Today’s C-suite is focused heavily on growth, profitability, and ways to remain competitive. However, with ever-present economic pressure, rapidly changing global markets, and constant IT innovation, it’s increasingly hard for CEOs and CFOs to accurately forecast growth and develop strategies to meet the challenge.

“Today’s top business leaders understand that long-term success in this era of fast-paced technological change and global economic shifts requires a new way of thinking and operating,” said KPMG CEO Lynne Doughtie in the introduction of the firm’s most recent CEO survey. She went on to say, “In fact, the corporate playbook is being rewritten and replaced by one that takes business agility to a level we have never seen before.”

IT managers have witnessed first-hand how rapid expansion in business and rapid innovation in technology do not always move in sync. In the past, the critical question was “What does the business need now?” Today IT and corporate management must also ask “What will the business need in 3, 5, and 10 years?”

As companies embark on new ventures involving IT expansion, they must address this issue, which can be termed “capacity vs. cost.” Do we purchase extra capacity now, or do we add it on as we need it? Which is more cost effective? Which provides more flexibility?

The Aberdeen IT Solutions Team has assembled this report to help all those on corporate teams involved in determining needs, specifying technology, and approving capital expenditures to understand emerging scale-up vs. scale-out solutions for storage capacity.

**What is scale-up?**

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**Scale-Up Systems**

What is *scale-up*? *Scale-up* refers to installing a single defined system with an anticipated life and capacity. While some expansion is possible, *scale-up* forecasts capacity and builds for it. For example, if you project your needs for storage to be 500 terabytes over the next few years, you would invest in a storage solution that would accomplish that. This is often referred to as a “single box” solution. In this case, it would be a 500 terabyte storage device.

While most *scale-up* solutions have some
What is scale-out?
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Scale-Out Systems
Thanks to innovation in both hardware and software, scale-out has emerged as a new alternative to the traditional scale-up storage system design. Scale-out allows a company to employ a storage solution that can grow out laterally in the future. The initial system is expanded by adding more capacity, most likely in the form of additional “boxes” or storage units, used as one combined storage solution. (See diagram below.)

Using the example above, rather than installing a single 500 terabyte box today, if immediate needs are for 200 terabytes, a company could choose to put in 200 terabytes of storage capacity now, and add additional “boxes” of storage at a later date. These boxes would utilize application delivery controllers that allow the machines to be used like a single box solution, but with the benefit of greater expandability.

A Practical View
Many view scale-up as a simpler, more straightforward approach. Determine need, build out the correct system, and move on. Critical to long-term success is understanding your current and future needs, and making sure you are covered with the scale-up solution.

One practical downside with scale-up is if you create a storage solution that includes anticipated growth, you will have some unused capacity for a period of time. It is capacity that is paid for, but not needed for some time. This may be small, or it may be financially significant.

In the same way, scale-out is designed to very easily expand with time. That seems like a good thing, right? In the case of having difficulty forecasting needs or requirements, this is a very good thing. As you grow, and when you grow, you add capacity.

That added capacity does come at a cost. Over time, a scale-out system will cost more per terabyte than a scale-up system. Part of the premium of cost buys you the ability to expand more easily and to a much greater degree.

Dollars & Sense
Here are two truths the C-suite needs to understand. First, where all other things are constant, scale-up storage solutions cost less per byte than scale-out solutions. Plain and simple, scale-up is less expensive per byte.

The second truth, is that scale-out is a more effective way to grow capacity when you don’t know a) when you will need to expand, and/or b) how much expansion you will need. Plain and simple, scale-out provides more long-term flexibility.
In general, a scale-up storage system will cost more up front. It is a greater initial investment, because you are purchasing and implementing right now for your needs over an anticipated period of time.

In scale-out, you would likely be implementing a smaller system initially, thereby reducing the initial outlay. As you build out more capacity over time in a scale-out system, your costs will continue as you grow.

Scale-up and scale-out have purchasing implications, as well. First off, scale-up generally requires a significant initial purchase/approval process. But once done, you maintain the system and the "heavy lifting" is over. With scale-out, your IT department will likely have to go through the purchasing and approval process each time you need to expand.

Cash flow is another consideration. CFOs are increasingly using cash flow as a strategic weapon. According to a recent Sage State of the Startup Survey, managing cash flow is one of the most difficult tasks for startups and new ventures. As a result, many companies are choosing to delay certain expenditures currently in order to manage cash flow. When this is the case, scale-out can help to reduce immediate expenditures. Keep in mind, though, that scale-out assumes that future expansion costs will need to be realized.

One other consideration is the effect of time. The Statistical Brain Research Institute, in a recent study, showed how the cost of storage, on a per gigabyte basis, has dropped an average of more than tenfold every 5 years for the past 35 years. Based on this history, one could expect advances in storage technology that could possibly lower storage costs in time. Unfortunately it is hard to accurately predict. Scale-out solutions are better positioned to take advantage of this, should it occur.

Which Is Better?

Which system of expansion is better? Which is more cost effective, more efficient, and provides more performance?

"There is no single answer," says Niso Levitas, Manager of Research and Development at Aberdeen. "This decision must be made on a case-by-case basis, based on the company’s needs, both financial and technological."

As a server and storage manufacturer with more than a quarter century of experience, Aberdeen has in the past and continues to implement both types of strategies for clients. Aberdeen builds, configures and implements both scale-up and scale-out solutions for clients of all sizes, and each one is unique.

"In terms of developing effective storage solutions, every client is different," says Chaz Stevens, Director of Marketing for Aberdeen. "That’s why every one of our systems is fully customizable to client needs, now and in the future."

Companies that can accurately forecast needs may be able to take advantage of the lower cost-per-byte scale-up solutions. “Scale-up solutions can be very effective for companies that don’t anticipate too much unforeseen growth,” says Levitas. “With proper ITIL analysis, scale-up can be an excellent choice for companies who have the desire and budget to build systems for their precise needs.”

One way Aberdeen is continuing to serve the scale-up market is with their Petarack™ solution. It starts as a single rack with one petabyte of storage, but is expandable to 4.3PB of raw data storage in the single rack.

“Small firms, as well as larger and fast growing companies that need to allow for unknown capacity needs,
may benefit by considering a scale-out solution,” says Levitas. “If the company has specific financial strategies that seek lower expenditures up front as well as capacity flexibility, scale-out is a viable path.”

Aberdeen has also introduced a new scale-out product to address the growing market need and demand for affordable yet expandable data storage. The new AberNAS N20C scale-out NAS bundle is scalable up to 6.4 petabytes maximum storage under a single namespace/volume.

When developing plans for expanding storage capacity, companies should carefully balance the strengths of both types of systems, as well as the downsides. “Our account managers work with clients on a daily basis to assess, forecast, and plan for both current and future needs,” says Stevens. “We do this with a team of professionals and technicians who work very closely with clients to make sure all options are explored. We have found that by working as a team with clients, in a fully open and transparent way, clients gain better understanding of all options, and ultimately make better long-term decisions.”

When exploring possibilities, the C-suite needs to consider and weigh the following key criteria:
1) What your current needs are;
2) What your future needs are (both how much capacity will be needed and when it will be needed);
3) If your firm is more interested in “replace it and forget it” with a single solution, or leaving options open for increased capacity needs in the future; and
4) Purchasing and cash flow considerations (e.g.; initial outlay vs. on-going investment).

IT managers and purchasing team members (including controllers, CFOs, and other C-suite personnel) don’t need to feel they are in this “alone,” or having to figure everything out themselves. Aberdeen offers clients a free analysis that looks at your current and future storage needs, as addressed by both scale-up and scale-out options. Ultimately, it makes finding the right hardware and system much easier. •

About Aberdeen LLC—Aberdeen LLC is a manufacturer and developer of customizable server and storage hardware and solutions for companies of all sizes. They are the only server and storage company to offer their unique 5-Year Warranties, fully customizable hardware, and their special “try for 30 days” test drive program. For more information, visit them at www.aberdeeninc.com or call (800) 500-9526.

1 KPMG’s U.S. CEO Outlook 2016
2 sage.com
3 statisticsbrain.com

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