

BEMOSS and Its Enhanced Applications

Brian Lauer
Advisor: Dr. Suruz Miah

Department of Electrical and Computer Engineering
Bradley University
1501 W. Bradley Avenue
Peoria, IL, 61625, USA

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Outline

- 1 Install Ubuntu 16.04
 - On Disk
 - Virtual Machine
- 2 Install BEMOSS Launcher Wizard
- 3 Launch BEMOSS Launcher Wizard
- 4 Install BEMOSS System
- 5 Post-Installation
 - Configure PostgreSQL database
- 6 Problems
- 7 Progress
- 8 Plan

Install Ubuntu 16.04

On Disk

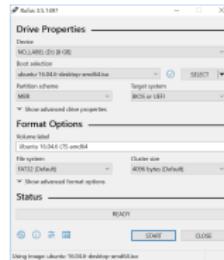


Figure: Rufus USB Formatting Utility

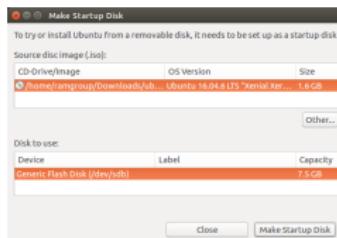


Figure: Startup Disk Creator

Link

<http://releases.ubuntu.com/16.04/>

Create Bootable Flash Medium

- Rufus (Windows)
- SanDisk Cruzer Media (MacOS)
- Startup Disk Creator (Linux)

Install Ubuntu 16.04

Virtual Machine

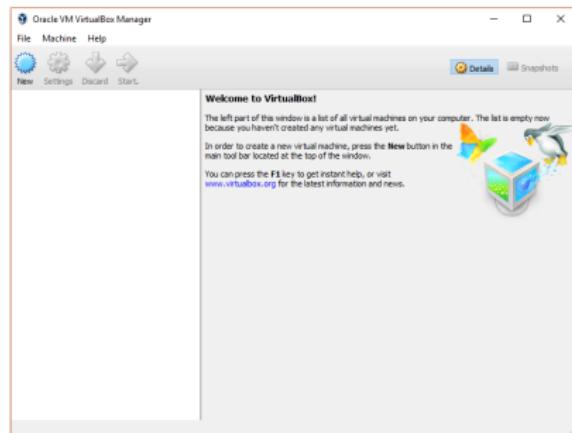


Figure: Oracle VM VirtualBox Manager, courtesy of https://github.com/bemoss/wiki_images/

Links

- ① <https://www.virtualbox.org/wiki/Downloads>
- ② <https://github.com/bemoss/BEMOSS3.5/wiki/Ubuntu-Installation>

Install BEMOSS Launcher Wizard

```
ramgroup@ramgroup-Latitude-E6510:~  
ramgroup@ramgroup-Latitude-E6510:~$ sudo apt-get update  
Hit:1 http://us.archive.ubuntu.com/ubuntu xenial InRelease  
Hit:2 http://us.archive.ubuntu.com/ubuntu xenial-updates InRelease  
Hit:3 http://us.archive.ubuntu.com/ubuntu xenial-backports InRelease  
Hit:4 http://security.ubuntu.com/ubuntu xenial-security InRelease  
Reading package lists... Done  
ramgroup@ramgroup-Latitude-E6510:~$
```

Figure: Updating the system

Steps

- ① Open a terminal
- ② Update the system
- ③ Install git
- ④ Clone BEMOSS repo

```
ramgroup@ramgroup-Latitude-E6510:~  
ramgroup@ramgroup-Latitude-E6510:~$ sudo apt-get install git  
Reading package lists... Done  
Building dependency tree  
Reading state information... Done  
git is already the newest version (1:2.7.4-0ubuntu1.6).  
0 upgraded, 0 newly installed, 0 to remove and 172 not upgraded.  
0 not fully installed or removed.  
After this operation, 0 B of additional disk space will be used.
```

Figure: Installing git

```
ramgroup@ramgroup-Latitude-E6510:~/temp  
ramgroup@ramgroup-Latitude-E6510:~/temp$ git clone -b master https://github.com/  
bemoss/BEMOSS3.5.git  
Cloning into 'BEMOSS3.5'...  
remote: Enumerating objects: 2689, done.  
remote: Total 2689 (delta 0), reused 0 (delta 0), pack-reused 2689  
Receiving objects: 100% (2689/2689), 5.89 MB | 954.00 KB/s, done.  
Resolving deltas: 100% (1613/1613), done.  
Checking connectivity... done.  
ramgroup@ramgroup-Latitude-E6510:~/temp$
```

Figure: Cloning BEMOSS

Launch BEMOSS Launcher Wizard

```
ramgroup@ramgroup-Latitude-E6510:~/BEMOSS3.5/GUI  
ramgroup@ramgroup-Latitude-E6510:~/BEMOSS3.5/GUI$ ./startBEMOSS_GUI.sh  
/home/ramgroup/BEMOSS3.5/GUI/startBEMOSS_GUI.sh  
/home/ramgroup/BEMOSS3.5/GUI  
Install ok installed  
Package Installed  
  
Installing Package...  
[sudo] password for ramgroup: [REDACTED]
```

Figure: Running startBEMOSS_GUI.sh using a relative path

Steps

- ① Run `startBEMOSS_GUI.sh` in `/#bemoss_folder/ BEMOSS3.5/GUI`
- ② Enter system password



Figure: BEMOSS Launcher Wizard

Install BEMOSS System

```
  Applying beamoss.beamoss.applications.0001_initial... OK
  Applying beamoss.beamoss.buildinginfos.0001_initial... OK
  Applying beamoss.beamoss.devices.0001_initial... OK
  Applying beamoss.beamoss.device.0001_initial... OK
  Applying beamoss.beamoss.discovery.0001_initial... OK
  Applying beamoss.beamoss.dns.0001_initial... OK
  Applying beamoss.beamoss.scheduledate.0001_initial... OK
  Applying beamoss.beamoss.sessions.0001_initial... OK
/home/beamoss/.m2/repository/beamoss/beamoss/5/web_server
/home/beamoss/.m2/repository/beamoss/beamoss/5/web_server
No cassandra_settings file. Using current IP
No cassandra config file. Using the default cassandra cassandra user/pass
cassandra check failed
Connection cannot be established
  '(unable to connect to any servers', ['[192.168.1.111:9042]': error(113, "tried connecting to [(\"192.168.1.111:9042\")]; last error: Connection refused")])
System check identified some issues:
WARNINGS:
! Beamoss URL: ${beamoss.url} Your URL pattern '$' uses include with a regex ending with a '$'
  Remove the dollar from the regex to avoid problems including URLs.
  Beamoss URL: ${beamoss.url} Beamoss URL: ${beamoss.url} has no effect on Anytinytinyold
Username [leave blank to use 'rangromp']: admin
Email address: 
```

Figure: Prompt for Django Superuser

Steps

- ① Click "Run BEMOSS"
 - ② Define Django Superuser
 - ③ Define parameters for Cassandra database

```
[root@rampage:rampage-Latitude-E5510 ~]# ./temp/BEMOSS3.5/GUI
PlatformInitiator>> Done 6: database bemossdb connection is closed
rm cannot remove '/home/rampage/temp/BEMOSS3.5/log/volttron.log': No such file or directory
rm: cannot remove '/home/rampage/temp/BEMOSS3.5/log/cassandra.log': No such file or directory
PlatformInitiator>> Done 7: clear volttron log file, kill volttron process, kill all processes
$5 settings imported
creating a new cassandra_settings file
using default cassandra host: localhost
using default clustername: bemosscuster
tater database userame:
tater database userame: bemoss
tater database password:
tater database password:
using default password: bemoss

* Congratulations! BEMOSS Installation is complete!
Before running BEMOSS for the first time, please refer following link
for more information:
https://github.com/bemoss/BEMOSS3.5/wiki/Post-Installation-Instruction

[root@rampage:rampage-Latitude-E5510 ~]# ./temp/BEMOSS3.5/GUIS
```

Figure: Cassandra database login info

Post-Installation

Configure PostgreSQL database



Steps

- 1 Click "Advanced Setting"

Figure: Advanced Settings window

Post-Installation

Configure PostgreSQL database

```
57 # - Connection Settings -
58
59 listen_addresses = '*'          # what IP address(es) to listen on;
60                      # comma-separated list of addresses;
```

Figure: postgresql.conf lines 57-60

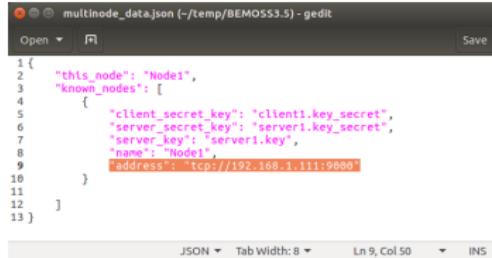
```
92 host      all            all            127.0.0.1/32      md5
93 host      all            all            192.168.1.111/32  md5
```

Figure: pg_hba.conf lines 92-93

Steps (Cont.)

- ② Change line 59 of postgresql.conf to
listen_addresses = '*'
- ③ Copy line 92 of pg_hba.conf
and paste on line 93
- ④ Change IP address on line 93 to
system's IP address

Post-Installation



```
multinode_data.json (~-/temp/BEMOSS3.5) - gedit
Open Save
1 {
2   "this_node": "Node1",
3   "known_nodes": [
4     {
5       "client_secret_key": "client1.key.secret",
6       "server_secret_key": "server1.key.secret",
7       "server_key": "server1.key",
8       "name": "Node1",
9       "address": "tcp://192.168.1.111:9888"
10    }
11  ]
12 }
13 }

JSON Tab Width: 8 Ln 9, Col 50 INS
```

Figure: multinode_data.json open in gedit

Steps (Cont.)

- ⑤ Modify multinode_data.json in /#bemoss_folder/BEMOSS3.5 with system's IP address
- ⑥ Modify parent_ip.txt in /#bemoss_folder/BEMOSS3.5 with system's IP address



```
parent_ip.txt (~-/temp/BEMOSS3.5) - gedit
Open Save
1 192.168.1.111

Plain Text Tab Width: 8 Ln 1, Col 1 INS
```

Figure: parent_ip.txt open in gedit

Problems

```
ramgroup@ramgroup-Latitude-E6510:~/BEMOSS3.5/GUI$ PlatformInitiator >> Done 7: clear volttron log file, kill volttron process, kill all BEMOSS processes
OS settings imported
Not found:/home/ramgroup/BEMOSS3.5/cassandra/conf/cassandra.yaml
Traceback (most recent call last):
  File "bemoss_llb/databases/cassandraAPI/Initialize.py", line 186, in <module>
    _init()
  File "bemoss_llb/databases/cassandraAPI/Initialize.py", line 99, in _init
    cassanlyfile = open(settings.PROJECT_DIR+ "/cassandra/conf/cassandra.yaml",'r')
)
IOError: [Errno 2] No such file or directory: '/home/ramgroup/BEMOSS3.5/cassandra/conf/cassandra.yaml'
sudo: bemoss_llb/utils/increase_open_file_limit.sh: command not found
rm: cannot remove 'bemoss_llb/utils/increase_open_file_limit.sh': No such file or directory
*****
* Congratulations! BEMOSS Installation is complete!
* Before running BEMOSS for the first time, please refer the following link
* for post installation configuration:
* https://github.com/bemoss/BEMOSS3.5/wiki/Post-Installation-Instruction
*
*****
ramgroup@ramgroup-Latitude-E6510:~/BEMOSS3.5/GUI$
```

Figure: Error raised by BEMOSS during installation

Description

- Cassandra directory non-existent
- Broken link on line 48 of `bemoss_install_v3.5.sh` in `#bemoss_folder/ BEMOSS3.5/GUI`

```
48 wget http://downloads.datastax.com/community/dsc-cassandra-3.0.9-bin.tar.gz
49 tar -xzf dsc-cassandra-3.0.9-bin.tar.gz
50 sudo rm dsc-cassandra-3.0.9-bin.tar.gz
51 sudo rm -rf cassandra/
52 sudo mv dsc-cassandra-3.0.9 cassandra
```

Figure: Lines 48-52 of `bemoss_install_v3.5.sh`

Problems

```
● bemooss_install_v3.5.sh (~-/BEMOSS3.5/GUI) - gedit
Save
Open ▾  ↗
45 sudo apt-get install openjdk-8-jre libjna-java --assume-yes
46 # Install Cassandra
47 cd $projectpath
48 # replaced link
49 wget https://archive.apache.org/dist/cassandra/3.0.9/apache-
cassandra-3.0.9-bin.tar.gz
50 tar -xzf apache-cassandra-3.0.9-bin.tar.gz
51 sudo rm apache-cassandra-3.0.9-bin.tar.gz
52 sudo rm -rf cassandra/
53 sudo mv apache-cassandra-3.0.9 cassandra
54 # Install Cassandra Driver
55 # (For better performance of Cassandra, the install-option can be
# removed but might cause installation failure in some boards.)
56 CASS_DRIVER_NO_CYTHON=1 pip install cassandra-driver
57 # Go to the bemooss web ui and run the syncdb command for the
sh ▾ Tab Width: 8 ▾ Ln 48, Col 16 ▾ INS
```

Figure: bemooss_install_v3.5.sh with URL changed

Possible Solution

Replace

<http://downloads.datastax.com/community/dsc-cassandra-3.0.8-bin.tar.gz> with

<https://archive.apache.org/dist/cassandra/3.0.9/apache-cassandra-3.0.9-bin.tar.gz>

Problems

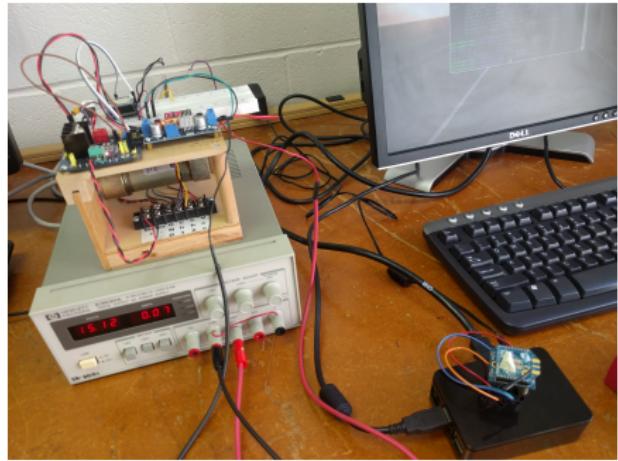
```
ramgroup@rangroup-Latitude-E6510:~/BEMOSS3.5
r/lib/python2.7/logging/_init_.py", line 861, in emit
2019-06-14 11:20:03,773 (TSDagent-3.0 5453) <stderr> ERROR:      msg = s
elf._format(record)
2019-06-14 11:20:03,773 (TSDagent-3.0 5453) <stderr> ERROR:      File "/u
r/lib/python2.7/logging/_init_.py", line 734, in format
2019-06-14 11:20:03,773 (TSDagent-3.0 5453) <stderr> ERROR:          return
fmt._format(record)
2019-06-14 11:20:03,774 (TSDagent-3.0 5453) <stderr> ERROR:      File "/ho
me/rangroup/BEMOSS3.5/voltron/platform/agent/utils.py", line 242, in f
ormat
2019-06-14 11:20:03,774 (TSDagent-3.0 5453) <stderr> ERROR:          return
jsonapi.dumps(dtct)
2019-06-14 11:20:03,774 (TSDagent-3.0 5453) <stderr> ERROR:      File "/ho
me/rangroup/BEMOSS3.5/env/local/lib/python2.7/site-packages/zmq/utils/j
sonapi.py", line 40, in dumps
2019-06-14 11:20:03,775 (TSDagent-3.0 5453) <stderr> ERROR:          s = jso
nmod.dumps(o, **kwargs)
2019-06-14 11:20:03,775 (TSDagent-3.0 5453) <stderr> ERROR:      File "/ho
me/rangroup/BEMOSS3.5/env/local/lib/python2.7/site-packages/simplejson/
_init_.py", line 399, in dumps
2019-06-14 11:20:03,775 (TSDagent-3.0 5453) <stderr> ERROR:          **kw).e
ncode(obj)
2019-06-14 11:20:03,776 (TSDagent-3.0 5453) <stderr> ERROR:      File "/ho
me/rangroup/BEMOSS3.5/env/local/lib/python2.7/site-packages/simplejson/
encoder.py", line 296, in encode
2019-06-14 11:20:03,776 (TSDagent-3.0 5453) <stderr> ERROR:          chunks
= self._iterencode(o, one_shot=True)
2019-06-14 11:20:03,777 (TSDagent-3.0 5453) <stderr> ERROR:      File "/ho
me/rangroup/BEMOSS3.5/env/local/lib/python2.7/site-packages/simplejson/
encoder.py", line 378, in _iterencode
2019-06-14 11:20:03,778 (TSDagent-3.0 5453) <stderr> ERROR:          return
iterencode(o, 0)
2019-06-14 11:20:03,778 (TSDagent-3.0 5453) <stderr> ERROR:      File "/ho
me/rangroup/BEMOSS3.5/env/local/lib/python2.7/site-packages/simplejson/
encoder.py", line 273, in default
2019-06-14 11:20:03,778 (TSDagent-3.0 5453) <stderr> ERROR:          o._cla
ss_name
2019-06-14 11:20:03,779 (TSDagent-3.0 5453) <stderr> ERROR:      TypeError:
object of type defaultdict is not JSON serializable
2019-06-14 11:20:03,779 (TSDagent-3.0 5453) <stderr> ERROR:      Logged from
file connection.py, line 1129
2019-06-14 11:20:04,872 (multinodeagent-0.1 5559) <stdout> INFO: Sendin
```

Additional Problems

- Error reported by TSDagent (Time Series Database Agent) when server is running
- Additional changes may need to be made

Figure: Error raised by BEMOSS during operation

Progress



DC Motor

- Used python scripts written by members of previous senior project to control DC motor

Plan

By June 24

- Build GUI with Python to control IoT devices

By June 28

- Create an icon within BEMOSS to control the DC motor
- Write conference paper
- Find a new device to implement within BEMOSS

Resources I



BEMOSS Team

BEMOSS Installation Guide

[https://github.com/bemoss/BEMOSS3.5/
wiki/BEMOSS-Installation-Guide](https://github.com/bemoss/BEMOSS3.5/wiki/BEMOSS-Installation-Guide)



BEMOSS Team

BEMOSS Wiki Images

https://github.com/bemoss/wiki_images/

Any Questions?