



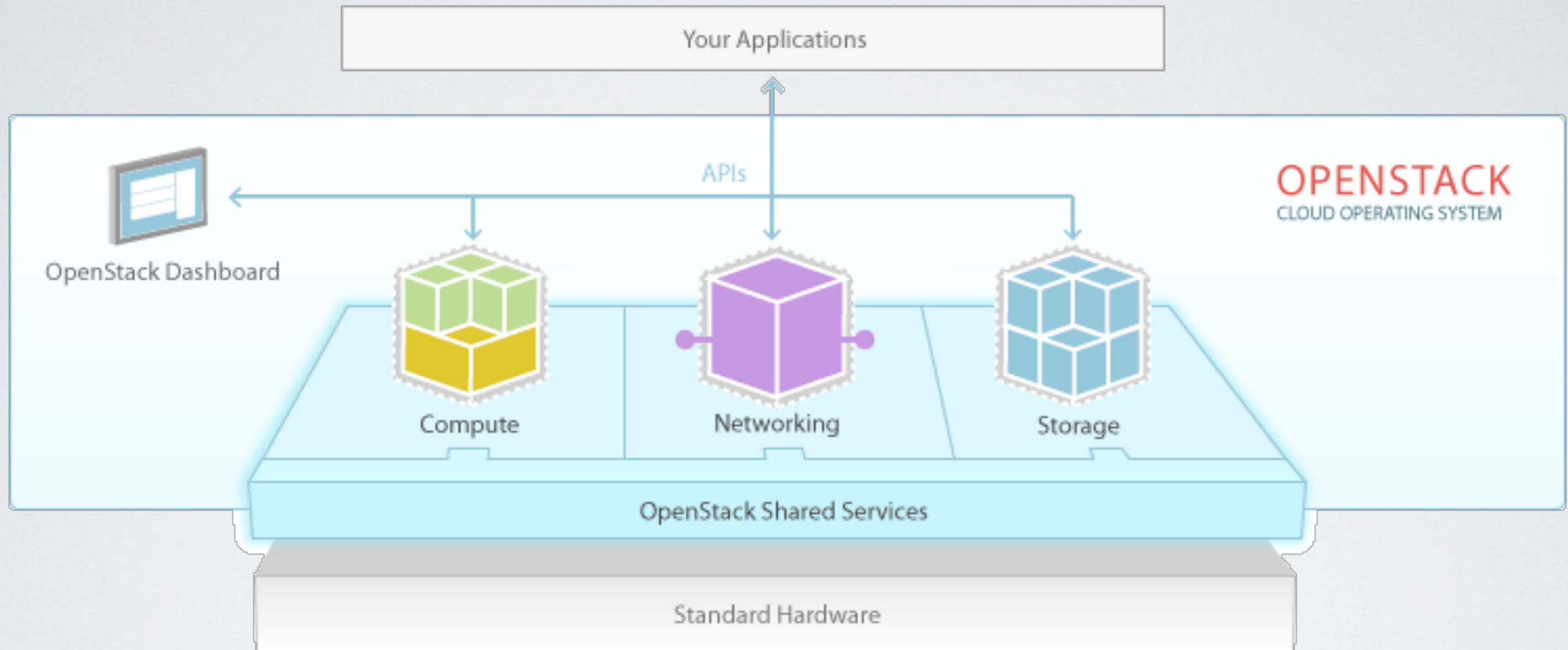
# OPEN ACADEMY

Tim Paine - Project OpenStack

# OPENSTACK

- Massively scalable cloud operating system
- Open Source
- Think AWS

# OVERVIEW



# OVERVIEW

- OpenStack Compute (**Nova**)
- OpenStack Image service (**Glance**)
- OpenStack Networking (**Neutron**)
- OpenStack Object Storage (**Swift**)
- OpenStack Block Storage (**Cinder**)
- OpenStack Identity (**Keystone**)
- OpenStack Telemetry (**Ceilometer**)
- OpenStack Orchestration (**Heat**)
- OpenStack Dashboard (**Horizon**)
- OpenStack Common Libraries (**Oslo**)

# OVERVIEW

- Russell Bryant, Red Hat Engineer
- <http://youtu.be/hWWSaBOMTNo>
- [http://rhsummit.files.wordpress.com/2013/06/bryant\\_t\\_0340\\_openstack\\_architecture1.pdf](http://rhsummit.files.wordpress.com/2013/06/bryant_t_0340_openstack_architecture1.pdf)

# MY PROJECT

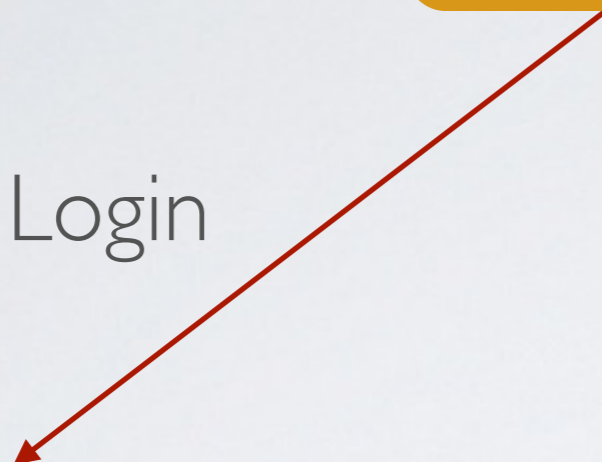
- Implement two-factor authentication for OpenStack
- Derek Chiang, Cornell
- Ved Lad, Cloud Engineer at Paypal

User

Login

Horizon

Keystone



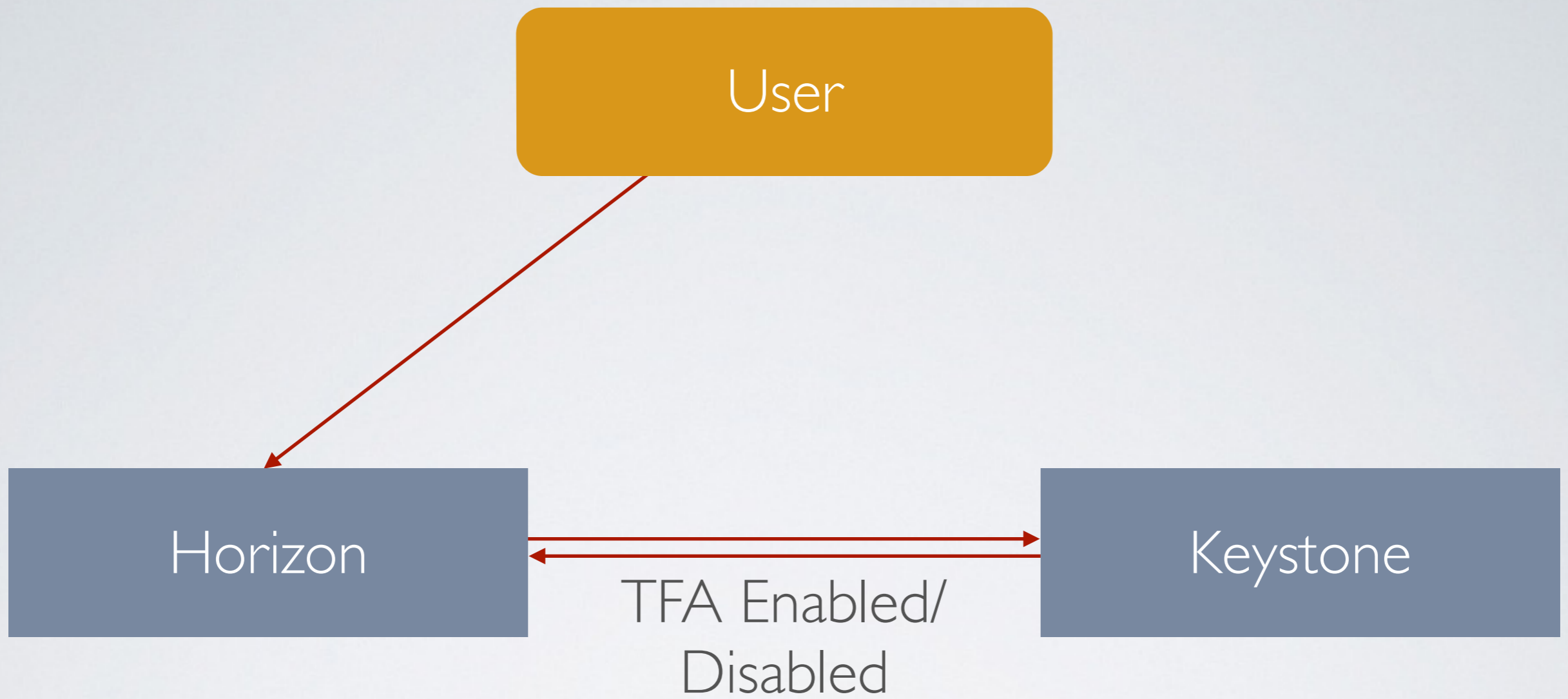
User

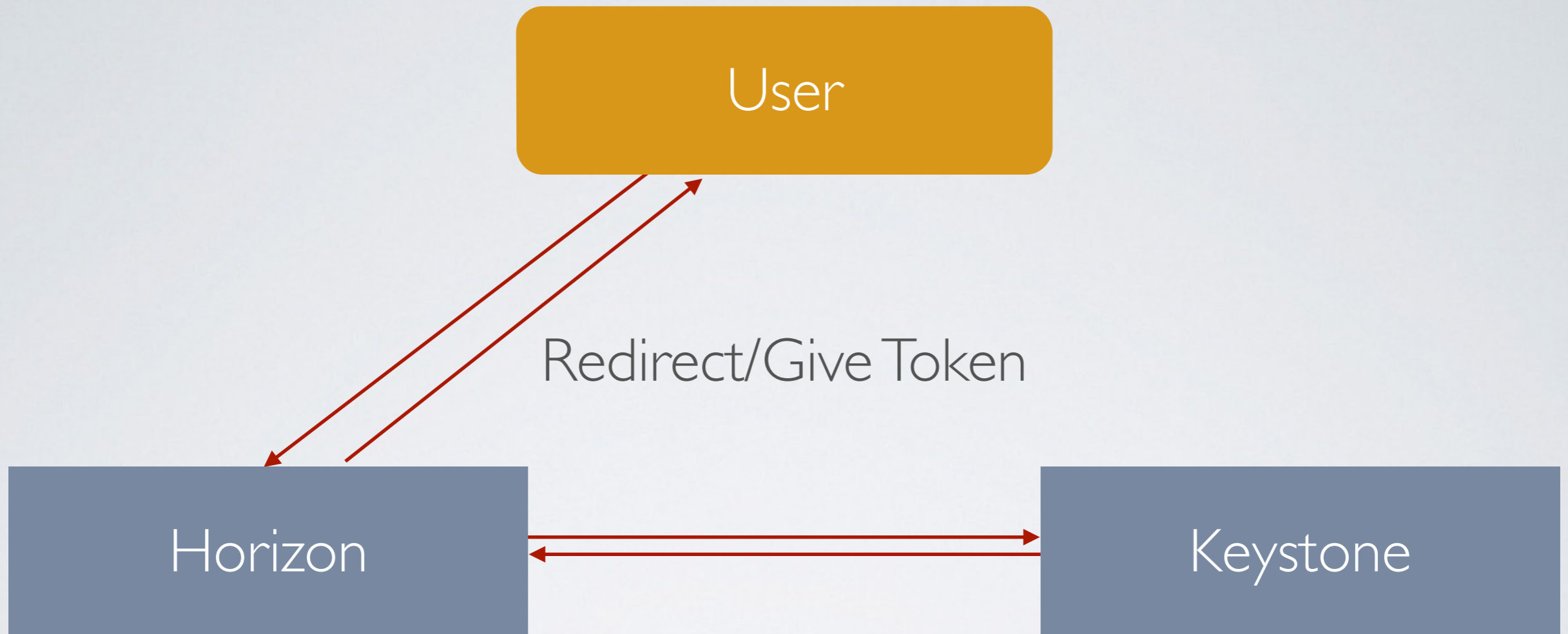
Horizon

Query for TFA

Keystone







User

Query with APIs

Horizon

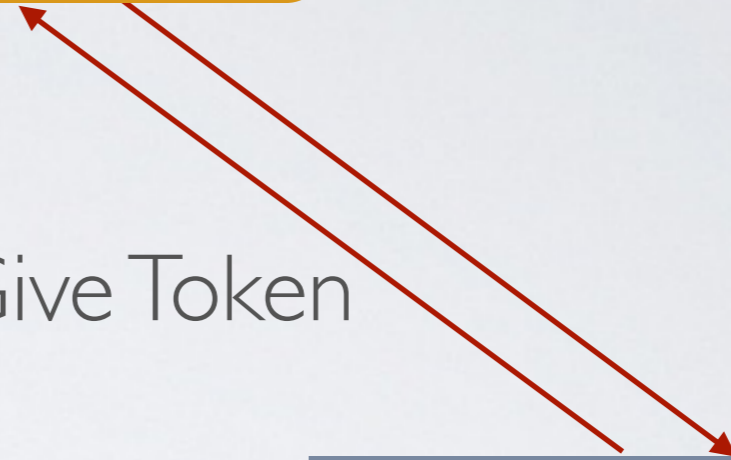
Keystone

User

Query for TFA/Give Token

Horizon

Keystone



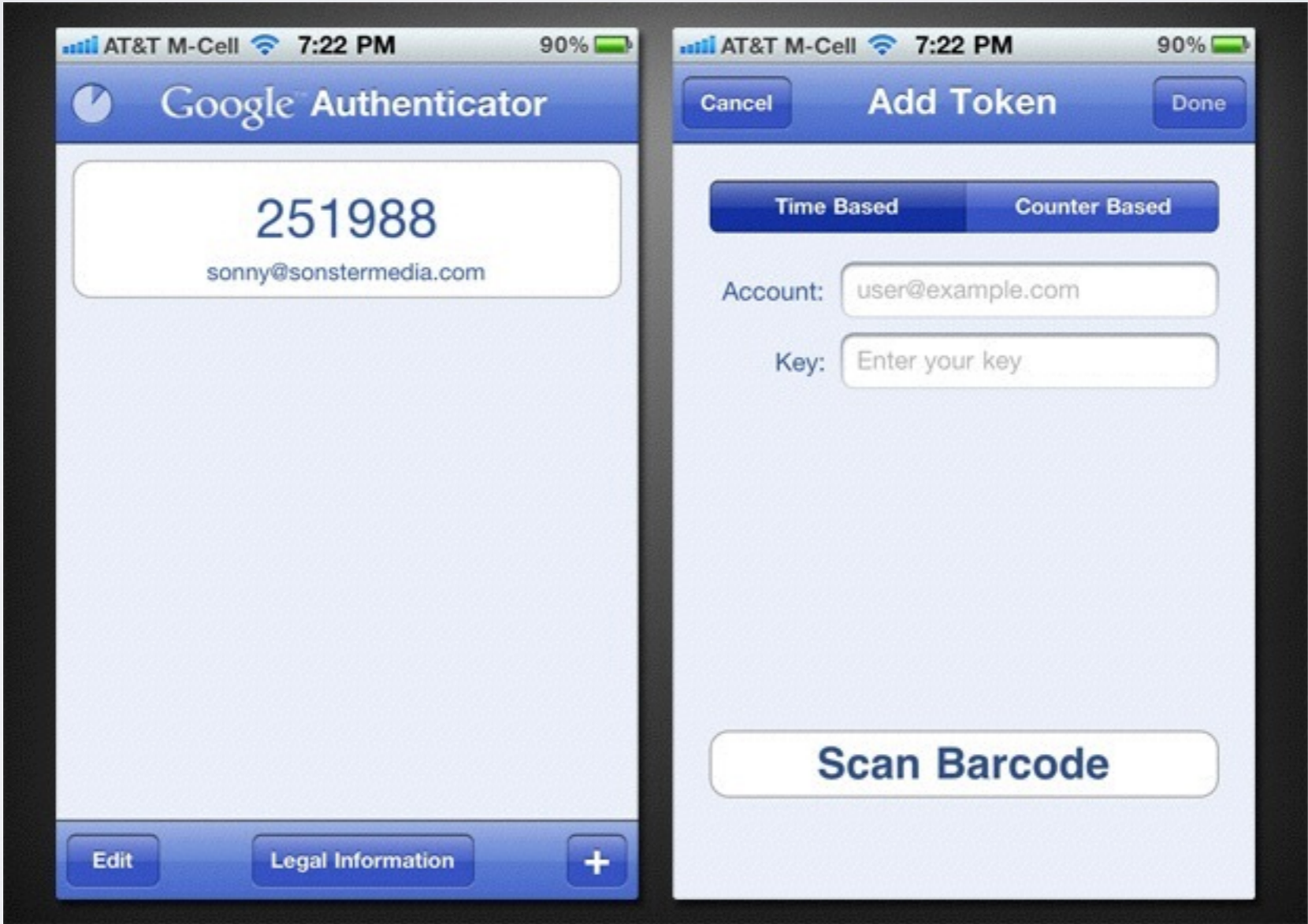
# TFA

- Register a second factor of authentication for a user
- User-level, Project-level, and Domain-level
- TOTP codes with Google Authenticator

# TOTP

- Time-based One-time password
- “combines a secret key with the current timestamp using a cryptographic hash function to generate a one-time password”
- Secret key used in the hash shared between user/keystone

# GOOGLE AUTHENTICATOR



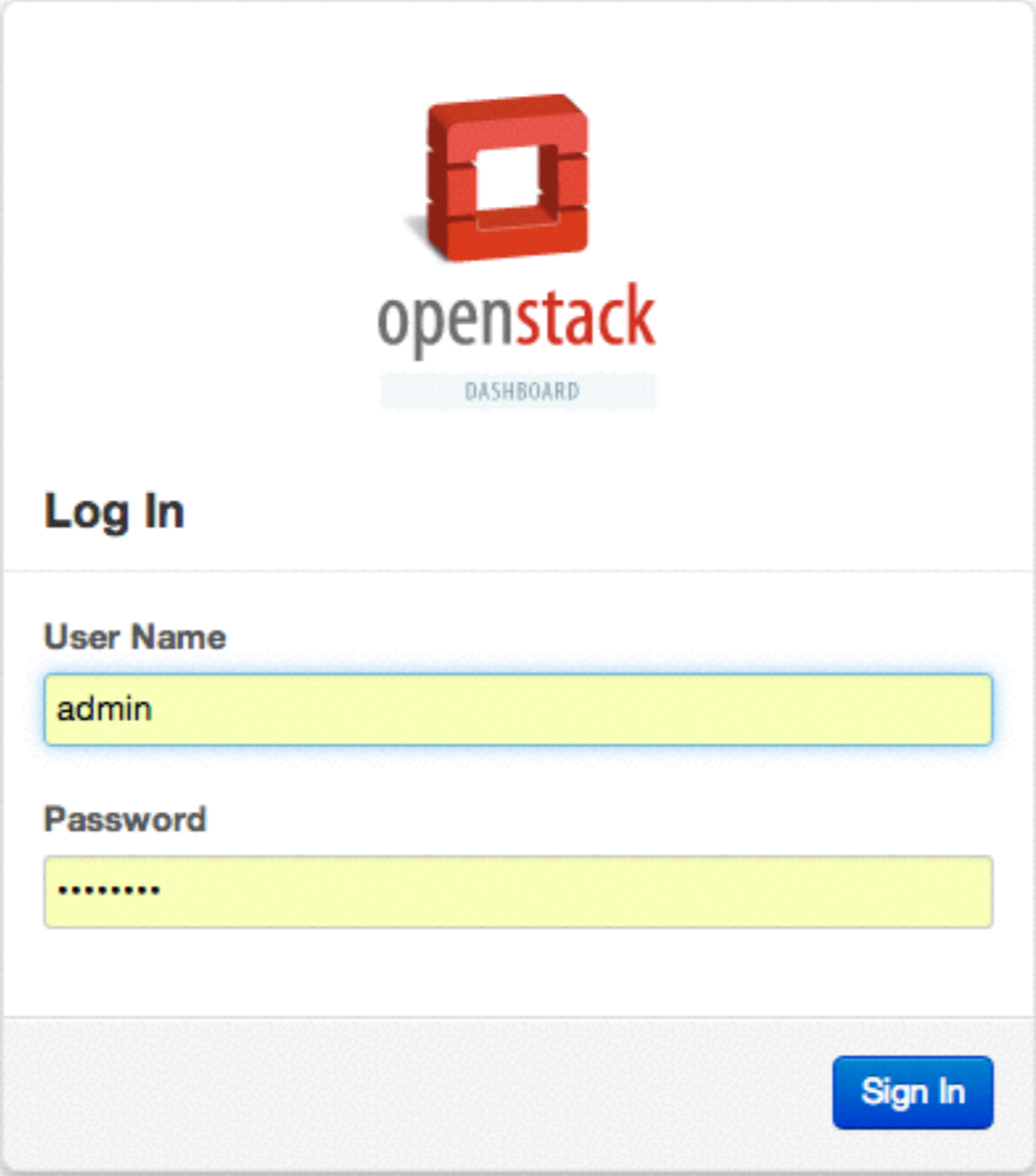
# QR REGISTRATION



Scan with Google Authenticator and input code to register device



# TWO FACTOR LOGIN



The image shows a screenshot of the OpenStack Dashboard login page. At the top center is the OpenStack logo, a red 3D cube with a white square in the center, above the text "openstack" in a sans-serif font. Below the logo is a light blue button labeled "DASHBOARD".

Below the logo is the heading "Log In". Underneath is a form with two input fields. The first field is labeled "User Name" and contains the text "admin". The second field is labeled "Password" and contains seven dots. At the bottom right of the form is a blue button labeled "Sign In".

**Log In**

**User Name**  
admin

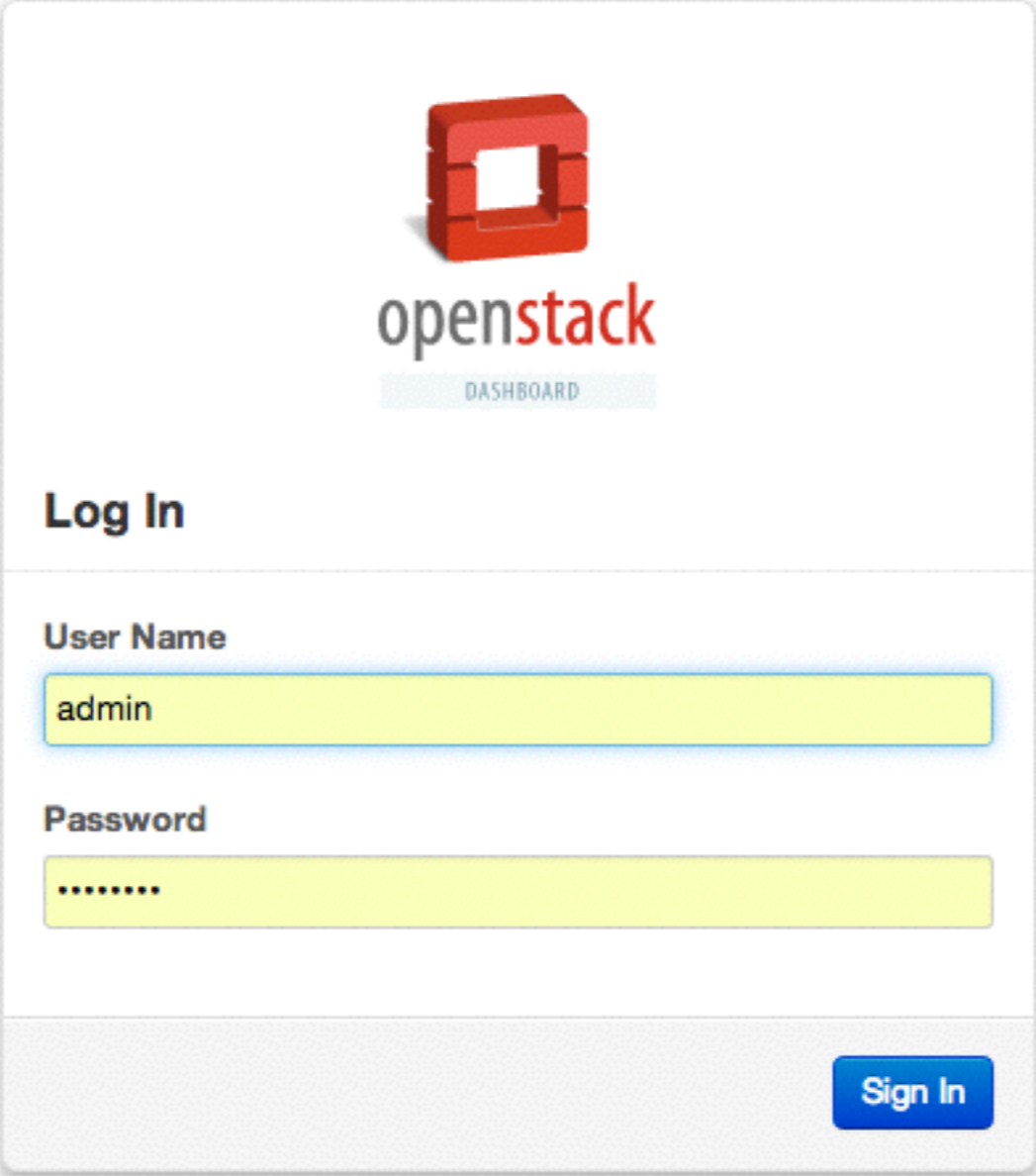
**Password**  
.....

**Sign In**

# TWO FACTOR LOGIN

```
vagrant@precise64:/opt/stack/python-keystoneclient/keystoneclient/v3$ source /vagrant/admin-openrc.sh
Please enter your OpenStack Password:
vagrant@precise64:/opt/stack/python-keystoneclient/keystoneclient/v3$ openstack
(openstack) user set
usage: user set [-h] [--name <new-user-name>] [--password <user-password>]
               [--password-prompt] [--email <user-email>] [--domain <domain>]
               [--project <project>] [--description <description>]
               [--enable | --disable] [--enable-tfa | --disable-tfa]
               <user>
user set: error: too few arguments
(openstack) user set --enable-tfa admin
The secret was successfully reset.
Please enter the following secret into your TFA client: 5DS3MTLNB04Y5KWS
(openstack) █
```

# TWO FACTOR LOGIN



The image shows a screenshot of the OpenStack Dashboard login page. At the top center is the OpenStack logo, a red 3D cube with a white square in the center, above the text "openstack" in a sans-serif font. Below the logo is a light blue button labeled "DASHBOARD".

Below the logo and button is the "Log In" section. It contains two input fields: "User Name" with the value "admin" and "Password" with a masked password represented by seven dots. A blue "Sign In" button is located at the bottom right of the form.


**Log In**

**User Name**  
admin

**Password**  
.....

**Sign In**

# TWO FACTOR LOGIN



openstack  
DASHBOARD

## Log In


You have 2 Factor Authentication enabled.  
Please use your tethered device to generate  
the code

**User Name**  
admin

**Password**  
.....

Sign In

# TWO FACTOR LOGIN



The image shows a screenshot of the OpenStack Dashboard login page. At the top center is the OpenStack logo, which consists of a red 3D cube with a white square cutout in the center, and the text "openstack" below it. Underneath the logo is a light blue button labeled "DASHBOARD". Below this is a section titled "Log In". There are three input fields: "User Name" with the value "admin", "Password" with masked characters ".....", and "TFA Password" with the value "015494". A blue "Sign In" button is located at the bottom right of the form.

**openstack**  
DASHBOARD

**Log In**

**User Name**  
admin

**Password**  
.....

**TFA Password**  
015494

Sign In

# TWO FACTOR LOGIN



DASHBOARD

- Project
- Admin
- System Panel
  - Overview
  - Hypervisors
  - Instances
  - Volumes
  - Flavors
  - Images
  - Defaults

## Overview

Logged in as: admin [Settings](#) [Help](#) [Sign Out](#)

### Select a period of time to query its usage:

From:  To:   The date should be in YYYY-mm-dd format.

Active Instances: - Active RAM: - This Period's VCPU-Hours: - This Period's GB-Hours: -

## Usage Summary

[Download CSV Summary](#)

Project Name	VCPU	Disk	RAM	VCPU Hours	Disk GB Hours
No items to display.					
Displaying 0 items					

# MY CONTRIBUTIONS

- Keystone TFA API design
- Horizon Device Registration
- Horizon Token Management
- Horizon Login Redirection and TFA code input

# WHAT I LEARNED

- Open Source development (Gerrit, pull requests, version control, etc)
- Working with vast, undocumented code bases
- Working with constantly-changing code (v2->v3, stable and unstable branches, etc)
- A broad understanding of the mechanics cloud management
- A deep understanding of the Keystone and Horizon services



THANKS FOR WATCHING

QUESTIONS