

Upsilon Project Documentation

Table of Contents

Introduction	1
Help improve this documentation!	2
Services & Introduction	2
Architecture Overview	2
Drone	3
Web	3
Reactor	3
Custodian	3
Installation	3
Deployment Environments	3
"All in one" CentOS Virtual Machine	4
Upsilon on OpenShift	6
Upsilon on Docker	9
Upsilon with Ansible	9
Upsilon your way... ..	9
Setup	10
Database	11
Web	11
Drone	13
Custodian	15
Usage	15
Setting up a service check	15
Integration	15
Grafana	15
Authentication	17
Common Issues	17
Database Issues	17
Upgrading	17
Appendix	17

Introduction

[\[Build Status\]](#)

These are the Upsilon docs. They are available at docs.upsilonproject.io and the [upsilon-docs project on GitHub](#). You can also [download a PDF](#) if that's what you're into.

To learn more about the Upsilon project, please visit <http://www.upsilonproject.io>.

Help improve this documentation!

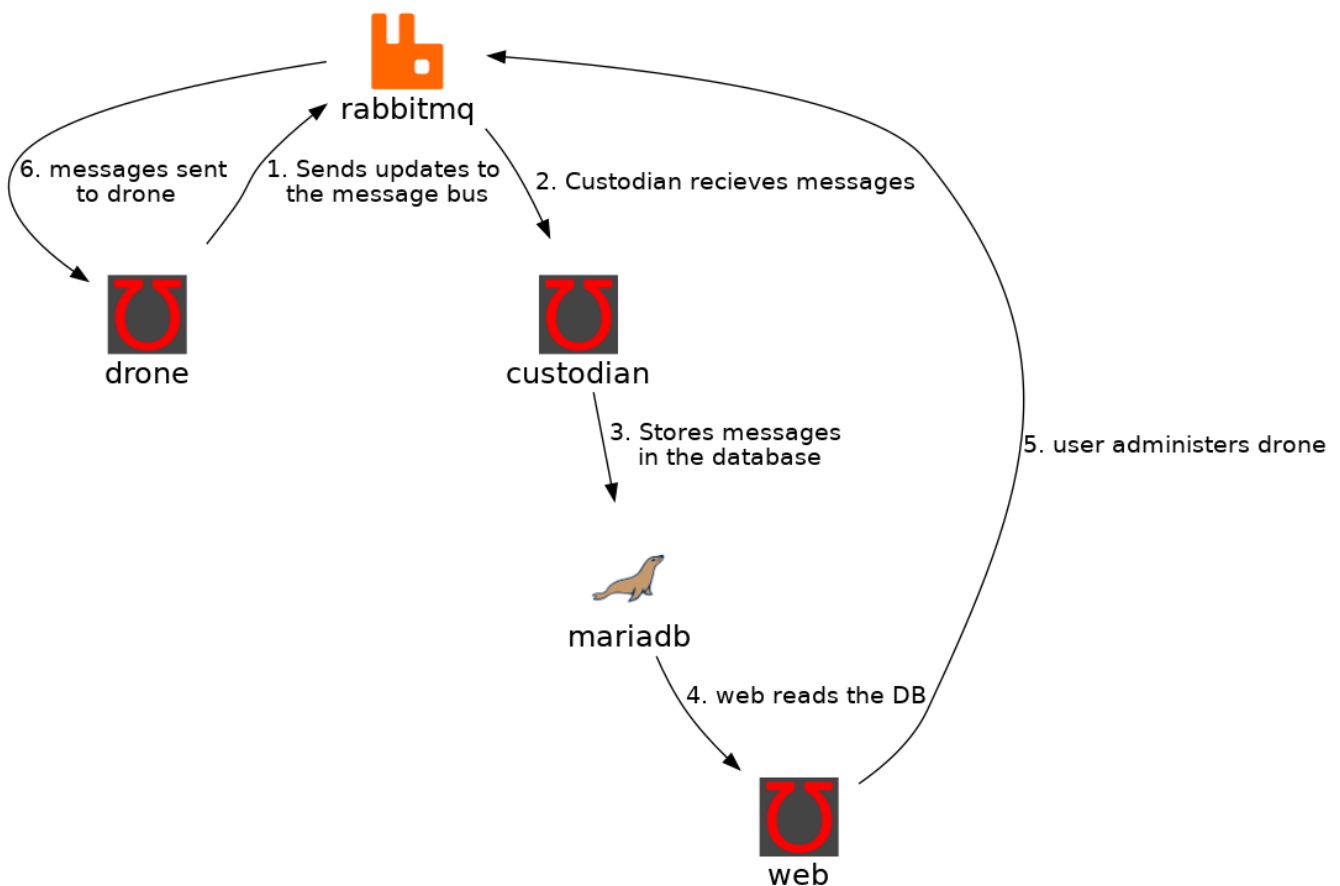
This documentation is written in a very simple human-readable language called [AsciiDoc](#). This means basically anyone can make changes and improvements by just visiting the GitHub repository for the documentation raise a GitHub pull request against your own feature branch.

If you don't know how to do that, please just [tell us how to improve documentation](#) by raising an issue ticket against the docs and we'll take it from there!

Services & Introduction

Architecture Overview

- [Drone](#) - The drone is the main worker, it run service checks and collects results.
- [Web](#) - The web interface provides a graphical dashboards, and administrator command and control.
- MobileWeb - A native Android application with shortcuts for the web application, as as the ability to recieve notifications from reactors.
- [Reactor](#) - Alerting and notifications.
- [Custodian](#) - Provides an API on top of the database.



Drone

upsilon-drone runs the service checks.

Configuration

Autoconfiguration

upsilon-drone will look for the following environment variables on startup;

Environment Variable	Example	Description
UPSILON_IDENTIFIER	test.example.com	The unique identifier for the node
UPSILON_CONFIG_SYSTEM_AMQPHOST	amqp.example.com	The address of the AMQP Server

config.xml

upsilon-drone can be manually configured by a simple config.xml file, usually installed at `/etc/upsilon-drone/config.xml` on most platforms. This is necessary if you don't want to use central configuration management for some reason.

Web

The web interface.

Reactor

The reactor "reacts" to things in upsilon. It should provide alerting one day.

Custodian

TODO.

Installation

This section could be called **installation options**, as it presents a couple of different options to install Upsilon. However, it's probably a bit more correct to think of these as "deployment environments" so that is the terminology used by this documentation.

Deployment Environments

Here are a set of common deployment environments. It's important to know that you **can change**, scale and upgrade Upsilon later on as well - the architecture is such that if you start off in a single virtual machine but later decide to go "full on with containers" (!) you can do that without too much

hassle. See [the upgrading section](#) for more information.

- [Upsilon all-in-one on a CentOS Virtual Machine](#) (~20 minutes)
- [Upsilon on OpenShift](#) (~5 minutes)
- Upsilon in docker Containers (~10 minutes)
- [Upsilon with Ansible](#) (advanced installation)
- [Upsilon your way...](#) (advanced installation)

"All in one" CentOS Virtual Machine

Upsilon can quite happily exist all in a single virtual machine for most deployments. You can scale out and change fairly easily after that too, but this sort of configuration is normally best for playing around, testing, kicking the tyres and similar.

This article assumes you know how to install CentOS 7 in a virtual machine on your favourite hypervisor, or cloud. Upsilon doesn't really care where it runs.

Virtual Machine requirements

- **Hypervisor:** any hypervisor/virtualisation that runs CentOS 7 Linux.
- **RAM:** 4 Gb
- **CPU:** 2x virtual CPUs
- **NIC:** 1x public network interface
- **OS:** CentOS 7, <http://centos.org>
- **Firewall:** *see below...*

Protocol & Port	Source	Reason
TCP Port 22	inbound	SSH inbound traffic - to connect to the VM for administration
TCP Port 80	inbound	HTTP inbound traffic - to access the web interface (upsilon-web)
TCP Port 4000	inbound	upsilon-drone inbound traffic - REST API port
TCP (Various port)	outbound	What do you want upsilon to connect to?

Install packages and enable dependant services

Become root on your virtual machine, lets begin :)

```
root@host:
```

Add the upsilon yum repository, and the EPEL repository for CentOS (Extra Packages for Enterprise Linux);

```
root@host: cd /etc/yum.repos.d/
root@host: curl -O http://repos.upsilonproject.io/upsilon-rpm-el7/upsilon-rpm-el7.repo
root@host: rpm -U https://dl.fedoraproject.org/pub/epel/epel-release-latest-7.noarch.rpm
```

For RHEL, you need to enable the following repositories;

```
root@host: subscription-manager --enable 'rhel-7-server-rpms'
root@host: subscription-manager --enable 'rhel-7-server-extras-rpms'
root@host: subscription-manager --enable 'rhel-7-server-optional-rpms'
```

Lets install everything! Dependencies will be installed automatically.

```
root@host: yum install centos-release-scl
root@host: yum install upsilon-drone upsilon-web upsilon-database-sql rabbitmq-server
mariadb-server httpd mariadb-server php php-pdo php-mysql
```

Lets start the webserver (httpd), the database server (mariadb), the message server (rabbitmq) and make sure they restart on reboot (using **enable**);

```
root@host: systemctl enable httpd mariadb rabbitmq-server
root@host: systemctl start httpd mariadb rabbitmq-server
```

Should be no problems so far. Lets open up the port for the web interface if it's not already open;

```
root@host: firewall-cmd --add-service http --permanent
```

Create a "upsilon" DNS record

Many of the upsilon services rely on a DNS record called "upsilon" to find the messaging server, and perform auto-configuration.

Because this is all in one virtual machine, we can simply edit the hosts file. Open **/etc/hosts** and add "upsilon" as a name for localhost;

```
127.0.0.1    localhost localhost.localdomain localhost4 localhost4.localdomain4 upsilon
::1         localhost localhost.localdomain localhost6 localhost6.localdomain6 upsilon
```

You should be able to **ping** **upsilon** if you have done this correctly.

```
[root@upsilon-allinone upsilon-drone]# ping upsilon
PING localhost (127.0.0.1) 56(84) bytes of data.
64 bytes from localhost (127.0.0.1): icmp_seq=1 ttl=64 time=0.023 ms
64 bytes from localhost (127.0.0.1): icmp_seq=2 ttl=64 time=0.048 ms
...
```

Get the web interface installed

Now try and visit the web interface;

<http://yourVmIPAddress/upsilon-web/>

There isn't anything that exciting in the web interface by default, so lets setup a drone so we can start monitoring stuff.

Start using the web interface

In the web interface, go to Nodes >> List, you should see the custodian and drone show up. If so, you're ready to get going!

Go to .

Upsilon on OpenShift

Upsilon can be deployed quite easily on top of OpenShift 3 - all it's services dockerized/containerized. You can scale-out of the OpenShift environment and deploy upsilon-drone and other services outside too.

This article assumes you have a OpenShift 3 environment up and running, and have a fairly reasonable quota.

Create a OpenShift project for Upsilon

Call it anything you like!

Create Project

* Name

A unique name for the project.

Display Name

Description

Upload the Upsilon application template to OpenShift

There is a pre-built Upsilon application template for OpenShift, stored in a GitHub repository called [upsilon-on-openshift](https://github.com/upsilonproject/upsilon-on-openshift).

On your local workstation, clone this repository:

```
user@host: mkdir upylon-sandbox && cd upylon-sandbox
user@host: git clone https://github.com/upsilonproject/upsilon-on-openshift.git
user@host: cd upylon-on-openshift
```

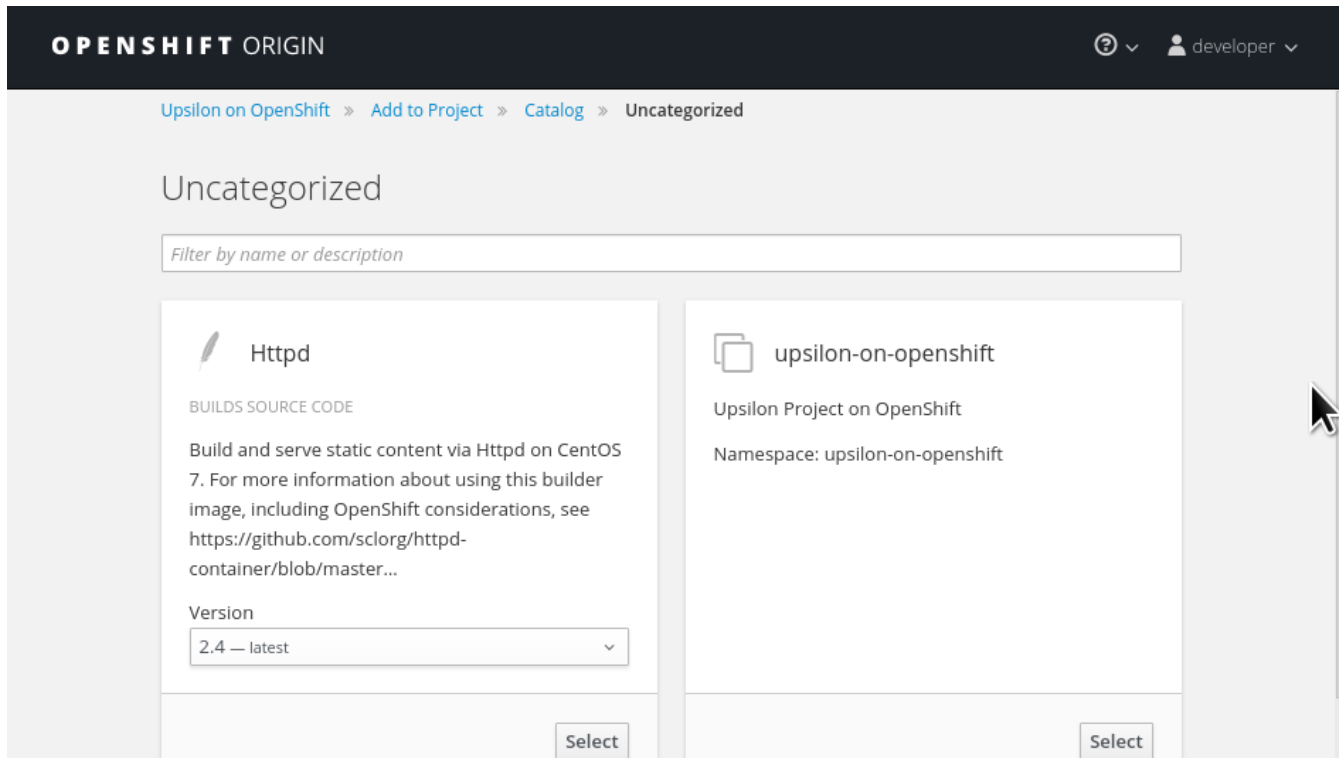
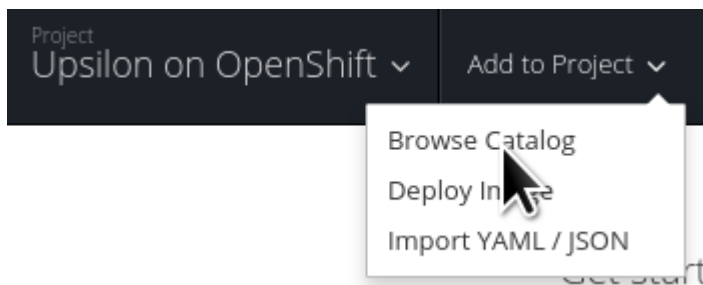
Login to OpenShift using the command line tool and upload the application template.

```
user@host: oc new-project upylon-on-openshift
user@host: oc status
In project Upsilon on OpenShift (upsilon-on-openshift) on server
https://openshift.example.com:8443

You have no services, deployment configs, or build configs.
Run 'oc new-app' to create an application.

user@host: oc create -f upylon-on-openshift.yaml
```

The application template should complete successfully, and you should be able to browse and find Upsilon in the OpenShift catalog;



You can change some of the deployment options before starting the deployment, but the defaults are fine.

Project Upsilon on OpenShift
Add to Project
?
developer

Name
Filter by name
List by Application

APPLICATION
upilon-on-openshift
<http://amqp-mgmt-upilon-on-openshift.52.169.163.233.nip.io>

>	DEPLOYMENT mysql, #1	Recreate deployment is pending ... View Events Cancel	⋮
>	DEPLOYMENT upilon-amqp, #1	Recreate deployment is pending ... View Events Cancel	⋮
>	DEPLOYMENT upilon-custodian, #1	Recreate deployment is pending ... View Events Cancel	⋮
>	DEPLOYMENT upilon-drone, #1	Recreate deployment is pending ... View Events Cancel	⋮

When the pods deploy successfully, continue to the [Setup](#) section of this manual.

Upsilon on Docker

Drone on Docker

```
docker create --name upilon-drone -p 4000:4000 upilonproject/drone
-EUPSILON_IDENTIFIER=myDroneName
```

Upsilon with Ansible

Note: These ansible scripts are in very **early development**, they help, but don't install a full environment. Only useful if you know Upsilon pretty well right now. If you just want to play around with Upsilon for testing, **don't use this method**.

The GitHub repository is stored and maintained here with documentation;

- [upilon-ansible](#)

Upsilon your way...

Upsilon was designed to not be too prescriptive to the architecture it runs on, as everyone has different environments and different requirements.

Here are the high level requirements for running Upsilon

- DNS record "upsilon" that points to the AMQP server.
- Linux environment is largely expected, although parts of Upsilon might run on windows or MacOS, this isn't tested really at all at the moment. CentOS is used by the project developers, hence CentOS packages are available. Debian based or other distributions are likely to work fine though.

Here are some other deployment configurations that are known to work;

- Using 1 uspsilon service to 1 docker container, then deploying on OpenShift, or docker on it's own.
- Deploying every service inside a virtual machine.

Setup

This section is about how to setup Upsilon once it is installed.

Database

When MySQL is installed, it will not be setup automatically with the `upsilon` database. We need to set that up manually using a couple of scripts.

If you are running on a Linux machine (without containers);

Make sure the `upsilon-database-sql` package is installed.

```
user@host: yum install upsilon-database-sql
```

Go into the database setup directory that is created for you;

```
root@host: cd /usr/share/upsilon-database-sql/mysql/
```

There is a "create-database" script in this directory, but that requires a few settings that we have not setup. Instead lets just run the following commands to import the database;

```
root@host: mysql -u root -e 'CREATE DATABASE upsilon'
root@host: mysql -u root upsilon < sql/schema.sql
root@host: mysql -u root upsilon < sql/initialData.sql
```

If you are running inside a Linux container (like OpenShift);

The `upsilon-web` container image contains the database installer. You just need to launch a shell inside this container to run the initial database setup.

Create the database

Create the initial database using the `create-database` script.

```
user@host: cd /usr/share/upsilon-database-sql/mysql/
user@host: ./create-database
```

Web

Launching the installer

`upsilon-web` will automatically launch the web installer if it cannot find a `config.php` file. This happens when `upsilon-web` is initially installed (or it's config file has been deleted).

This is what the `upsilon-web` installer looks like;



upsilon-web

This is the upsilon-web installer, it checks the system for any obvious errors and generates a config.php file for you. It doesn't make any automated changes to the site, just helps things along a little.

System tests

These are a few basic tests that check your system prior to installation. If any of the items below are "FAIL", you should fix them.

Test	Result
phpVersion	PASS
pdoAvailable	PASS
mysqlAvailable	PASS
sessionPathWritable	PASS
configFileCreated	PASS

Read the [installation guide](#) for more help.

Generate config.php - installation questions

Database

Your database credentials have been provided by environment variables, so the installer has completed the database section of the installer. You still need to enter your initial administrator

System tests

Various common tests will run to check that upsilon-web can be installed correctly. Everything should be green with a **PASS** in order to continue.

Most of these issues require additional packages to be installed, for example the **pdoAvailable** check can be fixed by doing **yum install php-pdo** on some systems.

Generate config.php

Database

When all the system tests have passed, you need to then configure the database connection.

Field	Example	Description
DSN	<code>mysql:host=myserver;dbname=upsilon</code>	See http://php.net/manual/en/pdo.construct.php for more information.
Database user	<code>admin</code>	The username of the user that the web interface will use to connect to the database.

Field	Example	Description
Database pass	toomanysecrets	The password for your database username.

NOTE

In some environments like OpenShift the username and password can be automatically completed for you as shown below. In other cases, you must specify the username and password of an existing MySQL user, or use the root user.

Generate config.php - installation questions

Database

Your database credentials have been provided by environment variables, so the installer has completed the database section of the installer. You still need to setup your initial administrator.

DSN

Database user

Database pass

Common Issues

- asdf

First administrator

The default first admin is `admin`, but you can change that here and set a password that you like as well. Additional administrators can be configured later too.

Administrator

First Admin Username

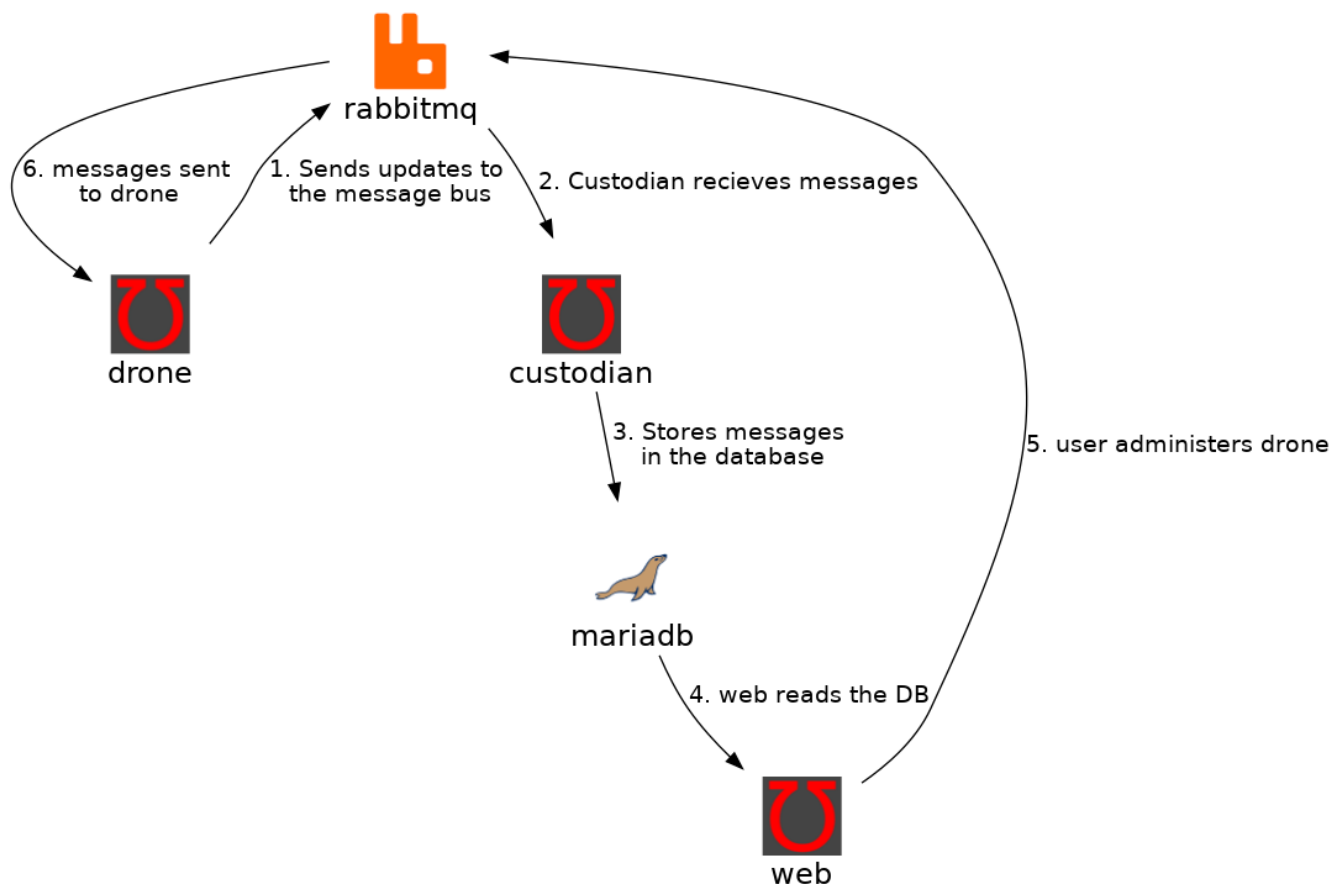
First Admin Password

First Admin Password (confirm)

Drone

upsilon-drone is the workhorse of Upsilon, and you need at least one drone to get anything done.

Here's how the architecture works;



The upslon-drone service ships with a "sample" configuration file that is ready to use in this simple deployment;

```

root@host: cd /etc/upsilon-drone/
root@host: cp config.xml.sample config.xml

```

We should now start the drone, which should pick up the configuration file

```

root@host: service upslon-drone restart

```

Lets try and ping it;

```

root@host: upslon-ping
Waiting 3 seconds for responses to pings.
+-----+-----+-----+
| Identifier | Version | Type |
+-----+-----+-----+
| 5b4e1ec4-ab8d-4f03-88b3-0746f6e5922e | 2.2.0-0-1514431787 | amqp, rest |
+-----+-----+-----+

```

Looks good. However, we need a custodian to write results to a database now...

Custodian

```
user@root: yum install upsilon-custodian -y
```

upsilon-custodian should work without any additional configuration, so lets start it.

```
user@root: service upsilon-custodian restart
```

Lets do another ping to check it came up;

```
root@host: upsilon-ping
Waiting 3 seconds for responses to pings.
```

Identifier	Version	Type
upsilon-custodian	development	db, amqp
5b4e1ec4-ab8d-4f03-88b3-0746f6e5922e	2.2.0-0-1514431787	amqp, rest

Usage

Setting up a service check

Integration

Grafana

Grafana can quite happily read from the Upsilon MySQL database and show lots of information. The easiest way to probably do this is create a couple of SQL Views that make building Grafana queries a little easier.

Services Dashboard

Upsilon Services				
time ▼	id	karma	identifier	node
2019-06-01 21:15:47	6.00	GOOD	ispnouching	stuffbox.teratan.lan
2019-06-01 21:15:47	7.00	BAD	ping_superone	stuffbox.teratan.lan
2019-06-01 21:15:47	9.00	GOOD	http_jwread	stuffbox.teratan.lan
2019-06-01 21:15:47	10.00	GOOD	http_tydus	stuffbox.teratan.lan
2019-06-01 21:15:47	11.00	GOOD	http_xconspirisist	stuffbox.teratan.lan
2019-06-01 21:15:47	50.73 K	UNKNOWN	check_updates	stuffbox.teratan.lan
2019-06-01 21:15:42	50.71 K	BAD	check_updates	upsilon-dev
2019-06-01 21:15:42	50.71 K	GOOD	gather_ip_addresses	upsilon-dev
2019-06-01 21:15:42	8.42 K	GOOD	collect_public_ip	upsilon-dev

SQL View

```
create view `grafana_services` as select id, identifier, lastUpdated, node, case karma
when 'GOOD' THEN 3 WHEN 'BAD' THEN 0 WHEN 'UNKNOWN' THEN 1 WHEN 'OLD' THEN 2 ELSE '?'
END karma, karma AS karmaDescription FROM services;
```

Grafana Data Source Query (MySQL)

▼ A

FROM	grafana_services	Time column	lastUpdated	Metric column	none	
SELECT	Column: id	+				
	Column: karma	+				
	Column: identifier	+				
	Column: node	+				
WHERE	+					
GROUP BY	+					
Format as	Table ▼	Show Help ▶				

Grafana Table view

Use normal settings for table column headers.

Here is how you setup the karma column highlighting.

Options		Type		Value Mappings		Thresholds	
Apply to columns named	karma	Type	String	Type	Value to text	Thresholds ⓘ	1,2
Column Header	Override header label	Sanitize HTML	<input type="checkbox"/>	x 0	→ BAD	Color Mode	Cell
Render value as link	<input type="checkbox"/>	Preserve Formatting	<input type="checkbox"/>	x 3	→ GOOD	Colors	● ● ● <input type="button" value="Invert"/>
				x 1	→ UNKNOWN		
				+			

Authentication

Really sorry, but Upsilon does not really have any integration into authentication providers at the moment :(

Common Issues

Database Issues

web database install, Settings table does not exist

DSN

Settings table does not exist. Did you import the [setup/databases/schema.sql](#) file?

You need to [setup the database](#).

Upgrading

Upsilon is designed to be N-1 compatible for updates, with automatic upgrades of database schema and similar whenever possible.

Appendix

Please check out the website for further links, and to contact the community.

<http://upsilonproject.io>