Total impact on Operations Efficiency

Calculation: Add sub-total from above:

$$\begin{array}{l} \text{Annual savings from productivity gain} \\ + \text{ Annual savings of lab infrastructure costs} \\ \text{---} \\ = \text{ Annual savings on Operations Efficiency} \end{array}$$

Example calculation: Add subtotal from above sample calculations

$$\begin{array}{l} \text{\$200K Annual savings from productivity gain} \\ + \text{ \$300K Annual savings of lab infrastructure costs} \\ \text{---} \\ = \text{ \$500K Annual savings on Operations Efficiency} \end{array}$$

Financial Impact of Storage Cost Optimization

Find optimal cost storage solution based on workload performance requirements

You can start by estimating your planned annual spending on new storage infrastructure. Your efficiency gains will be due to optimal engineering (architecture / vendor / configuration) decisions due to your new ability to have the real data on performance requirements. We suggest you use the following equation. As a guideline, many customers conservatively estimate a 20% efficiency gain.

Calculation

$$\begin{array}{r} \text{Projected yearly spend on new storage infrastructure} \\ \times \text{Efficiency gain \% from optimal engineering decisions} \\ \hline = \text{Annual savings benefit} \end{array}$$

Example calculation

$$\begin{array}{r} \$1000K \text{ Projected yearly spend on new storage infrastructure} \\ \times \text{20\% Efficiency gain \% from optimal engineering decisions} \\ \hline = \$200K \text{ Annual savings benefit} \end{array}$$

Financial Impact of Risk Mitigation/Faster Innovation

Impact of avoiding problems in production deployments

Larger companies and federal agencies are constantly rolling out new products and services with the goal of using the latest technologies available. Unfortunately, deploying new technologies and products before adequate testing can be completed is a highly risky endeavor. The conflict between trying to innovate quickly and minimizing the risk of performance problems is substantially alleviated when using Load DynamiX. With IT managers increasingly being charged with using Service Level Agreements to guarantee performance and availability levels, the impact of such problems can be dramatic. By reducing risk through comprehensive storage testing and validation, IT can contribute to the company's competitiveness by enabling faster innovation.

To determine the financial risks, you need to estimate the number of performance-related incidents per year related to scaling or new rollouts, and the average "cost to the business" of these incidents. There are many studies concerning the cost of downtime, and they point out that most datacenter incidents are not caused by just storage performance problems, but they do exist. In one study, dated 2013, Ponemon Institute reports costs per outage incident of between \$390K and \$970K, depending on industry. In our sample calculation below, we take the lowest figure found in that study, and assume only one per year.

Calculation

$$\begin{array}{r} \text{Outage / incidents per year related to} \\ \text{performance issues} \\ \times \text{ Average business cost of each incident} \\ = \text{ Total yearly cost of not mitigating risk} \end{array}$$

Example calculation

$$\begin{array}{r} 2 \text{ Outage / incidents per year related to} \\ \text{performance issues} \\ \times \text{ \$400K Average business cost of each incident} \\ = \text{ \$800K Total yearly cost of not mitigating risk} \end{array}$$

Note that in the Sample Calculations in sections 2, 3 and 4, the yearly cost of doing business your current way could be over \$1M, as in this fictional example. Your numbers are sure to be different.

Summary

The cost of Load Dynamix is easily justified by a combination of any of the above benefits. After estimating your OPEX and CAPEX savings, your Load Dynamix account team can provide a quote for our solutions. From this, you can generate an expected Return on Investment calculation. One of our customers, the QA Director at Cisco, said it best: “After testing with Load Dynamix, we found 30 bugs in 30 days — after our other testing tools found nothing. Getting a \$1M ROI in one month is pretty cool.”

We can't promise a one month ROI, but we look forward to working with you to add your actual projections into our full ROI model. Working together, we can develop a complete picture of the expected financial savings of deploying Load Dynamix.

“After testing with Load Dynamix, we found 30 bugs in 30 days – after our other testing tools found nothing. Getting a \$1M ROI in one month is pretty cool.”

QA Director
Cisco