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Release Date: April 2019

Protected by U.S. Patent No.: 5,951,698
This documentation introduces the main features of the product and/or provides installation instructions for a production environment. Read through the documentation before installing or using the product.

Detailed information about how to use specific features within the product may be available in the Trend Micro Online Help and/or the Trend Micro Knowledge Base at the Trend Micro website.

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Welcome to the Trend Micro™ Virtual Mobile Infrastructure™ version 6.0 Installation and Deployment Guide. This guide helps you to get “up and running” by introducing Virtual Mobile Infrastructure, assisting with deployment, installation, initial configuration, and post-installation configuration tasks.

This preface discusses the following topics:

• *Audience on page vi*
• *Virtual Mobile Infrastructure Documentation on page vi*
• *Document Conventions on page vii*
Audience

The Virtual Mobile Infrastructure documentation is intended for both administrators—who are responsible for administering and managing Mobile Device Agents in enterprise environments—and mobile device users.

Administrators should have an intermediate to advanced knowledge of Linux system administration and mobile device policies, including:

• Installing and configuring Linux servers
• Installing software on Linux servers
• Configuring and managing mobile devices (such as smartphones and tablet computers)
• Network concepts (such as IP address, netmask, topology, and LAN settings)
• Various network topologies
• Network devices and their administration
• Network configurations (such as the use of VLAN, HTTP, and HTTPS)

Virtual Mobile Infrastructure Documentation

The Virtual Mobile Infrastructure documentation consists of the following:

• Installation and Deployment Guide—this guide helps you get "up and running" by introducing Virtual Mobile Infrastructure, and assisting with network planning and installation.

• Administrator’s Guide—this guide provides detailed Virtual Mobile Infrastructure technologies and configuration.

• Online help—the purpose of online help is to provide "how to's" for the main product tasks, usage advice, and field-specific information such as valid parameter ranges and optimal values.
Readme—the Readme contains late-breaking product information that is not found in the online or printed documentation. Topics include a description of new features, installation tips, known issues, and release history.

Tip
Trend Micro recommends checking the corresponding link from the Documentation Center (http://www.docs.trendmicro.com/) for updates to the product documentation.

Document Conventions

The documentation uses the following conventions.

<table>
<thead>
<tr>
<th>Table 1. Document Conventions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONVENTION</strong></td>
</tr>
<tr>
<td>UPPERCASE</td>
</tr>
<tr>
<td><strong>Bold</strong></td>
</tr>
<tr>
<td><strong>Italics</strong></td>
</tr>
<tr>
<td><strong>Monospace</strong></td>
</tr>
<tr>
<td><strong>Navigation &gt; Path</strong></td>
</tr>
<tr>
<td>For example, <strong>File &gt; Save</strong> means, click <strong>File</strong> and then click <strong>Save</strong> on the interface</td>
</tr>
<tr>
<td><strong>Note</strong></td>
</tr>
<tr>
<td><strong>Tip</strong></td>
</tr>
<tr>
<td>CONVENTION</td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>Important</td>
</tr>
<tr>
<td>WARNING!</td>
</tr>
</tbody>
</table>
Chapter 1

Introducing Virtual Mobile Infrastructure

This chapter assists administrators in planning the server components for Trend Micro™ Virtual Mobile Infrastructure™.

This chapter contains the following sections:

- *About Virtual Mobile Infrastructure* on page 1-2
- *Why Use Virtual Mobile Infrastructure* on page 1-2
- *System Requirements* on page 1-3
- *Architecture of Virtual Mobile Infrastructure* on page 1-4
- *Components of Virtual Mobile Infrastructure* on page 1-7
About Virtual Mobile Infrastructure

Trend Micro Virtual Mobile Infrastructure is a service that hosts independent workspaces for every user. A user workspace is based on the Android operating system, which is accessible via the Virtual Mobile Infrastructure mobile client application installed on an Android or iOS mobile device. Using the mobile client application, users can access the same mobile environment that includes all their applications and data from any location, without being tied to a single mobile device. The mobile client application preserves the original Android user experience by providing all the Android features and their controls to the user.

Since all the workspaces are hosted onto the server and maintained by the administrator, Virtual Mobile Infrastructure enables a clear separation between the personal and corporate data available to the users. This clear separation ensures data safety and provides more centralized and efficient workspaces that are easier to manage and maintain.

Why Use Virtual Mobile Infrastructure

Virtual Mobile Infrastructure provides the following benefits:

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Protection</td>
<td>All enterprise applications and data are saved in secure corporate servers under administrator's control.</td>
</tr>
<tr>
<td>Good User Experience</td>
<td>Users can use their personal mobile device to access corporate data, and therefore the mobile OS user experience is preserved.</td>
</tr>
<tr>
<td></td>
<td>Easy-to-use system to access corporate virtual workspace.</td>
</tr>
<tr>
<td></td>
<td>Natural screen touch experience for smartphones and tablets.</td>
</tr>
<tr>
<td>Simplified Management</td>
<td>Administrator can centrally manage all users from single Web console.</td>
</tr>
</tbody>
</table>
Introducing Virtual Mobile Infrastructure

**Benefit**

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Sign-On</td>
<td>Reducing time spent in re-entering passwords in virtual workspace.</td>
</tr>
<tr>
<td></td>
<td>Reducing administration cost due to lower number of IT help desk calls about passwords.</td>
</tr>
<tr>
<td>Workspace Customization</td>
<td>Administrator can create a personal virtual mobile workspace for each employee.</td>
</tr>
<tr>
<td></td>
<td>Administrator can centrally customize applications for employees in their virtual workspaces from the server.</td>
</tr>
<tr>
<td>User-based Profile</td>
<td>Provides user based profile management.</td>
</tr>
<tr>
<td></td>
<td>Users can use their own virtual workspace from any of their mobile devices.</td>
</tr>
<tr>
<td>Manageable Life Cycle</td>
<td>Administrator can remotely manage a workspace's entire life cycle-from provisioning to the end of life.</td>
</tr>
<tr>
<td>Easy Deployment</td>
<td>Provides on-premise deployment.</td>
</tr>
<tr>
<td></td>
<td>Provides self-contained Linux-based operating system for easy deployment.</td>
</tr>
<tr>
<td>Integration with Enterprise Infrastructure</td>
<td>Provides integration with LDAP and external storage.</td>
</tr>
</tbody>
</table>

**System Requirements**

Review the following requirements before installing Virtual Mobile Infrastructure.

**Table 1-1. System Requirements for Server**

<table>
<thead>
<tr>
<th>Component</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>64-bit x86 eight-core Intel processor with SSSE3 support</td>
</tr>
<tr>
<td>Memory</td>
<td>8-GB</td>
</tr>
<tr>
<td>Hard disk</td>
<td>50-GB available for installation</td>
</tr>
</tbody>
</table>
## Component Requirements

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>REQUIREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Card (NIC)</td>
<td>One 1-GB NIC</td>
</tr>
</tbody>
</table>

### TABLE 1-2. System Requirements for Secure Access

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>REQUIREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>64-bit x86 four-core</td>
</tr>
<tr>
<td>Memory</td>
<td>4-GB</td>
</tr>
<tr>
<td>Hard disk</td>
<td>30-GB available for installation</td>
</tr>
<tr>
<td>Network Cards (NIC)</td>
<td>One 1-GB NIC</td>
</tr>
</tbody>
</table>

### TABLE 1-3. System Requirements for Virtual Mobile Infrastructure mobile client

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>REQUIREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating system</td>
<td>• iOS 10.0 or later</td>
</tr>
<tr>
<td></td>
<td>• Android 5.0 or later</td>
</tr>
</tbody>
</table>

## Architecture of Virtual Mobile Infrastructure

Depending on your company scale and requirements, Trend Micro Virtual Mobile Infrastructure enables you to deploy single or multiple Servers and Secure Access. In the case of multiple servers, Virtual Mobile Infrastructure balances the load between servers to achieve maximum efficiency.

Trend Micro Virtual Mobile Infrastructure also supports high availability for Management Server and Secure Access.

## Single Server Installation Model

The Single Server Installation Model is the deployment of only one Virtual Mobile Infrastructure Server and Secure Access.
Introducing Virtual Mobile Infrastructure

**Note**

Trend Micro strongly recommends deploying Secure Access in your environment to enable mobile clients to access Virtual Mobile Infrastructure Server via Internet. See *Why Use Secure Access on page 1-8* for more information.

---

**Multiple Server Installation Model**

The Multiple Server Installation Model is the deployment of more than one Virtual Mobile Infrastructure Server and Secure Access.
Virtual Mobile Infrastructure High Availability

Virtual Mobile Infrastructure enables you to configure High Availability (HA) to ensure the uninterrupted service to the users. For high availability deployment, install at least four servers: two Management Nodes, and two Compute Nodes, with all of these servers run in active-active mode. In this setup, both Management Servers provide management features, and host user workspaces, and access the same database. If one server goes down or disconnects from the network for any reason, the other server(s) can still be accessible and work as normal.

**Note**

Trend Micro recommends configuring an external database for data safety.
Introducing Virtual Mobile Infrastructure

Components of Virtual Mobile Infrastructure

The Virtual Mobile Infrastructure system includes the following components:

**TABLE 1-4. Virtual Mobile Infrastructure Components**

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>DESCRIPTION</th>
<th>REQUIRED OR OPTIONAL</th>
</tr>
</thead>
</table>
| Virtual Mobile Infrastructure Server           | The Virtual Mobile Infrastructure server contains management node and compute node.  

  - Management node provides management console for administrator and web service for user logon, logoff and connection to users’s workspace.
  - Compute node hosts workspaces. Each workspace runs as a Virtual Mobile Infrastructure instance. |
|                                                 |                                                                             | Required             |
| Virtual Mobile Infrastructure Mobile Client Application | The mobile client application is installed on the mobile devices. The client application connects with the Virtual Mobile Infrastructure server to allow users to use their workspaces hosted on the server. | Required             |

**FIGURE 1-3. Trend Micro Virtual Mobile Infrastructure High Availability architecture**
## Component Description

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>DESCRIPTION</th>
<th>REQUIRED OR OPTIONAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secure Access</td>
<td>The Virtual Mobile Infrastructure Secure Access enables mobile clients to access Virtual Mobile Infrastructure server via Internet. See Why Use Secure Access on page 1-8 for more information.</td>
<td>Strongly recommended</td>
</tr>
<tr>
<td>Active Directory</td>
<td>The Virtual Mobile Infrastructure server imports groups and users from Active Directory.</td>
<td>Optional</td>
</tr>
<tr>
<td>External Database</td>
<td>External Database provides scalable data storage for user data. By default, Virtual Mobile Infrastructure server maintains a database on its local hard drive. However, if you want to store the data on an external location, then you will need to configure External Database.</td>
<td>Optional</td>
</tr>
<tr>
<td>External Storage</td>
<td>Using this option will enable you to store the user data in an external storage.</td>
<td>Optional</td>
</tr>
</tbody>
</table>

### Why Use Secure Access

Virtual Mobile Infrastructure Secure Access enables mobile device clients to securely access the Virtual Mobile Infrastructure server via the Internet. If you do not want to expose the Virtual Mobile Infrastructure Server on the Internet, not even in the DMZ, you will need to install Secure Access. If required, you can install multiple Secure Access through an L4 switch for load balancing.

The following are the advantages of using Secure Access:

- If using Secure Access, you only need to open one IP Address and one port number for mobile clients. The Secure Access receives a mobile device client enrollment request through HTTPS, and relays it to the Virtual Mobile Infrastructure server.
- Secure Access and Virtual Mobile Infrastructure server use a firewall for outbound network connections to ensure security.
Secure Access can be deployed in a DMZ or an Intranet, using single or two network cards:

- You need only one network card, if you configure the Internet mobile devices and Secure Access in different networks.
- You need two network cards, if you configure the Internet mobile devices and Secure Access in the same network, in bridge mode. That is, one network card provides connection between the mobile device clients and Secure Access, while the other network card connects Secure Access with the Virtual Mobile Infrastructure server.
Chapter 2

Installing on Bare Metal Servers

This chapter provides the information that you will need to install Trend Micro Virtual Mobile Infrastructure.

This chapter contains the following sections:

• Installing Virtual Mobile Infrastructure Server on a Bare Metal Server on page 2-2
• Installing Virtual Mobile Infrastructure Secure Access on a Bare Metal Server on page 2-13
Installing Virtual Mobile Infrastructure Server on a Bare Metal Server

Any existing data or partitions are removed during the installation process. Back up any existing data on the system (if any) before installing Virtual Mobile Infrastructure.

---

**Important**

If you are installing the first server, make sure to configure it as **Management Node** or **Management and Compute Node** during installation.

---

**Procedure**

1. Power on the Bare Metal server where you want to install Virtual Mobile Infrastructure.
2. Insert the installation DVD into the DVD drive, and reboot the server.

   The Virtual Mobile Infrastructure installation menu appears.

3. Select **Install Virtual Mobile Infrastructure Server** and press **Enter**.
On continuing with the installation, the setup starts loading the installation image file. After it completes, **Trend Micro License Agreement** screen appears.

4. Press Tab to select **Proceed to Confirm**, and press Enter.
A page appears where you can accept the license agreement.

5. Press Tab to select **Accept**, and press Enter to continue.
The installation begins. The installation process may take about 10 minutes or more to complete. Once the installation process completes, the system reboots to allow configuration and displays the following screen.

6. Use username (localhost login) **admin**, and default password **admin** to log in.
7. Type **enable**, and the default password **admin** to enter the privilege mode and start the configuration steps.

8. If you need help during configuration, type **configure init help** and press **Enter** to check the configuration help.

9. Type **configure init password**, to configure password for root account and admin account.

```
$ configure init password
Password must be at least six (6) characters in length, and contain:
   a minimum of 1 lower case letter and
   a minimum of 1 upper case letter and
   a minimum of 1 numeric character and
   a minimum of 1 special character

Type the root password: 
Confirm the root password: 
Changing password for user root.
New password: Retype new password: password: all authentication tokens updated successfully.

Passwords must be at least six (6) characters in length, and contain:
   a minimum of 1 lower case letter and
   a minimum of 1 upper case letter and
   a minimum of 1 numeric character and
   a minimum of 1 special character

Type the admin and tenant password: 
Confirm the admin and tenant password: 
```
10. Type one of the following to configure IP address for Virtual Mobile Infrastructure server:

- For static IP address: `configure init network <static> <IP address/subnet_mask_bits> <gateway address> <DNS1> [DNS2]`

- For dynamic IP address: `configure init network dhcp`

For example, `configure init network static 10.206.139.48/22 10.206.139.254 10.64.1.54`.

**Note**

In multiple server setup, Trend Micro does not recommend using dhcp for the first Virtual Mobile Infrastructure server. This is because the other servers need to connect to the first Virtual Mobile Infrastructure server through an IP address. Therefore, the dynamic IP address may change later, and will cause multiple servers to work abnormally.

11. Do one of the following:

- Set up single server
  - Setup single server with a new database. See *Table 2-1: Setting Up Single Server with New Database on page 2-8* for the procedure.
  - Setup single server and use an already installed database. See *Table 2-2: Setting Up Single Server and Configuring Existing Database on page 2-8* for the procedure.

- Setup multiple servers
  - Setup multiple servers with a new database. See *Table 2-3: Setting Up Multiple Servers with New Database on page 2-9* for the procedure.
  - Setup multiple servers and use an already installed database. See *Table 2-4: Setting Up Multiple Servers and Configuring Existing Database on page 2-10* for the procedure.
TABLE 2-1. Setting Up Single Server with New Database

| To set up a single server with a new database, install a **Management and Compute Node**. | • To install a **Management and Compute Node**:  
  • Type `configure init server 1 new`. |

TABLE 2-2. Setting Up Single Server and Configuring Existing Database

| To set up a single server only, and configure an existing external database, install a **Management and Compute Node**, and then configure the existing database information. | • To install a **Management and Compute Node**, and add an external database information:  
  a. Type `configure init server 1 db <db ip address> <db name> <db username> [db port] <db type>`, and then press **Enter**.  
  b. Type the password for the database you want to use for Virtual Mobile Infrastructure when prompted. |

---

**Note**

Before you install a virtual machine, you must create an account for Virtual Mobile Infrastructure on your external database, and make sure that the database user account can access the database. For example, the database name may look like: **vmidb**.

When you create the database, such as, **vmidb**, set the character as "UTF-8", and grant all privileges to the user. For example, mysql can use the command `GRANT ALL ON vmi_db.* TO 'vmi_user'@'%' IDENTIFIED BY 'passowrd';`.

*db type* can be "**mysql**" or "**oracle**".

For example, `configure init server 1 db 10.206.139.20 vmidb tmvmi 3306 mysql`.
### TABLE 2-3. Setting Up Multiple Servers with New Database

| To setup multiple servers and a new database, install at least two Virtual Mobile Infrastructure servers. | a. Do one of the following to install the first server: |
|                                                                                                             |   • To install the first server as **Management and Compute Node**: |
|                                                                                                             |   • Type `configure init server 1 new`. |
|                                                                                                             |   • To install first server as **Management Node**: |
|                                                                                                             |   • Type `configure init server 3 new`. |
|                                                                                                             | b. Follow [step 12 on page 2-11](#) to [step 15 on page 2-13](#) of this topic (configuring timezone, hostname, keyboard), and finish first server installation. |
|                                                                                                             | c. Configure external storage. See [Configuring External Storage on page 7-11](#) for the procedure. |
|                                                                                                             | d. Do one of the following to install subsequent servers: |
|                                                                                                             |   • To install subsequent server as **Management and Compute Node**: |
|                                                                                                             |   • Type `configure init server 1 vmi <first server's IP address>`. |
|                                                                                                             |   • To install subsequent server as **Compute Node**: |
|                                                                                                             |   • Type `configure init server 2 vmi <first server's IP address>`. |
|                                                                                                             |   • To install subsequent server as **Management Node**: |
|                                                                                                             |   • Type `configure init server 3 vmi <first server's IP address>`. |
|                                                                                                             | e. Repeat [step 9 on page 2-6](#) (configuring password), [step 10 on page 2-7](#) (configuring network) and then steps a on page 2-9 to c on page 2-9 of this procedure to install more servers, if required. |

---

**Note**

When installing multiple servers, the first server must be a **Management and Compute Node** or a **Management Node**.

**Note**

If you install multiple servers, make sure that the first server is already configured, and then configure the other servers. Otherwise, the data in the database may get corrupted.

If you meet problems while configuring multiple servers, contact Trend Micro technical support.
To setup a multiple server, and configure an existing external database, you need to install at least two Virtual Mobile Infrastructure servers.

**Important**
See the Notes following this table.

### Table 2-4. Setting Up Multiple Servers and Configuring Existing Database

<table>
<thead>
<tr>
<th>To setup a multiple server, and configure an existing external database, you need to install at least two Virtual Mobile Infrastructure servers.</th>
<th>a. Do one of the following to install the first server.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Important</strong> See the Notes following this table.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Follow step 12 on page 2-11 to step 15 on page 2-13 of this topic (configuring timezone, hostname, keyboard), and finish first server installation.</td>
<td></td>
</tr>
<tr>
<td>c. Configure external storage. See Configuring External Storage on page 7-11 for the procedure.</td>
<td></td>
</tr>
<tr>
<td>d. Do one of the following to install subsequent servers:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Repeat step 9 on page 2-6 (configuring password), step 10 on page 2-7 (configuring network) and then steps a on page 2-10 to c on page 2-10 of this procedure to install more servers, if required.</td>
<td></td>
</tr>
</tbody>
</table>

| a. Do one of the following to install the first server. |  
|---|---|
| **To install as Management and Compute Node:** Type, `configure init server 1 db <db ip address> <db name> <db username> [db port] <db type>`, press Enter, and then type the database password when prompted. |
| For example, `configure init server 3 db 10.206.139.20 vmidb tmvmi 3306 mysql`. |  
| **To install as Management Node:** Type `configure init server 3 db <db ip address> <db name> <db username> [db port] <db type>`, press Enter, and then type the database password when prompted. |
| For example, `configure init server 1 db 10.206.139.20 vmidb tmvmi 3306 mysql`. |  

|  
| b. Follow step 12 on page 2-11 to step 15 on page 2-13 of this topic (configuring timezone, hostname, keyboard), and finish first server installation. |  
|  
| c. Configure external storage. See Configuring External Storage on page 7-11 for the procedure. |  
| d. Do one of the following to install subsequent servers: |  
|  
| e. Repeat step 9 on page 2-6 (configuring password), step 10 on page 2-7 (configuring network) and then steps a on page 2-10 to c on page 2-10 of this procedure to install more servers, if required. |  

**Note**
To install subsequent servers, you do not need to specify the database IP address during this step.
Note
Before you install a virtual machine, you must create a database for Virtual Mobile Infrastructure on your external database, and make sure that the database user account can access the database you have just created.

For example, the database name may look like: “vmidb”.

When you create vmidb database, set character as "UTF-8", and grant all privileges to the user. For example, mysql can use the command "GRANT ALL ON vmi_db.* TO 'vmi_user'@'%' IDENTIFIED BY 'passowrd';".

Note
If you install multiple servers, make sure that the first server is already configured, and then configure the other servers. Otherwise, the data in the database may get corrupted.

If you meet problems while configuring multiple servers, contact Trend Micro technical support.

12. Type configure init timezone to configure timezone, and type your timezone; for example, America/Los_Angeles.

13. To change the default hostname (localhost), type configure init hostname <host name>. For example, configure init hostname vmi.
14. To change the default keyboard type (US), type `configure init keymap`, and enter the type you want to set. For example, `jp`. 

```bash
# configure init hostname vmi
After set, new hostname is: vmi
# _
```
15. Type `reboot` to restart your system for the configurations to take effect.

### Installing Virtual Mobile Infrastructure Secure Access on a Bare Metal Server

Any existing data or partitions are removed during the installation process. Back up any existing data on the system (if any) before installing Secure Access.

#### Procedure

1. Power on the Bare Metal server where you want to install Virtual Mobile Infrastructure Secure Access.

2. Insert the installation DVD into the DVD drive, and reboot the server.

   The Secure Access installation menu appears.
3. Select **Install Secure Access** and press **Enter**.
On continuing with the installation, the setup starts loading the installation image file. After it completes, **Trend Micro License Agreement** screen appears.

4. Press **Tab** to select **Proceed to Confirm**, and press **Enter**.
A page appears where you can accept the license agreement.

5. Press Tab to select Accept, and press Enter to continue.
The installation begins. The installation process may take about 10 minutes or more to complete. Once the installation process completes, the system reboots to allow configuration and displays the following screen.

```
TMJUISA release 6.0.29
Kernel 3.10.0-622.11.6.el7.x86_64 on x86_64
localhost login:
```

6. Use username (localhost login) admin, and default password admin to log in.

7. Type enable, and the default password admin to enter the privilege mode and start the configuration steps.

8. If you need help during configuration, type configure init help and press Enter to check the configuration help.
9. Type `configure init password`, to configure password for root account and admin account.

10. Type one of the following to configure IP address for Virtual Mobile Infrastructure server:
• For static IP address: `configure init network <static> <IP address/subnet_mask_bits> <gateway address> <DNS1> [DNS2]`

• For dynamic IP address: `configure init network dhcp`

For example, `configure init network static 10.206.139.48/22 10.206.139.254 10.64.1.54`.

**Note**

Trend Micro does not recommend using dynamic IP address (dhcp) for Secure Access. This is because the client mobile devices need to connect to the Virtual Mobile Infrastructure server through an IP address. Therefore, the dynamic IP address may change later, and will disconnect the communication between servers and client mobile devices.

```
# configure init network static 10.206.139.48/22 10.206.139.254 10.64.1.54
Try bring up eth0
Connection successfully activated (0-Ins active path: /org/Freedesktop/NetworkManager/ActiveConnecti
om/15)
Finish set eth0 to static mode
Note: Forwarding request to 'systemctl enable sshd.service'.
Restarting network via systemctl: [ OK ]
Redirecting to /bin/systemctl restart sshd.service
```

11. Type `configure init server <VMI server IP address>` to bind a Virtual Mobile Infrastructure server to this Secure Access.
12. Type `configure init timezone` to configure timezone, and type your timezone; for example, `America/Los_Angeles`.

```
# configure init timezone
Current timezone is:
  Local time: Thu 2018-12-27 17:08:44 CST
  Universal time: Thu 2018-12-27 09:08:44 UTC
  RTC time: Thu 2018-12-27 09:08:44
  Time zone: Asia/Shanghai (CST, +0800)
  NTP enabled: yes
  NTP synchronized: yes
  RTC in local TZ: no
  DST active: no
Please input new timezone name, empty for help: America/Los_Angeles
Set timezone to: America/Los_Angeles ok
```

13. To change the default hostname (localhost), type `configure init hostname <host_name>`. For example, `configure init hostname vmi`.
14. To change the default keyboard type (US), type `configure init keymap`, and enter the type you want to set. For example, `jp`. 
15. Type `reboot` to restart your system for the configurations to take effect.
Chapter 3

Installing on VMware vSphere ESXi Hypervisor

This chapter provides the information that you will need to create and configure a virtual machine on VMware vSphere ESXi Hypervisor and install Trend Micro Virtual Mobile Infrastructure.

This chapter contains the following sections:

• Installing Virtual Mobile Infrastructure Server on page 3-2
• Installing Virtual Mobile Infrastructure Secure Access on page 3-14
Installing Virtual Mobile Infrastructure Server

Installing Virtual Mobile Infrastructure on VMware vSphere ESXi Hypervisor involves the following steps:

1. Creating a virtual machine (See Step 1: Creating a Virtual Machine on page 3-2).

2. Installing Virtual Mobile Infrastructure (See Step 2: Installing Virtual Mobile Infrastructure on VMware ESXi on page 3-13).

Step 1: Creating a Virtual Machine

Procedure

1. Copy the iso image setup file on the ESXi server hard drive, or any other location that can be accessed from the computer where ESXi server is installed.

2. Start VMware vSphere Client.

3. Click File > New > Virtual Machine from the menu.

   The Create New Virtual Machine screen appears.

4. Select Typical and click Next.
Figure 3-1. Select Configuration

The **Name and Location** screen appears.

5. Type a name for the virtual machine, and click **Next**.
Figure 3-2. Type a name for the new virtual machine

The Resource Pool screen appears.

Note

The Resource Pool screen will not appear if you had selected a resource pool on the left resource tree, instead of the root computer. Skip step 6 on page 3-4 and proceed to step 7 on page 3-5 to configure the Storage screen.

6. Select the resource pool in which you want to run this virtual machine and click Next.
Figure 3-3. Select a resource pool

The **Storage** screen appears.

7. Select the disk storage for the virtual machine files and click **Next**.
Figure 3-4. Select a storage to install Virtual Mobile Infrastructure Server

The Guest Operating System screen appears.

8. Select Linux and choose Other Linux (64-bit) from the drop-down and click Next.
FIGURE 3-5. Select the guest operating system

The Network screen appears.

9. Select one NIC and specify the following settings:

<table>
<thead>
<tr>
<th>NAME</th>
<th>NETWORK</th>
<th>ADAPTER</th>
<th>CONNECT AT POWER ON</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIC 1</td>
<td>VM Network</td>
<td>E1000</td>
<td>Enabled</td>
</tr>
</tbody>
</table>
FIGURE 3-6. Create network connections

10. Click Next.

The Create a Disk screen appears.

11. On the Create a Disk screen, do the following:
   a. Select at least 50-GB of virtual disk space for Virtual Mobile Infrastructure.
   b. Select Thick Provision Lazy Zeroed
   c. Click Next.
FIGURE 3-7. Specify Hard Disk Space

The **Ready to Complete** screen appears.

12. Select **Edit the virtual machine settings before completion** and click **Continue**.
Figure 3-8. Ready to Complete

The Virtual Machine Properties screen appears.

13. On the Hardware tab, do the following:
   a. Select Memory (adding)
      Memory Configuration appears in the right pane.
   b. In the Memory Size field, select at least 8-GB.
14. On the Hardware tab, select CPU (adding).

   CPU settings appear in the right pane.

15. In the CPU settings, do the following:

   • In the Number of virtual sockets drop-down list, select 2.
   • In the Number of cores per socket drop-down list, select 4.
16. On the **Hardware** tab, click **New CD/DVD (adding)**.

   The CD/DVD settings appear in the right pane.

17. In the CD/DVD settings, do the following:
   a. Under **Device Type** section, select **Datastore ISO File**, and click **Browse**, and then select the iso setup image file from the ESXi server hard drive.
   b. Under **Device Status** section, select **Connect at power on**.
Step 2: Installing Virtual Mobile Infrastructure on VMware ESXi

Procedure

1. Start VMware ESXi and power on the virtual machine that you created in Step 1: Creating a Virtual Machine on page 3-2.
2. Click the **Console** tab on the virtual machine.

The Virtual Mobile Infrastructure installation menu appears.

3. Follow *step 3 on page 2-2 to step 16 on page 2-13* of the topic *Installing Virtual Mobile Infrastructure Server on a Bare Metal Server on page 2-2* to complete Virtual Mobile Infrastructure installation.

---

### Installing Virtual Mobile Infrastructure Secure Access

Installing Secure Access on VMware vSphere ESXi Hypervisor involves the following steps:

1. Creating a virtual machine (See *Step 1: Creating a Virtual Machine on page 3-14*)

2. Installing Secure Access (See *Step 2: Installing Virtual Mobile Infrastructure Secure Access on VMware ESXi on page 3-25*)

---

### Step 1: Creating a Virtual Machine

**Procedure**

1. Copy the iso image setup file on the ESXi server hard drive, or any other location that can be accessed from the computer where ESXi server is installed.

2. Start **VMware ESXi**.

3. Click **File > New > Virtual Machine** from the menu.

   The **Create New Virtual Machine** screen appears.

4. Select **Typical** and click **Next**.
5. Type a name for the virtual machine, and click **Next**.
Figure 3-13. The Resource Pool screen appears.

The Resource Pool screen appears.

**Note**

The Resource Pool screen will not appear if you had selected a resource pool on the left resource tree. Skip step 6 on page 3-16 and proceed to step 7 on page 3-17 to configure the Storage screen.

6. Select the resource pool in which you want to run this virtual machine and click Next.
Figure 3-14. Select a resource pool

The **Storage** screen appears.

7. Select the disk storage for the virtual machine files and click **Next**.
Figure 3-15. Select a storage to install Virtual Mobile Infrastructure Secure Access

8. Select Linux and choose Other Linux (64-bit) from the drop-down and click Next.
**Figure 3-16. Guest Operating System**

The **Network** screen appears.

9. Select one NIC, and specify the following settings:

**Table 3-2. Network Settings for Secure Access**

<table>
<thead>
<tr>
<th>NAME</th>
<th>NETWORK</th>
<th>ADAPTER</th>
<th>CONNECT AT POWER ON</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIC 1</td>
<td>VM Network</td>
<td>E1000</td>
<td>Enabled</td>
</tr>
</tbody>
</table>
10. Click Next.

The Create a Disk screen appears.

11. On the Create a Disk screen, do the following:
   a. Select at least 30-GB of virtual disk space for Virtual Mobile Infrastructure.
   b. Select Thick Provision Lazy Zeroed.
   c. Click Next.
Figure 3-18. Specify Hard Disk Space

The Ready to Complete screen appears.

12. Select Edit the virtual machine settings before completion and click Continue.
The Virtual Machine Properties screen appears.

13. On the **Hardware** tab, do the following:
   a. Select **Memory (adding)**.
      
      **Memory Configuration** appears in the right pane.
   
      b. In the **Memory Size** field, select at least 4-GB.
14. On the **Hardware** tab, select **CPU (adding)**. CPU settings appear in the right pane.

15. In the **CPU settings**, do the following:
   - In the **Number of virtual sockets** drop-down list, select 2.
   - In the **Number of cores per socket** drop-down list, select 2.

   The CD/DVD settings appear in the right pane.

17. In the CD/DVD settings, do the following:

   a. Under Device Type section, select Datastore ISO File, and click Browse, and then select the iso setup image file from the ESXi server hard drive.

   b. Under Device Status section, select Connect at power on.
Step 2: Installing Virtual Mobile Infrastructure Secure Access on VMware ESXi

Procedure

1. Start VMware ESXi and power on the virtual machine that you created in Step 1: Creating a Virtual Machine on page 3-14.
2. Click the **Console** tab on the virtual machine.
   The Secure Access installation menu appears.

3. Follow *step 3 on page 2-14 to step 15 on page 2-22* of the topic *Installing Virtual Mobile Infrastructure Secure Access on a Bare Metal Server on page 2-13* to complete Secure Access installation.
Chapter 4

Installing on VMware Workstation

This chapter provides the information that you will need to create and configure a virtual machine on VMware Workstation and install Trend Micro Virtual Mobile Infrastructure.

This chapter contains the following sections:

• Installing Virtual Mobile Infrastructure Server on page 4-2
• Installing Virtual Mobile Infrastructure Secure Access on page 4-9
Installing Virtual Mobile Infrastructure Server

Installing Virtual Mobile Infrastructure on VMware Workstation involves the following steps:

1. Creating a virtual machine (See Step 1: Creating a Virtual Machine on page 4-2)
2. Installing Virtual Mobile Infrastructure (See Step 2: Installing Virtual Mobile Infrastructure on VMware Workstation on page 4-9)

Step 1: Creating a Virtual Machine

Procedure

1. Copy the iso image setup file on the VM Workstation hard drive, or any other location that can be accessed from the computer where VM Workstation is installed.

2. Start VMware Workstation.

3. Click **File > New > Virtual Machine** from the menu.
   
   The **New Virtual Machine Wizard** screen appears.

4. Select **Custom (Advanced)** and click **Next**.
   
   The **Choose the Virtual Machine Hardware Compatibility** screen appears.

5. Select an appropriate option from the Hardware compatibility drop-down list.

   **Note**
   
   This document uses Workstation 12.5.9 hardware compatibility.

   The **Guest Operating System Installation** screen appears.

6. Select **I will install the operating system later**, and click **Next**.
   
   The **Select a Guest Operating System** screen appears.
7. On the Select a Guest Operating System screen, configure the following settings:
   
a. **Guest operating system**: Linux
   
b. **Version**: Other Linux 2.6.x kernel 64-bit

![Select a Guest Operating System](image)

**Figure 4-1. Select a guest operating system**

8. Click Next.

   The Name the Virtual Machine screen appears.

9. Type a name for the virtual machine, and click Next.
The Processor Configuration screen appears.

10. Under the Processor section, do the following:
   • In the Number of processors drop-down list, select 2.
   • In the Number of cores per processor drop-down list, select 4.

11. Click Next.

   The Memory for the Virtual Machine screen appears.

12. In the Memory for the virtual machine field, select at least 8-GB, and click Next.

   The Network Type screen appears.

13. Select Use bridged networking, and click Next.

   The Select I/O Controller Types screen appears.

14. From the SCSI Controller list, select the recommended type: LSI Logic, and click Next.

   The Select a Disk Type screen appears.

15. Select the recommended disk type: SCSI, and click Next.

   The Select a Disk screen appears.

16. Select Create a new virtual disk and click Next.

   The Specify Disk Capacity screen appears.

17. Do the following:
   • Select 50-GB for the Maximum disk size.
   • Select Split virtual disk into multiple files.
18. Click Next.

The Ready to Create Virtual Machine screen appears.

19. Click Customize Hardware.

The Hardware screen appears.

20. Click Add.

The Add Hardware Wizard appears displaying Hardware Type screen.

21. Select Network Adapter and click Next.
The **Network Adapter Type** screen appears.

22. Configure the following:

   - Under **Network Connection** section, select **Bridged Connected directly to the physical network**.
   - Under **Device status** section, select **Connect at power on**.

![Configure network adapter type](image)

**Figure 4-3. Configure network adapter type**

23. Click **Finish** on the **Network Adapter Type** screen and then click **Close** on the **Hardware** screen.

The **Ready to Create Virtual Machine** screen appears.
24. Click **Finish**.

![Virtual machines in VMware Workstation](image)

**FIGURE 4-4. Virtual machines in VMware Workstation**

The virtual machine you have just created appears in the left resource tree under **My Computer**.

25. Skip this step if you are using Workstation 12.0. If you are using Workstation 10.0, do the following:

   a. Open the .vmx configuration file for the virtual machine. The configuration file exists in the folder where you have saved your virtual machine.

   b. Make sure the following key exists in the configuration file:

      ```
      ethernet0.virtualDev = "e1000"
      ```

      If they do not exist, or have the wrong values, add the keys at the bottom of the file or update their values to the correct ones.

26. In the left resource tree, right-click the virtual machine you have just created, and click **Settings**.

    The **Virtual Machine Settings** screen appears.
27. On the **Hardware** tab, click **CD/DVD (IDE)**.

   The CD/DVD settings appear on the right pane.

28. In the CD/DVD settings, do the following:

   a. Under **Connection** section, select **Use ISO image file**, and click **Browse**, and then select the Virtual Mobile Infrastructure Server iso setup image file.

   b. Under **Device status** section, select **Connect at power on**.

![Virtual Machine Settings](image)

**Figure 4-5.** Browse and select Virtual Mobile Infrastructure Server ISO image file

29. Click **OK** to complete the virtual machine configuration and close the window.
Step 2: Installing Virtual Mobile Infrastructure on VMware Workstation

Procedure

1. Start VMware Workstation and power on the virtual machine that you created in Step 1: Creating a Virtual Machine on page 4-2.

2. Click the Console tab on the virtual machine.

   The Virtual Mobile Infrastructure installation menu appears.

3. Follow step 3 on page 2-2 to step 16 on page 2-13 of the topic Installing Virtual Mobile Infrastructure Server on a Bare Metal Server on page 2-2 to complete Virtual Mobile Infrastructure installation.

Installing Virtual Mobile Infrastructure Secure Access

Installing Virtual Mobile Infrastructure Secure Access on VMware Workstation involves the following steps:

1. Creating a virtual machine (See Step 1: Creating a Virtual Machine on page 4-9).

2. Installing Virtual Mobile Infrastructure Secure Access (See Step 2: Installing Virtual Mobile Infrastructure Secure Access on VMware Workstation on page 4-15).

Step 1: Creating a Virtual Machine

Procedure

1. Copy the iso image setup file on the VM Workstation hard drive, or any other location that can be accessed from the computer where VM Workstation is installed.
2. Start VMware Workstation.


4. Select Custom (Advanced) and click Next. The Choose the Virtual Machine Hardware Compatibility screen appears.

5. Select an appropriate option from the Hardware compatibility drop-down list.

---

**Note**

This document uses Workstation 12.5.9 hardware compatibility.

---

The Guest Operating System Installation screen appears.

6. Select I will install the operating system later, and click Next. The Select a Guest Operating System screen appears.

7. On the Select a Guest Operating System screen, configure the following settings:
   
a. **Guest operating system**: Linux

b. **Version**: Other Linux 2.6.x kernel 64-bit
8. Click **Next**.

The Name the Virtual Machine screen appears.

9. Type a name for the virtual machine, and click **Next**.

The Processor Configuration screen appears.

10. Under the Processor section, do the following:

   • In the **Number of processors** drop-down list, select 2.
   • In the **Number of cores per processor** drop-down list, select 2.
11. Click **Next**.

   The **Memory for the Virtual Machine** screen appears.

12. In the **Memory for the virtual machine** field, select at least **4-GB**, and click **Next**.

   The **Network Type** screen appears.

13. Select **Use bridged networking**, and click **Next**.

   The **Select I/O Controller Types** screen appears.

14. From the **SCSI Controller** list, select the recommended type: **LSI Logic**, and click **Next**.

   The **Select a Disk Type** screen appears.

15. Select the recommended disk type: **SCSI**, and click **Next**.

   The **Select a Disk** screen appears.

16. Select **Create a new virtual disk** and click **Next**.

   The **Specify Disk Capacity** screen appears.

17. Do the following:

   - Select **30-GB** for the **Maximum disk size**.
   - Select **Split virtual disk into multiple files**.
18. Click Next.

The Ready to Create Virtual Machine screen appears.

The virtual machine you have just created appears in the left resource tree under My Computer.

20. In the left resource tree, right-click the virtual machine you have just created, and click Settings.

The Virtual Machine Settings screen appears.


The CD/DVD settings appear on the right pane.

22. In the CD/DVD settings, do the following:
   
   a. Under Connection section, select Use ISO image file, and click Browse, and then select the Virtual Mobile Infrastructure Secure Access iso setup image file.

   b. Under Device status section, select Connect at power on.
Installing on VMware Workstation

**Figure 4-9.** Browse and select Virtual Mobile Infrastructure Secure Access ISO image file

23. Click **OK** to complete the virtual machine configuration and close the window.

---

Step 2: Installing Virtual Mobile Infrastructure Secure Access on VMware Workstation

**Procedure**

1. Start VMware Workstation and power on the virtual machine that you created in *Step 1: Creating a Virtual Machine* on page 4-9.
2. Click the **Console** tab on the virtual machine.

   The Virtual Mobile Infrastructure installation menu appears.

3. Follow *step 3 on page 2-14 to step 15 on page 2-22* of the topic *Installing Virtual Mobile Infrastructure Secure Access on a Bare Metal Server on page 2-13* to complete Secure Access installation.
Chapter 5

Installing on Microsoft Hyper-V

This chapter provides the information that you will need to create and configure a virtual machine on Microsoft Hyper-V and install Trend Micro Virtual Mobile Infrastructure.

This chapter contains the following sections:

• Installing Virtual Mobile Infrastructure Server on page 5-2
• Installing Virtual Mobile Infrastructure Secure Access on page 5-5
Installing Virtual Mobile Infrastructure Server

Installing Virtual Mobile Infrastructure on Microsoft Hyper-V involves the following steps:

1. Creating a virtual machine (See Step 1: Creating a Virtual Machine on page 5-2).
2. Installing Virtual Mobile Infrastructure (See Step 2: Installing Virtual Mobile Infrastructure Server on Microsoft Hyper-V on page 5-5).

Step 1: Creating a Virtual Machine

Procedure

1. Copy the iso image setup file on the Microsoft Hyper-V computer hard drive, or any other location that can be accessed from the computer where Microsoft Hyper-V is installed.
2. Copy the iso image setup file on the Microsoft Hyper-V computer hard drive.
4. On the Before You Begin screen, click Next.
   The Specify Name and Location screen appears.
5. Type a name for the Virtual Mobile Infrastructure server, and click Next.
   The Specify Generation screen appears.
6. Select Generation 1, and click Next.
   The Assign Memory screen appears.
7. In the Startup memory field, type 8192 MB, and click Next.
   The Configure Networking screen appears.
8. Select a virtual switch from the drop-down list that you want to use for the Virtual Mobile Infrastructure Server, and click Next.
The **Connect Virtual Hard Disk** screen appears.

9. Check the virtual hard disk name, location and size, and make the changes if necessary, and then click **Next**.

![Create Virtual Hard Disk screen](image)

**Figure 5-1. Create Virtual Hard Disk screen**

The **Installation Options** screen appears.

10. Select **Install an operating system later** and then click **Next**.

The **Summary** screen appears.

11. Verify the virtual hard disk settings on the **Summary** screen, and click **Finish**. Click **Previous** to go back to any previous screen and change settings, if required.

The virtual machine setup completes, and the **Settings** screen appears.

12. On the left side of the **Settings** screen, click **Processor** under **Hardware** section, and then in the **Number of virtual processors** field, type **8**.
13. On the left side of the screen, click **DVD Drive**, and then click **Image file**, and select the Virtual Mobile Infrastructure Server installation setup file.

**Figure 5-2. Select the Virtual Mobile Infrastructure server installation file**

14. Click **OK** to finish setting up the virtual machine.
Step 2: Installing Virtual Mobile Infrastructure Server on Microsoft Hyper-V

Procedure

1. Start Microsoft Hyper-V and power on the virtual machine that you created in Step 1: Creating a Virtual Machine on page 5-2.

2. Click the Console tab on the virtual machine.

The Virtual Mobile Infrastructure installation menu appears.

3. Follow step 3 on page 2-2 to step 16 on page 2-13 of the topic Installing Virtual Mobile Infrastructure Server on a Bare Metal Server on page 2-2 to complete Virtual Mobile Infrastructure installation.

Installing Virtual Mobile Infrastructure Secure Access

Installing Virtual Mobile Infrastructure Secure Access on Microsoft Hyper-V involves the following steps:

1. Creating a virtual machine (See Step 1: Creating a Virtual Machine on page 5-5).

2. Installing Virtual Mobile Infrastructure Secure Access (See Step 2: Installing Virtual Mobile Infrastructure Secure Access on Microsoft Hyper-V on page 5-9).

Step 1: Creating a Virtual Machine

Procedure

1. Copy the iso image setup file on the Microsoft Hyper-V computer hard drive, or any other location that can be accessed from the computer where Microsoft Hyper-V is installed.
2. Copy the iso image setup file on the Microsoft Hyper-V computer hard drive.

3. Start Microsoft Hyper-V. Click File > New > Virtual Machine from the menu.
   The New Virtual Machine Wizard screen appears.

4. On the Before You Begin screen, click Next.
   The Specify Name and Location screen appears.

5. Type a name for the Virtual Mobile Infrastructure Secure Access, and click Next.
   The Specify Generation screen appears.

6. Select Generation 1, and click Next.
   The Assign Memory screen appears.

7. In the Startup memory field, type 4096 MB, and click Next.
   The Configure Networking screen appears.

8. Select a virtual switch from the drop-down list that you want to use for the Virtual Mobile Infrastructure Secure Access, and click Next.
   The Connect Virtual Hard Disk screen appears.

9. Check the virtual hard disk name, location and size, and make the changes if necessary, and then click Next.
Installing on Microsoft Hyper-V

The Installation Options screen appears.

10. Select **Install an operating system later** and then click **Next**.

The Summary screen appears.

11. Verify the virtual hard disk settings on the Summary screen, and click **Finish**. Click **Previous** to go back to any previous screen and change settings, if required.

The virtual machine setup completes, and the Settings screen appears.

12. On the left side of the Settings screen, click **Processor** under **Hardware** section, and then in the **Number of virtual processors** field, type **4**.

13. On the left side of the screen, click **DVD Drive**, and then click **Image file**, and select the Virtual Mobile Infrastructure Secure Access installation setup file.

**Figure 5-3. Create Virtual Hard Disk screen**
**Figure 5-4.** Select the Virtual Mobile Infrastructure Secure Access installation file

14. Click **OK** to finish setting up the virtual machine.
Step 2: Installing Virtual Mobile Infrastructure Secure Access on Microsoft Hyper-V

Procedure

1. Start VMware Workstation and power on the virtual machine that you created in Step 1: Creating a Virtual Machine on page 5-5.

2. Click the Console tab on the virtual machine.
   The Virtual Mobile Infrastructure Secure Access installation menu appears.

3. Follow step 3 on page 2-14 to step 15 on page 2-22 of the topic Installing Virtual Mobile Infrastructure Secure Access on a Bare Metal Server on page 2-13 to complete Secure Access installation.
Chapter 6

Installing on Citrix XenServer

This chapter provides the information that you will need to create and configure a virtual machine on Citrix XenServer and install Trend Micro Virtual Mobile Infrastructure.

This chapter contains the following sections:

• Installing Virtual Mobile Infrastructure Server on page 6-2
• Installing Virtual Mobile Infrastructure Secure Access on page 6-5
Installing Virtual Mobile Infrastructure Server

Installing Virtual Mobile Infrastructure server on Citrix XenServer requires creating a virtual machine and installing Virtual Mobile Infrastructure Server. (See Creating a Virtual Machine and Installing Virtual Mobile Infrastructure Server on page 6-2.)

Creating a Virtual Machine and Installing Virtual Mobile Infrastructure Server

Note

The procedure is based on XenServer 7.4.

Procedure

1. Start Citrix XenCenter.

2. Click Add New Server button on the toolbar.
Figure 6-1. Add New Server dialog box

The Add New Server dialog box appears.

3. Type the server name, user name and password, and then click Add.

XenCenter connects to XenServer and adds it to the server tree on the left side of the screen.

4. On the server tree on the left side of the screen, right-click the server name, then click New VM.

The New VM screen appears.

5. From the list of operating systems, select CentOS 7, and click Next.
6. Type a server name and description and then click Next.

The Installation Media screen appears.

7. Select an installation media. If you want to install Virtual Mobile Infrastructure server from a network location, click New ISO library, select Windows File Sharing (CIFS), and then follow the instructions on the screen.

8. Click Next.

9. Select a server computer from the list, where you want to install Virtual Mobile Infrastructure, and click Next.

10. On the CPU & Memory screen, type the following:

a. Number of vCPUs: 8

b. Memory: 8 GB

11. Click Next.
The Storage screen appears.

12. Click Properties, and in the Size field, type 50 GB, and then click OK.

13. Click Next on the Storage screen.

The Networking screen appears.

14. Click Next on the Networking screen.

The Finish screen appears displaying the summary of settings for the new virtual machine.

15. Make sure that Start the new VM automatically is selected, then click Create Now.

The wizard creates the virtual machine and adds it to the tree on the left side of the screen.

16. Select the VM you just created, and click Console. The Virtual Mobile Infrastructure installation menu appears.

17. Follow step 3 on page 2-2 to step 16 on page 2-13 of the topic Installing Virtual Mobile Infrastructure Server on a Bare Metal Server on page 2-2 to complete Virtual Mobile Infrastructure installation.

---

Installing Virtual Mobile Infrastructure Secure Access

Installing Virtual Mobile Infrastructure Secure Access on Citrix XenServer requires creating a virtual machine and installing Virtual Mobile Infrastructure Secure Access. (See Creating a Virtual Machine and Installing Virtual Mobile Infrastructure Secure Access on page 6-6.)
Creating a Virtual Machine and Installing Virtual Mobile Infrastructure Secure Access

**Procedure**

1. Start **Citrix XenCenter**.

2. Click **Add New Server** button on the toolbar.

![Add New Server dialog box](image)

**FIGURE 6-3. Add New Server dialog box**

The **Add New Server** dialog box appears.

3. Type the server name, user name and password, and then click **Add**.

   XenCenter connects to XenServer and adds it to the server tree on the left side of the screen.

4. On the server tree on the left side of the screen, right-click the server name, then click **New VM**.
The **New VM** screen appears.

5. From the list of operating systems, select **CentOS 7 (64-bit)**, and click **Next**.

![Select a VM template screen](image)

**Figure 6-4. Select a VM template screen**

6. Type a server name and description and then click **Next**.

The **Installation Media** screen appears.

7. Select an installation media. If you want to install Virtual Mobile Infrastructure server from a network location, click **New ISO library**, select **Windows File Sharing (CIFS)**, and then follow the instructions on the screen.

8. Click **Next**.

9. Select a server computer from the list, where you want to install Virtual Mobile Infrastructure Secure Access, and click **Next**.

10. On the **CPU & Memory** screen, type the following:
a. **Number of vCPUs:** 4

b. **Memory:** 4 GB

11. Click **Next**.

   The **Storage** screen appears.

12. Click **Properties**, and in the **Size** field, type **30 GB**, and then click **OK**.

13. Click **Next** on the **Storage** screen.

   The **Networking** screen appears.

14. Click **Next**.

   The **Finish** screen appears displaying the summary of settings for the new virtual machine.

15. Make sure that **Start the new VM automatically** is selected, then click **Create Now**.

   The wizard creates the virtual machine and adds it to the tree on the left side of the screen.

16. Select the virtual machine you have just created, and click the **Console** tab.

   The Virtual Mobile Infrastructure installation menu appears.

17. Follow *step 3 on page 2-14* to *step 15 on page 2-22* of the topic *Installing Virtual Mobile Infrastructure Secure Access on a Bare Metal Server on page 2-13* to complete Secure Access installation.
Chapter 7

Post-Installation Configuration

Trend Micro recommends performing all tasks in this chapter before using Virtual Mobile Infrastructure.

This chapter contains the following sections:

- Accessing Virtual Mobile Infrastructure Administration Web Console on page 7-2
- Activating Your Product on page 7-3
- Changing Administrator Account Password on page 7-5
- Configuring LDAP Settings (Optional) on page 7-6
- Configuring Mobile Client Settings on page 7-7
- Configuring Microsoft Exchange Server and Office 365 Settings (Optional) on page 7-9
- Configuring Network Settings on page 7-10
- Configuring External Storage on page 7-11
- Configuring Email Notifications on page 7-12
- Configuring Syslog (System Logs) on page 7-14
- Managing Groups and Users on page 7-14
- Deploying Virtual Mobile Infrastructure to Mobile Devices on page 7-16
Accessing Virtual Mobile Infrastructure Administration Web Console

To access the Virtual Mobile Infrastructure Web console:

Procedure

1. Using a Web browser, open the following URL:
   https://<Virtual Mobile Infrastructure_domain_name_or_IP_address>:8443
   The following screen appears.

   ![Virtual Mobile Infrastructure Web console logon screen]

2. Type a user name and password in the fields provided and click Log On.
Note

The default User Name for Virtual Mobile Infrastructure Web console is admin and the Password is admin.

Make sure that you change the administrator password after your first sign in. Refer to the topic Changing Administrator Account Password on page 7-5 for the procedure.

Activating Your Product

Virtual Mobile Infrastructure displays a New Activation Code screen on logging on to the administration Web console for the first time.

Use the Product License screen to activate your product.

![Figure 7-2. Product License screen](image)
Note
If you do not have a license, contact your Trend Micro contact person to obtain your license.

Procedure

1. Type your Activation Code that you have received in your email in the field provided.
2. Click Save.

Configuration Tasks

The following table depicts the configuration tasks for Virtual Mobile Infrastructure server after installation.

**TABLE 7-1. Post installation configuration tasks for Virtual Mobile Infrastructure server**

<table>
<thead>
<tr>
<th>ACTION</th>
<th>DESCRIPTION</th>
</tr>
</thead>
</table>
| (Optional) Configure administrator account setting. | Administrator account, email address and password settings.  
|                                                 | See *Changing Administrator Account Password on page 7-5* for the detailed procedure.                                                      |
| (Optional) Configure LDAP settings.             | Supports integration with Microsoft Active Directory and OpenLDAP to manage users and groups.  
|                                                 | See *Configuring LDAP Settings (Optional) on page 7-6* for the detailed procedure.                                                          |
| (Optional) Configure mobile client settings.    | User settings for mobile client and users.  
|                                                 | See *Configuring Mobile Client Settings on page 7-7* for the detailed procedure.                                                             |
### Action Table

<table>
<thead>
<tr>
<th>ACTION</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Optional) Configure Exchange settings.</td>
<td>Microsoft Exchange server settings to user single sign on for workspace.</td>
</tr>
<tr>
<td></td>
<td>See <em>Configuring Microsoft Exchange Server and Office 365 Settings (Optional) on page 7-9</em> for the detailed procedure.</td>
</tr>
<tr>
<td>(Optional) Configure network settings.</td>
<td>Proxy and Virtual Mobile Infrastructure public IP address settings for user workspace.</td>
</tr>
<tr>
<td></td>
<td>See <em>Configuring Network Settings on page 7-10</em> for the detailed procedure.</td>
</tr>
<tr>
<td>(Optional) Configure external storage.</td>
<td>External storage to save user data.</td>
</tr>
<tr>
<td></td>
<td>(Required, if multiple Virtual Mobile Infrastructure servers are deployed.)</td>
</tr>
<tr>
<td></td>
<td>See <em>Configuring External Storage on page 7-11</em> for the detailed procedure.</td>
</tr>
<tr>
<td>(Optional) Configure syslog settings.</td>
<td>System log server settings to save server debug logs.</td>
</tr>
<tr>
<td></td>
<td>See <em>Configuring Syslog (System Logs) on page 7-14</em> for the detailed procedure.</td>
</tr>
<tr>
<td>(Optional) Configure email notification settings.</td>
<td>SMTP server settings to send email notification to users.</td>
</tr>
<tr>
<td></td>
<td>See <em>Configuring Email Notifications on page 7-12</em> for the detailed procedure.</td>
</tr>
</tbody>
</table>

### Changing Administrator Account Password

Use the **Administrator Accounts** screen to modify the administrator's account password in Virtual Mobile Infrastructure.

---

**Attention**

Trend Micro recommends changing the administrator's account password every 30 to 90 days.
Procedure

1. Under admin section, click Change password.

   The Change Password dialog box pops up.

2. Use the following fields:
   
   • Old password–type the current administrator password.
   
   • New password and Confirm password–type the new administrator password.

3. Click Save on the pop-up dialog box.

Configuring LDAP Settings (Optional)

Virtual Mobile Infrastructure provides optional integration with Microsoft Active Directory and OpenLDAP to manage users and groups more efficiently.

Use the LDAP tab in System Settings to enable and configure the LDAP settings.

If you do not want to import users and groups from LDAP, or want to manage users locally on the Virtual Mobile Infrastructure server, then you will need to disable the LDAP integration.

Procedure

1. On the System Settings screen, click the LDAP tab.

2. Select Use LDAP to enable the feature

3. Configure the following:
   
   • LDAP Server Type–select the LDAP server.
   
   • Server name or IP address
   
   • Server port
   
   • Base DN–select a Base DN from the drop down list.
• **User name and Password**—a user name and password to access the LDAP server.

• **Update frequency**—select a time from the list to determine how often to synchronize content with the LDAP server.

• **LDAP encryption**—select encryption method according to your LDAP server settings.

4. **Click Save.**

The server tests the connection with the LDAP server and saves System Settings.

---

### Disabling LDAP Server

Use the **LDAP** tab in **System Settings** to disable the LDAP settings.

**Procedure**

1. **Click the LDAP tab.**

2. **Clear Use LDAP checkbox to disable the feature.**

3. **Click Save.**

---

### Configuring Mobile Client Settings

The Virtual Mobile Infrastructure mobile client provides access to the user workspace from a mobile device.

Use the **Mobile Client** tab on the **System Settings** screen to configure mobile clients for Virtual Mobile Infrastructure.

**Procedure**

1. **On the System Settings screen, click the Mobile Client tab.**

2. **Under User Settings section, configure the following:**
• If you want to allow users to save their passwords on their mobile devices, select **Allow users to save password on mobile device**.

• If you want users to wait for a certain time before retrying after typing in a wrong password, select **Enable unsuccessful signin restriction**, and then select the number of attempts and the waiting time from the drop-down lists.

• If you want to configure the password security level for user workspaces on their mobile devices, select a security option from the **Workspace screen lock security level** drop-down list.

  **Note**
  This setting will take effect when the users sign in the next time.

• If you want to stop users from taking screenshots on Android, select **Do not allow user to take screenshot**.

  **Note**
  On iOS mobile devices, if the screenshot is taken, the Virtual Mobile Infrastructure mobile client logs the event and transfers it to the server.

• From **User keyboard for cloud workspace**, select the keyboard you want users to use during their Virtual Mobile Infrastructure session.

• If you want to restrict users from accessing workspace from a rooted or jailbroken mobile device, select **Do not allow users to log in from rooted or jailbroken mobile devices**.

• Select **Enable client side rendering** option to set client side rendering mode to default on TMVMI client.

• From the **Graphics Options** drop-down menu, select one of the following options:
  
  • **Performance**: This option provides more speed, but less quality (screen clarity), and utilizes less bandwidth.
  
  • **Balance** (default): This option provides balance between quality (screen clarity) and speed.
• **Quality**: This option provides more quality (screen clarity), but less speed, and utilizes more bandwidth.

3. Click **Save**.

---

**Configuring Microsoft Exchange Server and Office 365 Settings (Optional)**

If you have already set up an Exchange server in your enterprise environment, you can configure Virtual Mobile Infrastructure to automatically configure Exchange server and Office 365 settings for all the users on their workspace.

---

**Note**

You can only configure Virtual Mobile Infrastructure to use an Exchange server if you are using Active Directory server to manage user and group permissions in Virtual Mobile Infrastructure.

Use the **Exchange Server** tab on **System Settings** screen to configure Microsoft Exchange Server and Microsoft Office 365 settings.

---

**Procedure**

1. On the **System Settings** screen, click the **LDAP** tab.

2. Make sure that the **Use LDAP** checkbox is selected, and the LDAP settings are configured.

3. Click the **Exchange Server** tab.

4. Select **Use automatic configuration for Exchange Server on workspace**, and then type the server name in the **Exchange server** field.

5. Select **Office 365 customization**, if you are using Exchange Online, and type the Office 365 login ID in the **User name** field.
Note
For Office 365 Exchange Online, usually the user name in email account setting is the value of the user's User Principal Name (UPN) in Active Directory. However, in some environments administrators use the alternate login ID functionality. If you have used an alternate login ID, type the correct attribute of the user object other than UPN in the User name field.

6. Click Save.

Configuring Network Settings

Use the Network Settings screen from the System Settings menu to configure VMI Public IP Address and proxy settings for Virtual Mobile Infrastructure server.

The VMI public IP address setting is required for mobile devices to access Virtual Mobile Infrastructure server from outside the network. If Secure Access is connected to a gateway or an external router, configure the IP address of the gateway or the router instead of the IP address of Secure Access. If Secure Access is not installed, keep the default settings.

If your network settings require a proxy to connect to the Internet, configure the proxy settings on Virtual Mobile Infrastructure server.

Procedure

1. Under the VMI Public IP Address section, type the public domain name or IP address, and port number for public address.

   Note
   The default port number for public address is 443.

2. Under the Proxy section, select Use the following proxy settings, and configure the following:
   - Host name or IP address
   - Port number
• Proxy server authentication
  • User name
  • Password
  • Bypass proxy for these addresses

Note
The bypass setting only takes effect for the user workspaces, and from the next time users sign in.

3. Type a URL in the Test address field, and then click Test Connection to verify proxy settings.

4. Select one of the following options for Apply proxy to:
  • Server and Workspace
  • Server only
  • Workspace only

5. Click Save.

Configuring External Storage

Virtual Mobile Infrastructure enables you to use external storage to store user data. External storage is required if you want to use multiple servers with Virtual Mobile Infrastructure.

Use the Servers screen to configure external storage for Virtual Mobile Infrastructure server.

Important
Make sure to stop all compute nodes before you add an external storage.
Procedure


2. Select Enable external storage, and configure the following:
   - Host name or IP address
   - Path—type the location where you want to save the user data on the specified host or IP address.

3. Click Test Connection and then click OK on the pop-up dialog box.

4. Click Save.

   The server tests the connection with the external storage and saves the Servers screen.

Configuring Email Notifications

You must set up an email server and then configure the email notification settings to send the invitation or reset password emails to the users.

Use Email Notifications screen to configure email notifications in Virtual Mobile Infrastructure.

Procedure

1. On the Email Settings tab, configure the following:
   - From—type the address from which you want to send the email notification.
   - SMTP
   - SMTP Server—type the SMTP server name or IP address.
   - Port—type the SMTP server port number.
   - Authentication—if the SMTP address requires authentication, select this option and type the following information:
• User name
• Password
• Use TLS protocol for authentication—if the SMTP server requires TLS protocol for authentication, select this option.

2. Click Test Connection to verify SMTP server address and port number.

   Note
   This test does not verify the user name and password configured to access the SMTP server.

3. Select Automatically send email notification to new users if you want to send an invitation email to new users that are added from LDAP.

4. On the Invitation Email Template Settings tab, type the following:
   • Subject—the subject of the email message.
   • Message—the body of the email message.

   Note
   While editing the Message field, make sure to include the token variables % (name)s, %username)s, %password)s, which will be replaced by the actual values in the email message.

5. On the Reset Password Template Settings tab, type the following:
   • Subject—the subject of the email message.
   • Message—the body of the email message.

   Note
   While editing the Message field, make sure to include the token variables % (name)s, %username)s, %password)s, which will be replaced by the actual values in the email message.
6. Click **Save** to save settings.

---

**Configuring Syslog (System Logs)**

Configure syslog server settings to save server debug logs.

Use the **Syslog** tab in **System Settings** to configure system logs settings for Virtual Mobile Infrastructure.

---

**Procedure**

1. On the **System Settings** screen, click the **Syslog** tab.
2. Select **Enable syslog**.
3. Configure the following settings for the syslog server:
   - **Protocol**
   - **Host name or IP address**
   - **Port number**
4. Click **Save**.

---

**Managing Groups and Users**

Virtual Mobile Infrastructure enables you to add users and groups manually or import them from the LDAP server. On importing a group from LDAP server, Virtual Mobile Infrastructure inherits all user account information from the LDAP server database.

---

**Note**

User accounts imported from the LDAP server cannot be modified from the Virtual Mobile Infrastructure server.
Importing Groups or Users from LDAP

Before importing groups or users from LDAP server, make sure that you have already configured the LDAP settings. See Configuring LDAP Settings (Optional) on page 7-6 for the procedure.

Use the User Management screen to import groups or users from LDAP.

Procedure

1. Click Import Users.

   The Import Group or User from LDAP screen appears.

2. Type the group or user information in the search field provided, and click Search.

3. Select the site in which you want to import users.

4. Select the groups or users that you want to import from the search result, and then click Import.

   **Note**

   If you configured SMTP server address in Administration > Email Notifications > Email Settings, and selected Automatically send email notification to new users, the invitation email will be sent to all new users that you import.

Creating a User Account Locally

Virtual Mobile Infrastructure allows you to add a local user account to the server. However, you cannot use Active Directory in conjunction with the local users. This means, you will need to disable Active Directory to add a local user.

Before you can create a local user account, make sure that you have disabled the Active Directory integration. See Disabling LDAP Server on page 7-7 for the procedure.

Use the User Management screen to create a user account locally.
Procedure

1. Click **Add User**.

Add A New User screen appears.

2. Configure the following:

   - **User name**
   - **First name**
   - **Last name**
   - **Email address**
   - **Group**—select a group from the drop-down menu for the user.
   - **Profile**—select a profile from the drop-down menu for the user.

3. Click **Add**.

Virtual Mobile Infrastructure server sends an invitation email to the user. The invitation email includes the user account information to log on to server.

Deploying Virtual Mobile Infrastructure to Mobile Devices

Trend Micro recommends configuring Notification Settings to send an invitation email to the users. When you import users or groups from Active Directory, or add users locally, the Virtual Mobile Infrastructure server sends an invitation email to the users that includes the account information to log on to the server. Users can download the client application from Google Play store or Apple App Store.

See *Configuring Email Notifications on page 7-12* for the procedure of creating and configuring system notifications.
Installing Android Client for Virtual Mobile Infrastructure

Download the Android client application for Virtual Mobile Infrastructure from Google Play store.

Procedure

1. Open Google Play store on an Android mobile device and search for TMVMI Client.
2. In the search results, look for Trend Micro Virtual Mobile Infrastructure and tap Install.
3. Tap Install on the access permissions screen that appears and wait while the app downloads and installs, then tap Open.
4. Type User name, Password and Server address as mentioned in the email, and tap Sign In.
5. If a dialog box appears requiring you to enable GPS on the mobile device, tap OK and then enable GPS satellites.

Note

Virtual Mobile Infrastructure requires to use the mobile device location information for any application installed in the user workspace. If you tap Cancel, Virtual Mobile Infrastructure will display this pop-up dialog box again the next time you start the application.

You can now access the user workspace and use the applications installed.

Installing iOS Client for Virtual Mobile Infrastructure

Download the iOS client app for Virtual Mobile Infrastructure from Apple App Store.

Procedure

1. Open App Store on an iOS mobile device and search for TMVMI Client.
2. In the search results, look for **Trend Micro Virtual Mobile Infrastructure** and tap **Free**, and then tap **Install**.

3. If required, type your password for the Apple account, and wait while the app downloads and installs, then tap **Open**.

   The Virtual Mobile Infrastructure client app **Sign In** screen appears.

4. Type **User name**, **Password** and **Server Address** as mentioned in the email, and tap **Sign In**.

   A notification appears requiring you to allow the application to use the location.

5. Tap **OK**.

---

**Note**

Virtual Mobile Infrastructure requires the use of the mobile device location information for any application installed in the user workspace. If you tap **Don't Allow**, Virtual Mobile Infrastructure will NOT display this pop-up dialog box again. You will need to enable this setting manually. To enable Virtual Mobile Infrastructure to use the mobile device location information, tap **iOS Settings** > **Privacy** > **Location Services**, and enable Virtual Mobile Infrastructure.

---

You can now access the user workspace and use the applications installed.
Appendix A

Network Port Configurations

This appendix provides all the network ports configurations that you need while installing Virtual Mobile Infrastructure.

This appendix contains the following sections:

• *Network Port Configuration for Virtual Mobile Infrastructure Server on page A-2*
• *Network Port Configuration for Virtual Mobile Infrastructure Secure Access on page A-4*
# Network Port Configuration for Virtual Mobile Infrastructure Server

Configure the following network ports for Virtual Mobile Infrastructure server:

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>NETWORK PORTS</th>
<th>DETAILS</th>
<th>REQUIRED OR OPTIONAL</th>
<th>DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Web console</td>
<td>HTTPS port 8443</td>
<td>Used to access Virtual Mobile Infrastructure management Web console.</td>
<td>Required</td>
<td>Inbound</td>
</tr>
<tr>
<td>Mobile client enrollment</td>
<td>HTTPS port 443</td>
<td>Used to enroll mobile client to the server.</td>
<td>Required</td>
<td>Inbound</td>
</tr>
<tr>
<td>Mobile client access</td>
<td>TCP port 5902 to 6923</td>
<td>Used by mobile client to access Virtual Mobile Infrastructure server.</td>
<td>Required</td>
<td>Inbound</td>
</tr>
<tr>
<td>Active Directory</td>
<td>TCP port 389 (Domain Controller) for Management console&lt;br&gt; TCP port 636 (Domain Controller) for Management console&lt;br&gt; TCP port 3268 (Global Category) for Management console</td>
<td>Used for user authentication using Active Directory. If you are not using Active Directory to authenticate or import users, these ports are not required.</td>
<td>Optional</td>
<td>Outbound</td>
</tr>
<tr>
<td>COMPONENT</td>
<td>NETWORK PORTS</td>
<td>DETAILS</td>
<td>REQUIRED OR OPTIONAL</td>
<td>DIRECTION</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>SMTP server</td>
<td>TCP port 25</td>
<td>Used to access email server. If you are not using SMTP server to send emails, this port is not required.</td>
<td>Optional</td>
<td>Outbound</td>
</tr>
<tr>
<td>Notification Channel port</td>
<td>HTTPS port 443</td>
<td>Used to connect to the Trend Micro Cloud Communication server to receive APNs notifications.</td>
<td>Required</td>
<td>Outbound</td>
</tr>
<tr>
<td>APNs Center</td>
<td>TCP port 2195</td>
<td>Allows outbound connection to Apple Push Notification Server. The hostname of Apple Push Notification Service is gateway.push.apple.com.</td>
<td>Required, if iOS TMVMI client is customized</td>
<td>Outbound</td>
</tr>
<tr>
<td>Wi-Fi-network port</td>
<td>TCP port 5223</td>
<td>Allows iOS mobile devices to receive push notifications from Apple's server, especially when connecting through Wi-Fi network where port 5223 is blocked. However, if the mobile devices are on a 3G network, you do not need to configure this port.</td>
<td>Optional</td>
<td>Outbound</td>
</tr>
</tbody>
</table>
Network Port Configuration for Virtual Mobile Infrastructure Secure Access

Configure the following network ports for Virtual Mobile Infrastructure Secure Access:

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>NETWORK PORTS</th>
<th>DETAILS</th>
<th>REQUIRED OR OPTIONAL</th>
<th>DIRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile client enrollment</td>
<td>HTTPS Port 443</td>
<td>Used to enroll mobile client to the server.</td>
<td>Required</td>
<td>Inbound</td>
</tr>
<tr>
<td>Connection to Virtual Mobile Infrastructure</td>
<td>HTTPS Port 443</td>
<td>Used by Secure Access to communicate with Virtual Mobile Infrastructure server.</td>
<td>Required</td>
<td>Outbound</td>
</tr>
<tr>
<td>TCP Port 5902 to 6923</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Appendix B

Public SSL Certificate Deployment

Virtual Mobile Infrastructure server and secure access are installed and managed using HTTPS and SSL, by default. The default installation of Virtual Mobile Infrastructure server and secure access uses a self-signed SSL certificate. Trend Micro recommends deploying public SSL certificate on Virtual Mobile Infrastructure server and secure access. A public SSL certificate on the server can avoid the browser security warning, and on the secure access, it can help user to make sure \texttt{tmvmi} client connects to a secure server and avoids security warning.

This chapter describes how to generate and install a public SSL certificate on Virtual Mobile Infrastructure server and secure access.

This appendix contains the following sections:

- \textit{Managing Public SSL Certificate on page B-2}
- \textit{Generating Certificate Signing Request (CSR) on page B-2}
- \textit{Deploying SSL Certificate on Virtual Mobile Infrastructure Server on page B-4}
- \textit{Deploying SSL Certificate on Virtual Mobile Infrastructure Secure Access on page B-6}
Managing Public SSL Certificate

Managing Public SSL Certificate on Virtual Mobile Infrastructure server and secure access involves the following steps:


   **Note**
   
   If you already have a Wildcard SSL Certificates, skip this step, and proceed to the next step; Deploying SSL Certificate on page B-4.

2. Deploying SSL Certificate:
   
   • Deploying SSL certificate on Virtual Mobile Infrastructure server. (See Deploying SSL Certificate on Virtual Mobile Infrastructure Server on page B-4)
   
   • Deploying SSL certificate on Virtual Mobile Infrastructure secure access (See Deploying SSL Certificate on Virtual Mobile Infrastructure Secure Access on page B-6).

Generating Certificate Signing Request (CSR)

   **Note**
   
   If you already have a Wildcard SSL Certificates, skip this step, and proceed to the next step; Deploying SSL Certificate on page B-4.

   **Note**
   
   The steps to generate Certificate Signing Request (CSR) for Virtual Mobile Infrastructure server and secure access are same. However, you will need to deploy public SSL certificate on the server and secure access separately.
Procedure

1. Log on to Virtual Mobile Infrastructure server or secure access terminal (SSH) using account tmvmi, and then switch to root account after logging in using command "su root".

2. At the terminal, type the following command:

   ```bash
   openssl req -new -newkey rsa:2048 -nodes -keyout yourdomainname.key -out yourdomain.csr
   ```

   Replace yourdomainname with the domain name you are using. For example, if your domain name is example.com, you would type example.key and example.csr.

3. Provide the following information:

   • **Common Name**: The fully-qualified domain name, or URL, you are using.
     
     If you are requesting a Wildcard certificate, add an asterisk (*) to the left of the common name where you want the wildcard, for example *.example.com.
   
   • **Organization**: The legally-registered name for your business. If you are enrolling as an individual, enter the certificate requester’s name.
   
   • **Organization Unit**: If applicable, enter the DBA (doing business as) name.
   
   • **City or Locality**: Name of the city where your organization is registered/located. Do not abbreviate.
   
   • **State or Province**: Name of the state or province where your organization is located. Do not abbreviate.
   
   • **Country**: The two-letter International Organization for Standardization (ISO) format country code for where your organization is legally registered.
   
   • **Passphrase**: If you do not want to enter a password for this SSL, you can leave this field blank. However, there might be additional risks.
4. After the process is completed, you can get the CSR and a key file in the current folder.

Save the CSR file and the key file. The key file is required when deploying the certificate.

5. Send the CSR file to a public Certificate Authority (CA) for signing. After you send the CSR to a CA, they issue a server certificate.

---

**Deploying SSL Certificate**

After you have received the server certificate from the Certificate Authority (CA) or have a Wildcard SSL Certificates, you should install the certificate on the Virtual Mobile Infrastructure server and/or secure access.

**Deploying SSL Certificate on Virtual Mobile Infrastructure Server**

Virtual Mobile Infrastructure server uses Apache SSL HTTP server to manager SSL certificate.

**Procedure**

1. Log on to Virtual Mobile Infrastructure server terminal (SSH) using account `tmvmi`, and then switch to root account after logging in using command “`su root`”.

2. Copy your SSL certificate files and the certificate bundle file to VMI server. For example, `/home/tmvmi/`, and unzip the certificate file. You can get certificate chain, public certificate.
Public SSL Certificate Deployment

Note
The CA may not provide certificate chain, and only provide root certificate and public certificate. You need to generate certificate chain using the following command:

```
cat public_certificate.crt root_certificate.crt > servercert2to1.pem
```

3. Copy the certificate file at the correct location:
   - Copy the private key here: `/etc/pki/tls/private/`

   Note
   The private key is generated when you generate CSR file.

   - Copy the certificate file and certificate key chain here: `/etc/pki/tls/certs/`

4. Change configuration file `/etc/httpd/conf.d/wsgi-vmi.conf` by replacing corresponding file name with your real file name.
   - Use the following for certificate file:
     
     ```
     SSLCertificateFile /etc/pki/tls/certs/xxxx.crt
     SSLCertificateChainFile /etc/pki/tls/certs/xxxx.crt
     ```

     Note
     If your keychain is pem file, then it should be
     ```
     SSLCertificateChainFile /etc/pki/tls/certs/servercert2to1.pem
     ```

     - Use the following for the private key file:
     ```
     SSLCertificateKeyFile /etc/pki/tls/private/xxxx.key
     ```

5. Restart Apache service using the following command:

   ```
   service httpd restart
   ```
Deploying SSL Certificate on Virtual Mobile Infrastructure Secure Access

Procedure

1. Copy your SSL certificate file and the certificate bundle file to Virtual Mobile Infrastructure secure access, for example at `/home/tmvmi/`. You should already have a key file on the server from when you generated your certificate request. Copy the key file in the same folder as the SSL certificate file and bundle file.

   **Note**
   
   The certificate that deployed in secure access should be `.p12` format. If your certificate is not `.p12` file, follow step 3 and 4 to generate the certificate. If your certificate is `.p12` file, skip to step 5 directly.

2. Log on to the secure access terminal by `tmvmi` account and then switch to root account by using command `su root`.

   You need to merge the server certificates from the CA into certificate keychain file in secure access, to generate the `.p12` format certificate.

3. Use the following command to merge the three certificate files to certificate key chain:

   ```
   cat yourdomainname.crt public_certificate.crt root_certificate.crt > DefaultTempCert3to1.crt
   ```

   **Note**
   
   Replace `yourdomainname` with the domain name you are using. For example, if your domain name is `example.com`, you would type `example.crt`.

4. Generate the certificate `.p12` file using the following command:

   ```
   openssl pkcs12 -export -out TmmsDefaultTempCert.p12 -inkey
   xxxx.key -in DefaultTempCert3to1.crt -password pass:your_password
   ```
5. Copy the certificate file to folder `/vmi/gateway/` using the following command:

```
cp TmmsDefaultTempCert.p12 /vmi/gateway/
TmmsDefaultTempCert.p12
```

6. Skip this step if your certificate does not have a password. If you have password for your certificate, use the following command to generate key:

```
/vmi/gateway/cs -e *****
```

   **Note**
   Replace ***** with your password for the certificate.

7. Change configuration file `/vmi/gateway/configuration.json`, replace corresponding file name with your real file name, and replace the key with your key using the following commands:

```
"ssl_cert_file": "*****.p12"

"ssl_key_password": "*****"
```

   **Note**
   If you do not have a password for the certificate file, replace **** with blank.

8. Restart secure access for your new certificate to take effect, using the following command:

```
service vmigateway restart
```