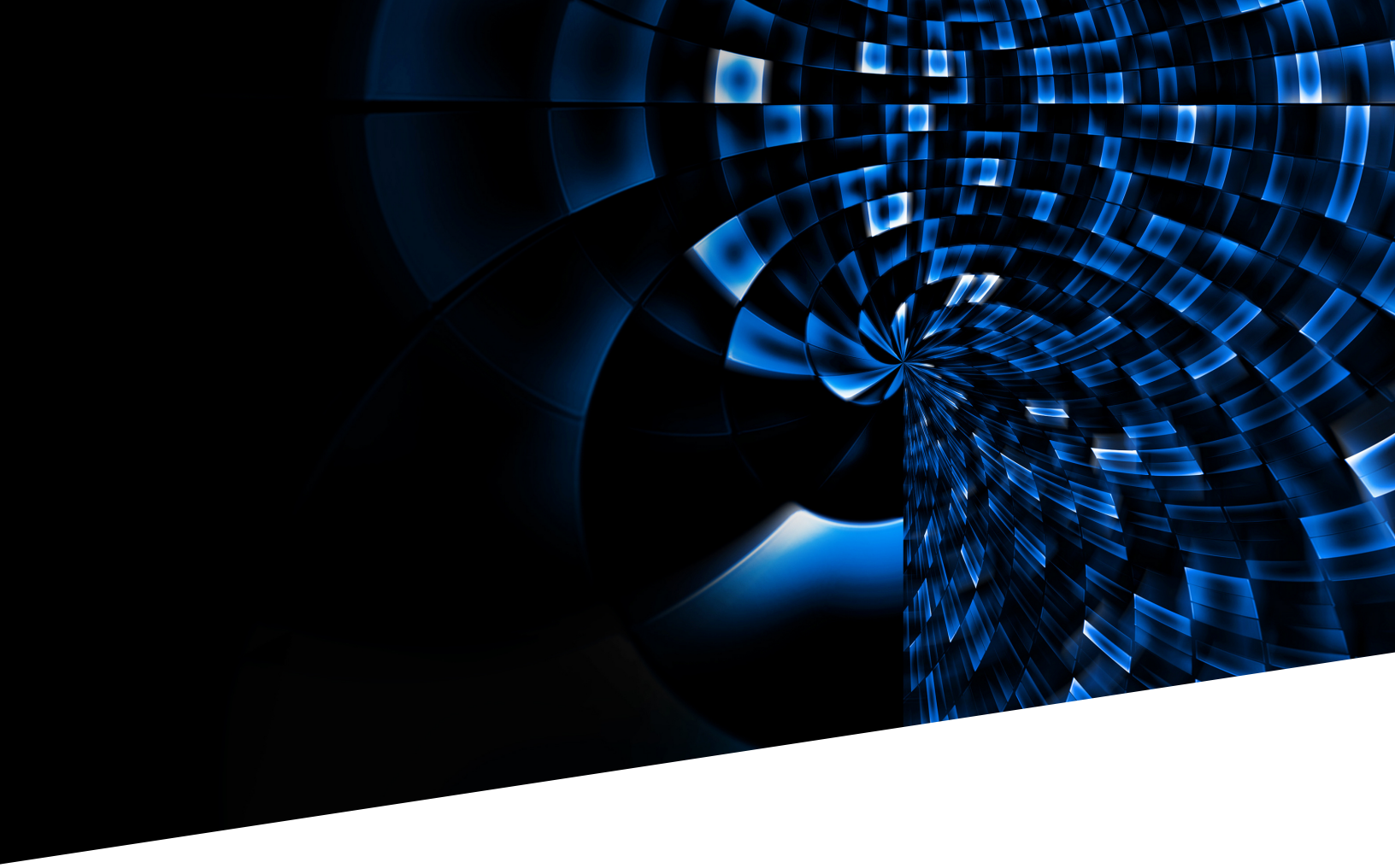


THREE WAYS FOR STORAGE ADMINISTRATORS TO MAXIMIZE *HP NIMBLE*

VSI's storage resource management service can uniquely maximize your *Nimble* infrastructure - avoiding surprises and emergency purchases.

PHIL GODWIN, PRESIDENT & COO

AUGUST 2021

visualstorage INTELLIGENCE

THREE WAYS TO GET THE MOST OUT OF *HP NIMBLE*

Nimble is a popular choice among enterprise IT leaders, and for good reason. *Nimble* arrays are one of many new "All Flash" storage arrays in the marketplace with compression and deduplication built into the product. Thanks to these space reduction technologies, customers can buy 20TB of storage while actually storing 80TB of data.

Customers love these arrays because they improve the cost-effectiveness of all-flash storage, delivering excellent performance over time (with a simple set-up-and-run).

While these arrays are simple to implement and manage at an operational level, there are some unique features of these arrays that can cause management-related issues if not properly maintained.

Unlike traditional storage management tools, *Visual Storage Intelligence's* services can uniquely **maximize the value of variable capacity arrays** - while also **optimizing *Nimble* performance** and **improving showbacks**.

THE CHALLENGE OF VARIABLE CAPACITY ARRAYS

HP Nimble arrays are "variable capacity arrays." These are arrays in which data reduction occurs automatically, meaning the overall capacity of an array can, and often does, change over time. Whereas the capacity of a traditional array is fixed, variable capacity arrays are like moving targets, shifting up or down based on changes in data reduction ratios.

In some cases, the reduction ratios can go up, allowing storage arrays to last longer. For example, a variable capacity array with 10 TB of raw storage might actually be able to hold 40 TB of effective storage in this scenario.

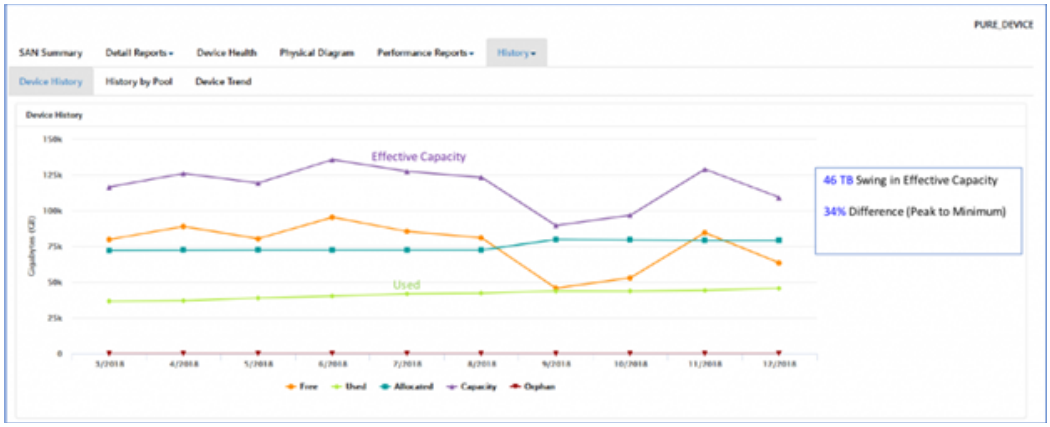
In other cases, however, these ratios can go down, causing arrays to reach capacity sooner than expected.

As data changes, so does effective capacity.

The challenge with this environment is not *managing* to the effective capacity, but rather *predicting* the effective capacity's changes over time. This may not sound so difficult, but when your effective capacity changes by 20% over a 1-2 week period it can create a variety of unexpected or even "emergency" events.

You can easily see this in action on the next page. Take the example of a VSI client who uses a variety of *Nimble* storage arrays to meet their requirements. Note that during the period of time being monitored, there was NO CHANGE to the storage hardware. This was the same device with the same physical storage attached – the only change over the period of time analyzed was the data stored.

Here is their storage capacity trend chart, with used storage data (light green) and effective capacity data (purple):



For this client, the change in effective capacity over a 6 month period of time was:

- 46 TB Change in Effective Capacity (135 TB in June to 89 TB in September)
- 34% Reduction in Capacity
- 34 TB Largest Monthly Change in Capacity

As data changes, so does the “effective capacity”. As more data is stored, typically (but not always) these swings should be reduced, but never eliminated.

Monitoring a Moving Target

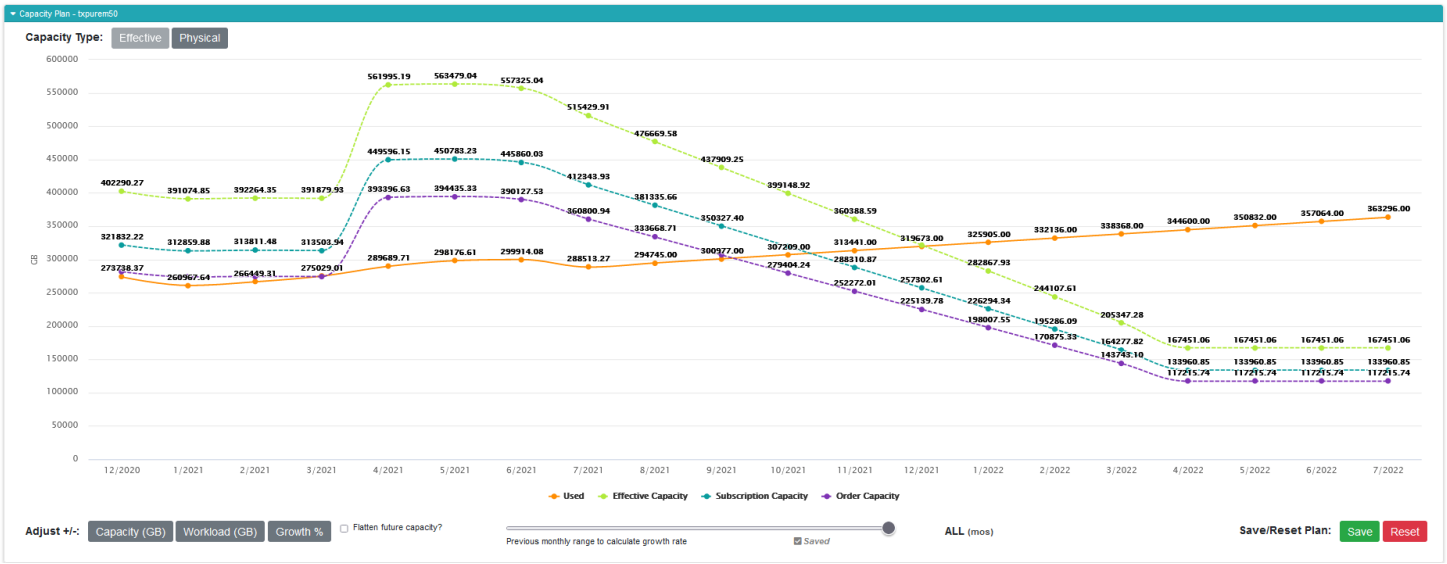
Most customers monitor storage growth and assume that capacity remains constant. As we see above, this is not true with *Nimble* storage arrays. For *Nimble* storage you must monitor both “effective capacity” and storage consumption – tracking the relative relationship between these two numbers and setting warnings/alerts for when the trends reach prespecified thresholds.

Easier said than done! These kinds of arrays are only cost-effective if you can dedicate the time and energy needed to analyze and anticipate changes - or, better yet, if something can do it for you.

VSI OFFERS PITCH-PERFECT FORECASTING IN A FRACTION OF THE TIME

Wouldn't it be nice if you could model *and forecast* your effective capacity, used storage trends, and data reduction changes - without sidelining other projects in order to find the necessary time? VSI enhances the work of IT professionals by doing all of this, even using trends to project across the next six months.

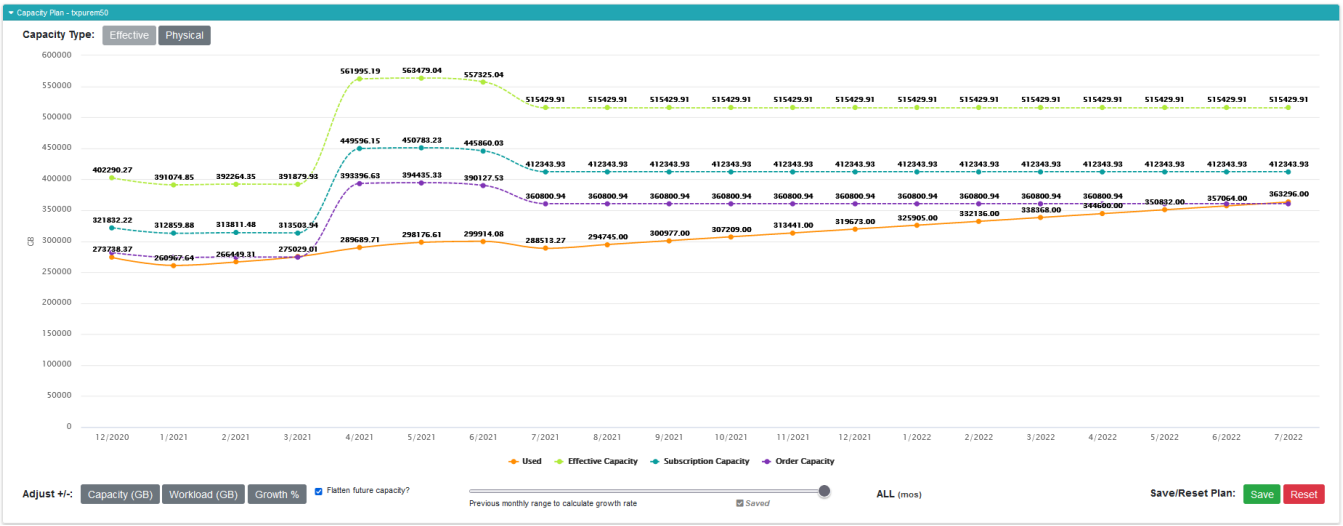
In the example below, you can see both data reduction (light green) and used storage increases (orange) modeled for another VSI client.



As of August 2021, the client's data reduction ratios have dropped from approximately 3.4-to-1 to 3.0-to-1. That might not seem like much, but it equates to a significant 60-70 TB on this array. At this rate, the client may need additional storage sooner than anticipated.

How soon? Look at the chart again. Using the trends in the data, VSI could forecast that the array will reach 80% used storage sometime in Q4. This is critical information - especially if the client was waiting until Q1 or a new budget cycle to make additional storage purchases.

But what if the array capacity does not change and remains constant? It would be nice to have the ability to model this as well. VSI provides this capability and you can see the conclusions are very different from the previous chart.



Now the array is not projected to even reach 70% until months later in July 2022.

Variable capacity arrays are only cost-effective if you can easily analyze and anticipate changes. With Visual Storage Intelligence, you can.

Which scenario should you plan for? It's best to monitor and plan for both, which is why VSI provides multiple styles of modeling plus a six-month predictive analytics trend analysis.

Moreover, there is one other piece of information that can help you predict which scenario is more likely: the array's data reduction ratio historical trends.

Below are the data reduction trends for this array:

Now we can see that the client historically has bottomed out around 3:1 - the same level they are at currently. This helps the client predict that Scenario #2 (constant array capacity) is more likely than Scenario #1 (changing array capacity).

Still, both scenarios should ideally be reviewed monthly so that future changes don't result in avoidable emergency purchases.

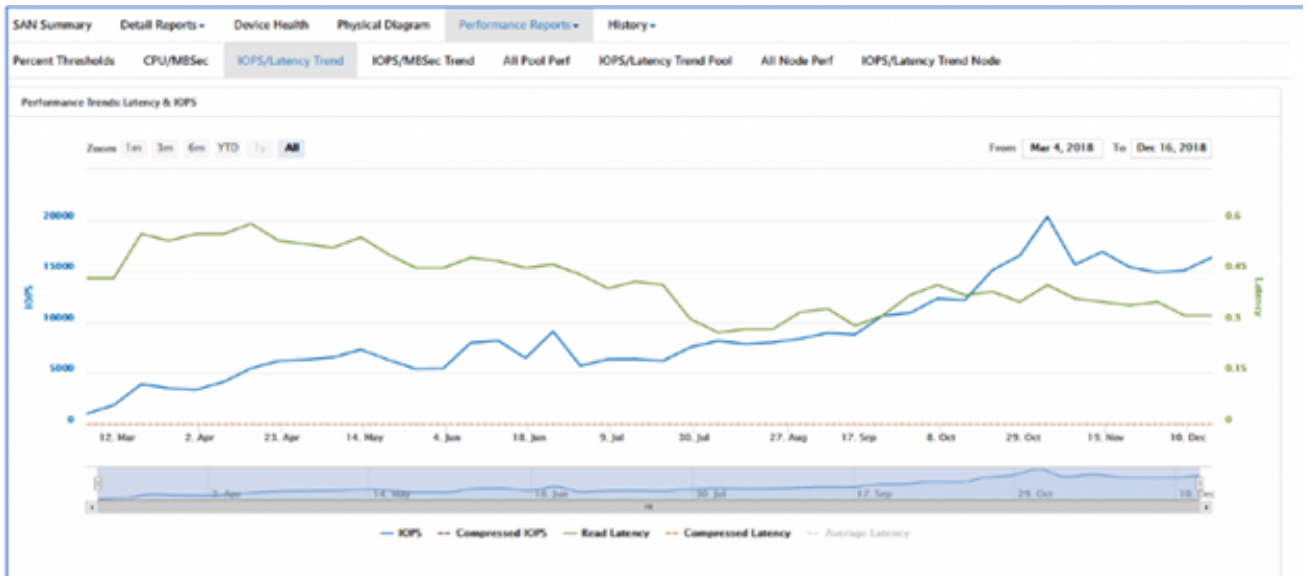
With single-pane-of-glass analyses, VSI provides automated and human intelligence you can't get anywhere else.

"Initially, I did not understand why I needed additional capacity...my usage trends were growing very slowly. ***VSI showed me what I did not understand*** *and gave me the business evidence to justify additional capacity purchases in advance of running out of storage.* ***We estimate VSI saved us over $100,000*** *in purchase and staff overtime costs – and even more importantly* ***improved management's confidence*** *in our IT organization's ability to manage all IT resources." - VSI Customer*

OPTIMIZING *NIMBLE* PERFORMANCE

So VSI is excellent at helping manage *Nimble* storage capacity growth; but are there any other ways VSI can help me manage my *Nimble* storage environment?

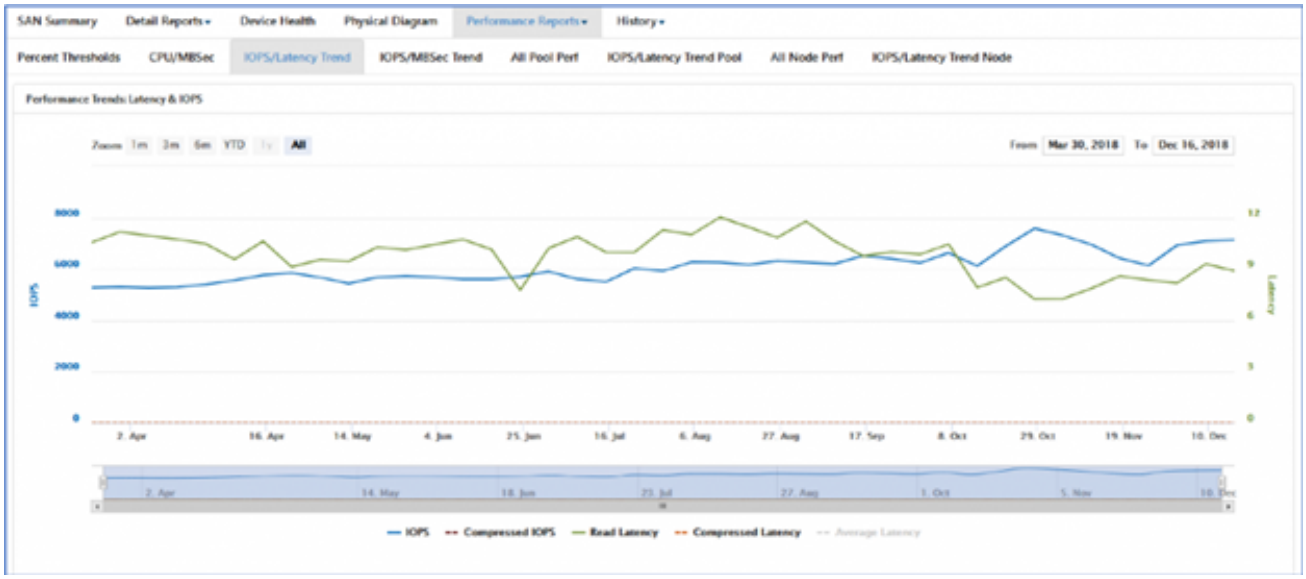
The answer is yes, beginning with performance management. Let's look at a standard VSI chart, provided for all devices within VSI, that displays the relationship between workload (IOPS in blue) and performance (latency in green).



The trends on this chart are excellent. As workload (blue) increases, the performance (green) remains the same – between .3 and .45 ms. This allows you to see overall device trends and recognize your overall storage trends.

But let's drill deeper. Since VSI analyzes performance data at all levels of your storage environment (array, pool, host/lun), detailed analysis can be performed to determine “root cause” issues if unexpected results are reported. Most of the *Nimble* storage arrays we see deliver excellent performance, but not all. VSI is able to identify the workloads that are not well suited for *Nimble* storage.

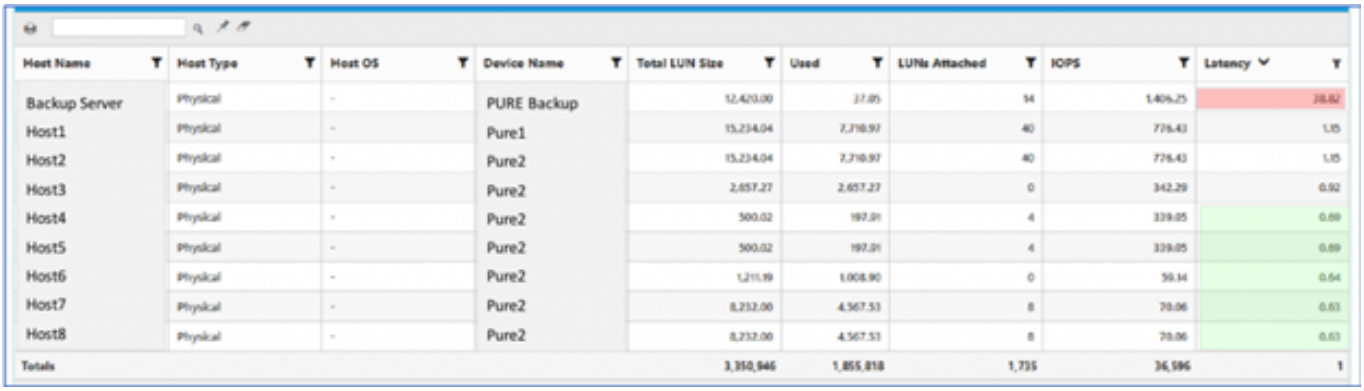
The following performance chart is from a VSI client using a variable capacity array to support a specific subset of their applications.



While the trends as a whole look fine, an overall average of 9 ms seems extremely high for an all-flash storage array. At surface level, it appears as if this particular array is performing very poorly. If the client didn't drill any deeper, their organization could be on the cusp of making an expensive mistake.

VSI helps you avoid mistakes by calculating for all seven levels of your host and storage infrastructure.

By taking a look at host performance across all arrays in the enterprise (see next page), we realize the performance issue does not affect all hosts in the storage environment. In fact, the overall high latency numbers are due to a single host!



Host Name	Host Type	Host OS	Device Name	Total LUN Size	Used	LUNs Attached	IOPS	Latency
Backup Server	Physical	-	PURE Backup	12,420.00	27.05	14	1,406.25	28.82
Host1	Physical	-	Pure1	15,234.04	7,710.97	40	776.43	1.15
Host2	Physical	-	Pure2	15,234.04	7,710.97	40	776.43	1.15
Host3	Physical	-	Pure2	2,657.27	2,657.27	0	342.29	0.92
Host4	Physical	-	Pure2	500.02	197.01	4	339.05	0.69
Host5	Physical	-	Pure2	500.02	197.01	4	339.05	0.69
Host6	Physical	-	Pure2	1,211.19	1,008.90	0	59.14	0.64
Host7	Physical	-	Pure2	8,232.00	4,567.53	8	78.06	0.63
Host8	Physical	-	Pure2	8,232.00	4,567.53	8	78.06	0.63
Totals				3,350,946	1,855,818	1,735	36,596	1

Host Performance Across All Enterprise Arrays

This is actually good news – it tells us that this host (which happens to be a backup server) should be moved to a traditional storage environment which is better suited for large write workloads.

Don't make strategic decisions without all relevant data. VSI provides the context you need to future-proof your efforts.

VSI provided the analytics to understand which workloads are getting the most value from a *Nimble* storage environment and which are not.

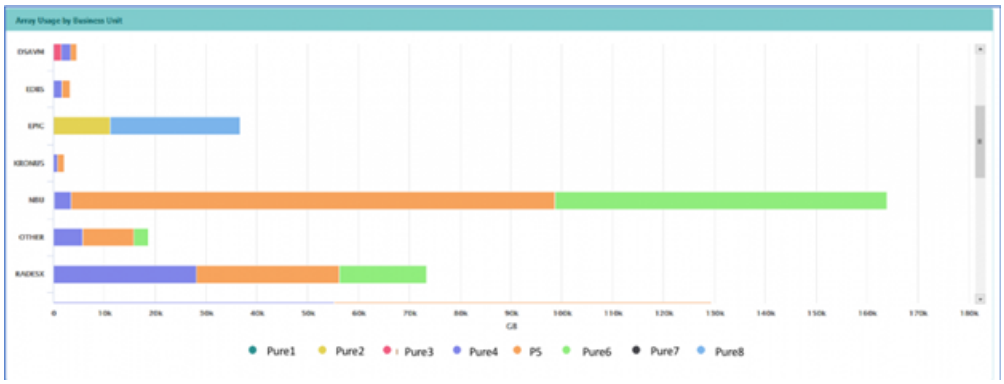
Migrating this single server to a storage array optimized for backup / large write workloads will improve the performance of the customer's backup workloads and also improve the performance of all the other hosts currently using storage on this specific storage array.

And there is still one more way VSI improves *Nimble* storage environments.

ENHANCING BUSINESS UNIT CHARGEBACKS / SHOWBACKS

Another unique value VSI provides *HP Nimble* users is the ability to see what business functions are using which portions of each storage array. This enables clients to ensure the right business arrays are using the proper storage to meet their requirements and ensures the business can meet both its performance and cost objectives collectively.

Oftentimes, this is a labor-intensive process that requires so much time it is done only once a year. With VSI, these reports are generated weekly, can be drilled into on-demand through a web portal, and can be used to discover and resolve issues in a timely manner.



The advanced software capabilities provided by *HP Nimble* requires advanced analytics to meet customer's needs in capacity, performance, and business application planning. *Visual Storage Intelligence* provides specific features to meet each of these needs from a simple browser interface. It provides alerts on-demand and when needed, ensuring that clients are able to meet their capacity planning needs, performance expectations, and business application show back/chargeback requirements.

visualstorage INTELLIGENCE

More automated than excel.
Less complicated than SRM.

Multi-vendor analytics with quick and easy reporting.

Delivered as a Storage Resource Management-as-a-Service (SRMaaS), *Visual Storage Intelligence*® provides data-driven insights into performance, capacity, utilization and governance challenges.

Our **"white glove service"** incorporates AI with a human touch to deliver consolidated alerting on a regular basis. Through these analyses, we help our clients shift from reactive system management to a more proactive approach.

Call us or schedule a demo to see how *Visual Storage Intelligence* helps you manage your multi-vendor infrastructure from a single pane of glass.

Visit *www.VisualStorageIntelligence.com* or call *(972) 906-7500*.