Building IaaS infrastructures on the AWS Cloud

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Abstract

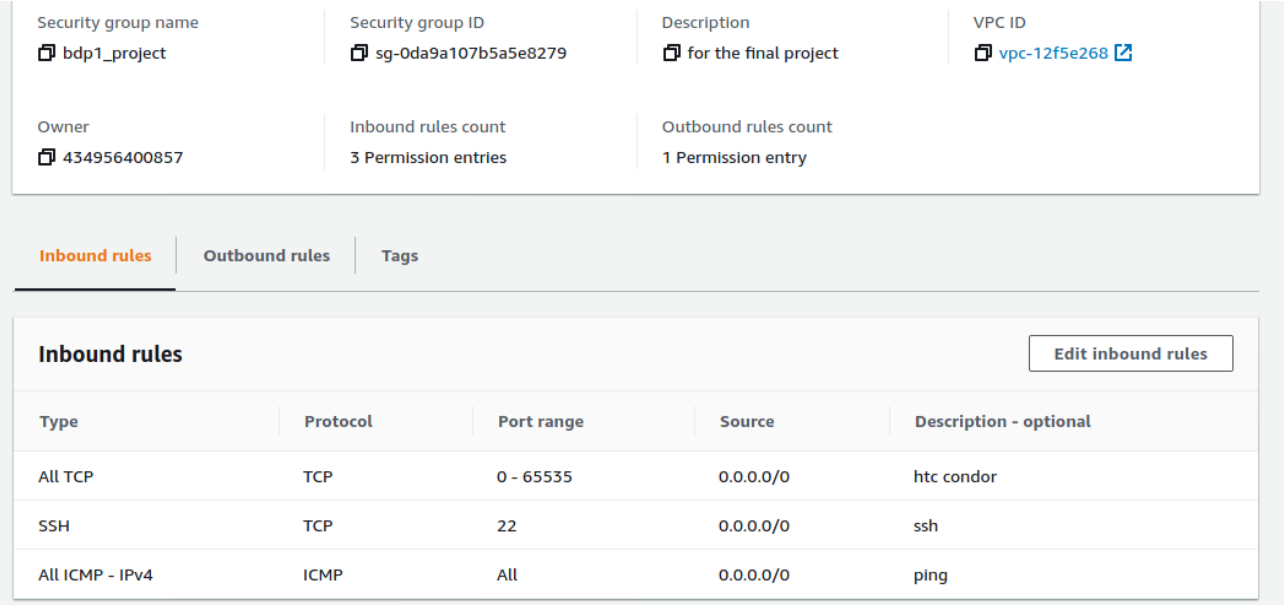
The abstract text goes here.

1 General Description of the Infrastructure

The demostrative infrastructure described in this project consists of an HTCcondor cluster of three nodes. One node is configured as Master Node, while 2 nodes are configured as Worker Nodes. The infrastructure can be easily expanded by replicating the Worker Nodes instances.

2 Initialization of the instances on the AWS Cloud

Worker Nodes and the Master Node were both built on the same base instance configuration. The `t2.medium` instance type was used with a 50 Gb SSD as root storage. The operating system choosen is Ubuntu Server 18.04.4 LTS. The Master Node and the Worker Nodes were all instatiated in the same availability zone (`us-east-1a`), so that they would be able to communicate through private IPv4 adresses. The security group for the instances was configured as follows:



The TCP ports 0-65535 required by HTCondor were open, as well as the ICMP ports for accepting incoming `ping` requests and the TCP port 22 for incoming `ssh` connections.

3 Configuration of the Master Node

The PS1 prompt of the Master Node was changed so to make the node easily identifiable from the command line.

HTCondor was then installed with the following commands:

```
sudo su
wget -qO - https://research.cs.wisc.edu/htcondor/ubuntu/HTCondor-Release.gpg.key | apt-key add - #
    import the gpg key of HTCondor
```

```
ubuntu@bdp1-master-node:~$ echo $PS1
\[\e]0;\u@\h: \w\a\]${debian_chroot:+($debian_chroot)}\[\033[01;32m\
]\u@bdp1-master-node\[\033[00m\]:\[\033[01;34m\]\w\[\033[00m\]\$
```

```
echo "deb http://research.cs.wisc.edu/htcondor/ubuntu/8.8/bionic bionic contrib" >> /etc/apt/sources.
    list # add the repository
echo "deb-src http://research.cs.wisc.edu/htcondor/ubuntu/8.8/bionic bionic contrib" >> /etc/apt/
    sources.list
apt update
apt install htcondor
systemctl start condor # start and enable the condor service
systemctl enable condor
```

The correct proceeding of the installation and the start of the `condor` service where checked with the following commands:

```
ubuntu@bdp1-master-node:~$ sudo systemctl status condor
● condor.service - Condor Distributed High-Throughput-Computing
   Loaded: loaded (/lib/systemd/system/condor.service; enabled; vendor preset: enabled)
   Active: active (running) since Tue 2020-06-16 10:31:25 UTC; 1min 16s ago
 Main PID: 15225 (condor_master)
   Status: "All daemons are responding"
    Tasks: 3 (limit: 32767)
   CGroup: /system.slice/condor.service
           ├─15225 /usr/sbin/condor_master -f
           ├─15266 condor_procd -A /var/run/condor/procd_pipe -L /var/log/condor/ProcLog -R 1000000 -S 60 -C 111
           └─15268 condor_shared_port -f

Jun 16 10:31:25 ip-172-31-8-109 systemd[1]: Started Condor Distributed High-Throughput-Computing.
ubuntu@bdp1-master-node:~$ ps ax | grep condor
15225 ?        Ss     0:00 /usr/sbin/condor_master -f
15266 ?        S      0:00 condor_procd -A /var/run/condor/procd_pipe -L /var/log/condor/ProcLog -R 1000000 -S 60 -C 111
15268 ?        Ss     0:00 condor_shared_port -f
15286 pts/0    S+     0:00 grep --color=auto condor
ubuntu@bdp1-master-node:~$
```