Configure ASA IPsec VTI Connection to Azure

Contents

Introduction

This document describes how to configure an Adaptive Security Appliance (ASA) IPsec Virtual Tunnel Interface (VTI) connection to Azure.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- An ASA connected directly to the Internet with a public static IPv4 address that runs ASA 9.8.1 or later.
- An Azure account

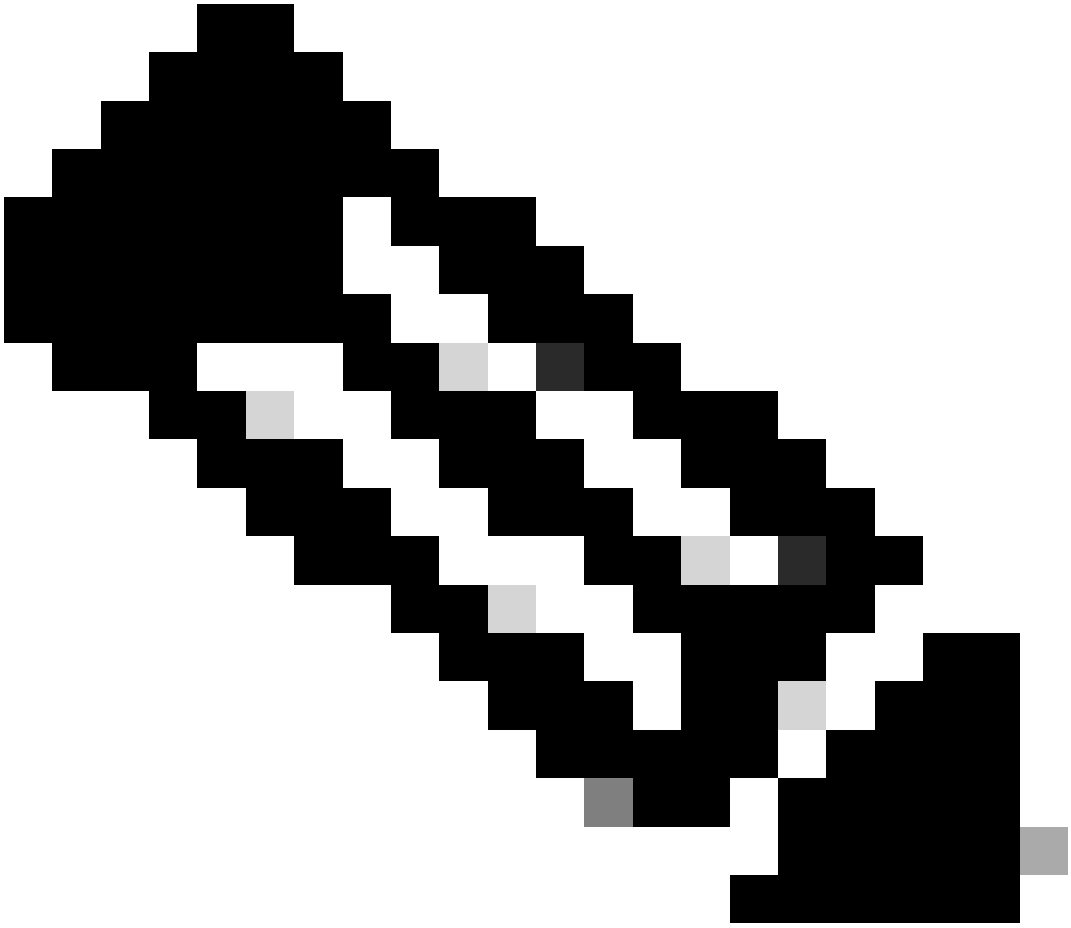
Components Used

This document is not restricted to specific software and hardware versions.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Background Information

In ASA 9.8.1, the IPsec VTI feature was extended to utilize IKEv2, however, it is still limited to sVTI IPv4 over IPv4. This configuration guide was produced with the use of the ASA CLI interface and the Azure Portal. The configuration of the Azure portal can also be performed by PowerShell or API. For more information about the Azure configuration methods, refer to the Azure documentation.



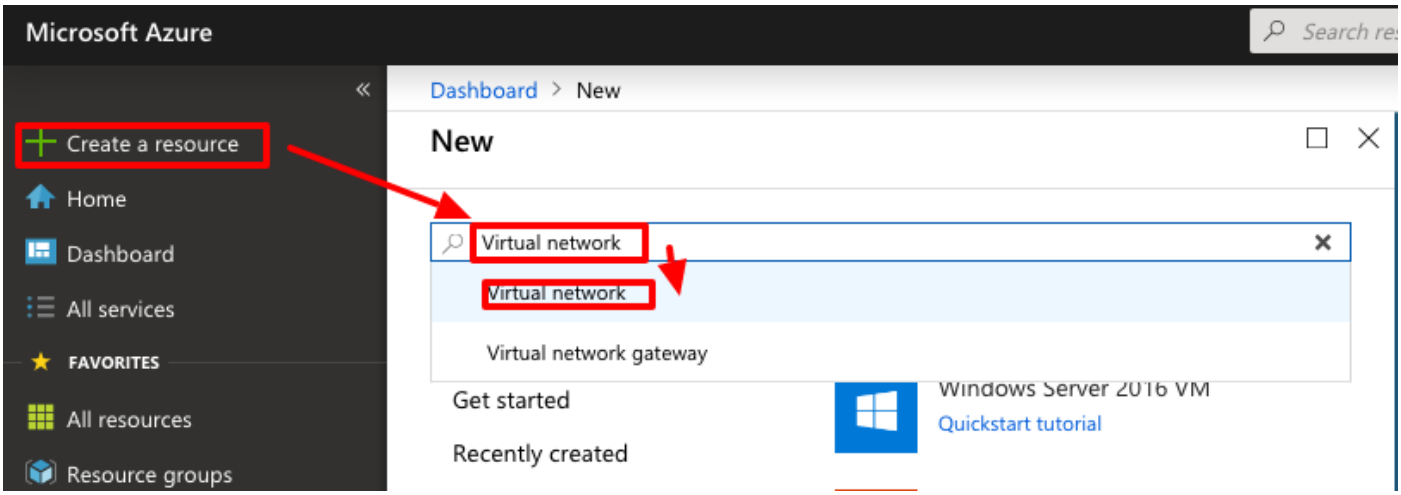
Note: Currently, VTI is only supported in single-context, routed mode.

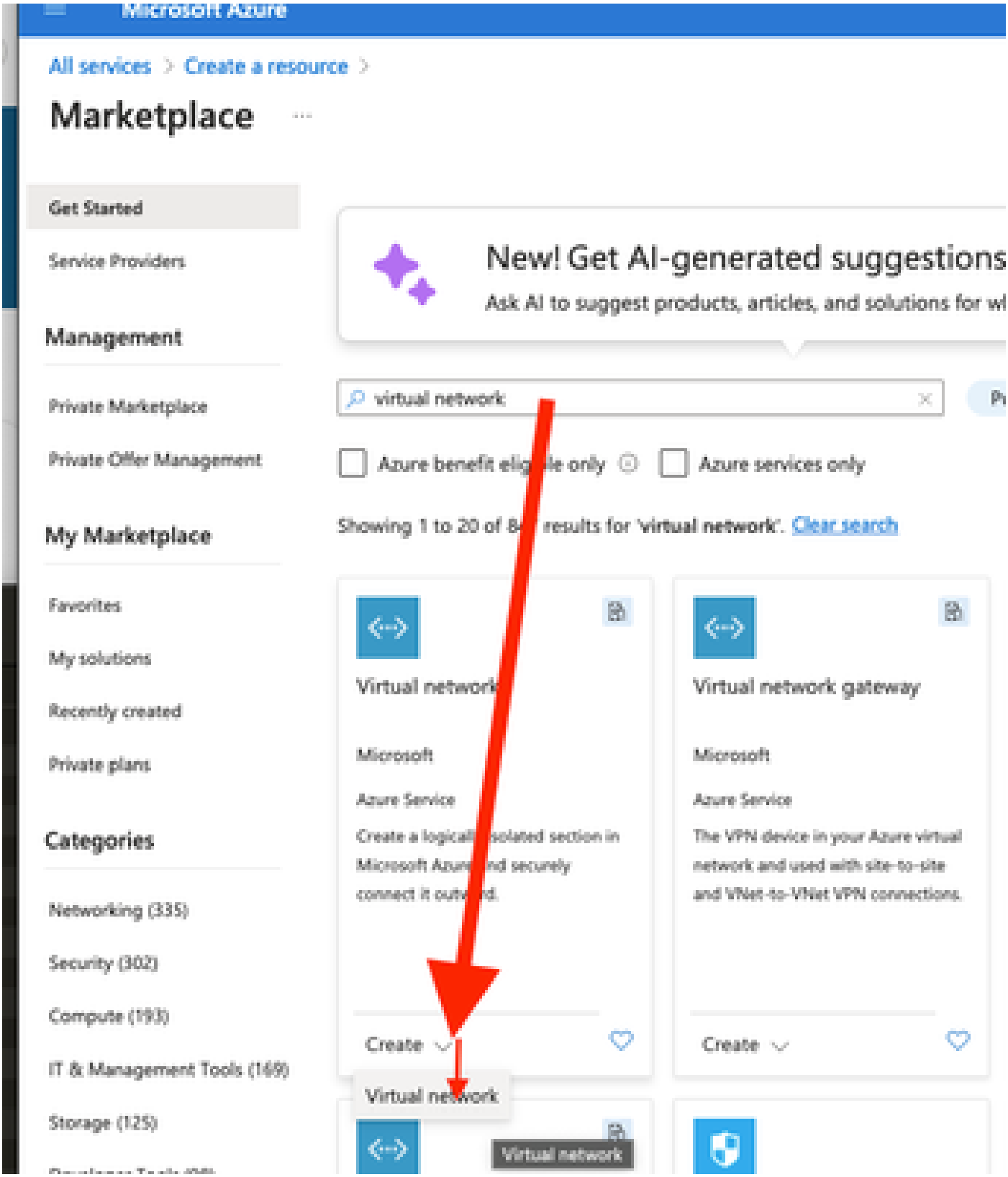
Configure

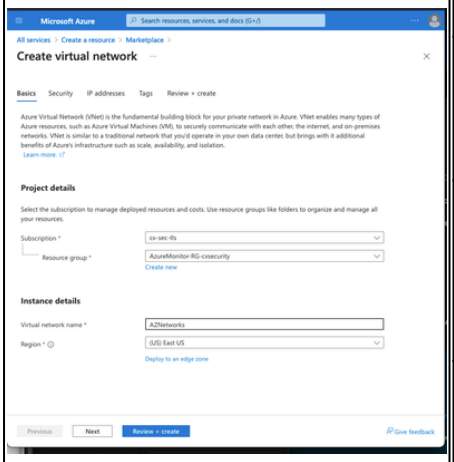
This guide assumes that the Azure cloud has not been configured. Some of these steps can be skipped if the resources are already established.

Step 1. Configure a network within Azure.

This is the network address space that lives in the Azure Cloud. This address space must be large enough in order to accommodate sub-networks within them as shown in the image.


Microsoft Azure
Search re
Create a resource
Home
Dashboard
All services
FAVORITES
All resources
Resource groups
Dashboard > New
New
Virtual network
Virtual network
Virtual network gateway
Get started
Recently created
Windows Server 2016 VM
Quickstart tutorial

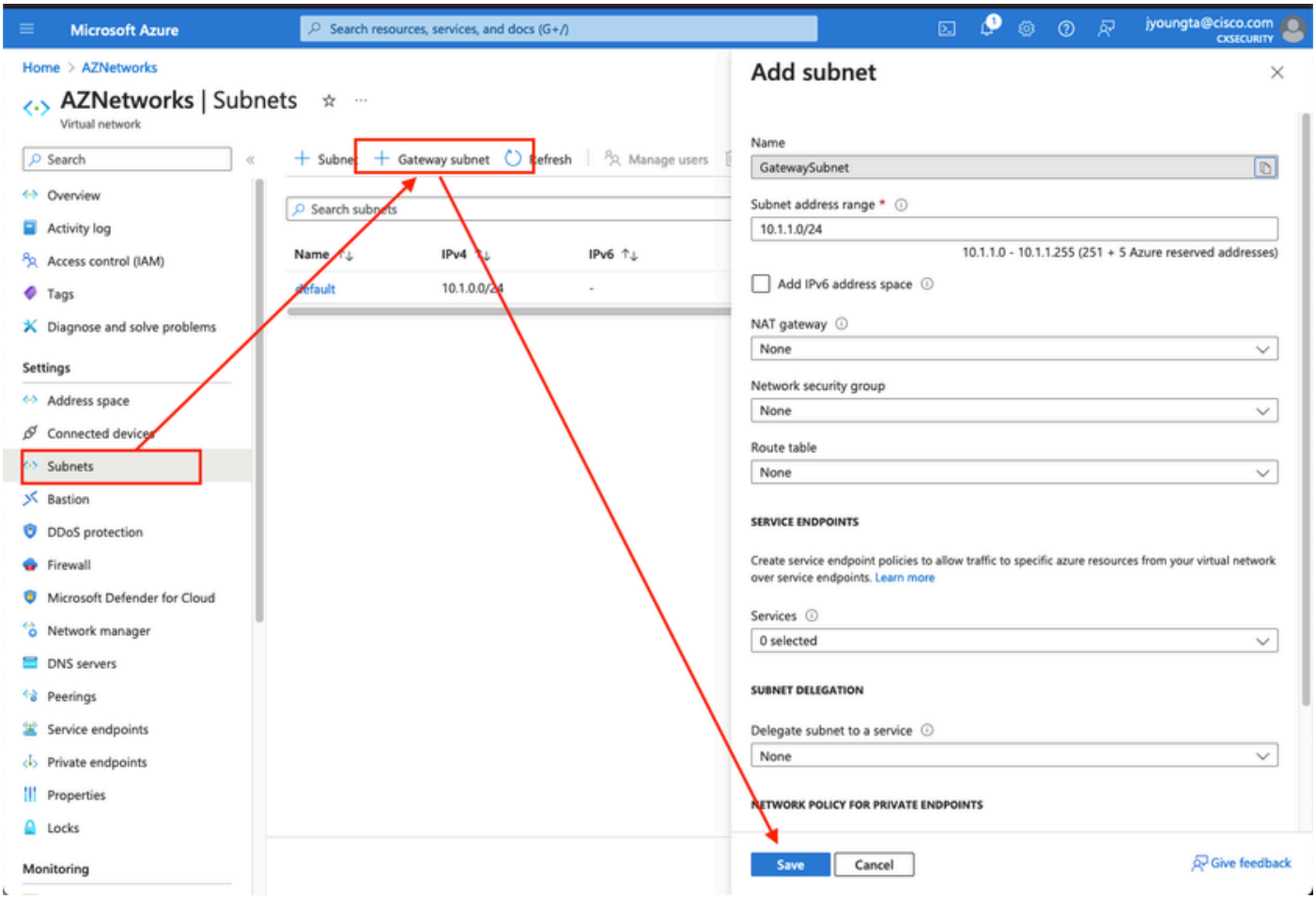

Microsoft Azure
All services > Create a resource >
Marketplace
Get Started
Service Providers
Management
Private Marketplace
Private Offer Management
My Marketplace
Favorites
My solutions
Recently created
Private plans
Categories
Networking (335)
Security (302)
Compute (193)
IT & Management Tools (169)
Storage (125)
New! Get AI-generated suggestions
Ask AI to suggest products, articles, and solutions for wl
virtual network
Azure benefit eligible only
Azure services only
Showing 1 to 20 of 8 results for 'virtual network'. Clear search
Virtual network
Microsoft
Azure Service
Create a logically isolated section in Microsoft Azure and securely connect it outward.
Create
Virtual network gateway
Microsoft
Azure Service
The VPN device in your Azure virtual network and used with site-to-site and VNet-to-VNet VPN connections.
Create
Virtual network
Virtual network



Name	A Name for the IP Address Space Hosted in the Cloud
Address Space	The whole CIDR range hosted in Azure. In this example, 10.1.0.0/16 is used.
Subnet Name	The name for the first subnet created within the virtual network to which VMs are usually attached. A subnet called default is usually created.
Subnet Address range	A subnet created within the Virtual Network.

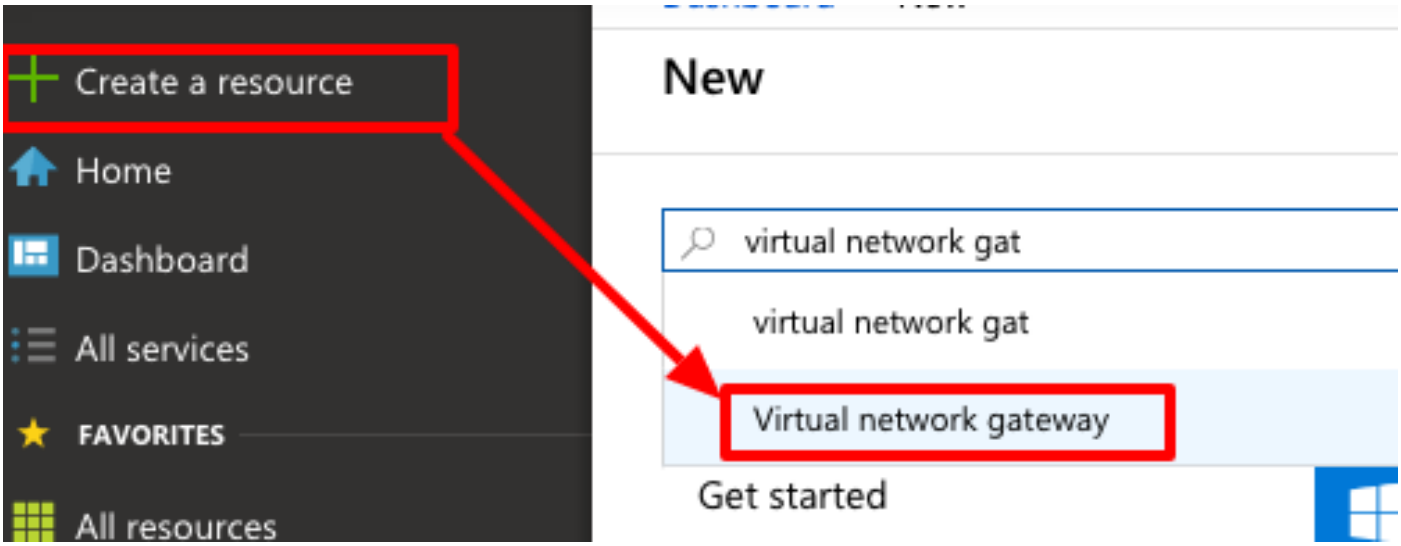
Step 2. Modify the Virtual Network in order to create a Gateway Subnet.

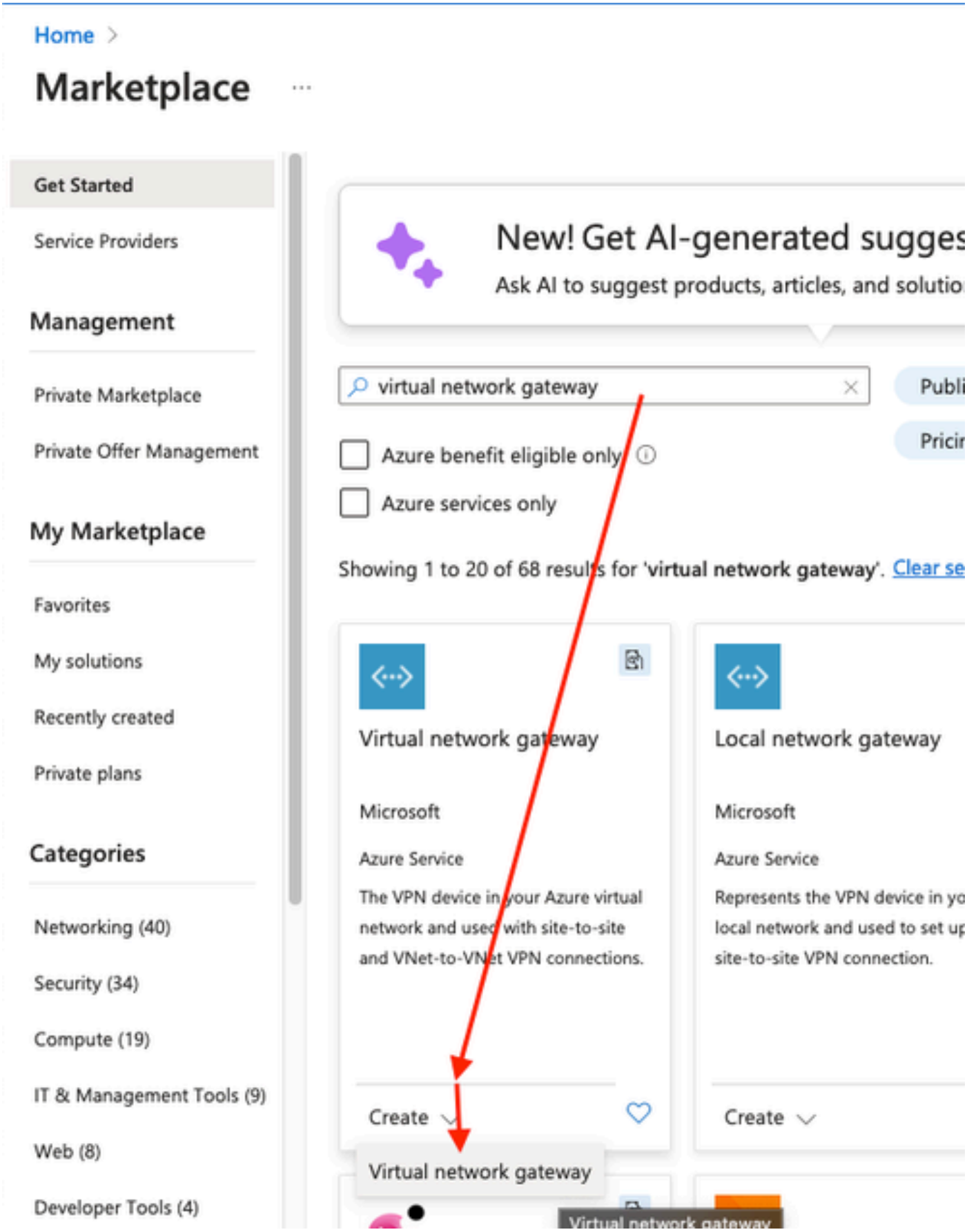
Navigate to the **Virtual network** and add a gateway subnet. In this example, 10.1.1.0/24 is used.



Step 3. Create a Virtual Network Gateway.

This is the VPN endpoint that is hosted in the cloud. This is the device that the ASA builds the IPsec tunnel with. This step also creates a public IP which is assigned to the Virtual network gateway. This step can take 15 - 20 minutes to complete.


Create a resource
Home
Dashboard
All services
FAVORITES
All resources
New
virtual network gat
virtual network gat
Virtual network gateway
Get started

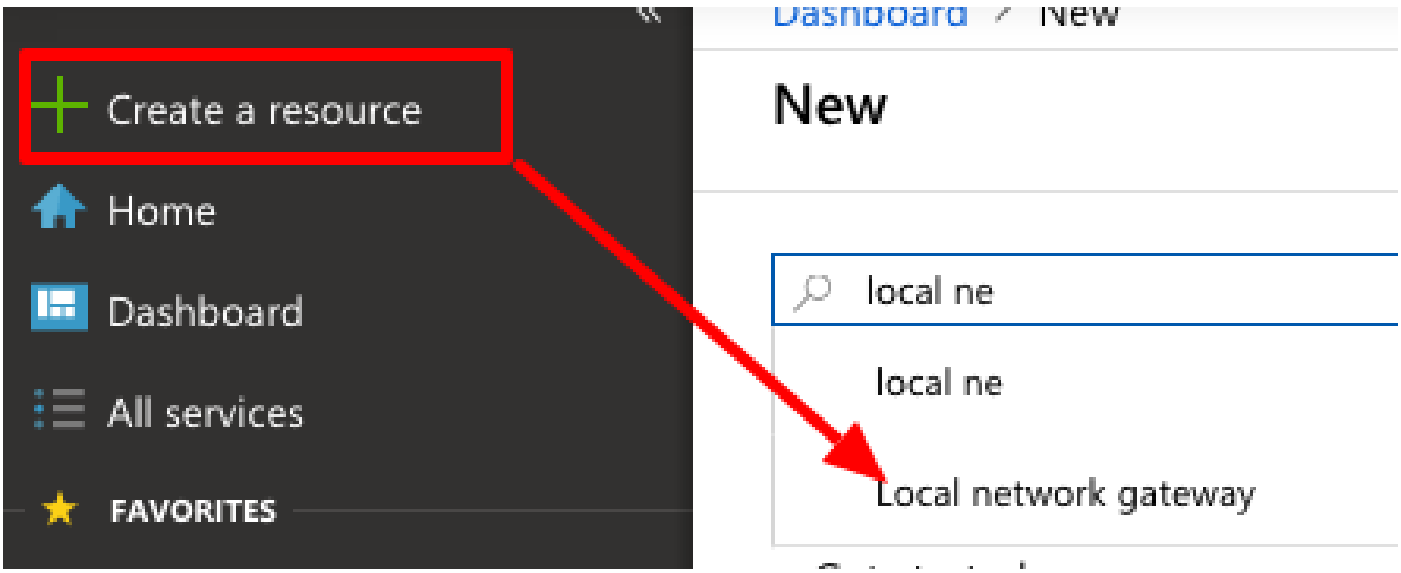


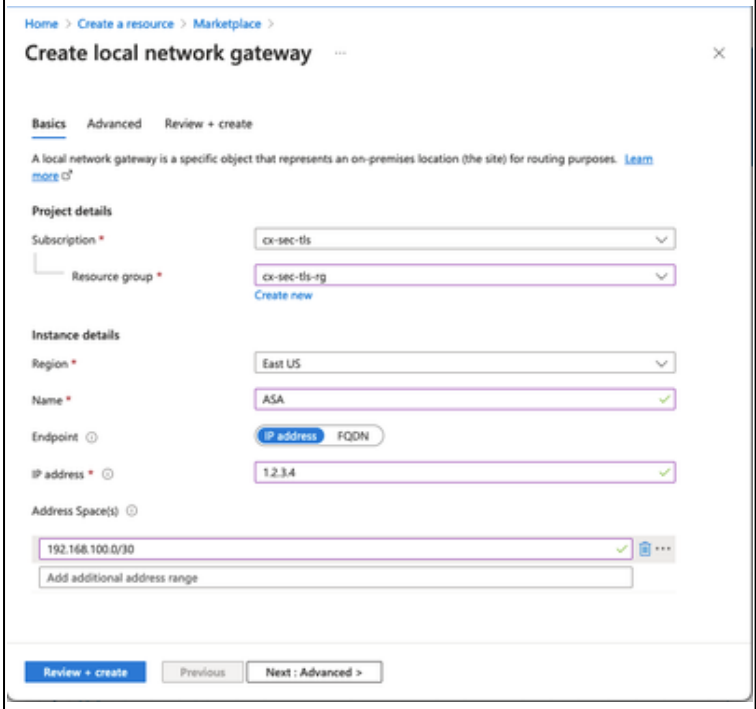
Name	**Name for the Virtual Network Gateway**

Gateway Type	Select VPN as this is an IPsec VPN.
VPN Type	Select Route-based because this is a VTI. Policy-based is used when a crypto map VPN is done.
SKU	Need to select VpnGw1 or greater based on the amount of traffic needed. Basic does not support Border Gateway Protocol (BGP).
Enabled active/active mode	Do not enable. At the time of posting, the ASA does not have the capability to source the BGP session from a loopback or inside the interface. Azure only allows 1 IP address for the BGP peering.
Public IP address	Create a new IP address and assign a name to the resource.
Configure BGP ASN	Check this box to enable BGP on the link.
ASN	Leave this as the default 65515. This is the ASN Azure that presents itself.

Step 4. Create a Local Network Gateway.

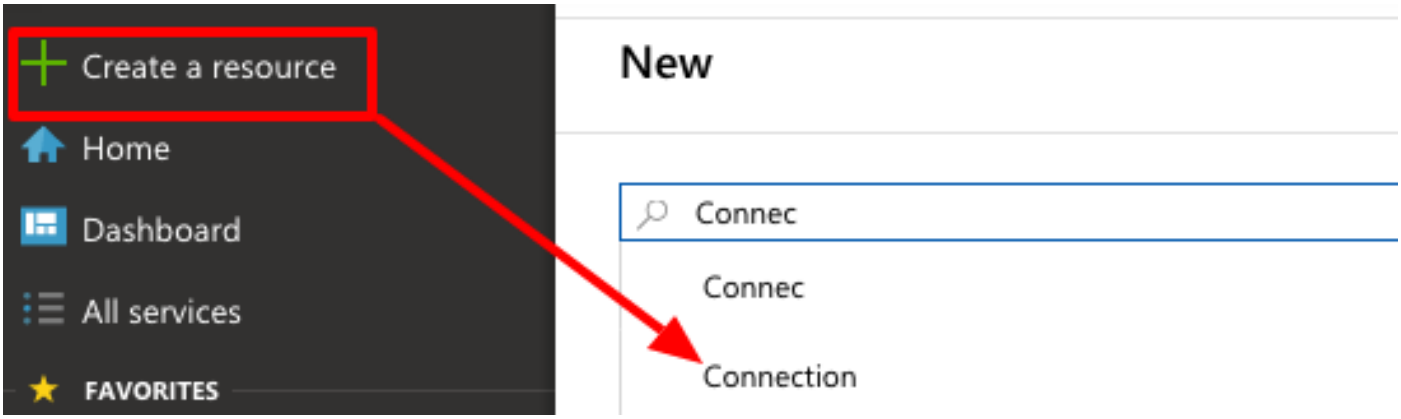
A Local network gateway is the resource that represents the ASA.

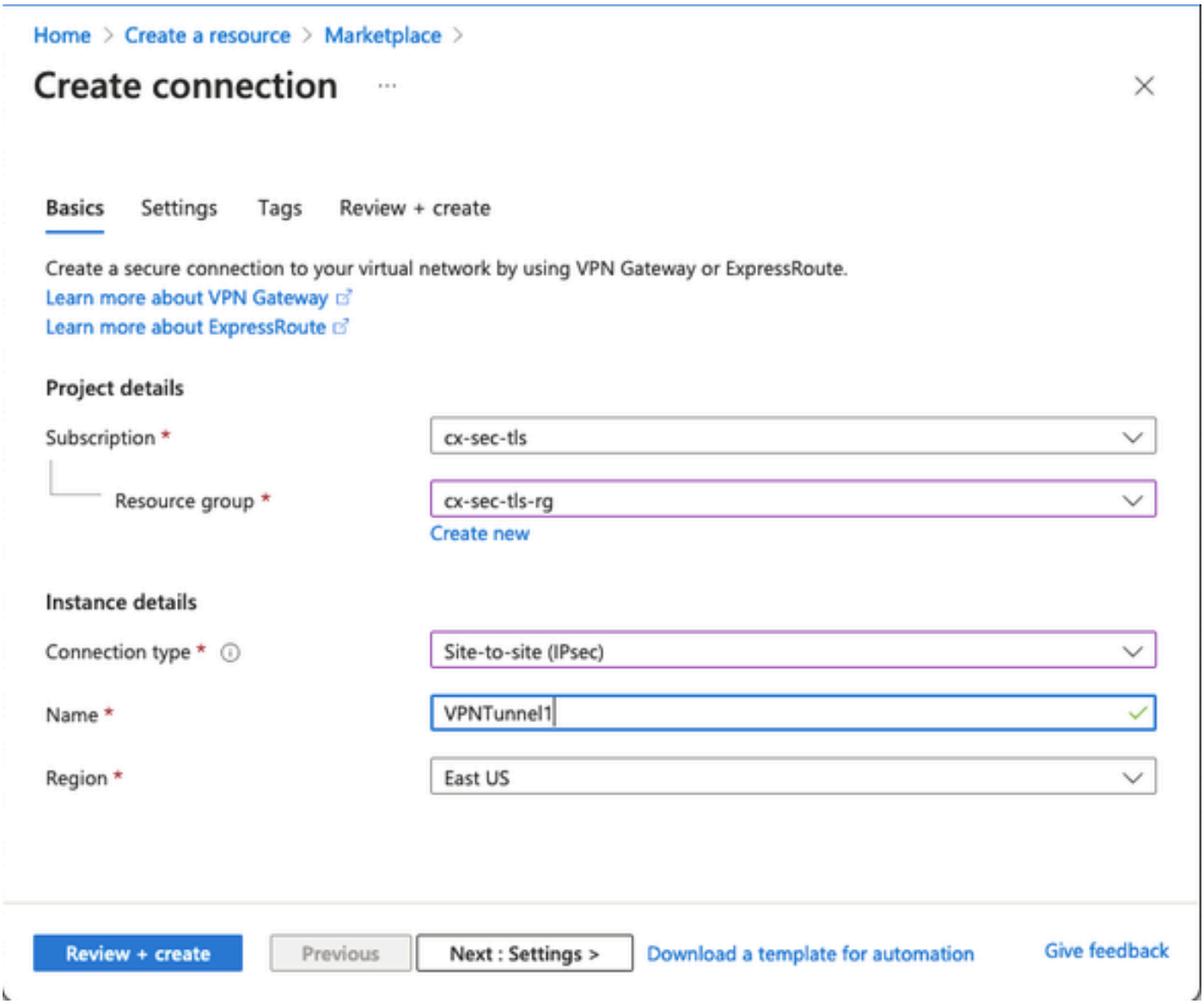


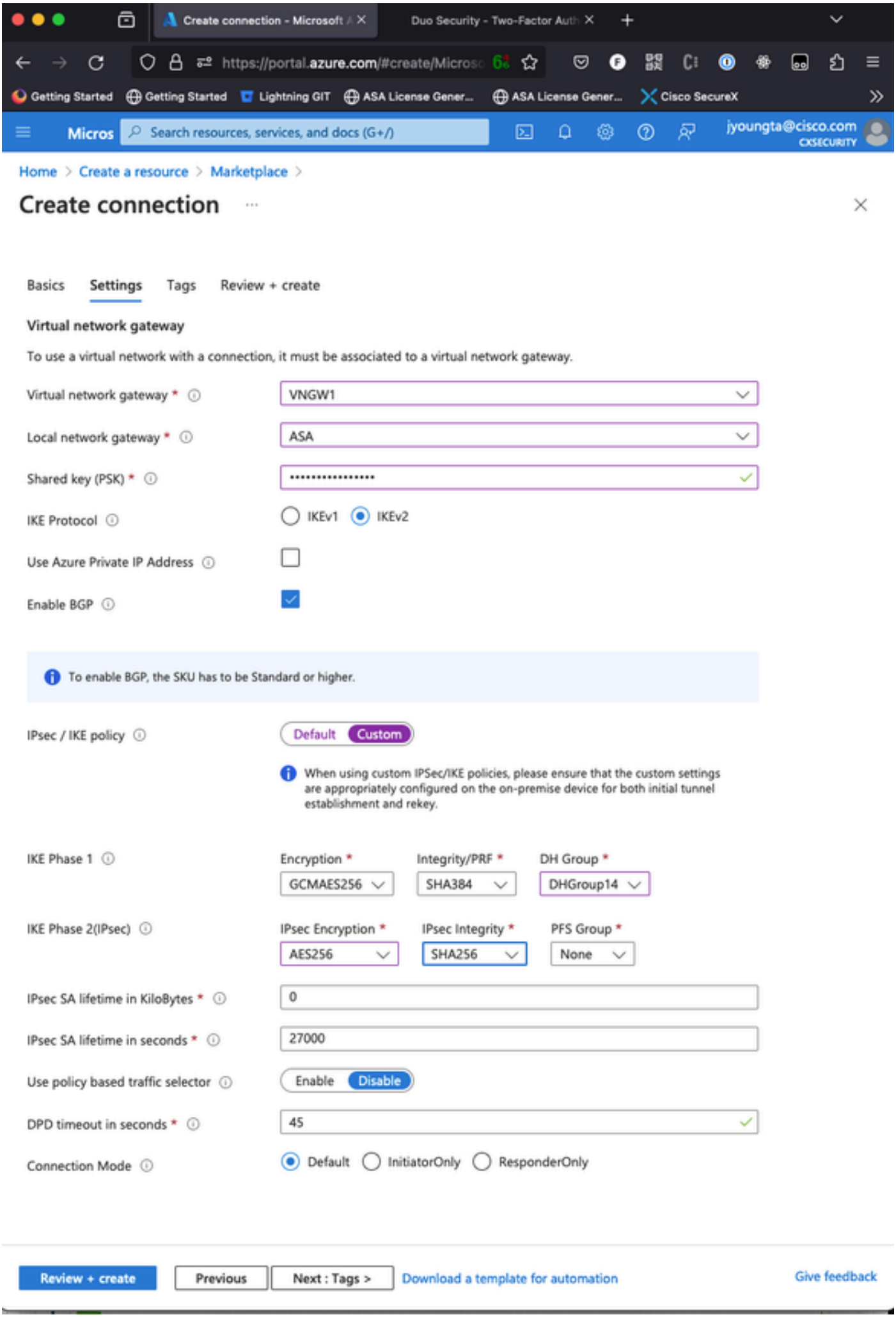


Name	A Name for the ASA
IP Address	The public IP address of the ASA's outside interface.
Address Space	The subnet is configured on the VTI later.
Configure BGP Settings	Check this to enable BGP.
ASN	This ASN is configured on the ASA.
BGP peer IP address	The IP address is configured on the ASA VTI interface.

Step 5. Create a new connection between the Virtual network gateway and the Local network gateway as shown in the image.




Home > Create a resource > Marketplace >
Create connection
Basics
Settings
Tags
Review + create
Create a secure connection to your virtual network by using VPN Gateway or ExpressRoute.
Learn more about VPN Gateway
Learn more about ExpressRoute
Project details
Subscription *
cx-sec-tls
Resource group *
cx-sec-tls-rg
Create new
Instance details
Connection type *
Site-to-site (IPsec)
Name *
VPNTunnel1
Region *
East US
Review + create
Previous
Next : Settings >
Download a template for automation
Give feedback



Step 6. Configure the ASA.

in order to validate layer 3 routing and layer 4 connectivity for BGP or the endpoint resources if you use static routing.

```
<#root>

ciscoasa#

ping 10.1.2.254

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.1.2.254, timeout is 2 seconds:

!!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 40/42/50 ms
ciscoasa#

ping tcp 10.1.2.254 179

Type escape sequence to abort.
No source specified. Pinging from identity interface.
Sending 5 TCP SYN requests to 10.1.2.254 port 179
from 192.168.100.1, timeout is 2 seconds:

!!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 41/42/42 ms
ciscoasa#
```

Step 4. When you use BGP, verify BGP connectivity routes received and advertised to Azure and the routing table of the ASA.

```
<#root>

ciscoasa#

show bgp summary


BGP router identifier 192.168.100.1, local AS number 65000
BGP table version is 6, main routing table version 6
4 network entries using 800 bytes of memory
5 path entries using 400 bytes of memory
2/2 BGP path/bestpath attribute entries using 416 bytes of memory
1 BGP AS-PATH entries using 24 bytes of memory
0 BGP route-map cache entries using 0 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory
BGP using 1640 total bytes of memory
BGP activity 14/10 prefixes, 17/12 paths, scan interval 60 secs

Neighbor        V           AS MsgRcvd MsgSent   TblVer  InQ OutQ Up/Down  State/PfxRcd
10.1.2.254      4        65515 73      60              6    0    0

01:02:26  3


ciscoasa#

show bgp neighbors 10.1.2.254 routes
```

```
BGP table version is 6, local router ID is 192.168.100.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
              r RIB-failure, S Stale, m multipath
Origin codes: i - IGP, e - EGP, ? - incomplete

   Network          Next Hop        Metric LocPrf Weight  Path

*> 10.1.0.0/16      10.1.2.254                       0  65515 i   <<< This is the virtual network defi

*  192.168.100.0/30 10.1.2.254                       0  65515 i
r> 192.168.100.1/32 10.1.2.254                       0  65515 i

Total number of prefixes 3
ciscoasa#
```

show bgp neighbors 10.1.2.254 advertised-routes

```
BGP table version is 6, local router ID is 192.168.100.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
              r RIB-failure, S Stale, m multipath
Origin codes: i - IGP, e - EGP, ? - incomplete

   Network          Next Hop        Metric LocPrf Weight  Path

*> 192.168.2.0      0.0.0.0              0         32768  i        <<< These are the routes being advert
*> 192.168.100.0/30 0.0.0.0              0         32768  i        <<<


Total number of prefixes 2
ciscoasa#
ciscoasa#
```

show route

```
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, V - VPN
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route, + - replicated route
Gateway of last resort is 10.1.251.33 to network 0.0.0.0

S*       0.0.0.0 0.0.0.0 [1/0] via B.B.B.C, outside

B        10.1.0.0 255.255.0.0 [20/0] via 10.1.1.254, 01:03:33


S        10.1.2.254 255.255.255.255 [1/0] via 192.168.100.2, AZURE
C        B.B.B.A 255.255.255.224 is directly connected, outside
L        B.B.B.B 255.255.255.255 is directly connected, outside
C        192.168.2.0 255.255.255.0 is directly connected, inside
L        192.168.2.2 255.255.255.255 is directly connected, inside
C        192.168.100.0 255.255.255.252 is directly connected, AZURE
L        192.168.100.1 255.255.255.255 is directly connected, AZURE
```

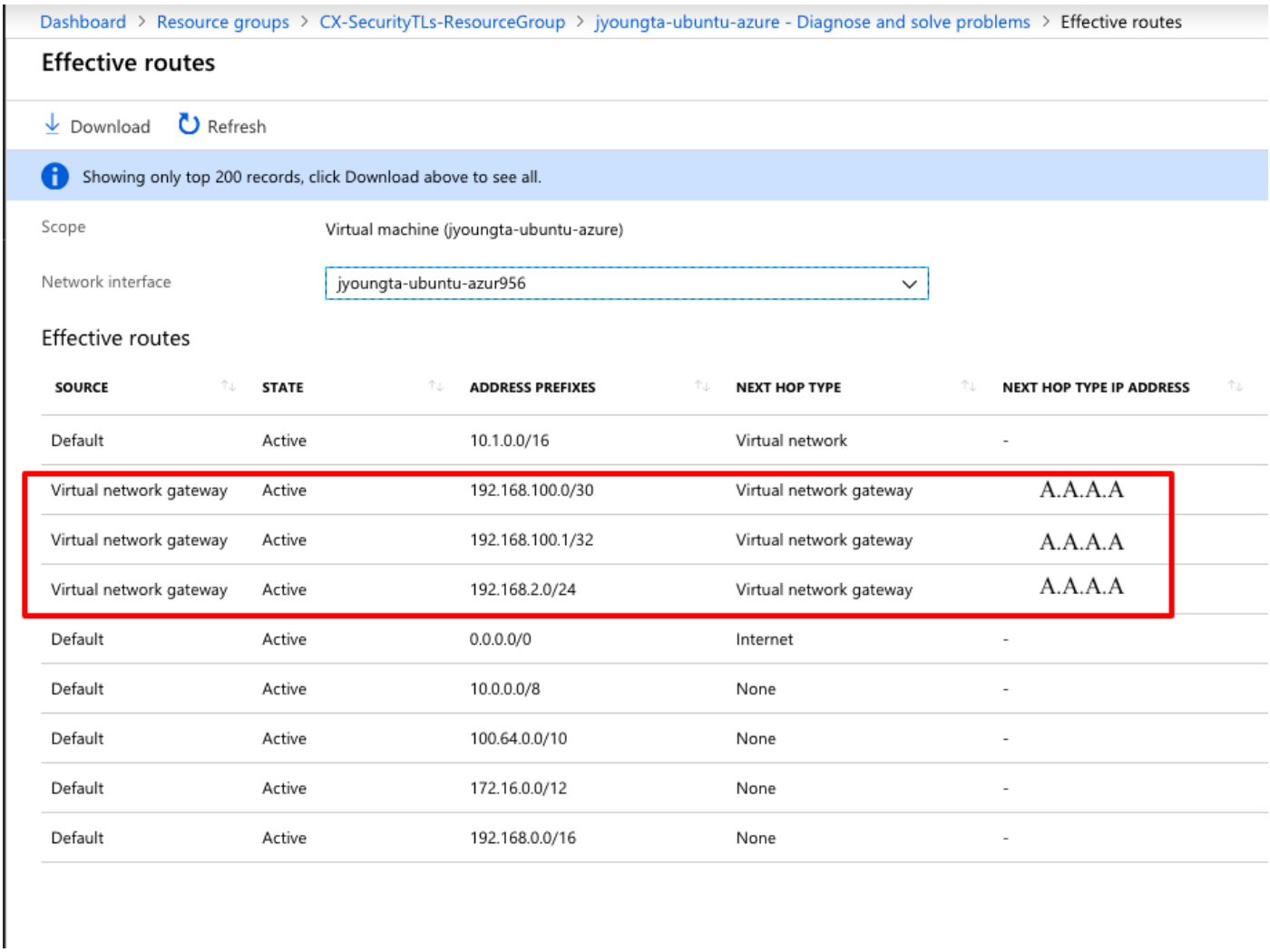
Step 5. Ping a device over the tunnel. In this example, it is an Ubuntu VM that runs in Azure.

<#root>

```
ciscoasa# p
ing 10.1.0.4

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.1.0.4, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 40/42/50 ms
```

View the effective routes on the remote VM now. They must show the routes the ASA advertised to the cloud as shown in the image.



Troubleshoot

There is currently no specific information available to troubleshoot this configuration.