

SJSU CMPE 283 HW vCenter Server FALL 2016

Theme: Java-based vCenter server programming

Description

Please follow “CMPE vCenter Server Lab Rules” (see slide). Manually deploy VM from *instructor-provided* VM template w/ VMware tools under *your* own folder on CMPE vCenter.

Please create a Java-based command line program with **four command line arguments**: IP login password vmName. where IP is the IP address of the ESXi (in Env 1) or CMPE vCenter server (in Env 2), and login and password are the credentials in order to login to the ESXi or CMPE vCenter server.

- Step 1: Take (before) screen shots of VM’s summary (from VI or Web client) which includes managing host
- Step 2: invoke your program which performs
 - Enumerate *all* hosts. Do the following for *each* host:
 - Print out host name and product full name to stdout
 - Enumerate *all* VMs (independent of step 2) and narrow down (filter) to the specified vmName:
 - For the specified vmName, print out VM name, guest OS full name, guest state, power state, and managing ESXi host to stdout
 - For the specified vmName, **programmatically** perform a snapshot and wait until the task completes. Print task result to stdout (for unsuccessful one, include localized error message).
 - For the specified vmName, **programmatically** full clone to a new VM (name appended with “-clone”, under the same folder/resource pool/datastore, without powered on) and wait until the task completes. Print task result to stdout (for unsuccessful one, include localized error message).
 - If number of hosts > 1, **programmatically** migrate the specified vmName to another ESXi host (with the same power state, under the same folder/resource pool/datastore) and wait until the task completes. Print task result to stdout (for unsuccessful one, include localized error message).
 - **Programmatically** get *recent tasks* for the specified vmName (*not* limited to the most recent task you just performed). For each task, print out the name of the operation, task start time, task end time, task result to stdout (for unsuccessful one, include localized error message).
- Step 3: Take the following (after) screen shots for vmName (from VI or Web client):
 - Stdout of program execution
 - VM’s summary which includes managing host
 - VM’s snapshot manager: snapshot (w/ or w/o creation time)
 - VM’s tasks: name, target, status, start time, end time
 - VM’s events: description, datetime, task, target

Run your code on Env 1 and then Env 2

- Env 1: On your standalone ESXi
 - Manually create a VM named as <YourName>-<os><version>-<L3SID>, e.g., demo-ubuntu1210-123
 - Make sure the VM is **powered off**.
 - Specify the VM name as parameter to run your code (perform step 1 to 3)
 - Manually clean up env by removing the -clone VM
 - Repeat the above except VM is **powered on**
- Env 2: On CMPE vCenter

- Manually create your own vm folder named as <YourName>-<L3SID>
- Under your own folder, manually deploy VM from *instructor-provided* VM template w/ VMware tools under *your own folder*; the VM name is <YourName>-<os><version>-<L3SID>, e.g., john-ubuntu1210-123
- Make sure the VM is powered off and assume the VM is managed by host1.
- Specify the VM name as parameter to run your code (perform step 1 to 3)
- Manually clean up your env by removing the –clone VM
- Repeat the above in Env 2 except VM is powered on and is managed by host2 (different from host1).
- Remove *your* VM and *your* folder (VI client instead of web client)

Additional requirements

- Each invocation the program always prints out “CMPE283 HW2 from <FirstName> <LastName>” only once to stdout. Screenshot of stdout **must** include this message.

Submission

Submit the followings as separate files to Canvas

- CMPE283_HW2_<YourName>_<L3SID> (.pdf, .doc, or .docx) which includes separate sets of screen shots from Step 1 & 3 (one set per program execution)

NOTE:

- You receive no credit if your report is not .pdf, .doc, or .docx.
- If a screenshot is unreadable, it will be treated as if you did not turn in that screenshot.
- You will not receive credit if you do not follow requirements (including naming conventions).
- You will not receive credit if the screen shot of stdout from program execution does not include the message “CMPE283 HW2 from <FirstName> <LastName>”.

- Java source code (.java)

Note:

- You will not receive credit if your Java code does not print out “CMPE283 HW2 from <FirstName> <LastName>”.

The ISA and/or instructor leave feedback to your homework as comments and/or in Crocodoc of your submission. To access Crocodoc, click “view feedback” button. For details, see the following URL:

<http://guides.instructure.com/m/4212/l/106690-how-do-i-use-the-submission-details-page-for-an-assignment>

Reference: vijaja\com\vmware\vim25\mo\samples

Extra Credit 1 (up to 10 pts): Demonstrate **no service disruption** with vMotion in Env 2. Include your rationale and corresponding screenshots.

Extra Credit 2 (up to 30 pts): navigate the inventory tree

In addition to the original program, you have a 2nd Java-based command line program with four command line arguments: IP login password vmFolderPath.

- For Env 1 and Env2, respectively, perform similar operations in all steps except
 - Enumerate all hosts under Datacenter folder (front portion of vmFolderPath)
 - Manually deploy two VM’s based on instructor-provided template with proper naming convention under your own folder
 - VM1: powered on, managed by host1

- VM2: powered off, managed by host2 (different from host1)
 - Enumerate all VMs under vmFolderPath, e.g., CMPE LABS/CMPE283 SEC3/workspace/john-123, perform specified operations for each VM under vmFolderPath.
 - Before/after screenshots for both VMs (step 1 and 3)
- vmFolderPath format
 - ESXi: /
 - vCenter: Datacenter/f1/f2/.../fn

vmFolderPath	Datacenter folder	VM folder
CMPE LABS	CMPE LABS	CMPE LABS/group-v??
CMPE LABS/foo	CMPE LABS	CMPE LABS/group-v??/foo
CMPE LABS/foo/bar	CMPE LABS	CMPE LABS/group-v??/foo/bar

Notes for “VM folder” column:

- Notice the *hidden* vm folder under data center on vCenter
- *group-v??* is the value of property vmFolder, refer to managed object browser

Note: your Java code for extra credit 2 must print out “CMPE283 HW2 Extra Credit 2 from <FirstName> <LastName>” only once to stdout. The screen shot of stdout from program execution *must* include this message.

Sample output (ESXi, extra credit 2):

- command line arguments: https://a.b.c.d/sdk login password /

```
args[3] = /
Datacenter folder = ha-folder-root
vm folder = ha-folder-root
host[0]:
Name = unknown000C29460F38.localdomain
ProductFullName = VMware ESXi 5.1.0 build-1483097

VM[0]:
Name = xp_pro_32
GuestOS = Microsoft Windows XP Professional (32-bit)
Guest state = notRunning
Power state = poweredOff
Host = unknown000C29460F38.localdomain
Snapshot: status = success
Clone: status = error
Migration skipped: only one ESXi host
task: target=xp_pro_32, op=CreateSnapshot_Task, startTime=01/11/2015 15:58:46, endTime=01/11/2015 15:58:47,
status = completed
task: target=xp_pro_32, op=CloneVM_Task, startTime=01/11/2015 15:58:49, endTime=01/11/2015 15:58:49, status =
The operation is not supported on the object.

VM[1]:
Name = ubuntu_12.10_32
GuestOS = Ubuntu Linux (32-bit)
Guest state = running
Power state = poweredOn
Host = unknown000C29460F38.localdomain
Snapshot: status = success
Clone: status = error
Migration skipped: only one ESXi host
task: target=ubuntu_12.10_32, op=CreateSnapshot_Task, startTime=01/11/2015 15:58:50, endTime=01/11/2015
15:59:58, status = completed
task: target=ubuntu_12.10_32, op=CloneVM_Task, startTime=01/11/2015 15:59:59, endTime=01/11/2015 15:59:59,
status = The operation is not supported on the object.
```

Sample output (vCenter, extra credit 2):

- command line arguments: https://a.b.c.d/sdk login password “CMPE LABS/CMPE283 SEC3/workspace/john-123”

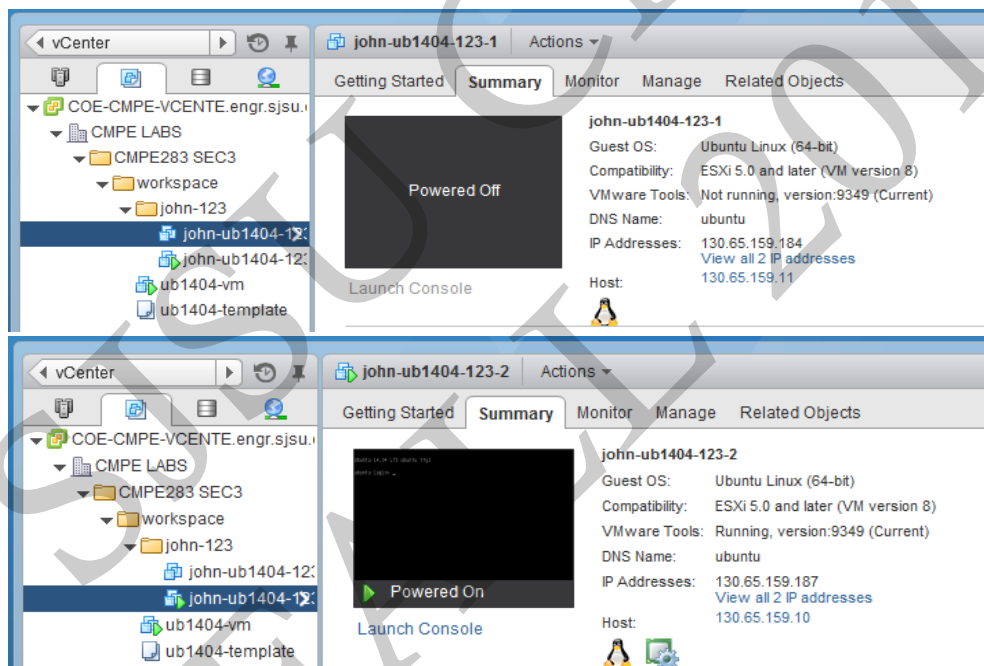
```
args[3] = CMPE LABS/CMPE283 SEC3/workspace/john-123
Datacenter folder =CMPE LABS
vm folder = john-123
```

```
host[0]:
Name = 130.65.159.10
ProductFullName = VMware ESXi 5.5.0 build-1623387
host[1]:
Name = 130.65.159.11
ProductFullName = VMware ESXi 5.5.0 build-1623387
```

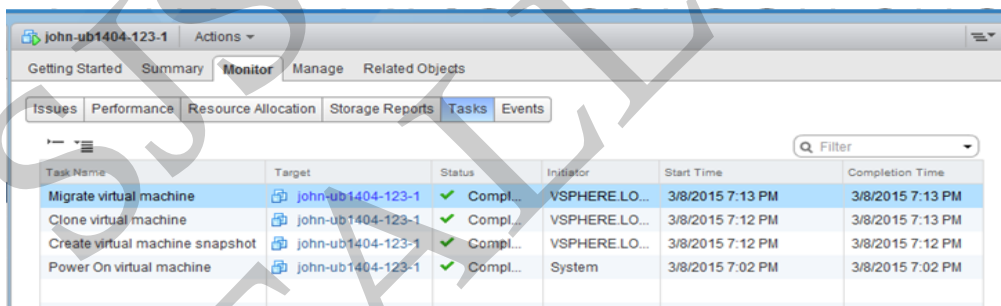
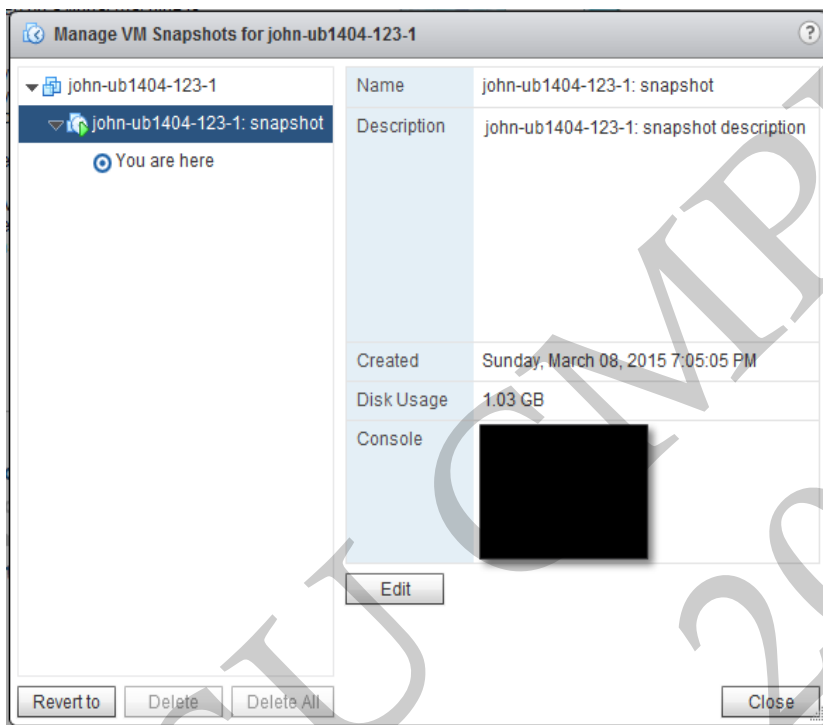
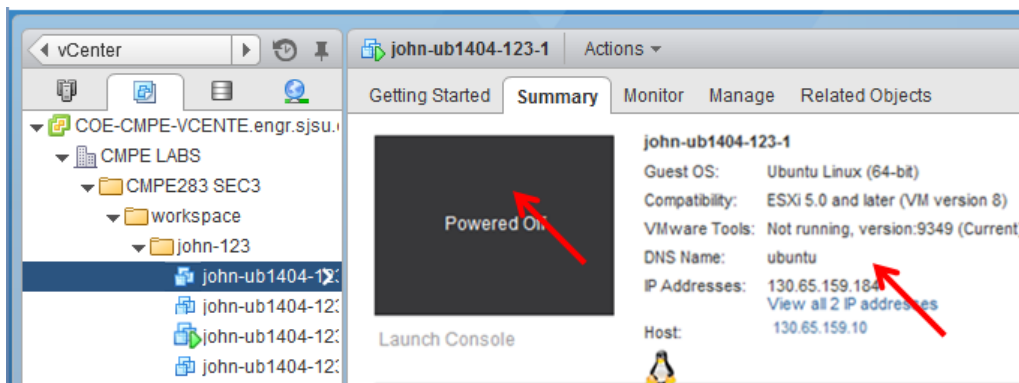
```
VM[0]:
Name = john-ub1404-123-1
GuestOS = Ubuntu Linux (64-bit)
Guest state = running
Power state = poweredOn
Host = 130.65.159.11
Snapshot: status = success
Clone: status = success
Migrate to 130.65.159.10: status = success
task: target=john-ub1404-123-1, op=CreateSnapshot_Task, startTime=03/08/2015 19:12:25,
endTime=03/08/2015 19:12:55, status = completed
task: target=john-ub1404-123-1, op=CloneVM_Task, startTime=03/08/2015 19:12:57,
endTime=03/08/2015 19:13:30, status = completed
task: target=john-ub1404-123-1, op=MigrateVM_Task, startTime=03/08/2015 19:13:32,
endTime=03/08/2015 19:13:47, status = completed
```

```
VM[1]:
Name = john-ub1404-123-2
GuestOS = Ubuntu Linux (64-bit)
Guest state = notRunning
Power state = poweredOff
Host = 130.65.159.10
Snapshot: status = success
Clone: status = success
Migrate to 130.65.159.11: status = success
task: target=john-ub1404-123-2, op=CreateSnapshot_Task, startTime=03/08/2015 19:13:49,
endTime=03/08/2015 19:13:51, status = completed
task: target=john-ub1404-123-2, op=CloneVM_Task, startTime=03/08/2015 19:13:52,
endTime=03/08/2015 19:14:17, status = completed
task: target=john-ub1404-123-2, op=MigrateVM_Task, startTime=03/08/2015 19:14:19,
endTime=03/08/2015 19:14:22, status = completed
```

Env2: before screenshots



Env2: After screenshots for VM1



Filter				
Description	Type	Date Time	Task	Target
Resource allocation changed	Information	3/8/2015 7:16 PM		john-ub1404-123-1
Alarm 'Virtual machine mem...	Information	3/8/2015 7:14 PM		john-ub1404-123-1
Alarm 'Virtual machine CPU ...	Information	3/8/2015 7:14 PM		john-ub1404-123-1
Migration from host 130.65.1...	Information	3/8/2015 7:13 PM		john-ub1404-123-1
Resource allocation changed	Information	3/8/2015 7:13 PM		john-ub1404-123-1
Resource allocation changed	Information	3/8/2015 7:13 PM		john-ub1404-123-1
Alarm 'Virtual machine mem...	Information	3/8/2015 7:13 PM		john-ub1404-123-1
Alarm 'Virtual machine CPU ...	Information	3/8/2015 7:13 PM		john-ub1404-123-1
Migrating off host 130.65.15...	Information	3/8/2015 7:13 PM		john-ub1404-123-1
Migrating VM from 130.65.15...	Information	3/8/2015 7:13 PM		john-ub1404-123-1
Task: Migrate virtual machine	Information	3/8/2015 7:13 PM	Migrate virtual machine	john-ub1404-123-1
Virtual machine disks conso...	Information	3/8/2015 7:13 PM		john-ub1404-123-1
Being cloned to john-ub140...	Information	3/8/2015 7:13 PM		john-ub1404-123-1
Migration from 130.65.159.1...	Warning	3/8/2015 7:13 PM		john-ub1404-123-1
Task: Clone virtual machine	Information	3/8/2015 7:12 PM	Clone virtual machine	john-ub1404-123-1
Task: Create virtual machine...	Information	3/8/2015 7:12 PM	Create virtual machin...	john-ub1404-123-1

Env2: After screenshots for VM2

The screenshot shows the vCenter interface for VM **john-ub1404-123-2**. The VM is in a **Powered On** state. The summary tab is selected, showing details such as Guest OS (Ubuntu Linux (64-bit)), Compatibility (ESXi 5.0 and later (VM version 8)), and IP Addresses (130.65.159.187, 130.65.159.111). A red arrow points to the 'Powered On' status, and another red arrow points to the IP address 130.65.159.111.

The screenshot shows the 'Manage VM Snapshots for john-ub1404-123-2' dialog box. It displays a snapshot named **john-ub1404-123-2: snapshot** with a description **john-ub1404-123-2: snapshot description**. The snapshot was created on **Sunday, March 08, 2015 7:14:21 PM** and has a disk usage of **798.03 MB**. A console screenshot is also visible. The dialog includes buttons for **Revert to**, **Delete**, **Delete All**, and **Close**.

john-ub1404-123-2Actions

Getting StartedSummaryMonitorManageRelated Objects

IssuesPerformanceResource AllocationStorage ReportsTasksEvents

Filter

Task Name	Target	Status	Initiator	Start Time	Completion Time
Migrate virtual machine	john-ub1404-123-2	✓ Compl...	VSPHERE.LO...	3/8/2015 7:14 PM	3/8/2015 7:14 PM
Clone virtual machine	john-ub1404-123-2	✓ Compl...	VSPHERE.LO...	3/8/2015 7:13 PM	3/8/2015 7:14 PM
Create virtual machine snapshot	john-ub1404-123-2	✓ Compl...	VSPHERE.LO...	3/8/2015 7:13 PM	3/8/2015 7:13 PM

IssuesPerformanceResource AllocationStorage ReportsTasksEvents

Filter					
Description	Type	Date Time	Task	Target	
Completed the relocation of ...	Information	3/8/2015 7:14 PM		john-ub1404-123-2	
Relocating from 130.65.159...	Information	3/8/2015 7:14 PM		john-ub1404-123-2	
Task: Migrate virtual machine	Information	3/8/2015 7:14 PM	Migrate virtual machine	john-ub1404-123-2	
Being cloned to john-ub140...	Information	3/8/2015 7:13 PM		john-ub1404-123-2	
Migration from 130.65.159.1...	Warning	3/8/2015 7:13 PM		john-ub1404-123-2	
Task: Clone virtual machine	Information	3/8/2015 7:13 PM	Clone virtual machine	john-ub1404-123-2	
Task: Create virtual machine...	Information	3/8/2015 7:13 PM	Create virtual machin...	john-ub1404-123-2	