Installation of VMware vSphere: ICM v6.7 virtual pods as described in this guide requires that your NETLAB+ VE system is equipped with software version 18.0.0 or later.
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1 Introduction

This document provides detailed guidance on performing the installation and configuration of the VMware vSphere: ICM v6.7 pod on the NETLAB+ VE system.

1.1 Introducing the VMware vSphere: ICM v6.7 Pod

The *VMware vSphere: ICM v6.7* pod is a 100% virtual machine pod consisting of 5 virtual machines. Linked together through virtual networking, these 5 virtual machines provide the environment for a student or a team to perform the *VMware vSphere: ICM v6.7* labs.
2 Planning

This guide provides specific information pertinent to delivering the VMware vSphere ICM v6.7 pod. The NETLAB+ Remote PC Guide Series provides the prerequisite guidance for setting up your VMware infrastructure, including:

- An introduction to virtualization using NETLAB+.
- Detailed setup instructions for standing up VMware vCenter and VMware ESXi.
- Virtual machine and virtual pod management concepts using NETLAB+.

This document assumes that you have set up virtual machine infrastructure in accordance with the NETLAB+ Remote PC Guide Series. The planning information below refers to specific sections in the Remote PC Guide when applicable.

2.1 Pod Creation Workflow

The following list is an overview of the pod setup process.

1. Obtain the master virtual machine images required for the master pod.
2. Deploy the master virtual machine images to your VMware vCenter Appliance.
   a. Deploy virtual machines using Thin Provisioning to reduce storage consumption.
   b. Make necessary adjustments to each virtual machine in the environment.
      i. Insert manual MAC addresses.
      ii. Change the default network to SAFETY NET.
      iii. Any other configuration changes mentioned in this guide.
3. Import the deployed virtual machines to the NETLAB+ Virtual Machine Inventory.
4. Activate or license the required software on each virtual machine when prompted.
5. Take a snapshot of each virtual machine in the master pod labeled GOLDEN_MASTER after all configurations and licensing have taken effect. The GOLDEN_MASTER snapshot is used to clone virtual machine images for the user pods.
6. Use the NETLAB+ Pod Cloning feature to create student pods from the master pod.
7. If multiple hosts are used in the NETLAB+ environment, make a Full Clone of the master pod on the initial host (Host A) to the subsequent host (Host B) and so on using the NETLAB+ Pod Cloning feature.
2.2 Pod Resource Requirements

The VMware vSphere: ICM v6.7 course will consume 94.4 GB of storage per each master pod instance.

The following table provides details of the storage requirements for each of the virtual machines in the pod.

<table>
<thead>
<tr>
<th>Virtual Machine</th>
<th>OVF/OVA</th>
<th>Initial Master Pod (Thin Provisioning)</th>
</tr>
</thead>
<tbody>
<tr>
<td>sa-aio</td>
<td>21.6</td>
<td>45.2</td>
</tr>
<tr>
<td>sa-esxi-01</td>
<td>7.5</td>
<td>14.8</td>
</tr>
<tr>
<td>sa-esxi-02</td>
<td>2.6</td>
<td>5.4</td>
</tr>
<tr>
<td>sa-student</td>
<td>7.9</td>
<td>12.9</td>
</tr>
<tr>
<td>sa-vcsa</td>
<td>6.9</td>
<td>16.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>46.5 GB</strong></td>
<td><strong>94.4 GB</strong></td>
</tr>
</tbody>
</table>

2.3 ESXi Host Server Requirements

Before you try to deploy the VMware vSphere ICM 6.7 pod, you'll need to check the VMware Compatibility List to verify that your CPU is compatible to support vSphere 6.7 software. Reading VMware’s official release notes, notice that VMware has dropped support for many legacy CPUs.

Please refer to the NDG website for specific ESXi host requirements to support virtual machine delivery: [http://www.netdevgroup.com/content/vmita/requirements/](http://www.netdevgroup.com/content/vmita/requirements/)

The deployment of the VMware vSphere VMs from the VMware vSphere: ICM v6.7 pod requires a VMware vSphere Version of 5.1 for the infrastructure at minimum due to the Hardware Version of select VMware vSphere VMs (version 9) in the pod.

The number of active pods that can be used simultaneously depends on the NETLAB+ product edition, appliance version and the number of VMware ESXi host servers meeting the hardware requirements specifications.

For current ESXi server requirements and active pod count, refer to the following URL:
[http://www.netdevgroup.com/support/remote_pc.html#vm_host_server_specifications](http://www.netdevgroup.com/support/remote_pc.html#vm_host_server_specifications)
2.4 NETLAB+ Requirements

Installation of VMware vSphere: ICM v6.7 pods, as described in this guide, requires that your NETLAB+ system is equipped with NETLAB+ VE version 17.3.15 or later.

Previous versions of NETLAB+ do not support requirements for the VMware vSphere: ICM v6.7 course on the physical host servers.

Please refer to the NETLAB+ Remote PC Guide Series.

2.5 Software Requirements

For the purpose of software licensing, each virtual machine is treated as an individual machine, PC or server. Please refer to the specific vendor license agreements (and educational discount programs, if applicable) to determine licensing requirements for your virtual machines’ software, operating system, and applications.

The minimum virtual infrastructure software required for standing up this pod is in the following table.

<table>
<thead>
<tr>
<th>Virtual Infrastructure Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software</td>
</tr>
<tr>
<td>vSphere ESXi</td>
</tr>
<tr>
<td>vCenter Server</td>
</tr>
</tbody>
</table>

2.6 Networking Requirements

To accommodate the movement of large VMs, OVF/OVAs, and ISO disk images from one host to another, Gigabit Ethernet or better connectivity is recommended to interconnect your NETLAB+, vCenter Server system and ESXi host systems.

The two standard networking models recommended to interconnect your servers are described in detail in the Networking Models section of the Remote PC Guide Series, Volume 1 - Introduction and Planning.
3 Obtaining Software and Licenses

3.1 Downloading OVF Files

The virtual machines are made available as *Open Virtualization Format (OVF)* or *Open Virtualization Archive (OVA)* files. These files are available for download from CSSIA.

To request access to the preconfigured virtual machine templates from CSSIA:

1. Go to the CSSIA Resources page: [http://www.cssia.org/cssia-resources.cfm](http://www.cssia.org/cssia-resources.cfm).
2. Select VM Image Sharing Agreement – Image Sharing Agreement.
3. Select VM Image Sharing Agreement to open the request form.
4. Complete and submit your access request by following the instructions on the request form.
5. CSSIA will email a link, along with a username and password to access the download server. Access to the download server is provided only to customers who are current with their NETLAB+ support contract and are participants in the appropriate partner programs (i.e., Cisco Networking Academy, VMware IT Academy, Red Hat Academy, Palo Alto Academy, and/or EMC Academic Alliance).
6. Once access to the download server has been established, the virtual machines can be deployed directly to the vCenter Server by clicking on File > Deploy OVF Template in the client window and copying the link into the location field.
7. The deployment will start after the username and password are entered.
8. Each virtual machine is deployed individually.

3.2 Obtaining Software Licenses

Licensing considerations will vary, depending on your school's participation in the *VMware IT Academy Program (VITA)* program and/or the *VMware Academic Subscription (VMAS)*. Guidance on navigating licensing is available on the [VMware Product Licensing VMA vs. VITA chart](#).

Based on the deployment of the pod, administrators may choose to update the licenses on their already deployed master pods or they may choose to download updated OVAs from [CSSIA.org](http://www.cssia.org) which will already include updated licensed virtual machines for the next licensing renewal cycle.

1. Follow the link provided to you by VMware when you registered in the VMware Academic Subscription. This will take you to the academic software store.
2. Sign in with your registered login.
3. Click on Faculty/Staff at the top followed by VMware and then Software to see the available downloads. You must be an authorized Faculty/Staff user. For more information, contact the VMware Academy contact at your school.

4. Click on VMware vSphere 6.5 Enterprise or VMware vSphere 6 Enterprise Plus - both licenses will work with VMware vSphere v6.7. This is the first of two software items you will obtain from your school’s webstore.

5. Click on Add to Cart.

6. Click on Continue Shopping.

7. Click on VMware vCenter Server 6 Standard.

8. Click on Add to Cart.

9. Click on Check Out to continue.

10. Read and accept the EULA.

11. On the confirmation page, click on Proceed With Order.

12. On the receipt page, record the serial numbers found under Items.
4 Master Pod Configuration

4.1 Deploying Virtual Machine OVF/OVA Files

Deploy the OVF/OVA files you have downloaded to your host server.

1. Navigate to your vSphere Web Client using your management workstation, ensure that your downloaded OVA/VOF files are accessible on this machine and then connect to your vCenter Server.
2. From the vSphere Web Client dashboard, select Hosts and Clusters.

3. Right-click on the target ESXi Host Server and select Deploy OVF Template.
4. In the *Deploy OVF Template* window, on the *Select source* section, select the *Local File* radio button and click *Browse*.

5. Locate and select one of the VMs for the pod, click *Open*.

   - **Please Note:** Only one VM can be selected using this wizard. The process will have to be repeated for the remaining VMs.

6. Verify that the VM file path and name appears next to the *Browse* button and click *Next*.
7. In the **Review details** section, make sure to fill the checkbox for **Accept extra configuration options (if present)** and click **Next**.

![Review details screenshot](image)

8. In the **Select name and folder** section, change the name of the virtual machine to something that is easy to manage. You can use the names provided in the list below as names for the virtual machines if you do not have a set naming convention. Select the appropriate datastore and click **Next**.

<table>
<thead>
<tr>
<th>Virtual Machine Topology Name</th>
<th>Virtual Machine Deployment Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>sa-aio</td>
<td>VMware_ICMv67_Master.saAIO</td>
</tr>
<tr>
<td>sa-esxi-01</td>
<td>VMware_ICMv67_Master.saESXi01</td>
</tr>
<tr>
<td>sa-esxi-02</td>
<td>VMware_ICMv67_Master.saESXi02</td>
</tr>
<tr>
<td>sa-student</td>
<td>VMware_ICMv67_Master.saStudent</td>
</tr>
<tr>
<td>sa-vcsa</td>
<td>VMware_ICMv67_Master.saVCSA</td>
</tr>
</tbody>
</table>

9. In the **Select Storage** section, choose the appropriate storage device and make sure to select **Thin Provision**. Click **Next**.

10. In the **Setup networks** section, select **SAFETY NET** as the destination and click **Next**.

If **SAFETY NET** is not available, refer to the Create a Safe Staging Network section in the *Remote PC Guide Series – Volume 2*. 
11. In the *Ready to complete* section, make sure *Power on after deployment* is unchecked and confirm the settings. Click Finish.
12. *vCenter* will begin deploying the virtual machine. This may take some time depending on the speed of your connection, HDDs, etc. Repeat the previous steps for each remaining virtual machine in the master pod.

### 4.2 Modify and Activate Virtual Machines

The following tasks must be performed prior to taking snapshots or assigning the virtual machines to pods.

#### 4.2.1 Modify Virtual Machines

Once the virtual machines are imported onto the host, verify the configurations. The following steps will guide you through the process.

1. In the *vSphere Web Client* interface, right-click on the imported virtual machine and select *Edit Settings*.
2. For all of the virtual machines manually assign the MAC addresses for each NIC. The table below identifies the MAC addresses per NIC.

<table>
<thead>
<tr>
<th>Virtual Machine</th>
<th>NIC</th>
<th>MAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>sa-aio</td>
<td>1</td>
<td>00:50:56:82:b3:26</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>00:50:56:82:ab:1d</td>
</tr>
<tr>
<td>sa-esxi-01</td>
<td>1</td>
<td>00:50:56:82:f4:08</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>00:50:56:8a:46:26</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>00:50:56:8a:5d:23</td>
</tr>
<tr>
<td>sa-esxi-02</td>
<td>1</td>
<td>00:50:56:8a:d1:b0</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>00:50:56:8a:96:c6</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>00:50:56:8a:44:c4</td>
</tr>
<tr>
<td>sa-student</td>
<td>1</td>
<td>00:50:56:82:1b:5f</td>
</tr>
<tr>
<td>sa-vcsa</td>
<td>1</td>
<td>00:50:56:82:00:ab</td>
</tr>
</tbody>
</table>
3. Repeat the previous steps for each of the remaining virtual machines in the master pod.
4. Verify that *hardware virtualization* is exposed to the `sa-esxi-01` and `sa-esxi02` virtual machines by using the *Edit Settings* tool.
4.2.2 VM Credentials

For your reference, the following table provides a list of the credentials for the systems in the pod:

<table>
<thead>
<tr>
<th>Machine</th>
<th>User name</th>
<th>Password</th>
</tr>
</thead>
<tbody>
<tr>
<td>sa-aio</td>
<td>sysadmin</td>
<td>vmware123</td>
</tr>
<tr>
<td>sa-esxi-01</td>
<td>root</td>
<td>Train1ng$</td>
</tr>
<tr>
<td>sa-esxi-02</td>
<td>root</td>
<td>Train1ng$</td>
</tr>
<tr>
<td>sa-student</td>
<td>sysadmin</td>
<td>vmware123</td>
</tr>
<tr>
<td>sa-vcsa</td>
<td><a href="mailto:administrator@vclass.local">administrator@vclass.local</a></td>
<td>s3cretP@$</td>
</tr>
</tbody>
</table>

4.2.3 Activate Licenses

This pod is designed to use the VMware IT Academy (vITA) infrastructure license keys for both vSphere ESXi Host Servers (sa-esxi-01 and sa-esxi-02) and for the vCenter Server Appliance (sa-vcsa) virtual machines.

The vITA infrastructure license keys are to be used for licensing the master pods using the administrator@vclass.local account only.

The virtual machine OVA/OVF files obtained from CSSIA for this pod should already be licensed. If you wish to license the virtual machines using your own license keys, you may choose to do so and follow the instructions below.

Follow these steps to set up licenses on the master pod:

1. Power on all virtual machines in the master pod, either through vSphere Web Client or by making a reservation through NETLAB+.

It is recommended to have a master pod already configured with virtual machines attached before going through the instructions below on how to activate licenses. It is much easier to schedule a reservation on the master pod and then follow the steps for activating licenses.

2. Log in to the sa-student machine with the username sysadmin and the password vmware123.
3. Open the Mozilla Firefox web browser and access the VMware vSphere Web Client by navigating to the following URL: https://sa-vcsa.vclass.local. Use the administrator credentials to log in.

If you cannot successfully load the VMware Getting Started webpage, then please wait an additional 3-4 minutes and refresh the page to continue. During this time, the vCSA is still booting up and requires extra time to initialize.

You may ignore the “browser-OS combination” warning message presented on the VMware vCenter Single Sign-On page and continue moving forward.

4. Once you are logged into the VMware vSphere Web Client, click on the Home icon then click on Administration in the navigator pane.

5. Under Administration in the navigator pane, click on Licenses and then click on the Licenses tab in the content pane.
6. Click the plus sign to open the Add License Keys window.
7. Enter the vITA infrastructure license keys in the text area box provided and then click Finish.
8. To assign the VMware vCenter Server key, click on the Assets tab followed by ensuring that the vCenter Server systems button is selected.
9. Right-click on the sa-vcsa.vclass.local entry and select Assign License.
10. In the Assign License window, select the appropriate license and click OK.
11. To assign the VMware ESXi key, click on the Hosts button and right-click on the sa-esxi-01.vclass.local entry, select Assign License.
12. In the Assign License window, select the appropriate license key and click OK.
13. Repeat steps 11-12 for the remaining VMware ESXi Host.
14. Once the vCenter and hosts are licensed, gracefully power down the virtual machines.

Gracefully shutdown the virtual machines for snapshot in the following order:

- sa-vcsa (Wait for the virtual machine to be completely powered down before continuing)
- sa-esxi-01
- sa-esxi-02
- sa-aio
- sa-student

Failure to follow the power down sequence prior to snapshots can cause problems with the vCenter/host environment.

4.3 NETLAB+ Virtual Machine Infrastructure Setup

The NETLAB+ Virtual Machine Infrastructure setup is described in the following sections of the NETLAB+ Remote PC Guide Series:

- Registering a Virtual Datacenter in NETLAB+
- Adding ESXi hosts in NETLAB+
- Proactive Resource Awareness

It is important to configure Proactive Resource Awareness to maximize the number of active pods per physical ESXi host.

4.4 NETLAB+ Virtual Machine Inventory Setup

This section will guide you in adding your templates to the Virtual Machine Inventory of your NETLAB+ system.

1. Log in to your NETLAB+ VE system with the administrator account.
2. Select the **Virtual Machine Infrastructure** icon.

3. Click the **Virtual Machine Inventory** icon.

4. Click the **Import Virtual Machines** button located at the bottom of the list.

5. Select the appropriate datacenter from the list where your master VMs reside.
6. Select the check box next to the virtual machines you had just deployed and click **Import Selected Virtual Machines**.

7. When the **Configure VMs** page loads, you can set your virtual machine parameters.
   a. Check the drop-down box for the correct operating system for each imported virtual machine.
   b. Change **Role** to **Master** for each VM.
   c. Add any comments for each virtual machine in the last column.
   d. Verify your settings and click **Import (X) Virtual Machines** (notice the number in parenthesis is dynamic, depending on the amount of VMs selected).

It is advised to leave the **Version** and **Build** numbers in the **Comments** section for reference when requesting **NDG** support.
e. Verify all *Import Statuses* report back with **OK** and then click on the **Dismiss** button.

f. Verify that your virtual machines show up in the inventory.

For additional information, please refer to the *NETLAB+ VE Administrator Guide*.

### 4.5 Create the Master VMware vSphere: ICM v6.7 Pod

This section will assist you in adding the *VMware vSphere: ICM v6.7* pod to your *NETLAB+* system.

1. Log in to *NETLAB+ VE* using the *administrator* account.
2. Select the **Pods** icon.

3. Create a new pod by scrolling to the bottom and clicking the **Create New Pod** button.

4. On the *New Pod Wizard*, page click **Next**.
5. Then click on the **VMware vSphere ICM 6.7** pod type.

6. On the *New Pod* window, input a value into the **Pod ID** field.

   *It is best practice to use a block of sequential ID numbers for the number of pods you are going to install. The **Pod ID** number determines the order in which the pods will appear in the scheduler.*

7. Type in **VMware_ICMv6.7_Master** for the *Pod Name* and click **Next**.
8. To finalize the wizard, click **OK**.

For additional information, please refer to the *NETLAB+ VE Administrator Guide*. 
4.6 Attach VMs to the Master Pod

Update the master pod to associate the virtual machines with the newly created pod.

1. Attach VMs to the master pod on your NETLAB+ system.
   a. Log in to NETLAB+ VE using the administrator account.
   b. Select the Pods link.

2. Select the VMware vSphere: ICM v6.7 master pod from the pod list.

3. Click on the Action dropdown next to the virtual machine you are about to assign and select Attach VM.
4. Select the corresponding virtual machine from the inventory list.

5. Once redirected back to the master pod view, repeat the previous steps for the remaining virtual machines.

### 4.7 Create Snapshots for the Master Virtual Machines

In order to proceed with pod cloning, snapshots must be created on each of the pod's virtual machines.

> Verify that all VMs are still powered off before taking snapshots.

1. Log in to NETLAB+ VE using the administrator account.
2. Select the Pods link.
3. Select the **VMware vSphere: ICM v6.7** master pod from the pod list.
4. Click on the **Action** dropdown next to the virtual machine you are about to assign and select **Snapshots**.

5. In the **Snapshot Manager** window, click on **Take**.

6. In the **Take Snapshot** window, type **GOLDEN_MASTER** into the **Name** text field, or you may choose another naming convention as long as it is consistent. Click **OK**.
7. Notice the new snapshot appear in the Snapshot Manager. Click Dismiss.

8. Repeat the previous steps for the remaining VMs in the master pod.

4.8 Update the Master Pod

Update the master pod to associate the newly created snapshots in the VM settings.

1. Update the master pod on your NETLAB+ system.
   a. Log in to NETLAB+ VE using the administrator account.
   b. Select the Pods link.

2. Select the VMware vSphere: ICM v6.7 master pod from the pod list.
3. Click on the **Action** dropdown next to the virtual machine you are about to configure and select **Settings**.

4. On the virtual machine’s settings page, verify the information and make sure that the **Base Snapshot/Revert to Snapshot** is set to **GOLDEN_MASTER**. Once finished modifying the settings for the virtual machine, click **Submit**.

5. Once redirected back to the master pod view, repeat the previous steps for the remaining virtual machines.
5  Pod Cloning

This section will help you create multiple student pods. The following sections describe the NETLAB+ pod cloning feature used to create student pods on one or two host systems.

5.1  Linked Clones and Full Clones

NETLAB+ can create linked clones or full clones.

A linked clone (or linked virtual machine) is a virtual machine that shares virtual disks with the parent (or master) virtual machine in an ongoing manner. This conserves disk space and allows multiple virtual machines to use the same software installation. Linked clones can be created very quickly because most of the disk is shared with the parent VM.

A full clone is an independent copy of a virtual machine that shares nothing with the parent virtual machine after the cloning operation. Ongoing operation of a full clone is entirely separate from the parent virtual machine.

5.2  Creating User Pods

The following section describes how to create user pods on the same VMware Host system that holds your master pod's virtual machines. In this scenario, we will create linked virtual machines using the NETLAB+ pod cloning utility.

Make sure the pod status is Offline prior to continuing. The cloning process requires the pod be offline. Since this is a master pod, which is used for cloning other pods, we will keep it offline to create the instructor and student pods from.

1. Log in to NETLAB+ VE using the administrator account.
2. Select the Pods icon.
3. Click on the master pod.
4. Click the **Clone Pod** button to create a new pod based on the settings and snapshots of this pod.

5. Input a new ID value into the **New Pod ID** field. It is advised to keep the pods in numerical order. If the **pod IDs** are not in numerical order, they will not show up in the scheduler in numerical order. Click **Next**.

6. Enter a name for the cloned pod into the **New Pod Name** text field. For example, *VMware_ICMv6.7_Pod1*. Click **Next**.

7. When the action has finished processing, you are presented with a **Clone Pod** configuration wizard. Notice each VM has its own tab. Go through each tab and verify the following:

   **Source Virtual Machine**:
   a. **From Snapshot** should be set to the **GOLDEN_MASTER** snapshot you created previously.

   **Target Virtual Machine**:
   a. For **Type**, verify that **Linked** is selected.
   b. For **Role**, verify that **Normal** role is selected.
   c. For **Take Snapshot**, verify that **GOLDEN_MASTER** is input.

8. When you are done changing settings, click **Clone Pod**. This should complete within a minute as we are creating linked virtual machines.

9. When the pod clone process is finished, click **OK**.

10. If you want to dedicate this pod to a particular class, team, or student, use the **Pod ACLs** feature. For details, see the [NETLAB+ VE Instructor Guide](#).
11. Click the **Online** Button in the *Pod Management* page to activate the pod.

The user pod can now be reserved. When the reservation becomes active, *NETLAB+* will automatically configure virtual machines and virtual networking for the active reservation.

The *GOLDEN_MASTER* snapshot is the starting point for all pods. We recommend that you reserve the 1st pod and conduct some labs to make sure the snapshot images work correctly. If there are defects, make corrections to the images to the master pod and retake the *GOLDEN_MASTER* snapshot before creating additional pods.

### 5.3 Cloning Your Master Pod to a Second Host

For this task, we will use the pod cloning utility to copy our master pod to a second host.

1. Log in to *NETLAB+ VE* with the administrator account.
2. Select the **Pods** icon.
3. Click on the master pod.
4. Click the **Clone** button to create a new pod based on the settings of this pod.
5. Input a new ID value into the **New Pod ID** field. It is advised to keep the pods in numerical order. If the pod IDs are not in numerical order, they will not show up in the scheduler in numerical order. Click **Next**.
6. Enter a name for the cloned pod into the **New Pod Name** field. For example, *VMware_vSphere_ICMv6.7_Master2*. Click **Next**.
7. When the action has finished processing, you are presented with a **Clone Pod** configuration wizard. Notice each VM has its own tab. Go through each tab and verify the following:

   - **Source Virtual Machine:**
a. *From Snapshot* should be set to the **GOLDEN_MASTER** snapshot you created previously.

**Target Virtual Machine:**

a. For *Type*, verify that **Full** is selected.

b. For *Role*, verify that **Master** role is selected.

c. For *Take Snapshot*, verify that **GOLDEN_MASTER** is input.

d. For *Runtime Host*, select the second host system (which should be different than the system you are cloning from).

8. When you are done changing settings, click **Clone Pod**. This may take up to 30 minutes as full copies are being made. You may navigate away from the cloning progress screen, and then later return to the pod to check progress.

9. When the pod clone process is finished, click **OK**.

### 5.4 Creating User Pods on the Second Host

To create user pods on the second host, repeat the steps to create user pods on the first host (*Section 5.2 Creating User Pods*), substituting the second master pod (created in the previous section) as the cloning source.

### 5.5 Assigning Pods to Students, Teams, or Classes

Please refer to the [NETLAB+ VE Instructor Guide](#) for details on using the *Pod ACLs* feature.