TIBCO® Enterprise Administrator

User Guide

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TIBCO Enterprise Administrator Concepts

TIBCO® Enterprise Administrator provides a centralized administrative interface to manage and monitor multiple TIBCO products deployed in an enterprise.

You can perform common administrative tasks such as authenticating and configuring runtime artifacts across all TIBCO products within one administrative interface. You can also manage products that do not have a complete administrative interface, providing you a unified and simplified administrative experience.

The following are the salient features of TIBCO Enterprise Administrator:

- **Centralized Administration**: TIBCO Enterprise Administrator provides a single-point access to multiple products deployed across an enterprise. You can easily manage and monitor runtime artifacts.
- **Simple to use**: TIBCO Enterprise Administrator is simple to install, develop, use, and maintain.
- **Shared Services Model**: TIBCO Enterprise Administrator shares common administrative concepts across all products thereby promoting a consistent and reusable shared services model.
- **Pluggable and Extensible**: As your enterprise evolves, you can add new products to the TIBCO Enterprise Administrator.
- **Rich set of APIs**: With TIBCO Enterprise Administrator Agent Library, organizations can develop custom TIBCO Enterprise Administrator agents to manage TIBCO and non-TIBCO products and applications. TIBCO products such as TIBCO ActiveMatrix BusinessWorks™ and TIBCO® MDM provide agents for TIBCO Enterprise Administrator. If you have installed the TIBCO Enterprise Administrator SDK variant, you can develop your own agents to expose your product on TIBCO Enterprise Administrator. The SDK variant comes with a set of APIs that is both declarative and extensible. You can develop your own agents and decide what part of your product needs to be rendered on TIBCO Enterprise Administrator.
- **Support for Interactive Shell**: TIBCO Enterprise Administrator provides a command-line utility called TIBCO Enterprise Administrator Shell. You can use the shell to perform almost all the tasks offered by the web-based GUI.

TIBCO Enterprise Administrator Architecture

TIBCO Enterprise Administrator is based on an agent-based architecture. TIBCO Enterprise Administrator comes with the TIBCO Enterprise Administrator server. The TIBCO Enterprise Administrator provides three distinct user interfaces: a web-based GUI, a command-line based shell interface, and a Python scripting interface.

A product being managed using the TIBCO Enterprise Administrator (TEA) must have a product agent registered with the TIBCO Enterprise Administrator server. The following TIBCO Enterprise Administrator agents are included as a part of TIBCO Enterprise Administrator:

- TIBCO® Enterprise Message Service™ : The agent for TIBCO Enterprise Message Service is shipped with TIBCO Enterprise Administrator.
- TIBCO® Security Server: The agent for TIBCO Security Server is shipped with TIBCO Enterprise Administrator.

The following products have developed a TEA agent to manage and monitor their products by using TIBCO Enterprise Administrator:

- TIBCO ActiveMatrix BusinessWorks™
- TIBCO® MDM
- TIBCO® Hawk
- TIBCO® ActiveMatrix Container Edition
- TIBCO BusinessEvents®

To see your product on TIBCO Enterprise Administrator, you must register the agent with the TIBCO Enterprise Administrator server.

Register an Agent with the Server

Register the agent with the TIBCO Enterprise Administrator server. The steps are listed in the procedure, Registering an Agent.

Components of TIBCO Enterprise Administrator

The TIBCO Enterprise Administrator comprises a server, an agent corresponding to a product, a server UI, a shell interface, and python scripts.

The TIBCO Enterprise Administrator has the following components:

The Server

The server is the equivalent of a web server. The server is hosted within a web server and caters to the HTTP requests coming from the browser. The server manages the communication between the browser and agents. The server interacts with the agent to get data about the products registered on the TIBCO Enterprise Administrator. The server is responsible for:

- Collecting data on all the products registered with it
- Maintaining a cache of the data; thereby promoting faster searches
- Hosting all the TIBCO Enterprise Administrator server views
- Responding to auto-registration requests from agents
- Providing details about the machines on which the products are running
- Providing user management features such as granting and revoking a user's permissions

The Agent

An agent is a bridge between the TIBCO Enterprise Administrator server and a product. When an agent is registered with the TIBCO Enterprise Administrator, it discovers the product that must be exposed to the administrator. The agent creates a graph of objects specific to the product that needs to be rendered on the TIBCO Enterprise Administrator server UI. The agent interacts with the server using the REST API. TIBCO Enterprise Administrator agents can run in any of the following ways: standalone, embedded, or hosted. TIBCO Enterprise Administrator comes with an extensible API that helps you develop your own agents for your products. An agent provides the following basic concepts:

- Group: is a container of artifacts. For example, a cluster, domain, and ActiveMatrix environment.
- Process: is any operating system process. For example, a BusinessWorks engine, and ActiveMatrix node.

- Resource: is a shareable configuration or artifact. For example, a JMS connection, or a port number.
- Application: is any deployable archive. For example, a WAR and DAA.
- Access_Point: is a means of interacting with an application. For example, an ActiveMatrix service endpoint, or an EMS queue.
- Top_level: A special type that represents the root-level object in the tree. There can be only one such instance of the object per agent. This is the only object that cannot have a configuration or state. Note that methods that access objects of this type do not have the `key` argument that is otherwise required by other concepts.

Web UI

TIBCO Enterprise Administrator provides a default UI to manage and monitor products. You can customize labels and icons on the UI to match the object types of your product. You can add more views to suit your product requirements.

Shell

TIBCO Enterprise Administrator provides a command-line utility called the TIBCO Enterprise Administrator shell. It is a remote shell based on the SSH protocol. The Shell is accessible using any terminal program such as Putty. The scripting language is similar to bash from UNIX, but has important differences. You can use the Shell to perform almost all the tasks offered by the server UI.

Python Scripting

You can use Python scripting to perform any activity you performed using the Web UI. Python scripting is especially useful when you have to repeat a task for multiple users or use control structures to work through some conditions in your environment. Although you can use the Shell utility to use the command-line UI, the Shell UI does not support conditional statements and control structures. Python scripting proves to be useful in such cases.

Log in to the TIBCO Enterprise Administrator Server Using the Web UI

You can use the Web UI to connect to the TIBCO Enterprise Administrator server.

Before you begin

You must start the TIBCO Enterprise Administrator server before logging into the Web UI. Open the command prompt and navigate to `<TIBCO_HOME>`. Run `<TIBCO_HOME>\tea\<version>\bin\tea.exe`. You must also start the agents for respective products if you want to monitor the product on the Web UI.

Password Policies

Following are the constraints on creating a password:

- The length of the password must be between 1 and 128 characters.
- You cannot reuse the past 5 passwords.
- Your account gets locked after 10 failed attempts. The `admin` account is the only exception to this rule, but the `admin` account experiences a lag of 1 second on every login after 10 failed attempts.
- You must reset a password after a lockout because it cannot be changed.

Note: If you want to set custom password policy, refer to Setting Custom Password Policy.

Procedure

1. Open a browser and navigate to the URL `http://localhost:8777/tea/`, where `localhost` is the default hostname and `8777` is the default port number.

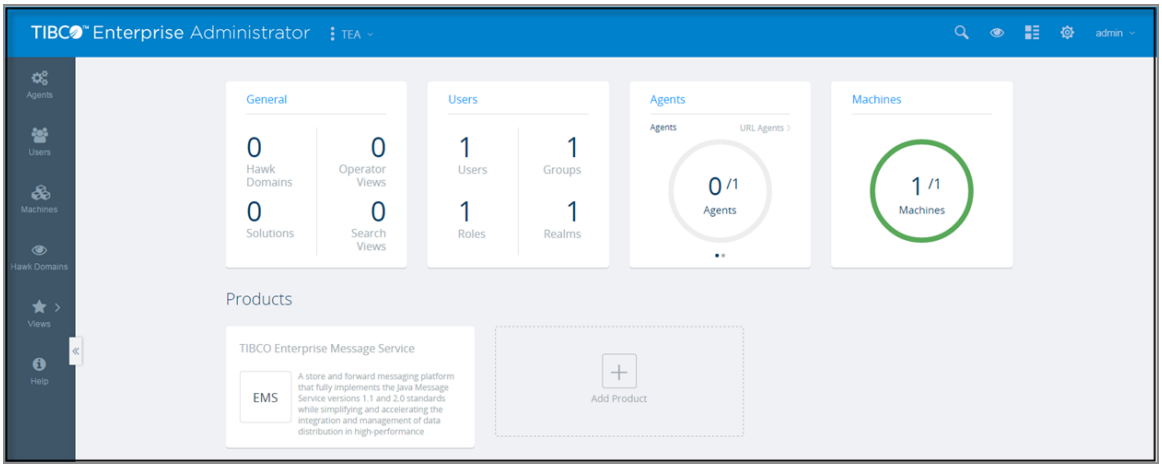
> **Note:** The default port number and other settings can be changed by modifying the settings in `tea.conf` file that is available under `<TIBCO_CONFIG_HOME>\tibco\cfgmgmt\tea\conf`.

2. Enter your Login credentials.

   The default username is *admin* and the default password is *admin.*

   > **Note:** The default timeout for a session is 30 minutes.

   Landing Page

   > **Note:** To get more help on any of the features, click admin. Select **Help** and click **Go to Documentation**. This takes you to the TIBCO Enterprise Administrator Documentation.

Result

On successful authentication, the landing page is displayed. The username with which you have logged in is shown as a menu option in the title pane. The landing page displays cards with information on the general details, users, agents, machines, and products exposed to the TIBCO Enterprise Administrator server. Each of the details appearing on the card can be clicked to see more details. All the products exposed to the server appear as cards. You can click on a product card to see product details.

Note: The commonly used options available on the menu are available on the side navigation bar. Commonly used options available on the menu are also visible on the navigation bar, but the procedures in this guide use the options from the menu.

Configuring the TIBCO Enterprise Administrator Server

Assume that the location of the configuration folder selected during installation is *TIBCO_CONFIG_HOME*. The default configuration file `tea.conf` is available under `<TIBCO_CONFIG_HOME>\tibco\cfgmgmt\tea\conf`.To customize the server configuration, you can add additional properties to this file.

You can modify the following properties:

Property Name	Description	Default Value
tea.http.port	The HTTP port on which the TIBCO Enterprise Administrator server listens to requests.	`8777`
tea.http.session.timeout	The HTTP Session Timeout for the TIBCO Enterprise Administrator server.	`1800 seconds`
tea.http.buffer-max-size	The maximum buffer size (in bytes) of the requests and responses made by the TIBCO Enterprise Administrator server.	`52428800 bytes`
tea.agents.ping-interval	The time interval in which the TIBCO Enterprise Administrator server pings each agent.	`15000 ms`
tea.auth.timeout	The timeout value for fetching the user configuration during login.	`60000 ms`
tea.agents.request-timeout	The timeout value for the requests made to the TIBCO Enterprise Administrator server.	`60000 ms`
tea.shell.port	The port number to connect to the SSH	`2222`

Property Name	Description	Default Value
	server hosted by the TIBCO Enterprise Administrator server.	
tea.shell.timeout	The time for which the TIBCO Enterprise Administrator server waits for a response from the shell command.	`15000 ms`
tea.indexing.interval	The time taken for the elements to become available on the server after registration	`30000 ms`
tea.server.instance.name	When there are multiple instances of the server running, you can distinguish the instances by their instance name. The instance name appears under TIBCO Enterprise Administrator in the UI.	
tea.storage.remote.enabled	When set to true, the internal database is enabled for data sharing.	`true`
tea.storage.remote.tcpPort	Sets the port used by the internal database.	`9092`
tea.storage.remote.username	Use this property only if you plan to use TIBCO Enterprise Administrator from a CONFIG_HOME different from the existing one.	
tea.storage.remote.password	This property is coupled with `tea.storage.remote.username`. Use this property only if you plan to use TIBCO Enterprise Administrator from a *CONFIG_HOME* different from the existing one.	
tea.ext.hawk.enabled	Set this property to `true` to enable Hawk server extension.	`false`
tea.dev.developer-mode	Set this property to `true` to start TIBCO	`false`

Property Name	Description	Default Value
	Enterprise Administrator in the developer mode.	
tea.jvminfo.enabled	Set this property to true view the JVM details on the server side.	`false`

The format supported is HOCON. See GitHub.

Setting Custom Password Policy

There may be instances where you may need to set a custom password policy. There is a new property that has been added to the `tea.tra` file to meet this requirement.

Procedure

1. Open the `tea.tra` file.
2. Under the TEA variables section, locate `tibco.env.TEA_START_PARAMS`.
3. Specify the `name` and the `-Dpassword.policy` where `-Dpassword.policy ="<location_of_custom_password_policy_xml_file>"`. The following is an example of setting a custom password policy:

```
name=password.policy
-Dpassword.policy="%TEA_CONFIG_HOME%/conf/TEAPasswordPolicy.xml"
or C:\tea240\tibco\cfgmgmt\tea\conf\TEAPasswordPolicy.xml
or "/home/user/tea_
2.4.0/tibco/cfgmgmt/tea/conf/TEAPasswordPolicy.xml"
```

SSL Configuration on the TIBCO Enterprise Administrator: An Overview

The TIBCO Enterprise Administrator supports both one-way (server side) and two-way (server side as well as client side) SSL authentication. You can configure SSL between the

web browser and the TIBCO Enterprise Administrator as well as between the TIBCO Enterprise Administrator and the agent.

- **One-way Authentication** - This authentication is also known as server-side authentication. For this type of authentication, the HttpClient residing in an application authenticates the HttpServer residing in another application. The HttpServer is not required to authenticate the HttpClient. On TIBCO Enterprise Administrator, the following factors would be true:
    - The HttpClient residing on the TIBCO Enterprise Administrator server verifies the HttpServer residing on the agent.

      AND
    - The HttpClient residing on the agent verifies the HttpServer residing on the TIBCO Enterprise Administrator server.

So, the HttpServers residing on both the TIBCO Enterprise Administrator server and agent simply trust each others' HttpClients.

- **Two-way Authentication** - In addition to the server-side authentication used for the one-way authentication, the two-way authentication requires client-side authentication too. On TIBCO Enterprise Administrator, the following factors would be true:
    - The HttpClient residing on the TIBCO Enterprise Administrator server verifies the HttpServer residing on the agent.
    - The HttpClient residing on the agent verifies the HttpServer residing on the TIBCO Enterprise Administrator server.
    - The HttpServer residing on the TIBCO Enterprise Administrator server verifies the HttpClient residing on the agent.
    - The HttpServer residing on the agent verifies the HttpClient residing on the TIBCO Enterprise Administrator server.

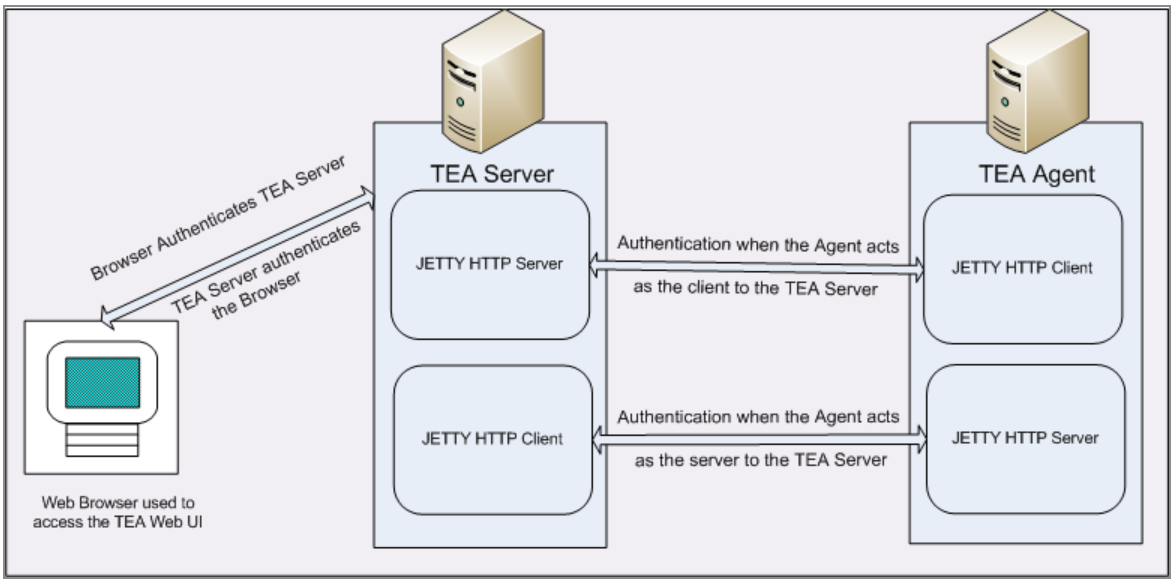
Note: Earlier versions of TIBCO Enterprise Administrator supported only one-way authentication. TIBCO Enterprise Administrator 1.3.0 and above supports two-way authentication. However, you always have the option to implement one-way authentication alone too.

In TIBCO Enterprise Administrator, the web browser (which you use to run the TIBCO Enterprise Administrator web UI) is a client to the TIBCO Enterprise Administrator server. The TIBCO Enterprise Administrator server on the other hand, acts as a client to the agent

when it makes a request to the agent, but acts as a server to the agent when the agent requests some information from it. Similarly, the agent acts as a server to the TIBCO Enterprise Administrator server when fulfilling a request from the TIBCO Enterprise Administrator server but acts as a client to the TIBCO Enterprise Administrator server when making a request to the TIBCO Enterprise Administrator server (such as when getting itself registered with the TIBCO Enterprise Administrator server).

The following diagram shows a very high-level overview of authentication in a two-way authentication setup:

Two-way Authentication



Configuring SSL: One-Way Authentication

To configure a one-way SSL authentication, you must set some SSL-related properties in the `tea.conf` file as well as on the agent.

Procedure

1. Open `<TIBCO_CONFIG_HOME>\tibco\cfgmgmt\tea\conf\tea.conf`.
2. Add the properties listed in the section, SSL Properties in the `tea.conf` file.

   The following is an example of the `tea.conf` file with SSL settings:

```
tea.http.keystore =
"/Users/<username>/tea/keystore/httpserversslkeys.jceks"
tea.http.truststore =
"/Users/<username>/tea/keystore/httpserverssltrusts.jceks"
tea.http.keystore-password = "password"
tea.http.truststore-password = "password"
tea.http.key-manager-password = "password"
tea.http.cert-alias = "httpserver"
tea.http.want.client.auth = false
tea.http.need.client.auth = false
```

Note: The TIBCO Enterprise Administrator server supports the keystore formats supported by Java. Therefore, keystore formats such as, `jks`, `jceks`, `pkcs12` are supported by the TIBCO Enterprise Administrator server. For a detailed list of supported keystore formats, refer to the *KeyStore Types* documentation on the Oracle Website.

3. Set the same properties on the agent. Refer to the section, "Setting SSL Properties on the agent", in the *TIBCO Enterprise Administrator Developer Guide*.

Configuring SSL: Two-Way Authentication

Two-way SSL authentication requires you to configure both server-side authentication and client-side authentication.
To set up this two-way authentication, you must perform the following steps. You can perform these steps in one of the two ways - either using the keytool (to be run from your `<JAVA_HOME>/bin` directory) or by running the commands specified on the OpenSSL documentation website.

Procedure

1. Follow the steps outlined in Configuring SSL: One-Way Authentication.
2. Generate the key store and private key for the HttpServer on the TIBCO Enterprise Administrator server and the HttpServer on the agent.
3. Generate a self-signed certificate or obtain a CA-signed certificate for the HttpServer on the TIBCO Enterprise Administrator server and the HttpServer on the agent.
4. Generate the key store and private key for the HttpClient on the TIBCO Enterprise

Administrator server and the HttpClient on the agent.

5. Generate a self-signed certificate or obtain a CA-signed certificate for the HttpClient on the TIBCO Enterprise Administrator server and the HttpClient on the agent.
6. Import the agent HttpServer's certificate into the trust store used by TIBCO Enterprise Administrator server's HttpClient.
7. Import the TIBCO Enterprise Administrator server's HttpServer's certificate into the agent's HttpClients' trust store.
8. For the web browser (from where you access the TIBCO Enterprise Administrator UI): Generate a PKCS #12 format certificate that includes a private key for the browser and a public key and the browser's certificate.
9. Import the certificate from the above step into the web browser's trust store. Refer to the browser's documentation for details on importing the certificate into the browser.

Result

Once the SSL configuration has been set up and is working, the URL to access the TIBCO Enterprise Administrator server from the web UI changes from http://localhost:8777 to https://localhost:8777.

SSL Properties

When configuring SSL on the TIBCO Enterprise Administrator, you must set some properties on both the TIBCO Enterprise Administrator server as well as the agent.

Note: Setting the HttpClient properties on both the agent and the TIBCO Enterprise Administrator server is mandatory only if you want to set up a two-way SSL configuration. Do not set the HttpClient properties if you want to set up a one-way SSL configuration or do not want to set up SSL at all. If you do not set the HttpClient properties on the agent and the TIBCO Enterprise Administrator server, the HttpClients residing on both of them are configured to "Trust All".

To enable SSL on the TIBCO Enterprise Administrator server, set these properties for the HttpServer and HttpClient residing on the TIBCO Enterprise Administrator server:

TIBCO Enterprise Administrator Server Properties

Property	Description
Properties for the HttpServer on the TIBCO Enterprise Administrator server	
tea.http.keystore	The file name or URL of the key store location. For example: `tea.http.keystore = "/Users/<username>/tea/keystore/httpserversslkeys.jceks"`
tea.http.keystore-password	Password for the key store residing on the TIBCO Enterprise Administrator server. This is the password that was set when the key store was created. For example: `tea.http.keystore-password = "MyPassword"`
tea.http.cert-alias	Alias for the SSL certificate. The certificate can be identified by this alias in case there are multiple certificates in the trust store. For example: `tea.http.cert-alias = "httpserver"`
tea.http.key-manager-password	The password for the specific key within the key store. This is the password that was set when the key pair was created. For example: `tea.http.key-manager-password = "password"`
tea.http.truststore	The file name or URL of the trust store location. For example: `tea.http.truststore = "/Users/<username>/tea/keystore/httpserverssltrusts.jceks"`
tea.http.truststore-password	The password for the trust store.

Property	Description
	For example: `tea.http.truststore-password = "password"`
tea.http.want.client.auth	See section Guidelines to set the tea.http.want.client.auth and tea.http.need.client.auth Parameters below. This property is used for mutual authentication. For example: `tea.http.want.client.auth = true`
tea.http.need.client.auth	See section Guidelines to set the tea.http.want.client.auth and tea.http.need.client.auth Parameters below. This property is used for mutual authentication. For example: `tea.http.need.client.auth = true`
tea.http.exclude.protocols	The property to list the protocols to be excluded. To exclude multiple protocols, use comma as a delimiter. For example, `tea.http.exclude.protocols="SSLv3,TLS1"` If the property is *not* mentioned, the SSLV3 protocol is excluded. If TIBCO Enterprise Administrator server must support all protocols including SSLV3, set the property to be empty. For example, `tea.http.exclude.protocols=""`. **Attention:** When connecting using HTTPS, some versions of the popular browsers may be configured to use SSLv3 as the protocol. If you have problems accessing secured TIBCO Enterprise Administrator server (by default the SSLv3 is disabled) using the browser, follow the browser's user guide to configure that browser to excludeSSLv3 protocol.

Property	Description
Properties for the HttpClient on the TIBCO Enterprise Administrator server Only required if you want to set up a two-way SSL configuration	
tea.http.client.keystore	The file name or URL of the key store location. For example: `tea.http.client.keystore = "/Users/<username>/tea/keystore/httpclientsslkeys.jceks"`
tea.http.client.keystore-password	The password for the key store residing on the client (agent). For example: `tea.http.client.keystore-password = "password"`
tea.http.client.cert-alias	Alias for the SSL certificate. The certificate can be identified by this alias in case there are multiple certificates in the trust store For example: `tea.http.client.cert-alias = "httpclient"`
tea.http.client.key-manager-password	The password for the specific key within the key store. For example: `tea.http.client.key-manager-password = "password"`
tea.http.client.truststore	The file name or URL of the trust store location. For example: `tea.http.client.truststore = "/Users/<username>/tea/keystore/httpclientssltrusts.jceks"`
tea.http.client.truststore-password	The password for the trust store. For example: `tea.http.client.truststore-password = "password"`

Property	Description
tea.http.client.exclude.protocols	The property to list the protocols to be excluded. To exclude multiple protocols, use comma as a delimiter. For example, `tea.http.exclude.protocols="SSLv3,TLS1"` If the property is *not* mentioned, the SSLV3 protocol is excluded. If TIBCO Enterprise Administrator server must support all protocols including SSLV3, set the property to be empty. For example, `tea.http.exclude.protocols=""`. **Attention:** When connecting using HTTPS, some versions of the popular browsers may be configured to use SSLv3 as the protocol. If you have problems accessing secured TIBCO Enterprise Administrator server (by default the SSLv3 is disabled) using the browser, follow the browser's user guide to configure that browser to excludeSSLv3 protocol.

Agent PropertiesTo enable SSL on the agent, set the following properties for the HttpServer and HttpClient residing on the agent:

Property	Description
Properties for the HttpServer on the agent	
tea.agent.http.keystore	The file name or URL of the key store location. For example: `tea.agent.http.keystore = "/Users/<username>/tea/keystore/httpserversslkeys.jceks"`
tea.agent.http.keystore.password	Password for the key store residing on the agent. This is the password that was set when the key store was created. For example: `tea.agent.http.keystore.password =`

Property	Description
	`"MyPassword"`
tea.agent.http.cert.alias	Alias for the SSL certificate. The certificate can be identified by this alias in case there are multiple certificates in the trust store. For example: `tea.agent.http.cert.alias = "httpserver"`
tea.agent.http.keymanager.password	The password for the specific key within the key store. This is the password that was set when the key pair was created. For example: `tea.agent.http.keymanager.password = "password"`
tea.agent.http.truststore	The file name or URL of the trust store location. For example: `tea.agent.http.truststore = "/Users/<username>/tea/keystore/httpserverssltrusts.jceks"`
tea.agent.http.truststore.password	The password for the trust store. For example: `tea.agent.http.truststore.password = "password"`
tea.agent.http.want.client.auth	See section Guidelines to set the tea.http.want.client.auth and tea.http.need.client.auth Parameters below. This property is used for mutual authentication. For example: `tea.agent.http.want.client.auth = true`

Property	Description
tea.agent.http.need.client.auth	See section Guidelines to set the tea.http.want.client.auth and tea.http.need.client.auth Parameters below. This property is used for mutual authentication. For example: `tea.agent.http.need.client.auth = true`

tea.agent.http.exclude.protocols	The property to list the protocols to be excluded. To exclude multiple protocols, use comma as a delimiter.
	
	For example,
	`tea.http.exclude.protocols="SSLv3,TLS1"`
	If the property is *not* set either using system properties or using agent Server API, the SSLV3 protocol is excluded. If TIBCO Enterprise Administrator agent must support all protocols including SSLV3, set the property to be empty.
	
	For example,
	`tea.http.exclude.protocols=""`
	
	Attention: When connecting using HTTPS, some versions of the popular browsers may be configured to use SSLv3 as the protocol. If you have problems accessing secured TIBCO Enterprise Administrator server (by default the SSLv3 is disabled) using the browser, follow the browser's user guide to configure that browser to excludeSSLv3 protocol.

Properties for the HttpClient on the Agent Only required if you want to set up a two-way SSL configuration	
tea.agent.http.client.keystore	The file name or URL of the key store location. For example: `tea.agent.http.client.keystore = "/Users/`

Property	Description
	<username> /tea/keystore/httpclientsslkeys.jceks"
tea.agent.http.client.keystore.password	The password for the key store residing on the client (agent). For example: tea.agent.http.client.keystore.password = "password"
tea.agent.http.client.cert.alias	Alias for the SSL certificate. The certificate can be identified by this alias in case there are multiple certificates in the trust store. For example: tea.agent.http.client.cert.alias = "httpclient"
tea.agent.http.client.keymanager.password	The password for the specific key within the key store. For example: tea.agent.http.client.keymanager.password = "password"
tea.agent.http.client.truststore	The file name or URL of the trust store location. For example: tea.agent.http.client.truststore = "/Users/ *<username>* /tea/keystore/httpclientssltrusts.jceks"
tea.agent.http.client.truststore.password	The password for the trust store. For example: tea.agent.http.client.truststore.password = "password"
tea.agent.http.client.exclude.protocols	The property to list the protocols to be excluded. To exclude multiple protocols, use comma as a delimiter.

Property	Description
	For example, `tea.http.exclude.protocols="SSLv3,TLS1"` If the property is *not* set either using system properties or using agent Server API, the SSLV3 protocol is excluded. If TIBCO Enterprise Administrator agent must support all protocols including SSLV3, set the property to be empty. For example, `tea.http.exclude.protocols=""` **Attention:** When connecting using HTTPS, some versions of the popular browsers may be configured to use SSLv3 as the protocol. If you have problems accessing secured TIBCO Enterprise Administrator server (by default the SSLv3 is disabled) using the browser, follow the browser's user guide to configure that browser to excludeSSLv3 protocol.

Guidelines to set the tea.http.want.client.auth and tea.http.need.client.auth Parameters

Here are some guidelines for setting these parameters depending on the scenario you want to implement:

For this type of authentication...	setting the parameters in this combination...	results in...
Certification-based two-way authentication	http.want.client.auth = true http.need.client.auth = false	The TEA server asks the client (web browser or agent) to provide its client certificate while handshaking. But the client chooses not to provide authentication information about itself, but the authentication process continues.

For this type of authentication...	setting the parameters in this combination...	results in...
		So that would mean that the client certification is optional which in turn means that no certificate needs to be generated on the client. **End Result** The authentication process is successful.
	http.want.client.auth = false http.need.client.auth = true	The TEA server asks the client (web browser or agent) to provide its client certificate while handshaking, but the client chooses not to provide authentication information about itself, the authentication process stops. So that would mean that the client certification is required which in turn means that a keypair and certificate must be generated on the client (agent). **End Result** The authentication process fails
	http.want.client.auth = true http.need.client.auth = true	Same as the above case where the client certification is required and a keypair and certificate must be generated on the client (agent). **End Result** The authentication process fails
Certification-based one-way authentication	http.want.client.auth = false http.need.client.auth = false	Both of the parameters set to 'false' which means that it is a One-way Authentication, where only the client (web browser or agent) verifies the TEA server but the TEA server

For this type of authentication...	setting the parameters in this combination...	results in...
		trusts all the clients without verification. Do not generate any certificates. **End Result** The authentication process is successful, as long as the user name and password provided by the agent are both correct.

Setting SSL Properties on the Agent

To enable SSL, you must set the SSL system properties on both the TIBCO Enterprise Administrator server and the agent.

Refer to the SSL Properties section for details on the system properties to be set.

Procedure

1. On the agent, you can set the SSL system properties in **one** of the following ways:
   - Set the properties using the API.

     For example,

```
server.setKeystorePath(
“/tea/keystore/httpserversslkeys.jceks”
server.setKeyStorePath
("/tea/keystore/httpserversslkeys.jceks");
server.setKeyStorePassword("password");
server.setCertAlias("httpserver");
server.setTrustStorePath
("/tea/keystore/httpserverssltrusts.jceks");
server.setTrustStorePassword("password");
server.setKeyManagerPassword("password");
server.setWantClientAuth(true);
server.setNeedClientAuth(true);
```

```
server.setHttpClientKeyStorePath
("/tea/keystore/httpclientsslkeys.jceks");
server.setHttpClientKeyStorePassword("password");
server.setHttpClientCertAlias("httpclient");
server.setHttpClientTrustStorePath
("/tea/keystore/httpclientssltrusts.jceks");
server.setHttpClientTrustStorePassword("password");
server.setHttpClientKeyManagerPassword("password");
```

- Create an SSLContext and inject it into the TIBCO Enterprise Administrator server using the agent API.

  To do so:

  a. Create an SSLContext object. Follow the JDK documentation on the Oracle web site for instructions on how to do so.

  b. Use the SSLContext API to set the configuration properties into the SSLContext instance. Follow the JDK documentation on the Oracle web site for instructions on how to do so.

  c. Inject the SSLContext instance into the TEA agent's HttpServer and HttpClient using one of the following APIs:

  ```
  public TeaAgentServer(final String name, final String
  version, final String agentinfo, final int port, final
  String contextPath,
  final Boolean enableMetrics, final SSLContext
  sslContextForHttpServer, final SSLContext
  sslContextForHttpClient)
  ```

  or

  ```
  public TeaAgentServer(final String name, final String
  version, final String agentinfo, final String hostname,
  final int port,
  final String contextPath, final Boolean enableMetrics,
  final SSLContext sslContextForHttpServer, final SSLContext
  sslContextForHttpClient)
  ```

> **Note:** If you choose not to specify the hostname parameter as shown in the first interface above, a default value of `localhost` is used for the hostname.

An example of using the first API above:

```
final TeaAgentServer server = new TeaAgentServer
("SSLTestAgent","1.1","Agent for SSL
test",port,"/ssltestagent",true,
sslContextForServer, sslContextForClient);
```

- Set the properties from the command line using these System.properties when running the agent.

  For example,

```
-Dtea.agent.http.keystore=
"/Users/<username>/tea/keystore/httpserversslkeys.jceks"
-Dtea.agent.http.truststore=
"/Users/<username>/tea/keystore/httpserverssltrusts.jceks"
-Dtea.agent.http.keystore.password="password"
-Dtea.agent.http.truststore.password="password"
-Dtea.agent.http.keymanager.password="password"
-Dtea.agent.http.cert-alias="httpserver"
-Dtea.agent.http.want.client.auth=true
-Dtea.agent.http.need.client.auth=true
-Dtea.agent.http.client.keystore=
"/Users/<username>/tea/keystore/httpclientsslkeys.jceks"
-Dtea.agent.http.client.truststore=
"/Users/<username>/tea/keystore/httpclientssltrusts.jceks"
-Dtea.agent.http.client.keystore.password="password"
-Dtea.agent.http.client.truststore.password="password"
-Dtea.agent.http.client.keymanager.password="password"
-Dtea.agent.http.client.cert-alias="httpclient"
```

2. Start the agent. If you did not set the system properties using the API or create and inject an SSLContext, then make sure to start the agent in SSL mode by setting the properties through the command line as shown in the example in the last bullet item above.

Logging

The product does not ship an slf4j adapter along with it. For agent library logging, you must install log4j or logback and configure it. The location of `logback.xml` or `log4j.xml` must be placed in the classpath. For server logging, the default location of the log configuration file `logging.xml` is<*TIBCO_CONFIG_HOME*>\tibco\cfgmgmt\tea\conf.

Loggers

Changes made to the log configuration file are recognized by the server dynamically; hence avoiding a restart. The following loggers are available:

Loggers	Description
com.tibco.security	Used to log DSS.
com.tibco.tea.server	Used to log DSS.
com.tibco.tea.server.lifecycle	Used to log the internal server events associated with start, stop, or restart of the internal components.
com.tibco.tea.server.console	Used to log the server startup. Controls the output visible on the server console. Do not change this logger.
com.tibco.tea.server.io	Used to log the internal server events associated with reading from or writing to a file.
com.tibco.tea.server.security	Used to log the internal server events associated with authentication and authorization.
com.tibco.tea.server.remoting	Used to log the internal server events associated with remote agent registration and connectivity.
com.tibco.tea.server.service	Used to log the internal server events associated with the execution of service requests on behalf of the user.
com.tibco.tea.server.error	Used to log the internal server events associated with

Loggers	Description
	business errors encountered while executing service operations on behalf of the user.
com.tibco.amx.ra.dbrealm	Used for managing realms over Hibernate, JDBC.
com.tibco.amx.ra.dbauth	Used for authentications over Hibernate, JDBC.
com.tibco.amx.ra.ldaprealm	LDAP realms; do not confuse with LDAP authentication or connection.
com.tibco.amx.ra.ldapauth	LDAP authentication; do not confuse with LDAP realm or connection.
com.tibco.amx.ra.trinity	Is a generic logger used mostly in configurations. Is useful with `-Dcom.tibco.trinity.runtime.core.connector`. Use the `.debug=true` to debug the steps.
com.tibco.amx.ra.keystore	Used for a keystore type.
com.tibco.tea.server.ext.hawk	Used only for integrating with Hawk. You can see the Hawk Extension messages by configuring this logger.

Log Levels

The default log levels for the loggers is INFO. The following log levels are available:

- TRACE
- DEBUG
- INFO
- WARN
- ERROR
- FATAL

To learn more about the third-party log configuration files, visit the following:

- HOCON (Human-Optimized Config Object Notation)
- LOGBACK configuration

Rolling and Triggering Policy

The rolling and triggering policies are available in the<*TIBCO_CONFIG_HOME*>\tibco\cfgmgmt\tea\conf\logging.xml file. You can change these policies to suit your requirement. The following snippet serves as an example:

```
<rollingPolicy
class="ch.qos.logback.core.rolling.FixedWindowRollingPolicy">
<fileNamePattern>${tea.logs}/tea.%i.log.zip</fileNamePattern>
<minIndex>1</minIndex>
<maxIndex>3</maxIndex>
</rollingPolicy>

<triggeringPolicy
class="ch.qos.logback.core.rolling.SizeBasedTriggeringPolicy">
<maxFileSize>5MB</maxFileSize>
</triggeringPolicy>
```

By default, if the log file reaches 5MB, it is saved as a ZIP file and a new log file is created.

Agent Management

You can use the Web UI to register TIBCO Enterprise Administrator agents and URL agents. The URL agents are not TIBCO Enterprise Administrator agents; however they might be a web application that you want to port as TIBCO Enterprise Administrator agent. Every agent that is added to the TIBCO Enterprise Administrator is displayed on the landing page. You can perform basic administrative tasks collectively on these agents such as reconnecting or unregistering agents.

Registering an Agent

A product is exposed to the TIBCO Enterprise Administrator through an agent. When you register an agent corresponding to a product, the agent ensures that the product is visible on TIBCO Enterprise Administrator.

Before you begin

Start the agent for the corresponding product.
As an example, this procedure uses an example of a Tomcat agent.

Procedure

1. Login to TIBCO Enterprise Administrator. The username and the password is `admin`.

   The landing page is displayed.

2. Click the **Agents** card.

   The Agent Management Pane is displayed.

3. By default, the Agents tab is selected. Click **Register New**.

   The Register Agent window is displayed.

4. Provide the following details:

   - Agent Name
   - Agent URL

- Agent Description

> **Warning:** When registering agents, ensure that the agent IDs do not collide.

5. Click **Register**.

   The agent is visible in the Agents pane. The agent card on the landing page also shows an increase in number for every registered agent.

   Attention: Watch out for the following:

   a. If there are two agents for the same object type, ensure that they have the same operation name and number. This is to ensure that when you invoke an operation, you can select the agent on which you want to execute the operation from the drop-down list.

   b. If the URL used during registration is invalid, the `404–Page not Found` error occurs.

   c. Ensure that you avoid registering two agents with the same IDs. The TIBCO Enterprise Administrator server does not validate whether two agents have registered with the same ID.

   d. Agents built with the higher version of the library cannot be registered with the lower version of the server. For example, an agent built with the 1.3.0 version of the library cannot be registered with the 1.2.0 version of the TIBCO Enterprise Administrator server.

Reconnecting an Agent

You can collectively reconnect agents using TIBCO Enterprise Administrator.

Before you begin

Ensure that the TEA server and the Admin agent are running.

Procedure

1. Click the **Agents** card.

The Agent Management Pane is displayed.

2. From the **Agents** tab, select the agents you want to reconnect. Click **Reconnect**.

   A confirmation window is displayed.

3. Click **Reconnect** to confirm.

   The agents are reconnected with the server.

Unregistering an Agent

You can collectively unregister agents using the TIBCO Enterprise Administrator.

Before you begin

Ensure that the TIBCO Enterprise Administrator server and the agents are running.

Procedure

1. Click the Agents card.

   The Agent Management pane is displayed.

2. From the Agents tab, select the agents you want to unregister. Click **Unregister**.

   A confirmation window is displayed.

3. Click **Unregister** to confirm.

   The agents are unregistered from the server.

Registering URL Agents

URL Agents are not TIBCO Enterprise Administrator agents. If you want a web application to be ported on TIBCO Enterprise Administrator, you can register the URL with the server.

Procedure

1. Login to TIBCO Enterprise Administrator. The username and the password is `admin`.

   The landing page is displayed.

2. Click the **Agents** card.

The Agent Management Pane is displayed.

3. Click **URL Agents**.
4. Click **Register New**.
5. Provide the following details:
    - Agent Name
    - Agent URL
    - Agent Description
6. Click **Register**.

   The URL agent is visible in the URL Agents pane.

Unregistering an URL Agent

You can collectively unregister agents using the TIBCO Enterprise Administrator.

Procedure

1. Click the Agents card.

   The Agent Management pane is displayed.
2. From the URL Agents tab, select the agents you want to unregister. Click **Unregister**.

   A confirmation window is displayed.
3. Click **Unregister** to confirm.

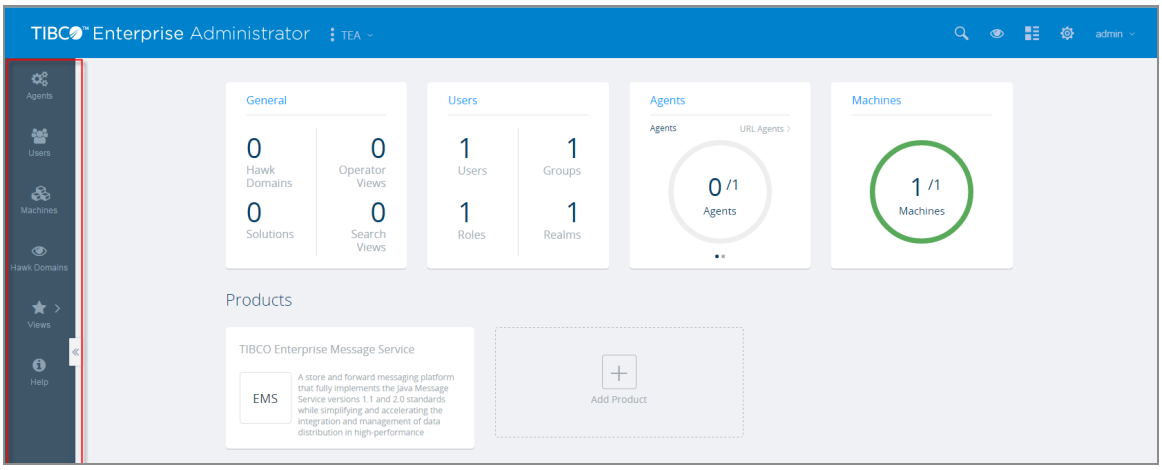
   The URL agents are unregistered from the server.

The Side Navigation Bar

TIBCO Enterprise Administrator Web UI supports the side navigation bar visible to the left of the page.

The most commonly used menu options are available on the navigation bar. If you do not want to use the main menu, you can manage agents, users, machines, Hawk, and views using the options available on the navigation bar. By default, the side navigation bar is visible when you log into the Web UI. You can use the » icon visible on the left to show or hide the navigation bar.

The Left Navigation Bar



Listing Products in TIBCO Enterprise Administrator

You can view the products exposed to TIBCO Enterprise Administrator using the Product List menu. This procedure uses an example of the Tomcat agent to drill down into the assets made available by the Tomcat server.

Procedure

1. Click 

.

   A list of products registered with TIBCO Enterprise Administrator are displayed.

2. Select one of the products. This procedure uses the example of Tomcat.

   Tomcat details are displayed. The content displayed varies according to the product selected. The menu option changes according to the product selected. Rest of these steps depend on the product selected.

3. Assuming the product selected is Tomcat, click **Create** to create a server instance. Provide the following details:

   - Select Operation Target: select the Agent on which the instance must be created.
   - Name: name of the instance.
   - HTTP Port: In case of the Tomcat agent example, the default HTTP port is 8082.
   - AJP Port: you can leave this empty; a random port number is picked up.
   - Shutdown Port: In case of the Tomcat agent example, the default Shutdown port is 9999.

   Note: If you are an agent developer, and if you have TIBCO Enterprise Administrator SDK variant installed, some sample agents are available to you at `<TIBCO_HOME>\tea\<version>\samples`. This procedure uses the sample Tomcat agent. The samples folder is not available in the TIBCO Enterprise Administrator server variant.

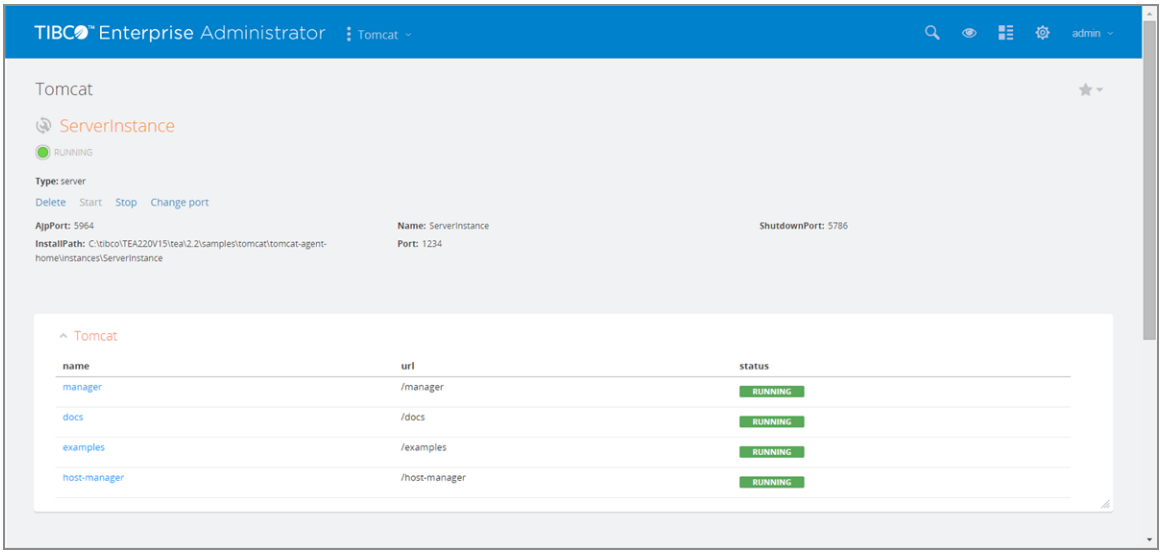
4. Click **Create**.

   The server instance is displayed in the Servers pane.

5. Click one of the instances. You have options to start, stop, delete, or change the port of the server.

6. Under the Server details, a list of assets is displayed. Click one of the assets to drill down further. You can start or stop any of these assets.

   Product Listing of the Tomcat Agent



Using System Views

In addition to the agents, TIBCO Enterprise Administrator also keeps track of the machines on which they are running. TIBCO Enterprise Administrator provides a Machine View that lists all the machines in an enterprise. Agents running on those machines expose the data to TIBCO Enterprise Administrator.

Procedure

1. On the menu, click  and select **Machines**.

   The Machine pane lists all the machines in the enterprise. Details such as the status of the machine, operating system, CPU usage, memory, and the number of agents running on it are listed.

   > **Note:** The **Machines** view always shows the **CPU/Load** column for a Windows machine instance as `N/A`.

2. Click a machine of your choice.

   A detailed report about the machine is displayed. The report lists details about the machine, agents, network interfaces, and operating system processes.

   > **Warning:** If you are viewing a machine that is running a Hawk micro agent on Windows, the Network and System Details are not displayed. Details such as CPU Load, Memory, Usage, Network Interfaces, and so on are not displayed on the Windows platform.

3. For further details, you can drill down on the clickable items displayed in the window. For example, when you click an agent, the Agent Management pane is displayed.
4. Click the arrow next to any of the columns to sort on that column. The up arrow is used to sort in the ascending order and the down arrow is used to sort in the descending order.

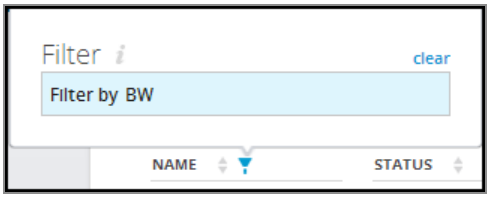
   The machines are sorted on their names.

5. Click the 

icon next to a column to group by the column. Notice that not all columns have Filter icons.

   In the Filter window, enter the Filter condition. For example, to group machines whose names start with "BW", use the condition: Filter by BW.

   The machines are now sorted by their names.



> **Note:** The server also displays the details of the machines on which a Hawk agent was discovered in the Machine view. These machines are displayed with an asterisk (*) next to them. These machines are detected only if the following criteria are met:
>
> - You have created a Hawk domain. For details on creating a Hawk domain, see Registering a Hawk Domain.
> - An agent is running in the Hawk domain.
> - You must have one Hawk agent per machine.

Support for IPv6 Addresses

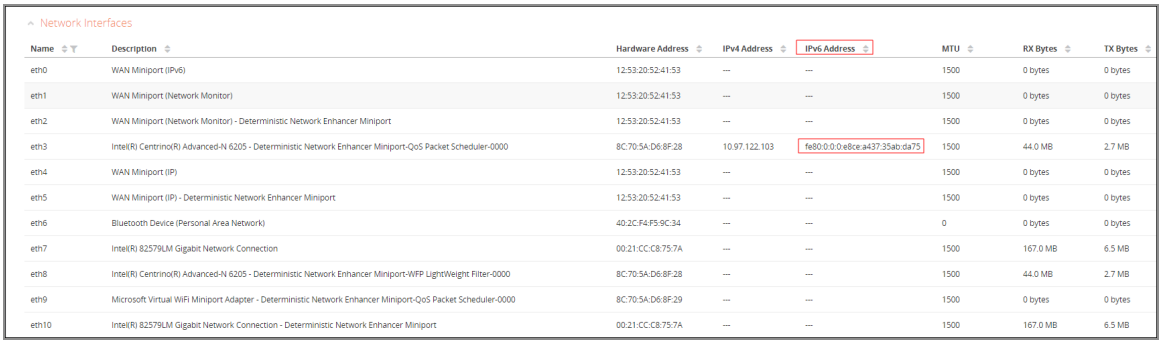
Starting with version 2.2.0, TIBCO Enterprise Administrator provides support for IPv6 address format.

By default, the IPv4 address format is the preferred format. To use IPv6 address format you must set system property, `java.net.preferIPv6addresses` to true. For example, `-Djava.net.preferIPv6addresses=true`. This property is set to `false` by default. When this property is set, the IPv6 address format is visible as a column in the Machine View. The property, Machineipaddress visible on the Machine view takes either the IPv4 or the IPv6 format depending on the `java.net.preferIPv6addresses` property.

If the IPv6 format is enabled, make a note of the following points:

- For TIBCO Enterprise Administrator agents that are older than version 2.2.0 and are

registered with TIBCO Enterprise Administrator server version 2.2.0 or greater, the **IPv6 Address** column in the **Machines** view in the TEA Web UI is blank. The IPv6 address for the agent's machine is not displayed in the IPv6 Address column. The IPv4 addresses are visible in IPv4 Column.


Network Interfaces

Name	Description	Hardware Address	IPv4 Address	IPv6 Address	MTU	RX Bytes	TX Bytes
eth0	WAN Miniport (IPv6)	12:53:20:52:41:53	---	---	1500	0 bytes	0 bytes
eth1	WAN Miniport (Network Monitor)	12:53:20:52:41:53	---	---	1500	0 bytes	0 bytes
eth2	WAN Miniport (Network Monitor) - Deterministic Network Enhancer Miniport	12:53:20:52:41:53	---	---	1500	0 bytes	0 bytes
eth3	Intel(R) Centrino(R) Advanced-N 6205 - Deterministic Network Enhancer Miniport-QoS Packet Scheduler-0000	8C:70:5A:D6:8F:28	10.97.122.103	fe80:0:0:0:e8ce:a437:35ab:da75	1500	44.0 MB	2.7 MB
eth4	WAN Miniport (IP)	12:53:20:52:41:53	---	---	1500	0 bytes	0 bytes
eth5	WAN Miniport (IP) - Deterministic Network Enhancer Miniport	12:53:20:52:41:53	---	---	1500	0 bytes	0 bytes
eth6	Bluetooth Device (Personal Area Network)	40:2C:F4:F5:9C:34	---	---	0	0 bytes	0 bytes
eth7	Intel(R) 82579LM Gigabit Network Connection	00:21:CC:C8:75:7A	---	---	1500	167.0 MB	6.5 MB
eth8	Intel(R) Centrino(R) Advanced-N 6205 - Deterministic Network Enhancer Miniport-WFP LightWeight Filter-0000	8C:70:5A:D6:8F:28	---	---	1500	44.0 MB	2.7 MB
eth9	Microsoft Virtual WiFi Miniport Adapter - Deterministic Network Enhancer Miniport-QoS Packet Scheduler-0000	8C:70:5A:D6:8F:29	---	---	1500	0 bytes	0 bytes
eth10	Intel(R) 82579LM Gigabit Network Connection - Deterministic Network Enhancer Miniport	00:21:CC:C8:75:7A	---	---	1500	167.0 MB	6.5 MB

- When registering an agent with a server, use square brackets around the IPv6 address. The following is an example of a URL that uses an IPv6 address format to register a Tomcat agent with the TIBCO Enterprise Administrator server:

  `http://[FEDC:BA98:7654:3210:FEDC:BA98:7654:3210]:8082/tomcatagent`

- The default format is IPv4, unless the agent developer enables the IPv6 address format explicitly by setting the `java.net.preferIPv6addresses` property.

Viewing the Installed TIBCO Software and Running TIBCO Processes on a Machine

You can view the *TIBCO_HOME* details detected on a machine with a TIBCO Enterprise Administrator agent or a TIBCO Hawk agent running on it. You can drill down every *TIBCO_HOME* location to see the software installed in the *TIBCO_HOME*.
Constraints: TIBCO Enterprise Administrator detects only those software installations that were performed using TIBCO Universal Installer.

Note: Optionally, *TIBCO_HOME* location details can be explicitly provided by setting the following system property:

```
tea.agent.tibcohome-info =
tibcoHomeEnvName|tibcoHomeLocation|tibcoHomeConfigLocation"
(tibcoHomeConfigLocation is an optional field.)

 For example, tea.agent.tibcohome-info =

mytibcohome|/home/userHome/tibcohome|/home/userHome/tibcohome/t
ibco
```

Procedure

1. On the menu, click  and select **Machines**.
2. Click a machine of your choice.

   Note: Alternatively, you can click on the **Machines** card on the landing page.

3. Scroll down to see Software Installation Details.

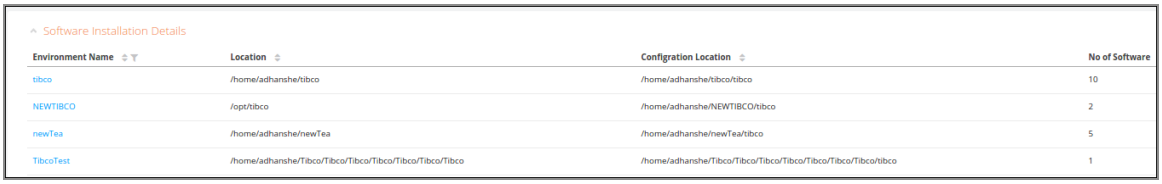
   The Software Installation Details group lists the *TIBCO_HOME* details detected on the machine provided there is a TIBCO Enterprise Administrator agent or a TIBCO Hawk agent and Product_Info MicroAgent running on it. The following details are displayed:

   a. Environment name

   b. Location

   c. Configuration Location: The configuration location is displayed only if you had specified one during installation.

   d. Number of Software



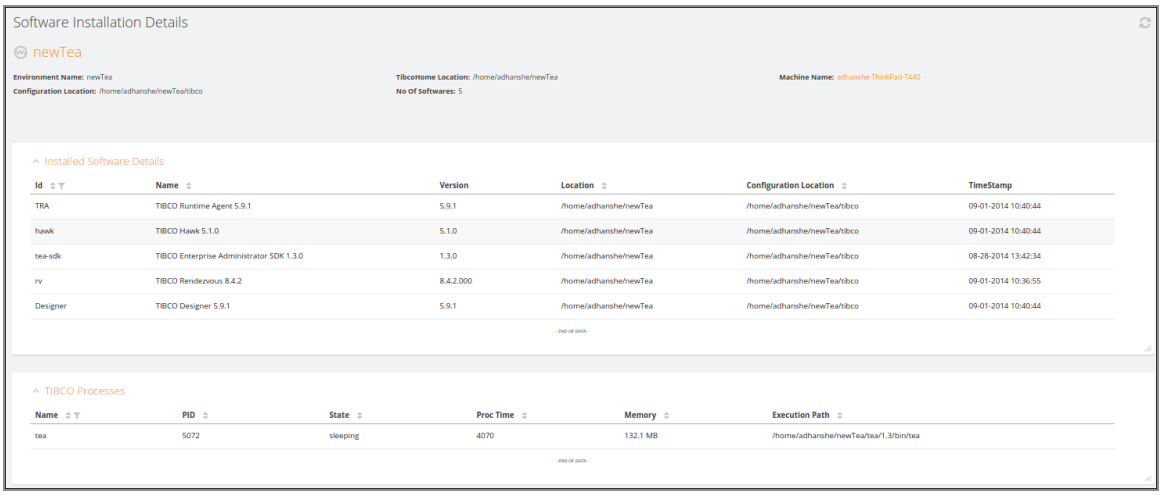
Attention: If you started the server as an NT service on boot up, the Software

Installation details and the TIBCO Processes are not displayed. To view these details, start the NT service under a particular user by configuring the NT service with user name and password. In this case, you can only see the details of the TIBCO software installed for the configured user.

4. Scroll down to see the TIBCO processes running on the machine.
5. From the Software Installation Details pane, click a *TIBCO_HOME* name of your choice.

   The page that is displayed has three panes: *TIBCO_HOME* Environment Name, the Installed Software details for that location, and the TIBCO processes running on the *TIBCO_HOME*.

> **Note:** Any TIBCO process running under TIBCO_HOME gets displayed.



> **Note:** In case of TIBCO Hawk detected machines, all running TIBCO processes may not be detected due to certain limitations.

Viewing JVM Information from an Agent

You can configure TIBCO Enterprise Administrator to detect JVMs running on a machine on which TIBCO Enterprise Administrator Agent is running. When configured, the Machine View displays the JVM Processes pane. The JVM Processes pane shows process ids with display names (if present) of the JVMs in a drop-down list.

By default, the JVM details are not displayed. To view the JVM details, you must configure a property either on the server or on the machines on which the agents are running. When you choose to view the JVM details, the JAR files provided by the server loads on the external JVM. Once loaded on an external JVM, these JAR files cannot be unloaded.

Before you begin

To view the JVM details on the server side, in the `tea.conf` file, set the `tea.jvminfo.enabled` to `true`. To view the JVM details of the machine on which the agents are running, set the `tea.agent.jvminfo.enabled` to `true`.

Procedure

1. On the menu, click  and select **Machines**.

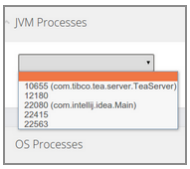
   > **Note:** Alternatively, you can click on the **Machines** card on the landing page, or the Machines option on side navigation bar.

2. Click a machine of your choice.
3. Scroll down to see the JVM processes pane. Remember that the JVM information is not displayed if the corresponding JVM returned empty values or if the process ids are empty.

   > **Warning:** You might not see the JVM details if you started the server as an NT service on boot up. To avoid this, start the NT service under a particular user by configuring the NT service with user name and password. In this case, you can only see the details of the TIBCO software installed for the specific user.

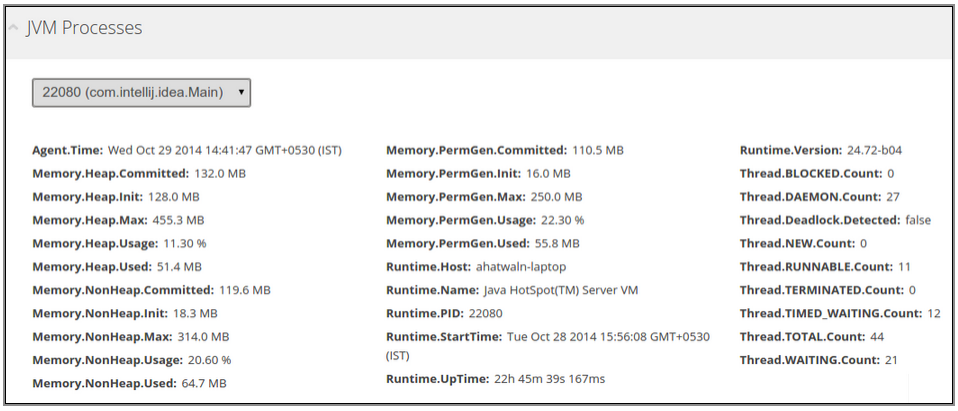
4. Click the drop-down list and select a JVM process entry.
5. You are prompted with the following message: `Do you want to install cloud op agent jar with an external JVM`. Click **OK**.

   The JAR files provided by the server loads on the external JVM. This prompt is displayed only in the beginning of a once for a browser tab.



The details of the selected JVM process are displayed.

> **Note:** If there are two agents running on the same machine, one with JVM details enabled and the other with JVM details disabled, the JVM details might or might not be displayed depending on the agent selected by the server to fetch the JVM information. The behavior would be random in this case.



Attention:

- For the JVM that corresponds to a TIBCO Enterprise Administrator Agent, the information displayed is of that instant in time.
- For rest of the JVMs, the information displayed is as it was captured in time; which is displayed by `Agent.Time` field's value. The JVM information is periodically collected by the remote JVMs in a file. The interval of collecting the information for all such JVMs is currently set to 60 seconds (not configurable).
- If an agent is running on the same machine as the TIBCO Enterprise Administrator server, the timestamp for that agent won't be instantaneous and updates every 60 seconds.
- If an agent is running on a remote machine, then the timestamp is instantaneous for that agent.

Working with Multiple Products

TIBCO Enterprise Administrator oversees a collection of assets in an enterprise. To exercise better control, you can isolate staging environments, business functionality, and organizational group from each other.

The TIBCO Enterprise Administrator server provides a set of views that helps you categorize the assets in an enterprise as per your requirements. You can easily switch from one view to another.

In addition to the available views, you can customize operator and search views depending on the products you want to track. You can create your own operator and search views by using the Manage Views option.

Solutions View

A *Solution* is a collection of assets that provides a business functionality. Using this view, you can bring together assets (applications, processes, resources, endpoints) from across products to provide a unified solution.

A solution has a name, status, and contact information as its attributes. You can assign an asset to and unassign an asset from a solution. You can also define custom action by providing scripts for a solution. Using the TIBCO Enterprise Administrator server, you can:

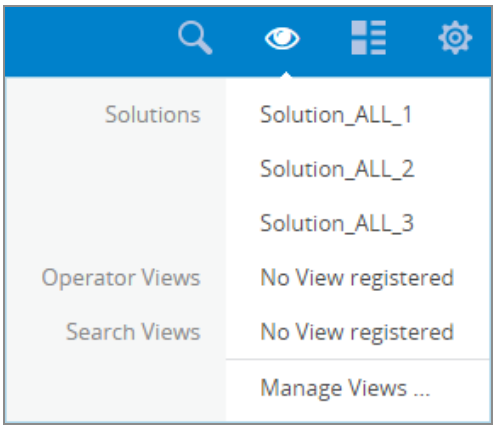
- Create and manage multiple collections.
- Create access-controlled lists on solutions.
- Operate within the context of a Solution to CRUD assets across TIBCO Products.
- Add existing assets to a solution
- Delete existing assets from a solution.

Note: Solutions are displayed on the Solutions menu, only if the agents contribute them. Ensure that the contributing agent is registered with the server.

Procedure

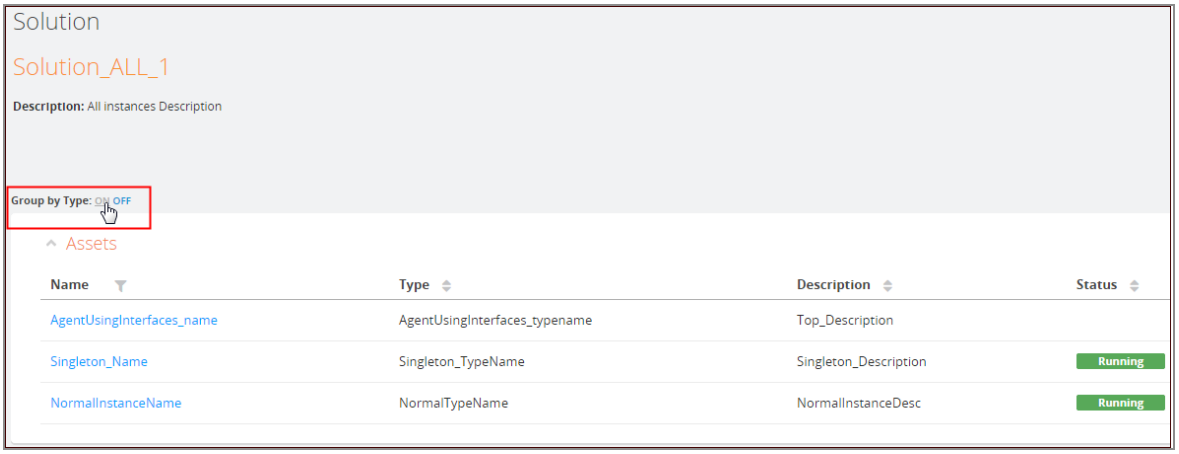
1. Click  and select a solution from the Solutions list.

   The Solution pane is displayed. A list of assets is displayed.



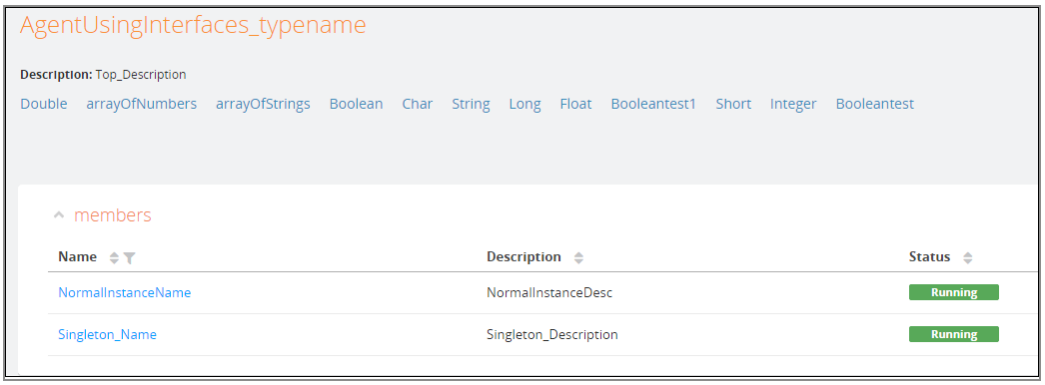
2. Next to the **Group by Type** field, click **ON**.

   The assets are grouped by type.



> **Note:** When a TopLevelObject is added as a member of a solution, you cannot see the status of the TopLevelObject.

3. You can select multiple assets in a group to perform administrative tasks on them. For example, in the SampleProductAgentSolution, you can start, stop, delete, or change the port of a server. Similarly, you can get members of a selected node, or delete nodes collectively.



Search Views

You can search for assets that you have permissions to access. The result of the search can be saved in a view that is displayed in the Search Views option.

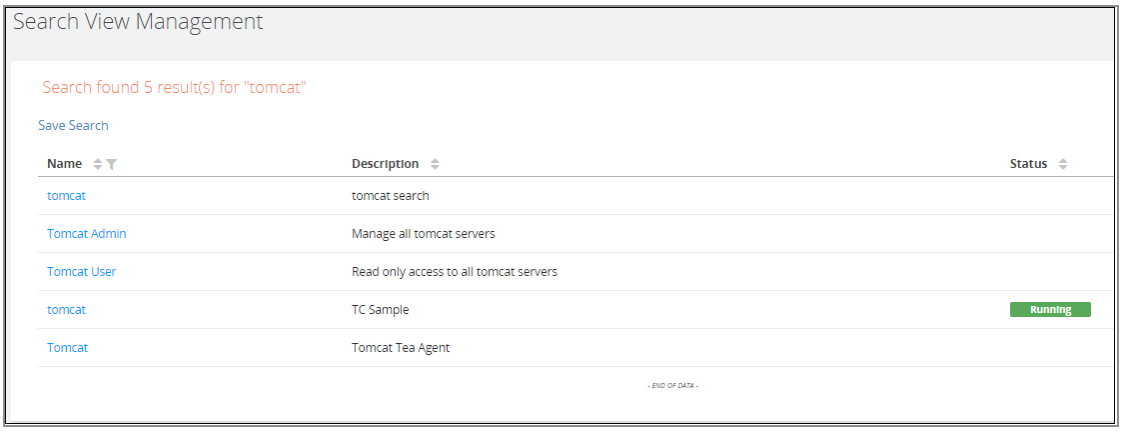
Before you begin

By default, no search views are created by the TIBCO Enterprise Administrator. Ensure that you create the search views by using the procedure mentioned in Creating Custom Search Views.

Procedure

1. Click . If you have created a list of search views, they are listed in the Search Views option.
2. Click a Search View of your choice.

   The saved search is displayed with the results.
3. You can drill down the assets and collectively perform basic administrative tasks on the assets.



Note: After registering an agent with the server, the elements are available only after 30 seconds of registration. To change this setting, open the `<TIBCO_CONFIG_HOME>\tibco\cfgmgmt\tea\conf\tea.conf` file and change the value in the `tea.indexing.interval` property. The default value is `30000` milliseconds.

Operators View

An operator view can be constructed based on the participating products. You can group together applications, processes, and other assets from various tenant product groups into a manageable "operator view". The view provides you with a single window of visibility into the applications, processes, and other assets that interest you.

Before you begin

By default, there are no operator views created by the TIBCO Enterprise Administrator. Ensure that you create the operator views by using the procedure mentioned in Creating Custom Operator Views.

Procedure

1. Click . If you have created a list of operator views, they are listed in the Operator Views option.
2. Click an Operator View of your choice.

   The Operator View pane lists a set of assets.

3. You can drill down the assets and collectively perform basic administrative tasks on the assets.

Creating Custom Search Views

After fetching the results of a search, TIBCO Enterprise Administrator provides the Save Search option to save search views.

Procedure

1. Click the magnifying glass icon on the upper right corner of the browser window.
2. Enter a string in the **Search** field. For example, tomcat.

   The search result is displayed.
3. Click **Save Search**.

   The Save Search window is displayed.
4. Enter a name and description of the search. Click **Save Search**.

   The Search View is now saved.
5. To verify that the custom search view exists, refresh the browser and click  .

   Your latest view is displayed in the Search Views option.

Creating Custom Operator Views

An operator view can be constructed based on the participating products. You can group together applications, processes, and other assets from various tenant product groups into a manageable "operator view". The view provides you with a single window of visibility into the applications, processes, and other assets that interest you.

Procedure

1. Click  and select **Manage Views**.

   The Operator Views and the Search Views panes are displayed.
2. In the Operator Views pane, click **Add**.

The Add View window is displayed.

3. Enter a name and description of the view. Click **Add View**.

   The view is now displayed in the Operator Views pane.

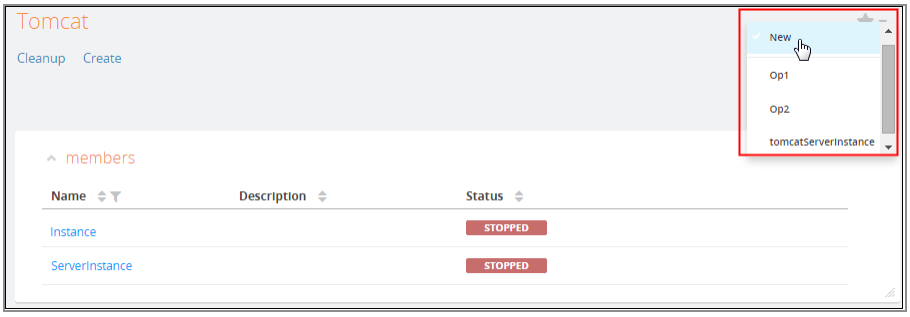
4. To verify that the custom operator view is displayed on the Views menu, refresh the browser and click  .

   Your latest view is displayed in the Operator Views option.

Adding Assets to a View at Runtime

You can add assets to an existing operator view or create a new operator with a set of assets at runtime. This helps you focus only on those assets that concern you at that particular time.

In every pane that lists a set of assets, you can click the ☆ button to add panels to an operator view of your choice. The button is similar to the Favorites button on a browser. You can add the assets to an existing operator view or create a new operator view with the selected assets.



User Management

You can use TIBCO Enterprise Administrator to manage users, groups, roles, permissions, and realms. TIBCO Enterprise Administrator can only manage the roles and permissions exposed by the agent. You cannot add new permissions other than those provided by the agent.

Users

Users are entities that need access to the system. Each user might need a different level of access to the system.

TIBCO Enterprise Administrator can manage users internally, or can manage users in an external system. Users from external systems are mapped into TIBCO Enterprise Administrator to allow access to the system. The default user provided by TIBCO Enterprise Administrator is `admin`.

Adding Users

You can add users to the TIBCO Enterprise Administrator. You cannot add new users to an existing agent.

Procedure

1. Click the **Users** card.

   The User Management pane is displayed.

2. Under Users, click **Add**.

   The New User window is displayed.

3. Provide the **Name** and a valid **Password**.
4. Click **Next**.
5. Add the user to a group, if available.

6. Click **Next**.
7. Select the roles to be assigned to the user. You can select multiple roles.
8. Click **Finish**.

   The User pane shows the details of the new user created. Use this page to reset the user's password, add or remove roles, and add or remove the user from a group.

Importing Users

While you can add users to the default TEA_DB realm, you cannot add them to the LDAP realm. However, you can import users from the LDAP realm.

Before you begin

Ensure that you have added an LDAP realm to the TIBCO Enterprise Administrator before importing users from the realm. To add a realm, follow the procedure in Adding Realms.

Procedure

1. Click the **Users** card.

   The User Management pane is displayed.
2. Under Users, click **Import**.

   The Import User window is displayed.
3. Select **Realm** and the users to be imported, and click **Finish**.

> **Note:** The User details page of an imported user only lists the roles and groups for a user. You cannot reset the password for an imported user. You can see the groups the user belongs to, and you can add or remove roles for an imported user.

Assigning Users to Groups

Users can be added to groups if they are not the ones imported from the LDAP realm. The default user, admin, cannot be added to groups.

Before you begin

Ensure that you have created a group before starting this procedure. For more details on creating groups, see Creating a New Group.

Procedure

1. Click the **Users** card.

   The User Management pane is displayed.

2. Select one or more users. You cannot select a user imported from the LDAP realm.

3. Click **Assign to Group**.

   The Assign to Group window is displayed.

4. Select a group, and click **Add**.

   > **Caution:** You cannot map the users of a group in the LDAP realm with those in the TEA_DB realm or vice versa.

5. To verify, on the User Management pane, click the user. The user's details are displayed. Verify that the Group pane lists the group that the user was recently added to.

   > **Note:** Alternatively, to assign groups to a specific user:
   >
   > a. Click a user to see the details of the user.
   >
   > b. From the Groups pane, click **Add**. The Add Groups window is displayed.
   >
   > c. Select the group you want to add and click **Add**. The group gets added to the user.
   >
   > You can remove groups for a specific user in a similar fashion.

Assigning Roles to Users

You can assign roles to users in both the TEA_DB realm and the LDAP realm. When you register an agent, you can see the roles defined by the agent.

You can add new permissions to the role, but you cannot delete the roles defined by the agent. TEA_ADMIN is the default role and can be assigned to other users.

Procedure

1. Click the **Users** card.

   The User Management pane is displayed.

2. Under Users, select one or more users, and click **Assign to Roles**.

   The Assign Roles to Users window is displayed.

3. Select one or more roles to assign. Click **Add**.

4. To verify that the role has been assigned. Click a user to see the details of the user. On the User details page, you can see the latest role you assigned to the user.

   Note: Alternatively, to assign roles to a specific user:

   a. Click a user to see the details of the user.

   b. From the Roles pane, click **Add**. The Add Roles window is displayed.

   c. Select the role you want to add and click **Add**. The role gets added to the user.

   You can remove roles for a specific user in a similar fashion.

Deleting Users

You can delete users added to the TEA_DB realm and LDAP realm. You cannot delete users added by the agent.

Procedure

1. Click the **Users** card.

   The User Management pane is displayed.

2. Under Users, select the users to be deleted.

3. Click **Delete**.

4. Click **Delete Users** to confirm deletion.

Resetting the Password

You can change passwords of existing users on TIBCO Enterprise Administrator.

Procedure

1. Click the **Users** card.

   The User Management pane is displayed.

2. Under Users, click on the user whose password you want to change.

   The User details are displayed.

3. Click **Reset Password**.

   The Reset Password window is displayed.

4. Reset the password for the user.

5. Click **Finish** to set the new password.

Groups

Groups are logical groupings of the users within an organization. A user can belong to multiple groups and a group can contain multiple users.

Groups provide easier way to control access to users. Instead of specifying the access permissions for each user, it is easier and practical to specify access permissions to the groups to which they belong to. Groups can contain sub-groups.

Creating a New Group

You can create a new group and assign multiple users and roles to it. You can assign users and roles to multiple groups.

Procedure

1. Click the **Users** card.

   The User Management pane is displayed.

2. Under Groups, click **Add**.

The New Group window is displayed.

3. Provide the **Name** and a valid **Description**.

   You can click **Finish** at this stage or proceed to add users and roles to a group.

4. (Optional) Click **Next**.
5. (Optional) Add users to a group.
6. (Optional) Click **Next**.
7. (Optional) Select the roles to be assigned to the user. You can select multiple roles.
8. Click **Finish**.
9. To verify, click on the group to view the group details. Ensure that the roles and users selected are displayed in the details.

Importing Groups

You can import existing groups from the LDAP realm. However, you cannot create new groups in the LDAP realm.

Before you begin

Ensure that you have added an LDAP realm to the TIBCO Enterprise Administrator before importing users from the realm. For details on adding a realm, see Adding Realms.

Procedure

1. Click the **Users** card.

   The User Management pane is displayed.

2. Under Groups, click **Import**.

   The Import Groups window is displayed.

3. Select the realm and the groups to be imported from the realm.
4. Click **Finish**.
5. Click a group to see the details of the user. On the Groups details page, you can add or remove users, and add or remove roles from a group.

> **Caution:** You cannot map the users of a group in the LDAP realm with those in the TEA_DB realm or vice versa.

Assigning Roles to Groups

You can assign roles to groups in both the TEA_DB realm and the LDAP realm. When you register an agent, you can see the roles defined by the agent. You can add new permissions to the role, but you cannot delete the roles defined by the agent.

Procedure

1. Click the **Users** card.

   The User Management pane is displayed.

2. Under Groups, select one or more groups, and click **Assign to Roles**.

   The Assign Roles to Groups window is displayed.

3. Select one or more roles to assign. Click **Add**.

4. To verify that the role has been assigned. Click a group to see the details of the group. On the Group details page, you can see the latest role you assigned to the user.

> **Note:** Alternatively, to assign roles to a specific group, perform the following steps:
>
> a. Click a group to see the details of the group.
>
> b. From the Roles pane, click **Add**. The Add Roles window is displayed.
>
> c. Select the role you want to add and click **Add**. The role gets added to the group.
>
> You can remove roles from a specific group in a similar fashion.

Deleting Groups

You can delete groups added to the TEA_DB realm and LDAP realm.

Procedure

1. Click the **Users** card.

   The User Management pane is displayed.

2. Under Groups, select the groups to be deleted.
3. Click **Delete**.
4. Click **Delete Groups** to confirm deletion.

Roles

Role is a mechanism to grant or revoke access to users. A Role is a collection of privileges and are assigned to users and groups. All the privileges in a role get associated to the user or group to which it is assigned.

Adding Roles

You can add new roles to TEA_DB, LDAP realm and to the agents. You can also add permissions to an existing role available in the agent. TEA_ADMIN is the default role.

Agents can contribute roles that are visible in the Roles pane. You cannot delete these roles, but you can add new roles to the TIBCO Enterprise Administrator server.

Procedure

1. From the Home page, select the **Users** card.

   The User Management pane is displayed.

2. Select **Roles**.
3. From the Roles pane, click **Add**.
4. On the New Role window, specify the name of the role, description if any, and the product to which you want to apply the role. Click **Next** to continue defining the role.

> **Note:** You could exit the wizard by clicking **Finish** at any stage of the wizard.

The second step of the wizard is to help you add permissions to the role. This pane lists all the entity types in one tab and the instances, if any, in another tab. By default, the Entity Type tab is in focus. If you want to assign entity-based permissions, refer to Setting Entity-Based Permissions on a Role. If you want to assign instance-based permissions, refer to Setting Instance-Based Permissions on a Role.

5. Select the users you want to apply the role to, and click **Next**.
6. Select the groups you want to assign the role to.
7. Click **Finish**.

> **Note:** If you upgrade an agent, you can only have additional roles on the same agent. You cannot delete or change the existing role definition.

Result

The new role is displayed on the Roles details page. The page shows the role definition. You can add or remove the permissions, users, or groups for the role from the Roles details page.

> **Note:** If you had exited the wizard without completing the procedure, you can redefine the role by adding or removing the permissions, users, or groups from this page.

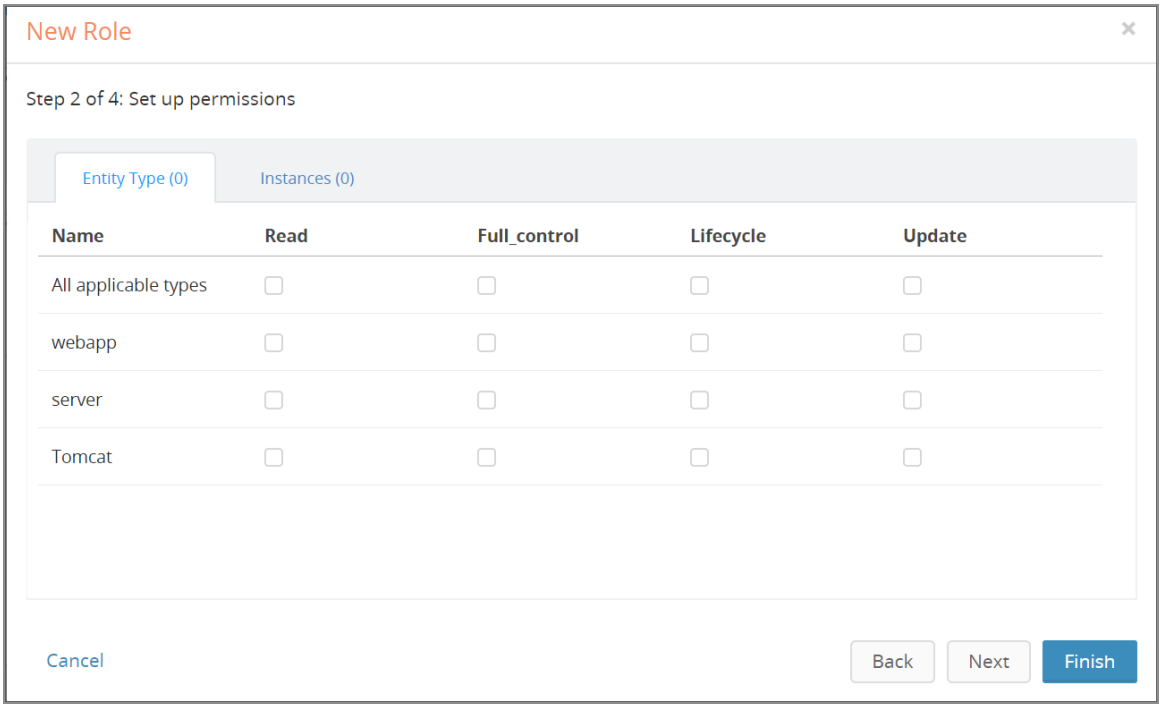
Setting Entity-Based Permissions on a Role

This is the classic way of assigning permission. Each row represents an entity type and each column represents the type of permission. You can also see the count of permissions selected on the header of the tab.

Procedure

1. Select the permissions that you want to assign on the entity types.

The permissions you select here apply to all the instances of the selected entity type across all the agents. Rows represent the entity type and column represents the type of the permission.



2. Click **Next**.

   The next step of the wizard is to help you add users to the role.

3. To continue adding users to the role, complete the steps mentioned in Adding Users to a Role. You can also click **Finish** at this stage to exit the wizard.

Result

The new role is displayed on the Roles details page. The page shows the role definition. You can add or remove the permissions, users, or groups for the role from the Roles details page.

Note: If you had exited the wizard without completing the procedure, you can redefine the role by adding or removing the permissions, users, or groups from this page.

Setting Instance-Based Permissions on a Role

By using instance-based permissions, users can now enforce permissions on a particular instance of an entity type.

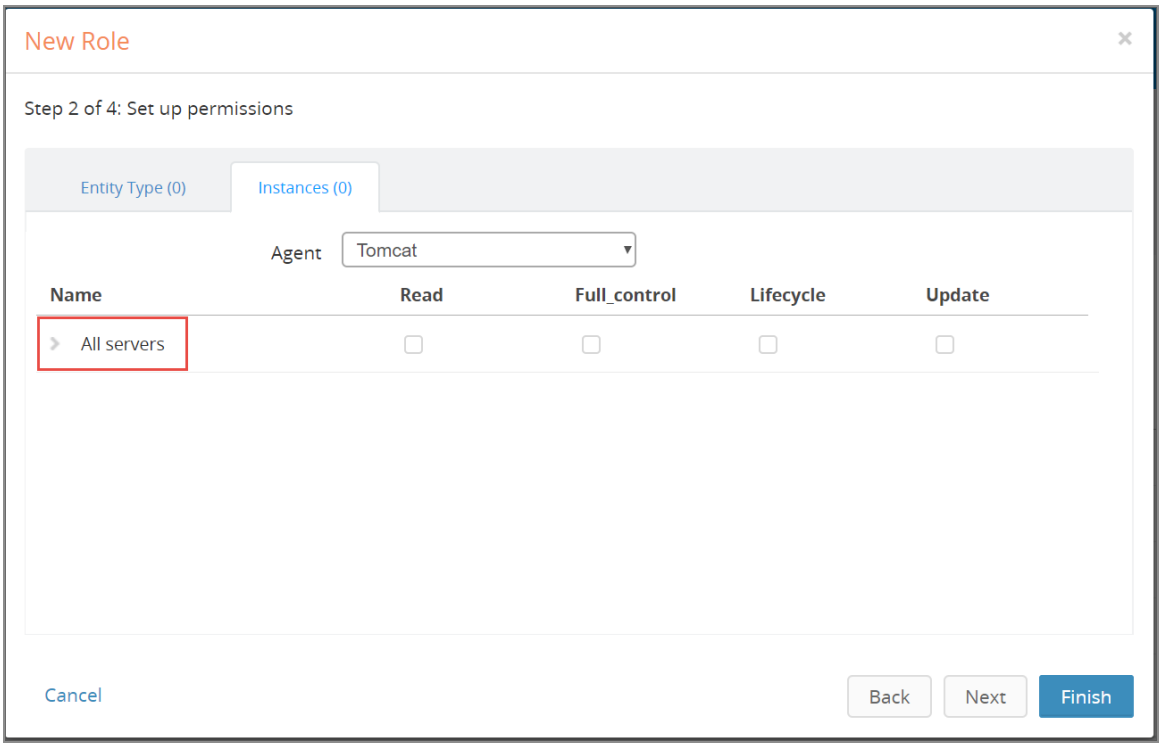
When you assign instance-based permission to a given agent, you can control whether or not the permission is applicable to the user, group, or role on one or more instances of an entity type. In addition to that, you can also control whether the permission must be assigned to one or multiple instances of an entity type. You can set instance-based permission from the **Instances** tab of the Add Role wizard.
Attention: The **Instances** tab is not displayed if the agent does not support instance-based permissions.

Procedure

1. Click the **Instances** tab.
2. From the drop-down box, select the **Agent**.

   This pane below shows instances on which a user can assign permissions in a collapsed tree format.
3. In the **Name** column, click **All servers** to view the servers list in a tree structure.

   All Servers Tree under Instances



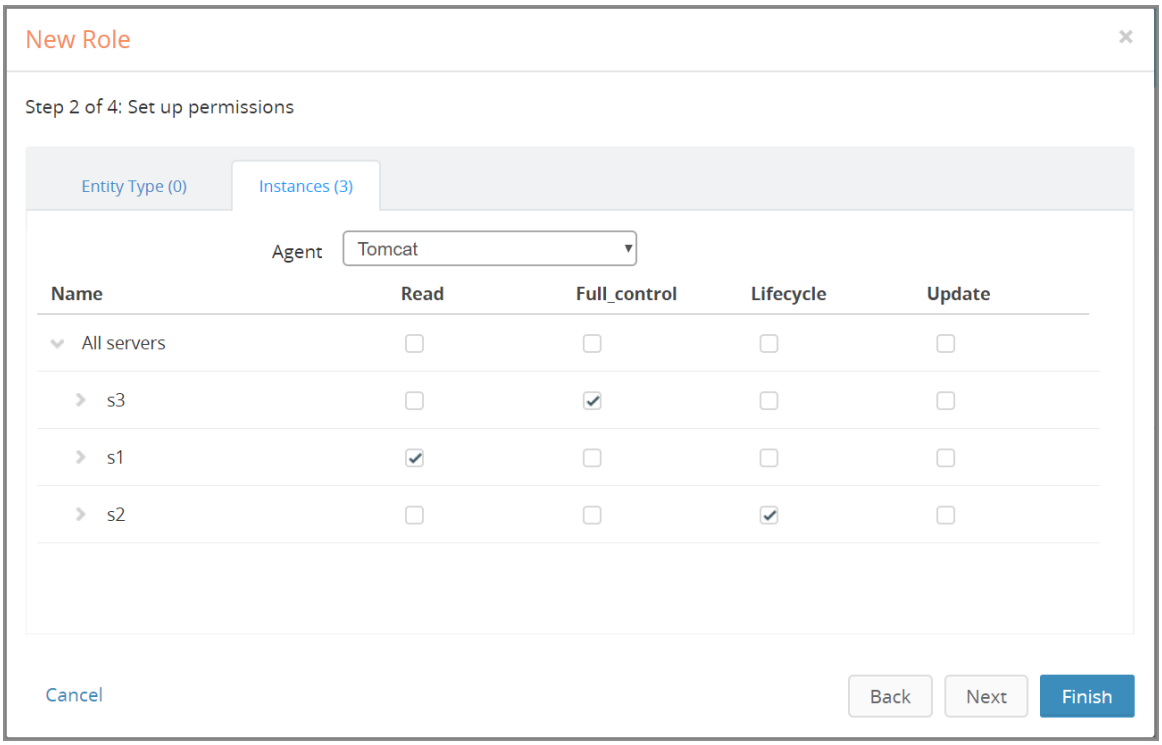
The tree expands to show a list of servers. Here you can see all the instances in a tree format of a selected agent.

4. Set permissions using one of the following methods:

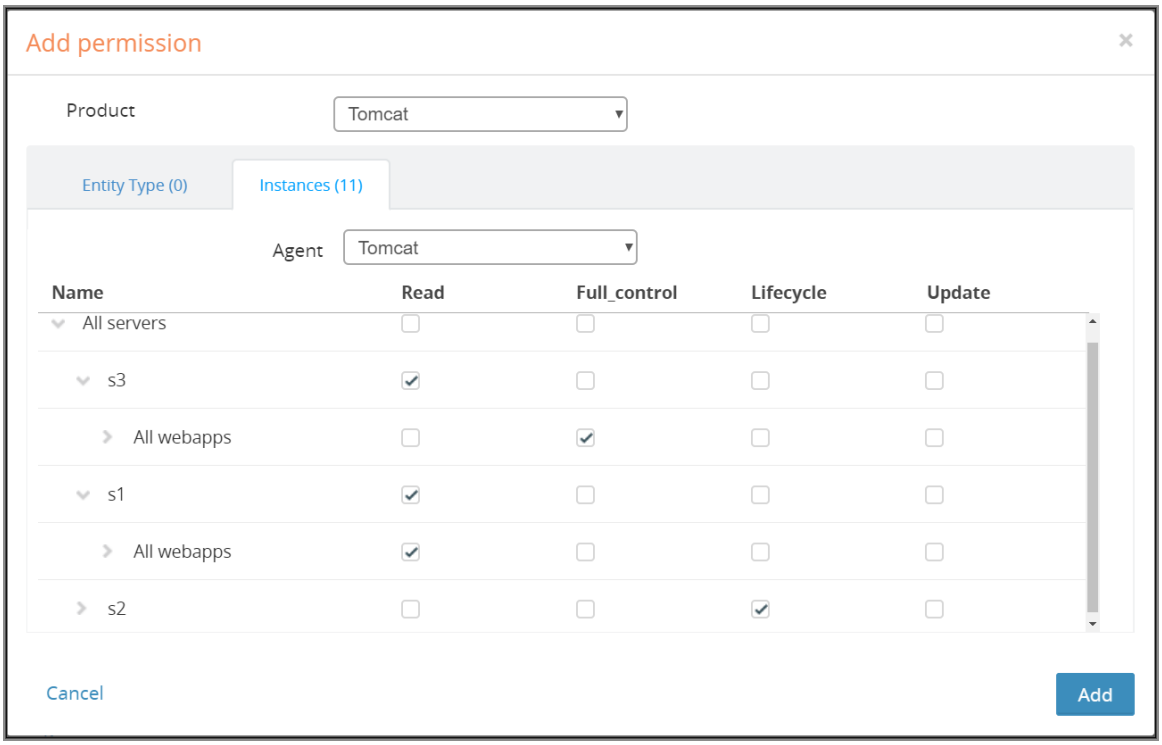
Action	Consequence
Click on the permissions displayed against a row as shown in Setting Permissions for All the Instances in an Entity.	You are setting permissions to all the instances in that entity type of that agent.
Drill down further by selecting a row of a given entity type as shown in Setting Permissions for a Specific Instance in an Entity.	You get to browse through the hierarchy of instances. You get to set permissions for a specific instance in the tree.

Click **Next**.

Setting Permissions for All the Instances in an Entity



Setting Permissions for a Specific Instance in an Entity



Attention: When you select a permission for a child instance, a READ permission for the parent is auto-selected.
The next step of the wizard is to help you add users to the role.

5. Click **Next**.

   The next step of the wizard is to help you add users to the role.

6. To continue adding users to the role, complete the steps mentioned in Adding Users to a Role. You can also click **Finish** at this stage to exit the wizard.

Result

The new role is displayed on the Roles details page. The page shows the role definition. You can add or remove the permissions, users, or groups for the role from the Roles details page.

Note: If you had exited the wizard without completing the procedure, you can redefine the role by adding or removing the permissions, users, or groups from this page.

Deleting Roles

You can delete roles added to the TEA_DB realm and LDAP realm. You cannot delete roles added by the agent.

Procedure

1. Click the **Users** card.

   The User Management pane is displayed.
2. Under Roles, select the roles to be deleted.
3. Click **Delete**.
4. Click **Delete Roles** to confirm deletion.

Permissions

A string on the basis of which access control is enforced. The agent decides the granularity of the permissions that it provides.

A permission could be as fine-grained as `UpdateConfig` which is applicable to only one operation, or it could be as coarse-grained as `Full Control` which applies to the entire system. A *Privilege* is a collection of permissions that are applicable to an object or a collection of objects.

Other than the permissions contributed by the agent, by default, TIBCO Enterprise Administrator provides two permissions to every agent: `read` and `full_control`. Having `full_control` is not equivalent to a user with the TEA_ADMIN role. A user with the TEA_ADMIN role can access Machine Management and User Management panes that a user with full_control cannot.

Note: You are able to see the `read` and `full_control` permissions only if the agent is registered with the TIBCO Enterprise Administrator 1.2 and above.

Adding Permissions to a User-Defined Role

You can add new permissions to roles defined by a user. However, you cannot add permissions to agent-defined roles.

Procedure

1. Click the **Users** card.

   The User Management pane is displayed.
2. Under Roles, select a user-defined role.

   The Role details are displayed.
3. From the Permissions pane, click **Add**.

   The Add Permission window is displayed.
4. Select the product on which you want to add the permission. A list of available permissions is listed.
5. Select the permissions you want to assign to the role, and select the object type it applies to.
6. Click **Add**.

> **Note:** If you upgrade an agent, you can only have additional permissions on the same agent. You cannot delete or change the existing permission definition.

Removing Permissions

You can remove permissions from a role that is defined by the user, but not the permissions contributed by the agent.

Procedure

1. Click the **Users** card.

   The User Management pane is displayed.
2. Under Roles, select a role.

3. From the Permissions pane, select a permission, and Click **Remove**.
4. Click **Remove Permissions** to confirm deletion.

Viewing Permissions

You can view permissions contributed by an agent.

Procedure

1. Click the **Users** card.

   The User Management pane is displayed.
2. To see a list of permissions, click **Permissions**.

Realms

A security realm comprises mechanisms for protecting TIBCO Enterprise Administrator resources. It contains users, groups, and their security credentials. Information about users and the groups they belong to, is provided by a realm.

TIBCO Enterprise Administrator supports two kinds of realms: TEA_DB and LDAP. In case of the TEA_DB realm, the user and group information is stored in a file. In case of LDAP realm, the user or group information exists on an LDAP server and is accessed from the TIBCO Enterprise Administrator server.

Adding Realms

You can add LDAP realms to the TIBCO Enterprise Administrator server. The default realm available is TEA_DB.

Procedure

1. Click the **Users** card.

   The User Management pane is displayed.
2. Under Users, click **Realms**.

The Realms pane is displayed.

3. Click **Add**.

   The Register New Realm is displayed.

4. Provide the following general information:

   - Name
   - Description
   - Server URL
   - Search Timeout
   - BindUserDN
   - Bind Password

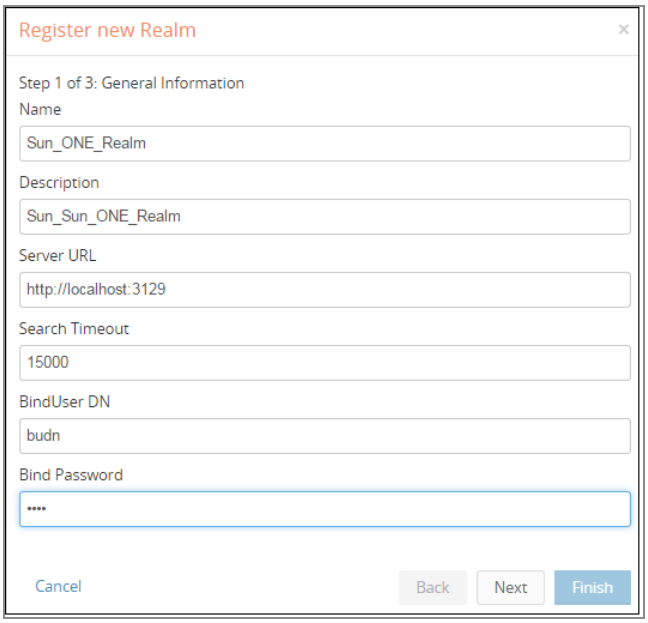
   Note: When specifying **BindUserDN**, if the CN attribute contains reserved character like comma (,), use escape character backslash (\) in front of reserved characters. Other reserved characters include the semicolon, the plus sign, the backslash, and the left and right angle brackets. For example, if the LDAP user is

   ```
   CN=John, Smith,CN=Users,DC=trinitytest,DC=com
   ```

   Then specify **BindUserDN** as

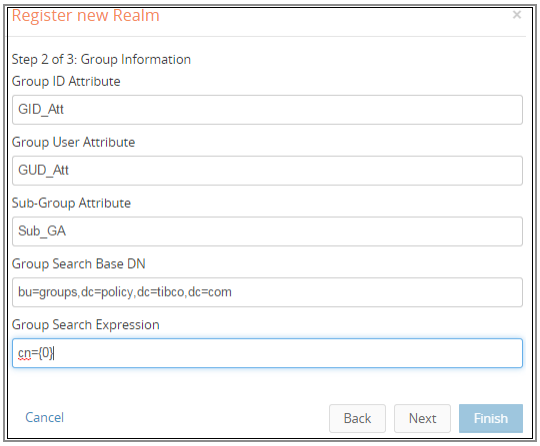
   ```
   CN=John\, Smith,CN=Users,DC=trinitytest,DC=com
   ```

Adding a Realm: General Information



5. Click **Next**. Provide the following group information:
    - Group ID Attribute
    - Group User Attribute
    - Sub-Group Attribute
    - Group Search Base DN
    - Group Search Expression

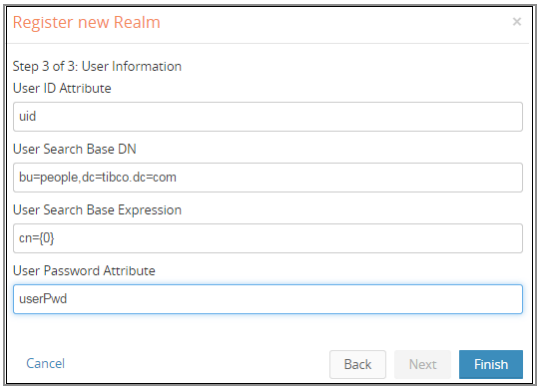
    Adding a Realm: Group Information



6. Click **Next**. Provide the following User information:

- User ID Attribute
- User Search Base DN
- User Search Base Expression
- User Password Attribute

Adding a Realm: User Information



7. Click **Finish**.

Result

The realm is added to the TIBCO Enterprise Administrator server.

Deleting Realms

You can delete realms available in the TIBCO Enterprise Administrator server.

Procedure

1. Click the **Users** card.

   The User Management pane is displayed.

2. Click **Realms**.

   The Realms pane is displayed.

3. Select a realm and click **Delete**.
4. Click **Delete Realms** to confirm deletion.

Default Landing Page

You can set a default landing page for a user or for a group. To set up a landing page for one or more groups, you must have administrator privileges (TEA_ADMIN role).

Setting the Landing Page for a User

You can customize the TIBCO Enterprise Administrator UI to set a default landing page.

Procedure

1. Switch to the page that you want as your landing page in the UI.
2. Click  and select **Set as Start Page**.

   You get a notification that the landing page is set, but these changes are visible only on your next login.

   > **Warning:** If a page of a particular agent does not support notification bars, the notification is not displayed. However, you can see these changes on your next login.

3. Log out and log in to see the changes.

   > **Warning:** When you set a default landing page for yourself, currently there is no option to clear that choice. However, you can choose a different page as your landing page.

Setting the Landing Page for a Group

If you have the `TEA_ADMIN` privileges, you can assign a landing page for a group of users.

By default, the `EVERYONE` group is available if there is no group created by the administrator (the user with the `TEA_ADMIN` privileges.) If you want to assign a landing

page to a group, ensure that you have already created the groups by going through the steps in Creating a New Group.

Procedure

1. Switch to the page that you want as your landing page in the UI.
2. Click  and select **Set Start Page For**.
3. To select a group, select **Group** and pick an appropriate group from the drop-down box.

   By default, the EVERYONE group is selected.

   > **Warning:** Users must have the permission to access the landing page which is assigned to their group.

4. Click **Save**.

   You get a notification that the landing page is set. These changes are visible to a user, the next time a user from the group logs in using the Web UI.
5. To verify the changes, perform the following steps:
   a. Click the **User Management** icon in the left navigation bar.
   b. In the User Management window, select **Groups**.
   c. For the groups you assigned a default landing page, ensure that the START PAGE column shows the link to the selected landing page.

How the Server Picks up a Default Landing Page

When a default landing page is set for a user and the user belongs to one or more groups, the default landing page is selected, based on certain criteria.

The Order of Selecting a Default Landing Page

When there is a group setting and a user's setting of a landing page, the priority is worked out in the following manner:

1. The user's setting of the default landing page gets the highest priority.

2. If there is no user setting, the group gets the priority.
3. If there is no group setting, all users fall in the EVERYONE group.
4. If you have not set a landing page for the EVERYONE group, the default landing page takes effect.
5. If a user belongs to multiple groups, the default landing page is picked up in the alphabetical order of group names. For example, if the user is in the group A, B, and C, the default landing page of group A is picked up. If none of these groups has a default landing page, the page belonging to the EVERYONE group is picked up.

Clearing the Landing Page for Multiple Groups

You must have administrator privileges to clear a landing page assigned to a group. You can select multiple groups and delete the landing page set for them by using the Clear Start Page option.

Procedure

1. Click the **Users** card.
2. In the User Management window, select **Groups**.
3. Select the appropriate group, and select the **Clear start page** option.
4. At the prompt, click **clearStartPage**.

   The Start Page link is not displayed for the group. After you clear the landing page, if there is a landing page assigned to the Everyone group, that takes effect now. If not, the default landing page that comes up when you start the server takes effect.

Deleting the Landing Page Set for a Group

You must have administrator privileges to clear a landing page assigned to a group. You can use this option to clear the landing page of one group at a time.

Procedure

1. Click the **Users** card.

2. In the User Management window, select **Groups**.
3. Select the appropriate group, and select the (recycle bin icon) next to the `Start Page` column to delete the landing page associated with the group.
4. At the prompt, click **clearStartPage**.

   The Start Page link is not displayed for the group. If there is a landing page assigned to the Everyone group, that takes effect now. If not, the default landing page that comes up when you start the server takes effect.

Registering a Hawk Domain

You can configure Hawk domains using the TIBCO Enterprise Administrator server. When you configure the Hawk domain, the server detects machines in the domain that has a Hawk Agent installed and running on it.

Before you begin

Enable Hawk Management

By default, the Hawk Domains option is not visible in the UI unless you opted for the TIBCO Hawk Agent component during installation. To ensure that the Hawk Domains option is visible, set the `tea.ext.hawk.enabled` property to `true` in the`<*TIBCO_CONFIG_HOME*>\tibco\cfgmgmt\tea\conf`. file and restart the server.

Change the Hawk Properties in the tea.tra file

Refer to the *Configuring Properties to Enable Hawk Integration* section of the *TIBCO Enterprise Administrator Installation* guide to configure the Hawk properties. Ensure that the `tibco.env.HAWK_HOME` specified in the `<*TIBCO_HOME*>\tea\<version>\bin\tea.tra` file points to the `HAWK_HOME` location. By default, if no transport type is specified, the default transport type is set to TIBCO ActiveSpaces. Depending on the transport type used, ensure that you specify one of the following:

Transport Type	Property in The tea.tra File	Points to
TIBCO ActiveSpaces	`tibco.env.AS_HOME`	`TIBCO_ACTIVESPACES_HOME`
TIBCO Enterprise Message Service	`tibco.env.EMS_HOME`	`TIBCO_EMS_HOME`
TIBCO Rendezvous	`tibco.env.RV_HOME`	`TIBCO_RV_HOME`

For example, if the transport type is TIBCO Enterprise Message Service, ensure that the `tibco.env.EMS_HOME` points to `TIBCO_EMS_HOME`.

Add the Hawk Domain Configuration Properties

Create a Hawk domain configuration properties file to configure the Hawk Domain. You can either use the Hawk properties file available to you or create a new one and specify it while creating a Hawk domain in TIBCO Enterprise Administrator server. You can use one of the following transport types: TIBCO Rendezvous (`hawk_transport=tibrv`), TIBCO Enterprise Message Service (`hawk_transport=tibems`), and TIBCO ActiveSpaces (`hawk_transport=tibas`). By default, the transport type used by TIBCO Hawk infrastructure is TIBCO ActiveSpaces.

The properties file shown in the example lists the properties to be specified for each transport type.

Specify the properties for the transport type you are using in the `hawkdomainconfiguration.properties` file:

```
# Default hawk domain
hawk_domain=default

# Default transport uses ActiveSpaces
hawk_transport=tibas

#Default properties when transport is "tibas"
# ActiveSpaces discover parameter
as_discover_url=tibpgm://8989/

#ActiveSpaces listen parameter
#as_listen_url=

#
# Properties to use to configure Rendezvous as the Hawk Transport
#
#hawk_transport=tibrv
# RV transport parameters
#rv_service=7474
#rv_network=;
#rv_daemon=tcp:7474

#
# Properties to use when using EMS transport (between Agent and
Console only)
#
#hawk_transport=tibems
#ems_server_url=tcp://localhost:7222
```

```
#ems_username=
#ems_password=
```

Note: To use the `hawkdomainconfiguration.properties` file from TIBCO Enterprise Administrator Shell, you must first upload the file to the TIBCO Enterprise Administrator server using the sftp/scp commands. For help, use the command, `registerhawkdomain --help`

Running Instances

Ensure that the TIBCO Hawk Agent and Hawk Microagent (HMA) instances are running. The executable that is used to run the HMA is platform specific. Refer to the *TIBCO Hawk Installation, Configuration, and Administration* guide.

Procedure

1. Click the **Hawk Domains** icon in the left navigation bar. The Hawk Domains are displayed.
2. Click **Register**.
3. In the Register Hawk Domain window, provide the following details:
    - Name: the name of the Hawk domain.
    - Description: the description of the Hawk domain.
    - Properties: choose the Hawk Domain configuration properties file that you created with the new properties.
4. Click **Register Hawk Domain**.

Caution: If you are using Enterprise Message Service as the transport type, ensure that the Hawk agent and the TIBCO Enterprise Administrator server points to the same Enterprise Message Service server. To successfully create the Hawk domain, the Enterprise Message Service server must be running.

Result

The Hawk Domains pane displays all the Hawk domains configured on the server. After

configuring the Hawk domain on the server, the server detects the agents in the Hawk domain and displays entries per machine on which a Hawk agent was discovered, in the Machines view. You can register or unregister domains from the Hawk Domains pane.

Note: If the Enterprise Message Service server restarts and the Hawk domain is already added, the TIBCO Enterprise Administrator server automatically reconnects with the Enterprise Message Service server. Similarly, if the Hawk agent is not running, but comes up later, it gets discovered automatically.

Change Password

Before you begin

Following are the constraints on creating a password:

- The length of the password must be between 1 and 128 characters.
- You cannot reuse the past 5 passwords.
- Your account gets locked after 10 failed attempts. The `admin` account is the only exception to this rule, but the `admin` account experiences a lag of 1 second on every login after 10 failed attempts.
- You cannot start a password with "`OBF:`" ("O", "B", and "F" written in uppercase followed by a colon).
- You must reset a password after a lockout because it cannot be changed.

Procedure

1. Click admin and select **Change Password**.

   The Change Password pane is displayed.
2. Specify **Current Password**, **New Password**, and **Confirm New Password**.
3. Click **Finish**.

What to do if you forget the super user password?

If you changed the super user password, but cannot recollect it, delete the `<`*`TIBCO_CONFIG_HOME`*`>\tibco\cfgmgmt\tea\data` folder. Restart TIBCO Enterprise Administrator with a fresh data folder. The user name and password is now reset to admin/admin.

Warning: Deleting the data folder might result in losing all the agent configurations and LDAP integration.

Obfuscating Passwords

When using commands on TEA shell, you can obfuscate passwords. `PasswordObfuscation.sh` is the tool used to obfuscate passwords and is available under `<TEA_HOME>\<version>\bin`.

Note: You cannot use the TEA UI or Python scripting to obfuscate passwords.

You cannot use the TEA UI to obfuscate passwords, but you can use the obfuscated password in the TEA UI when you are changing a password or creating a new user. You can also create an obfuscated password for a user that does not exist. Whenever you create the user later, you can use the obfuscated password you had created for the user.

Important: An obfuscated password is complicated; thereby making it difficult for onlookers to memorize it. TIBCO recommends that obfuscated passwords must be kept confidential since not only are they reversible but they can also be used interchangeable with real passwords in shell commands.

Before you begin

Ensure that Java is mentioned in the PATH environment variable.

Procedure

1. Open the command prompt and navigate to `<TEA_HOME>\<version>\bin`.
2. Run the following command:

   ```
   PasswordObfuscation.sh <user_name> <user_password>
   ```

   The obfuscation tool takes the user name and password as parameters. If you run the tool without these parameters, you are prompted to enter the user name and password. After providing the password, the tool obfuscates the password and provides a string prefixed with "OBF:". Copy the entire string including "OBF:" to use it as the obfuscated password.

> **Note:** The length of the obfuscated password increases with the length of the password that you are obfuscating.

3. To exit the tool, press any key to continue.

> **Note:** When you enter a plain-text password, you cannot start a password with "`OBF:`" ("O", "B", and "F" written in uppercase followed by a colon).

Introduction to the Shell Commands

TIBCO Enterprise Administrator provides a set of commands to perform almost all the tasks possible using the user interface.

TIBCO Enterprise Administrator shell is a remote shell based on SSH protocol. The shell only needs an SSH client such as PUTTY or Terminal to connect to the shell. The shell scripting language is similar to bash in Unix.

In addition to these commands, the Shell scripting language offers some features that can help you work better with the command-line interface. Command completion, piping, support for interactive arguments, and support for binding session variables to arguments are some such features.

- Command completion: Commands can be completed by using the `Tab` key. Commands and arguments passed to path-based commands such as ls, cd, show status, and so on are automatically completed by pressing the `Tab` key.
- Support for interactive arguments: You can enter a command by entering each argument when being prompted to. For example, the `create` command takes `arg1` and `arg2` as parameters. You can pass these arguments in an interactive mode as follows:

  ```
  create

  arg1:foo

  arg2:bar

  foo bar
  ```

- Support for Complex Parameters: In the TIBCO Enterprise Administrator shell, operations that take Complex type parameters can be passed in the JSON format for both the single line mode and the interactive mode.

  If the JSON input is in a single line, use single quotes with the JSON String.

  ```
  removeprivileges '[{"productName":"tomcat", "objectType":"all",
  "name":"Lifecycle"}]'
  ```

```
Executed the command 'removeprivileges' successfully.
```

If the JSON input is in an interactive mode, *do not* use single quotes with the JSON string.

```
removeprivileges
permissions:[{"productName":"tomcat", "objectType":"all",
"name":"Update"}]
Executed the command 'removeprivileges' successfully.
```

- Support for binding session variables to arguments: Consider an operation defined on agent this way:

```
create(@TeaParam(name="type") String type, @TeaParam(name="name")
String name,
@TeaParam(name="domain", alias="d") String domain);
```

In this case, you can invoke the operation in the following manner:

```
domain = QA-Domain
create appspace HR-AppSpace
```

- Support for piping of commands: You can send the output of one command as an input to the other using pipes (|).

Warning: The number of attempts a user can make to connect to the TIBCO Enterprise Administrator server depends on the configuration file of your shell client. If you want to change the number of attempts available to a user, tweak the `NumberOfPasswordPrompts` property in the configuration file of your shell client. Changing the `MaxAuthRequests` property in the `tea.conf` alone does not help reflect these changes. On Unix-based platforms, look for the `NumberOfPasswordPrompts` property in `/etc/ssh/ssh_config`. On Windows, a ssh client tool like PuTTY must have a similar configuration file to provide the number of password attempts.

Connecting to the Remote Shell

The TIBCO Enterprise Administrator shell is a shell based on remote SSH. You can use a terminal program to connect to the remote shell.

Procedure

1. Use a terminal program of your choice. For example, Putty.
2. Connect to the remote SSH server using the command ssh -p 2222 admin@localhost.
3. Enter admin as the password.

Result

On successful connection, a banner is displayed.

Shell Commands

Shell commands are quite similar to the `bash` commands in Unix. Almost all tasks performed on the Web UI can be performed using Shell commands. The shell provides a rich set of navigation, scripting, and help commands.

The default idle timeout for the shell is 15000 milliseconds.

Note: If you are using IPv6 addresses, assuming that the IP address of the machine is 10::4, the syntax of `ssh` command to be used is:

```
'ssh -p 2222 admin@10::4
```

Remember that with IPv6 addresses, `ssh -p 2222 admin@[10::4]` is not supported.

When working with the Shell commands, after executing a command, an exit code is propagated from the TIBCO Enterprise Administrator server to the agent. When an exception occurs while evaluating a shell command, it results in a non-zero exit code returned by the `ssh`. You can also create your own exit codes. If an agent throws an exception, you can explicitly set an exit code on the exception.

Caution: Avoid registering two agents with the same ID. The TIBCO Enterprise Administrator server does not validate whether two agents have registered with the same ID.

Help Command

To get comprehensive help using a command, use the `--help` option with the command.

Help prints out the following details of the command:

- Description
- Name and description of Arguments

- Name, description, and aliases for Options
- Syntax for usage

The two modes of using the help command are: `cd --help` and `help cd`. The `cd --help` mode is used to display a detailed description of the command. For example, the following is the output of the command, `cd --help`:

```
DESCRIPTION

        tea:cd

                Changes the context to the given path

SYNTAX
        tea:cd [path]

ARGUMENTS

        path
                Target path to which to change the context to.
```

The `help cd` mode is used to display a detailed description along with some examples of usage. For example, the following is the output of the command, `help cd`:

```
 NAME
        tea:cd

                Changes the context to the given path

SYNTAX
        tea:cd [path]

ARGUMENTS
        path
                Target path to which to change the context to.


DESCRIPTION
                Change Directory - change the current working directory
                to a specific Folder.
                If directory is not given, the current working directory
                is not changed.

SAMPLES
                1. Do cd command in TEA server without argument:
```

```
                    admin@localhost:/>cd
                    admin@localhost:/>
                    admin@localhost:/>pwd
                    /
                2. Do cd command in TEA server with optional argument
[path] to change to another path:

                    admin@localhost:/>cd TEA
                    admin@localhost:/TEA>
                    admin@localhost:/TEA>pwd/TEA
                    /
                3. Do cd command in TEA server to move up one path:

                    admin@localhost:/TEA>cd ..
                    admin@localhost:/>
                    admin@localhost:/>pwd
                    /
```

Navigation Commands

Navigating the object hierarchy on the TIBCO Enterprise Administrator server is quite similar to navigating a file system. Commands offered are similar to the basic navigation commands available in Unix. Each object has a path corresponding to it.

The following are some helpful navigation commands:

- ls: lists the members contained in an object.

```
admin@localhost:/TEA> ls
members
agents
users
groups
roles
realms
machines
solutions

admin@localhost:/TEA> cd members
admin@localhost:/TEA/members> ls
Machines
Solutions
```

```
Groups
Users
Roles
Realms
Permissions
OperatorViewManager
SearchViewManager
Agents
```

- ls <path>: lists the members at the specified path.

```
admin@localhost:/TEA>ls <path>
```

  where <path> is the path of the target object whose contents are to be listed.

  If the path is not specified, it lists the objects under the current object. You can nest the path to subsequent levels. For example, you can list the members contained in the default realm by using the command `ls TEA/Access/Realms/default-realm`.

- cd: navigates to the TIBCO Enterprise Administrator object at the specified path.

```
admin@localhost:/>cd <path>
```

  where <path> is the target path to which the context changes.

  If a directory is not specified, the current directory is not changed. If you are already in one of the nested directories, the `cd` command takes you back to the root.

  Note: If there are spaces embedded in the path, use an escape sequence of back slash and a space to represent a space. For example, if 'foo bar' is a part of the path, type 'foo\ bar'. This feature works with the autocompletion of the `ls`, `sort`, and `cd` commands.

- pwd: prints the absolute path of the current TIBCO Enterprise Administrator object.

```
admin@localhost:/TEA>pwd
```

Note: TIBCO Enterprise Administrator objects are case sensitive.

Scripting Commands

You can use advanced scripting constructs to combine multiple commands and write complex scripts.

The Shell commands support the following advanced constructs for scripting:

- Arrays
- Running multiple commands at once
- Pipes
- Closures
- Json ComplexType

Arrays

Arrays can be passed as arguments to some commands. For example, the `echo` command takes an array of arguments passed to it and displays them at the command prompt.

```
echo [ 'a' 'b' 'c']
[a,b,c]
```

Note: In the web UI, use commas as separators. For example, ['a', 'b', 'c']. In the shell UI, do not use commas as separators. For example, ['a' 'b' 'c'] .

Running Multiple Commands at Once

Multiple commands can be run by separating them with a `';'` (semicolon).

```
admin@localhost:/> cd /TEA;ls
members
agents
users
groups
roles
realms
machines
solutions
```

Pipes

Output of one command can be piped to the input of another command using a '|'.

```
admin@localhost:> ls TEA/members/Roles | grep a
TEA_ADMIN
Tomcat Admin
Tomcat User
```

Closures

Closures are functions which can be invoked with arguments. You can define and invoke the functions at run time. Curly braces, '{ ' and '} ' are used to enclose a closure definition.

```
admin@localhost:/TEA> each {ls}{show info $it}
Name:TEA
Type:tea:2.1:TEA
Status:Running

Name:Agents
Type:tea:2.1:agents

Name:Users
Type:tea:2.1:users

Name:Groups
Type:tea:2.1:groups

Name:Roles
Type:tea:2.1:roles

Name:Realms
Type:tea:2.1:realms

Name:Machines
Type:tea:2.1:teaMachines

Name:Solutions
Type:tea:2.1:solutions
```

Json ComplexType

If the definition of TeaParam in a TeaOperation is a user-defined object, ensure that you use a String of the type: Json complexType.

```
'{"strA":"aa","strB":"bb"}'
```

Note: Use single quotation marks to wrap the JSON input in the single command mode. In the interactive mode, do not use quotation marks.

Interactive Mode

When using the command-line interface, you can use the Shell commands in an interactive mode. The interactive mode gives you immediate feedback on every statement.

The Interactive mode is ideally used with commands that need user input. All commands that expect user input, support the interactive mode. When you use the Shell commands in an interactive mode, you are prompted for input at every step. To enable the interactive mode, use the following syntax:

```
<command> --interactive
```

For example, the following code snippet shows how to create a user in an interactive mode:

```
admin@localhost:/TEA/users> createuser --interactive
name:user1
password:password
groups [[]]:group1
roles [[]]:roles1
User 'user1' created.
```

Advanced Scripting Commands

In addition to the basic scripting commands, the Shell command language supports some advanced constructs that help in scripting. Use these constructs to write complex scripts.

The following is a list of supported constructs:

- each

- if
- sort
- set
- get

each

Calls a given function (a closure) on each of the elements in the given array.

Usage: `each values function`

where:

- `values` : can be an array or a closure which evaluates to an array.
- `function`: a closure which must be invoked on each element.

```
admin@localhost:/> each [Jan Feb Mar] { echo $it}
Jan
Feb
Mar
```

if

Command to support conditional execution.

Usage: `if {condition} ifTrue [ifFalse]`

```
admin@localhost:/TEA> if {echo 'true'} {ls} {echo 'false'}
members
agents
users
groups
roles
realms
machines
solutions

admin@localhost:/TEA>
```

where:

- condition: is the condition to meet by the if construct.
- `ifTrue`: is the segment that gets executed when the condition is `true`.
- `ifFalse`: is the segment that gets executed when the condition is `false`.

sort

Sorts the input objects.

Usage: `tea:sort [options]`

where:

`[options]` can be one of the following:

- `--ignore-leading-blanks` or `-b`: ignores leading blanks.
- `--numeric-sort` or `-n`: compares according to the string numerical value.
- `--unique` or `-u`: displays only the first of an equal run.
- `--reverse` or `-r`: reverses the result of comparisons.
- `--ignore-case` or `-f`: changes lowercase to uppercase characters.

```
admin@localhost:/TEA> ls
members
agents
users
groups
roles
realms
machines
solutions

admin@localhost:/TEA> ls | sort -r
users
solutions
roles
realms
members
machines
groups
agents
```

set

Sets a particular option in the current session.

Usage: `tea:set [options]`

where:

`[options]` is `--scope`. The --scope option specifies the global scope name to be set for the current session.

```
admin@localhost:/> set --scope TEA
Successfully set the current scope to TEA
admin@localhost:/>
```

get

Gets the current value of a supported option from the current session.

Usage: `tea:get [options]`

where:

`[options]` is `--scope`. The --scope option requests for the global scope stored in the current session.

```
admin@localhost:/> get --scope
Current scope is: TEA
admin@localhost:/>
```

Direct Commands

The TIBCO Enterprise Administrator shell supports executing commands directly from the input.

The following code block shows the usage of a direct command.

```
ssh -p 2222 admin@localhost ls
Output
```

```
TEA
```

The Script File Command

A script file is equivalent to a batch file where you can list all the commands you want to execute sequentially.

Before using the file, ensure that you have populated it with the commands you want to use. Assume that the content of the script file, `script.txt` is:

- `'ls`
- `pwd`
- `history'`

The following code snippet shows the usage of the command:

```
ssh -p2222 admin@localhost scriptmode < script.txt
Output

ls
TEA

pwd
/
history
0 ls
1 pwd
2 history
```

The Protocol Commands: SFTP and SCP

TIBCO Enterprise Administrator server supports the SSH File Transfer Protocol (SFTP) and Secure Copy Protocol (SCP) commands.

- The SFTP command: when you get connected to SFTP using an SFTP-compliant terminal, you can use the help command at the prompt to get the detailed usage of

SFTP.

```
C:\>psftp -P 2222 admin@localhost
admin@localhost's password:
Remote working directory is /

psftp> help
!      run a local command
bye    finish your SFTP session
cd     change your remote working directory
chmod  change file permissions and modes
close  finish your SFTP session but do not quit PSFTP
del    delete files on the remote server
dir    list remote files
exit   finish your SFTP session
get    download a file from the server to your local machine
help   give help
lcd    change local working directory
lpwd   print local working directory
ls     list remote files
mget   download multiple files at once
mkdir  create directories on the remote server
mput   upload multiple files at once
mv     move or rename file(s) on the remote server
open   connect to a host
put    upload a file from your local machine to the server
pwd    print your remote working directory
quit   finish your SFTP session
reget  continue downloading files
ren    move or rename file(s) on the remote server
reput  continue uploading files
rm     delete files on the remote server
rmdir  remove directories on the remote server
psftp>
```

The following example is of uploading and downloading a file:

```
psftp> put /Users/myname/a.txt
Uploading /Users/myname/a.txt to /a.txt
/Users/myname/a.txt 100% 934 0.9KB/s 00:00
psftp> ls
a.txt
psftp> get a.txt
Fetching /a.txt to a.txt
```

```
/a.txt
```

Note: If you are using IPv6 addresses, assuming that the IP address of the machine is 10::4, the syntax of `sftp` command to be used is:

```
sftp -P 2222 admin@[10::4]
```

You can use the above command with or without the square brackets around the IP address.

- The SCP Command: When you get connected to SCP using an SCP-compliant terminal, you can use the help command at the prompt to get the detailed usage of SCP.

```
C:\>pscp
PuTTY Secure Copy client
Release 0.63
Usage: pscp [options] [user@]host:source target
       pscp [options] source [source...] [user@]host:target
       pscp [options] -ls [user@]host:filespec
Options:
  -V        print version information and exit
  -pgpfp    print PGP key fingerprints and exit
  -p        preserve file attributes
  -q        quiet, don't show statistics
  -r        copy directories recursively
  -v        show verbose messages
  -load sessname  Load settings from saved session
  -P port   connect to specified port
  -l user   connect with specified username
  -pw passw login with specified password
  -1 -2     force use of particular SSH protocol version
  -4 -6     force use of IPv4 or IPv6
  -C        enable compression
  -I key    private key file for authentication
  -noagent  disable use of Pageant
  -agent    enable use of Pageant
  -batch    disable all interactive prompts
  -unsafe   allow server-side wildcards (DANGEROUS)
  -sftp     force use of SFTP protocol
  -scp      force use of SCP protocol
```

The following example is about uploading a file:

```
C:\>pscp -scp -P 2222 /TEA/a.xml admin@localhost:/a.xml
admin@localhost's password:
a.xml | 5 kB |   5.0 kB/s | ETA: 00:00:10 | 100%

C:\>
```

Note: If you are using IPv6 addresses, assuming that the IP address of the machine is 10::4, the syntax of `scp` command to be used is:

```
scp -P 2222 admin@[10::4]:<filename>
```

Remember that with IPv6 addresses, `scp -P 2222 admin@10::4:<filename>` is not supported.

Using Position and Named Arguments while Defining TeaParam

The definition of TeaParam provides four options when it comes to supporting positions and named arguments: position only, position and named arguments without an alias, position and named arguments with an alias, and named argument only.

The following is the usage of the four ways of defining the positions and named arguments:

- Position only:

```
TeaParam definition

public String testA(@TeaParam(name = "aa", description = "Greetings
parameter", alias = "") final long[] greetings)
Usage

shell> testA [12,15]
```

- Position and named arguments without an alias:

```
TeaParam definition
public String testA(@TeaParam(name = "aa", description = "Greetings
```

```
parameter") final long[] greetings)

Usage
shell> testA [12,15]
shell> testA -aa [12,15]
shell> testA --aa [12,15]
```

- Position and named arguments with an alias:

```
TeaParam definition
public String testA(@TeaParam(name = "aa", description = "Greetings
parameter", alias="bb") final long[] greetings)

Usage
shell> testA [12,15]
shell> testA -aa [12,15]
shell> testA --aa [12,15]
shell> testA -bb [12,15]
shell> testA --bb [12,15]
```

- Named argument only:

```
TeaParam definition
public String testA(@TeaParam(name = "aa", description = "Greetings
parameter", alias="aa") final long[] greetings)

Usage
shell> testA -aa [12,15]
shell> testA --aa [12,15]
```

Python Scripting

You can perform the activities that you perform using the Web UI or the shell commands using Python scripts. For example, you can perform the queries or administrative actions that are exposed by products in their TIBCO Enterprise Administrator agents. In addition to this, you can build scripts with conditional statements and control structure, features that are not supported by the Shell interface.

Setting up Python Scripting

There are some prerequisites that you must perform before developing your Python scripts.

Before you begin

This section assumes that you have an understanding of the Python language, and common development practices associated with it.

Procedure

1. Install Python.

   You can verify the installation by typing `python` at the command prompt on a Windows machine and `python3` in a shell on a UNIX machine.

   > **Caution:** TIBCO Enterprise Administrator uses the `pip` module that is packaged with Python 3.4.1. If you are using an earlier version of Python, install the `pip` module.

2. Install the `requests` module needed to make the HTTP calls. At the command prompt, navigate to `<PYTHON_HOME>\scripts`, and install the module using the following command:`pip install requests`
3. Enable the Python module for TIBCO Enterprise Administrator by setting the `PYTHONPATH` environment variable to `<TIBCO_HOME>\tea\<version>\python`.
4. You must install the `jsonpickle` module if you want to use Python scripts in the

TIBCO Enterprise Administrator agent for TIBCO Security Server. You must also install this module, if you want Python scripts to support plain old java objects (POJOs). In the case of POJOs, `jsonpickle` module is needed to serialize and deserialize java objects. Based on the version of Python you are using, you can install the module using the following command:

Python Version	Command
2	`pip install jsonpickle`
3	`pip3 install jsonpickle`

5. To enable POJO support, you must enable the `enable_class_generation` property on `EnterpriseAdministrator` as follows:

```
import tibco.tea
tea =tibco.tea.EnterpriseAdministrator(config={'enable_class_
generation':True})
```

The property is by default set to `false`, so ensure that you set this to `true` if you want the Python scripts to support POJO objects. POJO support comes with some supported scenarios and limitations.

6. Ensure that the TIBCO Enterprise Administrator server is running.

tibco.tea Module

The `tibco.tea` module gives you access to the members and functions that can be used to access the TIBCO Enterprise Administrator server, and all products that have agents registered with the server. With the help of this module, you can perform just about any activity that can be performed using the Shell commands or the Web UI.

The tibco.tea Module

The `tibco.tea` module is available as a built-in module. Before using this module, perform the steps specified in the Setting up Python Scripting section. To access the classes and members offered by `tibco.tea`, from the Python command line, run the following:

```
import tibco.tea
```

You can now create an instance of the Enterprise Administrator by using the following statement:

```
tea=tibco.tea.EnterpriseAdministrator()
```

The `EnterpriseAdministrator()` constructor can also take the following parameters:

- url: The default URL is `http://localhost:8777`.
- user: The default user is `admin`.
- pwd: The default password is `admin`.

The object, `tea`, in this example refers to an instance of `EnterpriseAdministrator`. You can use any name for the object, but this example uses `tea`. This is the root object of the entire object hierarchy. You need this object to perform any activity on TIBCO Enterprise Administrator. After creating this object, you can use this to register agents, create users, view machines, and so on.

Note: After connecting to the TIBCO Enterprise Administrator server for the first time using `tibco.tea.EnterpriseAdministrator()`, if the session expires, the `EnterpriseAdministrator.login()` method can be called to login again with the previously used credentials.

The session expires if the user script execution stays idle for a period longer than the value specified in `for tea.http.session.timeout` in `tea.conf`. Same is the case while debugging using interactive python shell.

Number of Retry Attempts

You can modify tibco.tea.EnterpriseAdministrator() to support retry and wait options. Python binding attempts to connect to the server URL till the retry attempts exhaust. It waits for the specified interval (in seconds) between each retry. For example, the following code snippet tries to connect to the server 6 times, waiting 5 seconds between each retry. If the connection is successful, the attempt to retry stops.

```
import tibco.tea
tibco.tea.EnterpriseAdministrator(retry=6, wait=5)
```

The Object Hierarchy

Using the `tea` object, created earlier in the example, you can get more information on the object hierarchy. Any reference to the `tea` object is a dictionary, such as `tea.products`, `tea.agents` and so on. Standard functions such as `keys()`, `items()`, and `values()` are available on all reference dictionaries. The standard help() function can be applied to any expression resolving to a TIBCO Enterprise Administrator object, to discover the functions available on that class of object.

tea.products

`tea.products` is a dictionary with a collection of (name,value) pairs. The `tea.products` command is used to list the products registered with the server that support Python binding. The following is an example of the product list generated by the command:

```
>>> tea.products
{'TIBCOSecurityServer': <'TIBCOSecurityServer','
:TIBCOSecurityServerAgent:1.0:TIBCOSecurityServer:
TIBCOSecurityServer'>, 'EMS
': <'EMS',':EMSAgent:1.0:EMS:EMS'>}
>>>
```

The output shows EMS as the product registered. The command `help(tea.products ['EMS'])` lists the functions supported by the Tomcat product.

```
>>> help(tea.products['EMS'])
Help on EMSAgent_1_0_EMS in module builtins object:

EMS = class EMSAgent_1_0_EMS(tibco.tea.TeaObject)
 |  Agent to manage EMS Servers
 |
 |  Method resolution order:
 |      EMSAgent_1_0_EMS
 |      tibco.tea.TeaObject
 |      object
 |
 |  Methods defined here:
 |
 |  registerEmsServer(self, serverName='MyEMSServer',
URL='tcp://localhost:7222',
 |  userName='admin', password='', agentId=None)
 |
```

```
 |      Register an EMS Server
 |
 |      Parameters:
 |          serverName -- EMS server name (type str) (default
MyEMSServer)
 |          URL -- URL (type str) (default tcp://localhost:7222)
 |          userName -- UserName (type str) (default admin)
 |          password -- Password (type str) (default )
 |          agentId -- Identifier for the agent (type agentId)
(default None)
 |
 |      Result Type: reference
 |
 |  ----------------------------------------------------------------
----
 |  Data and other attributes defined here:
 |
 |  module_ = None
 |
 |  omitted_operations = []
 |
 |  type_descr = {'agentTypeId': 'EMSAgent:1.0', 'concept': 'TOP_
LEVEL', '...
 |
 |  ----------------------------------------------------------------
----
 |  Methods inherited from tibco.tea.TeaObject:
 |
 |  __init__(self, tea, obj_descr)
 |
 |  __repr__(self)
 |
 |  __str__(self)
 |
 |  refresh_(self)
 |
 |  ----------------------------------------------------------------
----
 |  Data descriptors inherited from tibco.tea.TeaObject:
 |
 |  __dict__
 |      dictionary for instance variables (if defined)
 |
```

```
 |  __weakref__
 |      list of weak references to the object (if defined)



>>>
```

tea.products.keys()

You can use `tea.products.keys()` to get a list of names of the products registered with the server.

```
>>> tea.products.keys()
dict_keys(['TIBCOSecurityServer', 'EMS'])
```

tea._products_with_provisional_apis

`tea._products_with_provisional_apis` is used to list the products registered with the server that have provisional apis. By default, the APIs exposed by the TIBCO Enterprise Administrator server do not support Python binding.

tea. product_with_provisional_api(name)

You can check whether or not a product has provisional apis by using the function, `tea.product_with_provisional_api(name)`. Pass the product name as the parameter to the function. On finding the product in the `tea._products_with_provisional_apis` dictionary, the function returns the object of the product type along with a message that the Python API for the product is provisional. It is not supported but that is likely to change in future. If the product name is found in `tea.products` dictionary, the function returns `None` along with a message indicating that it is available in `tea.products` dictionary. If not, it prints the warning message that the product with the specified name does not exist.

To support multiple retry attempts, this method also takes `retry` and `wait` as parameters as shown in the following code snippet:

```
tea. product_with_provisional_api(name, retry, wait) where,
name: is the name of the product you are looking for
retry: is the number of retry attempts
wait: is the interval to wait between two retry attempts.
```

if `retry` > 1, the system searches for the product in `provisional products` dictionary

till the number of retry attempts exhaust. If it finds the product, it returns the product and stops further retry attempts. If the product is not found after the specified retry attempts, an exception with a message is raised.

tea. products_with_provisional_apis()

`tea. products_with_provisional_apis()` returns a list of names of the products having provisional API, along with a warning message that the Python API for these products are provisional. They are not supported and are likely to change in future.

tea.product()

The `tea.product()` method is invoked on the `EnterpriseAdministrator` object, which is `tea` in this example. The method returns the supported products from the Python dictionary. Takes the three parameters as shown in the code snippet:

```
tea.product(name, retry, wait) where,
name: is the name of the product you are looking for
retry: is the number of retry attempts
wait: is the interval to wait between two retry attempts.
```

if `retry` > 1, the system searches for the product in `products` dictionary till the number of retry attempts exhaust. If it finds the product, it returns the product and stops further retry attempts. If the product is not found after the specified retry attempts, an exception with a message is raised.

if the `retry` parameter is not specified, the product() method returns the specified product from the `products` dictionary if it is available in it. If it is not available in the `products` dictionary, but it is available in the `provisional products dict`, `None` is returned with a proper `WARNING` message. If it is not available in any dictionary, it returns `None` and prints a `WARNING` message.

<Product>.module_ or <Member>.module_

You can use `module_` on a product or a member to get the modules of Plain Old Java Object (POJO) objects available on the product or member. `module_` is attached to each top level or member object. For example, the following is an example of using `module_` on a member:

```
tea._products_with_provisional_apis['Tomcat'].
members['Server 1'].module_
```

For products, we can use `tea._products_with_provisional_apis['Tomcat'].module_`

to retrieve the modules of POJOs on Tomcat. After obtaining the modules of POJO, you can pass a POJO as a parameter to a function in a Python script. For example:

```
# get an instance of the product as follows -
>>>prod = tea._products_with_provisional_apis['Tomcat']

# Module of POJOs is available on that product or member
 in variable "module_"
>>> mod = prod.module_

# Instantiate the POJO class in python as follows
>>> person = mod.Person("John Doe", 1)

# Invoke the TeaOperation with the python object in the earlier line
 as TeaParam and consume the POJO response as a Python Object
>>> response = prod.hw(person)
```

When you get an POJO as a return type, you can use the POJO like a regular Python object.

```
# Use the response as you use the regular python object
>>> response.name
'John Doe'
>>> response.i
1
```

tea.agents

You can use `tea.agents` to access the agents registered with the server. For example, `tea.agents.agents.registerAgent(name,url,description)` helps you register an agent with the server.

tea.users

You can use `tea.users` to create users, assign roles, groups to users. For example, you can create users using the `tea.users.createUser(self, name, password, groups, roles)` command.

tea.machines

You can use `tea.machines` to get more information about the machines on which the agents are running.

Caution: Different versions of Python handle i18n characters, such as Chinese and Japanese differently. Python 3 supports i18n characters, so the operations and parameters are visible in Python. If you are using Python 2, the following scenarios take effect:

- If the operation name contains i18n characters, the name is considered invalid. The operation is not visible in Python.
- If the parameter name contains i18n characters, but the operation name is valid, the operation is disabled. An exception occurs when you try to access such an operation.

The refresh_() Function

The `refresh_()` function is available to an instance of `EnterpriseAdministrator`() that helps get the latest state of the object from the remote server and agent. In this example, `tea.refresh_()` gets the latest state of the object. The following scenarios call for an explicit refresh:

1. After registering the first agent, the products list gets refreshed automatically, but after registering the second agent, the products list does not refresh. Remember to explicitly refresh the products list of the second agent.
2. After unregistering the agent, the agents dictionary must be refreshed explicitly.
3. Recently updated agents, solutions, products, and dictionaries must be explicitly refreshed before accessing their members, keys, items, and other details.

A Sample Python Script to Manage Agents

The sample Python script can be used to manage an agent associated with the TIBCO Enterprise Administrator server.

Ensure that before running the sample script, you have followed the steps in Setting up Python Scripting. The following Python script can be used to register, reconnect, or unregister an agent.

```
import tibco.tea
import pprint

server = tibco.tea.EnterpriseAdministrator()

def registerAgent( name, url,description):

 try:
   server.agents.registerAgent(name,url,description)
   print('Agent ' + name + ' registered succesfully')
 except Exception as e:
   details=e.args[0]
   print(details)
def unregister(name):
    try:
      agent = server.agents.members[name]
      agent.unregister()
      print('Agent ' + name + ' unregistered')
    except KeyError as e:
     print('Agent "'+ name +'" not found to unregister')
def reconnect(name):
    try:
      agent = server.agents.members[name]
      agent.reconnect()
      print('Agent  '+ name + ' reconnected')
    except KeyError as e:
         print('Agent "'+ name +'" not found to reconnect')


print('-------------------Register Hello World Agent------------------')
registerAgent
('HelloWorld','http://localhost:1234/helloworldagent','HelloWorldAgent')
print('-------------------- Register tomcat Agent------------------')
registerAgent('tomcat','http://localhost:8082/tomcatagent','tomcat' )
print('-----Reconnect Hello World Agent------')
reconnect('HelloWorld')
print('-----Unregister Hello World Agent------------')
unregister('HelloWorld')
```

Assuming you have saved this file as `AgentManagement.py`, you can run it by navigating to the location and running the command, `AgentManagement`. This yields the following output:

```
C:\TEA>python AgentManagement_Sushma.py
-------------------Register Hello World Agent--------------------------
```

```
-------------------
Agent 'HelloWorld' is already registered with url
'http://localhost:1234/helloworldagent'.
------------------- Register tomcat Agent-------------------------------
-------------------
Agent 'Tomcat' is already registered with url
'http://localhost:8082/tomcatagent'.
-----Reconnect Hello World Agent----------------------------------------
--------------------
Agent  HelloWorld reconnected
-----Unregister Hello World Agent---------------------------------------
--------------------
Agent HelloWorld unregistered
```

Note: You can use the usual debugging mechanisms, such as pdb, to debug the Python scripts used for invoking TEA operations.

A Sample Python Script for a Tomcat Agent

The sample Python script can be used to stop a web application on a Tomcat agent.

Ensure that before running the sample script, you have followed the steps in Setting up Python Scripting. The sample script shown in the code defines two methods. The `newTomcat()` method accepts the name of the server and port number as parameters. It creates an instance of the tomcat agent, provided a server with the same name does not already exist. The `stopWebApp()` method accepts a server and the name of an application as parameters and stops an application running on the server.

```
import tibco.tea
tea = tibco.tea.EnterpriseAdministrator()

tomcat = tea.products['tomcat']
def newTomcat( name, port ):

# idempotency: don't create if a server with this name already exists

 if name not in tomcat.members.keys():
    tomcat.createserver( name, port )
    #tomcat.refresh_
    print( 'tomcat server '+ name +' created successfully');
```

```
    server = tomcat.members[ name ]
    server .start()
    return server
 else:
    print( 'tomcat server '+ name +' already exists');
    server = tomcat.members[name]
    if server.status == 'RUNNING':
            print('tomcat server instance '+ name + ' is already
running');
    else:
            server.start()
    return  server

def stopWebapp( server, name ):
    webapp = server .members[ name ]
    # idempotency: don't generate an error if the app is already stopped
    if webapp.status == 'STOPPED':
        print( 'webapp ' + name + ' already stopped.' )
    else:
        webapp .stop()
        print( 'webapp ' + name + ' stopped.' )


tomcat1 = newTomcat( 'tomcat1', 8088 )
stopWebapp( tomcat1, 'docs' )
stopWebapp( tomcat1, 'examples' )
```

Assuming you have saved this file as `TomcatManagement.py`, you can run it by navigating to the location and running the command, `TomcatManagement`. This yields the following output:

```
C:\TEA>TomcatManagement.py
tomcat server tomcat1 created successfully
webapp docs stopped.
webapp examples stopped.
```

Support for POJOs

TeaOperation supports Plain Old Java Object (POJO) as parameters and return types.

To enable POJO support, you must enable the `enable_class_generation` property on `EnterpriseAdministrator` as follows:

```
import tibco.tea
tea =tibco.tea.EnterpriseAdministrator(config={'enable_class_
generation':True})
```

The property is, by default, set to `false`, so ensure that you set this to `true` if you want the Python scripts to support POJO objects. POJO support comes with some supported scenarios and limitations.

Supported Scenarios

The following java objects are supported as a parameter or a return type:

1. A POJO
2. Array of POJO
3. List of POJOs
4. Map of POJOs
5. Nested POJOs
6. A list of POJOs passed as a parameter to a Map is supported as a return type.
7. If you have classes with same names in different packages, underscore separated fully qualified names are used to distinguish them. For example, if there is a class by the name, `TeaAgent` in `com.tibco.tea.agentA`, and `com.tibco.tea.agent.agentB`, the class in package `agentA` is identified by using `com_tibco_tea_agent_agentA_TeaAgent` and the class in `agentB` is identified by using `com_tibco_tea_agent_agentB_TeaAgent`.

Fully Qualified Name in Java	Fully Qualified Name in Python
`com.tibco.tea.agent.agentA.TeaAgent`	`com_tibco_tea_agent_agentA_TeaAgent`
`com.tibco.tea.agent.agentB.TeaAgent`	`com_tibco_tea_agent_agentB_TeaAgent`

Using POJOs in Python Scripts

This procedure uses an example of the Person class as the Java object that is used as a TeaParam to TeaOperation and return type of the TeaOperation. POJOs can be used just as you use regular Python objects.

Procedure

1. Install the `jsonpickle` module. This module must be installed separately using `pip`. Refer the Python documentation for more details. You need the `jsonpickle` module to serialize and deserialize java objects. Based on the version of Python you are using, you can install the module using the following command:

Python Version	Command
2	`pip install jsonpickle`
3	`pip3 install jsonpickle`

2. Define a POJO. The following example defines a Person class:

```
package com.tibco.tea.agent;

import com.fasterxml.jackson.annotation.JsonPropertyOrder;

@JsonPropertyOrder({ "name", "i" })
public class Person {

    private String name;

    private int i;

    public void setName(String name) {
        this.name = name;
    }

    public void setI(int i) {
        this.i = i;
    }

    public String getName() {
        return this.name;
    }
```

```
    public int getI() {
        return this.i;
    }

}
```

3. Define a TeaOperation that takes a POJO as TeaParam and returns a POJO.

```
@TeaOperation(name = "hw", description = "Send greetings")
public Person helloworld(
        @TeaParam(name = "greetings", description = "Greetings
parameter") final Person greetings) throws IOException {
    return greetings;
}
```

4. Invoke the TeaOperation as follows:

```
# Import the tibco.tea module and make the connection
 to the TEA Server
>>> import tibco.tea
>>> tea = tibco.tea.EnterpriseAdministrator()

# First get hold of the product or member of the TeaOperation
 you want to invoke
>>> prod = tea.product_with_provisional_api
('HelloWorldTopLevelType')

# Module of POJOs is available on that product or member in
variable "module_"
>>> mod = prod.module_

# Now instantiate the POJO class in python as follows
>>> person = mod.Person("John Doe", 1)

# Invoke the TeaOperation with the python object in the earlier
line
 as TeaParam and consume the POJO response as a Python Object
>>> response = prod.hw(person)

# Use the response as you use the normal python object
>>> response.name
'John Doe'
>>> response.i
```

```
1
```

Limitations of POJO

The POJO support comes with some limitations.

The following POJOs are not supported:

1. A Map cannot have a POJO as a key
2. Nested maps
3. Nested lists
4. A `List` that takes a `List` of POJOs as a parameter

TIBCO Enterprise Administrator Containerization

You can run TIBCO Enterprise Administrator in a Docker or Kubernetes environment.

A docker container is an executable package that comprises the code and its dependencies needed to help you run the application independent of the platform and computing environment. For more information about Docker concepts, see Docker Documentation.

To containerize TIBCO Enterprise Administrator, follow the procedure listed in *<TIBCO_HOME>*/tea/<version>/docker/README.md.

Performance Optimization of the TIBCO Enterprise Administrator Server

You can fine-tune the performance of the TEA server by using the following properties in the `<TIBCO_HOME>\tea_config\tibco\cfgmgmt\tea\conf\tea.conf` file:

Properties in the tea.conf File

Property	Default Value	Notes
`tea.http.buffer-max-size`	52428800	
`tea.http.idle-timeout`	60000 ms	
`tea.http.threadpool.acceptors`	1	The value of this property is decided at run time, depending on the available processors.
`tea.http.threadpool.selectors`	1	The value of this property is decided at run time, depending on the available processors.
`tea.http.threadpool.workers`	2	This value must be twice as much as the available processors.
`tea.http.threadpool.idle-timeout`	60000 ms	
`tea.http.threadpool.session.timeout`	1800 ms	

Mapping Jetty Properties to TEA Properties

The properties listed in the Properties in the tea.conf File table map to the following Jetty properties:

```
maxThreads = acceptors + selectors + workers
```

```
minThreads = acceptors + selectors
```

Upgrading the TEA Agents

To use the TEA agents that were created with an older version of the agent library with a newer version of the TEA server, you must upgrade the TEA agents to use the newer version of the agent library.

Procedure

1. Stop the agent if it is running.
2. Update the agent library version in your CLASSPATH to the new version of the agent library.
3. Start the agent from the agent's `bin` directory.

Troubleshooting

Cannot Recover Password Changed by Super User

If the super user changes the admin/admin password and forgets it later, there is no way of recovering the password.

Solution

Delete the `<TIBCO_CONFIG_HOME>\tibco\cfgmgmt\tea\data` folder. Restart TIBCO Enterprise Administrator with a fresh data folder. The user name and password is now reset to admin/admin.

> ⚠ **Warning:** Deleting the data folder might result in losing all the agent configurations and LDAP integration.

Problem Accessing Content from The Backed up data Folder

You have backed up the data folder and after a point in time, you want to go back to the backed up data folder.

Solution

You can start TIBCO Enterprise Administrator with the backed up data folder by using the following option: Start TIBCO Enterprise Administrator with the `-data` parameter and point to the backed up data folder.

TIBCO Enterprise Administrator Server is Unable to Reach The Agent

Given an agent URL, the TIBCO Enterprise Administrator server resolves the URL to a specific IP address. When you run TIBCO Enterprise Administrator on laptops, they tend to switch between networks based on your location. In such cases, the TIBCO Enterprise Administrator server is unable to reach the agent.

Solution

Avoid using hostName of the machine when you construct an instance of `TeaAgentServer`. Use 0.0.0.0 or localhost if you anticipate agent machine or the TIBCO Enterprise Administrator server machine to switch between networks.

Software Installation Details and TIBCO Processes Not Displayed

When you start the TIBCO Enterprise Administrator as an NT service that is loaded automatically, the Software Installation Details and TIBCO Processes are not displayed in the Machines View. If you start the server as an NT service under SYSTEM user, the Software Installation Details and TIBCO Processes are not displayed.

Solution

Start NT service under a particular user by configuring the NT service with a user name and password. The NT service starts for the specified user and the Software Installation Details and TIBCO Processes are displayed. In this case, the TIBCO Enterprise Administrator service is now tied to a specific user. You can only see the details of the TIBCO software installed for the configured user.

TIBCO Documentation and Support Services

For information about this product, you can read the documentation, contact TIBCO Support, and join TIBCO Community.

How to Access TIBCO Documentation

Documentation for TIBCO products is available on the Product Documentation website, mainly in HTML and PDF formats.

The Product Documentation website is updated frequently and is more current than any other documentation included with the product.

Product-Specific Documentation

The documentation for this product is available on the TIBCO® Enterprise Administrator Product Documentation page.

To directly access documentation for this product, double-click the following file:

TIBCO_HOME`/release_notes/TIB_tea_2.4.2_docinfo.html` where *TIBCO_HOME* is the top-level directory in which TIBCO products are installed. On Windows, the default *TIBCO_HOME* is `C:\tibco`. On UNIX systems, the default *TIBCO_HOME* is `/opt/tibco`.

How to Contact Support for TIBCO Products

You can contact the Support team in the following ways:

- To access the Support Knowledge Base and getting personalized content about products you are interested in, visit our product Support website.
- To create a Support case, you must have a valid maintenance or support contract with a Cloud Software Group entity. You also need a username and password to log in to the product Support website. If you do not have a username, you can request one by clicking **Register** on the website.

How to Join TIBCO Community

TIBCO Community is the official channel for TIBCO customers, partners, and employee subject matter experts to share and access their collective experience. TIBCO Community offers access to Q&A forums, product wikis, and best practices. It also offers access to extensions, adapters, solution accelerators, and tools that extend and enable customers to gain full value from TIBCO products. In addition, users can submit and vote on feature requests from within the TIBCO Ideas Portal. For a free registration, go to TIBCO Community.

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