

Data Center Migration Best Practices

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The keys to a successful data center migration are planning, documentation, communication, team work, and execution. Data center migrations are complex and require broad internal and external technical skill sets. Data center management working with business management must develop a business impact assessment to guide the prioritization and development of move groups of equipment, operational software and business applications. The importance of clear and complete documentation coupled with ongoing communications to the technical team as well as the business team can not be over emphasized. Team leadership must work to develop strong team interaction and inter-dependencies. Execution of the plan is expected but more importantly when technical, timeline, budget or delivery challenges occur the team must work creatively and quickly to keep the project on track to a successful conclusion. These key parameters coupled with a healthy dose of constructive paranoia, assuming the worst and then assuming you are too optimistic, throughout the effort will lead to a successful data center migration

Data center migration planning should begin three (3) to six (6) months in advance of the planned relocation. Depending on the complexity of data center operations, the accuracy and completeness of current data center documentation, back up plans, and recovery site contingencies the planning phase may require more time. The data center migration plan should have internal and external infrastructure components. A discussion should be held with the internal and/or external auditor responsible for Sarbanes/Oxley compliance. This will ensure all documentation and/or required steps to meet Sarbanes/Oxley requirements.

Power and networks are two issues that surface frequently during data center relocations. These are often not adequately planned for by the engineers and architects and must be considered very early in the plan. Will dual entrances be required? What are the vault and conduit requirements? What is the length of the trench? Have they been adequately water proofed? Will two 4 inch telecommunications conduits be enough?

Utility services should be reviewed to understand electrical feeder routes, electrical reroute options, and repair times expected should outages occur. This should be factored into the emergency power plans for the data center to ensure adequate run time and generator refueling capabilities. The electrical requirements for IT spaces should be reviewed such as computer rooms, server rooms, PBX rooms, NOCs, etc. Include conduit work for telecom and data cabling from the data center to remote floor distribution closets. Ensure electrical plug type, electric circuit power distribution labeling, amperage and wattage requirements are adequate based on planned usage for

each particular IT space as well as emergency power requirements. Finally, grounding in the data center, telecommunication closets, labs, server rooms and other IT spaces must be correct and tied to a single-point building ground. Proper grounding must be validated and certified.

Not planning for telecom and network planners and project managers is often overlooked. It is difficult to move large organizations without some assistance. Often a bridged network is established between the new and old locations. This allows more flexibility for testing, movement of less critical equipment early and recovery should an unforeseen issue occur. High bandwidth WAN services can take up to 90 days to deliver from the time of order. Additionally, sufficient time should be planned for testing and “burn in” to ensure error free and continuity of service at the new site. Data center cabling for applications, data storage, and networking must be carefully planned and executed. The data center floor layout should include a grid assignment and each cabinet assigned identification. The floor layout for each cabinet should be known before electrical, fiber or copper cabling begins. If possible cabling should be done prior to floor tiles being in place. If this is not possible, care should be given to have no more than 6-8 tile removed at any one time in a section of the data center to avoid shifting of the floor due to data center pressurization. Cabinet placement and floor tile cuts should be marked on the floor to ensure proper cable and electrical tray layout. Electric and fiber optic/copper cable should always be in separate trays. A raised data center floor with cable trays, no sharp edges, rounded curves, with fiber and copper cable dividers are recommended. The cabling should be organized in the cable tray and properly dressed with cable ties. All cabling must be tested, certified and testing results documented. Cabinets should be outfitted with cable wire management. Server consolidation is often undertaken during a data center migration. Cabinet elevations showing shelf loading, port labeling and electrical requirements should be documented for the current and future data centers.

HVAC, fire protection and moisture detection require decisions early. With more blade servers and compact IT equipment, HVAC cooling design has become even more critical. HVAC design coupled with perforated floor tile placement and cabinet ventilation design all work together to provide proper cooling. Additionally, some cabinet makers offer internal air damper and door fans to further enhance cooling. The HVAC contractor should provide HVAC setting adjustments periodically to compensate for building conditioning, external temperatures, and alarm sensitivities. FM 200 total flooding is the preferred fire protection used in data centers. Building drawings should be reviewed to ensure no water or dry fire sprinkler piping is over the data center or any IT space. Under floor moisture detection is becoming common in most data centers. This simple detection can prevent problems from evolving into disasters. All of these systems can be tied into a monitoring system with capabilities to page, call and create logs when alarm conditions occur.

Security cameras are often placed in data centers. These cameras are positioned to monitor entrance/exits and aisles where cabinets are placed. DVRs are often outside the data center and maintain at least 72-96 hours of recorded history.

An inventory should be developed that correlates each piece of hardware, operating software, application and client. The inventory should include but is not limited to make, model, vendor, maintenance and technical support contracts, cabinet, rack position, port connections, data network connections, power requirements, current version of software, client owner, application owner, business purpose or application, dependency, if any, business criticality, acceptable downtime, etc. Current projects for hardware, operational software, and applications should be identified and include the name of the project manager. The data center transition team must work with management to set a date after which no further changes should be made to the data center environment prior to the data center migration. A date should be set as to when changes can commence as to allow the data center to stabilize from the move and ensure continuity of services to internal clients.

If a disaster recovery exercise has not been conducted within the last year consideration should be given to conducting a full or partial disaster recovery exercise. This will allow equipment to be turned down and emergency processes and procedures validated. Often equipment fails upon turn up and this exercise will likely prevent failures from occurring during the data center transition.

Maintenance and technical support contracts should be reviewed. Where appropriate open tickets with technical support organizations to circumvent initial set up delays. On hand part and part availability should be reviewed with support vendors. If contracts need to be upgraded for the data center migration this should be presented to management with the cost of downtime for a decision. Also ensure that cabling, electrical and other infrastructure resources are on site to provide immediate response if any issues are encountered.

Equipment warranties usually require the use of certified vendors for on site technical support during the migration and specialized movers. Identify potential vendors for these services and ask for recent references. Interview the vendors and ensure a good fit with the data center migration team. Make the selection carefully. This is the most critical portion of the migration.

Determine what type of insurance your technical support and move vendors provide for the move. If the insurance is not current equipment replacement cost or does not include business continuity insurance, management may wish to explore the cost of these type of insurance and costs.

New or "seed" equipment is necessary to provide the initial startup of the new data center. These can include routers, firewalls, data switches, PBX, new data and telecom circuits, cabinets, etc. It should also include new fiber facilities from outside carriers. It is not realistic to think you can move the existing data center as is without new or seed equipment. In some instances, vendors provide serial number swap outs or companies plan their upgrades or replacement plans with a data center migration.

Data backups must be completed for each system and application successfully completed prior to data center migration. Enough time must be built into the schedule to allow for

the backups to be completed. The disaster recovery remote site should be on alert in the event of an emergency.

If possible divide the data center migration over several weekends or an exceptionally long holiday. Create truck manifests to disperse the business criticality and value taken by each truck. Each person on site during the move must have a clear role and responsibility. Ensure data administrators are available to assist as needed with the start up of equipment. Provide control and leadership at the old as well as the new data center site during the transition. Adequate mobile communications should be provided for internal and external resources to remain in constant communication.

Ensure routes in and out of the new and old data center are surveyed by the technical and move vendors. The loading area must be free cars, trucks or other obstructions during the data center migration. Measure door widths and heights, turning radiuses, provide lighting, a loading dock or lift capabilities and have a plan should there be inclement weather.

Provide security at both sites. Ensure sign in and sign out rosters are utilized. Schedule personnel so fresh resources can be present throughout the move. Provide food and beverages for the staff and if appropriate arrange cots, rooms and hot showers.

Just prior to the data center migration, the data center should be cleaned under the floor, the tile grids wiped down, the floor clean of all debris and lightly damped mopped.

During the data center transition ensure procedures are in place to maintain data center cleanliness and control.

A communications process should be established to keep management informed during the data center migration. These updates can be by email or set conference calls can be arranged to review progress, schedule, issues, etc. The updates should continue until the data center migration is successfully completed.

A testing plan to validate each service is operational and response times are as expected should be developed and all testing results should be documented. Deviations from expected results should be reported immediately..

If phones are part of the move they should be placed on the desk, plugged into the voiced jack and tested for dial tone. If new phone services are provided a brochure may be left on each employee desk explaining the new service and how to use it. Help desk personnel should be trained prior to the data center migration to assist with any utilization questions from employees. In many companies, individuals are asked to pack and unpack their personal computers. Additional resources may be required if this is to be done for individuals.

The data center should also receive a complete and thorough cleaning after the move. HVAC filters should be checked and changed out if needed. Change management

processes should be in place post migration to ensure the data center maintains all standards established.