

MANAGING APPLICATIONS IN PRODUCTION WITHOUT MANAGING SERVERS

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*This article is about deployment and managing applications without managing server instances using AWS Fargate.*

Nowadays AWS is one of the most powerful and popular on-demand cloud computing platform, that is used by millions of companies for delivering their products to end users. Generally, each application hosted in AWS is deployed to EC2 instance inside private subnet and exposed by special security group. Of course, such deployment scheme requires servers managing. In other words, you need a specialist or even an operation team with good knowledge of such systems and cloud deployments. And even that does not guarantee, that your system will be enough secure, fast and reliable.

By the end of 2017 Amazon introduced AWS Fargate for running applications without having to manage servers or clusters. It was irrelevant till 2019 because of extremely high pricing. Currently Fargate has almost the same price as EC2 instances, so this service gives opportunity for deploying applications fast and secure without of managing application servers.

Let's imagine production infrastructure of microservice application deployed in a cloud according to AWS best practices [2]. Generally, it consists of the following resources:

- virtual private cloud (VPC);
- public and private subnets, route tables;
- NAT and internet gateways;
- application instances (EC2) hosted in private subnet;
- bastion instance hosted in public subnet for accessing application instance via SSH;
- autoscaling group, autoscaling policies and alarms for triggering autoscaling;
- container server, cluster and docker containers;
- load balancers and firewalls;
- security groups.

Building such infrastructure requires a lot of time, incorrect configuration can lead to different problems such as security holes or high billing.

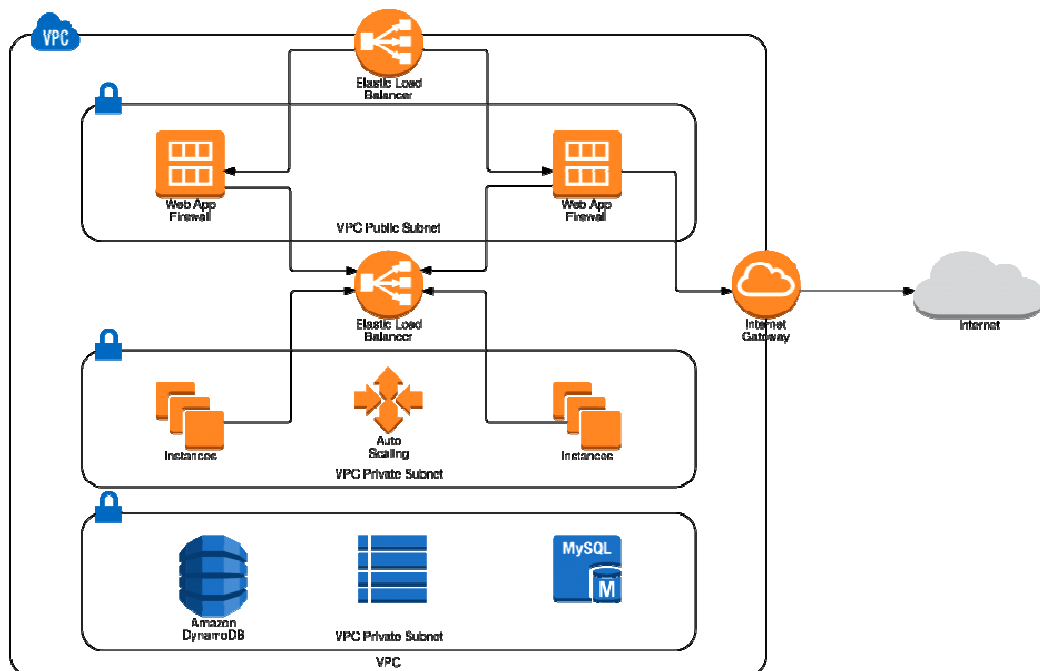


Figure 1. – General application infrastructure (without bastion host)

It takes a lot of time to configure all these resources. If you need SSH access to the application instance you have to add additional instance hosted in public subnet and called "bastion instance". This gives a lot of vulnerabilities. For example, AWS users in account which have access to AWS EC2 service can edit security group and log into application server and break something on production environment.

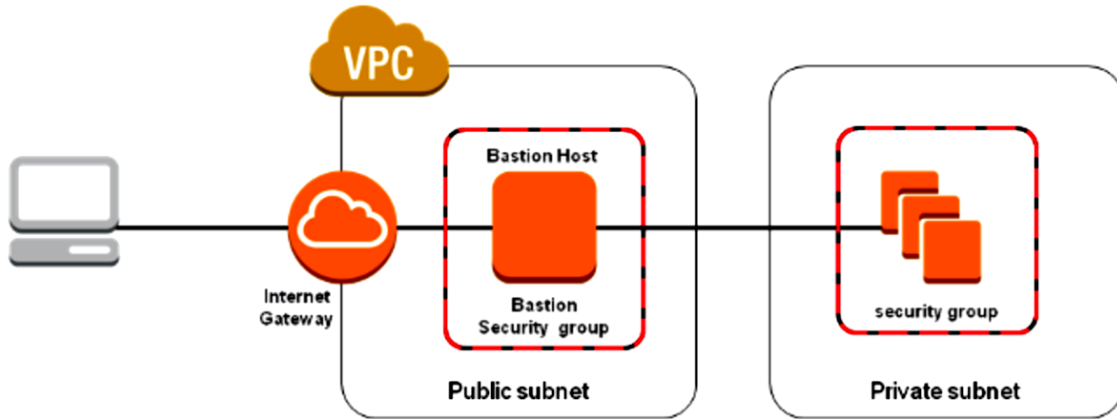


Figure 2. – Infrastructure for SSH access to application instance

This is required minimum to protect application server from attacks from the internet, but it does not protect from internal attack.

What if nobody has access to application servers even administrators? AWS Fargate allows you to run containers without having to manage servers or clusters. It removes the need for you to interact with or think about servers or clusters. Fargate lets you focus on designing and building your applications instead of managing the infrastructure that runs them.

With AWS Fargate you can get rid of EC2 instances, autoscaling groups, security groups for EC2 instances, alarms, it makes you infrastructure much easier and secure. Besides, it makes deployment faster.

Generally, monitoring is an important part of application production. With instance application servers you have to set up monitoring for instances and docker containers to know about CPU and memory consumption both on instances and application containers. It takes additional time, resources and gives potential vulnerabilities. With AWS Fargate you should setup monitoring only for containers, no application servers – nothing to monitor.

Speaking about scaling, with Fargate you don't have to setup autoscaling groups, policies, alarms. You don't need to scale instances, you can scale your application only by tasks (applications).

But what if your application uses additional software that should be installed on instance? No problems with that, AWS Fargate uses new network mode called "aws-vc". With this mode all application containers communicate with each other via isolated local network. All additional software can be installed in additional docker container and mounted to other application containers.

And the most important question is pricing. Of course, AWS Fargate is a little bit more expensive comparing to EC2 instances (20% more expensive for most of regions). But this is about empty EC2 instances, if we take into account monitoring, alarms, scaling and additional bastion instances for SSH access, it can be even cheaper, all depends on your system requirements. So, the best solution is to use cheap t2 instances for development purposes, and AWS Fargate for production.

Managing application servers adds a lot of problems for development and operation teams. It requires a lot of knowledge, time and resources. AWS Fargate solves these problems, it has a lot of advantages over EC2 deployment, it faster, easier, more secure and reliable. It can be used for almost all applications.

#### REFERENCES

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2. AWS Best practices – AWS Documentation [Электронныйресурс] / AWS Architecture best practices. – Режим доступа: <https://aws.amazon.com/architecture/>. – Датадоступа: 18.02.2019.