The background of the entire page is a photograph of server racks in a data center. The racks are dark grey and filled with server units. Overlaid on the image are several semi-transparent, glowing blue and white geometric shapes, including squares and lines, suggesting a network or data flow. The overall color scheme is dominated by blue and green, with white text.

Storage Capacity Planning Handbook:

Three Steps to Minimize Costs, Save Time, and Reduce Organizational Risk



The Enterprise Guide to Capacity Planning:

Three essential principles for proactively managing IT storage infrastructure – and impressing your boss by saving time, reducing costs, and dodging risks for your organization.

In the ever-changing world of data storage, capacity planning is an essential process for anticipating what you will need, where and when you'll need it, and how much it will cost.

Between potential budget cuts, the recent pandemic, and competitive challenges facing businesses worldwide, it's more important than ever to develop an accurate budget and strategy for your future data storage and infrastructure plans. Don't just look at what you spent this year or last year and assume you will spend the same next year. What changes should you be anticipating?

Consider the following costs. Do any feel familiar to you?

- Insufficient (or inaccurate) planning can cost hundreds of thousands of dollars in unbudgeted or even unnecessary **purchases**.
- Unplanned purchases can waste weeks of implementation **time**, leaving other projects and priorities delayed or ignored (while also prolonging overtime).
- Unmonitored infrastructure renders your capacity planning out-of-date too soon and can expose you to **risk** of outages, delays, or even security breaches.

Each of these scenarios hurts your bottom line.

Through strong capacity planning, IT leaders have an opportunity to spend less and improve organizational standing through better budget forecasting.

In typical workplaces, however, this is easier said than done.

Obstacles to Capacity Planning

Some popular capacity management tools only do exactly what they claim – capacity *management*, not capacity *planning*. For example, they might not be able to model or forecast with the ease you need.

Most storage environments use multiple vendor suppliers for their infrastructure. The problem is that most capacity management tools or vendor-supplied software are only compatible with certain vendors. In these circumstances, capacity planning can require multiple capacity management tools – which in turn must be exported, standardized, and combined, usually through manual spreadsheets.

So, whether someone is using native tools or Excel, chances are they will spend weeks working on manual spreadsheets in order to do capacity planning. Is that sustainable over the course of a year? And what happens if that employee leaves the company before training a successor?



Shortfalls of Traditional Capacity Planning

Because of these and other limitations, most capacity planning is not only haphazard but also surface-level. Considerations that often get missed include:

- Month-to-month variations – factoring in recent changes.
- Going beyond the array level – accounting for data center, tier, or application levels.
- Performance capacity – specifying percentage of IOPS or latency.
- Type of storage needed – considering high performance versus high capacity.
- Variable capacities – predicting the behavior of [variable capacity arrays](#) (such as those offered by *Pure Storage*).

VSI believes in empowering IT leaders to make the best long-term decisions for their organizations – without the traditional costs associated with thorough capacity planning. [We ground our capacity planning](#) in three principles that everyone should strive for:

1. Collect and analyze data from *all* levels of your storage infrastructure.
2. Build models and run forecasts that are tailored to your specific environment and goals.
3. Use consolidated reporting to ensure your capacity planning stays reliable in changing environments.

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Principle One:

Collect & Analyze Data from **All** Levels of Your Storage Infrastructure.

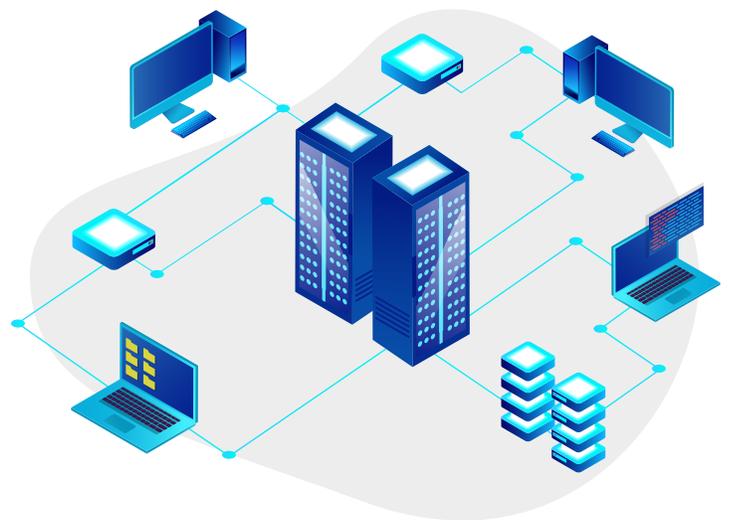
Don't pay for upgrades you don't need. One of the keys to successfully optimizing your storage environment lies in multi-level capacity planning. A lot of capacity planning tends to be done at a high level, tracking storage usage and growth trends with minimal detail. But it's this lack of detail that leads to missing knowledge and capacity shortfalls or emergency purchases.

Imagine running a high-level storage capacity report that shows 300 terabytes available across your storage environment – more than enough space for your next 100 TB project.

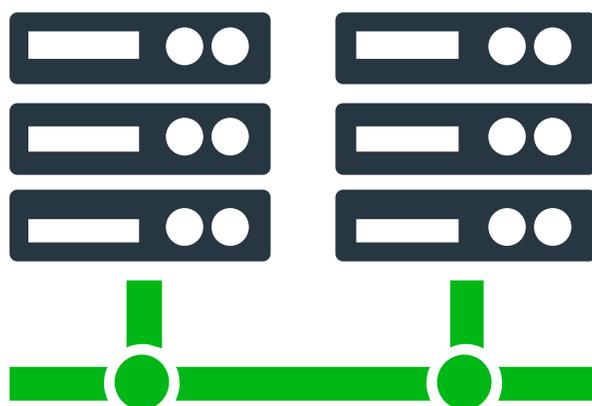
What you did *not* see was that space is split between your two data centers, then divided across a number of arrays. Finally, it's even further divided across multiple pools. In reality, your 300 terabytes are fractured storage, and there isn't enough of it in one place to handle the workloads that you need.

While everybody can do capacity management at some level, truly effective capacity planning should track all levels of the organization:

- Device
- Location
- Group
- Pool



Let's say that you have two big arrays, both doing production, and you've divided the workloads 50/50 between the arrays. Before long, it appears that one of the arrays needs a costly upgrade. From the array level, where most capacity planning is done, there seems to be no reason why one array has reached capacity faster than the other. But a more detailed look at the pool level shows that the growth trends for one array were different from the other. Rather than investing in an upgrade, all that was needed was to change the workloads.



An organization that starts capacity planning at the pool level would know this right away. But no one really monitors at the pool level manually. An [automated data collection](#) (like VSI) would be crucial.

Admittedly, it can be hard for IT teams to monitor and plan with this level of detail. It is time-consuming, takes time away from other critical responsibilities, and sometimes the data is simply unavailable.

That's why VSI offers an [automated data collection process](#) plus consistent reporting at all four levels. We make it easy for you to see and track all the data you need to fully lead your storage environment.

Principle Two:

Build models and run forecasts that are tailored to your specific environment and goals.

Quit playing guessing games. Forecasting helps IT leaders both plan more precise outcomes and avoid unexpected problems. Imagine your organization is considering a project that will require 400 TB of storage. What will the impact be on your infrastructure? Will you need to purchase more storage? If not, how much sooner do you expect to reach capacity than before?

If you want to help your boss make the best decision – and in order to be ready to implement the change without hurdles – you need to forecast likely outcomes with a high level of certainty.

Most organizations don't have enough data – or time – to really feel confident about their predictions. Even if all the right data is technically available, it still needs to be compiled in a way that makes sense and filters out unnecessary data. And then that data needs to be analyzed in a way that points to a likely outcome.



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This is where a strategic resource can help. [VSI's extensive modeling abilities](#) – and personalized Capacity Planning as a Service (CPaaS) options – helps provide the strongest forecasts with the least organizational effort from you. Using three different kinds of models, VSI predicts future events and can even imagine “what-if” scenarios.



Whatever you use for your capacity planning, you should rely on models that best match your data and circumstances. VSI uses three models that everyone should have the ability to run: weighted average, simple linear, and customer-selected.

Weighted Average

The weighted average builds on a company's most current data. This model looks at the last six months, using weighted averages and weighing the most recent month more than older months. Most businesses don't think they are growing as fast as they are, and they often think they have more time than they do to make storage decisions. The weighted average forecasting model can often be the most representative of a company's current situation.

Simple Linear Model

The linear growth forecasting model utilizes simple averages. It pulls from a limited sample of data to predict future growth trends. This is helpful when you have a limited data sample or are trying to draw conclusions based on less information.

Customer-Selected Model

This model can offer variable time frames and can also shrink and expand historical trending. This model can be adjustable for business changes.

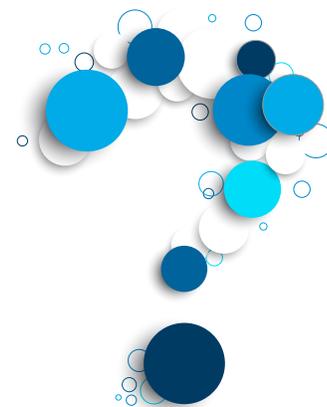
Each of the three forecasting models can be used to clarify capacity and growth assumptions. By applying one of these forecasting models, businesses can plan for various storage needs, including new workloads coming in or leaving, new applications, and performance requirements.

What-If Scenarios

While models are good for making predictions based on past conditions, those conditions can change. The models above lose their efficacy if important conditions change. Similarly, if you are thinking about a change in your workloads, these models are limited in their ability to help you see the impact of that change.

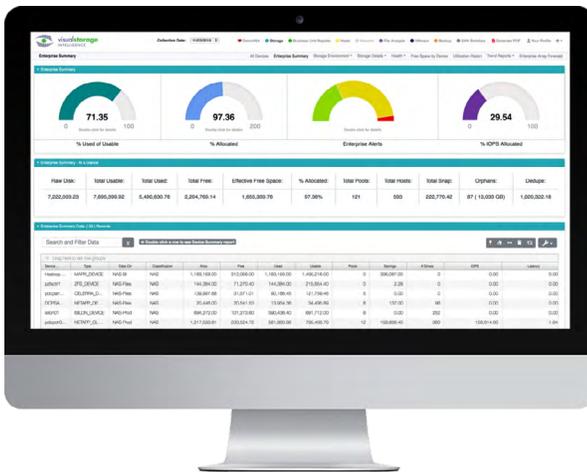
Businesses are good at knowing what their future workloads will be, but they often don't see the long-term effects of adding data. Unlike other services, VSI allows IT leaders to model applications or predictions for hypothetical circumstances beyond existing data.

By being able to accurately predict outcomes for these what-if scenarios, VSI helps businesses know what to expect and avoid surprises. To be effective, your capacity planning should ensure you are never caught off guard.



Principle Three:

Use consolidated reporting to ensure your capacity planning stays reliable in changing environments.



Don't let your plans get outdated. Have you ever walked past a car alarm that was blaring and barely given it a second glance? When car alarms were first introduced, they drew a significant amount of attention. Since then, most of us have stopped paying much attention when we hear them. After all, you probably know from experience how easy it is to accidentally set off a car alarm by bumping into it or pressing the wrong button on your keys.

When everyone is ignoring the sound of an alarm, what good does it do?

Your storage environment may not have an actual alarm that sounds when there is a problem, but real-time monitoring can have a similar effect. While storage resource management (SRM) initially placed a heavy emphasis on monitoring and alerting, those alerts have now become so prevalent that they are all but ignored.

[Consolidated reporting works differently](#), organizing a company's independent data elements into a unified, visual analysis across the multi-vendor storage environment. Reports are refreshed regularly and are available at any time for efficient and digestible analysis.

Consolidated Reporting Helps You Act, Not React

Organizations often mistakenly approach storage data from a reactive stance. While real-time monitoring technically provides instant data, it only alerts IT leaders to adverse events (or precursors to those events) that have already occurred.

Consolidated reporting allows IT teams to use the storage data analysis to be prepared, to anticipate changes, and to plan ahead.

With VSI, for example, IT leaders receive a regular AI-driven email from an on-staff VSI expert, alerting them to any problems as well as highlighting any opportunities. Within this email, IT leaders will receive notice if performance thresholds are being met before capacity thresholds.

These reports also include:

- Growth trends over time (by location, device class, and tier).
- Performance as well as capacity.
- Modeled assumptions.
- Predictive forecasts.

All of this is in addition to the reporting dashboard, which clients can access 24/7.

Consolidated reporting may be particularly important for geographically dispersed teams, keeping them all on the same page.

Today's storage environments have become so duplicated that they have progressed beyond real-time monitoring, which means it's time to move to the future.





Ready to Future-Proof Your Storage?

Deep data collection, strong modeling, and continued analysis are the foundation of [worthwhile capacity planning](#). These principles are essential – but they can also feel elusive, especially when relying on spreadsheets or vendor-specific tools.

VSI is a [vendor-agnostic storage reporting service](#) that goes far beyond simply reporting data. Our single-pane-of-glass presentation, as well as our personalized white-glove service and vendor neutrality, make us well-equipped to support you in your capacity planning.

Whether you're just starting to think about capacity planning or have been using a favorite tool for years, [let us show you what we have to offer](#).

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Testimonials

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One of our IT Infrastructure challenges was keeping track of our storage environment so that we can make smarter decisions about our current and future storage needs. Like everyone else, we need to do more with less time, money and resources. We chose Visual Storage Intelligence® because it is a low-cost solution that requires no education or training and gives us the visibility we need without having to install or learn additional products.

We get reports and charts that depict the status of our storage infrastructure, at any point in time, throughout our enterprise. It also summarizes this information into a single executive report as well as tracks historical growth within each environment – which is an added bonus.

VP of IT Infrastructure, Fortune 1000 Household & Personal Goods Company

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Before VSI we had a lot of spreadsheets and we had to do a lot of manual reporting and we spent a lot of time on it. After VSI we have much better reports. All the data is presented uniformly across all my storage systems and I'm able to make much better management and leadership decisions on how we maximize the capacity that we have.

Last year we increased our storage utilization from in the neighborhood of 30 percent to over 50 percent, which actually supersedes most industry standards for storage utilization. We saved a lot of money along the way as well, and it has benefited the company significantly.

Manager, Server & Storage Infrastructure, Fortune 500 Airline

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We're very grateful. We love having the VSI team around and we hope to continue having them around for many many years. They add tremendous value not just to us as a business or to an IT organization, but back to our customers.

Director of IT Infrastructure, Fortune 500 Food & Beverage Company