



Lenovo ThinkAgile CP Migration Manager User's Guide



Models: CP 4000, CP 6000

Note

Before using this information and the product it supports, be sure to read and understand the safety information and the safety instructions, which are available at the following address:

http://thinksystem.lenovofiles.com/help/topic/safety_documentation/pdf_files.html

In addition, be sure that you are familiar with the terms and conditions of the Lenovo warranty for your solution, which can be found at the following address:

<http://datacentersupport.lenovo.com/warrantylookup>

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Introduction to Migration Manager

The ThinkAgile CP Migration Manager application allows you to migrate existing VMware virtual machines (VMs) to ThinkAgile CP. Once set up, it performs periodic synchronization of a VMware virtual machine (VM) to ThinkAgile CP, and, once synchronized, a ThinkAgile CP VM can be spun-off and deployed from the synchronization. The result is a low-downtime cut-over from VMware to ThinkAgile CP.

Download PDF

https://thinkagile.lenovofiles.com/help/topic/thinkagile_cp/pdf_files.html

Note: For a list of issues and limitations related to Migration Manager for ThinkAgile CP, Release 5.1.6, see the following topic:

https://thinkagile.lenovofiles.com/help/topic/thinkagile_cp/log-on-to-migration-manager.html

How Migration Manager Works

ThinkAgile CP Migration Manager works as follows.

- Migration Manager creates a pool of Migration Workers, each of which is responsible for synchronizing and then converting a single VMware VM, after which the worker is made available for other source VMs.
- Each source VM has Change Block Tracking enabled, if it is not enabled already. (This can be done within Migration Manager.)
- Each worker performs periodic synchronizations using the VMware backup APIs:
 - A snapshot of the source VMware VM is taken using the VMware APIs;
 - The snapshot is mounted on the worker, and changed blocks since the last sync are copied;
 - The snapshot is removed;
 - The process is repeated until a Final Cutover is executed or the syncs are terminated.
- Once (at least one) synchronization has completed, you can perform conversions of the source VM. Conversions take the results from the latest synchronization and spin up a new VM on ThinkAgile CP, injecting the VirtIO drivers on Windows guests, adding the ThinkAgile CP Guest Agent, and uninstalling VMware Tools. There are two types of cut-overs:
 - **Cutover.** A cutover is initiated based on the last synchronization, keeping the source VM up in VMware. The target VM is created with a new IP address so as not to conflict with the source. Synchronizations continue after the cut-over and the worker stays assigned.
 - **Final Cutover.** This cutover first starts with shutting down the source VM, after which a final snapshot is taken, and the last-changed blocks are synced across. Then the target VM is brought up on ThinkAgile CP, with the same IP address as the source in VMware (as long as you are using VLANs common across both ThinkAgile CP and VMware). Synchronizations stop, and the worker is released into the pool to be assigned to a new source.

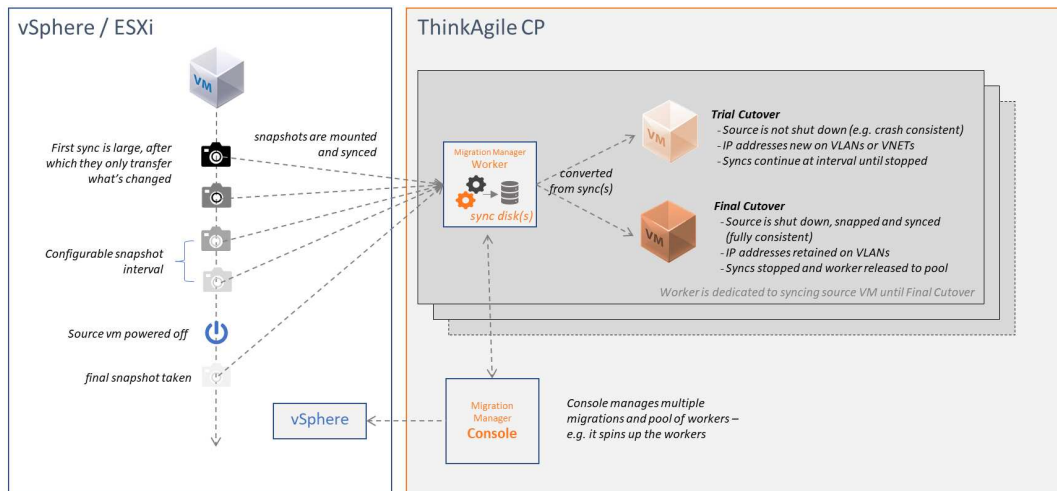


Figure 1. Migration Manager - Migration process for an individual source VM

Before you begin

Make sure that you review the requirements for Migration Manager before you begin to set up and use Migration Manager.

- [“Software prerequisites” on page 2](#)
- [“Application Template Requirements” on page 2](#)
- [“Network and firewall requirements” on page 3](#)
- [“Notes about Windows Datacenter or Enterprise Editions” on page 3](#)

Software prerequisites

The ThinkAgile CP Migration Manager requires the following software.

The ThinkAgile CP Migration Manager requires the following software:

- VMware vSphere or ESXi v5.5 or higher
- ThinkAgile CP 4.0 or higher

Application Template Requirements

Migration Manager is packaged as a template in the Lenovo Cloud Marketplace, called ThinkAgile CP Migration Manager. You need to download the template to the organization template store where you are performing the migration, and then deploy the ThinkAgile CP Migration Manager Console application.

The Migration Manager application can be deployed anywhere in your ThinkAgile CP environment, as long as the network connectivity outlined in the section, [“Before you begin” on page 2](#), is available. The Migration Manager application will deploy a Worker template and a set of "donor" templates to the virtual datacenter designated in the Worker Configuration settings. You will notice that the virtual datacenter template store will have a large number of donor templates that will exist while Migration Manager is in use. Migration Manager Workers must be deployed in the same Storage Pool to which you want to migrate and deploy the target VMs.

For complete instructions, see this topic, [“Set up the Migration Manager” on page 3](#).

Network and firewall requirements

Migration Manager requires NFS v3 connectivity between the Migration Manager instance and your storage controllers for template deployments. Note that firewall rules may need to change.

The following table outlines connectivity requirements for Migration Manager users, components, and VMware. As the Migration Manager Console is responsible for deploying and destroying workers via DHCP, it is important that the implementation of the rules below recognize the dynamic nature of workers. The Migration Manager Console can be assigned a static address via a VNET reservation or via the DHCP service provided external to ThinkAgile CP via a VLAN.

Table 1. Firewall ports and protocols for Migration Manager

Source / Initiator	Destination	Port(s)
End User	Migration Manager Console	443/TCP (HTTPS)
Migration Manager Console	manage.cp.lenovo.com	443/TCP (HTTPS)
Migration Manager Console	vSphere Host	443/TCP (HTTPS)
Migration Manager Console	Migration Manager Worker	443/TCP (HTTPS)
Migration Manager Worker	manage.cp.lenovo.com	443/TCP (HTTPS)
Migration Manager Worker(s)	vSphere HostESXi Hosts(s)	443/TCP (HTTPS) 902/TCP (NBDSSL / NFC)

Notes:

- For troubleshooting purposes, it may be necessary for Lenovo Support to log on to the Console or Worker (s) via SSH, 22/TCP.
- Migration Manager supports a single NIC on the target; multi-NIC VMs will require post-conversion shutdown and adding additional NICs.

Notes about Windows Datacenter or Enterprise Editions

Windows guests running Datacenter or Enterprise editions should expect to need to use Disk Manager to "online" non-boot disks, in accordance to the operating system's default storage policy.

Migration Manager launches a Powershell script at first-boot to modify the policy and disks, but group policy and/or third-party security tools may prevent the script from running.

Set up the Migration Manager

To set up Migration Manager, complete the following steps.

- [“Obtain Migration Manager template and deploy the console” on page 3](#)
- [“Log on to Migration Manager” on page 9](#)
- [“Configure the ThinkAgile CP connection” on page 10](#)
- [“Configure migration defaults” on page 11](#)
- [“Configure migration workers” on page 12](#)
- [“Configure the VMware connection” on page 15](#)

Obtain Migration Manager template and deploy the console

Follow these steps to obtain the Migration Manager template and deploy the Migration Manager console.

Note: During the early release phase of Migration Manager, the templates are distributed as two qcow2 files via a URL where they can be downloaded for upload into ThinkAgile CP Cloud Controller via the **Import VM** function. You will need a CIFS or NFS share to stage these files for using the Import capability.

- Step 1. Log on to your ThinkAgile CP Cloud Controller Management Portal account and navigate to the Lenovo Cloud Marketplace.
- Step 2. Select the Migration Manager – Lenovo Template.

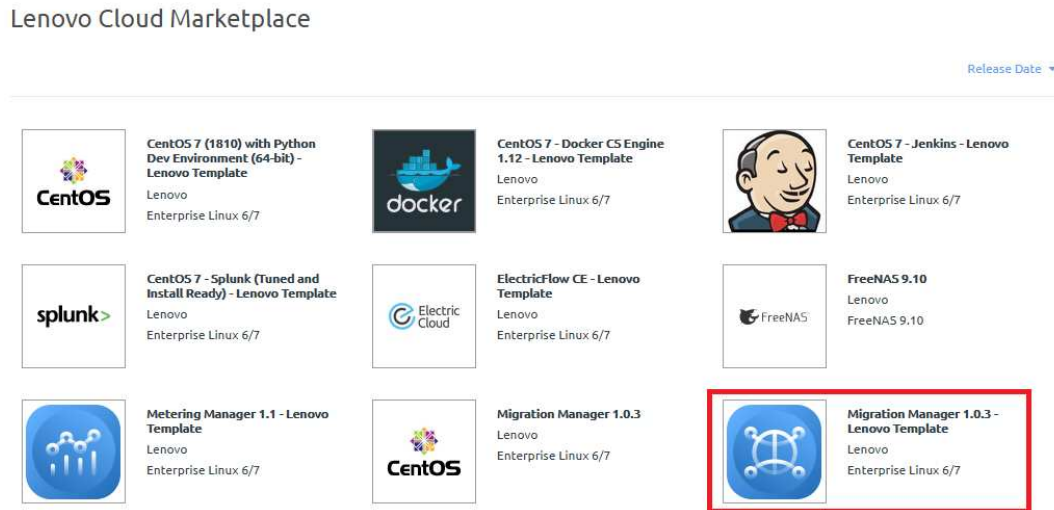


Figure 2. Lenovo Cloud Marketplace – Migration Manager

A dialog box opens. Click on the **Download Template** button to continue the process.

- Step 3. Configure the template with the following parameters:

- **Save to** – the target VDC (in this example: ACME Labs)

Note: If you do not select a VDC, the template is saved under **Applications → Organization Templates**.

- **Template Name** – a custom name for the Migration Manager template
- **Description** – a custom description for the Migration Manager template
- **Provisioning** – allocate CPU cores and memory

Download Template

Save To: ACME Labs (VDC Templates) ▼

Template Properties

Template Name

Migration Manager 1.0.3
🔗

Description

Migration Manager provides point-and-click live migration of your VMware workloads to ThinkAgileCP with no VM preparation and no post-migration reconfiguration. Leveraging snapshot technology, workloads are moved incrementally while the VM operates non-disruptively. The tool is provider free to our customer to use at their own risk. Optionally, professional services engagements are available to assist customers with migration, contact your Lenovo sales representative for details.

Provisioning

CPU

4

cores

Memory

8

GiB

Application Disk and Boot Order

The template's application disks and boot order are listed below.

BOOT ORDER

1	Disk 0	100 GiB
2	Network (vNIC0)	—

Cancel
Save Application Template

Figure 3. Download Template Options

- Step 4. Click **Save Application Template** to start downloading the Metering Manager template.
- Step 5. Navigate to **Applications → Organization Templates** or to **VDC Templates** for the VDC where you downloaded and saved the template.
- Step 6. Next to ThinkAgile CP Metering Manager, click **New Instance**.

Migration Manager 1.0.3

Migration Manager provides point-and-click live migration of your VMware workloads to ThinkAgileCP with no VM preparation and no post-migration reconfiguration. Leveraging snapshot technology, workloads are moved incrementally while the VM operates non-disruptively. The tool is provider free to our customer to use at their own risk. Optionally, professional services engagements are available to assist customers with migration, contact your Lenovo sales representative for details.

14.1 GiB | Created by Lenovo | Last updated on May 14, 2020

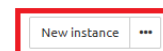


Figure 4. Create a New Instance of the Metering Manager

Step 7. Configure the following parameters for the template instance:

- **Virtual Datacenter**

New instance from Template

Properties

Instance Name

Description (Optional)

Source Template Linux Migration Manager 1.0.3 (created by Lenovo)

Templates created by ThinkAgile CP may come with default passwords (see template description). If so, please change this password as soon as the instance is created.

Template Type VDC Template

Virtual Datacenter

Select a virtual datacenter for the application instance, then complete the resource profile for networking, storage, and compute.

Virtual Datacenter

Application Group

Number of Instances

- **Storage Pool**

- **Compute Migration Zone**

Recommended settings for the application include:

- **Provisioning:** Four (4) vCPUs and at least 4Gb RAM

- **Network Settings:**

- **vNIC**
- **Networking Mode**
- **Network**

Storage

Storage Pool: pool1

Virtual Disks (vDisks)

Name	Size	IOPS Limit	Bandwidth Limit
Disk 0	100 GiB	—	—

Compute

Provisioning: CPU 4 cores, Memory 8 GiB

Migration Zone: zone1

Network

Configure at least one virtual network interface controller (vNIC) to specify the instance's network settings. [Add vNIC](#)

vNIC	Networking Mode	Network	Firewall Profile	Firewall Override	Mac Address
vNIC 0	VNET	VNET_Default	NONE	None	Automatic

Boot Order: Disk 0 > Network (vNIC 0)

Step 8. Click on **Create Instance** to launch a new Migration Manager instance.

Instance Settings

Instance mode can be changed after instance creation.

Instance Mode: Enhanced Mode
Virtio drivers are installed in the template.

Guest Tools: Guest tools are pre-installed in the template.
[Learn more about instance modes](#)

Timezone Configuration: Default* Custom
* The timezone is set to the timezone of the node on which the instance is started

Automatic Recovery: Enable Automatic Recovery
If node fails, restart instance elsewhere when resources are available

VT-x flag: Enable VT-x flag
This flag can be used to enable nested virtualization of KVM hypervisors in the ThinkAgile CP environment. No other nested hypervisors are supported.

Instance Startup: Start instance upon creation

Cancel **Create Instance**

Recommended settings for the application include:

- **Instance Mode**: Enhanced mode

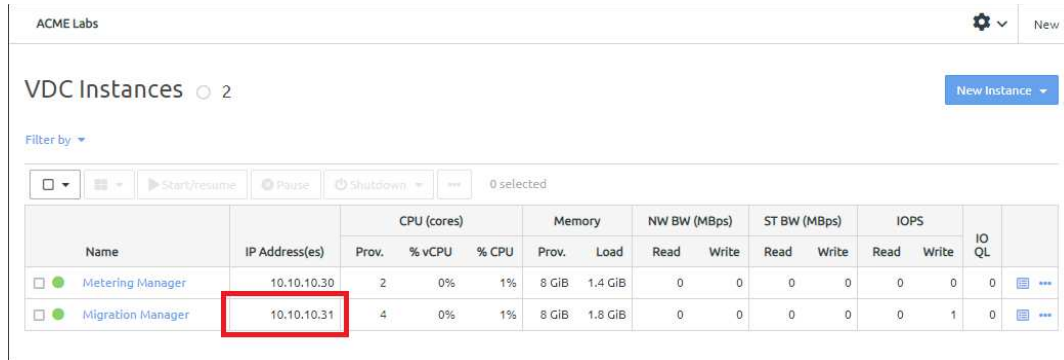
Note: The Migration Manager application can be deployed anywhere in your ThinkAgile CP Cloud Controller environment, as long as the network connectivity outlined in the section, [“Before you begin” on page 2](#), is available. Migration Manager Workers must be deployed in the same Storage Pool to which you want to migrate and deploy the target VMs.

Step 9. Click **Create Instance**, which starts the instance and assigns an IP address for the Migration Manager application.

Log on to Migration Manager

Follow these steps to log on to Migration Manager.

Step 1. Once the Migration Manager application instance has been installed and is running, navigate to the IP address for your instance of the Migration Manager application.



The screenshot shows the VMware vSphere VDC Instances page. At the top, it says 'ACME Labs' and 'VDC Instances 2'. There is a 'New Instance' button. Below that, there are filter and action buttons. A table lists two instances: 'Metering Manager' and 'Migration Manager'. The 'Migration Manager' instance has its IP address, 10.10.10.31, highlighted with a red box.

Name	IP Address(es)	CPU (cores)			Memory		NW BW (MBps)		ST BW (MBps)		IOPS		IO QL	
		Prov.	% vCPU	% CPU	Prov.	Load	Read	Write	Read	Write	Read	Write		
Metering Manager	10.10.10.30	2	0%	1%	8 GiB	1.4 GiB	0	0	0	0	0	0	0	...
Migration Manager	10.10.10.31	4	0%	1%	8 GiB	1.8 GiB	0	0	0	0	0	1	0	...

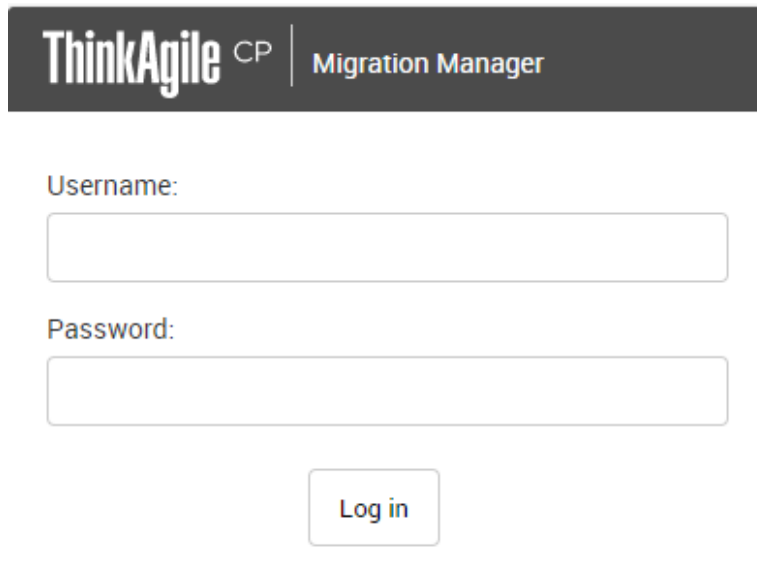
Figure 5. Locate IP Address for Migration Manager console

Step 2. Copy the IP address assigned to your Migration Manager Instance. Open a new web browser window or tab and paste the copied IP address. This opens a connection to the Migration Manager Instance.

Step 3. In the Login dialog box, enter the username and password and click **Log in**.

The default credentials are:

- Username: admin
- Password: ThinkAgileCP



The screenshot shows the ThinkAgile CP Migration Manager login page. It has a dark header with the 'ThinkAgile CP' logo and 'Migration Manager' text. Below the header, there are two input fields: 'Username:' and 'Password:'. At the bottom, there is a 'Log in' button.

Figure 6. Log on to Migration Manager

Note: The application deploys with a ThinkAgile CP-provided, self-signed SSL certificate. If you would like to deploy your own certificate, contact Lenovo Support for assistance (see https://thinkagile.lenovofiles.com/help/topic/thinkagile_cp/getting_help_technical_assistance.html).

If this is the first time that you are logging on the Migration Manager:

1. click **I accept the terms of this agreement**. Then click **Continue**.
2. Enter a new password. Then click **Change my password**.
3. You are redirected directly to the Settings page.

Configure the ThinkAgile CP connection

Before you can begin using the Migration Manager to migrate VMs, you need to add a ThinkAgile CP Developer API token so that the application can communicate with the ThinkAgile CP platform.

In the ThinkAgile CP Cloud Controller management portal, you can obtain an API token under Developer Options, which is described in https://thinkagile.lenovofiles.com/help/topic/thinkagile_cp/manage-developer-options.html.

Step 1. After you log on to Migration Manager, click **Settings** in the top navigation bar.



Figure 7. Migration Manager menu - Settings

Step 2. On the Settings page, click **ThinkAgile CP Connection**.

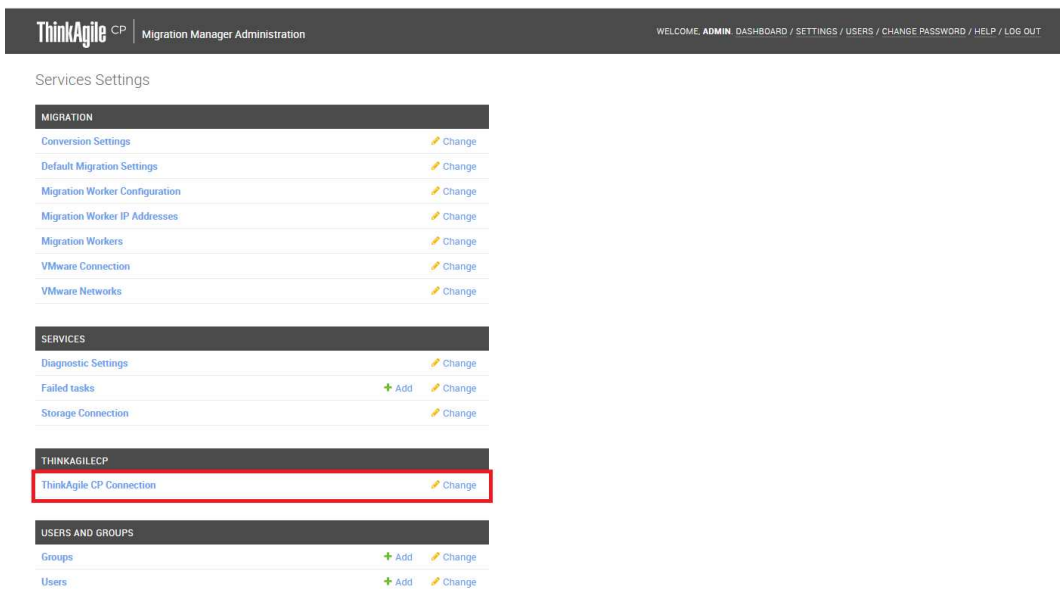


Figure 8. Migration Manager Settings

The Change ThinkAgile CP Connection page opens.

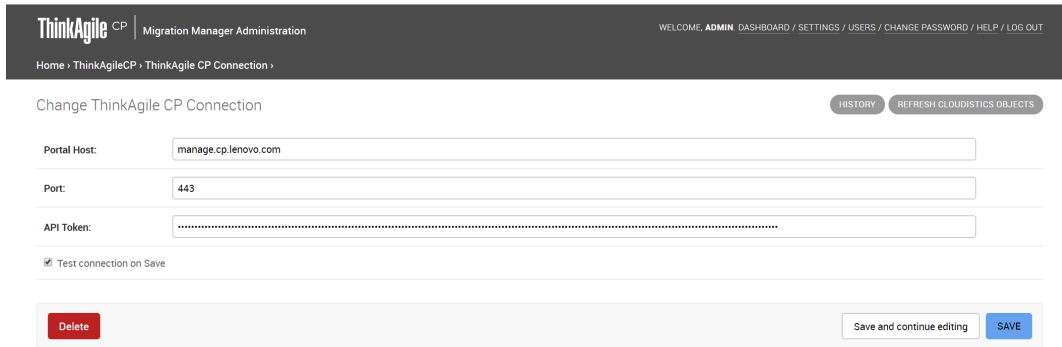


Figure 9. Change ThinkAgile CP Connection page

Step 3. On the Change ThinkAgile CP Connection page, enter the following information:

- **Portal Host** - Your ThinkAgile CP Cloud Controller management portal host address.
- **Port** - The port number on which to communicate.
- **API Token** - The API token from ThinkAgile CP Cloud Controller, which you can easily copy and paste in this API Token field. For more details about API Tokens, see https://thinkagile.lenovofiles.com/help/topic/thinkagile_cp/manage-developer-options.html
- **Test Connection on Save** - Selecting this option will verify the connection works when you click **Save**.

Step 4. Click **Save**.

Note: If you need to change the connection information at any time, click the **Settings** menu, make your changes, and then click **Save**.

Configure migration defaults

You need to set the ThinkAgile CP migration default settings, which includes defining the location for the target VMs.

Step 1. Click **Settings** in the top navigation bar.



Figure 10. Migration Manager menu - Settings

Step 2. On the Settings page, click ThinkAgile CP **Migration Defaults**.

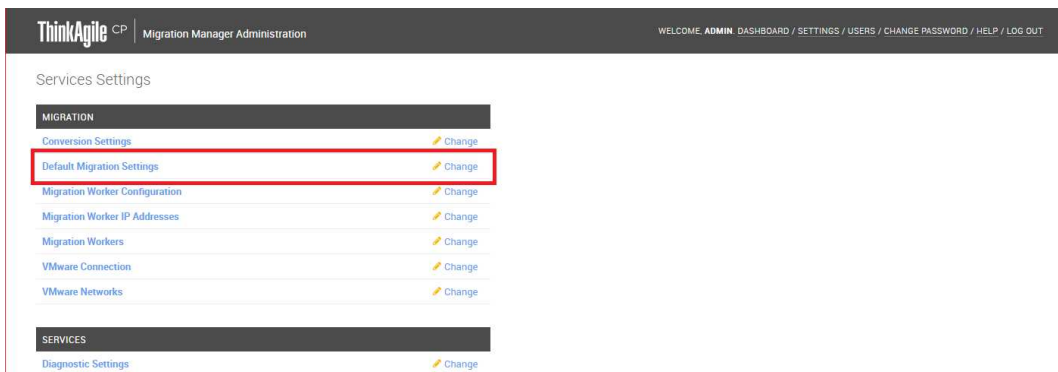


Figure 11. Migration Manager Settings

The Change ThinkAgile CP Migration Defaults page opens.

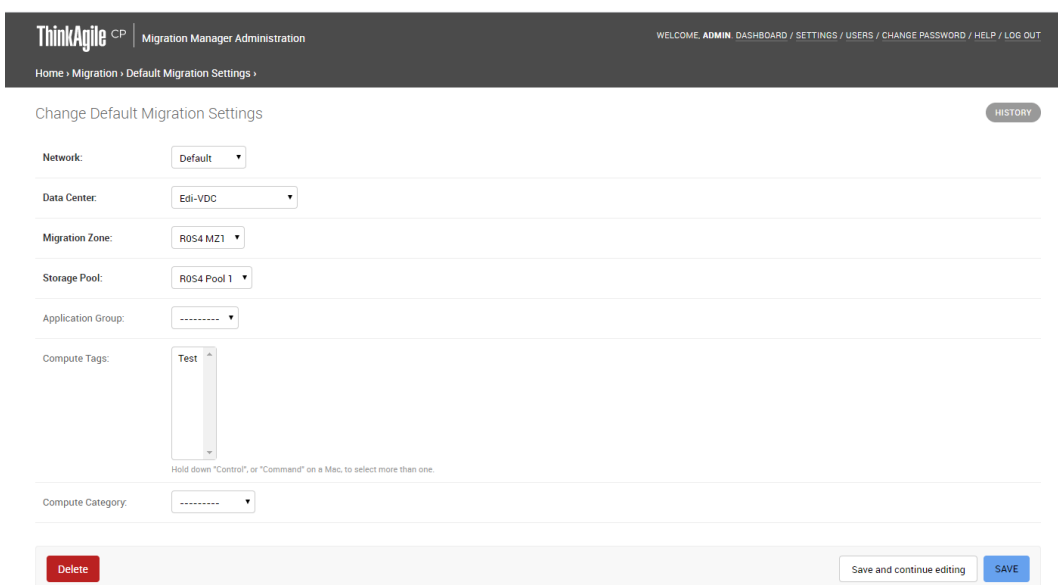


Figure 12. Change ThinkAgile CP Migration Defaults page

Step 3. On the Change ThinkAgile CP Migration Defaults page, define the following settings:

- **Network** – Select the network for this migration.
- **Data Center** – Select the target data center for the migrated VMs.
- **Migration Zone** – Select the target migration zone for the migrated VMs.
- **Storage Pool** – Select the target storage pool for the migrated VMs.
- **Application Group** – Select the application group for the migrated VMs, if needed.

Step 4. Click **Save**.

Configure migration workers

Follow these steps to configure your Migration Workers.

Step 1. Click **Settings** in the top navigation bar.

Figure 13. Migration Manager menu - Settings

Step 2. On the Settings page, click **Migration Worker Configuration**.

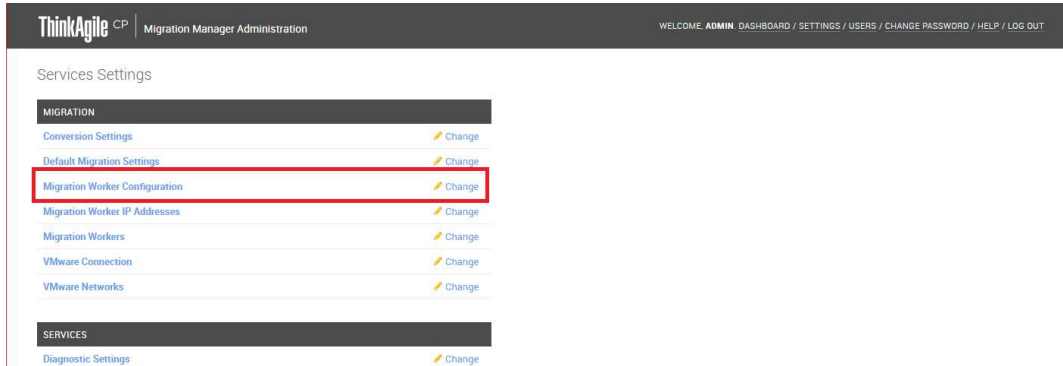


Figure 14. Migration Manager Settings

The Change Migration Worker Configuration page opens.

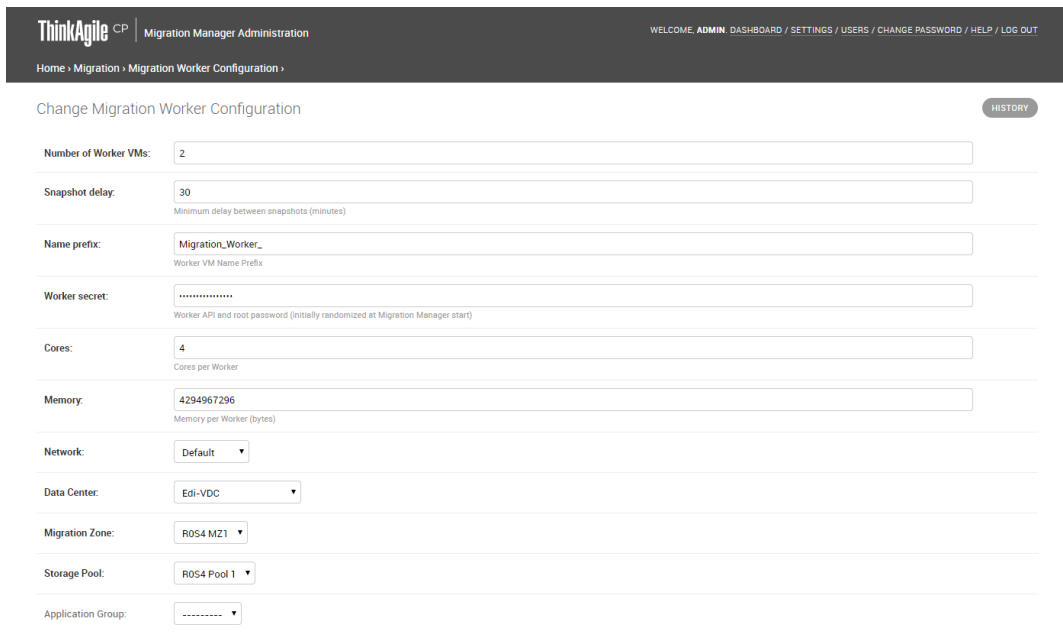


Figure 15. Migration Manager Settings - Migration Worker Configuration

Enable nested KVM on Worker
Will not work in all environments.

Worker IP range - start:
Start IP Address in x.x.x.x notation

Ip address range end:
End IP Address in x.x.x.x notation

Ip address netmask:
Worker IP Netmask in x.x.x.x notation

Ip address gateway:
Worker Default GW in x.x.x.x notation

Ip address nameservers:
Worker DNS (space-delimited)

Figure 16. Migration manager Settings - Cont. (Worker IP Configuration Settings — optional)

Step 3. Define the following settings to be used for and by Migration Workers.

Note: In the current Migration Manager release, these defaults apply to all migrations, and you are not (yet) able to override them. If you want to target migrations to multiple virtual datacenters, migration zones, and storage pools, ThinkAgile CP recommends deploying multiple Migration Manager instances.

- **Number of Worker VMs** – Enter the number of workers to create as a pool of VMs for migrations. One worker is assigned one VMware VM for synchronization and conversion, so the number of workers drives the number of parallel synchronizations and migrations that can occur. Once a VM has completed its Final Cutover, the worker is released and returned to the pool. For reasons of workload on the source side, we recommend starting with five (5) or less workers and scaling up as experience shows acceptable operational impacts.

Note: The number of workers that may run in parallel is governed by the VMware Network File Copy (NFC) connection limits, which apply per vSphere server and per ESXi host. Assuming 3rd-party backup applications may also be using NFC, we recommend five (5) workers as a number unlikely to interfere with existing VDDK backup applications. For planning purposes, note that each worker consumes two (2) NFC connections per virtual disk per VM with the connections only open during active synchronization.

- **Snapshot Delay** – Enter a snapshot interval, which is expressed as a minimum number of minutes between snapshots. If a sync takes more than this interval, the next sync will follow immediately. This delay is ignored during final cutovers, which happen immediately.
- **Name Prefix** – Enter a name prefix for the worker applications that the Console spins up.
- **Worker Secret** – Enter a worker API and root password. When the Migration Manager Instance first initializes, the worker secret is randomly generated.
- **Cores** – Enter a number of vCPUs to allocate to the workers. The default of four (4) makes sense to increase should a large number of source VMs have more than four virtual disks.
- **Memory** – Enter the number of bytes of RAM to allocate to the worker VM.
- **Network** – Select a network for the workers. This network must provide DHCP services for workers to be able to obtain an IP address and have name resolution with vSphere and ThinkAgile CP.
- **Data Center** – Select the data center for the worker.
- **Migration Zone** – Select the migration zone for the worker.
- **Storage Pool** – Select the storage pool for the worker.

Note: Workers can reside in different targets; but they all must be on the same storage pool.

- **Application Group** (optional) – Select the application group in which the workers should run.
- **Enable nested KVM on Worker** – Check to enable nested virtualization on the worker.

Note: This option does not work in all virtualization environments.

- **Worker IP Settings** - (optional) You can specify a range of IP addresses for workers. The workers will boot via DHCP on the specified network, and if static IP address ranges are specified, the VMs will be dynamically reconfigured to use an "in-range" IP address after they boot; a pool of IP addresses will be maintained and assigned to workers as they are created and released to be re-used when workers are removed.
 - **Worker IP Range - Start** - Enter the starting range of usable IP addresses for the workers.
 - **IP Address Range - End** - Enter the ending range of usable IP addresses for the workers.
 - **IP Address Netmask** - Enter the netmask address for the workers.
 - **IP Address Gateway** - Enter the default gateway address for the workers.
 - **IP Address Nameserver** - Enter the nameserver for the worker DNS.
- **Template** – Select the Migration Worker template previously downloaded and prepped with VDDK.

Step 4. Click **Save**.

Configure the VMware connection

Before you can begin using the Migration Manager to migrate your VMs, you need to enter the VMware connection settings. Follow these steps to configure the settings for Migration Manager to use for connecting to both vSphere and ESXi hosts.

Step 1. Click **Settings** in the top navigation bar.



Figure 17. Migration Manager menu - Settings

Step 2. On the Settings page, click **VMware Connection**.

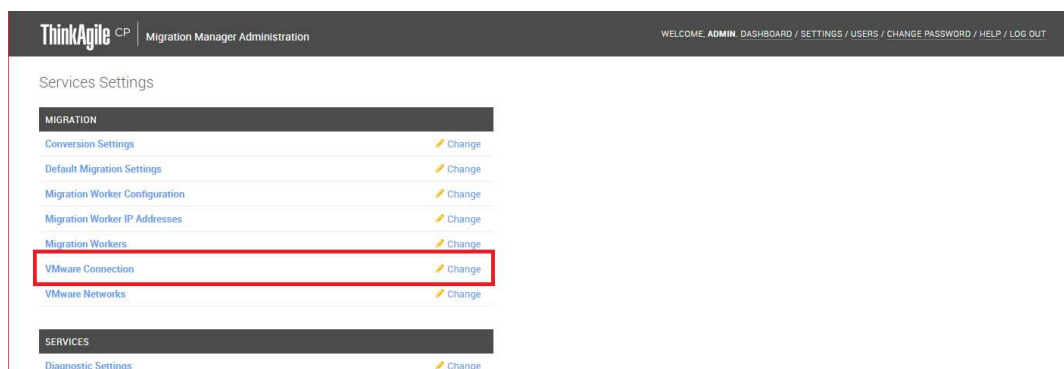


Figure 18. Migration Manager Settings

The Change VMware Connection page opens.

ThinkAgile CP Migration Manager Administration

WELCOME ADMIN DASHBOARD / SETTINGS / USERS / CHANGE PASSWORD / HELP / LOG OUT

Home > Migration > VMware Connection >

Change VMware Connection HISTORY

VSphere Server:

Port:

Username:

Password:

Test Connection on Save

Verify SSL Certificate

Figure 19. Change VMware Connection page

- Step 3. On the Change VMware Connection page, enter the following information:
- **vSphere Server** – The IP address or hostname of the vSphere server.
 - **Port** - The port number on which to communicate. (This defaults to 443 for SSL.)
 - **Username** - The username for connecting to VMware.
 - **Password** – The password for connecting to VMware.
 - **Test Connection and VDDK file on Save** - Selecting this option will test the connection and VDDK file to confirm the connection.
 - **Verify SSL Certificate** – Selecting this option will trigger the vSphere SSL certificate to be verified. If you are using a self-signed certificate on vSphere, leave this checkbox clear.
- Step 4. Click **Save**.

Migrate a VM

Follow the steps in this section to perform the migration for a source VM.

Note: Each source VM that you migrate must have Change Block Tracking (CBT) enabled. CBT is a VMware feature, useful in transferring blocks as the VM is running. For more information about CBT, see this [VMware article](#). You can enable CBT in Migration Manager as described in the steps below.

- Step 1. In Migration Manager, navigate to the **Dashboard**, which includes a list of your VMs.



Figure 20. Migration Manager menu - Dashboard

The Dashboard opens, showing the list of your VMs.

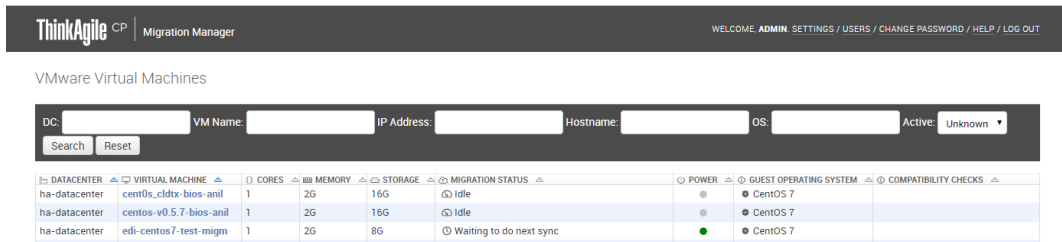


Figure 21. Migration Manager Dashboard

Step 2. In this list, click the name of the VM you want to migrate. A details page opens for that VM.

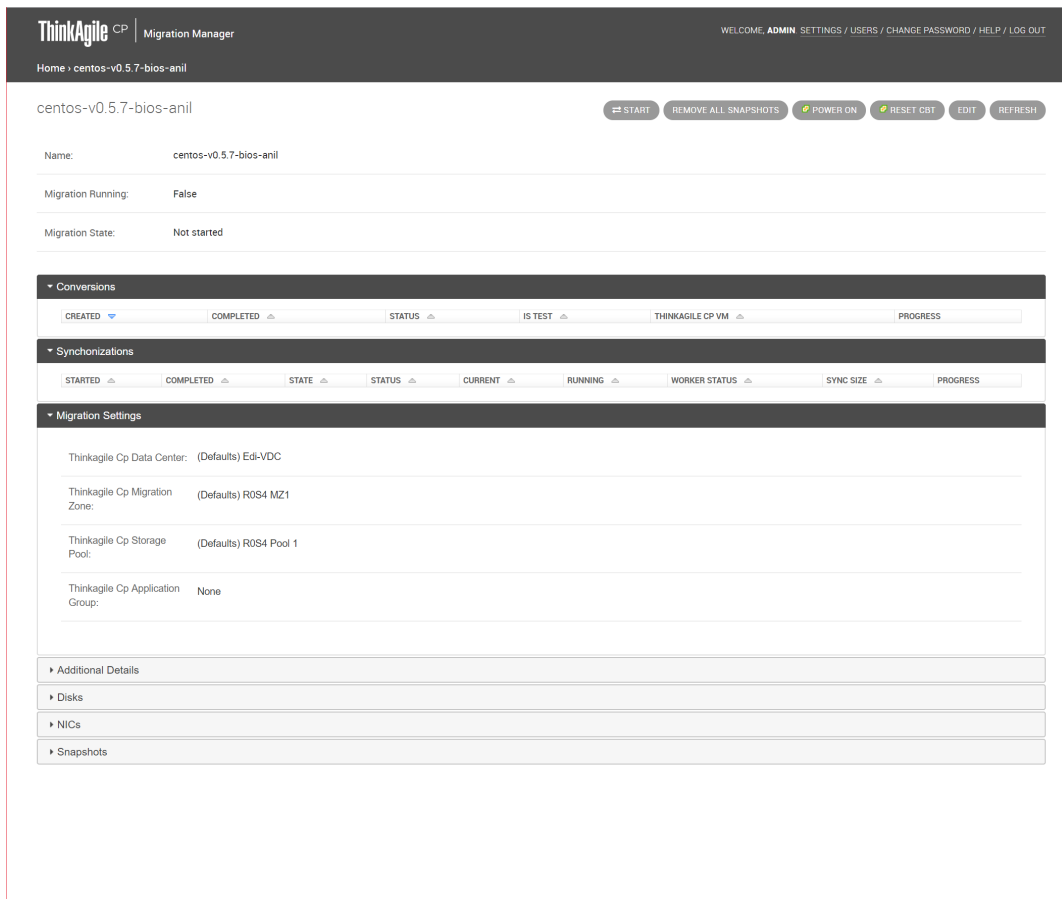


Figure 22. VM Details page

- Step 3. Click **Enable CBT** to enable CBT for this VM (if the VM does not already have CBT enabled).
- Step 4. You can click **Remove All Snapshots** to remove the snapshots for this VM.
- Step 5. Click **Start** to start synchronizations, which will continue until a final cutover or the process is terminated.

You can track the status of the migration in the Migration State field. You can also view the details of this migration under Conversions, Synchronizations, and Migration Data.

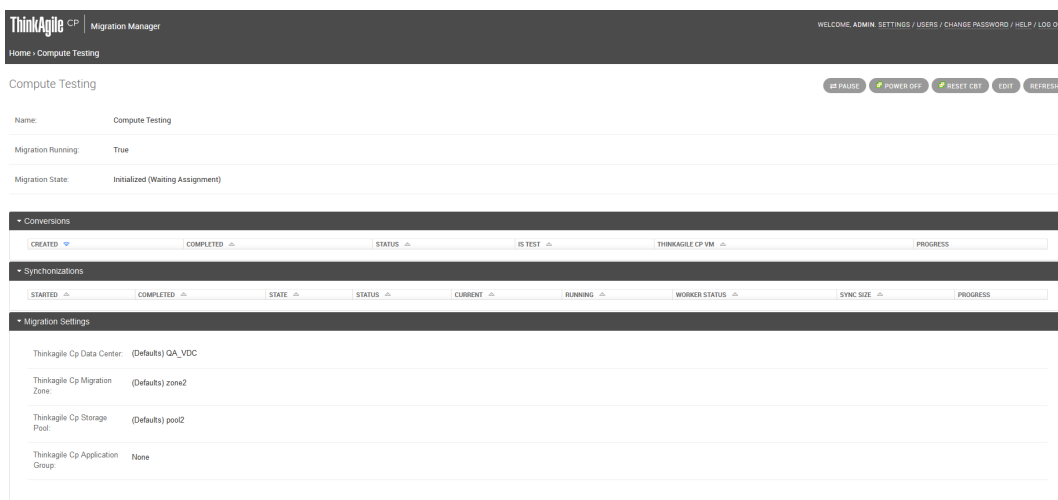


Figure 23. VM Details Page - Synchronization Running

Step 6. Once synchronizations have started you can do the following.

- Click **Pause** to pause synchronizations if needed.
- Once a synchronization has completed, you can click **Test Cutover** or **Cutover**. See the next step for more information.
- You can click **Edit** to modify the settings for this migration. This includes selecting a new data center, migration zone, storage pool, or application group, and clicking **Update**.
- Click **Refresh** to update the status of the migration as needed.

Notes:

- Note that if you see this icon next to an action, that action will be performed on the VM, such as **Power Off** or **Reset CBT**.
- The information listed under Additional Data on this page is provided for informational purposes and is useful for Support in the event troubleshooting is required.

Step 7. Once one or more synchronizations are complete, you can perform a cutover by clicking the appropriate button on the VM detail page. Cutovers come in two forms, which vary in their behavior and “finality”:

- **Cutover:** The source Virtual Machine stays up, meaning the snapshot is crash-consistent. The new VM on ThinkAgile CP gets a new IP address, and synchronizations continue after the cutover until stopped.
- **Final Cutover:** Migration Manager shuts the source VM (for example, meaning it is fully consistent), performs a final sync, and then spins up a ThinkAgile CP VM, keeping the old IP addresses, if placed on a VLAN. Synchronizations end, and the worker is released for another source VM to use.

View the dashboard

Complete these steps to view the Migration Manager dashboard.

Step 1. Click **Dashboard** in the top navigation menu.

Figure 24. Migration Manager menu - Dashboard

Step 2. The Dashboard shows a list of all of your VMware VMs. This list includes the name of the VM, the DC (Datacenter) in which it resides, the Migration Status (Running/State), whether CBT is enabled, the Guest Host Name, the Guest OS Full Name, and the VM's Power State.

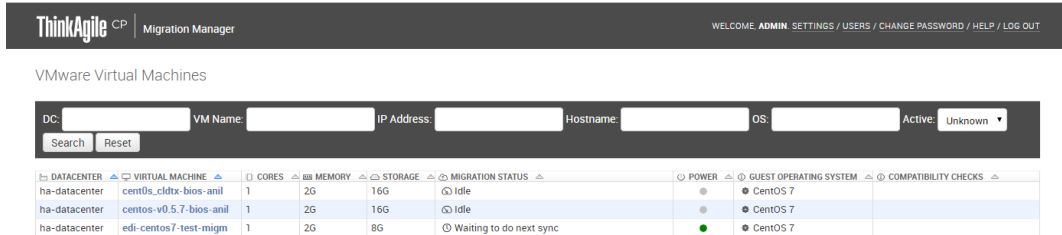


Figure 25. Migration Manager Dashboard

Step 3. In the DC, VM Name, IP Address, Hostname, and OS fields at the top of the Dashboard, you can enter text and click **Search** to search the list of VMs.

Step 4. You can also click the heading of a column in this list to sort the list by that column.

Step 5. In the Actions column, you can click the Actions menu to enable/disable CBT.

View and manage migration workers

Refer to the following topics to understand more about migration workers.

- [“View migration workers” on page 19](#)
- [“View and change IP addresses for workers” on page 21](#)

View migration workers

Complete these steps to view and manage migration workers.

Step 1. Click **Settings** in the top navigation bar.

Figure 26. Migration Manager menu - Settings

Step 2. On the Settings page, click **Migration Worker**.

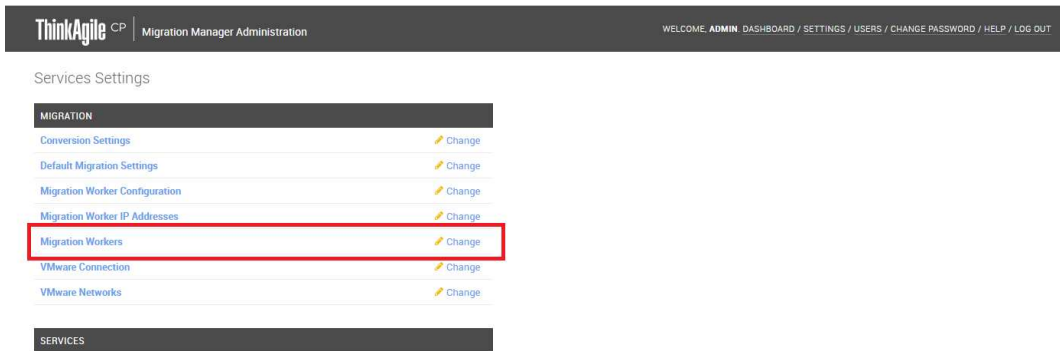


Figure 27. Migration Manager Settings

The Select Migration Worker to Change page opens.

- Step 3. On this page, you can select workers and click **Ensure Worker** to make sure that workers are all up. This is also useful to ensure that the number of workers matches your configuration.



Figure 28. Migration Workers page

- Step 4. In this list, you can click a migration worker to view details about that worker.

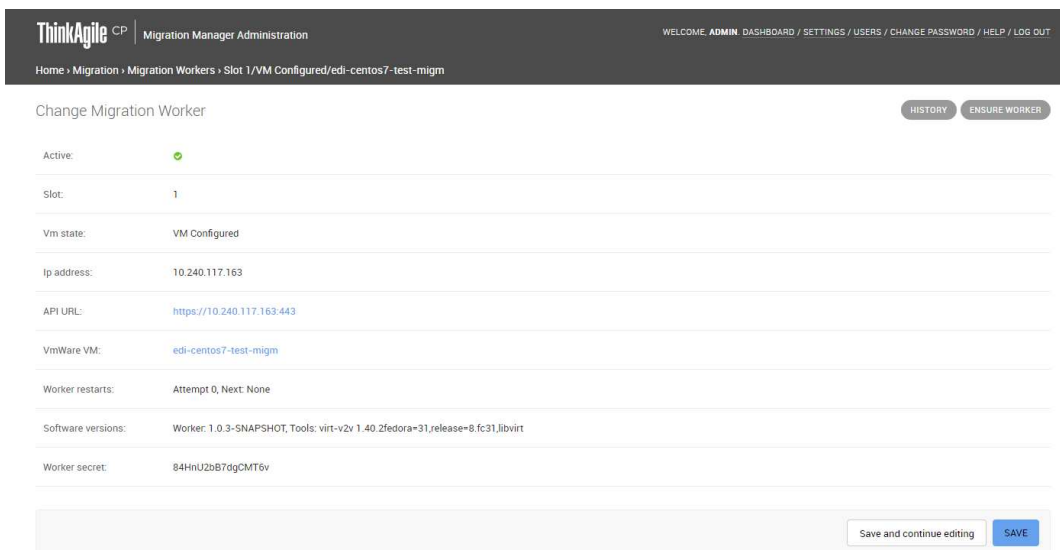


Figure 29. Migration Worker details page

This page shows the following information about the migration worker.

- Active status

- Slot
- VM State
- IP Address
- API URL
- VMware VM
- Worker restarts:
 - Number of restart attempts
 - Next restart attempt
- Software versions
- Worker secret

Step 5. You can click **History** to view a change history for this worker.

View and change IP addresses for workers

If you specified a range of IP addresses when configuring Migration Workers, you can view and change the IP addresses as needed.

Note: When you “specify IP addresses” on page 3, the workers will boot via DHCP on the specified network, and if static IP address ranges were specified, the VMs will be dynamically reconfigured to use an "in-range" IP address after they boot; a pool of IP addresses will be maintained and assigned to workers as they are created and released to be re-used when workers are destroyed. (This is optional).

Follow these steps to view or change IP addresses for workers.

Step 1. Click **Settings** in the top navigation bar.



Figure 30. Migration Manager menu - Settings

Step 2. On the Settings page, click **Migration Worker IP Addresses**.

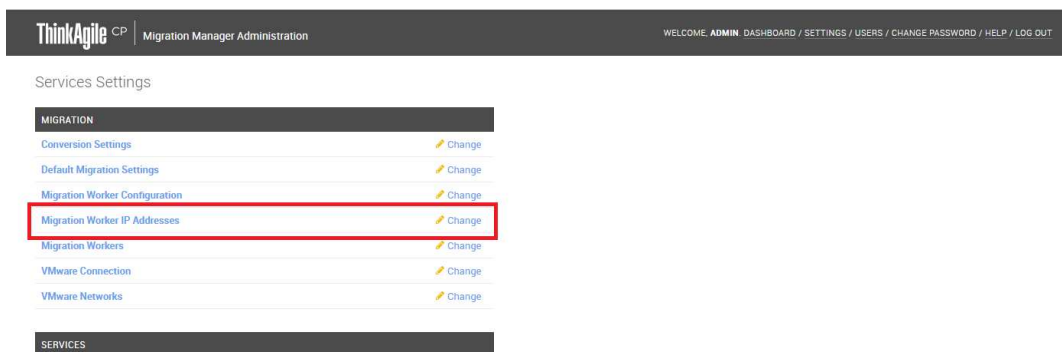


Figure 31. Migration Manager Settings

The Select Migration Worker IP Address to Change page opens.

Step 3. In the Search field, you can enter text and click Search to search the list of workers.

Step 4. Select a worker in the list to view or change.

Manage Groups and Users

In the ThinkAgile CP Migration Manager you can easily manage users and groups in the application, such as adding groups, adding and assigning users to groups, modifying users, and modifying groups.

Refer to the following topics:

- “View Groups” on page 22
- “Add a Group” on page 22
- “Modify a Group” on page 23
- “Delete Groups” on page 23
- “View Migration Manager users” on page 24
- “Add a User” on page 25
- “Modify a User” on page 26
- “Delete Users” on page 27

View Groups

Follow these steps to view groups.

Step 1. In the top navigation menu, click **Users**.



Figure 32. Users menu

Step 2. On the Users and Group Administration page, click **Groups**. The Select group to change page opens.

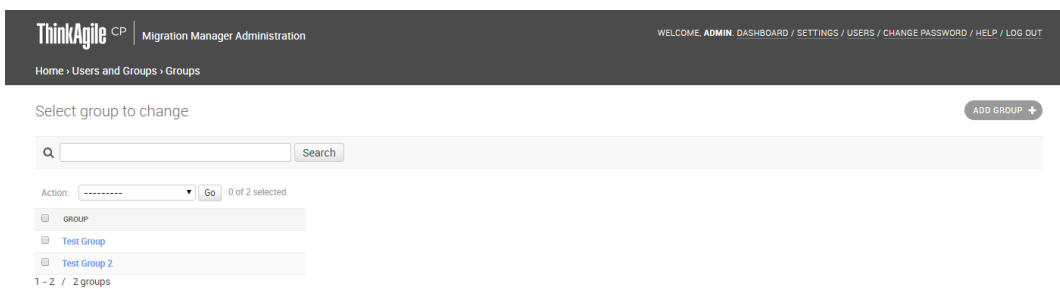


Figure 33. View Groups

Step 3. In the Search field, you can enter text and click **Search** to search the list of groups.

Step 4. Select a group in the list to view or change group details.

Add a Group

Follow these steps to add a group.

Step 1. In the top navigation menu, click **Users**.

Figure 34. Users menu

Step 2. On the Users and Group Administration page, click **Add** next to Groups.

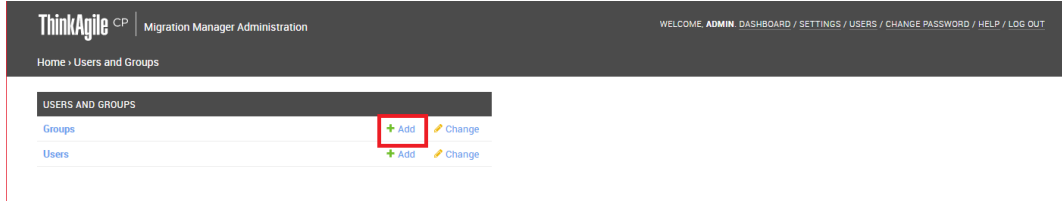


Figure 35. Add Groups

Step 3. On the Add Group page, enter a name for the Group.

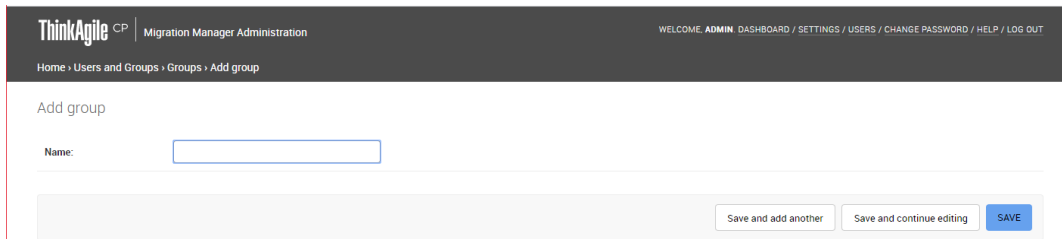


Figure 36. Add Group page

Step 4. Click **Save** or click **Save and Add Another** to add another group.

Modify a Group

Follow these steps to modify a group.

Step 1. In the top navigation menu, click **Users**.



Figure 37. Users menu

Step 2. On the Users and Group Administration page, click **Change** next to Groups.

Step 3. On the Select Group to Change page, select the group you want to modify.

The Change Group page opens.

Step 4. Modify the Group Name as needed.

Step 5. Click **Save** or click **Save and Add Another** to add another user.

Delete Groups

Follow these steps to delete groups.

Step 1. In the top navigation menu, click **Users**.

Figure 38. Users menu

- Step 2. On the Users and Group Administration page, click **Change** next to Groups.
- Step 3. On the Select Group to Change page, select the group(s) you want to delete.
- Step 4. In the Action drop-down menu, select **Delete Selected Groups**, and click **Go**.

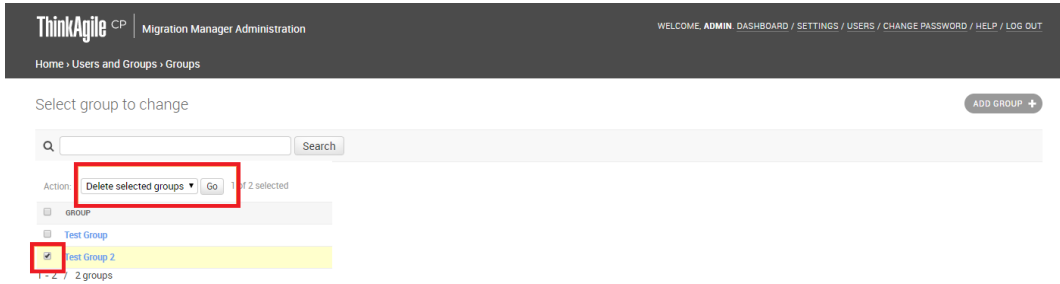


Figure 39. Delete selected group(s)

View Migration Manager users

You can view all users with access to the Migration Manager instance.

Complete the following steps to view Migration Manager users:

- Step 1. In the top navigation menu, click **Users**.

Figure 40. Users menu

- Step 2. On the Users and Group Administration page, click **Users**. The Select user to change page opens.

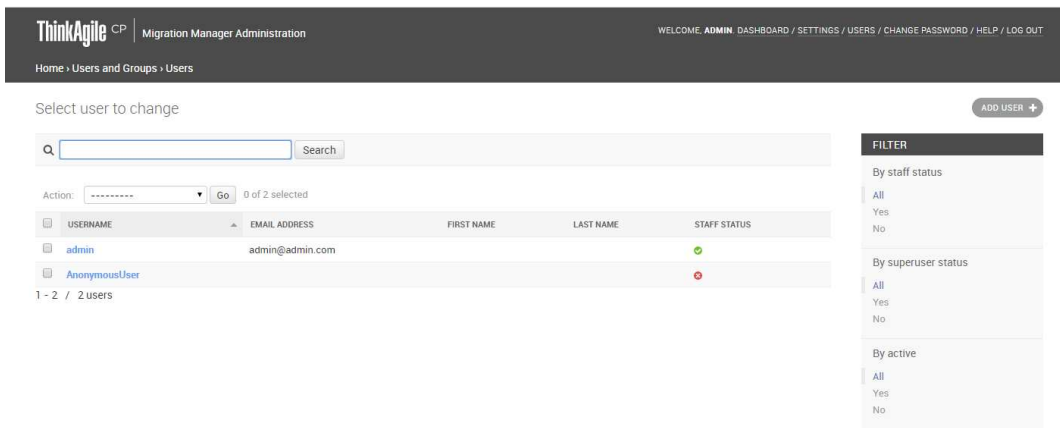


Figure 41. View Users

- Step 3. In the Search field, you can enter text and click **Search** to search the list of users.

Step 4. Under Filter, you can filter the list of users by selecting one of the following filters:

- **By Staff Status** – Select All, Yes, or No.
- **By Super User Status** – Select All, Yes, or No.
- **By Active** – Select All, Yes, or No.

Step 5. Select a user in the list to view or change user details.

Add a User

Follow these steps to add a user.

Step 1. In the top navigation menu, click **Users**.



Figure 42. Users menu

Step 2. On the Users and Group Administration page, click **Add** next to Users.

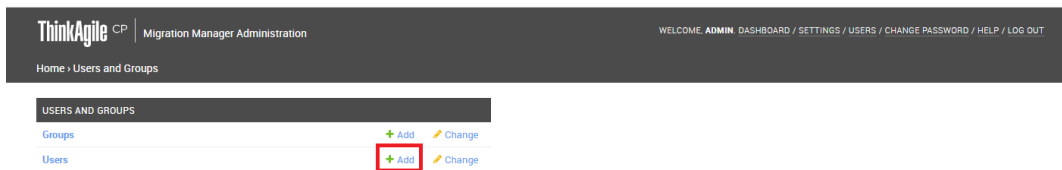


Figure 43. Add User

The Add User page opens.

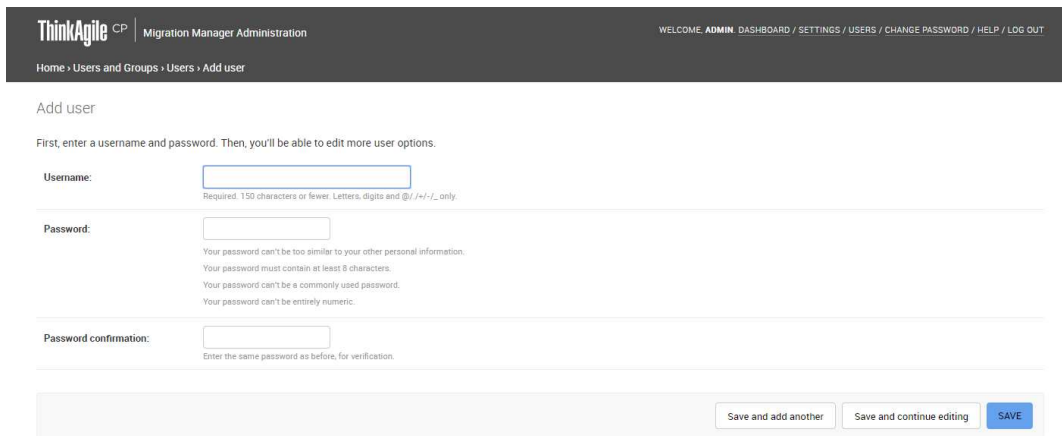
The image shows the 'Add user' page. At the top, it says 'Add user' and 'First, enter a username and password. Then, you'll be able to edit more user options.' There are three input fields: 'Username:' with a note 'Required. 150 characters or fewer. Letters, digits and @/./+/-/_ only.', 'Password:' with notes 'Your password can't be too similar to your other personal information.', 'Your password must contain at least 8 characters.', 'Your password can't be a commonly used password.', and 'Your password can't be entirely numeric.', and 'Password confirmation:' with a note 'Enter the same password as before, for verification.' At the bottom right, there are three buttons: 'Save and add another', 'Save and continue editing', and a blue 'SAVE' button.

Figure 44. Add User page

Step 3. Enter a username for the user.

Step 4. Enter and confirm the password for the user. Keep the following in mind when entering a password.

Notes:

- The password can't be too similar to the user's other personal information.
- The password must contain at least 8 characters.

- The password can't be a commonly used password.
- The password can't be entirely numeric.

Step 5. Click **Save** or click **Save and Add Another** to add another user.

Step 6. To assign this user to a group, see the next topic [“Modify a User” on page 26](#).

Modify a User

Follow these steps to modify a user.

Step 1. In the top navigation menu, click **Users**.



Figure 45. Users menu

Step 2. On the Users and Group Administration page, click **Change** next to Users.

Step 3. On the Select User to Change page, select the user you want to modify.

The Change User page opens.

Username:
Required: 150 characters or fewer. Letters, digits and @/./+/-/_ only

Password: **algorithm: pbkdf2_sha256 iterations: 100000 salt: CwLZJQ***** hash: E6kG+4*******
Raw passwords are not stored, so there is no way to see this user's password, but you can change the password using [this form](#).

Personal info

First name:

Last name:

Email address:

Permissions

Active
Designates whether this user should be treated as active. Unselect this instead of deleting accounts.

Staff status
Designates whether the user can log into this admin site.

Superuser status
Designates that this user has all permissions without explicitly assigning them.

Groups:

Available groups

Filter

Choose all

Chosen groups

Remove all

The groups this user belongs to. A user will get all permissions granted to each of their groups. Hold down "Control", or "Command" on a Mac, to select more than one.

Important dates

Last login: May 14, 2020, 3:32 p.m.

Date joined: May 21, 2018, 7:35 p.m.

Figure 46. Users menu

Step 4. To change the username, enter a new username in the Username field.

Step 5. To change the user password, click the **Change Password Form** link.

Note: Raw passwords are not stored, so there is no way to see this user's password, but you can change the password using the link provided.

Step 6. Enter a new password and confirm the new password. Keep the following in mind when entering a password.

Notes:

- The password can't be too similar to the user's other personal information.
- The password must contain at least 8 characters.
- The password can't be a commonly used password.
- The password can't be entirely numeric.

Delete Users

Follow these steps to delete users.

Step 1. In the top navigation menu, click **Users**.



Figure 47. Users menu

Step 2. On the Users and Group Administration page, click **Change** next to Users.

Step 3. On the Select User to Change page, select the user(s) you want to delete.

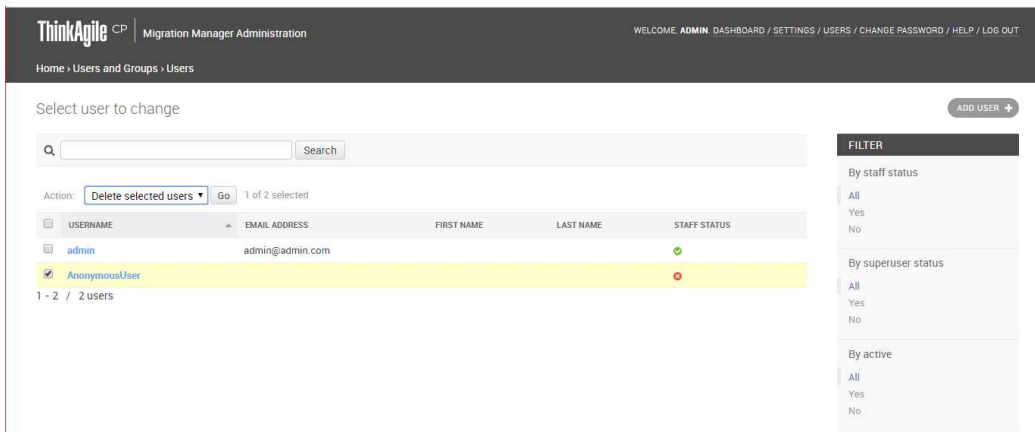


Figure 48. Delete selected user(s)

Step 4. In the Action drop-down menu, select **Delete Selected Users**, and click **Go**.

Change account password

Follow these steps to change your account password.

Step 1. To change your account password, click **Password** in the top navigation menu.



Figure 49. Migration Manager menu - Change Password

The Password Change page opens.

Figure 50. Password Change page

Step 2. Enter your current password, enter your new password, and confirm your new password. Keep the following in mind when entering a password.

Notes:

- The password can't be too similar to the user's other personal information.
- The password must contain at least 8 characters.
- The password can't be a commonly used password.
- The password can't be entirely numeric.

Step 3. Click **Change My Password**.

Manage API keys

Migration Manager API tokens are used for calling Migration Manager REST APIs by third-party tools.

Note: This feature is only supported by ThinkAgile CP for professional services engagements.

Step 1. Navigate to the Home page, which opens the Home (Site Administration) page.

Step 2. Click **API Keys** to add or modify Migration Manager API tokens.

vSphere account permissions

A vSphere user with administrative privileges will be sufficient for use with Migration Manager. For those users who want to more narrowly define a role with a service account, the detailed permissions for this account are provided for your reference in the following table.

Table 2. Low-level vSphere permissions for account used by Migration Manager

Privilege Level	Permission
Cryptographic operations	<ul style="list-style-type: none"> • Direct Access
Datastore	<ul style="list-style-type: none"> • Low-level file operations
Datastore Cluster	<ul style="list-style-type: none"> • Configure a datastore cluster

Table 2. Low-level vSphere permissions for account used by Migration Manager (continued)

Privilege Level		Permission	
Global		<ul style="list-style-type: none"> • Disable methods • Enable methods • Licenses 	<ul style="list-style-type: none"> • Log event • Manage custom attributes • Set custom attribute
Host	Configuration	<ul style="list-style-type: none"> • Network configuration 	
Network		<ul style="list-style-type: none"> • Configure 	
Virtual Machine	Change Configuration	<ul style="list-style-type: none"> • Acquire configuration • Toggle disk change tracking • Acquire disk lease 	<ul style="list-style-type: none"> • Modify device settings • Set Annotation
	Guest Operations	<ul style="list-style-type: none"> • Guest operation modifications • Guest operation program execution 	<ul style="list-style-type: none"> • Guest operation queries
	Interaction	<ul style="list-style-type: none"> • Guest operating system management by VIX API 	<ul style="list-style-type: none"> • Power On • Power Off
	Provisioning	<ul style="list-style-type: none"> • Allow read-only disk access 	<ul style="list-style-type: none"> • Allow virtual machine download
	Snapshot Management	<ul style="list-style-type: none"> • Create snapshot 	<ul style="list-style-type: none"> • Remove snapshot

Accessing the Migration Manager Instance Overview

This section covers how to access the Migration Manager Instance overview.

Step 1. Once the Migration Manager Instance is configured, you access it by navigating to **Applications** → **All Instances**, or to **VDC Instances** under your virtual datacenter.

Step 2. Select the Migration Manager from the list of application instances.

Application Instances ○ 10

[New Instance](#)

Filter by

Start/resume
 Pause
 Shutdown
 0 selected

Name	IP Address(es)	CPU (cores)			Memory		NW BW (MBps)		ST BW (MBps)		IOPS		IO QL	
		Prov.	% vCPU	% CPU	Prov.	Load	Read	Write	Read	Write	Read	Write		
<input type="checkbox"/> AP WinServer2016	10.240.22.216	4	0%	5%	8 GiB	2.2 GiB	0	0	0	0	0	0	0	
<input type="checkbox"/> CentOS 7 with FIO	10.10.10.23	8	24%	36%	32 GiB	1.1 GiB	0	0	29.4	12.6	7173	3077	0	
<input type="checkbox"/> CentOS 7.5_longevity	10.10.10.22	4	0%	0%	2 GiB	651 MiB	0	0	0	0	0	0	0	
<input type="checkbox"/> CentOS 7.5_uma	10.10.10.48	2	0%	0%	2 GiB	574 MiB	0	0	0	0	0	0	0	
<input type="checkbox"/> Metering Manager	10.10.10.30	2	26%	0%	8 GiB	1.3 GiB	0	0	0	0	0	0	0	
<input type="checkbox"/> Migration Manager	10.10.10.31	4	0%	0%	8 GiB	1.6 GiB	0	0	0	0	0	0	0	
<input type="checkbox"/> RHEL 7.4_Longevity	10.10.10.26	2	0%	0%	2 GiB	720 MiB	0	0	0	0	0	0	0	
<input type="checkbox"/> VNET_Default-NFV	10.10.10.2...	1	0%	1%	1 GiB	300 MiB	0	0	0	0	0	0	0	
<input type="checkbox"/> Windows Server 2016_lo...	10.10.10.24	8	0%	3%	32 GiB	1.9 GiB	0	0	0	0	0	0	0	
<input type="checkbox"/> Windows Server 2019_Lo...	10.10.10.25	8	5%	29%	32 GiB	2.3 GiB	0	0	0	0	0	1	0	

Figure 51. Application Instances List

The Migration Manager Overview is displayed.

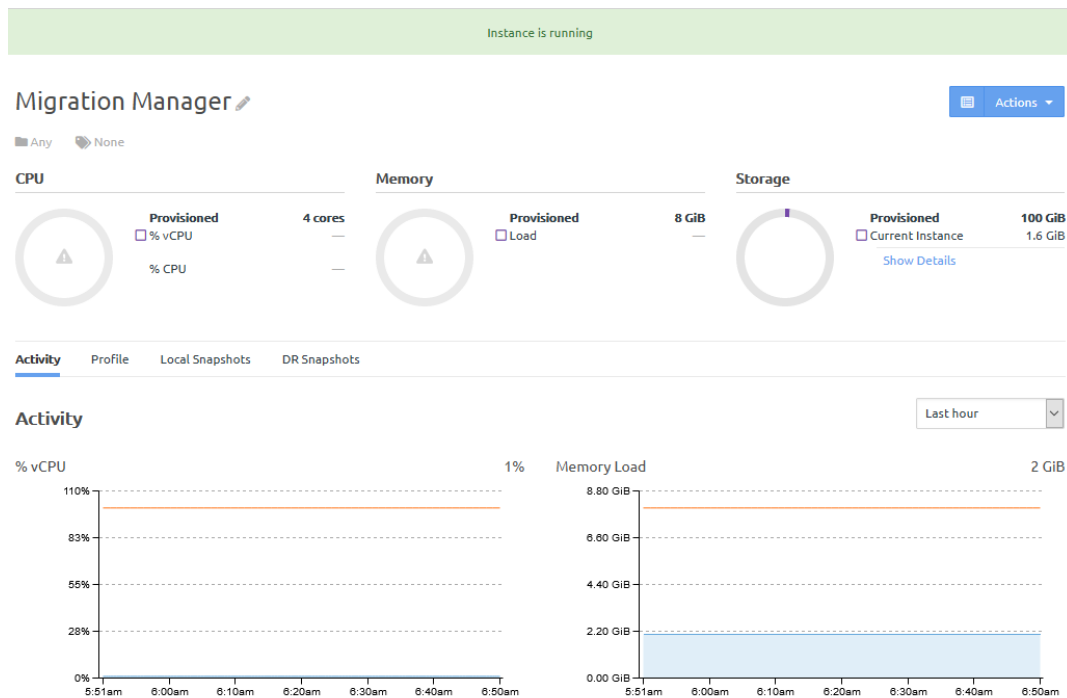


Figure 52. Migration Manager Overview

Migration Manager Overview Details

This section covers an overview of the Migration Manager CPU Overview details.

The Overview displays information about the following topics:

- Instance State

- Resource Usage
- Activity
- Profile
- Local Snapshots
- Disaster Recovery (DR) Snapshots

Activity Profile Local Snapshots DR Snapshots

Instance State

At the top of the Migration Manager Overview, the current state of the application is displayed:

- Instance is running
- Instance is paused
- Restarting application instance
- Shutting down application instance

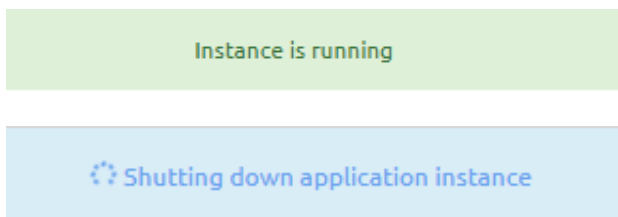


Figure 53. Migration Manager States

Resource Usage

The Overview displays the provisioned resources (CPU cores, memory and storage), and their current use.

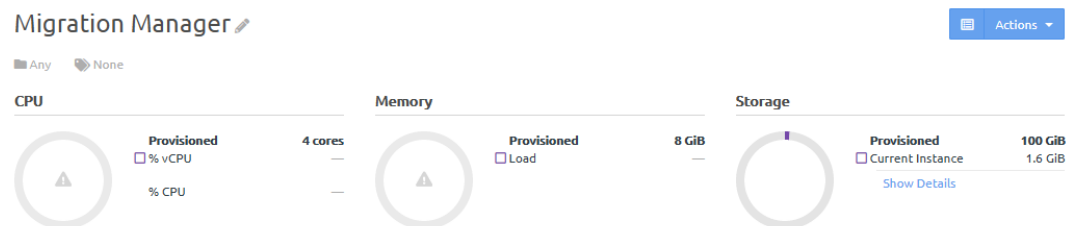


Figure 54. Migration Manager Resource Usage

Action Menu

This section covers the available options under the Action menu of the Migration Manager.

From the **Actions** menu of the application instance, you can perform a multitude of actions.

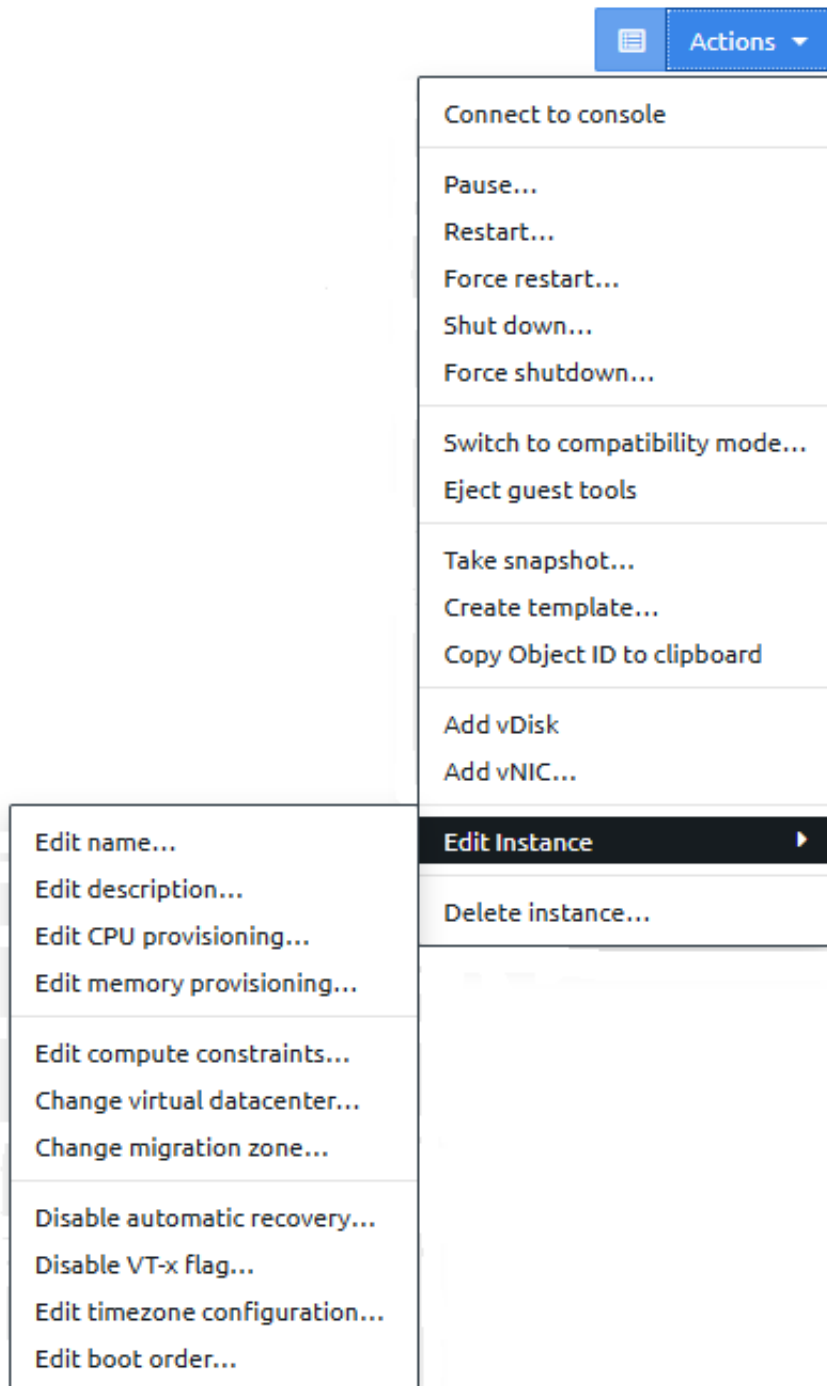


Figure 55. Migration Manager Action Menu Options

Connect to console

This option opens a connection to the Linux Kernel for the Migration Manager instance.

Instance State

To change the current state of the Migration Manager instance by selecting the following actions:

- **Pause...** — pause the operation of the application instance

- **Resume...** — resume the operation the application instance
- **Note:** This option is available only once the instance is paused.
- **Restart...** — restart the application instance
- **Force restart...** — forcefully restart the application instance
- **Shut down...** — shut down the application instance
- **Force shutdown...** — forcefully shut down the application instance

Instance Modes

The **Switch to...** action enables to change the instance mode for the Migration Manager. You can choose between enhanced mode and compatibility mode.

Note: The application instance must be first shut down before changing the instance mode.

Guest Agent Tools

To detach all Guest Agent tools from the instance, select the **Eject guest tools** option.

The Guest Agent tools can be attached by clicking the **Insert guest tools** option.

Snapshot

To create a snapshot of the current instance, select the **Take snapshot...** option.

Take a Snapshot

Instance	Migration Manager
Name	<input style="width: 90%; border: 1px solid #ccc;" type="text" value="Snapshot 1"/>

Cancel
Take Snapshot

Create Template

To create a new application template with the current configured instance settings, select the **Create template...** option.

Create Application Template

Save to:

Template Properties

Template Name

Description

OS Type Linux

Source Application Migration Manager

Virtual Datacenter ACME Labs

Provisioning CPU cores Memory GiB

Boot Order

Boot Order Disk 0 > vNIC 0

Instance Settings

Instance Mode

Compatibility Mode
All instances can boot in this mode.

Enhanced Mode
Virio drivers must be installed to boot in this mode.

Enhanced Mode

In this mode:

- Storage disks are exported as virtio iSCSI devices
- vNICs are exported as virtio vNICs
- Snapshots will be application consistent (when ThinkAgile CP Guest Agent is installed) if the guest OS supports freeze and thaw
- CPU and Memory Statistics are available (When ThinkAgile CP Guest Agent is installed)

[Learn more about instance modes](#)

Sysprep

Partial Sysprep
Resets the hostname and resets the network to DHCP.

Full Sysprep
Resets hostname and other identifiable information of the VM. Network mode will be set to DHCP.

Note: Full Sysprep is not available for a running instance or an instance with a vNIC as the first item in the boot order.

You can edit the following parameters:

- The destination of the new template
- The name and description of the new template
- The number of CPU cores and memory provisioned
- The boot sequence of the instance
- The instance mode

- The extent of sysprep (System Preparation)

Copy Object ID

To copy the object ID of the Migration Manager instance, select the **Copy Object ID to clipboard** option.

Add a vDisk

To add a new virtual disk (vDisk) to the application instance, select the **Add vDisk** option.

New vDisk

Enter details for the new vDisk

vDisk Name

vDisk Size

Add custom limits if needed. IOPS and bandwidth are unlimited by default.

IOPS Limit

Bandwidth Limit

You can configure the following parameters:

- **vDisk Name** — the name of the new virtual disk
- **vDisk Size** — the size in GB of the new virtual disk
- **IOPS Limit** — whether to limit the number of Input/Output operations per second
- **Bandwidth Limit** — whether to limit the allocated bandwidth in Mbps

Add a vNIC

To add a new virtual network interface controller (vNIC) to the application instance, select the **Add a vNIC** option.

Note: The instance must be first shut down before adding any vNICs.

New vNIC

Instance Migration Manager

Enter vNIC properties

vNIC Name

Networking Mode

Network

Firewall Profile **Firewall Override**

MAC Address

You can configure the following parameters:

- **vNIC Name** — the name of the new vNIC
- **Networking Mode** — the network mode of operation(VNET or VLAN)
- **Network** — the network used by the new vNIC
- **Firewall Profile and Override** — the firewall settings for the new vNIC
- **MAC Address** — whether the new vNIC is assigned automatically assigned a MAC address, or one is supplied manually

Edit the Instance

From the **Edit Instance** menu, you can configure multiple application instance parameters. For more details, see [“Profile” on page 40](#).

Delete the Instance

To delete the Migration Manager application instance, select the **Delete Instance...** option.

Activity

This section covers the information displayed under the **Activity** tab of the Migration Manager.

CPU, Memory and Network Statistics

The first section of the **Activity** tab displays statistics regarding the CPU load, memory load, and network read and write bandwidths. These statistics can be viewed for several time periods:

- Last hour

- Last 6 hours
- Last 12 hours
- Last 24 hours
- Last 7 days
- Last month
- Last 3 months
- Last year

Activity

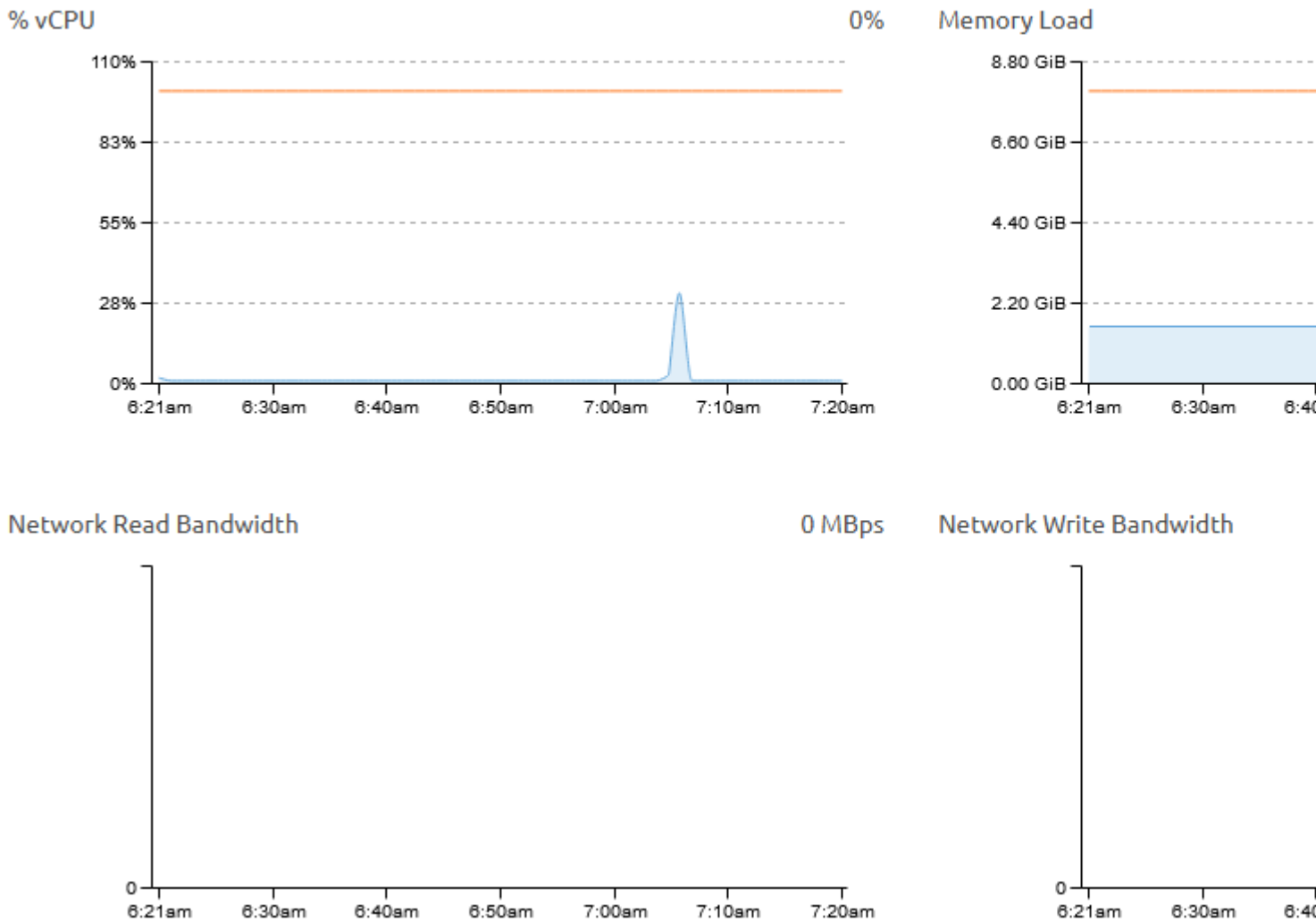


Figure 56. CPU, Memory and Network Usage Statistics

Storage Statistics

The second section of the **Activity** tab displays statistics regarding storage usage. These statistics include the following:

- Storage Instance

- Storage Footprint
- Storage Read Bandwidth
- Storage Write Bandwidth
- Read IOPS
- Write IOPS
- IO Queue Length (Average Across Disks)

You can select a specific storage disk from the drop-down menu.

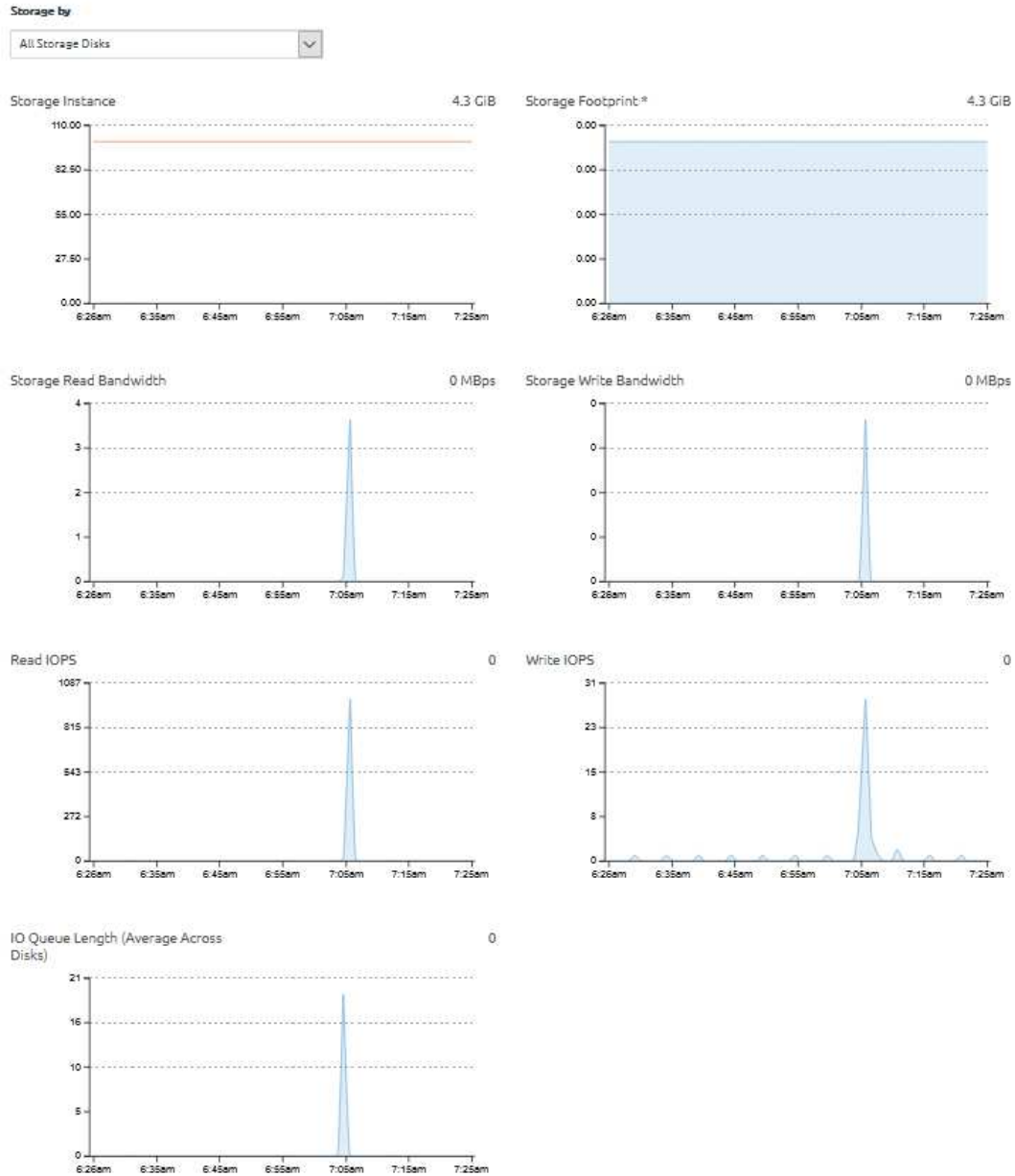


Figure 57. Storage Statistics

Profile

This section covers the Migration Manager **Profile** information and editable parameters.

Note: Any profile editing actions are available only when the Migration Manager application instance is shutdown. You can edit these parameters when the instance is running or it is paused.

General

This section covers the basic parameters for the application instance. These include:

- **Description** — the description of the Migration Manager instance
- **Virtual Datacenter** — the assigned VDC
- **Instance Mode** — the application instance mode: Enhanced or Compatibility

For more details about instance modes, see https://thinkagile.lenovofiles.com/help/topic/thinkagile_cp/understand-instance-modes.html.

- **ThinkAgile CP Guest Agent** — the currently installed guest agent tools

For more details about guest agents, see https://thinkagile.lenovofiles.com/help/topic/thinkagile_cp/install-guest-agent-tools.html.

Note: This option is available only when Enhanced Instance Mode is configured.

General



Description	Migration Manager provides point-and-click live migration of your VMware workloads to ThinkAgileCP with no VM preparation and no post-migration reconfiguration. Leveraging snapshot technology, workloads are moved incrementally while the VM operates non-disruptively. The tool is provider free to our customer to use at their own risk. Optionally, professional services engagements are available to assist customers with migration, contact your Lenovo sales representative for details. 
Virtual Datacenter	ACME Labs 
Instance Mode	Enhanced (Switch to compatibility mode)
ThinkAgile CP Guest Agent	—

Figure 58. Migration Manager Instance Profile — General parameters

Compute

This section covers the compute parameters for the Migration Manager instance. These include:

- **Migration Zone** — the migration zone assigned to the instance
- **Node** — specific compute nodes assigned to the instance
- **Compute Constraints** — any configured compute constraints applied to the instance
- **Provisioning** — the number of CPU cores and memory allocated to the instance

Compute

Migration Zone	zone1		
Node	—		
Compute Constraints	CATEGORY Any	TAGS	Not Specified
Provisioning	CPU 2 cores	MEMORY	8 GiB

Figure 59. Migration Manager Instance Profile — Compute parameters

Storage

This section covers the storage parameters for the Migration Manager instance. These include:

- **Storage Pool** — the storage pool assigned to the instance
- **Virtual Disks (vDisks)** — the virtual storage disks assigned to the instance

Storage

At least one virtual disk must be present.

Storage Pool pool1

Virtual Disks (vDisks)

Add vDisk

Name	Size	IOPS Limit	Bandwidth Limit	
Disk 0	100 GiB	—	—	...

Figure 60. Migration Manager Instance Profile — Storage parameters

Networking

This section covers the virtual Network Interface Controllers (vNICs) assigned to the Migration Manager instance.

Networking

At least one virtual network interface controller must be present.

Virtual Network Interface Controllers (vNICs)

Add vNIC

vNIC	IP Address	MAC Address	Networking Mode	Network	Firewall Profile	Firewall Override	
vNIC 0	—	b4:d1:35:00:00:ac (automatic)	VNET	VNET_Default	—	—	...

Figure 61. Migration Manager Instance Profile — Networking parameters

Settings

This section covers various settings for the Migration Manager instance. These include:

- **Boot Order** — the boot sequence for the application
- **Timezone Configuration** — the configured timezone

Note: By default, this setting is set to the timezone of the compute node on which the instance is started.

- **Automatic Recovery** — the current state of automatic recovery
- **VT-x flag** — the current state of the VT-x flag

Note: If enabled, this settings enables nested virtualization of KVM hypervisors in your ThinkAgile CP environment.

Settings

Boot Order	Disk 0 > vNIC 0 
Timezone Configuration	Default 
Automatic Recovery	Enabled (Disable)
VT-x flag	Enabled (Disable)

Figure 62. Migration Manager Instance Profile — Settings

Local Snapshots

This section covers the Migration Manager **Local Snapshots**.

In the **Local Snapshot** tab of the Migration Manager, you can take a snapshot of the current instance, revert to an earlier snapshot of the instance, or manage existing snapshots within the snapshot tree.

By default, the Migration Manager creates an initial instance snapshot after the template is downloaded.

You can create a new snapshot by clicking the **Take Snapshot** button.

Take a Snapshot

Instance Migration Manager

Name

The new snapshot is added to the snapshot tree, under the initial application snapshot.

Local Snapshots Enable Automatic Snapshots Take Snapshot ...

pool1




Name	Snapshot Time	Incremental Size	Replication Status
 Initial Application Snapshot (from template)	May 11, 2020 9:43 AM	0 MiB	Revert ...
 Snapshot 1	May 12, 2020 8:28 AM	4.3 GiB	Revert ...

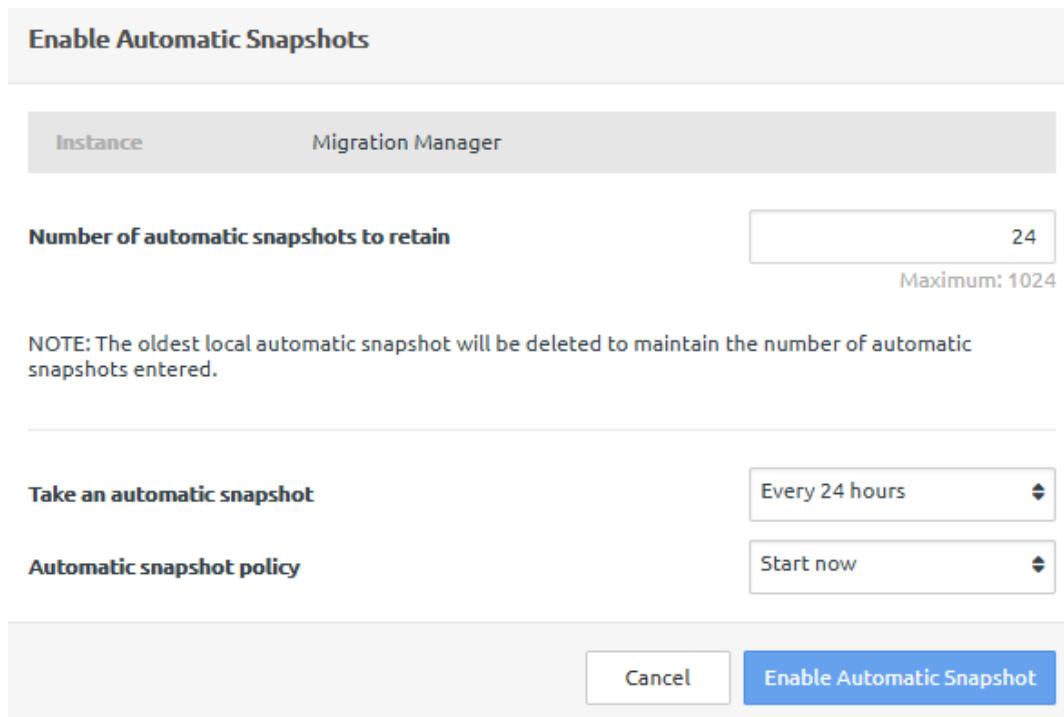
Figure 63. Migration Manager Local Snapshots Overview

From the Local Snapshots action menu , you can configure automatic snapshots, view the automatic snapshot settings, and delete all created snapshots. When configuring automatic snapshots, you can set the following parameters:

- The maximum number of stored snapshots

Note: If this number is exceeded, the oldest snapshots are deleted so new snapshots can be created.

- The time interval when to create an automatic snapshot
- The point in time when the automatic snapshot process starts



Enable Automatic Snapshots

Instance Migration Manager

Number of automatic snapshots to retain Maximum: 1024

NOTE: The oldest local automatic snapshot will be deleted to maintain the number of automatic snapshots entered.

Take an automatic snapshot

Automatic snapshot policy

Figure 64. Configuring Automatic Snapshots

Disaster Recovery Snapshots

This section covers the Migration Manager **DR Snapshots**.

ThinkAgile CP supports a comprehensive retention policy for snapshots. You can specify how many snapshots to keep at the remote site (daily, weekly, monthly or yearly) and the system automatically does the roll-up.

For more details about disaster recovery, see https://thinkagile.lenovofiles.com/help/topic/thinkagile_cp/disaster-recovery.html.

Under the **DR Snapshots** of the Migration Manager, you can view and manager Disaster Recovery (DR) Snapshots for the application instance.

Note: To manage DR snapshots, automatic snapshots and Disaster Recovery must first be enabled for the instance. Click on the **Enable Disaster Recovery** and configure the proper settings.

Turn On Disaster Recovery

Automatic snapshots must be turned on to enable disaster recovery.

Turn On Automatic Snapshot

Number of automatic snapshots to retain

Maximum: 1024

NOTE: The oldest local automatic snapshot will be deleted to maintain the number of automatic snapshots entered.

Take an automatic snapshot

Automatic snapshot policy

Disaster Recovery Settings

Copy automatic snapshots to

 (DR Location)

Retain all automatic snapshots for

 weeks

Retain

 daily snapshots

Retain

 weekly snapshots

Retain

 monthly snapshots

Retain

 yearly snapshots

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