

Getting started with Morpheus and VMware

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INTRODUCTION

This guide is designed to help you get started and quickly get the most out of Morpheus with VMware. By the end, you will integrate your first cloud, configure networking, prepare and consume images, provision instances, and get started with automation. We will briefly discuss installation and account setup but will provide links to additional resources for those very first steps. For the most part, this guide assumes you are able to get Morpheus installed and are ready to move forward from that point. There is a lot more to see and do in Morpheus that is beyond the scope of this guide. For more, consult the complete Morpheus documentation at https://docs.morpheusdata.com or take part in our user community forum at https://www.reddit.com/r/morpheusdata/.

INSTALLATION & SETUP

In the simplest configuration, Morpheus needs one appliance server which will contain all the components necessary to orchestrate virtual machines and containers. Full requirements, including storage and networking considerations, can be found in Morpheus documentation <u>here</u>. In order to provision any new instances, hosts, or applications, (or convert any discovered resources to managed resources) you will need a valid license. If you don't have one, you can request a community license for free at <u>Morpheus Hub</u>. Once obtained, the license can be applied in Administration > Settings > LICENSE.

GROUPS

Groups in Morpheus define which resources a user has access to. Clouds are added to groups and a user can only access clouds that are in the groups to which their roles give them access. More information on Morpheus groups is here. A deep dive into groups goes beyond the scope of this guide but it's often useful to create a group that contains all clouds for testing purposes. We will create that group now so that we can add our first cloud into this group in the next section.

Navigate to *Infrastructure > Groups*. Here we will see a list of all configured groups but, of course, this will be empty immediately after installation. Click "+CREATE". Give your group a name, such as "All Clouds". The "CODE" field is used when calling Morpheus through Morpheus API or Morpheus CLI. It's useful in most cases to have an "All Clouds" group for testing purposes so this will likely help you down the road.

NEW GROUP		×
Configuration		
NAME	All Clouds	
CODE		
LOCATION		
Advanced Option	S	
	SAVE CHANGE	S

Click "SAVE CHANGES". Your group is now ready to accept clouds.

INTEGRATING YOUR FIRST CLOUD

Clouds in Morpheus consist of any consumable endpoint whether that be On-Prem, Public clouds, or even bare metal. In this guide, we will focus on integrating and working with VMware vCenter.

To get started, we will navigate to *Infrastructure > Clouds*. This is the cloud detail page which lists all configured clouds. It will be empty if you've just completed installation and setup of Morpheus, but soon we will see our integrated vCenter cloud here.

Click the "+ADD" button to pop the "CREATE CLOUD" wizard. Select "VMWARE VCENTER" and click the "NEXT" button.

CREATE CLOUD			×
CLOUD CONFIGURE	GROUP REVIEW		
Search		C	<u>م</u>
💞 VirtualBox	VIRTUALBOX VirtualBox		^
virtustream.	VIRTUSTREAM Virtustream		
VMware on AWS	VMWARE CLOUD ON AWS VMWare Cloud on AWS		
ESXi	VMWARE ESXI VMware ESXi		
NMware Fusion	VMWARE FUSION VMWare Fusion		
vm ware [.]	VMWARE VCENTER VMWare VCenter cloud		
XenServer	XENSERVER Xenserver		
			NEXT

On the "CONFIGURE" tab, we're asked to set the initial connection strings into vSphere. The **API URL** should be in the following format: https://<URL>/sdk. The **USERNAME** should be in user@domain format.

CREATE CLOUD	×
	RE GROUP REVIEW
NAME	Lab vCenter
CODE	labvc
LOCATION	Denver, CO
Details	
API URL	https://192.168.0.110/sdk
USERNAME	administrator@vsphere.local
PASSWORD	
VERSION	6.7+ ~
VDC	Home ~
CLUSTER	All

Morpheus allows vCenter clouds to be scoped to the VDC and CLUSTER or even the specific RESOURCE POOL if you choose. Once you've entered your URL and credentials, these dropdown menus will become populated.

The **RPC MODE** setting determines how Morpheus will connect to VMs and make configuration and scripting calls if Morpheus Agent is not installed. In a VMware environment we have the additional option to select VMware Tools if WinRM/SSH are not available.

Additionally, we can opt to INVENTORY EXISTING INSTANCES to begin polling VMs for statistics and rightsizing recommendations as well as ENABLE HYPERVISOR CONSOLE to use native vSphere console with port 443 connectivity between Morpheus and ESXi hosts. To move on, expand the "Advanced Options" section.

Within the "Advanced Options" drawer are additional configurations to consider for your first cloud. Some of these won't usable until they reference additional configured integrations. Common settings to consider are **DOMAIN**, **STORAGE TYPE**, **APPLIANCE URL** (overrides the Morpheus URL for external systems), **GUIDANCE** (setting "Manual" will make recommendations for rightsizing), and **AGENT INSTALL MODE**.

 Advanced Optio 	ns
	ENABLE DISK TYPE SELECTION
	ENABLE NETWORK INTERFACE TYPE SELECTION
STORAGE TYPE	Thin
DOMAIN	Select ~
SCALE PRIORITY	1
	Only affects Docker Provisioning. Specifies the priority with which an instance will scale into the cloud. A lower priority number means this cloud integration will take scale precedence over other cloud integrations in the group.
APPLIANCE URL	https:// <externalfqdn></externalfqdn>
TIME ZONE	America/Denver 🗸

Once you're satisfied with your selections, click "NEXT"

We have now arrived at the "GROUP" tab. In this case, we will mark the radio button to "USE EXISTING" groups if you wish to use the group we configured earlier.

Once you've selected the group, click "NEXT"

On the final tab of the "CREATE CLOUD" wizard, you'll confirm your selections and click "COMPLETE". The new cloud is now listed on the cloud detail page. After a short time, Morpheus will provide summary information and statistics on existing virtual machines, networks, and other resources available in the cloud.

VIEWING CLOUD INVENTORY

CREATE CLOUD		×
	USE EXISTING CREATE NEW	
GROUP	All Clouds	\sim
	PREVIOUS	NEXT

Now that we've integrated our first VMware cloud, we can stop for a moment to review what Morpheus gives us from the cloud detail page. We can see that Morpheus gives us estimated costs and cost histories, metrics on used resources, and also lists out resource counts in various categories including container hosts, hypervisors, and virtual machines. We can drill into these categories to see lists of resources in the various categories individual resources within them by clicking on the category tabs. We can link to the detail page for any specific resource by clicking on it from its resource category list.

CONFIGURING RESOURCE POOLS

With our VMware cloud configured, Morpheus will automatically sync in available resource pools and data stores.

For resource pools, once Morpheus has had time to ingest them, then will be visible from the cloud detail page. Navigate to *Infrastructure > Clouds > (your VMware cloud) > RESOURCES tab.* In here, we are able to see and control access to the various resource pools that have been configured in vCenter. For example, we can restrict access to a specific resource pool within Morpheus completely by clicking on the "ACTIONS" button, then clicking "Edit". If we unmark the "ACTIVE" button and then click "SAVE CHANGES" we will see that the resource pool is now grayed out in the list. The resources contained in that pool will not be accessible for provisioning within Morpheus.

Often our clients will want to make specific blocks of resources available to their own customers. This can be easily and conveniently controlled through the same "EDIT RESOURCE POOL" dialog box we were just working in. If we expand the "Group Access" drawer, we are able to give or remove access to each pool to any group we'd like. We can also choose to make some or all of our resource pools available to every group. Specific resource pools can also be defined as the default for each group if needed.

POOLS Search Q					
NAME	DESCRIPTION	VISIBILITY	DEFAULT	TENANT	
Demo-vSAN		Private		morpheus	ACTIONS -
Demo		Private		morpheus	ACTIONS -
Pied Piper		Private		morpheus	ACTIONS -
Prod		Private		morpheus	ACTIONS -
Sandbox		Private		morpheus	ACTIONS -

EDIT RESOURCE POOL							
NAME	Demo-vSAN						
MOVE SERVERS							
	DEFAULT						
▼ Group Access							
GROUP		ACCESS	DEFAULT				
all		<					
АА							
AA-DB							

Additionally, we may choose to allow only certain service plans to be provisioned into a specific pool of resources. For example, perhaps a specific cluster is my SQL cluster and only specific services plans should be consumable within it. We can control that through this same dialog box.

CONFIGURING DATA STORES

To take a look at data stores, we'll move from the "RESOURCES" tab to the "DATA STORES" tab on our cloud detail page.

Morpheus gives the user similar control with data stores to what we saw with our resource pools earlier. Just like with resource pools, we can disable access within Morpheus completely by clicking on "ACTIONS" and then "Edit". If we unmark the "ACTIVE" checkbox and click "SAVE CHANGES", you will see that specific data store has been grayed out. Just like with resource pools, we are also able to scope data stores to specific groups. This ensures that the members of each group are only able to consume the data stores they should have access to.

SUMMARY	CLUSTERS	HOSTS	VMS	CONTAINERS	LOAD BALANCERS	NETWORKS	DATA STORES	RESOURCES	POLICIES	WIKI
Search	C	2								
□ NAME	т	YPE CAPACI	TY ONLINE	E VISIBILITY TENA	NT					
ds-65-roo	t V	mfs 461.1Gil	B Yes	Private morpl	neus					ACTIONS -

EDIT DATA STORE		×
NAME ds-65-root		
ACTIVE		
▼ Group Access		
GROUP	ACCESS	
all		
АА		
AA-DB	\Box	

CONFIGURING NETWORK FOR PROVISIONING

When configuring networking, we can set global defaults by going to *Infrastructure > Network > NETWORKS tab*. Here we can add or configure networks from all clouds integrated into Morpheus. Depending on the number of clouds Morpheus has ingested, this list may be quite large and may also be paginated across a large number of pages. In such a case, it may be easier to view or configure networks from the specific cloud detail page so that networks from other clouds are not shown.

Still in *Infrastructure > Network*, make note of the "INTEGRATIONS" tab. It's here that we can set up any integrations that may be relevant, such as IPAM integrations. Generally speaking, when adding IPAM integrations, we simply need to name our new integration, give the API URL, and provide credentials. There's more information in the IPAM integration section of Morpheus Docs.

ETWORKS					
NETWORKS	S ROUTERS IP POOL	S DOMAINS	PROXIES	SECURITY GROUPS INTEGRATIONS	
Search Q					+ ADD
NAME	TYPE	CLOUD	CIDR	POOL DHCP VISIBILITY TENANTS	
10.30.20.0	OracleVM Network	Morpheus Oracle VM	10.30.20.0/22	Public morpheus	ACTIONS -
172.31.0.0/20 (subnet-63dff13b)	Amazon Subnet	ah-only	172.31.0.0/20	Private morpheus	ACTIONS -

ADD IPAM INTEGR	ATION X
NAME	
	C ENABLED
URL	https://x.x.x.x/wapi/v2.2.1
USERNAME	
PASSWORD	
THROTTLE RATE	0 ms

In *Infrastructure > Networking* we can also set up IP address pools from the IP Pools tab. These pools can be manually defined, known as a Morpheus-type IP pool, or they can come from any IPAM integrations you've configured. As instances are provisioned, Morpheus will assign IP addresses from the pool chosen during provisioning. When the instance is later dissolved, Morpheus will automatically release the IP address to be used by another instance when needed. When adding or editing a network, we can opt to scope the network to one of these configured IP address pools.

Since this guide is focused on working within a VMware cloud that we integrated at the start, we will take a look at our network configurations on the cloud detail page as well. Navigate to *Infrastructure > Clouds > (your VMware cloud) > NETWORKS tab.* Just as with resource pools and data stores, we have the ability to make certain networks inactive in Morpheus, or scope them to be usable only for certain groups or tenants.

CREATE NETWORK	POOL	×
NAME		
POOL TYPE	Morpheus	\sim
IP Ranges		
STARTING ADDRESS	ENDING ADDRESS	
192.168.0.2	- 192.168.0.255	+
		SAVE CHANGES

SUMMARY	CLUSTERS	HOSTS VI	MS CONTA	INERS LOA	D BALANCERS	NETWORKS	DATA STOR	ES RESOUR	RCES POLICIES	WIKI
NETWORK	S									
Search	٩									
NAME		TYPE		CIDR	Ρ	OOL	DHCI	VISIBILITY	TENANT	
default		KVM Host Bri	idge	192.168.122.1	/24		~	Private	morpheus	ACTIONS -
🗌 docker bri	dge	Docker Bridge					~	Private	morpheus	ACTIONS -
Garf-Netv	vork	Overlay		0.0.0/10	V	anishing-IP-Test		Private	morpheus	ACTIONS -

PREPPING AN IMAGE

As we'll discuss and try out in the next section, Morpheus comes out of the box with a default set of blueprints that are relevant to many modern deployment scenarios. For the most part, these are base operating system images with a few additional adjustments. However, in many on-premise deployments, there are often custom image and networking requirements. We will work with images included in Morpheus by default in this guide but it's important to discuss how to prep custom images as well.

Creating A Windows Image

The following versions of Windows Server are supported:

```
2008 R2, 2012, 2012 R2, 2016, 2019
```

To start, create a new Windows machine in vCenter using a base version of your selected Windows build.

NOTE: It's recommended to make the VMDK drive as small as possible for your purposes as this generally speeds cloning and deploy times. Morpheus

provisioning and post-deploy scripts allow to expand the drive to any size that you need.

Once the machine is created, ensure VMtools is installed on the operating system. Then, apply all updates and service packs. Next, configure WinRM and open the firewall:

winrm quickconfig

NOTE: WinRM configuration is optional if using VMtools RPC mode for agent install and Morpheus Agent for guest exec.

Next, we'll install .NET 4.5 or higher. Ensure Windows Firewall will allow WinRM connections and shut down the virtual instance. Finally, convert it to a template.

NOTE: Morpheus will Sysprep images based on the "Force Guest Customizations" flag under VM settings when using DHCP. If this flag is enabled or if using static IP addresses or IP pools when provisioning, ensure a Sysprep has not been performed. In such cases, guest customization will always be performed and a Sysprep will be triggered.

Creating A CentOS/RHEL Image

Create a new machine in vCenter and install a base version of your preferred Linux distro.

NOTE: If you are using cloud-init as part of your image, you will need to ensure your virtual machine has a cdrom.

Before installing the operating system, set up a single ext or xfs partition without a swap disk. Next, install the distro applying any updates to the operating system or security updates. Once the operating system is running and updated, install the following:

```
yum install cloud-init
yum install cloud-utils-growpart
yum install open-vm-tools
yum install git
yum install epel-release
```

Unless otherwise required by organizational policy, set Selinux to "permissive" as "enforcing" can cause problems with cloud-init

```
sudo vi /etc/selinux/config
```

Cloud-Init

We'll start by installing cloud-init using the following command:

```
yum -y install epel-release
yum -y install git wget ntp curl cloud-init dracut-modules-
growroot
rpm -qa kernel | sed 's/^kernel-//' | xargs -I {} dracut -f
/boot/initramfs-{}.img {}
```

NOTE: The above command will install some core dependencies for cloud-init and automation later as you work with your provisioned instances. For example, we install Git here as it is used for Ansible automation. If you had no plans to use Ansible, this installation could be skipped. The dracut-modules-growroot is responsible for resizing the root partition upon initial boot which was potentially adjusted during provisioning.

One key benefit of using cloud-init is that we don't have to lock credentials into the blueprint. We recommend configuring a default cloud-init user that will get created automatically when the VM is booted by cloud-init. We can define that default user in *Administration > Provisioning > Cloud-Init*.

Network Interfaces

As of CentOS 7, network interface naming conventions have changed. You can check this by running *ifconfig* and noting that the primary network interface has some value similar to "ens2344". The naming is dynamic and typically set based on hardware ID. We don't want this to fluctuate when provisioning this blueprint in our VMware environments. To accomplish this end, we will rename the interface back to "ethO" using the steps below.

First, adjust the bootloader to disable interface naming:

The next step is to adjust network scripts in CentOS. Start by confirming the presence of a file called */etc/sysconfig/network-scripts/ifcfg-ethO*. Once confirmed, run the following script:

```
export iface_file=$(basename "$(find /etc/sysconfig/network-
scripts/ -name 'ifcfg*' -not -name 'ifcfg-lo' | head -n
1)")
export iface_name=${iface_file:6}
echo $iface_file
echo $iface_name
sudo mv /etc/sysconfig/network-scripts/$iface_file
/etc/sysconfig/network-scripts/ifcfg-eth0
sudo sed -i -e "s/$iface_name/eth0/" /etc/sysconfig/network-
scripts/ifcfg-eth0
sudo bash -c 'echo NM_CONTROLLED=\"no\" >>
/etc/sysconfig/network-scripts/ifcfg-eth0'
```

This script tries to confirm there is a new *ifcfg-ethO* config created to replace the old config file. Confirm this config exists after running and if not you will have to build your own:

TYPE=Ethernet DEVICE=eth0 NAME=eth0 ONBOOT=yes NM_CONTROLLED="no" BOOTPROTO="dhcp" DEFROUTE=yes

For more on CentOS/RHEL image prep, including additional configurations for specific scenarios, take a look at the <u>VMware image prep</u> page in Morpheus Docs.

Creating an Ubuntu Image

Create a new machine in vCenter and install a base version of your preferred Linux distro.

NOTE: If you are using cloud-init as part of your image, you will need to ensure your virtual machine has a cdrom.

Before installing the operating system, set up a single ext partition without a swap disk. Install the distro and apply any operating system and security updates. Ensure you've set a root password.

Install cloud-init and cloud-utils-growpart:

sudo apt install cloud-init
sudo apt install cloud-utils

Install desired hypervisor drivers, such as Virto or Open-VM Tools

Install Git:

sudo apt install git

Since Debian 9 includes network manager, ensure this is disabled. You can do this by editing the configuration file at */etc/NetworkManager/NetworkManager.conf*. Within that file, update the "managed" flag to false:

managed=false

We also recommend setting the network adapter to "eth0". This process is described above in the "Network Interfaces" section of the CentOS image prep guide above.

PROVISIONING YOUR FIRST INSTANCE

At this point, we are ready to provision our first image. As a first instance, we'll provision an Apache web server to our vCenter cloud.

Navigate to *Provisioning > Instances*. If any instances are currently provisioned, we will see them listed here. To start a new instance, we click the "+ADD" button to pop the "CREATE INSTANCE" wizard. We'll scroll down to and select the Apache instance type and click "NEXT".

CREATE INSTANCE			×
TYPE GROUP	CONFIGURE AUTOMATION REVIEW		
Search	⊇ ⊇ ⊘ € & # # 6 ♥ ≥ ⊕ %	TECHN	IOLOGY 👻
ACTIVE MQ	ACTIVEMQ A fast and popular messaging server with support for many platforms and protocols including AMQP and STOMP.	• 🖻	
C-J Alibaba Cloud	ALIBABA Easily provision any Alibaba Image tied to your Alibaba cloud account just as if it were any other instance type.		
APACHE HTTP SERVER	APACHE An open-source modern web server common on many websites today. A secure, efficient and extensible server that provides HTTP services in sync with the current HTTP standards.	• 루	
Microsoft Azure	AZURE Spin up any VM Image in the Azure Cloud.		•
🗢 cassandra	CASSANDRA An open source distributed database management system designed to handle large amounts of data across many commodity servers, providing high availability with no single point of failure.	• 🕏	
#CentOS	CENTOS A popular Linux flavor operating system. Fasily provision CentOS yms	• •	-
		PREVIOUS	NEXT

First, we'll specify the group to provision into which determines the clouds available. If you've followed this guide to this point, you should at least have a group that houses all of your clouds which you can select here. This will allow us to select the vCenter cloud from the "CLOUD" dropdown menu. Provide a unique name to this instance and then click "NEXT"

From the "CONFIGURE" tab, we're presented with a number of options. The options are cloud and layout-specific, more generalized information on creating instances and available options is <u>here</u>. For our purposes, we'll select the following options:

- LAYOUT: Includes options such as the base OS, custom layouts will also be here when available
- PLAN: Select the resource plan for your instance. Some plans have minimum resource limits, Morpheus will only show plans at or above these limits. User-defined plans can also be created in *Administration > Plans & Pricing*.
- VOLUMES and DATASTORES: The minimum disk space is set by the plan, this value may be locked if you've selected a custom plan that defines the volume size
- **NETWORKS**: Select a network, note that IP pools must be linked with the networks defined in VMware in order to assign static IP addresses

Under the "User Config" drawer, mark the box to "CREATE YOUR USER". Click "NEXT".

CREATE INSTAN	VCE							×
TYPE GROU			EVIEW					
Configuration (Options							
	LAYOUT	ESXi Apache on Ubuntu 14.04					\sim	
	PLAN 1 Core, 512MB Memory							
	VOLUMES	Cores: 1 Memory: 512 MB	10	*	GB	Auto - Datastore	\sim	+
	NETWORKS	VM Network	✓ DHCP					+
 User Config 								
		CREATE YOUR USER						
	USER GROUP	Select					\sim	
Network Op	tions							
Advanced O	ptions							
 Metadata 								
Environment	t							-
								ł
						PREVIOU	IS N	IEXT

NOTE: "CREATE YOUR USER" will seed a user account into the VM with credentials set in your Morpheus user account settings. If you've not yet defined these credentials, you can do so by clicking on your username in the upper-right corner of the application window and selecting "USER SETTINGS".

For now, we'll simply click "NEXT" to move through the "AUTOMATION" tab but feel free to stop and take a look at the available selections here. There is more information later in this guide on automation and even more beyond that in the rest of Morpheus docs.

Review the settings for your first instance and click "COMPLETE".



We are now dropped back onto the instances list page. We can see a new entry in the list at this point with a status indicator that the new machine is being launched (rocket icon in the status field). We can double click on the instance in the list to move to the instance detail page. For now, we will see a progress bar indicating that the instance is being created and is starting up. The exact amount of time this process will take depends on your environment and selections made when provisioning the instance. Initially, Morpheus will guess as to how long this will take, and the progress bar may not be accurate. Over time, Morpheus will learn how long these processes take and progress bar accuracy will improve. For more detailed information on the status of various provisioning processes, we can scroll down and select the "HISTORY" tab. The "STATUS" icon will change from the blue rocket to a green play button when the instance is fully ready. Furthermore, we can click on the hyperlinked IP address in the "VMS" section of this page to view a default page in a web browser to confirm success.

▼	INFO													
	Group: admin Created By: Nick Cores: 1 Source Image: M Ubuntu 14.04.3		Celebic Layout: ESXi Apache on Ubuntu 14 Memory: 512.0MiB orpheus Apache 2.4 on			04	Date Created: 11/13/2019 01:44 PM Version: 2.4 Total Storage: 10.0GiB							
•	VMS													
		STATUS	NAME		TYPE		CLOUD	L	OCATION		COMPUTE	MEMORY	STORAGE	
		0	apachetest		Apache 2.4		esxtank				0	0	0	ACTIONS -
	SUMMARY	WIKI	DEPLOY	STORAGE	NETWORK	LOGS	BACKUPS	ENVIRO	DNMENT	SCALE	HISTORY			
	NAM	E	DESCRIP	TION	CREATED BY		START DATE		ETA/DUR	ATION	STATUS	ERROR		
-	▼ apach	etest	Provision		Nick Celebic		11/13/2019 01	:44 PM	00:18:44					0
	4		Prepare R	lesources			11/13/2019 01	:44 PM	00:18:44		Complete			0
	•		Prepare Ir	mage			11/13/2019 01	:44 PM	00:00:01		Complete			0
			Configure	Instance			11/13/2019 01	:44 PM	260ms		Complete			0
			Deploy In	stance			11/13/2019 01	:44 PM	00:18:44					0

CREATING YOUR FIRST LIBRARY ITEM

In the prior section, we manually provisioned our first instance. However, Morpheus allows you to build a catalog of custom provisionable items to simplify and speed provisioning in the future. In this section, we'll build a catalog item and show how that can translate into quick instance provisioning after configuration.

NOTE: Before starting this process, it's important to decide which virtual image you plan to use. If you're not using a Morpheus-provided image, you'll want to ensure it is uploaded. You will not be able to complete this section without selecting an available image. In this example we will use Morpheus Redis 3.0 on Ubuntu 14.04.3 v2.

Operations	Provisioning) Infra	structure	Backups	Logs	Monitoring	Tools	Administration
Instances	000 000 Apps	Blueprints	Jobs	Automation	لمن Virtual Images	Library	Deploymen	ts Service Mesh
LIBRARY	LAYOUTS	NODE TYPES	OPTION TYPES	OPTION LISTS	FILE TEMPLATES	SCRIPTS SP	EC TEMPLATES	CLUSTER LAYOUTS
Search	Q	SELECT: TECHN	OLOGY - SEL	ECT: CATEGORY 👻				+ ADD

Navigate to *Provisioning > Library > NODE TYPES* and click "+ADD".

In this example, I am going to set the following options in the "NEW NODE TYPE" wizard:

• NAME

- SHORT NAME
- VERSION: 1 (In this particular case, the version is not important)
- TECHNOLOGY: VMware
- VM IMAGE: Morpheus Redis 3.0 on Ubuntu 14.04.3 v2

NOTE: Within the "VMware VM Options" section you should add anything that will always be used for this node, regardless of the specific deployment details. This can include LDAP Authentication, bash scripts that should run on installation, among other things.

	NAME	customnodetype									
	SHORT NAME	customnodetype									
		The short name is a na your container list.	The short name is a name with no spaces used for display in your container list.								
	VERSION	1									
	TECHNOLOGY	VMware									
	ENVIRONMENT VARIABLES	Name	Value		¢	+					
٧N	/ware VM Optio	ns									
	VM IMAGE	Morpheus Redis 3.0 on	Ubuntu 14.04.3 v2			\sim					
	LOG FOLDER										
	CONFIG FOLDER										
	DEPLOY FOLDER										
		(Optional) If using deple replaced with the conte	oyment services, this ents of said deploym	s mount p ents.	oint w	ill be					
	EXTRA OPTIONS	Name	Value		Ŵ	+					
	SERVICE PORTS	port 🛓	name	No LB	\sim	+					
	SCRIPTS	Search									
	FILE TEMPLATES	Search									
Þ	Advanced Option	15									
						F					
				SAVE	CHAN	IGES					

With the new node created, we'll now add a new instance type which will be accessible from the provisioning wizard once created. Move from the "NODE TYPES" tab to the "INSTANCE TYPES" tab and click "+ADD".

INSTANCE TYPES	LAYOUTS	NODE TYPES	OPTION TY	PES	OPTION LISTS	FILE TEMPLATES	SCRIPTS	SPEC TEMPLATES	CLUSTER LAYOUTS
Search	٩	SELECT: TECHN	OLOGY 👻	SELEC	T: CATEGORY 👻				+ ADD

In the "NEW INSTANCE TYPE" wizard, I'll simply enter a **NAME** and **CODE** value. Click "SAVE CHANGES".

NEW INST	TANCE TYP	PE X
	NAME	NewInstanceType
	CODE	newtype
		Useful shortcode for provisioning naming schemes and export reference.
DES	CRIPTION	
		255 Characters Remaining
C	ATEGORY	Web 🗸
	ICON	Browse
		Suggested Dimensions: 150 x 51

Now that we've created a new instance type, access it by clicking on the name in the list of custom instances you've created. In my case, I've given the name "NewInstanceType".

LIBRARY						
INSTANCE TYPES	LAYOUTS NODE TYPES OPTION	TYPES OPTION LISTS	FILE TEMPLATES	SCRIPTS	SPEC TEMPLATES	CLUSTER LAYOUTS
Search	Q SELECT: TECHNOLOGY -	SELECT: CATEGORY -				+ ADD
	NAME	TECHNOLOGY	CATEO	GORY	FEATURED	
	NewInstanceType		Web			ACTIONS -
ACTIVE MQ	ActiveMQ	Mixed	Messa	iging		ACTIONS -
C-C Alibaba Cloud	Alibaba	Alibaba	Cloud			ACTIONS -
API Gateway	Amazon Api		Apps			ACTIONS -
MQ	AmazonMQ		Messa	iging		ACTIONS -

Once we've opened the new instance type, by default, we should be on the "LAYOUTS" tab.

Click "+ADD LAYOUT". I've set the following fields on my example layout:

- NAME
- VERSION: This is the version number of the layout itself, which is labeled 1.0 in the example
- **TECHNOLOGY**: VMware
- **Nodes**: Select the node we created earlier, if desired you can specify multiple nodes

Click "SAVE CHANGES".

NEW LAYOUT			×
NAME	customlayout		
VERSION	1.0		
DESCRIPTION			
	CREATABLE		
TECHNOLOGY	VMware		\sim
	0	MB	\sim
MEMORY	This will override any memory requirement set on the virtual image		
WORKFLOW			\sim
	SUPPORTS CONVERT TO MANAGED		
ENVIRONMENT VARIABLES	Name Value	¢	+
Option Types			
Search option type	s		
Neder			
Nodes			
customnodetypev	n		
customnodet	ypevm (1)		
	SAV	E CHAN	GES

At this point we've completed the setup work and can now provision the instance we've created to our specifications. Navigate to *Provisioning > Instances* and click "+ADD". From the search bar we can search for the new instance type we've created. In the example case, we called it "newinstancetype". Click "NEXT".

CREATE INSTANCE	×
TYPE GROUP CONFIGURE AUTOMATION REVIEW	
new	•
PREVIOUS NE	кт

As before, we can select a group and cloud to provision this new instance. Click "NEXT". On the "CONFIGURE" tab, make note that the layout and plan are already selected because they were configured as part of creating the new instance type. Select a network and click "NEXT". Once again, we will also click "NEXT" through the "AUTOMATION" tab. Finally, click "COMPLETE".

CREATE INSTANCE					:	×
TYPE GROUP CONFIGU		EVIEW				
Configuration Options						
LAYOUT	\sim					
PLAN	\sim					
	Cores: 1 Memory: 512 MB					
VOLUMES	root	10	▲ GB	Auto - Datastore	× +	
NETWORKS	VM Network	✓ DHCP			+	
▶ User Config						
 Network Options 						
 Advanced Options 						
Metadata						
Environment						
					•	
				PREVIO	US NEXT	

As before when we manually provisioned an instance, Morpheus will now begin to spin up the new VM. How long this will take depends on your environment, but Morpheus will predict how long this process will take and represent that on a progress bar. Over time, Morpheus begins to learn how long these processes take and becomes more accurate in predicting spin-up time.

Once the provisioning process has completed, open the instance detail page in Morpheus and click on the "CONSOLE" tab. You'll be logged in with your user account and are then able to confirm the machine is ready and available.

0	?	0	100.00%	N/A	1%	39%	27%
STATUS	HEALTH	LAST BACKUP	AVAILABILITY	RESPONSE TIME	MAX CPU	MEMORY	STORAGE
INFO							
MISSIF LOGO	NG	Group: admin Created By: Nick Celebic Cores: 1 Source Image: Morpheus Red Ubuntu 14.04.3 v2	Cloud: Layou Memo is 3.0 on Provis	: esxtank t: customlayout ny: 512.0MiB ion Time: 14 minutes 29 secon	Date Created Version: 1.0 Total Storage ds	4: 11/14/2019 12:21 РМ н: 10.0GiB	
VMS	ATUS NAME	TYPE	CLC	DUD LOCATION	COMPUT	E MEMORY STORAG	
	newinstand	customnodety	pe esx	tank 192.168.88.73	1	39 27	ACTIONS -
					•		
SUMMARY	WIKI STORAG	GE NETWORK LOGS	BACKUPS ENV	IRONMENT HISTORY	CONSOLE		

AUTOMATION AND CONFIGURATION MANAGEMENT

Morpheus automation is composed of Tasks and Workflows. A task could be a script added directly, scripts or blueprints pulled from the Morpheus Library, playbooks, recipes, or a number of other things. The complete list of task types can be found in the <u>Automation section</u> of Morpheus docs. Tasks can be executed individually but they are often combined into workflows. We can opt to run a workflow at provision time, or they can be executed on existing instances through the Actions menu.

In this guide we will set up an Ansible integration, create a task, add the task to a workflow, and run the workflow against a new and existing instance. If you've worked through this guide to this point, you should already have an Apache instance running. If you don't yet have that, provision one before continuing with this guide and ensure it is reachable on port 80.

Operations	Provisionin	g	Infrastructure	Backups		Logs N	Monitoring	Tools	Administrati	
-@- Tenants	(Ŝ) Plans & Pricing	2 Boles	<u>D</u> Users	ංදීං ගැනි Integrations	Policies	+. Provisioning	() Monitoring	Backups	0 0 Logs	्रि Settings
INTEGRA	TIONS							-	+ NEW INT	regration 🗸
	NAME								automati	ion
									Chef	
									Ansible	
									Ansible	Tower
									vRealize	Orchestrator
									Salt Mas	ster
									dns	
									Microso <	ft DNS

We'll first set up the Ansible integration, you can integrate with the sample repository referenced here or integrate with your own. Go to 'Administration > Integrations'. Click "+NEW INTEGRATION" and select Ansible from the dropdown menu. Fill in the following details:

- NAME
- ANSIBLE GIT URL: <u>https://github.com/ncelebic/morpheus-ansible-</u> <u>example</u>, or enter the URL for your own Ansible git repository
- PLAYBOOKS PATH
- ROLES PATH
- Mark the box to "USE MORPHEUS AGENT COMMAND BUS"

NOTE: If your git repository requires authentication, you should create a keypair and use the following URL format: <u>git@github.com:ncelebic/morpheus-ansible-example.git</u>.

NEW ANSIBLE INTEGR	RATION	×
NAME	NewAnsibleIntegration	
	ENABLED	
ANSIBLE GIT URL	https://github.com/ncelebic/morpheus-ansible-example	
KEY PAIR	~	
PLAYBOOKS PATH	/	
ROLES PATH	/roles	
GROUP VARIABLES PATH		
HOST VARIABLES PATH		
	USE ANSIBLE GALAXY	
0	ENABLE VERBOSE LOGGING	
	USE MORPHEUS AGENT COMMAND BUS	l,
	SAVE CHA	NGES

Click "SAVE CHANGES". You'll now see our new Ansible integration listed among any other configured integrations. If we click on this new integration to view detail, a green checkmark icon indicates the git repository has been fully synced.

With the Ansible integration set up, we can now create a task that includes our playbook. Go to *Provisioning > Automation*, click "+ADD". We'll first set our "TYPE" value to Ansible Playbook so that the correct set of fields appear in the "NEW TASK" wizard. Set the following options:

- NAME
- ANSIBLE REPO: Here we will choose the Ansible integration that we just created
- PLAYBOOK: In our example case, enter 'playbook.yml'

NEW TASK	>
NAME	New Ansibie Task
CODE	
TYPE	Ansible Playbook
ANSIBLE REPO	NewAnsibleIntegration ~
GIT REF	
PLAYBOOK	playbook.yml
TAGS	
SKIP TAGS	
COMMAND OPTIONS	
Target Options	
EXECUTE TARGET	Resource 🗸
Execute Options	
	SAVE CHANGES

Click "SAVE CHANGES" to save our new task. We can test the new task on our Apache VM now by going to *Provisioning > Instances* and clicking into our VM. From the "ACTIONS" menu select "Run Task". From the "TASK" dropdown menu, select the task we just added and click "EXECUTE".

EXECUTE TASK?			×
Are you	sure you would like to perform this	task operation?)
TASK	New Ansible Task		\sim
		CANCEL	EXECUTE

To see the progress of the task, click on the "HISTORY" tab and click on the (i) button to the right of each entry in the list. In this case, we can also see the results of the task by clicking on the link in the "LOCATION" column of the "VMS" section.

Now that our task is created, we can put it into a workflow. Back in *Provisioning > Automation* we will click on the "WORKFLOWS" tab. Click "+ADD" and select Provisioning Workflow. We'll give the new workflow a name and expand the Post Provision section. As we begin to type in the name of the task we've created, it should appear as a selection. Click "SAVE CHANGES".

NEW WORKFLOW	×
NAME New Workflow	
DESCRIPTION	
PLATFORM All	~
Tasks	
Pre Provision	
 Provision 	
Search Tasks	
Post Provision	
new Ansible Task	
New Ansible Task	
Stop Service	
Pre Deploy	
▶ Deploy	
Reconfigure	
▶ Teardown	
	SAVE CHANGES

Now that we have a workflow, return to *Provisioning > Instances* and begin to provision another Apache instance. More detailed instructions on provisioning a new Apache instance are included earlier in this guide if needed. Now, when you reach the "AUTOMATION" section of the "CREATE INSTANCE" wizard, we have a workflow to select. From the "WORKFLOW" dropdown menu, select the workflow we just created and complete provisioning of the new instance.

CREATE INSTANCE	×
▼ Automation	
WORKFLOW New Workflow	\sim
New Ansible Task	
COMMAND OPTIONS	a
▶ Deployment	
▶ Load Balancer	
► Scale	
► Backups	
► Lifecycle	
PREVIOUS	NEXT

As the instance is provisioning, we can go to the "HISTORY" tab and see Morpheus executing the tasks that were contained in our workflow.

This is just one example of using Morpheus to automate the process of configuring and instance to your needs. There are a number of other automation types that can be built into your workflows as well. For further information, take a look at the <u>automation integrations</u> guide in Morpheus docs.

CONCLUSION

At this point you should be up and running in Morpheus, ready to consume VMware. This guide only scratches the surface, there is a lot more to see and do in Morpheus. Take a look at the rest of <u>Morpheus Docs</u> for more information on supported integrations and other things possible.