TTerm Connect Installation Guide

What is TTerm Connect?

TTerm Connect is Turbosoft's web-based terminal emulator. Built on common web technologies such as HTML5, CSS and Javascript, TTerm Connect requires no desktop software installation or management and is able to provide terminal emulation services regardless of platform.

TTerm Connect consists of a server component which provides the actual emulation and host connectivity and a lightweight browser-based client which provides the end user interface. Administration and management is also provided through a browser-based interface.

The server component is available for both Windows® and Linux® based servers, specifically Red Hat Enterprise Linux 7/8 and CentOS 7/8. Webserver software explicitly supported includes Apache (Windows and Linux) and IIS (Windows).

The TTerm Connect client is simply any modern HTML5 capable browser with Javascript enabled. The following browsers are explicitly supported.

- Microsoft Edge®
- Mozilla Firefox®
- Apple Safari®
- Google Chrome®

About this Document

This document applies to TTerm Connect version ***2.1.2*** and above.
All browser screenshots in this document are taken using Google's *Chrome* web browser.

Intended Audience

This document describes the installation process for the server component of TTerm Connect. Once complete TTerm Connect should be in a state where it is possible to login to the web based Administration Portal and begin configuring for day-to-day use.

It assumes an understanding of the server environment that the installation will take place on as well as appropriate permissions to install software on said server. As TTerm Connect interfaces are web based a working knowledge of webserver software and its configuration is also required.

TTerm Connect explicitly supports Apache and IIS and instructions in this document will refer only to those platforms.

Technical Support and Assistance

For further assistance please visit ***www.ttwin.com/support*** or contact Turbosoft Support directly. Full contact details are listed on the last page of this document.

Deployment Overview

Important Terms: A **server** is an individual TTerm Connect installation, either virtualized or installed on hardware, which contains all the components required to provide host connectivity. A **pool** is a grouping of one or more TTerm Connect **servers**.

TTerm Connect is designed to serve the host connectivity needs of organizations both large and small. It offers several deployment configurations whose suitability will depend on various factors such as the size of the intended user base, performance requirements or the need for redundancy.

An understanding of which deployment type will meet your requirements is important as it will affect your choices during the installation process.

Pool Modes

A pool can be configured to operate in one of three modes:

Single Server Configuration

For smaller sites TTerm Connect can operate in a mode where it runs as a single, stand-alone server. In this mode of operation TTerm Connect also installs a database to the server.

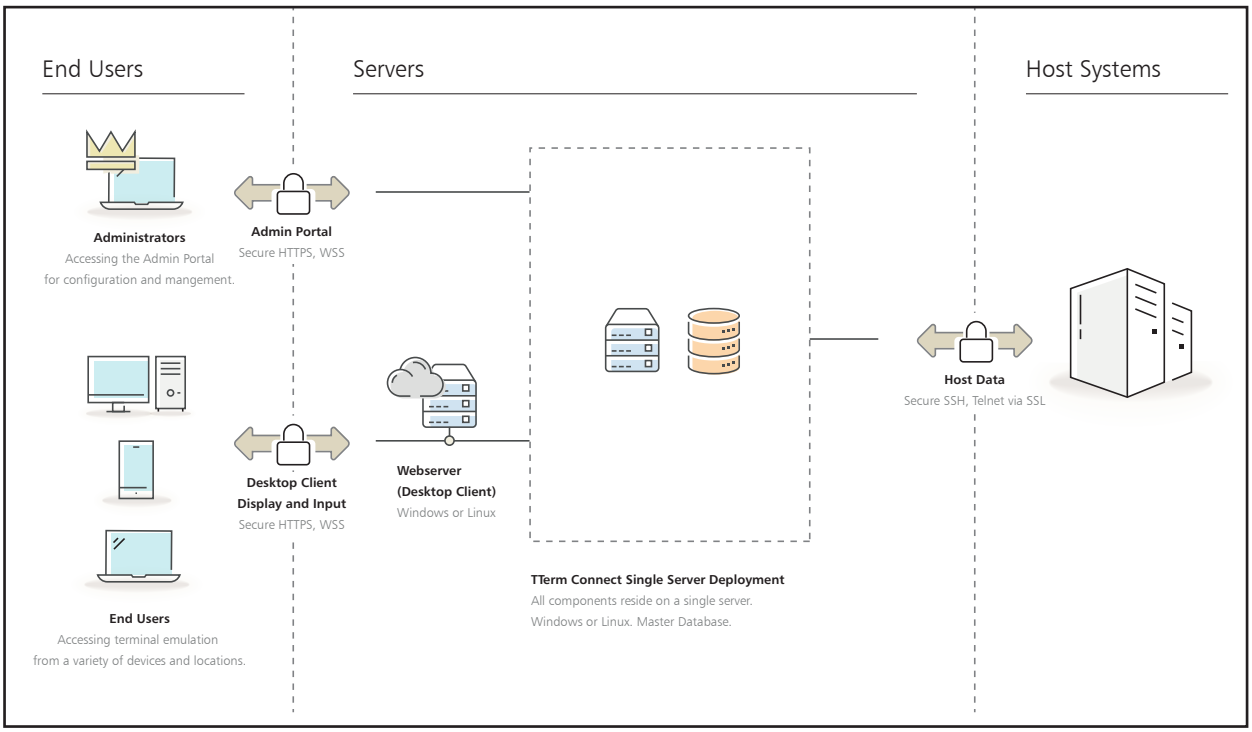

Figure 1. Single Server Pool

Redundant Pool Configuration

A redundant pool consists of two or more servers in the pool without inter-server load balancing. An end user is assigned to one server and all their host sessions will run on that server. A failure of any individual server will result in reduced capacity, but host connectivity will still be available to all users.

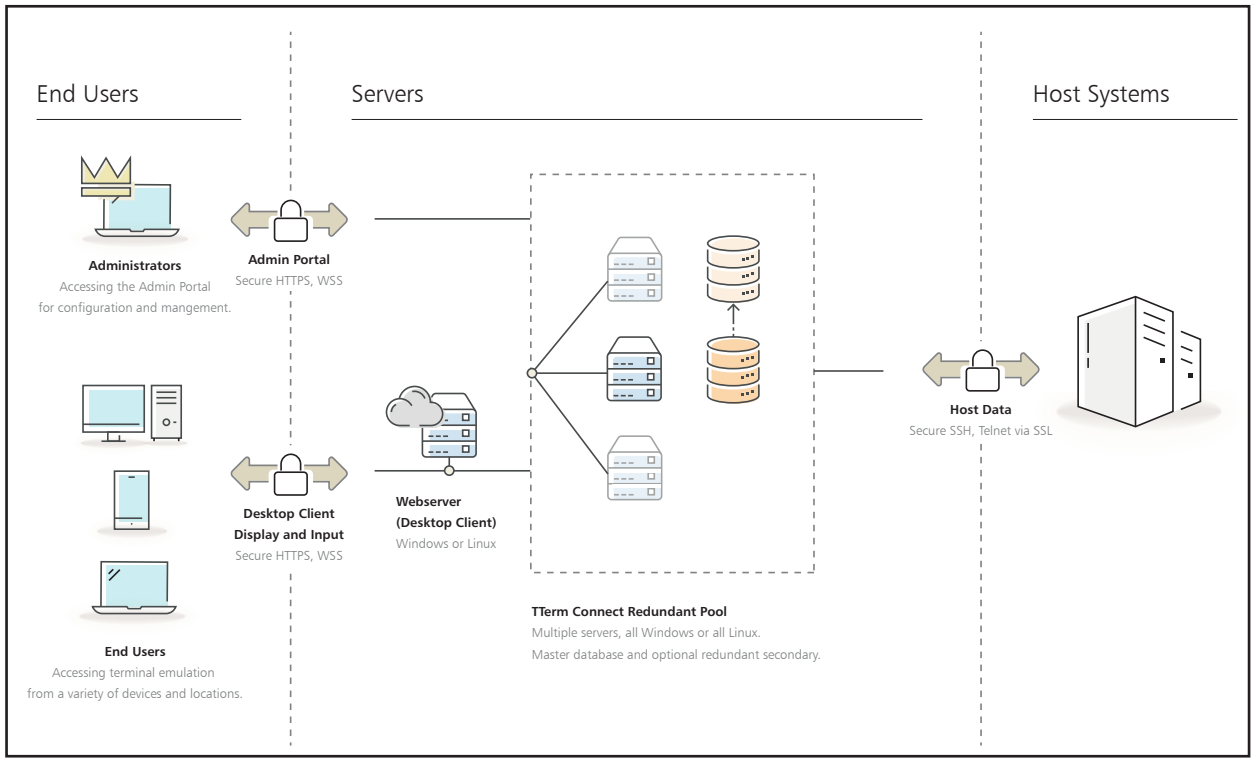

Figure 2. Redundant Server Pool

Within the redundant pool individual servers can be assigned several roles:

- **Active** - An active server is available to serve host sessions to end users.
- **Stand-by** - A server in standby mode will run but will not serve sessions until needed. In this pool configuration a stand-by servers' role is to be available to take over an active server role should that active server fail.

In addition to the primary database that will exist on the master server (the initial installation) a secondary database may optionally be installed on any of the secondary servers.

A secondary database will provide redundancy and automatically assume the role of the primary database in the event of a failure.

Load balancing

A load balancing pool consists of two or more servers in the pool where host sessions will be spread amongst the servers. New host sessions are automatically assigned to the least loaded server.

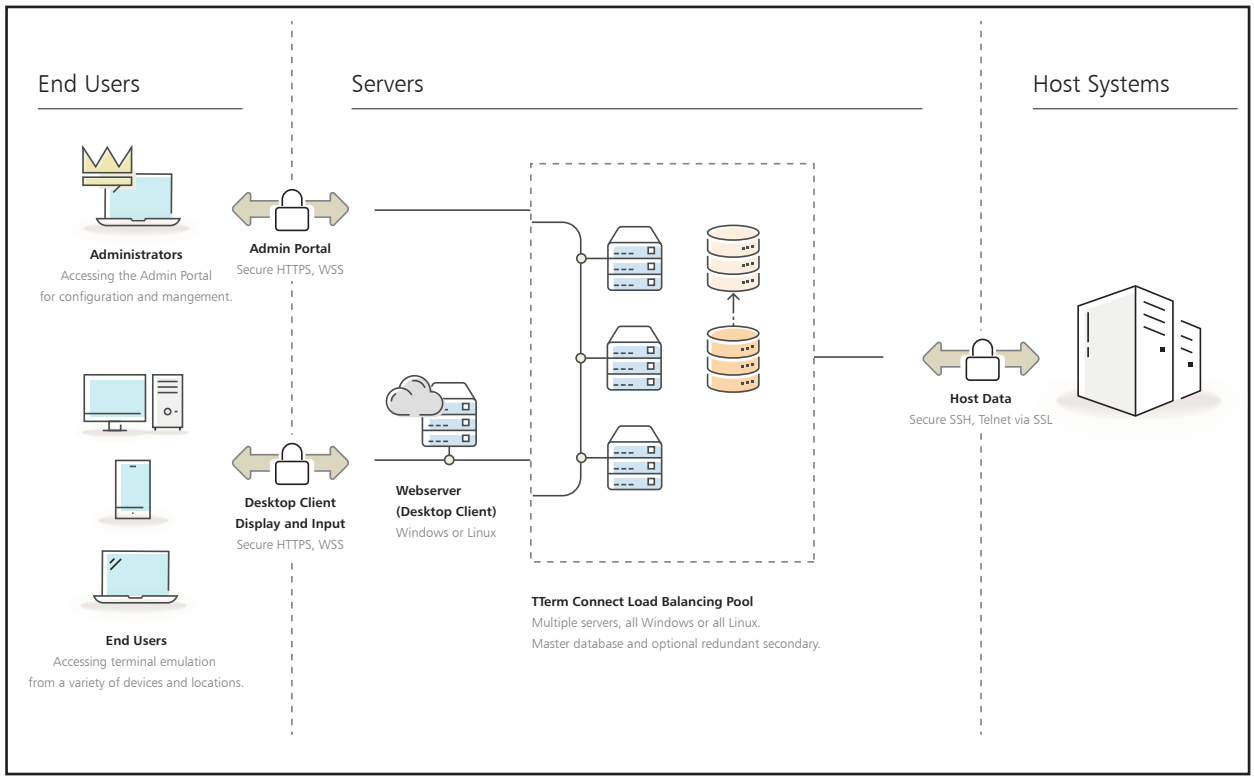

Figure 3. Load Balancing Server Pool

As with a redundant pool, individual servers within a load balancing pool can be assigned several roles:

- **Active** - An active server is available to serve host sessions to end users.
- **Stand-by** - A server in standby mode will run but will not serve sessions until needed.

In addition to the primary database that will exist on the master server (the initial install) a secondary database may optionally be installed to any of the secondary servers.

A secondary database will provide redundancy and automatically assume the role of the primary database in the event of a failure.

A multiple server pool (load balancing and redundant configurations) allows individual servers to be placed into a 'maintenance mode' for server updates and configuration changes whilst the remaining server maintains uninterrupted services for end users.

Server Configuration

This section provides an overview of how TTerm Connect works and describes the individual server components. If you wish to proceed directly to the installation process, skip ahead to page 9.

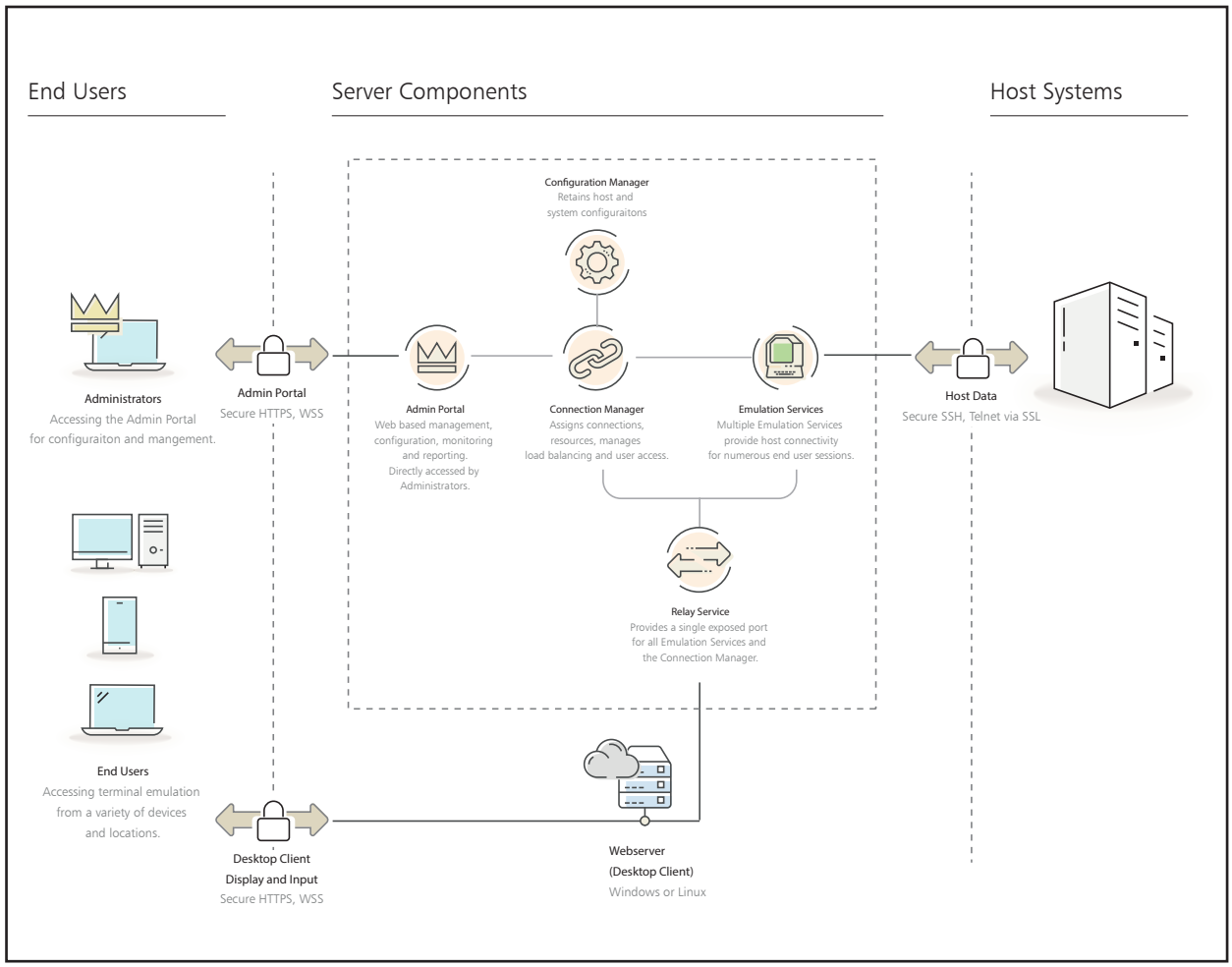

Figure 4. The components of a TTerm Connect server.

Figure 4 illustrates the components and services of a single server deployment handling host connectivity**.**

Please note that previous versions of TTerm Connect utilized an *optional* **Relay Service** service which simplified delivery of host sessions and firewall configuration by exposing a single port for all end user traffic. This feature is no longer optional, is transparent to both administrator and end users, requiring no configuration.

Refer to page 16 for information on configuring firewalls for use with TTerm Connect.

TTerm Connect comprises the following components:

The Admin Server and Administration Portal

The Admin Server hosts the web-based Administration Portal used for configuring TTerm Connect as well as all management and monitoring functions. Pages are served via ***http*** or ***https*** depending on how the installation has been configured. By default, the Administration Portal is available at port 8090 of the domain TTerm Connect is installed to. This port may be reconfigured post installation.

The Administration Portal is designed to be usable on any device with a modern web browser. Please note that while it is entirely possible to configure a freshly installed TTerm Connect using a phone or tablet it is recommended that initial configuration be performed on a desktop device.

Emulation Services

An Emulation Service is an independent TTerm Connect process which provides host connectivity to the end user. Each Emulation Service can provide host connectivity for multiple host sessions.

Emulation Services are managed separately and in multiple instances in order to balance internal server loads and provide separate functionality from administration and configuration handling. New host sessions are dynamically assigned to an Emulation Service by the Connection Manager in order to balance server loads.

The exact number of services that TTerm Connect maintains is determined firstly by configuration options specified through the Administration Portal and secondly by any license conditions.

By default, TTerm Connect will start with four (4) services enabled per server, however this number should be altered to suit requirements through the Administration Portal after installation.

End users may connect to a host system through TTerm Connects end user Desktop Client or through a custom web page - both scenarios are capable of running multiple simultaneous host sessions. When an end user maintains more than one connected host session it is possible they will utilize several Emulation Services to facilitate that host connectivity.

The web client will maintain a single connection to TTerm Connect server regardless of how many host sessions they may be running.

How Many Emulation Services?

There are several factors which would influence this choice, most critically, the number of host sessions that are likely to be running concurrently and the hardware resources available to TTerm Connect.

As a rough guide, Turbosoft recommends running a minimum of 4 services. If you are likely to run greater than 100 simultaneous sessions simply divide the maximum number of likely sessions by 25 to arrive at the number of required services (for example, 150 sessions = 6 services).

The number of Emulation Services is a is configurable option available through the Administration portal, post installation.

Connection Manager

The Connection Manager is responsible for providing access to resources such as session profiles (host session configurations), license assignment and tracking, user authorization and assigning session requests to Emulation Services and so on.

Configuration Manager

The Configuration Manager retains host and system configurations. When interfacing with the Administration Server the Configuration Manager operates in read/write mode. In all other circumstances the Configuration Manager is available as a read-only resource.

Webserver

TTerm Connect offers a variety of deployment options, such as the included *Desktop Client*, a multi-session capable web application.

The webserver that hosts *Desktop Client* is third party software. Explicit support is provided for Apache or Microsoft's IIS only.

The Desktop Client option is most suitable for replicating the functionality of a traditional desktop terminal emulation application. During the installation process the source files for the Desktop Client are installed in a specified directory. The installer default option for this directory is a default folder used by Microsoft's IIS to serve web content. It is recommended that prior to installing TTerm Connect webserver software is installed and configured.

Note that cross-origin resource sharing and mixed content is likely to cause client browser errors. To avoid these, ensure that the webserver hosting TTerm Connect content resides on the same domain as the TTerm Connect server installation and that both the webserver and the TTerm Connect installation are configured to use the same protocol - either ***http*** **or** ***https*** but **not** a mixture of both.

Relay Service

The Relay Service is a TTerm Connect component that is designed to provide a single exposed port for all Emulation Services and Connection Manager functions. By presenting a single port for all incoming connections to the various client facing TTerm Connect components this allows a minimal adjustment to firewalls and simplified network operation.

End Client Components

Regardless of the deployment method used for delivering host connectivity, TTerm Connect's web page components will interact with the server in a similar way.

One or more individual host sessions may be embedded within the page itself. A Session Manager coordinates requests from the individual host session objects in the page to the Connection Manager and Emulation Services, handing the creation and closing of a host session through a dedicated websocket.

When a connection is requested the Session Manager retrieves configuration options (the *Session Profile)* from the Connection Manager which in turn, queries the Configuration Manager. The Connection Manager will then assign the new session to an available Emulation Service. The Emulation Service attempts to establish a connection to the host system as per the configuration options and returns screen content to the web client.

Each individual session maintains its own websocket connection to the relevant Emulation Service through a common port.

For information on working with the Desktop Client refer to the **TTerm Connect Quick Start Guide**. For information on embedding terminal emulation in an existing web page or creating a custom web page for terminal emulation refer to the **TTerm Connect Embedded Guide**. Both documents are included with the TTerm Connect installation or can be obtained by visiting the support section of ***www.ttwin.com***.

Installing TTerm Connect on Windows®

System Requirements

Before initiating the installation process ensure you have the correct installation package for your operating system and that your server environment meets the required specifications.

- A supported 64-bit Windows operating system: Windows server 2019+ or Windows 10 & 11
- CPU Cores: 4*
- RAM: 8GB
- Disk: 256GB
- Supported webserver software, Apache or IIS, pre-installed.

These figures represent minimum recommended specifications for a production server serving up to 1000 concurrent host sessions. Exact usage will vary depending on emulation used, features enabled and the level of user activity.

For larger site requirements please contact Turbosoft.

Install Process

On your Windows Server, run the `.exe` installation file.

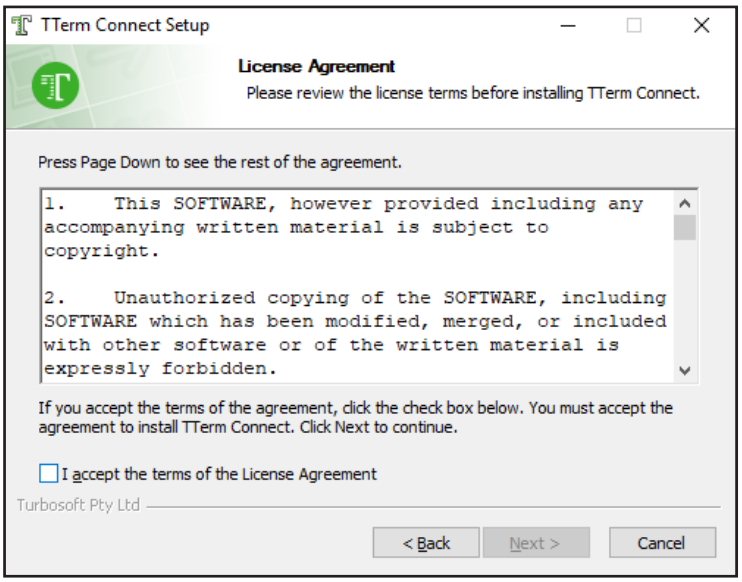

Figure 5. License Agreement

The software License Agreement is displayed. Please review the License Agreement and check the box at the bottom of the tile noting your acceptance to continue the installation process.

Installing Components and File Locations

There are two web-based elements to TTerm Connect, an *Administration Portal*, where configuration, monitoring and management of host connectivity and user activity take place as well as an optional *Desktop Client,* where end users can login and connect to host systems.

The Administration Portal is self-contained and installed with the core TTerm Connect components, however the Desktop Client will run under webserver software of your choice, either IIS or Apache. The two components are installed to different locations.

The installer will first prompt for an installation location where the TTerm Connect (including the Administration Portal) will be installed. To change the default destination folder, click on the **Browse...** button.

By default, TTerm Connect is installed in `C:\Program Files\Turbosoft\TTermConnect`

The installer will then prompt for an install location for the Web Components (the Desktop Client). By default this location is set to `C:\inetpub\TTerm Connect`, a default IIS directory. Click **Browse...** to specify an alternate location accessible to your webserver software.

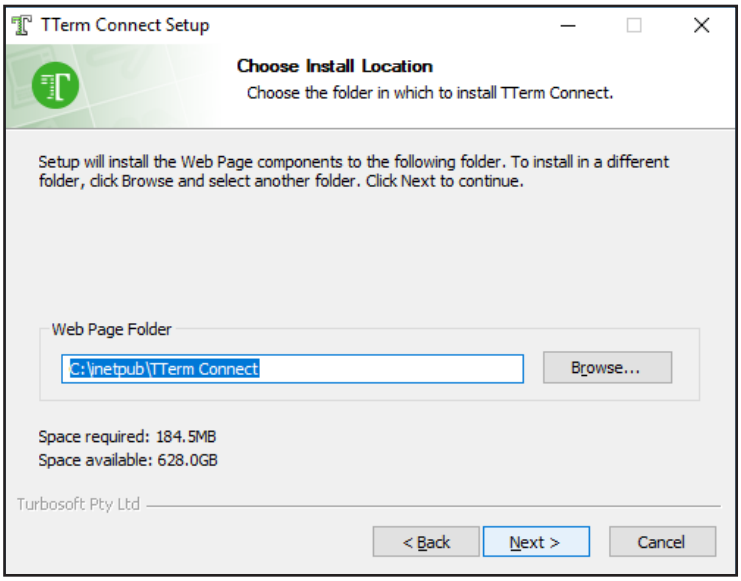

Figure 6. Select an installation location for the web components.

Set a Server Type

Select a server type for installation. Selection options are:

- **Standalone Server** - A single server environment. Most suitable for smaller sites (and for testing and evaluation purposes). Corresponds to the singer server pool mode described on page 2.
- **Master Server** - Select this option when installing the first server of a multi-server TTerm Connect site. Corresponds to the load-balancing and redundant pool modes described on page 3 and page 4.
- **Secondary Server** - Select this option when adding additional servers to an existing TTerm Connect pool. Corresponds to the load-balancing and redundant pool modes described on page 3 and page 4.

  Installing a secondary server requires a configuration file which is generated by TTerm Connect. The configuration file allows the installer to skip all additional installation steps and automatically complete the process.

  For more information on generating the configuration file required for a secondary server refer to '***Installation of Additional Servers***' on page 23.

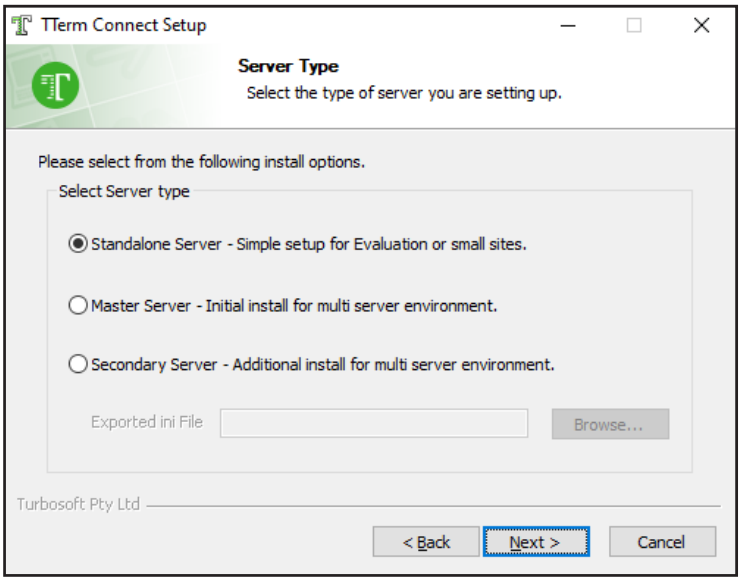

Figure 7. Select server type.

Server Setup (Master Server only)

This step configures the TTerm Connect database component and will only be displayed when installing a master server.

TTerm Connect utilizes an internal PostgreSQL database and will install and configure the required resources for this automatically. However the installer requires an IP address, port number and a password for the database. Ensure that the IP address and port are accessible as they will be utilized by any secondary servers you intend to install.

TTerm Connect will install its own PostgreSQL resources which will not conflict with any existing PostgreSQL installation running in your server environment.

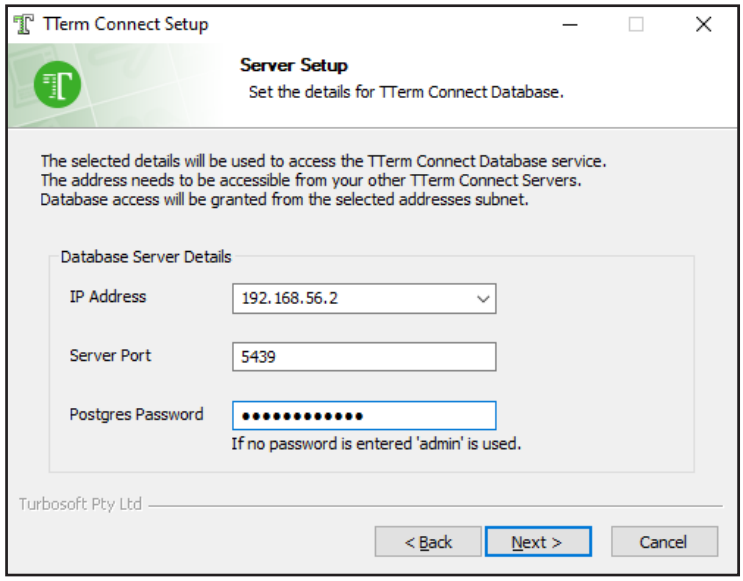

Figure 8. Configure the database component.

Set a Domain

Specify a domain or IP address where you intend to access both the Administration Portal and Desktop Client. Note that this setting can be altered after installation through the Administration Portal. If you intend to utilize an SSL certificate (added in the next installation step) the domain name will, of course, need to match that certificate.

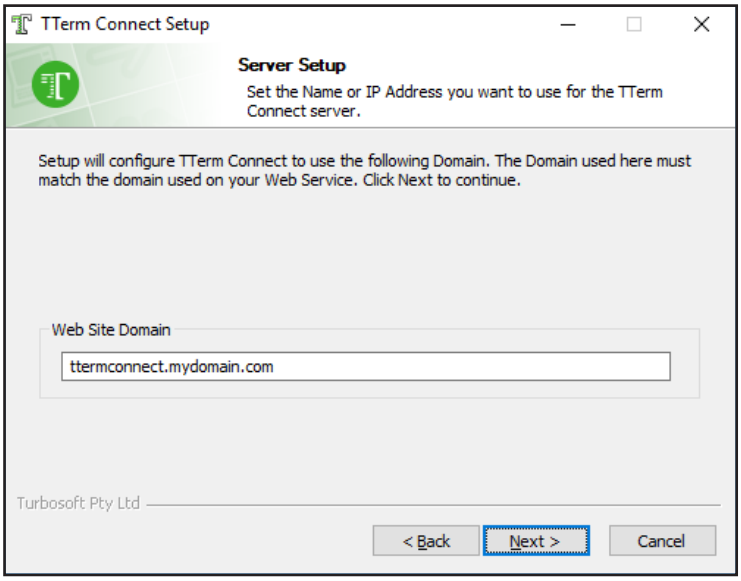

Figure 9. Specify a domain for TTerm Connect.

SSL Configuration

TTerm Connect is designed to be run over SSL to ensure the security of all communications between components and clients. However, it is also possible to run TTerm Connect over plain ***http://*** without the need for an SSL certificate.

For a live deployment, Turbosoft strongly recommends the use of an SSL certificate. If deploying a multiple server pool over SSL it is a requirement that a wildcard SSL certificate by employed.

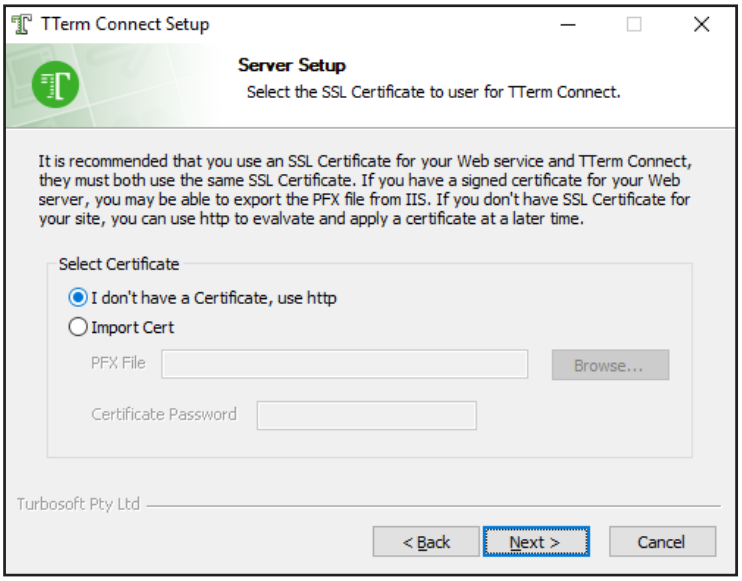

Figure 10. SSL options.

To use TTerm Connect without an SSL certificate select **I don't have a Certificate, use http**.

To utilize SSL, select the **Import Cert** option and click the **Browse..** button to locate a certificate on your local device. TTerm Connect supports `.pfx` and `.pem` certificates.

If required, enter a **Certificate Password**.

You may wish to evaluate TTerm Connect without an SSL certificate. SSL options may be enabled later through the Administration Portal.

The installer will now install the files to the locations specified with the settings described.

TTerm Connect's Connection Manager runs as a Windows Service, allowing TTerm Connect to provides host connectivity immediately after the server boots.

At this point in the installation process this service will be started.

Setup Complete

The setup is now complete. The installer lists the URL and default login credentials for the Administration Portal based on your configuration options. Note these details.

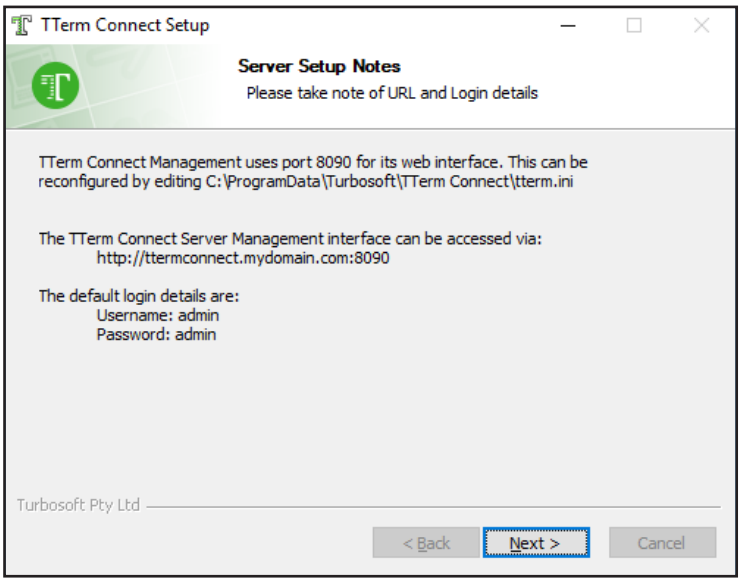

Figure 11. On completion, the installer lists the default Administration Portal login details.

The default port for the Administration Portal is 8090. This is not configurable during the installation process, however may be altered later through the Web Administration Portal itself.

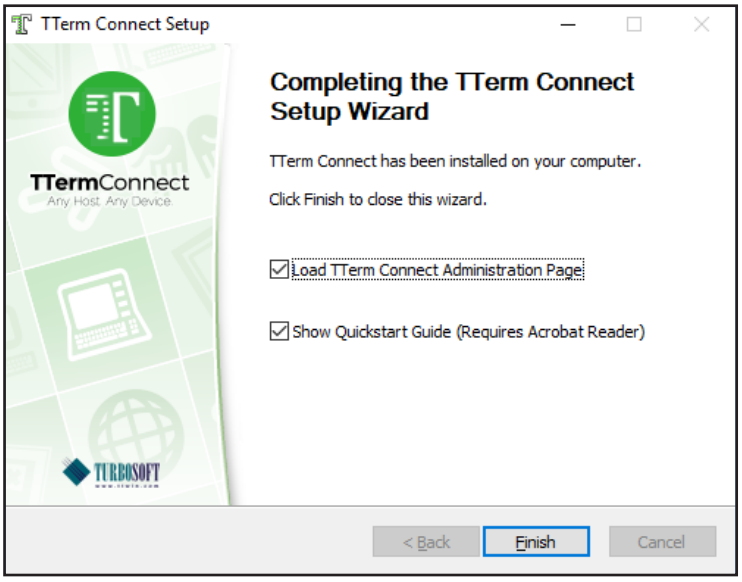

Figure 12. Post-installation options.

On completing the installer options are given to spawn a web browser directly to the Administration Portal and to view the **TTerm Connect Quick Start Guide** in PDF format.

Firewall Ports

TTerm Connect requires the use of the following ports.

Please note that the ports listed below represent TTerm Connects default settings. Alternates may be configured through the Server Configuration page of the Administrator Portal, in which case, please adjust your firewall rules accordingly.

8090

The Administrator Portal serves webpages over port 8090. The Administrator Portal is not used by end users, only administrators.

80 or 443

Access to the Desktop Client via a webserver such as Apache or IIS. The end user web client is served over port 80 (HTTP) or port 443 (HTTPS) depending on how your webserver is configured.

For secure communications Turbosoft strongly recommends that HTTPS is utilized.

8080

Connection manager.

5439

Database replication. This port is only required when running TTerm Connect as a multi-server configuration. It may be omitted in a single server environment.

Lastly, TTerm Connect needs to be able to connect to your host system, however this is usually an internal server and does not require an external entry point.

Caching

Website caching enables the storing of previously retrieved web page content and resources for faster repeat viewing and an overall improved user experience. Caching is implemented at both the webserver and in the browser client.

For the Administration Portal no extra configuration is required. The Administration Portal runs its own, self-contained webserver and applies HTTP headers which direct the browser to always retrieve the latest content when loading pages and resources.

The Desktop Client, on the other hand, is served through third party webserver software such as Apache or IIS. In this instance it is important that cache settings are configured appropriately through your webserver. This will ensure that when TTerm Connect is upgraded to a new version your users always receive updated content without any extra actions required on their part.

Examples of cache configuration are provided for Apache and IIS on the following pages. However please note that there are typically multiple methods of implementing cache control and you should always refer to your 3rd party software documentation for the most up to date and appropriate methods.

IIS 7.0 and Above

For Microsoft's Internet Information Services webserver cache control can be implemented through the `web.config` file, an XML file which is placed in the root directory of the target website.

Creating a `web.config` file with the following content will ensure that important TTerm Connect Desktop Client resources are not cached.

```
<?xml version="1.0" encoding="UTF-8"?>
<configuration>
  <location path="index.html">
    <system.webServer>
      <httpProtocol>
        <customHeaders>
          <add name="Cache-Control" value="no-cache, no-store, must-revalidate" />
          <add name="Pragma" value="no-cache" />
          <add name="Expires" value="-1" />
        </customHeaders>
      </httpProtocol>
    </system.webServer>
  </location>
  <location path="desktop.html">
    <system.webServer>
      <httpProtocol>
        <customHeaders>
          <add name="Cache-Control" value="no-cache, no-store, must-revalidate" />
          <add name="Pragma" value="no-cache" />
          <add name="Expires" value="-1" />
        </customHeaders>
        </httpProtocol>
      </system.webServer>
  </location>
  <location path="js/ttc.config.js">
    <system.webServer>
      <httpProtocol>
        <customHeaders>
          <add name="Cache-Control" value="no-cache, no-store, must-revalidate" />
          <add name="Pragma" value="no-cache" />
          <add name="Expires" value="-1" />
        </customHeaders>
      </httpProtocol>
    </system.webServer>
  </location>
</configuration>
```

Apache

To configure cache control in Apache first ensure the Headers modules (`mod_headers`) in enabled in your installation. This enables control and modification of HTTP request and response headers.

Modify the TTerm Connect site configuration (`.conf`) file to set an appropriate cache control header for the matched files:

```
<FilesMatch "(index\.html|desktop\.html|ttc\.config\.js)">
        Header set Cache-Control "no-cache, no-store, must-revalidate"
        Header set Pragma "no-cache"
        Header set Expires "-1"
</FilesMatch>
```

After saving the configuration file Apache will need to be reloaded.

Accessing the Administration Portal

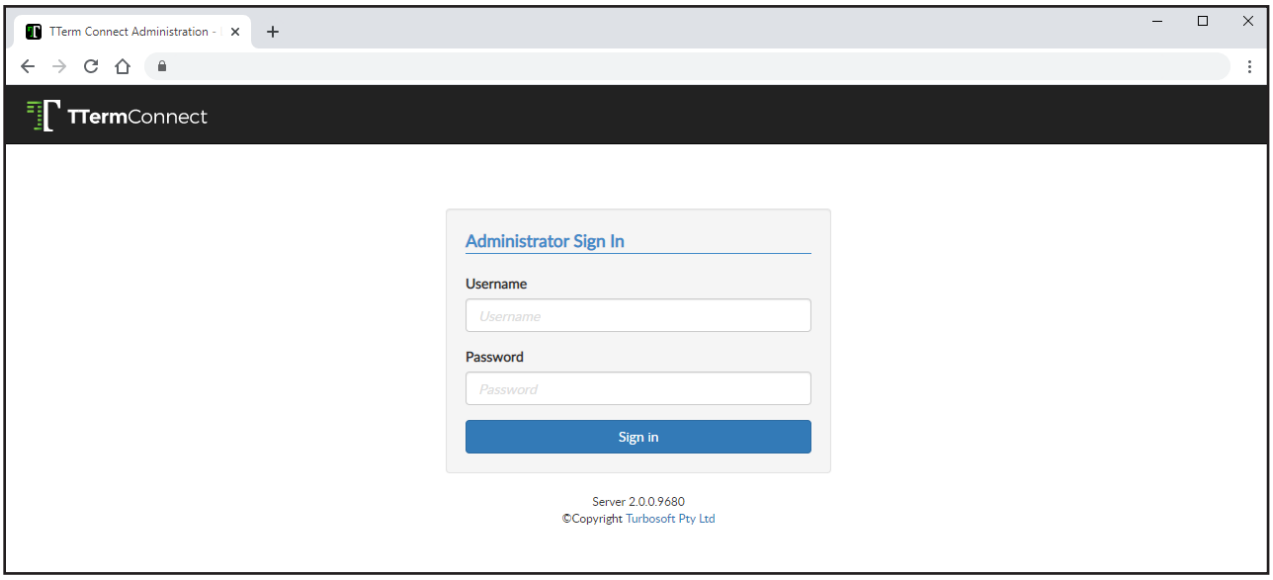

Figure 13. Administration Portal Login

The **Quick Start Guide** is designed to provide the user(s) who will be Administering TTerm Connect with enough information to begin working with the software. It covers the basics of administering and configuring TTerm Connect for host connectivity. The document is also available from within the Administration Portal itself through the internal help pages.

The Desktop Client

The included Desktop Client option is most suitable for replicating the functionality of a traditional desktop terminal emulation application. You will recall that during the installation process TTerm Connect installed the Desktop Client files to a specified directory, by default `C:\inetpub\TTerm Connect`

To complete the installation of TTerm Connect you must ensure that your webserver is hosting a site where the site root points to this directory. This site should also be configured to serve content via ***http*** or ***https*** depending on your SSL configuration choices during installation. For ***https*** operation the webserver will need to utilize the same SSL certificate as the TTerm Connect installation.

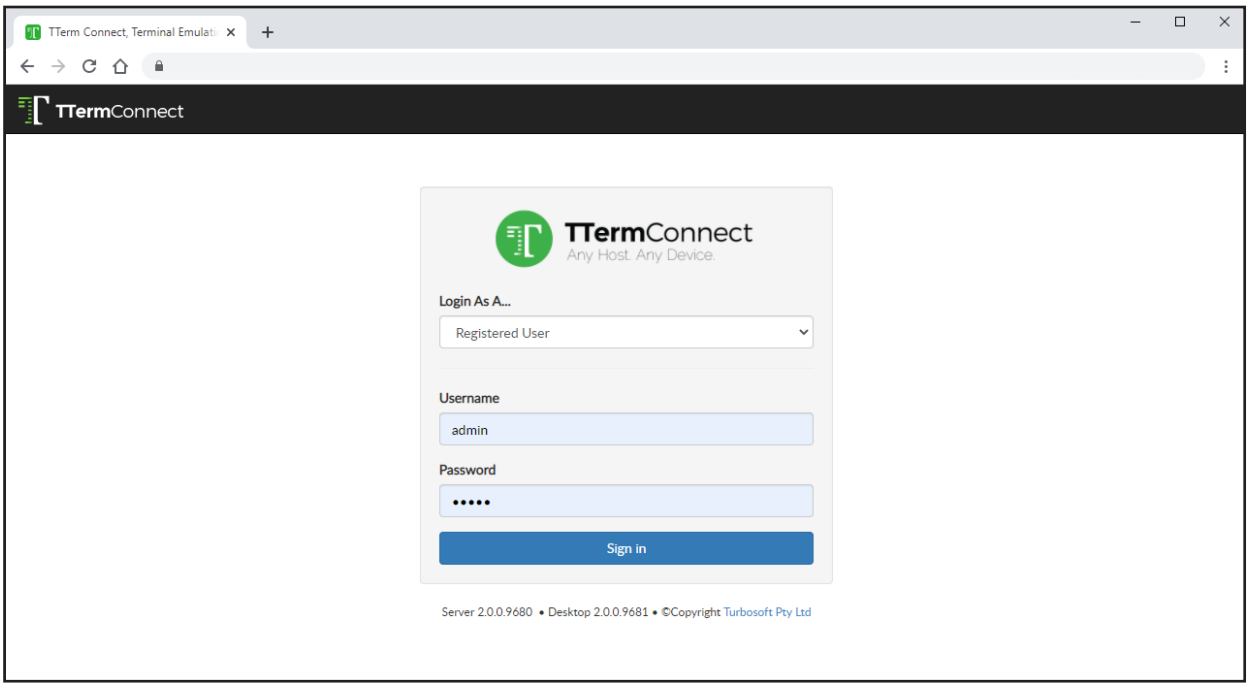

Figure 14. Desktop Client Login

Embedded TTerm Connect Example Content

Of course, it is not essential to use the Desktop Client for host connectivity. You may choose instead to add TTerm Connect to an existing web page or create a custom web page for terminal emulation. This approach requires some knowledge of web development and is covered in detail in the separate documents, the **TTerm Connect Embedded Guide** and the **TTerm Connect Javascript API.**

These documents, along with several example files and templates intended to assist with the development of embedded TTerm Connect webpages are installed alongside the TTerm Connect Desktop Client.

It is recommended that the `/examples` directory located with the Web Components (the Desktop Client) be deleted in a production environment.

When default installation directories are used, these can be located at `C:\inetpub\TTerm Connect\examples\`. During the development process these templates can be accessed through a web browser at ***https://server.com/examples/index.html***, replacing ***server.com*** with your web domain.

None of the files in the examples directory will connect to a remote host system without some minor configuration through the Administration Portal however it is strongly recommended that the entire `C:\inetpub\TTerm Connect\examples\` directory be deleted in a production environment.

What's Next?

At this point, you should have successfully installed a single TTerm Connect server.

Single Server Only

If your intention is to run TTerm Connect in a single server configuration (see page 2) then the installation process can be considered complete. The user(s) responsible for administering TTerm Connect should now login to the Administration Portal using the credentials provided during the installation process.

Once logged into the Administration Portal, follow the directions in the Quick Start Guide or follow the on-screen prompts to begin configuring TTerm Connect for host connectivity.

Multiple Servers

Alternately if you wish to install additional servers to the pool you will now need to install one or more secondary servers - continue to the next page.

Installation of Additional Servers

If you wish to utilize one of TTerm Connects multiple server modes for load-balancing and redundancy you will now need to bring secondary servers into the pool.

The configuration process for installing additional servers is managed through the Administration Portal of TTerm Connect. An overview of the steps involved:

1. Using the Administration Portal's **Server Configuration** page configure the particulars of the new server.
2. At the completion of the configuration process the Administration Portal will generate a configuration file (*new_server_name*.ini) which can be downloaded through the web browser.
3. Run the program installer package on the new server, set the new server type as a **secondary server** and select the configuration file when prompted.
4. When the installation completes the new server will start, and using the configuration options supplied, it will locate the existing pool, authenticate itself and then join that pool.

New servers start with Emulation Services in a paused state to allow for additional configuration before they become available to end users. Log into the new servers Administration Portal and configure as required.

Real time monitoring data and general controls for all servers in the pool are available from the dashboard of any individual server however any detailed server configuration must be performed from the Administration portal of each server.

Configuring a New Server

Follow these steps to configure an additional server.

1. Login to the **Administration Portal** of the existing TTerm Connect master server using the credentials given during the initial installation process. Typically, the login page can be found at ***https://myserver.com:8090***
2. Navigate to the **Server Configuration** page.
3. On the **System** tab scroll down to **Server Configuration** and click or tap **New** as shown in Figure 15

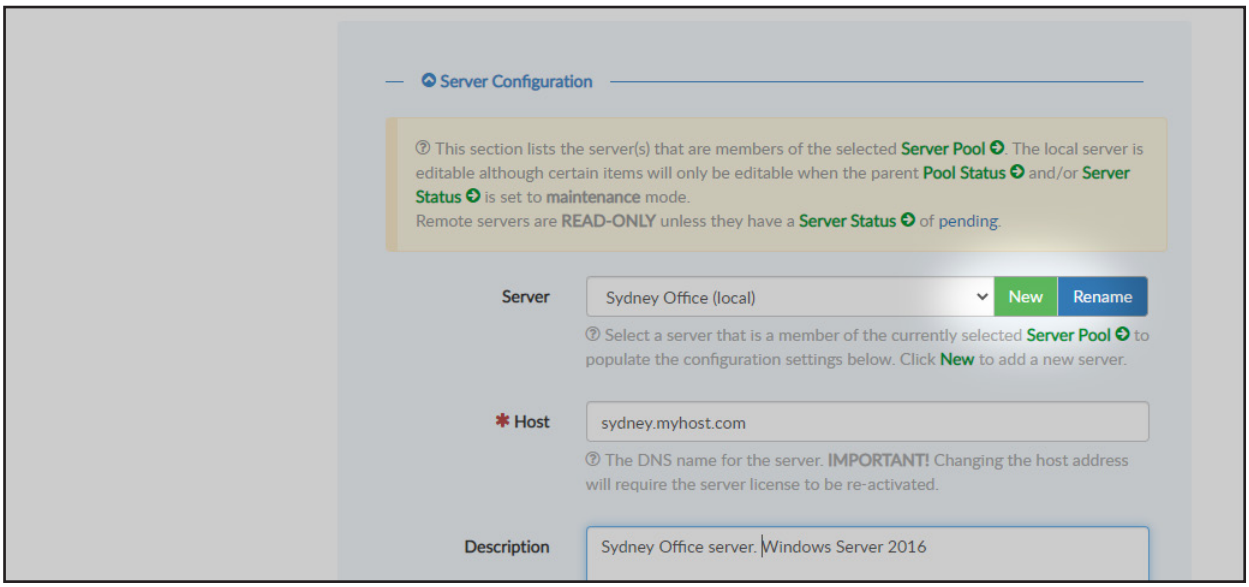

Figure 15. Add a new server.

❹ This will open the **Add a New Server** wizard. Follow the directions on screen, the wizard will prompt you to change pool modes if you are adding a server to a pool current set to **Single** mode.

❺ On completion the wizard will add your new server to the pool in a ***pending*** state. A generated configuration file (`new_server_name.ini`) will be downloaded to your local device. Save this file as it is required by the program installer in order to apply your configuration settings.

❻ Copy (or make available) the configuration file to the target server.

❼ On the target server run the TTerm Connect installer package as described on page 9. When prompted select the generated configuration file. This will apply your configuration settings to a new TTerm Connect server and when the server is initialized it will automatically join it to the nominated pool.

'Pending' Status

A newly created server will be listed in the **Server Configuration** with a status of ***Pending*** until it is installed on hardware and has joined the nominated pool.

Prior to installation the pending server settings can be modified and the configuration file (`new_server_name.ini`) can be re-created at any time. Once installation is completed these edit options will no longer be unavailable.

If a new server configuration is modified and a new configuration file is downloaded please ensure any previously created configuration files for the pending server are not used during installation as this may result in a non-functional server. Use only the most current version!

Support and Further Information

For issues relating directly to TTerm Connect which are not covered by this document consider checking the online resources available at ***www.ttwin.com/support*** or contacting Turbosoft support staff directly. To lodge a support ticket with Turbosoft support please visit ***www.ttwin.com/support_form*** and have the following details ready:

- Your **license details** - these can be found on the **About** page of the Administration Portal. Please also include any maintenance contract number or service agreement you may have with Turbosoft.
- **TTerm Connect version number** - TTerm Connect consists of a number of components and each will have its own, slightly different version number. These components are:
  - **The Administration Portal** - The web-based administration tool.
  - **The Desktop Client** - The optional web-based end user client.
  - **The Server** - The collection of server-based components which provide the core of TTerm Connects emulation and management processes.

  If possible, please send the server license version and either the Desktop Client version OR the Administration Portal version number, depending on the source of the issue.

  Version details can be found on the **About** page of the Administration Portal and the settings section of the Desktop client. These details can also be found on the respective login screens.
- **Details of the client (end user) environment**, including operating system and browser, for example, *Windows 10, Chrome version 124.0.6367.61*

This information is essential to enable Turbosoft to resolve your issue in a timely manner.

Contact Details

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