Data center workload migration and consolidation service

Providing solutions that save energy, reduce costs and provide the reliability and capacity your business requires
Your IT infrastructure is the foundation of your organization and you need that foundation to be scalable, adaptive and secure. It should allow you to run your business faster and more efficiently, not hinder you and slow you down. At Perspecta, we have the deep expertise and innovative technologies to improve the sophistication and capabilities of your infrastructure. We deliver solutions that meet immediate needs and sustain long-term results.

We streamline operational processes, minimize risk and assist in the transition to a zero-downtime culture. We address optimization holistically and have developed repeatable best practice methodologies and automation tools that reduce project cost and delivery time throughout the infrastructure transformation processes.

Our proven data center methodology

Migrations are inevitable. Improperly planned and poorly performed data center infrastructure migrations can result in significant lost revenue, extended disruption of service, additional expense and worst of all, customer dissatisfaction. We understand the complexity and sensitivity of data center migration management and work closely with our customers to ensure an appropriate strategy is developed. Every business must balance cost and risk when contemplating data migration so we offer customized strategies that meet your needs.

Our methodology provides the opportunity to overcome the challenges associated with major infrastructure transformation projects coupled with solutions that save energy, reduce costs and provide the reliability and capacity your organization requires.

We offer proven risk mitigation strategies, formalized planning and execution processes, along with the training and enterprise communications required to ensure mission success.

Our proven methodology provides a framework for analyzing migration strategies and alternatives, while providing the techniques and tools to develop and implement documented action plans with responsibilities, activities and support. Perspecta delivers a thorough and smooth migration and the visibility that you require for 100% accountability and true asset transparency.

Perspecta's team understands the importance of implementing a unified approach to executing a complex migration through gathering data, precision planning and scheduling.

Our migration tool set

We utilize standard software tool sets in conjunction with a standardized relocation methodology and a centralized approach to information management. Through a series of standard as well as ad-hoc reporting functions, our tools ensure that the right information is available to decision makers throughout the project. This eliminates the need for estimation and guesswork when driving decisions and saves valuable time in the latter stages of migration activities. Utilizing the these tools alongside the principles and components of active asset management, you can:

- Understand key drivers for the initiative
- Define the requirements and goals
- Ease the execution of the project
- Install controls to manage and monitor the process
- Maintain an accurate data set that is ready to facilitate the organization into its new operational parameters

Our current tool set suite consists of three components: universal discovery (asset/data discovery), transition manager (data analysis) and double-take (server/data migration).

**Universal discovery:** Provides a single, consolidated inventory view of your data center assets. It combines the automation of inventory discovery and dependency mapping, while also assisting with incident, problem and change management. It also supports transformation projects and asset and business service management.

Universal discovery allows users to capture specific data about each asset (e.g., tag number, name, location, type, model, etc.), load model-specific data and run reports that provide vital, quick and accurate information to the management team regarding total power consumption, costs and overall “greening” of the data center. Using the reporting feature, users are able to calculate the total power consumption and associated costs for the new data center environment.

Universal discovery also captures all of the data required to complete a logical migration. During the discovery period, Perspecta captures the build requirements for completing the new environment, including all hardware, software, infrastructure and applications. Throughout the migration planning period, the team uses universal discovery to build out the wave scheduling process and ensure compatibility for all migrations.
The image contains a portion of a document discussing the methodology and tools used in migrating data centers. The text highlights the importance of having a repeatable and automated data center migration process, as well as the use of best practices, templates, and tools.

### Project management and communications
Perspecta utilizes a proven, effective and repeatable data center migration project process and project plan that is implemented on all engagements in accordance with the goals, timeline and schedule of our customers’ mission. We incorporate widely accepted standards (e.g., the Institute of Electrical and Electronics Engineers), best practices with an ideal methodology (e.g., the Migration Project Management Methodology from the Project Management Institute).

### Transition manager
Provides a foundation for making accurate decisions through a consolidated set of data aggregated from disparate sources. It provides visual mapping and grouping of assets by any IT or operational criteria as well as automated runbooks that ensure task execution in the precise sequence needed to achieve no unplanned downtime.

### Double-take
Enables workloads or data sets for migration and provides continuous backup and recovery of data and applications. It ensures workload availability or easily manages desktop and server workloads in physical and virtual environments.

### Phase 1: Relocation strategy and hardware baseline
Perspecta develops a migration plan that allows existing IT systems to migrate to a new facility without interruption. Successful accomplishment of this task requires a detailed assessment of the current operational environment, supporting infrastructure, and systems and applications in order to identify potential obstacles or risks, propose migration approaches and develop a detailed migration plan. The first and most critical piece of this task is to understand the hardware environment of the organization.

### Data collection and analysis
The data collection and analysis during this phase requires intricate data from numerous data management sources, physical devices and key support individuals. This hardware baseline is then layered with business applications and dependencies data as well as IT support infrastructure data to conceptualize the complete IT environment.

### Phase 2: Business analysis
Having executed multiple migrations, our staff is well trained and able to hit the ground running with no ramp up time needed.

### Phase 3: Relocation strategy and hardware baseline
Our enterprise data center migration methodology is divided into three distinct phases to ensure a smooth transition to your new IT facility: Relocation strategy and hardware baseline, business analysis, relocation structure and detailed planning and migration execution.

### Table: Universal discovery data

<table>
<thead>
<tr>
<th>Assets</th>
<th>People/staffing</th>
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<tbody>
<tr>
<td>• Asset ID</td>
<td>• Project manager</td>
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<tr>
<td>• Customer ID (or barcode)</td>
<td>• Project lead and asset manager</td>
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<tr>
<td>• Device name</td>
<td>• Relocation analyst</td>
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<td>• Manufacturer</td>
<td>• Data center relocation SME</td>
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<tr>
<td>• Model</td>
<td>• Facilities engineer</td>
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<tr>
<td>• Serial number</td>
<td>• Application name</td>
</tr>
<tr>
<td>• Asset type</td>
<td>• Application acronym</td>
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<tr>
<td>• Number of power sources, power supplies</td>
<td>• Key customer contacts</td>
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<td>• Application description</td>
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<td>• Application hardware operational requirements</td>
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<td>• Database, storage and disaster recovery specifications</td>
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<td>• Best practices data center</td>
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<td>recommendations</td>
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### Applications

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<tr>
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<td>• Proposed floor plan utilizing best practices with:</td>
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<td>• Grid coordinates</td>
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<tr>
<td>• Vulnerability assessment</td>
<td>• Rack locations</td>
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<td>• Management processes and tools</td>
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### Applications and Facilities

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Universal discovery is the asset management system utilized throughout the migration execution. Following the migration effort, data can be downloaded to other asset management and configuration management tools in support of data center operations, including remedy.

### A three-phase approach
Perspecta delivers our proven methodology by leveraging interdisciplinary talent including application and infrastructure engineers, migration architects, program managers and staff logisticians. Our process covers the full life cycle of the IT relocation process from data center selection and design through minute-by-minute management of all execution activities.

Our enterprise data center migration methodology is divided into three distinct phases to ensure a smooth transition to your new IT facility: Relocation strategy and hardware baseline, business analysis, relocation structure and detailed planning and migration execution.
Perspecta is able to quickly assess and inventory all data center floors.

Perspecta reviews the inventory data provided by our customers and loads this data into the transition manager tool. The team then validates all required data elements by physically looking through each rack on the data center floors, in storage rooms and in any other location that contains infrastructure with data to be migrated.

Additionally, the team captures structured cabling requirements and schemas in preparation for the build-out of all new hardware during the execution phase of the data center migration effort. The team applies data center asset tags to all equipment to facilitate the migration execution and ease the transition to operations following the migration.

The business requirements of our customers are the primary drivers for the migration approach and how it is executed. Detailed analysis of the application-layer data allows the team to assess the overall impacts to the business during the migration process and provide a strategy to mitigate the risks and negative impacts to the organization.

To plan successfully, it is imperative to have an in-depth understanding of the application environment, to include: the business requirement(s) each application fulfills, the application relationships, the business impacts, the costs associated with any downtime, the data inputs and outputs, application security, the application architecture, physical connection, technical application requirements and recommended move strategies.

Perspecta meets with each of the application managers to collect the application or business area data required to identify which data needs to be migrated together. Using a standard template, the team members conduct one-on-one sessions with each of the application managers to collect all pertinent information for each application.

At the conclusion of this effort, Perspecta imports the information into the transition manager tool for analysis and reporting. This process is critical to the development of the application relationship matrix which comprises the applications associated with the migration. The migration effort includes a review of the physical assets that comprise the applications associated with the migration. The effort required is based on the existing documentation provided. The existing physical documentation is then compared against a sampling of systems for accuracy. The comparison is based upon examining the network switch port and physical server location sampling of systems for accuracy. The comparison is based upon examining the network switch port and physical server location.

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### Relocation phases

**Phase 1: Relocation strategy and hardware baseline**
- Collect, validate and centralize site audit data using a structured process
- Define systems for migration, consolidation and transition
- Define mission drivers and constraints
- Define/document system interdependencies
- Develop discovery results document and gap analysis
- Develop data center infrastructure plans

**Outputs and deliverables**
- Total asset baseline
- Interdependency matrix
- Move groups
- Data center floor plan and requirements
- Business impact analysis and risk mitigation plans
- Strategy approval

**Phase 2: Business analysis, relocation structure and detailed planning**
- Finalize engineered consolidated data center floor plan
- Implement facilities modifications
- Prepare final detailed minute by minute relocation plans
- Finalize customer, team and key support resources
- Resource risk mitigation strategies
- Finalize cabling plans
- Finalize rack elevations

**Outputs and deliverables**
- Final facilities plan
- Final detailed relocation plan
- Preparation of test plans
- Pre-relocation trial
- Final outage and impact schedules

**Phase 3: Migration execution**
- Conduct logistical data center preparation and quality assurance
- Conduct go/no go decision on facilities
- Mission area go/no go decision
- CIO go/no go decision
- Execute the final plan

**Outputs and deliverables**
- Relocation execution
- GFE re-use and decommissioning plans

### Data center design

Perspecta provides a data center floor plan and rack elevations that incorporate industry best practices and standards. All rack elevations and floor diagrams are documented in Microsoft Visio® to communicate the current and future locations of all hardware and infrastructure. The application documentation is used to create a facilities diagram necessary for the hardware installation at the data center.

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### Outputs and deliverables

- Extract the network switch running configuration with the host media access control (MAC) address of each system

### Data center migration services
• Locate the MAC address for the system and update the documentation to reflect the new switch port location
• Compare the rack location document with the actual rack location
• Review the IP address documentation with the actual IP addresses assigned to each application
• Review the VLAN documentation with the actual VLAN assigned to the products
• Review the hosts assigned to each product in the documentation and correct as necessary
• Review the DNS entries associated with each product and update the documentation as necessary

Migration planning

Upon completion of the documented inventory with our universal discovery tool, the data is extracted to begin migration planning and structure data center design. The applications documented are categorized within the web, application or database layers. From the categorization and customer-determined acceptable downtime for each system, the appropriate method for migration of the system and its data is determined. The specific technologies and timelines are predicated on the application types, downtime tolerances and data sizes. Each migration follows a unique plan to create a production environment in the new data center.

Using the application relationship matrix and infrastructure inventory, Perspecta develops impact clusters. An impact cluster is a collection of application and infrastructure architectures that have one or more of the following relationships:

• Business: applications that have no technical dependencies but affect the same user group (business area)
• Technical: application and infrastructure architectures that have a technical dependency on one another
• Physical: applications that sit on shared hardware

Each impact cluster is a logical group of applications that would be migrated together due to the relationships that each application has with others within the group. Impact clusters are used to define the overall migration strategy for each application.

Each impact cluster is assigned to a move group in accordance with our customers’ overall migration project schedule.

When organizing and arranging move groups, careful consideration must be given to:

• Minimize end-user impact and downtime
• Infrastructure and facility migration constraints
• Availability of resources (support, testing, etc.)
• Impact on move complexity versus application availability

Upon completion of the move groups, an outage schedule is developed to represent the time frames that each server and subsequent applications will be offline or have a degraded performance due to data availability and other relocation activities.

Application testing

Perspecta divides testing into “application operational,” meaning that the application is functioning properly in the new environment, and “interfaces operational,” meaning that the necessary interactions with other systems are functioning properly. During the data center relocation, both business areas and application owners conduct application and integration testing. All application test plans are collected and validated prior to the relocation execution time frame.

Logistics

Detailed planning involves the logistics around how each move will occur and fit within the overall project schedule. Perspecta’s experienced logistics experts provide analyses of environmental constraints, physical limitations and efficiencies.

A detailed logistical plan helps determine move group strategies and an overall scheduling scheme. The logistical move methodology and process is driven and managed by Perspecta personnel.

Minute-by-minute planning

The key to a successful relocation weekend is to ensure all planning and sequencing data is correct, and a detailed project schedule is maintained for each task related to the relocation of every piece of hardware. Each weekend schedule meticulously details every step of the relocation execution process.

Perspecta holds a series of move group reviews to ensure the accuracy of all data and to allow all business owners and stakeholders to analyze and evaluate each move group for specific concerns.

Phase 3: Migration execution

Preparation

Preparation is the first and most critical step of the relocation weekend. During this phase, all equipment remains in the custody of our customer.

We recommend that full backups be taken of each server on the Wednesday prior to the move weekend. On Friday at 6:00 p.m., the applications and databases are stopped and incremental backups are taken of each relocating server.

Upon completion, a designee of our customer signs off that the backup was successful and that the server can be restored using the backup if a hardware failure occurs.

Each customer is responsible for backups of their systems and provides sign off upon successful completion of the backup for each individual device.

The relocation team oversees and coordinates the process, however, it is the responsibility of the backup team within each customer to execute the work.

Transport

The transport phase indicates the transfer of execution responsibility to Perspecta, the technician support vendor and the packing / transport vendor. The vendors selected to execute this work meet the industry’s highest standards for removal, packaging, transport and installation of IT devices.

Critical success factors for executing this phase are:

• All resources arrive on time to complete preparation phase work
• Backups are completed on schedule as planned
• All devices are shut down on schedule
• Resource direction is provided only by Perspecta personnel
• All devices with hardware problems are relocated and repaired at the new facility (if that is where the parts are)
**Installation**

Upon receipt at the facility, the installation phase begins. Installation of the server marks the end of the relocation technicians’ responsibilities. The installation process relies heavily on multiple resource pools and they all utilize the command center ticketing process to actively manage issues to resolution. This process includes testing of the servers and assets relocating up to the infrastructure level. System administrators verify that the systems operate correctly and our responsibility for the device in the new facility begins. If the device does not start up as expected, the technician support vendor provides break / fix engineers to make any hardware repairs necessary to restore service.

**Testing**

End-user testing is normally conducted on Saturday night. The phase starts with staff reporting to the new facility to conduct their test scripts.

Upon validation that the system is working from within the facility, any field offices or remote users are notified to commence testing from their location in accordance with the relocation application test plans developed by the customer.

**Schedule**

All of the above tasks, as part of the execution of the data center relocation, are meticulously scheduled in minute-by-minute project plans for each relocation weekend. All tasks fit into the high-level tasks presented in the figure below.

**Contingency and escalation**

Throughout the data center migration period, Perspecta integrates into each customers’ current help desk and issue resolution process. The escalation process is documented and adhered to. If an issue cannot be resolved by the help desk or any other internal customer support groups, the Perspecta project manager reports the problem to the customer team leader and / or other managers as appropriate.

Perspecta develops contingency plans for all identified risks to the project. The contingency plans include contracting break / fix technicians to ensure proper operation and quick parts turn around for all equipment.

**Post-move support plan**

Perspecta works with every customer to develop a transition plan that ensures all data center support is seamless and does not allow for any adverse impact on the user community.