MySQL on the cloud, from virtual machines to serverless options

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Renato & Funambol

WHITE-LABEL build your brand & customer value

MOBILE LIFE-centric much more than cloud storage

FLEXIBLE readily adapt to differentiate your service

HOSTED OR ON-PREMISES deployment

HA

infrastructure as code

autoscaling

DevOps

Docker

K8s

serverless

S3

orchestration

Instance-based databases

Connection limits

Networking issues

Provisioning issues

Scaling issues

Infrastructure as code issues

blue/green

before or after?

Decoupling schema changes from code changes

Public cloud providers

Google

Azure

AWS

VMware

IBM

Oracle

Alibaba

MySQL & AWS

3 options

MySQL on EC2

Fully control the database

Rely on EBS
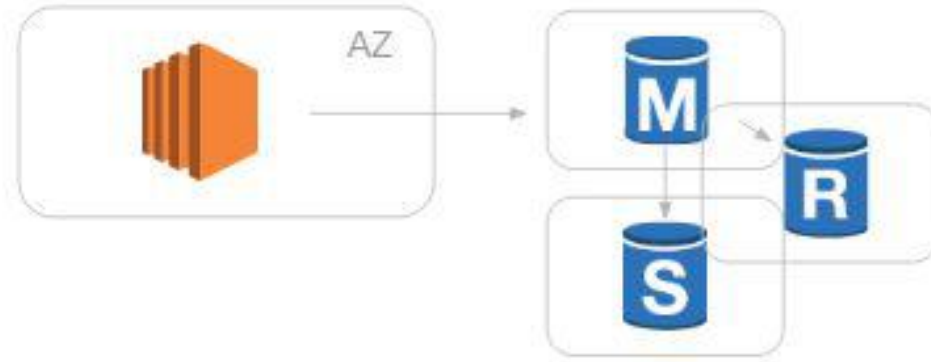
Full control: root access

Flexibility

Easy vertical scaling

Set your own replication

Backup & failover

Very latest MySQL, Percona

Virtual machine

RDS MySQL

Managed and scalable MySQL

Managed service

(almost) 10 years old

Vertical scaling

Sync replication

Backup & point in time recovery

Other RDS engines available

Performance Insights

Managed service

Amazon Aurora

built for the cloud, fully managed

MySQL/PostgreSQL compatible

Vertical scaling

Proprietary technology

Automatically allocates storage

Automatic, six-way replication

Backtrack: turn back time

Multi-Master (preview)

automation

How you scale vertically an instance

size for the peak load?

Create Alarm

Alarm Threshold

Provide the details and threshold for your alarm. Use the graph on the right to help set the appropriate threshold.

Name: alarm-demo-rds01

Description: alarm-demo-rds01

Whenever: CPUUtilization

is: [>= ▾] [60]

for: [3] ✖ ✔ out of [3] datapoints ❶

Additional settings

Provide additional configuration for your alarm.

Treat missing data as: [bad (breaching threshold) ▾] ❶

Actions

Define what actions are taken when your alarm changes state.

Notification	Delete

Whenever this alarm: [State is ALARM ▾]

Alarm Preview

This alarm will trigger when the blue line goes up to or above the red line for 3 datapoints within 15 minutes
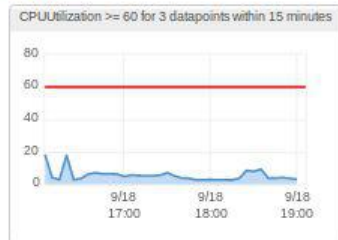
CPUUtilization >= 60 for 3 datapoints within 15 minutes

80
60
40
20
0
　　　9/18　　　9/18　　　9/18
　　　17:00　　　18:00　　　19:00

Namespace: AWS/RDS

DBInstance-Identifier: dogfood-rds01

Metric Name: CPUUtilization

Period: [5 Minutes ▾]

Statistic: ● Standard　○ Custom

[Average ▾]

Cancel　**Previous**　Next　**Create Alarm**

Topics

Publish to topi

Filter

	Name
☐	cloudwatch
☐	dog-ets-not
☐	dynamodb
☐	hosting
☐	hosting-inte
☐	omh-prod-e
☐	rds-low-sto
☐	renato
☐	ses-bounce-omh	arn:aws:sns:us-east-1:032576607177:ses-bounce-omh
☑	topic-test-rds	arn:aws:sns:us-east-1:032576607177:topic-test-rds

Create subscription

Topic ARN   arn:aws:sns:us-east-1:032576607177:topic-test-rds

Protocol   AWS Lambda ▾

Endpoint   arn:aws:lambda:us-east-1:032576607177:function:test-rds ▾

Version or alias   default ▾

Cancel   **Create subscription**

Create Alarm

1. Select Metric   **2. Define Alarm**

Name: alarm-demo-storage

Description: alarm-demo-storage

Whenever: FreeStorageSpace

is: [>= ▾] [10737418240]

for: 1 ✏ out of [1] datapoints ⓘ

Additional settings

Provide additional configuration for your alarm.

Treat missing data as: [bad (breaching threshold) ▾] ⓘ

Actions

Define what actions are taken when your alarm changes state.
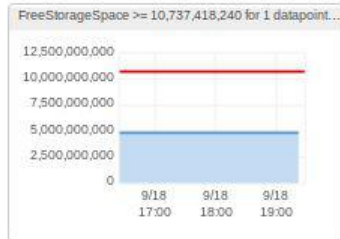
Notification	Delete

Whenever this alarm: [State is ALARM ▾]

Send notification to: [Select a notification list ▾] New list Enter list ⓘ

[+ Notification] [+ AutoScaling Action] [+ EC2 Action]

FreeStorageSpace >= 10,737,418,240 for 1 datapoint...

12,500,000,000	
10,000,000,000	
7,500,000,000	
5,000,000,000	
2,500,000,000	
0	9/18 9/18 9/18
	17:00 18:00 19:00

Namespace: AWS/RDS

DBInstance-Identifier: dogfood-rds01

Metric Name: FreeStorageSpace

Period: [5 Minutes ▾]

Statistic: ⦿ Standard ◯ Custom

[Average ▾]

Cancel [Previous] [Next] [Create Alarm]

IOPS

Lambda

CPU

fake autoscaling

SDK

storage   latency   minor version

bash (CLI)

Why are they not available out of the box?

DBA

DBA time spent

On Premises

- Application
- Database
- Monitoring
- Access
- **Platform**

Amazon RDS

- **Application**
- **Database**
- Monitoring
- Access
- Platform

outage

Modify DB Instance: my-dummy-rds01-2018-05-18
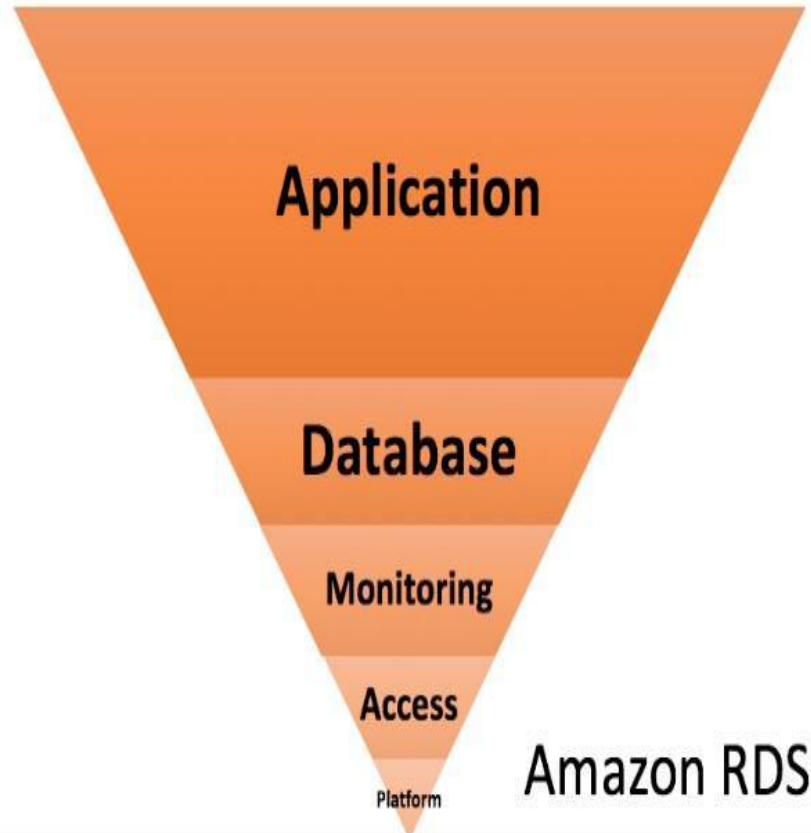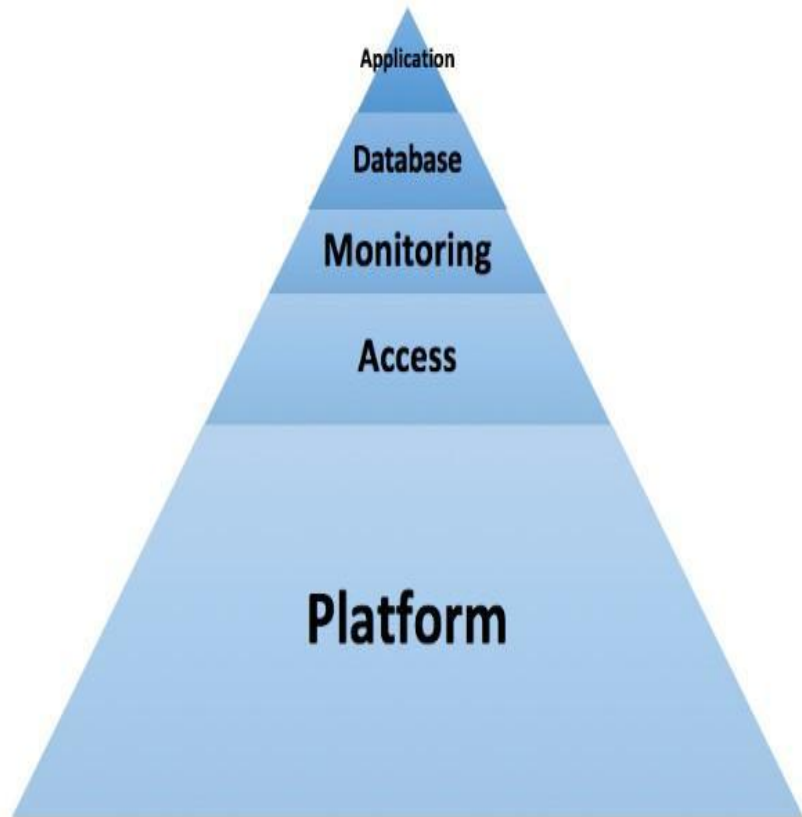
Instance specifications

Dashboard
Instances
Clusters
Performance Insights
Snapshots
Reserved Instances

Security groups
Subnet groups
Parameter groups
Option groups

Events
Event subscriptions

Notifications 1

DB engine version
Version number of the database engine to be used for this instance.

mysql 5.7.21 ▼

DB Instance class
Contains the compute and memory capacity of the DB instance.

db.t2.small — 1 vCPU, 2 GiB RAM ▼

Multi-AZ deployment
Specifies if the DB instance should have a standby deployed in another availability zone.

○ Yes
● No

Storage type

Provisioned IOPS (SSD) ▼

Allocated storage

300   GiB

This instance supports multiple storage ranges between 500 and 16384 GiB. See all

Provisioned IOPS Info

1200

ⓘ For a workload with 50% writes and 50% reads running on a r3.4xlarge instance, you can realize up to 25,000 IOPS. However, by provisioning more than this limit, you may be able to achieve lower latency and higher throughput. Your actual realized IOPS may vary from the amount you provisioned based on your database workload and instance type. Refer to the Factors That Affect Realized IOPS section to learn more.

Settings

DB instance identifier
DB instance identifier. This is the unique key that identifies a DB instance. This parameter is stored as a lowercase string (e.g. mydbinstance).

my-dummy-rds01-2018-05-18

New master password
Set a new password for the master DB instance user.

Network & Security

Subnet group
Use this field to move the DB instance to a new subnet group in another vpc. Learn more

oro-prod-rds ▼

Security group
List of DB security groups to associate with this DB instance.

Choose security groups ▼

Database frozen

Cannot change it back. You are paying for it.

not simultaneously

Multiples changes

multiple failovers

order is hard to predict

db.m4.xlarge→ db.m4.2xlarge
400 GB → 800 GB

- 12h (instance+storage)
- 13m (instance)
- 11h 45m (storage)

PLEASE DONT TRY TO SLEEP HERE

BE ADVISED

BY ORDER OF INTERIOR MINISTRY

Modifying...

No risks?
As good as before?
Really?

RDS is running out of IOPS What can I do?

How do I know how long I can burst?

burst

Running out of IOPS

latency spike

lower IOPS after burst

Storage type

General Purpose (SSD) ▼

Allocated storage

800 ⌃⌄ GiB

This instance supports multiple storage ranges between 300 and 16384 GiB.   See all

⚠️ **Scaling your instance storage can:**

- Deplete the initial General Purpose (SSD) I/O credits, leading to longer conversion times. Learn more
- Impact instance performance until operation completes. Learn more

Storage type

Provisioned IOPS (SSD) ▼

Allocated storage

300   GiB

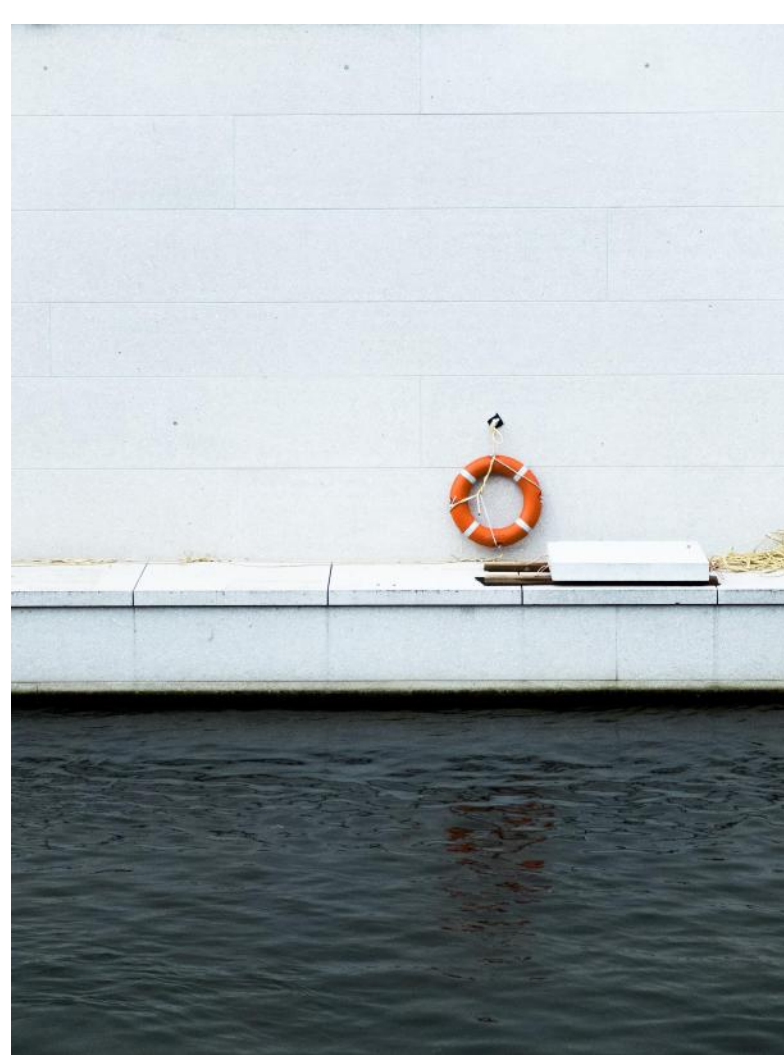This instance supports multiple storage ranges between 300 and 16384 GiB.   See all

Provisioned IOPS   Info

2000

⚠ **Scaling your storage or IOPS can:**

- Impact instance performance until operation completes. Learn more

Peak or sustained traffic?

CAUTION

WET FLOOR

serverless

Aurora Serverless

auto-scaling configuration

Endpoint without instance size

Easy scaling

Pay-per-use

Auth IAM roles

MySQL 5.6 compatible (preview Postgres)

GA since Aug 2018

JDBC / ODBC

———

Aurora Serverless might not be able to find a scaling point if you have long-running queries or transactions in progress, or temporary tables or table locks in use.

Serverless Aurora or Autoscaling Aurora?

Aurora Serverless Data API (beta)

weekly reporting

unpredictable load

super exciting?

development/test

intermittent

thanks!

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