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Welcome to Tenable Identity Exposure

Last updated: December 11, 2023

Tenable Identity Exposure (formerly Tenable.ad) provides real-time security monitoring for Microsoft Active Directory (AD) infrastructures. By leveraging a non-intrusive approach based on the AD replication process, Tenable empowers security teams in their audit, threat hunting, detection, and incident response tasks.

This On-Premise Installation Guide gives the following information:

- The technical requirements to deploy and operate Tenable Identity Exposure as an on-premises platform that is disconnected from the Internet.
- The environment specifications from a network and application perspective.
- The tasks to perform before enabling security monitoring.

To get started, see Work with Tenable Identity Exposure.
Work with Tenable Identity Exposure

Use the following getting started sequence to prepare, install, configure, and manage your Tenable Identity Exposure deployment.

1. Prepare
2. Install or Upgrade
3. Configure
4. Manage

Prepare

Before you install Tenable Identity Exposure, review the architectures and the following technical prerequisites to ensure that your platform runs optimally:

- On-premises Architectures
- Resource Sizing
- Network Requirements
- Integration with an Active Directory Domain

Install or Upgrade

You download the installation programs from the Tenable Identity Exposure portal. Tenable Identity Exposure offers several types of TLS installations depending on your infrastructure.

- Install Tenable Identity Exposure
- Installation Options
- Upgrade Tenable Identity Exposure

Configure

For all configuration tasks including the deployment of Indicators of Attack, see the Tenable Identity Exposure Administrator Guide.

Manage
You use the Tenable Identity Exposure portal to review, manage, and receive relevant information about the security state of the monitored infrastructure.

- [Connect to an Event Log Collector](#)
- [Change the IIS Certificate](#)
- [Scale Tenable Identity Exposure Services](#)
- [Upgrade and Maintenance](#)
Technical Prerequisites

See the following sections for the technical prerequisites for an on-premises installation of Tenable Identity Exposure.

- **On-premises Architectures**
- **Tenable Identity Exposure Deployment**
- **Resource Sizing**
- **Hardware Requirements**
- **Network Requirements**
- **Web Portal Requirements**
- **Integration with an Active Directory Domain**
- **Prerequisites Checklist**

See the following sections in the Tenable Identity Exposure Administrator Guide:

- **Access to AD Objects or Containers**
- **Access for Privileged Analysis**

### On-premises Architectures

The Tenable Identity Exposure platform relies on several Windows services hosted on virtual machines (VMs). Your environment must support the following infrastructure:

- **The Directory Listeners**: working closely with the monitored domain controllers, the Directory Listeners receive real-time Active Directory flows and apply several treatments to decode, isolate, and correlate security changes.

- **The Security Engine Nodes**: hosting analysis-related services, the security engine nodes support the Tenable Identity Exposure security engine, internal communication bus, and end-user applications (such as the Web portal, the REST API, or the alert notifier). This component builds on different isolated Windows services.

- **The Storage Managers**: providing hot and cold storage support, the Storage Managers oversee serving data to the Directory Listeners and the Security Engine Nodes. This component is the only one that must remain persistent to save information. Internally, they use Microsoft MS SQL Server to store internal data and configuration.

For the number and sizing of these components, see [Resource Sizing](#).

### Architectures

Tenable Identity Exposure's on-premises solution uses a software package hosted in a dedicated Windows Server environment that you provide and manage, based on the following architectures:

#### Centralized Architecture

The centralized architecture hosts all Tenable Identity Exposure components in the same network zone.

- The main components (Directory Listeners, Security Engine Nodes, and Storage Managers) work side-by-side and can communicate with each other without any network filtering.

- To ensure proper network security, Tenable recommends that you secure this architecture with a firewall at the entrance to the zone. The following illustration shows the ingoing and outgoing network flows as described in the [Network Flow Matrix](#).
Advantages — This architecture offers the best balance between manageability and security:

- Each Tenable Identity Exposure service is at the same logical place behind a unique firewall.
- Each service flow (Active Directory, end-users, alerts, etc.) goes through the same network equipment.
- This architecture links new Active Directory domains easily because it does not need service or extra configuration on the targeted domains.

Disadvantages — The centralized architecture can consume bandwidth because it must transfer each Active Directory flow from the monitored domain controllers to the Tenable Identity Exposure network zone.
**Tip**: Tenable recommends using the centralized architecture because it offers better flexibility and easier deployment.

**Distributed Architecture**

The distributed architecture places Directory Listeners in the same network zone as the domain controllers, and hosts the Security Engine Node and the Storage Manager in another network zone, as shown in the following illustration:
**Advantages**

- **Bandwidth reduction:** Active Directory flows can be significant when monitoring large directories. By filtering relevant security changes and compressing the objects, the Directory Listeners reduce the bandwidth that the platform uses.

- **Better network filtering:**
  - An Active Directory infrastructure requires the use of numerous TCP and UDP ports which can be targets during a cyberattack. Following the principle of least privilege, Tenable recommends that you expose only these network ports when it is strictly necessary.
  - By placing Directory Listeners in the same network zone as the domain controllers, Tenable Identity Exposure does not need to expose Active Directory ports to another network zone.

- **Isolated infrastructure:** Specific contexts sometimes require a complete isolation of the Active Directory infrastructure from the rest of the information system. Using the distributed architecture, Tenable Identity Exposure’s platform only requires one inbound and one outbound network flow, which preserves the security of the isolated infrastructure.

- **Network security:** Tenable Identity Exposure’s Directory Listeners use a specific host-based firewall. Tenable also recommends that you use a specific firewall at the entrance of the zone hosting the Security Engine Nodes and Storage Managers. For more information on inbound and outbound network flows, see [Network Flow Matrix](#).

**Disadvantages** — Tenable only recommends this architecture for highly sensitive environments that require high-level network isolation.

- The distributed architecture is more complex to deploy and to maintain because it requires multiple network configurations in different network locations.

- This architecture is also less flexible since it requires the deployment of new Directory Listeners each time the customer wants to add a new domain to monitor.

**Tenable Identity Exposure Deployment**

You install Tenable Identity Exposure as an application package hosted in a dedicated Windows environment that must fulfill specific hosting specifications. Tenable Identity Exposure requires access to the operating system’s master image on the system where you install it.
**Required account permissions:** The account you use to deploy Tenable Identity Exposure must have these specific permissions: SeBackupPrivilege, SeDebugPrivilege, and SeSecurityPrivilege.

Tenable preconfigures the application package with only Tenable services and your specific requirements. This deployment option offers maximum flexibility and integrates seamlessly into your specific environment.

![Diagram of Tenable Identity Exposure deployment](image)

**Note:** Tenable Identity Exposure runs on a micro-services architecture embedded into Windows services. These services have a dedicated purpose (storage, security analysis, application, etc.) and all are mandatory. Consequently, you can only install Tenable Identity Exposure on operating systems supporting the micro-services model.

### Unsupported Configurations

The following table details unsupported configurations:

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active anti-virus or Endpoint Detection and Response (EDR) solution</td>
<td>The Tenable Identity Exposure platform requires intensive disk I/O.</td>
</tr>
<tr>
<td></td>
<td>• Using anti-virus and EDR can drastically decrease platform performances.</td>
</tr>
<tr>
<td></td>
<td>• You must have an exception to allow Tenable Identity Exposure services and data folder.</td>
</tr>
<tr>
<td>FIPS-compliant algorithms</td>
<td>For data privacy reasons, do not activate Federal Information Processing Standards (FIPS)-compliant algorithms for encryption.</td>
</tr>
<tr>
<td>---------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Firewalls</td>
<td>Do the following to allow Tenable Identity Exposure services to communicate with each other to have reliable security monitoring:</td>
</tr>
<tr>
<td></td>
<td>• Disable local firewall rules preventing outgoing traffic.</td>
</tr>
<tr>
<td></td>
<td>• Grant local firewall rules to allow incoming traffic on Tenable Identity Exposure services.</td>
</tr>
<tr>
<td>Erlang</td>
<td>• Do not customize the HOMEDRIVE environment variable.</td>
</tr>
<tr>
<td></td>
<td>• The PATHEXT environment variable must contain the .exe and .bat file extensions.</td>
</tr>
</tbody>
</table>

**Third-Party Applications**

Deploying Tenable Identity Exposure’s platform in a non-certified environment can create unexpected side effects.

In particular, the deployment of third-party applications (such as a specific agent or daemon) in the master image can cause stability or performance issues.

Tenable strongly recommends that you reduce the number of third-party applications to a minimum.

**Access Rights**

Tenable Identity Exposure’s platform requires local administrative rights to operate and ensure a proper service management.
You must provide the Tenable technical lead with the credentials (username and password) associated with the administrative account of the host machine.

When deploying to a production environment, consider a password renewal process that you validate jointly with the Tenable technical lead.

**Product Updates**

As part of its upgrade program, Tenable frequently publishes updates to its systems to provide new detection capabilities and new product features.

- In this deployment, Tenable only provides updates for Tenable Identity Exposure components. You must ensure a proper management of your operating systems, including the frequent deployment of security patches. For more information about Tenable Identity Exposure releases, see the Tenable Identity Exposure Release Notes.

- Tenable Identity Exposure's micro-services architecture supports the immediate application of operating system patches.

**Resource Sizing**

To ensure correct behavior, the Tenable Identity Exposure components — Storage Manager, Security Engine Nodes, and Directory Listener — require a certain amount of memory and computing power.

- These required resources scale depending on the size of the Active Directory (AD) infrastructure that you monitor.

- Tenable Identity Exposure uses the number of active users as a metric to compute the sizing requirements. This includes the regular user accounts and the service accounts that applications use.

To compute the AD volume:

- Run the following PowerShell command line on each Active Directory domain to monitor:

```powershell
Import-Module ActiveDirectory
(Get-ADUser -Server "dc.domain.com" -Filter 'enabled -eq $true').Count
```

where:
- Server specifies the Active Directory Domain Services (ADDS) instance to connect to.
- dc.domain.com is the fully qualified domain name (FQDN) of the domain controller to use for counting.

## Sizing Requirements

After you compute the number of active users to monitor, see the following sections for the appropriate sizing requirements:

- The **Directory Listeners** receive real-time Active Directory flows.

### Required sizing for the system hosting the Directory Listener components:

<table>
<thead>
<tr>
<th>Directory Listener</th>
<th>Active AD users</th>
<th>Instance required</th>
<th>vCPU (per instance)</th>
<th>Memory (per instance)</th>
<th>Disk space (per instance)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 – 25,000</td>
<td>1 virtual machine</td>
<td>2 cores on 2 sockets</td>
<td>16 GB of RAM</td>
<td>30 GB (Silver)</td>
</tr>
<tr>
<td></td>
<td>25,001 – 50,000</td>
<td>1 virtual machine</td>
<td>4 cores on 2 sockets</td>
<td>16 GB of RAM</td>
<td>30 GB (Silver)</td>
</tr>
<tr>
<td></td>
<td>50,001 – 75,000</td>
<td>1 virtual machine</td>
<td>4 cores on 2 sockets</td>
<td>32 GB of RAM</td>
<td>30 GB (Silver)</td>
</tr>
<tr>
<td></td>
<td>75,001 – 100,000</td>
<td>1 virtual machine</td>
<td>4 cores on 2 sockets</td>
<td>32 GB of RAM</td>
<td>30 GB (Silver)</td>
</tr>
<tr>
<td></td>
<td>100,001 – 150,000</td>
<td>1 virtual machine</td>
<td>8 cores on 2 sockets</td>
<td>64 GB of RAM</td>
<td>30 GB (Silver)</td>
</tr>
<tr>
<td></td>
<td>150,001 – 300,000</td>
<td>1 virtual machine</td>
<td>8 cores on 2 sockets</td>
<td>64 GB of RAM</td>
<td>30 GB (Silver)</td>
</tr>
<tr>
<td></td>
<td>300,001 – 500,001+</td>
<td>1 virtual machine</td>
<td>8 cores on 2 sockets</td>
<td>64 GB of RAM</td>
<td>30 GB (Silver)</td>
</tr>
</tbody>
</table>
The **Security Engine Nodes** support Tenable Identity Exposure’s security engine, storage services, and end users.

**Required sizing for the system hosting the Security Engine Node components:**

<table>
<thead>
<tr>
<th>Security Engine Node</th>
<th>Active AD users</th>
<th>Instance required</th>
<th>vCPU (per instance)</th>
<th>Memory (per instance)</th>
<th>Disk space (per instance)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 – 25,000</td>
<td>1 virtual machine</td>
<td>8 cores on 2 sockets</td>
<td>16 GB of RAM</td>
<td>200 GB (Gold)</td>
</tr>
<tr>
<td></td>
<td>25,001 – 50,000</td>
<td>1 virtual machine</td>
<td>8 cores on 2 sockets</td>
<td>32 GB of RAM</td>
<td>300 GB (Gold)</td>
</tr>
<tr>
<td></td>
<td>50,001 – 75,000</td>
<td>1 virtual machine</td>
<td>10 cores on 3 sockets</td>
<td>32 GB of RAM</td>
<td>300 GB (Gold)</td>
</tr>
<tr>
<td></td>
<td>75,001 – 100,000</td>
<td>1 virtual machine</td>
<td>12 cores on 4 sockets</td>
<td>64 GB of RAM</td>
<td>400 GB (Gold)</td>
</tr>
<tr>
<td></td>
<td>100,001 – 150,000</td>
<td>1 virtual machine</td>
<td>16 cores on 4 sockets</td>
<td>96 GB of RAM</td>
<td>400 GB (Gold)</td>
</tr>
<tr>
<td>Split Security Engine Node</td>
<td>150,001 – 300,000</td>
<td>5 virtual machines</td>
<td>VM1: 8 cores on 2 sockets</td>
<td>VM1: 16 GB of RAM</td>
<td>VM1: 1 TB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>VM2: 8 cores on 4 sockets</td>
<td>VM2: 16 GB of RAM</td>
<td>VM2: 300 GB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>VM3: 16 cores on 4 sockets</td>
<td>VM3: 32 GB of RAM</td>
<td>VM3: 100 GB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>VM4: 16 cores on 4 sockets</td>
<td>VM4: 16 GB of RAM</td>
<td>VM4: 100 GB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>VM5: 16 cores on 4 sockets</td>
<td>VM5: 48 GB of RAM</td>
<td>VM5: 100 GB</td>
</tr>
<tr>
<td>User Range</td>
<td>Number of Virtual Machines</td>
<td>VM1: Cores &amp; Sockets</td>
<td>VM1: RAM</td>
<td>VM1: Storage</td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>----------------------------</td>
<td>----------------------</td>
<td>---------</td>
<td>--------------</td>
<td></td>
</tr>
<tr>
<td>300,001 - 500,001+</td>
<td>5 virtual machines</td>
<td>8 cores on 2 sockets</td>
<td>16 GB of RAM</td>
<td>1 TB</td>
<td></td>
</tr>
<tr>
<td>VM2: 8 cores on 4 sockets</td>
<td>VM2: 16 GB of RAM</td>
<td>VM2: 300 GB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VM3: 12 cores on 4 sockets</td>
<td>VM3: 32 GB of RAM</td>
<td>VM3: 100 GB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VM4: 16 cores on 4 sockets</td>
<td>VM4: 32 GB of RAM</td>
<td>VM4: 100 GB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VM5: 16 cores on 4 sockets</td>
<td>VM5: 64 GB of RAM</td>
<td>VM5: 100 GB</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- The **Storage Manager** provides hot and cold storage support for the Directory Listeners and the security nodes services.

**Required sizing for the system hosting the Storage Manager components:**

<table>
<thead>
<tr>
<th>Storage Manager</th>
<th>Active AD Users</th>
<th>Instance Required</th>
<th>vCPU (per instance)</th>
<th>Memory (per instance)</th>
<th>Disk Space (per instance)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 25,000</td>
<td>1 virtual machine</td>
<td>8 cores on 2 sockets</td>
<td>16 GB of RAM</td>
<td>600 GB</td>
<td></td>
</tr>
<tr>
<td>25,001 - 50,000</td>
<td>1 virtual machine</td>
<td>8 cores on 2 sockets</td>
<td>16 GB of RAM</td>
<td>800 GB</td>
<td></td>
</tr>
<tr>
<td>50,001 - 75,000</td>
<td>1 virtual machine</td>
<td>12 cores on 4 sockets</td>
<td>32 GB of RAM</td>
<td>1.2 TB</td>
<td></td>
</tr>
<tr>
<td>75,001 - 100,000</td>
<td>1 virtual machine</td>
<td>12 cores on 4 sockets</td>
<td>32 GB of RAM</td>
<td>2 TB</td>
<td></td>
</tr>
<tr>
<td>100,001 - 150,000</td>
<td>1 virtual machine</td>
<td>12 cores on 4 sockets</td>
<td>64 GB of RAM</td>
<td>4 TB</td>
<td></td>
</tr>
<tr>
<td>150,001 - 300,000</td>
<td>1 virtual machine</td>
<td>16 cores on 4 sockets</td>
<td>64 GB of RAM</td>
<td>6 TB</td>
<td></td>
</tr>
<tr>
<td>300,001 – 500,001+</td>
<td>1 virtual machine</td>
<td>16 cores on 4 sockets</td>
<td>128 GB of RAM</td>
<td>8 TB</td>
<td></td>
</tr>
</tbody>
</table>

For information about disk performance, see [Storage Manager Disk Requirements](#).

**Storage Policy Management**

Gold, silver, and bronze storage are different tiers or levels of storage services based on performance, reliability, and cost. Definitions may vary among providers.

- Gold is the highest tier with the best performance and reliability, suitable for critical workloads.
- Silver is a mid-tier option with balanced performance and cost.
- Bronze is the lower tier with lower performance and reliability, often chosen for less critical workloads.

**Sizing Example**

An Information System made of three Active Directory domains has the following sizing.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Number of Active AD users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domain A</td>
<td>45,000</td>
</tr>
<tr>
<td>Domain B</td>
<td>15,000</td>
</tr>
<tr>
<td>Domain C</td>
<td>150</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>60,150</strong></td>
</tr>
</tbody>
</table>

Following the sizing matrix, this Tenable Identity Exposure deployment requires the following resources.

<table>
<thead>
<tr>
<th>Tenable Identity Exposure services</th>
<th>Instance Required</th>
<th>vCPU (per instance)</th>
<th>Memory (per instance)</th>
<th>Disk Space (per instance)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directory Listeners</td>
<td>1</td>
<td>4 cores, at least 2.6 GHz</td>
<td>32 GB of RAM</td>
<td>30 GB</td>
</tr>
<tr>
<td>Security Engine Nodes</td>
<td>1</td>
<td>10 cores, at least 2.6 GHz</td>
<td>32 GB of RAM</td>
<td>300 GB</td>
</tr>
</tbody>
</table>
### Storage Manager Disk Requirements

As part of its security analysis, Tenable Identity Exposure stores the differences for each Active Directory (AD) change either from the AD database or the Sysvol network share.

The **Storage Manager** component oversees the storage of these events using the following:

- An event log storage for attacks related events
- A Microsoft SQL Server instance for all other events

Tenable provides both minimum and recommended hardware requirements depending on your Active Directory activity:

- A minimum sizing configuration to start and run the platform in most infrastructures.
- A recommended sizing configuration to cover the needs of most event-intensive AD infrastructures.

Tenable Identity Exposure also requires the implementation of a specific disk layout to store the different database files and to ensure that I/O performances are compatible with its activity.

Due to the amount of Active Directory data it processes, Tenable Identity Exposure is a disk-intensive application. To avoid any bottleneck introduced by the storage (disk or SAN), Tenable Identity Exposure offers a minimal and recommended configuration.

- As with sizing, the minimal disk performances generally cover the needs of most infrastructures.
- The recommended infrastructure offers better experience for large or active AD infrastructures.

#### Supported and Recommended Disk Layout

Some specific environments require splitting the database files across different disks:

- One data file disk
- One temporary DB disk
- One log file disk
- (Optional) 1 backup disk
The following tables describe the minimal and recommended disk sizing to store six months of Active Directory events in Tenable Identity Exposure.

### Storage managers – Disk Sizing Matrix

<table>
<thead>
<tr>
<th>Active AD users (per instance)</th>
<th>Data File Disk Space</th>
<th>Log File Disk Space</th>
<th>TempDb Disk Space</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Recommended</td>
<td>Minimum</td>
</tr>
<tr>
<td>1 – 25,000</td>
<td>600 GB</td>
<td>340 GB</td>
<td>375 GB</td>
</tr>
<tr>
<td>25,001 – 50,000</td>
<td>800 GB</td>
<td>400 GB</td>
<td>500 GB</td>
</tr>
<tr>
<td>50,001 – 75,000</td>
<td>1.2 TB</td>
<td>600 GB</td>
<td>775 GB</td>
</tr>
<tr>
<td>75,001 – 100,000</td>
<td>2 TB</td>
<td>725 GB</td>
<td>1.3 TB</td>
</tr>
<tr>
<td>100,001 – 150,000</td>
<td>4 TB</td>
<td>1.6 TB</td>
<td>3 TB</td>
</tr>
<tr>
<td>150,001 – 300,000</td>
<td>6 TB</td>
<td>2.45 TB</td>
<td>4.7 TB</td>
</tr>
<tr>
<td></td>
<td>8 TB</td>
<td>3.3 TB</td>
<td>6.4 TB</td>
</tr>
</tbody>
</table>
The limiting factor of the database is usually the underlying disk performances. The better disk throughput/IOPS, the better overall performances of Tenable Identity Exposure are. A low latency is also necessary (<5 ms).

### Storage managers – Disk Performance Matrix

<table>
<thead>
<tr>
<th>Active AD users</th>
<th>Minimal Disk Performance</th>
<th>Recommended Disk Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Throughput (MB/sec)</td>
<td>IOPs (read/write)</td>
</tr>
<tr>
<td>1 - 25,000</td>
<td>150</td>
<td>2,500</td>
</tr>
<tr>
<td>25,001 - 50,000</td>
<td>200</td>
<td>5,000</td>
</tr>
<tr>
<td>50,001 - 75,000</td>
<td>200</td>
<td>5,000</td>
</tr>
<tr>
<td>75,001 - 100,000</td>
<td>200</td>
<td>5,000</td>
</tr>
<tr>
<td>100,001 - 150,000</td>
<td>250</td>
<td>7,500</td>
</tr>
<tr>
<td>150,001 - 300,000</td>
<td>250</td>
<td>7,500</td>
</tr>
<tr>
<td>300,001 - 500,001+</td>
<td>500</td>
<td>16,000</td>
</tr>
</tbody>
</table>

### Hardware Requirements

Tenable Identity Exposure requires the following hardware:
• Supported Microsoft Windows Operating Systems
  ◦ Windows Server 2016
  ◦ Windows Server 2019
  ◦ Windows Server 2022

• The requirements described in the sizing sections are for the well-being of Tenable Identity Exposure’s platform; they do not include the operating system requirements of an application package-based deployment.

• CPU speed must be at least 2.6 GHz.

• Tenable Identity Exposure’s platform supports the x86-64 processor architecture (at least Sandy Bridge or Piledriver) with Intel Turbo Boost Technology 2.0.

• One required network interface: you can add other network interfaces for administration, monitoring, or any other reason.

Network Requirements

Tenable Identity Exposure requires access to your Active Directory infrastructures to initiate security monitoring. You must allow network flows between the different Tenable Identity Exposure services as described in Network Flow Matrix.

Bandwidth

As a monitoring platform, Tenable Identity Exposure receives Active Directory events continuously. Depending on the scale of the infrastructure, this process can generate a significant volume of data.

You must allocate an appropriate bandwidth to guarantee data transmission to Tenable Identity Exposure for analysis in a reasonable amount of time.

The following table defines the required bandwidth based on the size of the monitored AD.

<table>
<thead>
<tr>
<th>Active AD Users</th>
<th>Average Number of Objects Received (per minute)</th>
<th>Minimum Bandwidth</th>
<th>Recommended Bandwidth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 5,000</td>
<td>10</td>
<td>1 Mbps/sec</td>
<td>2 Mbps/sec</td>
</tr>
<tr>
<td>5,001 –</td>
<td>150</td>
<td>5 Mbps/sec</td>
<td>10 Mbps/sec</td>
</tr>
</tbody>
</table>
Microsoft APIs

To subscribe to the replication flows and begin monitoring them, Tenable Identity Exposure must contact standard directory APIs from Microsoft. Tenable Identity Exposure only requires communication with the Primary Domain Controller emulator (PDCe) with a regular user account. You must also deploy a new group policy object (GPO) to activate the attack detection engine.

Communication with AD

For an on-premises installation, Tenable Identity Exposure is a software package that you deploy on your Windows Server environment. Tenable Identity Exposure must communicate with the monitored Active Directory.

Internet Access

Tenable provides a continuous integration process to allow regular releases of new detection capabilities and features. Tenable recommends that you plan an Internet access to upgrade Tenable Identity Exposure regularly.

Network Protocols

Specific network protocols (such as Syslog, SMTP or HTTP) allow Tenable Identity Exposure to offer native alerting features, the ability to design specific analysis flows bound to a Security Information and Event Management (SIEM) platform, and a REST API that can integrate into a cybersecurity ecosystem.

**Network Flow Matrix**

To do security monitoring, Tenable Identity Exposure must communicate with the Primary Domain Controller emulator (PDCe) of each domain. You must open network ports and transport protocols on each PDCe to ensure efficient monitoring.

In addition to these network flows, you must consider other network flows, such as:

<table>
<thead>
<tr>
<th>Traffic Size</th>
<th>Expected Bandwidth</th>
</tr>
</thead>
<tbody>
<tr>
<td>75,000</td>
<td></td>
</tr>
<tr>
<td>75,001–400,000</td>
<td>15 Mbps/sec</td>
</tr>
<tr>
<td></td>
<td>30 Mbps/sec</td>
</tr>
</tbody>
</table>
• Access to the end-user services.

• The network flows between Tenable Identity Exposure services.

• The network flows from the support services that Tenable Identity Exposure uses, such as the update management infrastructure and the network time protocol.

The following network matrix diagram gives more details about the different services involved.

### Required Protocols

Based on this diagram, the following table describes each required protocol and port that Tenable Identity Exposure uses.
<table>
<thead>
<tr>
<th>Network Flows</th>
<th>From</th>
<th>To</th>
<th>Tenable Identity Exposure’s Usage</th>
<th>Type of Traffic</th>
<th>Protocol and Port</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>User and Computer Authentication, Forest Level Trusts</td>
<td>Kerberos</td>
<td>TCP/88, TCP/464 and UDP/464</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>User and Computer Authentication, Name Resolution, Trusts</td>
<td>DNS</td>
<td>UDP/53 and TCP/53</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Replication, User and Computer Authentication, Group Policy, Trusts</td>
<td>RPC, DCOM, EPM, DRSUAPI, NetLogonR, SamR, FRS</td>
<td>TCP Dynamic (&gt; 1024)</td>
</tr>
<tr>
<td></td>
<td>First Tier</td>
<td>Second Tier</td>
<td>Third Tier</td>
<td>Fourth Tier</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>------------</td>
<td>-------------</td>
<td>------------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Directory, Replication, User and Computer Authentication, Group Policy, Trusts</td>
<td>Global Catalog</td>
<td>TCP/3268 and TCP/3269</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Replication</td>
<td>RPC Endpoint Mapper</td>
<td>TCP/135</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Tenable Identity Exposure’s Directory Listeners</td>
<td>Tenable Identity Exposure’s Security engine nodes</td>
<td>Tenable Identity Exposure’s communication bus</td>
<td>TCP/5671 and TCP/5672</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Advanced Message Queuing Protocol</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tenable Identity Exposure’s internal API flows (optional)</td>
<td>TLS/HTTP</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TCP/443</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>End users</td>
<td>Tenable Identity Exposure’s Security engine nodes</td>
<td>Tenable Identity Exposure’s end-user services (Web portal, REST API, etc.)</td>
<td>TLS/HTTP</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TCP/443</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Tenable Identity Exposure</td>
<td>Support services</td>
<td>Time synchronization</td>
<td>NTP</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>UDP/123</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Update infrastructure (for example WSUS or SCCM)</td>
<td>HTTP/HTTPS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TCP/80 or TCP/443</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PKI</td>
<td>HTTP/HTTPS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TCP/80 or TCP/443</td>
<td></td>
</tr>
</tbody>
</table>
### Infrastructure

<table>
<thead>
<tr>
<th>Identity provider</th>
<th>Type of Traffic</th>
<th>Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAML server</td>
<td>TLS/HTTP</td>
<td>TCP/443</td>
</tr>
<tr>
<td>LDAP</td>
<td>LDAP/LDAPS</td>
<td>TCP/389 and TCP/636</td>
</tr>
<tr>
<td>OAuth</td>
<td>TLS/HTTP</td>
<td>TCP/443</td>
</tr>
</tbody>
</table>

### Additional Flows

In addition to the Active Directory protocols, certain Tenable Identity Exposure configurations require additional flows. You must open these protocols and ports between Tenable Identity Exposure and the targeted service.

<table>
<thead>
<tr>
<th>Network flows</th>
<th>From</th>
<th>To</th>
<th>Tenable Identity Exposure’s Usage (optional)</th>
<th>Type of Traffic</th>
<th>Protocol and Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>Tenable Identity Exposure’s Security Engine Nodes</td>
<td>Cybersecurity services</td>
<td>Tenable Identity Exposure Web Application</td>
<td>HTTP/TLS</td>
<td>TCP/443</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Email notifications</td>
<td>SMTP</td>
<td>TCP/25, TCP/587, TCP/465, TCP/2525, TCP/25025 (depending on the SMTP server’s configuration)</td>
</tr>
</tbody>
</table>
Syslog notifications | Syslog | TCP/601, TCP/6515, UDP/514 (depending on the event log server’s configuration)  
Tenable REST API | HTTP/TLS | TCP/443

**Ports**

If you split the Security Engine Nodes and the Storage Managers into two different subnets, Tenable Identity Exposure requires access to the following ports.

**Note:** Tenable does not recommend separating the Security Engine Nodes and the Storage Manager services on different networks to avoid performance issues.

<table>
<thead>
<tr>
<th>Network flows</th>
<th>From</th>
<th>To</th>
<th>Tenable Identity Exposure’s Usage</th>
<th>Type of Traffic</th>
<th>Protocol and Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Tenable Identity Exposure’s Security Engine Nodes</td>
<td>Tenable Identity Exposure’s EventLogStorage database access</td>
<td>MS SQL Server database access</td>
<td>MS SQL queries</td>
<td>TCP/1433</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EventLogStorage database access</td>
<td>EventLogStorage queries</td>
<td>TCP/4244</td>
</tr>
</tbody>
</table>

**Support Services**

Support services are often highly vendor or configuration-specific. For example, the WSUS service listens by default on port TCP/8530 for its 6.2 version and higher, but on TCP/80 for other versions. You can reconfigure this port to any another port.

**Network Address Translation (NAT) support**
Tenable Identity Exposure initiates all network connections, except those from end users. You can use network address translation (NAT) to connect to Tenable Identity Exposure through network interconnection.

**On-premise platform**

![Diagram of network connections and protocols](image)

**On-premise platform using Secure Relay**

![Diagram of network connections and protocols using Secure Relay](image)
Network Matrix for Transport Layer Security (TLS) Mode

The illustration below shows the network matrix for a TLS platform with the required protocol and port.

Note: Tenable Identity Exposure does not support TLS versions earlier than 1.2.
Based on this diagram, the networks flows are as follows:

<table>
<thead>
<tr>
<th>Network Flows</th>
<th>To</th>
<th>From</th>
<th>Tenable’s Usage</th>
<th>Type of Traffic</th>
<th>Protocol and Port</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TCP/445</td>
</tr>
<tr>
<td>Trusts</td>
<td>SamR, SrvSvc</td>
<td>TCP/88, TCP/464 and UDP/464</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>-------------------------</td>
<td>----------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>User and Computer Authentication, Forest Level Trusts</td>
<td>Kerberos</td>
<td>TCP/88, TCP/464 and UDP/464</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>User and Computer Authentication, Name Resolution, Trusts</td>
<td>DNS</td>
<td>UDP/53 and TCP/53</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Replication, User and Computer Authentication, Group Policy, Trusts</td>
<td>RPC, DCOM, EPM, DRSUAPI, NetLogonR, SamR, FRS</td>
<td>TCP Dynamic (&gt; 1024)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Directory, Replication, User and Computer Authentication, Group Policy, Trusts</td>
<td>Global Catalog</td>
<td>TCP/3268 and TCP/3269</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Replication</td>
<td>RPC Endpoint Mapper</td>
<td>TCP/135</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Tenable Security probe</td>
<td>Tenable Identity Exposure SaaS platform</td>
<td>Tenable’s security probe TLS Tunnel</td>
<td>Advanced Message Queuing Protocol encrypted in</td>
<td>TCP/5671</td>
<td></td>
</tr>
</tbody>
</table>
Depending on your Tenable Identity Exposure configuration, you may need to allow additional flows by opening these protocols and ports between Tenable Identity Exposure and the targeted service.

<table>
<thead>
<tr>
<th>Network Flows</th>
<th>To</th>
<th>From</th>
<th>Tenable’s Usage (optional)</th>
<th>Type of Traffic</th>
<th>Protocol and Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Tenable Identity Exposure SaaS platform</td>
<td>Support services</td>
<td>Email notifications</td>
<td>SMTP</td>
<td>TCP/25, TCP/587, TCP/465, TCP/2525, TCP/25025 (depending on the SMTP server’s configuration)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TCP/601, TCP/6515, UDP/514 (depending on the event log server’s configuration)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TCP/443</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tenable REST API</td>
<td>TLS/HTTP</td>
<td>TCP/80 or TCP/443</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PKI infrastructure</td>
<td>HTTP/HTTPS</td>
<td>TCP/443</td>
</tr>
<tr>
<td>Identity provider</td>
<td>SAML server</td>
<td>TLS/HTTP</td>
<td>TCP/443</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------</td>
<td>----------</td>
<td>---------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identity provider</td>
<td>LDAP</td>
<td>LDAP/LDAPS</td>
<td>TCP/389 and TCP/636</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identity provider</td>
<td>OAuth</td>
<td>HTTPS</td>
<td>TCP/443</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Web Portal Requirements**

Tenable Identity Exposure does not require any specific configuration or plugin from client browsers.

**Supported Internet Browsers**

You must use the most recent version of your supported web browser.

<table>
<thead>
<tr>
<th>Supported Web Browsers including minimum version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft</td>
</tr>
<tr>
<td>Edge version 38.14393 or Internet Explorer 11</td>
</tr>
<tr>
<td>Google</td>
</tr>
<tr>
<td>Chrome version 56.0.2924</td>
</tr>
<tr>
<td>Mozilla</td>
</tr>
<tr>
<td>Firefox version 52.7.3</td>
</tr>
<tr>
<td>Apple</td>
</tr>
<tr>
<td>Safari version 11.0</td>
</tr>
</tbody>
</table>

**TLS Server Certificate**

Tenable Identity Exposure uses SSL/TLS encryption mechanism to access its application.

Tenable strongly recommends using a valid certificate which you provide during installation.

**Supported TLS configuration and version**

- TLS 1.1 to TLS 1.3
- Self-signed certificate from Tenable
Certificate issued from your private PKI

Alternative TLS certificate

**Recommended TLS configuration and version**

- TLS 1.2
- Certificate issued from your private PKI

**TLS certificate update**

If you need to change your TLS certificates outside of an upgrade, you can update the CRT and key files under Tenable\Tenable.ad\Certificates and restart the services.

**See also**

- HTTPS for Tenable Identity Exposure Web Application

**Integration with an Active Directory Domain**

Tenable Identity Exposure runs on Microsoft Server operating systems that connect to an Active Directory (AD) domain. The following are guidelines on whether or not to connect these servers to an AD domain.

- Because Tenable Identity Exposure offers sensitive security information, **Tenable does not recommend joining its servers to any AD domain**. In fact, working on an isolated environment allows for a clear separation between the monitored perimeter and the monitoring entity (i.e., Tenable Identity Exposure). In this configuration, an attacker with initial access or limited privileges on the monitored domain cannot directly access Tenable Identity Exposure and its security analysis results.

- If you have a trustful infrastructure, you can choose to run Tenable Identity Exposure on domain-joined servers. This approach improves server management as it is part of the regular process that you use for each domain-joined server. In particular, Tenable Identity Exposure servers apply the same hardening policies as any other corporate server. Tenable recommends this architecture only on secure AD environments, and you must take into consideration the following risks in the case of an AD compromise:
An attacker with server-administration privileges can gather more information about ways to compromise the system using data analysis from Tenable Identity Exposure.

The security policy on domain-joined servers can forbid the administrative access granted to Tenable Support or its certified partners.

An attack can corrupt Tenable Identity Exposure’s security monitoring by hiding a security incident.

Prerequisites Checklist

- Tenable Identity Exposure works with Windows Server 2016 with the latest available update.
- Tenable Identity Exposure installation program requires Local Administrator rights on Windows Server 2016. If the account used for the installation is the default account, ensure that this account can run programs without restrictions.
- Tenable Identity Exposure services require Local Administrator rights to run local services on the machine.
- Tenable Identity Exposure requires a dedicated data partition. Do not run Tenable Identity Exposure on the OS partition to prevent system freeze if the partition is full.
- Tenable Identity Exposure SQL instance requires the virtual accounts usage feature.
- When installing or upgrading Microsoft SQL Server after implementing tighter security measures, the installation process fails due to insufficient user rights. Check that you have the necessary permissions for a successful installation. For more information, see the Microsoft documentation.
- Tenable Identity Exposure must run as a black box. Dedicate each machine to Tenable Identity Exposure and do not share it with another product.
- Tenable Identity Exposure can create any folder starting with the ‘Alsid’ or ‘Tenable’ prefix on the data partition. Therefore, do not create folders starting with “Alsid” nor “Tenable” on the data partition.
- Erlang: Do not modify the HOMEDRIVE environment variable. The PATHEXT environment variable must contain the .exe and .bat file extensions.
If you must set the AD service account of Tenable Identity Exposure as a Protected Users group member, ensure your Tenable Identity Exposure configuration supports [Kerberos authentication](#), because Protected Users cannot use NTLM authentication.

This table resumes the prerequisites in a handy checklist before installation.

<table>
<thead>
<tr>
<th>Information or Resource to Reserve</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>The required agreements (NDA, Evaluation Software License), if applicable</td>
<td></td>
</tr>
<tr>
<td>The choice of architecture (centralized or distributed)</td>
<td></td>
</tr>
<tr>
<td>The number of active AD users in the targeted domains to monitor</td>
<td></td>
</tr>
<tr>
<td>The computing and memory resources based on Tenable Identity Exposure’s sizing matrix.</td>
<td></td>
</tr>
<tr>
<td>The private IP of each virtual machine used to deploy Tenable’s platform</td>
<td></td>
</tr>
<tr>
<td>The type and IP address of the update management infrastructure</td>
<td></td>
</tr>
<tr>
<td>The type and IP address of the time server</td>
<td></td>
</tr>
<tr>
<td>The type and IP address of the PKI server</td>
<td></td>
</tr>
<tr>
<td>The type and IP address of the identity provider</td>
<td></td>
</tr>
<tr>
<td>Open required network flows for each service that Tenable Identity Exposure requires.</td>
<td></td>
</tr>
<tr>
<td>The private IP addresses of each Primary Domain Controller emulator</td>
<td></td>
</tr>
<tr>
<td>Creation of a regular user account on each Active Directory forest to monitor.</td>
<td></td>
</tr>
<tr>
<td>On the specific Active Directory containers, grant access right to the Tenable service account.</td>
<td></td>
</tr>
<tr>
<td>Grant access for Privileged Analysis if you want to enable this feature.</td>
<td></td>
</tr>
<tr>
<td>The AD domain user account login:</td>
<td></td>
</tr>
<tr>
<td>• Format: User Principal Name, for example “<a href="mailto:tenablead@domain.example.com">tenablead@domain.example.com</a>” (recommended for <a href="#">Kerberos compatibility</a>) or NetBIOS, for example “DomainNetBIOSName\SamAccountName”.</td>
<td></td>
</tr>
</tbody>
</table>
A TLS certificate issued for Tenable Identity Exposure’s Web Portal issued from the customer’s PKI
  - Otherwise, inform Technical Lead of the use of self-signed certificate.

The list of Tenable Identity Exposure user accounts to create:
  - Required information: first and last name, email address, and desired login.

The list of optional configurations to activate (email notification, Syslog event forwarding, etc.)

An identified and available project coordinator to work with Tenable.

Technical staff to respond to potential technical issues such as network filtering issue and unreachable PDCe.
Install Tenable Identity Exposure

Tenable Identity Exposure's installation program installs the following components on three different machines:

- A Storage Manager (SM) to host all data based on MSSQL.
- A Directory Listener (DL) to target audited domains.
- A Security Engine Node (SEN) to perform security analysis and serve the user interface.

For more information about how to install the SEN on several machines, see Split Security Engine Node (SEN) Services.

All three machines and installed binaries support the application of any security update for the underlying OS, either through Windows Server Update Services (WSUS) or System Center Configuration Manager (SCCM).

For more information about different TLS setups, see Installation Options.

Installation Program

The Tenable Identity Exposure executable program from Tenable's Downloads site is the main installer for most on-premises and SaaS (excluding SaaS-TLS) deployments.

For SaaS-TLS deployments, you must download the Tenable Identity Exposure Security Probe installer. You must also have your customized cert.s.zip file containing the required certificates that the Tenable Identity Exposure team provides.

Starting from version 3.11, the Tenable Identity Exposure Security Probe Installer is only compatible with SaaS-TLS deployments. To install a Directory Listener node, you must use the Tenable Identity Exposure Installer file and select the “Directory Listener” component only.

Note: Tenable requires that you reboot all machines before you start a new installation.

Before you start

Reserve the following resources and have their information on hand before you install Tenable Identity Exposure:
• Network – Private IP addresses.

• Access – DNS name used to access Tenable Identity Exposure’s web portal.

• Security – TLS certificate and its associated private key to secure access to the web portal.

For more information, see Network Requirements.

### Installation log file

If the installation program cannot install Tenable Identity Exposure on a machine, you can forward the log file to our support (https://community.tenable.com/s/).

This log file is in your %tmp% folder, and its name always starts with “MSI” followed by random numbers, such as MSI65931.LOG.

To generate log files in another location (for example, if you placed the installer on the desktop):

1. In the command line of the local machine, type cd desktop.

2. Type .\installername.exe /LOGS "c:\<path>\logsmsi1.txt".

---

### Installation Options

Tenable Identity Exposure offers the possibility to encrypt internal communications between Tenable Identity Exposure components (micro-services) for eventual cybersecurity policy requirements or regulatory reasons using Transport Layer Security (TLS).

Tenable Identity Exposure enables TLS on protocols by using HTTPS instead of HTTP, AMQPS (AMQP+TLS) instead of AMQP (Advanced Message Queuing Protocol), and TLS encryption for MS-SQL.
**Note:** This is not the same as the activation of HTTPS on the Tenable Identity Exposure web portal using an Internet Information Services (IIS) certificate.

**Note:** The TLS installations offered here concern TLS encryption between Tenable Identity Exposure components and are not related to SaaS-TLS deployments.

For more information about TLS, see [Network Matrix for Transport Layer Security (TLS) Mode](#).

Tenable Identity Exposure offers four types of TLS setups during the installation, from the least to the most hardened:

<table>
<thead>
<tr>
<th>Installation Option</th>
<th>Recommended For</th>
<th>Encryption Between Internal Communications and Tenable Identity Exposure Components</th>
<th>Peer Verification</th>
<th>Installation Option to Select</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No TLS</strong></td>
<td>A trusted network of machines. An easy installation with little configuration.</td>
<td><strong>Not encrypted</strong></td>
<td>N/A</td>
<td><strong>No TLS option in &quot;Expert mode&quot;</strong></td>
</tr>
<tr>
<td><strong>Default TLS</strong> (no &quot;Expert mode&quot;)</td>
<td>An organization without its own internal public key infrastructure (PKI) that requires protection against passive eavesdropping.</td>
<td><strong>Encrypted</strong> using an internal PKI for Tenable Identity Exposure with its own certificates and private keys, which the installation automatically generates and stores on the disk of the first machine.</td>
<td>Disabled</td>
<td><strong>Default</strong></td>
</tr>
<tr>
<td><strong>Default TLS</strong> (&quot;Expert mode&quot;)</td>
<td></td>
<td></td>
<td></td>
<td><strong>Default TLS using Autogenerated and Self-signed Certificates option in &quot;Expert mode&quot;</strong></td>
</tr>
</tbody>
</table>
**Note:** The default TLS installations — one that uses the "Expert" mode and one that does not — are essentially the same.

<table>
<thead>
<tr>
<th><strong>Custom TLS Without Peer Verification</strong></th>
<th><strong>Custom TLS With Peer Verification</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>An organization with its own internal PKI that requires protection against passive eavesdropping.</td>
<td>An organization with its own internal public key infrastructure (PKI) that requires protection against both passive eavesdropping and man-in-the-middle (MITM) attacks.</td>
</tr>
<tr>
<td>Encrypted, using certificates from your internal PKI. Certificates must contain the IP address of the corresponding machine in the Subject Alternative Name (SAN) extension and a signature from the provided Certificate Authority (CA).</td>
<td>Encrypted, using certificates from your internal PKI. Certificates must contain the IP address of the corresponding machine in the Subject Alternative Name (SAN) extension and have a signature from the provided Certificate Authority (CA).</td>
</tr>
<tr>
<td>Disabled</td>
<td>Enabled</td>
</tr>
<tr>
<td>Tenable Identity Exposure does not check server certificates. This setup is not resistant to active MITM attacks.</td>
<td>Tenable Identity Exposure checks server certificates. This setup is resistant to active MITM attacks.</td>
</tr>
<tr>
<td>TLS with Custom certificates without peer verification option in &quot;Expert mode&quot;</td>
<td>TLS with Custom certificates with peer verification option in &quot;Expert mode&quot;</td>
</tr>
</tbody>
</table>
Installation with Default TLS

Required User Role: Administrator on the local machine

This installation process installs the following Tenable Identity Exposure components in default TLS mode without peer verification and with self-signed certificates.

At each installation or upgrade, Tenable Identity Exposure generates a new self-signed certificate. The validity period for the certificate is 3650 days. After the installation or upgrade, the certificates are located at C:\Tenable\Tenable.ad\DefaultPKI\Certificates.

Order of installation

Install the components in the following order:

1. Storage Manager
2. Security Engine Node
3. Directory Listener

Caution: For the installation or upgrade to work, you must run the installer as a local user or a domain user who is a member of the Local Administrators group.

To install the Storage Manager with default TLS:

1. On the local machine, run the installation file Tenable.ad_v3.29.x.exe.
   A welcome screen appears.
2. In the setup language box, click the arrow to select the language for the installation, and click Next.
The Setup Wizard appears.

3. Click Next.

**Note:** Do not select the "Expert Mode" checkbox.

The Custom Setup window appears.

Note: Tenable strongly recommends that you keep the default TENABLE instance name.

5. Click **Next**.

   The **Ready to Install** window appears.

6. Click **Install** to begin the installation.

   After the installation completes, the **Completing the Tenable.ad Setup Wizard** window appears.

7. Click **Finish**.

   A dialog box asks you to restart your machine.

8. Click **No**.

   **Caution: Do not** restart the machine now.


To install the Security Engine Node with default TLS:

1. On the local machine, run the installation file Tenable.ad_v3.29.x.exe.

   A welcome screen appears.
2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.

![Setup language selection](image1)

The **Setup Wizard** appears.

3. Click **Next**.

**Note**: Do not select the "Expert Mode" checkbox.
The Custom Setup window appears.

4. Deselect the Storage Manager and Directory Listener components.

**Note:** To install SEN services over several machines, see Split Security Engine Node (SEN) Services.

5. Click Next.

The Storage Manager window appears.

6. Provide the following information:

- In the MSSQL and Event Logs Storage boxes, type the host name of the Storage Manager.
- In the Password box, type the service account password for the MSSQL database defined in the Storage Manager installation.

**Note:** The installer requires an SA password with the syntax described in Strong Passwords for the
7. Click **Next**.

The **Security Engine Node** window appears.

8. In the **DNS name or IP** box, type the DNS name (preferred) or IP address of the web server that end users enter to access Tenable Identity Exposure.
Note: By default, the installation process creates a self-signed certificate with the DNS name or the IP address that you entered. For more information, see Change the IIS Certificate.

9. Click **Next**.

The **Ready to Install** window appears.

10. Click **Install** to begin the installation.

After the installation completes, the **Completing the Tenable.ad Setup Wizard** window appears.

11. Click **Finish**.

A dialog box asks you to restart your machine.

12. Click **No**.

   **Caution: Do not** restart the machine now.


   **To install the Directory Listener with default TLS:**

   1. On the local machine, run the installation file `Tenable.ad_v3.29.x.exe`.

      A welcome screen appears.
2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.

![Dialog box with language options]

Note: Do not select the "Expert Mode" checkbox.

3. Click **Next**.
The **Custom Setup** window appears.

4. Deselect the **Storage Manager** and the **Security Engine Nodes** components.

![Custom Setup window]

5. Click **Next**.

The **Security Engine Node** window appears.

6. In the **Host** box for RabbitMQ, type the host name of the Security Engine Node hosting RabbitMQ.

![Security Engine Node window]
7. Click **Next**.

The **Ready to Install** window appears.

8. Click **Install** to begin the installation.

After the installation completes, the **Completing the Tenable.ad Setup Wizard** window appears.

9. Click **Finish**.

A dialog box asks you to restart your machine.

10. Click **Yes**.

The machine restarts.


12. Restart the Storage Manager.

See also

- [HTTPS for Tenable Identity Exposure Web Application](#)

**Installation with Default TLS in "Expert Mode"**

**Required User Role:** Administrator on the local machine
This installation process installs the following Tenable Identity Exposure components in TLS mode without peer verification and with automatically generated and self-signed certificates. It requires the "Expert Mode" setting in the Setup Wizard.

Order of installation

Install the components in the following order:

1. Storage Manager
2. Security Engine Node
3. Directory Listener

Caution: For the installation or upgrade to work, you must run the installer as a local user or a domain user who is a member of the Local Administrators group.

To install the Storage Manager with default TLS using the "Expert Mode":

1. On the local machine, run the installation file Tenable.ad_v3.29.x.exe.

   A welcome screen appears.

2. In the setup language box, click the arrow to select the language for the installation, and click Next.
The Setup Wizard appears.

3. Select the **Expert Mode** checkbox.

4. Click **Next**.

The **Custom Setup** window appears.

5. Deselect the **Security Engine Nodes and Directory Listener** components.
6. Click **Next**.

The **TLS Options** window appears.

7. Select the **TLS with autogenerated and self-signed certificates (Default)** option.

8. Click **Next**.

The **Storage Manager** window appears.

9. In the **Password** box, type a password for the MSSQL database.

   **Note**: The installer requires an SA password with the syntax described in [Strong Passwords](#) for the SQL...
Note: Tenable strongly recommends that you keep the default TENABLE instance name.

10. Click Next.

The Ready to Install window appears.
11. Click **Install** to begin the installation.

12. Click **Finish**.

A dialog box asks you to restart your machine.

13. Click **No**.

   **Caution:** Do not restart the machine now.


   **To install the Security Engine Node with default TLS using the "Expert Mode":**

   1. On the local machine, run the installation file `Tenable.ad_v3.29.x.exe`.

      A welcome screen appears.

   2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.
The **Setup Wizard** appears.

3. Select the **Expert Mode** checkbox.

4. Click **Next**.

   The **Custom Setup** window appears.

5. Deselect the **Storage Manager** and **Directory Listener** components.
**Note:** To install SEN services over several machines, see [Split Security Engine Node (SEN) Services](#).

6. Click **Next**.

The **TLS Options** window appears.

7. Select the **TLS with autogenerated and self-signed certificates (Default)** option.

8. Click **Next**.
The **Storage Manager** window appears.

9. Provide the following information:

   - In the **MSSQL** and **Event Logs Storage** boxes, type the hostname of the Storage Manager.
   - In the **Password** box, type the service account password for the MSSQL database defined in the Storage Manager installation.

   **Note:** The installer requires an SA password with the syntax described in [Strong Passwords](#) for the SQL Server.

   ![Storage Manager Window](image)

10. Click **Next**.

   The **Security Engine Node** window appears.

11. In the **DNS name or IP** box, type the DNS name (preferred) or IP address of the web server that end users enter to access Tenable Identity Exposure.
Note: By default, the installation process creates a self-signed certificate with the DNS name or the IP address that you entered. For more information, see Change the IIS Certificate.

12. Click Next.

The Ready to Install window appears.

13. Click Install to begin the installation.
After the installation completes, the **Completing the Tenable.ad Setup Wizard** window appears.

14. **Click Finish.**

   A dialog box asks you to restart your machine.

15. **Click No.**

   **Caution: Do not** restart the machine now.


   **To install the Directory Listener with default TLS using the "Expert Mode":**

   1. On the local machine, run the installation file `Tenable.ad_v3.29.x.exe`.

      A welcome screen appears.

   2. In the setup language box, click the arrow to select the language for the installation, and click **Next.**

      ![Tenable.ad Setup](image)

      **Welcome to the Tenable.ad Setup Wizard**

      ![Select the setup language:](image)

      ![Next > Cancel](image)

      The **Setup Wizard** appears.
3. Select the **Expert Mode** checkbox.

4. Click **Next**.

   The **Custom Setup** window appears.

5. Deselect the **Storage Manager** and the **Security Engine Nodes** components.

6. Click **Next**.

   The **TLS Options** window appears.
7. Select the **TLS with autogenerated and self-signed certificates (Default)** option.

8. Click **Next**.

The **Security Engine Node** window appears.

9. In the **Host** box for RabbitMQ, type the address of the Security Engine Node hosting RabbitMQ.
10. Click **Next**.

The **Directory Listener** window appears.

11. In the **Subnets** box, type the subnet address for the Directory Listener. For multiple subnets, use a comma to separate the addresses.

12. Click **Next**.

The **Ready to Install** window appears.

13. Click **Install** to begin the installation.
After the installation completes, the **Completing the Tenable.ad Setup Wizard** window appears.

14. Click **Finish**.

    A dialog box asks you to restart your machine.

15. Click **Yes**.

    The machine restarts.

16. Restart the SEN machine.

17. Restart the Storage Manager machine.

See also

- [HTTPS for Tenable Identity Exposure Web Application](#)

**Installation with Custom TLS and without Peer Verification**

**Required User Role:** Administrator on the local machine

This installation type installs the following Tenable Identity Exposure components with custom TLS and without peer verification.
Order of installation

Install the components in the following order:

1. Storage Manager
2. Security Engine Node
3. Directory Listener

Caution: For the installation or upgrade to work, you must run the installer as a local user or a domain user who is a member of the Local Administrators group.

To install the Storage Manager with custom TLS and without peer verification:

1. On the local machine, run the installation file Tenable.ad_v3.29.x.exe.
   A welcome screen appears.

2. In the setup language box, click the arrow to select the language for the installation, and click Next.

   ![Welcome screen for Tenable.ad Setup](image)

   The Setup Wizard appears.

3. Select the Expert Mode checkbox.
4. Click **Next**.

The **Custom Setup** window appears.

5. Deselect the **Security Engine Nodes** and **Directory Listener** components.

6. Click **Next**.

The **TLS Options** window appears.

7. Select the **TLS with custom certificates without peer verification** option.
8. Click **Next**.

   The **TLS certificates** window appears.

9. Provide the following information:
   
   - In the **Server PFX Archive** box, click ... to browse to your PFX archive.
   
   - In the **PFX Password** box, type the password for the PFX file.
In the **CA Cert File** box, click ... to browse to your CA certificate file.

10. Click **Next**.

The **Storage Manager** window appears.

11. In the **Password** box, type a password for the MSSQL database.

**Note:** The installer requires an SA password with the syntax described in [Strong Passwords](#) for the SQL...
12. Click **Next**.

The **Ready to Install** window appears.

**Note**: Tenable strongly recommends that you keep the default TENABLE instance name.
13. Click **Install** to begin the installation.

![Installation Progress](image)

After the installation completes, the **Completing the Tenable.ad Setup Wizard** window appears.

14. Click **Finish**.

A dialog box asks you to restart your machine.

15. Click **No**.

   **Caution: Do not** restart the machine now.


**To install the Security Engine Node with custom TLS and without peer verification:**

1. On the local machine, run the installation file `Tenable.ad_v3.29.x.exe`.

   A welcome screen appears.

2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.
The Setup Wizard appears.

3. Select the **Expert Mode** checkbox.

4. Click **Next**.

   The **Custom Setup** window appears.

5. Deselect the **Storage Manager** and **Directory Listener** components.
**Note:** To install SEN services over several machines, see Split Security Engine Node (SEN) Services.

6. Click **Next**.

The **TLS Options** window appears.

7. Select the **TLS with custom certificates without peer verification** option.

8. Click **Next**.
The **TLS certificates** window appears.

9. Provide the following information:
   - In the **Server PFX Archive** box, click ... to browse to your PFX archive.
   - In the **PFX Password** box, type the password for the PFX file.
   - In the **CA Cert File** box, click ... to browse to your CA certificate file.

![TLS certificates window](image)

10. Click **Next**.

    The **Storage Manager** window appears.

11. Provide the following information:
   - In the **MSSQL** and the **Event Logs Storage** boxes, type the hostname of the Storage Manager.
   - In the **Password** box, type the service account password for the MSSQL database defined in the Storage Manager installation.

    **Note:** The installer requires an SA password with the syntax described in [Strong Passwords](#) for the...
12. Click Next.

The Security Engine Node window appears.

13. In the DNS name or IP box, type the DNS name (preferred) or IP address of the web server that end users enter to access Tenable.ad.
14. Click **Next**.

The **Ready to Install** window appears.

15. Click **Install** to begin the installation.

![Tenable.ad Setup window](image)

After the installation completes, the **Completing the Tenable.ad Setup Wizard** window appears.

16. Click **Finish**.

A dialog box asks you to restart your machine.

17. Click **No**.

**Caution:** Do not restart the machine now.

18. Install the Directory Listener.

**To install the Directory Listener with custom TLS and without peer verification:**

1. On the local machine, run the installation file `Tenable.ad_v3.29.x.exe`.

A welcome screen appears.
2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.

The **Setup Wizard** appears.

3. Select the **Expert Mode** checkbox.

4. Click **Next**.

The **Custom Setup** window appears.
5. Deselect the Storage Manager and the Security Engine Nodes components.

6. Click **Next**.

The TLS Options window appears.

7. Select the **TLS with custom certificates without peer verification** option.
8. Click **Next**.

The **TLS certificates** window appears.

9. Nothing is required in this screen. Click **Next**.

The **Security Engine Node** window appears.

10. In the **Host** box for RabbitMQ, type the address of the Security Engine Node hosting RabbitMQ.
11. Click **Next**.

The **Directory Listener** window appears.

12. In the **Subnets** box, type the subnet address for the Directory Listener. For multiple subnets, use a comma to separate the addresses.

13. Click **Next**.

The **Ready to Install** window appears.

14. Click **Install** to begin the installation.
After the installation completes, the Completing the Tenable.ad Setup Wizard window appears.

15. Click Finish.

A dialog box asks you to restart your machine.

16. Click Yes.

The machine restarts.

17. Restart the SEN machine.

18. Restart the Storage Manager machine.

Installation with Custom TLS and with Peer Verification

**Required User Role:** Administrator on the local machine

This installation type installs the following Tenable Identity Exposure components with custom TLS and peer verification.

Public Key Infrastructure (PKI) Certificate

To use peer verification, your PKI certificate must include the IP addresses or DNS of all the machines used to install Tenable Identity Exposure.
Order of installation

Install the components in the following order:

1. **Storage Manager**
2. **Security Engine Node**
3. **Directory Listener**

**Caution**: For the installation or upgrade to work, you must run the installer as a local user or a domain user who is a member of the **Local Administrators** group.

**To install the Storage Manager with custom TLS and peer verification:**

1. On the local machine, run the installation file `Tenable.ad_v3.29.x.exe`.
   
   A welcome screen appears.

2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.
The Setup Wizard appears.

3. Select the Expert Mode checkbox.

4. Click Next.

The Custom Setup window appears.

6. Click **Next**.

   The **TLS Options** window appears.

7. Select the **TLS with custom certificates with peer validation** option.

8. Click **Next**.

   The **TLS certificates** window appears.
9. Provide the following information:

- In the **Server PFX Archive** box, click ... to browse to your PFX archive.
- In the **PFX Password** box, type the password for the PFX file.
- In the **CA Cert File** box, click ... to browse to your CA certificate file.

10. Click **Next**.

   The **Storage Manager** window appears.

11. In the **Password** box, type a password for the MSSQL database.

    **Note**: The installer requires an SA password with the syntax described in [Strong Passwords](#) for the SQL
Note: Tenable strongly recommends that you keep the default TENABLE instance name.

12. Click **Next**.

The **Ready to Install** window appears.
13. Click **Install** to begin the installation.

14. Click **Finish**.

   A dialog box asks you to restart your machine.

15. Click **No**.

   **Caution**: Do not restart the machine now.


   **To install the Security Engine Node with custom TLS and peer verification:**

   1. On the local machine, run the installation file `Tenable.ad_v3.29.x.exe`.

      A welcome screen appears.

   2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.
The Setup Wizard appears.

3. Select the Expert Mode checkbox.

4. Click Next.

   The Custom Setup window appears.

5. Deselect the Storage Manager and Directory Listener components.
**Note:** To install SEN services over several machines, see [Split Security Engine Node (SEN) Services](#).

6. Click **Next**.

The **TLS Options** window appears.

7. Select the **TLS with custom certificates with peer validation** option.

8. Click **Next**.
The **TLS certificates** window appears.

9. Provide the following information:
   - In the **Server PFX Archive** box, click ... to browse to your PFX archive.
   - In the **PFX Password** box, type the password for the PFX file.
   - In the **CA Cert File** box, click ... to browse to your CA certificate file.

![TLS certificates window](image)

10. Click **Next**.

    The **Storage Manager** window appears.

11. Provide the following information:
   - In the **MSSQL** and **Event Logs Storage** boxes, type the hostname of the Storage Manager.
   - In the **Password** box, type the service account password for the MSSQL database defined in the Storage Manager installation.

**Note:** The installer requires an SA password with the syntax described in [Strong Passwords](#) for the SQL Server.
12. Click **Next**.

The **Security Engine Node** window appears.

13. In the **DNS name or IP** box, type the DNS name (preferred) or IP address of the web server that end users enter to access Tenable Identity Exposure.

**Note**: By default, the installation process creates a self-signed certificate with the DNS name or the IP address that you entered. For more information, see [Change the IIS Certificate](#).
14. Click **Next**.

The **Ready to Install** window appears.

15. Click **Install** to begin the installation.

![Image of the Installation Window]

After the installation completes, the **Completing the Tenable.ad Setup Wizard** window appears.

16. Click **Finish**.

A dialog box asks you to restart your machine.

17. Click **No**.

**Caution:** Do not restart the machine now.

18. Install the Directory Listener.

**To install the Directory Listener with custom TLS and peer verification:**

1. On the local machine, run the installation file **Tenable.ad_v3.29.x.exe**.

A welcome screen appears.

2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.
The Setup Wizard appears.

3. Select the Expert Mode checkbox.

4. Click Next.

   The Custom Setup window appears.

5. Deselect the Storage Manager and the Security Engine Nodes components.
6. Click **Next**.

   The **TLS Options** window appears.

7. Select the **TLS with custom certificates with peer validation** option.

8. Click **Next**.

   The **TLS certificates** window appears.

9. In the **CA Cert File** box, click ... to browse to your CA certificate file.
10. Click **Next**.

11. The **Security Engine Node** window appears.

12. In the **Host** box for RabbitMQ, type the address of the Security Engine Node hosting RabbitMQ.

13. Click **Next**.

   The **Directory Listener** window appears.
14. In the **Subnets** box, type the subnet address for the Directory Listener. For multiple subnets, use a comma to separate the addresses.

![Tenable.ad Setup window with Subnets field]

15. Click **Next**.

The **Ready to Install** window appears.

16. Click **Install** to begin the installation.
After the installation completes, the **Completing the Tenable.ad Setup Wizard** window appears.

17. Click **Finish**.

   A dialog box asks you to restart your machine.

18. Click **Yes**.

   The machine restarts.

19. Restart the SEN machine.

20. Restart the Storage Manager machine.

**Installation with No TLS**

**Required User Role:** Administrator on the local machine

This installation type installs the following Tenable Identity Exposure components without TLS.

**Order of installation**

Install the components in the following order:

1. **Storage Manager**
2. **Security Engine Node**
3. **Directory Listener**

**Caution:** For the installation or upgrade to work, you must run the installer as a local user or a domain user who is a member of the **Local Administrators** group.

**To install the Storage Manager with no TLS:**

1. On the local machine, run the installation file `Tenable.ad_v3.29.x.exe`.
   
   A welcome screen appears.

2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.
The Setup Wizard appears.

3. Select the Expert Mode checkbox.

4. Click Next.

The Custom Setup window appears.
5. Deselect the **Security Engine Nodes** and **Directory Listener** components.

6. Click **Next**.

   The **TLS Options** window appears.

7. Select the **No TLS** option.

8. Click **Next**.

   The **Storage Manager** window appears.
9. In the **Password** box, type a password for the MSSQL database.

**Note:** The installer requires an SA password with the syntax described in [Strong Passwords](#) for the SQL Server.

![Password box screenshot]

**Note:** Tenable strongly recommends that you keep the default TENABLE instance name.

10. Click **Next**.

The **Ready to Install** window appears.
11. Click **Install** to begin the installation.

After the installation completes, the **Completing the Tenable.ad Setup Wizard** window appears.

12. Click **Finish**.

A dialog box asks you to restart your machine.

13. Click **No**.

   **Caution: Do not** restart the machine now.


**To install the Security Engine Node with no TLS:**

1. On the local machine, run the installation file **Tenable.ad_v3.29.x.exe**.

   A welcome screen appears.

2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.
The Setup Wizard appears.

3. Select the **Expert Mode** checkbox.

4. Click **Next**.

   The **Custom Setup** window appears.

5. Deselect the **Storage Manager** and **Directory Listener** components.
Note: To install SEN services over several machines, see Split Security Engine Node (SEN) Services.

6. Click **Next**.
   
The TLS Options window appears.

7. Select the **No TLS** option.

8. Click **Next**.
The **Storage Manager** window appears.

9. Provide the following information:

   - In the **MSSQL** box, type the IP address of the Storage Manager.
   - In the **Password** box, type the service account password for the MSSQL database defined in the Storage Manager installation.

   **Note:** The installer requires an SA password with the syntax described in [Strong Passwords](#) for the SQL Server.

10. Click **Next**.

    The **Security Engine Node** window appears.

11. In the **DNS name or IP** box, type the DNS name (preferred) or IP address of the web server that end users enter to access Tenable Identity Exposure.
By default, the installation process creates a self-signed certificate with the DNS name or the IP address that you entered. For more information, see Change the IIS Certificate.

12. Click Next.

The Ready to Install window appears.

13. Click Install to begin the installation.
After the installation completes, the **Completing the Tenable.ad Setup Wizard** window appears.

14. Click **Finish**.

A dialog box asks you to restart your machine.

15. Click **No**.

   **Caution: Do not** restart the machine now.


   **To install the Directory Listener with no TLS:**

   1. On the local machine, run the installation file `Tenable.ad_v3.29.x.exe`.

      A welcome screen appears.

   2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.

   ![Welcome to the Tenable.ad Setup Wizard](image)

      The **Setup Wizard** appears.

   3. Select the **Expert Mode** checkbox.
4. Click **Next**.

The **Custom Setup** window appears.

5. Deselect the **Storage Manager** and the **Security Engine Nodes** components.

6. Click **Next**.

The **TLS Options** window appears.
7. Select the **No TLS** option.

8. Click **Next**.

   The **Security Engine Node** window appears.

9. In the **Host** box for RabbitMQ, type the hostname of the Security Engine Node hosting RabbitMQ.

10. Click **Next**.
11. In the **Subnets** box, type the subnet address for the Directory Listener. For multiple subnets, use a comma to separate the addresses.

12. Click **Next**.

The **Ready to Install** window appears.
13. Click **Install** to begin the installation.

![Tenable.ad Setup](image)

After the installation completes, the **Completing the Tenable.ad Setup Wizard** window appears.

14. Click **Finish**.

A dialog box asks you to restart your machine.

15. Click **Yes**.

The machine restarts.

16. Restart the SEN machine.

17. Restart the Storage Manager machine.

### Security Probe

**Required User Role:** Administrator on the local machine

You install Tenable Identity Exposure's security probe in a SaaS-TLS deployment.

**Before you start**
• Obtain from Tenable Identity Exposure the `certs.zip` archive that contains the required certificate files to configure the SaaS-TLS installation.

• Extract the required certificate files to a local directory.

• Obtain from Tenable Identity Exposure the public IP address for RabbitMQ.

**Caution:** For the installation or upgrade to work, you must run the installer as a local user or a domain user who is a member of the **Local Administrators** group.

**To install the security probe:**

1. On the local machine, run the installation file `Tenable.ad_Security_Probe_v3.19.x.exe`.
   
   A welcome screen appears.

2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.

   ![](image)

   The **Security Probe Setup Wizard** appears.
3. Click **Next**.

The **Custom Setup** window appears.

4. Click **Browse** to select the installation folder location. Change only the drive letter.

5. Click **Next**.

The **TLS certificates** window appears.
6. Provide the following information extracted from the the `certs.zip` archive:
   - In the **Client PFX Archive** box, click ... to browse to your PFX archive.
   - In the **PFX Password** box, type the password for the PFX file.
   - In the **CA Cert File** box, click ... to browse to your CA certificate file.

![Tenable.ad Security Probe Setup](image)

7. Click **Next**.

   The **Security Engine Node** window appears.

8. In the **IP** box, type the public IP address for RabbitMQ that you obtained from Tenable Identity Exposure.
9. Click **Next**.

The **Security Probe** window appears.

10. In the **Subnets** box, type the subnet address for the security probe. For multiple subnets, use a comma to separate the addresses.

11. Click **Next**.
The **Ready to Install** window appears.

12. Click **Install** to begin the installation.

When the installation completes, the **Completing the Tenable.ad Security Probe Setup Wizard** window appears.

13. Click **Finish**.
A dialog box message asks you to restart your machine.

14. Click **Yes**.

The machine restarts.

**Split Security Engine Node (SEN) Services**

The standard architecture for the Tenable Identity Exposure on-premises platform uses three virtual machines (VMs) by default for the Storage Manager, Security Engine Node, and Directory Listener.

However, if the environment that you monitor has **more than 150K users**, you can split the Security Engine Node (SEN) over five different machines to improve performance.

The installation process installs the following Tenable Identity Exposure components:

<table>
<thead>
<tr>
<th>VM #</th>
<th>vCPU (per instance)</th>
<th>Memory (per instance)</th>
<th>Disk Space (per instance)</th>
<th>Recommended Service</th>
<th>Service Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8 cores – at least 2.6 GHz</td>
<td>16 GB of RAM</td>
<td>1 TB</td>
<td>RabbitMQ</td>
<td>A message broker between services.</td>
</tr>
<tr>
<td>2</td>
<td>8 cores – at least 2.6 GHz</td>
<td>16 GB of RAM</td>
<td>100 GB</td>
<td>Attack Path</td>
<td>Computes attack path relations and maintaining them over time.</td>
</tr>
<tr>
<td>3</td>
<td>12 cores – at least 2.6 GHz</td>
<td>32 GB of RAM</td>
<td>300 GB</td>
<td>Cephei</td>
<td>Computes values for different analytics used for the Tenable Identity Exposure dashboards.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CetiBridge</td>
<td>Communication plugins and service in charge</td>
</tr>
<tr>
<td>Name</td>
<td>Function</td>
<td>Details</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>----------</td>
<td>---------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electra</td>
<td>Manages web sockets to update information without reloading the user interface.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enif</td>
<td>Authenticates web users.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eridanis</td>
<td>Connects to the SQL Server; ensures the exactness of Tenable Identity Exposure's information.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eltanin</td>
<td>Sends data to the Tenable Cloud, if enabled in Tenable Identity Exposure.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kapteyn</td>
<td>Runs in the end user's browser to show the user interface.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cancri</td>
<td>Decodes raw information; fetches delta</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 4 | 16 cores — at least 2.6 GHz | 16 GB of RAM | 100 GB |
between events; computes event type.

<table>
<thead>
<tr>
<th></th>
<th>EventLogsDecoder</th>
<th>Decodes information related to IOA events.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5</strong></td>
<td>16 cores – at least 2.6 GHz</td>
<td>32 GB of RAM</td>
</tr>
</tbody>
</table>

For more information, see Sizing the Security Engine Nodes for requirements.

**SEN Installation on Several Machines**

To install the Security Engine Node on several machines, you select the services to install on each specific virtual machine.

**Public Key Infrastructure (PKI) Certificate**

To use peer verification, your PKI certificate must include the IP addresses or DNS of all the machines used to install Tenable Identity Exposure.
Example

The following example shows an installation of RabbitMQ and Attack Path on one virtual machine.

To install the RabbitMQ and Attack Path services on a VM:

Note: This procedure installs Tenable Identity Exposure with TLS using the "Expert mode."

1. On the local machine, run the installation file `Tenable.ad_v3.19.x.exe`.

   The **Setup Wizard** appears.
2. Select the **Expert Mode** check box.

3. Click **Next**.

   The **Custom Setup** window appears.

4. Deselect the **Storage Manager** and **Directory Listener** components.

5. Deselect all SEN services except for **RabbitMQ** and **AttackPath**.
6. (Optional) Click **Browse** to change the installation folder location. Change only the drive letter.

7. Click **Next**.

The **TLS Options** window appears.

8. Select the **TLS with autogenerated and self-signed certificates (Default)** option.

9. Click **Next**.

The **Storage Manager** window appears.

10. Provide the following information:

    - In the **MSSQL** box, type the IP address of the Storage Manager.

    - In the **Password** box, type the service account password for the MSSQL database defined in the Storage Manager installation.
11. Click **Next**.

The **Security Engine Node** window appears.

12. In the **DNS name or IP** box, type the DNS name (preferred) or IP address of the web server that end users enter to access Tenable Identity Exposure.

**Note**: By default, the installation process creates a self-signed certificate with the DNS name or the IP address that you entered. For more information, see [Change the IIS Certificate](#).
13. Click **Next**.

14. The **Directory Listener** window appears.

15. In the **Subnets** box, type the subnet address for the Directory Listener. For multiple subnets, use a comma to separate the addresses.

16. Click **Next**.

The **Ready to Install** window appears.
17. Click **Install** to begin the installation.

After the installation completes, the **Completing the Tenable.ad Setup Wizard** window appears.

18. Click **Finish**.

A dialog box asks you to restart your machine.

19. Click **No**.

**Caution**: Do not restart the machine until **after** you install the Directory Listener.

20. Repeat this procedure to install the remaining SEN services.

See also

- [Resource Sizing](#) for Security Engine Node
- [Installation Options](#)
- [Install Tenable Identity Exposure](#)
- [Upgrade Tenable Identity Exposure](#)
Upgrade Tenable Identity Exposure

**Required User Role:** Administrator on the local machine

**Before you start**

Tenable strongly recommends that you **take a snapshot of your environment before you upgrade**. If the upgrade fails, Tenable Identity Exposure support cannot perform a rollback, and this will result in a fresh installation and cause you to lose your previous data.

**Back up and restore the Storage Manager**

Tenable strongly recommends that you back up the Storage Manager before you upgrade Tenable Identity Exposure.

For instructions on how to back up or restore MSSQL, see the official Microsoft documentation.

**Upgrade path**

To upgrade to the latest version of Tenable Identity Exposure, you must follow this installation path: 2.7 -> 3.1 -> 3.11 -> 3.19 -> 3.29 -> 3.42.

**Note:** You can upgrade to the next major release from any minor release.

**Upgrade order**

To upgrade Tenable Identity Exposure, proceed in the following order:

1. Upgrade the Directory Listener.
2. Upgrade Security Engine Nodes.
3. Upgrade the Storage Manager.

**Note:** During the upgrade, the Tenable Identity Exposure installer asks you to choose a TLS installation type. For more information, see [Installation Options](#).

**See also**
• **Installation Options**
  
• **Upgrade with Default TLS**

• **Upgrade with Default TLS using "Expert Mode"**

• **Upgrade with TLS without Peer Verification**

• **Upgrade with TLS and with Peer Verification**

• **Upgrade with No TLS**

• **Restart Services**

---

**Upgrade with Default TLS**

**Required User Role:** Administrator on the local machine

This process upgrades the following Tenable Identity Exposure components in default TLS mode without peer verification and with self-signed certificates.

At each upgrade, Tenable Identity Exposure generates a new self-signed certificate. The validity period for the certificate is 3650 days. After the installation or upgrade, the certificates are located at C:\Tenable\Tenable.ad\DefaultPKI\Certificates.

**Note:** You can change this default TLS option at a later date if you wish and upload your own certificates.

**Order of Upgrade**

Upgrade the components in the following order:

1. **Directory Listener**

2. **Security Engine Node**

3. **Storage Manager**

**Caution:** For the installation or upgrade to work, you must run the installer as a local user or a domain user who is a member of the **Local Administrators** group.

**Note:** Restart your machine **before** each upgrade.
After you upgrade the components, restart the machines in the following order:

1. Storage Manager
2. Security Engine Node
3. Directory Listener

**To upgrade the Directory Listener with default TLS:**

1. On the local machine, run the installation file `Tenable.ad_v3.29.x.exe`.
   A welcome screen appears.
2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.

   ![Welcome to the Tenable.ad Setup Wizard](image)

   The **Setup Wizard** appears.
3. Click **Next**.

   **Note:** Do not select the "Expert Mode" checkbox.
The **Custom Setup** window appears.

4. Click **Next**.

The **Custom Setup** window appears.

5. The installer preselects the Directory Listener component. If this is not the case, deselect the **Storage Manager** and the **Security Engine Nodes** components.

6. Click **Next**.
The **Security Engine Node** window appears.

7. In the **IP** box for RabbitMQ, the installer shows the address of the Security Engine Node machine based on your previous installation. Check that this information is still valid and correct if necessary.

![Security Engine Node window](image)

8. Click **Next**.

The **Ready to Install** window appears.

![Ready to Install window](image)
9. Click **Install** to begin the upgrade.

After the installation completes, the **Completing the Tenable.ad Setup Wizard** window appears.

10. Click **Finish**.

A dialog box asks you to restart your machine.

11. Click **No**.

**Caution**: Do not restart the machine until after you complete the upgrade of the Storage Manager.


**To upgrade the Security Engine Node with default TLS:**

1. On the local machine, run the installation file `Tenable.ad_v3.29.x.exe`.

   A welcome screen appears.

2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.
The **Setup Wizard** appears.

3. Click **Next**.

**Note**: Do not select the “Expert Mode” checkbox.

The **Custom Setup** window appears.
4. Click Next.

The Custom Setup window appears.

5. The installer preselects the Security Engine Node component based on your previous installation. If this is not the case, deselect the Storage Manager and the Directory Listener components.

6. Click Next.

The Storage Manager window appears.
Caution: Remember to update the Event Logs Storage IP or host name address during this step. Failing to do so leads to attack detection issues. If you have successfully completed this screen and upgraded the SEN, you must update the environment variables for ALSID_CASSIOPEIA_CYGNI_Service__EventLogsStorage__Host and ALSID_CASSIOPEIA_EVENT_LOGS_DECODER_Service__EventLogsStorage__Host from the current value to the accurate value for `<Storage Manager host name or IP address>`. For more information, see the Troubleshooting knowledge base article.

7. The installer shows the IP address of your MSSQL database from your previous installation. Check that it is still valid and correct if necessary. Click Next.

Note: If you change the SA password since the previous installation, the installer requires it to follow the syntax described in Strong Passwords for the SQL Server.

The Security Engine Node window appears.

8. In the DNS name or IP box, the installer shows the DNS name or IP address of the web server that end users enter to access Tenable Identity Exposure from your previous installation. Check
that it is still valid and correct if necessary.

**Note**: By default, the installation process creates a self-signed certificate with the DNS name or the IP address that you entered. For more information, see Change the IIS Certificate.

9. Click **Next**.

The **Ready to Install** window appears.
10. Click **Install** to begin the installation.

![Installing Tenable.ad](image)

After the installation completes, the **Completing the Tenable.ad Setup Wizard** window appears.

11. Click **Finish**.

A dialog box asks you to restart your machine.

12. Click **No**.

**Caution**: Do not restart the machine until after you complete the upgrade of the Storage Manager.

13. Upgrade the Storage Manager.

**To upgrade the Storage Manager with default TLS:**

1. On the local machine, run the installation file `Tenable.ad_v3.29.x.exe`.

   A welcome screen appears.

2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.
3. Click Next.

**Note**: Do not select the "Expert Mode" checkbox.

The **Custom Setup** window appears.
4. Click **Next**.

The **Custom Setup** window appears.

5. The installer preselects the Storage Manager component based on your previous installation. If this is not the case, deselect the **Security Engine Node** and **Directory Listener** components.

6. (Optional) Click **Browse** to change the installation folder location. Change only the drive letter.

7. Click **Next**.

The **Storage Manager** window appears.

8. The installer reuses the information from your previous installation. Click **Next**.

**Note:** If you change the SA password since the previous installation, the installer requires it to follow the syntax described in **Strong Passwords** for the SQL Server.
9. Click **Next**.

The **Ready to Install** window appears.

10. Click **Install** to begin the upgrade.
After the installation completes, the **Completing the Tenable.ad Setup Wizard** window appears.

11. Click **Finish**.

A dialog box asks you to restart your machine.

12. Click **Yes**.

The machine restarts.

13. **Restart Services**.

See also

- [HTTPS for Tenable Identity Exposure Web Application](#)

### Upgrade with Default TLS using "Expert Mode"

**Required User Role:** Administrator on the local machine

This process upgrades the following Tenable Identity Exposure components in TLS mode without peer verification and with auto-generated self-signed certificates. It requires the "Expert mode" in the installation wizard.

**Order of Upgrade**
Upgrade the components in the following order:

1. Directory Listener
2. Security Engine Node
3. Storage Manager

Caution: For the installation or upgrade to work, you must run the installer as a local user or a domain user who is a member of the Local Administrators group.

Note: Restart your machine before each upgrade.

After you upgrade the components, restart the machines in the following order:

1. Storage Manager
2. Security Engine Node
3. Directory Listener

To upgrade the Directory Listener with default TLS using the "Expert Mode":

1. On the local machine, run the installation file Tenable.ad_v3.29.x.exe.
   A welcome screen appears.
2. In the setup language box, click the arrow to select the language for the installation, and click Next.
The Setup Wizard appears.

3. Select the **Expert Mode** checkbox.

4. Click **Next**.

The Custom Setup window appears.

5. The installation program automatically preselects the Directory Listener component based on your previous installation. Click **Next**.
The **TLS Options** window appears.

6. Select the **TLS with autogenerated and self-signed certificates (Default)** option.

![TLS Options Window](image)

7. Click **Next**.

The **Security Engine Node** window appears.

8. In the **IP** box for RabbitMQ, the installer shows the address or host name of the SEN machine based on your previous installation. Check that this information remains valid and correct if
9. Click **Next**.

The **Directory Listener** window appears.

10. In the **Subnets** box, type the subnet address for the Directory Listener. For multiple subnets, use a comma to separate the addresses.

11. Click **Next**.
The **Ready to Install** window appears.

12. Click **Install** to begin the upgrade.

After the upgrade completes, the **Completing the Tenable.ad Setup Wizard** window appears.

13. Click **Finish**.

A dialog box asks you to restart your machine.
14. Click No.

Caution: Do NOT reboot the machine now.


To upgrade the SEN with default TLS using the "Expert Mode":

1. On the local machine, run the installation file Tenable.ad_v3.29.x.exe.

   A welcome screen appears.

2. In the setup language box, click the arrow to select the language for the installation, and click Next.

   ![Welcome to the Tenable.ad Setup Wizard](image)

   The Setup Wizard appears.

3. Select the Expert Mode checkbox.
4. Click **Next**.

The **Custom Setup** window appears.

5. The installation program automatically preselects the SEN component based on your previous installation. Click **Next**.

The **TLS Options** window appears.

6. Select the **TLS with autogenerated and self-signed certificates (Default)** option.
7. Click **Next**.

The **Storage Manager** window appears.

8. Verify or enter the following information:

   - In the **IP** box, check that your MSSQL database's IP address from your previous installation remains valid and correct it if necessary.

   - In the **Event Logs Storage** box, type the IP address of the machine storing your event logs. This address is typically the same as the MSSQL database IP address.

**Note:** If you change the SA password since the previous installation, the installer requires it to follow the syntax described in **Strong Passwords** for the SQL Server.
Caution: Remember to update the Event Logs Storage IP or host name address during this step. Failing to do so leads to attack detection issues. If you have successfully completed this screen and upgraded the SEN, you must update the environment variables for ALSID_CASSIOPEIA_CYGNI_Service__EventLogsStorage__Host and ALSID_CASSIOPEIA_EVENT_LOGS_DECODER_Service__EventLogsStorage__Host from the current value to the accurate value for <Storage Manager host name or IP address>. For more information, see the Troubleshooting knowledge base article.

9. Click Next.

The Security Engine Node window appears.

10. In the DNS name or IP box, the installer shows the DNS name (preferred) or IP address of the web server that end users type to access Tenable Identity Exposure from your previous installation. Check that this remains valid and correct if necessary.
**Note:** By default, the installation process creates a self-signed certificate with the DNS name or the IP address that you entered. For more information, see [Change the IIS Certificate](#).

11. Click **Next**.

The **Ready to Install** window appears.
12. Click **Install** to begin the upgrade.

![Installing Tenable.ad](image)

After the upgrade completes, the **Completing the Tenable.ad Setup Wizard** window appears.

13. Click **Finish**.

A dialog box asks you to restart your machine.

14. Click **No**.

**Caution:** **Do NOT** reboot the server now.

15. Upgrade the Storage Manager.

**To upgrade the Storage Manager with default TLS using the "Expert Mode":**

1. On the local machine, run the installation file `Tenable.ad_v3.29.x.exe`.

   A welcome screen appears.

2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.
The **Setup Wizard** appears.

3. Select the **Expert Mode** checkbox.

4. Click **Next**.

The **Custom Setup** window appears.
5. The installation program automatically preselects the Storage Manager component based on the previous installation. Click Next.

6. (Optional) Click Browse to change the installation folder location. Change only the drive letter. The TLS Options window appears.

7. Select the TLS with autogenerated and self-signed certificates (Default) option.

8. Click Next.
The **Storage Manager** window appears.

9. The installer reuses the information from your previous installation. Click **Next**.

   **Note**: If you change the SA password since the previous installation, the installer requires it to follow the syntax described in [Strong Passwords](#) for the SQL Server.

10. Click **Next**.

    The **Ready to Install** window appears.
11. Click **Install** to begin the upgrade.

12. Click **Finish**.

A dialog box asks you to restart your machine.

13. Click **Yes**.
The machine restarts.

14. **Restart Services**.

See also

- **HTTPS for Tenable Identity Exposure Web Application**

**Upgrade with TLS without Peer Verification**

**Required User Role**: Administrator on the local machine

This process upgrades the following Tenable Identity Exposure components with custom TLS and without peer verification. It requires the "Expert mode" setting in the installation wizard.

**Order of Upgrade**

Upgrade the components in the following order:

1. **Directory Listener**
2. **Security Engine Node**
3. **Storage Manager**

**Caution**: For the installation or upgrade to work, you must run the installer as a local user or a domain user who is a member of the **Local Administrators** group.

**Note**: Restart your machine before each upgrade.

**After you upgrade the components**, restart the machines in the following order:

1. Storage Manager
2. Security Engine Node
3. Directory Listener

**To upgrade the Directory Listener with custom TLS and without peer verification:**
1. On the local machine, run the installation file `Tenable.ad_v3.29.x.exe`.

   A welcome screen appears.

2. In the setup language box, click the arrow to select the language for the installation, and click `Next`.

   ![Welcome screen](image)

   The **Setup Wizard** appears.

3. Select the **Expert Mode** checkbox.

   ![Setup Wizard](image)
4. Click **Next**.

The **Custom Setup** window appears.

5. The installation program automatically preselects the Directory Listener component based on the previous installation. Click **Next**.

The **TLS Options** window appears.

6. Select the **TLS with custom certificates without peer verification** option.
7. Click **Next**.

The **TLS certificates** window appears.

8. Nothing is required in this screen. Click **Next**.

The **Security Engine Node** window appears.

9. In the **IP** box for RabbitMQ, the installer shows the address or host name of the SEN machine based on your previous installation. Check that this information remains valid and correct if necessary.
10. Click **Next**.

The **Directory Listener** window appears.

11. In the **Subnets** box, type the subnet address for the Directory Listener. For multiple subnets, use a comma to separate the addresses.

12. Click **Next**.

The **Ready to Install** window appears.
13. Click **Install** to begin the upgrade.

After the upgrade completes, the **Completing the Tenable.ad Setup Wizard** window appears.

14. Click **Finish**.

A dialog box asks you to restart your machine.

15. Click **No**.
Caution: Do NOT reboot the server now.


To upgrade the SEN with custom TLS and without peer verification:

1. On the local machine, run the installation file Tenable.ad_v3.29.x.exe.

   A welcome screen appears.

2. In the setup language box, click the arrow to select the language for the installation, and click Next.

   ![Welcome screen](image)

   The Setup Wizard appears.

3. Select the Expert Mode checkbox.
4. Click **Next**.

The **Custom Setup** window appears.

5. The installation program automatically preselects the **Security Engine Node** feature based on the previous installation. Click **Next**.

The **TLS Options** window appears.

6. Select the **TLS with custom certificates without peer verification** option.
Caution: Remember to update the Event Logs Storage IP or host name address during this step. Failing to do so leads to attack detection issues. If you have successfully completed this screen and upgraded the SEN, you must update the environment variables for `ALSID_CASSIOPEIA_CYGNI_Service__EventLogsStorage__Host` and `ALSID_CASSIOPEIA_EVENT_LOGS_DECODER_Service__EventLogsStorage__Host` from the current value to the accurate value for `<Storage Manager host name or IP address>`. For more information, see the Troubleshooting knowledge base article.

7. Click **Next**.

The **TLS certificates** window appears.

8. Provide the following information:

   - In the **Server PFX Archive** box, click ... to browse to your PFX archive.
   - In the **PFX Password** box, type the password for the PFX file.
   - In the **CA Cert File** box, click ... to browse to your CA certificate file.
9. Click **Next**.

The **Storage Manager** window appears.

10. The installer shows the IP address or host name of your MSSQL database from your previous installation. Check that it remains valid and correct if necessary. Click **Next**.

   **Note:** If you change the SA password since the previous installation, the installer requires it to follow the syntax described in **Strong Passwords** for the SQL Server.
Caution: Remember to update the Event Logs Storage IP or host name address during this step. Failing to do so leads to attack detection issues. If you have successfully completed this screen and upgraded the SEN, you must update the environment variables for ALSID_CASSIOPEIA_CYGNI_Service__EventLogsStorage__Host and ALSID_CASSIOPEIA_EVENT_LOGS_DECODER_Service__EventLogsStorage__Host from the current value to the accurate value for `<Storage Manager host name or IP address>`. For more information, see the Troubleshooting knowledge base article.

11. Click Next.

The Security Engine Node window appears.

12. In the DNS name or IP box, the installer shows the IP address of the web server that end users type to access Tenable Identity Exposure from your previous installation. Check that this remains valid and correct if necessary.
Note: By default, the installation process creates a self-signed certificate with the DNS name or the IP address that you entered. For more information, see Change the IIS Certificate.

13. Click **Next**.

The **Ready to Install** window appears.
14. Click **Install** to begin the upgrade.

After the upgrade completes, the **Completing the Tenable.ad Setup Wizard** window appears.

15. Click **Finish**.

A dialog box asks you to restart your machine.

16. Click **No**.

**Caution**: Do NOT reboot the server now.

17. Upgrade the Storage Manager.

**To upgrade the Storage Manager with custom TLS and without peer verification:**

1. On the local machine, run the installation file `Tenable.ad_v3.29.x.exe`.

   A welcome screen appears.

2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.
The Setup Wizard appears.

3. Select the Expert Mode checkbox.

4. Click Next.

The Custom Setup window appears.
5. The installation program automatically preselects the Storage Manager component based on the previous installation. Click **Next**.

6. (Optional) Click **Browse** to change the installation folder location. Change only the drive letter. The **TLS Options** window appears.

7. Select the **TLS with custom certificates without peer verification** option.

8. Click **Next**.
The **TLS certificates** window appears.

9. Provide the following information:
   - In the **Server PFX Archive** box, click ... to browse to your PFX archive.
   - In the **PFX Password** box, type the password for the PFX file.

![TLS Certificates Window](image)

10. Click **Next**.

    The **Storage Manager** window appears.

11. The installer reuses the information from your previous installation. Click **Next**

    **Note**: If you change the SA password since the previous installation, the installer requires it to follow the
syntax described in Strong Passwords for the SQL Server.

12. Click **Next**.

The **Ready to Install** window appears.
13. Click **Install** to begin the upgrade.

![Tenable.ad Setup](image)

After the upgrade completes, the **Completing the Tenable.ad Setup Wizard** window appears.

14. Click **Finish**.

A dialog box asks you to restart your machine.

15. Click **Yes**.

The machine restarts.

16. **Restart Services**.

**Upgrade with TLS and with Peer Verification**

**Required User Role:** Administrator on the local machine

This process upgrades the following Tenable Identity Exposure components with custom TLS and with peer verification. It requires the "Expert mode" setting in the installation wizard.

**Public Key Infrastructure (PKI) Certificate**

To use peer verification, your PKI certificate must include the IP addresses or DNS of all the machines used to install Tenable Identity Exposure.
Upgrade the components in the following order:

1. Directory Listener
2. Security Engine Node
3. Storage Manager

**Caution:** For the installation or upgrade to work, you must run the installer as a local user or a domain user who is a member of the Local Administrators group.

**Note:** Restart your machine before each upgrade.

**After you upgrade the components,** restart the machines in the following order:

1. Storage Manager
2. Security Engine Node
3. Directory Listener

To upgrade the Directory Listener with custom TLS and with peer verification:
1. On the local machine, run the installation file Tenable.ad_v3.29.x.exe.

A welcome screen appears.

2. In the setup language box, click the arrow to select the language for the installation, and click Next.

3. Select the Expert Mode checkbox.
4. Click **Next**.

The **Custom Setup** window appears.

5. The installation program automatically preselects the Directory Listener component based on the previous installation. Click **Next**.

The **TLS Options** window appears.

6. Select the **TLS with custom certificates with peer verification** option.
7. Click **Next**.

   The **TLS certificates** window appears.

   ![TLS certificates window]

8. In the **CA Cert File** box, click ... to browse to your CA certificate file.

9. Click **Next**.

   The **Security Engine Node** window appears.
10. In the **IP** box for RabbitMQ, the installer shows the address of the SEN machine based on your previous installation. Check that this information remains valid and correct it if necessary.

11. Click **Next**.

    The **Directory Listener** window appears.

12. In the **Subnets** box, type the subnet address for the Directory Listener. For multiple subnets, use a comma to separate the addresses.
13. Click **Next**.

The **Ready to Install** window appears.

14. Click **Install** to begin the upgrade.

After the upgrade completes, the **Completing the Tenable.ad Setup Wizard** window appears.

15. Click **Finish**.
A dialog box asks you to restart your machine.

16. Click **No**.

**Caution:** Do NOT reboot the server now.


**To upgrade the SEN with custom TLS and with peer verification:**

1. On the local machine, run the installation file `Tenable.ad_v3.29.x.exe`.

   A welcome screen appears.

2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.

   ![Welcome Screen](image)

   The **Setup Wizard** appears.

3. Select the **Expert Mode** checkbox.
4. Click **Next**.

The **Custom Setup** window appears.

5. The installation program automatically preselects the **Security Engine Node** feature based on the previous installation. Click **Next**.

The **TLS Options** window appears.

6. Select the **TLS with custom certificates with peer verification** option.
7. Click **Next**.

   The **TLS certificates** window appears.

8. Provide the following information:

   ◦ In the **Server PFX Archive** box, click ... to browse to your PFX archive.

   ◦ In the **PFX Password** box, type the password for the PFX file.

   ◦ In the **CA Cert File** box, click ... to browse to your CA certificate file.
9. Click **Next**.

   The **Storage Manager** window appears.

10. The installer shows the host name or IP address of your MSSQL database from your previous installation. Check that it remains valid and correct if necessary. Click **Next**.

    **Note**: If you change the SA password since the previous installation, the installer requires it to follow the syntax described in **Strong Passwords** for the SQL Server.
Caution: Remember to update the Event Logs Storage IP or host name address during this step. Failing to do so leads to attack detection issues. If you have successfully completed this screen and upgraded the SEN, you must update the environment variables for ALSID_CASSIOPEIA_CYGNI_Service__EventLogsStorage__Host and ALSID_CASSIOPEIA_EVENT_LOGS_DECODER_Service__EventLogsStorage__Host from the current value to the accurate value for <Storage Manager host name or IP address>. For more information, see the Troubleshooting knowledge base article.

11. Click **Next**.

The **Security Engine Node** window appears.

12. In the **DNS name or IP** box, the installer shows the DNS name (preferred) or IP address of the web server that end users type to access Tenable Identity Exposure from your previous installation. Check that this remains valid and correct if necessary.
Note: By default, the installation process creates a self-signed certificate with the DNS name or the IP address that you entered. For more information, see Change the IIS Certificate.

13. Click Next.

The Ready to Install window appears.
14. Click **Install** to begin the upgrade.

![Upgrade Progress](image)

After the upgrade completes, the **Completing the Tenable.ad Setup Wizard** window appears.

15. Click **Finish**.

A dialog box asks you to restart your machine.

16. Click **No**.

**Caution:** Do **NOT** reboot the server now.

17. Upgrade the Storage Manager.

**To upgrade the Storage Manager with custom TLS and with peer verification:**

1. On the local machine, run the installation file `Tenable.ad_v3.29.x.exe`.

   A welcome screen appears.

2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.
The Setup Wizard appears.

3. Select the Expert Mode checkbox.

4. Click Next.

The Custom Setup window appears.
5. The installation program automatically preselects the **Storage Manager** component based on the previous installation. Click **Next**.

6. (Optional) Click **Browse** to change the installation folder location. Change only the drive letter.

   The **TLS Options** window appears.

7. Select the **TLS with custom certificates with peer verification** option.

8. Click **Next**.
The TLS certificates window appears.

9. Provide the following information:
   - In the **Server PFX Archive** box, click ... to browse to your PFX archive.
   - In the **PFX Password** box, type the password for the PFX file.

10. Click **Next**.

The Storage Manager window appears.

11. The installer reuses the information from your previous installation. Click **Next**

    **Note**: If you change the SA password since the previous installation, the installer requires it to follow the
syntax described in Strong Passwords for the SQL Server.

12. Click Next.

The Ready to Install window appears.
13. Click **Install** to begin the upgrade.

![Tenable.ad Setup](image)

After the upgrade completes, the **Completing the Tenable.ad Setup Wizard** window appears.

14. Click **Finish**.

A dialog box asks you to restart your machine.

15. Click **Yes**.

The machine restarts.

16. **Restart Services**.

---

**Upgrade with No TLS**

**Required User Role:** Administrator on the local machine

This process upgrades the following Tenable Identity Exposure components without the TLS mode. It requires the "Expert mode" setting in the installation wizard.

**Order of Upgrade**

Upgrade the components in the following order:
1. **Directory Listener**

2. **Security Engine Node**

3. **Storage Manager**

**Caution:** For the installation or upgrade to work, you must run the installer as a local user or a domain user who is a member of the **Local Administrators** group.

**Note:** Restart your machine **before** each upgrade.

**After you upgrade the components,** restart the machines in the following order:

1. Storage Manager

2. Security Engine Node

3. Directory Listener

**To upgrade the Directory Listener without TLS:**

1. On the local machine, run the installation file `Tenable.ad_v3.29.x.exe`.

   A welcome screen appears.

2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.
3. Select the **Expert Mode** checkbox.

4. Click **Next**.

The **Custom Setup** window appears.
5. The installation program automatically preselects the Directory Listener component based on your previous installation. Click Next.

The TLS Options window appears.

6. Select the No TLS option.

![TLS Options Window]

7. Click Next.

The Security Engine Node window appears.

8. In the IP box for RabbitMQ, the installer shows the address or host name of the SEN machine based on your previous installation. Check that this information remains valid and correct if
9. Click **Next**.

The **Directory Listener** window appears.

10. In the **Subnets** box, type the subnet address for the Directory Listener. For multiple subnets, use a comma to separate the addresses.

11. Click **Next**.
The **Ready to Install** window appears.

12. Click **Install** to begin the upgrade.

After the upgrade completes, the **Completing the Tenable.ad Setup Wizard** window appears.

13. Click **Finish**.

A dialog box asks you to restart your machine.
14. Click **No**.

**Caution**: Do **NOT** reboot the server now.


**To upgrade the SEN without TLS:**

1. On the local machine, run the installation file Tenable.ad_v3.29.x.exe.

   A welcome screen appears.

2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.

   ![Welcome to the Tenable.ad Setup Wizard](image)

   The **Setup Wizard** appears.

3. Select the **Expert Mode** checkbox.
4. Click **Next**.

The **Custom Setup** window appears.

5. The installation program automatically preselects the SEN component based on your previous installation. Click **Next**.

The **TLS Options** window appears.

6. Select the **No TLS** option.
7. Click **Next**.

The **Storage Manager** window appears.

8. The installer shows the host name or IP address of your MSSQL database from your previous installation. Check that it remains valid and correct if necessary. Click **Next**.

**Note:** If you change the SA password since the previous installation, the installer requires it to follow the syntax described in **Strong Passwords** for the SQL Server.
Caution: Remember to update the Event Logs Storage IP or host name address during this step. Failing to do so leads to attack detection issues. If you have successfully completed this screen and upgraded the SEN, you must update the environment variables for ALSID_CASSIOPEIA_CYGNI_ServiceEventLogsStorage__Host and ALSID_CASSIOPEIA_EVENT_LOGS_DECODER_ServiceEventLogsStorage__Host from the current value to the accurate value for Storage Manager host name or IP address. For more information, see the Troubleshooting knowledge base article.

9. Click Next.

The Security Engine Node window appears.

10. In the DNS name or IP box, the installer shows the host name or IP address of the web server that end users type to access Tenable Identity Exposure from your previous installation. Check that this remains valid and correct if necessary.
**Note**: By default, the installation process creates a self-signed certificate with the DNS name or the IP address that you entered. For more information, see [Change the IIS Certificate](#).

11. Click **Next**.

The **Ready to Install** window appears.
12. Click **Install** to begin the upgrade.

![Image of Tenable.ad Setup window](image)

After the upgrade completes, the **Completing the Tenable.ad Setup Wizard** window appears.

13. Click **Finish**.

A dialog box asks you to restart your machine.

14. Click **No**.

   **Caution:** *Do NOT* reboot the server now.

15. Upgrade the Storage Manager.

   **To upgrade the Storage Manager without TLS:**

   1. On the local machine, run the installation file `Tenable.ad_v3.29.x.exe`.

      A welcome screen appears.

   2. In the setup language box, click the arrow to select the language for the installation, and click **Next**.
The Setup Wizard appears.

3. Select the Expert Mode checkbox.

4. Click Next.

The Custom Setup window appears.
5. The installation program automatically preselects the Storage Manager component based on the previous installation. Click **Next**.

6. (Optional) Click **Browse** to change the installation folder location. Change only the drive letter.

   The **TLS Options** window appears.

7. Select the **No TLS** option.
8. Click **Next**.

The **Storage Manager** window appears.

*Note:* If you change the SA password since the previous installation, the installer requires it to follow the syntax described in [Strong Passwords](#) for the SQL Server.

9. The installer reuses the information from your previous installation. Click **Next**

The **Ready to Install** window appears.
10. Click **Install** to begin the upgrade.

After the upgrade completes, the **Completing the Tenable.ad Setup Wizard** window appears.

11. Click **Finish**.

A dialog box asks you to restart your machine.

12. Click **Yes**.
The machine restarts.

13. **Restart Services.**

## Restart Services

After you finish upgrading the Tenable Identity Exposure components Storage Manager, Security Engine Node, and Directory Listener, you can restart the services.

### Storage Manager

The Storage Manager is the first component to restart after you finish the upgrade.

To restart the Storage Manager machine:

1. At the prompt from the installation program, click **Yes**.
2. Check that these Storage Manager services are running:
   - SQL Server (Tenable)
   - SQL Server Agent (Tenable)
   - *alsid_EventlogStorage1*

### Security Engine Node

The databases must be running before you restart Security Engine Nodes (SEN) services.

To restart the SEN machine:

1. At the prompt from the installation program, click **Yes**.
2. If you have more than one SEN machine, restart the machines in this order:
   1. RabbitMQ
   2. Others (Eridanis, Kapteyn, etc.)
   3. Cancri, EventLogsDecoder
   4. Cygni
3. Check that the following SEN services are running:
- alsid_AttackPath1
- alsid_Cancri1
- alsid_Cephei
- alsid_CetiBridge
- alsid_Cygni
- alsid_Electra
- alsid_eltanin1
- alsid_Enif
- alsid_Eridanis
- alsid_EventlogsDecoder1
- alsid_Kapteyn
- RabbitMQ
- World Wide Web Publishing Services

Directory Listener

Databases and Security Engine Nodes must be running before you restart Directory Listener services.

To restart Directory Listener services:

1. At the prompt from the installation program, click Yes.
2. Check that the following Directory Listener service is running:
   - alsid_Ceti
Manage Tenable Identity Exposure

Using its web portal, Tenable Identity Exposure allows you to review, manage, and receive relevant information about the security state of the monitored infrastructure. The web portal displays the following:

- Live Active Directory security flows to allow security teams to perform security compliance tasks, threat hunting, or incident response tasks.
- Administrative panes to manage the monitoring of new infrastructures.
- Access rights of each user or service connected to the platform.

Tenable Identity Exposure can also forward its security monitoring flows to other services such as internal application logs for further correlation.

**Alerts and Notifications**

Tenable Identity Exposure includes notifications and alerts that you can connect to third-party services, such as an event log collector (for example, a Security Information and Event Management), an email service provider using SMTP, or a ticketing system. When a new security incident appears, Tenable Identity Exposure raises notifications to inform security teams to take immediate action.

Tenable Identity Exposure uses email notifications to send general purpose information to users, such as password recovery information, as well as notifications about security incidents.

To enable alerts, provide Tenable Identity Exposure with credentials for a user account with permissions to send emails to the selected SMTP server. This can be the same user account as the one you use to connect to your Active Directory.

The following is a generic email template for a security incident detected by Tenable:
You can integrate Tenable Identity Exposure into a security ecosystem using its RESTv3 (Representational State Transfer) API to enable management, logging, or notification capabilities.

Tenable Identity Exposure provides a public API that you can use to connect the platform to third-party services. This API supports the REST v3 standard which you access using HTTP.

For more information, see the Tenable Identity Exposure API Reference Portal.

**Connect to an Event Log Collector**

You can configure Tenable Identity Exposure to send notifications, such as alerts or security offenses, to an event log collector. Tenable Identity Exposure also allows you to redirect a subset of the traffic flows to a collector for further correlation.

The following illustration shows an integrated process managing Security Information and Event Management (SIEM) events.

Tenable Identity Exposure uses the Syslog protocol to carry messages in LEEF format.
Tenable Identity Exposure supports most SIEMs or event log collectors. Tenable Identity Exposure supports the following event collectors:

- IBM QRadar
- Splunk
- RSA Netwitness
- LogRhythm
- Micro Focus ArcSight
- Tibco Loglogic
- McAfee Enterprise Security Manager

**Scale Tenable Identity Exposure Services**

**Required User Role:** Administrator on the local machine

To improve data processing performance, you can scale up or down these Tenable Identity Exposure services.

**Cancri**

Cancri’s scaling up mechanism goes through its reconfiguration using an environment variable.

To scale Cancri:

1. Open a PowerShell (x64) terminal.

2. Define the environment variable `ALSID_CASSIOPEIA_CANCRI_Application__MaxConcurrentPublishToEridanis`:

   ```
   [Environment]::SetEnvironmentVariable("ALSID_CASSIOPEIA_CANCRI_Application__MaxConcurrentPublishToEridanis", "IntegerValue", "Machine")
   ```

   **Note:** The default value is 100.

3. Restart Cancri:
Example:

```powershell
[[Environment]::SetEnvironmentVariable("ALSID_CASSIOPEIA_CANCRI_Application__MaxConcurrentPublishToEridanis", "200", "Machine")
Restart-Service -Name Alsid_Cancri
```

**EventLogsDecoder**

The EventLogsDecoder component needs to process data at a high speed. It's possible that a single instance of EventLogsDecoder may not suffice, so consider running multiple instances of this component concurrently.

To determine when to initiate additional instances, you monitor a specific metric, which is the number of messages queued in the RabbitMQ queue named `event-logs-decoder-ioa-input-queue`. When this metric reaches a threshold of 8000 messages, it's imperative to launch a new instance of the EventLogsDecoder component.

To scale a new instance of EventLogsDecoder on a new machine, launch the installation program on this machine and follow the same procedure as the one you used for the first instance:

- Default TLS
- Default TLS in "Expert Mode"
- TLS without Peer Verification
- TLS with Peer Verification
- No TLS

You do not need to restart any service because Tenable Identity Exposure automatically takes in account this new instance.

**Note:** It is not possible to add several instances of EventLogsDecoder on the same machine.
To scale up the total number of Eridanis instances, you must update the `ERIDANIS_WORKER_COUNT` environment variable.

To scale Eridanis:

1. Open a PowerShell (x64) terminal.
2. Run the following command (replace the value in brackets with the real expected value):
   ```powershell
   [System.Environment]::SetEnvironmentVariable('ERIDANIS_WORKER_COUNT', <number of Eridanis instances>, 'Machine')
   ```
3. Restart Eridanis:
   ```powershell
   Restart-Service -Name 'alsid_Eridanis'
   ```

**Example:** For 3 Instances of Eridanis

```powershell
[System.Environment]::SetEnvironmentVariable('ERIDANIS_WORKER_COUNT', 3, 'Machine')
Restart-Service -Name 'alsid_Eridanis' -Force
```

---

**Change IP Addresses or FQDNs for Tenable Identity Exposure Nodes**

Changing the IP addresses or fully qualified domain names (FQDNs) of machines running the Storage Manager (SM), Security Engine Nodes (SEN), and Directory Listener (DL) is a required task in certain situations, such as disaster recovery testing. Using scripts to modify environment variables with the new IPs or FQDNs and to restart services is the most efficient way to perform this operation which also minimizes downtime.

To change the IP addresses or FQDN for Tenable Identity Exposure nodes:

1. If your Tenable Identity Exposure installation type uses:
   - **Default TLS**: Generate and replace all self-signed TLS certificates with the new IP addresses or FQDNs.
- Custom TLS: Generate and replace all custom TLS certificates with the new IP addresses or FQDNs.

- No TLS: Proceed to the next step.

2. In PowerShell, list all the IP/FQDN-related environment variables with the new IPs or FQDNs, such as in the following example:

Note: The following scripts only show the environment variables that you would need to update in a conventional setup of Tenable Identity Exposure. It excludes any setup using split SENs or multiple DLs.

- Security Engine Node (SEN):

```powershell
vars = @(
    ERIDANIS_MSSQL_HOST = $MssqlNodeIp # Storage Manager Node IP Address
    ERIDANIS_MSSQL_PORT = $MssqlNodePort # Storage Manager Default Port 1433
    ERIDANIS_KAPTEYN_PUBLIC_DOMAIN = $WebAppHostName # FQDN or IP Address of Web UI
    ALSID_CASSIOPEIA_EVENT_LOGS_DECODER_Service_EventLogsStorage__Host = $DecoderIP # Storage Manager Node IP Address
    ALSID_CASSIOPEIA_EVENT_LOGS_DECODER_Service_EventLogsStorage__Port = $DecoderPort # Default Port 4244
)

ForEach ($var in $vars.GetEnumerator()) {
    [System.Environment]::SetEnvironmentVariable($var.Name, $var.Value, 'Machine')
}
```

- Directory Listener (DL):

```powershell
vars = @(
    ALSID_CASSIOPEIA_CETI_Service__Broker__Host = $SecurityEngineNodeIP # Security EngineNode IP Address
    ALSID_CASSIOPEIA_CETI_Service__Broker__Port = $SecurityEngineNodePort # Security EngineNode Port
)

ForEach ($var in $vars.GetEnumerator()) {
    [System.Environment]::SetEnvironmentVariable($var.Name, $var.Value, 'Machine')
}
```
3. Restart all services on each machine.

<table>
<thead>
<tr>
<th>Restart services on each machine</th>
</tr>
</thead>
<tbody>
<tr>
<td># Restart all services</td>
</tr>
<tr>
<td>Get-Service alsid*</td>
</tr>
<tr>
<td>Get-Service tenable*</td>
</tr>
</tbody>
</table>

**HTTPS for Tenable Identity Exposure Web Application**

When the Tenable Identity Exposure installation process installs the Security Engine Node (SEN), it creates a self-signed certificate and binds it to the Tenable Identity Exposure web application to let you access Tenable Identity Exposure via HTTPS.

For example, if the SEN server's IP address is `10.0.48.55`, you can log in to the Tenable Identity Exposure web application at `https://10.0.48.55` after installation.

Tenable Identity Exposure provides a default self-signed certificate for your convenience. But to secure fully the web application, you must change this IIS certificate for a valid one, such as a signed certificate from the organization’s PKI/internal Certificate Authority.

Moreover, the SSL/TLS protocols versions and their enabled cipher suites have globally configured settings in the underlying Windows operating system (OS). Tenable Identity Exposure does not modify these settings, so you must configure them to obtain the desired level of security in line with your organization’s requirements.

In the absence of specific requirements and within a modern environment, Tenable recommends that you enable TLS 1.2. You can enable TLS 1.3 if you use Windows Server 2022 with the compatible Tenable Identity Exposure version. You should also disable weak cipher suites (DES, 3DES, RC2, RC4, AES 128, etc.)

Refer to the Microsoft documentation to [Restrict the use of certain cryptographic algorithms and protocols in Schannel.dll](https://docs.microsoft.com/en-us/windows/win32/security/ssl-tls-configuration). Use the configuration method that your organization recommends to deploy those settings (for example local configuration, GPO, third-party tool, etc.) However, Tenable does not offer support around this.

For more information, see:
• View the IIS Certificate

• Change the IIS Certificate

View the IIS Certificate

The Tenable Identity Exposure installation process creates and places a self-signed certificate in Internet Information Services (IIS) Manager.

To view the IIS certificate:

1. Go to Windows Start > Windows Administrative Tools > Internet Information Services (IIS) Manager.

2. In the Connections panel on the left, click on the server name.

3. Double-click on Server Certificates to display certificates in the IIS Manager.

4. To explore the binding, expand Sites on the left panel.

5. Right-click your website and choose Edit Bindings.

   The Site Bindings window appears.

6. Select the https binding.

7. Click Edit.

   The Edit Site Binding window appears.
8. Under SSL Certificates, click on the drop-down menu to view installed certificates.

**Change the IIS Certificate**

To use your certificate for the Tenable Identity Exposure web application, you must:

1. Install your certificate in IIS.
2. Edit site binding to use your installed certificate.

To install the IIS certificate:

1. Go to **Windows Start > Windows Administrative Tools > Internet Information Services (IIS) Manager**.
2. In the **Connections** panel on the left, click on the server name.
3. Double-click on **Server Certificates** to display certificates in the IIS Manager.
4. In the right panel, click **Import** to import your certificate.

![Image of Importing Certificate]

To change the IIS certificate:

1. **View the IIS Certificate.**
2. From the drop-down list of SSL certificates, select the certificate you just installed.
3. Click **OK.**

![Image of Selecting Certificate]

4. Right-click on the website in the **Connections** panel and select **Manage Website > Restart** for
the new certificate to take effect.
Upgrade and Maintenance

As part of its upgrade program, Tenable frequently publishes updates to provide new detection capabilities and new features.

- These upgrades include security patches for the underlying operating system. See the latest Tenable Identity Exposure Release Notes for more information.
- You can access them on Tenable Downloads site.

To update Tenable Identity Exposure, deploy the update installation packages on each Windows Server machine. For more information about the update process, see Update.

Maintenance and Support Services

To keep servers in good security conditions the Tenable Identity Exposure platform requires access to the following support services. For more information about the required network flows, see Network Flow Matrix.

During maintenance operations, Tenable Support requires administrative access to the operating systems that host Tenable Identity Exposure.

<table>
<thead>
<tr>
<th>Service Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Update management infrastructure</td>
<td>Your company's update management infrastructure (e.g., WSUS or SCCM) or Microsoft update servers on the Internet. This service applies security patches on the underlying operating system.</td>
</tr>
<tr>
<td>Time Server</td>
<td>Your company's time server (e.g., NTP server). This service synchronizes Tenable Identity Exposure’s platform internal clock to your reference time. Time synchronization offers consistent security monitoring.</td>
</tr>
<tr>
<td>Identity provider</td>
<td>Your identity and access provider. This service activates SAML, LDAP, or OAUTH authentication to Tenable Identity Exposure’s web services (portal, API, etc.).</td>
</tr>
</tbody>
</table>
Uninstall Tenable Identity Exposure

**Required User Role:** Administrator on the local machine

The uninstallation process removes all Tenable Identity Exposure components.

To uninstall Tenable Identity Exposure:

1. In Windows, go to **Control Panel > Programs > Programs and Features**.
2. Select Tenable Identity Exposure.
3. Click **Uninstall**. A dialog box asks for confirmation:
4. Click **Yes**.
   - The confirmation dialog box disappears after the uninstallation completes.
   - An icon in the system tray indicates that a second uninstallation phase is in process. This icon disappears when the uninstallation has fully completed.