Deciding how to migrate workloads to the cloud or between service providers can be just as important as the critical steps that precede it. Once you've done your due diligence; run the ROI on hard and soft costs; developed a risk management policy; and assuaged the internal fears, Peak 10 can help you through the next steps.

Moving to the cloud? Peak 10 offers migration services that can help you and your workloads get there safely, efficiently and cost effectively.

Migrating to Peak 10 Cloud Services

It's time to migrate to the cloud but not just any cloud. You're moving to the Peak 10 cloud, and our goal is to make the process as easy and painless as possible. Our solution engineers and technical support staff are on hand to answer questions and help you every step of the way.

Before you even become a Peak 10 customer (or start a new cloud service) our team, including your account manager and a dedicated solution engineer, will go over the information you’ll need to move your data and applications. This will be done as part of the presentation and review of your proposed cloud solution. We want to make sure you have a clear understanding of what will be entailed.

Your Peak 10 team will also help you assess the various migration methods available so you can select the one best suited to your needs. Additional consultation is available to help you with application dependency mapping and profiling.

The actual migration process will be dependent on your Peak 10 cloud solution, business requirements and other factors. However, the following provides a general overview of the steps entailed.

**Step 1: Assess Your Migration Needs**

The first step in the workload migration process is assessing the various factors that will influence your choice of methodology. Among them:

- **Distance** — How far are you from your designated Peak 10 cloud infrastructure? Will you be migrating data over the Internet or physically transporting it? Is latency an issue for you?
- **Cost** — Will you have to pay for courier service, Internet bandwidth, software, experienced labor and conversion or replication tools?
- **Risks** — Will the number of servers increase the complexity of the job? Will you have enough bandwidth? Do you have a long enough window for completing the task? How will you protect your data while it is in transit?
- **Size** — How big are your data files? Are you looking at migration methodologies best suited to the size of your workloads?
- **Format** — Do you plan to transfer workloads in your native format, or will you convert over to Peak 10’s format?
• Application dependencies — What applications are you migrating? What are their immediate dependencies and are any applications dependent on the other applications’ dependencies?
• Node-level data — For each node on which the application runs, what is the CPU usage, memory usage, storage data (such as throughput, latency and input/output operations per second) and network data (such as throughput, connections per second and dropped connections)?
• Profile user activity — What is your total number of connected users, request and transaction rates and request latencies?

**Step 2: Choose Your Migration Methodology**

Based on the answers to the previous questions, you can choose the migration method best suited to your needs. Common ones to consider are:

• Manual data migration between old and new operating systems and application environments
• Offline media transfer involving the shipment of portable media
• Internet transfer of virtual disk images
• Software agent-based data replication between old and new operating system and application environments
• Full server failover from the original operating system environment to the cloud using software agents

The following provides a brief overview of these processes.

**Manual Data Migration from Old to New**

Manual migration is best for one or two simple applications that don't have a lot of dependencies or require custom configurations. The process begins with getting access to your new environment from Peak 10. Your account manager and a Peak 10 solution engineer will work with you to make this happen. Then, you can copy over your data via the Internet. Keep in mind that the larger the workloads, the longer it will take to send them. If we are close enough to your physical location, carry the copied files over to us. It may be the faster option.

Migration tools are typically already built into your OS or application. For example, the Windows server OS includes the file replication command Robocopy (Robust File Copy), as well as SQL Backup, for creating a back-up copy of a SQL database. For Linux, there is mysqldump and rsync utility software.

The most significant risk you'll likely face is that your data will be in flight, leaving it vulnerable to prying eyes or more sinister characters. Whether you use this or any other migration method, always encrypt your data. The encryption used by Secure Shell (SSH) network protocol provides confidentiality and integrity of data over unsecured networks, such as the Internet. Using a VPN tunnel to transfer sensitive data is best practice.

Do a dry run of the migration before actually committing to placing workloads into production. Then, you will want to test thoroughly to ensure that everything that was supposed to migrate actually did. Did any unknown dependencies surface? Is the application attempting to communicate with something that's not there?

**Offline Media Transfer Using Portable Media**

Moderate size workloads are best suited to this method. The approach is straightforward: perform the data conversion and copy the information to a USB drive. Some conversion tools may require that systems be offline, which can be disruptive. Conversely, if systems remain online, data changes made during the conversion process will not be captured. As with the previous method, always encrypt!

Ship the USB drive(s) via a reliable carrier. The costs for USB drives and courier service are nominal. Then, import the virtual images and test. If testing fails, the process has to be repeated in its entirety. This could result in additional costs. In addition, you'll need to take care of DNS, VPN, certifications and other patch items associated with the move.

The maintenance window for this method is quite long. From the moment the copy/conversion process begins to the time it's complete, online production system data is being lost, or service is unavailable so long as the maintenance window remains open. If the process fails, stop, roll back and repeat.

Offline transfer using portable media works well if you are located close enough to Peak 10 that driving or shipping via courier is faster than Internet transfer.

**Internet Transfer of Virtual Disk Images**

With this method, you can transfer workloads in your native format. This saves you from having to rebuild your application environment. Or, you can convert over to Peak 10's format. Either way, after you have uploaded to a SFTP server or similar system, Peak 10 will import the virtual images to its cloud via the Internet.

This method is particularly well suited to migrations of smaller data files and virtual machines over long distances. While there will be some latency resulting from distance and network, it's negligible.

Internet bandwidth at the source and at Peak 10 will account for the majority of cost. There may also be minimal software costs. However, the conversion tools are typically free and simple to use. FileZilla is a commonly used FTP program for file uploading and downloading to and from an FTP site. VMware vCenter Converter is a free conversion tool that takes a physical server and prepares it as virtual machines for the cloud.
Again, always encrypt. SFTP and HTTPS secure communications protocols protect your data over unsecured networks. Test runs help mitigate other risks associated with successfully completing the migration. However if the test fails, you have to go back to square one and start the process over again. If you encounter problems during a maintenance window, you have to back out and try again at the next window.

The maintenance window for completing this is still long. The size of the Internet connection at the source is usually a bottleneck. Starting services on the new environment require that the full data copy process is complete.

- **Software Agent-based Data Replication Between Old and New OS and Application Environments**
  Using data replication tools such as Double-Take lets you replicate over time without bringing systems down for prolonged periods. Consider agent-based replication for migrating large data sets, when time is not an issue, and your cloud services provider (CSP) is far away. Minor latency caused by network and distance is irrelevant.

  Install the replication software on the old server and the new destination server. Let the data trickle through during business hours when Internet usage is at its peak, and flow freely when there are no users around to complain about how slow things are. All the while, production servers continue to run, and you can maintain this sync state indefinitely.

  When the new server catches up with the old server, stop the replication and test the new servers (testing will break sync between old and new). Once you're satisfied that all is well, restart synchronization until the new server catches up again with the old server. When replication and testing are complete, you can failover to the new environment.

  Internet bandwidth at both ends needs to be properly sized so that it can keep up with the rate of exchange, which may add cost, especially in rapidly changing environments such as databases. The complexity of this method increases with the number of servers. However, any risks are lowered by the fact that you can stop the replication process and test any time.

  The maintenance window is short. The actual failover process from old to new doesn't take long. However, unexpectedly large changes to source-system data, as can happen with disk defragmentation programs, effectively restart the process from the beginning.

- **Full Server Failover Using Software Agents**
  With this migration method, you capture everything installed and configured on the source system and move it in its entirety to Peak 10. Depending on the scale of the migration, you can replicate to a shell VM, agent to agent or to an aggregated target such as a VM appliance.

  There are many similarities between this and previous method. Both allow you to migrate heterogeneous environments, such as Xen to VMware or Amazon to Peak 10. They are non-disruptive to the production environment, replicating over time without bringing your systems down for prolonged periods.

  The server image replication moves at a controllable pace: slowly during heavy Internet use and full speed during off-hours. You can test at any point in the process as many times as you want until the target site is completely in sync with the source. Minor latency caused by network and distance is irrelevant. The risks are similar such as insufficient bandwidth at both ends.

  A key difference is that the target server is a complete duplicate of the source server. No rebuilding or reconfiguring or dependencies should be expected, and you don't have to worry about missing installation media or configuration work-arounds. The complete server package is there. Double-Take software is a reliable software agent for this.

  This method is particularly good for large numbers of servers, and it scales well.

**Step 3: Plan and Test**

Next, develop your migration work plan and tests for your actual migration. These will vary based on the types of applications you're migrating and their business continuity requirements. The data you collect during the application dependency and profiling processes in Step 1 will help you create test suites and simulate different user types and loads.

You may choose to migrate your applications in phases, with the existing and migrated ones available for some period of time. After initial tests, you can also migrate your users in batches. Cloud capacity can be increased over time.

**Step 4: Migrate**

With your plan in place and your tests executed, it's time to migrate using your selected method. Peak 10 solution engineers are available to help you, and our experienced technical support specialists are available 24/7 to answer questions and troubleshoot.

**Additional Information**

For more information about migrating to the cloud, take advantage of this resource from Peak 10:


Or, use the sample cloud migration checklist on the next page.
Cloud Migration Checklist

- Audit your data. Don’t transfer outdated or corrupt data into the cloud.
- Conduct application dependency mapping.
- Conduct application profiling, and identify the applications that make sense for migration or should have priority.
- Build your short- and long-term transition plans. Which applications move first? Which ones need more fine tuning?
- Determine end user priority. Who has to have access to what applications immediately?
- Test and test again. Use non-critical data to test the capabilities of your new cloud setup.
- Develop your test response plan. You’ll be testing for inefficiencies and will also need to be prepared to address privacy and security concerns during the move. Develop tactics for dealing with test results.
- Identify the standards that govern cloud computing, and make sure your setup abides by them.
- Read your Service Level Agreement (SLA) line-by-line. Make you understand everything and how it could or does impact your data during and after migration.
- Go live. Keep testing – put a test plan schedule in place.
- Implement tactics for soliciting, gathering and assessing feedback.

Please contact us if you have specific questions or concerns about migrating to Peak 10 cloud services.

You can contact us for a free consultation with a Peak 10 Solutioneer at (866) 473-2510. Or, use the Contact Us form at www.peak10.com

About Peak 10

Peak 10 provides IT infrastructure solutions that ensure the 24/7/365 availability and security of our customers’ critical data and applications. Customer-centric and cost-competitive, Peak 10 solutions are designed to scale and adapt to customers’ changing business needs, enabling them to increase agility, lower costs, improve performance and focus internal resources on their core competencies — all while maintaining uptime, access and security.