DEV GRAPH

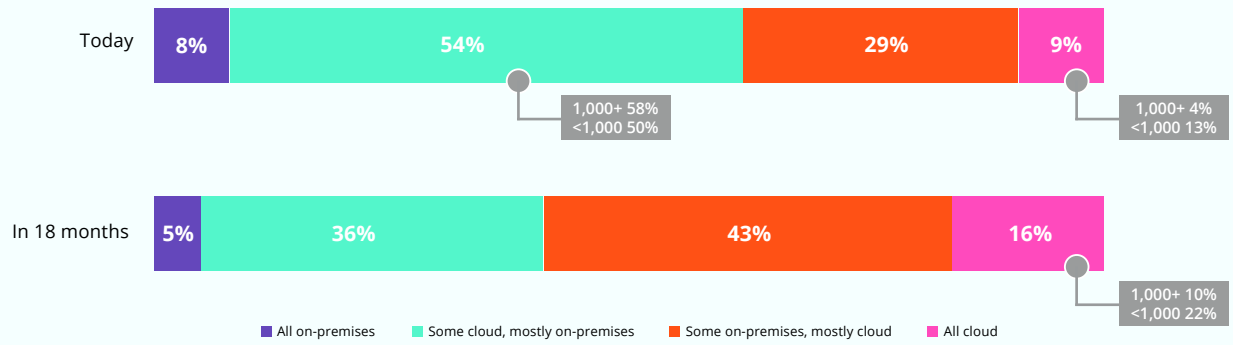
Organizations Should Opt for Zero Downtime and Consider Cloud Databases

Organizations are moving to the cloud at a rapid pace, and cloud databases are a great way to test the waters before a large-scale transition and optimize their cloud infrastructure into the future. Learn how to streamline migrations with a database load balancer.

Organizations are rapidly shifting to the cloud to achieve cost efficiencies and power agile business initiatives.

In fact, according to IDG's 2020 Cloud Computing Survey, by the end of 2021 it's expected that 59% of organizations will be running most or all of their workloads in the cloud. This is a dramatic shift from just 38% today and suggests that cloud computing could surpass on-premise infrastructure in the near future.

The Shift Continues to Cloud



In the graph above, the top bar describes organization's total IT environment (infrastructure, applications, data analytics, etc.) today. The bottom bar describes where organizations expect to be by the end of 2021.

For those enterprises considering a move to the cloud, migrating on-premise databases could be a great first step before making sweeping changes across the organization. That said, there are several risk factors such as downtime, data loss, and compromised transactions that businesses should look to minimize before attempting the shift to a cloud model.

With this in mind, let's take a closer look at the drivers for cloud databases, the challenges of migrating to the cloud, and the technology available to streamline the process and maintain successful business operations.

Why Cloud Databases Make Sense

There is are a multitude of reasons why many organizations are shifting to cloud infrastructure. Here are some key drivers specific to cloud database adoption.

Simplicity

On-premise database infrastructure has always been complex to manage. A large team of database administrators (DBAs) would need to estimate computing needs far in advance and install servers to handle the workload. This usually required specific vendor expertise with the necessary hardware and software to get the servers running. In addition, with a limited number of servers, it's also hard for DBAs to set up enough redundancy to deal with sudden traffic spikes or failovers.

With cloud databases, however, fewer DBAs can maintain a similar size data infrastructure. Once the cloud data tier is implemented, organizations can reduce their specialized staffing for maintaining on-premise servers and other hardware. This frees up IT operations staff to focus on optimizing cloud computing resources rather than racking servers, installing and patching server software, and other low-level tasks. That's why cloud databases are a great way to test the waters before moving entire applications to the cloud.

Resilience & Scalability

Maintaining on-premise databases is challenging because it's difficult to scale out the infrastructure when necessary. Moreover, scaling up on-premise infrastructure would require upgrading hardware that has a high upfront cost. That means on-premise databases can limit the data tier's scalability and resilience, which directly impacts applications and their end-users.

Cloud databases, however, can be easily replicated to scale horizontally and the cloud servers they run on can scale vertically as well. Most public cloud services—such as Amazon Web Services or Microsoft Azure—are infinite pools of on-demand infrastructure, so DBAs can add or remove cloud resources whenever they want. In many cases, they can configure the cloud infrastructure to automatically achieve high availability and prevent downtime as well.

Cost Savings

Along with heavy upfront costs in IT staffing and hardware, on-premise data infrastructure often includes dedicated database servers that are underutilized and a waste of computing resources. By shifting to cloud computing, however, organizations can consolidate multiple applications and databases on a single cloud instance to average out usage and drive cost savings.

Cloud database infrastructure is not only scalable, but elastic as well. That means cloud servers can scale vertically or horizontally when necessary and then scale back down when traffic peaks.

Cloud elasticity can be an enormous cost-saver for businesses with seasonal or irregular application usage because it reduces the risk of overprovisioning.

Security

While on-premise infrastructure had previously been touted as more secure, over the past few years public cloud vendors have invested heavily in security. That means moving to the cloud and leveraging the expertise of cloud vendors could be safer than relying solely on the organization's own cybersecurity investments.

For example, cloud vendors typically have the highest levels of security and resiliency in terms of encryption, firewalls, and disaster recovery. Investing in these at the organizational level for on-premise infrastructure could be cost-prohibitive and leave enterprises exposed to data breaches or service interruptions. A reliable cloud vendor will ensure they're following best practices for data, server, and network layer security.

The Challenges of Transitioning to the Cloud

Transitioning IT infrastructure to the cloud always presents some challenges, and database migrations are no exception. For one, databases often store business-critical information that organizations can't afford to lose access to during the migration. Even a few minutes of downtime can drive users away and leave a lasting negative impact on the business.

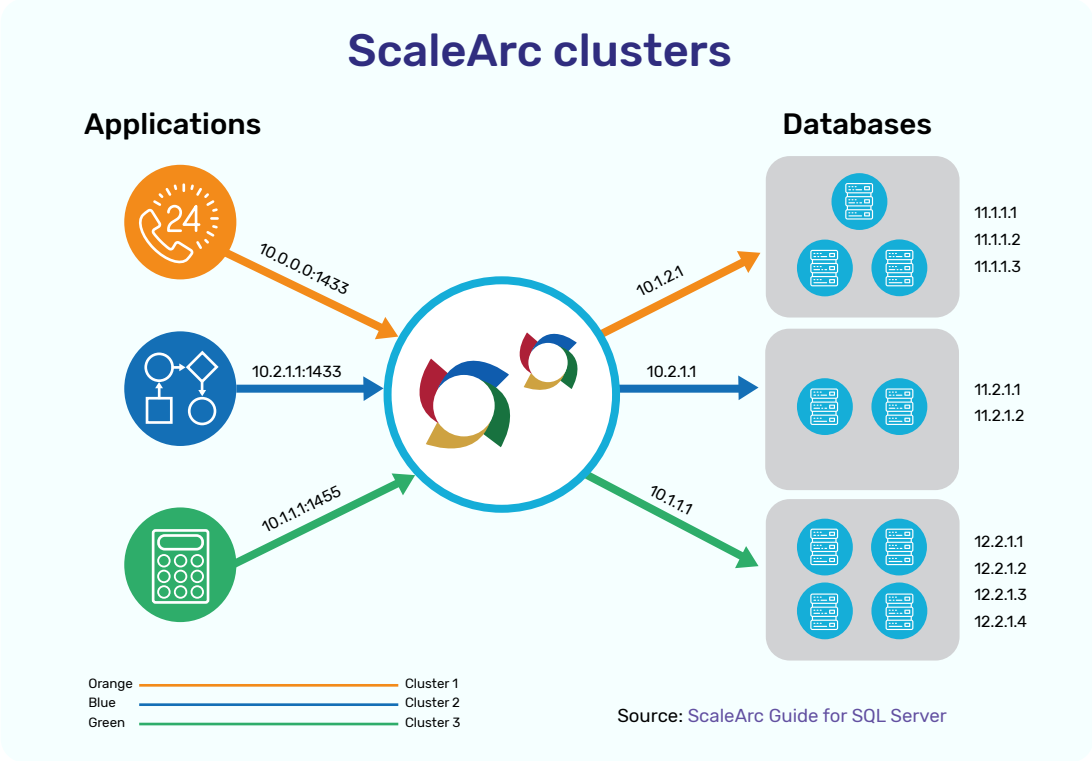
Many organizations avoid downtime by running on-premise and cloud databases in parallel. That way, they can slowly transition functionality to the cloud. For example, they'll migrate their old data to the cloud database and then start writing to both databases functionality. If there are no issues and both databases are in sync, they can later switch over read queries as well. The problem is that it's complicated to partially roll over data functionality if organizations can't efficiently route read and write traffic to specific databases.

Even if organizations switch over their database traffic gradually, they can still run into issues. In many cases, DBAs won't have the ability to quickly roll back when things go wrong. Data and application logic are often tightly coupled, so switching to another database during a failover without code changes may not be an option and could lead to application errors. Many organizations lack the ability to modify their data infrastructure in real-time, and this makes migrations risky.

Finally, many IT teams lack transparency during a database migration. Successfully transitioning to the cloud requires in-depth insights into the data infrastructure's performance and a clear audit trail for accountability. The thought of a database migration without reliable monitoring and centralized logging capabilities holds many enterprises back from making the move at all.

Operating Cloud Databases Efficiently

Transitioning databases to the cloud and operating them efficiently afterwards doesn't need to be difficult. Using database load balancing, organizations can gradually transition to the cloud and manage their database infrastructure without any downtime.

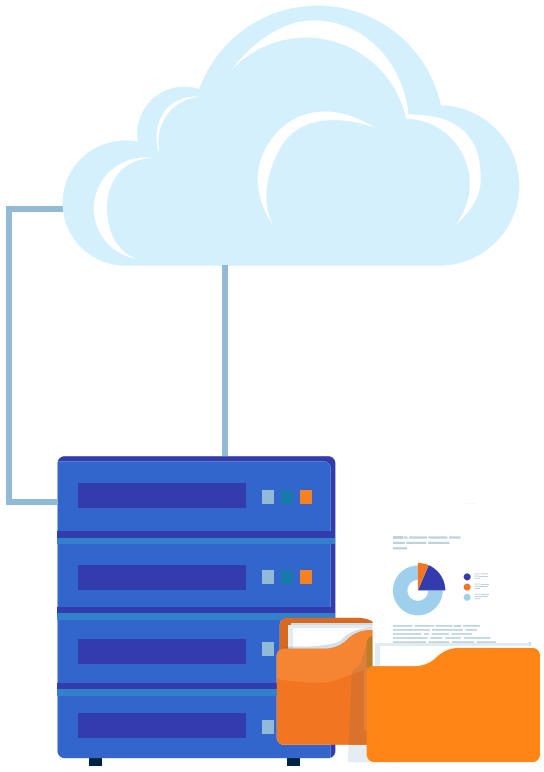


Once implemented, developers can point applications towards the database load balancer and interact with the data tier without knowing anything about the underlying database infrastructure. The application is completely decoupled from data, so DBAs can make changes to the database infrastructure without requiring code changes on the application side as well.

That means DBAs can gradually shift individual database nodes in the cluster to a new vendor or cloud provider without impacting application performance. There's no need for planned downtime or massive migration events because the load balancer can gradually route traffic to certain databases based on predetermined criteria.

In addition, if there are any issues with a particular database, DBAs can quickly remove the node from the cluster. That means the migration can be quickly and safely rolled back when necessary. DBAs can configure failover criteria to automatically reroute traffic from faulty database nodes without resulting in application errors.

A database load balancer also brings greater efficiency. Cloud servers can scale up quickly and efficiently, so organizations can optimize their computing resources by consolidating database schemas into a single data cluster. Database load balancers can also be configured to automatically replicate certain databases when necessary to handle traffic spikes. While cloud databases can handle replication themselves, the database load balancer has a full picture of computing resources across multiple vendors and database technologies. That way, organizations can harness the capabilities of on-demand infrastructure without over-provisioning resources.



Consider ScaleArc

SCALEARC

Organizations ready to make the shift to cloud databases should consider ScaleArc to streamline the transition. The database load balancing software sits conveniently between business applications and cloud databases. That way, developers can point the application towards a single connection and interact with data without worrying about the database infrastructure.

ScaleArc can understand multiple SQL dialects, which allows it to analyze specific queries and dynamically reroute traffic to separate database nodes without compromising transactions. This gives DBAs peace of mind when scaling and servicing the database infrastructure. Dynamic traffic routing also reduces or eliminates downtime, which can contribute to cost savings.

Moreover, ScaleArc can intelligently audit database queries at the SQL level, ensuring that they're valid before running them against an actual database node. The load balancer can also analyze traffic spikes to allocate resources accordingly and minimize the impact on end-users. That means ScaleArc keeps mission-critical business applications running efficiently by ensuring data is available and accessible.

About ScaleArc

Every organization considering a transition to the cloud should opt for zero downtime. ScaleArc can not only ease the transition, but also ensure organizations make the most of the cloud once they've made the move. Contact DevFactory to learn more about managing cloud databases with ScaleArc.