

# Lctree



## Linked Clone Tree Visualizer for vCloud Director

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## 1 Introduction

Lctree is a tool designed for the visualization of linked clone VM trees created by VMware vCloud Director. Linked clone is a feature available in vSphere that creates a clone of a VM from a snapshot point. The new VM's disks are not full copies of the source disks, but instead, are delta disks which point back to the snapshot's disks. This feature is widely used in vCloud Director.

## 2 Requirements

- Java Runtime Environment 6 (<http://www.oracle.com/technetwork/java/javase/downloads/jre-6u29-download-513650.html>)
- vCloud Director (vCD) 1.5 or 5.1

## 3 Features

- Tree generation is fast compared to solutions using data fetched from vCenter/ESX server
- Hierarchical tree view:

vCD node

vCenter-1

Datastore-1

Linked Clone Tree-1

Linked Clone Tree-2

Datastore-2

Linked Clone Tree-3

## Linked Clone Tree-4

## vCenter-2

- Node properties & separate disk chain view
- Refresh & Search option
- Traditional tree view in separate tabs
- Relocate order of virtual machines in a tree

## 4 Feedback

Send in your feedback/comments/bugs to:

- Vipin Balachandran (mailto:vbala@vmware.com)
- Sandeep P S (mailto:ssrinivas@vmware.com)

## 5 User Guide

### 5.1 Running lctree

- Run the following command from the folder containing *lctree.jar*:

```
java -jar lctree.jar [path-to-config-file]
```

- If *path-to-config-file* is omitted, the program will search for the config file (*lctree.ini*) in user's home directory
- If the config file cannot be found, the user will be prompted to enter the configuration details (see below).

### 5.2 Configuring lctree

- Running the program for the first time will display the following configuration dialog:

- Enter the vCD database connection parameters
- If *Load tree on start up* is unchecked, linked clone tree details are collected only on demand
- Click *Save*; the configuration file (*lctree.ini*) will be saved in user's home directory (for e.g., %USERPROFILE% in Windows 7 & Windows XP)

Notes:

- The program has to be restarted after saving the configuration.

### 5.3 Icons

Expanding a vCenter node lists all the datastores managed by that vCenter.

- Left click a datastore node to view its details:
  - The node info tab lists the details of all the disk descriptor files in the datastore and various datastore properties.

[illegible]

Expanding a datastore node lists all the linked trees created by vCloud director in that datastore.

- Left click a VM node to view its details:
  - The node info tab lists the details of all the disk descriptor files corresponding to the virtual machine and various virtual machine properties.
  - The disk tree tab displays the various links in the virtual machine's disks.

The screenshot shows the Lctree application interface. On the left is a tree view of the vCloud Director hierarchy. The main pane is divided into two tabs: 'Node info' and 'Disk tree'. The 'Node info' tab is active, displaying a table of disk descriptors and a list of node properties.

Descriptor	Size (MB)	Parent Descriptor	# VMs	# Powered VMs
[nfs-datastore] vm1-b ... 0.0	0.0	[nfs-datastore] vm1-b ... 1	0	0
[nfs-datastore] vm1-b ... 0.0	0.0	[nfs-datastore] vm1-b ... 1	0	0

Below the table, the 'Node properties' section lists various attributes for the selected node (vm1-b).

Name	vm1-b (02ec9d49-6ad7-4f60-93b4-1521c5638807)
Folder	[nfs-datastore] vm1-b (02ec9d49-6ad7-4f60-93b4-1521c5638807)
VM node	[nfs-datastore] vm1-b (02ec9d49-6ad7-4f60-93b4-1521c5638807)
Powered on	<input checked="" type="checkbox"/>
Max disk chain length	7
Node fanout	0
Provisioned disk size(MB)	0.0
Actual disk size(MB)	0.0
VM name	vm1-b
moref	vm-93
uuid	4024f6d-14df-c0b3-ca9b-0f56f1d0fa88
vCD Entity Ref ID	02ec9d49-6ad7-4f60-93b4-1521c5638807
VM path name	[nfs-datastore] vm1-b (02ec9d49-6ad7-4f60-93b4-1521c5638807)
# CPUs	1
Memory (MB)	512
Guest OS name	
Template	
vApp	vm-7

At the bottom of the 'Node info' tab, there is a log of recent actions:

```

[Thu Nov 17 17:52:58 IST 2011] Reading child node details of node vc-1 (10.147.27.112)
[Thu Nov 17 17:53:00 IST 2011] Reading child node details of node nfs-datastore
[Thu Nov 17 18:00:15 IST 2011] Loading tree view for [vm1]
[Thu Nov 17 18:00:19 IST 2011] Tree view loaded for [vm1]
[Thu Nov 17 18:00:22 IST 2011] Loading tree view for [vm1 (8213104f-312a-4306-a9db-92b225f9a6b3)]
[Thu Nov 17 18:00:23 IST 2011] Tree view loaded for [vm1 (8213104f-312a-4306-a9db-92b225f9a6b3)]
  
```

The 'Disk tree' tab on the right shows a hierarchical view of the disks for the selected VM, including 'Disk 1' and 'Disk 2' with their respective descriptors and sizes.

## 5.6 Node popup menu options

The screenshot shows the Lctree application with a right-click context menu open over a VM node in the tree view. The menu options are:

- Refresh
- Relocate order..
- Reload disk size
- Traditional tree view

The tree view on the left shows the hierarchy of the vCloud Director, including the 'datastore-2' and 'nfs-datastore' nodes, and the 'vm1' node which is the target of the right-click.

▪ Refresh

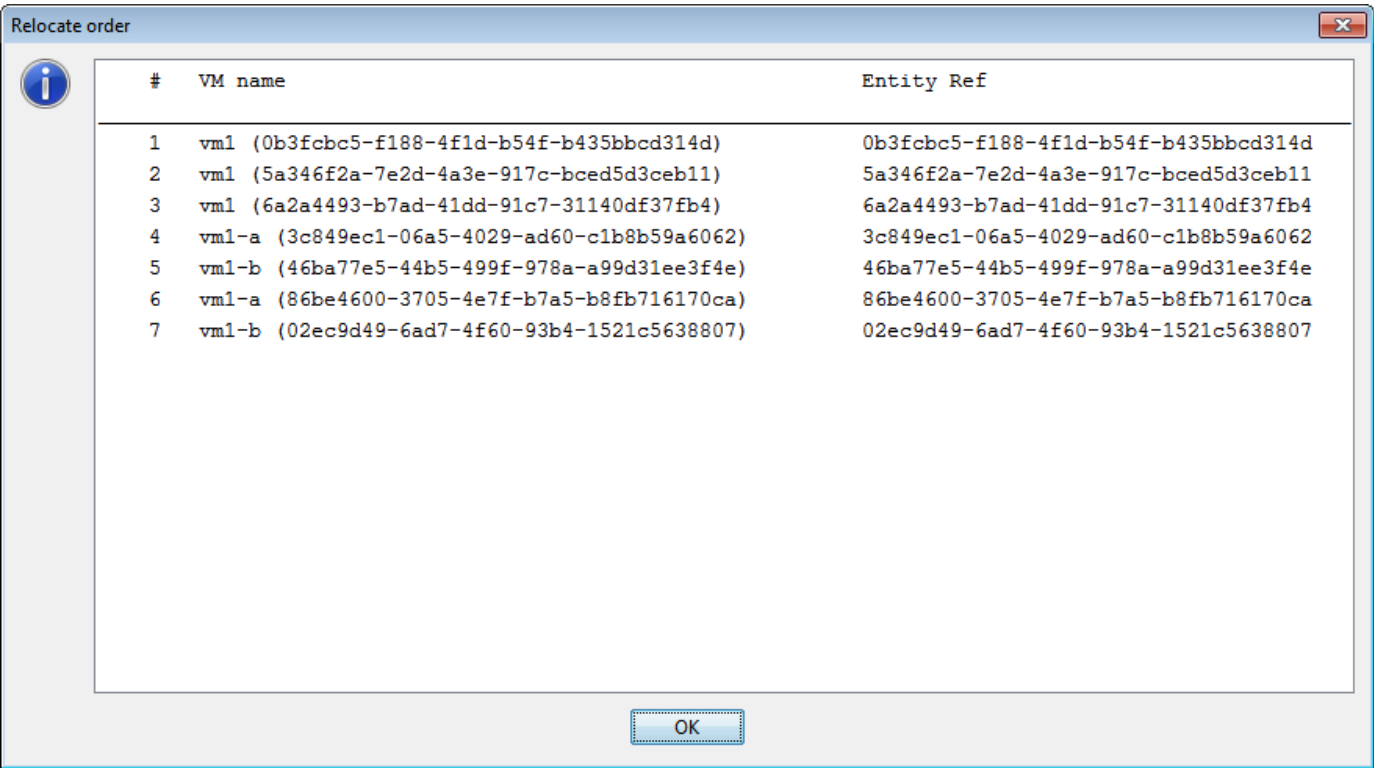
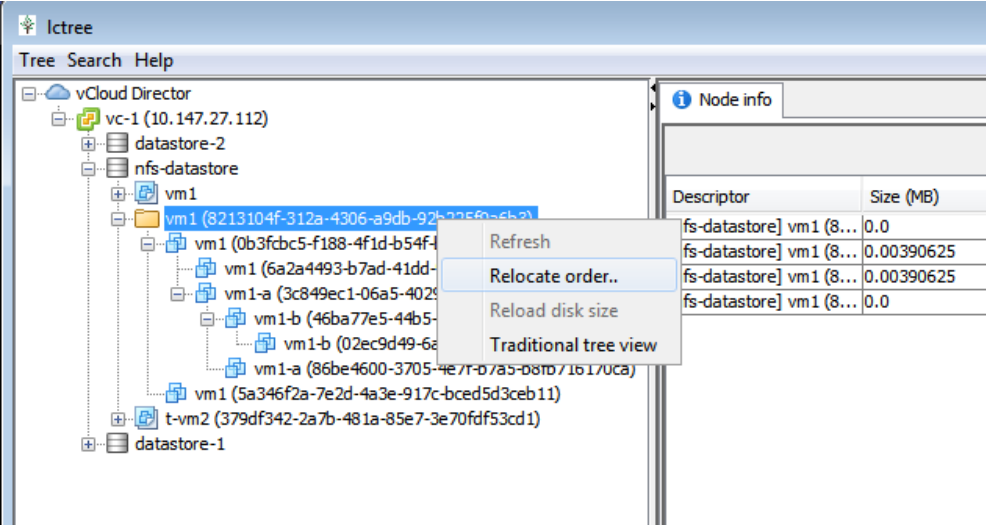
Reloads the sub-tree rooted at the selected node

▪ Reload disk size

This option can be used to populate the disk size data.  
*Note: This option requires a direct connection to vCenter server and will be prompted for vCenter admin credentials*

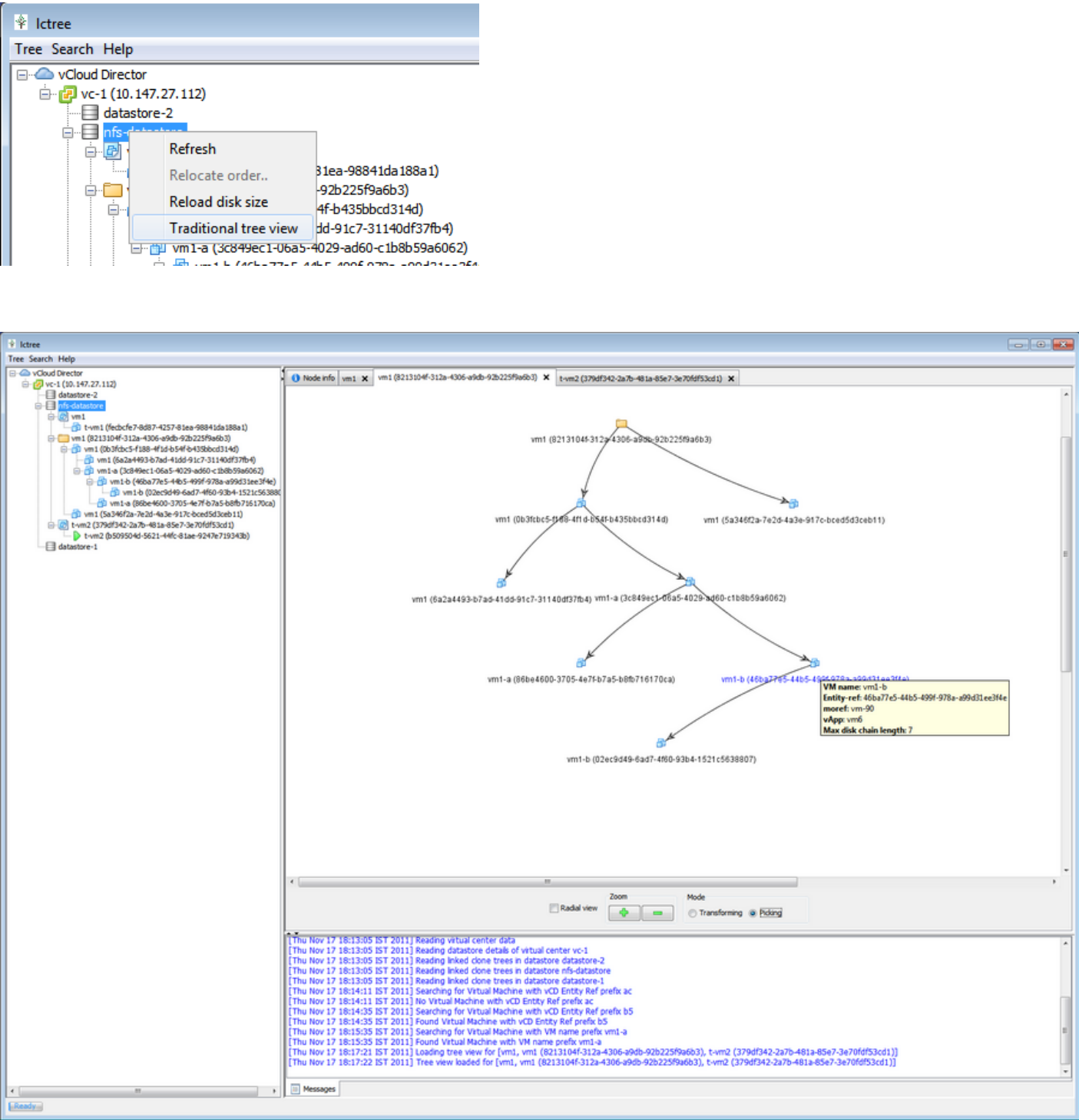
▪ Relocate order

To display the order in which the VMs in the datastore has to be relocated.

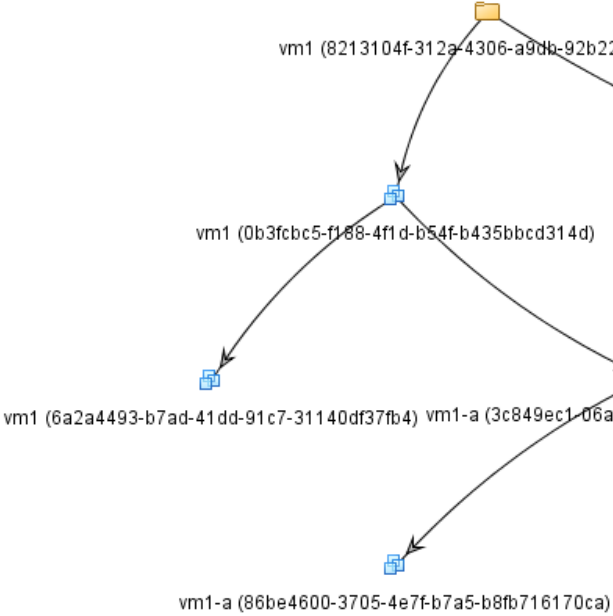
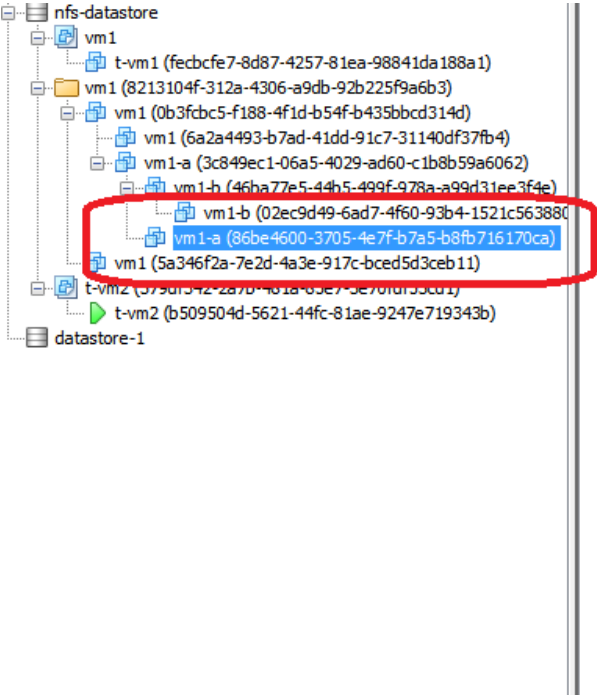
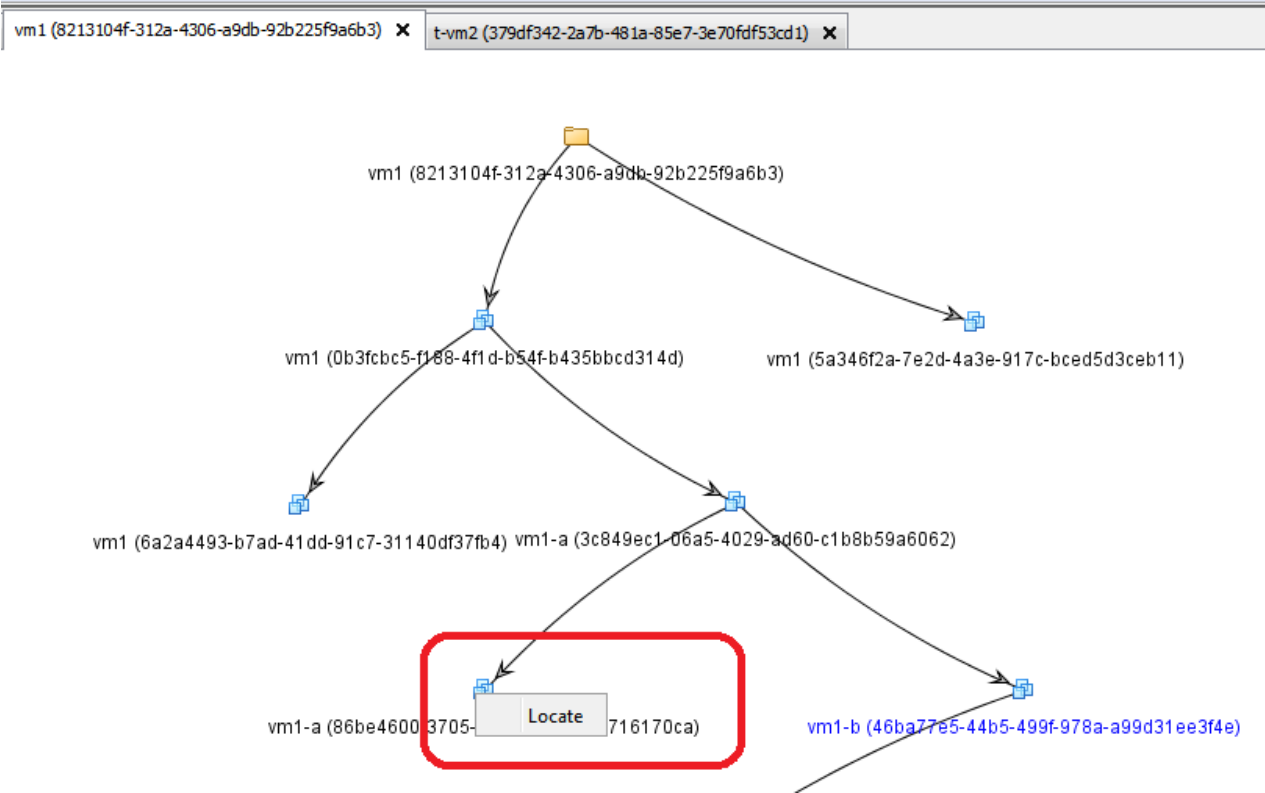


■ Traditional tree view

Choosing this option will open a tab (one for each tree rooted at the selected node) showing the traditional tree view.



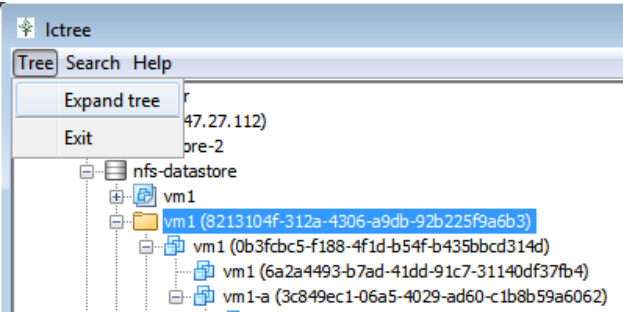
In the traditional view, right click a VM node and select "Locate" to locate that node in the main tree view.



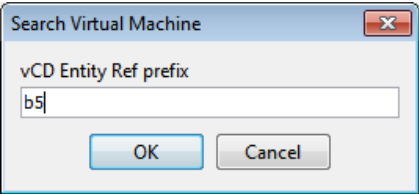
# 6 Other options

- Expand tree

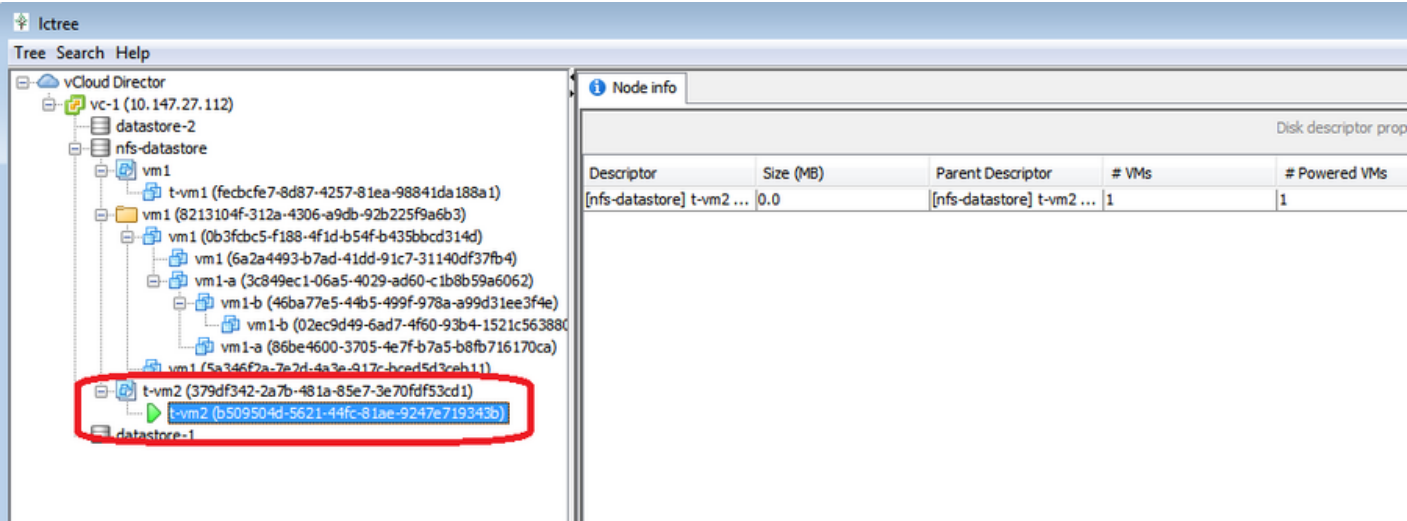
This reloads the entire tree and expand all the nodes.



▪ Search VM by vCD entity-ref prefix



If the node is found, it is selected automatically.





Node properties

Name	t-vm2 (b509504d-5621-44fc-81ae-9247e719343b)
Folder	[nfs-datastore] t-vm2 (b509504d-5621-44fc-81ae-9247e7193...
VM node	<input checked="" type="checkbox"/>
Powered on	<input checked="" type="checkbox"/>
Max disk chain length	2
Node fanout	0
Provisioned disk size(MB)	0.0
Actual disk size(MB)	0.0
VM name	t-vm2
moref	vm-86
uuid	42245796-0361-b0f7-aa0e-208214e83259
vCD Entity Ref ID	b509504d-5621-44fc-81ae-9247e719343b
VM path name	[nfs-datastore] t-vm2 (b509504d-5621-44fc-81ae-9247e7193...
# CPUs	1
Memory (MB)	512
Guest OS name	
Template	<input type="checkbox"/>
vApp	wk-2

Disk tree

[Thu Nov 17 18:00:23 IST 2011] Tree view loaded for [vm1 (8213104f-312a-4306-a9db-92b225f9a6b3)]

[Thu Nov 17 18:05:04 IST 2011] Reloading size of all disk files at node nfs-datastore

[Thu Nov 17 18:05:26 IST 2011] Computing relocate order for node vm1 (8213104f-312a-4306-a9db-92b225f9a6b3)

[Thu Nov 17 18:10:37 IST 2011] Computing relocate order for node vm1 (8213104f-312a-4306-a9db-92b225f9a6b3)

[Thu Nov 17 18:13:05 IST 2011] Reading virtual center data

[Thu Nov 17 18:13:05 IST 2011] Reading datastore details of virtual center vc-1

[Thu Nov 17 18:13:05 IST 2011] Reading linked clone trees in datastore datastore-2

[Thu Nov 17 18:13:05 IST 2011] Reading linked clone trees in datastore nfs-datastore

[Thu Nov 17 18:13:05 IST 2011] Reading linked clone trees in datastore datastore-1

[Thu Nov 17 18:14:11 IST 2011] Searching for Virtual Machine with vCD Entity Ref prefix ac

[Thu Nov 17 18:14:11 IST 2011] No Virtual Machine with vCD Entity Ref prefix ac

[Thu Nov 17 18:14:35 IST 2011] Searching for Virtual Machine with vCD Entity Ref prefix b5

[Thu Nov 17 18:14:35 IST 2011] Found Virtual Machine with vCD Entity Ref prefix b5

Messages

▪ Search VM by name

Search Virtual Machine

VM name prefix

vm1-a

OK

Cancel