

ASSIGNMENT 3

CLOUD COMPUTING

(Container-Complex)

Submitted by:

-Akansha Gupta(2015h112181P)

-Rashmi Gulhane(2015h112187P)

LXC Containers

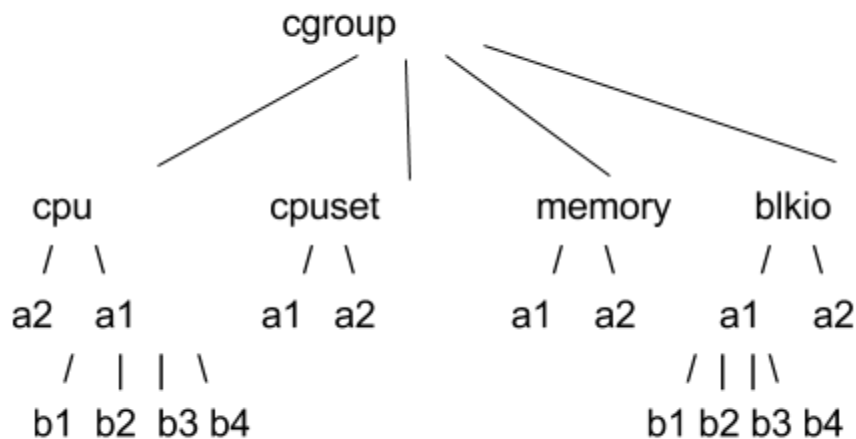
Feature Description:

1. A feature providing Resource provisioning and instance caging for database specific containers.
2. Resource provisioning is done in such a way that Database applications will get 85% of CPU shares,CPUSET core,Main memory, disk block IO and other applications which are not database specific will get remaining resources.
3. In absence of database specific application, a fare share of resources will be given to all the applications.
4. Instance Caging is done for database applications using Partitioning Approach. for eg. 4 cgroups are created. Group A is given 50% of all the resources, Group B 25%, Group C 12.5, Group D 12.5.
5. Instance Caging is done to make sure that when multiple databases are running, they do not interfere with each other's resources.
6. For Resource provisioning and instance caging the following resources are controlled:

```
cpu --- cpu.shares
cpuset --- cpuset.cpus
memory --- memory.soft_limit_in_bytes
blkio --- blkio.weight
```

Design of how the feature will be integrated into the container

1. This feature is enabled in the container when the user execute command `Enable_RP`(Enable resource provisioning) in container terminal.
2. On execution of this command, a daemon process is invoked in the container which will monitor all the processes which are ready to run and create a hierarchy of Cgroups in the Container workspace to prioritize the resources for database specific applications.
3. A pictorial representation of hierarchy created is as follows:-
4. If the arrived application is a database application it is added to the cgroup with higher priority(a1) else it is added to cgroup with lower priority(a2).



External module / library that implements part of the feature:-

libcgroup.h library is used to implement the feature. Creation of Cgroups, setting its characteristic and adding PID to task file of appropriate Cgroup is done with the help of the method provided by this library.

Patching / integrating it into the Container library with appropriate additional code:-

An appropriate patch is added to template lxc-ubuntu.in.

While executing lxc-create command, the template is provided in the argument, it checks for cache downloads of host to provide the executables for container.

We copied the executable to this cache and provided its path in the template file.

This template in turn will copy the executables to container space and we will be able to you the feature by executing Enable_RP command.