



## vFunction Deployment Guide

### 1. Use Cases

#### A. Cloud migration:

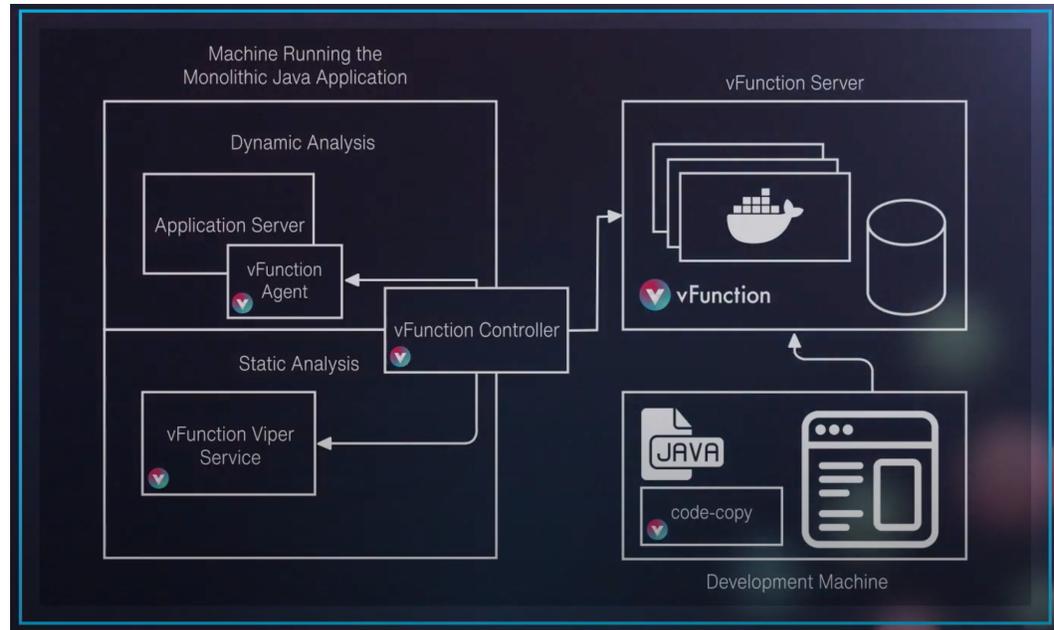
1. Combining cloud migration with the vFunction application modernization platform enables organizations to maximize cloud migration ROI and achieve greater cloud computing benefits. While lifting and shifting applications to the cloud may allow customers to shut down their data center, it does not enable them to realize the benefits of the cloud such as elasticity, re-gained engineering velocity, and cost savings. Containerization of monolithic apps, without refactoring, can enable some DevOps benefits, such as security and portability gains, but enterprises still are unable to gain increased engineering velocity and elasticity. Innovation, short release cycles, elasticity, and cost savings are enabled by true transformation into microservices. This is the focus of the vFunction platform.
2. Deciding which applications to retire, which to re-host/re-platform, and which to refactor is hard, time-consuming, and resource-intensive. vFunction is able to analyze applications, determine their complexity, and recommend which are the best fit for refactoring, based on a data-driven approach that takes the assessment information and uses it as part of the automatic refactoring enabled by vFunction.

#### B. Legacy modernization:

1. Customers may have large Java monolithic applications, where maintenance is expensive and innovation is hampered by complexity and long release cycles. Modernization becomes necessary in order to support business competitiveness, whether the modernization initiative is part of a large cloud migration project or not. vFunction is the only platform for developers and architects that intelligently and automatically transforms these complex monolithic Java applications into microservices.

### 2. Environment

The vFunction platform requires installation of the vFunction server followed by installation of the vFunction controller on any application's JVM to be assessed and analyzed.



**Chart I: The vFunction Deployment**

If the use case of the deployment is to assess several applications, it is advised to install the vFunction agent on applications in production so it can collect data while the applications run in production. If the use-case is to either assess or analyze and start to decompose one application, vFunction can be installed in a pre-production environment (dev/test) where the customer will need to run a suite of tests (acceptance, regression, or sanity) that cover the application's functionality in general and more specifically, the functionality one wishes to extract into separate services.

### 3. Installation & Upgrade

vFunction installation guides are available here (requires access to vFunction portal ):

- vFunction installation and upgrade guides: <https://portal.vfunction.com/files/shares/Installation%20&%20Upgrade%20Guides>
- vFunction installation files: <https://portal.vfunction.com/files/shares/Installation%20Files>

vFunction **Compatibility matrix** is available here (requires portal access):

<https://portal.vfunction.com/file/94b195a3-acf7-42a8-b2d6-476717d75a5e/Compatibility+matrix-+vFunction.pdf>

### 4. vFunction Server Deployment Options

For a standard installation, the vFunction server can be installed on a single VM as described in the vFunction Server installation guide. For a scalable installation, supporting organizations with over 100 applications, the vFunction server can be installed on an Kubernetes or OpenShift environment as detailed in the vFunction Operator installation



guide:

<https://portal.vfunction.com/files/shares/Installation%20&%20Upgrade%20Guides/Operator%20Installation%20Guide>

## 5. Prerequisites:

*vFunction server installation checklist:*

- [ ] Instance running Linux OS (Note: not a container, MacOS is not supported).
- [ ] At least 8GB of memory required for the server (16GB recommended)\*.
- [ ] Recommended 4 vCPUs\*.
- [ ] A minimum of 50 GB of storage (General purpose storage)\*.
- [ ] Docker service available on the instance (minimal version 17.03).
- [ ] Security-Enhanced Linux (SELinux) either in disabled or permissive mode.
- [ ] A URL or hostname that is accessible in the organization's network (e.g. hostname.myorg.com).
- [ ] If HTTP/S is required for the POC: an SSL certificate for the selected hostname. Self-signed certificates are not supported. HTTP is supported.

Note (\*): Installing the vFunction server on an AWS instance will incur cost based on the instance type ([EC2 Pricing](#)) and the amount of storage ([EBS Pricing](#)).

Note: Root access is not required. Separate installation files are available for root and non-root installations. No publicly accessible resources are required for the server to operate. Furthermore, no additional IAM access requirements and no additional permissions are needed.

For the OpenShift or Kubernetes installation, please refer to the installation guide for a list of required permissions and capacity.

A reference AWS cloud instance that meets the requirements above is: Amazon EC2 m5.xlarge.

*vFunction Security whitepaper* is available here (requires portal access):

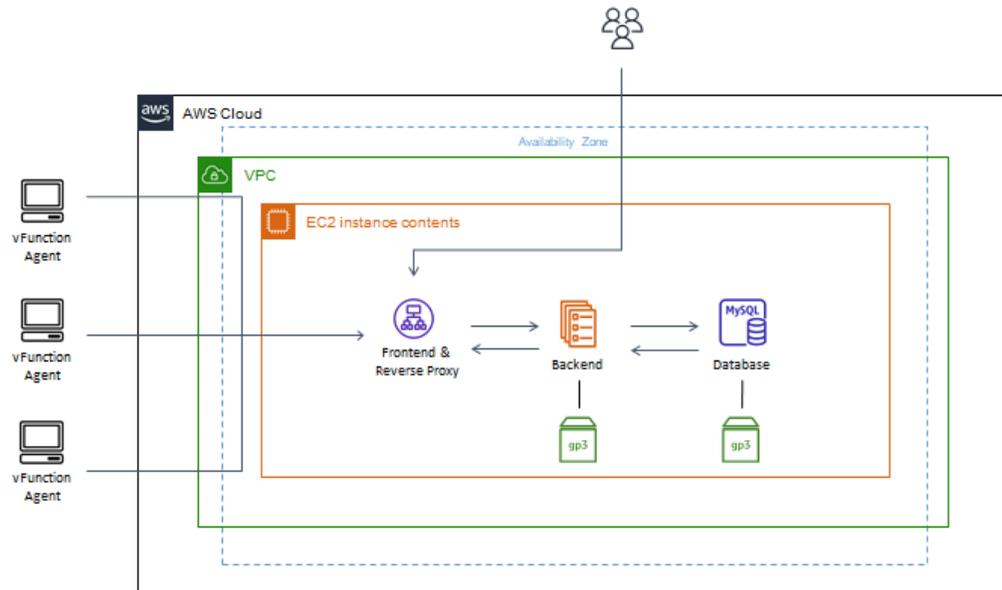
<https://portal.vfunction.com/file/1108d550-6595-4f4e-9580-b8ea61c9c299/vFunction+Security+White+Paper+-+12-2020.pdf>

With the prerequisites checklist done, the server installation should take less than one hour to complete. The skills that are required to install the server are basic Linux administration skills. To install the vFunction Controller it is recommended to have basic administration skills for the relevant application server (e.g. WebLogic Server Admin, WebSphere admin, etc.).

## 6. Deployment Architecture Diagrams (Amazon AWS):

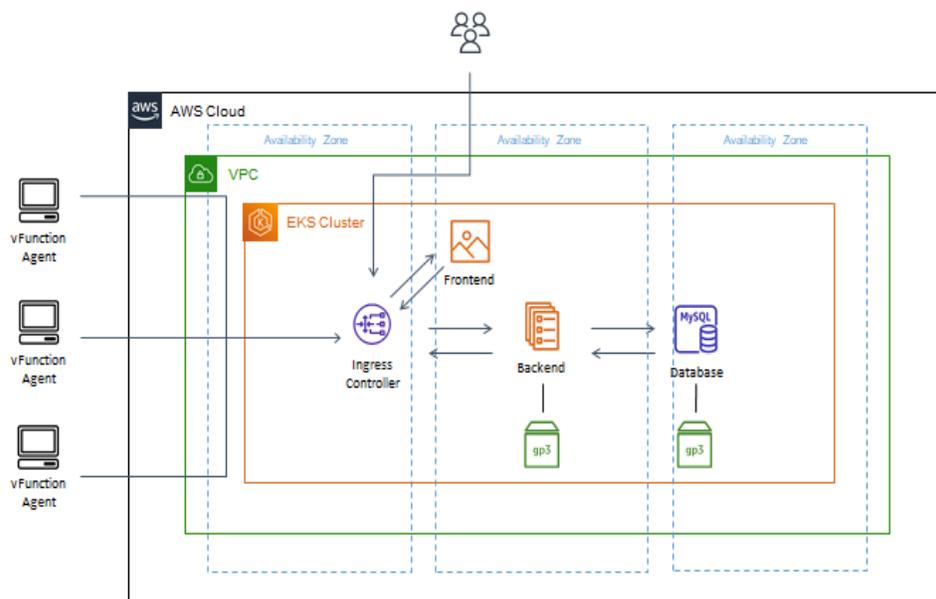
### A. vFunction Server Installation Diagram

In this installation, the entire server is confined to a single instance. There are several docker containers running on this instance, including an nginx container, a mysql database and the vFunction services themselves.



### B. vFunction Operator/Kubernetes Installation Diagram

In this type of installation, the containers are installed on an EKS cluster. Different containers, including an nginx container, a mysql database and the vFunction services themselves run on different nodes, health checks are done by the K8s and the system may also scale as needed.





## 7. Backup and Restore

The vFunction Server automatically backs up its database every 24 hours, and before every upgrade to the server version.

The backup is stored on the database volume attached to the vfunction-mysql container.

It is recommended to create daily snapshots of the volumes attached to the vFunction server. In a single server installation, by default, the docker volumes are located on the same EBS volume. In a K8s (EKS) installation, snapshots need to be taken of the volume attached to the vfunction-mysql container and the volume attached to the vfunction-storage container.

In order to perform scheduled snapshots of the attached EBS volume, using AWS Cloud Watch, follow the instructions in this [link](#).

The Recovery Point Objective (RPO) of the vFunction Server is determined by the frequency of backups. With default settings and with daily snapshots, the RPO is 24 hours. The Recovery Time Objective (RTO) will be determined by the procedures followed by the customer.

In order to restore the server from a backup, take down the docker service, replace the attached volumes with volumes created from backup snapshots, and then run the upgrade.sh script.

To restore the database from the last available backup of the current deployed version (created daily and saved as a backup on the database volume), run:

```
bash upgrade.sh --restore-from-last-dump .
```

## 8. Restarting and Restoring Functionality to the vFunction Server

In order to restart the vFunction Server in cases where one of the containers fails, run “bash upgrade.sh” script from the /opt/vfunction/server-installation directory. This will restart all the docker containers and restart the server.

In case the vFunction Server is installed on Amazon EKS using the vFunction Operator, the system will recover automatically from any failed container.

In extreme situations, such as a complete loss of instance or Availability Zone (AZ) failure, reinstall the server and restore the storage from backup as described in the previous section.

## 9. Health Check

In order to perform a health-check on the vFunction Server one can check the following urls:

- <https://{server url}/version>



- <https://{server url}/api/unauth/users/version>
- <https://{server url}/api/unauth/measurements/version>
- <https://{server url}/api/unauth/organizations/version>

## 10. Getting Support

The vFunction platform is for development and modernization purposes, and as such, should not be considered a critical system.

**In case vFunction is installed on a critical production system, it should be disabled in case an issue arises, thus removing its effect from the critical production system.**

With that in mind, all incidents related to vFunction are considered non-critical and with limited business impact, and will be handled with the same SLA.

All issues reported to [support@vfunction.com](mailto:support@vfunction.com) will be responded to within 1 business day, local provider hours (Sunday-Thursday 8am-6pm Provider's Local time).