Containerized Applications with AWS Fargate

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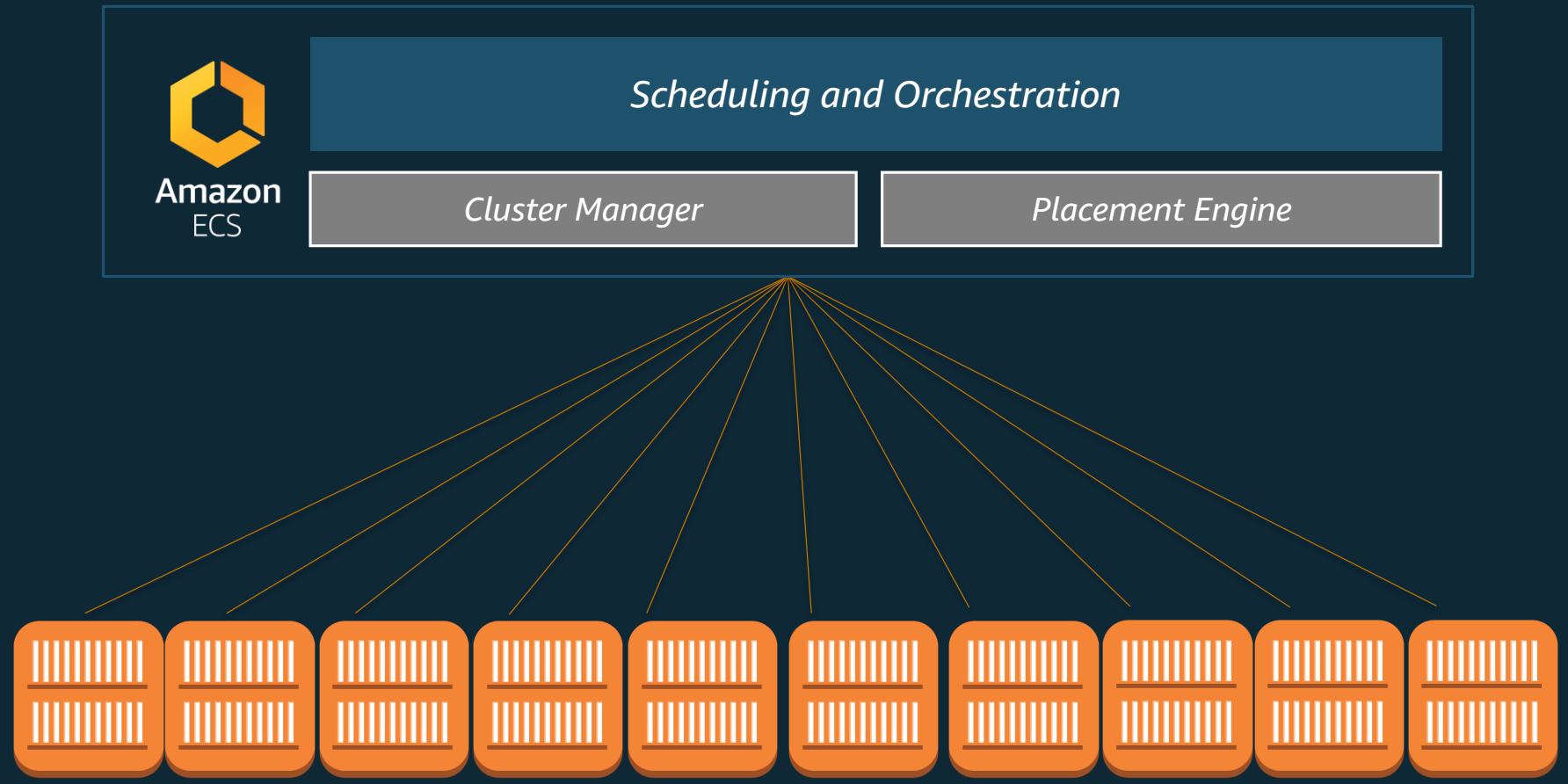
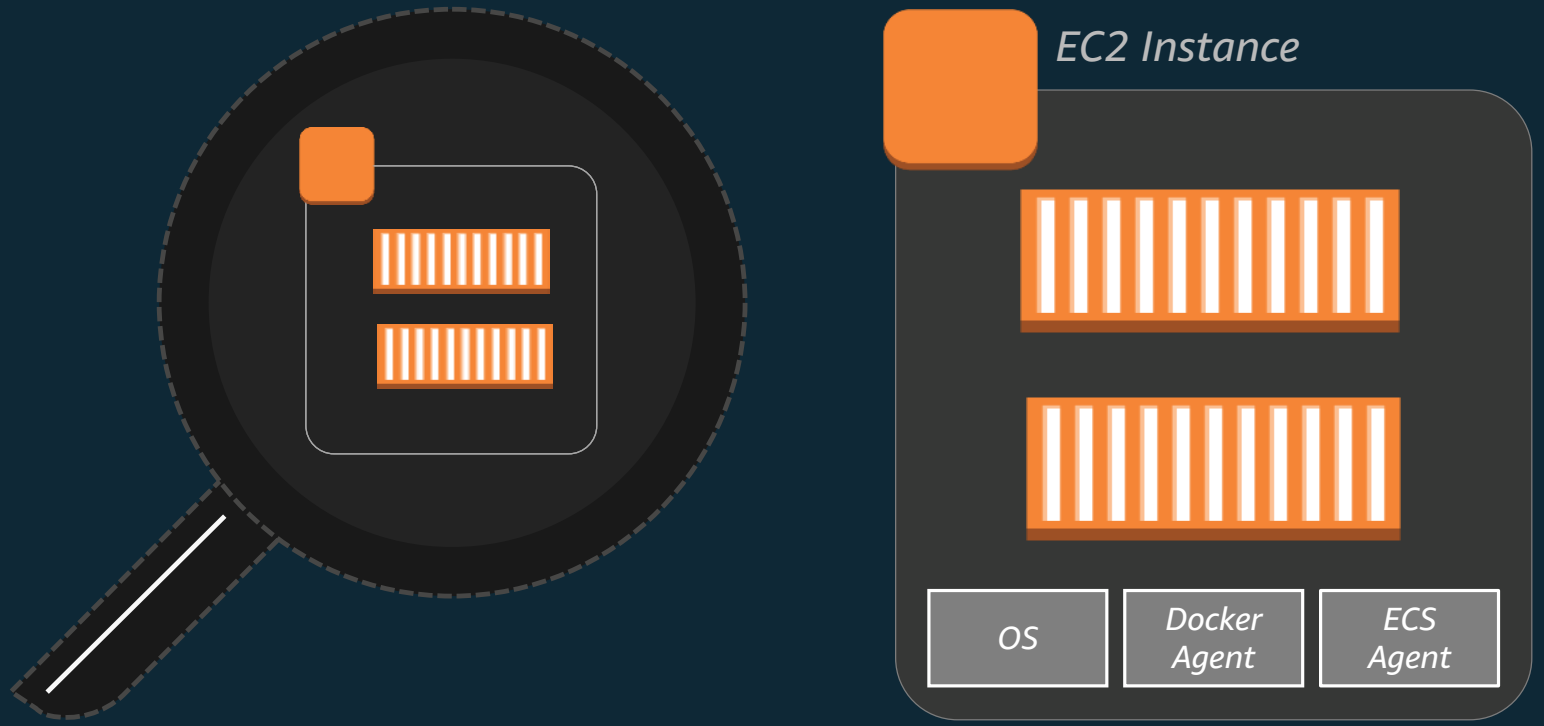
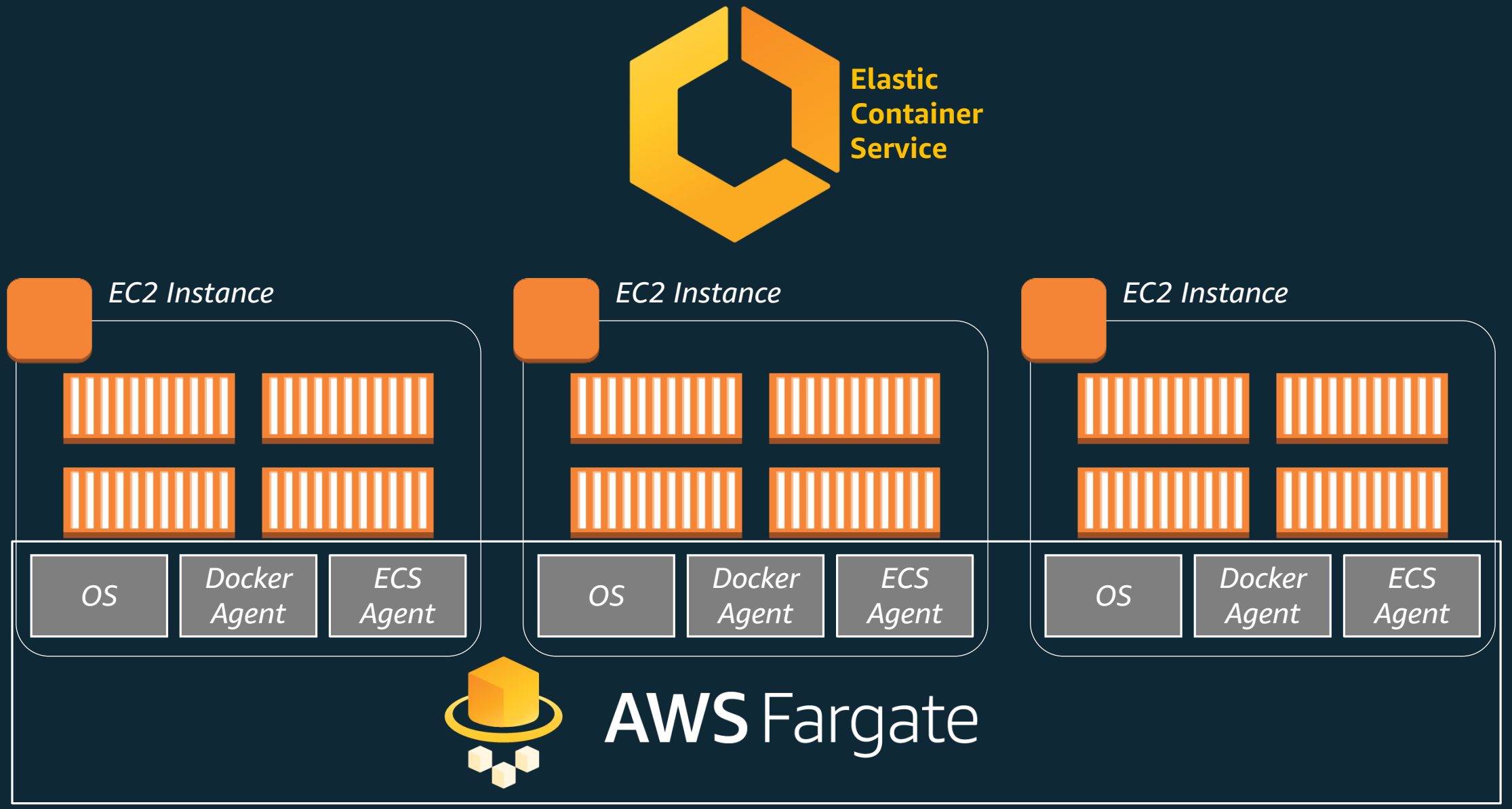
aws

Containers made it easy to build and scale cloud-native applications



You still end up managing more than just containers





AWS FARGATE

Your Containerized Applications

MANAGED BY AWS
No EC2 Instances to provision, scale or manage

ELASTIC
Scale up & down seamlessly. Pay only for what you use

INTEGRATED
with the AWS ecosystem: VPC Networking, Elastic Load Balancing, IAM Permissions, Cloudwatch and more.

AWS Container Services Landscape

MANAGEMENT
Deployment, Scheduling, Scaling & Management of containerized applications

Amazon Elastic Container Service

Amazon Elastic Container Service for Kubernetes

HOSTING
Where the containers run

Amazon EC2

AWS Fargate

IMAGE REGISTRY
Container Image Repository

Amazon Elastic Container Registry

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Fargate is now available in EU (London) region!

Region Name	Region
US East (N. Virginia)	us-east-1
US East (Ohio)	us-east-2
US West (Oregon)	us-west-2
EU (Ireland)	eu-west-1
EU (London)	**eu-west-2**
EU (Frankfurt)	eu-central-1
Asia Pacific (Tokyo)	ap-northeast-1
Asia Pacific (Singapore)	ap-southeast-1
Asia Pacific (Sydney)	ap-southeast-2

Pricing: https://aws.amazon.com/fargate/pricing/

WORKING WITH FARGATE

CONSTRUCTS WHEN USING FARGATE WITH ECS

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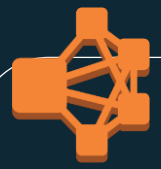
register

Task Definition

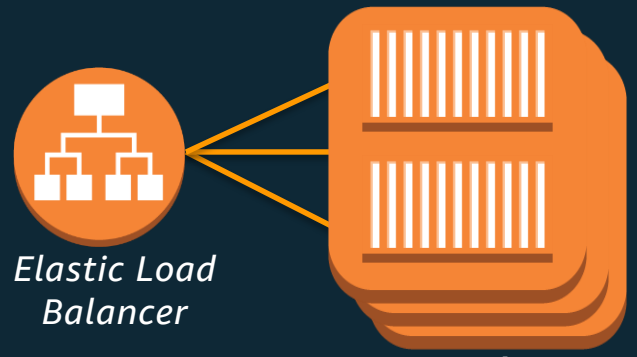
Define application containers: Image URL, CPU & Memory requirements, etc.



run

Task

- *A running instantiation of a task definition*
- *Use FARGATE launch type*



create

Service

- *Maintain n running copies*
- *Integrated with ELB*
- *Unhealthy tasks automatically replaced*

create

Cluster

- *Infrastructure Isolation boundary*
- *IAM Permissions boundary*

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REGISTRY SUPPORT

Amazon Elastic Container Registry (ECR)

Public Repositories supported

3rd Party Private Repositories

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TASK CPU MEMORY CONFIGURATIONS

CPU	*Memory*
256 (.25 vCPU)	*512MB, 1GB, 2GB*
512 (.5 vCPU)	*1GB, 2GB, 3GB, 4GB*
1024 (1 vCPU)	*2GB, 3GB, 4GB, 5GB, 6GB, 7GB, 8GB*
2048 (2 vCPU)	*Between 4GB and 16GB in 1GB increments*
4096 (4 vCPU)	*Between 8GB and 30GB in 1GB increments*

50 different CPU/Memory configurations to choose from

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PRICING

Pay for what you provision

Billed for Task level CPU and Memory

Per-second billing. 1 minute minimum

NETWORKING

VPC INTEGRATION

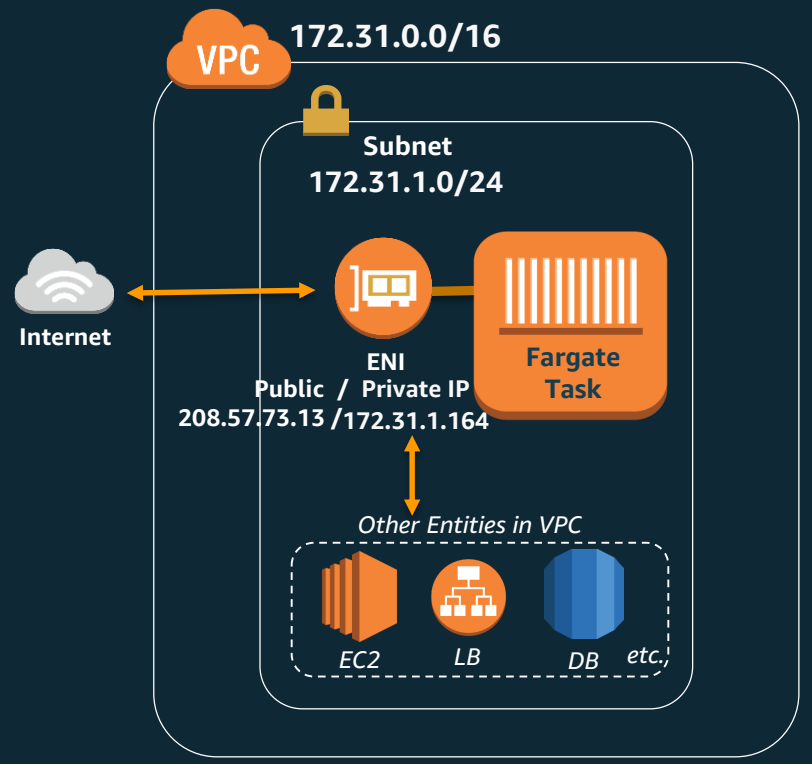
Launch your Fargate Tasks into subnets

Under the hood :

- *We create an Elastic Network Interface (ENI)*
- *The ENI is allocated a private IP from your subnet*
- *The ENI is attached to your task*
- *Your task now has a private IP from your subnet!*

You can assign public IPs to your tasks

Configure security groups to control inbound & outbound traffic



STORAGE

DISK STORAGE

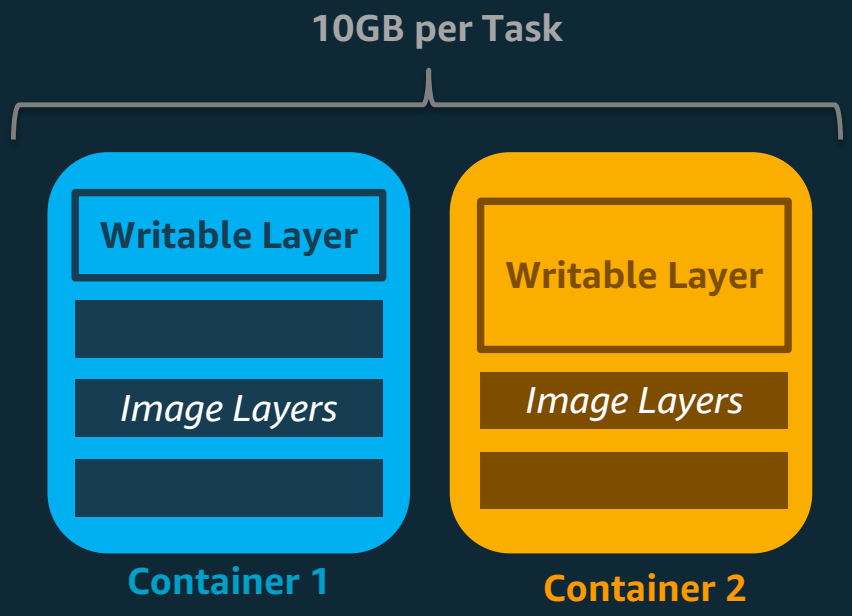
EBS backed Ephemeral storage provided in the form of:

Writable Layer Storage

Volume Storage

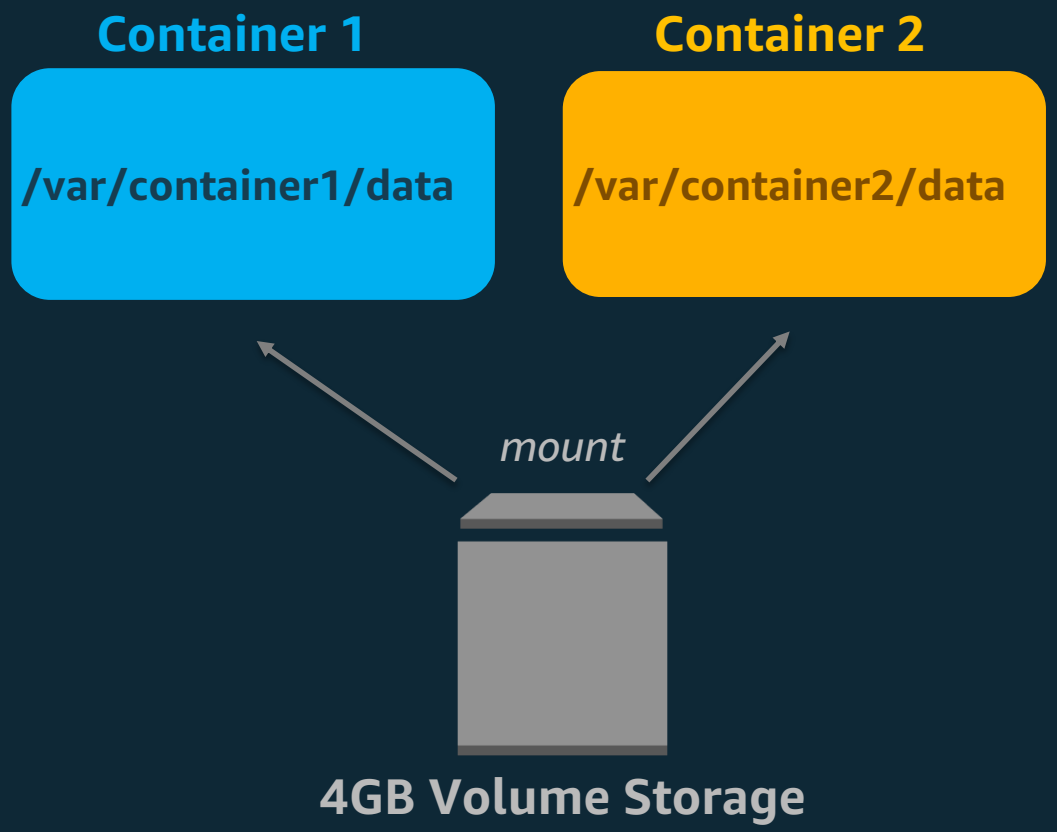
LAYER STORAGE

- *Docker images are composed of layers*
  The topmost layer is the "writable" layer to capture file changes made by the running container
- *10GB Layer storage available per task, across all containers, including image layers*
- *Writes are not visible across containers*
- *Ephemeral. Storage is not available after the task stops.*



VOLUME STORAGE

- *Need writes to be visible across containers?*
- *Fargate provides 4GB volume space per task*
- *Configure via volume mounts in task definition*
  - *Can mount at different containerPaths*
  - *Do not specify host sourcePath*
- *Remember this is also ephemeral, i.e. not available after the task stops*



IAM PERMISSIONS

PERMISSION TIERS

Cluster Permissions:

Control who can launch/describe tasks in your cluster

Application Permissions:

Allows your application containers to access AWS resources securely

Housekeeping Permissions:

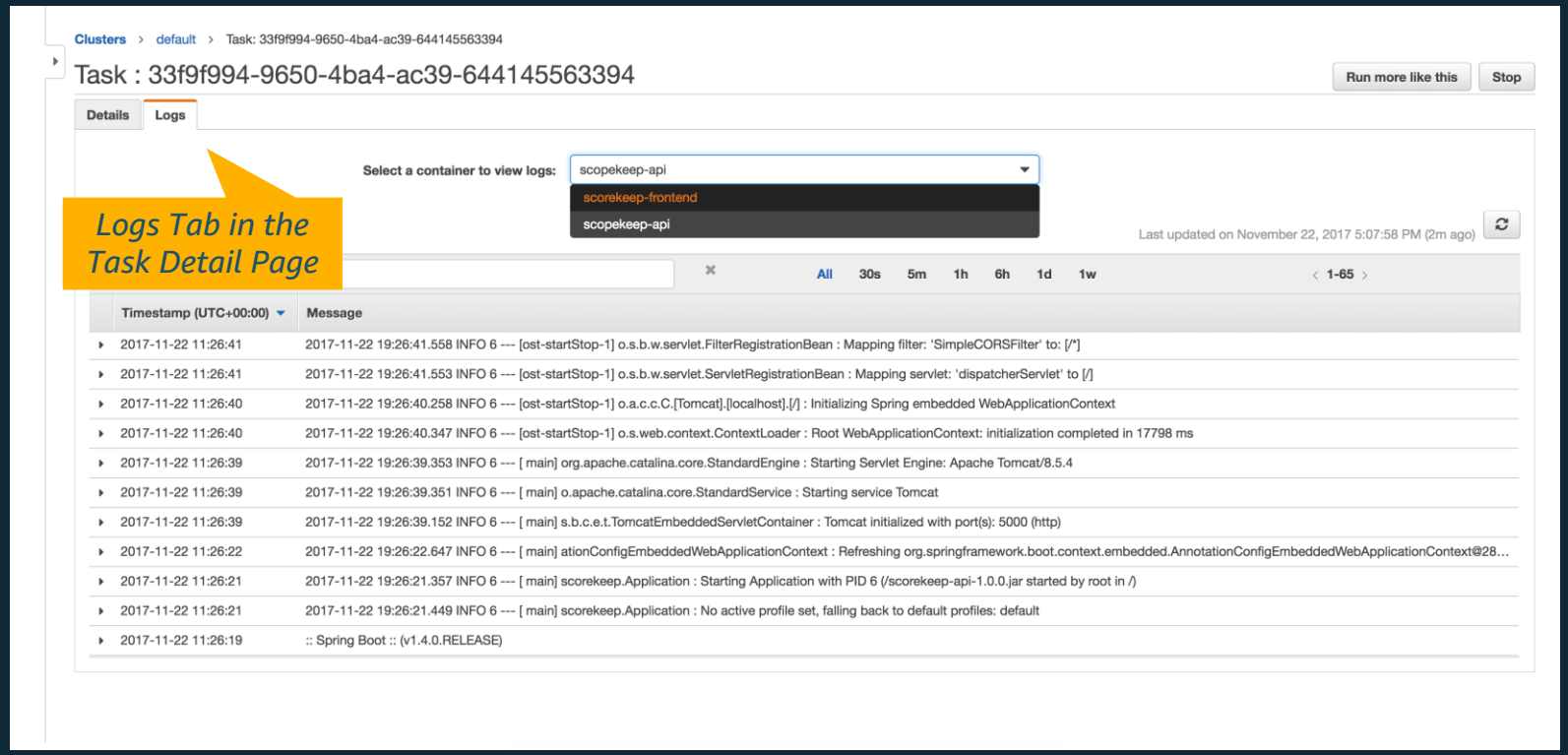
Allows us to perform housekeeping activities around your task:

- *ECR Image Pull*
- *Cloudwatch logs pushing*
- *ENI creation*
- *Register/Deregister targets into ELB*

VISIBILITY & MONITORING

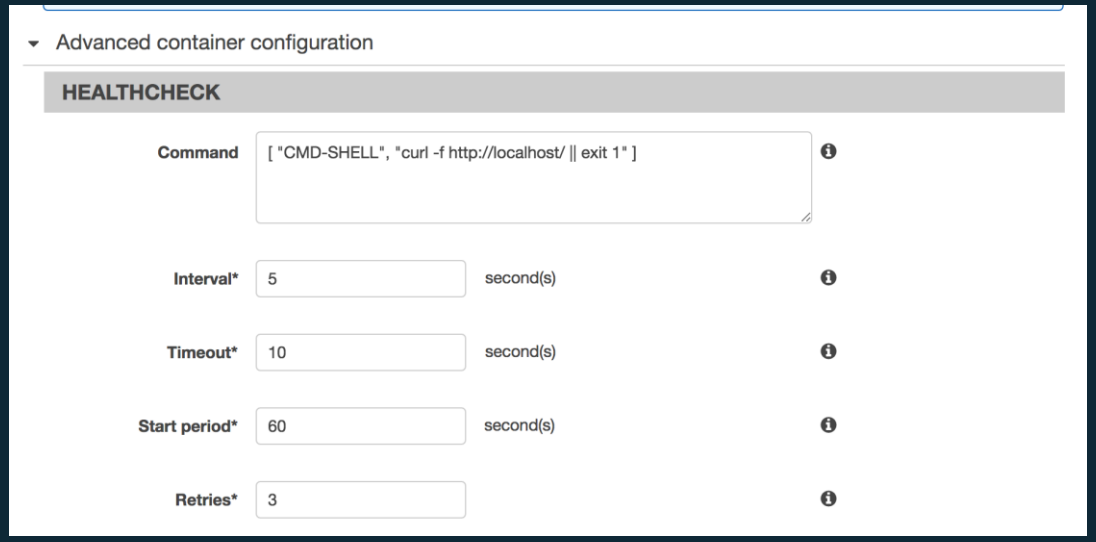
CLOUDWATCH LOGS

View logs in the ECS or Cloudwatch Console



Container Health Checks

- Define *custom* health check commands in the ECS Task Definition



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Task Metadata

- *Query environmental data and statistics for running tasks from within the Task!*
  Enables monitoring tools like Datadog, etc

- *Endpoints available:*
  Task Level (for all containers)
    - *169.254.170.2/v2/metadata – Metadata JSON for Task*
    - *169.254.170.2/v2/stats - Docker stats JSON for all containers in the Task*

  Container Level
    - *169.254.170.2/v2/metadata/<container-id>*
    - *169.254.170.2/v2/stats/<container-id>*

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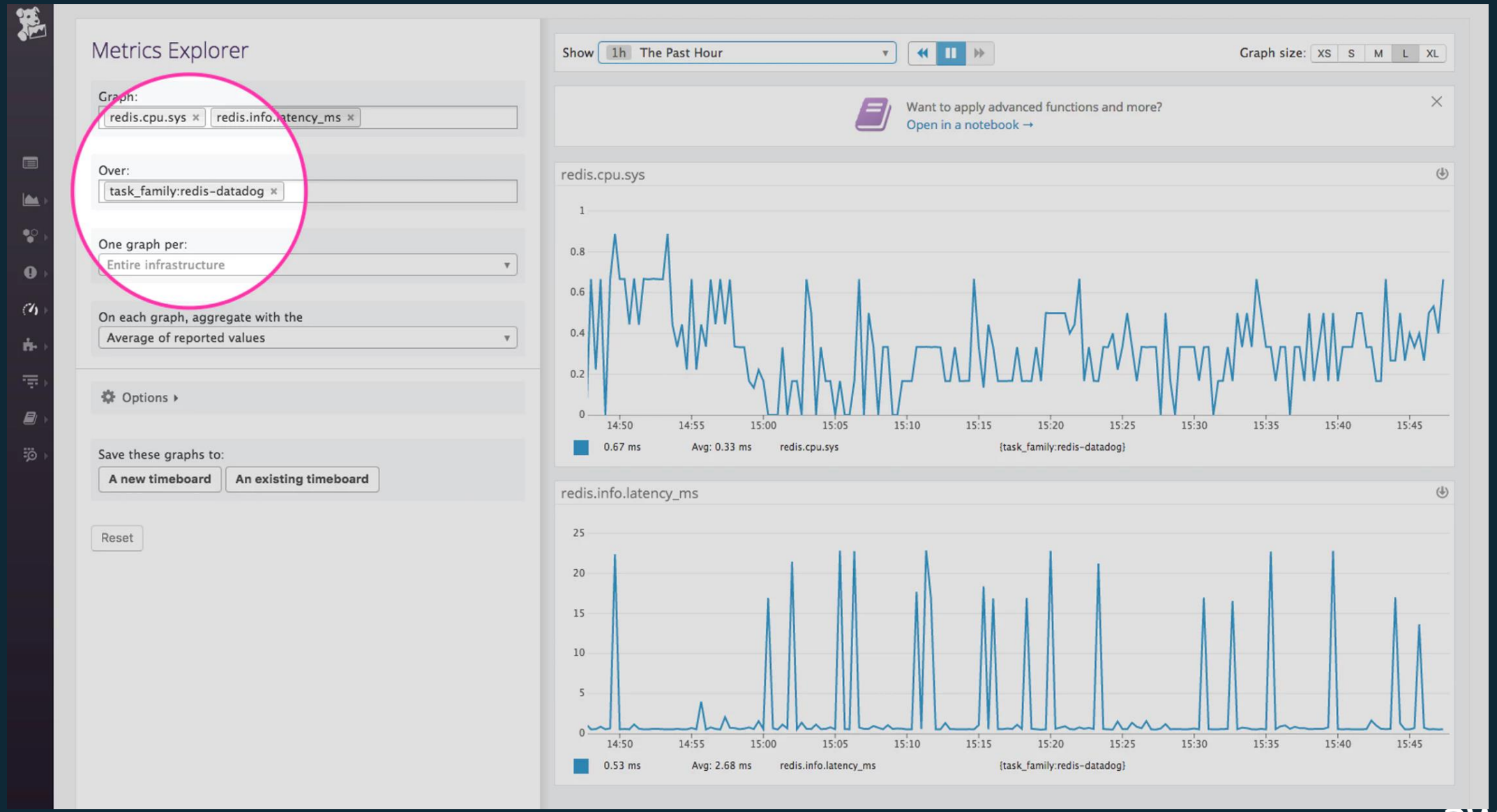
Monitoring with Datadog Autodiscovery and Fargate



Thank you!

Learn more at

aws.amazon.com/Fargate

www.datadoghq.com/blog/monitor-aws-fargate/