SYNCHROWORKS CONSULTING

SECTION 7

Migrate

Once you have completed your discovery and assessment, it's time to prepare for the next step: cloud migration.

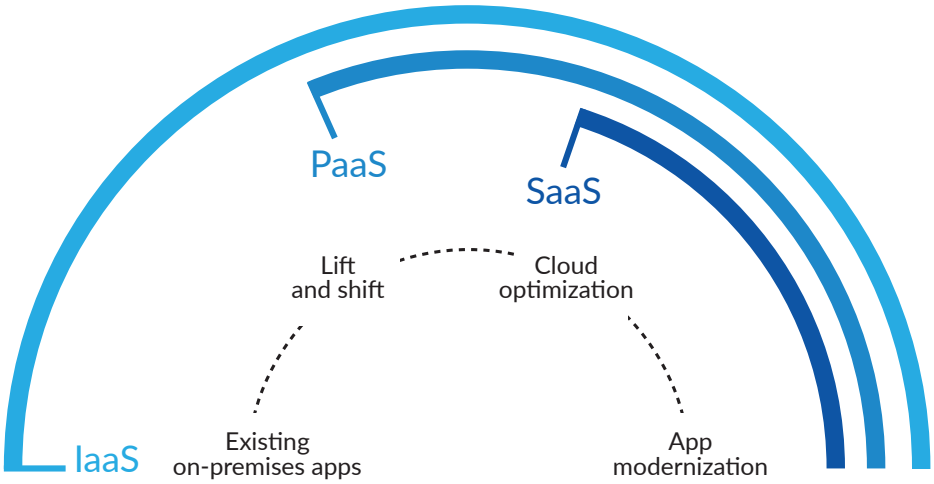
This is where, after you have landed on your migration goals and gathered all requirements and constraints, you can choose the best method of migration. In previous datasheets, we overviewed the migration evolution model that showed workloads progressing through phases of lift and shift, cloud optimization, and eventually app modernization.

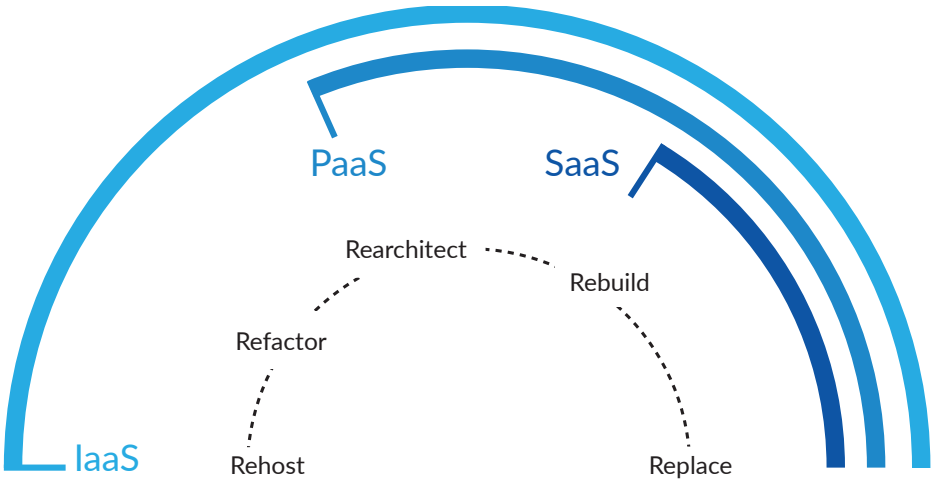
During the migration effort, you'll determine the approach that best meets your requirements. This is best addressed per application. Essentially, in this phase, you're physically moving your workloads and applications (including their data) to the cloud and planning to retire the on-premises versions. Every organization will have a different approach and mixture of using rehosting, refactoring, rearchitecting, or rebuilding for their applications.

This datasheet focuses on the rehost approach, moving applications running on traditional servers and virtual machines to Azure IaaS. In many cases, organizations will start with lift and shift to drive rapid migration and early cost savings. Lift and shift makes no changes to your app or workload framework or architecture; it simply involves exchanging hardware and OS management with the cloud environment.

This approach requires confidence regarding two key issues. Can your workload be easily migrated, without too many manual steps? Will your workload function as expected in the cloud? As such, several decision points come into play based on what's being moved, and especially how (or if) you want to access it while the migration is taking place.

The lift-and-shift method most often employed for server or VM migration is real-time replication, due to its flexibility and capability in staged migration. Real-time replication allows the workload to remain online and accessible during the migration. And, as you'll see in the next section, modern tools enable the system to cleanly migrate real-time data even when the system is actively being used.



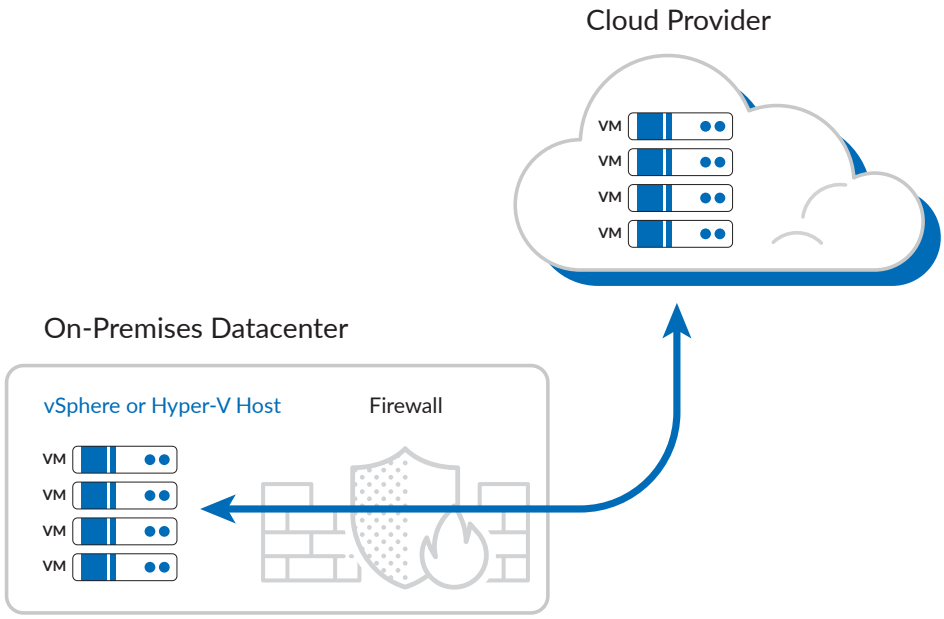


Real-time Replication

Real-time replication involves setting up a copy of the workload in the cloud and allowing asynchronous replication to keep the copy and the workload in sync. This means that while you're building and executing your migration plans, any data or server updates are synced between the copies.

This model also enables groups of virtual machines to be connected, as in a multi-tiered application or workload. This is important when testing, and once complete, the final migration cut-over can begin. When the system is aware of the connections and dependencies between virtual machines, you can create plans to ensure the VMs are bought up in the correct order when starting. For example, with a simple web app, your database source needs to be available before the application runtime begins.

Using your assessment plans as a guide—and your migration tool of choice—you can configure each VM to replicate to the correct VM instance in your cloud provider. This is also the point when you should define the storage and network connections that you set up initially in the environment creation. Most tools have a mechanism to define the replication timeframe (usually from 30 seconds to 15 minutes). This will be based on your network capability and latency.



Many tools also support application-aware replication automatically. Microsoft applications (such as SharePoint, Dynamics, SQL Server, and Active Directory) and apps from other vendors (including Oracle, SAP, IBM, and Red Hat) can be migrated with applicationaware replication, which ensures the source data consistency before replication. Initial replication is also bandwidth intensive, and mechanisms discussed earlier—like ExpressRoute and Data Box—can assist with this. It's something to consider when planning your migration timeline.

Testing

Testing is integral to ensuring system health before final cut-over. Many migration tools include options to start up your set of VMs in an isolated environment, which allows you to mimic the production environment in the cloud. This means you can fully test the application without affecting either the on-premises or cloud production versions. Once replication is complete, simply start your application or workloads using the isolated environment option, while taking time to test your start-up script or runbook for any errors. When you're fully satisfied that both are functioning as expected, it's time to perform the final cut-over.

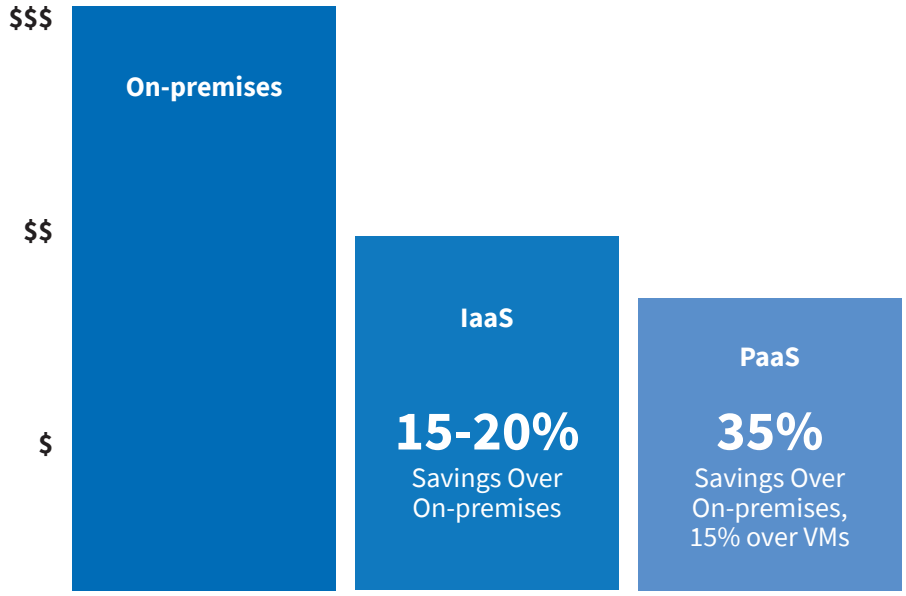
Migration tools can also do the final launch in your cloud and turn off the on-premises version. In some cases, you may have to update some DNS records for the new cloud-based workloads. However, if you migrated to use DNS in the cloud as part of your initial environment setup, this may happen automatically.

Taking Further Advantage of Your Cloud Provider to Drive Application Innovation

As you migrate your existing virtual machines in Azure, this is also the perfect time to continue on the path to application modernization. To do this, you can take advantage of your cloud provider, delivering even further cost savings and flexibility.

As you may remember from the migration evolution model, cloud optimization is the next logical step following lift and shift, or "rehosting," for your workloads, as you'll find many of them can take advantage of PaaS services.

The PaaS services of immediate interest are containers, app services, and database services. Why look at cloud optimization so soon after migrating? The answer is simple. Now that you have done all the hard work in assessing, analyzing, and migrating to the cloud, you've made it easier to take the step to PaaS. Plus, you can get more cost benefits through reduced management and operating expense reduction.



By moving to PaaS for your suitable apps and databases, you're significantly lowering costs by reducing your footprint and management requirements. You can save an additional 15–20 percent (or more) by migrating workloads and applications to PaaS, over and above the savings you are making today with IaaS.

It's important to note that there will be an initial investment of time, effort, and budget to move to more advanced PaaS services. In some cases, you'll have a simple migration where the application is "cloud ready," but in others, configuration changes and code updates may be required. Fortunately, there are tools available that enable you to analyze the code and determine the effort required to move to App Service.

For your databases, this is a straightforward process. Azure provides options for database PaaS services, including Azure SQL Database, where you are hosting the data on a full database as a service (DBaaS) platform. Azure SQL Database enables you to host database data in a service, reducing your database management costs, but has some limitations compared to a full SQL Server deployment. If your applications need functionality that may not be available in Azure SQL Database, then SQL Database Managed Instance is recommended. Azure SQL Database Managed Instance provides the full platform experience of SQL Server, but with the underlying OS and SQL service fully managed by Azure.

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