Hitachi Data Systems Can Make Your Data Migrations Easier

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Introduction: A Data Migration Can Drive an IT Team Nuts

On occasion (and perhaps more often than we care to admit!), IT professionals participating in a data migration effort emerge from the experience so traumatized that they vow to avoid future migrations like the plague.

Most likely, that aversion is an outcome of the technical or expertise-related setbacks that arose during the project, causing the team to feel rather “beaten down” by the experience. Important steps didn’t unfold as planned. Perhaps migration activities resulted in IT disruptions that impaired and irritated end-users. The project might have been marked by late nights, finger-pointing-filled status meetings, nerve-wracking updates to senior leadership, and general stress, making the effort feel both overwhelming and under-rewarding.

With a Migration, Cost and Risk Always Come into Play

The antipathy and reluctance that IT people feel about migrations boils down to fears linked to cost and risk. Of course, cost and risk are interrelated concepts: When you risk consuming too much of an IT team’s time and impairing end-users’ productivity, you also risk costing the business money.

Cost

Headcount and budget are necessary prerequisites to any migration effort. With that fact in mind, it is usually the case that IT managers won’t undertake such a costly, resource-consuming project unless some form of business rationale was absolutely compelling them to do so. For example:

- An important new application needs to be deployed.
- An updated architecture is needed because the old one isn’t working well anymore.
- Some piece of additional technology needs to be incorporated into the environment as part of a larger effort to help the company remain (or become) efficient and competitive.
- Some form of data center move is occurring, or a remote location is being added.
- A storage platform is reaching end-of-life, end-of-lease, or end-of-maintenance.

In other words, something is forcing that complex migration to occur. Its complexity will have a direct effect on its price tag in terms of time and budget outlays.

Risk

Deploying new equipment to replace old equipment undoubtedly can introduce risk. For example, even before the team members start setting up the “new gear,” they may discover that the “old gear” it replaces is hooked so tightly into various important applications that pulling it becomes an incredibly complicated endeavor. Daily operations may be disrupted. The team may have to work nights or weekends.

The risks inherent in a major data migration might dismay an IT professional even more than the costs do. Think about what a data disruption can do to an enterprise, then think of “artificially causing” such a disruption because your migration project had a hiccup.

What About the ‘DIY or Not’ Decision?

Naturally, IT wants to limit the time, cost, and risk of any migration as much as possible. But the migration must happen, so an early-stage question has to be: “Do you pay your people to do it, or do you engage an outside vendor—a team with experience accumulated over similar projects that may be able to do it faster, more safely, and more affordably?” Consider that:

- Risk aversion is of utmost importance. If you place cost ahead of risk and something goes wrong, costs would likely skyrocket and potentially cause irreparable damage to the company, data, and brand. (It could perhaps hurt personnel performance, too.)
• Doing a migration yourself might mean relying upon limited expertise, tools, and other capabilities, therefore increasing costs, timeframes, missed business opportunities, and frustration levels.

• You might decide to assemble an internal team that has done it before. That option is likely more applicable to bigger enterprises that have typically already learned on their own, however painfully, how to work through data migration project intricacies. They’re fairly fast, and they expect they can do it again.

• Perhaps you opt for a combination of the two: Although some vendors enable a level of “self-service” migration, typically 80% of that migration might consist of strategy planning, and only 20% represents the actual data migration/movement. In a case where an organization wishes to do its own migration, the best option may be to call on experts to help plan and strategize. The organization can then complete the project solo. Benefits would usually include reducing risk while improving time to value.

Ultimately, the route that an organization should take—assuming no other factors come into play—is the one that exposes it to the least risk and offers the greatest potential ROI.

IT Organizations Are Challenged by Storage Growth, Cost, and Complexity

Again, the sticking point with migrations (namely, the need for them combined with the animosity toward them) boils down to cost represented in lost time, spent resources, budget overruns, and added risk/impact to the business. ESG research into IT organizations’ challenges related to the growth, cost, and complexity of their data infrastructures shows that IT managers definitely count cost reduction and containment among their most important technology spending drivers in 2014.

Thirty-nine percent of respondents surveyed by ESG consider cost reduction and containment to be a spending driver for them. In fact, it was those respondents’ most frequently mentioned technology spending driver for the next 12 months. Similarly, 36% of IT professionals surveyed by ESG said purchasing new technologies with improved ROI is a measure they are taking to reduce or otherwise contain their IT expenditures.

And, year after year, surveyed respondents have been identifying managing data growth, deploying or upgrading major applications, and data center consolidation among their top IT priorities (see Figure 1). Those are the kinds of initiatives that can result in a need to kick off a data migration effort.

**Figure 1. Top Ten 2014 IT Priorities**

<table>
<thead>
<tr>
<th>Top 10 most important IT priorities over the next 12 months. (Percent of respondents, N=562, ten responses accepted)</th>
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</thead>
<tbody>
<tr>
<td>Information security initiatives</td>
</tr>
<tr>
<td>Increased use of server virtualization</td>
</tr>
<tr>
<td>Improve data backup and recovery</td>
</tr>
<tr>
<td>Manage data growth</td>
</tr>
<tr>
<td>Desktop virtualization</td>
</tr>
<tr>
<td>Use cloud infrastructure services</td>
</tr>
<tr>
<td>Regulatory compliance initiatives</td>
</tr>
<tr>
<td>Major application deployments or upgrades</td>
</tr>
<tr>
<td>Business intelligence/data analytics initiatives</td>
</tr>
<tr>
<td>Data center consolidation</td>
</tr>
</tbody>
</table>


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2 Ibid.
3 Ibid.
In terms of spending specific to storage hardware or software, a combined 75% of IT managers surveyed by ESG reported that technologies that are able to help them improve performance or optimize capacity are priorities for their organizations (see Figure 2). That, too, is a relevant finding because getting more capacity-efficient, faster-performing storage onto the floor is just the type of desirable outcome that would force a data migration to happen in the first place.

Figure 2. Storage Technology Spending Priorities

In terms of 2014 storage budget plans, which of the following is a higher priority for your organization in the upcoming year? (Percent of respondents, N=306)

- Technologies to help optimize/maximize disk-based storage capacity (e.g., deduplication, compression, etc.), 37%
- Technologies to help improve storage performance (e.g., flash/solid-state drives), 38%
- Neither is a priority for our organization in 2014, 25%
- Neither is a priority for our organization in 2014, 25%


Don’t Just Get Rid of Pain—Introduce Gain

If an IT organization is paying exorbitant maintenance fees for a storage system or environment that is no longer adequate for its needs, it might as well use that money instead to buy or lease a new array and move the corporate data to it. A new array might help the business to accomplish more of its goals.

As mentioned, a data migration project is almost always spurred by a forcing function—an operational pain that needs alleviating. Although it is important to get rid of that pain, it’s far more compelling (not to mention more rewarding for the IT team and the overall business) to, in the process, introduce gains in efficiency and competitiveness. For example:

- The migration/replumbing could help the IT organization to support company growth with improved alacrity and agility.
- It could facilitate or expedite IT integration efforts following a merger or acquisition.
- Perhaps migrating to a new storage platform could finally solve the problem of excessive “IT junk” that unavoidably but incessantly accumulates in environments over many years—meaning that, once again, the whole infrastructure will just work right.
- The migration might help IT to be viewed as less reactive and more agile and proactive in deploying future-ready architectures and conducting revenue-generating activities (such as data analytics and IT-as-a-service functions).

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4 Ibid.
Organizations Really Can Benefit from Data Migrations

Some IT teams engage in data migrations to gain operational improvements. Others move to another storage platform simply because a lease is ending, and they want to upgrade.

The procrastination, fretting, and hair pulling arises with the realization that large-scale data migrations and normal data-movement operations are radically different endeavors. Backups are routine; replications, likewise. IT administrators regularly move data volumes around on a small scale to balance workloads, upgrade discrete pieces of equipment, or consolidate infrastructure. That is not what we’re discussing here. A major data migration is a lock, stock, and barrel replacement traditionally prompted by “have to” instead of “want to.”

As an analogy, think of a family considering relocating to an adjacent suburb to take advantage of better schools, easier commutes, and lower taxes. It’s a desirable “want to” move that can deliver plenty of upside. Compare that family with one that has lost access to food, water, and shelter; is being persecuted; and knows that emigration, although perilous, will be necessary for survival. That’s almost the level of urgency some organizations hit before they finally initiate a major—“have to”—data migration.

The hope, of course, is that the émigré family making a traumatic move not only avoids something very bad happening to it, but also ends up in a much better place eventually.

Ideally, the IT organization doing a data migration achieves the same kind of rewarding uplift. And best of all, if that organization figures out how to avoid typical migration pain points in the process of striving for that “better existence,” a whole new world might open up to it—namely, voluntary “want to” migration projects that could incrementally improve the environment in all sorts of ways.

Approaches to Migrating Data

Data migration approaches can involve or encompass hosts (this is typical of routine monthly or weekly migrations, which these days are very often VMware-centric), storage, and/or the network. Some are more headache-inducing than others:

- Most small-level weekly or monthly data movements are done using a host-installed tool (often Hyper-V, VMware, or the like) to move VMDK or similar files and data generated by virtual machines. The server-based tool used in this process (for example, Microsoft System Center or VMware vCenter) is likely to be quite familiar to the IT administrator responsible for the task.

- Another type of small-scale data movement happens over the network. Many network administrators wouldn’t even classify such movements as full-fledged “data migrations” because moving data across a SAN for backup, replication, or volume migration within an existing environment is so commonplace. And although there’s always room for improvement, IT professionals are generally quite comfortable with the task.

- Some organizations do tape-based migrations, involving copying data to be migrated onto tapes, trucking the tapes to another location, and mounting them or copying the data again at that end. That approach is regarded by some as an appealing way to handle file-based (rather than block data-based) migrations, even larger ones.

- Disk storage refreshes are riskier than any of the operations above. After all, a run-of-the-mill server refresh can be almost as simple as alerting end-users that an upgrade will occur, unplugging the old host, attaching the new one, and restarting. Conversely, migrating hundreds of terabytes of array-based data being shared among multiple applications, hosts, and users (and you might not even be sure you have that topology mapped accurately) can affect or, at worst, take out everyone.

- Then, of course, there’s the good old do-nothing option—avoiding a migration out of fear of reliving past problems, causing those dreaded availability disruptions, etc. That hesitancy ties back to the notion of
“have to” migrate versus “want to” migrate. People’s concerns put a damper on potentially positive, helpful, do-by-choice migrations, leaving only the negative, absolutely required migrations to be done—and that only exacerbates the procedure’s poor image even further! This stance, of course, also perpetuates the reality/perception of IT as a reactive group, not a revenue-generating one.

**Easing the Pain: Migration Capabilities of HDS**

Hitachi Data Systems (HDS) is a storage vendor that has been putting a lot of personnel, time, thought, and energy into helping its midsize and enterprise-scale customers and prospects—i.e., those most likely to be using or evaluating HDS products—to overcome data migration challenges. The HDS approach centers on reducing costs, time, and risk.

In addition to migration-specific product functions and attributes designed to help its customers manage data transitions more effectively and easily, HDS has developed a full-fledged professional services competency related to migration services capabilities. The Hitachi Migration Center of Excellence (MCoE) is composed of focused people and supporting tools, services, methodologies, best practices, and partnerships meant to drive improved operational and business outcomes for HDS customers (see Figure 3).

![Figure 3. The Hitachi Migration Center of Excellence: Components](chart)

Source: Enterprise Strategy Group, from HDS-supplied information, 2014.

Hitachi’s MCoE approach includes an appropriate set of solutions to solve customer challenges and provide maximum migration-related value. By design, the approach adds a degree of flexibility and deepens everyone’s capability to support or own/manage a complete IT transition (from strategy definition, to deployment, to operation) in partnership with the customer’s team. The idea is to insert a future-ready IT infrastructure to drive the customer’s business forward.

Hitachi’s MCoE leverages a distinctive model and framework. It captures and codifies best practices and emphasizes standardization, reuse, and productivity for efficient migration of data to new architectures and operating environments. The model provides a centralized service that consolidates migration services into one unit. The focus on standardization helps customers to leverage economies of scale. Essentially, the center of excellence model introduces processes and services featuring proven methodologies, best practices, and tools to deliver a consistent, predictable outcome—for example, it offers standardized tools and processes (leveraged across all projects) for project-effort estimation, assessment, architecture definition, and migration techniques for infrastructure consolidation.
Through HDS’s open technological and collaborative approach, the vendor’s solutions integrate with customers’ existing environments and help them get more out of those investments. Organizations engaging the service benefit from working with multifaceted experts and a jointly defined, validated reference architecture infused with best practices stemming from HDS’s partner ecosystem (Microsoft, VMware, Oracle, SAP, and many others). HDS says it is striving to give its migration customers a seamless experience and better performance and functionality via a highly tuned solution.

HDS also has built several interesting migration capabilities natively into its Hitachi Unified Storage Virtual Machine (HUS VM) and Virtual Storage Platform (VSP) systems. For example, to help avoid disruptions in application availability, Hitachi’s storage virtualization tools enable IT administrators to eliminate one outage period altogether—an outage that could otherwise represent two or even three hours of downtime per server. More impressive is that a strictly HDS-to-HDS migration can actually bypass all outage periods—a boon to Hitachi customers who may wish to migrate data nondisruptively from an old to a new HDS array while keeping hassles and worries to a minimum. (More on that later.)

HDS migration capabilities are built into the storage controller. Others are appliance based. Use of the appliance-based capabilities might entail/allow bringing in another device to help “shepherd” the migration process. Relying on the native Hitachi capabilities—capabilities that are in many ways equivalent to those competitive appliance-based products—offers a benefit (as will be discussed). The point is that HDS migration technology is built into the platform and does not require the use of appliances.

**Automation: Faster, with Less Possibility of Human Error**

Many of the distinctive benefits center on automation. The HDS platform is instructed by the migration team up front what to do, and then it does what it’s told—fast and correctly. Naturally, whenever you can get a machine to
do the work of a person, you are removing a labor cost and taking a lot of potential human error out of the equation.

A person or team still has to manage the planning phase—using MCoE-devised tools to uncover the topological connections among infrastructure components—before anything can be unhooked. That human-centric planning step will probably always be needed in any migration project, whether done by Hitachi personnel or (especially) as a self-service migration. The difference with the automated HDS approach is that speed increases, disruptions are lessened, and the chance of a mistake being made is drastically reduced.

Importantly, when one uses automation to increase the speed and minimize the disruption of a data migration, not to mention reduce the headcount needed for it, the outcome is a lower price tag for the effort. And remember, cost containment is a vital driver in IT spending and deployment decisions.

**Agnostic, Too**

Today’s storage environments are often heterogeneous, and it is perfectly normal to find an assortment of EMC, HDS, IBM, NetApp (listed alphabetically!), and similar arrays on a given user’s data center floors. Notably, the HDS storage virtualization technology is almost exclusively storage agnostic. It is able to use its capabilities to “take over the personality” of an array, discover all the data stored within it, and then proceed with automated data movement. Incidentally, beyond its capabilities specific to data movement, HDS storage virtualization platforms also can replicate data, tier it, back it up, tune it, and as mentioned, discover it—again without needing human intervention.

**Nondisruptive Migration: When You Take Out Outages, You Take Out Cost and Risk**

Via machine-centric activity and focused human experts, the HDS approach removes risk and time—and therefore cost—representing an advantage over other traditional methods.

With traditional, host-centric data migration, it is necessary to turn off affected servers twice—once during the discovery process, and again when hooking up the new array. That application downtime could impact end-users, requiring the IT organization to send out an e-mail alert warning of potentially two to three hours of application unavailability per server. Employees’ productivity could be lost—at scale—yet those idle workers still must be paid.

HDS storage virtualization removes one of the outage periods, which translates into a big cost-related advantage. Time and money can really add up when one is doing a large-scale migration encompassing tens, hundreds, or even thousands of servers that need to go offline (some of them hosting high-impact applications such as e-commerce, e-mail, or the ERP system).

That’s the impact of HDS removing complexity and cost. What about removing risk? Risk really enters the picture when the time comes to turn on the new storage array. Whenever one has to turn a piece of mission-critical IT equipment off or on, some fear arises that everything might not come back safely and properly. Will the data still be accessible? If not, what happened?

Arguably, a vendor-agnostic machine performing a migration quickly, smoothly, and automatically is less likely to incur a problem than a customer’s team of tired, stressed IT people late on a Saturday night would be. Using HDS storage virtualization, those administrators merely would “flip a switch” after their discovery phase was complete, then return later and “flip” it again after the migration is completed.

**Unlocking Options for “Want to” Migrations Benefitting IT Environments**

The hourly cost of downtime continues to rise, and downtime tolerance windows continue to shrink, especially for tier-1 and mission-critical applications and data. Fortunately, it is now possible to cast aside a process that can

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easily risk two or three hours of downtime per server (with a host-based migration method) to one that requires perhaps 30 minutes of offline time. And with an HDS-to-HDS migration (typically, when moving from older enterprise HDS gear to newer enterprise HDS gear), no downtime need occur at all.

When data migrations become less disruptive and painful (or to put it another way, when they become nearly painless), a new world of efficiency opens up. Migration can become an activity associated with opportunity rather than pure necessity. For example, an IT organization could finally:

- Lower its TCO profile by putting an end to lease overruns, lease overlaps, excess-capacity overpayments, and technological obsolescence caused by poor asset management and associated maintenance costs.
- Consolidate or relocate its IT operations to reduce OpEx (e.g., power/cooling, floor space) and better support the business.
- Keep pace with data growth and manage data more effectively.
- Call a halt (more or less, at least for this activity) to weekend work and costly overtime.
- Support new applications and workloads.
- Improve the reliability, availability, I/O capability, and throughput characteristics of the entire storage environment.
- Leverage a storage infrastructure that offers more robust functionality (i.e., data analytics, snapshotting, tiering, compression, replication, SSDs, thin provisioning, remote monitoring ... the list goes on).

**Go It Alone, or Choose a Professional Migration Services Partner?**

Organizations can spend considerable resources and assume more risk than necessary when going through a data migration. As a result, schedule and budget overruns arise. Those organizations may want to look into outsourcing the process, or at least supplementing the efforts of the full-time IT employees with experienced contractors who are migration service providers.

Before shopping around, however, it’s advisable to consider the magnitude of what you are launching into. The largest-scale migrations take weeks or months: This is a major decision. The following questions can help IT managers scope the effort accurately and decide whether a purely internal project, a service-provider approach, or some combination is the best way to go.

**Things to Consider, Questions to Ask**

- How big is your environment? How many servers and applications are going to be affected by this effort? How much capacity are you migrating?
- Are you migrating multiple storage platforms from multiple vendors? That’s more complicated.
- Are you doing both SAN and NAS technologies together or splitting them out?
- Do you know your schedule already? Do you need help defining it? Do you have a realistic idea of how long it’s going to take, and have you truly planned for it? And what is the impact of going beyond those deadlines if you take a DIY approach?
- Does your staff know how to do this? Have they been trained or actually done it before? Do you think they know what they are getting themselves into? Do they have the right tools?
- Does your company in general (both senior leaders and workers) understand the impact? Could you even make sure nobody notices? If they do notice, will you be ready with the right warnings/alerts/answers to their questions before you start pulling plugs?
- What is your company’s downtime tolerance level, both in general and specifically in regard to the applications whose data will be migrated?
Do you know your cost envelope? If you know the magnitude of impact, and you know how many people are going to be affected, then you should also have a good idea of what it will cost. You can use that information to help you decide whether to pay somebody to assume all the responsibility, do it all yourself, or team up with a contractor if you think you have the expertise. Strategically, it might be better to pay somebody else to do it—someone with expertise, tools, and personnel.

And if you do consider leveraging the expertise of a vendor or service provider, ask:

- What is the average experience level (both time and depth) of the migration experts?
- What are some projects they have completed that are similar to your organization, your needs, or your industry? And what made them successful in those migration efforts?
- What is their overall approach/philosophy to doing a migration?
- As an option, can they work with you to strategize and plan, and then allow you to handle the actual data movement yourself?
- Are they able to easily migrate data in a heterogeneous environment?
- What services or capabilities do they have available to work with you after the migration if you need additional help? Indeed, what are the other migration-related capabilities they offer or provide?

Finally, Consider the Following

Hitachi Data Systems prides itself on helping customers reduce migration complexity, cost, effort, and risk, thereby enabling them to take their own products/services to market more quickly. Adhering to this general HDS principle, the Hitachi MCoE provides migration-related support from legacy or non-HDS to Hitachi solutions for both open-systems and mainframe environments. That support capability has been honed through the delivery of thousands of migration projects globally each year.

HDS helps with project ownership, management, and execution of the transition. It may be an environment refresh, a consolidation, a storage reclamation effort, or an initiative such as an adoption of a new technology or an on-demand, self-service, “as-a-service,” or cloud-ready infrastructure.

HDS has many years of experience and a proven methodology for storage transformation:

- The vendor conducts more than 2,000 transition engagements yearly worldwide, with more than 40PB migrated annually.
- It has been using its well-established virtualization technology for technology refreshes since 2004.
- An average transition environment is a 1PB-plus SAN and approximately 500 servers.
- At the high end of the scale, HDS can migrate 5,000-plus servers and more than 2PB of data.
- Transitions include migrations from EMC, IBM, HP, NetApp, and others.
- The migration consultants have an average of 15 years of industry experience and hundreds of migrations under their belts.

Through its MCoE, HDS utilizes multiple approaches with success: virtualization, nondisruptive migration, appliance-based migration, and host-based migration—at scales ranging from local inter-site migrations to global data center consolidations.
The Bigger Truth

IT professionals have always shied away from migrations because migrations have always been a “PaaS” (i.e., a pain in the @$%). However, when a migration is effective, it really is worth the effort. And when one solicits the help of a capable storage vendor partner, the effort can be rewarded with improved IT operations, reduced costs and risks, and improved time to value.

*Not only can a well-executed migration alleviate several negative aspects of IT operations, but it also can release positives: When migrations become easier, all sorts of new opportunities for IT operational efficiency and improvement open up to an enterprise.*

IT decision makers should consider the idea that, rather than continuing to do nothing because migrations are so ghastly, they should look into approaches that do exist and are just awaiting their consideration. One choice they have is Hitachi Data Systems. Its Migration Center of Excellence capabilities can bring value and a real level of ease to a migration effort by lowering its required time, cost, and risk in meaningful ways (such as by helping with migration services and expertise, reducing or eliminating outage periods, and leveraging automation to lower the risk of human error). Some native migration capabilities are built into the vendor’s HDS HUS VM, VSP, HCP, and HNAS platforms. The HUS VM and VSP platforms also can virtualize third-party storage products, so they are capable of migrating “from any, to any”—HDS, EMC, IBM … it doesn’t matter.

By not only doing a migration, but also doing it well, an IT team can overcome migration’s negatives. And when migrations become easier, the organization can (maybe for the first time) start looking into performing additional migrations for all the good reasons they ignored or hesitated to pursue before—incrementally improving the storage environment and raising the confidence of IT staff and end-users with each subsequent effort.

Data migration *sounds* like a very technical process. But at its core, the effort is a business and economic one in which time, risk, and related strategic and operational matters are the major considerations. Data migration, done right with suitable products and expert support of some kind, can provide genuine business value in addition to simply smoothing operations. And HDS seems to be offering IT organizations a way to “do it right.”