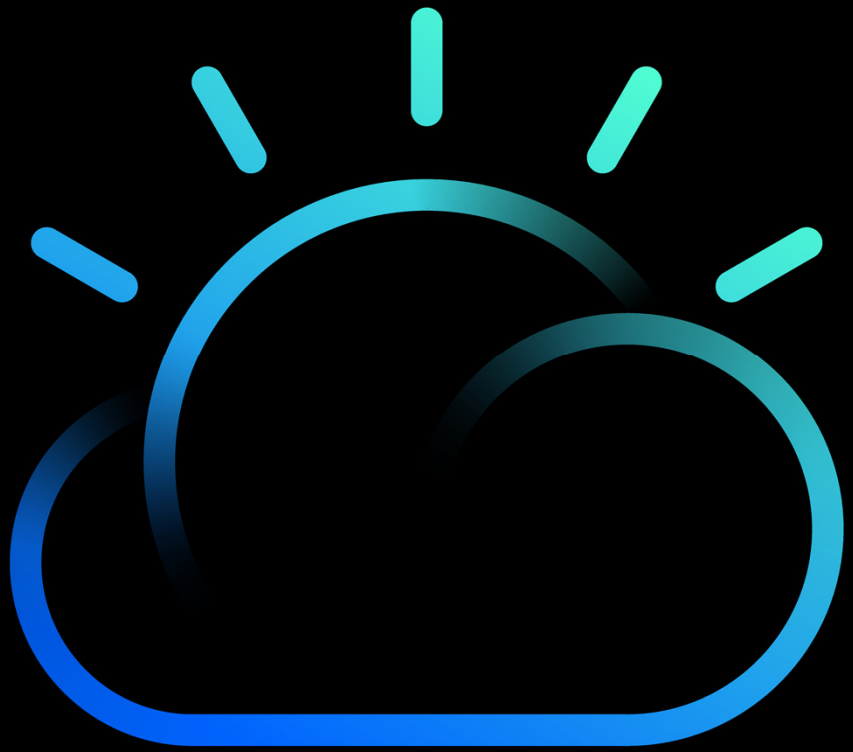
IBM Db2 to Db2 on Cloud

Simon Lightsone, Jerry Mathew
Product Management Team



IBM Cloud + AWS

1. Understanding Cloud

Why should you chose to move to cloud? What advantages do you gain from a cloud environment on a strategic level?

2. Understanding Db2 on Cloud

Why Db2 on cloud is the organic choice for existing Db2 users

3. Total Cost of ownership

On prem vs cloud. Db2 on cloud vs competitors.

Benefits of Cloud

Pay for the resources you use

As opposed to on-prem, customers have the ability to pay for usage and scale up/down as needed.

Agility and speed to innovation

With the wide range of services available on cloud, building systems is easier. Cloud shortens the journey from ideation to implementation – helping you compete in the market place!

Lower maintenance

Because cloud software is hosted for you, you don't need to worry about the maintenance of your software or the hardware it resides on, compatibility and upgrades are taken care of by the cloud service provide

...And much more!

Db2 on Cloud

IBM Cloud

aws

a fully-managed, high performance, highly available cloud transactional SQL database

Our value proposition:

1. ***Save time by deploying Db2 on the cloud vendor of your choice with a click of a button***
2. ***Help database administrators by taking care of the back-end operational tasks***
3. ***Reduce total cost of ownership by upto 83%* compared to on-prem***

**Calculations provided on slide 7*

Deploying Db2 on your own – the current process

1 → **2** → **3** → **4** → **5**

Procure Db2 licenses and infrastructure separately

Enterprises buy typical Db2 on prem licenses and procure appropriate hardware. The enterprise is responsible for setting up and maintaining the infrastructure.

Deploy Db2 on VM's or K8'S

Enterprises can either install Db2 on VM's or using Kubernetes. Both of these options require the in-house technical team to gain expertise in new areas and slows down the process of getting the system up.

Understand how to set up HA and DR – then implement it.

Enterprises are left to architect their own solutions on how to maintain a highly available system. Implementing the solution, taking into account geographical isolation and seamless failover, is challenging.

Set up security and compliances

Enterprises are left to understand and manage their own security measures, and seek compliances for their system to satisfy industry/government requirements.

Lot of day to day manual labor and maintenance

Once the system is set up, enterprises are responsible for the following tasks – (i) software updates (ii) security patches (iii) backups (iv) networking

… these steps can take anywhere from 4-8 months with limited ability to scale

Introducing Db2 on cloud – a DBA's best friend

1 ***Deploy Db2 on cloud on either AWS or IBM Cloud and start working on your database.***

We provide:

- High Availability
- Rolling Updates
- Backups
- Disaster Recovery
- Instant scale up/down
- Security
- Hardware
- Networking

… and much more!

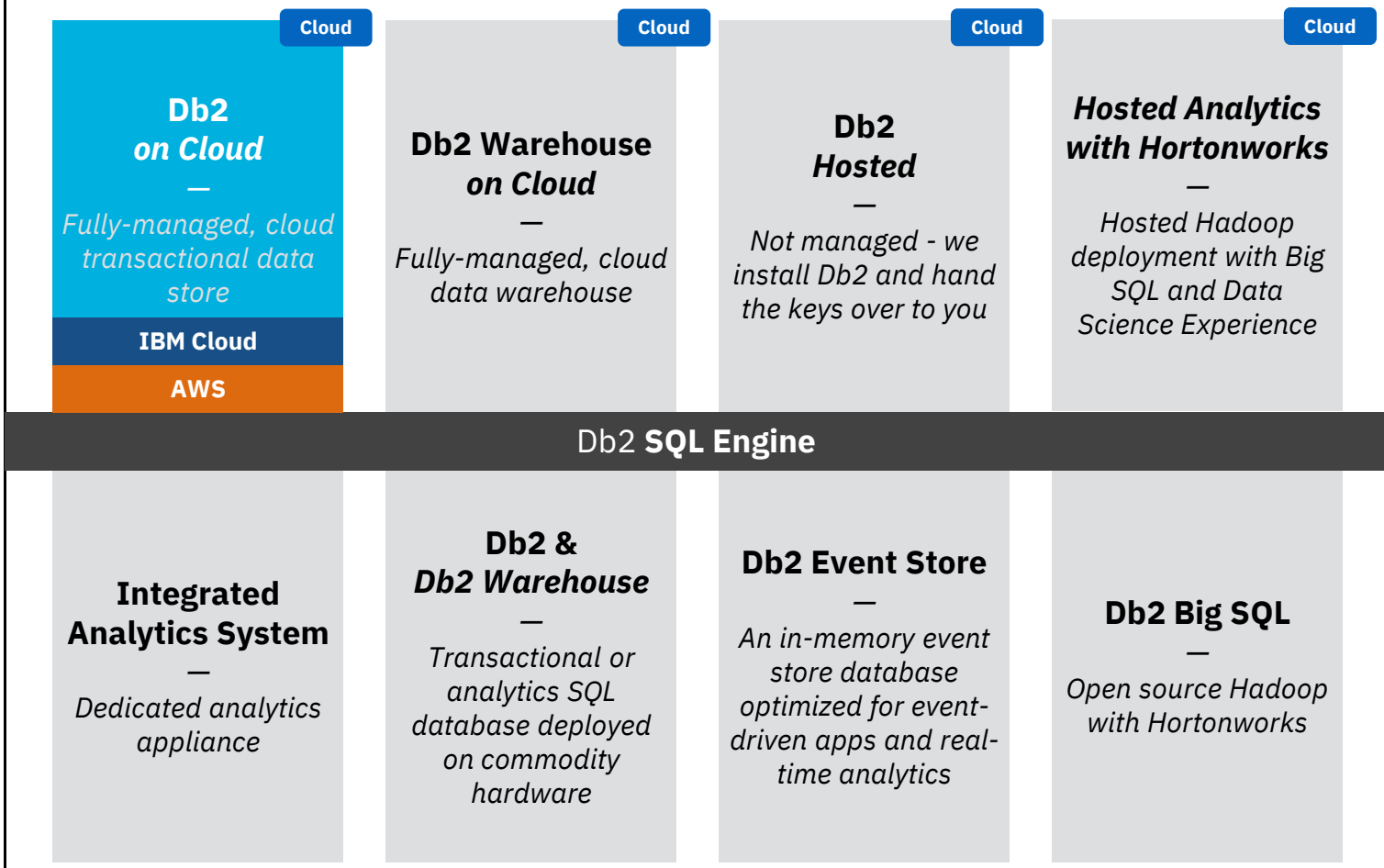
Reduce your total cost of ownership by upto 83%

	Db2 on Premise (AESE)	Db2 on Cloud (IBM Cloud)	Db2 on Cloud (AWS)
Db2 cost per core/year	$7,800	$2,268	$7800
Server* cost per core /year (hardware + rack cost of ~$150k over 3 years for 12 core system)	$4,000	Included	Included
Storage Cost*	$4USD/GB	$1USD/GB	$1USD/GB
Support Cost/year*	$500	Included	Included
Network Cost per core* /year ($63,000 over 3 years for 12 core system)	$1000	Included	Included
Average Cost/Core	~$13,300	$2,268	$7800
Cost comparison of 10core/200GB Db2 Database/year	**$140,800**	**$10,284**	**$80,400**

*Fully loaded cost

Our family of **Hybrid Data Management** solutions built on the **Db2** common SQL engine

Write your SQL once deploy against any form factor
run anywhere



IBM

Db2 on Cloud

Fully managed
by our DevOps team 24x7x365

Highly-available
99.99% uptime with high availability node

Scalable & elastic
with independent scaling of storage & compute

High performance and easy to use
Powered by the Db2 engine

Reliable
Offsite DR node and 14 day backup

No vendor lock-in
Now available on AWS and soon to be on Azure

Choose from two
cloud deployment options

IBM
Cloud

The future is choice

Fully-managed

by our world-class DevOps team, 24x7x365

Our DevOps team is composed of experts in managing Db2 and cloud-based offerings.

We take care of...

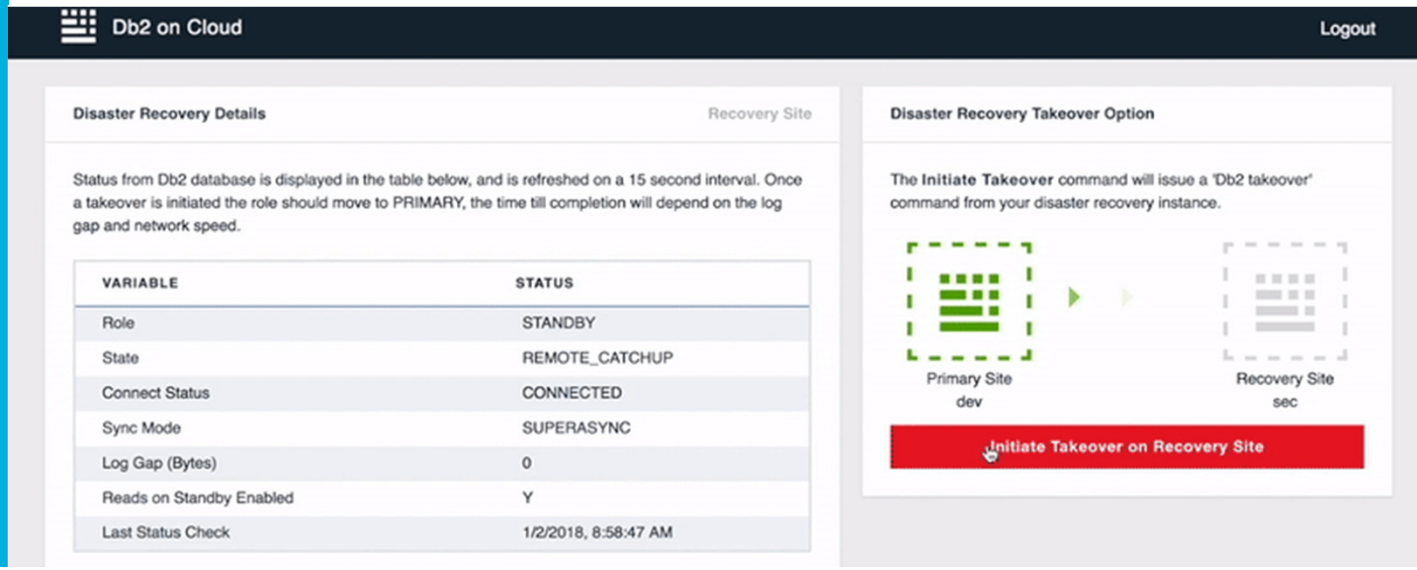
- operating system updates and patches
- rollout of new offering features, including engine updates and console enhancements
- self healing for unexpected software and hardware failure
- automated daily backups for the worst case scenario

...we're on-call 24x7x365, so you can focus on more important things

High Availability and Disaster Recovery

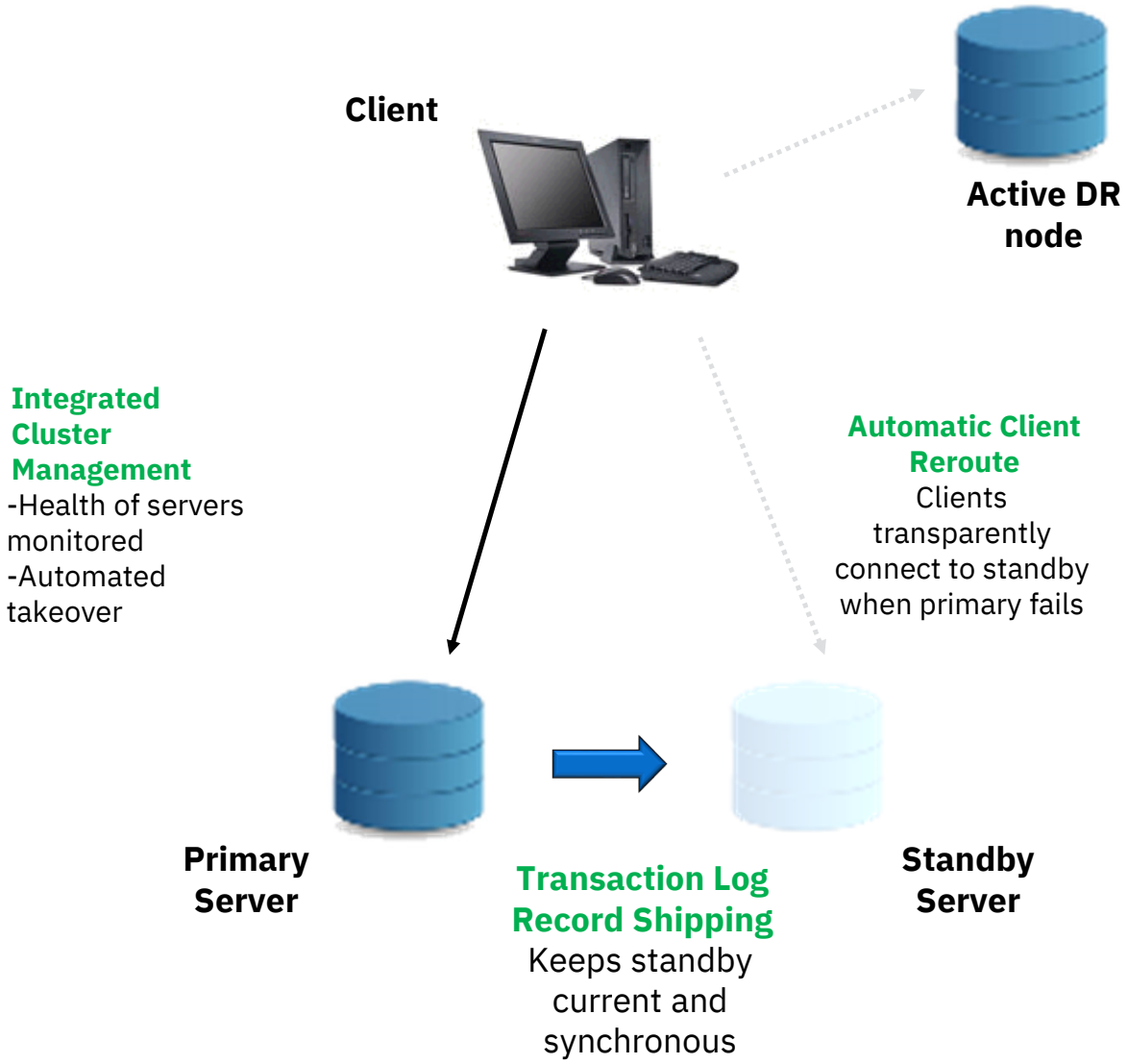
Up and Running, even when disaster hits to ensure business continuity

99.99% Uptime SLA
&
Disaster Recovery
Failover with 1-click



High Availability Configuration

Up and Running, even when disaster hits to ensure business continuity



Scalable

with independent scaling of storage and compute, with slider-bars

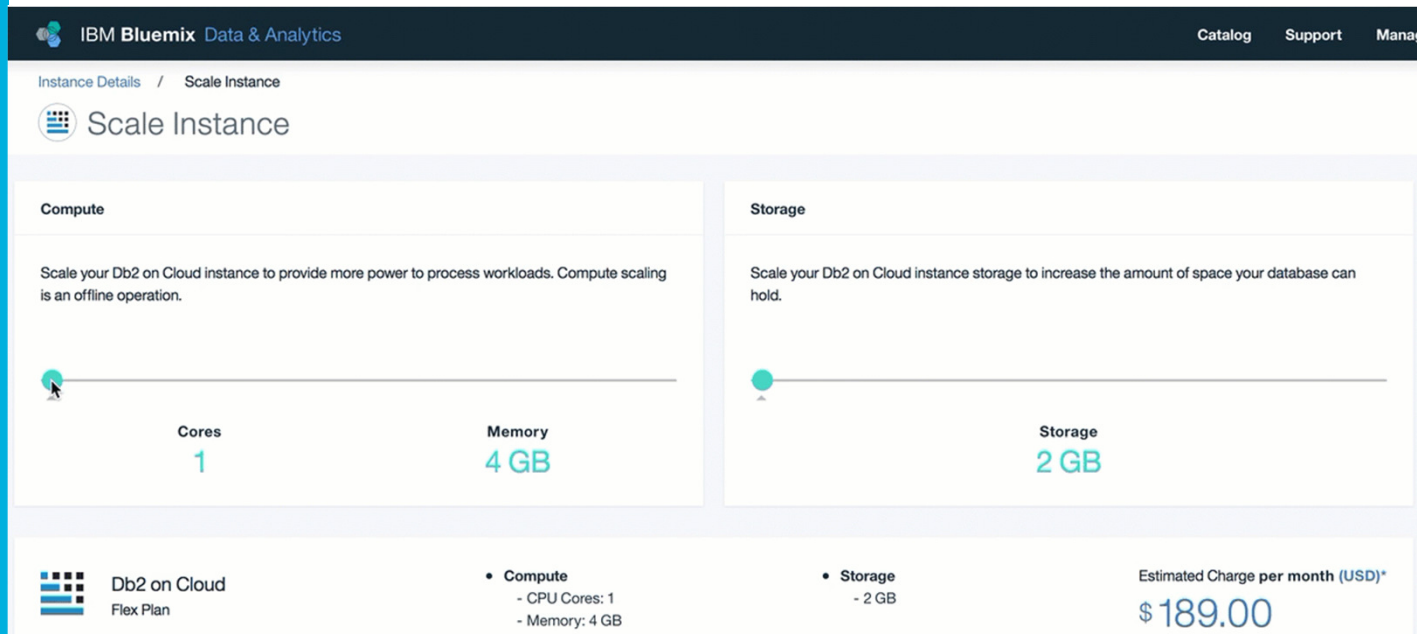
Scale your compute
during peak demand or when demand falls

Ramp up your data storage
as you data needs grow

Sit back and relax.
You don't need experts.

<40 mins

For HA couple



Other key features

Homogeneous data management

With the same engine for on-prem and cloud workloads, no code has to be changed

Easily scales with your growing business

Start with the lite plan, deploy with one click. Gradually expand to flex or precise performance depending on your business needs

Top level security

Data is encrypted at rest and during transit. Certifications include – ISO 27001, 27017/18, HIPAA, SOC2 Type 2, Privacy Shield, GDPR

Control your cloud costs with all-in pricing

No hidden fees. No surprise bill at the end of the month. Pay only for what you use.

GDPR AND EU Cloud

EU Cloud is an IBM Initiative that expands upon GDPR requirements and makes sure EU Data that stays in EU is managed and supported by EU Citizens from within EU. Frankfurt DC supports EU Cloud

Choosing the right plan – IBM Cloud

	Lite	Flex	Precise Performance	Hybrid Flex
Use case	Simple use cases	Dynamically scale both RAM and storage with flexible pricing. Used for production workloads.	Used for workloads that require high performance	Similar to flex but purchased using HDMP
Base Cost	**Free!**	$189/core	Starts at $250/core	$189/core
Compute	200MB	4GB/core + $13/GB	8GB – 1TB RAM	4GB/core + $13/GB
High Avail.	-	$189/core	Starts at $250/core	$189/core
Storage	-	2GB included + $1/GB	500 GB – 11TB	2GB included + $1/GB
Disaster R	-	$189/core	Starts at $250/core	$189/core

SUMMARY
Db2 on Cloud
For AWS
Technical Preview

Core Specs & Prices

- *Same price per core as Db2 for HDMP Monthly. ($650 per core per month.)*
- *4 core minimum.*
- *Includes 100 GB of storage*
- *Extra storage $1 per GB*
- *High Availability doubles cost of cores and storage*
- *Includes 1TB of data transfer free. After that, same rates as Amazon apply.*

Details

- *Runs Db2 Advanced. (Aka Db2 AESE.)*
- *On request, each customer can obtain a private VPC just for them, so there is no risk of neighbors causing issues.*
- *Very fast provisioned IOs.*
- *Standard Edition coming in 2020 for lower-end or development workloads.*

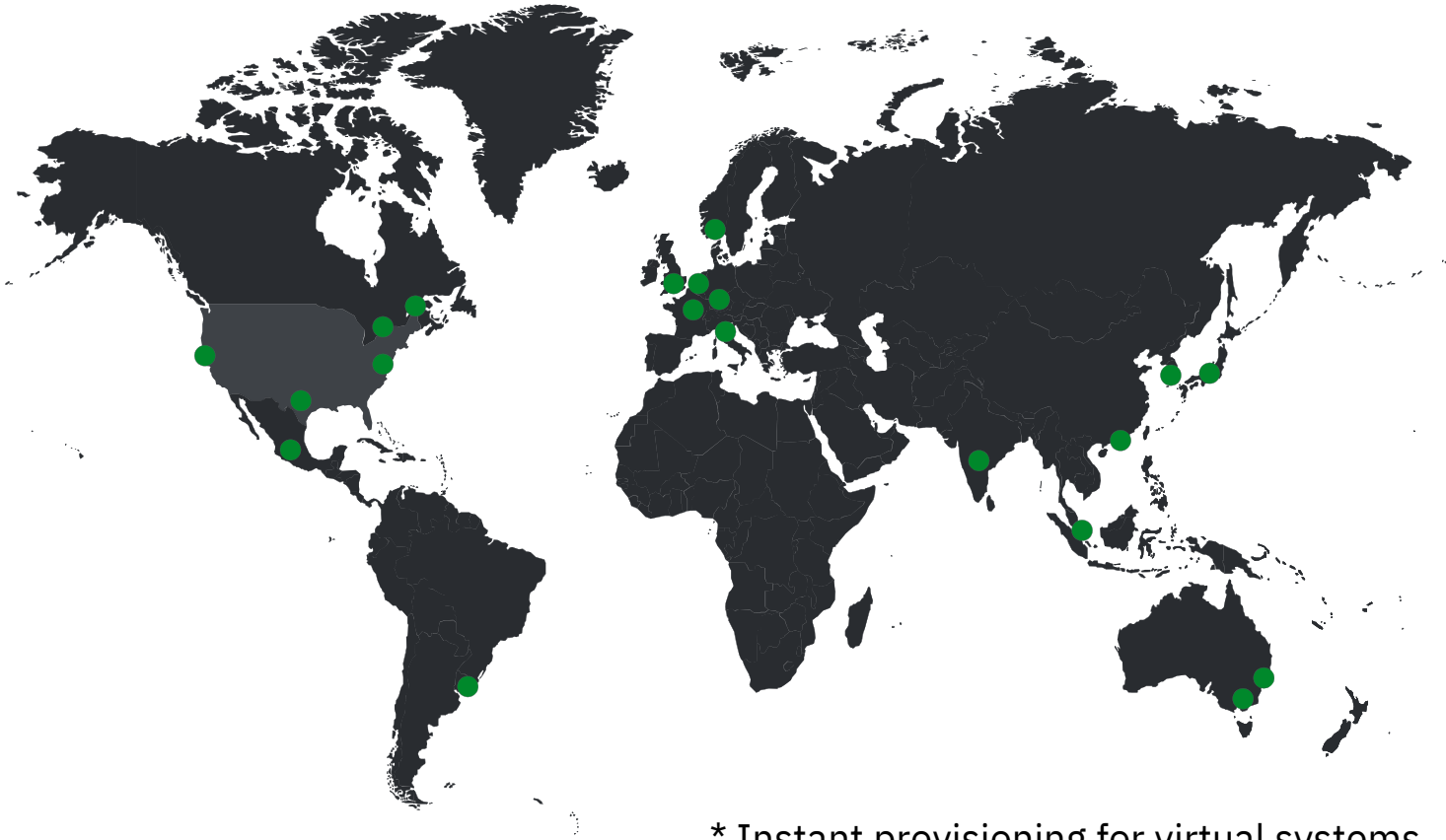
Availability Zones: 20 Data Centers across the World

- Dallas *
- Washington DC *
- San Jose
- Toronto
- Montreal
- Queretaro
- Sao Paolo

- London *
- Amsterdam *
- Paris *
- Milan
- Oslo

- Frankfurt**

- Sydney *
- Melbourne
- Singapore
- Hong Kong
- Seoul
- Chennai
- Tokyo *



* Instant provisioning for virtual systems
** EU Cloud

What makes Db2-on-cloud the organic choice for existing on-prem Db2 users?

Same Db2 engine – and that means a lot…

1

Homogenous Data Migration

Move your on-prem workloads faster to cloud. With the same Db2 engine as on-prem, there's little change to in database code or SQL query optimization.

2

BYOL Program

Existing Db2 users get discounted prices for Db2 on cloud. Program is designed to make sure our customers are not over paying.

3

Available on multiple clouds – no vendor lock in

With Db2 on cloud now on AWS and IBM Cloud, we have one message for our customers – we go where you go.

4

Lower Total Cost of Ownership

Fully managed offering means that less personnel is dedicated to managing the database itself, freeing up resources for core business workstreams for our client

5

Unified console across cloud and on-prem

With the same user experience as on-prem console, no resources are wasted in re-training DBA's or engineers

Reduce your total cost of ownership by upto 83%

	Db2 on Premise (AESE)	Db2 on Cloud (IBM Cloud)	Db2 on Cloud (AWS)
Db2 license Cost per core/year	$7,800	$2,268	$7800
Server cost per core /year (hardware + rack cost of ~$150k over 3 years for 12 core system)	$4,000	Included	Included
Storage Cost	$4USD/GB	$1USD/GB	$1USD/GB
Support Cost/year	$500	Included	Included
Network Cost per core /year($63,000 over 3 years for 12 core system)	$1750	Included	Included
Average Cost/Core	~$14,000	$2,268	$7800
Cost comparison of 10core/200GB Db2 Database/year	**$140,800**	**$10,284**	**$80,400**

Same experience, everywhere

Db2 Unified Console

Build & Built for your client

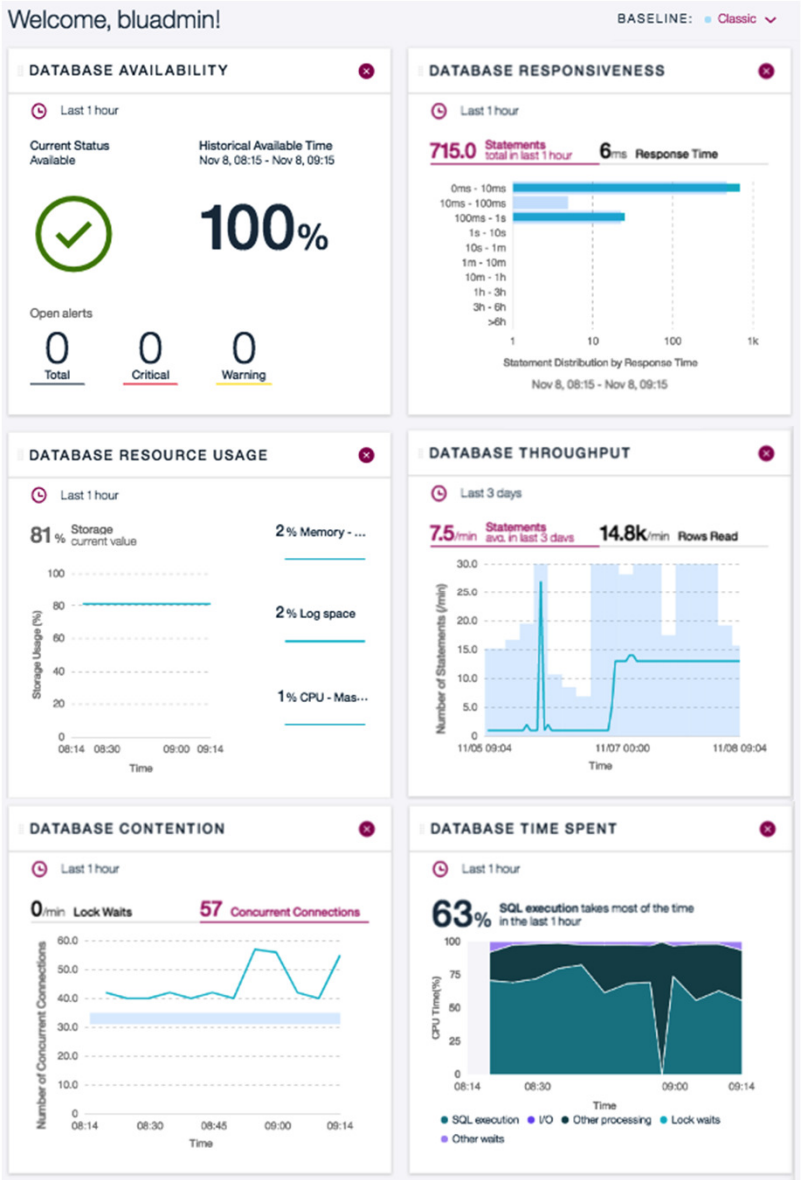
You can extend and join each of your consoles through a single enterprise console. Open APIs, SNMP, and a composable interface make integration easy. Security, HA and recoverability are built in.

The same experience from ground to cloud

The same user experience means lower training costs, higher productivity and greater project success across your IBM hybrid data enterprise.

Walk up and use

There is nothing to install to get started. Each offering includes the same easy and intuitive experience for new and demanding users.



How easy is your product to use?

PC™
PCMAG.COM
EDITORS' CHOICE

EDITOR RATING: ●●●●○ EXCELLENT (4.0)

"IBM Db2 on Cloud is a dream Database-as-a-Service (DBaaS) solution for developers and business analysts because they can use it without the assistance of a database administrator, even with minimal skills."

knowis

A Business Partner in Germany

"Db2 on Cloud offered the opportunity to have the data center in Frankfurt and all the management and support to be done by European citizens located within European Union. There was no other competitor who could offer that for us. "

Over 50% of users give us an NPS score of 9 or above

"It's very easy to use and feature rich.

Desmond L. Feb 17th, 2019

"DB2 is extremely robust, user friendly and easily accessible with Python."

Tendayi S. April 17th, 2019

What is included in your “fully managed” service?

IBM **Cloud**

	Db2 on Cloud	**Db2** Hosted
Rolling Updates	IBM Managed	Client Managed
High Availability	IBM Managed	Client Managed
Backups	IBM Managed	Client Managed
Disaster Recovery	IBM Managed	Client Managed
Scale up and down	IBM Managed	Client Managed
SW Security	IBM Managed	Client Managed
Hardware	IBM Managed	IBM Managed
Networking	IBM Managed	IBM Managed
Root Access	None	Yes

	Db2 on Cloud -AWS	**Db2** License
Rolling Updates	Managed	Client Managed
High Availability	Managed	Client Managed
Backups	Managed	Client Managed
Disaster Recovery	Managed	Client Managed
Scale up and down	Managed	Client Managed
SW Security	Managed	Client Managed
Hardware	Managed	Client Managed
Networking	Managed	Client Managed
Root Access	None	Yes

IBM Db2 on Cloud – *DBA Responsibilities*

DBA Responsibilities	Traditional role	Role with Db2 on cloud
Designing schema, access patterns, locking strategy, SQL development, and tuning.	✓	✓
Database modification	✓	✓
Optimizing SQL queries	✓	✓
Generating needed ad hoc reports by querying from the database	✓	✓
Proactive performance tuning	✓	✓
Controlling user access to the database	✓	✓
Parameter configuration and tuning	✓	✓

*Db2 on cloud **helps** DBA's manage databases and focus more of their time on the application and business as opposed to the operational tasks of maintaining a database*

But Amazon has its own cloud database offerings.

How are you different?

Compare to RDS, we are fully managed and provide better care

	Db2 on Cloud for AWS	AWS RDS	DIY on AWS using your own Db2 License
Use case	Deploy & full autopilot	Framework to help you deploy & manage	Set up and maintain Db2 on AWS yourself
Autonomous & Failover			
Failover	Smooth failover including transfer of large transactions. (HADR+ACR).	Can't transfer large transactions; often needs downtime.	Customer must manage their own failover and orchestration.
Autonomous Healing	Over 100 health checks. Autonomous healing when possible.	Management framework so you can do it yourself.	Customer must set up own tools.
High Availability	Robust, during large transactions via db2s active connection reroute. Smooth rolling updates.	Transactions will need to roll back. Even serverless the transactions are cut. (Customer must retransmit the whole transaction)	Customer is responsible
Support			
What happens when database fails?	If health checks fail and cannot autonomously heal, IBM devOps staff gets system back online.	Customer is responsible.	Customer is responsible.
Expertise	DevOps by IBM Db2 specialists, familiar with Db2 on Cloud & IBM stacks.	Db2 not available with RDS. Not as specialized with Db2 or IBM technologies.	Customer's own teams, plus Db2 on-prem support.

Technology: IBM Db2 on Cloud *vs everyone else*

Dimension	AWS Aurora	Azure SQL Database	IBM Db2 on cloud
Hardware	EC2 virtual machines	Virtual machines	**High-performance virtual machines on IBM Cloud or EC2 virtual machines on AWS**
Technology	PostgreSQL 8.0.2 forked in 2005	SQL Server	**IBM Db2 technology developed by IBM Research**
Application & data portability between OLTP & OLAP, private & public cloud	No	Yes	**Yes**
Independent scaling of storage & compute	Yes	Yes	**Yes**
Backup & restore	Yes	Yes	**Yes**
SLA	99.95%	99.99%	**99.99%**
Regulatory compliance	HIPAA, SOC 1/2/3, PCI, ISO 9001, 27001, 27017, 27018, FedRAMP, DoD CC SRG, MTCS, C5, K-ISMS	ISO 9001, 27001, SOC 2 Type 2, FedRAMP, GxP, HITRUST, PCI, MCTS	**HIPAA, ISO27001, 27002, 27017, 27018, SOC 2 Type 2**

*We have a **highly-performant** Cloud transactional database, offered at a **highly competitive price point**, and approaching **feature parity with our fiercest competitors**.*

IBM Db2 on Cloud *Competitive Differentiators*

Dimension	AWS Aurora	Azure SQL Database	IBM Db2 on cloud
Ease of Use	• Amazon has more complex interface. • Very complex billing; ends up being more $$$ than expected. • Requires desktop SQL editor.	• Azure SQL needs Visual Studio. • Db2 on Cloud price model is easier to understand. • Many "gotchas" like disconnections when above resource limit.	• No complex cloud configurations. • No desktop tools to install. • Web console includes SQL editor and tools.
Performance	Benchmark shows we're about 2X faster per dollar: https://ibm.biz/db2oncloud-aurora-benchmark-17 (Can share publicly)	Db2 on Cloud is far faster per dollar. (Especially baremetal Precise Performance plans.)	Faster per dollar & fastest overall.
Db2 Engine	-	-	DB2 technology is trusted by 97 of the world's top 100 banks. • Oracle compatible, rich SQL PL language, Time Travel Query for audit, Data Virtualization, column access control etc
Uptime	• 99.95% uptime SLA • Customers are expected to monitor and ensure their database is running.	• 99.99% uptime SLA • Undocumented or unclear level of Microsoft devOps monitoring & commitment if an individual database crashes.	• 99.99% SLA (with HA) • Over 100 health checks • If system is down, and cannot autonomously heal, IBM devOps will work to get system back online.

*We have a **highly-performant** Cloud transactional database, offered at a **highly competitive price point**, and approaching **feature parity with our fiercest competitors**.*

How am I going to migrate my data to the Cloud?

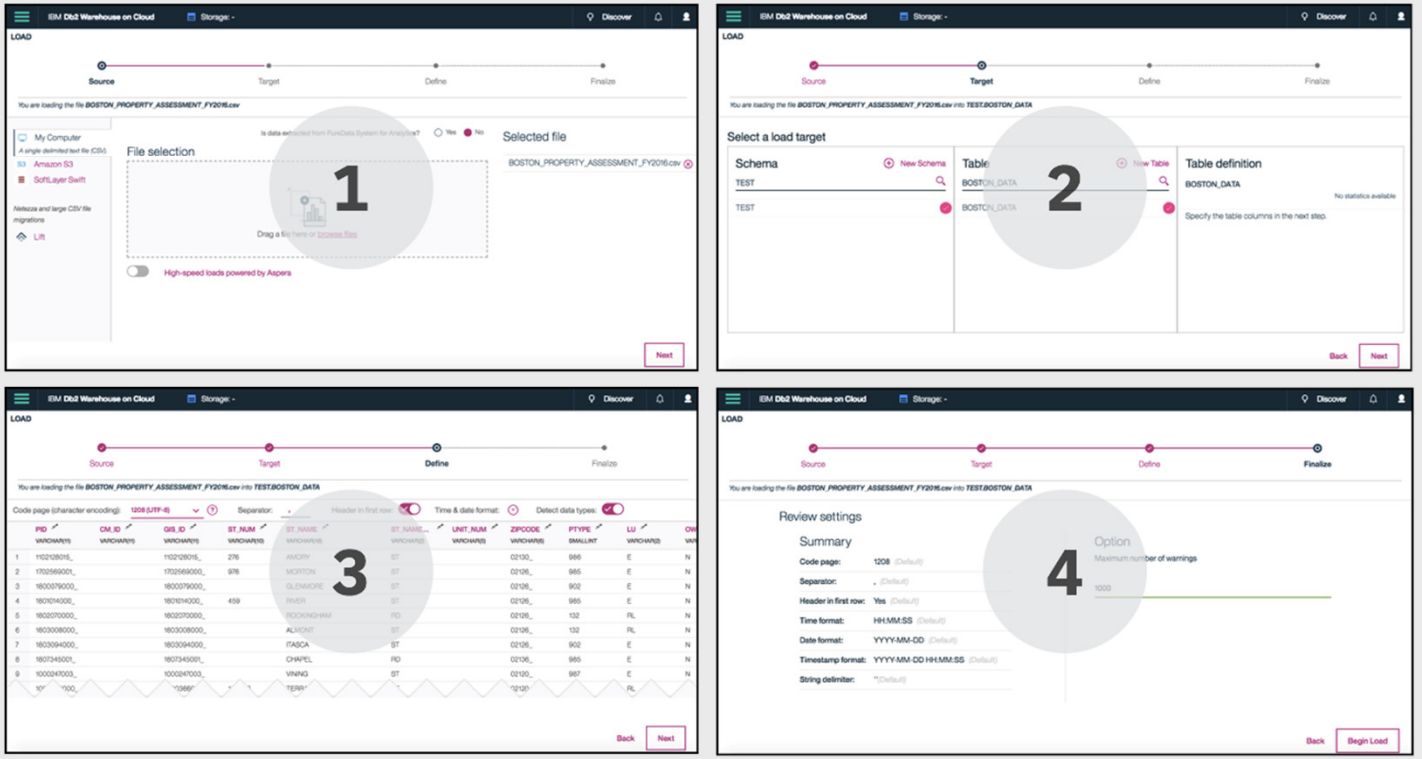
Simple file load through the built-in console

Pros

really easy to go from a CSV file data set to running SQL queries

Cons

one file at a time file size limits



Choose Load, My Computer and drop a CSV file. Check the column type mapping and hit go.

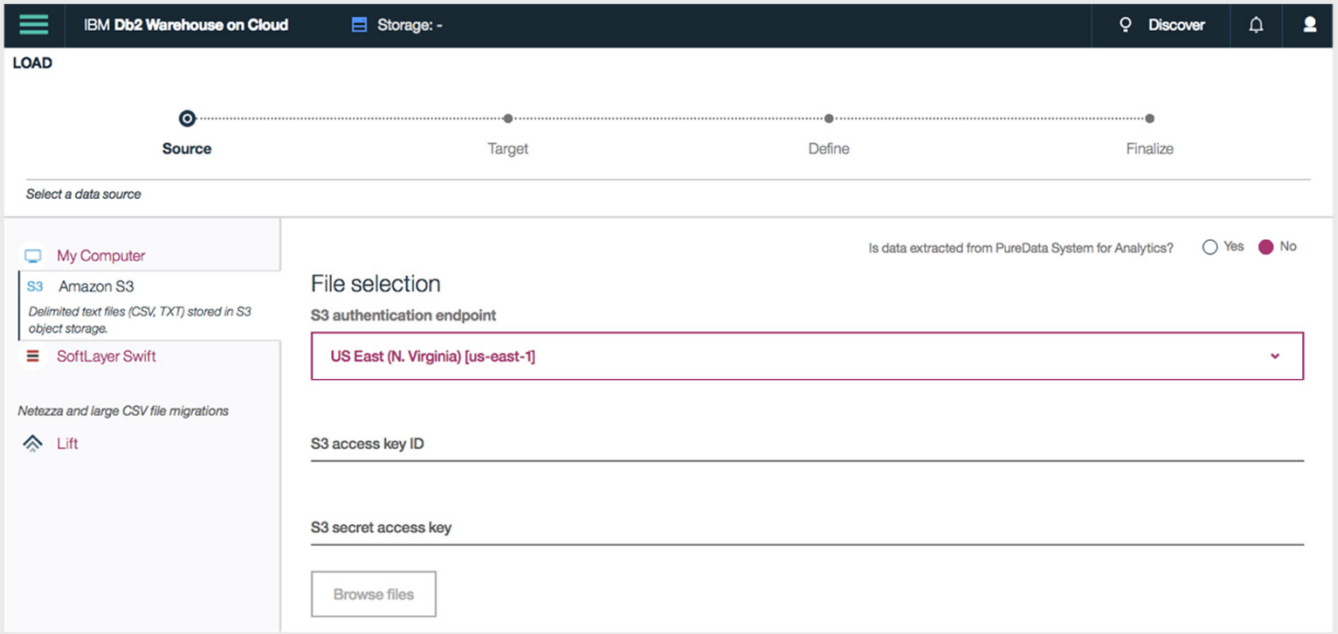
Pulling data from our IBM Cloud Object Storage with external tables

```
INSERT INTO BOSTON_PROPERTY_ASSESSMENTS
SELECT * FROM EXTERNAL 'BOS_PROP_ASSESSMENTS.csv'
USING(s3('s3-api.us-geo.objectstorage.service.networklayer.com',
'sJ8uHeupJR4roOFy7NDh',
'xwg72FVrEA47qu09L4tyY3HxksY0sy6yeFZwDzTs',
'property_files_bucket' ));
```

Pros	***Cons***
programmatically load large data files into existing tables via SQL (no additional tooling needed)	*not point & click, but that's ok*

Pulling data from AWS S3

Grab data sets directly from an S3 bucket and ingest into Db2 Warehouse on the IBM Cloud



Pros

a simple way to liberate your CSV or TXT files by bringing them over to the IBM Cloud

Cons

one file at a time

Lift data to Cloud from the IBM Integrated Analytics System

Db2W

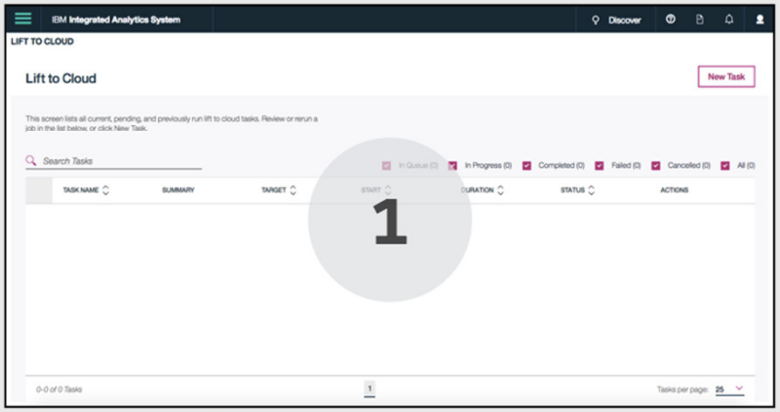
1 Start a new task

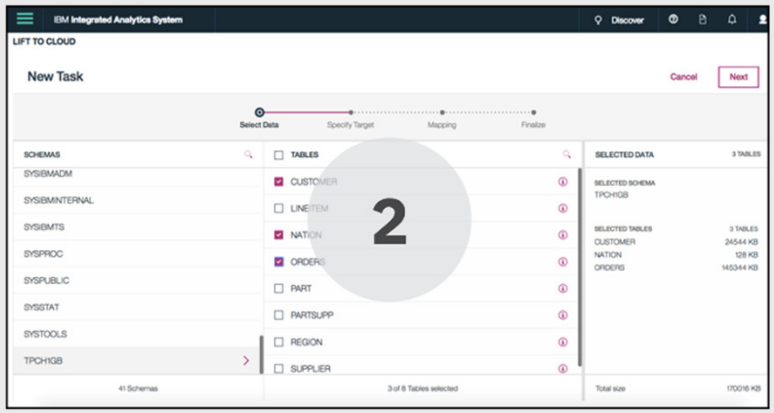
2 Pick the schema and tables

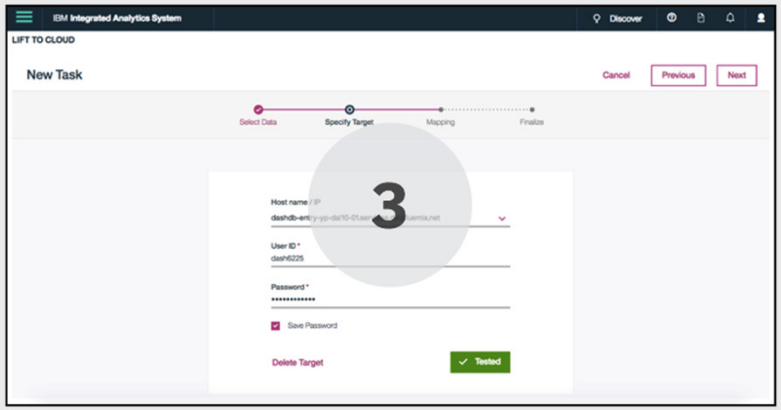
3 Provide target connection info

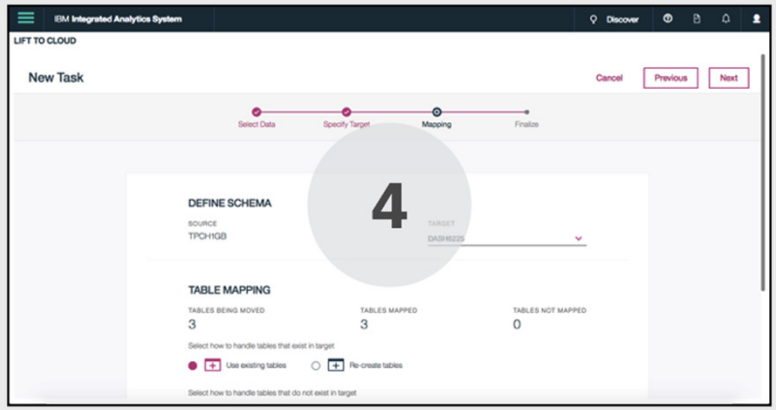
4 Verify table mapping

5 Go









Over-the-wire migration with the Lift CLI

Lift is...

Blazing-fast

Lift uses IBM Aspera under the covers to move your data to the cloud at blazing fast speeds.

Secure

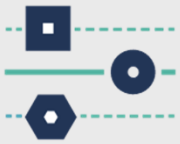
Nobody wants to end up on the front page of the news. Any data moved over the wire to the IBM Cloud is completely secure via a 256-bit encrypted connection.

Free

Who would charge for data movement, anyway? We want you to try our cloud data services. Cost shouldn't be an issue.

Resilient

Automatically recovers from common problems you'll hit during the migration.



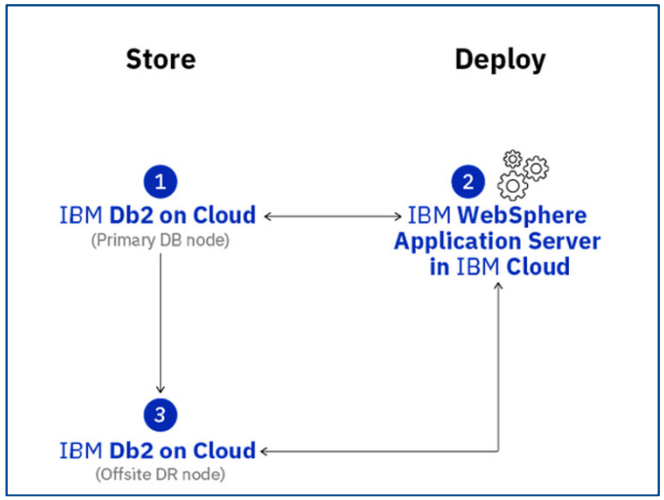
Flexible

Every data migration is split into three steps: extract from source, transport over the wire, and load into target. Run them independently, and on your schedule.

Built for the cloud

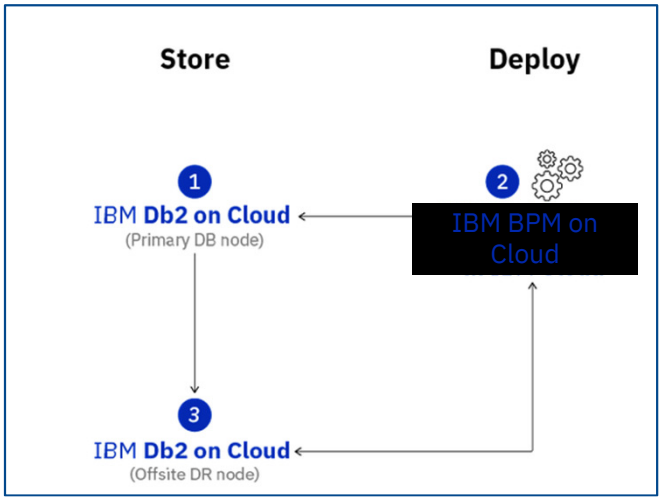
You'll install the Lift CLI only once on your on-premises machine. Updates stream automatically.

Websphere App Server

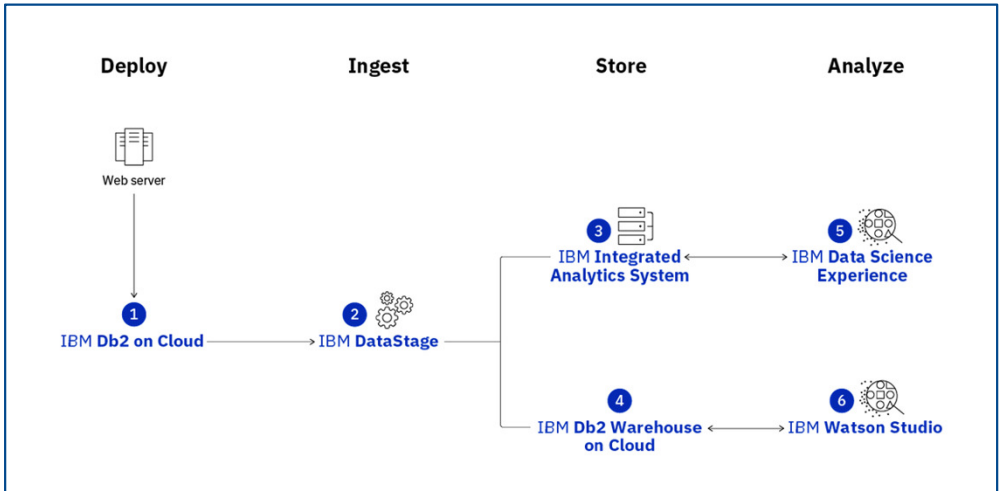


Common Use Cases

BPM on Cloud



Data Science Applications



IBM Db2 on Cloud on AWS

AWS Instance Sizes

Model (Gbps)	vCPU	Memory (GB RAM)
r4.xlarge	4	30.5
r4.2xlarge	8	61
r44xlarge	16	122
r4.8xlarge	32	244