



## Lifting InterSystems IRIS to the Cloud

### *Migration Options for Application & Solution Providers*

Migrating InterSystems IRIS and InterSystems IRIS for Health from on-premises to the cloud offers many advantages for Application Providers and Solution Providers. These advantages include simplified operations, access to flexible resources, and enhanced resilience. Companies no longer need to worry about the physical constraints and expenses associated with maintaining on-prem infrastructure, such as power and space requirements and expensive computer hardware.

One of the most compelling benefits is the ability to accelerate **speed to market**. By removing the burden of infrastructure maintenance, cloud environments enable faster development and deployment cycles, allowing businesses to respond quickly to market demands and opportunities. Operational costs are also lowered, because companies can **scale resources** up or down based on actual needs, leading to more efficient use of capital. Moreover, migrating to the cloud can contribute to a reduced carbon footprint by optimizing energy usage through shared cloud infrastructure.

Transitioning to the cloud may involve significant changes. Companies may benefit from a more operational focus, managing and optimizing cloud resources continuously. This shift may require changes to business models, reconsideration of margins, and strategies for scaling operations up or out. While requiring more investment, embracing these changes can lead to improved agility and competitive advantage in the marketplace.

## Architectural Choices in Cloud Migration

When considering the simplest cloud migration, lifting an existing on-premises application to one of the public clouds requires companies to choose one or more services (AWS, Azure, Google, or another). Companies then face an important architectural choice: migrate entirely to the cloud or create a prem-to-cloud hybrid cluster. **Both InterSystems IRIS and InterSystems IRIS for Health fully support either option.** A hybrid cluster mirrors the on-prem instance to the cloud asynchronously. This alternative can be helpful in situations such as when the OLTP continues to run on-prem, but the cloud instance provides support for analytics, reporting, and other read-only operations.

## Migration Options

Each architectural choice for cloud migration has advantages and limitations, making it essential for companies to evaluate their specific needs and goals when planning a cloud strategy. The first step is to choose between a full move to the cloud or a hybrid setup.

Migration choice	Number of InterSystems IRIS deployments after migration	Characteristics
<b>Lift &amp; Shift:</b> full move to cloud	1	Local on-premises setup moved to a cloud-based architecture
<b>Hybrid Cluster:</b> on-prem plus cloud mirror copy ("stretch cluster")	2	On-premises cluster mirrored to an asynchronously updated, read-only cloud copy

Once the migrate/hybrid decision is made, additional cloud choices are available, with appropriate payment models.

InterSystems IRIS offering type	Description	Support for migration choices	
		Lift & Shift	Hybrid
Licensed: On-prem or cloud	Same license regardless of deployment location. For more information, see our online documentation on <a href="#">Server Migration Guide</a> .	✓	✓
Cloud Managed Services: partially managed cloud services, fee-based	Environment partially managed by InterSystems, while keeping control of cloud infrastructure. For more information, see our online documentation on <a href="#">InterSystems IRIS Cloud Managed Services</a> .	✓	✓
Cloud SQL/ML/Doc/Vector: fully managed cloud services, fee-based	Specialized, fully managed cloud micro-services for SQL databases, machine learning, document storage, and (soon) vector processing.  Does not support <b>mirroring</b> .  Contact your Account Executive and see our online documentation for more information on <a href="#">InterSystems IRIS Cloud Services</a>	✓	X

### Cloud migration and services offerings

The **Lift & Shift** choice allows leveraging of cloud benefits while maintaining ownership of a single copy of InterSystems IRIS.

The **Hybrid** choice combines the stability and familiarity of on-premises systems with the flexibility and scalability of the cloud.

*See our online documentation for more information on [Mirroring](#).*

The licensed and cloud managed offerings not only support mirroring but support mirroring to *each other*. For instance, if you have an on-prem, *licensed* OLTP you can mirror that to a cloud-based, *Cloud Managed Services* OLAP with InterSystems IRIS.

## Multi-Tenant vs. Single Tenant Architecture with InterSystems IRIS

Although migration does not require changes to your tenancy method, the cloud offers powerful options for scaling and billing. For this reason, you may want to re-evaluate your tenancy model. For any of our offerings, when deploying InterSystems IRIS applications in the cloud, companies can choose between the following architectures for multiple customers:

- **Single Tenant:** Multiple deployments; one for each of your customers.
- **Multi-Tenant:** Multiple customers on a single deployment.

Each architecture offers distinct advantages and drawbacks. This is especially important for application and solution providers with solutions built with InterSystems IRIS technology that have large numbers of customers, are destined for major expansion, or that house sensitive or regulated data.

### Scaling of Resources and Operations

- **Multi-Tenant:** Scaling a multi-tenant environment involves adding resources to a single shared instance for each customer (tenant), which can be more cost-effective and simpler to manage. However, the performance of one tenant can affect others if adequate resources are not allocated, leading to resource contention.
- **Single Tenant:** Scaling a single tenant environment means provisioning more resources for each customer individually. While this offers more predictable performance, the need for additional infrastructure and management overhead can make this choice more complex to scale.

### Isolation of Data

- **Multi-Tenant:** In a multi-tenant configuration, multiple tenants share the same instance of the application and database. Data isolation is achieved through software-level partitioning, ensuring that each tenant's data remains secure and separate from others. This approach can be efficient in its use of resources but can require robust security measures to prevent data breaches.
- **Single Tenant:** With a single tenant architecture, each customer has a separate instance of the application and database. This setup provides a higher level of data isolation, as each tenant's data resides in a separate environment. This choice can be more secure and easier to manage, facilitating compliance with data protection regulations.

### Billing Your Customers by Consumption or by CPU and Storage Allocation

How you charge your customers is of course up to you. However, cloud billing is often based on resource consumption, such as CPU and storage usage – or on another, similar metric. This can provide cost savings for tenants with variable or lower usage patterns. This is different from typical on-premises billing which tends to be license based.

- **Multi- Tenant:** Cloud billing may be more difficult to implement in a multi-tenant environment, as it may take extra steps to determine how much CPU time or storage is consumed by each individual tenant.
- **Single Tenant:** Cloud billing in a single tenant setup is typically based on the resources allocated to each deployment, which is relatively simple.

## Migration Methods

Multiple approaches are available to migrate your InterSystems IRIS solution from on-premises to the cloud service of your choice.

The two most common methods are described next. They both start with the same step of mirroring an existing deployment to the cloud, but then diverge.

### Choosing Mirror or Lift-and-Shift

Both the mirror method and the lift-and-shift method start by copying your existing InterSystems IRIS from on-prem to a cloud platform. Once the cloud copy is synchronized with the on-prem instance, you make a final choice of where the migration path ends:

- **Mirror:** Continue to use the on-prem instance as primary and the cloud instance for backup and read-only operations, like analytics and machine learning. The cloud instance is asynchronous but periodically updated.
- **Lift-and-Shift:** With the on-prem primary instance and the cloud-based secondary instances now in sync, “fail over” operations from the on-prem instance to the cloud copy, which now becomes the primary subsequently for all operations (not just read-only). At that point, the on-prem deployment can be archived as a snapshot backup.

Mirroring your existing local InterSystems IRIS instance to the cloud is the most common, resilient, and straightforward way to migrate your on-prem deployment. For more information, see the [Server Migration Guide](#) in our online documentation.

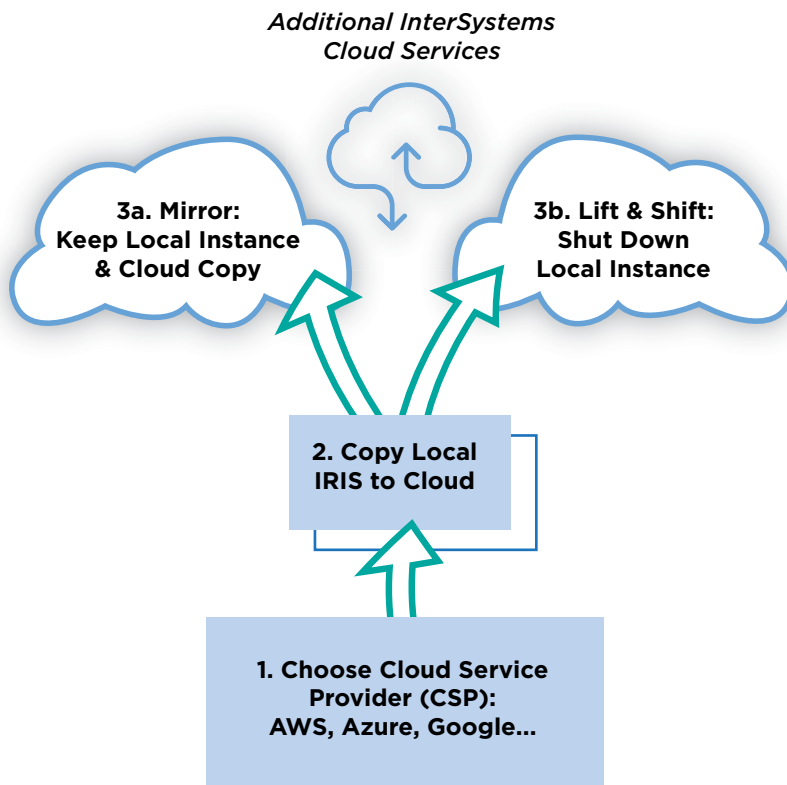


Figure: Schematic of cloud migration steps

## Netsmart: An InterSystems Customer Moves to the Cloud

A leading healthcare technology company and a longtime user of InterSystems IRIS for Health, Netsmart sets its mission as delivering innovative technology that supports the complex and evolving needs of healthcare organizations and enabling providers to deliver better care and achieve better outcomes in a wide range of community healthcare contexts, including behavioral, home, and public health; social services, senior living, and hospice care.

### Key Services Provided by Netsmart

Netsmart provides digital health services that enable consistency, integration, improvement, and optimization of care and whose breadth favored cloud migration:

- **Electronic Health Records (EHRs):** Netsmart provides comprehensive EHR (Electronic Health Records) compliance with industry regulations.
- **Care coordination:** Enhance care coordination across different care settings, facilitating communication and collaboration.
- **Analytics and reporting:** To enable data-driven decisions, Netsmart provides advanced analytics and reporting tools. With these, healthcare providers can track outcomes and identify areas for improvement areas for improvement in an actionable way.
- **Population health management:** Netsmart population health management solutions help to manage and improve the health of specific patient populations.
- **Mobile and telehealth solutions:** Netsmart offers mobile and telehealth solutions that allow virtual delivery of care, independent of location.
- **Interoperability:** Netsmart interoperability ensures that their systems can seamlessly exchange information with other healthcare systems.
- **Consulting and managed services:** In addition to software solutions, Netsmart provides consulting and managed services to help organizations implement novel technologies and navigate the complexity of healthcare regulations.

### Why Netsmart Moved InterSystems IRIS for Health to the Cloud

Netsmart was motivated to move its InterSystems IRIS for Health operations to the cloud by several key considerations and objectives:

- **Enhanced collaboration and DevOps integration:** Netsmart aimed to further improve their collaborative DevOps environment to bridge the gap between engineering and cloud teams. One goal of moving to the cloud was to improve communication and integration among distinct roles, enabling a more cohesive and efficient workflow.
- **Visibility and cost management:** Transition to the public cloud provided Netsmart with additional visibility into costs. Such transparency allowed them to identify cost drivers and adjust strategies to manage and reduce expenses. The visibility features inherent to the public cloud made it easier to track and optimize spending compared with their private cloud, which required more effort to achieve similar insights.
- **Agility and flexibility:** With the public cloud, Netsmart found it easier to deploy novel solutions and leverage improvements in technology and systems, including artificial intelligence (AI) / machine learning (ML).





## How Netsmart Solved Challenges to its Cloud Migration

• **Integration and adaptation challenges:** As any organization would, Netsmart encountered challenges integrating their operations into the new cloud environment. While some challenges were resolved quickly, others took more time. The key was the ability to adjust in response and continuously improve their processes.

**Resolution:** Netsmart encouraged strong collaboration and communication within their teams, allowing quick sharing of insights and deployment of updates to address challenges. This agile approach drove down costs and improved key performance indicators (KPIs).

• **Additional visibility into costs:** While public cloud environments offer built-in visibility into costs, Netsmart had to pivot to fully leverage this feature. They needed to integrate cost visibility tools and processes into their standard operational models to monitor and control expenses effectively.

**Resolution:** Netsmart worked to enhance their cost visibility and management practices, using the public cloud's default capabilities to gain insights into their spending. These insights were then communicated back to their teams, who were able to swiftly implement changes and updates to optimize costs.

Through these efforts, Netsmart overcame the initial challenges of moving to the cloud, achieving better operational efficiency and improving cost management and overall performance.

## Why Netsmart Chose a Single-Tenant Architecture

In choosing a single-tenant architecture, Netsmart prioritized data security, performance reliability, and customization, all critical factors in healthcare technology. Netsmart made this choice for the following specific reasons:

• **Higher level of data isolation:** Single tenant architecture provides a higher level of data isolation as compared to multi-tenant setups. Each customer has their own dedicated instance, which helps ensure that data remains secure and separate from other customers' data. This level of isolation is crucial for complying with stringent data protection regulations and maintaining client trust.

• **Predictable performance:** By having separate instances for each customer, Netsmart can offer more predictable and reliable performance. A single tenant setup minimizes resource contention, ensuring that the performance of one customer's application does not negatively affect another's.

• **Customization and flexibility:** Single tenant architecture allows for greater customization and flexibility. Each instance can be tailored to meet individual customer requirements. This is particularly important in healthcare, where different organizations often have unique workflows and compliance needs.

• **Easier management of updates and upgrades:** With a single tenant setup, updates and upgrades can be managed more easily on a per-instance basis. This reduces the risk that an issue can affect multiple customers and allows for more controlled rollouts of new features or patches.



## Netsmart: The First Step in a Cloud Journey

In taking its first step into the cloud, Netsmart chose to move its InterSystems IRIS for Health to public cloud for the sake of DevOps, visibility, and cost management. To migrate, Netsmart took the simplest and most familiar path and mirrored their local instance in the cloud. Netsmart then chose a single tenant architecture because they valued the higher level of data isolation it provides, in alignment with their compliance requirements.

By carefully considering the benefits and trade-offs of different architectures, companies like Netsmart can select the cloud deployment model that best aligns with their operational goals, security requirements, and customer expectations.

### For More Information About Lifting InterSystems IRIS into the Cloud

If you are interested in running InterSystems IRIS (or InterSystems IRIS for Health) in the cloud, contact InterSystems through your account team or [on our website](#), read our relevant documentation, and join our large and lively [user community](#) and benefit from its trove of useful information.

