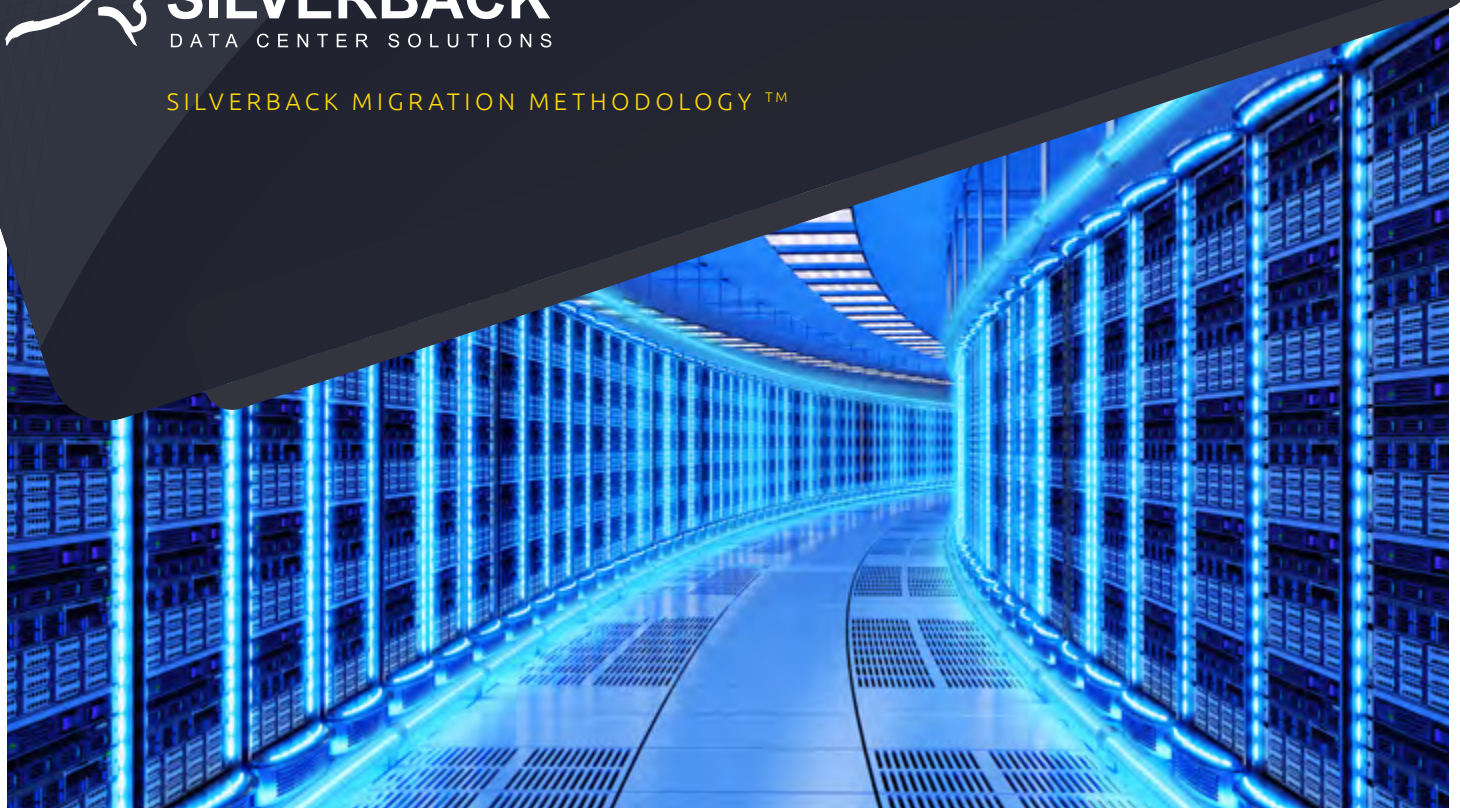
SILVERBACK
DATA CENTER SOLUTIONS

SILVERBACK MIGRATION METHODOLOGY ™

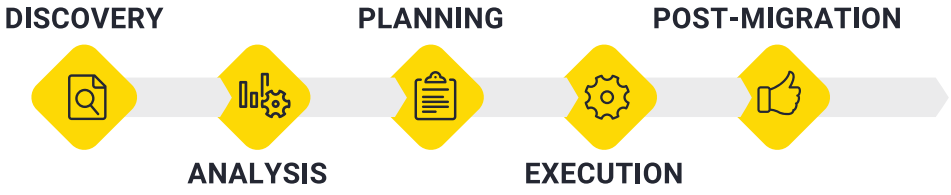


FIVE PHASES OF A SUCCESSFUL DATA CENTER MIGRATION

A data center migration requires careful planning to minimize risk and enjoy a fast return on investment. Silverback Migration MethodologyTM has five phases. Our approach is comprehensive and designed to minimize risk during the migration process. It also enables easy deployment and configuration and helps future-proof your information technology systems, minimizing rework in the future.

Data Center Migration

FIVE PHASES



DISCOVERY

Understanding your existing IT environment

The data center migration process begins with a full assessment of your current IT environment, identification of program objectives, and a business case Identifying which assets are included in the program's scope is a vital starting point. This will help you determine an appropriate budget and timeframe and clearly define your migration goals. Given your current data center, cloud, colocation, and edge environments, identify potential migration types (physical to physical, physical to virtual, virtual to physical, virtual to virtual), taking into consideration security and regulatory compliance. Also include in your evaluation the project teams' skill sets, which can be a significant cost driver if skill gaps need to be addressed.

The discovery phase addresses three main questions:

1. **What exactly are we migrating?**
    - Applications and specific data assets (Workloads)
    - Physical IT compute, storage, and network devices
    - Server racks, PDUs, and other hardware components
2. **What is the budget and timeline?**
    - Technical and business costs
    - Prorated across one to five years
3. **What are your desired outcomes?**
    - Bottom line and productivity impact
    - Department-level success metrics
    - Facility consolidation, facility repurpose, and lease closeout

How you answer these questions depends entirely on your current environment and what you wish to achieve. This paper largely focuses on physical to physical migrations, Silverback Data Center Solutions' specialty. Once you have outlined your priorities, it is time to move on to the best practices for the Discovery phase:

Consult with your stakeholders

Since a data center migration will likely affect many operational areas of the business, it is vital to work closely with your stakeholders of these operational areas. Each stakeholder must understand how and which business functions will be impacted during the migration. You should assign a capable project leader. Additionally, you need to build a cross-functional team to engage stakeholders and keep them informed about the process. At this point, you may also want to hire an external consultant to provide expertise to and augment your team.

Submit migration questionnaires

Each data center migration is unique, but there are several key questions to include in a survey to facilitate the discovery process.

Here are some of the most important:

- Which existing network dependencies, processes, and interrelated applications might be impacted by the migration?
- Will you require any compliance certificates or attestations?
- What type of support will you need during and after migration?
- What are your availability requirements, as defined in your SLAs?
- Which security measures will be required to protect your data during migration?

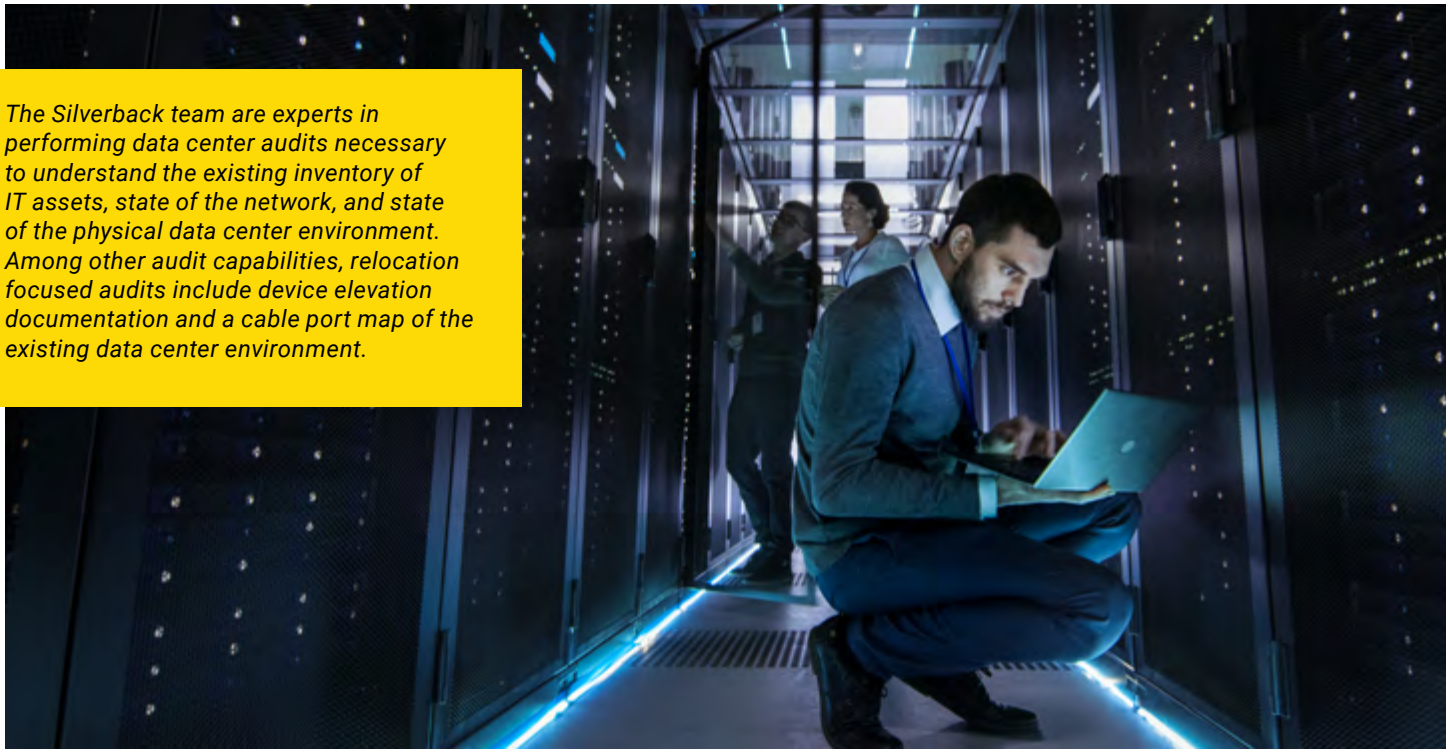
For physical data center assets, you will also need to determine your telecommunication, cabling, physical space, power, and cooling requirement, leaving capacity for future expansion.

Complete asset inventory

The Discovery Phase includes identification and documentation of your physical and virtual environment, inclusive of the software application inventory and interdependencies. Building your asset inventory is essential to ensure you can keep track of all assets during the migration process. Conduct a data center audit that includes all physical and virtual assets, including data center hardware, applications, and storage assets. Also, your inventory should clearly identify network connectivity, how each asset interacts across your wider network. This will allow the creation of a network dependency summary. A thorough inventory will begin with:

- Workloads, application software, and data (including DR, HA, and backup systems).
- Physical hardware, including compute, storage, and network devices.
- Dependencies between all assets including applications, data, hardware, and networks.
- Stakeholder ownership of all assets.

The Silverback team are experts in performing data center audits necessary to understand the existing inventory of IT assets, state of the network, and state of the physical data center environment. Among other audit capabilities, relocation focused audits include device elevation documentation and a cable port map of the existing data center environment.



ANALYSIS

Drafting your data center migration strategies

Now that you have a complete picture of your existing environment, the next phase is to determine your technical requirements. This stage involves creating a draft migration strategy, identifying a suitable migration method, and evaluating your new infrastructure needs.

Draft your migration strategy

Define your future state operating model for the program, including build, colocation, public and private cloud, and edge components. For physical data center space, there are two main options, including building your own, or renting either an entire facility or shared space in a colocation facility. Building your own data center offers by far the greatest degree of control, but it also comes at a huge capital expense that is rarely justified in today's business environment. Leasing data center colocation space, by contrast, reduces the upfront capital expenses to the cost of the actual migration program. Everything thereafter becomes an operational expense.

Regardless of the option you choose, there will be significant costs involved in any data center relocation project. How much it will cost and how much time it will take will depend on the type of migration.

Next, you will need to think about the computing and storage requirements for your workloads and applications. This includes operating systems, hypervisors, and other important software required to run a data center. Finally, remember that every data center migration takes time and will inevitably cause some disruption. This is why it is important to plan ahead for upgrades and changes and determine a maximum period of allowable downtime.

Identify migration methods

Data center migration is a broad term that represents the process of moving IT systems and workloads from one infrastructure to another. Some migrations are entirely software-defined. Others involve moving physical compute, data, network devices, and other physical systems.

The easiest migrations tend to be virtual to virtual which involve moving virtual machines and data assets, or physical to physical which involves moving existing hardware assets and typically does not require any application software or data layer changes. More complex is migration from physical to virtual or virtual to physical often involving changes to the hardware and software stack through retiring existing or purchasing new physical assets or moving your workloads to either a private or public cloud (or both). In the case of cloud-to-cloud migrations, besides managing potentially large data transfers between cloud sites, your existing vendor might charge data egress fees for moving your data out of their systems.

Evaluate your infrastructure needs

The last part of the analysis phase is to evaluate your technical infrastructure needs. For physical data center relocations, you will need to consider physical space and infrastructure requirements, such as cabling, cooling, telco, and power. It is crucial to consider optimal rack and device layouts to facilitate better cooling and energy use. You will also need accurate network connectivity diagrams.

For virtual to virtual migrations, you will need to think about the compute and storage requirements for your workloads and applications in the new environment whether moving to cloud or to new hardware. This includes operating systems, hypervisors, and other essential software required to run a data center. Finally, remember that every migration takes time and will inevitably cause some disruption. This is why it is important to plan ahead for upgrades and changes and determine a maximum period of allowable downtime.

PLANNING

Creating a master plan for data center migration

Now that you understand your existing environment and where you want to be with your future state model, it is time to create the comprehensive data center migration master plan itself. A solid plan will greatly reduce the risk of unexpected downtime and potential revenue losses. The plan will include a timeline, schedule, communication plan, work breakdown structure, contingency plan, and identification of asset move groups for each relocation event.

Outline your project plans

An outline of your plan must include the complete asset inventory you compiled earlier. Count every application, hardware device, and data asset. Your project plan should include a migration checklist and roadmap that prioritizes assets into move groups, with each move group organized into a relocation event. Separating assets into multiple move groups reduces the size and the risk of each relocation event.

Move groups should be defined by analyzing the asset inventory to understand interdependencies between workloads and underlying transactions, systems, applications, data, networks, compliance regulations, and hardware. Move groups should be defined to keep related systems together and to minimize interdependencies between each group. Move groups can then be sequenced over the project schedule. Review and verify the sequenced move group schedule with the business stakeholders to ensure effectiveness.

Beyond physical move groups events, if the program includes any virtual migration of software applications and data, there are three basic steps to think about. First, you need to extract the data from its source system. Next, you need to prepare it for migration, which may involve transforming it between different formats and file systems. Third, you will need to load the data into the new environment. Naturally, moving data between arrays or moving the array itself is much easier than migrating data between entirely different environments, such as public to private clouds.

Mitigate potential migration risks and issues with contingency dates, go-no-go decision gates with sign offs, rollback plans, backup resources, a clear escalation path for quick decisions, enforced change control, and other elements crucial to a robust fault-tolerant plan. After the data center is audited and documented, implement rigorous change control processes, and minimize subsequent changes prior to completing the relocation event.

Prepare a statement of work

You should also consider hiring external resources to help with part of all of the physical data center relocation. This is especially important if your current team lacks the skills, experience, or time required to carry out the process in a safe, secure, and efficient manner. Skilled partners bring unique expertise, resources, equipment, freight logistics, and specialized insurance appropriate for physical migration projects. For partners involved in the project, prepare a scope of work with clearly identified roles and responsibilities. Scope of work should include a list of the data center migration steps. This involves documenting your deliverables, defining a timeline and performance period, outlining your evaluation criteria, and adding any relevant terms and conditions. Your team members must also understand their roles and responsibilities. All parties should understand their responsibilities and dependencies with other parties and be accountable to one another, with specific reporting requirements. Execute the scope of work sufficiently in advance during the planning phase to engage the supplier in the project preparation steps.

Finalize your master plan

Finalizing your master plan involves allocating resources, planning your contingencies, and obtaining any external help and other resources you might need.

When migrating hardware, be sure that all components are properly organized, packaged, and expertly transported to minimize the risk of damage. Ensure a chain of custody process is strictly followed to avoid any equipment or data loss. SIlverback approach utilizes specialized IT equipment crates, air ride transport, GPS tracking, and chain of custody process through every step of a relocation event.

EXECUTION

The data center migration event

Your physical migration may be broken into separate relocation events based on identified asset groups. Each event begins with communication between all stakeholders and the final pre-migration preparation. Facilitate go-no-go meetings at appropriate intervals, including the day the relocation event begins. Confirm resource schedules and shifts. 48 hours before the event, confirm again. This will help you ensure full resource availability throughout the event. Your communications plan should give your stakeholders multiple points of reference for the schedule. You can use physical posters, online dashboards, and email reminders describing the project and events, where to get more information, and outage windows. It is essential that you have real-time communication between everyone involved throughout the move.

Checklist of major items to consider for each relocation event.

- ☑ Go-no-go decisions 2 weeks prior to, 48 hours prior to, and on the day of the relocation event.
- ☑ Signoff of validation testing plan with business stakeholders.
- ☑ Proper shutdown procedures documented for all software applications.
- ☑ Labeling of all devices and associated device rails.
- ☑ Chain of custody process for all devices and any specialty network cables or other critical assets.
- ☑ Confirmation of resource schedules including supplier resources.
- ☑ Confirmation of single points of contact and escalation path for each work shift, supplier, and business team.
- ☑ Confirmation of operational telco network services at the destination facility.
- ☑ Resources should include a network engineer familiar with the destination network port map and configuration.
- ☑ Access tickets verified for all team members at origin and destination facilities.
- ☑ Signed off destination device elevation and network port map 3 to 6 weeks in advance of the event.
- ☑ Generation of a BOM for and procurement of network cables and other assets required to reconnect equipment.
- ☑ Verification of receipt of network cables and related assets.
- ☑ Completion of any pre-cabling at the new facility (if required).
- ☑ Verify complete backups and, if applicable, DR site readiness prior to equipment shutdown.
- ☑ Confirmation of equipment shutdown schedule.
- ☑ Confirmation of communication plan and schedule for the event.
- ☑ Documented asset inventory, including model, configuration, and serial numbers for transit insurance requirements.

Test your plan

Before putting your plan into action, it is important to conduct practice or trial walk-thrus to ensure team members understand the flow of tasks. To help with the testing and validation, you may consider virtualization tools to carry out performance tests, functional tests, and other types of tests based on the type of workload.

Execute your plan

Consider the French concept of “mise en place” roughly defined as ensuring all resources, equipment, plans, etc are established and in place before the scheduled equipment shutdown time and outage window. Your project plan must be followed precisely to prevent any steps from being missed or being followed out of sequence. As soon as you execute your plan, mark each task as complete. Using your project plan as a live event timeline to sign off on each task offers an easy way to keep track of things. For this, you can use a web-based work-management platform like Smartsheet, Trello, Asana, or a similar project tracking application (Silverback Visibility ™ includes both a live event timeline and GPS tracking of the assets), providing visibility to project management and stakeholders of project progress.

Closely monitor applications in production for the next 24 hours for any issues.

Keep the relocation support desk open to ensure full stabilization of the systems and to address any issues that surface for a week or so after the relocation event.

Facilitate knowledge transfer

Depending on the complexity of your data center relocation, you may need to facilitate the transfer of extra knowledge. For example, architectural decisions may need to be revisited as new information is provided. Technical designs may need to be modified. More resources might be required than previously expected. It is vital that your team is ready for such eventualities, not least because any data center relocation is likely to involve a few unknowns.

POST-MIGRATION

Wrapping up your data center migration

Once you have executed every task in your data center relocation event plan and the equipment is powered on at the new facility, complete post-migration testing to verify network connectivity, storage devices, software systems, and data are healthy and ready to hand off to the business for user acceptance testing. Proper testing involves a comprehensive follow-up assessment of all aspects of the new data center, including hardware, applications, data, and network infrastructure.

Finalize your documentation

Finalizing your data center relocation involves assembling the final documentation, which you will use to determine the success of the project. All assets must be tracked in their new environment. To make sure that everything has been taken into consideration, create an up-to-date inventory including final device elevations, network port map, and power cord connections. Map your new room layouts with rack locations at your new facility. Upload this information into your CMDB or DCIM. If you have not already deployed these applications, this project provides a great opportunity to do so.

Execute your decommissioning plan

If you are relocating a portion of your workloads from a physical environment to a private or public cloud, or refreshing any of your IT hardware, you will also want to execute a data center asset decommissioning plan. This will ensure that any retired data-bearing assets are properly wiped of potentially sensitive data. Further, retired assets may have significant market value. Be sure to validate and document all your decommissioning preconditions and package all retired hardware correctly.

Qualified decommissioning and remarketing providers, such as IT asset disposition companies, should specialize in data center IT equipment. Servers and other hardware that is no longer viable need to be recycled or repurposed in accordance with both external regulations and your company's CSR policies. Data-bearing devices that are no longer needed must be securely wiped, degaussed, or physically destroyed. Silverback provides expertise with both decommissioning a facility to meet lease closeout requirements and facilitating IT asset disposition and remarketing through our network of qualified partners.

Closeout

The last step in the post-migration phase is to finalize the documentation. You will schedule follow-up sessions with the teams and stakeholders to address any outstanding issues. Then, close the project. During the sessions, you should also address device contracts and life cycle management for the IT assets. Discuss any additional staff training or onboarding that might be required. Review lessons learned with the team and stakeholders, and take the time to document considerations discovered during the migration project.

Continuously monitor, measure, and improve procedures and practices to ensure responsiveness to business dynamics and needs. Review key success metrics, and savings, and package them into a debriefing report for the stakeholders' acceptance.

Final Words About Successful Data Center Migration

You can use the best practices we have covered in this guide as a starting point for developing a customized action plan specific to your company. After all, whether you are migrating just a couple of applications or hundreds of server racks of IT equipment across the country, every migration is different. With the right plan and the right talent, your data center migration can help set your business up for future success and improve the bottom line – all while keeping outage risk and costs to a minimum.

Silverback Data Center Solutions is an industry leader in data center migration, deployment, staffing, auditing, and decommissioning.
We understand that your digital infrastructure is mission-critical, and that is exactly how we treat it.
Contact us today to discuss your data center migration needs.

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