CloudGuard Deployment in Microsoft Azure

Summary:

This whitepaper walks through the creation of an Azure environment with a Check Point CloudGuard firewall protecting a Web Server. The Azure environment consists of a VNet with three subnets: Frontend, Backend and Web. The CloudGuard firewall will have a NIC in the Frontend and Backend subnets and the Web Server will be deployed in the Web subnet. A Check Point R80.20 Security Management Server will be deployed in the Frontend subnet and integrated with the CloudGuard Controller.

Prerequisites:

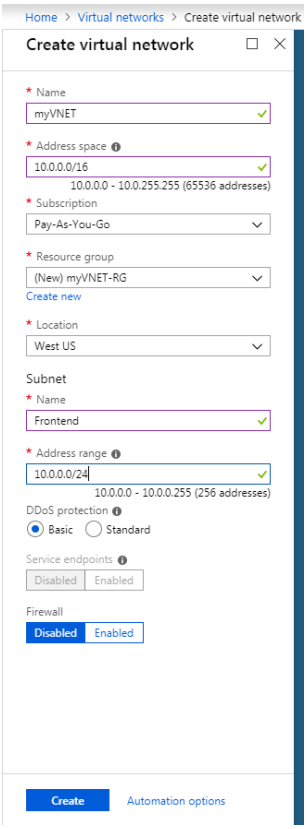
- You will need a Microsoft Azure account with a valid subscription
- Basic understanding of the following Azure Services:
    - Azure Virtual Networks: An Azure Virtual Network (VNet) is a representation of your network in the cloud. It is a logical isolation of the Azure cloud dedicated to your resources.
    - User Defined Routes: AKA Azure Route Tables, allow you to create network routes so that your Check Point CloudGuard firewalls can handle traffic between all subnets and destined for outside the VNet.
    - Virtual Machines: Provide flexibility of virtualization for a wide range of computing solutions.
- Basic admin experience with SmartConsole
    - How to create/modify objects
    - How to create/modify rules in a policy
    - How to publish sessions and install policy
    - How to view logs

Additional Resources:

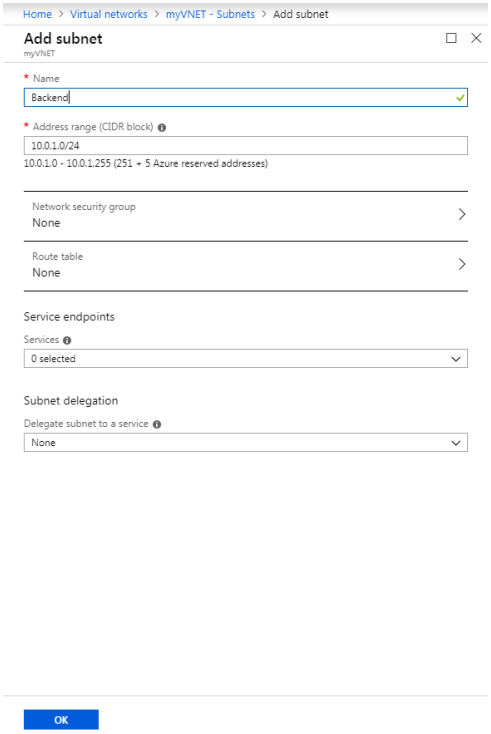
- Recorded demonstration of this deployment: https://www.youtube.com/watch?v=HX3mG-hjSDo
- Check Point Secure Knowledge Article sk109360 – Check Point Reference Architecture for Microsoft Azure
- Check Point Secure Knowledge Article sk132192 – CloudGuard for Azure Latest updates

Deployment Steps:

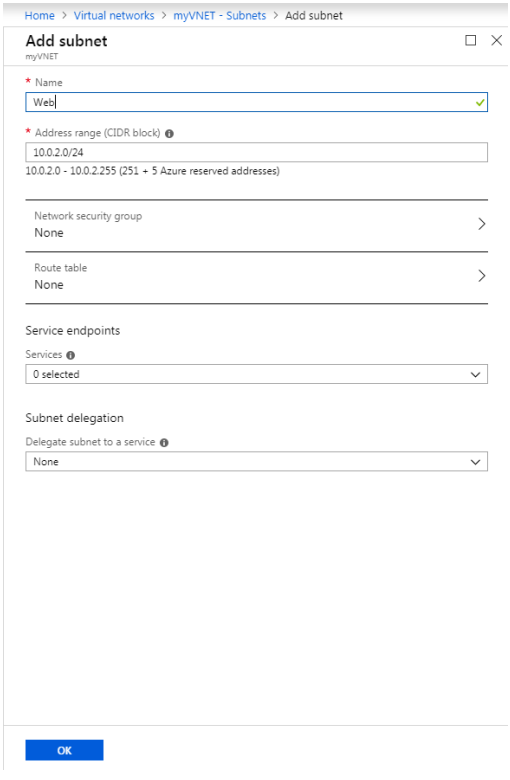
1. How to create a Virtual Network with a Frontend subnet
    a. Navigate to Virtual Networks and click **Create**
    b. Name: myVNET
    c. Address space: 10.0.0.0/16
    d. Choose your subscription
    e. Create new Resource Group: myVNET-RG
    f. Location: West US
    g. Subnet:
        i. Name: Frontend
        ii. Address range: 10.0.0.0/24
    h. Leave the rest as default and click **Create**



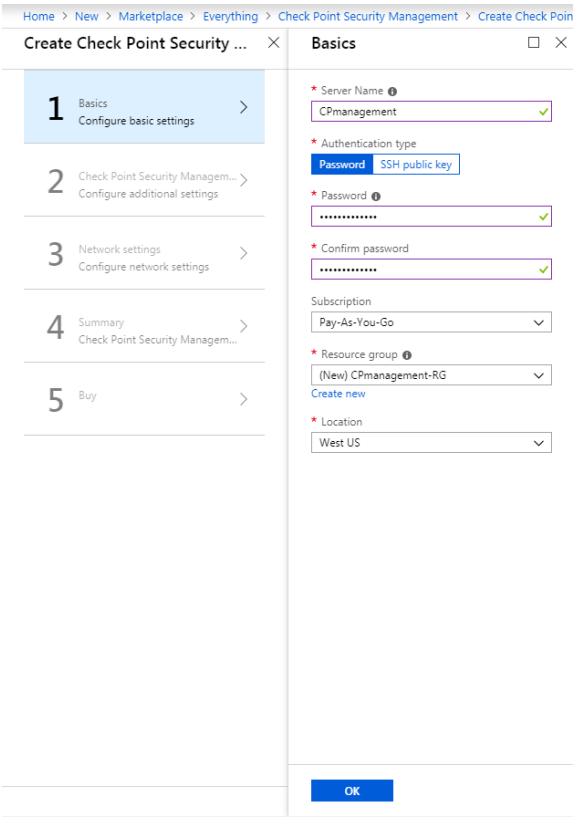
2. Add two more subnets to the Virtual Network
    a. Click on **myVNET**
    b. Navigate to Subnets and click on **new Subnet**
    c. Name: Backend
    d. Address range: 10.0.1.0/24
    e. No Network Security Group
    f. No Route tables
    g. Click **OK**



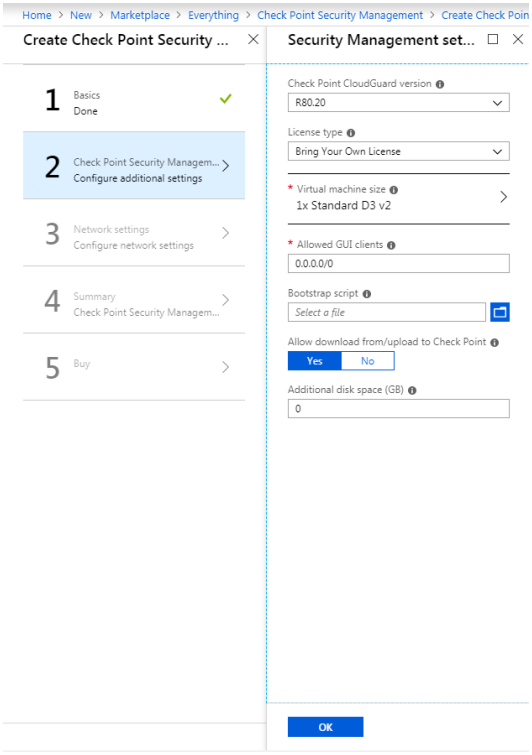
h. Click on **new Subnet**
i. Name: Web
j. Address range: 10.0.2.0/24
k. No Network Security Group
l. No Route tables (We will create this at a later time)
m. Click **OK**



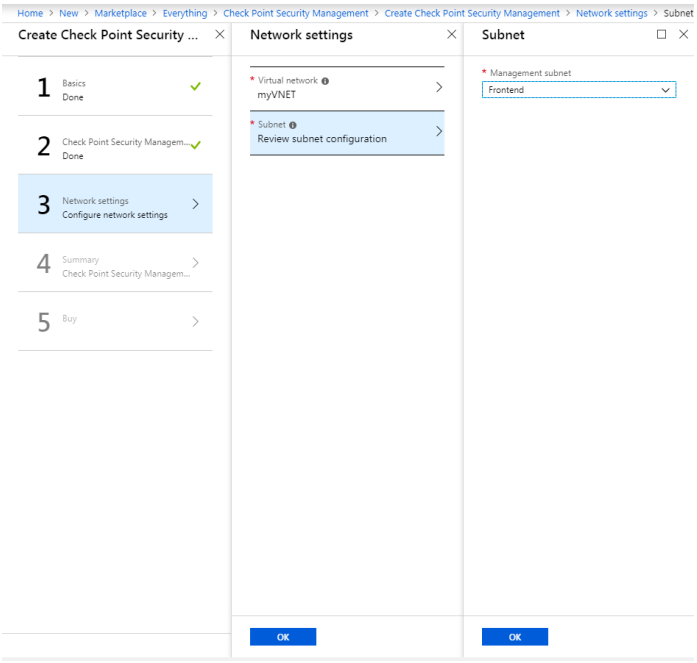
3. How to deploy the R80.20 Management Server
    a. Search the Marketplace for Check Point
    b. Select Check Point Security Management and click **Create**
    c. Server Name: CPmanagement
    d. Authentication type: Password
    e. Choose Subscription
    f. Create Resource Group: CPmanagement-RG
    g. Location: West US



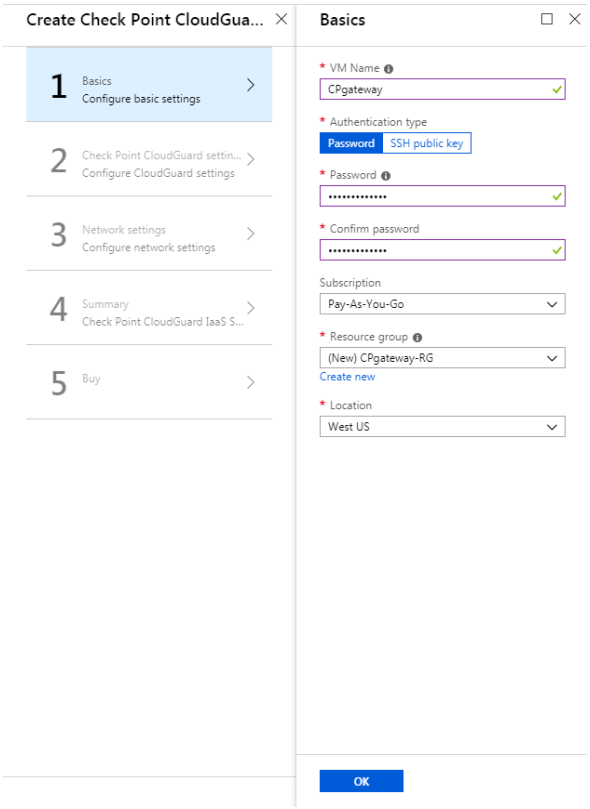
    h. Click **OK**
    i. Check Point CloudGuard version: R80.20
    j. License type: Bring Your Own License
    k. Virtual machine size: 1x Standard D3 v2
    l. Allowed GUI clients 0.0.0.0/0
    m. Allow download from/upload to Check Point



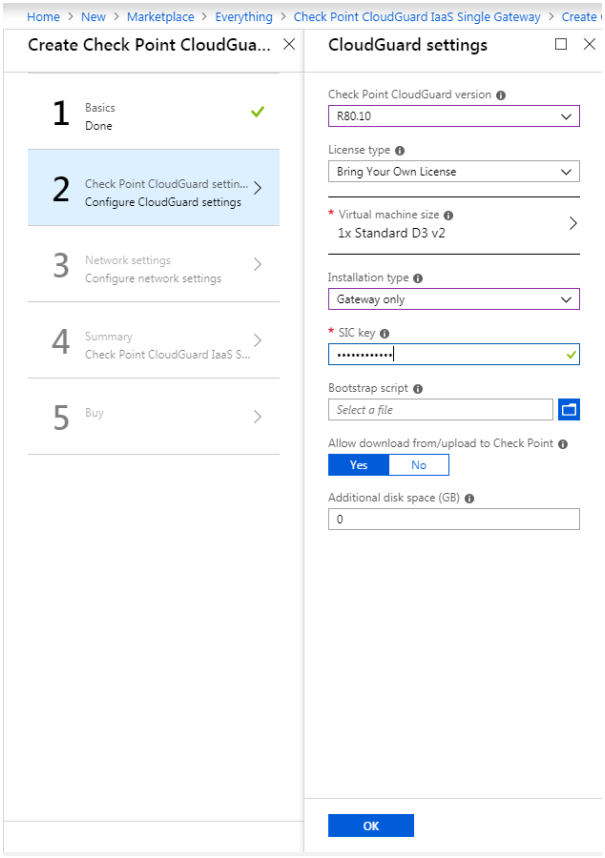
n. Click **OK**
o. Virtual Network: myVNET
p. Subnet: Frontend
q. Once validation passes click **Create**



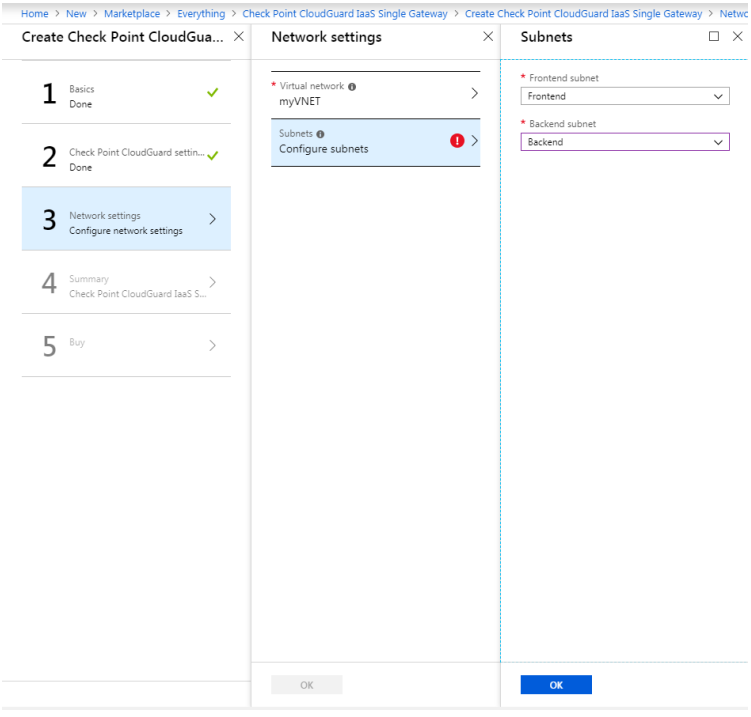
4. How to deploy the CloudGuard firewall
    a. Search Marketplace for Check Point
    b. Select Check Point CloudGuard IaaS Single Gateway and click **Create**
    c. VM Name: CPgateway
    d. Authentication Type: Password
    e. Choose Subscription
    f. Create Resource Group: CPgateway-RG
    g. Select Location and click **OK**



    h. Check Point CloudGuard Version: R80.10
    i. License Type: Bring Your Own License (Check Point gives default 15 day evaluation period)
    j. Virtual Machine Size: 1x Standard D3 v2
    k. Installation Type: Gateway only
    l. SIC key – Vpn123456789
    m. Allow download from/upload to Check Point
    n. Click **OK**



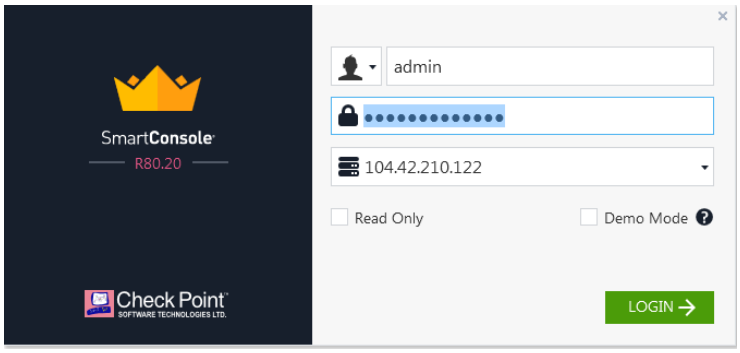
o. Virtual Network: myVNET
p. Frontend subnet: Frontend
q. Backend subnet: Backend
r. Click OK



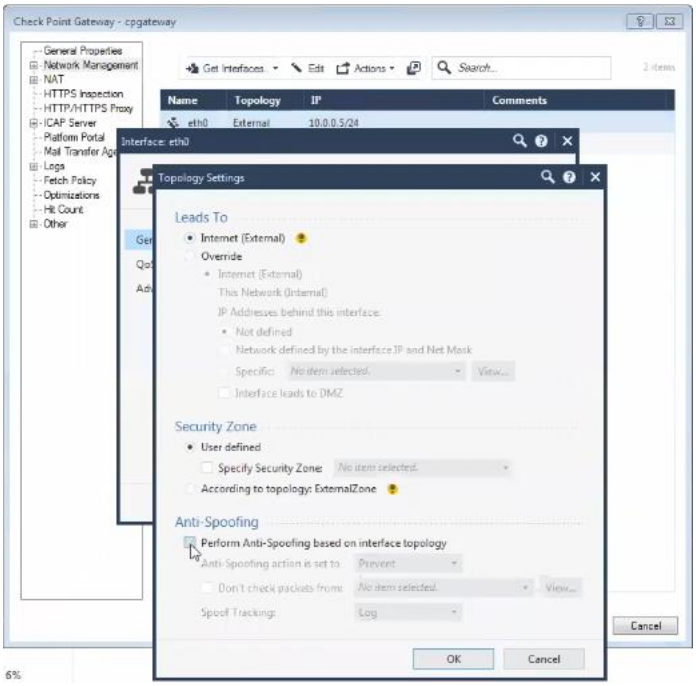
s. Once validation passes click **Create**

5. Access Security Management Server Web UI to download SmartConsole
    a. Use browser to navigate to: https://YourMgmtPublicIP
    b. Click **Download** SmartConsole

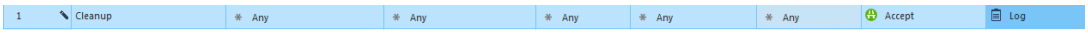
6. How to create the gateway object in SmartConsole
    a. Open R80.20 SmartConsole using credentials defined during creation and SMS Public IP



    b. Create a new gateway object
        i. Name: cpgateway
        ii. Platform: CloudGuard IaaS
        iii. Gateway IP address: Static - Use the gateway's frontend private IP (10.0.0.5)
        iv. Click **Next**
        v. Initialize SIC
        vi. Click **Next**
        vii. Disable Anti-Spoofing on both NICs
            i. Go to Network Management and double click **eth0 and eth1**
            ii. Modify Topology and disable Anti-Spoofing on both interfaces. Anti-Spoofing is already done by Azure.

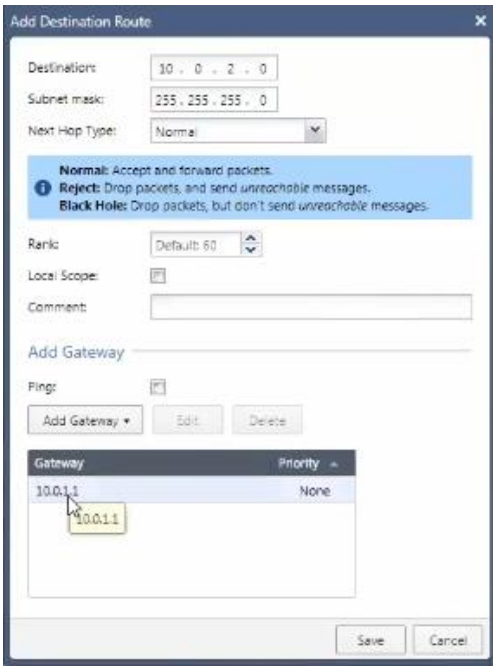


c. Create a permissive policy by changing Cleanup rule to:
    i. Action: Accept
    ii. Track: Log

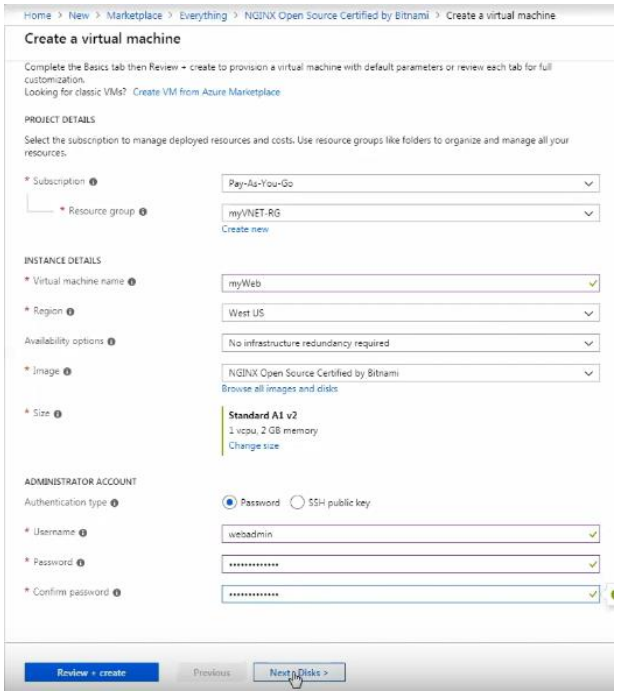


d. Install only Access Control policy

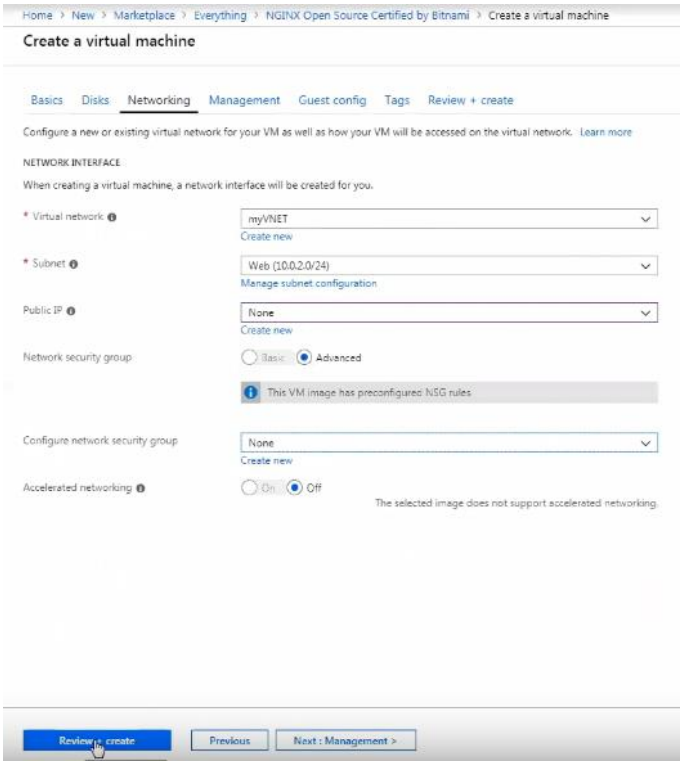
7. Access firewall Web UI to create a static route
    a. Use browser to navigate to: https://YourGWPublicIP
    b. Create route on firewall to route traffic destined for the Web Subnet through the internal firewall interface. This is required because the firewall is not directly connected to the Web Subnet
        i. Navigate to IPv4 Static Routes
        ii. Click **Add**
            i. Destination: Web Subnet address space – 10.0.2.0
            ii. Subnet mask: 255.255.255.0
        iii. Add Gateway IP
            i. Using first address of the Backend subnet as it represents the Azure router – 10.0.1.1



8. How to deploy the Web Server
    a. Search the Marketplace for Nginx Bitnami
        i. Select NGINX Open Source Certified by Bitnami
        ii. Choose Subscription
        iii. Resource Group: myVNET-RG
        iv. Virtual machine name: myWeb
        v. Region: West US
        vi. Authentication type: Password



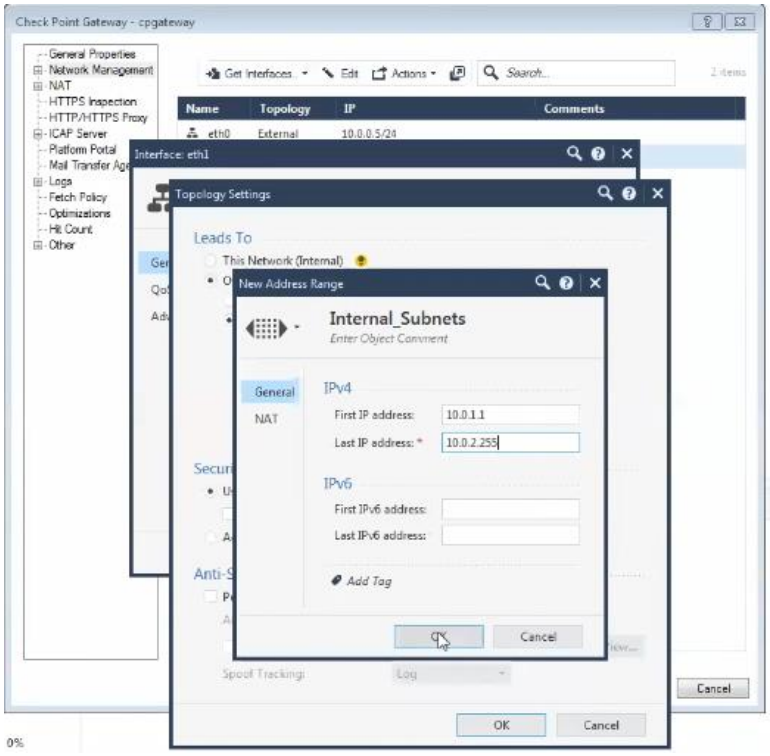
vii. Click **Next : Disks** and leave settings as default
viii. Virtual network: myVNET
ix. Subnet: Web
x. Public IP: None
xi. Network Security Group: None



b. Click **Review + Create**
c. Once validation passes click **Create**

9. How to create the User Defined Routes:
    a. Navigate to Route Tables
    b. Click **Create route table**
    c. Name: myVNETroutes
    d. Choose Subscription
    e. Resource group: myVNET-RG
    f. Location: West US
    g. Click **Create**
    h. Once created, Navigate to Routes:
    i. Click **Add**
        i. Route name: Intra_VNET
        ii. Address prefix: 10.0.0.0/16
        iii. Next hop type: Virtual Appliance
        iv. Next hop address: Internal NIC of the firewall (10.0.1.4)
        v. Click **OK**
    j. Click **Add**
        i. DefaultGW
        ii. Address prefix: 0.0.0.0/0
        iii. Next hop type: Virtual Appliance
        iv. Next hop address: Internal NIC of the firewall (10.0.1.4)
        v. Click **OK**
    k. Navigate to Subnets
        i. Click **Associate**
        ii. Virtual Network: myVNET
        iii. Subnet: Web
        iv. Click **OK**

10. Defining Networks that sit behind internal NIC of firewall
    a. Edit cpgateway object
    b. Navigate to Network Management
        i. Modify Topology and Select Override
            i. Leads to Specific Networks
            ii. Create new address range object
                i. Name: Internal_Subnets
                ii. First IP Address: 10.0.1.1
                iii. Last IP Address: 10.0.2.255



11. Update Access Control Policy
    a. New rule:
        i. Name: Traffic to web server
        ii. Destination: cpgateway object
        iii. Service: http & https
        iv. Action: Accept
        v. Track: Log
    b. New rule below this
        i. Name: SSH to all
        ii. Service: ssh
        iii. Action: Accept
        iv. Track: Log

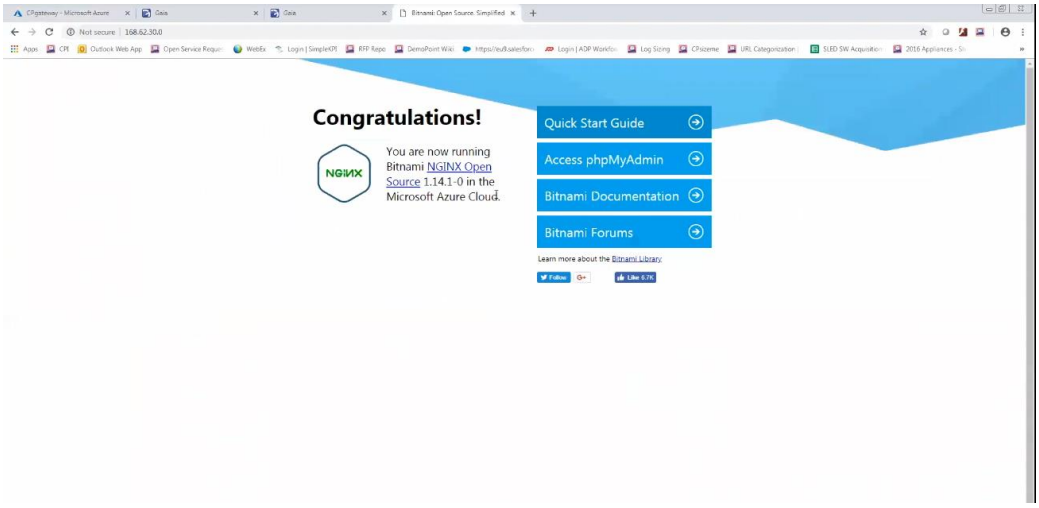
No.	Name	Source	Destination	VPN	Services & Applications	Action	Track	Install On
1	Traffic to web server	Any	cpgateway	Any	http https	Accept	Log	Policy Targets
2	SSH to all	Any	Any	Any	ssh	Accept	Log	Policy Targets
3	Cleanup rule	Any	Any	Any	Any	Drop	Log	Policy Targets

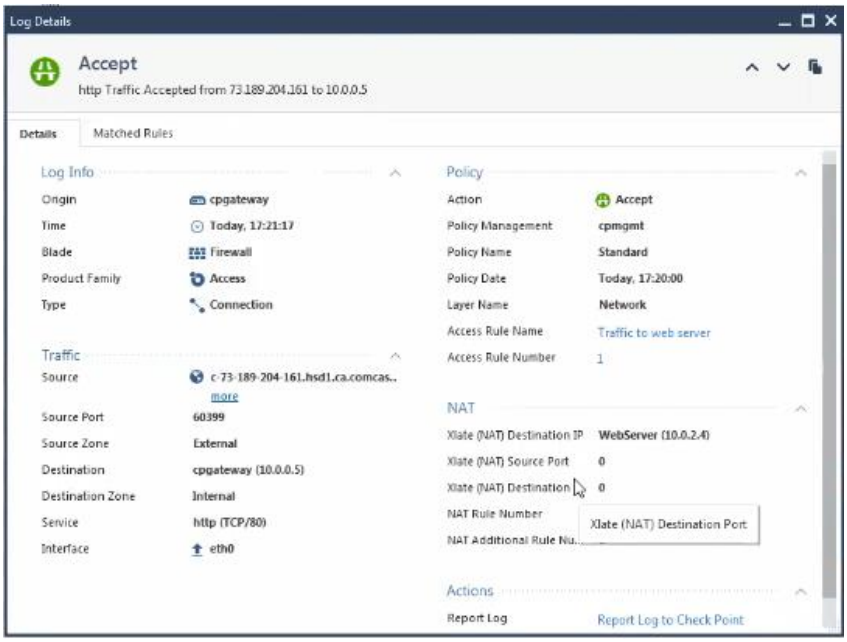
    c. New NAT rule
        i. Original Source: Any
        ii. Original Destination: cpgateway object
        iii. Original Services: http
        iv. Translated Source: Original
        v. Translated Destination: Create host object called WebServer with IP address of the Web server 10.0.2.4 (depends)
        vi. Translated Services: Original

No.	Original Source	Original Destination	Original Services	Translated Source	Translated Destin...	Translated Services	Install On	Comments
1	Any	cpgateway	http	= Original	WebServer	= Original	Policy Targets	

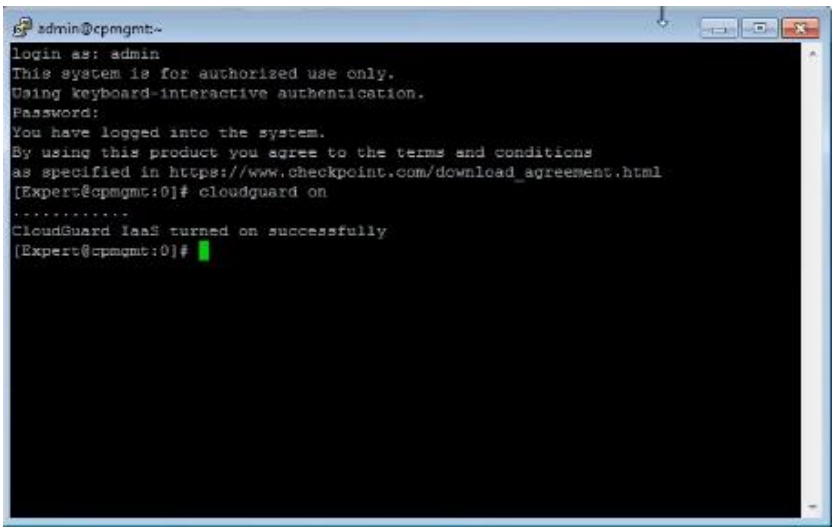
    d. Install Access Control policy

12. Use a browser to navigate to the Public IP address of the firewall. Filter for http traffic in SmartConsole to see what is happening.

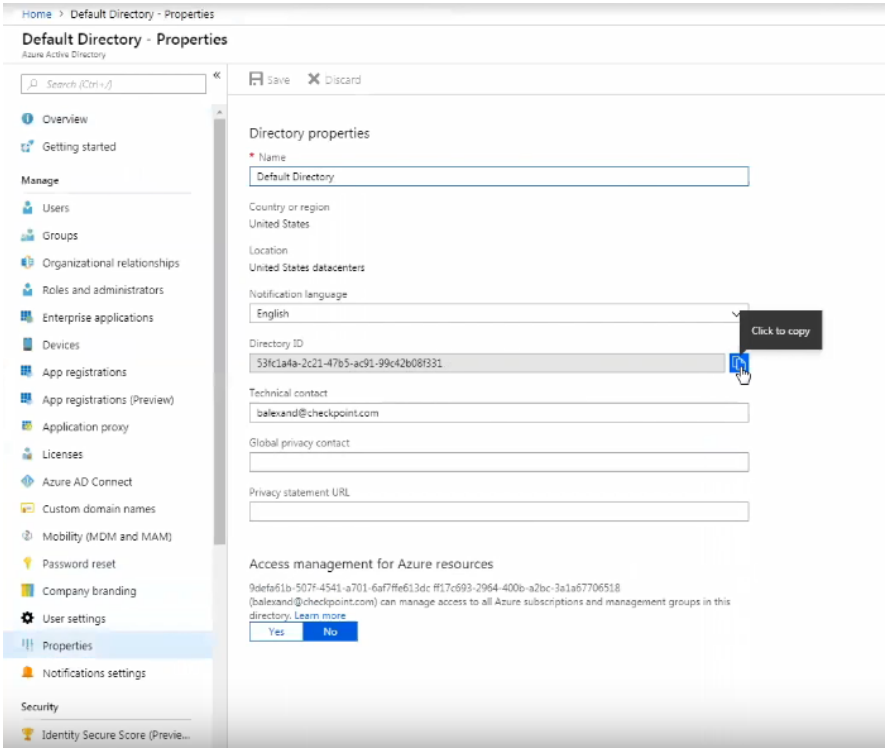




13. How to integrate the CloudGuard Controller
    a. Activate CloudGuard Controller on Management Server
        i. Use putty to ssh to Management Server
        ii. Type **cloudguard on** in expert mode



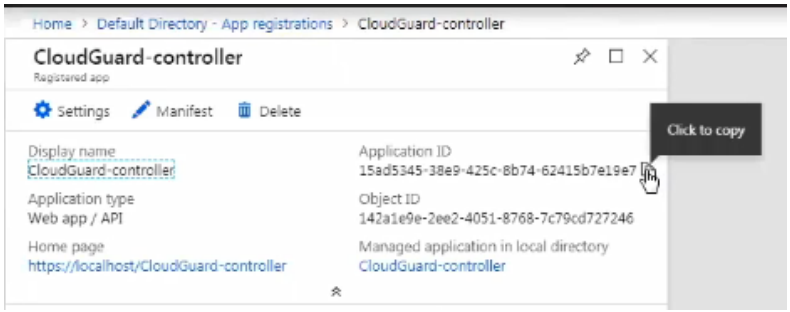
    b. Go to Azure Portal to create the authentication method which the SMS will use to access Azure environment
    c. Navigate to Azure Active Directory
        i. Navigate to Properties and Copy the directory ID



        ii. Navigate to App registrations
            i. Click **New application registration**
            ii. Name: CloudGuard-controller
            iii. Application type: Web app / API

iv. Sign-on URL: https://localhost/CloudGuard-controller
v. Click **Create**

iii. Copy Application ID



iv. Click **Settings**
  i. Navigate to Keys
    i. Description: CloudGuard
    ii. Expires: Never
    iii. Click **Save**
    iv. Copy Value

d. Now choose Resource Group or Subscription that SMS will have access to:
  i. Navigate to myVNET-RG
  ii. Select IAM
    i. Click **Add**
      i. Role: Contributor role
      ii. Assign access to: Azure AD user, group or service principal
      iii. Select CloudGuard-controller
      iv. Click **Save**
e. How to create the new datacenter object
  i. New object -> More -> Server -> Datacenter -> Microsoft Azure
    i. Name: Azure-Controller
    ii. Input Application ID
    iii. Input Secret key
    iv. Input Directory ID
  ii. Click **Test Connection**
    i. Connected means that Azure native objects can be used in policy
f. Publish session

14. We can now use Azure native objects in the policy
    a. Navigate to Access Control policy
    b. Click the **+** in Source or Destination of any rule
    c. Click **Import**
    d. Hover over Data Centers
    e. Click **Azure-controller**