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## vMX100 Setup Guide for Microsoft Azure

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### Overview

This document is a walkthrough for setting up a virtual MX (vMX100) appliance in the Microsoft Azure Marketplace. After completing the steps outlined in this document, you will have a virtual MX appliance running in Azure that serves as an AutoVPN termination point for your physical MX devices.

Currently, the vMX100 on Azure supports a one-armed VPN concentrator configuration with split-tunnel VPN architecture. For more info on how to deploy a one-armed concentrator, please refer to [this](#) document.

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### Key Concepts

Before deploying a virtual MX, it is important to understand several key concepts:

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#### Concentrator Mode

All MXs can be configured in either NAT or VPN concentrator mode. There are important considerations for both modes. For more detailed information on concentrator modes, [click here](#).

#### One-Armed Concentrator

In this mode the MX is configured with a single Ethernet connection to the upstream network. All traffic will be sent and received on this interface. This is the only supported configuration for MX appliances serving as VPN termination points into Azure.

#### NAT Mode Concentrator

In this mode the MX is configured with a single Ethernet connection to the upstream network and one Ethernet connection to the downstream network. VPN traffic is received and sent on the WAN interfaces connecting the MX to the upstream network and the decrypted, unencapsulated traffic is sent and received on the LAN interface that connects the MX to the downstream network.



**Note:** This is not supported for virtual MX VPN concentrators operating within Azure.

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## VPN Topology

There are several options available for the structure of the VPN deployment.

### Split Tunnel

In this configuration, branches will only send traffic across the VPN if it is destined for a specific subnet that is being advertised by another MX in the same Dashboard organization. The remaining traffic will be checked against other available routes, such as static LAN routes and third-party VPN routes, and if not matched will be NATed and sent out the branch MX unencrypted.

### Full Tunnel

In full tunnel mode all traffic that the branch or remote office does not have another route to is sent to a VPN hub.



**Note:** This is not supported for virtual MX VPN concentrators operating within Azure.

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## Azure Terminology

This document will make reference to several key Azure-specific terms and concepts.

### Azure Virtual Network

A virtual network is where a block of associated IP addresses, DNS settings, security policies and route tables can be configured and managed.

### Azure Resource Manager (ARM) and Azure Classic

Azure has different types of virtual network environments, which represent two different methods of deploying and managing Azure virtual environments. The vMX uses '[managed applications](#)', which is an MSFT platform, and is **not** compatible with [Azure 'classic' deployments](#).

### Resource group

A resource group is a container within Microsoft Azure's infrastructure where resources, such as virtual machines are stored.

### Azure Managed Applications

[Managed Applications](#) within Azure serve as the network used to manage and support the Cisco Meraki virtual MX.

### Additional Information

During the setup of your vMX100 instance, or over the course of working within Azure, you may encounter additional terminology which is not defined in this document. To find out more about these terms, and for additional details on the terms listed above, please see the [Microsoft Azure glossary](#).

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## Meraki Dashboard Configuration

Begin by creating a new Security Appliance network in your organization. This [guide](#) will walk you through creating a new network in the Meraki Dashboard.

The Meraki Dashboard will require a vMX100 [license to be added](#) before you are able to continue. If you do not have access to a vMX100 license, please reach out to your Meraki Reseller or Sales Rep.

Once you have created the network and added the appropriate license you will be able to deploy a new vMX100 to your network by clicking on 'Add vMX':

### My\_Virtual\_MX

There are no Meraki devices in this network. If you [add one](#) we can help you configure it. Alternatively, click on the button below to automatically add a vMX to your network:

Add vMX

After you add the new vMX100 to your network, click on “Generate authentication token” to generate the token for Azure custom-data field.

0c:8d:db:5c:81:82

vMX100

Has never connected to the Meraki cloud

WAN

Not connected

Serial number

Q2AZ-KRJ2-98DN

Address

Tags

Notes

Firmware

Update available

Current version: MX 12.24

Config

Never fetched

Generate authentication token...

Remove appliance from network...

[View old version](#)

### Authenticate vMX to Meraki Cloud

To connect your vMX to the Meraki Cloud, generate a token for the AWS user data field or Azure custom data field using the "Generate authentication token..." button on the left

**Copy the newly generated token and save it for the next part in 'Azure Setup'.** It will be used when creating a new resource group and will be added to the 'Meraki Authentication Token' field of the Azure template.



The authentication token **must** be entered into the Azure instance within 1 hour of generating it. If it has been more than 1 hour then a new token must be generated.

Next, follow the steps outlined in [this guide](#) to configure the vMX100 as a one-armed concentrator.

On the Site-to-Site VPN page, add each subnet in your resource group that should be accessible to remote Auto VPN peers to the list of 'Local Network(s)'. For more information on configuring Auto VPN, please refer to the [Site to Site VPN settings documentation](#).



Configuring a static IP on a vMX100 in Microsoft Azure via Dashboard is currently not supported. Attempting to configure one will result in the node losing network connectivity and going offline.

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## Azure Setup

### Before You Begin

You must have the following before you begin:

- An Azure virtual network and virtual subnet on a resource groups separate from the resource group you will be creating to host the vMX. To find more information about this, please click [here](#).



**Note:** Your virtual network must be in a separate resource group from the one hosting your vMX. If you assign the vMX to a resource group that already contains a virtual network/virtual subnet, you will not be able to deploy the vMX.

This section walks you through configuring the necessary requirements within Microsoft Azure, and adding a vMX100 instance to your resource group. For more details on setting up a resource group and other components, please refer to Azure's Documentation [here](#).

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## Accessing the Offer

To gain access to the VM Offer, please access [this link](#). A screenshot of the Marketplace list of Cisco Meraki vMX100 in Azure is included below:





Cisco Meraki's virtual MX extends your physical MX deployment in minutes through the same Meraki dashboard. vMX100 can be used as your SD-WAN and Auto VPN node to easily connect your network with your Azure deployed services. Leveraging the power of the cloud, Cisco Meraki's virtual MX can configure, monitor, and maintain your VPN so you don't have to. Managed from the Meraki Dashboard just like a physical MX100.



PUBLISHER

Cisco Systems, Inc.

SUPPORT

<https://meraki.cisco.com/support/>

Select a deployment model ⓘ

Resource Manager



Create

From the Marketplace listing, click on 'Create.'

After creating, you will be prompted to configure basic settings:



## Create Cisco Meraki vMX100



## Basics



1

Basics

Configure basic settings



2

Deployment Details

Required



3

Summary

Cisco Meraki vMX100



4

Buy



\* VM Name ⓘ

CiscoMerakiVM



\* Meraki Authentication Token ⓘ

87caf860220869c8d7a52c4fa79689c9/57f...



Subscription

Pay-As-You-Go



\* Resource group

☒ Create new ☐ Use existing

CiscoMerakiRG



\* Location

Japan East



OK



**VM Name:** Choose a name for your Cisco Meraki vMX100 VM, it can be any name.

**Meraki Authentication Token:** Paste the token previously generated on the Meraki dashboard.

**Subscription:** Choose the subscription that you want to be billed for from the drop-down menu.

**Resource group:** Create a new resource group with any name.

**Location:** Select the region where the vMX100 will be deployed in.

After completing all the basic settings configuration, hit 'OK.'

Choose an existing Virtual Network from the list:

Microsoft Azure « Create Cisco Meraki vMX100 > Deployment Details > Choose virtual network Search resources, services and docs

+

1 Basics Done ✓

2 Deployment Details Required >

3 Summary Cisco Meraki vMX100 >

4 Buy >

\* Virtual Network JapanNetwork >

Subnets Configure subnets ⓘ >

\* VM size ⓘ 1x Standard D2 v2 >

OK

Choose virtual network

i

These are the virtual networks in the selected subscription and location 'Japan East'.

+

Create new

<...>

JapanNetwork Group

Then choose the subnet in which the vMX will be deployed. To find more information about subnets in Azure, click [here](#).

Microsoft Azure

[« Create Cisco Meraki vMX100](#)
[Deployment Details](#)
[Subnets](#)

Search resources, services and docs

Create Cisco Meraki vMX100

Deployment Details

Subnets

1 Basics Done

2 Deployment Details Required

3 Summary Cisco Meraki vMX100

4 Buy

\* Virtual Network JapanNetwork

Subnets Configure subnets

\* VM size 1x Standard D2 v2

\* Subnet default

OK

OK

Choose the VM size which will be D2\_V2 Standard:

Microsoft Azure

Create Cisco Meraki vMX100

Deployment Details

Choose a size

Search resources, services and docs

Create Cisco Meraki vMX100

Deployment Details

Choose a size

1 Basics Done

2 Deployment Details Required

3 Summary Cisco Meraki vMX100

4 Buy

Virtual Network JapanNetwork

Subnets Review subnet configuration

VM size 1x Standard D2 v2

Prices presented are estimates in your local currency that include only Azure infrastructure costs and any discounts for the subscription and location. The prices don't include any applicable software costs. Recommended sizes are determined by the publisher of the selected image based on hardware and software requirements.

Supported disk type HDD

Minimum vCPUs 1

Minimum memory (GiB) 0

D2\_V2 Standard

2 vCPUs

7 GB

4 Data disks

4x500 Max IOPS

100 GB Local SSD

Load balancing

152.52 USD/MONTH (ESTIMATED)

★ Recommended | View all

OK

Select

Review the deployment details before hitting 'OK.'



Create Cisco Meraki vMX100



Deployment Details



1

Basics  
Done



2

Deployment Details  
Required



3

Summary  
Cisco Meraki vMX100



4

Buy



\* Virtual Network  
JapanNetwork



\* Subnets  
Review subnet configuration



\* VM size ⓘ  
1x Standard D2 v2



OK

Microsoft Azure

EverythingCisco Meraki vMX100Create Cisco Meraki vMX100Summary

Search resources, services a

Create Cisco Meraki vMX100

Summary

1 Basics Done

2 Deployment Details Done

3 Summary Cisco Meraki vMX100

4 Buy

Validation passed

Basics

SubscriptionPay-As-You-Go

Resource groupCiscoMerakiRG

LocationJapan East

VM NameCiscoMerakiVM

Meraki Authentication Token87caf860220869c8d7a52c4fa79689c9/57f6f5b19b4363ff2b51e0f...

Deployment Details

Virtual NetworkJapanNetwork

Subnetdefault

Subnet address prefix10.100.0.0/24

VM sizeStandard D2 v2

OK

Download template and parameters

Review the terms of use and privacy policy before hitting 'Create.'

Microsoft Azure
Everything
Cisco Meraki vMX100
Create Cisco Meraki vMX100
Create
Search resources, services a

Create Cisco Meraki vMX100

1 Basics Done

2 Deployment Details Done

3 Summary Cisco Meraki vMX100

4 Buy

Create

performed and which resources or offerings will be deployed, and for locating and reviewing the pricing and legal terms associated with those resources or offerings. Template deployment is intended for advanced users only. If you are uncertain which actions will be performed by this template, which resources or offerings will be deployed, or what prices or legal terms pertain to those resources or offerings, do not deploy this template.

Current retail prices for Azure resources are set forth [here](#) and may not reflect discounts applicable to your Azure subscription.

Prices for Marketplace offerings are set forth [here](#), and the legal terms associated with any Marketplace offering may be found in the Azure portal; both are subject to change at any time prior to deployment.

Neither subscription credits nor monetary commitment funds may be used to purchase non-Microsoft offerings. These purchases are billed separately. If any Microsoft products are included in a Marketplace offering (e.g., Windows Server or SQL Server), such products are licensed by Microsoft and not by any third party.

**The highlighted Marketplace purchase(s) are not covered by your Azure credits, and will be billed separately.**  
You cannot use your Azure monetary commitment funds or subscription credits for these purchases. You will be billed separately for marketplace purchases.

### Co-Admin Access Permission

By checking the box and clicking "Create" I give permission for the template provider referenced above (the "Provider") to have Administrative-level access to one or more Azure resources in order to provide support and management services for the template. In the event of an issue arising from a Provider's services or failure to provide services, your sole recourse is with the Provider. Unless Microsoft is the Provider, Microsoft (i) does not approve, monitor or manage the Provider's access, and (ii) bears no responsibility whatsoever for acts or omissions of a Provider.

☒ I agree to the terms and conditions above.

### Terms of use

By checking the box and clicking "Create", I (i) agree to the Provider's Terms of Use and Privacy Statement linked above as well as the legal terms and privacy statement(s) associated with each Marketplace offering that will be deployed using this template, if any; (ii) authorize Microsoft to charge or bill my current payment method for the fees associated with my use of the offering(s), including applicable taxes, with the same billing frequency as my Azure subscription, until I discontinue use of the offering(s); (iii) agree that, unless Microsoft is the Provider, Microsoft may share my contact information and transaction details with any third-party sellers of the offerings deployed by this template; and (iv) give Microsoft permission to use and share my contact information so that Microsoft or the Provider can contact me regarding this product and related products. Microsoft assumes no responsibility for any actions performed by third-party templates and does not provide rights for third-party products or services. See the [Azure Marketplace Terms](#) for additional terms.

☒ I agree to the terms and conditions above.

Create

After you click on 'Purchase,' the deployment will begin:

## Notifications



Dismiss: Informational Completed All

Deployment in progress... Running  
Deployment to resource group 'CiscoMerakiRG' is in progress.

Once this has been completed, it may be several minutes before the deployment completes and the instance launches.



**Note:** Once the deployment has finished, it is expected that a new resource group will be created with the name of the resource group you referenced, appended with a random string of characters.

0c:8d:db:5c:81:82  
vMX100

WAN 52.185.149.141 **Active**

Serial number Q2AZ-KRJ2-98DN

Address

Tags

Notes

Firmware [Update available](#)  
Current version: MX 12.24

Config Up to date

[Generate authentication token...](#)

[Remove appliance from network...](#)

Summary **Uplink** Location Tools [View old version](#)

### Configuration

**General**

Public IP 52.185.149.141

**WAN**

Status Active

IP (DHCP) 10.100.0.6

Virtual IP

Gateway 10.100.0.1

DNS 168.63.129.16

### Live data

**Uplink traffic**

320 Kbps  
240 Kbps  
160 Kbps  
80 Kbps  
0 Kbps

Total Download

**Historical data** for the last day

No destination IP addresses configured to gather connectivity statistics. These destinations can be configured in [Traffic Shaping](#).

Once the vMX100 is online, a route table needs to be created including the Auto VPN subnets so that the Azure resources know how to access the Meraki subnets over Auto VPN.

To create a route table, click on "New" and then "Route Table".







## Route table

Microsoft



A route table contains a set of rules, called routes, that specifies how packets should be routed in a virtual network. Route tables are associated to subnets, and each packet leaving a subnet is handled based on the associated route table. Each route table can be associated to multiple subnets, but a subnet can only be associated to a single route table.

Packets are matched to routes using the destination. This can be an IP address, a virtual network gateway, a virtual appliance, or the internet. If a matching route can't be found, then the packet is dropped. By default, every subnet in a virtual network is associated with a set of built-in routes. These allow traffic between virtual machines in a virtual network; virtual machines and an address space as defined by a local network gateway; and virtual machines and the internet.

There are no additional charges for creating route tables in Microsoft Azure.



PUBLISHER

Microsoft

USEFUL LINKS

[Service overview](#)

[Documentation](#)

Create





## Create route table

You can add routes to this table after it's created.



\* Name

CiscoMerakiTable



\* Subscription

Pay-As-You-Go



\* Resource group



Create new



Use existing

CiscoMerakiRG



\* Location

Japan East



Pin to dashboard

Create

Automation options

Once the Route Table has been created, add the VPN routes pointing to the vMX100 as the next hop, including the Client VPN subnet is applicable:



## CiscoMerakiTable - Routes

Route table



Search (Ctrl+/)

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

### SETTINGS

Routes

Subnets

Properties

Locks

Automation script

### SUPPORT + TROUBLESHOOTING

Effective routes

New support request

Add

Search route.

NAME

No results.





## Add route

CiscoMerakiTable



\* Route name

CiscoMerakiTable



\* Address prefix ⓘ

192.168.128.0/24



Next hop type ⓘ

Virtual appliance



\* Next hop address ⓘ

10.100.0.6



Ensure you have IP forwarding enabled on your virtual appliance. You can enable this by navigating to the respective network interface's IP address settings.

OK





Please ignore the IP forwarding warning, it has already been enabled in the backend.

Finally, associate the Route Table with the Subnet where the vMX was deployed. Click on "Subnets" and then "Associate".



## CiscoMerakiTable - Subnets

Route table




Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

### SETTINGS

Routes

Subnets

Properties

Locks

Automation script

### SUPPORT + TROUBLESHOOTING

Effective routes

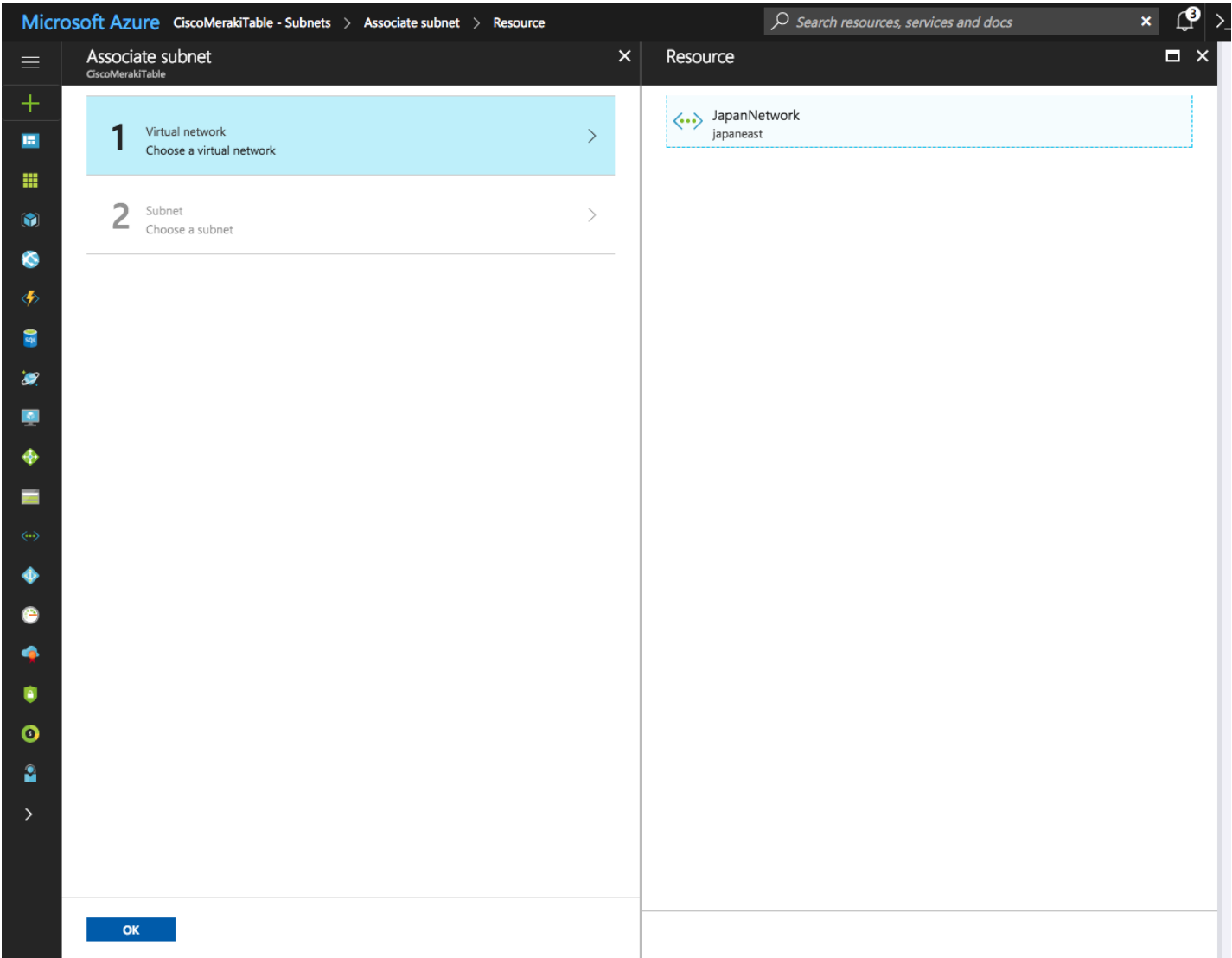
New support request

Associate

NAME

No results.

Choose the Virtual Network where the vMX was deployed:



Then, choose the subnet used to deploy the vMX100 and click on 'OK.'

Microsoft Azure CiscoMerakiTable - Subnets > Associate subnet > Choose subnet

Search resources, services and...

Associate subnet

CiscoMerakiTable

1

Virtual network  
JapanNetwork

✓

2

Subnet  
Choose a subnet

>

OK

Choose subnet

<.> default  
Group

Once the subnet has been associated, enable Site to Site VPN on Dashboard.

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## Troubleshooting

The virtual MX security appliance is fully managed through the Cisco Meraki Dashboard. This requires the vMX100 to establish bi-directional communication to the Meraki Cloud. If, after following the steps above, the vMX100 is inaccessible, please ensure the following:

1. The following characters are not being used in the template: '~ ! @ # \$ % ^ & \* ( ) = + \_ [ ] { } \ \ \ | ; : ' \ " , < > / ? . \ " ' .
2. Azure naming convention does not support spaces, make sure spaces in resource names are eliminated.
3. The token is entered into the Meraki Authentication Token field within an hour of being generated.
4. The DNS server is reachable from the subnet that the vMX100 is in and can resolve <https://config-2037.meraki.com>.
5. A Route Table has been created and associated to the correct subnet(s).



Please note that Meraki Support does not troubleshoot Azure specific firewall rules and deployments.

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## vMX100 on Azure CSP Portal

Meraki vMX100 is currently not available on the CSP portal. In the meantime, there is a workaround using an ARM template which has been attached to this article. If a CSP partner needs to deploy vMX100, then perform the following to access the portal in the context of the customer:

1. Login to Partner Center with credentials that have admin agent privileges
2. Click Dashboard and then Customers
3. Click on the customer where this resource should be deployed
4. Click Service Management and then click on the Microsoft Azure Management portal link

The above task will load the Azure Management portal, and it will be scoped to the context of the customer. This will enable you to deploy the template using the appropriate Azure subscription. To deploy this template perform the following

1. Extract the contents of the attached [zip archive](#)
2. Click the + *Create a resource* button located in the upper left
3. Search the marketplace for *Template deployment*, click the item, and then click the *Create* button



## Template deployment

Microsoft



Applications running in Microsoft Azure usually rely on a combination of resources, like databases, servers, and web apps. Azure Resource Manager templates enable you to deploy and manage these resources as a group, using a JSON description of the resources and their deployment settings.

Edit your template with IntelliSense and deploy it to a new or existing resource group.

[Save for later](#)

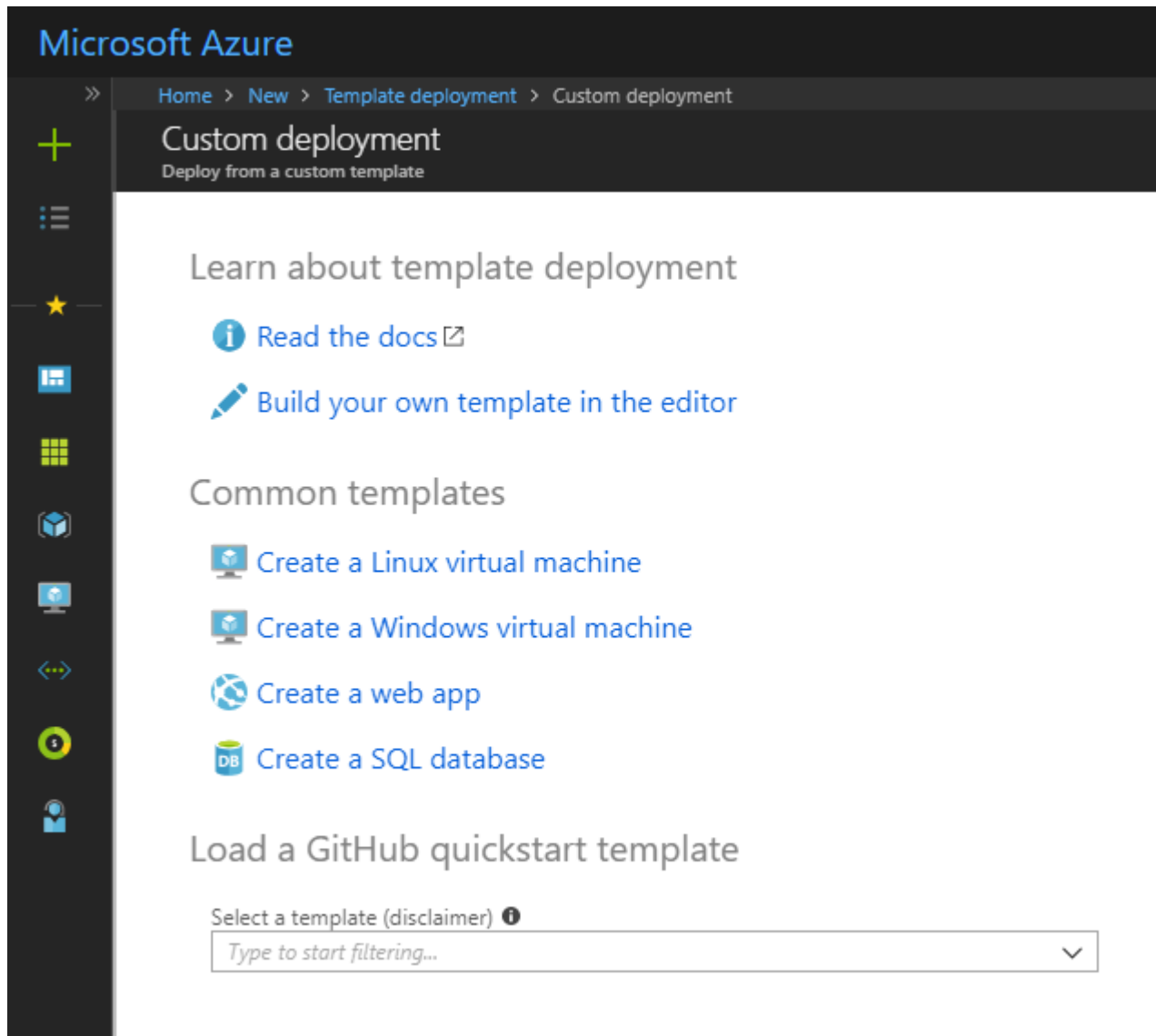
---

PUBLISHER	Microsoft
LOGICAPPSUPPORTED	none
USEFUL LINKS	<a href="#">Documentation</a>

---

Create

4. Click the *Build your own template in the editor* link as shown in the figure below



5. Click the *Load File* button found at the top. Select the *azuredeploy.json* file and then click *Ok* to load the template



Microsoft Azure

Home > New > Template deployment > Custom deployment > Edit template

## Edit template

Edit your Azure Resource Manager template

+ Add resource   ↑ Quickstart template   ↗ Load file   ⬇ Download

- Parameters (12)
- Variables (1)
- Resources (1)
  - [parameters('applicationResource...)]

```

1 {
2   "$schema": "https://schema.management.azure.com/schemas/2015-01-01/deploymentTemplate.json#",
3   "contentVersion": "1.0.0.0",
4   "parameters": {
5     "location": {
6       "type": "string",
7       "metadata": {
8         "description": "Deployment location"
9       }
10    },
11    "vmName": {
12      "type": "string",
13      "metadata": {
14        "title": "VM Name",
15        "description": "This is the name of the your VM"
16      }
17    },
18    "merakiAuthToken": {
19      "type": "string",
20      "metadata": {
21        "description": "This is your authentication string generated by Meraki Dashboard"
22      }
23    },
24    "virtualNetworkName": {
25      "type": "string",
26      "metadata": {
27        "description": "New or Existing VNet Name"
28      }
29    },
30    "virtualNetworkNewOrExisting": {
31      "type": "string",
32      "metadata": {
33        "description": "Boolean indicating whether the VNet is new or existing"
34      }
35    },
36    "virtualNetworkAddressPrefix": {

```

Save   Discard

- Click the **Save** button to complete the process of loading the template
- Click the *Edit parameters* button
- Click the *Load File* button found at the top. Select the *azuredeploy.parameter.json* file and then click *Ok* to load the parameters
- Click the **Save** button to complete the process of loading the parameters
- Modify the *Settings* value to correctly match the customer's environment.



Please note that for the "Basics" section a new resource group should be created to avoid locking existing resources.

When filling out the "Settings" section, use the information of an existing Virtual Network.

Microsoft Azure

Home > New > Template deployment > Custom deployment

Custom deployment  
Deploy from a custom template

BASICS

\* Subscription

Visual Studio Enterprise

\* Resource group

Create new

Use existing

vMX100-RG

\* Location

West US 2

SETTINGS

\* Location ⓘ

West US 2

\* Vm Name ⓘ

Meraki-VM

\* Meraki Auth Token ⓘ

6192552da6c70de6412943517e246212/3309b567211cb27cbdab922e30cc29ab...

\* Virtual Network Name ⓘ

Meraki-NET

\* Virtual Network New Or Existing ⓘ

existing

\* Virtual Network Address Prefix ⓘ

10.0.0.0/16

\* Virtual Network Resource Group ⓘ

Meraki-RG

\* Virtual Machine Size ⓘ

Standard\_D2\_v2

\* Subnet Name ⓘ

Meraki-NET

\* Subnet Address Prefix ⓘ

10.0.0.0/24

Base Url ⓘ

https://gallery.azure.com/artifact/20151001/cisco.meraki-vmxmeraki-vmx100.1.0.1...

Application Resource Name

e66f5b3b08274953a0be4cd24e589cc6

☐ Pin to dashboard

Purchase

11. Check the *I agree to the terms and conditions stated above* checkbox after you have reviewed the terms and condition. By checking the box you will be agreeing to the terms.

12. Click the *Purchase* button

This will start the deployment and within a few moments, the appliance will be deployed.