DAT210

Modernize applications using Amazon RDS for SQL Server

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Audience poll

Modernize applications using Amazon RDS for SQL Server

Learn how you can modernize your SQL Server applications on Amazon RDS; use RDS Proxy to make your application more scalable, available, and secure; use Amazon RDS Custom to migrate custom and legacy applications to the AWS Cloud with minimal architectural changes, allowing you to take advantage of AWS managed database services while retaining OS and database control

Agenda

Deployment Options for MS SQL Server on AWS

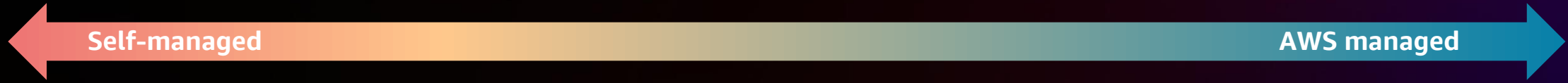
Operating MS SQL Server at scale using RDS

HADR for MS SQL Server on RDS

Modernizing MS SQL Server on AWS

SQL Server deployment options

	SQL Server on Amazon EC2	RDS Custom for SQL Server	RDS for SQL Server
	Self-managed experience	Managed experience (shared responsibility)	Managed experience
	Full control	Full control	No sysadmin / OS access
	All DB engine features	Access all SQL Server configurations	Optimized architecture
	Self managed provisioning, monitoring, backup, restore, point in time recovery	Automated provisioning, monitoring, backup, restore, point in time recovery	Automated provisioning, monitoring, backup, restore, point in time recovery
	Self managed patching	Automated patching	Automated patching
	Self managed high availability	Self managed high availability	High availability & Multi-AZ
	Allows 3rd party apps on DB host	Allows 3rd party apps on DB host	No 3rd party apps on DB host
License Supported	BYOL, License Included	License Included	License Included
Editions Supported	All	Web, Standard, Enterprise	Express, Web, Standard, Enterprise
Versions Supported	All	2019	2014, 2016, 2017, 2019



SQL Server features at a glance

	Amazon RDS	Amazon EC2
Versions supported:	2012, 2014, 2016, 2017, 2019	All
Editions supported:	Express, Web, Standard, Enterprise	All
High availability:	AWS-managed with DBM or Always On support	Self-managed; Always On, Mirroring . . .
Encryption:	Encrypted storage using AWS KMS (all editions); TDE support	
Authentication:	Windows and SQL authentication	
Backups:	Managed automated backups	Maintenance plans and third-party tools
Maintenance:	Automated software patching	Self-managed
Licensing options:	License included only	License included **or** Bring Your Own License
SQL component services:	SSAS (tabular), SSIS (no OS tasks), SSRS	SSIS, SSAS, SSRS, MDS, DQS

RDS Custom Architecture

Concepts and terminology

Automation mode

Controls the Amazon RDS Custom automation such as monitoring, backups, and database status.

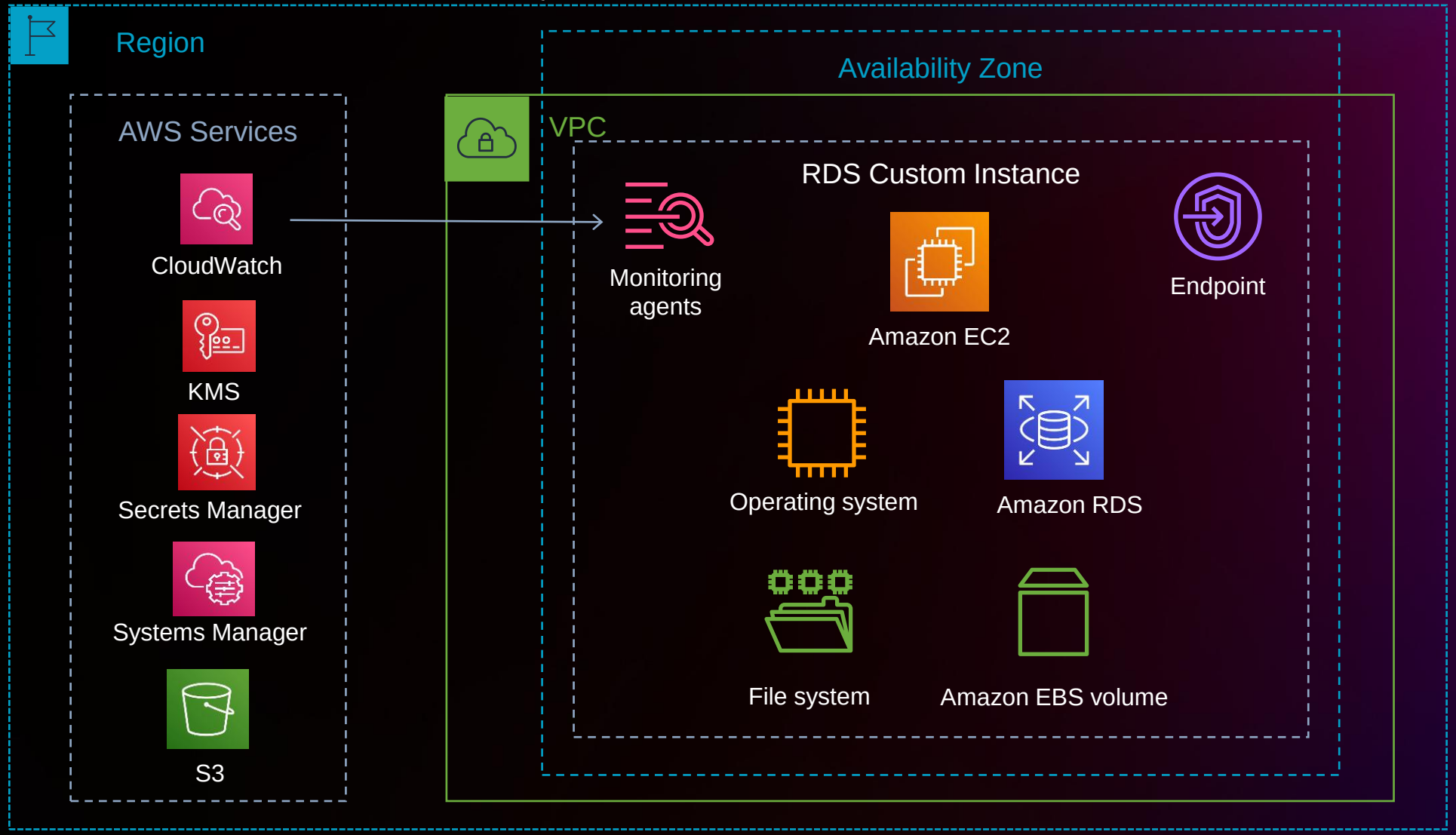
Customers can pause Automation mode when performing customizations to prevent unintended interference with RDS Custom automation

Support perimeter

Determines if a customization breaks our automation (once automation mode is resumed if previously paused).

Customers have full access to the EC2 host. The action is supported as long as the change does not put the database outside of the perimeter.

RDS Custom for SQL Server architecture



Use cases

Granular Control

Install custom drivers, enable features or applications that require elevated privileges

Example: Extended stored procedures, CLR, Resource governor, Linked server (various DB engines)

Lift and Shift Business Apps

Third-party or packaged applications with minimal changes

Example: Microsoft SharePoint, Microsoft Dynamics

Disaster Recovery

Setup DR from a self-managed environment

Example: SQL Server Always On Availability Groups, Replication

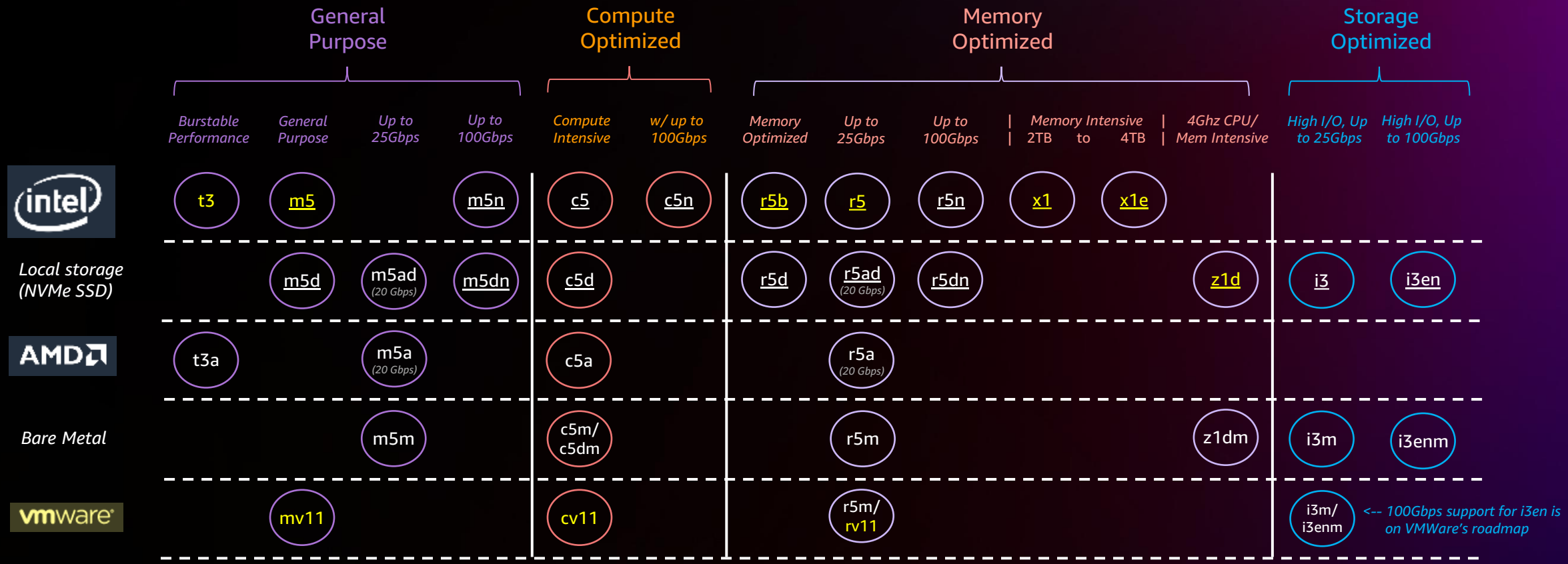
Operating MS SQL Server at scale using RDS

The Right AWS instance type

OPTIONS TO FIT ALL YOUR SQL SERVER WORKLOAD NEEDS

** Instance types that are underlined can be used as Dedicated Hosts*
(With Windows Server BYOL or LI and SQL Server BYOL licensing options for Microsoft workloads)

*** Instance types with yellow font are available to run SQL Server on RDS*
(Windows Server LI and SQL Server LI licensing options only)



Prescriptive Guidance:

- *Aligning the workload type with the instance type's capabilities are critical to avoid overprovisioning and higher compute cost*
- *Avoiding overprovisioning will ensure SQL licensing requirements are not bloated, putting AWS in the best position to compete*

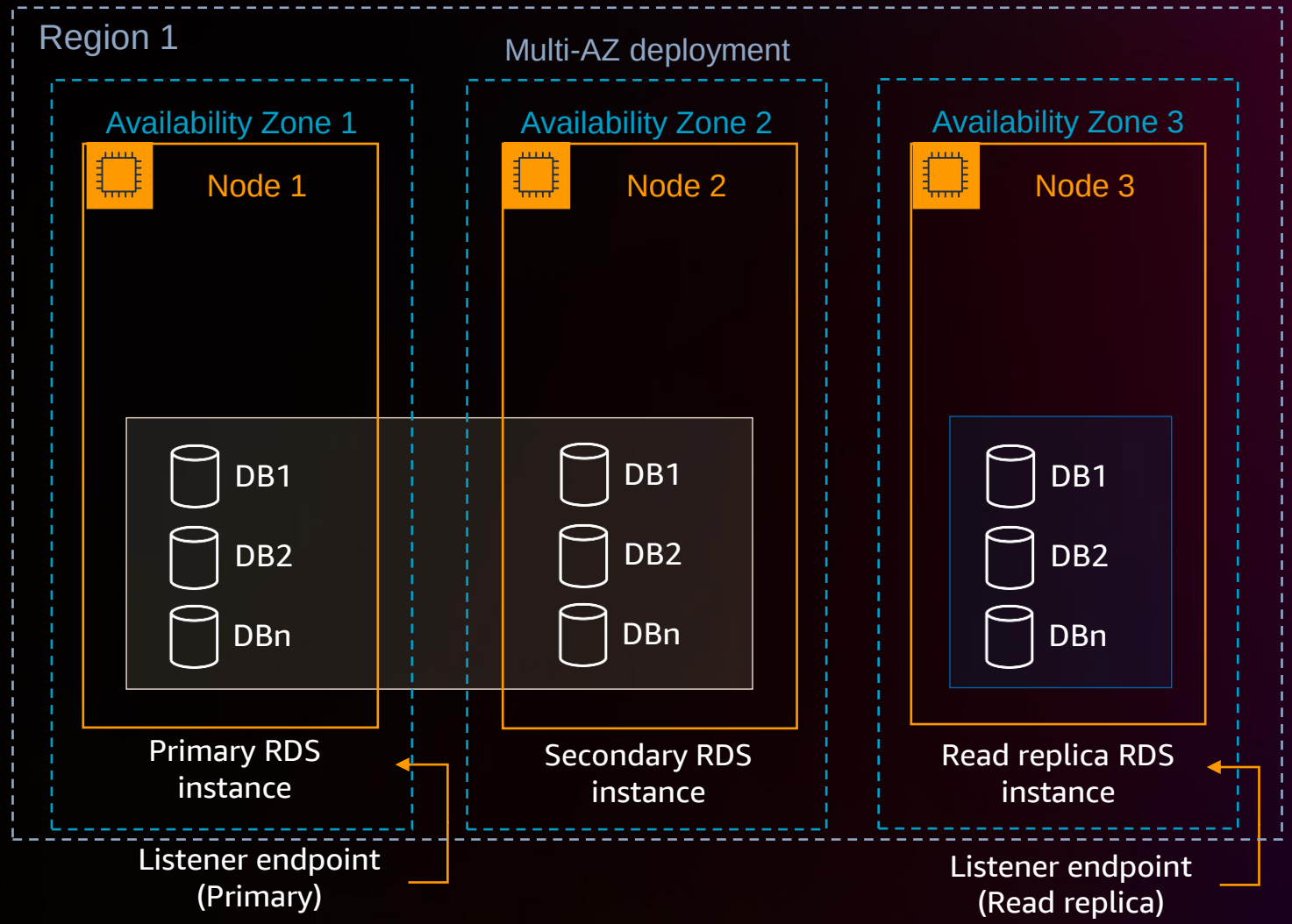
aws

Performance planning

- Change the DB instance class
  - Requires a reboot (or failover in Multi-AZ)
  - Can scale compute capacity with the workload, if practical
- Change the DB storage capacity
  - Can modify allocated storage, storage type, and IOPs
  - Storage size modifications available within minutes
  - Storage performance degraded during optimization
  - Consider storage auto scaling
- Modification options
  - AWS Management Console, AWS CLI, AWS API, and PowerShell

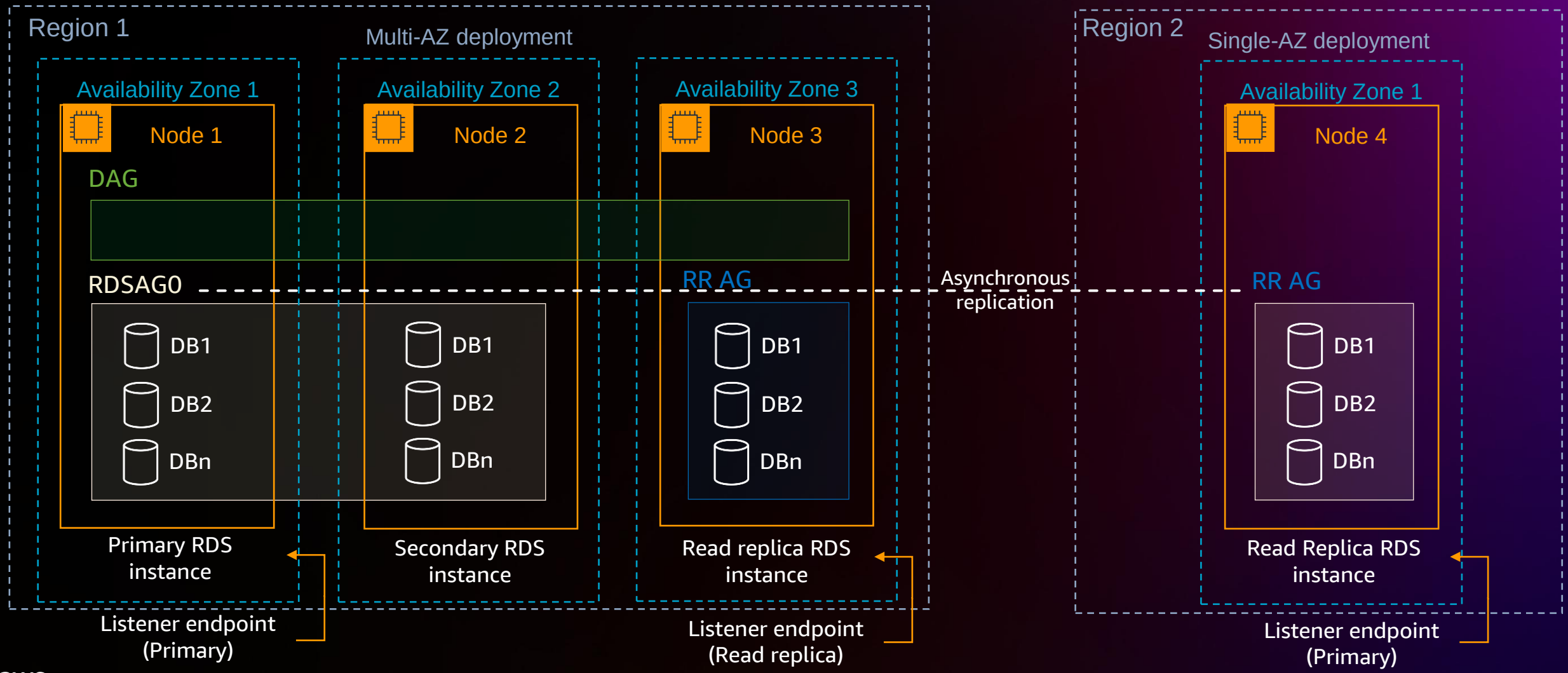
High availability

Cross-Region read replica architecture on Amazon RDS



Disaster recovery

Cross-Region read replica architecture on Amazon RDS



Modernization

Lift and shift, move to managed, or break free?

Value

Time

Migrate: Lift and Shift
(re-host)

- Quickest way to onboard workloads
- Self-managed (i.e. Runs as on-premises)
- Vendor lock-in on commercial databases (e.g. Oracle, SQL Server)

Migrate: Move to Managed
(re-platform)

- Reduce undifferentiated heavy lifting (backup, recovery, patching, etc)
- RDS Commercial Engines (Oracle, SQL Server) & Open Source (PostgreSQL, MySQL, MariaDB)
- Support for growing # of 3rd party apps *

Modernize: Break Free
(re-factor)

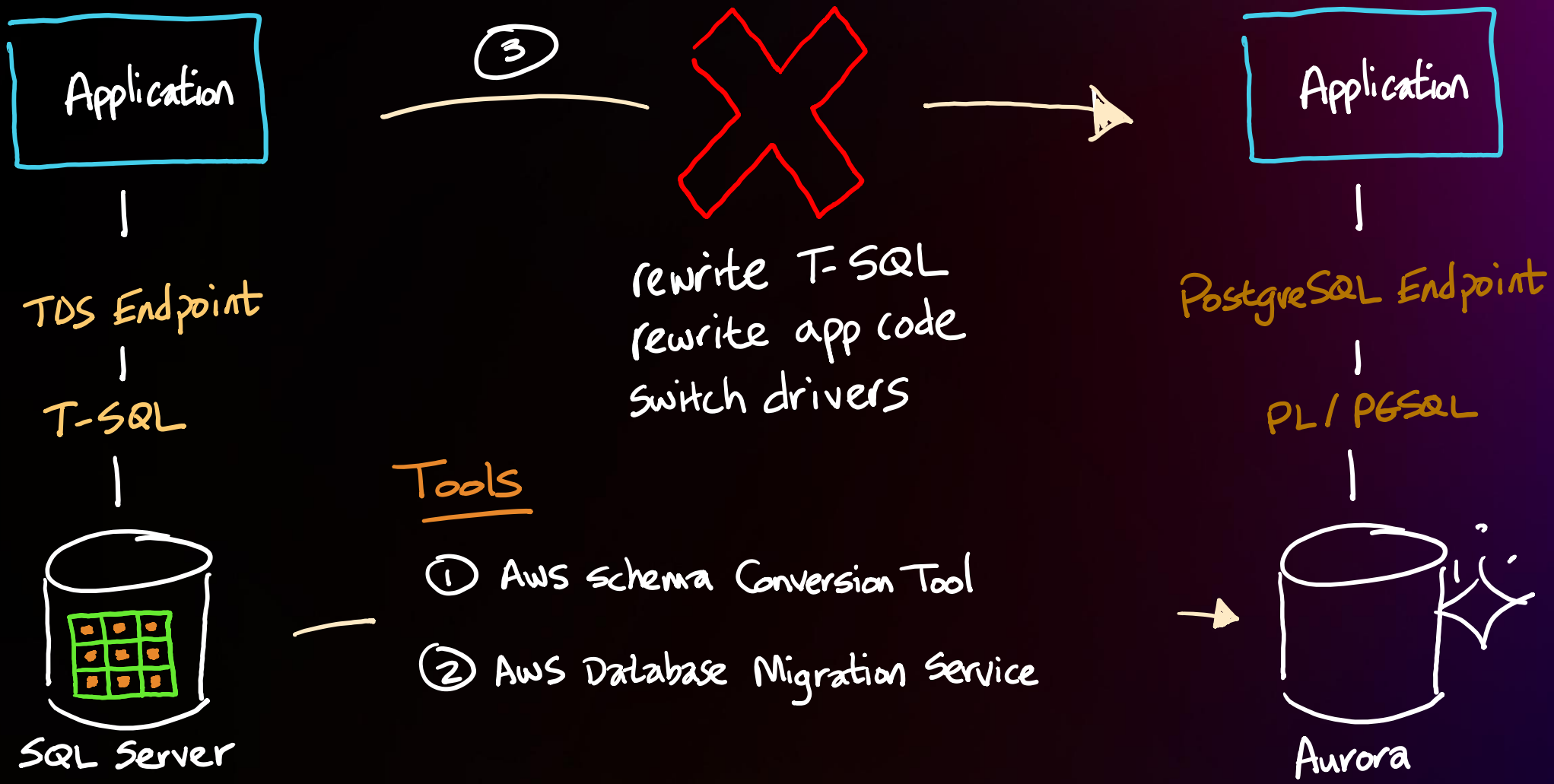
- Reduced licensing costs
- Move to AWS modern managed databases like Aurora, DynamoDB, and Amazon Redshift for faster innovation
- Break free from legacy databases
- Avoid lock-in with open source database
- Pick the right tool for the right job: choose from 15 purpose-built databases

SQL Server modernization choices on AWS

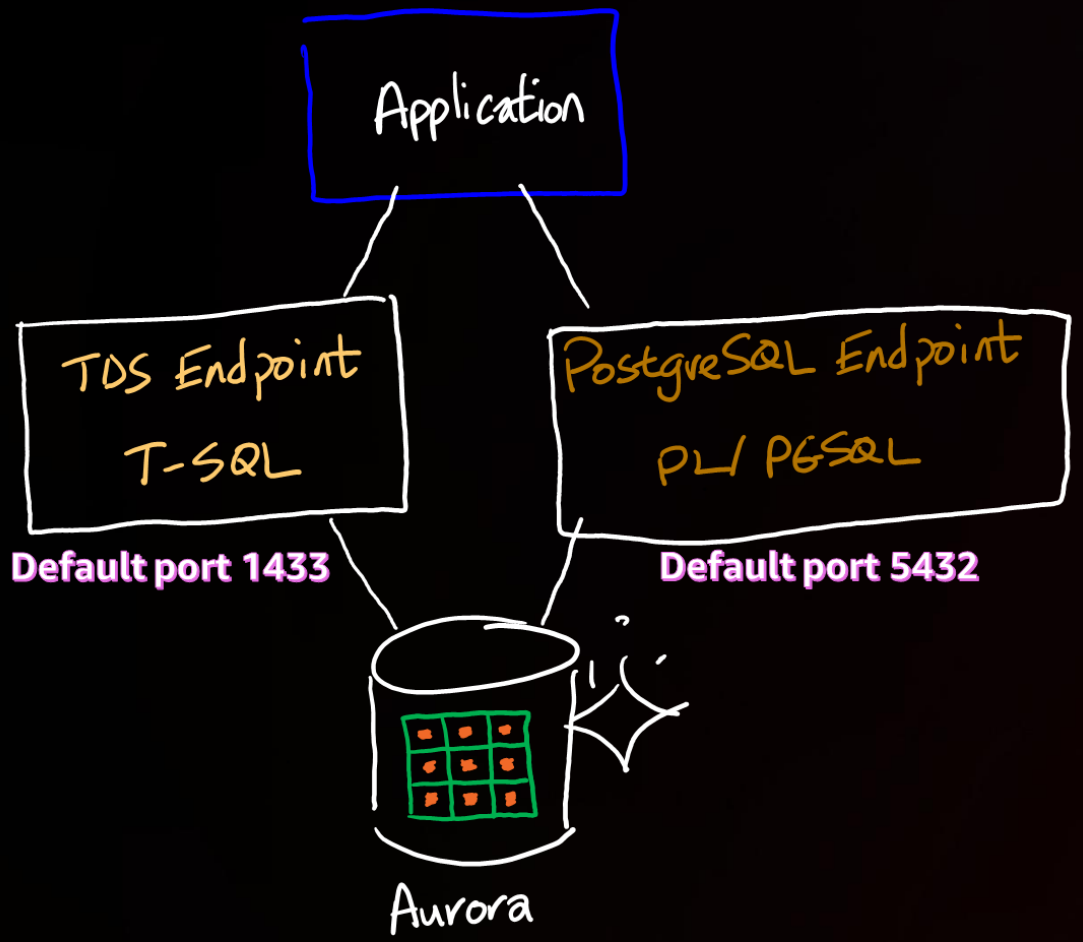
Rehost	Replatform		Refactor
Amazon EC2	**Amazon RDS Custom**	**Amazon RDS**	**Cloud-native services**
Familiar admin experience Full control All SQL Server features All SQL Server versions Lift and shift business apps License included + BYOL	Managed experience Familiar admin experience Full control All SQL Server features* Automated patching Automated backups* Lift and shift business apps License included	Managed experience Optimized architecture Automated patching Automated backups High availability License included	Amazon Aurora Babelfish for Aurora PostgreSQL Amazon Redshift Amazon DynamoDB Amazon ElastiCache Amazon DocumentDB Amazon Neptune Amazon Timestream

Customer managed | Shared responsibility | AWS managed

Challenges in migrating from commercial to open source

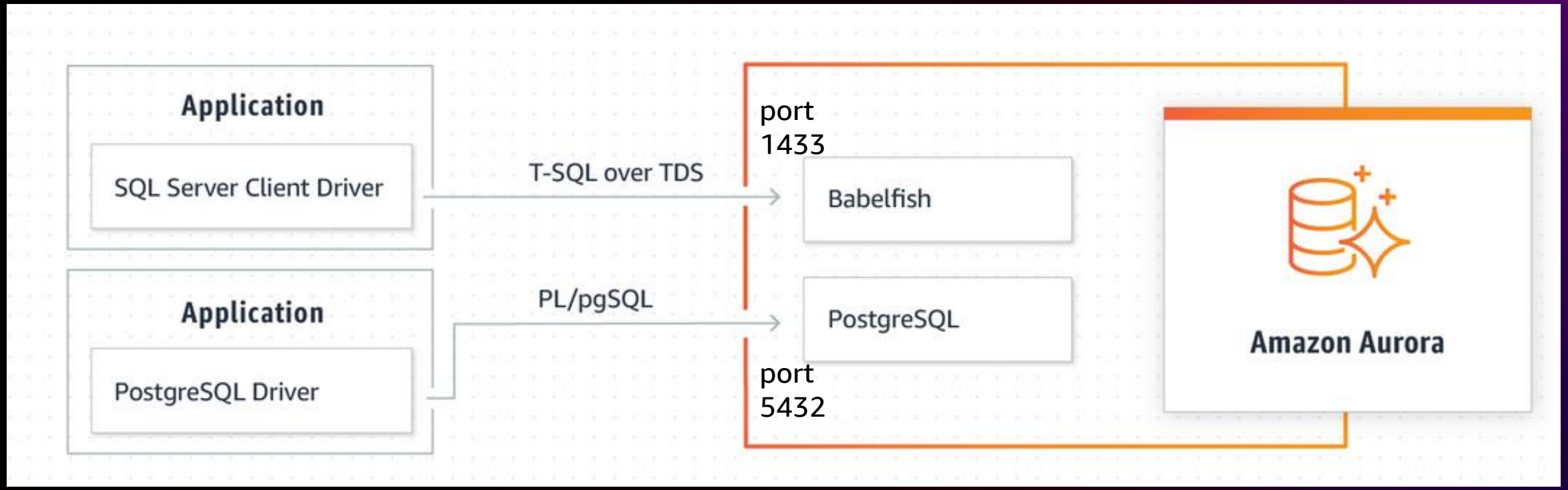


Imagine if you could . . .

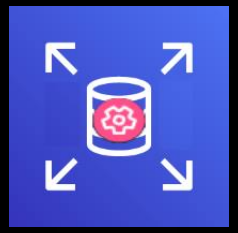


1. Legacy application code remains written for SQL Server
2. Client drivers do not need to be changed
3. New application code written directly to PostgreSQL

Babelfish architecture



Amazon RDS Proxy



Amazon RDS Proxy

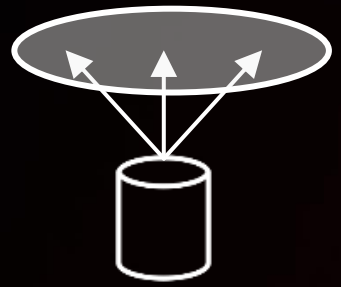
A fully managed, highly available database proxy for Amazon RDS and Amazon Aurora

Pools and shares DB connections to make applications more scalable, more resilient to database failures, and more secure

Fully managed

No need to deploy and maintain a proxy; highly available; **MySQL- and PostgreSQL-compatible**

Connection pooling



Pool and share DB connections for improved scalability

Fast and seamless failovers

66% faster failovers and no loss of connectivity

Improved security

Store passwords in AWS Secrets Manager and **enforce IAM authentication**

Thank you!

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