



Trend Micro™

# Deep Discovery Inspector

# 6.8 Service Pack 1

## AWS Deployment Guide

Breakthrough Protection Against APTs and Targeted Attacks

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Document Part No.: APEM69999/250605

Release Date: June 2025

Protected by U.S. Patent No.: 8595840; 8925074; 7707635; 8505094

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# Preface

## Preface

Learn more about the following topics:

- *[Documentation on page 2](#)*
- *[Audience on page 3](#)*
- *[Document Conventions on page 3](#)*

## Documentation

The documentation set for Deep Discovery Inspector includes the following:

**TABLE 1. Product Documentation**

DOCUMENT	DESCRIPTION
Administrator's Guide	The Administrator's Guide contains detailed instructions on how to configure and manage Deep Discovery Inspector, and explanations on Deep Discovery Inspector concepts and features.
AWS Deployment Guide	The AWS Deployment Guide contains information about requirements and procedures for planning deployment, deploying, and troubleshooting Deep Discovery Inspector deployment on AWS.
Inline (LAN bypass) Network Interface Card Installation Guide	The Inline (LAN bypass) Network Interface Card Installation Guide contains information about requirements and procedures for installing an additional bypass network interface card on supported Deep Discovery Inspector appliances.
Installation and Deployment Guide	The Installation and Deployment Guide contains information about requirements and procedures for planning deployment, installing Deep Discovery Inspector, and using the Preconfiguration Console to set initial configurations and perform system tasks.
Syslog Content Mapping Guide	The Syslog Content Mapping Guide provides information about log management standards and syntaxes for implementing syslog events in Deep Discovery Inspector.
Quick Start Card	The Quick Start Card provides user-friendly instructions on connecting Deep Discovery Inspector to your network and on performing the initial configuration.
Readme	The Readme contains late-breaking product information that is not found in the online or printed documentation. Topics include a description of new features, known issues, and product release history.

DOCUMENT	DESCRIPTION
Online Help	Web-based documentation that is accessible from the Deep Discovery Inspector management console.  The Online Help contains explanations of Deep Discovery Inspector components and features, as well as procedures needed to configure Deep Discovery Inspector.
Support Portal	The Support Portal is an online database of problem-solving and troubleshooting information. It provides the latest information about known product issues. To access the Support Portal, go to the following website:  <a href="https://success.trendmicro.com">https://success.trendmicro.com</a>

View and download product documentation from the Trend Micro Online Help Center:

<https://docs.trendmicro.com/en-us/home.aspx>

## Audience

The Deep Discovery Inspector documentation is written for IT administrators and security analysts. The documentation assumes that the reader has an in-depth knowledge of networking and information security, including the following topics:





- Network topologies
- Database management
- Antivirus and content security protection

The documentation does not assume the reader has any knowledge of sandbox environments or threat event correlation.

## Document Conventions

The documentation uses the following conventions:

**TABLE 2. Document Conventions**

CONVENTION	DESCRIPTION
UPPER CASE	Acronyms, abbreviations, and names of certain commands and keys on the keyboard
<b>Bold</b>	Menus and menu commands, command buttons, tabs, and options
<i>Italics</i>	References to other documents
Monospace	Sample command lines, program code, web URLs, file names, and program output
<b>Navigation &gt; Path</b>	The navigation path to reach a particular screen  For example, <b>File &gt; Save</b> means, click <b>File</b> and then click <b>Save</b> on the interface
 <b>Note</b>	Configuration notes
 <b>Tip</b>	Recommendations or suggestions
 <b>Important</b>	Information regarding required or default configuration settings and product limitations
 <b>WARNING!</b>	Critical actions and configuration options

# Chapter 1

## About deployment on AWS

This guide provides additional information that enables you to evolve from an on-premises Deep Discovery Inspector appliance to a Deep Discovery Inspector appliance on AWS. For more details about the Deep Discovery Inspector features and functions, see the *Deep Discovery Inspector Administrator's Guide* on <https://docs.trendmicro.com/en-us/enterprise/deep-discovery-inspector.aspx>.

## Specialized knowledge

This guide assumes familiarity with networking basics. This guide also requires a moderate level of familiarity with AWS. If you are new to AWS, visit the *Getting Started Resource Center* (<https://aws.amazon.com/getting-started/>) and *AWS Training and Certification* (<https://aws.amazon.com/training/>). These sites provide materials for learning how to design, deploy, and operate your infrastructure and applications on AWS.

## AWS Account

If you do not already have an AWS account, create one at <https://aws.amazon.com> by following the on-screen instructions. Part of the sign-up process involves receiving a phone call and entering a PIN using the phone keypad.

AWS automatically signs up your account for all AWS services. You are charged only for the services you use.

## Cost and licenses

In order to access and use the AMI version of the Deep Discovery Inspector virtual appliance, you must already have and continually maintain an active AWS Account on the AWS Marketplace and you are responsible for purchasing and maintaining through such AWS Account, your use of the Amazon Web Service platform/infrastructure that is required for your deployment of a Deep Discovery Inspector virtual appliance.

The Deep Discovery Inspector virtual appliance is offered as an AMI in the AWS Marketplace. Access to the AMI can be obtained by searching the AWS Marketplace console.

## Chapter 2

### Deployment planning

## Planning the deployment

The following steps provide an overview for planning the deployment of Deep Discovery Inspector virtual appliances in an AWS environment.

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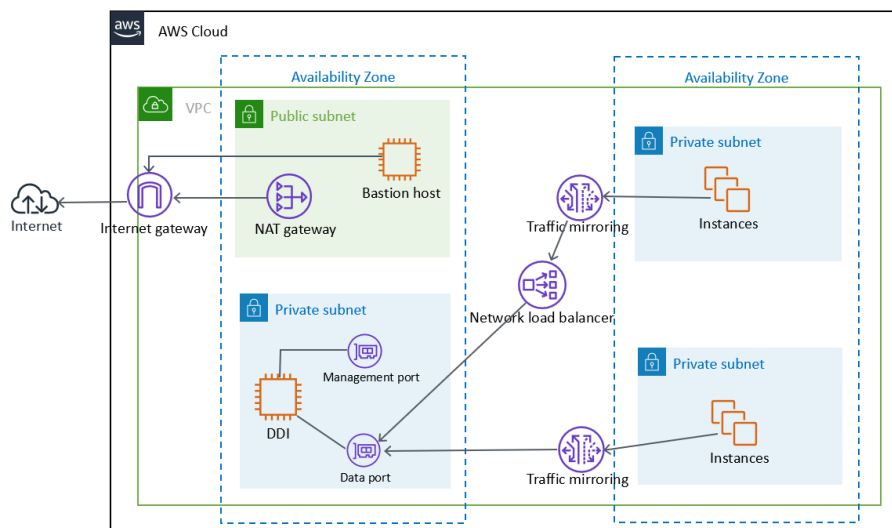
### Procedure

1. Review the architecture.  
For details, see [Architecture on page 2-3](#).
  2. Review the system requirements.  
For details, see [System requirements on page 2-3](#).
  3. Choose a deployment option to integrate with Amazon VPC Traffic Mirroring.  
For details, see [Deployment options on page 2-5](#).
  4. Prepare items before deploying Deep Discovery Inspector.  
For details, see [Items to prepare on page 2-8](#).
  5. Deploy the Deep Discovery Inspector virtual appliance.  
For details, see [Deployment on page 3-1](#).
  6. Access the Deep Discovery Inspector virtual appliance management console.  
For details, see the *Deep Discovery Inspector Administrator's Guide*.
-



## Architecture

The Deep Discovery Inspector virtual appliance supports deployment on an AWS EC2 environment and can scan as well as analyze mirrored packets from an AWS VPC traffic mirror.



**FIGURE 2-1. Deployment Architecture**

## System requirements

Trend Micro recommends the following minimum specifications based on your licensed model's throughput.



### Note

When using a Deep Discovery Inspector virtual appliance on AWS with Virtual Analyzer, only external Virtual Analyzers and Sandbox as a Service are supported.

TABLE 2-1. System Requirements

THROUGHPUT (Mbps)	AWS vCPU	AWS MEMORY (GiB)	AWS STORAGE (GiB)	AWS ENI (ELASTIC NETWORK INTERFACES)	RECOMMENDED AWS EC2 INSTANCE TYPE
250	8	32	500	2	<ul style="list-style-type: none"><li>• t3.2xlarge</li><li>• t3a.2xlarge</li><li>• m5.2xlarge</li><li>• m5a.2xlarge</li></ul>
500	8	32	500	2	<ul style="list-style-type: none"><li>• t3.2xlarge</li><li>• t3a.2xlarge</li><li>• m5.2xlarge</li><li>• m5a.2xlarge</li></ul>
1000	16	64	1000	2	<ul style="list-style-type: none"><li>• m5.4xlarge</li><li>• m5a.4xlarge</li></ul>

**Note**

T3 and T3a instances launch as unlimited mode by default. For more details about using unlimited mode or standard mode on the instance types, see <https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/burstable-performance-instances.html>.

For details about AWS EC2 instance types, see <https://aws.amazon.com/ec2/instance-types/>.

You can use non-recommended instance types as long as the instance type meets the minimum system requirements.

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## Deployment options

By integrating with the Amazon VPC Traffic Mirroring feature, the Deep Discovery Inspector virtual appliance can provide a network security solution via two deployment options:

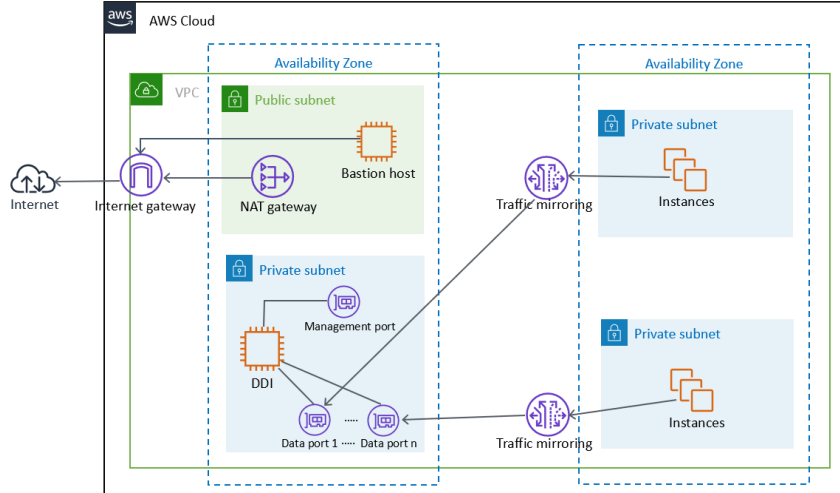
- **Option 1: Deploy the Deep Discovery Inspector virtual appliance as a traffic mirror target**

Network traffic is mirrored from an ENI (Elastic Network Interfaces) mirror source to a data port of the Deep Discovery Inspector virtual appliance. This option depends on the settings of traffic mirror filter as shown in the figure below.

**Note**

If the Deep Discovery Inspector virtual appliance is attached to more than 1 data port, you can set each data port as traffic mirror target.

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**FIGURE 2-2. Option 1: Deploy the Deep Discovery Inspector virtual appliance as a traffic mirror target**

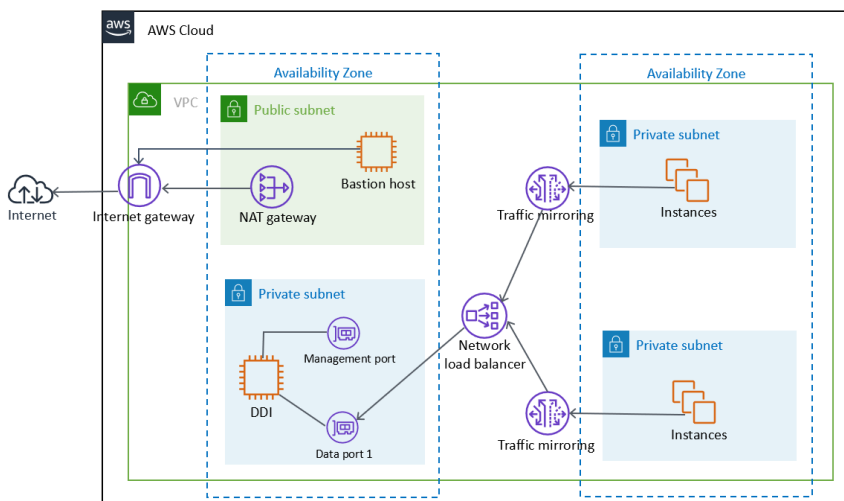
- **Option 2: Deploy the Deep Discovery Inspector virtual appliance behind the NLB**

Deploy the Deep Discovery Inspector virtual appliance in the target group behind the NLB (Network Load Balancer). Network traffic is mirrored to the NLB and the NLB forwards traffic to health instances belonging to the target group as shown in the figure below.



**Note**

The NLB only forwards the mirrored traffic to data port 1 of the Deep Discovery Inspector virtual appliance.



**FIGURE 2-3. Option 2: Deploy the Deep Discovery Inspector virtual appliance behind the NLB**

## Considerations

The quota limitation enforced by AWS traffic mirrors has the following limitations for the deployment options:

- Maximum number of mirror sources per a non-dedicated instance type as target: 10
- Maximum number of mirror sources per a dedicated instance type as target: 100



### Note

For more details about the limitation, see <https://docs.aws.amazon.com/vpc/latest/mirroring/traffic-mirroring-considerations.html>.

You are not limited to a particular deployment option. If you deploy a Deep Discovery Inspector virtual appliance as a traffic mirror target for early validation and later change to deploy a Deep Discovery Inspector virtual appliance behind an NLB, then it is unnecessary to re-launch a new Deep

Discovery Inspector virtual appliance after changing. In addition, advanced deployments can incorporate both deployment options at the same time in the VPC environment.

## Items to prepare

- **Deep Discovery Inspector AMI**

AMI of the Deep Discovery Inspector virtual appliance from the AWS Marketplace

- **Deep Discovery Inspector Activation Code**

Activation Code for the Deep Discovery Inspector virtual appliance

- **AWS VPC and subnet**

A VPC configured with public and private subnets, according to AWS best practices, to provide you with your own virtual network on AWS.

**Note**

For details about creating a VPC and subnet, see <https://docs.aws.amazon.com/vpc/latest/userguide/working-with-vpcs.html>.

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Public subnets and:

- Managed NAT gateways to allow outbound internet access for the Deep Discovery Inspector virtual appliance in the private subnets.

**Note**

For details about creating a NAT gateway, see <https://docs.aws.amazon.com/vpc/latest/userguide/vpc-nat-gateway.html>.

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Private subnets and:

- Management port and Data port of the Deep Discovery Inspector virtual appliance which can be in the same subnet or different subnets in your VPC.

- **AWS VPC Traffic Mirror**

Traffic Mirroring is an AWS VPC feature that you can use to copy network traffic from an elastic network interface (ENI) of Amazon EC2 instances. The security and monitoring appliances can be deployed as individual instances, or as a fleet of instances behind a Network Load Balancer (NLB) with a UDP listener.

**Note**

For details, see <https://docs.aws.amazon.com/vpc/latest/mirroring/traffic-mirroring-how-it-works.html>.

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- One or more instances that create some network connections. The instances act as the traffic mirror sources.

**Important**

There is a limit on the size of the mirrored packet, and packets larger than 8947 bytes are always truncated. Ensure that your traffic mirror source's MTU size is set to equal or less than 8947 bytes. To check and set MTU on your AWS EC2 instance which you want to set as traffic mirror source, see [https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/network\\_mtu.html#set\\_mtu](https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/network_mtu.html#set_mtu) and [https://docs.aws.amazon.com/AWSEC2/latest/WindowsGuide/network\\_mtu.html#set\\_mtu\\_windows](https://docs.aws.amazon.com/AWSEC2/latest/WindowsGuide/network_mtu.html#set_mtu_windows).

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- Only instances powered by the AWS Nitro system can be traffic mirror sources. For details, see <https://aws.amazon.com/blogs/aws/new-vpc-traffic-mirroring/>.
- (Optional) A Network Load Balancer, with the settings configured properly:
  - Target group
- Traffic mirror, with the settings configured properly:
  - Traffic mirror filter

- Traffic mirror target
- Traffic mirror session

**Note**

For details about creating a traffic mirror target and filter, and then using those resources to create a session, see <https://docs.aws.amazon.com/vpc/latest/mirroring/traffic-mirroring-getting-started.html>.

- **AWS EC2 Security Group**

INBOUND/ OUTBOUND RULE	TYPE	PROTOCOL	PORT	SOURCE	DESCRIPTION
Inbound	HTTPS	TCP	443	CIDR that can reach your instance	For accessing the Deep Discovery Inspector virtual appliance management console
Inbound	SSH	TCP	22	CIDR that can reach your instance	For accessing the Deep Discovery Inspector virtual appliance pre-configuration console



INBOUND/ OUTBOUND RULE	TYPE	PROTOCOL	PORT	SOURCE	DESCRIPTION
Inbound	Custom UDP	UDP	4789	CIDR of your mirror source or the NLB	For VXLAN traffic required by the AWS traffic mirror
Inbound	Custom TCP	TCP	14789	CIDR of NLB	(Optional) Implemented by the Deep Discovery Inspector virtual appliance for answering the NLB health check.

**Note**

Outbound Rules in the default security group should allow all traffic. The Deep Discovery Inspector virtual appliance works well with the default outbound rules. The following exceptions may apply:

- For some organizations, whose policies may need more specific protocols and port numbers, see *Chapter 2: About Your System* in the *Deep Discovery Inspector Installation and Deployment Guide*.
- For some organizations, whose infrastructure may need an outbound proxy with domains allowed to access the internet, see [https://docs.trendmicro.com/all/ent/ddi/v5.7/en-us/ddi\\_5.7\\_olh/access\\_trend\\_service.html](https://docs.trendmicro.com/all/ent/ddi/v5.7/en-us/ddi_5.7_olh/access_trend_service.html) for detailed addresses.



# Chapter 3

## Deployment

## Deployment overview

The following is an overview of the steps required to deploy a Deep Discovery Inspector virtual appliance and a VPC traffic mirror in your AWS environment.

1. Launch a Deep Discovery Inspector virtual appliance.

For details, see [Launching a virtual appliance on page 3-2](#).

2. (Optional) Configure the description for the virtual appliance network interfaces.

For details, see [Configuring the description for network interfaces on page 3-12](#).

3. Choose one of the following options to deploy the AWS VPC traffic mirror.

- Deploy a virtual appliance as a traffic mirror target

For details, see [Deploying a virtual appliance as a traffic mirror target on page 3-14](#).

- Deploy a virtual appliance behind an NLB

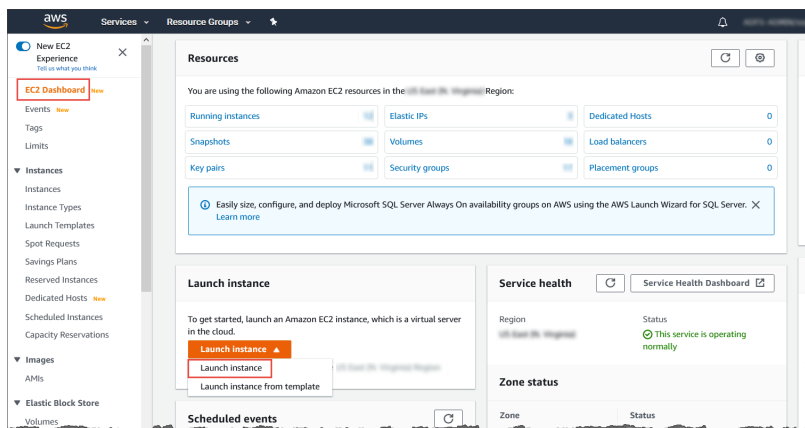
For details, see [Deploying a virtual appliance behind an NLB on page 3-22](#).

## Launching a virtual appliance

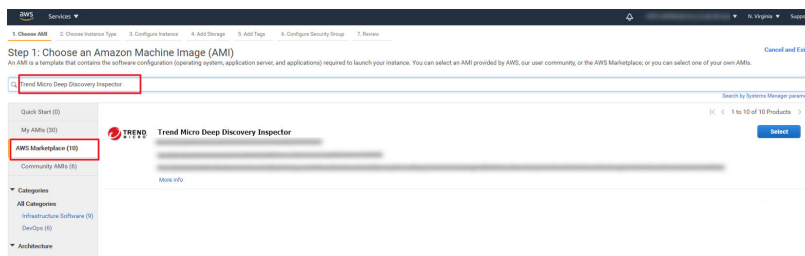
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### Procedure

1. Initiate the instance launch.
  - a. Open the **Amazon EC2** console at <https://console.aws.amazon.com/ec2/>.
  - b. In the navigation bar at the top of the screen, select a Region for the instance that meets your needs.
  - c. From the **Amazon EC2** console dashboard, select **Launch instance**.



2. Choose the AMI for Deep Discovery Inspector.
  - a. On the **Choose an Amazon Machine Image (AMI)** screen, select **AWS Marketplace** in the left pane.
  - b. In the search box, search for **Trend Micro Deep Discovery Inspector**.



- c. After the search results appear, click **Select** for **Trend Micro Deep Discovery Inspector <version>**.
3. Choose an Instance Type.
  - a. On the **Choose an Instance Type** screen, choose an instance type that meets the minimum specifications based on your licensed model's throughput.

For details, see [System requirements on page 2-3](#).

- b. Choose **Next: Configure Instance Details** to configure your instance further.**

General purpose	Instance type	vCPUs	Memory (GiB)	Storage	EBS only	Yes/No	Up to 10 Gigabit
<input type="checkbox"/>	General purpose	r5n.2xlarge	96	768	EBS only	Yes	100 Gigabit
<input type="checkbox"/>	General purpose	r5dn.24xlarge	96	768	4 x 900 (SSD)	Yes	100 Gigabit
<input type="checkbox"/>	General purpose	m5.large	2	8	EBS only	Yes	Up to 10 Gigabit
<input type="checkbox"/>	General purpose	m5.xlarge	4	16	EBS only	Yes	Up to 10 Gigabit
<input type="checkbox"/>	General purpose	m5.2xlarge	8	32	EBS only	Yes	Up to 10 Gigabit
<input checked="" type="checkbox"/>	General purpose	m5.4xlarge	16	64	EBS only	Yes	Up to 10 Gigabit
<input type="checkbox"/>	General purpose	m5.8xlarge	32	128	EBS only	Yes	10 Gigabit
<input type="checkbox"/>	General purpose	m5.12xlarge	48	192	EBS only	Yes	10 Gigabit
<input type="checkbox"/>	General purpose	m5.16xlarge	64	256	EBS only	Yes	20 Gigabit
<input type="checkbox"/>	General purpose	m5.24xlarge	96	384	EBS only	Yes	25 Gigabit
<input type="checkbox"/>	General purpose	m5.metal	96	384	EBS only	Yes	25 Gigabit
<input type="checkbox"/>	General purpose	m4.large	2	8	EBS only	Yes	Moderate

#### 4. Configure the Instance Details.

- a. On the **Configure Instance Details** screen, change the follow settings.**
- **Network:** Select the VPC.
  - **Subnet:** Select the subnet into which to launch your instance. Select a subnet that is planned for the data port subnet.
  - **Auto-assign Public IP:** Select **Disable**. Trend Micro recommends that you deploy the Deep Discovery Inspector virtual appliance behind an AWS NAT gateway.

- **Network interfaces:** Add a secondary network interface for the Deep Discovery Inspector virtual appliance instance by choosing **Add Device**.

**Important**

The management port for Deep Discovery Inspector on-premises is fixed at the first NIC port (eth0 in Deep Discovery Inspector). In order to adapt into the AWS environment, the Deep Discovery Inspector virtual appliance has swapped port enumeration for the management port to port 1 (eth1) and data port to port 0 (eth0).

---

- Device eth0:
  - **Subnet:** The subnet has been configured in a previous step.
  - **Primary IP:** Type a private IPv4 address from the range of your subnet, or leave **Auto-assign** to let AWS choose a private IPv4 address for you.
- Device eth1:
  - **Subnet:** Select a subnet that is planned for the management port subnet.
  - **Primary IP:** Type a private IPv4 address from the range of your subnet, or leave **Auto-assign** to let AWS choose a private IPv4 address for you.
  - **IPv6 IPs:** (Optional) Click **Add IP** and type an IPv6 address from the range of the subnet, or leave **Auto-assign** to let AWS choose an IPv6 address for you.

- b. Click **Next: Add Storage** to specify the root volume size of your instance
5. Add Storage.
  - a. Specify the following settings on the **Add Storage** screen.
    - **Size:** The storage size should meet the minimum specifications based on your licensed model's throughput.

For details, see [System requirements on page 2-3](#).



### Note

To enlarge the storage size, specify the storage size of the **Volume Type: Root**. The Deep Discovery Inspector virtual appliance only partitions the storage when the **Volume Type** is **Root**. The extra storage will not be used.

- **Volume Type:** Use the default value, **General Purpose SSD (gp2)**.



**Step 4: Add Storage**  
Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. [Learn more](#) about storage options in Amazon EC2.

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MiB/s)	Delete on Termination	Encryption
Root	/dev/xvda	snapp-...	100	General Purpose SSD (gp2)	1500 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypted

[Add New Volume](#)

Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage. [Learn more](#) about free usage tier eligibility and usage restrictions.

b. Click **Next: Add Tags** to add some custom tags.

## 6. Add Tags.

a. On the **Add Tags** screen, specify tags by providing the key and value combinations.

For example, for **Key** type **Name** and for **Value** type **vDDI-demo**.

b. Click **Next: Configure Security Group**.

**Step 5: Add Tags**  
A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver. A copy of a tag can be applied to volumes, instances or both. Tags will be applied to all instances and volumes. [Learn more](#) about tagging your Amazon EC2 resources.

Key (128 characters maximum)	Value (256 characters maximum)	Instances	Volumes
Name	vDDI-demo	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

[Add another tag](#) (Up to 50 tags maximum)

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Configure Security Group](#)

## 7. Configure Security Group.

a. On the **Configure Security Group** screen, use a security group to define firewall rules for the Deep Discovery Inspector virtual appliance instance.

- To use existing security group, select **Select an existing security group**, and select your security group.
- To create a new security group, select **Create a new security group**.

- b.** Verify that your selected security group contains the following rules:

**TABLE 3-1. Inbound Rules**

TYPE	PROTOCOL	PORT RANGE	SOURCE	REASON
SSH	TCP	22	CIDR that can reach your instance	For accessing Deep Discovery Inspector virtual appliance Pre-Configuration console
HTTPS	TCP	443	CIDR that can reach your instance	For accessing Deep Discovery Inspector virtual appliance management console
Custom UDP	UDP	4789	CIDR of your mirror source or the NLB	For VXLAN traffic required by AWS traffic mirror
Custom TCP	TCP	14789	CIDR of NLB	Implemented by the Deep Discovery Inspector virtual appliance for answering NLB health check

**Note**

Outbound Rules: Rules in default security group allow all traffic. The Deep Discovery Inspector virtual appliance works well with default outbound rules. The following exceptions may occur:

- For some organizations, whose policies may need more specific protocols and port numbers, see *Chapter 2: About Your System > Ports Used by the Appliance* in the *Deep Discovery Inspector Installation and Deployment Guide*.
- For some organizations, whose infrastructures may need an outbound proxy with domains allowed to access the internet, see [https://docs.trendmicro.com/all/ent/ddi/v5.7/en-us/ddi\\_5.7\\_olh/access\\_trend\\_service.html](https://docs.trendmicro.com/all/ent/ddi/v5.7/en-us/ddi_5.7_olh/access_trend_service.html) for detailed addresses.

- c. Click **Review and Launch**.
8. Review Instance Launch and select key pair.
    - a. On the **Review Instance Launch** screen, check the details of your instance, and make any necessary changes by choosing the appropriate **Edit** link.
    - b. Click **Launch**.
    - c. In the **Select an existing key pair or create a new key pair** dialog box, select **Proceed without a key pair**.
    - d. To launch your instance, select the acknowledgment check box, then click **Launch Instances**.

### Select an existing key pair or create a new key pair

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about [removing existing key pairs from a public AMI](#).

Proceed without a key pair

☒ acknowledge that I will not be able to connect to this instance unless I already know the password built into this AMI.

Cancel

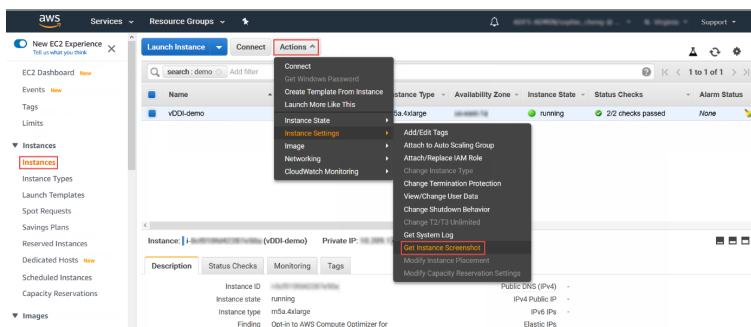
Launch Instances

9. Wait for the Deep Discovery Inspector virtual appliance to become ready.

**Note**

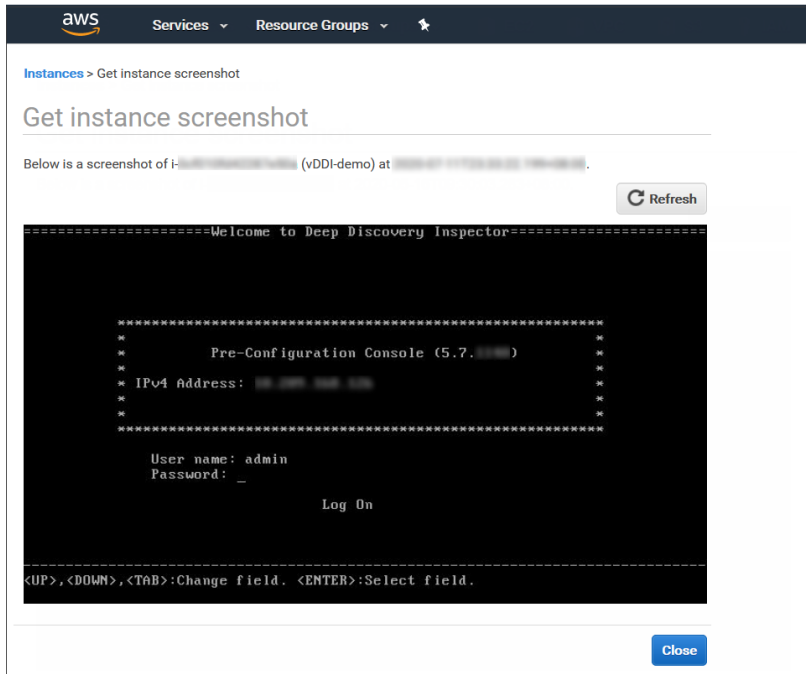
The Deep Discovery Inspector virtual appliance takes about 15 minutes to become ready.

- a. View the Deep Discovery Inspector installation progress by using the following steps:
  1. In the left navigation page, click **Instances**.
  2. Select the Deep Discovery Inspector virtual appliance instance.
  3. Select **Actions** > **Instance Settings** > **Get Instance Screenshot**.



For more details, see <https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/launching-instance.html>.

- b.** When the Deep Discovery Inspector virtual appliance pre-configuration console appears, then Deep Discovery Inspector is ready.



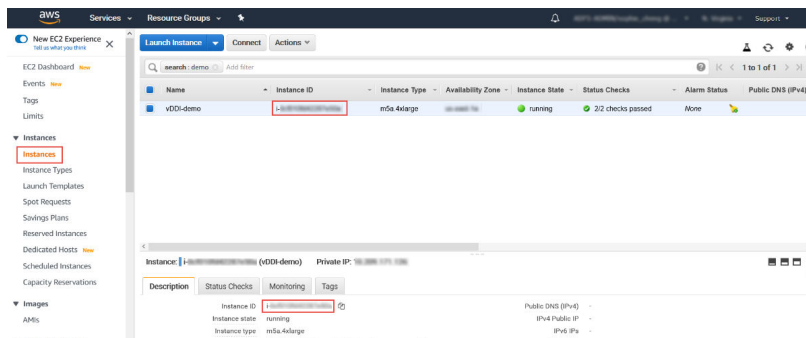
## Configuring the description for network interfaces

This task is optional. Trend Micro recommends setting the description for network interfaces of instances. When selecting one ENI from a long list of many ENIs, you can save time and avoid operation errors.

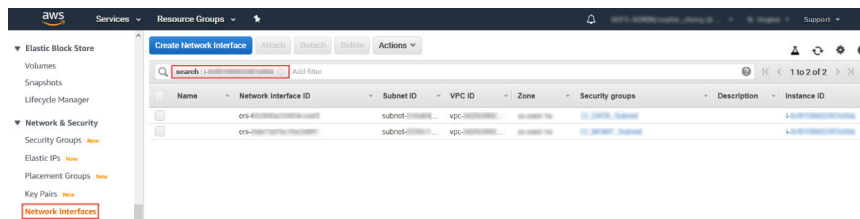
### Procedure

1. Open the **Amazon EC2** console at <https://console.aws.amazon.com/ec2/>.
2. In the navigation pane, select **Instances** and copy the instance ID using the following steps.
  - a. Search for the Deep Discovery Inspector virtual appliance that you created in [Launching a virtual appliance on page 3-2](#).

**b. Copy the value of **Instance ID**.**



- 3. In the navigation pane, select **Network Interfaces** and find the network interfaces of the Deep Discovery Inspector virtual appliance by searching for the instance ID.**



- 4. Select the network interfaces of the Deep Discovery Inspector virtual appliance and then select **Actions** > **Change Description**.**
- 5. In the **Change Description** dialog box, type a description for the network interface, select **Save** and then perform the following steps:**
- Set description of eth0 to **Data port 1**.
  - Set description of eth1 to **Management port**.

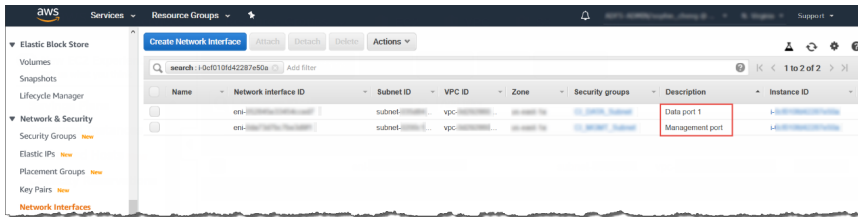
**Tip**

To view which interface is eth0 and which interface is eth1, perform the following:

- a. Select the interface.
- b. Click **Actions** > **Manage IP addresses**.

The port label appears.

- c. Click **Cancel** to return to the previous screen.



## Deploying a virtual appliance as a traffic mirror target

### Procedure

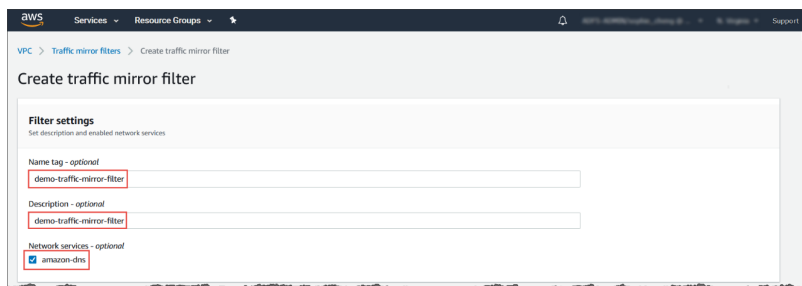
1. Configure the traffic mirror filter.

For details, see <https://docs.aws.amazon.com/vpc/latest/mirroring/traffic-mirroring-filters.html>.

- a. Open the **Amazon VPC** console at <https://console.aws.amazon.com/vpc/>.
- b. In the **Region** selector, select the AWS Region that you used when you created the VPCs.
- c. On the navigation pane, go to **Traffic Mirroring** > **Mirror Filters**.
- d. Select **Create traffic mirror filter**.



- e. For **Name tag**, type a name for the traffic mirror filter.  
For example, type `demo-traffic-mirror-filter`.
- f. (Optional) For **Description**, type a description for the traffic mirror filter.  
For example, type `demo-traffic-mirror-filter`.
- g. Select **amazon-dns**.



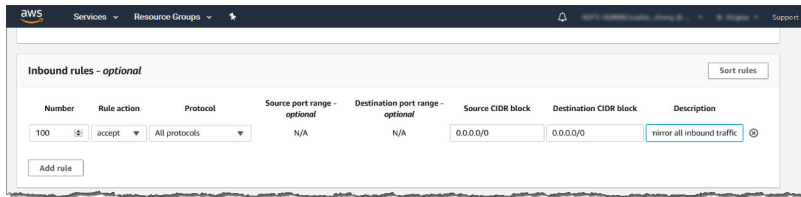
The screenshot shows the 'Create traffic mirror filter' page in the AWS console. Under the 'Filter settings' section, the following fields are visible and highlighted with red boxes:

- Name tag - optional:** demo-traffic-mirror-filter
- Description - optional:** demo-traffic-mirror-filter
- Network services - optional:** amazon-dns (selected with a blue checkbox)

- h. Add inbound rules. Select **Inbound rules > Add > rule**, and then specify the following information about the traffic mirror source inbound traffic:
  - **Rule number:** Type a priority to assign to the rule.
  - **Rule action:** Select the action to take for the packet.
  - **Protocol:** Select the L4 protocol to assign to the rule.
  - (Optional) **Source port range:** Type the source port range.
  - (Optional) **Destination port range:** Type the destination port range.
  - **Source CIDR block:** Type a source CIDR block.
  - **Destination CIDR block:** Type a destination CIDR block.
  - (Optional) **Description:** Type a description for the rule.

The following is an example of the values.

- Rule number: Use the default number
- Rule action: Select **accept**.
- Protocol: Select **All protocols**.
- Source CIDR block: Type `0.0.0.0/0`.
- Destination CIDR block: Type `0.0.0.0/0`.
- Description: Type `mirror all inbound traffic`.



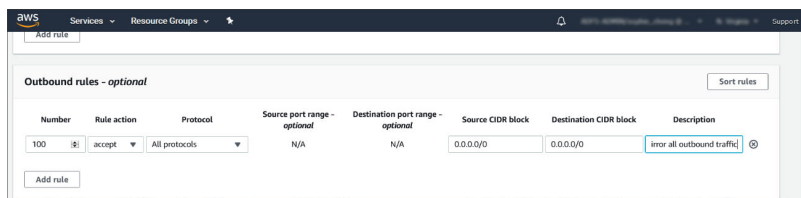
- i. Add outbound rules. Select **Outbound rules > Add > rule**, and then specify the following information about the traffic mirror source outbound traffic:

- **Rule number:** Type a priority to assign to the rule.
- **Rule action:** Select the action to take for the packet.
- **Protocol:** Select the L4 protocol to assign to the rule.
- (Optional) **Source port range:** Type the source port range.
- (Optional) **Destination port range:** Type the destination port range.
- **Source CIDR block:** Type a source CIDR block.
- **Destination CIDR block:** Type a destination CIDR block.
- (Optional) **Description:** Type a description for the rule.

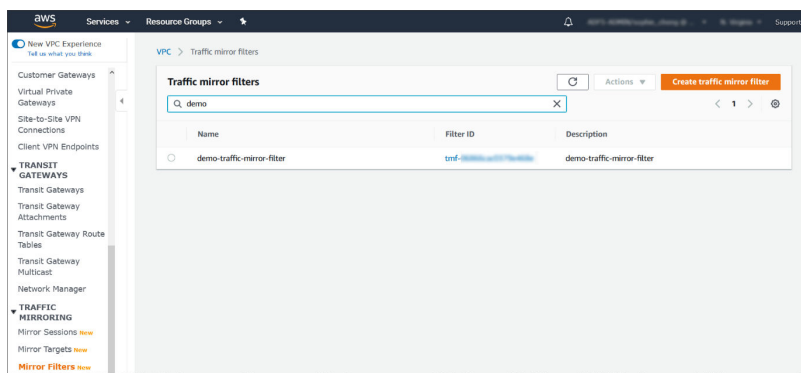
The following is an example of the values.

- Rule number: Use the default number
- Rule action: Select **accept**.

- Protocol: Select **All protocols**.
- Source CIDR block: Type `0.0.0.0/0`.
- Destination CIDR block: Type `0.0.0.0/0`.
- Description: Type `mirror all outbound traffic`.



- Repeat the previous step for each inbound rule and outbound rule that you want to add.
- Click **Create**.



- Configure the traffic mirror target.
  - On the navigation pane, select **Traffic Mirroring** > **Mirror Targets**.
  - Select **Create Traffic Mirror Target**.
  - For **Name tag**, type a name for the traffic mirror target.  
For example, type `demo-traffic-mirror-target`.

- d. (Optional) For **Description**, type a description for the traffic mirror target.

For example, type `demo-traffic-mirror-target`.



The screenshot shows the AWS Management Console page for creating a traffic mirror target. The page title is 'Create traffic mirror target'. Under the 'Target settings' section, there are two optional fields: 'Name tag - optional' and 'Description - optional'. Both fields have the value 'demo-traffic-mirror-target' entered.

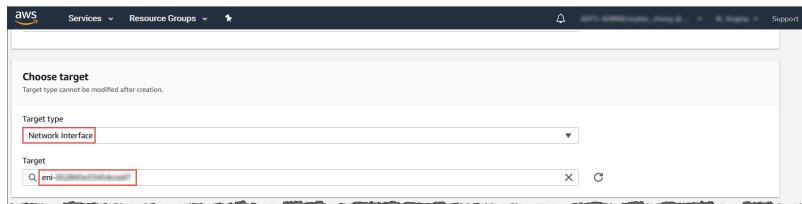
- e. For **Target type**, select **Network Interface**.
- f. For **Target**, select the Deep Discovery Inspector virtual appliance's eth0 (the data port that is connected to your subnet) as the traffic mirror target.



### Note

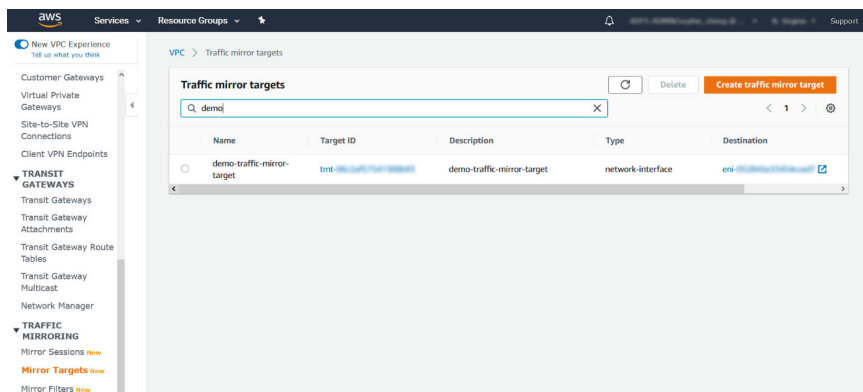
You can select any other data port that you have attached on the Deep Discovery Inspector virtual appliance, such as eth2, or eth3.

Do not select the eth1 port that is used as the management port for the Deep Discovery Inspector virtual appliance.

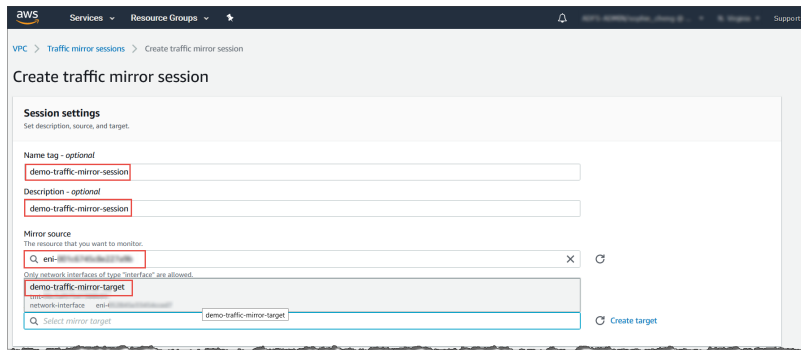


The screenshot shows the AWS Management Console page for choosing a target. The page title is 'Choose target'. Under the 'Target type' dropdown, 'Network Interface' is selected. Under the 'Target' field, the value 'eni-0a5b1c3d4e5f6g7h' is entered.

- g. Click **Create**.



3. Repeat the previous step to create a traffic mirror target for each Deep Discovery Inspector virtual appliance in your AWS environment.
4. Configure the traffic mirror session.
  - a. On the navigation pane, select **Traffic Mirroring > Mirror Sessions**.
  - b. Select **Create traffic mirror session**.
  - c. For **Name tag**, type a name for the traffic mirror session.  
For example, type `demo-traffic-mirror-session`.
  - d. (Optional) For **Description**, type a description for the traffic mirror session.  
For example, type `demo-traffic-mirror-session`.
  - e. For **Mirror source**, select the network interface of the instance that you want to monitor.
  - f. For **Mirror target**, select the traffic mirror target.  
For example, select **demo-traffic-mirror-target**.



g. Under **Additional settings**, perform the following:

- For **Session number**, type the session number **1**.

The session number determines the order that the traffic mirror sessions are evaluated in both of the following situations:

- When an interface is used by multiple sessions
- When an interface is used by different traffic mirror targets and traffic mirror filters.

Traffic is only mirrored one time. Use **1** for the highest priority. Valid values are 1-32766.

- (Optional) For **VNI**, type the VXLAN ID to use for the traffic mirror session.

For details, see <https://tools.ietf.org/html/rfc7348>.

If you do not specify a value, AWS assigns a random, unused number.

- (Optional) For **Packet Length**, type the number of bytes in each packet to mirror.

If you do not want to mirror the entire packet, set **Packet Length** to the number of bytes in each packet to mirror. For example, if you set this value to 100, the first 100 bytes after

the VXLAN header that meet the filter criteria are copied to the target.

To mirror the entire packet, do not enter a value in this field.

- For **Filter**, select the traffic mirror filter that determines what traffic gets mirrored.

For example, select **demo-traffic-mirror-filter**.

- (Optional) Under the **Tags** section, add or remove a tag.

The following are example settings.

- For **Session number**, type the session number **1**.
- For **VNI**, leave the value empty. AWS will assign a random number.
- For **Packet Length**, leave the value empty. AWS will mirror the entire packet.
- For **Filter**, select **demo-traffic-mirror-filter**.

The screenshot shows the 'Additional settings' section of the AWS console. It includes the following fields and options:

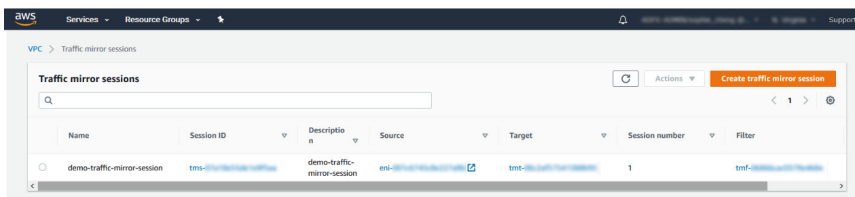
- Session number:** A text input field containing the value '1'. Below it, a note states: 'The entire sessions for the same resource are evaluated. Number between 1 and 32768.'
- VNI - optional:** A text input field that is empty. Below it, a note states: 'The unique VXLAN network identifier that is included in the encapsulated mirrored packet that is sent to the target. A random unique VNI will be chosen unless specified. Number between 0 and 16777215.'
- Packet length - optional:** A text input field that is empty. Below it, a note states: 'The number of bytes in each packet to mirror. eg 255 bytes - the entire packet is default.'
- Filter:** A dropdown menu with 'demo-traffic-mirror-filter' selected. Below it, a search bar contains 'demo-traffic-mirror-filter' and a 'Create filter' button is visible.

h. Click **Create**.



### Note

For more details, see *Working with Traffic Mirroring* at <https://docs.aws.amazon.com/vpc/latest/mirroring/working-with-traffic-mirroring.html>.



5. Repeat the previous step to create more traffic mirror sessions when there are multiple sources that you want to monitor.

## Deploying a virtual appliance behind an NLB

### Procedure

1. Configure a load balancer and a listener.
  - a. Open the **Amazon EC2** console at <https://console.aws.amazon.com/ec2/>.
  - b. On the navigation pane, under **LOAD BALANCING**, select **Load Balancers**.
  - c. Select **Create Load Balancer**.
  - d. For **Network Load Balancer**, select **Create**.
  - e. For **Name**, type a name for your load balancer.  
For example, type `demo-nlb`.
  - f. For **Scheme**, select **internal**.
  - g. For **Listeners**, modify protocol to **UDP** and type `4789` for the port to receive mirrored traffic.
  - h. For **Availability Zones**, select the VPC that you used for the Deep Discovery Inspector virtual appliance instance and select the subnet for the data port 1 (known as eth0) subnet.



**Note**

If you enable multiple **Availability Zones** for your load balancer, ensure each target group has at least one target in each **Availability Zone**. Otherwise, the load balancer will not route traffic to Deep Discovery Inspector. For more details, see <https://docs.aws.amazon.com/elasticloadbalancing/latest/network/introduction.html#network-load-balancer-components>

- i. For **IPv4 address**, you can select **Assigned from CIDR** to have AWS assign the address or select **Enter IP from CIDR** to specify the address.

- j. Click **Next: Configure Security Settings**.
2. Configure the security settings.
  - a. No changes are necessary in the **Configure Security Settings** screen.

- b. Click **Next: Configure Routing**.
3. Configure a target group.
  - a. For **Target group**, keep the default, **New target group**.
  - b. For **Name**, type a name for the target group.  
For example, type `demo-target-group`.
  - c. For **Target type**, select **Instance**.
  - d. For **Protocol**, select **UDP**.
  - e. For **Port**, type `4789`.
  - f. For **Protocol** under **Health checks**, select **TCP**.
  - g. For **Port** under **Advanced health check settings**, select **override** and type `14789` for the port.
  - h. Leave other settings as default.

**Step 3: Configure Routing**  
Your load balancer routes requests to the targets in this target group using the protocol and port that you specify, and performs health checks on the targets using these health check settings. Note that each target group can be associated with only one load balancer.

**Target group**

Target group

Name

Target type ☒ Instance

Protocol

Port

**Health checks**

Protocol

**Advanced health check settings**

Port ☐ traffic port ☒ override

Healthy threshold

Unhealthy threshold

Timeout  seconds

Interval ☐ 10 seconds ☒ 30 seconds

[Cancel](#) [Previous](#) [Next: Register Targets](#)

- i. Click **Next: Register Targets**.
4. Register targets with the target group.
  - a. For **Instances**, select the Deep Discovery Inspector virtual appliance.

For example, select **demo-ddi**.

- b. Keep the default instance listener port and select **Add to registered**.

**Step 4: Register Targets**  
Register targets with your target group. If you register a target in an enabled Availability Zone, the load balancer starts routing requests to the targets as soon as the registration process completes and the target passes the initial health checks.

**Registered targets**  
To deregister instances, select one or more registered instances and then click Remove.

Instance	Name	Port	State	Security groups	Zone
	vDDI-demo	4789	running	sg-xxxxxx	us-east-1a

**Instances**  
To register additional instances, select one or more running instances, specify a port, and then click Add. The default port is the port specified for the target group. If the instance is already registered on the specified port, you must specify a different port.

**Add to registered** on port 4789

Search instances:

Instance	Name	State	Security groups	Zone	Subnet ID	Subnet CIDR
	vDDI-demo	running	sg-xxxxxx	us-east-1a	subnet-xxxxxx	192.168.0.0/24
	Instance-xxxxxx	running	sg-xxxxxx	us-east-1a	subnet-xxxxxx	192.168.0.0/24

[Cancel](#) [Previous](#) [Next: Review](#)

- c. Click **Next: Review**.

The **Review** screen appears.

**Step 5: Review**  
Please review the load balancer details before continuing.

**Load balancer**

Name: demo-rlb  
Scheme: internal  
Listeners: port:4789 - Protocol:UDP  
IP address type: ipv4  
VPC: vpc-xxxxxx (vDDI-aws-demo)  
Subnets: subnet-xxxxxx (vDDI-aws-demo-data)  
Tags: [None]

**Routing**

Target group: New target group  
Target group name: demo-target-group  
Port: 4789  
Target type: instance  
Protocol: UDP  
Health check protocol: TCP  
Health check port: 4789  
Healthy threshold: 3  
Unhealthy threshold: 3  
Interval: 30

**Targets**

Instances: vDDI-demo:4789

[Cancel](#) [Previous](#) [Create](#)

5. Create the load balancer.
  - a. On the **Review** screen, click **Create**.
  - b. After the load balancer is created, click **Close**.
  - c. On the navigation pane, under **LOAD BALANCING**, select **Target Groups**.

- d. Select the newly created target group.

For example, select **demo-target-group**.

- e. Select **Targets** and verify that your instances are ready.



### Note

If the status of an instance is initial, it's probably because the instance is still in the process of being registered, or it has not passed the minimum number of health checks to be considered healthy. After the status of at least one instance is healthy, you can test your load balancer.

If the Deep Discovery Inspector virtual appliance is launched after the NLB was created, use **Register targets** to add the Deep Discovery Inspector virtual appliance to the NLB target groups. For more details, see <https://docs.aws.amazon.com/elasticloadbalancing/latest/network/target-group-register-targets.html>.

The screenshot shows the AWS Management Console interface for the 'demo-target-group'. The left sidebar contains navigation links for various AWS services. The main content area displays the 'demo-target-group' configuration. Under the 'Basic configuration' section, the target type is 'Instance', the protocol is 'UDP:4789', and the load balancer is 'demo-nlb'. The 'Targets' tab is active, showing a table of registered targets. One target is listed with the name 'vddi-demo' and a status of 'healthy'.

Instance ID	Name	Port	Zone	Status	Status details
i-12345678	vddi-demo	4789	us-east-1a	healthy	

6. Configure the traffic mirror filter.

For details, see <https://docs.aws.amazon.com/vpc/latest/mirroring/traffic-mirroring-filters.html>.

- a. Open the **Amazon VPC** console at <https://console.aws.amazon.com/vpc/>.
- b. In the **Region** selector, select the AWS Region that you used when you created the VPCs.
- c. On the navigation pane, go to **Traffic Mirroring > Mirror Filters**.
- d. Select **Create traffic mirror filter**.
- e. For **Name tag**, type a name for the traffic mirror filter.  
For example, type `demo-traffic-mirror-filter`.
- f. (Optional) For **Description**, type a description for the traffic mirror filter.  
For example, type `demo-traffic-mirror-filter`.
- g. (Optional) For **Network services**, select **amazon-dns**.

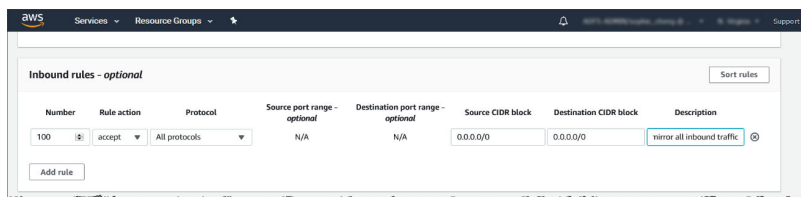
The screenshot shows the AWS VPC console interface for creating a traffic mirror filter. The breadcrumb navigation is 'VPC > Traffic mirror filters > Create traffic mirror filter'. The main heading is 'Create traffic mirror filter'. Below it is the 'Filter settings' section, which includes the instruction 'Set description and enabled network services'. There are three input fields: 'Name tag - optional' with the value 'demo-traffic-mirror-filter', 'Description - optional' with the value 'demo-traffic-mirror-filter', and 'Network services - optional' which has a checked checkbox next to 'amazon-dns'.

- h. Add inbound rules. Select **Inbound rules > Add > rule**, and then specify the following information about the traffic mirror source inbound traffic:
  - **Rule number:** Type a priority to assign to the rule.
  - **Rule action:** Select an action to take for the packet.
  - **Protocol:** Select a L4 protocol to assign to the rule.
  - (Optional) **Source port range:** Type a source port range.
  - (Optional) **Destination port range:** Type a destination port range.

- **Source CIDR block:** Type a source CIDR block.
- **Destination CIDR block:** Type a destination CIDR block.
- (Optional) **Description:** Type a description for the rule.

The following is an example of the values.

- **Rule number:** Use the default number
- **Rule action:** Select **accept**
- **Protocol:** Select **All protocols**
- **Source CIDR block:** Type `0.0.0.0/0`.
- **Destination CIDR block:** Type `0.0.0.0/0`.
- **Description:** Type `mirror all inbound traffic`.



- i. Add outbound rules. Select **Outbound rules > Add > rule**, and then specify the following information about the traffic mirror source outbound traffic:

- **Rule number:** Type a priority to assign to the rule.
- **Rule action:** Select an action to take for the packet.
- **Protocol:** Select a L4 protocol to assign to the rule.
- (Optional) **Source port range:** Type a source port range.
- (Optional) **Destination port range:** Type a destination port range.
- **Source CIDR block:** Type a source CIDR block.
- **Destination CIDR block:** Type a destination CIDR block.

- (Optional) **Description:** Type a description for the rule.

The following is an example of the values.

- **Rule number:** Use the default number
- **Rule action:** Select **accept**
- **Protocol:** Select **All protocols**
- **Source CIDR block:** Type **0.0.0.0/0**.
- **Destination CIDR block:** Type **0.0.0.0/0**.
- **Description:** Type **mirror all outbound traffic**.

**Add rule**

Outbound rules - optional

Number	Rule action	Protocol	Source port range - optional	Destination port range - optional	Source CIDR block	Destination CIDR block	Description
100	accept	All protocols	N/A	N/A	0.0.0.0/0	0.0.0.0/0	mirror all outbound traffic

[Add rule](#)

- Repeat the previous step for each inbound rule and outbound rule that you want to add.
- Click **Create**.

VPC > Traffic mirror filters

**Traffic mirror filters**

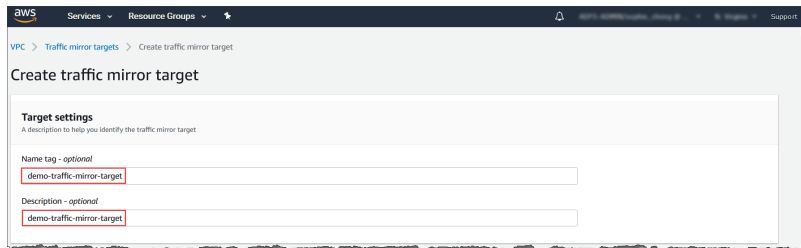
demo

Name	Filter ID	Description
demo-traffic-mirror-filter	tmf-...	demo-traffic-mirror-filter

- Configure the traffic mirror target.

- a. Open the **Amazon VPC** console at <https://console.aws.amazon.com/vpc/>.
- b. In the **Region** selector, select the AWS Region that you used when you created the VPCs.
- c. On the navigation pane, go to **Traffic Mirroring** > **Mirror Targets**.
- d. Select **Create Traffic Mirror Target**.
- e. For **Name tag**, type a name for the traffic mirror target.  
For example, type `demo-traffic-mirror-target`.
- f. (Optional) For **Description**, type a description for the traffic mirror target.

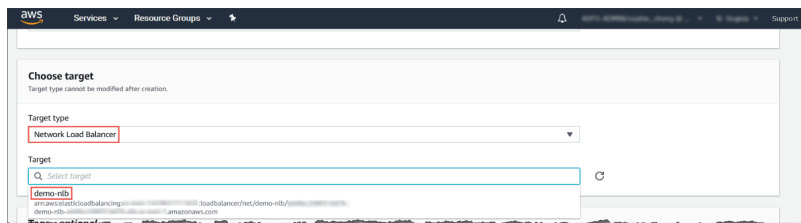
For example, type `demo-traffic-mirror-target`.



The screenshot shows the 'Create traffic mirror target' page in the AWS VPC console. The 'Target settings' section is visible, with the 'Name tag - optional' field highlighted by a red box and containing the text 'demo-traffic-mirror-target'. The 'Description - optional' field is also highlighted by a red box and contains the text 'demo-traffic-mirror-target'.

- g. For **Target type**, select **Network Load Balancer**.
- h. For **Target**, select a Network Load Balancer as the traffic mirror target.

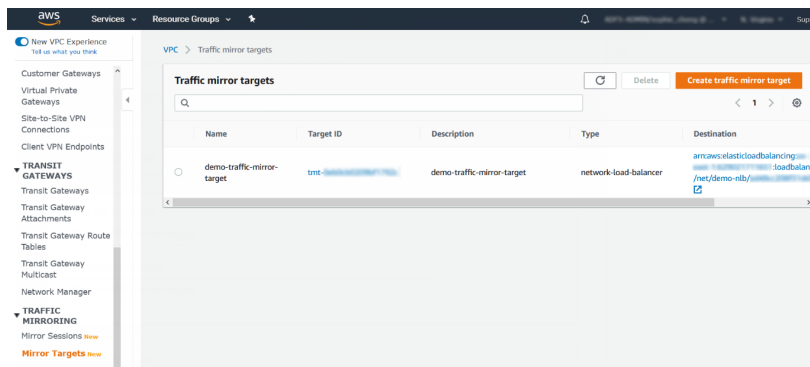
For example, select **demo-nlb**.



The screenshot shows the 'Choose target' page in the AWS VPC console. The 'Target type' dropdown is set to 'Network Load Balancer' and is highlighted by a red box. The 'Target' search bar is highlighted by a red box and contains the text 'demo-nlb'. Below the search bar, the search results show 'demo-nlb' as the selected target.

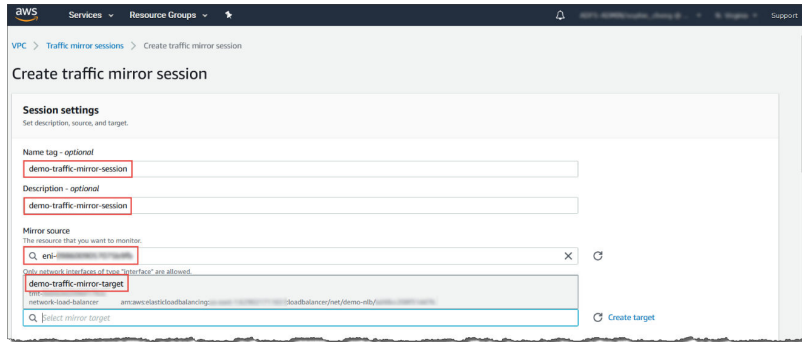


i. Click **Create**.



8. Configure the traffic mirror session.

- a. On the navigation pane, select **Traffic Mirroring > Mirror Sessions**.
- b. Select **Create traffic mirror session**.
- c. For **Name tag**, type a name for the traffic mirror session.  
For example, type `demo-traffic-mirror-session`.
- d. (Optional) For **Description**, type a description for the traffic mirror session.  
For example, type `demo-traffic-mirror-session`.
- e. For **Mirror source**, select the network interface of the instance that you want to monitor.
- f. For **Mirror target**, select the traffic mirror target.  
For example, select **demo-traffic-mirror-target**.



g. Under **Additional settings**, perform the following:

- For **Session number**, type the session number **1**.

The session number determines the order that traffic mirror sessions are evaluated in both of the following situations:

- When an interface is used by multiple sessions.
- When an interface is used by different traffic mirror targets and traffic mirror filters.

Traffic is only mirrored one time. Use **1** for the highest priority. Valid values are 1-32766.

- (Optional) For **VNI**, type the VXLAN ID to use for the traffic mirror session.

For details, see <https://tools.ietf.org/html/rfc7348>.

If you do not specify a value, AWS assigns a random, unused number.

- (Optional) For **Packet Length**, type the number of bytes in each packet to mirror.

If you do not want to mirror the entire packet, set **Packet Length** to the number of bytes in each packet to mirror. For example, if you set this value to 100, the first 100 bytes after the VXLAN header that meet the filter criteria are copied to the target.

To mirror the entire packet, do not enter a value in this field.

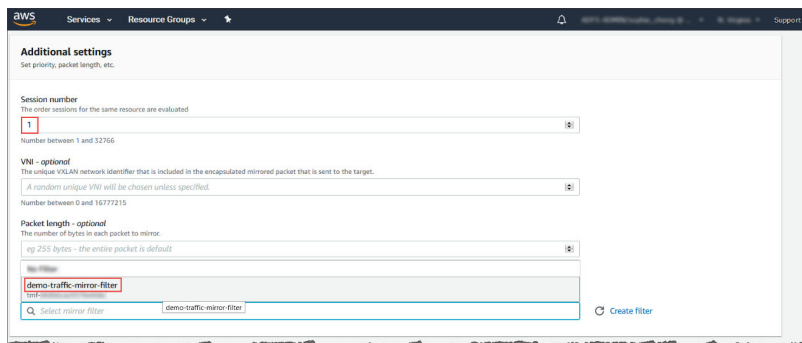
- For **Filter**, select the traffic mirror filter that determines what traffic gets mirrored.

For example, select **demo-traffic-mirror-filter**.

- (Optional) Under the **Tags** section, add or remove a tag.

The following are example settings.

- For **Session number**, type the session number **1**.
- For **VNI**, leave the value empty. AWS will assign a random number.
- For **Packet Length**, leave the value empty. AWS will mirror the entire packet.
- For **Filter**, select **demo-traffic-mirror-filter**.



**Additional settings**  
Set priority, packet length, etc.

**Session number**  
The order sessions for the same resource are evaluated.  
Number between 1 and 32768  
1

**VNI - optional**  
The unique VLAN network identifier that is included in the encapsulated mirrored packet that is sent to the target.  
A random unique VNI will be chosen unless specified.  
Number between 0 and 16777215

**Packet length - optional**  
The number of bytes in each packet to mirror.  
eg 255 bytes - the entire packet is default

**Filter**  
demo-traffic-mirror-filter  
Select mirror filter demo-traffic-mirror-filter

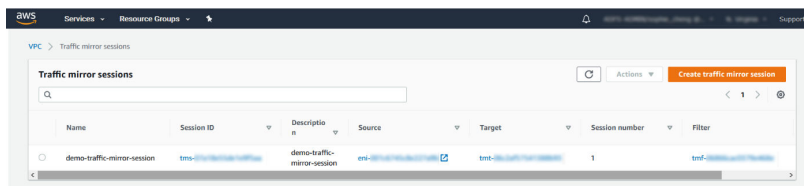
Create filter

h. Click **Create**.



### Note

For more details, see <https://docs.aws.amazon.com/vpc/latest/mirroring/working-with-traffic-mirroring.html>.



9. Repeat the previous step to create more traffic mirror sessions when there are multiple sources that you want to monitor.

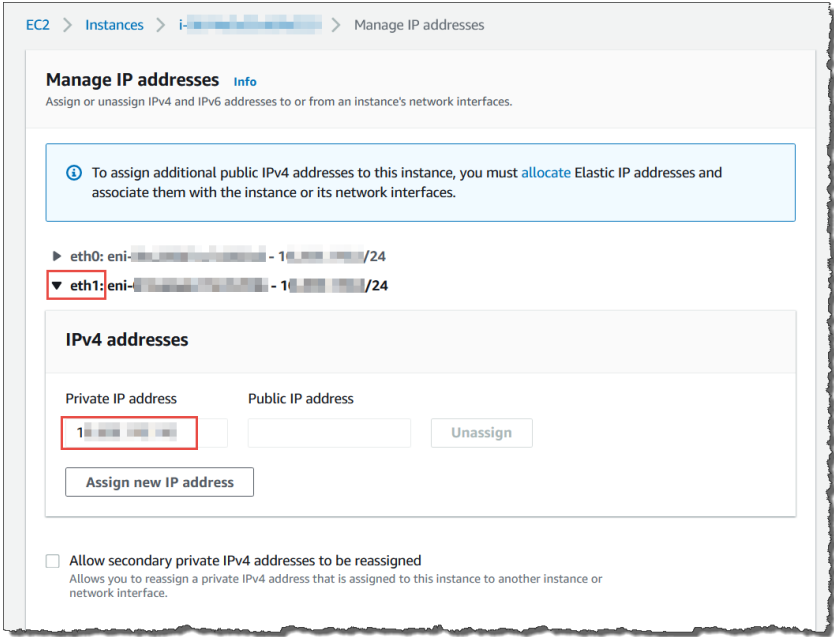
## **Chapter 4**

### **Deployment testing and troubleshooting**

## Checkpoints

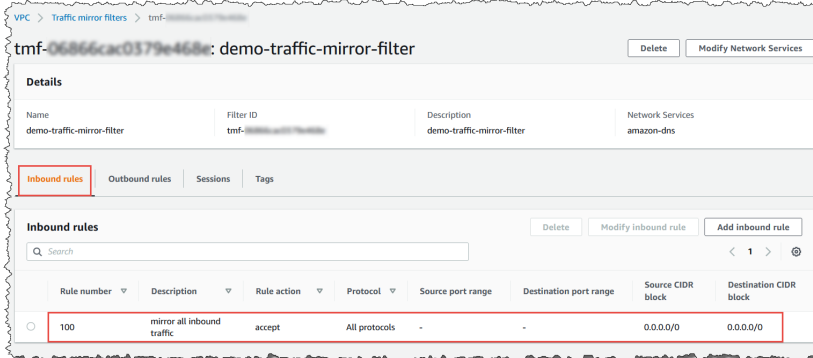
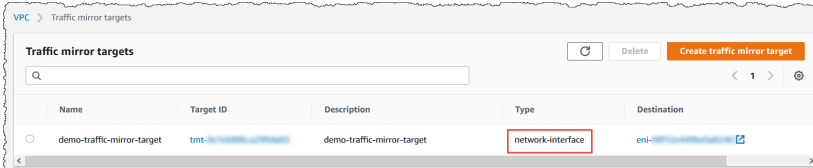
Pass the following checkpoints to ensure that the deployment is successful.

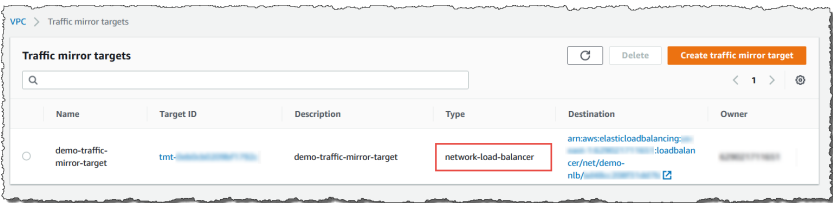
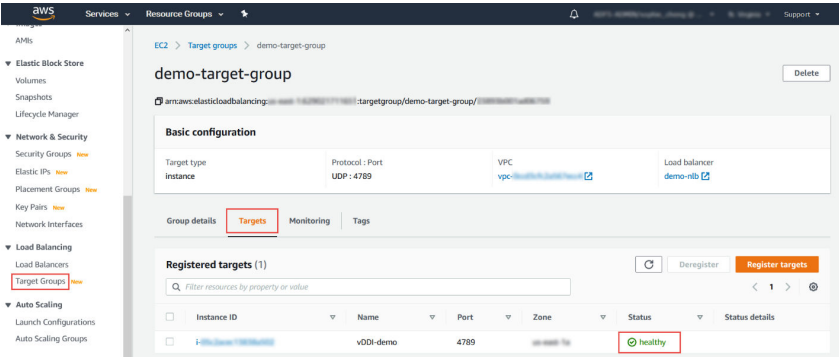
**TABLE 4-1. Checkpoints**

#	DESCRIPTION
1	<p>Use an IPv4 address to log in to the management console of the Deep Discovery Inspector virtual appliance.</p> <p>You can find the management IP address on the Amazon EC2 console by following the steps below.</p> <ol style="list-style-type: none"> <li>1. Open the Amazon EC2 console at <a href="https://console.aws.amazon.com/ec2/">https://console.aws.amazon.com/ec2/</a>.</li> <li>2. In the navigation pane, select <b>Instances</b>.</li> <li>3. Select the Deep Discovery Inspector virtual appliance.</li> <li>4. Select <b>Actions &gt; Networking &gt; Manage IP Addresses</b>.</li> <li>5. Expand <b>eth1</b>. The <b>Private IP Address</b> is the IP address of the management console for the Deep Discovery Inspector virtual appliance.</li> </ol> 
2	Active the Deep Discovery Inspector appliance with the Activation Code.

#	DESCRIPTION
3	Update the components on the Deep Discovery Inspector appliance.
4	<div><p>Follow the steps below to perform a network services diagnostic test on the Deep Discovery Inspector appliance and verify that all the tests are successful.</p><ol style="list-style-type: none"><li>Go to <code>https://&lt;virtual appliance IP address&gt;/html/troubleshooting.htm</code> and click <b>Network Services Diagnostics</b>.</li><li>Select one or more enabled services and click <b>Test</b>.</li><li>When there are no connection issues, the result of all tested services is <b>Connected</b>.</li></ol></div> <div></div>



#	DESCRIPTION																
5	<p>Verify that the traffic mirror filter contains rules allowing the HTTP protocol in both inbound and outbound traffic.</p>  <p>The screenshot shows the AWS Management Console interface for a traffic mirror filter. The filter is named 'demo-traffic-mirror-filter' and is associated with the 'amazon-dns' network service. The 'Inbound rules' tab is active, displaying a table of rules. A single rule is listed with the following details:</p> <table><tr><th>Rule number</th><th>Description</th><th>Rule action</th><th>Protocol</th><th>Source port range</th><th>Destination port range</th><th>Source CIDR block</th><th>Destination CIDR block</th></tr><tr><td>100</td><td>mirror all inbound traffic</td><td>accept</td><td>All protocols</td><td>-</td><td>-</td><td>0.0.0.0/0</td><td>0.0.0.0/0</td></tr></table> <p>The 'Outbound rules' tab is also visible, showing a similar rule configuration.</p>	Rule number	Description	Rule action	Protocol	Source port range	Destination port range	Source CIDR block	Destination CIDR block	100	mirror all inbound traffic	accept	All protocols	-	-	0.0.0.0/0	0.0.0.0/0
Rule number	Description	Rule action	Protocol	Source port range	Destination port range	Source CIDR block	Destination CIDR block										
100	mirror all inbound traffic	accept	All protocols	-	-	0.0.0.0/0	0.0.0.0/0										
6	<p>If you deploy Deep Discovery Inspector as the traffic mirror target, verify that the mirror target, for example <b>demo-traffic-mirror-target</b>, is configured with destination to the Deep Discovery Inspector virtual appliance.</p>  <p>The screenshot shows the AWS Management Console interface for a traffic mirror target. The target is named 'demo-traffic-mirror-target' and is associated with the 'demo-traffic-mirror-filter'. The target is configured with the destination 'network-interface' and the target ID 'eni-...'. The 'Create traffic mirror target' button is visible.</p>																

#	DESCRIPTION
7	<p>If you deploy Deep Discovery Inspector behind the NLB, verify that the mirror target, for example <b>demo-traffic-mirror-target</b>, is configured with destination to the NLB.</p>  <p>The screenshot shows the 'Traffic mirror targets' page in the AWS console. A table lists one target: 'demo-traffic-mirror-target' with Target ID 'tmt-...', Description 'demo-traffic-mirror-target', Type 'network-load-balancer' (highlighted with a red box), and Destination 'arn:aws:elasticloadbalancing:us-east-1:123456789012:loadbalancer/net/demo-nlb/...'. The 'Create traffic mirror target' button is visible at the top right.</p>
8	<p>Verify that the mirror session, for example <b>demo-traffic-mirror-session</b>, is configured properly for the following fields:</p> <ul style="list-style-type: none"><li>• Source</li><li>• Target</li><li>• Session number</li><li>• Filter</li></ul>
9	<p>If you deploy Deep Discovery Inspector behind the NLB, verify that the status of the registered instance in the target group, for example <b>demo-target-group</b>, is healthy.</p>  <p>The screenshot shows the 'demo-target-group' page in the AWS console. Under the 'Targets' tab, a table lists one registered target: 'vDI-demo' with Instance ID 'i-...', Name 'vDI-demo', Port '4789', Zone 'us-east-1a', and Status 'healthy' (highlighted with a red box). The 'Register targets' button is visible at the top right of the targets section.</p>

## Testing the deployment

You can perform the following steps to validate the Deep Discovery Inspector virtual appliance deployment:

### Procedure

1. Access a test website on your test EC2 instance.

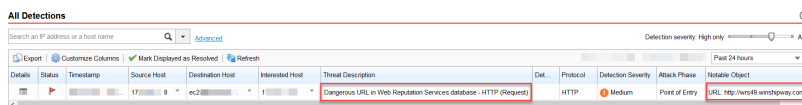
The following example is for a Linux instance.

Your testing EC2 instance must be configured as the traffic mirror source when Deep Discovery Inspector is deployed as a traffic mirror target and when Deep Discovery Inspector is deployed behind and NLB.

In the example below, replace `hxxp` with `http`.

```
~$ curl hxxp://wrs49.winshipway.com/
```

2. Verify the detection on the Deep Discovery Inspector virtual appliance.
  - a. Log in to the management console of the Deep Discovery Inspector virtual appliance.
  - b. Go to **Detections > All Detections**.
  - c. Verify that the website was detected.



The screenshot shows the 'All Detections' page in the Deep Discovery Inspector console. A table lists detected threats. The first entry is highlighted with a red box, indicating a 'Dangerous URL in Web Reputation Services database - HTTP (Requests)' with a 'Medium' severity. The 'URL' field shows 'http://wrs49.winshipway.com/'.

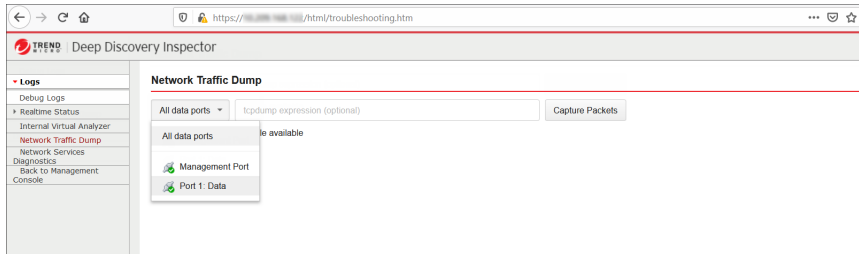
Details	Status	Timestamp	Source Host	Destination Host	Interested Host	Threat Description	Det.	Protocol	Detection Severity	Attack Phase	Malware Object
			172.17.0.1	ec2-172-17-0-1	172.17.0.1	Dangerous URL in Web Reputation Services database - HTTP (Requests)		HTTP	Medium	Point of Entry	URL: http://wrs49.winshipway.com/

## Troubleshooting the deployment

The following are several tips for troubleshooting packet reception issues on Amazon EC2.

- Use the Deep Discovery Inspector virtual appliance Network Traffic Dump

On the Deep Discovery Inspector virtual appliance, go to **Troubleshooting > Network Traffic Dump** and capture packets to check the data port's reception.



- Verify Network ACLs settings

For details, see <https://docs.aws.amazon.com/vpc/latest/userguide/vpc-network-acls.html>.

- Verify Security Group settings

For details, see [https://docs.aws.amazon.com/vpc/latest/userguide/VPC\\_SecurityGroups.html](https://docs.aws.amazon.com/vpc/latest/userguide/VPC_SecurityGroups.html). For the traffic mirror target, the traffic mirror target requires the allowance of **VXLAN traffic (UDP port 4789)** from the traffic mirror source in the security groups that are associated with the traffic mirror target.



#### Note

If you are using deploying Deep Discovery Inspector behind an NLB, you may need to allow **custom traffic (TCP port 14789)** to the Deep Discovery Inspector virtual appliance in the security groups that are associated with the Deep Discovery Inspector virtual appliance.

## Frequently asked questions

- *what are the changes on the Deep Discovery Inspector virtual appliance on AWS? on page 4-9*
- *Does the Deep Discovery Inspector virtual appliance support AWS EC2 auto scaling? on page 4-14*

- *Does Deep Discovery Inspector support creating an Amazon Machine Image (AMI) from an EC2 instance of the Deep Discovery Inspector virtual appliance? on page 4-14*
- *Does Deep Discovery Inspector support creating an Elastic Block Store (EBS) snapshot from an EC2 instance of the Deep Discovery Inspector virtual appliance? on page 4-15*
- *Does Deep Discovery Inspector support AWS backup service? on page 4-16*
- *What are the IAM policies needed to deploy Deep Discovery Inspector's virtual appliance on AWS? on page 4-16*

## what are the changes on the Deep Discovery Inspector virtual appliance on AWS?

In order to adapt into the AWS environment, the Deep Discovery Inspector virtual appliance has some minor changes. These changes do not impact any major features and are described in the following list.

- Swapping port enumeration for management port

The management port for Deep Discovery Inspector on-premises is fixed at the first NIC port (known as eth0). This change provides consistent information on Amazon EC2 console.

The Deep Discovery Inspector virtual appliance swapped port enumeration for the management port to port 1 (known as eth1) and the data port to port 0 (known as eth0).

**Network Interface** ⓘ

☐ Check VLAN tags of each stream to differentiate connections [Show advanced settings](#)

Interface	Function	MAC Address	EC2 Instance Network Interface ⓘ	Status
Management Port	Management	02:00:00:00:00:00	eth1	✓ <small>connected</small>
Port 1	Data	02:00:00:00:00:00	eth0	✓ <small>connected</small>
Port 2	Data	02:00:00:00:00:00	eth2	✓ <small>connected</small>
Port 3	Data	02:00:00:00:00:00	eth3	✓ <small>connected</small>
Port 4	Data	02:00:00:00:00:00	eth4	✓ <small>connected</small>

- IPv4 address for management port only supports DHCP

Management ports configured as IPv4 only support DHCP. To modify the IPv4 address that is assigned, use the Amazon EC2 console.

The screenshot shows the 'System Settings' page for 'Network'. On the left is a sidebar with 'System Settings' and 'Network' selected. The main content area is titled 'Network' and contains two sections: 'Appliance Identity' and 'Management Port'. In 'Appliance Identity', the 'Host name or FQDN' field is set to 'vDDI-on-AWS'. In 'Management Port', the 'IPv4 Type' dropdown is set to 'Dynamic IP address (DHCP)'. Below this are fields for 'IPv4 address', 'IPv4 subnet mask', 'IPv4 gateway', 'IPv4 DNS server 1', and 'IPv4 DNS server 2'. At the bottom, there is a checkbox for 'Enable IPv6 address'.

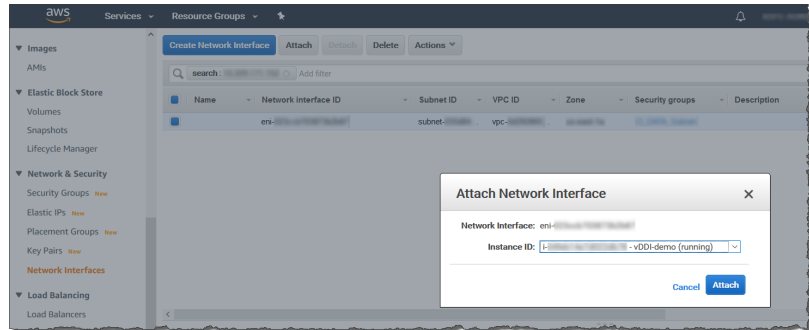
To modify the IPv4 address that is assigned, perform the following steps on the Amazon EC2 console.

1. Open the Amazon EC2 console at <https://console.aws.amazon.com/ec2/>.
2. In the navigation pane, select **Instances** and select the Deep Discovery Inspector virtual appliance.
3. Go to **Actions** > **Networking** > **Detach Network Interface**.
4. In the drop-down list, select **eth1** and click **Detach**.
5. In the navigation pane, select **Network interfaces**.

You can create a network interface (For details, see [https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/using-eni.html#create\\_eni](https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/using-eni.html#create_eni)) or find the IPv4 address that you want to attach to the management port of the Deep Discovery Inspector virtual appliance.

6. Select the network interface that you created or found in the previous step, and then click **Attach**.

7. Select the instance ID of the Deep Discovery Inspector virtual appliance, and then click **Attach**.

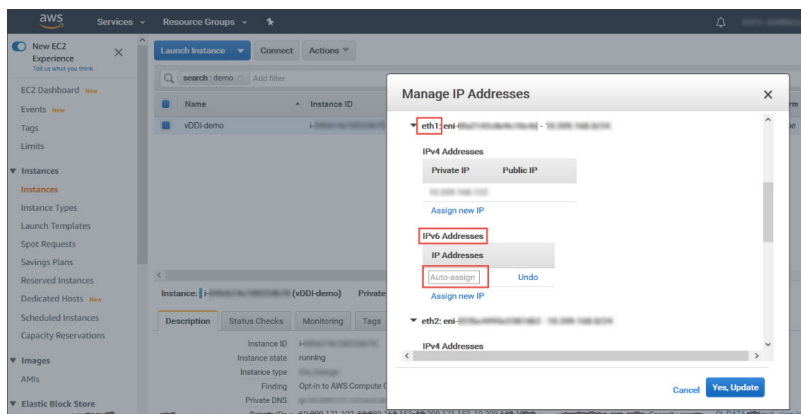


8. **Reboot** the Deep Discovery Inspector virtual appliance.
  9. Verify that the management port (eth1) of the Deep Discovery Inspector virtual appliance is assigned to the new IPv4 address.
- IPv6 address for management port only supports DHCP

On AWS, the IPv6 address is managed on the Amazon EC2 console. The Deep Discovery Inspector virtual appliance on AWS retrieves the IPv6 address automatically when IPv6 is assigned to a network interface on the Amazon EC2 console.


To assign an IPv6 address, perform the following steps.

1. Open the Amazon EC2 console at <https://console.aws.amazon.com/ec2/>.
2. In the navigation pane, select **Instances**.
3. Select the Deep Discovery Inspector virtual appliance, and then select **Actions** > **Networking** > **Manage IP Addresses**.
4. For **eth1**, under **IPv6 Addresses**, select **Assign new IP**. You can specify an IPv6 address in the subnet range, or leave the **Auto-assign** value to let Amazon choose an IPv6 address for you.



5. Click **Yes, Update**.
6. Log in to the management console of the Deep Discovery Inspector virtual appliance.
7. Go to **Administration > System Settings > Network**.
8. In **Management Port** section, select **Enable IPv6 address**.
9. Click **Save**.
10. **Reboot** the Deep Discovery Inspector virtual appliance.
11. Go to **Administration > System Settings > Network** and verify that the Deep Discovery Inspector virtual appliance is assigned an IPv6 address.



 Deep Discovery Inspector

Dashboard | Detections ▾ | Reports | Administration ▾ | Help ▾

You are here: Administration > System Settings > Network

System Settings
Network
Network Interface
Proxy
SMTP
SNMP
HTTPS Certificate
Time
Session Timeout

### Network

#### Appliance Identity

Host name or FQDN:

☐ Use host name instead of IP address as the identity of this Deep Discovery Inspector

#### Management Port

IPv4 Type:

IPv4 address:

IPv4 subnet mask:

IPv4 gateway:

IPv4 DNS server 1:

IPv4 DNS server 2:

☒ Enable IPv6 address

IPv6 Type:

IPv6 address:

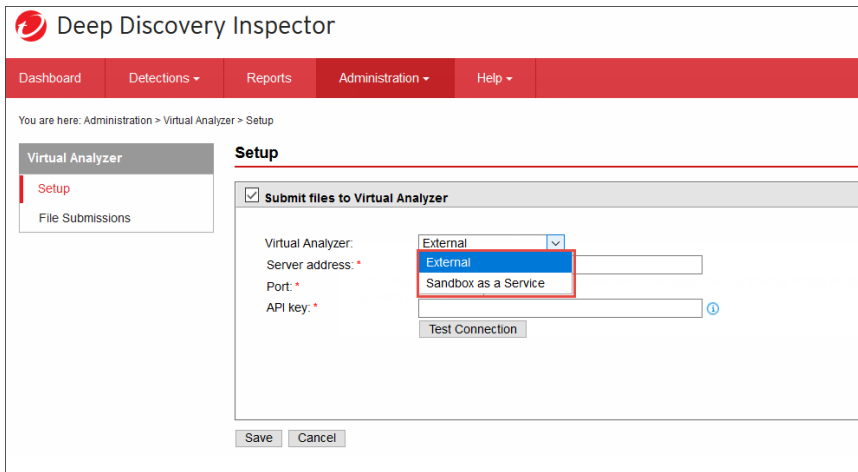
IPv6 subnet prefix length:

IPv6 gateway:

IPv6 DNS server:

- No support for internal Virtual Analyzer

When launching a Deep Discovery Inspector virtual appliance on AWS, only external Virtual Analyzer and Sandbox as a Service are supported.

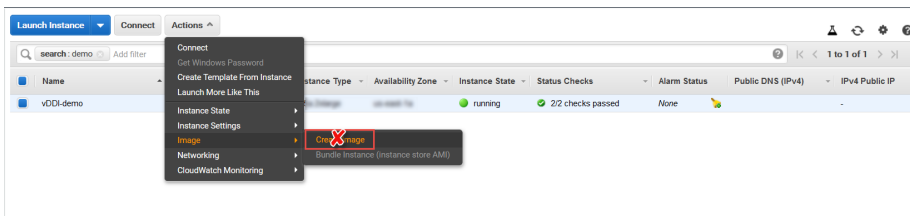


## Does the Deep Discovery Inspector virtual appliance support AWS EC2 auto scaling?

No. The Deep Discovery Inspector virtual appliance does not support AWS EC2 auto scaling.

## Does Deep Discovery Inspector support creating an Amazon Machine Image (AMI) from an EC2 instance of the Deep Discovery Inspector virtual appliance?

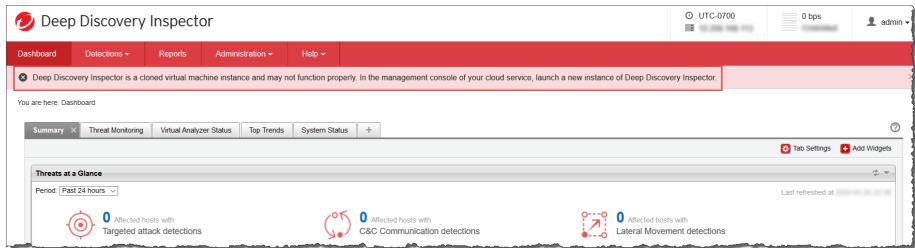
No. Deep Discovery Inspector does not support creating an AMI from an EC2 instance of the Deep Discovery Inspector virtual appliance.



After installation, the Deep Discovery Inspector virtual appliance creates a UUID automatically and this UUID is used everywhere when communicating

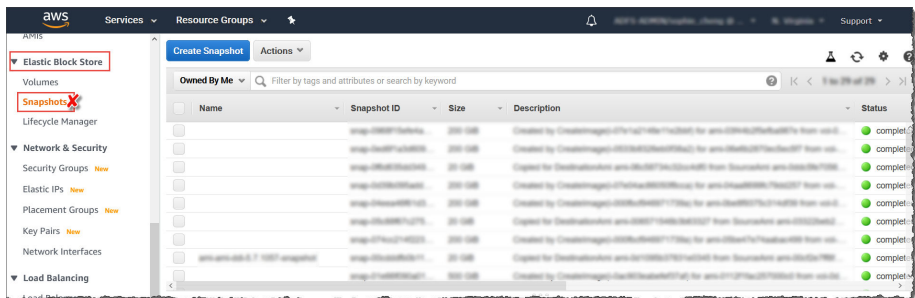
with Trend Micro global services. Creating a VM clone will corrupt the health status of bounded services.

If the Deep Discovery Inspector virtual appliance detects that the instance ID has changed, there is a warning message on the Deep Discovery Inspector virtual appliance management console.



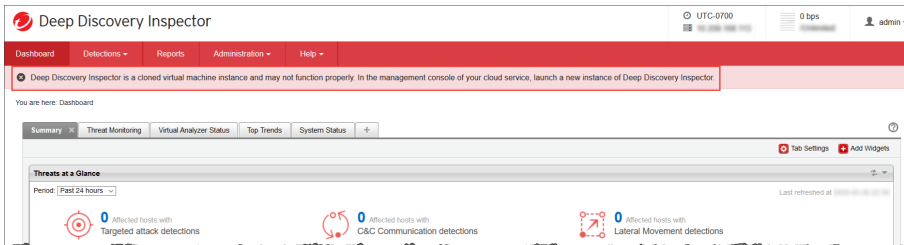
## Does Deep Discovery Inspector support creating an Elastic Block Store (EBS) snapshot from an EC2 instance of the Deep Discovery Inspector virtual appliance?

No. Deep Discovery Inspector does not support creating an EBS snapshot from an EC2 instance of the Deep Discovery Inspector virtual appliance.



After installation, the Deep Discovery Inspector virtual appliance creates a UUID automatically and this UUID is used everywhere when communicating with Trend Micro global services. Creating a VM clone will corrupt the health status of bounded services.

If the Deep Discovery Inspector virtual appliance detects that the instance ID has changed, there is a warning message on the Deep Discovery Inspector virtual appliance management console.



## Does Deep Discovery Inspector support AWS backup service?

Deep Discovery Inspector does not support **AWS Backup** service.

After installation, Deep Discovery Inspector virtual appliance creates a UUID automatically, and this UUID is used everywhere when communicating with Trend Micro global services. Creating a VM clone will corrupt the health status of integrated services.

When Deep Discovery Inspector has detected that the instance ID has changed, a warning message appears in the Deep Discovery Inspector virtual appliance management console.

## What are the IAM policies needed to deploy Deep Discovery Inspector's virtual appliance on AWS?

IAM (Identity and Access Management) is an AWS feature you can use to control who is authenticated and authorized to use resources. To deploy Deep Discovery Inspector, ensure your IAM user has the following permissions.

AWS SERVICE	POLICY NAME
EC2 instances	<ul style="list-style-type: none"><li>• AmazonEC2FullAccess</li><li>• IAMReadOnlyAccess</li><li>• AllowAssumeCIEC2Deployment</li><li>• AmazonEC2SpotFleetTaggingRole</li></ul>
EC2 Network & Security	<ul style="list-style-type: none"><li>• AmazonEC2FullAccess</li><li>• IAMReadOnlyAccess</li><li>• AllowAssumeCIEC2Deployment</li><li>• AmazonEC2SpotFleetTaggingRole</li></ul>
EC2 Load Balancing	<ul style="list-style-type: none"><li>• AmazonEC2FullAccess</li><li>• IAMReadOnlyAccess</li><li>• AllowAssumeCIEC2Deployment</li><li>• AmazonEC2SpotFleetTaggingRole</li></ul>
VPC TRAFFIC MIRRORING	<ul style="list-style-type: none"><li>• AmazonEC2FullAccess</li><li>• IAMReadOnlyAccess</li><li>• AllowAssumeCIEC2Deployment</li><li>• AmazonEC2SpotFleetTaggingRole</li></ul>
AWS Marketplace	AWSMarketplaceManageSubscriptions
AWS Compute Optimizer finding	ComputeOptimizerReadOnlyAccess



# Index



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Item Code: APEM69999/250605