Configuring Communication with the Internet

In the previous chapter we discussed how to set up SSL to help secure traffic between clients (browsers, mobile devices, etc.) and Tableau Server. Configuring SSL is always a good idea, but it's *essential* if you're going to allow clients from outside your network (that is, from the public internet) to access Tableau Server. If you skipped that chapter but you might allow people to access Tableau Server from outside your network, please go back and review it. Really, you absolutely *should not* allow to access the server unless you've got SSL set up.

If you intend to allow external access, you also have to set up a reverse proxy server. This chapter discusses proxy servers---what they are and why you use them. We also provide some guidance about how to configure proxy servers.

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[][]{.icon--med-lg .icon--arrow-up .heading-item__icon}{.heading-item__link .print-hidden} Time to call your IT friend

Unlike most of the other chapters of *[Tableau Server: Everybody's Install Guide]{.VariablesEAGuideTitle}*, where you can complete server configuration with only minimal aid of an IT professional, we've written this chapter for the IT professional. We've tried to describe the concepts in ways that we hope everyone can follow, but setting up proxy servers involves certificate management, configuring proxy and gateway settings, and advanced network configuration. If you're not an IT professional and you've been going at it alone so far with this guide, now is the time to reach out to a professional. :::

[][]{.icon--med-lg .icon--arrow-up .heading-item__icon}{.heading-item__link .print-hidden} How Tableau communicates with the internet

Tableau Server requires outbound access to the internet for these scenarios:

- Working with maps. Tableau uses map data that is hosted externally. Tableau Server needs to connect to maps locations using port 443. If it cannot make this connection, maps may fail to load. By default, Tableau uses OpenStreetMaps for map data.

  Tableau Server needs to connect to the following internet locations for maps:

  - mapsconfig.tableau.com
  - api.mapbox.com

  For versions 2019.1.x and earlier Tableau Server needs to connect to this location for maps:

  - maps.tableausoftware.com

- Connecting to the Tableau send-logs server.

  You can upload log files to Tableau when working with Support. To successfully upload files to Tableau, your Tableau Server must be able to communicate with the send-logs server on port 443:

  report-issue.tableau.com

- Licensing. Tableau products connect to the internet to activate product keys. Unless you activate Tableau software with the Offline Activation Tool, all Tableau products must have continuous access to the internet to validate their licenses.

  Tableau Server needs to connection to the following internet locations for licensing purposes:

  - licensing.tableau.com:443
  - atr.licensing.tableau.com:443
  - s.ss2.us
  - ocsp.rootg2.amazontrust.com
  - ocsp.rootca1.amazontrust.com
  - ocsp.sca1b.amazontrust.com
  - crt.sca1b.amazontrust.com
  - crt.rootca1.amazontrust.com
  - ocsp.sca0a.amazontrust.com
  - crt.sca0a.amazontrust.com
  - ocsp.sca1a.amazontrust.com
  - crt.sca1a.amazontrust.com
  - ocsp.sca2a.amazontrust.com
  - crt.sca2a.amazontrust.com
  - ocsp.sca3a.amazontrust.com
  - crt.sca3a.amazontrust.com
  - ocsp.sca4a.amazontrust.com
  - crt.sca4a.amazontrust.com
  - crl.rootca1.amazontrust.com
  - crl.rootg2.amazontrust.com
  - crl.sca1b.amazontrust.com

  Requests to the above domains may be on port 80 or 443.

  If Tableau Server cannot make a connection while attempting to activate its license, you will be prompted to do an offline activation.

- Working with external or cloud-based data.

Tableau Server can run without internet access, but in most organizations, the scenarios in the list require Tableau to be able to access the internet.

[](.icon--med-lg .icon--arrow-up .heading-item__icon){.heading-item__link .print-hidden} Tableau Server and proxy servers

Tableau Server was designed to operate inside a protected internal network. Therefore, our first strong recommendation is this: do not set up Tableau Server on the computer that's acting as your organization's internet gateway. As we recommended at the beginning, put Tableau Server on a dedicated computer that runs no other processes, and in this case, that is not directly exposed to the internet.

Instead, you should configure a *proxy server*---a computer that mediates traffic between a local (internal) network and the internet. *Forward proxy servers* mediate traffic from inside the network to targets on the internet. *Reverse proxy servers* mediate traffic from the internet to targets inside the network.

If you're working in a big organization, your IT department has undoubtedly set up proxy servers already. If you're setting up everything yourself, this is, as noted, where might need to consult with someone who's got experience with proxy servers. But let's start with an overview of proxy servers.

Important: As we discussed in the Planning Your Deployment chapter, we do not recommend installing Tableau Server on a computer that is running IIS. Additionally, if you are running antivirus software, you should follow the recommendations in the Knowledge Base[(Link opens in a new window)]{.sr-only} to exclude the Tableau Server directories. The procedures in this chapter assume that you've installed Tableau Server onto a clean computer.

Forward proxy server

A forward proxy is a server that sits between the computers inside your network and the internet. When an application on a network computer needs access to the internet, it doesn't send the request directly to the internet. Instead, it sends the request to the forward proxy, which in turn, well, forwards the request. Forward proxies help administrators manage traffic out to the internet for tasks such as load balancing, blocking access to sites, etc.

Many organizations use a forward proxy on their network. In those organizations, the computers inside the network must be configured to send traffic to the forward proxy. This is generally necessary even if users themselves aren't trying to access the internet. For example, in order for users to be able to create workbooks that include maps, Tableau Desktop and Tableau Server must have access to the Tableau map servers that are hosted on the internet. In addition, by default, the licensing component for Tableau products connects to the internet to activate our products. Unless you activate Tableau software with the Offline Activation Tool[(Link opens in a new window)]{.sr-only}, all Tableau products must have access to the internet to validate their licenses.

If your organization runs a forward proxy server, you must make sure that Tableau Desktop and Server are configured to use that proxy server. If your proxy server authenticates users for outbound connections, you need to configure Windows Internet Options on Tableau Server to use the Run As User account as the security context.

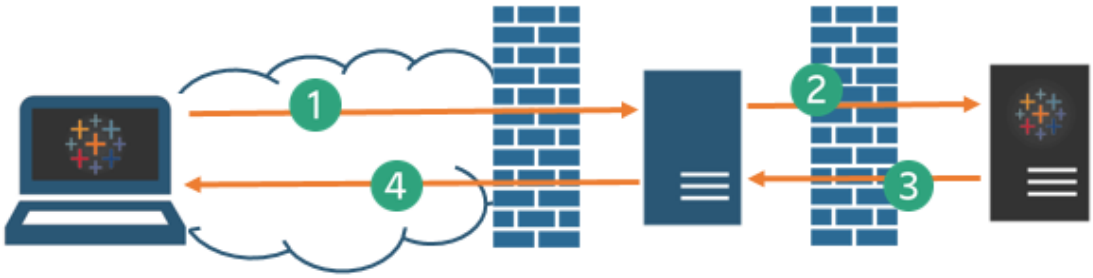
The Additional resources section later includes a link to more information about how to set up a forward proxy server.

[](.icon--med-lg .icon--arrow-up .heading-item__icon){.heading-item__link .print-hidden} Reverse proxy server

A reverse proxy is a server that receives requests from external (internet) clients and forwards them to Tableau Server. Why use a reverse proxy? The basic answer is security. A reverse proxy makes Tableau Server available to the internet without having to expose the IP address of that server to the internet. A reverse proxy also acts as an authentication and pass-through device, so that no data is stored where people outside the company can get to it (in the DMZ, for those who know that term). This requirement can be important for organizations that are subject to various privacy regulations such as PCI, HIPAA, or SOX.

[](){.icon--med-lg .icon--arrow-up .heading-item__icon}{.heading-item__link .print-hidden} An illustration of how a reverse proxy work with Tableau Server

The following diagram illustrates the communication path when a client makes a request to Tableau Server that is configured to work with a reverse proxy server.



1. An external client initiates a connection to Tableau Server. The client uses the public URL that's been configured for the reverse proxy server, such as `https://tableau.example.com`. (The client does not know that it's accessing a reverse proxy.)
2. The reverse proxy passes the request to Tableau Server. The reverse proxy can be configured to authenticate the client (using SSL/TLS) as a precondition to passing the request to Tableau Server.
3. Tableau Server gets the request and sends its response to the reverse proxy.
4. The reverse proxy sends the content back to the client. As far as the client is concerned, it just had an interaction with Tableau Server, and has no way to know that the communication was mediated by the reverse proxy.

Proxy servers and SSL

For better security, you should configure the proxy servers to use SSL for any traffic that's external to your network. This helps to ensure privacy, content integrity, and authentication. Unless you've deployed other security measures to protect traffic between your internet gateway and Tableau Server, we also recommend configuring SSL between the gateway proxy and Tableau Server. As noted in the previous chapter, Securing Traffic Between Clients and Your Server, you can use internal or self-signed certificates to encrypt traffic between Tableau Servers and other internal computers.

We actually recommend that traffic be secured by SSL along each hop---from outside to the reverse proxy server, and from the reverse proxy to Tableau Server. In this scenario, we recommend that you configure the reverse proxy to reject connections that do not use SSL (that is, that don't use `https://` in the URL).

If you'll be using Kerberos authentication, you must configure Tableau Server for your proxy before you configure Tableau Server for Kerberos.

For more information, see Configure Kerberos[(Link opens in a new window)]{.sr-only}. Additionally, you can use SAML, OpenID Connect, or Trusted Tickets with a reverse proxy.

[](){.icon--med-lg .icon--arrow-up .heading-item__icon}{.heading-item__link .print-hidden} Configure Tableau Server to work with a reverse proxy server

Ok, we've talked you into using a reverse proxy. Before you configure Tableau Server, you'll need to collect the following information about the proxy server configuration. Unless you're the person who set up the reverse proxy server, you'll need to ask your IT person for this information.

+--------------------+---+ | Item | Description | +====================+===+ | [IP | You can either enter an IP address or a CNAME | | ad | for this option. | | dress]{style="font | | | -weight: normal;"} | The public IP address or addresses of the proxy | | or `CNAME` | server. The IP address must be in IPv4 format, | | | such as `203.0.113.0`, and it must be a static | | | IP. | | | | | If you are unable to provide a static IP, or if | | | you are using cloud proxies or external load | | | balancers, you can specify the CNAME (Canonical | | | Name) DNS value that clients will use to | | | connect to Tableau Server. This CNAME value | | | must be configured on your reverse proxy | | | solution to communicate with Tableau Server. | +--------------------+---+ | FQDN | The fully qualified domain name that people use | | | to reach Tableau Server, such as | | | `tableau.example.com`. Tableau Server does not | | | support a FQDN with information beyond the | | | domain name, such as `example.com/tableau`. | | | (Your IT pro might understand this to mean that | | | Tableau Server does not support context | | | switching.) | +--------------------+---+ | Non-FQDN | Any subdomain names for the proxy server. In | | | the example of `tableau.example.com`, the | | | subdomain name is `tableau`. | +--------------------+---+ | Aliases | Any public alternative names for the proxy | | | server. In most cases, aliases are designated | | | using CNAME values. An example would be a proxy | | | server `bigbox.example.com` and CNAME entries | | | of `ftp.example.com` and `www.example.com`. | +--------------------+---+ | Ports | Port numbers for traffic from the client to the | | | reverse proxy server, and for traffic from the | | | proxy server to Tableau Server. | +--------------------+---+

To configure Tableau Server, use Tableau Services Manager (TSM). Tableau Services Manager is a the management toolset used to install, configure, and manage Tableau services.

1. Enter the following command to set the FQDN that clients will use to reach Tableau Server through the proxy server, where `name`{style="font-style: italic;"} is the FQDN:

   ```
   tsm configuration set -k gateway.public.host -v "name"
   ```

   For example, if Tableau Server is reached by entering `https://tableau.example.com` in the browser, enter this command:

   ```
   tsm configuration set -k gateway.public.host -v "tableau.example.com"
   ```

2. Enter the following command to set the address or the CNAME of the proxy server, where `server_address`{style="font-style: italic;"} is the IPv4 address or CNAME value:

   ```
   tsm configuration set -k gateway.trusted -v "server_ip_address"
   ```

   If your organization uses multiple proxy servers, enter multiple IPv4 addresses , separating them with commas. IP ranges are not supported. To improve start up and initialization of Tableau Server, minimize the number of entries for `gateway.trusted`.

3. Enter the following command to specify alternate names for the proxy server, such as its fully qualified domain name, any not fully qualified domain names, and any aliases. If there's more than one name, separate the names with a comma.

   ```
   tsm configuration set -k gateway.trusted_hosts -v "name1, name2, name3"
   ```

   For example:

```
tsm configuration set -k gateway.trusted_hosts -v "proxy1.example.com, proxy1, ftp.example.com, www.example.com"
```

4. If the proxy server is using SSL to communicate with the internet, run the following command, which tells Tableau that the reverse proxy server is using port 443 instead of port 80:

   ```
   tsm configuration set -k gateway.public.port -v 443
   ```

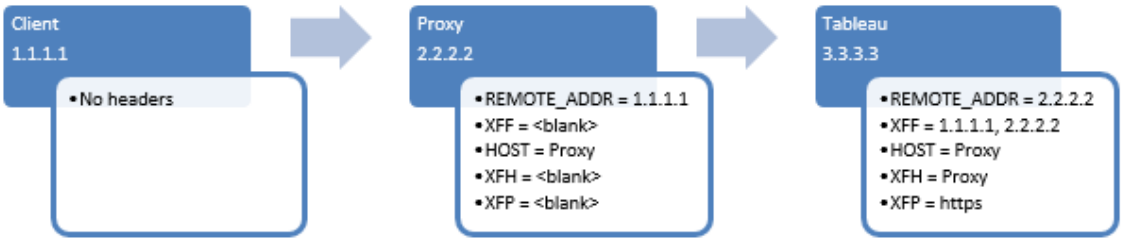
   Note: If the proxy server is using SSL to communicate with Tableau Server, SSL must be configured and enabled on Tableau Server.

5. Enter the following command to commit the configuration change and to restart Tableau Server:

   ```
   tsm pending-changes apply
   ```

[](){.icon--med-lg .icon--arrow-up .heading-item__icon}{.heading-item__link .print-hidden} Configure the reverse proxy server to work with Tableau Server {#configure-the-reverse-proxy-server}

Enabling client access from the internet through a reverse proxy requires that specific message headers are preserved (or added) for Tableau Server. The following graphic shows this.



The headers that Tableau Server require are:

- `REMOTE_ADDR` and `X-FORWARDED-FOR` (`XFF`). Tableau Server needs these headers to determine the IP address of origination for requests.
- `HOST` and `X-FORWARDED HOST` (`XFH`). These headers are used to generate absolute links to Tableau Server when it replies to the client.
- `X-FORWARDED-PROTO` (`XFP`). This header is required if you are running SSL at the proxy, but not on Tableau Server. As noted, we recommend running SSL on each hop.

[](){.icon--med-lg .icon--arrow-up .heading-item__icon}{.heading-item__link .print-hidden} Troubleshooting and notes for reverse proxies {#troubleshooting}

Because there are different proxy solutions, we can't spell out steps for setting up the end-to-end configuration. However, we've collected some tips and other information related to enabling a reverse proxy with Tableau Server.

[](){.icon--med-lg .icon--arrow-up .heading-item__icon}{.heading-item__link .print-hidden} Configuring headers

- The `X-FORWARDED-PROTO` headers are important for scenarios where HTTP or HTTPS is not maintained along each hop of the message route. For example, if the reverse proxy requires SSL for outside requests, but traffic between the reverse proxy and Tableau Server is not configured to use SSL, `X-FORWARDED-PROTO` headers are required. Some proxy solutions add the `X-FORWARDED-PROTO` headers automatically, while others do not. Finally, depending on your proxy solution, you might have to configure port forwarding to translate the request from port 443 to port 80.
- Some proxy servers require a rule in addition to the `X-FORWARDED-PROTO` header. For example, an F5 proxy device requires that you apply an iRule to the virtual server that is hosting the URL namespace for Tableau Server.
- Proxy servers and external load balancers can be mixed and stacked in multiple formations. In the case where there are multiple hops, the order of headers presented to Tableau Server must match the sequence of hops the traffic has taken to reach Tableau Server. In addition, to enable trusted tickets, all proxy servers in the chain must be specified in the `gateway.trusted` and `trusted.hosts` settings.
- If you have multiple IPs in the `gateway.trusted` setting, you must separate the values with a comma *and* a space when you issue the command, such as `"203.0.113.0, 10.32.56.78"`. The entire string must also be enclosed in double quotation marks, as shown.

[]{.icon--med-lg .icon--arrow-up .heading-item__icon}{.heading-item__link .print-hidden} Authentication

- If you'll be using Kerberos authentication, you must configure Tableau Server for your proxy before you configure Tableau Server for Kerberos.

  For more information, see Configure Kerberos[(Link opens in a new window)]{.sr-only} in the Tableau Server Help.
- Apache reverse proxy servers are not supported if Tableau Server is using SSPI (Active Directory with Enable automatic logon) for authenticating Tableau Server users. Apache reverse proxy servers *are* supported if Tableau Server is authenticating server users with just Active Directory (no **Enable automatic logon**).
- Configure your proxy to authenticate with SSL. Do not configure your proxy server to prompt users for authentication.

Continue to Creating Users.

Additional resource ----------

- Configuring Proxies for Tableau Server[(Link opens in a new window)]{.sr-only}. A topic in the Tableau Server Help that provides configuration information for complex deployments.
- Desktop Deployment Guide[(Link opens in a new window)]{.sr-only}. This guide provides information about how to plan, install, and upgrade Tableau Desktop for yourself or for multiple users.