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SISTEMAS EN LA NUBE

T4: My own Datacenter

Requerimiento:

Datacenter

- 8 host
  - Two Cores (1000 MIPS each core)
  - 4 GB RAM
  - 100 GB Storage (100000 MB)
  - 4000 Kbits/s bandwidth

Cloudlets

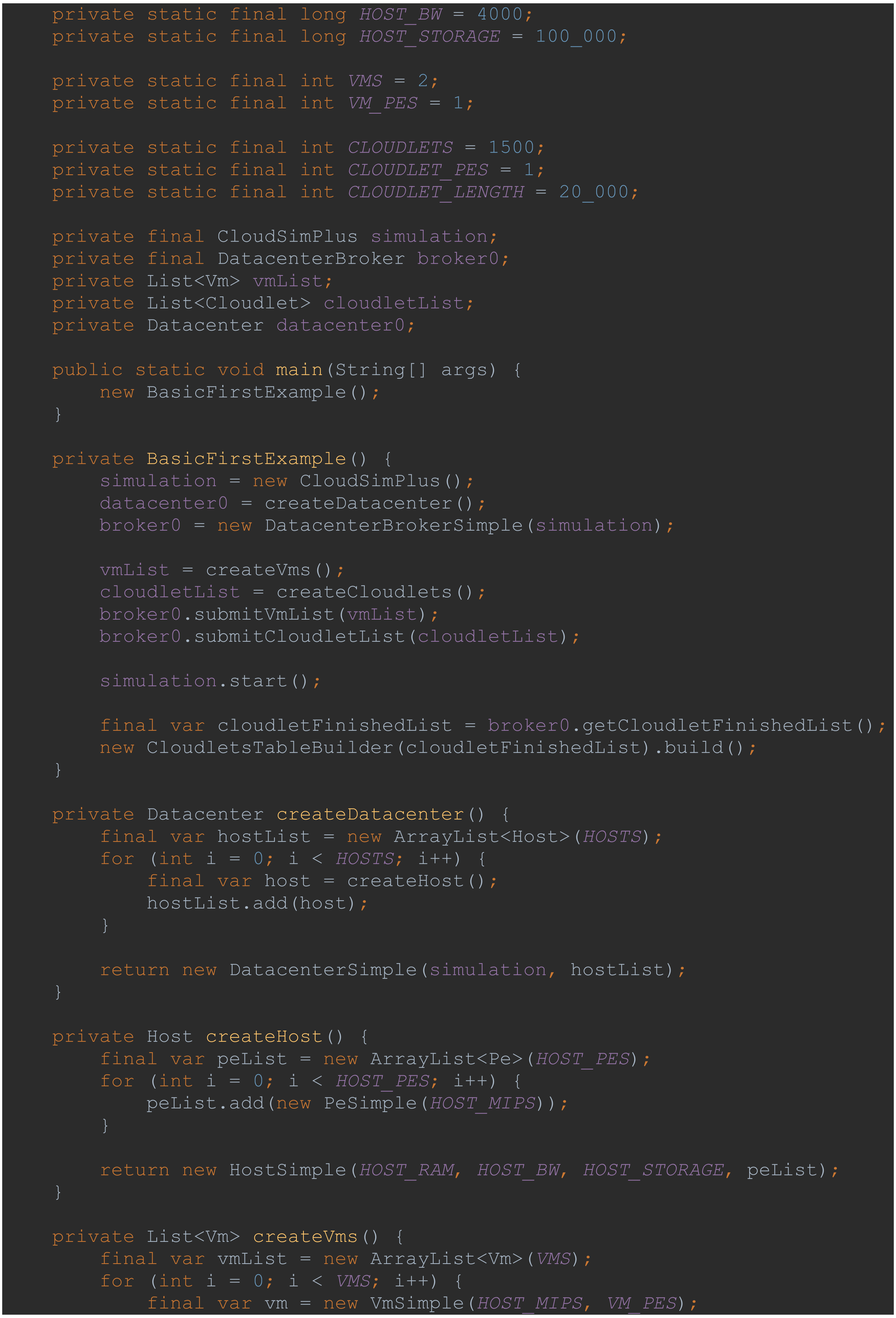
- 1500 cloudlets with dynamic length
- 20000+(random) instruction length
- 400 kb output filesize
- 1 core CPU requirement
- Full Utilization

Virtualization

- 2 virtual machine
- 50 GB storage disk
- 2 GB Ram
- 1 vCPU with 1000 MIPS
- 2000 Kbits/s bandwidth
- CloudleSchedulerTimeShared scheduler

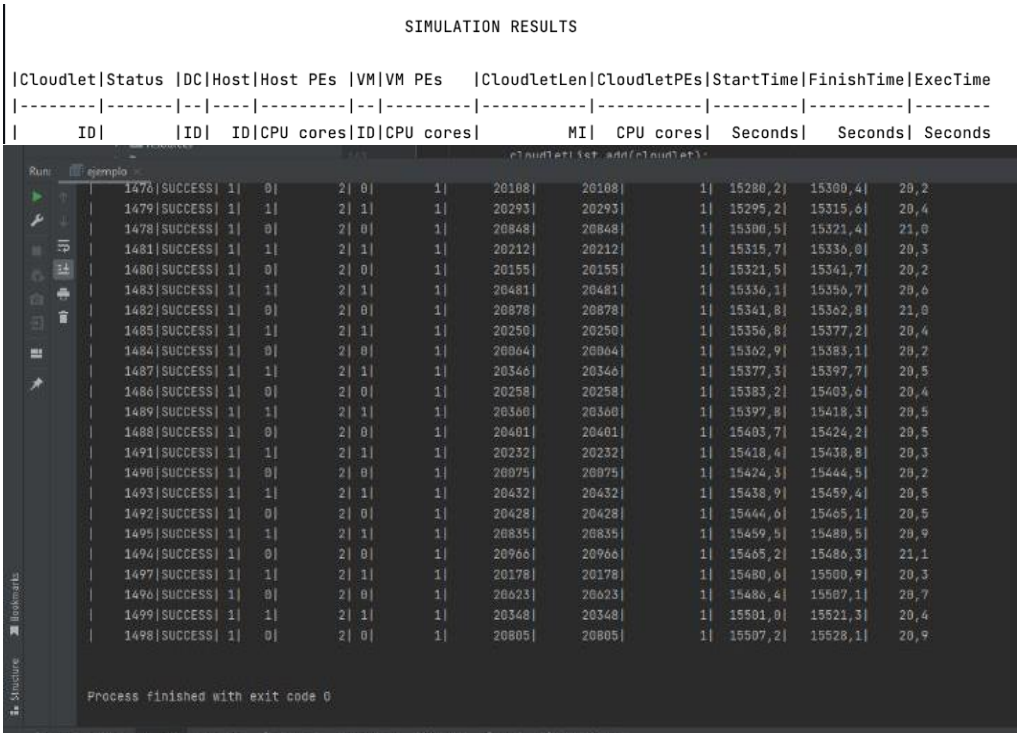
Código

```java
 */
package org.cloudsimplus.examples;

import org.cloudsimplus.brokers.DatacenterBroker;
import org.cloudsimplus.brokers.DatacenterBrokerSimple;
import org.cloudsimplus.builders.tables.CloudletsTableBuilder;
import org.cloudsimplus.cloudlets.Cloudlet;
import org.cloudsimplus.cloudlets.CloudletSimple;
import org.cloudsimplus.core.CloudSimPlus;
import org.cloudsimplus.datacenters.Datacenter;
import org.cloudsimplus.datacenters.DatacenterSimple;
import org.cloudsimplus.hosts.Host;
import org.cloudsimplus.hosts.HostSimple;
import org.cloudsimplus.resources.Pe;
import org.cloudsimplus.resources.PeSimple;
import org.cloudsimplus.utilizationmodels.UtilizationModelDynamic;
import org.cloudsimplus.vms.Vm;
import org.cloudsimplus.vms.VmSimple;

import java.util.ArrayList;
import java.util.List;
import java.util.Random;

public class BasicFirstExample {
    private static final int HOSTS = 8;
    private static final int HOST_PES = 2;
    private static final int HOST_MIPS = 1000;
    private static final int HOST_RAM = 4096;
```



```
    private static final long HOST_BW = 4000;
    private static final long HOST_STORAGE = 100_000;

    private static final int VMS = 2;
    private static final int VM_PES = 1;

    private static final int CLOUDLETS = 1500;
    private static final int CLOUDLET_PES = 1;
    private static final int CLOUDLET_LENGTH = 20_000;

    private final CloudSimPlus simulation;
    private final DatacenterBroker broker0;
    private List<Vm> vmList;
    private List<Cloudlet> cloudletList;
    private Datacenter datacenter0;

    public static void main(String[] args) {
        new BasicFirstExample();
    }

    private BasicFirstExample() {
        simulation = new CloudSimPlus();
        datacenter0 = createDatacenter();
        broker0 = new DatacenterBrokerSimple(simulation);

        vmList = createVms();
        cloudletList = createCloudlets();
        broker0.submitVmList(vmList);
        broker0.submitCloudletList(cloudletList);

        simulation.start();

        final var cloudletFinishedList = broker0.getCloudletFinishedList();
        new CloudletsTableBuilder(cloudletFinishedList).build();
    }

    private Datacenter createDatacenter() {
        final var hostList = new ArrayList<Host>(HOSTS);
        for (int i = 0; i < HOSTS; i++) {
            final var host = createHost();
            hostList.add(host);
        }

        return new DatacenterSimple(simulation, hostList);
    }

    private Host createHost() {
        final var peList = new ArrayList<Pe>(HOST_PES);
        for (int i = 0; i < HOST_PES; i++) {
            peList.add(new PeSimple(HOST_MIPS));
        }

        return new HostSimple(HOST_RAM, HOST_BW, HOST_STORAGE, peList);
    }

    private List<Vm> createVms() {
        final var vmList = new ArrayList<Vm>(VMS);
        for (int i = 0; i < VMS; i++) {
            final var vm = new VmSimple(HOST_MIPS, VM_PES);
            vm.setRam(2_048).setBw(2).setSize(50_000);
            vmList.add(vm);
        }

        return vmList;
    }

    private List<Cloudlet> createCloudlets() {
        final var cloudletList = new ArrayList<Cloudlet>(CLOUDLETS);

        final var utilizationModel = new UtilizationModelDynamic(0.5);
        Random m = new Random();
        for (int i = 0; i < CLOUDLETS; i++) {
            final var cloudlet = new CloudletSimple(CLOUDLET_LENGTH +
m.nextInt(10), CLOUDLET_PES, utilizationModel);
            cloudlet.setOutputSize(400_000);
            cloudletList.add(cloudlet);
        }

        return cloudletList;
    }
}
```

RESULTADO DE LA EJECUCIÓN:



```
                                         SIMULATION RESULTS

|Cloudlet|Status |DC|Host|Host PEs |VM|VM PEs   |CloudletLen|CloudletPEs|StartTime|FinishTime|ExecTime
|--------|-------|--|----|---------|--|---------|-----------|-----------|---------|----------|--------
|      ID|       |ID|  ID|CPU cores|ID|CPU cores|         MI|  CPU cores|  Seconds|   Seconds| Seconds
|    1476|SUCCESS| 1|   0|        2| 0|        1|      20108|      20108|        1|  15280,2|   15300,4|    20,2
|    1479|SUCCESS| 1|   1|        2| 1|        1|      20293|      20293|        1|  15295,2|   15315,6|    20,4
|    1478|SUCCESS| 1|   0|        2| 0|        1|      20848|      20848|        1|  15300,5|   15321,4|    21,0
|    1481|SUCCESS| 1|   1|        2| 1|        1|      20212|      20212|        1|  15315,7|   15336,0|    20,3
|    1480|SUCCESS| 1|   0|        2| 0|        1|      20155|      20155|        1|  15321,5|   15341,7|    20,2
|    1483|SUCCESS| 1|   1|        2| 1|        1|      20481|      20481|        1|  15336,1|   15356,7|    20,6
|    1482|SUCCESS| 1|   0|        2| 0|        1|      20878|      20878|        1|  15341,8|   15362,8|    21,0
|    1485|SUCCESS| 1|   1|        2| 1|        1|      20250|      20250|        1|  15356,8|   15377,2|    20,4
|    1484|SUCCESS| 1|   0|        2| 0|        1|      20064|      20064|        1|  15362,9|   15383,1|    20,2
|    1487|SUCCESS| 1|   1|        2| 1|        1|      20346|      20346|        1|  15377,3|   15397,7|    20,5
|    1486|SUCCESS| 1|   0|        2| 0|        1|      20258|      20258|        1|  15383,2|   15403,6|    20,4
|    1489|SUCCESS| 1|   1|        2| 1|        1|      20360|      20360|        1|  15397,8|   15418,3|    20,5
|    1488|SUCCESS| 1|   0|        2| 0|        1|      20401|      20401|        1|  15403,7|   15424,2|    20,5
|    1491|SUCCESS| 1|   1|        2| 1|        1|      20232|      20232|        1|  15418,4|   15438,8|    20,3
|    1490|SUCCESS| 1|   0|        2| 0|        1|      20075|      20075|        1|  15424,3|   15444,5|    20,2
|    1493|SUCCESS| 1|   1|        2| 1|        1|      20432|      20432|        1|  15438,9|   15459,4|    20,5
|    1492|SUCCESS| 1|   0|        2| 0|        1|      20428|      20428|        1|  15444,6|   15465,1|    20,5
|    1495|SUCCESS| 1|   1|        2| 1|        1|      20835|      20835|        1|  15459,5|   15480,5|    20,9
|    1494|SUCCESS| 1|   0|        2| 0|        1|      20966|      20966|        1|  15465,2|   15486,3|    21,1
|    1497|SUCCESS| 1|   1|        2| 1|        1|      20178|      20178|        1|  15480,6|   15500,9|    20,3
|    1496|SUCCESS| 1|   0|        2| 0|        1|      20623|      20623|        1|  15486,4|   15507,1|    20,7
|    1499|SUCCESS| 1|   1|        2| 1|        1|      20348|      20348|        1|  15501,0|   15521,3|    20,4
|    1498|SUCCESS| 1|   0|        2| 0|        1|      20805|      20805|        1|  15507,2|   15528,1|    20,9


Process finished with exit code 0
```