
AWS
re:Invent
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DAT208-R

Effective multi-tenant solutions using Amazon Aurora Serverless v2

Roneel Kumar (he/him)

Senior Relational Databases Solutions Architect
AWS

Anum Jang Sher (she/her)

Senior Product Manager
AWS

Agenda

Introduction to Amazon Aurora

Single tenant vs. multi-tenant

Deep dive into Aurora Serverless v2

Demo

Discussion

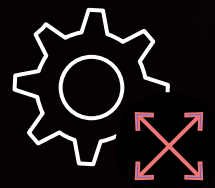
Amazon Aurora

Amazon Aurora is a MySQL- and PostgreSQL-compatible relational database built for the cloud – performance and availability of commercial databases at 1/10th the cost

Performance and scalability

Faster than standard MySQL and PostgreSQL

15 read replicas



Availability and durability

Fault-tolerant self-healing storage

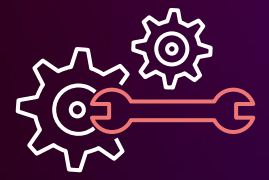
6 copies of data across 3 Availability Zones (AZ)

Global database with cross-Region replication

Highly secure

Network isolation

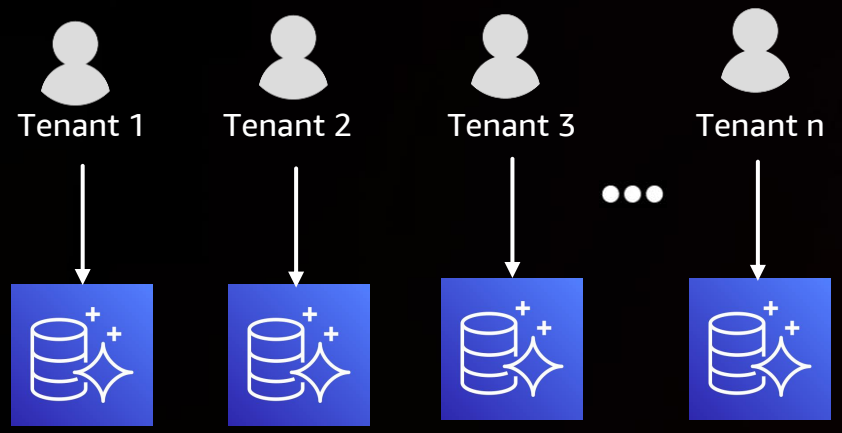
Encryption at rest/transit



Fully managed

Managed by Amazon RDS: no hardware provisioning, software patching, setup, configuration, or backups

Single tenant



Pros

- Highest level of isolation
- Tenant-specific tuning
- Easier to identify individual tenant costs

Cons

- Cost
- Agility compromised
- Operational complexity

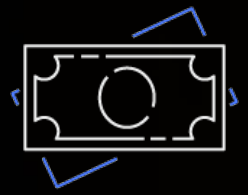
Why a multi-tenant model?

Growth

Drive existing and new segment growth

Agility

Improve pace of innovation, time to value, flexibility



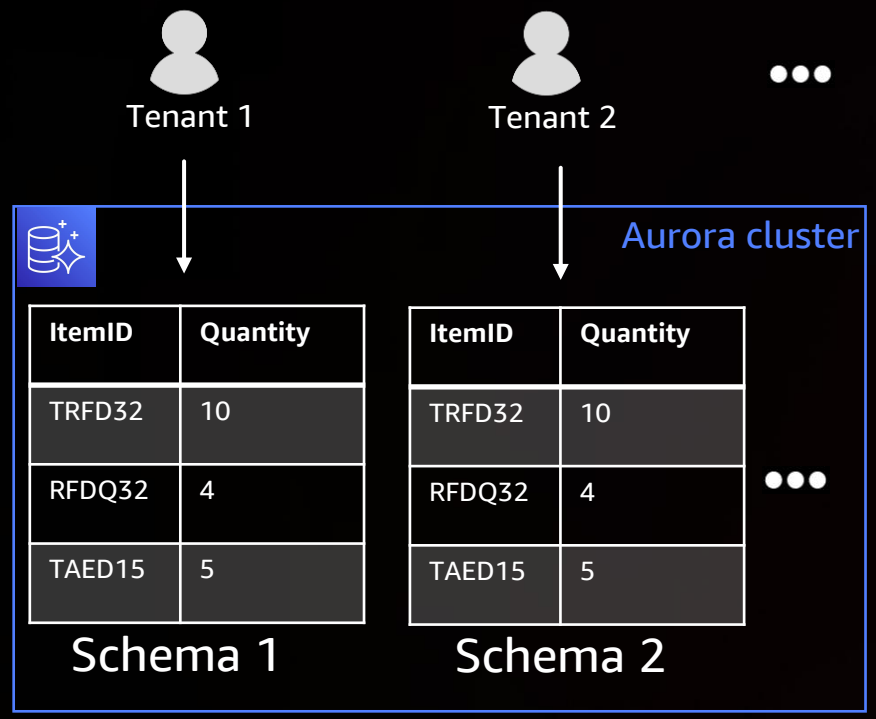
Cost Optimization

Reduce serving costs, improve operational efficiencies as business scales

Business Value

Deliver recurring revenue with greater predictability

Database/schema per tenant



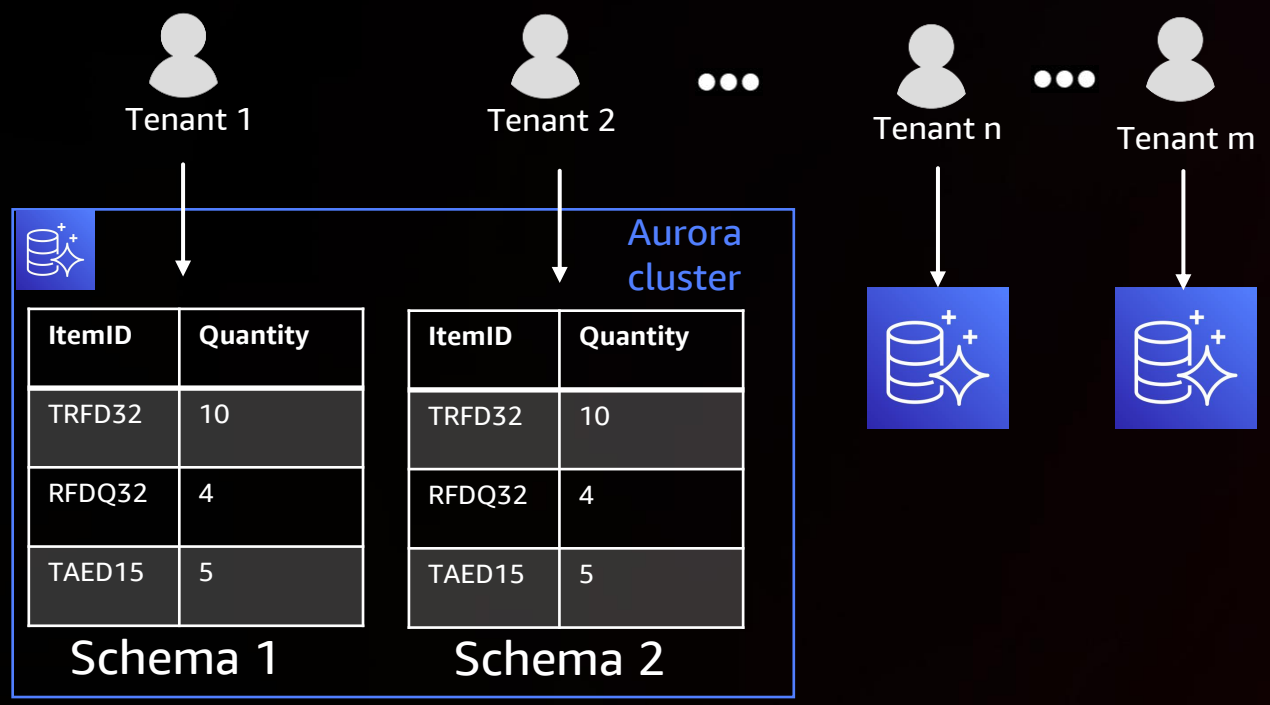
Pros

- Agility
- Cost optimization
- Centralized management
- Simplified deployment

Cons

- Cross-tenant impact
- Security and compliance challenges
- Difficult to allocate cost per tenant
- Complex to make tenant-level changes

Mix of single tenant and schema per tenant



Pros

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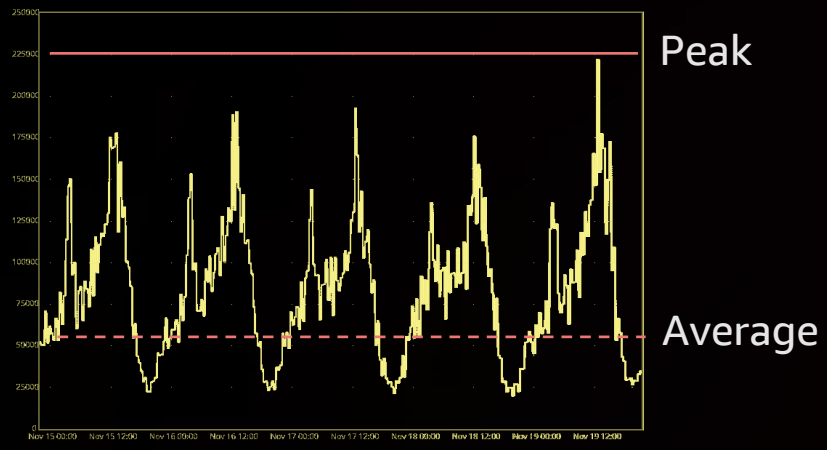
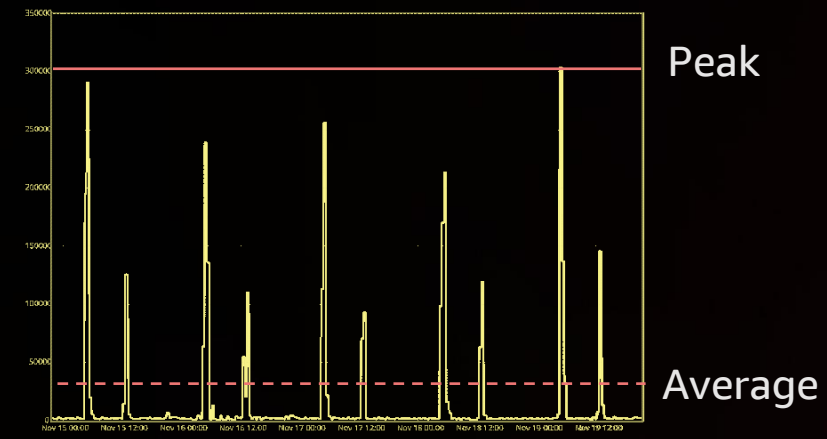
Database capacity: Cost vs. management



Tenant 1



Tenant 2

Insufficient capacity → Experience degradation

Provision for peak → Expensive, under-utilized

OR

Continuously monitor and scale → Difficult, requires experts, involves downtime

Amazon Aurora Serverless v2

On-demand and automatically scaling configuration

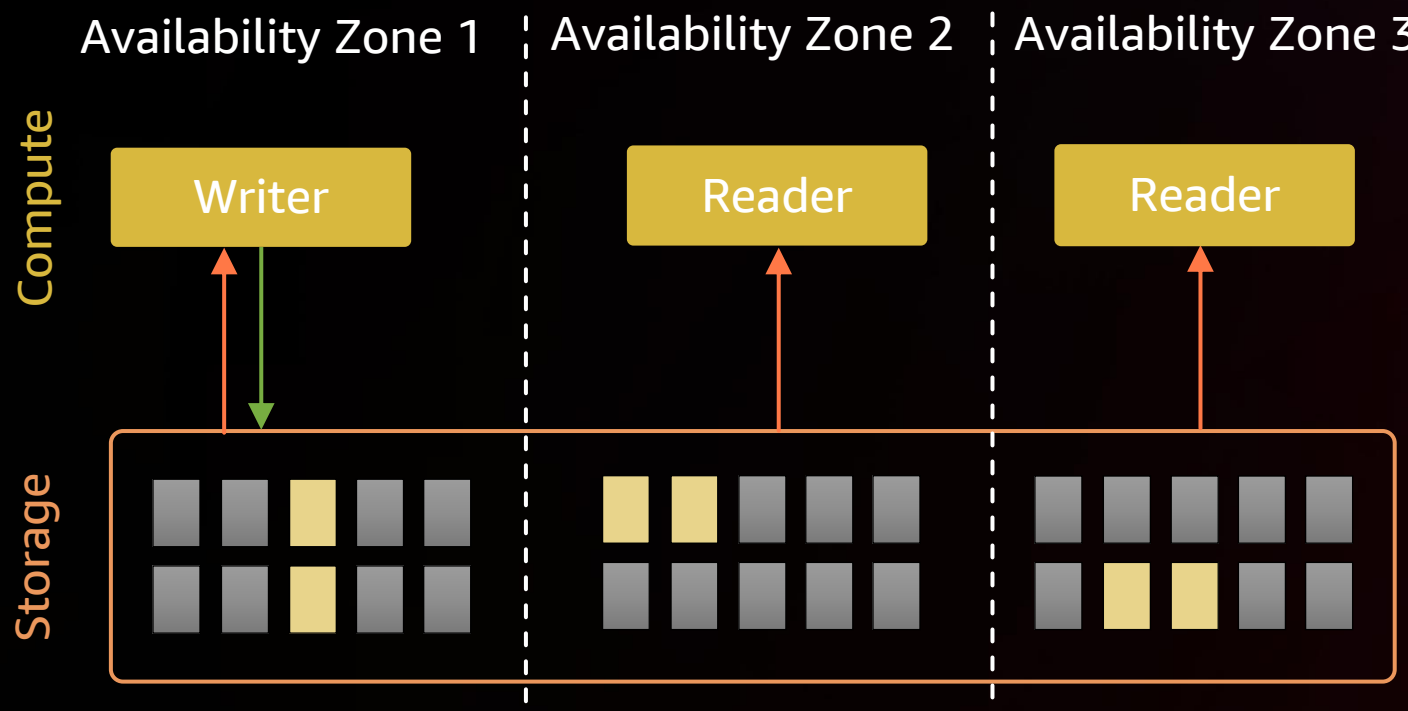
Automatically scales capacity based on application needs

Simple **pay-per-use** pricing per second

Next version scales instantly to support demanding applications

Worry-free database capacity management

Amazon Aurora Architecture



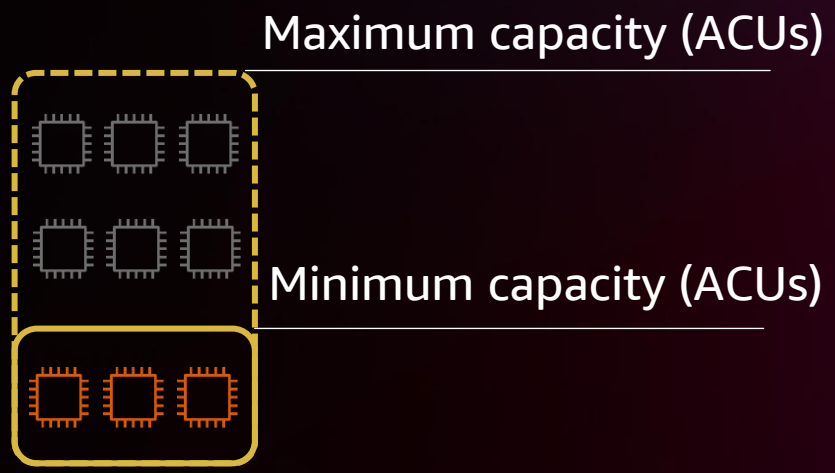
Purpose-built, log-structured, distributed storage designed for cloud databases

6 copies across 3 AZs for high availability, durability, and performance

Separation of storage and compute:

- Routine operations (e.g., backups) done without compute
- Storage volume grows automatically
- Up to 15 low-latency (<100 millisecond) readers
- **Compute scales independently**

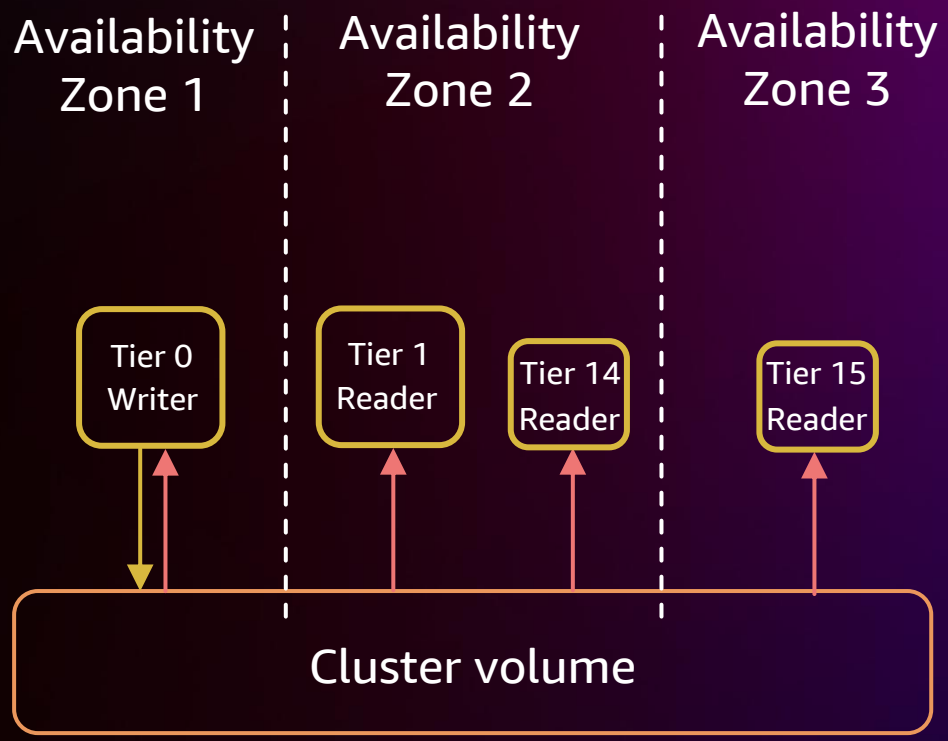
Instant and non-disruptive scaling



- Database scales within the min/max range based on the workload
- Capacity is measured in Aurora Capacity Unit (ACU)
- 1 ACU comes with 2 GiB of memory; CPU and networking similar to provisioned Aurora instances
- Fine-grained scaling with as little as 0.5 ACU (1 GiB) increments

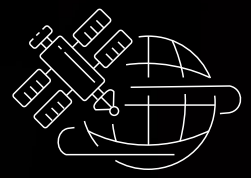
High availability and read scaling

- Up to 15 read replicas act as failover targets
- All instances inherit capacity configuration from the cluster
- Tier 0 and 1 read replicas match the size of the primary instance
- Deploy across separate AZs
- Multi-AZ Aurora clusters supported by 99.99% uptime SLA



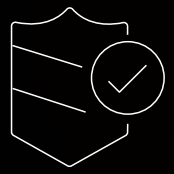
Amazon RDS Proxy

A FULLY MANAGED, HIGHLY AVAILABLE DATABASE PROXY FOR AMAZON RDS AND AMAZON AURORA



Pool and share DB connections for improved app scaling

Increase app availability and reduce DB failover times

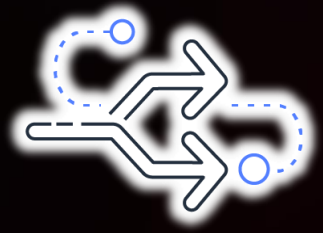


Manage app data security through integration with AWS Secrets Manager and IAM authentication

Monitoring

Instance

Amazon CloudWatch



Operating system

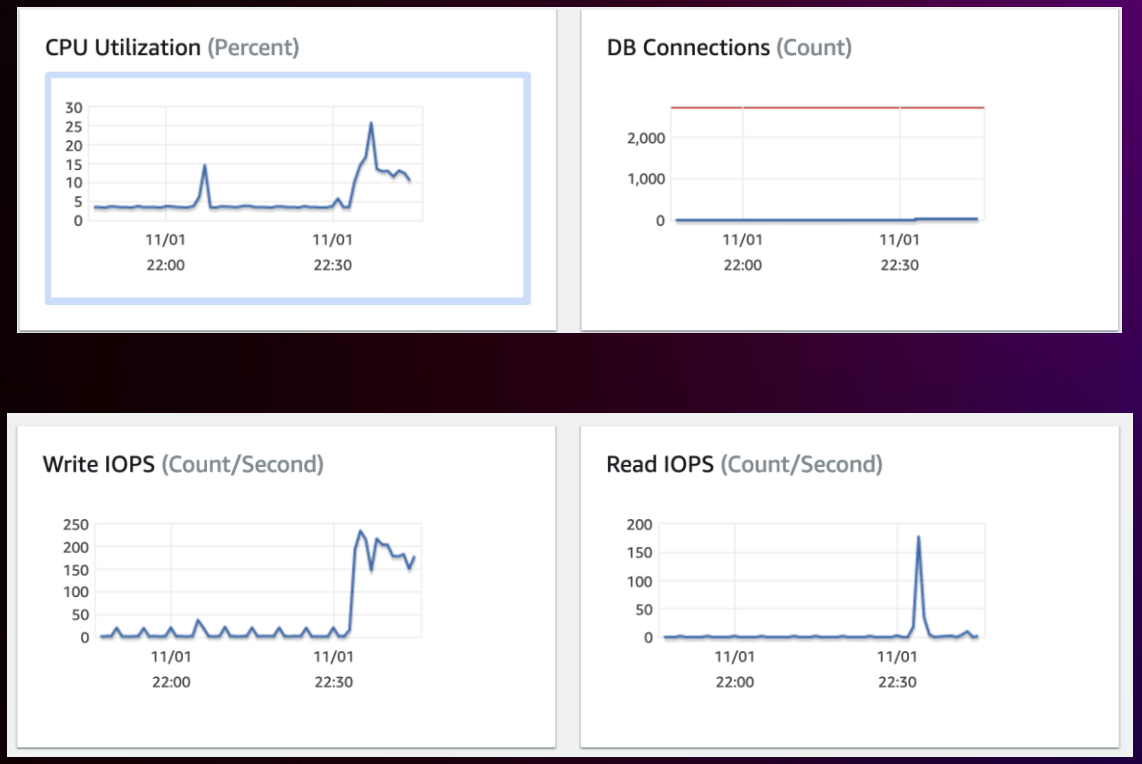
Amazon RDS
Enhanced Monitoring

Database engine

Amazon RDS
Performance Insights

Instance level metrics

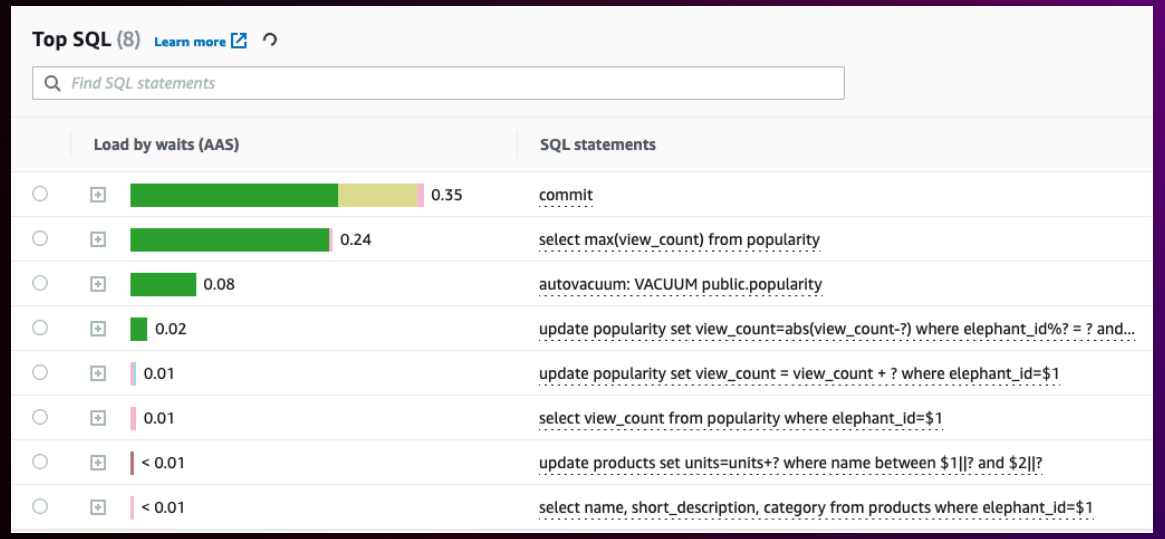
- DB instance class consideration (CPU, Memory, Network throughput)
- Number of connections & objects (DBs, Tables)
- Database Catalog Contention
- Auto-vacuum/purge
- Open File descriptors

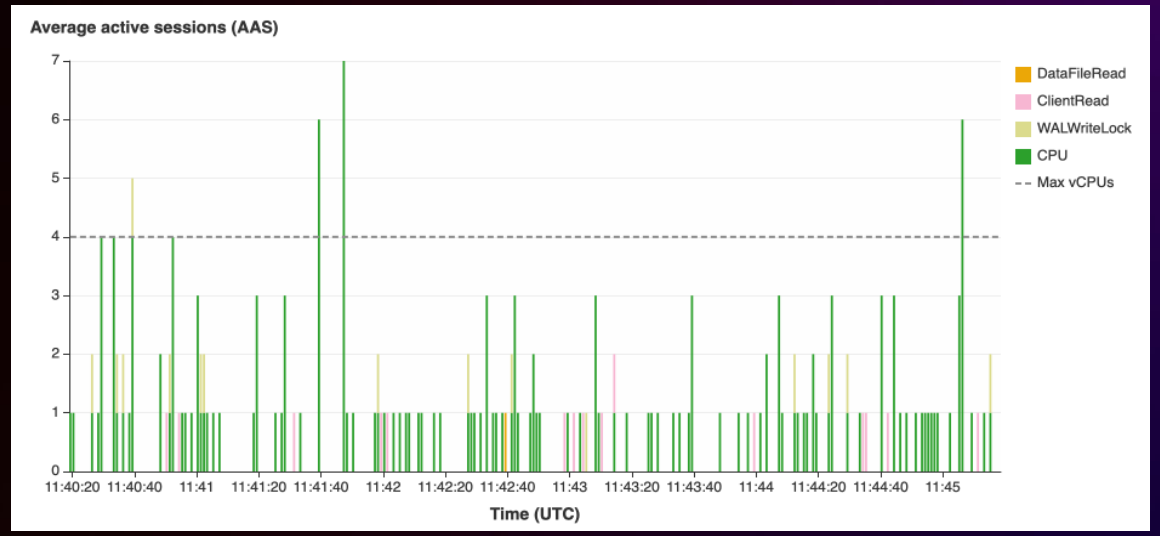


CloudWatch Dashboard

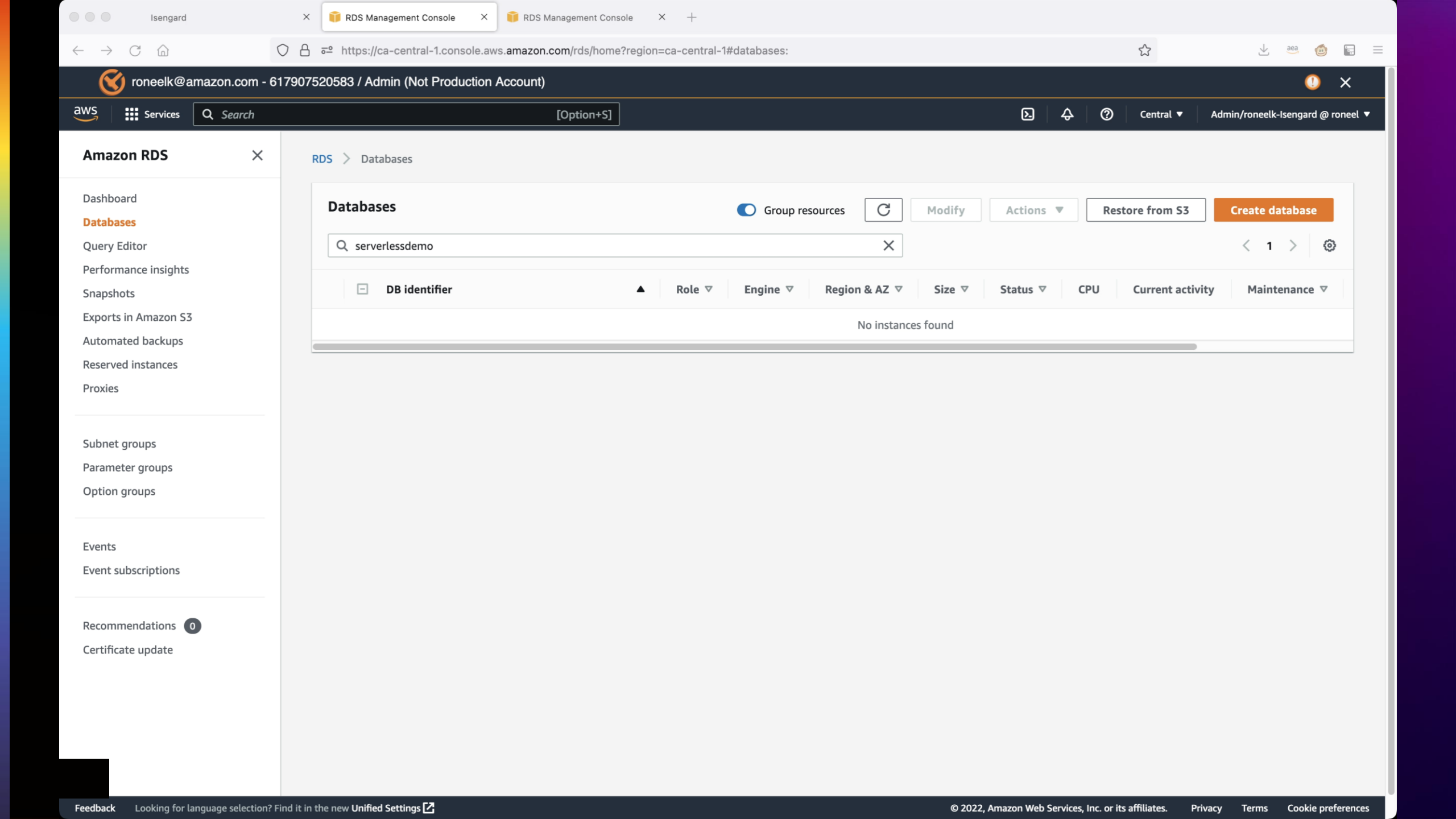
Tenant metrics

- CPU Usage
- Memory Usage
- IO Usage
- Network throughput
- Connections
- Number of tables, size, growth rate
- Temporary space usage per process usage





Performance Insights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RDS Management Console
RDS Management Console
https://ca-central-1.console.aws.amazon.com/rds/home?region=ca-central-1#databases:
roneelk@amazon.com - 617907520583 / Admin (Not Production Account)
aws
Services
Search
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Central
Admin/roneelk-Isengard @ roneel
Amazon RDS
Dashboard
Databases
Query Editor
Performance insights
Snapshots
Exports in Amazon S3
Automated backups
Reserved instances
Proxies
Subnet groups
Parameter groups
Option groups
Events
Event subscriptions
Recommendations 0
Certificate update
RDS > Databases
Databases
Group resources
Modify
Actions
Restore from S3
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DB identifier
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Engine
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Size
Status
CPU
Current activity
Maintenance
No instances found
Feedback
Looking for language selection? Find it in the new Unified Settings
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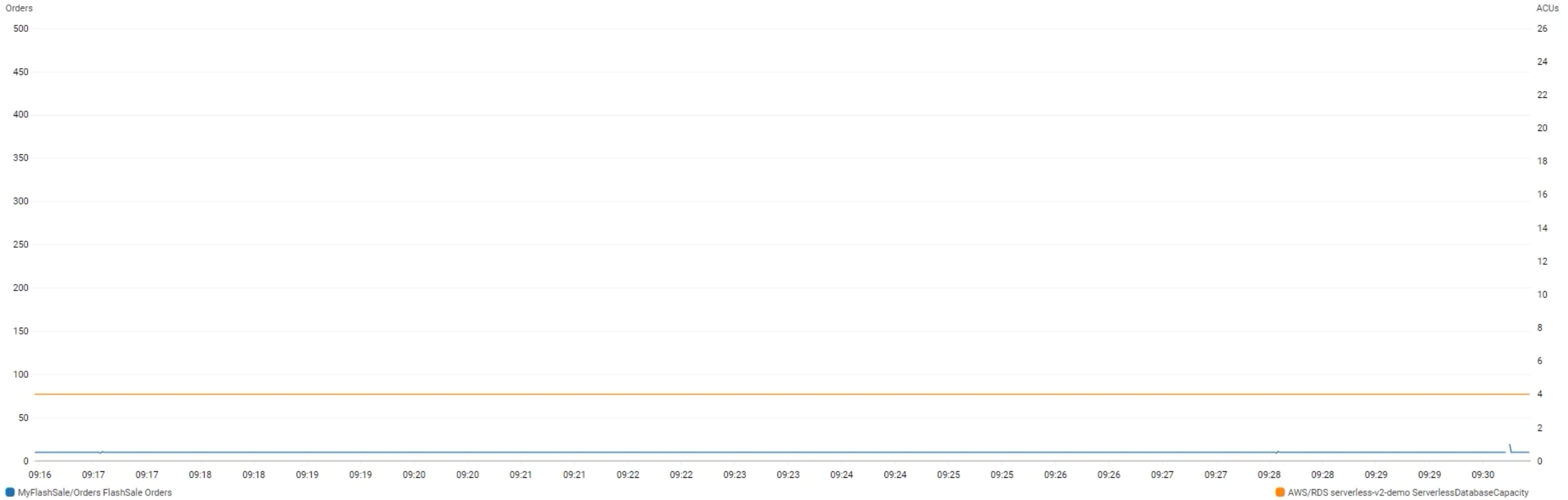
Untitled graph

1h 3h 12h 1d 3d 1w custom (15m) ▾ Line ▾ Actions ▾



All metrics | Graphed metrics (2) | Graph options | Source

Math expression ▾ Dynamic labels ▾ Statistic: (multiple) ▾ Period: 1 Second ▾ Remove all

Label	Details	Statistic	Period	Y Axis	Actions
MyFlashSale/Orders FlashSale Orders	MyFlashSale/Orders • Orders • OfferType: FlashSale	Sum	1 Second		
AWS/RDS serverless-v2-demo ServerlessDatabaseCapacity	RDS • ServerlessDatabaseCapacity • DBClusterIdentifier: serverless-v2-demo	Average	1 Second		

Feedback English (US) ▾

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Roneel Kumar
roneelk@amazon.com

Anum Jang Sher
anujangs@amazon.com

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