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1. **Introduction**

1.1 **Document purpose and scope**

This document introduces the procedures to deploy Intel® Education Theft Deterrent solution for version 4.x.

The document contains the following information:

- Introduction to the Theft Deterrent solution
- Requirements of the Theft Deterrent server depending on the deployment scenarios
- Deployment steps for the Theft Deterrent server
- Steps to migrate from earlier versions of the Theft Deterrent server to version 4.x
- Pre-configuration steps of the Theft Deterrent server
- Configuration steps to enable the Theft Deterrent server to use a separate download server
- Deployment steps for the Theft Deterrent client and guardian 4.x
- troubleshooting and FAQ

1.2 **Terminology**

1.2.1 **Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>server</td>
<td>Theft Deterrent server</td>
</tr>
<tr>
<td>client</td>
<td>Theft Deterrent client</td>
</tr>
</tbody>
</table>

1.2.2 Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>device</td>
<td>Intel® classmate PC or Intel® Education Tablet</td>
</tr>
<tr>
<td>online devices</td>
<td>The devices that are connected with the server network and their clients are activated and communicating with the server.</td>
</tr>
<tr>
<td>Sponsor server</td>
<td>Theft Deterrent run in Sponsor mode, which can manage the Proxy and TD server in central-server supported mode.</td>
</tr>
<tr>
<td>Proxy server</td>
<td>Theft Deterrent run in Proxy mode, which can register in Sponsor server and need keep the sync-up with Sponsor server for TD feature.</td>
</tr>
<tr>
<td>Non-Proxy server</td>
<td>Theft Deterrent run in central-server supported mode.</td>
</tr>
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</table>

1.3 **Revision History**

<table>
<thead>
<tr>
<th>Revision</th>
<th>Date</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.62</td>
<td>2013/9</td>
<td>Add usage for server upgrade package and add re-install</td>
</tr>
<tr>
<td>Revision</td>
<td>Date</td>
<td>Comment</td>
</tr>
<tr>
<td>----------</td>
<td>----------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>server section. Update the migrate tool usage</td>
</tr>
<tr>
<td>0.63</td>
<td>2013/11</td>
<td>Move migrate section to Toolkits User Guide.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Add one dependency for Linux client.</td>
</tr>
<tr>
<td>0.64</td>
<td>2014/6</td>
<td>Change TD server minimize Hard disk size request</td>
</tr>
<tr>
<td>0.8</td>
<td>2014/12</td>
<td>Update for TDv3 RC1 new release</td>
</tr>
<tr>
<td>0.9</td>
<td>2015/3</td>
<td>Add offline register for TDv3 RC2 release</td>
</tr>
<tr>
<td>0.91</td>
<td>2016/6</td>
<td>Modify Performance Tune</td>
</tr>
<tr>
<td>0.91</td>
<td>2017/11</td>
<td>Update client supported OS and client log</td>
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</tbody>
</table>

1.4 Reference Document

<table>
<thead>
<tr>
<th>Document</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel® Education Theft Deterrent server User Manual</td>
<td>2013-04</td>
</tr>
<tr>
<td>Intel® Education Theft Deterrent client User Manual</td>
<td>2013-02</td>
</tr>
<tr>
<td>Intel® Education Theft Deterrent Root CA Server Deployment Guide</td>
<td>2013-04</td>
</tr>
<tr>
<td>Intel® Education Theft Deterrent Central Server Deployment Guide</td>
<td>2013-07</td>
</tr>
<tr>
<td>Intel® Education Theft Deterrent Toolkits User Guide</td>
<td>2013-11</td>
</tr>
<tr>
<td>Intel® Education Theft Deterrent manufactory guide</td>
<td>2013-11</td>
</tr>
</tbody>
</table>
2. Theft Deterrent Overview

As part of the Intel® Education Software suite, Theft Deterrent provides a complete physical security management solution for your Intel® Education Tablet and Intel® classmate PC.

Note: The term device is used throughout this document to refer to Intel® Education Tablet and Intel® classmate PC.

At first, you need understand your deployment environment, like:

- Business requirement, like what is business model of hosting and sustaining the solution?
- Network environment, like how about the internet connectivity in school?
- IT technology background, like whether school IT has the capability to manage the server?
- Security consideration, like whether the school can maintain the server hardware secure.

Figure 1 - Theft Deterrent High level Architecture

And prior to deployment, it is necessary to understand the different components of Theft Deterrent:

- **Root CA server**: Each Theft Deterrent solution must contain one root CA server. This server generates and manages the root key pair, trusted by every Theft Deterrent client that it manages.
- **Theft Deterrent (TD) servers**: Key components of the Theft Deterrent solution, which provide feature, including device and certificate management, device locking/unlocking etc. Refer to next sections on how to select the TD server mode and relative deployment architecture.
• **Theft Deterrent client** (client): This component runs on devices and can connect with Theft Deterrent server to update the certificate for lock and unlock devices based on the certificates received from the Theft Deterrent server.

**Note:** Central server is the legacy TD server component. TDv3 Sponsor server can run as a central server as well, so a separately central server is not recommended.

### 2.1 Server Support Mode

TDv3 server provides several modes during install and you can access different functionalities with different modes:

<table>
<thead>
<tr>
<th>Installation Mode</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Stand-alone mode with the Intel Root Public Key** | The server can run standalone without connect with any other server. It cannot be transformed to other modes.  
As the Root key is from Intel, this mode is only target to test or demo. It is not recommended for real deployment. |
| **Central Server supported mode**              | Must be activated to a Central server (or a Sponsor server running as Central server).  
Need connect with Central server for online backup and school transfer features.  
Can access other features without connect with any other server. |
| **Proxy mode**                                 | Must be activated to a Sponsor server.  
Need keep sync-up with Sponsor server for TD features. |
| **Stand-alone mode with your own Root Public Key** | Can run standalone to access TD features.  
It has several possibility to be transformed to other modes:  
- After activate to Central server, it transforms to the Central Server supported mode.  
- After activate to Sponsor server, it transforms to the Proxy server.  
- After being registered and activated, it will be updated to Sponsor server and run as a Central server as well. It can manage both Proxy server and TD server in central-server supported mode. |

Proxy mode and central server supported mode provide more functionality compared with the Standalone server. Below is the functionality comparison between them, which can help you to understand the new features Proxy mode provided.

<table>
<thead>
<tr>
<th>Add-in functionality</th>
<th>Central server supported mode</th>
<th>Proxy mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online transfer</td>
<td>Y. Must keep central server and Root server online.</td>
<td>Y. Simplified transfer procedure with Assign group in Sponsor server.</td>
</tr>
<tr>
<td>Online backup</td>
<td>Y.</td>
<td>Y. Simplified backup through sync-up between Sponsor</td>
</tr>
</tbody>
</table>
2.2 Deployment Workflow

In general, a new deployment of the Theft Deterrent solution follows this order:

1. **Deploy root CA server.** The Root CA server is suggested to be located in MoE centre. As to detail step on how to deploy the root CA server, see the Intel® Education Theft Deterrent Root CA Server Deployment Guide.

2. **Choose the TD Architecture:** Before deployment, you need understand your internet environment for the server. There are 4 typical deployment scenarios and corresponding suggested TD architecture.

<table>
<thead>
<tr>
<th>Deployment Scenario</th>
<th>Network environment</th>
<th>TD Architecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>School has good internet connectivity and no network congest at daytime.</td>
<td>Centralized architecture, or Intel cloud service</td>
</tr>
<tr>
<td>D</td>
<td>School has no internet.</td>
<td>Decentralized architecture</td>
</tr>
<tr>
<td>B/C</td>
<td>School has not good internet (even no internet), while need the centralized management or need more safe solution for school admin cannot keep school server safety.</td>
<td>Hierarchized architecture</td>
</tr>
</tbody>
</table>
3. **Deploy TD server solution**: After identified your TD architecture, follow next section on how to setup the infrastructure.

4. **Deploy TD client solution**: Refer to the TD client manufactory guide on the detail of deployment steps.

5. Once deployment completes, you cannot change the Root Public Key used in the Theft Deterrent solution. Make sure that you deployed the server with the correct mode before you connect any device to the server.

   **Note:** As to Standalone mode is easiest mode to install and can be transferred to other modes after some operation. It is highest recommend to install a server as Standalone mode if possible.

### 2.3 Theft Deterrent Solution Architecture

You can deploy the Theft Deterrent solution with one of the following architectures according to the network, management and security request:

- **Centralized** and **Intel cloud service**
- **Decentralized**
- **Hierarchized**

#### 2.3.1 Centralized Architecture and Intel cloud service

If Internet connection is stable at region or country level, MoE can host the concentrative server by themselves or utilize the cloud service hosted by Intel.

##### 2.3.1.1 Centralized Architecture

MoE can host the concentrative server in MoE data center or in the cloud.
The deployment options selected for this architecture is as follows:

<table>
<thead>
<tr>
<th>Deployment Configurations</th>
<th>Recommended Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Root key pair</td>
<td>Your own root key pair</td>
</tr>
<tr>
<td>Concentrative server</td>
<td>Standalone mode with your own Root Public Key.</td>
</tr>
</tbody>
</table>

2.3.1.2 Intel Cloud service

If customer permits Intel to get the private information of end users, they can utilize the cloud service running by Intel, to save the cost for IT and secure maintenance.

Intel cloud service provide feature:

- Patch for Server Operation system
- Setup, upgrade and backup, trouble shooting for issue relative the server
- Create account for MoE and operator and help them to manage the device belong to them

URL of Intel cloud service is service.theftdeterrent.intel.com. Please refer to Section 8.3 on how to pre-set the address.

Note: Now the Intel cloud service is running in pilot and mainly target for demo purpose.

2.3.2 Decentralized Architecture

The server is hosted at individual school LAN level in decentralized architecture. Select this architecture in either of the following cases:

- Deploying a test or demo server
- The schools or devices do not have stable Internet connection. For example, the network latency of your school network is larger than 300ms.
The deployment options selected for this architecture is as follows:

<table>
<thead>
<tr>
<th>Deployment Configurations</th>
<th>Recommended Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Root key pair</td>
<td>Your own root key pair</td>
</tr>
<tr>
<td>School server</td>
<td>Stand-alone mode with your own Root Public Key</td>
</tr>
</tbody>
</table>

### 2.3.3 Hierarchized Architecture

There are 2 layers TD servers are hosted in hierarchized architecture.

- Concentrative server at MoE centre or cloud.
- School server at individual school level.
  - For school without stable internet connection, the school server is hosted in school LAN.
  - For school has stable internet connection, the school server is not mandatory for devices can direct connect to the concentrative server.

The deployment options selected for this architecture is as follows:

<table>
<thead>
<tr>
<th>Deployment Configurations</th>
<th>Recommended Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Root key pair</td>
<td>Your own root key pair</td>
</tr>
<tr>
<td>Concentrative server</td>
<td>Install with Standalone mode. After activated, it will run as Sponsor mode. Except devices management, it also can manage the Proxy or non-Proxy server. It enables centralized management feature and more security capability.</td>
</tr>
<tr>
<td>School server</td>
<td>For school server, it can install with Proxy mode or Central</td>
</tr>
</tbody>
</table>
### 2.4 Choose Download Server Locations

Once you determine the options for the Theft Deterrent architecture, you can consider having a separate download server for better performance or scalability of your server:

![Figure 6 - Theft Deterrent server Options](image)

The server includes a **Smart Client Upgrade** function which provides clients (TD client above 4.x) with upgrade packages through HTTP or HTTPS download. You can deploy the feature with either of the following methods:

- **Local**: Deploy the download feature as a feature of the web service.
- **Separate**: Use a third-party download server to provide the download feature.

In general, it is recommended that you deploy the server on the Internet with a separate download server if the number of online devices it manages is larger than 5K.

You can configure the server to specify the location where clients should download the packages according to the location of the download feature chosen. Detailed configuration steps are introduced in chapter 7.
3. Theft Deterrent server Requirements

3.1 Requirements for Decentralized Architecture

This section introduces the requirements for deploying the server in the decentralized architecture. This architecture deploys the server on LAN in schools and the general deployment scenario assumes that the number of devices to be managed is less than 5K.

It is recommended that you deploy the download feature in local.

The hardware and network requirements for the server are as follows:

<table>
<thead>
<tr>
<th>Online devices</th>
<th>Requirement</th>
<th>Recommended configuration</th>
<th>Minimal configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1K</td>
<td>Hardware</td>
<td>CPU: 1 x Intel® Xeon®, 2 cores</td>
<td>CPU: 1 x Intel® Xeon®, 1 cores</td>
</tr>
<tr>
<td></td>
<td>Memory: 2 GB</td>
<td></td>
<td>Memory: 2 GB</td>
</tr>
<tr>
<td></td>
<td>OS</td>
<td>Linux or Windows</td>
<td>Linux or Windows</td>
</tr>
<tr>
<td></td>
<td>Network bandwidth</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>(Mbps)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 5K</td>
<td>Hardware</td>
<td>CPU: 1 x Intel® Xeon®, 4 cores</td>
<td>CPU: 1 x Intel® Xeon®, 2 cores</td>
</tr>
<tr>
<td></td>
<td>Memory: 4 GB</td>
<td></td>
<td>Memory: 4 GB</td>
</tr>
<tr>
<td></td>
<td>OS</td>
<td>Linux or Windows</td>
<td>Linux or Windows</td>
</tr>
<tr>
<td></td>
<td>Network bandwidth</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>(Mbps)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The minimum hard disk space required is 2GB. However, the recommended hard disk space for the server is 30 GB and above.

3.2 Requirements for Centralized Architecture

This section introduces the requirements for deploying the server in the centralized architecture. This architecture deploys the concentrative server on the Internet at region or country level. Therefore, the general deployment scenario assumes that the number of devices to be managed is more than 5K. First of all, the following requirements must be met:

- The server must be protected against network DDoS attack.
- All the schools and students at home must be able to access the server with enough bandwidth and network latency, which should be less than 300ms in both directions.

It is recommended that you deploy the server with the separated download server third-party provided. Also, do not share the download bandwidth with the web server bandwidth. Otherwise, the downloading might use too much bandwidth and cause network congestion which will prevent devices from connecting with the server.
3.2.1 Requirements for Theft Deterrent server

The requirements for the server differ according to the network latency, which will cause time delay when data transmits between the server and the clients. To estimate the latency of your network, see Appendix.

If your network latency <= 300ms, refer to the server requirements displayed in the following table. If your network latency > 300ms, contact your local TME for support.

<table>
<thead>
<tr>
<th>Online devices</th>
<th>Requirement</th>
<th>Recommended configuration</th>
<th>Minimal configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 10K</td>
<td>Hardware</td>
<td>CPU: 1 x Intel® Xeon®, 4 cores Memory: 4 GB</td>
<td>CPU: 1 x Intel® Xeon®, 2 cores Memory: 4 GB</td>
</tr>
<tr>
<td></td>
<td>OS</td>
<td>Linux or Windows</td>
<td>Linux or Windows</td>
</tr>
<tr>
<td></td>
<td>Network bandwidth (Mbps)</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>10-50K</td>
<td>Hardware</td>
<td>CPU: 1 x Intel® Xeon®, 4 cores with hyper-thread Memory: 8 GB</td>
<td>CPU: 1 x Intel® Xeon®, 4 cores Memory: 8 GB</td>
</tr>
<tr>
<td></td>
<td>OS</td>
<td>Linux or Windows</td>
<td>Linux or Windows</td>
</tr>
<tr>
<td></td>
<td>Network bandwidth (Mbps)</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>50-100K</td>
<td>Hardware</td>
<td>CPU: 2 x Intel® Xeon®, 4 cores for each with hyper-thread Memory: 16 GB</td>
<td>CPU: 2 x Intel® Xeon®, 4 cores for each with hyper-thread Memory: 12 GB</td>
</tr>
<tr>
<td></td>
<td>OS</td>
<td>Linux</td>
<td>Linux</td>
</tr>
<tr>
<td></td>
<td>Network bandwidth (Mbps)</td>
<td>18</td>
<td>9</td>
</tr>
<tr>
<td>100-200K</td>
<td>Hardware</td>
<td>CPU: 2 x Intel® Xeon®, 6 cores for each with hyper-thread Memory: 24 GB</td>
<td>CPU: 2 x Intel® Xeon®, 4 cores for each with hyper-thread Memory: 16 GB</td>
</tr>
<tr>
<td></td>
<td>OS</td>
<td>Linux</td>
<td>Linux</td>
</tr>
<tr>
<td></td>
<td>Network bandwidth (Mbps)</td>
<td>35</td>
<td>18</td>
</tr>
</tbody>
</table>

The minimum hard disk required is 15 GB. However, the recommended hard disk space for the server is 30 GB and above.

**Note:** The network bandwidths recommended above are estimated according to the device numbers in four ranges. To calculate the network requirement for your specific device number, see Appendix.
3.2.2 Requirements for Download Server

You can either set up a separate download server or use an existing download services provided by a Content Delivery Network (CDN) operator, a cloud based download server, etc.

The download server you choose will affect the download performance. For information on how to improve the download performance, see Appendix.

**Note**: The download feature you use must support HTTP or HTTPS download.

If you choose to use an existing download service, make sure that the service provider offers stable download functions and you can skip this chapter.

If you want to set up your own download server, make sure that the following requirements are met.

<table>
<thead>
<tr>
<th>Online devices</th>
<th>Requirement</th>
<th>Recommended configuration</th>
<th>Minimal configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 10K</td>
<td></td>
<td>CPU: 1 x Intel® Xeon®, 2 cores  Memory: 4 GB</td>
<td>CPU: 1 x Intel® Xeon®, 2 cores  Memory: 4 GB</td>
</tr>
<tr>
<td></td>
<td>Hardware</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OS</td>
<td>Linux or Windows</td>
<td>Linux or Windows</td>
</tr>
<tr>
<td></td>
<td>Network bandwidth (Mbps)</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>10-50K</td>
<td></td>
<td>CPU: 1 x Intel® Xeon®, 2 cores  Memory: 4 GB</td>
<td>CPU: 1 x Intel® Xeon®, 2 cores  Memory: 4 GB</td>
</tr>
<tr>
<td></td>
<td>Hardware</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OS</td>
<td>Linux or Windows</td>
<td>Linux or Windows</td>
</tr>
<tr>
<td></td>
<td>Network bandwidth (Mbps)</td>
<td>26</td>
<td>13</td>
</tr>
<tr>
<td>50-100K</td>
<td></td>
<td>CPU: 1 x Intel® Xeon®, 4 cores  Memory: 8 GB</td>
<td>CPU: 1 x Intel® Xeon®, 2 cores  Memory: 8 GB</td>
</tr>
<tr>
<td></td>
<td>Hardware</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OS</td>
<td>Linux</td>
<td>Linux</td>
</tr>
<tr>
<td></td>
<td>Network bandwidth (Mbps)</td>
<td>43</td>
<td>21</td>
</tr>
<tr>
<td>100-200K</td>
<td></td>
<td>CPU: 1 x Intel® Xeon®, 4 cores  Memory: 12 GB</td>
<td>CPU: 1 x Intel® Xeon®, 4 cores  Memory: 8 GB</td>
</tr>
<tr>
<td></td>
<td>Hardware</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OS</td>
<td>Linux</td>
<td>Linux</td>
</tr>
<tr>
<td></td>
<td>Network bandwidth (Mbps)</td>
<td>74</td>
<td>37</td>
</tr>
</tbody>
</table>

**Note**: The network bandwidths recommended above are estimated according to the device numbers in four ranges. To calculate the network requirement for your specific device number, see Appendix.
3.3 Requirements for Hierarchized Architecture

This section introduces the requirements for deploying the server in the hierarchized architecture. The architecture requires deploying the concentrative server on the Internet and deploying the school server on LAN in schools. The scenario assumes that the number of devices to be managed is more than 5K.

The hardware and network requirements for the servers are

- The requirement for concentrative TD server and separate download server are similar as that in Centralized architecture.
- The requirement for school server is same as that in Decentralized architecture.

Except these requirements, the limitation for one Sponsor server architecture is:

- Total school server number < 500
- Total device number (including the devices directly connect with Sponsor server and those belong to Proxy server) < 1M
- Total device number directly connect to one server < 200K

So if your totally deployment scalability is larger than the limitation, need consider deploy several Sponsor servers in parallel.

3.4 General Requirements

3.4.1 Operating System Requirements

The server supports the following operating systems:

- **Windows**: Windows Server 2008 R2 64-bits
- **Linux**: Debian 6.0.3 64-bits/32-bits and above. You can find this operating system from the [Debian official website](https://www.debian.org/).

3.4.2 Domain Name Requirement

For centralized and hierarchized architecture, the servers or the central server are hosted on the Internet. Therefore, it is recommended that you configure a static domain name for the servers.

3.4.3 Security Guideline

The server is the root of trust for all devices in the Theft Deterrent solution. Once deployed, it is the responsibility of the IT admin to protect the server against unauthorized use or online attacks. Therefore, it is strongly recommended that you follow these guidelines to protect the server:

**Physical security:**

- Lock the machine in the cabinet and deny unauthorized personnel from physically accessing the server.

**Network security:**

- Install firewall, IPS, etc.
Operating system security:
- Configure the security settings of the operating system.
- Update the operating system and install security patches regularly.
- Close all the services not necessary for the server or restrict the services to be available only to internal IP. For example, the remote desktop/VNC.

Operating System administrator security:
- Secure the admin/root account of the operating system.
- Do not change the access permissions of the configuration files and keystore files, which are set to read only and accessible by admin/root account only by default.
- Do not add unnecessary account to the operating system or open guest accounts.

Theft Deterrent account security:
- Keep the passwords of the database server account and the database administrator account secure.
- If the database server is deployed on a separated machine, keep the machine in the internal network and configure the database server to be accessible by the web server only.
- Keep the user account passwords of the server secure. For example, require users to change their passwords frequently and never share their passwords with anyone.

General security:
- The server admin and other users should not log in the server from a public or shared computer. Also, it is recommended that you close all other websites when logged in the server.
- The server admin and other users must not misuse the server.

Device security (activation and check-in):
- It is recommended that you activate the devices in factory. The devices are protected by the Theft Deterrent solution only after activation completes.
- Guarantee that the devices can check in with the server.

Note: It is highly recommended that you do not install any unrelated software on the server machine.
If you cannot keep the server security or all the devices have good Internet connection, you can choose Intel cloud services.

3.4.4 Other Requirements

Also, if you have installed a server earlier than version 3.x (including 3.x) on the system, it is highly recommended that you uninstall this server and its dependencies (Tomcat and PostgreSQL) before installing the current server to avoid port conflict.

However, if you want to keep the earlier version of the server, you must stop its dependency, Tomcat, while installing and running the current server.
4. Deploy Theft Deterrent server on Debian

This chapter introduces the procedures to deploy the server on Debian.

The deployment steps install the download feature as part of the web service by default. If you want to use a separate download server, complete the following deployment steps and then configure the server to use the separate download server with the steps in chapter 7.

4.1 Install Dependencies

You must install the following dependencies on your Debian system before installing the server:

<table>
<thead>
<tr>
<th>Dependency</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>sudo</td>
<td>&gt;=1.7</td>
</tr>
<tr>
<td>Ufw</td>
<td>&gt;=0.2</td>
</tr>
<tr>
<td>Python</td>
<td>&gt;=2.6</td>
</tr>
<tr>
<td>Dialog</td>
<td>&gt;=1.0</td>
</tr>
</tbody>
</table>

To install the dependencies, follow these steps:

Note: Connect the machine to the Internet or use the Debian CD to install the dependencies.

1. Change to root account with the following command. Input password when needed:

   su -

2. Open the sources list located at /etc/apt/sources.list and add the following lines. Replace [release] with the Debian release version.

   ```
   deb http://cdn.debian.net/debian/ [release] main
   deb-src http://cdn.debian.net/debian [release] main
   ```

3. Update the sources list with the following command:

   ```
   apt-get update
   ```

4. Install dialog with the following command:

   ```
   apt-get install dialog
   ```

4.2 Install Theft Deterrent server

Copy the server installation package (Theft_Deterrent_server_v4.0.3010X.[version]) to any folder in the local disk. Go to the folder and then run the following commands:

1. Change to root account and input password when needed:

   ```
   su -
   ```

2. Change the file permission of the installation package:
3. Run the installation package to open the install wizard:

```
chmod +x Theft_Deterrent_server_v4.0.3010X.[version]
```

Follow these steps to deploy the server:

4. Select the language of your choice and then select **Next**. Press **Enter**.
5. Press **Enter** to accept the license agreement.
6. Select the **Local database** option and then select **Next**. Press **Enter**.

![Figure 7 - Database Location](image)

7. Set a password for the database server. Select **Next** and then press **Enter**.
8. Select a **server support mode** of your choice and then select **Next**. Press **Enter**.

![Figure 8 - Server Support Mode](image)

9. If you choose to install the **Stand-alone** mode, select select the Root Public Key type for your deployment on the next page.
10. If you choose to deploy the server with your own Root Public Key, you must import the Root Public Key file (with the extension .pubkey or .bin) by copying the key to your local machine and then inputting the location of the key in the following window. (e.g. /opt/CmpcRoot.pubkey)

**Figure 10 - Import Root Public Key (Stand-alone Mode)**

**Note:** In the install wizard, use Tab or arrow keys to move between the windows. Within the directory or filename windows, use the up or down arrow keys to scroll the current selection. Use the Space bar to confirm the selection.

11. On the next step, set a password and email for the master admin account. Select Next and then press Enter.

12. On the next step, specify your HTTP and HTTPS ports if you want to change or select Next to use default value (80 for HTTP and 443 for HTTPS).
13. Confirm the settings and then select OK. Press Enter.
14. Wait for the installation to complete.
15. After completion, you can select OK exit and automatically start TheftDeterrent Server, or select Exit without start the server to finish installation without TD service automatically start after system boot up.

Note: The password must be 8 to 30 characters in length and must contain at least one lowercase letter [a-z], uppercase letter [A-Z], number [0-9], and special character. It must not contain sequences of the same character (e.g. aa, 33, ##) or numbers that are longer than 5 characters (e.g. 12345, 67890).

To deploy the server with a separate database, contact the Intel local TME for support.

4.3 Best Practice of Performance Tuning

The default configuration of the server has limited the resource assignment, which could be a bottleneck for the server performance. To improve the performance of the server, you can tune the database service, web service, log, and download service with the perconfig tool.

If your server is deployed on LAN and manages less than 5K online devices, no tuning step is required and you can skip this chapter.

Otherwise, improve server performance with the following steps:
1. Run the following commands with root privilege to start the `perfconfig` tool:

```
cd /opt/Theftdeterrentserver/bin
./perfconfig
```

2. Select a language of your choice.

```
root@xyanglzk-debian2:/opt/theftdeterrentserver/bin# ./perfconfig

Information:
Theft Deterrent server performance configuration tool (4.6.0.14390)
Copyright (c) Intel Corporation. All rights reserved.

Select language:
1. English
2. Espanol (N/A)
3. Portugues (N/A)
4. Русский (N/A)
Input (1|2|3|4)[default:1]: 2
```

3. Select the number of online devices that your server will manage.

```
Information:
System Summary
Operating System Information
  Linux (Linux 3.16.0-4-amd64)
Processor Information
  CPU(1): 2999 MHz
  CPU(2): 2999 MHz
Memory Information
  Committed Bytes In Use: 1243.27734375 MB
  Available MBytes: 10802.5076125 MB
  Total MBytes: 12045.7651625 MB
Logging Folder Information
  Total Used MBytes: 123.11646256256104 MB
  Available MBytes: 26339.9375 MB

How many devices does your server manage?
1. <= 1K
2. <= 10K
3. <= 50K
4. <= 100K
5. <= 200K
Input (1|2|3|4|5)[default:2]: 2
```

4. You might also need to configure the following settings:

- **Is your server deployed on LAN or the Internet?**

```
Is your server deployed on LAN or the Internet?
1. LAN
2. Internet
Input (1|2)[default:2]: 1
```

- **Input the individual download speed limit (KB/s):** Set a download limit for the local download feature. This setting will not affect any separate download server.

```
Input the individual download speed limit(KB/s):
Input [default:100]: 100
```
• **How many log files you want to save?**

![Log files selection screenshot]

5. Input 1 and press ENTER to restart the web service.

![Restart confirmation screenshot]

### 4.4 Upgrade Theft Deterrent server

You can upgrade the server from version 4.x to a higher version. All the data and settings of the server are kept after the upgrade. Before upgrading, it is recommended that you [back up the server](#).

There are two kinds of upgrade package:

1. Upgrade only the TDserver itself without 3rd party dependency, using package named as Theft_Deterrent_server-upgrade_v4.0.3010X.[version] can be used for the size is much smaller than full installer package.

2. Upgrade both the TDserver and 3rd party dependency, using the installer package Theft_Deterrent_server_v4.0.3010X.[version] for the upgrade.

To upgrade a TDserver without 3rd party dependency, follow these steps:

1. Copy the latest server upgrade package (named as Theft_Deterrent_server-upgrade_v4.0.3010X.[version]) to the local disk.
2. Open the installation wizard by following the steps:

   ```
   ./*Theft_Deterrent_server-upgrade_v4.0.3010X.[version] install
   ```

3. Select a language of your choice and accept the license agreement.
4. Then wait for the wizard to complete the upgrade.
5. Clear cache of your browser before login to server again.

To upgrade a TDserver with 3rd party dependency, follow these steps:
1. Copy the latest server upgrade package (named as Theft_Deterrent_server-upgrade_v4.0.3010X.[version]) to the local disk.
2. Open the installation wizard by following the steps.

   ```
   .:/Theft_Deterrent_server_v4.0.3010X.[version] install
   ```

3. Select a language of your choice and accept the license agreement.
4. On the next page, select **Upgrade or Repair** to upgrade with keep all data.
5. Follow the installation wizard to complete the upgrade for TDserver and 3rd party dependency.
6. Clear cache of your browser before login to server again.

---

**Note:** The browser will cache old server and make the webpage display maybe distort after server upgrade.

**Figure 13 - Upgrade Theft Deterrent server**

---

### 4.5 Repair or Re-install Theft Deterrent server

If upgrade failed, the current server may be corrupted. You can repair the server with the current installation package. And you can reinstall the server to remove the server data, settings and key files. Before repair or re-install, it is recommended that you back up the server.

To repair or re-install a server, follow these steps:

1. Copy the latest serve install package (Theft_Deterrent_server_v4.0.3010X.[version]) to the local disk.
2. Open the installation wizard by following the steps in chapter 4.2.

   ```
   .:/Theft_Deterrent_server_v4.0.3010X.[version] install
   ```

3. Select a language of your choice and accept the license agreement.
4. On the next page, select **Upgrade or Repair** to keep all data and **Re-install** to remove all data of your current server.
5. Follow the installation wizard to complete the installation.

### 4.6 Uninstall Theft Deterrent server

If you want to uninstall the server, it is recommended that you back up the server before the action.

**Note:** Make sure that no device is managed by the server any more. Otherwise, the devices might be locked within a certain period of time.

To uninstall the server, follow these steps:

1. Go to the directory that contains the server installation package.
2. Run the following command with root privilege to uninstall the server.

   ```
   ./Theft_Deterrent_server_v4.0.3010X.[version] remove
   ```
5. Deploy Theft Deterrent server on Windows

This chapter introduces the procedures to deploy the server on Windows.

The deployment steps install the download feature as part of the web service by default. If you want to use a separate download server, complete the following deployment steps and then configure the server to use the third-party download server with the steps in chapter 7.

5.1 Install Theft Deterrent server

Copy the server installation package (Theft_Deterrent_server_v4.0.10000.[version].zip) to the local disk and then extract the installation package into a temporary folder. In the temporary folder, right-click setup.exe and select Run as administrator to open the installation wizard.

Follow these steps to deploy the server:

1. Select a language of your choice and then click OK.

   ![Figure 15 - Choose language]
   

2. Accept the license agreement and then click Next.
3. Select Local Database and then click Next.

   ![Figure 16 - Database Location]

4. Set a password for the database server and then click Next.
5. Select a server support mode of your choice and then click Next.
6. If you choose to install the **Stand-alone** mode, select the Root Public Key type for your deployment on the next page.

![Figure 17 - Server Support Mode](image)

**Figure 17 - Server Support Mode**

7. If you choose to deploy the server with **your own Root Public Key**, you must import the Root Public Key file (with the extension .pubkey or .bin) by copying the key to your local machine and then browse to the location of the key. (e.g. C:\CmpcRoot.pubkey)

![Figure 18 - Stand-alone Mode](image)

**Figure 18 - Stand-alone Mode**
8. On the next step, set a password and email for the master admin account and then click Next.
9. Confirm the settings and then click Install.
10. The installation will be completed in about 20 minutes.

**Note:** The password must be 8 to 30 characters in length and must contain at least one lowercase letter [a-z], uppercase letter [A-Z], number [0-9], and special character. It must not contain sequences of the same character (e.g. aa, 33, ##) or numbers that are longer than 5 characters (e.g. 12345, 67890).

To deploy the server with separate database, contact the Intel local TME for support.

### 5.2 Best Practice of Performance Tuning

If your server is deployed on LAN, no tuning step is required and you can skip this chapter.

If your server is deployed on the Internet, improve the performance of your server with the following steps because the default configuration of the server has limited the resource assignment, which could be a performance bottleneck.

#### 5.2.1 Common Configuration

Configure the performance options in Windows with the following steps:

2. On the popup window, switch to the Advanced tab and click Settings in the Performance area.
3. In the Visual Effects tab, select the Adjust for best performance option as shown below and then click Apply.
4. Switch to the **Advanced** tab, select **Background services** in the **Processor scheduling** area and then click **OK**.

Enable Write-caching for hard disks with the following steps:

5. From Windows desktop, click the **Start** menu-> **Control Panel** -> **Hardware** -> **Device manager**.
6. Double-click Disk drivers in the Device Manager window.
7. Right-click the hard disk device where the server is installed and select Properties.
8. On the popup window, click on the Policies tab and check Enable write caching on the device. Then click OK.

Figure 22 - Configure Performance (3)

Add the server URL to Trusted sites with the following steps:

10. On the Security page, select Trusted Sites and click the Sites button.
11. On the popup window, input https://localhost/ and then click the Add button.

Figure 23 - Add Trusted Sites

12. Click Yes on the confirmation window. Click Close.
13. Make sure that the security level for Trusted sites is Medium and then click OK.
5.2.2 Tune the Performance

The default configuration of the server has limited the resource assignment, which could be a bottleneck for the server performance. To improve the performance of the server, you can tune the database service, web service, log, and download service with the perfconfig tool.

If your server is deployed on LAN and manages less than 5K online devices, no tuning step is required and you can skip this chapter.

Otherwise, improve server performance with the following steps:

1. Run the following commands with admin privilege to start the perfconfig tool:

   ```
   cd C:\Program Files\Intel Education Software\Theft Deterrent server\bin
   call perfconfig.bat
   ```

2. Select a language of your choice.
3. Select the number of online devices that your server will manage.
4. You might also need to configure the following settings:
   - Is your server deployed on LAN or the Internet?
   - Input the individual download speed limit (KB/s): Set a download limit for the local download feature. This setting will not affect any separate download server.
   - How many log files you want to save?

5. Input 1 and press ENTER to restart the server.

5.3 Upgrade Theft Deterrent server

If upgrade failed, the current server may be corrupted. You can repair the server with the current installation package. Before repair or re-install, it is recommended that you back up the server.
There are two kinds of upgrade package:

1. Upgrade only the TDServer itself without 3rd party dependency, using package named as Theft_Deterrent_server-upgrade_v4.0.10000.[version] can be used for the size is much smaller than full installer package.

2. Upgrade both the TDServer and 3rd party dependency, using the installer package Theft_Deterrent_server_v4.0.10000.[version] for the upgrade.

To upgrade a TDServer without 3rd party dependency, follow these steps:

1. Copy the latest server upgrade package (named as Theft_Deterrent_server-upgrade_v4.0.10000.[version].zip) to the local disk then extract the installation package into a temporary folder. In the temporary folder, right-click setup.exe and select Run as administrator to open the installation wizard.
2. Select a language of your choice and accept the license agreement.
3. Then wait for the wizard to complete the installation.
4. Clear cache of your browser before login to server again.

To upgrade a TDServer with 3rd party dependency, follow these steps:

1. Copy the latest server upgrade package (named as Theft_Deterrent_server-upgrade_v4.0.10000.[version].zip) to the local disk then extract the installation package into a temporary folder. In the temporary folder, right-click setup.exe and select Run as administrator to open the installation wizard.
2. Select a language of your choice and accept the license agreement.
3. On the next page, select Upgrade or Repair to upgrade with keep all data.
4. Follow the installation wizard to complete the upgrade for TDServer and 3rd party dependency.
5. Clear cache of your browser before login to server again.

![Figure 25 – Upgrade Theft Deterrent server](image)  

*Note:* The browser will cache old server and make the webpage display maybe distort after server upgrade.
5.4 Repair or Re-install Theft Deterrent server

If upgrade failed, the current server may be corrupted. You can repair the server with the current installation package. And you can reinstall the server to remove the server data, settings and key files. Before repair or re-install, it is recommended that you back up the server.

To repair or re-install a server, follow these steps:

1. Copy the latest server upgrade package (named as Theft_Deterrent_server_v4.0.10000.[version].zip) to the local disk then extract the installation package into a temporary folder. In the temporary folder, right-click setup.exe and select Run as administrator to open the installation wizard.
2. Select a language of your choice and accept the license agreement.
3. Select Upgrade or Repair to keep all data and Re-install to remove all data of your current server.

Figure 26 – Repair or re-install Theft Deterrent server

4. Follow the installation wizard to complete the installation.

5.5 Uninstall Theft Deterrent server

If you want to uninstall the server, it is recommended that you back up the server before the action.

Note: Make sure that no device is managed by the server any more. Otherwise, the devices might be locked within a certain period of time.

You can uninstall the server by using either the installation package or the Control Panel.

To uninstall the server with the installation package, follow these steps:

1. Open the folder that contains the installation package.
2. In the folder, right click setup.exe and select Run as administrator to open the uninstall wizard.
3. Click Next on the welcome page. Click Next.
4. Click Remove to uninstall the server.
5. Wait for the process to complete and then click Finish.
6. Reboot the system.
To uninstall the server from the Control Panel, follow these steps:

1. Click the Start menu -> Control Panel -> Programs -> Programs and Features.
2. Right-click Intel(R) Education Theft Deterrent server and select Uninstall.
3. Click Yes to confirm the action.
4. Click Yes to reboot the system.
6. Theft Deterrent server Pre-configurations

After server installation completes, you can use the server functionalities by accessing the server webpage with the following URL, where `[serverURL]` is the IP address or hostname of the server.

- [https://[serverURL]/TheftDeterrent](https://[serverURL]/TheftDeterrent)

To log in the server with the master admin account, use the following credentials:

- The username is `admin`
- The password is the one set during the installation process.

### 6.1 First Time Configurations

When you log in the server for the first time, you must complete certain settings before accessing the server functionalities. The settings differ according to the server support mode, which is set during the installation of the server.

<table>
<thead>
<tr>
<th>Server Support Mode</th>
<th>First login settings</th>
</tr>
</thead>
</table>
| Stand-alone mode    | • Set up Server Name & Address & Auto-backup strategy (Optional)  
  • Set up Email Server (Optional)  
  • Set up Root server address (Optional) |
| Central Server supported | • Activate or reactivate at Centre Server  
  • Set up Server Name & Address & Auto-backup strategy (Optional)  
  • Set up Email Server (Optional) |
| Proxy mode          | • Activate or reactivate at Sponsor server  
  • Set up Server Name & Address & Auto-backup strategy (Optional)  
  • Set up Email Server (Optional)  
  • Edit Sync-up Schedule (Optional) |

#### 6.1.1 Activate/Reactivate Proxy server at Sponsor Server

If the server is installed with the Proxy mode, you must activate or reactivate the server with the sponsor server during first login.

If the Proxy server has never been registered or activated on the Sponsor server, follow these steps to online activate the server:
1. In Proxy server, on the **Activate Theft Deterrent server** page for **Register**, input proxy server information and IP address of the sponsor server. Click **Register Server** and your activation request will be sent to the sponsor server.

![Figure 27 – Activate Proxy Working flow](image)

2. In Sponsor server, choose **Servers->Pending Approvals**. Select the proxy that you want to approve, and click **Accept Proxy Server**.

![Figure 28 - Register Server](image)

3. In Sponsor server, copy the **Activation Code** generated and send the **Activation Code** to Proxy server by email or offline.

![Figure 29 - Pending approvals](image)
4. In Proxy server, inputs the activation code and Sponsor server address to activate the proxy server.

5. When you see the activation success message, click OK.

Except the online register/activation, you can do the offline register/activation through these steps if no connectivity between central server and TD server:

1. In TD server, click the Register offline to export the offline registration package
2. In Sponsor server, import the Offline registration package and export the offline activation package
3. In TD server, click Activation offline and import the offline activation package to finish the activation process.

If want to crash recovery an activated Proxy server with a new installed Proxy server, follow these steps to reactivation the server:

1. In Sponsor server, click Servers->Proxy Servers and click the proxy server that is going to be reactive. In detail page, click Re-activate Server. Then the server will be moved under Servers -> Pending Approvals as Re-activating Status.
2. In Proxy server, On the **Activate Theft Deterrent server** page for Register, click **Re-activate**. On the **Re-activate Theft Deterrent server** page, input the Activation code and the URL for Sponsor server. Then click **Re-activate Server**.

3. When you see the reactivation success message, click **OK**.

### 6.1.2 Activate/Reactivate at Central Server

If the server is installed with the **Central Server supported** mode, you must activate or reactivate the server with the Central server during first login. The Central server can be a legacy Central server in 3.x or a TDv3 server 4.5.x in Sponsor mode running as a Central server.

**Requirements:**
- If activate it in Central server: make sure that the central server is connected with the Root CA server, keep connection between TD server and Central server.

- If activate it in Sponsor server: make sure the Sponsor server set the Root CA server address and is connected with the Root CA server, keep connection between TD server and Sponsor server.

If the server has never been registered or activated on the central server, follow these steps to activate the server:

1. On the **Activate Theft Deterrent server** page (Step 1), input all server information and the IP address of the central server.

2. Click **Register Server** and your activation request will be sent to the central server. 

   **Figure 34 - Activate Server**

3. When your request is approved by the central server admin, you will receive an activation code. The approval process might take a while and you can log out of the server during this period.

4. After you receive the activation code, log in the server and click **Register Server** on the **Activate Theft Deterrent server** page (Step 1). You can skip this step if you did not log out the server.

5. On the **Activate Theft Deterrent server** page (Step 2), input the activation code and the IP address of the central server. Then click **Activate Server**.

6. When you see the activation success message, click **OK**.
Except the online register/activation, you can do the offline register/activation through these steps if no connectivity between central server and TD server:

1. In TD server, click the **Register offline** to export the offline registration package.
2. In Central server, import the Offline registration package and export the offline activation package.
3. In TD server, click **Activation offline** and import the offline activation package to finish the activation process.

If you had already activated a server that later crashed and its key pair are lost permanently, you can replace the crashed server by installing a new server with the **Central Server supported** mode.

Follow these steps to reactivate at Central server:

1. Contact central server admin offline to request an activation code for reactivation.
2. On the **Activate Theft Deterrent server** page (Step 1), click **Skip**.
3. On the **Activate Theft Deterrent server** page (Step 2), input the activation code and the IP address of the central server. Then click **Reactivate Server**.
4. When you see the reactivation success message, click **OK**.

### 6.1.3 Set up Server Name & Address & Auto-back Strategy

**Server name**

- Server name must be less than 128 characters in length.
- If the server is installed with the **Central Server supported** mode, the server name is already set during the activation process.

**Server IP address/ URL**

- Server address is the IP address or URL of the server machine.
- This server address will be broadcasted to the clients when the **Automatic Server Broadcast** function is turned on in LAN.

**Auto-backup strategy**

- Turn on/off for the auto-backup policy.
- Interval for the auto-backup policy.

### 6.1.4 Set up E-mail Notification Service

You can set up the e-mail service to send user account and server information to users via e-mail. Input the following information:

- **E-mail username**: the e-mail address of your e-mail account
- **E-mail password**: the password of your e-mail account
- **SMTP server**: the hostname of the SMTP server.
- **Port**: the port number of the SMTP server.
- **Security Mode**: select a security mode.
After the email service is configured correctly, the server will send out e-mails in the following cases:

<table>
<thead>
<tr>
<th>When to send e-mails</th>
<th>Recipient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admin creates new user accounts</td>
<td>The new user</td>
</tr>
<tr>
<td>Admin resets user passwords</td>
<td>The user</td>
</tr>
<tr>
<td>Someone forgets his/her password and requests password reset</td>
<td>The person him/herself</td>
</tr>
<tr>
<td>Someone sets up the E-mail Notification function</td>
<td>The e-mail addresses that this person configured for the function</td>
</tr>
</tbody>
</table>

After you complete the first login settings, you will see the server Home page. You can also open the Inventory, Groups & Accounts, Servers (only for Sponsor server) and Settings pages to access different functions.

6.1.5 Set up Root server address

If you install a server in Standalone mode, and this server may manage the non-Proxy server in future, it is highly recommended you setup the Root server Address after first login.

You can access the Root server address setting in Settings -> Advanced tab.
6.1.6 Set up Sync-up Schedule

After Proxy server activated, the sync-up schedule is initialized to a random time with daily frequency. It is highly recommended you can set the regular fully sync-up frequency according to your network situation.

You can access the Server Sync-up setting in Settings -> Server tab.

Figure 38 - Set Up Sync-up Schedule

6.2 Modify the Server Log Level

By default, the server is set with the DEBUG log level to log all precise contexts concerning its running status in case any error occurs and requires debugging.

The log levels affect the server performance as follows:

<table>
<thead>
<tr>
<th>Log Level</th>
<th>Server Performance</th>
<th>Information Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEBUG</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>INFO</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>WARN</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

If you are experiencing slow server performance, it is recommended that you lower the server log level with the following steps. Otherwise, you can skip this chapter.

1. Open the log configure file:
   - Debian: /opt/TheftDeterrentserver/Site/webapps/TheftDeterrent/WEB-INF/classes/log4j.properties
   - Windows: %SystemDrive%\Program Files\Intel Education Software\Theft Deterrent server\Site\webapps\TheftDeterrent\WEB-INF\classes\log4j.properties

2. Set the log level to INFO or WARN by changing a line in the configure file as follows:

   log4j.logger.com.intel=INFO

   or

   log4j.logger.com.intel=WARN

3. Restart the server:
   - Debian: run the following command: service theftdeterrentserver restart
   - Windows: click the Start menu -> All Programs -> Intel Education Software -> Theft Deterrent server -> Start Server.
6.3 Server Installation Directories and Log Files

While using the server, make sure that you follow these rules:

- On both Windows and Debian, do not change the access permission to the installation directories.
- On Windows, do not access the installation directories with a standard user account by inputting the administrator password when prompted by Windows User Account Control.

The installation directories of the server are as follows:

**Windows:**
- `%SystemDrive%\Program Files\Intel Education Software\Theft Deterrent server`
- `%SystemDrive%\ProgramData\TheftDeterrent2`

**Debian:**
- `/opt/TheftDeterrentserver`
- `/etc/TheftDeterrent2`

The location of the binary files and log files are as follows:

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Linux</th>
<th>Windows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shortcut</td>
<td><code>/usr/local/theftdeterrentserver</code></td>
<td>Start menu -&gt; Intel Education Software -&gt; Theft Deterrent server</td>
</tr>
</tbody>
</table>
| Log folder       | `/var/log/theftdeterrentserver`  
                  | `/opt/TheftDeterrentserver/Site/logs` | `%systemdrive%\log\theftdeterrentserver` |
7. **Use Separate Download Server**

To use a separate download server for your server, you must first complete the deployment steps in chapter 4 or 5 and the pre-configuration steps in chapter 6. Then configure the server to use the separate download server.

You can either set up a separate download server or use an existing download services provided by a CDN operator, a cloud based download server, etc. If you want to set up your own download server, see Configure Download Server.

### 7.1 Configure Download Server

The deployment or configuration steps of the third-party download server are beyond the scope of this document. You can contact your third-party server provider for support.

However, if you have not decided which third-party download server to use, you can install another Theft Deterrent server to function as a download server with the following steps:

1. Install another Theft Deterrent server on a machine that meets the download server requirements.
2. Copy the client upgrade packages to the following location manually, according to your operating system:
   - **Windows**: `C:\Program Files\Intel Education Software\Theft Deterrent server\Site\webapps\tdupdate`
   - **Debian**: `/opt/TheftDeterrentserver/Site/webapps/tdupdate`

   **Note**: To obtain a client upgrade package, which ranges from 2MB to 10MB in size, contact the Intel local TME.

   Connect this download server to the same network as the server.

### 7.2 Configure Download Feature on Theft Deterrent server

When the download server is ready, configure the server to use the download server with the following steps:

1. Log in the server and open the Advanced page under Settings.
2. Click the **Configure download server(s)** link in the Smart Client Upgrade area.
3. Input the following information:
   - **Server Name**: the name of the download server.
   - **URL**: the location of the upgrade packages in the download server, which must be in HTTP scheme. For example, if you use another Theft Deterrent server as the download server, the URL is `http://[DownloadServer URL]/tdupdate/`

   **Note**: This URL is provided to clients for downloading upgrade packages when the Smart Client Upgrade function is enabled. However, you must copy the upgrade packages to your download server manually.

   - **Concurrent Download Limitation**: the maximum number of devices that can download the upgrade packages at the same time.
- Client Speed Limitation: the maximum network speed for a device to download the upgrade packages.

4. Click the Save Button.

You can configure multiple download servers. However, it is recommended that you keep the maximum number of download servers below 15.

You can select one or multiple download servers to implement the download function at the same time. The local server is the local download feature provided by default.

Note: When you add, edit, or delete a download server, the configuration takes effect only after you click the Save button.

Figure 39 - Configure Download Server

For more information on how to configure the separate download server, contact your local TME for support.
8. Manually Deploy Theft Deterrent client and guardian

The client and the Theft Deterrent guardian (guardian) are Theft Deterrent components that run on devices. The client can lock and unlock devices based on the certificates received from the Theft Deterrent server while the guardian is a client protection application that restores the client if it is uninstalled or disabled.

Both components support the following operating systems:
- Windows 7 or above
- Debian 7, Debian 8 and Debian 9 32-bits or 64-bits
- Ubuntu 14.04, Ubuntu 16.04 32-bits or 64-bits
- Android

The client and guardian are usually preloaded in factory during the manufacture of the devices. If your device is not preloaded with a client or guardian, you can deploy the components manually. As a best practise, the client should be kept running at all times. Therefore, for each client deployed, you must deploy a guardian on the same device.

This chapter introduces the steps to deploy the client and guardian on devices running the Windows or Debian operating system. For all devices running the Android operating system, the client and guardian are always preloaded and thus would not require manual deployment.

**Note:** The device’s TPM must be initialized in manufacture line before you deploy the client and guardian or the components will report error.

8.1 Deploy Theft Deterrent client and guardian on Windows

For devices running the Windows operating system, the installation package (Theft_Deterrent_client_guardian_[version].zip) supports two deployment methods:
- Command line, which installs client and guardian together.
- Install wizards, which install client and guardian separately.

For large deployments, it is recommended that you use the command line to install the client and guardian. Such deployment provides efficiency because the two components are deployed together while no user interaction is required during the process.

If you are deploying on a single device, you can use the install wizards, which are more user-friendly.

8.1.1 Prerequisite

Before you install the client, you must install **.Net 3.5 SP1** on the Windows operating system if not already installed.
- For Windows 7, you can install **.Net 3.5 SP1** either by turning on the feature in **Windows Feature** or by downloading and installing the package from Microsoft website.
- For Windows 8, download and install **.Net 3.5 SP1** from Microsoft website.
8.1.2 Install with Install Wizard Separately

With the install shield wizard, the client & guardian need be installed one by one. Generally, need install client at first, then install the guardian.

To install the client with the install wizard, follow these steps:
1. Extract the installation package (Theft_Deterrent_client.guardian_[version].zip) into a temporary folder.
2. In the temporary folder, open the agent folder under bin, right-click setup.exe, and select Run as administrator to open the installation wizard.
3. Select a language of your choice and then click OK.
4. Click Next on the welcome page.
5. Set the protection password for the client and then click Next. If you do not want to set the password, leave the password field blank, click Next and then click OK on the confirmation window.
6. Click Next to start the installation. This might take a few minutes.
7. When the installation completes, click Finish.
8. Click Yes on the popup window to reboot the system.

Note: The protection password must be 6 to 30 characters in length and must contain at least one uppercase letter [A-Z], one lowercase letter [a-z], one number [0-9], and one special character. If you set up the protection password during the installation, the password is required when you change the client settings or uninstall the client. The protection password can be reset by the server admin.

To install the guardian with the install wizard, follow these steps:
1. Extract the installation package (Theft_Deterrent_client.guardian_[version].zip) into a temporary folder.
2. In the temporary folder, open the guardian folder under bin, right-click setup.exe, and select Run as administrator to open the installation wizard.
3. Select a language of your choice and then click OK.
4. Click Next on the welcome page.
5. Set the protection password for the client and then click Next. If you do not want to set the password, leave the password field blank, click Next and then click OK on the confirmation window.
6. Click Next to start the installation. This might take a few minutes.
7. When the installation completes, click Finish.
8. Click Yes on the popup window to reboot the system.

Note: The protection password must be 6 to 30 characters in length and must contain at least one uppercase letter [A-Z], one lowercase letter [a-z], one number [0-9], and one special character. This protection password will replace the password set during the client installation.

8.1.3 Install with full installation package

To easy the installation process, there is a 2in1 installation package to install 2 packages by one executable file. To install the client and guardian with 2in1 package, follow these steps:
1. Click the Start menu -> Accessories -> right-click Command Prompt -> select Run as administrator.
2. Go to the in the temporary folder saved the 2in1 package named as “install_xxxxxx.exe”, run install_xxxxxx.exe.

3. The installer will prompt you to restart the system once the installation completes.

The client displays the language of the operating system. If the display language of the operating system is English, Portuguese, Turkish, or Spanish, the client follows the same display language. Otherwise, the client is displayed in English.

8.2 Deploy Theft Deterrent client and guardian on Debian

8.2.1 Install Dependency

You must install dbus on your Debian 7 operating system if not already installed. To install dbus, follow these steps:

- **Note:** Connect the machine to the Internet or use the Debian CD.

1. Change to root account with the following command. Input password when needed:

   ```bash
   su -
   ```

2. Install dbus with the following command:

   ```bash
   apt-get install dbus wireless-tools dmidecode
   ```

8.2.2 Install Theft Deterrent client and guardian with separately package

If you have 3 separately release package, follow these steps to install:

1. Copy the three installation packages to any folder in. (e.g., /tmp/):

   - Theft_Deterrent_client_[version].zip
   - Theft_Deterrent_guardian_[version].zip
   - theftdeterrentclient-lib_[version].deb

2. Change to root account with the following command. Input password when needed:

   ```bash
   su -
   ```

3. Go to the folder containing the installation package. For example,

   ```bash
   cd /tmp
   ```

4. Install client dependence libraries:

   ```bash
   dpkg -i theftdeterrentclient-lib_[version].deb
   ```

5. Unzip client and Install client with specific language:

   ```bash
   unzip Theft_Deterrent_client_[version].zip
   ./Theft_Deterrent_client_[version] install [Language]
   ```

6. Unzip the guardian and Install guardian:

   ```bash
   unzip Theft_Deterrent_guardian_[version].zip
   ./Theft_Deterrent_guardian_[version] install
   ```
8.2.3 Install Theft Deterrent client and guardian with full package

If you have the release package named as Theft_Deterrent_client_guardian_[version].tar.gz, follow these steps to install:

Copy the server installation packages (Theft_Deterrent_client_guardian_[version].tar.gz) to any folder in the local disk. Go to the folder and then run the following commands with root privilege:

1. Change to root account with the following command. Input password when needed:

   ```
su -
   ```

2. Extract the installation package into a temporary folder, for example, /tmp, with a command such as the following:

   ```
tar -zxvf install.tar.gz -C /tmp
   ```

3. Go to the bin folder in the temporary folder:

   ```
cd /tmp/bin
   ```

4. Run the installation script:

   ```
chmod a+x install.sh
./install.sh [language]
   ```

Replace [language] with one of the following values to assign a display language for the client. The default display language is English.

8.3 Pre-set server address and address modify protection password

The server address can be preset in master image, so all the client will have the server address before it shipped out to end customer.

A password to protect the server address being changed can be preset in the master image as well. This password will be reset to the protection password in server setting once after the client connects with the server.

<table>
<thead>
<tr>
<th>Item</th>
<th>Windows method</th>
<th>Linux method</th>
<th>Android method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server address</td>
<td>In Master image: edit the address and</td>
<td>A file named as tdip.txt</td>
<td></td>
</tr>
</tbody>
</table>
8.4 Open Theft Deterrent client

The client and guardian are loaded automatically at system start-up. You can open the client from either the client tray icon or the shortcut according to your operating system. For more information on how to use the client, see the Intel® Education Theft Deterrent client User Manual.

8.4.1 Open Theft Deterrent client on Windows

If your operating system is Windows 7, you can open the client with either of the following methods:

- Click the Theft Deterrent client application icon on the desktop.
- Right-click the client tray icon and select **Open Theft Deterrent client**.

If your operating system is Windows 8, you can open the client with one of the following methods:

- Click the Theft Deterrent client application icon on the Start screen.
- Click the Theft Deterrent client application icon on the desktop.
- Right-click the client tray icon on the desktop and select **Open Theft Deterrent client**.

If the client is in Inactive status, right-click the client tray icon on the desktop and select **Help** for instructions on how to activate the client.

![Figure 40 – Client Inactive Tray Icon (Windows)](image)

8.4.2 Open Theft Deterrent client on Debian

If your operating system is Debian 7, you can open the client by clicking the client tray icon on the upper-right corner of the desktop. If the client is in Inactive status, right-click the tray icon and select **Help** for instructions on how to activate the client.
Figure 41 – Client Inactive Tray Icon

Note: The client tray icon is only supported in GNOME 3.4 or above.

Also, if your Debian 7 displays the GNOME desktop, you can open the client by clicking Applications -> All -> the Theft Deterrent client icon.

Figure 42 - Shortcut on GNOME

If your Debian 7 displays the GNOME Classic desktop, you can open the client by clicking Applications -> System Tools -> Theft Deterrent client.
8.5 Installation Directories and Log Files

8.5.1 Installation Directories

The installation directories of the client and guardian are as follows:

<table>
<thead>
<tr>
<th>Operating system</th>
<th>Component</th>
<th>Installation Directory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows 7 or 8 32-bits</td>
<td>Client</td>
<td>C: \Program Files\Intel Education Software\Theft Deterrent client\</td>
</tr>
<tr>
<td></td>
<td>Guardian</td>
<td>C: \Program Files\Intel Education Software\Theft Deterrent guardian\</td>
</tr>
<tr>
<td>Windows 7 or 8 64-bits</td>
<td>Client</td>
<td>C: \Program Files (x86)\Intel Education Software\Theft Deterrent client\</td>
</tr>
<tr>
<td></td>
<td>Guardian</td>
<td>C: \Program Files (x86)\Intel Education Software\Theft Deterrent guardian\</td>
</tr>
<tr>
<td>Debian 7</td>
<td>Client</td>
<td>/opt/TheftDeterrentclient/client/</td>
</tr>
<tr>
<td></td>
<td>Guardian</td>
<td>/opt/TheftDeterrentclient/guardian/</td>
</tr>
<tr>
<td>Android</td>
<td>Client</td>
<td>/data/data/com.intel.cmpc.td.agent/</td>
</tr>
<tr>
<td></td>
<td>Guardian</td>
<td>/data/data/com.intel.cmpc.td.guardian.service/</td>
</tr>
</tbody>
</table>

8.5.2 Export Log and Log Files

The client log can be exported through the Export Log function in the client Setting tab. A file named as td.log will be generated and rename that as .zip file can

The location of the log files are as follows:

<table>
<thead>
<tr>
<th>Operating system</th>
<th>Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows 7 or 8</td>
<td>C: \ProgramData\Intel\TheftDeterrent</td>
</tr>
</tbody>
</table>
| Debian 7 | /var/theftdeterrent  
|          | /opt/TheftDeterrentClient/client/Theft_Deterrent_Client.autorun.log |
| Android  | /data/data/com.intel.cmpc.td.agent/agent.log |

**Note:** For devices running Android, it is recommended that you install the Android Debug Bridge (**adb**) to access the log files. For example, you can copy the log files to another directory with the following command:

```
adb pull /data/data/com.intel.cmpc.td.agent/agent.log
```

For more information about **adb**, see [Android Debug Bridge](#).
9. Troubleshooting

9.1 Theft Deterrent server Installation Failed

If the installation of the server failed, the install wizard displays an error message. Follow the solutions in this table according to the error message displayed.

<table>
<thead>
<tr>
<th>Error message</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment variables not found.</td>
<td></td>
</tr>
<tr>
<td>Installer files are missing.</td>
<td></td>
</tr>
<tr>
<td>Installer is missing or incorrect.</td>
<td></td>
</tr>
<tr>
<td>Failed to write in installer file.</td>
<td></td>
</tr>
<tr>
<td>Installer file copying failed.</td>
<td></td>
</tr>
<tr>
<td>Installer file removing failed.</td>
<td></td>
</tr>
<tr>
<td>Deploying failed.</td>
<td>Your installation package might be corrupted. Please contact the designated support personnel.</td>
</tr>
<tr>
<td>SSL key creating failed.</td>
<td></td>
</tr>
<tr>
<td>Webserver register failed.</td>
<td></td>
</tr>
<tr>
<td>Database register failed.</td>
<td></td>
</tr>
<tr>
<td>Broadcast register failed.</td>
<td></td>
</tr>
<tr>
<td>Database setting failed.</td>
<td></td>
</tr>
<tr>
<td>Socket Connecting failed. Please make sure that no database management tool is connected to the database.</td>
<td>Disconnect any database management tool from the database server.</td>
</tr>
</tbody>
</table>

For more details about the installation error, check the log files in the following location:

- On Debian: /var/log/theftdeterrentserver/install
- On Windows: %systemdrive%\log\theftdeterrentserver\install
10. FAQ

1. How do I start, stop, and restart the server as well as check server status?
   
   **Answer:** The steps differ according to the server operating system:
   
   - **Windows:** Click Start menu -> All Programs -> Intel Education Software-> Theft Deterrent server -> click Start Server, Stop Server or Check Server Status.
   - **Debian:** Run the following commands with root privilege:
     
     ```
     service theftdeterrentserver start
     service theftdeterrentserver stop
     service theftdeterrentserver restart
     service theftdeterrentserver status
     ```
     
     **Note:** In Windows, if the server is running, you can restart the server by clicking the Start Server option. If the server is installed with a separate database, make sure that you run the command on both the web server and the database server.

2. What do I do if the server webpages are distorted?
   
   **Answer:** First of all, make sure that you are using a web browser supported by the server:
   
   - Firefox
   - Chrome
   - Internet Explorer 8 or above

   Also, it is recommended that you clear the cache, cookies and history in your browser regularly.

3. Why does the client version 2.x keeps rebooting the device after connecting with the server?
   
   **Answer:** The issue might be caused by either of the following reasons:
   
   - The client is connected with and approved by a wrong server. To solve the issue, modify the URL in the client connection settings to connect the client to its related server.
   - The system time on the device is earlier than that on the server. To solve the issue, synchronize the system time between the device and the server, delete the **CMPC TDS SN.xxxxx** certificate in your web browser and connect the device with the server again.

4. Why does the client version 2.x keeps receiving a message asking to install SSL certificate?
   
   **Answer:** For clients with version earlier than 4.x, user must first install the CA certificate by accepting the install message before the client can be activated by the server. However, if the system time of the device is earlier than that on the server, the CA certificate cannot be installed correctly and the client will keep receiving the install message.

   To solve the issue, synchronize the system time between the device and the server.
5. **What is the broadcast service?**

**Answer:** The broadcast service is the server component that performs the **Automatic Server Broadcast**, which functions only on LAN.

In the current version of the server, the web service and the broadcast service are always installed on the same machine and no configuration is required for the broadcast service during deployment. Therefore, this service is not mentioned in the server overview.

6. **How to configure the TD SMS feature?**

**Answer:** TD SMS feature is applied to send TD short messages to receivers through an Android phone connected to TD server.

![Diagram of TD SMS setup](image)

To configure the SMS feature, at first, you need to complete the following installations on the server and Android phone sides respectively:

- **Server side**
  - **TD SMS service:** It will be pre-installed in the server by the TD server installer package.
  - **ADB (Android ADB service):** For Windows, the ADB will be pre-installed in the server by the TD server installer package.
  - **Phone driver:** It needs to be downloaded from the phone webpage according to the specific phone type.

- **Android phone side**
  - **TD SMS App:** It needs to be installed and launched in the Android phone to display a PIN code in order to identify the phone.

Then, follow these steps to complete the configuration of the SMS feature:

- Connect the server and the Android phone with a USB cable.
- Log in to the server webpage, and go to **Settings->General->SMS Notification** to input the PIN code shown by TD SMS App and set receiver’s phone number and the frequency of notification, then click the **Save** button.
7. Will I lose all server data when I uninstall the server?
Answer: When you uninstall the server with the steps in chapter 4.6 or 5.5, all the data and settings of the server are not removed from the machine. Therefore, you can restore the data and settings with the upgrade steps when you install a new server on the machine.

8. Can I upgrade from my server 3.x to a server 4.x in another language? For example, from a server 3.x in Spanish to a server 4.x in English.
Answer: Yes. By following the upgrade steps in chapter Error! Reference source not found., you can upgrade your server 3.x to server 4.x regardless of the server display language. The server 4.x supports 4 displays languages: English, Spanish, Portuguese, and Turkish. You can change the display language on server 4.x webpage according to your needs.

9. How do I find out the server support mode of my server?
Answer: To find out the server support mode, you can go to the Home page to understand current mode server is running.

![Server Management Interface](image)

Current server running mode include:

<table>
<thead>
<tr>
<th>Server Mode</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stand-alone server</td>
<td>The server without any connection with other side. If it is with your owner Root Public Key, it can be activate or being activated.</td>
</tr>
<tr>
<td>Central Server supported server</td>
<td>The server was registered and activated to central server (or Sponsor server run as central server).</td>
</tr>
<tr>
<td>Proxy server</td>
<td>The server was registered and activated to Sponsor server.</td>
</tr>
<tr>
<td>Sponsor server</td>
<td>The server was being registered and activated by a Central-server supported or a Proxy server.</td>
</tr>
</tbody>
</table>

10. How do I find the version of the server?
Answer: The server version number is displayed at the button of the server webpage.

11. How do I find the version of the client?
Answer: Open the client tray manual from the client tray icon and click About. The client version number is displayed on the popup window.
11. Appendix

11.1 Choose Root Key Pair

Although Intel hosts a root CA server for external usage, it is strongly recommended that you deploy your own root CA server, which can support a central server for your Theft Deterrent solution.

Also, by running your own root CA server, you will have full control of your Theft Deterrent solution. You will be responsible for the management of your own root CA server instead of interacting with the Intel root CA server admin.

11.2 How to Understand the Network Stability

You can understand the network stability through the network latency. Connect a test machine to the network to stand for the server and ping a URL or IP address, such as a device IP, with the following command.

```
ping [URL]
```

The result should include a series of numbers representing the communication delay, which looks as follows:

![Figure 44 - Check Network Latency]

Find the average round trip times, which is an approximate value for the network latency.

Usage the latency should be smaller than 100ms. If the network latency always bigger than 300ms, it mean your network is quite stable.

11.3 How to Calculate the Required Network Bandwidth

Once powered on, devices will send heartbeat requests to the server regularly (10 minutes by default). In general, the device will send 2.5K bytes to the server, and receive more than 3.3K bytes from the server during each heartbeat.

However, because the devices will not send heartbeat requests simultaneously, you must estimate the peak times of the heartbeat requests to calculate the required network bandwidth.

- Peak times = peak requests / average requests

In general, the minimal peak times is 2, but it is recommend that you use 4.

The network bandwidth required at school for devices to connect with the server:
• Download bandwidth (Mbps) = \( \frac{\text{online devices}}{\text{heartbeat interval}} \times \text{device download rate} \times \text{peak times} \times 8 \)
• Upload bandwidth (Mbps) = \( \frac{\text{online devices}}{\text{heartbeat interval}} \times \text{device upload rate} \times \text{peak times} \times 8 \)

You can set device download rate = 3.3K bytes/s and device upload rate = 2.5K bytes/s.

The network bandwidth required for the web server:
• Download bandwidth (Mbps) = \( \frac{\text{online devices}}{\text{heartbeat interval}} \times \text{server download rate} \times \text{peak times} \times 8 \)
• Upload bandwidth (Mbps) = \( \frac{\text{online devices}}{\text{heartbeat interval}} \times \text{server upload rate} \times \text{peak times} \times 8 \)

You can set server download rate = 2.5K bytes/s and server upload rate = 3.3K bytes/s.

The network bandwidth required for the download server:
Network bandwidth (Mbps) = \( \frac{\text{upgrade file} \times \text{number of devices}}{3600 \times \text{download hours per day} \times \text{download days} \times 8} \) \times \text{valid bandwidth usage}

For example, the upgrade file for the client is about 6.5MB in general. If the devices are powered on 8 hours a day, 100K devices try to download the upgrade file in 7 days, and only 60% bandwidth usage is valid, then the required network bandwidth is as follows:

\[
\frac{6.5 \times 100000}{3600 \times 8 \times 7} \times 60\% = 43Mbps
\]

In general, the more devices, the more valid bandwidth usage. It is recommended that set devices to complete the download in 7 to 14 days.

11.4 How to Improve the Download Performance

The download server sends upgrade packages to devices to fix bugs or update client features. The upgrade packages are generally larger than 6.5MB and therefore the download server will require large bandwidth for many devices to download the packages simultaneously.

You can improve the download performance of your server with one or several of the following methods to reduce the bandwidth requirements.

• **Set up several download servers**
  For example, if devices use two ISPs, A and B, to connect with the server, it would be too costly to put the download server into an Internet data centers (IDC) that has good connection to both ISPs. In such cases, you can set up download servers in both ISP A and ISP B.

• **Use Content Delivery Network (CDN) or cloud based download server**
  Because client upgrade occurs only occasionally, you can use a CDN service or cloud based download server instead of setting up your own download server. For more information, please contract CDN or cloud service provider.

• **Set the HTTP proxy in the school**
  If the schools have HTTP proxy, you can configure the devices to use the proxy, which saves download bandwidth and time.

11.5 How to Back up Theft Deterrent server

To back up the server, follow these steps:
1. **Log on the server** and open the **Advanced** page under **Settings**.
Note: You must complete the pre-configuration steps before you can access the Advanced page.

2. Click the Back up button.
3. To protect the backup files with password, select the option and input a password.
4. To save a copy of the backup file to local disk, select the option.
5. Click Back up.
6. If you chose to save a copy, select a location and save the file.

Note: The password must be 6 to 30 characters in length. This password will be required when you restore the server.

Figure 45 - Back up the server