Cloud Computing

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Unit :: **Project 3**

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> Evaluate database performance differences caused by using various storage mechanisms available on AWS EC2.

In this part of the project, we will be experimenting with "Vertical Scaling" for storage, by attaching different storage devices offered in AWS to an instance and measuring the performance of a benchmark

Note: For this checkpoint, assign the tag with Key: **Project** and Value: **3.2** for all resources

Launch a **Spot Instance**

- Server Instance type = m1.large, m1.xlarge
- Client Instance type = m1.small
- AMI (both client and server) = **ami-fab52b93** (same as Project 3 part 1)
- The server can be in any Availability Zone, however for the client you should choose the same Zone as the server. There is some performance loss to clients in a different zone, and you are charged for bandwidth.
- Both client and server should be placed in the same Security Group, and that group should allow TCP port 3306 (MySQL) open between all members of the same group.
- Check the Price History for a week and place a bid that is above any small spikes, but less than $0.30 (the on-demand pricing is $0.24). Recall that even if your bid is higher than the current spot price, you are only charged the current spot price
- Un-check the option for "EBS Optimized" for scenarios 1-5, 7-10
  - Only check it for scenarios 6 and 11

- Make sure to include both Ephemeral Storage drives

We want you test the following scenarios

Scenario	Server Instance Type	Server Storage Type	Run test from
1	m1.large	ramdisk	the server
2	m1.large	ramdisk	m1.small client
3	m1.large	eph0	m1.small client
4	m1.large	eph0+eph1 and 2-drive raid0 stripe	m1.small client
5	m1.large	EBS	m1.small client
6	m1.large*	EBS	m1.small client

7	m1.**xl**arge	ramdisk	the server
8	m1.**xl**arge	ramdisk	m1.small client
9	m1.**xl**arge	eph{0,1,2,3}: raid0 4-drive and stripe	m1.small client
10	m1.**xl**arge	EBS	m1.small client
11	m1.**xl**arge*	EBS	m1.small client

(* EBS Optimized has to be chosen at launch time, so these will be new Instances).

If any of the mini-HowTo's are completely new to you, I suggest running through the instructions once on a m1.small instance type, just to get more familiar (you won't be able to test ephemeral raid because it only has 1 volume). This will save money because the large and xlarge instance types are expensive.

You can create scripts for some of the actions above. Perform the m1.xlarge instance tests last, also to save money (they are 2x the price of m1.large)

Tests 1-5 or 7-10 can be done on the same machine (sequentially), or you could do 2 in parallel. Do not use the same client to test 2 servers, or run 2 tests on the server at a time - it will affect the results.

Setting up and performing each test consists of these basic steps:

- Launch instance
- Login
- setup disk (format, mount, copy files, etc)
- run sysbench benchmark for 5 minutes
- record result (SFTP output/csv)
- unmount disk
- repeat from setup disk, for each scenario of the same Server Instance Type
- Shutdown/Terminate Instance, Delete EBS Volumes (if not automatic)

Some EBS notes:

- When choosing EBS Optimized (scenario 6 and 11), you'll see "EBS Optimized: true" on the description tab on EC2 web console.
- When creating EBS volumes, 2-10GB is sufficient for the benchmark
  - do NOT choose IOPS Provisioned volumes (We found too much variation in testing these to include in this Project).

- For all EBS Scenarios, be sure to follow the "warm up" instructions (and let the dd command complete) before running the benchmark.

checkpoint

Vertical Scaling