Lab Setup

Last updated by | Vinay Pamnani | Jul 21, 2022 at 4:37 PM EDT

Contents

This page includes the steps that are required to create a new Configuration Manager lab environment in Azure. This lab environment will reside in a virtual machine in Azure, and gives you full Hyper-V access allowing you to perform all tests that don't require a physical machine, including OSD/BitLocker scenarios.

You can also watch the recorded session below that covers a lot of what's discussed on this page: **Recorded Session** ⧉

You must follow the steps in the order described below.

Step 1 - Obtain AIRS Subscription

All Configuration Manager engineers have been provisioned to use the Azure Internal Registration System (AIRS) to request a new subscription for hosting the lab environment. Please use the appropriate sections below to create a new AIRS subscription or update your existing AIRS subscription (if you have one) to use the **PC Code** assigned to Configuration Manager.

❗ **IMPORTANT** Before you proceed, you must obtain the PC Code to be used for the ConfigMgr AIRS Request, by joining the **CSS EM AIRS Accounts** (CSSEMAIRS) Security Group by visiting IDWeb ⧉. Once your request is approved, you will receive an email (similar to below) which contains the **PC Code** to be used for ConfigMgr..

```
From: IDWeb Notifications <mimmail@microsoft.com>
Sent: Tuesday, February 1, 2022 4:00 PM
To: IDWeb Notification (no reply) <idwebnoreply@microsoft.com>
Subject: You are now a member of CSS EM AIRS Accounts

Welcome to the Group. Here is the Code you need to get started with AIRS <PC Code> Don't share this.
```

💡 TIP
To check if you have an existing AIRS registration, please visit the My Registrations ⧉ page.
To check if you have an existing AIRS subscription, please visit the Manage Subscriptions ⧉ page.
If you previously registered but did not create a Subscription, you can skip the Registration and head over to https://signup.azure.com/signup?offer=MS-AZR-0015P ⧉ to create the subscription and use values for Step 2 using below section.

New Subscription

After you have the **PC Code**, create a new AIRS Registration/Subscription using steps below.

- **Step 1 - Registration Creation**

    - **Account type**: Internal billable account
    - **AccountOwnerID**: youralias@microsoft.com
    - **Property Service Name**: Microsoft Azure Internal Consumption
    - **PC Code for Cross Charging**: Use **ConfigMgr PC Code you received in email**.
    - **PFAM**: 000
    - **Program name**: Set to "Not Applicable"
    - **Paid Support**: Developer

- **Paid Support PC Code**: P10175065. Note that this PC code is used to assign Paid Support to the subscription and doesn't need to be the same as the PC Code allocated for ConfigMgr so use this PC code as-is.
- **Paid Support Program name**: CSS - Azure
- **Finance contact**: Charusa
- **Budget approver**: jikirchn
- **Property/Service Description**: Provide justification as `I'm a Configuration Manager support engineer and am requesting the subscription for hosting labs`
- **Production application hosted**: No

Once the Registration request is approved, you can move on to the next step. NOTE: At this point, you do not yet have an Azure subscription! You must proceed to Step 2 below to get a subscription.

- **Step 2 - Subscription Request**. Once the AIRS Registration has been approved, you will receive an email notification asking you activate your account. At that time, you will need to create your subscription. In the received email, you will see a link to create your new subscription.

  If this is the first time you've logged in to the portal using this Account Owner ID (your Alias@microsoft.com), create a new account profile for your ID. After you've created a profile for this Account Owner ID, you can skip this step for subsequent logins.

  You may see a notice stating "Free Trial is not available". If you do, please click "Sign up for an internal AIRS subscription through Service Tree". On the subsequent "Subscription Creation" page, please provide the following information:

  - **Purpose**: "This subscription will not be used to support any Microsoft service or tool. Instead, this subscription will be used for one of the following"
  - **Subscription Name**: Specify "<Your alias> AIRS Subscription". **Make sure to include your alias** in the title to make it easily identifiable. If you don't specify your alias in the subscription name, the subscription may get deleted.
  - **Subscription Description**: Write out justification. "Microsoft Azure Internal Consumption subscription for usage within CES Support"
  - **Subscription Container**: "CES Service Delivery New Subscriptions"
  - **Usage Information** > End Date: Generally, select a date a few years out.
  - **Usage Information** > Est. Average Monthly Spend: Specify the value $475.
  - **Billing Information PC Code**: Select **ConfigMgr PC Code you received in email**. If you dont see the ConfigMgr PC code in drop-down list, ensure that you specified "CES Service Delivery New Subscriptions" in the Subscription Container field.
  - **Billing Information Program Name**: Select **N/A**.

  Once the Subscription request is approved, you can move on to the next step.

- **Step 3 - Subscription Creation**. Once the request is approved, you will receive another email with a link to **Create new subscription**.

  - Click on the link to create new subscription.
  - You will then be asked to submit an email address (use your @microsoft.com email) for the subscription's Service Administrator, then agree to the terms and conditions.
  - At this point, your subscription is now fully provisioned and available in the Azure Portal.

> 💡 **TIP** The general process to request an AIRS subscription is listed at
> **https://microsoft.sharepoint.com/teams/azureinternal/CSSMgmt/SitePages/Home.aspx** ☑ which contains
> screenshots, but do NOT use the PC Codes listed in the general steps.

Existing Subscription

If you have an existing subscription, **you must ensure** that it is configured to use the **ConfigMgr PC Code**, by using the steps below:

1. Go to https://aka.ms/airs ☑
2. Select **Manage Subscriptions**
3. Enter your alias in the **Requester alias** field and click **Filter**
4. Click on the **PC Code** value or click **Edit** at the end of the row, which will then allow you to input the new **PC Code**. Specify the **ConfigMgr PC Code you received in email**. NOTE please do not click on the header that says **PC Code**, click on the actual value.
5. If **Budget approver alias** and **Finance contact alias** is missing or have incorrect values, you must specify values for these fields using steps in the previous section.
6. Click on **OK**, and then click on **Submit** to save the changes.
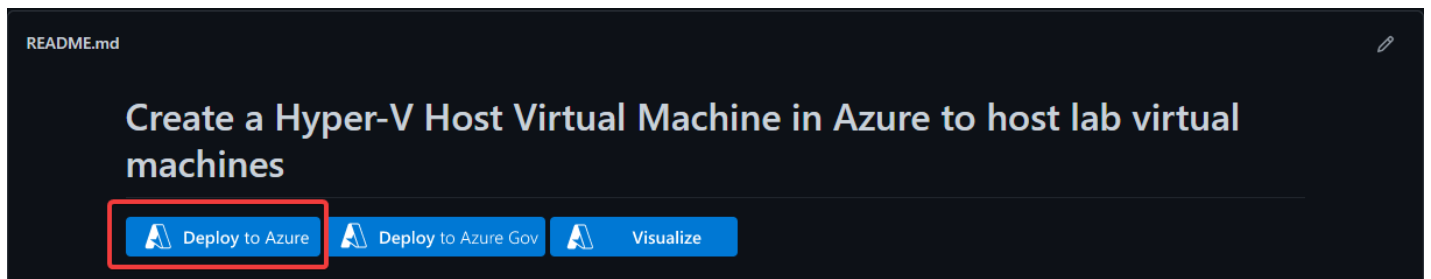
Verify PC Code

1. Go to https://aka.ms/airs ☑
2. Select **Manage Subscriptions**
3. Enter your alias in the **Requester alias** field and click **Filter**
4. In the resulting row, confirm that the PC Code matches the one that was provided in email. **NOTE that this PC code is not the same as P10175065**, so if you see the PC Code P10175065, you must change it using steps mentioned above in Existing Subscription section

Step 2 - Deploy Azure Host VM

> ❗❗ **IMPORTANT** Do NOT deploy more than one Host VM in Azure. Our budget restricts each engineer to one host VM, and multiple VM's will put you at risk for getting them deleted once you exceed the budget.

After you have created your AIRS Subscription using the ConfigMgr PC Code, follow the steps below to deploy your own Host VM in Azure where you will create the virtual machines.

1. Open a browser where you're logged in with your @microsoft.com account.

2. Visit the following URL and click on the **Deploy to Azure** button: https://github.com/vinaypamnani-msft/memlabs/tree/main/configmgr-lab-vmhost ☑

Create a Hyper-V Host Virtual Machine in Azure to host lab virtual machines

[A] **Deploy to Azure**   [A] **Deploy to Azure Gov**   [A]   **Visualize**

3. At the custom deployment page, select the AIRS Subscription you obtained.

   - **IMPORTANT** Do not use the $150 MSDN Subscription you receive as the FTE-Benefit. It will not be able to sustain the costs, and will get disabled in a few days.
   - **IMPORTANT** If you don't see your AIRS subscription on the **Custom deployment** page, please ensure you are logged in to the Azure Portal with your `@microsoft` account, and you are in the `Microsoft` directory by clicking on your account on top-right corner, and then **Switch directory**.

4. Next, at the **Custom deployment** page in the Azure Portal, create a new Resource Group by clicking the **Create new** link. Here, you can change the following options:

   1. Region where the VM would be created: Select the region that is closest to you for better latency. If your region doesn't support E16 VM Size, the deployment will fail with a message indicating this. Let us know if that happens, so we can update this page.

      - ❗ **IMPORTANT** If you are in the India region, please use 'West Europe' region since India regions do not support the E16 VM size, and 'South East Asia' region has bandwidth limitations.

   2. VM Name

   3. Local Administrator username

   4. Local Administrator password

   5. Operating System you want on the VM: We recommend using the latest Server OS which is '2022-datacenter-g2'.

   6. Time Zone for the VM. This same timezone is used later on when you deploy lab virtual machines on this host.

      💡 **TIP** If you want to change the Time Zone, use `Get-TimeZone -ListAvailable | Select DisplayName,ID | Where {$_.DisplayName -like "*Eastern*"}` in PowerShell after replacing `Eastern` with the timezone of interest, and use the exact **ID** of the timezone you want. If you're unsure, use the default value and change the timezone manually after you connect to the Host VM in Step 3 below.

   7. Branch Name: Use the default which is the `main` branch. The `develop` branch is used for testing, and should only be used when explicitly asked.

   ▶ Click to see screenshot of the Custom deployment page

5. Click **Review + Create**, and then click on **Create**. The deployment takes around 10-15 minutes.

Recovering from a failed deployment

In some instances, a timing issue can cause the deployment to fail with the below error:

```
 The WS-Management service cannot process the operation. The operation is being attempted on a client session
that is unusable.
```

If the Host VM deployment fails for any reason, you must delete the resource group you created and re-deploy. Do not try to just delete the Virtual Machine, without deleting the resource group. To delete the resource group, go to the **Azure portal**, **Resource Groups**, click on the resource group you crated at Step 2.4, and click on **Delete Resource Group** button. On the fly-out pane, re-type the name of the Resource group to confirm deletion and click on **Delete**. After the resource group is deleted, try Step 2 again.

Resetting the password of the Azure Host VM

If you forget the password for your Host VM, you can use the following steps to reset it from the [Azure Portal](#) ⧉

1. Go to **Resource Groups**, locate and click on the **Virtual Machine** you just created.
2. Click on **Reset password** in the **Help** section of the navigation pane.
   1. "Username" will be the "Local Administrator username" you specified in step 4.3 above when configuring the custom VM deployment.
   2. Specify what you want to Reset (change) the password to, and click **Update**

▶ Click to see screenshot of the Password Reset page

Step 3 - RDP to the Host VM

After the deployment finishes, use the following steps to connect to the Host VM.

Enable JIT

In order to RDP to the Host VM, you would need to enable just-in-time (JIT) access for the Host VM. To enable JIT, follow the steps outlined here: [https://dev.azure.com/servicesdocs/DevOps/_wiki/wikis/AzureInWCB wiki/24322/Secure-management-ports-with-just-in-time-(JIT)-access-from-Virtual-Machine](#) ⧉. When you configure JIT for the Host VM, we recommend setting the Max request time to 24 hours so you only need to request JIT access for the VM once a day.

❗ **IMPORTANT** ~~JIT is required for accessing the Host VM via RDP regardless of whether you are connecting from CorpNet, MSFTVPN, or your home location.~~ Due to issues observed, JIT from CorpNet is not required until the issues with RDP have been resolved. You would still need to request JIT access when accessing the Azure VM from MSFTVPN or non-corpnet location.

Issues enabling JIT

1. If you see the following screen when attempting to enable JIT, it's likely that you don't have the correct subscription selected in the Global Subscription Filter.
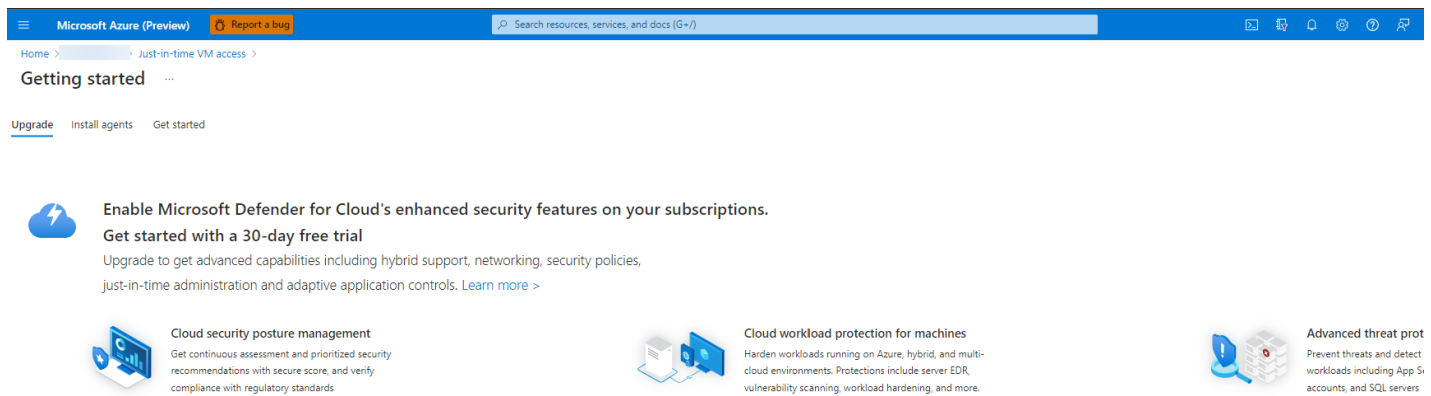
To resolve this, navigate to **Directories + Subscriptions**, then ensure that nothing except your AIRS subscription is selected in the **Default subscription filter** list.
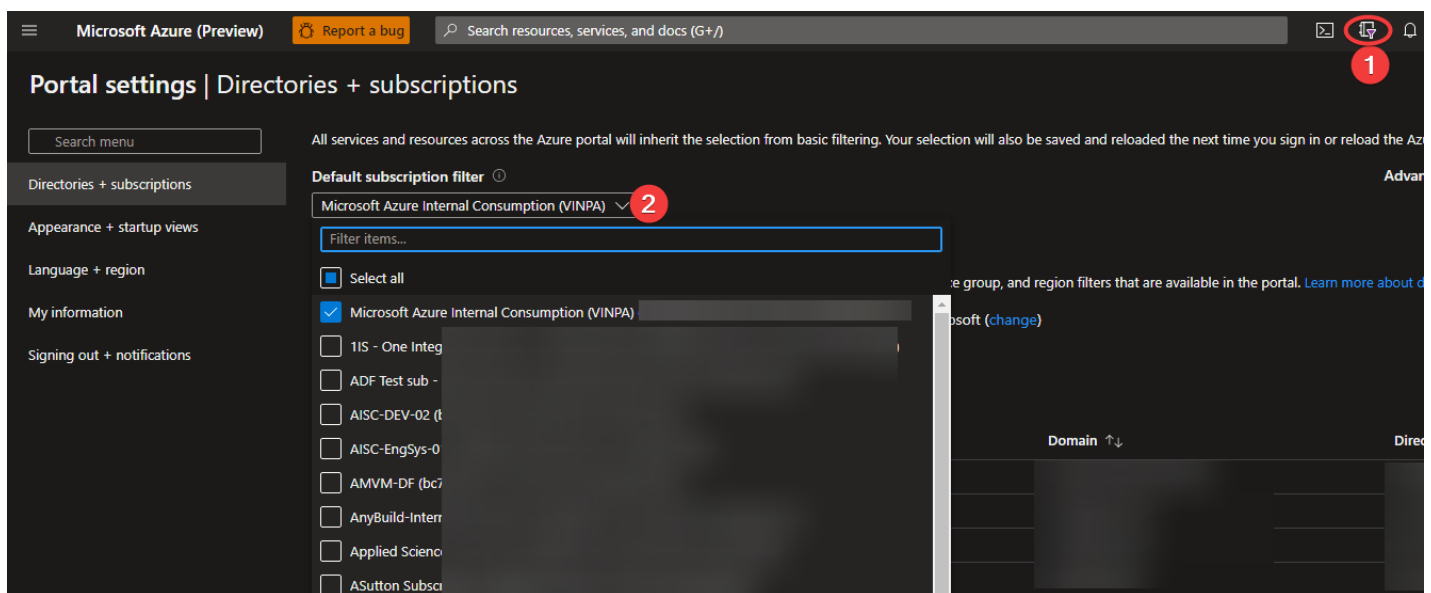
2. After selecting the correct subscription in the Default subscription filter, you may see the following screen preventing you from enabling JIT. If this happens, please reach out via email and provide a screenshot of the screen along with your Subscription ID.
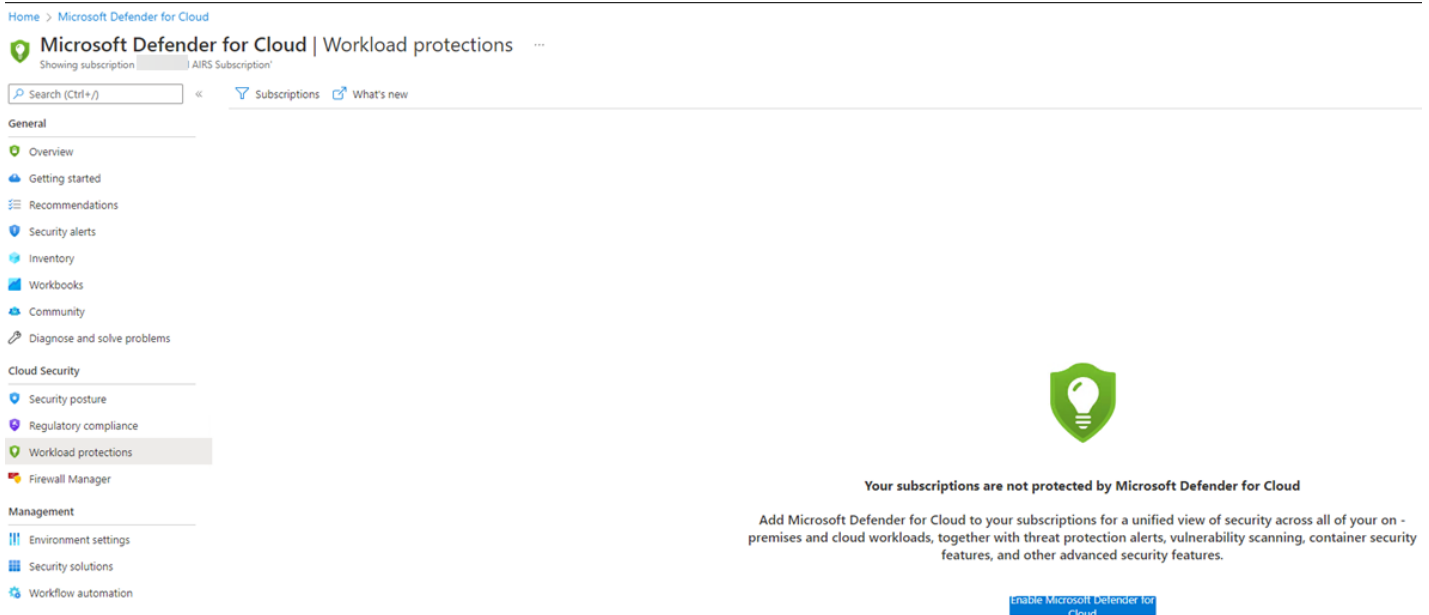
Request Access via JIT

After you configure JIT, to RDP to the Host VM:

1. Go to the **Azure Portal** -> **Resource Groups**. Locate and click on the **Virtual Machine** you created in Step 2.
2. Click on **Connect**, and select **RDP**.
3. Ensure **My IP** is selected under Source IP, then **Request access**. This automatically configures an Inbound security rule in the Network Security Group for your IP.
4. Proceed to **Download RDP file**. Use the credentials your configured in Step 2 to connect to the VM.

💡 **TIP** You can re-use a previously downloaded RDP file, but you still need to Request JIT access every day before you can connect to the Host VM. You can use the Azure Automation script found in the [Scripts Repository](#) to automate JIT request and launching the RDP Session for you.

🚨 **WARNING** If you attempt by bypass JIT request and add an inbound rule that allows RDP traffic from `Internet`, `*`, or `0.0.0.0/0.`, it will automatically get removed within an hour. If removal fails, you and your manager will receive a strongly worded email from the Azure Security team.

RDP via Windows Admin Center

If you see issues with JIT, or can't RDP due to other reasons, you can use Windows Admin Center to connect to the VM which allows you to RDP to the VM from the portal itself.

1. Go to the **Azure Portal** -> **Resource Groups**. Locate and click on the **Virtual Machine** you created in Step 2.
2. In the navigation blades on the left, click on **Windows Admin Center (preview)** under **Settings**.
3. Click on Connect using the public IP Address, specify the credentials you configured in Step 2 to connect to the VM.

Step 4 - Allow Storage Access

In order to simplify deployment of lab environments, we have created a set of scripts that are copied to the Host VM. These scripts require access to an Azure Storage account to download files that are necessary for deploying a lab environment. To access the storage, `_storageConfig.json` file must reside in `E:\memlabs\vmbuild\config` directory on the Host VM and contain valid Storage Location and Token.

1. Download the file by clicking here ⧉.

2. Place the `_storageConfig.json` file in `E:\memlabs\vmbuild\config` directory on the Host VM.

❗ **IMPORTANT** This file must be present and must contain a valid token before you can proceed further. The token in the file is valid until 2022/09/16. We will update the file with a new token when we approach the token expiration time.

Step 5 - Deploy New Lab

New lab deployments are automated by the `New-Lab.ps1` script which is located in the `E:\memlabs\vmbuild` directory. We recommend using `VMBuild.cmd` to launch the script since it performs a `git pull` which ensures you always have the latest version of the script.

- Navigate to `E:\memlabs\vmbuild` directory.
- Double click `VMBuild.cmd`.
- Follow the on-screen prompts to create the configuration.
- Once you create the configuration, you can either deploy it or save it to deploy it later by running `VMBuild.cmd` again.

💡 **TIP** When you run **VMBuild.cmd** and select the option to create a new domain, you are presented with options that create a sample configuration. Previously, we used some sample configurations in `config\samples` directory but those sample configurations are now deprecated and you should use **VMBuild.cmd** for everything.

About Lab Password

For security reasons, the password cannot be documented on the wiki. When you run `VMBuild.cmd`, the password is displayed in Configuration Summary before and during deployment. If for some reason, you missed it, you can obtain it again by running `VMBuild.cmd` and selecting option **P** to **Show Passwords**.

About ConfigMgr Installation

Product License

When using the scripts to deploy Configuration Manager CAS/Primary sites, the sites are installed with the **Eval License**. To convert these to a licensed install, please use the Product Key from your MSDN FTE benefit, and use the steps in the doc below:

- https://docs.microsoft.com/mem/configmgr/core/servers/deploy/install/upgrade-an-evaluation-install-to-a-full-install ⧉

Accounts Used

- `domainAdmin` user you specify in the [VM Options] menu provided by `VMBuild.cmd` is used to install ConfigMgr. The default is <domain>**admin**. If you're unsure what this account is, you'll find the `domainAdmin` user in the Notes property in VM Properties in Hyper-V. This account is a Domain Administrator. Do not change the password of this account.

- `vmbuildadmin` account is used for all other automations. This account is a Domain Administrator. Do not change the password of this account.

- `cm_svc` account is used for Client Push and Site System Installation. This account is a Domain User but added as a local Administrator on all machines built via `VMBuild.cmd`. Do not change the password of this account.

About SQL Installation

About Product License

SQL installations are done using the ISO from MSDN, and the license key for these installations is embedded in the ISO. You typically won't need the license key, unless you're trying to install SSRS. During SSRS installation, you will be asked for the license key, which you can retrive from the ISO using steps below:

1. Locate the appropriate SQL ISO in `E:\memlabs\vmbuild\azureFiles\iso` directory.
2. Mount the ISO, and navigate to x64 directory.
3. Open `DefaultSetup.ini` which contains the PID.

About Modifying configuration

`VMBuild.cmd` can be used to customize your configuration. After you run it, you can load a previously saved configuration and make changes by following the menu.

💡 **TIP** You can also modify the `.json` file manually, however using **VMBuild.cmd** is the recommended approach as it eliminates the chances of improperly configuring values in the .json files.

About VMBuild.cmd

Adding new machines to an existing domain

If you want to add another machine(s) to an existing domain you previously deployed, run `VMBuild.cmd` and select the option to `Expand existing domain`, select your domain and add a new VM with the appropriate role.

Deploying an Internet Client or AAD Client or OSD Client

If you want to test an Internet/AAD/OSD client, run `VMBuild.cmd` and select the option to `Expand existing domain`, select your domain and add a new VM with the appropriate role.

Domain Management

`VMBuild.cmd` has an option to manage the domain which allows you to:

- Start/Stop all machines in the domain.
- Compact all VHDX files for machines in the domain.

- Delete virtual machines.
- Snapshot entire domain.
- Restore entire domain to a previous snapshot.
- Remove snapshots.

Dos and Donts

See [Accounts Used](#) for more info on the accounts that are used.

- **DONT** change the password for `vmbuildadmin` domain account. This will break the ability to add more machines to the domain.
- **DONT** change the password for the `domainAdmin` you specified under 'VM Options' in the configuration menu. This will break the ability to add more machines to the domain.
- **DONT** change the password for the `cm_svc` account. This is a domain account that is added to all machines as a local Administrator and is used as the `Client Push` and `Site System` installation account.
- **DO** feel free to add any new accounts you want, as needed.
- **DO** feel free to use the built-in `Administrator` account and change the password if you want.

Known Limitations

1. Configuring a VM to be in the "External" VM Switch results in no Internet Access, instead use the "Internet" VM Switch if you need to manually change the VM network and need Internet access.
2. Storage on the host VM is limited to 3TB, in order to prioritize performance over space.
3. Automation Limitations:
   1. Every ConfigMgr Sitecode (except CAS) requires a unique subnet due to the way the script creates AD Sites. Use `VMBuild.cmd` to avoid using a duplicate subnet.
   2. Automated ConfigMgr site installations need a unique SQL Server each. This means you currently cannot use a single SQL Server to host the Site database for multiple sites in multiple named instances.

Known Issues

Guest VM fails to start due to TPM Errors

A couple of people reported VM start failures, with "*The computed authentication tag did not match the Input authentication tag*" error. We don't know why this issue occurs, but if you see this issue, please **Delete Saved State** for the VM from the Hyper-V console which will fix this issue.

Name	State	CPU Usage	Assigned Memory	Uptime	Status
C1	Saved				
MP1	Saved				
IDPMP1	Saved				
ISITE					
ISQL					
0Client1					
0Client2					

Checkpoints

- ☐ -DC1 - (5/13/2022
  - ▶ Now

Hyper-V Manager   ✕

❌ **An error occurred while attempting to start the selected virtual machine(s).**

'   C1' failed to restore.

Microsoft Virtual TPM Device (Instance ID 736E6AA9-A3F8-49C0-9550-A963214D259A): Failed to restore with Error 'The computed authentication tag did not match the input authentication tag.'.

⌄ See details   [Close]