


Advanced CloudStack Troubleshooting using Log Analysis

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Agenda

- Introduction
 - Log files and locations
 - What to look for?
 - What to do?
 - Examples
 - Q&A
- 

Management Server

- `/var/log/cloud/management/`
- `management-server.log`
 - Most important log
- `api-server.log`
 - Occasionally useful (who sent that API command that broke everything?)
- `catalina.out`, `host-manager.log`, `manager.log`, `access_log`, etc.
 - Rarely useful for troubleshooting, if ever

Hypervisor hosts

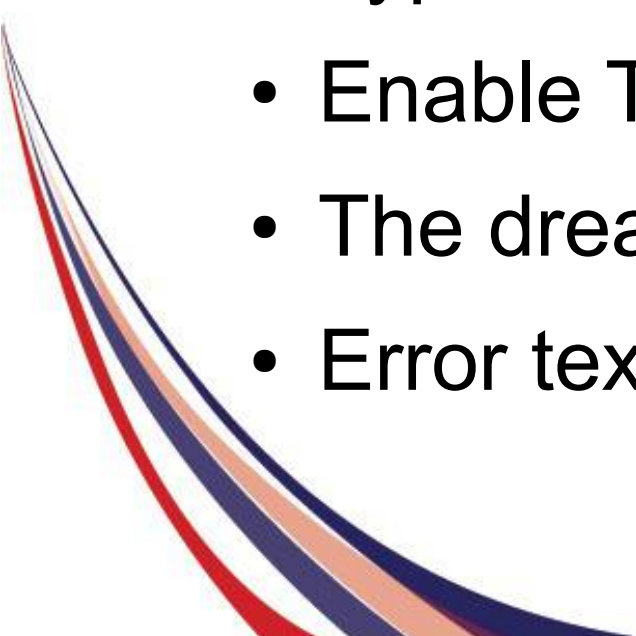
- XenServer / XCP
 - /var/log/SMlog, xensource.log
- KVM
 - /var/log/cloud/agent/agent.log
 - /var/log/libvirt/libvirtd.log
- vSphere
 - vCenter logs
 - Host logs rarely useful

Other logs

- SAN, firewalls, switches, routers
 - Helpful to narrow down permissions errors, blocked ports, etc.
 - Check vendor docs since CloudStack doesn't touch these

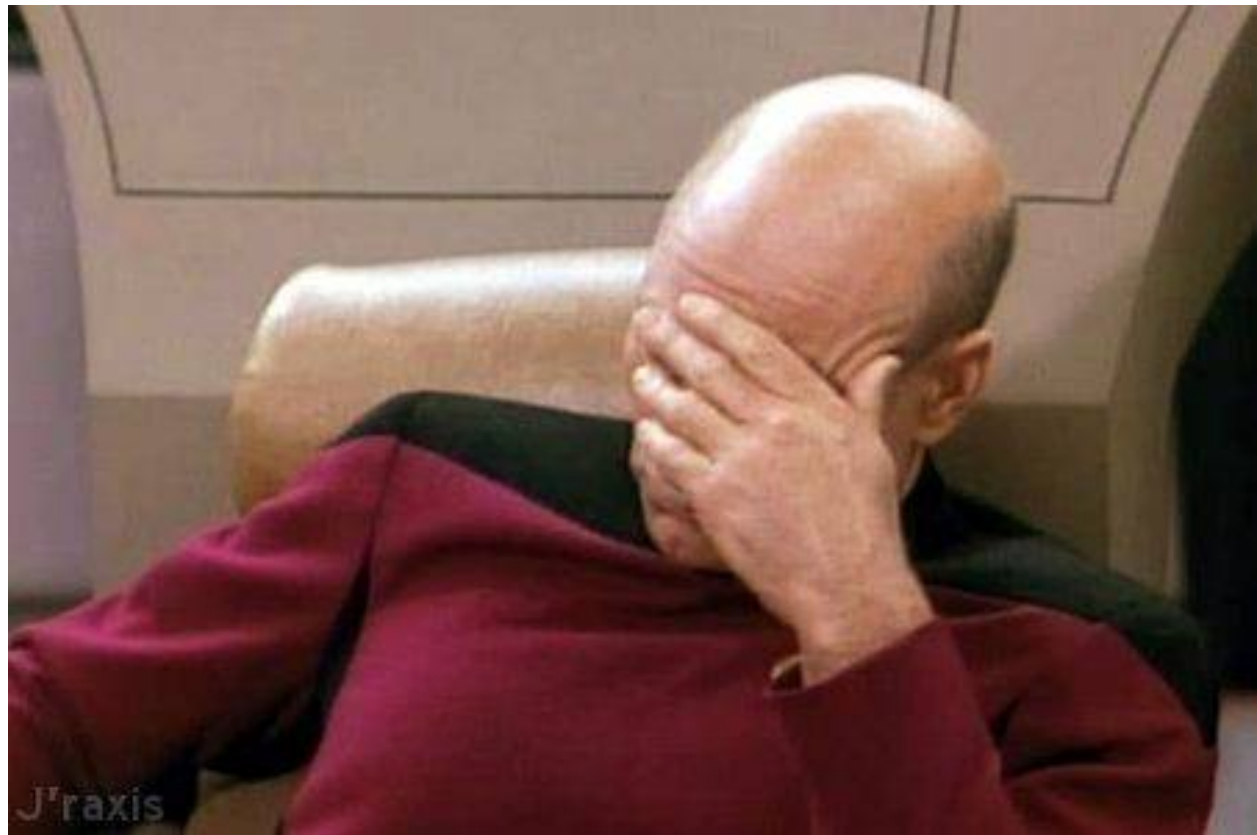


What to look for?

- Warnings and errors and exceptions, oh my!
 - WARN, ERROR, Exception, Unable, Failed
 - VM name
 - Type of task that failed
 - Enable TRACE if necessary
 - The dreaded “avoid set”
 - Error text from UI/API
- 

Job ID

- Can be sent to other management servers
- Very useful, but NOT currently logged
- Get it from database
- Figure it out



Sequences

- Also useful
- A job can contain multiple sequences
- Only shown in logs
- Can be sent to hosts
 - Look for “Executing request” and “Response received”
- Can be sent to other management servers
 - Look for “Forwarding Seq <id>”

What to do?

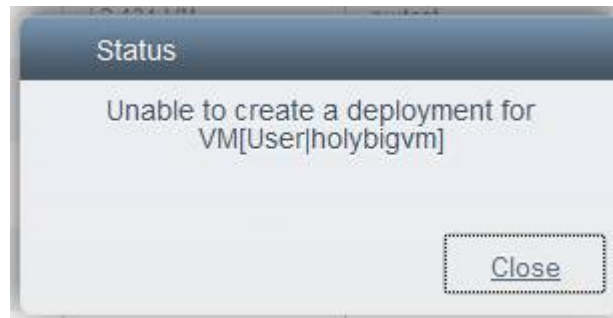
- Depends on the errors
- Check capacity
- Check network
- Keep waiting
- Hack database and try again
 - Bzzt! Wrong answer... usually.

Examples



UI Error

- Start with an error from the UI



Find the related log entry (at the end of the job).

```
2013-02-25 16:39:40,567 DEBUG [cloud.async.AsyncJobManagerImpl] (Job-
Executor-1:job-318) Complete async job-318, jobStatus: 2, resultCode:
530, result: Error Code: 533 Error text: Unable to create a deployment
for VM[User|holybigvm]
```

The actual error.

```
2013-02-25 16:39:40,459 DEBUG [cloud.deploy.FirstFitPlanner] (Job-
Executor-1:job-318) No clusters found having a host with enough
capacity, returning.
```

The avoid set...

Hey guys, why is my host in the avoid set, and how do I remove it?

```
2012-05-14 16:04:54,772 DEBUG [allocator.impl.FirstFitAllocator] (Job-
Executor-4:job-17638 FirstFitRoutingAllocator) Host name: val-
rk00008.example.local, hostId: 5 is in avoid set, skipping this and
trying other available hosts
```



...means SCROLL UP

The real error will always be earlier in the job.

```
2012-05-14 16:04:54,735 ERROR  
[network.router.VirtualNetworkApplianceManagerImpl] (Job-Executor-4:job-  
17638) Unable to set dhcp entry for VM[User|i-2-1607-VM] on domR: r-16-  
VM due to  
2012-05-14 16:04:54,735 INFO [cloud.vm.VirtualMachineManagerImpl] (Job-  
Executor-4:job-17638) Unable to contact resource.
```



Hypervisor Errors

```
2012-07-13 08:08:05,149 WARN [xen.resource.CitrixResourceBase]
(DirectAgent-73:null) Task failed! Task record:
uuid: 95e36660-702f-8e07-5025-3bcf1
573e18c
```

```
    nameLabel: Async.VM.start_on
  nameDescription:
allowedOperations: []
currentOperations: {}
    created: Fri Jul 13 08:08:04 PDT 2012
    finished: Fri Jul 13 08:08:04 PDT 2012
    status: FAILURE
  residentOn: com.xensource.xenapi.Host@fed4b193
  progress: 1.0
    type: <none/>
    result:
  errorInfo: [SR_BACKEND_FAILURE_46, , The VDI is not
available [opterr=VDI e7f5571b-44b1-48b7-ba84-34d9c3ee879b
already attached RW]]
  otherConfig: {}
  subtaskOf: com.xensource.xenapi.Task@aaf13f6f
  subtasks: []
```

More Hypervisor Errors

management-server.log

```
2013-01-08 13:47:17,256 WARN [cloud.vm.VirtualMachineManagerImpl]
(AgentManager-Handler-32:null) Cleanup failed due to Exception:
org.libvirt.LibvirtException
Message: internal error '/bin/umount /mnt/dd7d684f-255f-3a24-87ab-
512168a207b5' exited with non-zero status 16 and signal 0:
umount.nfs: /mnt/dd7d684f-255f-3a24-8
7ab-512168a207b5: device is busy
umount.nfs: /mnt/dd7d684f-255f-3a24-87ab-512168a207b5: device is busy
```

/var/log/messages

```
2012-09-19 12:14:37,002 WARN
[resource.computing.LibvirtComputingResource] (Agent-Handler-5:null)
Exception
org.libvirt.LibvirtException: internal error '/bin/umount /mnt/513d2d1f-
38a7-3e3b-b2c5-ea3f4e0db6ba' exited with non-zero status 16 and signal
0: umount.nfs: /mnt/513d2d1f-38a7-3e3b-b2c5-ea3f4e0db6ba: device is busy
umount.nfs: /mnt/513d2d1f-38a7-3e3b-b2c5-ea3f4e0db6ba: device is busy
```

Yet Another Hypervisor Error

```
2013-01-16 10:12:28,313 ERROR [vmware.resource.VmwareResource]
(DirectAgent-161:esx102.example.com) CreateCommand failed due to
Exception: java.io.FileNotFoundException
```

Message:

```
https://stor1.example.com/folder/39b7d77f7dd547f695172b07882daec9/ff7d2b4
6103e4595a1b422990a0799e2.vmdk?dcPath=Petaluma&dsName=aaf29b8e-b548-3fad-
8c59-0dad849b2704
```

```
java.io.FileNotFoundException:
```

```
https://stor1.example.com/folder/39b7d77f7dd547f695172b07882daec9/ff7d2b4
6103e4595a1b422990a0799e2.vmdk?dcPath=Petaluma&dsName=aaf29b8e-b548-3fad-
8c59-0dad849b2704
```

```
at
```

```
sun.net.www.protocol.http.HttpURLConnection.getInputStream(URLConnection.java:1401)
```

```
at
```

```
sun.net.www.protocol.https.HttpURLConnectionImpl.getInputStream(HttpsURLConnectionImpl.java:254)
```

```
<snip>
```


Exceptions

```
2013-02-06 15:36:45,023 ERROR [cloud.vm.VirtualMachineManagerImpl] (Job-Executor-112:job-56957) Failed to start instance VM[User|a9167fdc-7d43-49f1-93cb-6c6902a666fa]
com.cloud.utils.exception.CloudRuntimeException: Unable to acquire lock on
VMTemplateStoragePool: 2570
    at
com.cloud.template.TemplateManagerImpl.prepareTemplateForCreate (TemplateManagerImpl.java:638)
    at com.cloud.utils.db.DatabaseCallback.intercept (DatabaseCallback.java:30)
    at com.cloud.storage.StorageManagerImpl.createVolume (StorageManagerImpl.java:3418)
    at com.cloud.storage.StorageManagerImpl.prepare (StorageManagerImpl.java:3327)
    at
com.cloud.vm.VirtualMachineManagerImpl.advanceStart (VirtualMachineManagerImpl.java:749)
    at com.cloud.vm.VirtualMachineManagerImpl.start (VirtualMachineManagerImpl.java:467)
    at com.cloud.vm.UserVmManagerImpl.startVirtualMachine (UserVmManagerImpl.java:2944)
    at com.cloud.vm.UserVmManagerImpl.startVirtualMachine (UserVmManagerImpl.java:2616)
    at com.cloud.vm.UserVmManagerImpl.startVirtualMachine (UserVmManagerImpl.java:2604)
    at com.cloud.event.ActionEventCallback.intercept (ActionEventCallback.java:32)
    at com.cloud.api.commands.DeployVMCmd.execute (DeployVMCmd.java:328)
    at com.cloud.api.ApiDispatcher.dispatch (ApiDispatcher.java:235)
    at com.cloud.async.AsyncJobManagerImpl$1.run (AsyncJobManagerImpl.java:427)
    at java.util.concurrent.Executors$RunnableAdapter.call (Executors.java:471)
    at java.util.concurrent.FutureTask$Sync.innerRun (FutureTask.java:334)
    at java.util.concurrent.FutureTask.run (FutureTask.java:166)
    at java.util.concurrent.ThreadPoolExecutor.runWorker (ThreadPoolExecutor.java:1110)
    at java.util.concurrent.ThreadPoolExecutor$Worker.run (ThreadPoolExecutor.java:603)
    at java.lang.Thread.run (Thread.java:636)
```

Forwarding Sequences

```
2013-01-24 14:09:28,063 DEBUG [agent.manager.ClusteredAgentAttache]
(AgentManager-Handler-13:null) Seq 6-1372586715: Forwarding Seq 6-
1372586715: { Cmd , MgmtId: 83533443070, via: 6, Ver: v1, Flags: 100111,
[{"StopCommand":{"isProxy":false,"vmName":"i-7-121-VM","wait":0}}] } to
83533443165
```



TRACE example

- Cannot snapshot volume 4500

The error shown in the UI wasn't logged at DEBUG level. It was still possible to find the job (from job type and volume ID).

```
2013-01-15 13:01:43,249 DEBUG [cloud.async.AsyncJobManagerImpl]
(catalina-exec-9:null) submit async job-36626, details: AsyncJobVO
{id:36626, userId: 215, accountId: 180, sessionKey: null, instanceType:
Snapshot, instanceId: 19951, cmd:
com.cloud.api.commands.CreateSnapshotCmd, cmdOriginator: null, cmdInfo:
{"id":"19951","response":"json","sessionkey":"asdf","ctxUserId":"215","te
nant":"be04d916-a916-483e-a96c-
925e0cb89575","volumeid":"4500","ctxAccountId":"180","ctxStartEventId":"1
36303","signature":"asdf","apikey":"asdf"}, cmdVersion: 0, callbackType:
0, callbackAddress: null, status: 0, processStatus: 0, resultCode: 0,
result: null, initMsid: 172136269028748, completeMsid: null, lastUpdated:
null, lastPolled: null, created: null}
```

Could have found UI error with TRACE enabled.

```
2013-01-15 13:01:48,346 TRACE [cloud.async.AsyncJobManagerImpl]
(catalina-exec-14:null) Job status: AsyncJobResult {jobId:36626,
jobStatus: 2, processStatus: 0, resultCode: 530, result:
com.cloud.api.response.ExceptionResponse/null/
{"errorCode":530,"errortext":"Internal error executing command, please
contact your system administrator"}}
```



The actual error didn't require TRACE.

```
2013-01-15 13:01:43,314 ERROR [cloud.api.ApiDispatcher] (Job-Executor-41:job-36626) Exception while executing CreateSnapshotCmd:
com.cloud.utils.exception.CloudRuntimeException: There is other active
snapshot tasks on the instance to which the volume is attached, please
try again later
    at
com.cloud.storage.snapshot.SnapshotManagerImpl.createSnapshot (SnapshotMa
nagerImpl.java:384)
    at
com.cloud.utils.component.ComponentLocator$InterceptorDispatcher.interce
pt (ComponentLocator.java:1128)
    at
com.cloud.storage.snapshot.SnapshotManagerImpl.createSnapshot (SnapshotMa
nagerImpl.java:118)
<snip>
```

Patience level over 9000!

Deployment of a VM initiated.

```
2012-08-31 11:31:59,772 DEBUG [cloud.async.AsyncJobManagerImpl]
(catalina-exec-3:null) submit async job-5461, details: AsyncJobVO
{id:5461, userId: 188, accountId: 35, sessionKey: null, instanceType:
VirtualMachine, instanceId: 4157, cmd:
com.cloud.api.commands.DeployVMCmd, cmdOriginator: null, cmdInfo:
{"id":"4157","templateId":"210","ctxUserId":"188","hypervisor":"VMWare",
"serviceOfferingId":"14","ctxAccountId":"35","ctxStartEventId":"22391","ap
iKey":"asdf","signature":"asdf","displayname":"TESTVM","zoneId":"4"},
cmdVersion: 0, callbackType: 0, callbackAddress: null, status: 0,
processStatus: 0, resultCode: 0, result: null, initMsid: 345052684411,
completeMsid: null, lastUpdated: null, lastPolled: null, created: null}
```

Template 210 starts being transferred to primary storage.

```
2012-08-31 11:32:10,144 DEBUG [agent.transport.Request] (Job-Executor-112:job-5461) Seq 16-1415446801: Sending { Cmd , MgmtId: 345052684411, via: 16, Ver: v1, Flags: 100111, [{"storage.PrimaryStorageDownloadCommand":{"localPath":"/mnt/5a3dad9f-4c1a-3304-99e7-4975a6943605","poolUuid":"a08b0cef-d377-3d84-82c1-bf04e40bd6e2","poolId":237,"secondaryStorageUrl":"nfs://10.255.104.3/NFS_FS1","primaryStorageUrl":"nfs://VMFS datastore: /cmsma-cs-dc002/010_0117_0019_SATA_R5_DATA_LUN/cmsma-cs-dc002/010_0117_0019_SATA_R5_DATA_LUN","url":"nfs://10.255.104.3/NFS_FS1/template/tmp1/2/210//1ae89570-60e5-3872-9ecb-60d90da295c3.ova","format":"OVA","accountId":2,"name":"210-2-ce858db7-4f87-39f8-bf3b-d46dc378f1","wait":10800}}] }
```

Reboot of virtual router initiated.

```
2012-08-31 12:13:06,333 DEBUG [cloud.async.AsyncJobManagerImpl]
(catalina-exec-14:null) submit async job-5473, details: AsyncJobVO
{id:5473, userId: 161, accountId: 2, sessionKey: null, instanceType:
DomainRouter, instanceId: 4054, cmd:
com.cloud.api.commands.RebootRouterCmd, cmdOriginator: null, cmdInfo:
{"response":"json","id":"4054","sessionkey":"84uOYXRynfqNDk7QTVYO4Nek238\
u003d","ctxUserId":"161","_":"1346411586256","ctxAccountId":"2","ctxStart
EventId":"22455"}, cmdVersion: 0, callbackType: 0, callbackAddress: null,
status: 0, processStatus: 0, resultCode: 0, result: null, initMsid:
345052684411, completeMsid: null, lastUpdated: null, lastPolled: null,
created: null}
```


But it has to wait for Seq 1415446801.

```
2012-08-31 12:13:06,377 DEBUG [agent.transport.Request] (Job-Executor-131:job-5473) Seq 16-1415446919: Waiting for Seq 1415446801 Scheduling: { Cmd , MgmtId: 345052684411, via: 16, Ver: v1, Flags: 100111, [{"StopCommand": {"isProxy":false,"privateRouterIpAddress":"10.255.105.3","vmName":"r-4054-VM","wait":0}}] }
```



Template 210 successfully transferred to primary storage.

```
2012-08-31 12:41:14,749 DEBUG [agent.transport.Request] (DirectAgent-238:null) Seq 16-1415446801: Processing: { Ans: , MgmtId: 345052684411, via: 16, Ver: v1, Flags: 110, [{"storage.PrimaryStorageDownloadAnswer":{"installPath":"d40cb5b0-14c9-3ca3-a19b-8d6bbea1aeb4"},"templateSize":0,"result":true,"wait":0}]} }
```

So the virtual router reboot can finally proceed.

```
2012-08-31 12:41:14,749 DEBUG [agent.transport.Request] (DirectAgent-238:null) Seq 16-1415446919: Executing: { Cmd , MgmtId: 345052684411, via: 16, Ver: v1, Flags: 100111, [{"StopCommand": {"isProxy":false,"privateRouterIpAddress":"10.255.105.3","vmName":"r-4054-VM","wait":0}}] }
```

Virtual router finally finishes rebooting (it took about 30 minutes).

```
2012-08-31 12:45:54,197 DEBUG [cloud.async.AsyncJobManagerImpl] (Job-Executor-131:job-5473) Complete async job-5473, jobStatus: 1, resultCode: 0, re...
```

Less patience :-)

destroyRouter received by the management server.

```
2012-06-13 09:05:36,321 DEBUG [cloud.vm.VirtualMachineManagerImpl] (Job-Executor-88:job-135158) Destroying vm VM[DomainRouter|r-9218-VM]
```

Host 57 instructed to destroy the volume.

```
2012-06-13 09:05:36,387 DEBUG [agent.transport.Request] (Job-Executor-88:job-135158) Seq 57-57802800: Sending { Cmd , MgmtId: 345050807280, via: 57, Ver: v1, Flags: 100111, [{"storage.DestroyCommand":{"vmName":"r-9218-VM", "volume":{"id":10062, "name":"ROOT-9218", "mountPoint":"/pools/HKPool/kvm-primary", "path":"/mnt/25a4ee3a-7463-3bca-9e0e-cb0418f91557/09284c44-a940-4ec8-bec4-a44bf63f3576", "size":2097152000, "type":"ROOT", "storagePoolType":"NetworkFilesystem", "storagePoolUuid":"25a4ee3a-7463-3bca-9e0e-cb0418f91557", "deviceId":0}, "wait":0}}] }
```

Completed 40 minutes later.

```
2012-06-13 09:44:20,863 DEBUG [agent.transport.Request] (Job-Executor-88:job-135158) Seq 57-57802800: Received: { Ans: , MgmtId: 345050807280, via: 57, Ver: v1, Flags: 110, { Answer } }
2012-06-13 09:44:20,863 DEBUG [cloud.vm.VirtualMachineManagerImpl] (Job-Executor-88:job-135158) Cleanup succeeded. Details Success
2012-06-13 09:44:20,883 DEBUG [cloud.storage.StorageManagerImpl] (Job-Executor-88:job-135158) Volume successfully expunged from 208
2012-06-13 09:44:20,883 DEBUG [cloud.vm.VirtualMachineManagerImpl] (Job-Executor-88:job-135158) Expunged VM[DomainRouter|r-9218-VM]
```

Check agent.log on host 57...

```
2012-06-13 09:00:43,501 INFO [cloud.agent.Agent] (Agent-Handler-1:null)
Lost connection to the server. Dealing with the remaining commands...
2012-06-13 09:00:48,502 INFO [cloud.agent.Agent] (Agent-Handler-1:null)
Reconnecting...
2012-06-13 09:00:48,520 INFO [utils.nio.NioClient] (Agent-Selector:null)
Connecting to 192.168.114.102:8250
2012-06-13 09:00:48,799 ERROR [utils.nio.NioConnection] (Agent-
Selector:null) Unable to connect to remote
...
2012-06-13 09:14:43,275 ERROR [utils.nio.NioConnection] (Agent-
Selector:null) Unable to connect to remote
2012-06-13 09:14:48,275 INFO [cloud.agent.Agent] (Agent-Handler-1:null)
Reconnecting...
2012-06-13 09:14:48,276 INFO [utils.nio.NioClient] (Agent-Selector:null)
Connecting to 192.168.114.102:8250
2012-06-13 09:14:50,936 INFO [utils.nio.NioClient] (Agent-Selector:null)
SSL: Handshake done
```

It did not make it to the host until 40 minutes later (also agent.log).

```
2012-06-13 21:44:20,660 DEBUG [cloud.agent.Agent] (agentRequest-Handler-4:null) Request:Seq 57-57802800: { Cmd , MgmtId: 345050807280, via: 57, Ver: v1, Flags: 100111, [{"storage.DestroyCommand":{"vmName":"r-9218-VM", "volume":{"id":10062, "name":"ROOT-9218", "mountPoint":"/pools/HKPool/kvm-primary", "path":"/mnt/25a4ee3a-7463-3bca-9e0e-cb0418f91557/09284c44-a940-4ec8-bec4-a44bf63f3576", "size":2097152000, "type":"ROOT", "storagePoolType":"Network Filesystem", "storagePoolUuid":"25a4ee3a-7463-3bca-9e0e-cb0418f91557", "deviceId":0}, "wait":0}}] }
```

It did succeed, though.

```
2012-06-13 21:44:20,672 DEBUG [cloud.agent.Agent] (agentRequest-Handler-4:null) Seq 57-57802800: { Ans: , MgmtId: 345050807280, via: 57, Ver: v1, Flags: 110, [{"Answer": {"result":true, "details":"Success", "wait":0}}] }
```

20 minutes after the first destroyRouter, the administrator hacked the database and ran destroyRouter again.

```
2012-06-13 09:26:27,038 DEBUG [cloud.vm.VirtualMachineManagerImpl]
(Job-Executor-100:job-135208) Destroying vm VM[DomainRouter|r-9218-VM]
```



It got stuck waiting for Seq 57802800 (remember, from job-135158).

```
2012-06-13 09:26:27,050 DEBUG [agent.transport.Request] (Job-Executor-100:job-135208) Seq 57-57802807: Waiting for Seq 57802800 Scheduling:
{ Cmd , MgmtId: 345050807280, via: 57, Ver: v1, Flags: 100111,
[{"storage.DestroyCommand":{"vmName":"r-9218-VM","volume":
{"id":10062,"name":"ROOT-9218","mountPoint":"/pools/HKPool/kvm-
primary","path":"/mnt/25a4ee3a-7463-3bca-9e0e-cb0418f91557/09284c44-
a940-4ec8-bec4-
a44bf63f3576","size":2097152000,"type":"ROOT","storagePoolType":"Network
Filesystem","storagePoolUuid":"25a4ee3a-7463-3bca-9e0e-
cb0418f91557","deviceId":0},"wait":0}}] }
```

Sequence for second destroyRouter finally unstuck after the host connectivity was restored and the previous sequence completed.

```
2012-06-13 09:44:29,004 DEBUG [agent.manager.AgentAttache]
(AgentManager-Handler-9:null) Seq 57-57802807: Sending now. is current
sequence.
```

It failed since the volume was long gone (seconds earlier).

```
2012-06-13 09:44:31,788 DEBUG [agent.transport.Request] (AgentManager-
Handler-16:null) Seq 57-57802807: Processing: { Ans: , MgmtId:
345050807280, via: 57, Ver: v1, Flags: 110, [{"Answer":
{"result":false,"details":"org.libvirt.LibvirtException: Storage volume
not found: no storage vol with matching key","wait":0}]} }
```

Log entry anomalies

- Lost time
 - No known cases of aliens abducting CloudStack servers
- Out of order
 - CloudStack does not normally travel backwards in time
- 0 byte management-server.log
 - lol no, that's not normal.

Nearby entries

- Usually not relevant
- Still can take a look anyway

HA triggered on a few randomly dispersed Vms immediately after restart CloudStack.

```
2013-02-07 00:56:09,999 INFO [cloud.ha.HighAvailabilityManagerImpl]
(main:null) Schedule vm for HA: VM[User|i-2-12423-VM]
```

No sign of problems that might cause HA. But check nearby entries that like even slightly related.

```
2013-02-07 00:56:09,985 INFO [cloud.vm.VirtualMachineManagerImpl]
(main:null) Handling unfinished work item:ItWork[7d8a11b4-3c72-476b-
9b79-d9ce4171e131-Starting-12423-Release]
```

Q&A

- Any questions?

