

Adsz.io Technologies Inc.

Setup Development VM in AWS

Part 1

Version 0.1

RTBKit & Graphite

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15

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Introduction

The purpose of this document is to show you how to create an AWS EC2 using the existing RTBKit AIM I created and built from the source code. In addition, I also install RTBKit's Mock Exchange and the Graphite visualization tool.

Create a Development EC2 Instance based on an existing AIM ID ami-33db3e58 in N.Virginia (Close to Google AdX datacenter)

(Please provide me your AWS account and I will grant you a permission to access it)

The screenshot shows the AWS Management Console interface. The left sidebar contains navigation links for EC2 Dashboard, Events, Tags, Reports, Limits, INSTANCES, IMAGES, ELASTIC BLOCK STORE, NETWORK & SECURITY, and AUTO SCALING. The main content area displays a list of AMIs. The selected AMI is 'ubuntu14-rtbkit-for-developers-2015-05-23' with AMI ID 'ami-33db3e58'. A context menu is open over the AMI ID, showing options like Launch, Spot Request, Deregister, Register New AMI, Copy AMI, Modify Image Permissions, Add/Edit Tags, and Modify Boot Volume Setting. The details section shows the AMI's metadata, including its creation date, architecture, and root device information.

Name	AMI Name	AMI ID	Source	Owner	Visibility	Status
ubuntu14-rtbkit-for-developers-2015-05-23	ubuntu14-rtbkit-for-developers-2015-05-23	ami-33db3e58	199856795822/u...	199856795822	Private	available

Image: ami-33db3e58

Details

Property	Value
AMI ID	ami-33db3e58
Owner	199856795822
Status	available
Creation date	May 23, 2015 at 10:17:27 PM UTC-7
Architecture	x86_64
Virtualization type	hvm
Root Device Name	/dev/sda1
RAM disk ID	-
Product Codes	-

AMI Name: ubuntu14-rtbkit-for-developers-2015-05-23

Source: 199856795822/ubuntu14-rtbkit-for-developers-2015-05-23

State Reason: -

Platform: Ubuntu

Image Type: machine

Description: [Copied ami-e73c00d7 from us-west-2] ubuntu14-rtbkit-for-developers-2015-05-23

Root Device Type: ebs

Kernel ID: -

Block Devices: /dev/sda1=snap-8994e013:100:false:gp2

A 64-bit system is currently required because of the 4GB memory limit of 32-bit systems.

Make sure you have at least 16GB of disk for building from the source. Also, your CPU should have support for SSE4.2 as it greatly improves performance.

Select an m3.xlarge instance

The screenshot shows the AWS Management Console interface for the 'Launch Instance Wizard'. The browser address bar shows the URL: <https://console.aws.amazon.com/ec2/v2/home?region=us-east-1#LaunchInstanceWizard:ami=ami-33db3e58>. The console header includes the AWS logo, 'Services', and 'Edit' buttons. The navigation bar shows the steps: 1. Choose AMI, 2. Choose Instance Type (active), 3. Configure Instance, 4. Add Storage, 5. Tag Instance, 6. Configure Security Group, and 7. Review. The main content area is titled 'Step 2: Choose an Instance Type'. It displays a table of instance types with columns for selection, instance type, family, vCPUs, memory (GiB), storage, EBS only, and cost. The 'm3.xlarge' instance type is selected, highlighted in blue. Below the table are buttons for 'Cancel', 'Previous', 'Review and Launch', and 'Next: Configure Instance Details'. The footer includes 'Feedback', 'English', and copyright information: '© 2008 - 2015, Amazon Web Services, Inc. or its affiliates. All rights reserved.' along with 'Privacy Policy' and 'Terms of Use' links.

	Instance type	Family	vCPUs	Memory (GiB)	Storage	EBS only	Cost
<input type="checkbox"/>	General purpose	t2.micro Free tier eligible	1	1	EBS only	-	Low to Moderate
<input type="checkbox"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate
<input type="checkbox"/>	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate
<input type="checkbox"/>	General purpose	m3.medium	1	3.75	1 x 4 (SSD)	-	Moderate
<input type="checkbox"/>	General purpose	m3.large	2	7.5	1 x 32 (SSD)	-	Moderate
<input checked="" type="checkbox"/>	General purpose	m3.xlarge	4	15	2 x 40 (SSD)	Yes	High
<input type="checkbox"/>	General purpose	m3.2xlarge	8	30	2 x 80 (SSD)	Yes	High
<input type="checkbox"/>	Compute optimized	c4.large	2	3.75	EBS only	Yes	Moderate
<input type="checkbox"/>	Compute optimized	c4.xlarge	4	7.5	EBS only	Yes	High
<input type="checkbox"/>	Compute optimized	c4.2xlarge	8	15	EBS only	Yes	High
<input type="checkbox"/>	Compute optimized	c4.4xlarge	16	30	EBS only	Yes	High

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Configure Instance Details](#)

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Double check and launch your instance

Step 7: Review Instance Launch
Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

Improve your instances' security. Your security group, launch-wizard-3, is open to the world.
Your instances may be accessible from any IP address. We recommend that you update your security group rules to allow access from known IP addresses only. You can also open additional ports in your security group to facilitate access to the application or service you're running, e.g., HTTP (80) for web servers. [Edit security groups](#)

Your instance configuration is not eligible for the free usage tier
To launch an instance that's eligible for the free usage tier, check your AMI selection, instance type, configuration options, or storage devices. Learn more about [free usage tier](#) eligibility and usage restrictions. [Don't show me this again](#)

AMI Details [Edit AMI](#)
ubuntu14-rtbkit-for-developers-2015-05-23 - ami-33db3e58
[Copied ami-e73c00d7 from us-west-2] ubuntu14-rtbkit-for-developers-2015-05-23
Root Device Type: ebs Virtualization type: hvm

Instance Type [Edit instance type](#)

Instance Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
m3.xlarge	13	4	15	2 x 40	Yes	High

[Cancel](#) [Previous](#) [Launch](#)

[Feedback](#) [English](#) © 2008 - 2015, Amazon Web Services, Inc. or its affiliates. All rights reserved. [Privacy Policy](#) [Terms of Use](#)

Remember to download your key pair. Caution! This is the only time AWS provides you the right to download the key pair. So save you .pem file in a safe place.

Step 7: Review Instance Launch
Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

Improve your instances' security. Your security group, launch-wizard-3, is open to the world.
Your instances may be accessible from any IP address. We recommend that you update your security group rules to allow access from known IP addresses only. You can also open additional ports in your security group to facilitate access to the application or service you're running, e.g., HTTP (80) for web servers. [Edit security groups](#)

Your instance configuration is not eligible for the free usage tier
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AMI Details [Edit AMI](#)
ubuntu14-rtbkit-for-developers-2015-05-23 - ami-33db3e58
[Copied ami-e73c00d7 from us-west-2] ubuntu14-rtbkit-for-developers-2015-05-23
Root Device Type: ebs Virtualization type: hvm

Instance Type [Edit instance type](#)

Instance Type	ECUs
m3.xlarge	13

Select an existing key pair or create a new key pair

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about [removing existing key pairs from a public AMI](#).

Create a new key pair

Key pair name
adszio_rtbkit_dev_2015

[Download Key Pair](#)

You have to download the **private key file** (*.pem file) before you can continue. **Store it in a secure and accessible location.** You will not be able to download the file again after it's created.

[Cancel](#) [Launch Instances](#)

[Cancel](#) [Previous](#) [Launch](#)

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SSH in your AWS EC2 Instance

Need to generate your PPK file

You will need PuTTY Key Generator to generate your .ppk file

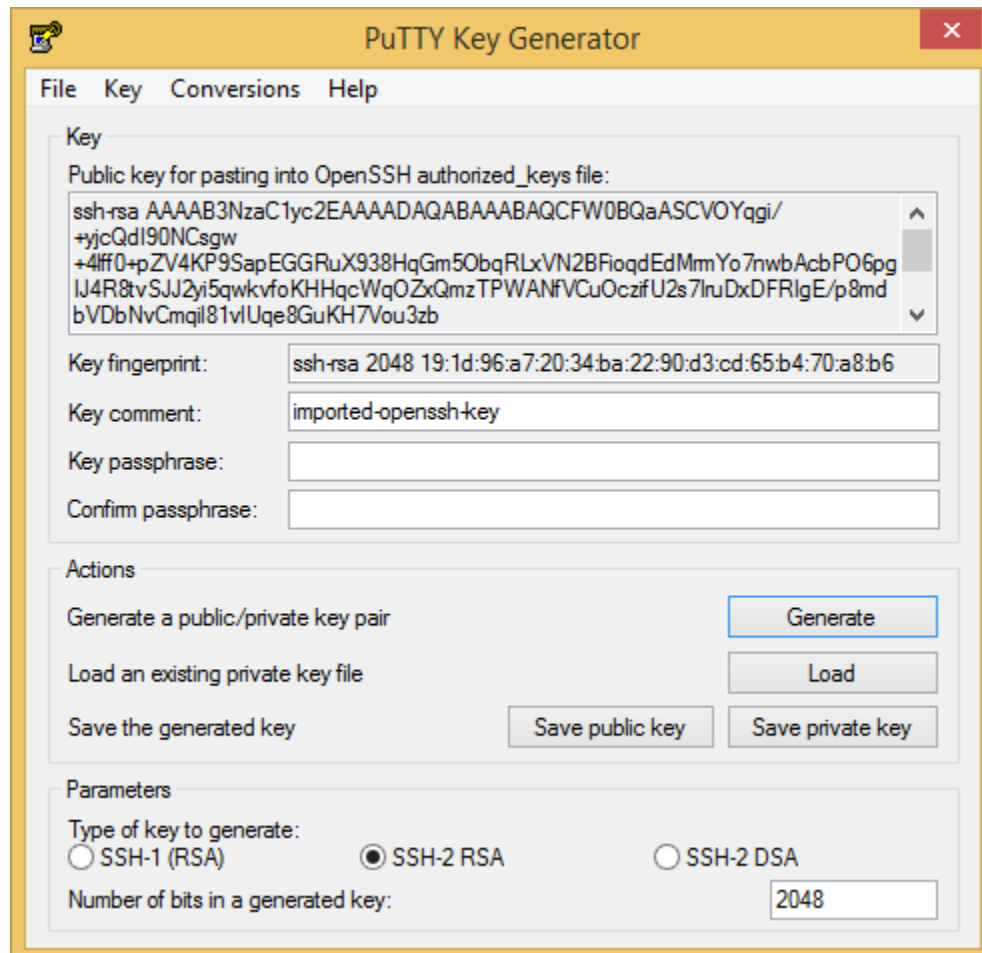
<http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html>

Create PPK file from PEM – Using Putty to connect to EC2

<http://cloudarch.co.uk/2011/09/create-ppk-file-from-pem-using-putty-to-connect-to-ec2/#.VW0sUs9Viko>

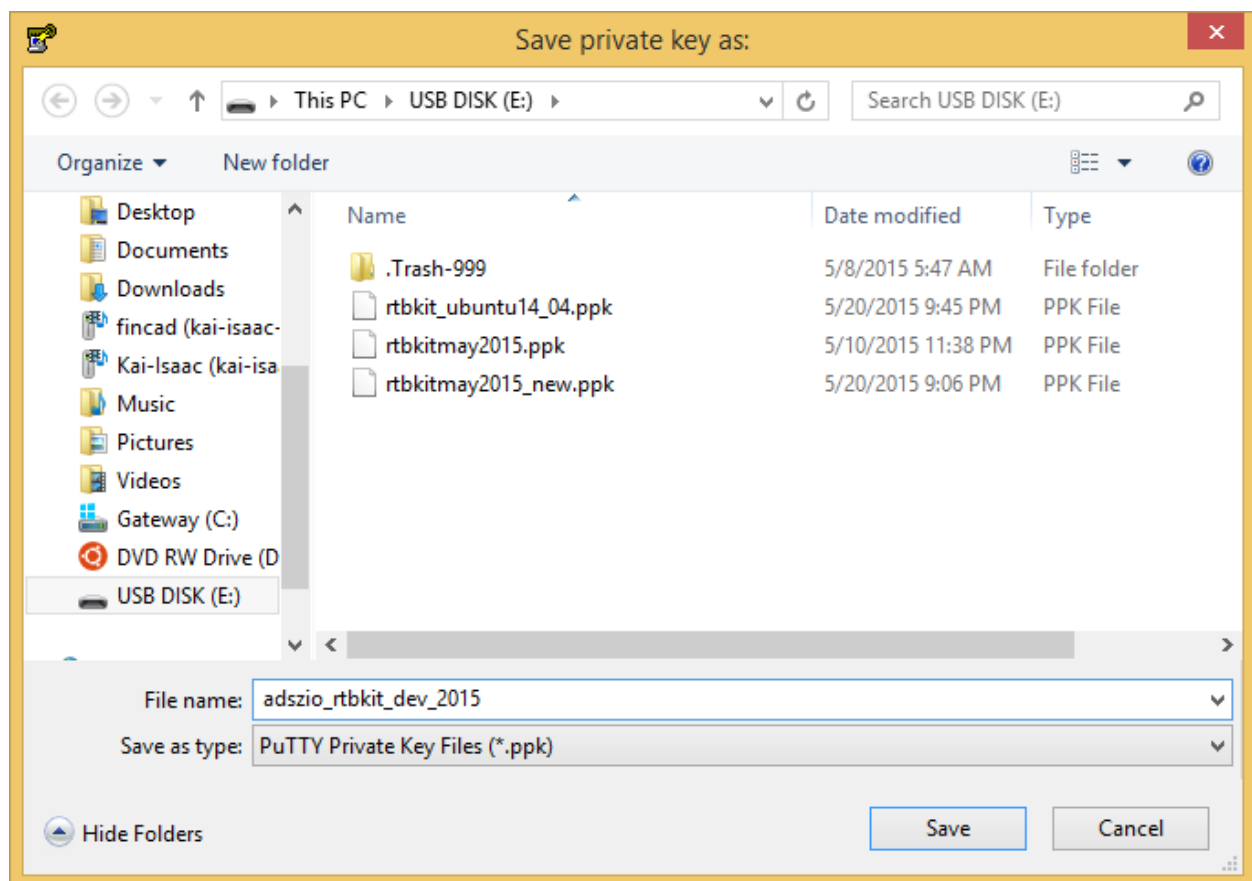
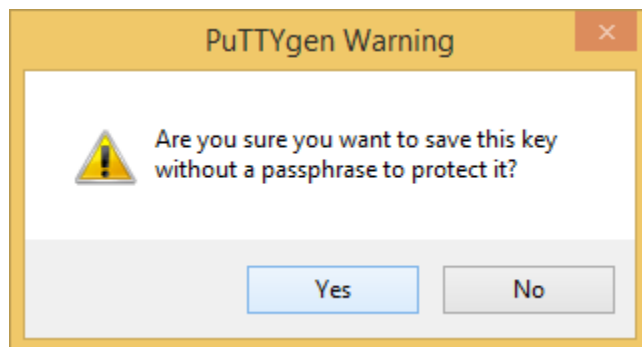
First import you .pem file

Conversions->Import Key



Click Load and select your .pem file.

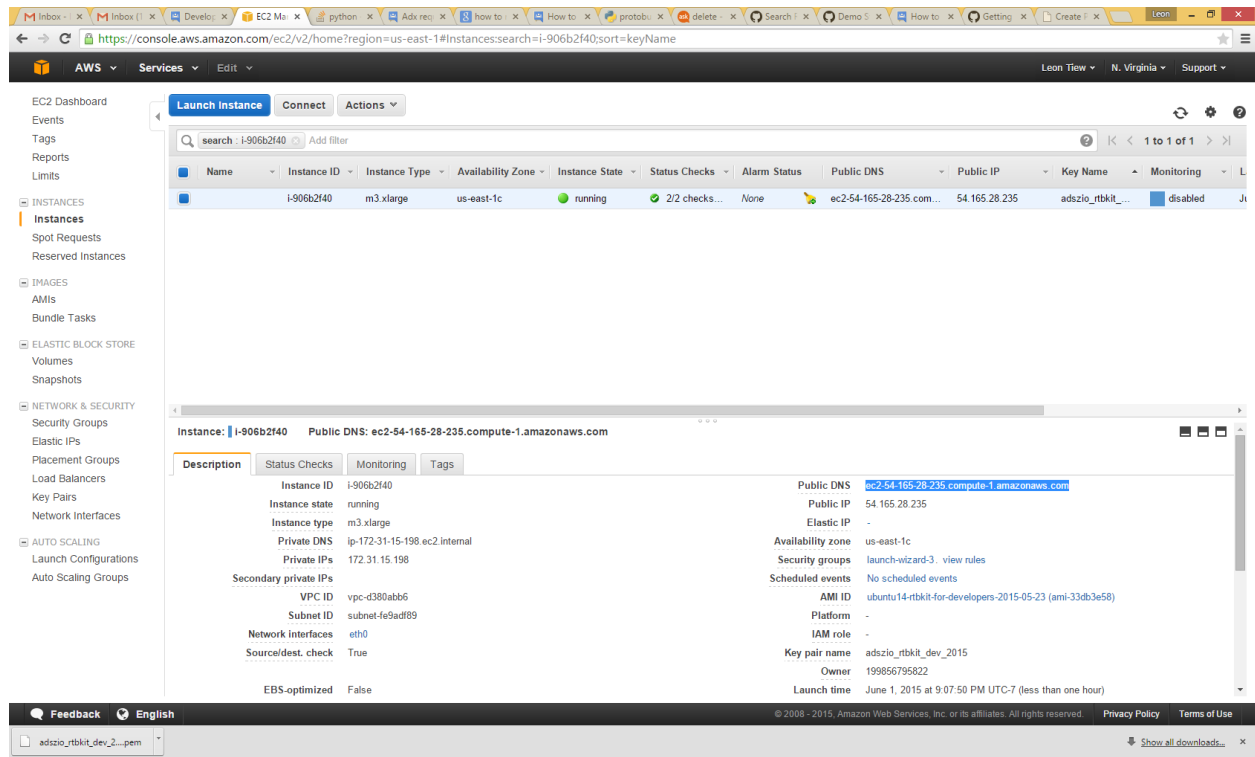
Click Save private key



Please save your .ppk file in a safe place.

Done.

Prepare to login your AWS EC2 using your .PPK file

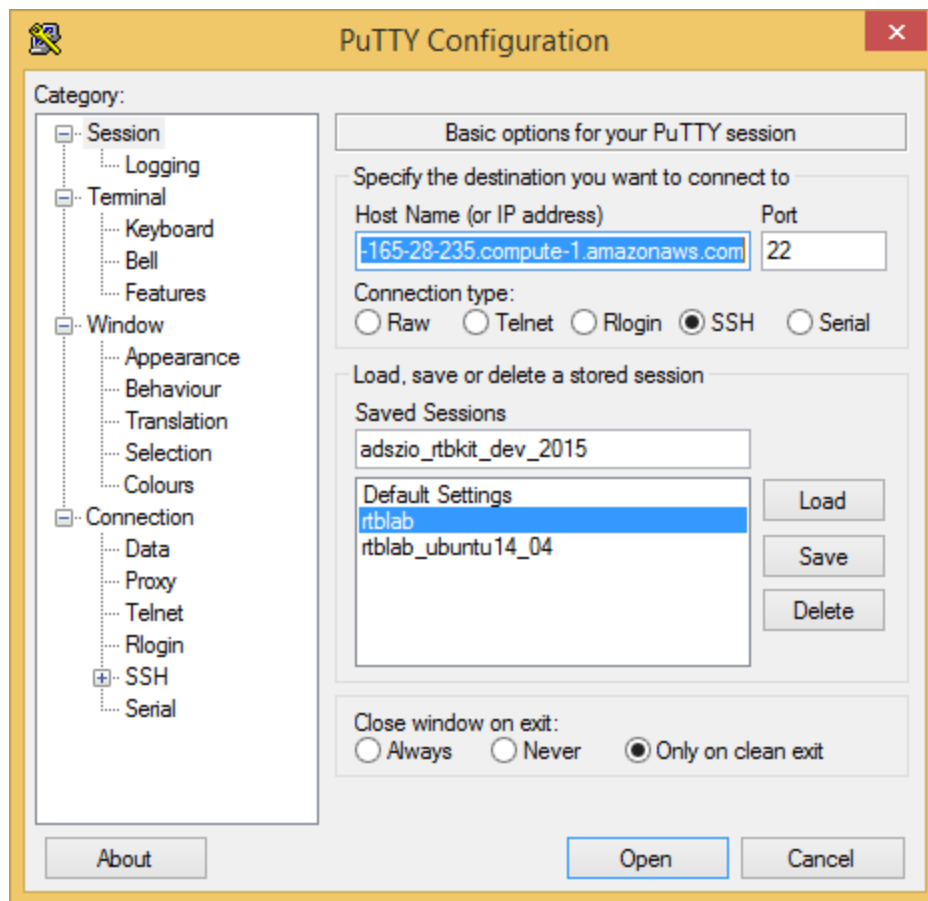


The screenshot displays the AWS Management Console interface. The top navigation bar shows the AWS logo, 'Services', and 'Edit'. The left sidebar contains a navigation menu with categories like EC2 Dashboard, INSTANCES, IMAGES, ELASTIC BLOCK STORE, and NETWORK & SECURITY. The main content area shows a list of EC2 instances with columns for Name, Instance ID, Instance Type, Availability Zone, Instance State, Status Checks, Alarm Status, Public DNS, Public IP, Key Name, and Monitoring. A single instance is listed with ID 'i-906b2f40', type 'm3.xlarge', and state 'running'. Below the list, the 'Instance: i-906b2f40' details page is open, showing various configuration parameters under tabs like Description, Status Checks, Monitoring, and Tags. The 'Description' tab is active, displaying details such as Instance ID, Instance state, Instance type, Private DNS, Private IPs, Secondary private IPs, VPC ID, Subnet ID, Network interfaces, Source/dest. check, EBS-optimized, Public DNS, Public IP, Elastic IP, Availability zone, Security groups, Scheduled events, AMI ID, Platform, IAM role, Key pair name, Owner, and Launch time.

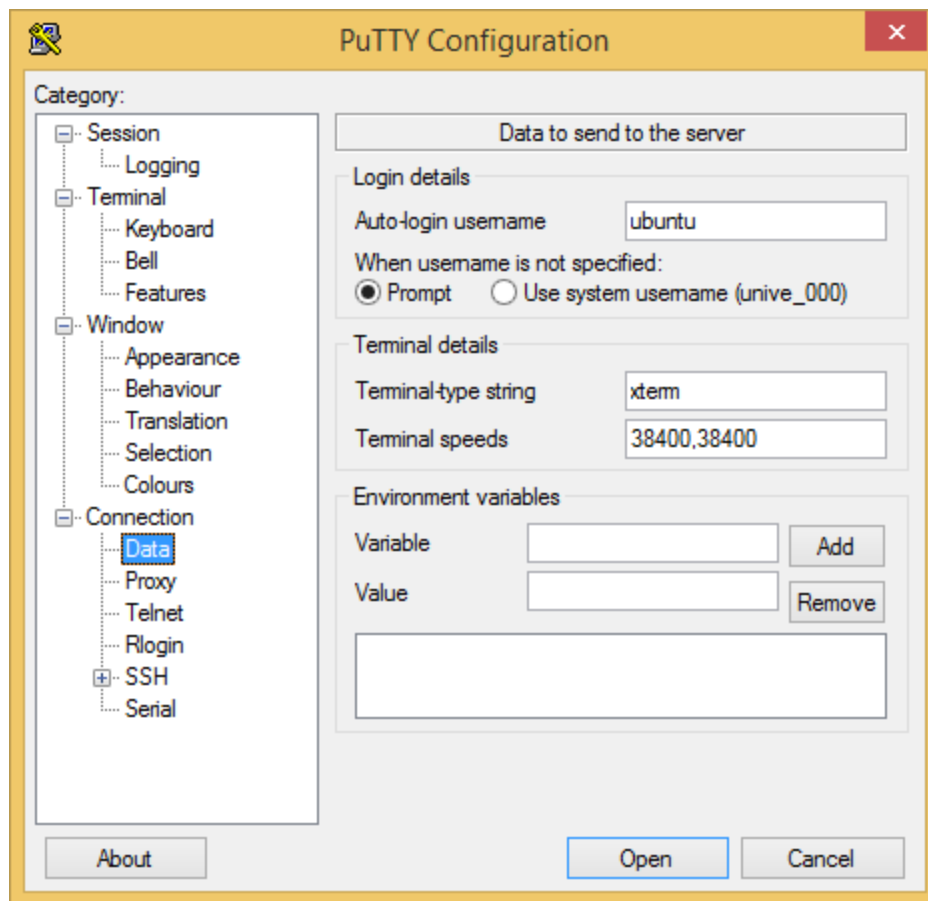
Category	Parameter	Value
Description	Instance ID	i-906b2f40
	Instance state	running
	Instance type	m3.xlarge
	Private DNS	ip-172-31-15-198.ec2.internal
	Private IPs	172.31.15.198
	Secondary private IPs	
	VPC ID	vpc-d380abb6
	Subnet ID	subnet-fe9ad89
	Network interfaces	eth0
	Source/dest. check	True
Description	EBS-optimized	False
	Public DNS	ec2-54-165-28-235.compute-1.amazonaws.com
Public DNS	Public IP	54.165.28.235
	Elastic IP	-
Availability zone	Availability zone	us-east-1c
	Security groups	launch-wizard-3, view rules
Scheduled events	Scheduled events	No scheduled events
	AMI ID	ubuntu14-rtkit-for-developers-2015-05-23 (ami-33db3e58)
Platform	Platform	-
	IAM role	-
Key pair name	Key pair name	adszio_rtbkit_dev_2015
	Owner	199856795822
Launch time	Launch time	June 1, 2015 at 9:07:50 PM UTC-7 (less than one hour)

Copy Public DNS

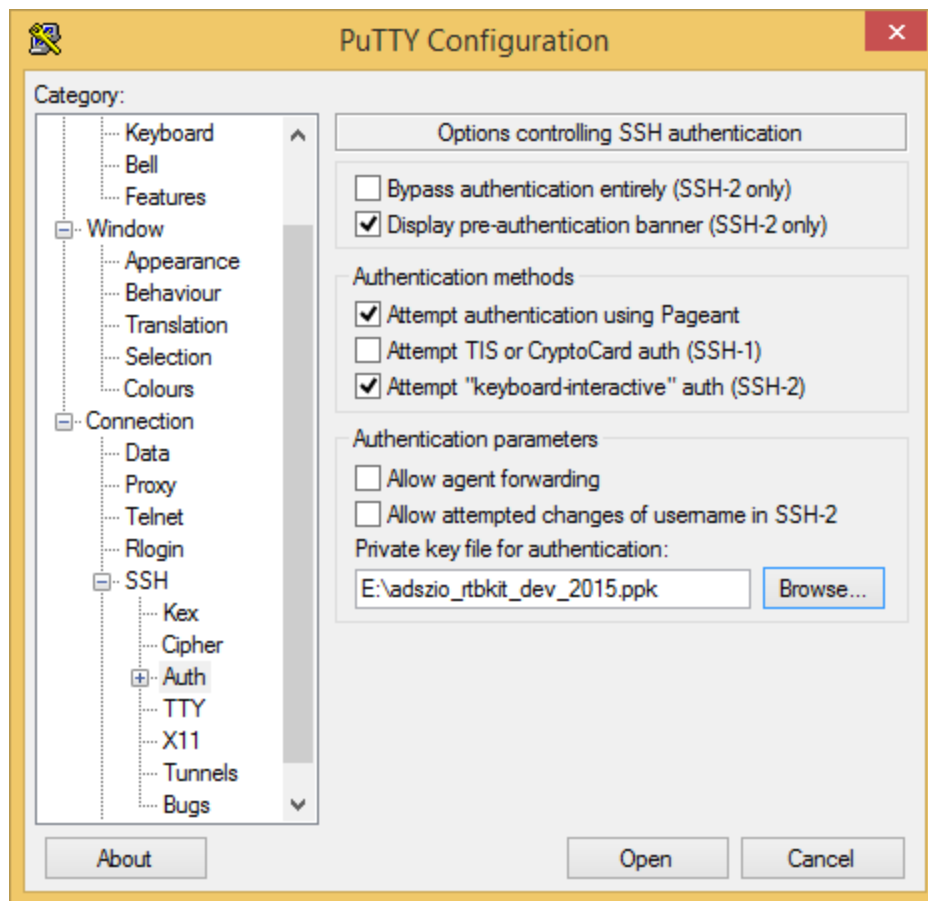
Create a session using Putty (please feel free to use other SSH tool that you are familiar)



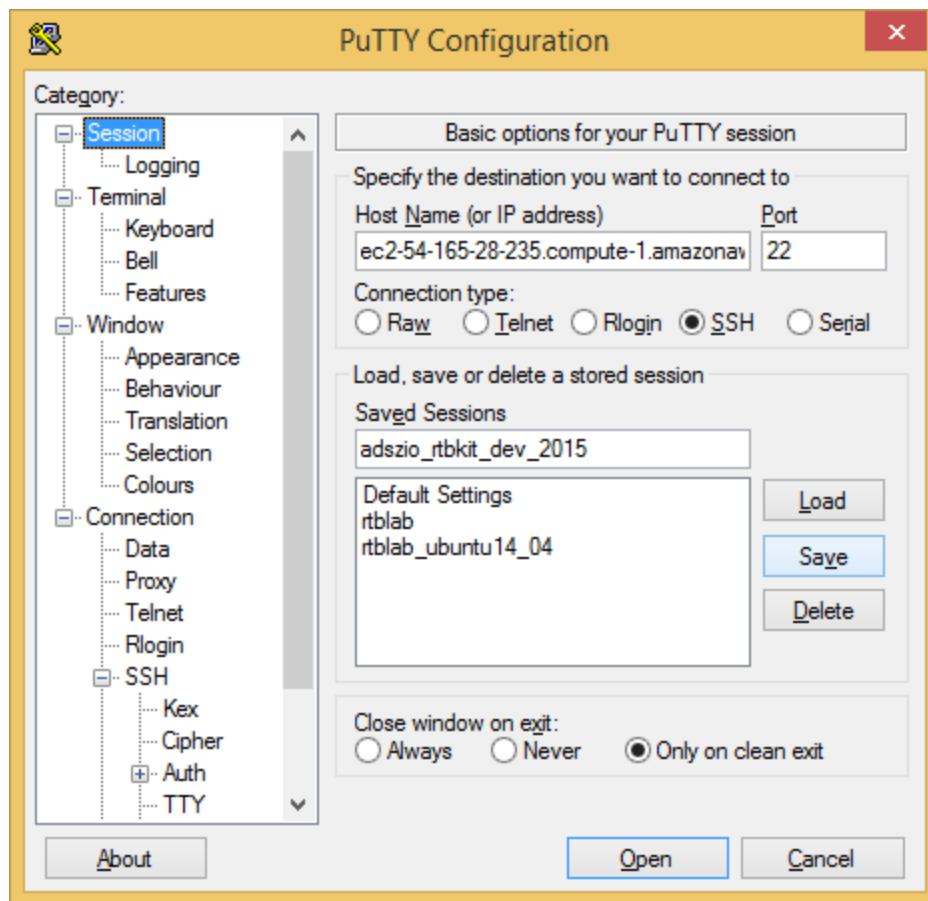
Create adszio_rtbit_dev-2015 session.



Enter Auto-login username = ubuntu

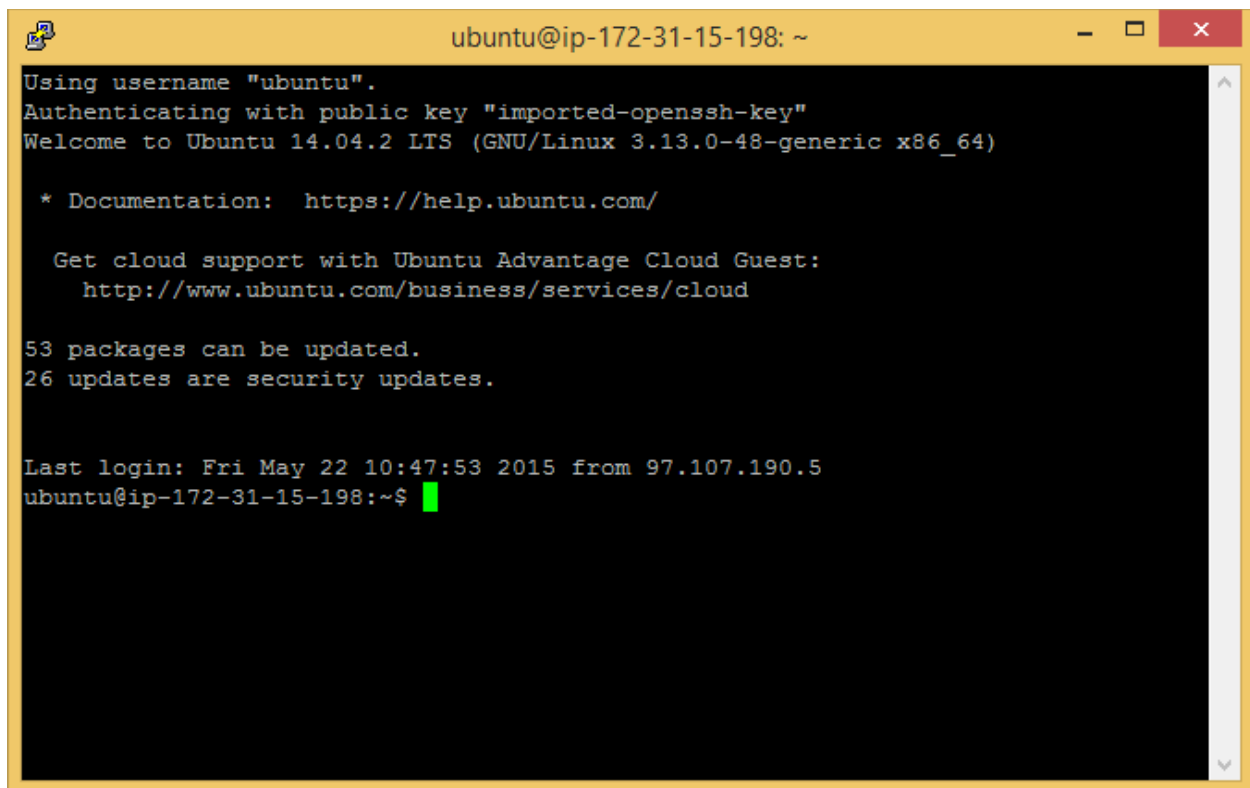
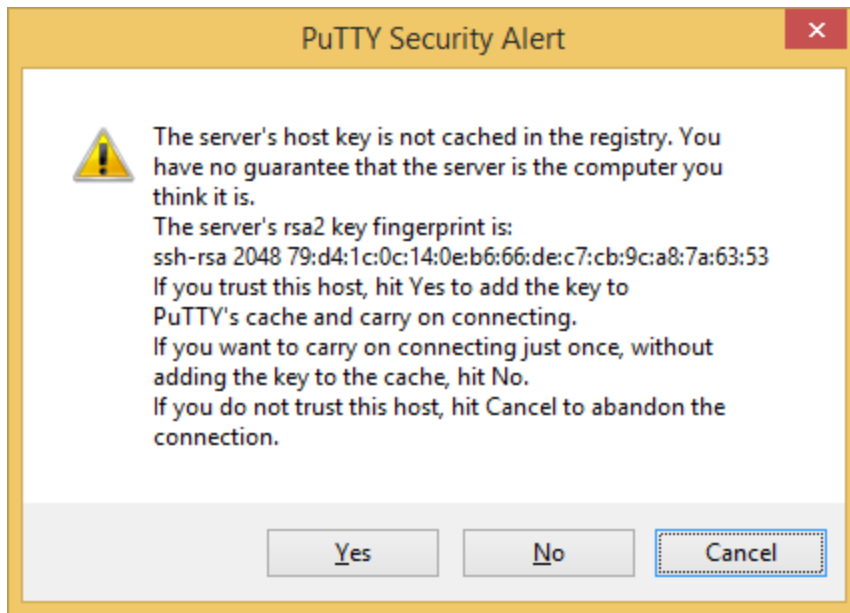


Select your .PPK file



Remember to save your session.

Click Open



sudo su - rtbkit

Test your RTBKit Stack making sure every core module is working

I will provide you the scripts to launch the services below.

For now do it manually so that you know how to start each RTBKit module.

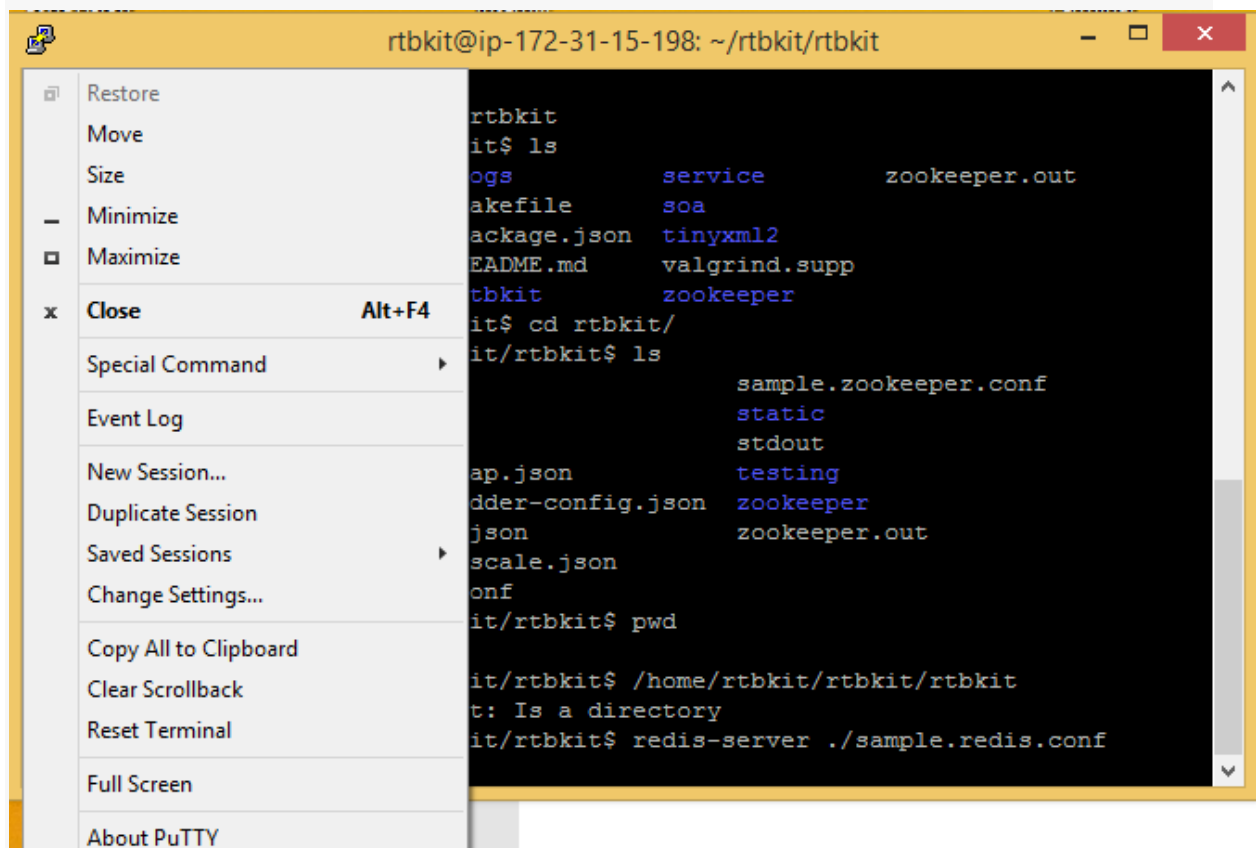
- 1) Start zookeeper

```
~/local/bin/zookeeper/bin/zkServer.sh start
```

- 2) Start Redis

```
cd /home/rtbkit/rtbkit/rtbkit  
redis-server ./sample.redis.conf
```

Duplicate putty session



sudo su - rtbkit to login again

3) Start Carbon

```
sudo -i /opt/graphite/bin/carbon-cache.py start
```

4) Start Mock Exchange

```
cd rtbkit  
./build/x86_64/bin/mock_exchange_runner
```

5) Finally start rtbkit stack

Duplicate a putty session (instruction given above)

```
sudo su - rtbkit  
cd rtbkit  
./launch.sh
```

This will start the tmux session

6) Look at a list of demo account

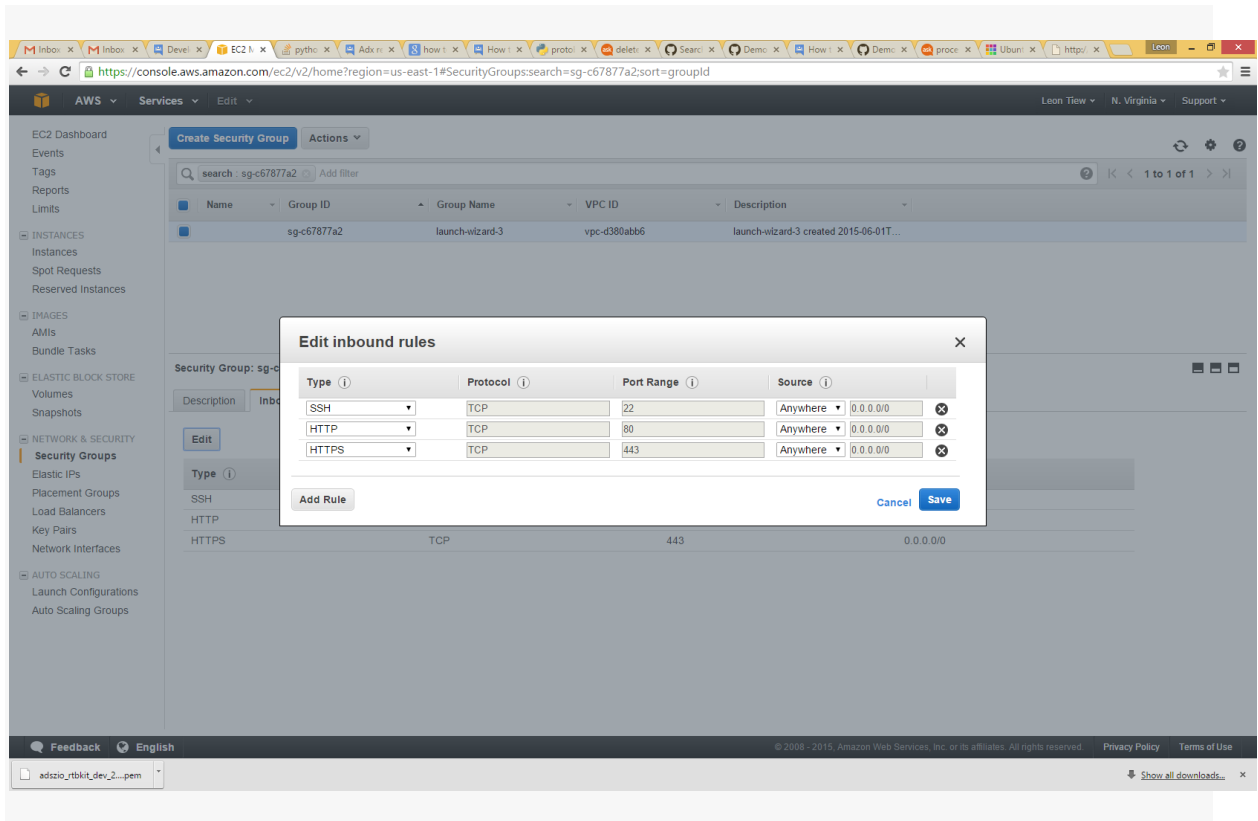
```
curl http://localhost:9985/v1/accounts
```

7) Add budget to the account “hello”

```
curl http://localhost:9985/v1/accounts/hello/budget -d '{ "USD/1M": 123456789 }'
```

Setup Graphite WebApp for Visualization

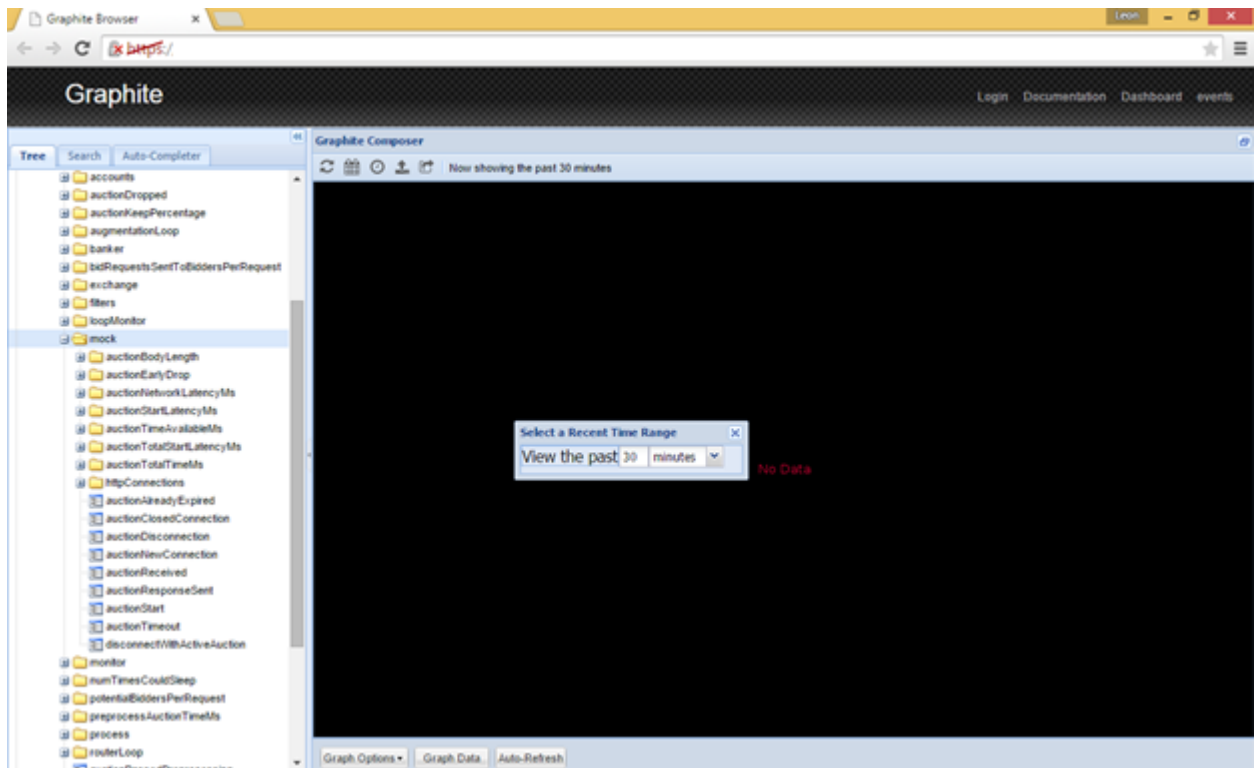
Add new rules for the Security Group in you AWS EC2 for Graphite



Launch Graphite

Open your browser and enter you EC2 Public or Elastic IP (handle to create one)

Let's use Graphite to visualize bidding information

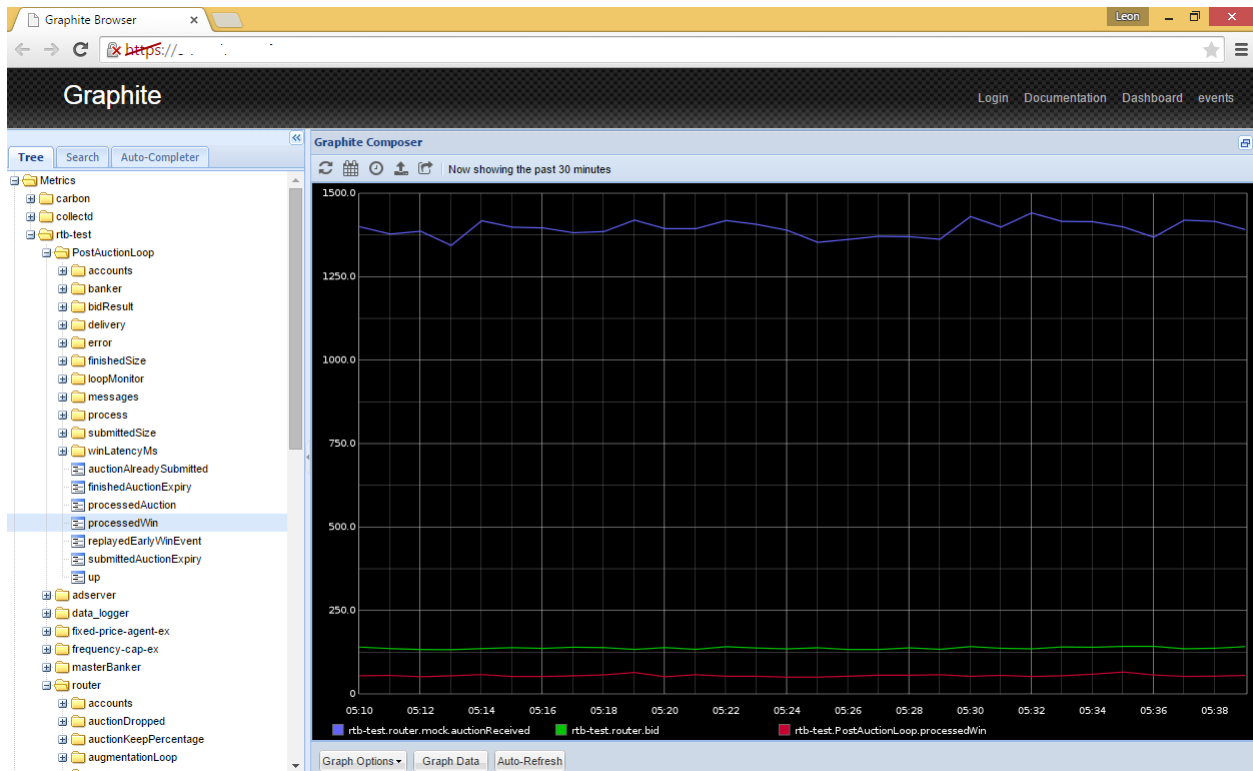


Set view the pass 30 min

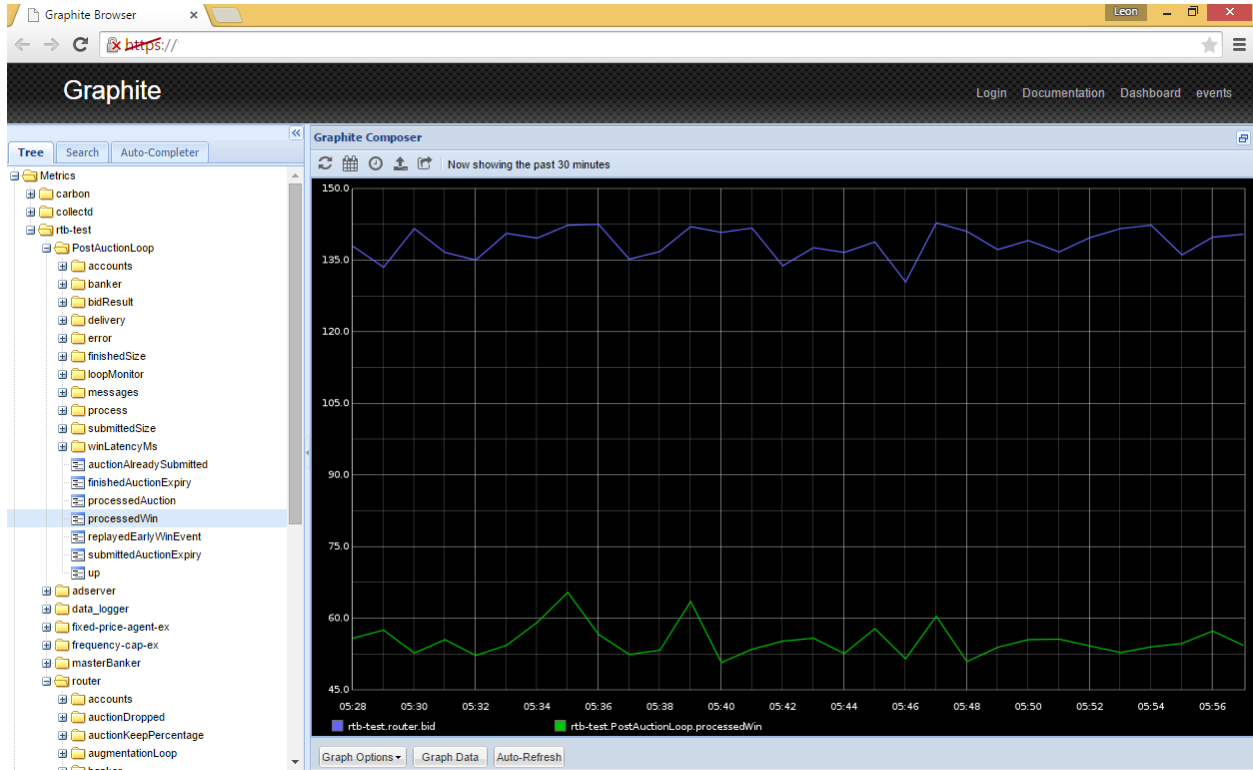
Create a custom graph

From the navigation tree, select

- 1) `rtb-test.router.mock.auctionReceived` (blue)
- 2) `rtb-test.router.bid` (green)
- 3) `rtb-test.postAuction.processedWin` (red)



A better graph

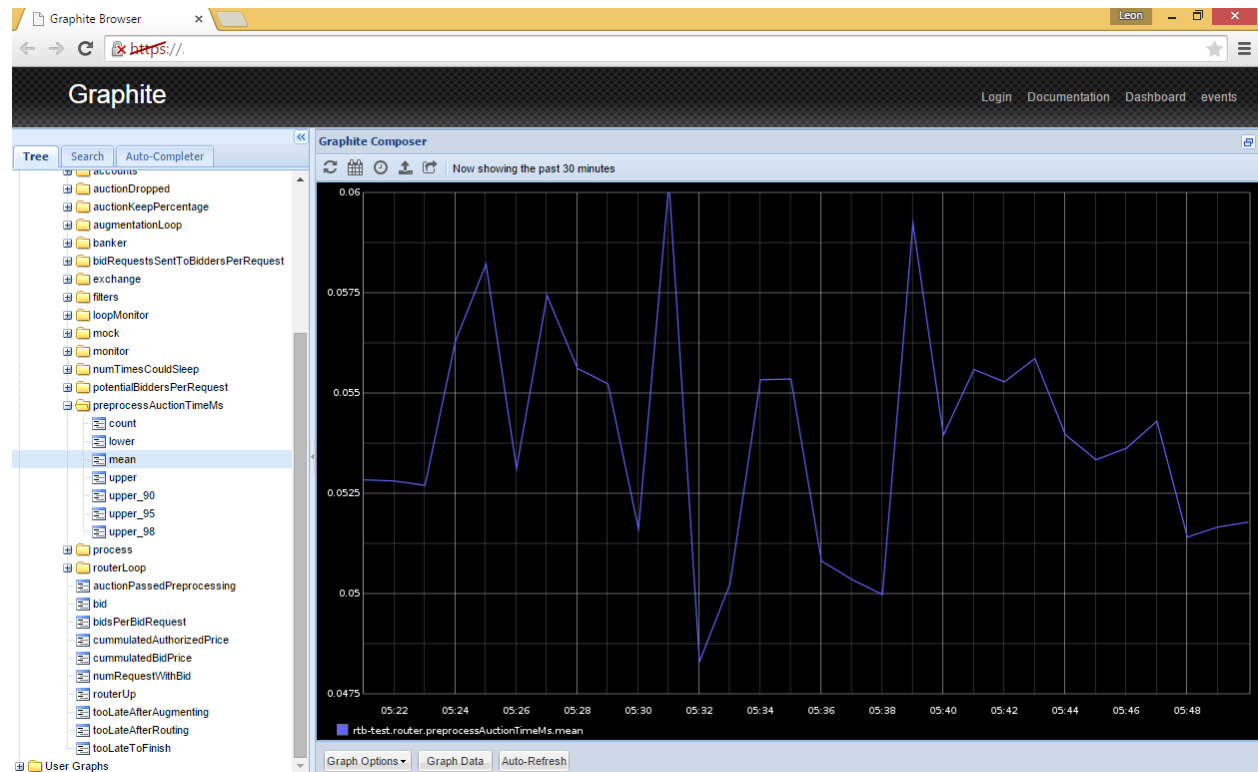


Here you can see that out of the 1350 plus bid requests received, the bidding agent placed over 135 plus bids and out of that it received over 50 – 60 winning bids (almost 37% - 44% winning bid in average if my math is correct)

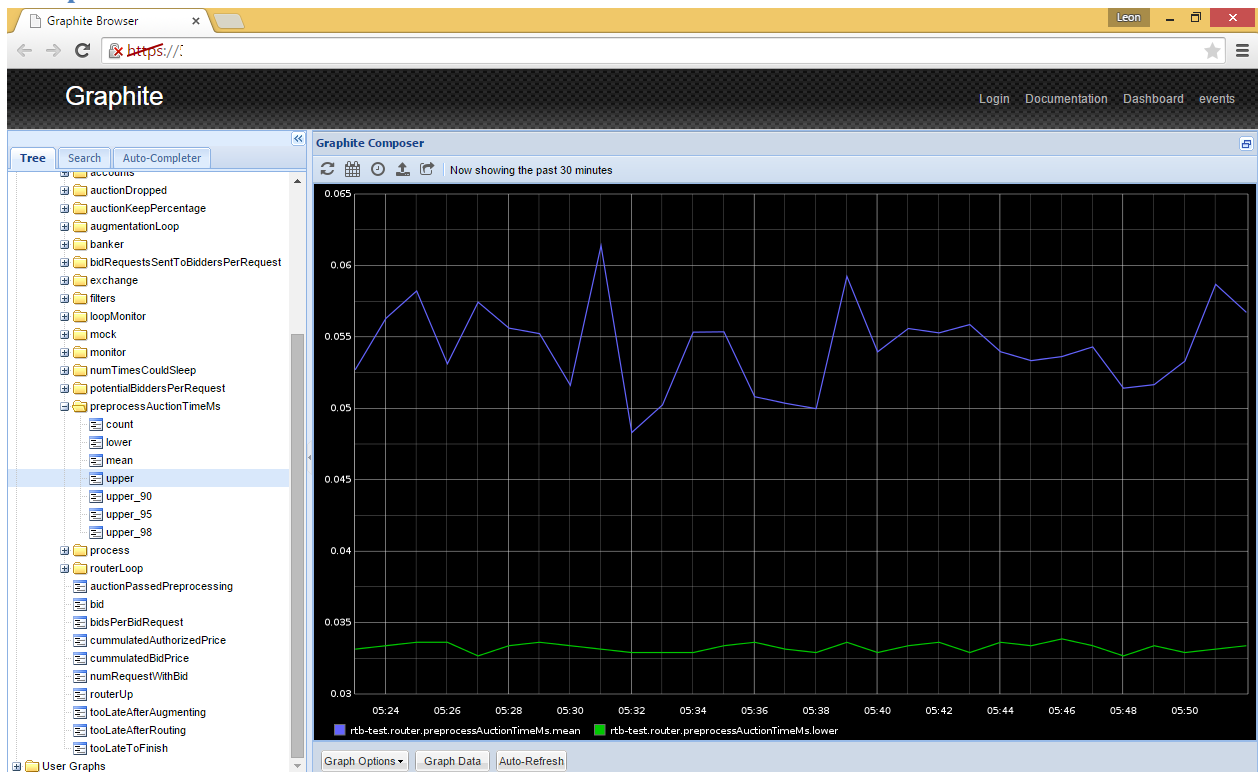
Monitor the Pre-process Auction Time

Remember most Add Exchange request a response time in 100 ms

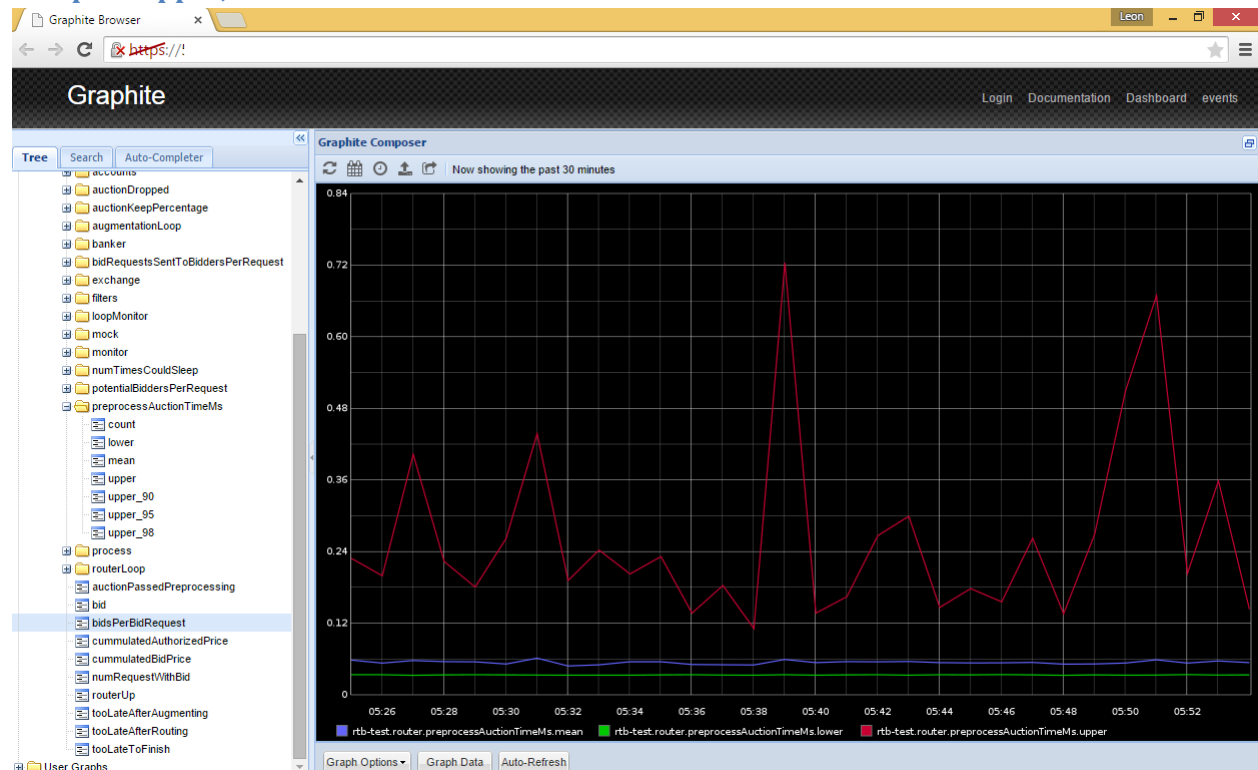
Preprocess Auction Time in Milliseconds (mean)



Compare mean and lower



Compare upper, mean and lower



The beauty of Graphite tool is, RTBKit no longer a black box, you can build custom graph and visualize all bidding transactions that interested you. Not the mention, it is also a good tool for debugging.

I hope this instruction is useful and get you up to speed with RTBKit faster; hence, save your precious time.