Sparkler Canvas On-Premises Deployment

Embedding Tableau dashboards in Salesforce.com

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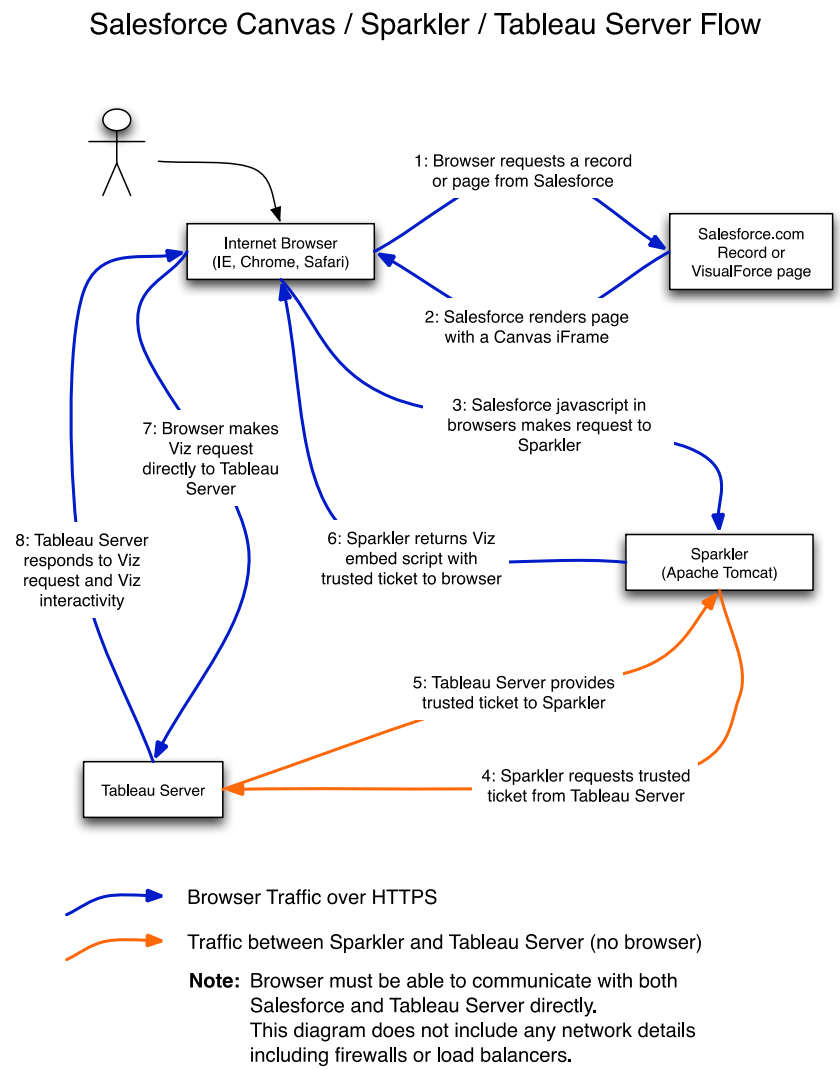
Introduction

This document describes how to embed Tableau dashboards in Salesforce.com using the Force.com Canvas framework. Canvas is Salesforce's framework for integrating third-party web applications into the Salesforce platform. General information about Canvas can be found in Appendix J: Additional Information.

Tableau Server does not have built-in support for Canvas, but we have created a Java adapter named Sparkler to enable embedding Tableau dashboards via Salesforce Canvas. This document describes how to deploy Sparkler on-premises and how to integrate it with an on-premises Tableau Server using Trusted Authentication. If you are using Tableau Online, you can also use SAML for authentication.

The following diagram illustrates how Sparkler allows users to embed Tableau Server visualizations (views) in Salesforce.com:



Technical Summary

Sparkler is a Java application that can be deployed on any Java application server that supports Java 7 or later. Though Sparkler can run on any Java App Server or Java servlet container, this document will cover how to deploy Sparkler on Apache Tomcat 7 and will provide configuration details for Windows and common Linux distributions.

Contents of the Package

The Sparkler distribution includes the Sparkler application as an Apache Tomcat WAR file, a Sparkler configuration XML file, this documentation, sample Tableau workbook files, and sample Salesforce VisualForce pages. The samples are designed to get you up and running quickly—see instructions in Appendix A: Using the Tableau Workbooks. However, these are just samples. For production deployments, you will need to provide your own Tableau workbooks and dashboards, as well as your own VisualForce pages.

Required Access and Skills

It is assumed that you have administrative access to both Salesforce.com and Tableau Server. Furthermore, you must be a system administrator on the system where the Sparkler application is being installed, and you should be familiar with how to navigate a command line terminal, configure applications, set operating system environment variables, locate and read application logs, and install Tomcat as a service.

Pre-Install Checklist

To work with Sparkler and with the samples, you must have the following components, configured as listed:

- Salesforce
  - Salesforce users must be able to reach Tableau Server and Salesforce at the same time from the same browser. Both must be reachable via HTTPS.
  - Salesforce (not the browser) must be able to communicate with the on-premises Sparkler adapter over HTTPS.
- Tableau Server
  - Automatic sign-in is not enabled.
  - SSL is enabled. A commercial x.509 SSL certificate is highly recommended.
  - Trusted authentication is configured on the server. (If you are working with Tableau Online, you can alternatively use SAML, as described in Appendix I: Connecting to Tableau Online with SAML.)
- On-premises Sparkler adapter
  - Java 7 or later is installed.
  - Tomcat 7 or later is installed.
  - SSL is enabled. A commercial x.509 SSL certificate is highly recommended.
  - The OpenSSL utility is installed. This is required on Windows in order to create RSA keys.
  - A static IP is configured for the adapter. (This is required for trusted authentication.)
  - The Sparkler adapter must be able to communicate with Tableau Server over HTTPS.

Supported Browsers

Tableau Server supports all major browsers, including Internet Explorer, Google Chrome, Mozilla Firefox, and Apple Safari. At the time of release, some issues were reported when users tried to use the embedded solution in Mozilla Firefox. We recommend testing your setup using Google Chrome. Verify that JavaScript and third-party cookies are enabled in the browser.

Accessing Sparkler from Public and Private Networks

Salesforce.com is a cloud solution that is accessible from the Internet. The on-premises Tableau Server/Sparkler solution runs on a corporate network. In order to ensure seamless integration, the end user (browser) must be able to access both Salesforce.com and Tableau Server in the same browser at the same time via HTTPS. If users are accessing embedded Tableau dashboards on site, generally no action is required. If users are accessing dashboards off-site (that is, from a client site), the user needs to be able to connect to the internal network using VPN, or Tableau Server needs to be publicly accessible from the Internet (see Proxy Servers in the Tableau Server documentation).

Support from Tableau Software

Sparkler is a supplementary application created and maintained by Tableau Software, Inc. Tableau will assist in basic configuration of the Sparkler app as it relates to communication with standard installations of Tableau Server.

The following items are explicitly **not supported**:

- Network connectivity, routing, firewalls, or load balancing between Salesforce.com and Sparkler.
- Network connectivity, routing, firewalls, or load balancing between Sparkler and Tableau Server.
- Issues related to SSL certificates that are issued by a Certificate Authority that is not trusted by default installations of Tableau Server, Oracle Java 7, or supported internet browsers.
- Installation of Java, Apache Tomcat, or other Java Servlet containers or operating system configuration.
- Salesforce.com configuration, beyond the documented Canvas App configuration, including custom Apex or VisualForce code.
- Browser-specific issues beyond standard support of Tableau Server.

SSL Certificates

Most of the instructions in this document assume that both Sparkler and Tableau Server are deployed using commercial x.509 SSL certificates purchased from a major certificate authority such as Thawte or VeriSign. While it is possible to use SSL certificates that are self-signed or signed by a corporate certificate authority for sandbox and proof-of-concept installations, you will need to perform additional configuration steps as described in this document. Self-signed SSL certificates **should not** be used in production environments.

Single Sign-On Using SAML

If Salesforce.com and Tableau Server are both configured to support single sign-on using SAML and if both use the same SAML identity provider, the user can access Tableau Server views directly in Salesforce.com without the use of Tableau Server trusted authentication. For more information about using SAML, see Appendix I: Connecting to Tableau Online with SAML.

Network Connectivity

Sparkler installation and operation **require** that:

- Salesforce.com can communicate directly with the Sparkler application over HTTPS. Salesforce will not allow communication with connected apps over HTTP. This document details how to enable SSL on Tomcat, but it is possible to run Tomcat over HTTP and have Salesforce communicate with Sparkler via an SSL proxy.
- The Sparkler application can communicate directly with Tableau Server over HTTP or HTTPS. Although the user's browser must communicate with Tableau Server over HTTPS, Sparkler can use HTTP.

The Salesforce.com Canvas Framework requires embedded applications to be secure and trusted. This requires a valid SSL configuration on both Sparkler and Tableau Server. If any browser warnings appear for either of the SSL configurations, embedded dashboards will not render in Salesforce.

Test environments can be configured using self-signed SSL certificates. However, production environments should use X.509 SSL certificates signed by a commercial certificate authority such as VeriSign or Thawte. An alternative for setting up SSL is to use a load balancer that supports SSL termination such as F5 Big-IP. If you use self-signed SSL certificates, users will most likely need to accept security warnings, and additional Sparkler configuration will be necessary.

Each organization might have different operating system configurations, network configurations, security controls, proxies, load balancers, and other technology implementations that can affect the Sparkler integration. You should either be able to configure your environment, or be able to consult with someone who can. This document is not able to account for the wide variety of environments. However, the Sparkler application includes a number of end-to-end test methods that are documented here that can help you evaluate the most common connectivity issues.

Tested Configurations

The standard Sparkler application installation involves deploying Sparkler on a separate server from the server that is running Tableau Server. For details regarding installing Sparkler on the same server as Tableau Server, see Appendix B: Running Tomcat and Tableau Server on the Same Machine. Multiple copies of the Sparkler application can be deployed. This application documents deployment of Sparkler on its own server.

The examples described in this document have been validated against the following:

- The latest generally available release of Salesforce.
- The latest generally available release of Tableau Server.
- Sparkler deployed using Java 7 and Tomcat 7 (on both Windows and Linux systems).

Configure Sparkler

The following tasks walk through installation of Apache Tomcat 7 and the Sparkler App on Linux or Windows.

> **Note:** To install on Windows, use the standard installers for the latest Java JRE (available on the Oracle website) and Apache Tomcat 7 (available on the download page of the Apache Tomcat site). 64-bit is recommended. Make a note of the install location of both Java (indicated by the `JAVA_HOME` environment variable) and Tomcat.

Task 1: Install Java

Java 7 or later must be installed to run Sparkler. You can use command-line commands to check whether Java is installed and which version is installed.

Windows:

```
C:>java -version
Java version "1.8.0_31"
Java(TM) SE Runtime Environment (build 1.8.0_31-b13)
Java HotSpot(TM) Client VM (build 25.31-b07, mixed mode, sharing)
```

Linux:

```
[ec2-user ~]$ java -version
 java version "1.7.0_71"
 OpenJDK Runtime Environment (amzn-2.5.3.1.49.amzn1-x86_64 u71-b14)
 OpenJDK 64-Bit Server VM (build 24.65-b04, mixed mode)
```

If Java is not installed, you will get one of the following error messages.

Windows:

```
C:>java -version
'java' is not recognized as an internal or external command, operable program or
batch file.
```

Linux:

```
[ec2-user ~]$ java -version
 -bash: java: command not found
```

If Java is not installed, or the version installed is lower than 1.7, download and install the latest version of Java from http://www.java.com. (At the time this document was written, the latest version was Version 8.) If you are downloading Java from a machine other than the one on which it will run, download the appropriate installer from http://www.oracle.com/technetwork/java/javase/downloads/.

Task 2: Install Tomcat

Windows:

1. Download Tomcat 7.0 Windows Service Installer from http://tomcat.apache.org.
2. Double-click the installer file and follow the on screen instructions, accepting all defaults. If you installed Java in the steps above, you will see your Java installation directory selected as the default.
3. From a command prompt, enter the following:

   ```
   services.msc
   ```

   This opens the Services window. At the top of the list you will see an entry for Apache Tomcat 7.0.

4. To start, Tomcat right-click this entry and then click **Start**. Note that options also exist to stop and restart Tomcat. This procedure is also how you will start and stop Tomcat later in the configuration process.

Linux:

1. Log into the AWS EC2 host using SSH, puTTY, or another terminal program.
2. Install Apache Tomcat7 by using the following commands:

   ```
   [ec2-user ~]$ sudo yum install tomcat7

   [root logs]# sudo yum install tomcat7-webapps
   ```

3. Verify that the Tomcat directories have been created by entering the following commands and checking that the directory listings match the example.

   ```
   [ec2-user ~]$ ls /usr/share/tomcat7
   bin  conf  lib  logs  temp  webapps  work

   [ec2-user ~]$ ls /etc/tomcat7
   Catalina             context.xml         tomcat7.conf
   catalina.policy      logging.properties  tomcat-users.xml
   catalina.properties  server.xml          web.xml
   ```

4. Start Tomcat7 by using the following command. Note that Tomcat can be stopped or restarted by ending the command with either `stop` or `restart`.

   ```
   [ec2-user ~]$ sudo service tomcat7 start
   [ec2-user ~]$                               [  OK  ]
   ```

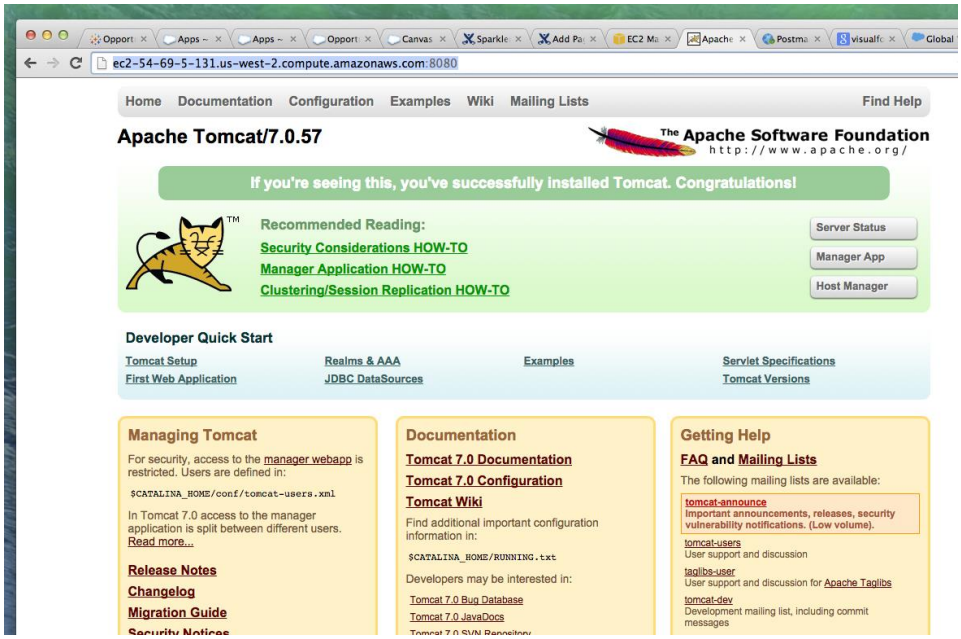
5. Test that Tomcat is running by opening a browser and navigating to the following URL:

   ```
   http://sparkler-hostname:8080/
   ```

   For example, on an Amazon EC2 instance this would be:

   ```
   http://ec2-hostname.us-west-2.compute.amazonaws.com:8080/
   ```

If Tomcat is running, you see a page like the following one:



Task 3: Enable HTTPS for Tomcat

The instructions in this section describe how to set up Tomcat with a SSL certificate.

Note: Production installations of Tomcat should use a commercial SSL certificate. Otherwise, views will not render in Salesforce.com because the browser will not trust the content.

1. To generate and install a self-signed certificate, use the Java `keytool` command.

   Note: Perform this step only if you want to work with a self-signed certificate. To install a CA certificate, follow the instructions under "Installing a Certificate from a Certificate Authority" on the SSL/TLS Configuration HOW-TO page on the Apache Tomcat site. Then continue to step 2 of this procedure.

   The `keytool` command asks you a series of questions; use the following responses:
   - Use `changeit` for your password.
   - On the last step, press Enter to use the same keystore password.

   Windows:

   ```
   c:\> c:\Program Files (x86)\Java\[javaversion]\bin\keytool.exe -genkey -alias tomcat -keyalg RSA -keystore "c:\Program Files (x86)\Apache Software Foundation\Tomcat 7.0\.keystore"
   ```

   Linux:

   ```
   [ec2-user tomcat7]$ sudo su
   ```

```
[root tomcat7]# cd /usr/share/tomcat7
[root tomcat7]# $JAVA_HOME/bin/keytool -genkey -alias tomcat -keyalg RSA -
keystore /usr/share/tomcat7/.keystore
```

The following listing shows the sequence of questions (same on Linux and Windows):

```
Enter keystore password:
Re-enter new password:
What is your first and last name?
  [Unknown]:  Sparkler
What is the name of your organizational unit?
  [Unknown]:  {Your Organization}
What is the name of your organization?
  [Unknown]:  {Your Company}
What is the name of your City or Locality?
  [Unknown]:  {Your City}
What is the name of your State or Province?
  [Unknown]:  {Your State}
What is the two-letter country code for this unit?
  [Unknown]:  {Your Country Code}
    Is CN=Sparkler, OU={Your Organization}, O={Your Company},
    L={Your City}, ST={Your State}, C={Your Country Code} correct?
   [no]:  y
Enter key password for <tomcat>
(RETURN if same as keystore password):
```

When the command finishes, the key is generated and installed in the following directory:

Windows:

`c:\Program Files (x86)\Apache Software Foundation\Tomcat 7.0\.keystore`

Linux:

`/usr/share/tomcat7/.keystore`

2. Edit the file `c:\Program Files (x86)\Apache Software Foundation\Tomcat 7.0\conf\server.xml` (Windows) or `/etc/tomcat7/server.xml` (Linux). In Windows, right-click the file and then click **Edit**. In Linux, use the following command:

```
[ec2-user ~]$ sudo nano /etc/tomcat7/server.xml
```

3. Uncomment the following section (remove `<!--` and `-->`)

```
<!--
<Connector port="8443" protocol="org.apache.coyote.http11.Http11Protocol"
maxThreads="150" SSLEnabled="true" scheme="https" secure="true"
clientAuth="false" sslProtocol="TLS" />
-->
```

4. Edit the tag to include the location of the keystore file and the keystore password:

   Windows:

   ```
   <Connector port="8443" protocol="org.apache.coyote.http11.Http11Protocol
   "maxThreads="150" SSLEnabled="true" scheme="https"
   secure="true" clientAuth="false" sslProtocol="TLS"
   keystoreFile="c:\Program Files (x86)\Apache Software Foundation\Tomcat
   7.0\.keystore" keystorePass="changeit"/>
   ```

   Linux:

   ```
   <Connector port="8443" protocol="org.apache.coyote.http11.Http11Protocol"
   maxThreads="150" SSLEnabled="true" scheme="https" secure="true"
   clientAuth="false" sslProtocol="TLS"
   keystoreFile="/usr/share/tomcat7/.keystore" keystorePass="changeit"/>
   ```

5. Save and close the file. (In Linux, use Ctrl+O, Ctrl+X.)
6. Restart Tomcat.

   Windows:

   ```
   c:\> services.msc
   ```

   Right-click **Apache Tomcat 7.0** and then click **Restart**.

   Linux:

   ```
   [ec2-user ~]$ sudo service tomcat7 restart
   [ec2-user ~]$                              [  OK  ]
   ```

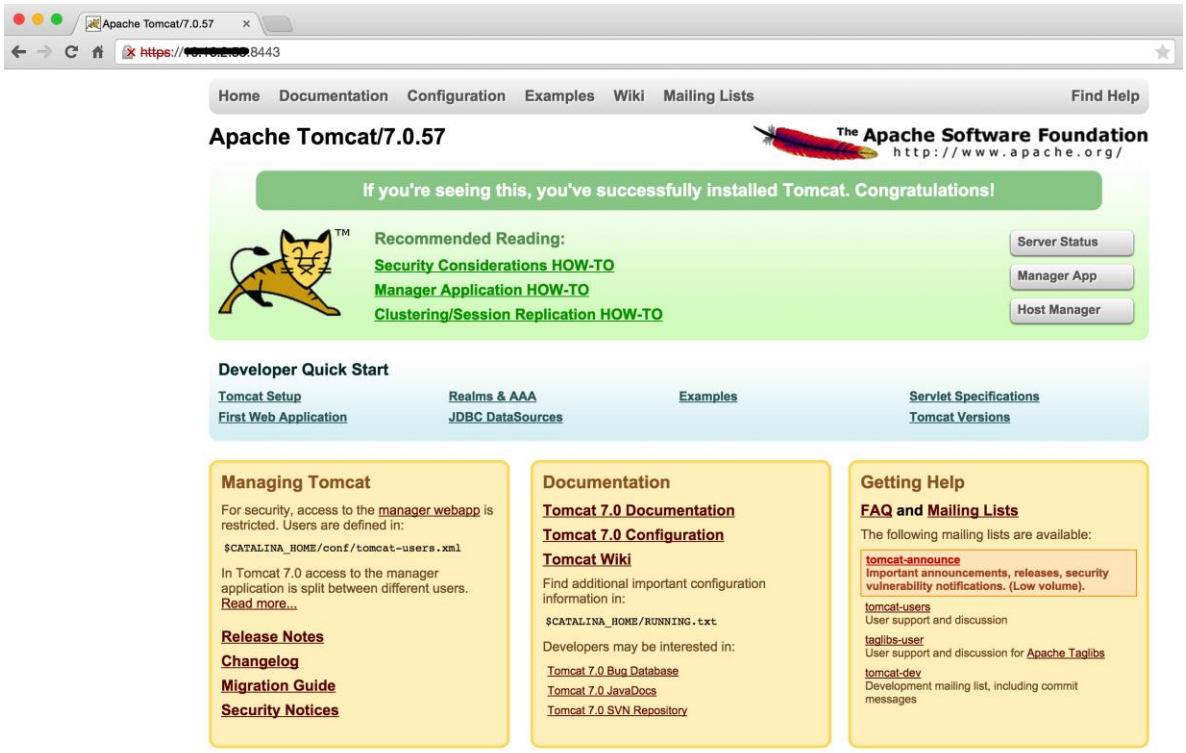
7. Test Tomcat over HTTPS by opening a browser and navigating to the following URL:

   ```
   https://sparkler-hostname:8443/
   ```

   Note that the URL uses HTTPS and port 8443. For example:

   ```
   https://ec2-hostname.region.compute.amazonaws.com:8443/
   ```

   If SSL is configured correctly for Tomcat, you see a page like the following one. Note that if you are using self-signed certificate, you might see a browser warning that you will need to accept in order to proceed. The red strike-through text for “https” in the screenshot URL indicates this page is using a self-signed certificate.



Task 4: Install Sparkler

Sparkler is distributed as a Java WAR file with an accompanying `sparkler.xml` configuration file. You need to copy the Sparkler WAR and XML files to a location on the target server where you want to deploy Sparkler. There are various ways to do this, including puTTY and WinSCP (on Windows).

1. On your computer, navigate to the directory where you saved the Sparkler WAR file and XML files.
2. Copy Sparkler files to the Linux or Windows host where Sparkler will be installed. On Windows you may need to use a program such as WinSCP. On Linux, the command will look like this:

   ```
   Myhost:~ username$ scp sparkler-reference-1.0.0.war
   [USERNAME]@[YOURSERVER]:~/

   Myhost:~ username$ scp sparkler.xml [USERNAME]@[YOURSERVER]:~/
   ```

3. Log in to the Linux or Windows instance where you copied Sparkler.
4. Change to the `webapps` directory. In Windows, use Windows Explorer to go to the following path:

   ```
   c:\Program Files (x86)\Apache Software Foundation\Tomcat 7.0\webapps
   ```

   In Linux, use the following command:

   ```
   [root home]# cd /usr/share/tomcat7/webapps
   ```

5. Copy the Sparkler WAR file to the `webapps` directory. (The XML file will be used later for configuration.)

   Windows:

   Rename `sparkler-reference-1.0.0.war` in your home directory to `sparkler.war`. Then drag it to `c:\Program Files (x86)\Apache Software Foundation\Tomcat 7.0\webapps`.

   Linux:

   ```
   [root webapps]# sudo cp /home/ user/sparkler-reference-1.0.0-SNAPSHOT.war
   /sparkler.war
   ```

   You can deploy Sparkler to a different URL by changing the target location name of the file. The name of the file corresponds to the URL path for the application. For example, deploying the file as `sparkler-test.war` will result in a URL of `https://sparkler-hostname:8443/sparkler-test`. In that case, since the target file name in the example is `sparkler.war`, the directory `/sparkler` will be created.

   Take note of the exact file name for the .war file—for example, here, the name is `sparkler.war`. Later on when you work with the XML file, you'll need to use exactly the same file name, except for the `.xml` extension instead of `.war`.

6. Test Sparkler over HTTPS by opening a browser and navigating to the following URL:

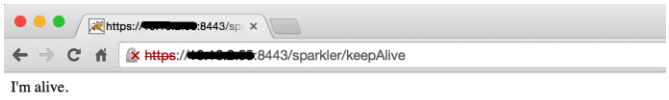
   `https://`*`sparkler-hostname`*`:8443/`

   Note that the URL uses `https` and port 8443.

   For example:

   `https://`*`ec2-hostname.region`*`.compute.amazonaws.com:8443/sparkler/keepAlive`

   If Sparkler is configured correctly, you see a page like the following one:



Task 5: Configure Sparkler to Use a Tableau Server Self-Signed SSL Certificate (If Required)

By default, Apache Tomcat will not support SSL certificates that are not signed by a commercial Certificate Authority (CA). In order to support self-signed SSL certificates, or SSL certificates signed by an internal or corporate certificate authority, you must perform the following steps. If you have a certificate issued by a commercial CA, you can skip this task.

1. When you obtain your certificate, ensure that requests to Tableau Server will use the same hostname as the canonical name (CN) of the SSL certificate being used by Tableau Server:
   - Example request URL: `https://tableau.mycompany.com`
   - Example Certificate CN: `CN=tableau.mycompany.com`
2. On the Sparkler server, convert the self-signed SSL certificate to DER format required by Java by running the following command. If you are using Windows, you need to first download the OpenSSL command-line utility from https://www.openssl.org/related/binaries.html.

   ```
   openssl x509 -in <filename-of-SSL-cert-in-PEM-format> -inform PEM -out
   tableau.der -outform DER
   ```

3. Verify the DER-formatted file by running the following command and ensuring you receive output similar to that listed.

   Windows:

   ```
   %JAVA_HOME%/bin/keytool -printcert -v -file tableau.der
   ```

   Linux:

   ```
   $JAVA_HOME/bin/keytool -printcert -v -file tableau.der
   ```

   If the file is correct, you see output similar to the following (`Owner` and `Issuer` will be unique to your key and organization):

   ```
   Owner: CN=*.tableausoftware.com, OU=Netops, O=Tableau Software, L=Seattle,
   ST=Washington, C=US
   Issuer: CN=thawte SHA256 SSL CA, O="thawte, Inc.", C=US
   Serial number: xxxxxxxxxxxxxxxxxxxxxxxxxxxxb5d4
   Valid from: Thu Oct 23 17:00:00 PDT 2014 until: Sun Nov 29 15:59:59 PST 2015
   ```

4. Import the SSL certificate in DER format into Java's `cacerts` keystore by entering the following command:

   Windows:

   ```
   %JAVA_HOME%/bin/keytool -import -trustcacerts -alias tableauserver -file full-path-to-DER-file/tableau.der -keystore %JAVA_HOME%/lib/security/cacerts
   ```

   Linux:

   ```
   sudo $JAVA_HOME/bin/keytool -import -trustcacerts -alias tableauserver -file full-path-to-DER-file/tableau.der -keystore $JAVA_HOME/lib/security/cacerts
   ```

   If you are prompted for a keystore password, use the Java default password, which is `changeit`.

5. Verify that the SSL certificate was imported by running the following command:

   Windows:

   ```
   %JAVA_HOME%/bin/keytool –list -v –keystore %JAVA_HOME%/lib/security/cacerts
   ```

   Linux:

   ```
   $JAVA_HOME/bin/keytool –list -v –keystore $JAVA_HOME/lib/security/cacerts
   ```

   If the certificate has been imported, you will see your SSL certificate listed as one of the certificates in the keystore. Search for the alias `tableauserver` that you used above in the output (the certificate might be listed at the bottom).

6. Restart Apache Tomcat.

Task 6: Set Up Tableau Server Trusted Authentication

To work with Sparkler, Tableau Server must be configured with trusted authentication enabled. (If you are using Tableau Online, you can use SAML for authentication. For more information, see Appendix I: Connecting to Tableau Online with SAML.)

Note: Automatic login must not be enabled on Tableau Server, because trusted authentication cannot be used with this feature enabled. If the server was installed with automatic login, you must re-run the installer and disable this feature after initialization.

---

1. Get the IP addresses of trusted clients that will be connecting to Tableau Server. The IP address of the server hosting Sparkler is the most important.
2. Get the IP addresses of any proxies, or load balancers that are being used to route traffic to Tableau Server.
3. On the computer where Tableau Server is running, open a command window. (Click Windows Start, then right-click **Command Prompt**, and then click **Run as administrator**.)

4. Run the following command to change directories to the location where the `tabadmin` command is installed.

   ```
   cd c:\Program Files\Tableau\Tableau Server\8.2\bin
   ```

5. Set the list of trusted hosts by entering the following command:

   ```
   tabadmin set wgserver.trusted_hosts "10.88.36.216, 10.88.36.218,
   10.88.36.220, 10.88.36.221"
   ```

   Substitute your own list of trusted clients for 10.88.36.216, etc.

6. Set the list of trusted proxies by entering the following command:

   ```
   tabadmin set gateway.trusted "10.1.1.69, 10.1.1.162, 10.1.1.157, 10.1.1.84"
   ```

   Substitute your own list of trusted proxies for 10.1.1.69, etc.

7. Save the configuration settings and restart the server by entering the following commands:

   ```
   tabadmin configure
   tabadmin restart
   ```

8. When the server is restarted, verify that the trusted hosts have been added by examining the `tabsvc.yml` file, which is in the following folder:

   ```
   c:\ProgramData\Tableau\Tableau Server\config\
   ```

   Verify that the following settings appear:

Note: You can view changes in this file, but you cannot change the values; to change values, you must use the `tabadmin set` command.

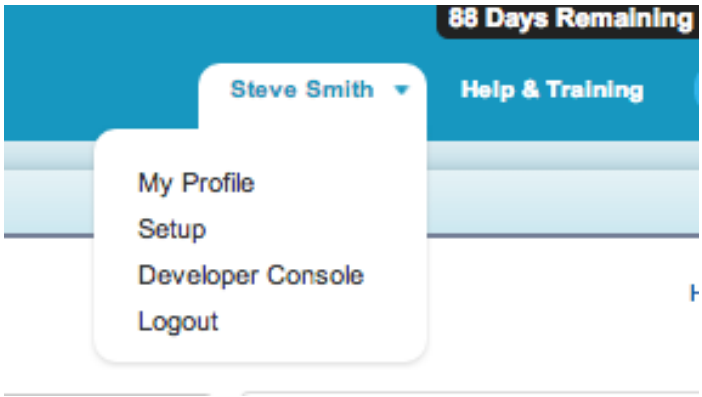
```
gateway.trusted_hosts: tableauserver.mycompany.com
vizqlserver.trustedticket.log_level: ?debu
ssl.key.file: C:\Program Files\Tableau\Tableau Server\SSL\sfdc-demo.key
ssl.cert.file: C:\Program Files\Tableau\Tableau Server\SSL\sfdc-demo.cer
gateway.public.host: tableauserver.mycompany.com
vizqlserver.initialsql.disabled: false
gateway.trusted: 10.1.1.69, 10.1.1.162, 10.1.1.157, 10.1.1.84
wgserver.trusted_hosts: 10.88.36.216, 10.88.36.218, 10.88.36.220,
10.88.36.221
config.version: 12
service.init.state: start
gateway.public.port: 443
```

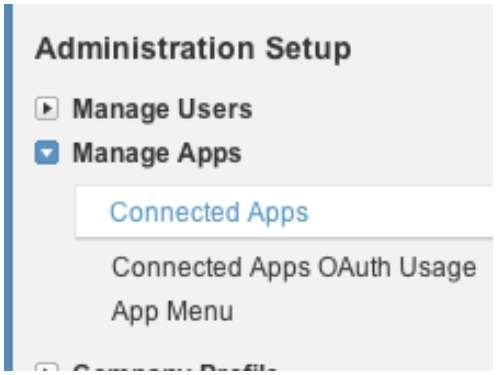
Configure Salesforce.com for the Sparkler Connected App

To configure the Sparkler Canvas Connected App in Salesforce, you need to be a Salesforce System Administrator. You also need to information about where Sparkler is deployed, such as the URL for the Sparkler host (and its port).

Task 1: Create the Connected App

1. Sign in to Salesforce.
2. Select **Setup** > **Create** > **Apps** > **Connected Apps** > **New**.





3. Make the following settings for the new app:

- **Basic Information**
  - **Name**: The user-friendly name of your app.
  - **API Name**: The name of the app as it will be referenced in code.
- **API (Enable oAuth Settings)**
  - **Enable oAuth Settings**: enabled (checked).
  - **Callback Url**: `https://Sparkler-hostame:Sparkler-port/Sparkler-directory/keepAlive`

    Example: `https://sparkler.mycompany.com:8443/sparkler/keepAlive`

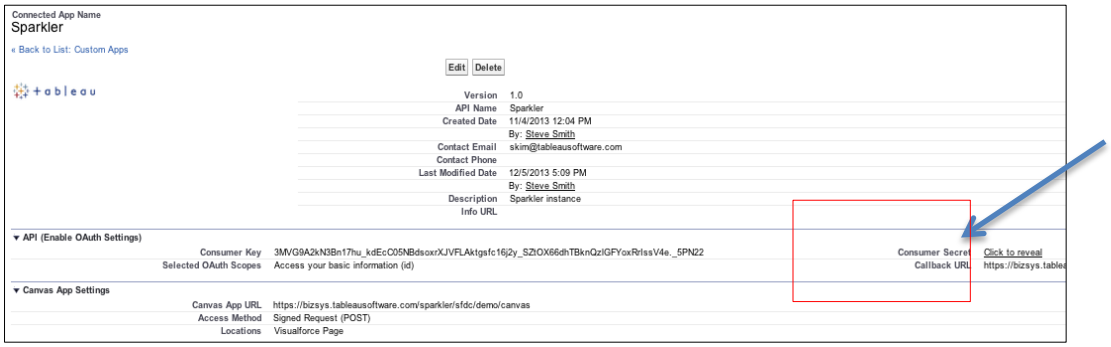
- **oAuth Scope**: The information that the app will request; it will need access to your basic information (ID, profile, email, address, phone).

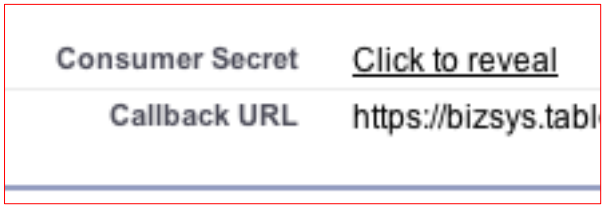
- **Canvas App Settings:**
  - **Force.com Canvas**: enabled (checked)
  - **Canvas App Url**: `https://Sparkler-hostame:Sparkler-port/Sparkler-directory/sfdc/canvas`

    Example: `https://sparkler.mycompany.com:8443/sparkler/sfdc/canvas`

  - **Access Method**: Signed Request (POST)
  - **Locations**:
    - VisualForce Page
    - Publisher
    - Chatter Feed

4. Select **Save**.
5. Select **Setup** > **Create** > **Apps** > **Connected Apps** > *App Name* to get the consumer secret that was automatically generated by Salesforce when you saved the app.
6. Get the consumer secret for your app generated by Salesforce by clicking **Click to reveal** next to **Consumer Secret**.





7. Copy this key and store it in a secure place. You will need it later when you set the value of `sparkler.sfdc.consumerSecret` in the `sparkler.xml` configuration file.

Task 2: Update the Connected App

1. In Salesforce, select **Setup** > **Create** > **Apps** > **Connected Apps** > *Sparkler App Name* > **Manage** > **Edit**.
2. Change the following option on the page and then click **Save**:

    - **oAuth Policies > Permitted Users:** Admin Approved Users are Pre-Authorized

3. Select **Setup** > **Create** > **Apps** > **Connected Apps** > *Sparkler App Name* > **Manage** > **Profiles** > **Manage Profiles**.

    Note that you won't see the Manage Profiles option until you've completed the preceding step.

4. Add one or more profiles, such as `System Administrator`.

Task 3: Configure Sparkler

Sparkler configuration is handled via the `sparkler.xml` file that came with the Sparkler WAR file. For more details about configuration parameters, see Appendix C: Sparkler Configuration Parameters.

1. Copy the `sparkler.xml` file from the installation location to the configuration directory of your Tomcat installation on the Sparkler server.

    Windows:

    Use File Explorer to copy the file to the following location:

    ```
    C:\Program Files (x86)\Apache Software Foundation\Tomcat
    7.0\conf\Catalina\localhost
    ```

    Linux:

    ```
    [root ~]# sudo cp ~/sparkler.xml /etc/tomcat7/conf/Catalina/localhost
    ```

2. Edit the `sparkler.xml` file.

    Windows:

    Right-click `sparkler.xml` and then click **Edit**.

    Linux:

    ```
    [root ~]# cd /user/share/tomcat7/conf/Catalina/localhost
    [root localhost]# sudo nano sparkler.xml
    ```

    All optional parameters are commented out. The `sparkler.xml` file contains descriptions of all optional parameters, which are also listed in Appendix C: Sparkler Configuration Parameters. You can enable these values by uncommenting the parameter's `<Environment>` tag.

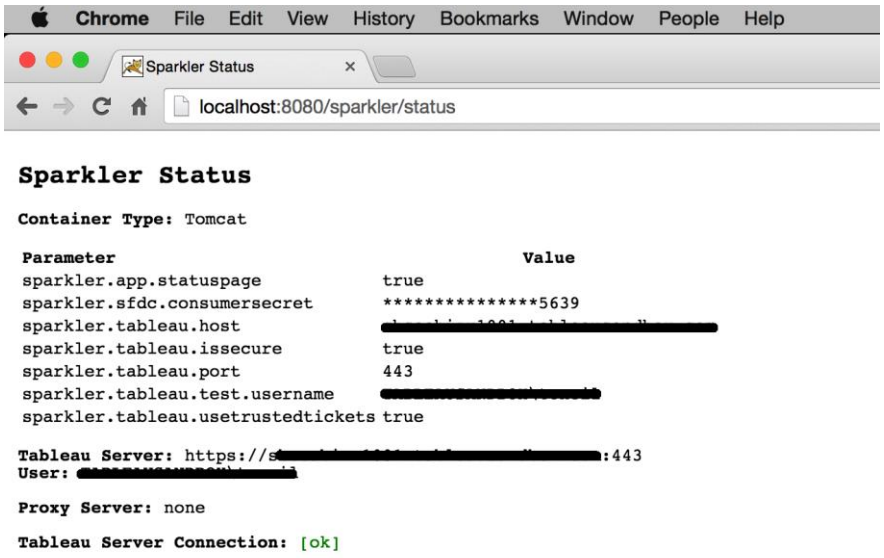
3. Enter the value for the `sparkler.sfdc.consumerSecret` parameter. This was the numeric value you made note of when configuring the Salesforce Connected App.
4. Enable the status page by uncommenting the `sparkler.app.statusPage` parameter and setting it to `true`.
5. Restart Tomcat.

Task 4: Validate Sparkler Configuration

1. In a browser, enter the following URL:

   `https://`*`Sparkler-host`*`:8443/sparkler/status`

   The page displays all of the parameters that were set, and indicates in red any required parameters that are missing or improperly formatted. In addition, the page lists the URL for Tableau Server trusted tickets and for the proxy server (if either or both has been set). If trusted tickets are enabled, a test request is made to Tableau Server and the results are displayed.



2. If any of the parameters are listed in red or if the Tableau Server Connection is not **ok**, adjust the parameters as needed to resolve the issue. For information about debugging, see Appendix F: Debugging Sparkler Application Configuration Debugging.

Task 5: Test the Connected App

- In Salesforce, select **Setup** > **Canvas App Previewer** > *Sparkler App Name*.

  This makes a request from Salesforce to Sparkler. If Sparkler is configured correctly, you see a page with information about the logged in Salesforce user, like the one shown in the preceding procedure.

If you see a blank page, Salesforce is not communicating correctly with Sparkler. For help with debugging, see Appendix E: Sparkler Application Configuration Debugging, specifically the section labeled Salesforce Canvas App Previewer.

If you see an error icon (in Chrome, this looks like a sad face), the issue might be that the browser does not trust the SSL certificate that Sparkler is using, particularly if you are using a self-signed SSL certificate.

Configure the VisualForce Page

This section describes how to embed a Sparkler Canvas App VisualForce Component in a Salesforce VisualForce page. The sample VisualForce pages can be found in the `examples/sfdc/vfp` directory of the distribution. For additional information, see Appendix C: VisualForce View Embedding Parameters.

Types of VisualForce Pages

VisualForce pages allow users to view pages directly in Salesforce. There are two types:

- Extensions to Salesforce objects. These pages start with a single Salesforce record, and then add data and visual capabilities. The pages can generally access all of the permissions-granted fields on the object, in addition to custom programmed fields. This is the most common type of VisualForce page.
- Custom pages. These are completely custom web views that are not tied to a specific record.

VisualForce pages can be accessed directly or embedded in a Salesforce record page layout.

Task 1: Create VisualForce Pages

1. Select **Setup** > **App Setup** > **Develop** > **Pages**.
2. Create the VisualForce pages for the Accounts Dashboard, Accounts, and Opportunities pages.
3. In the VisualForce markup section, copy and paste the VisualForce page from `examples/sfdc/vfp`.
4. After the pages have been created, click the **Security** link for each page and make sure the appropriate user has access to the page.

Task 2: Create a Tab Page

1. Select **Setup** > **App Setup** > **Create** > **Tabs**.
2. Create a new tab in VisualForce Tabs.
3. Verify that the tab you just created is shown on the toolbar. If it doesn't appear, click **+** on the toolbar and then click the **Customize my tabs** button.

Task 3: Embed the Dashboard in an Account/Opportunity

1. Enable the Accounts dashboard when a user selects an account by selecting **Setup** > **App Setup** > **Customize** > **Accounts** > **Page Layouts**.

   To use the Tableau-provided Sample workbooks, follow the instructions in Appendix A: Using the Sample Tableau Workbooks.

2. Edit the existing page layout or add new one, depending on your situation.
3. Under **Account Layout**, select the embedded Account VisualForce page and drag the page to where you want it.
4. Double-click the VisualForce page and if necessary, specify the height of the page and the width.
5. Enable the Opportunities dashboard when a user selects an opportunity by selecting **Setup** > **App Setup** > **Customize** > **Opportunities** > **Page Layouts**.
6. Repeat steps 2 through 4 to embed the dashboard for Opportunity.

Canvas App VisualForce Component

The information in this section is about the Canvas App VisualForce component, which is a way of embedding content easily in a VisualForce pages. The Canvas App VisualForce Component creates an `<iframe>` element into which the view is rendered.

The fields described below are part of the VisualForce component. The parameters field is the primary method of feeding data to Sparkler. The example that follows shows a complete example (all fields listed). In general, you pass only the following values:

- `applicationName` or `developerName`. This value is required.
- `height` and `width`.
- A subset of available parameters, typically to override defaults or values that are established using Sparkler configuration parameters.

```
<apex:canvasApp
    applicationName="Sparkler"
    height="536px"
    width="654px"
    parameters="
    {
        'ts.name':'OpportunityDashboardDreamforce/OpportunityDashboard',
        'ts.width':'1000',
        'ts.height':'400',
        'ts.javascriptLib':
             'https://mytableauserverdomain/javascripts/api/viz_v1.js',
        'ts.hostUrl':'https://mytableauserverdomain/',
        'ts.siteRoot':'/t/myOrganizationSite',
        'ts.tabs':'no',
        'ts.toolbar':'yes',
        'ts.trustedTicket.host':'mytableauserverdomain',
        'ts.trustedTicket.siteId':'myOrganizationSite',
        'ts.trustedTicket.username':
            '{!LEFT($User.Email, FIND("@",$User.Email)-1)}',
```

```
        'ts.filter':'Opportunity_Parameter={!Opportunity.Id}'
    }" />
```

The following table describes the attributes in a `<apex:canvasApp>` element and the values that you specify for embedding a view in a Salesforce page. For more information about the `apex:canvasApp` component, see the following pages in the Salesforce developer documentation:

- apex:canvasApp Component
- Global Variables

Attribute	Description	More information
`apex:canvasApp`	Tells Salesforce to use the built-in Canvas App VisualForce component.	
`applicationName="Sparkler"`	Tells Salesforce to use the Connected App called "Sparkler".	**Setup > Create > Apps > Connected Apps > Sparkler**
`developerName="Sparkler"`	Tells Salesforce to use the Connected App with the API Name of "Sparkler".	**Setup > Create > Apps > Connected Apps > Sparkler**
`height="536px"`	Tells Salesforce to render an HTML `<iframe>` element that is 536 pixels high.	
`width="654px"`	Tells Salesforce to render an HTML `<iframe>` element that is 654 pixels wide.	

The following table describes the attributes in the `<parameters>` element; the values in this element are passed to Sparkler and to the Tableau Server embed script.

Parameter	Description
`'ts.name':'OpportunityDashboardDreamforce/OpportunityDashboard'`	Specifies the name of the workbook and view to render.
`'ts.width':'1000'`	Tells the page to render the view at 1000 pixels wide; this is allowed to be different from the values passed for `<iframe>` element.
`'ts.height':'400'`	Tells the page to render the view at 400 pixels high; this is allowed to be different from the `<iframe>` element.
`'ts.javascriptLib':'https://mytableauserverdomain/javascripts/api/viz_v1.js'`	Tells the view embed code to use the specified JavaScript library. In most cases, you don't pass a value here; instead, you set the `sparkler.tableau.javascriptLib` configuration parameter for Sparkler.
`'ts.hostUrl':'https://mytableauserverdomain/'`	Specifies the URL of the Tableau Server where the view to be embedded is. In most cases, you don't pass a value here; instead, you set the `sparkler.tableau.externalURL` configuration parameter for Sparkler.
`'ts.siteRoot':'/t/myOrganizationSite'`	Specifies the site where the view is located. This

	value is included only if you are using a Tableau Server instance that has multiple sites.
`'ts.tabs':'no'`	Tells the view embed code to include tabs.
`'ts.toolbar':'yes'`	Tells the view embed code to include the toolbar.
`'ts.trustedTicket.host':'mytableauserverdomain'`	In most cases, you don't pass a value here; instead, you set the `sparkler.tableau.host` configuration parameter for Sparkler. If the value is included, the server must match the server specified in the `ts.hostUrl` parameter. This allows Sparkler to communicate with multiple Tableau Servers, since the Sparkler default configuration only allows for a single Tableau Server to be specified.
`'ts.trustedTicket.siteId':'myOrganizationSite'`	In most cases, you don't pass a value here; instead, you set the `sparkler.tableau.siteId` configuration parameter for Sparkler. If the value is included, the server must match the server specified in the `ts.siteRoot` parameter. This allows multiple Tableau Server sites to be accessed.
`'ts.trustedTicket.username':'{!LEFT($User.Email, FIND("@",$User.Email)-1)}'`	Specifies the username of a valid Tableau Server user with access to view the dashboard. The example includes a VisualForce expression that takes the Salesforce user's email address and extracts the portion before the `@` symbol
`'ts.filter':'Opportunity_Parameter={!Opportunity.Id}'`	Specifies a filter for the embedded view. In the example, the value is calculated by taking the ID of the Opportunity record from the VisualForce page on which the Canvas App component is embedded, and then putting it into a filter string. If the `Opportunity.Id` value is `006i0000001vvYD`, the filter passed to the view will be `"Opportunity_Parameter=006i0000001vvYD"`

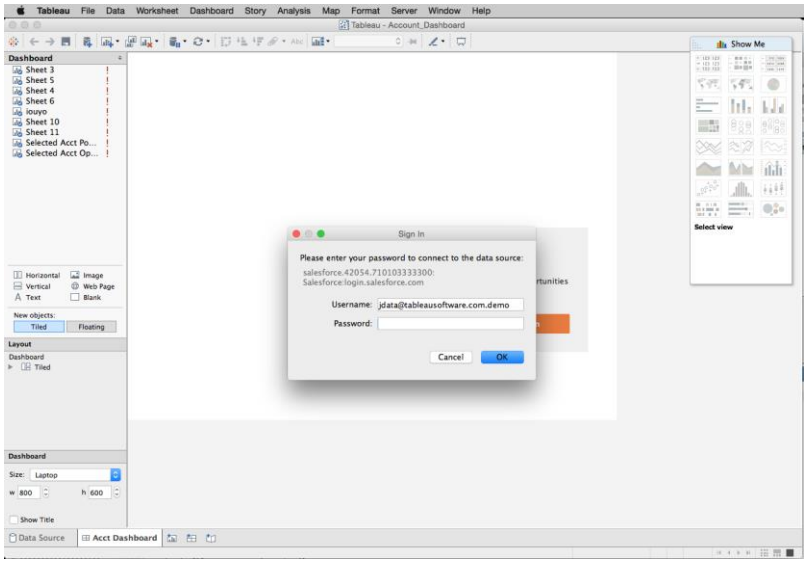
Appendix A: Using the Sample Tableau Workbooks

This appendix describes how to work with the sample workbooks that are included with the Sparkler installation. If you have workbooks you want to embed instead of the sample workbooks, you can ignore this section.

The following workbooks can be found bundled with Sparkler and can be published to your Tableau Server:

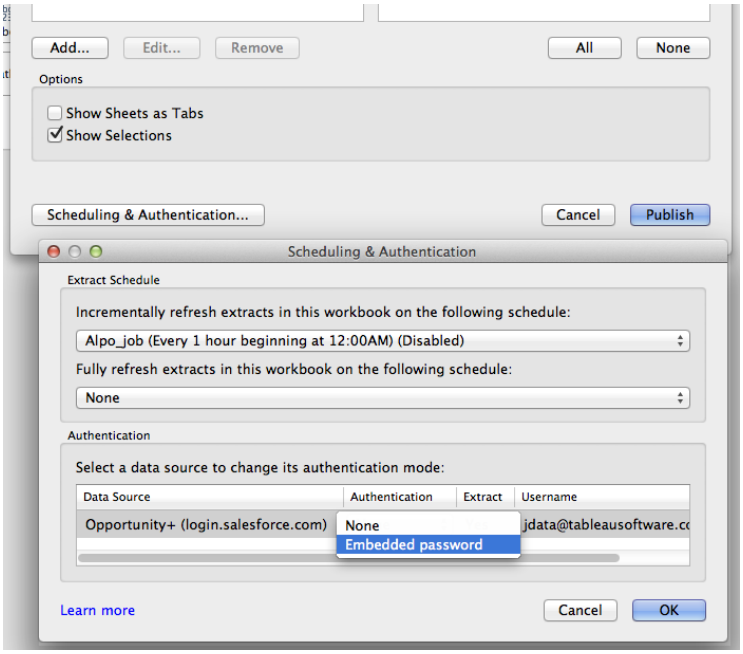
- `Accounts_Dashboard.twb` and `Quota for Accounts_Dashboard.xls` are referenced when a Salesforce user selects the **Accounts Dashboard** tab. Both of these files must be in the same directory.
- `Account_Dashboard.twb` is referenced when a Salesforce user selects an account.
- `Opportunity_Dashboard.twb` is referenced when a Salesforce user selects an opportunity.

The workbooks reference the Tableau demo environment. Update the settings to reflect your Salesforce environment (see screenshot below). To do this, open each .twb file individually. You will be prompted for your Salesforce login. Change the default username from `jdata@tableausoftware.com.demo` to your username and enter your password. Validate that the resulting Dashboards populate with your Salesforce data.



In addition, you can modify the `Quota for Accounts_Dashboard.xls` spreadsheet with your own data, and see it reflected in the Accounts_Dashboard.twb when you refresh.

For each .twb file, publish the workbook to your Tableau Server. In the Publish dialog box, click **Scheduling and Authentication**, enter the refresh frequency, and specify that you want to embed credentials. Tableau Server will not be able to refresh the extract if you do not embed your credentials. Click **OK** and then click **Publish**.



You can also create your own workbooks and publish them to Tableau Server. For information about how to connect to Salesforce, see New in Tableau 8: Salesforce Direct Connector on the Tableau blog.

The workbooks have URL Actions that allow the user to navigate to an opportunity or an account. Update the actions to reflect the appropriate Salesforce instance for your company (for example, na15.salesforce.com).

The accounts dashboard (`Accounts_Dashboard.twb`) filters based on the user's full name. If you want it to filter using the user's ID, email, or username instead, remove the name filter and create an alternate filter. You may also need to modify the drop down showing the salesperson's name to fit your situation. For more details about *Filters*, see Appendix J: Additional Information.

Troubleshooting the sample workbooks

- If you see the error `There was a problem connecting to …`, log into Salesforce and reset your security token through **Setup** > **My Personal Information** > **Reset security token**. The new token will be sent to you by email.
- If you see the error `Tableau Data Engine Error 4`, close Tableau, re-open the .twb file, and ensure that you are entering your Salesforce username and password into the first dialog box that appears.
- After you connect to Salesforce, if the dashboard appears blank, hold the mouse pointer over the top right corner of any worksheet in the dashboard and click **Go to worksheet**. From the worksheet, find the fields on the left with red exclamation points. One by one, right-click these and choose **Replace references**.

Appendix B: Running Tomcat and Tableau Server on the Same Machine

If Tomcat and Tableau Server are running on the same machine, and Tomcat is running without SSL enabled, then Tomcat needs to be modified to run on a different port than the default of 8080. Running Tomcat without SSL is a non-standard configuration and would only occur if Salesforce is communicating with Sparkler via an SSL proxy.

1. Edit the `server.xml` file.

   Windows:

   ```
   c:\Program Files (x86)\Apache Software Foundation\Tomcat 7.0\conf\server.xml
   ```

   Linux:

   ```
   [ec2-user ~]$ sudo nano /etc/tomcat7/server.xml
   ```

2. Change the `port` value from 8080 to 9090.

   ```
   <Connector port="9090" protocol="HTTP/1.1"
                  connectionTimeout="20000"
                  redirectPort="8443" />
   ```

3. Restart Tomcat.

Appendix C: Sparkler Configuration Parameters

The following table lists Sparkler configuration parameters. These are set a in the `sparkler.xml` configuration file.

Parameter	Description	Default
`sparkler.sfdc.consumerSecret`	The consumer secret from the Salesforce Connected App configuration.	
`sparkler.tableau.useTrustedTickets`	A value that instructs Sparkler to perform trusted ticket requests against Tableau Server. If this value is true, the trusted ticket username must be passed in every embedded Salesforce Canvas App component.	false
`sparkler.tableau.host`	The hostname of the tableau server. Does not include `https://` or http://.	null
`sparkler.tableau.port`	The port on which Tableau Server is listening.	80
`sparkler.tableau.isSecure`	A value that indicates whether SSL is enabled on Tableau Server.	false
`sparkler.tableau.test.userName`	The Tableau Server username to be used for testing the trusted ticket request on the Sparkler status page.	null
`sparkler.tableau.externalURL`	The external URL for Tableau Server to be used in the embedded view HTML sent to the user's browser. This is not the URL used by Sparkler to communicate with Tableau Server. Only set this parameter if the external URL for Tableau Server is different than that used for trusted tickets. This must be a complete URL and begin with either `http://` or `https://`.	null
`sparkler.tableau.trustedTicketSiteId`	The URL of the Tableau Server site, if the server has multiple sites. For example, if the value of the `sparkler.tableau.siteRoot` configuration parameter is `/t/mysite`, this value is `mysite`.	null
`sparkler.tableau.siteRoot`	For Tableau Server instances that contain multiple sites, the site that the user and the view belong to.	null
`sparkler.tableau.showTabs`	The value used as the `showTabs` value for embedded views.	false
`sparkler.tableau.showToolbar`	The value used as the `showToolbar` value for embedded views.	false
`sparkler.tableau.javascriptLib`	An alternative location for JavaScript library that is used to embed views.	/javascripts/api/viz_v1.js
`sparkler.proxy.host`	The host name or IP address for the proxy server. If this value is specified, the `sparkler.proxy.serName` and	null

	`sparkler.proxy.password` parameters are required.	
`sparkler.proxy.port`	The port on which the proxy server is listening.	80
`sparkler.proxy.isSecure`	A value that indicates whether the proxy is running with SSL.	false
`sparkler.proxy.userName`	The proxy server username.	null
`sparkler.proxy.password`	The proxy server password.	null
`sparkler.log.level`	The configuration setting variable that controls Sparkler logging. Primarily used for development purposes, and cab be ignored here.	
`sparkler.log.rootLevel`	Configuration variable that controls Sparkler root level logging. Primarily used for development purposes, and cab be ignored here.	
`sparkler.app.statusPage`	A value that enables the Sparkler status page. When this value is true, a warning message appears on all pages that contains embedded views. This feature should be disabled in production environments.	false
`sparkler.sfdc.org.{org}` *replace {org}* with a value specific to your installation	A value equivalent to `sparkler.sfdc.consumerSecret` for the URL where `{org}` is substituted. For more information, see the listing for the`/canvas/sfdc/{org}` endpoint in Appendix D: Sparkler Endpoints.	

Appendix D: VisualForce View Embed Parameters

View embedding with Sparkler is based on the native Salesforce view-embed functionality. Sparkler parameters allow data to be passed to Sparkler, which in turn allows them to be embedded in a view-embed script. For more information about embed parameters, see Tableau Server Embed Parameters in the Tableau Server documentation.

Parameter	Required ?	Description
`ts.name`	Yes	The name of the workbook or view.
`ts.width`	No	The width of the embedded dashboard itself, which is allowed to be different than the `<iframe>` element created by the Canvas App component. The default is the width parameter provided to the Canvas App VisualForce component.
`ts.height`	No	The height of the embedded dashboard itself, which is allowed to be different than the `<iframe>` element created by the Canvas App component. The default is the `height` parameter provide to the Canvas App VisualForce component
`ts.javascriptLib`	No	The JavaScript library used for view-embedding. The default is the value in the `sparkler.tableau.javascriptLib` configuration parameter.

`ts.hostUrl`	No	The URL of the Tableau Server instance. It should include a trailing slash. The default is a URL created by Sparkler using the `sparkler.tableau.host`, `sparkler.tableau.port`, and `sparkler.tableau.isSecure` configuration parameters. This default URL will be formatted like this:
		
		`http://`*`sparkler.tableau.host`*`:`*`sparkler.tableau.port`*`/`
		or
		`https://`*`sparkler.tableau.host`*`:`*`sparkler.tableau.port`*`/`

`ts.siteRoot`	No	For Tableau Server instances that use sites, the site that the user and view belong to. The default is the value of the `sparkler.tableau.siteRoot` configuration parameter.
`ts.tabs`	No	Whether or not to show tabs. The default is the value of the `sparkler.tableau.showTabs` configuration parameter if that variable is set, otherwise "no"
`ts.toolbar`	No	Whether or not to show the dashboard toolbar. The default is the value of the `sparkler.tableau.showTabs` configuration parameter if that variable is set, otherwise "no".
`ts.trustedTicket.host`	No	The hostname for Tableau Server using trusted authentication. The default is the value of the `sparkler.tableau.host` configuration parameter if that variable is set, otherwise null.
`ts.trustedTicket.siteId`	No	The Tableau Server site ID. The default is the value of the

		`sparkler.tableau.trustedTicketSiteId` configuration parameter if that variable is set, otherwise null.
`ts.trustedTicket.username`	No	The Tableau Server username for the trusted ticket.
`ts.filter`	No	The filter passed to embedded view. For more information about filters, see Appendix G: Additional Information.

Appendix E: Sparkler Endpoints

This lists all Sparkler URLS that can be accessed via a web browser for embedding dashboards, testing, and debugging Sparkler.

Endpoint	Description
`/keepAlive`	Tests that the application is running. Returns a static message.
`/sfdc/canvas`	Uses the consumer secret set by the `sparkler.sfdc.consumerSecret` environment variable. This is the default path tested by the Salesforce Canvas Tester.
`/sfdc/canvas/{org}`	Tests the end-to-end functionality of a signed request originating from Salesforce. A request made using this endpoint uses the consumer secret set by the `sparkler.sfdc.org.{org}` environment variable. The value of `{org}` in the environment variable is switched to lower case by Sparkler, so it will appear as such on the status page. For example, the endpoint `/sfcd/canvas/myorg` uses the value set by `sparkler.sfdc.org.MYORG` or `sparkler.sfdc.org.myorg` environment variable. Note that this endpoint is rarely used by most Sparkler implementers.
`/status`	Displays all configured Sparkler parameters, as well as missing required parameters, and parameters with invalid formatting. If trusted authentication is enabled in Sparkler, Sparkler displays the address of the Tableau Server configured for trusted authentication. If set, Sparkler displays the proxy server address and credentials. Displays the status of a test connection made to Tableau Server for trusted tickets. If this test connection failed, the failure message is displayed.

Appendix F: Debugging the Sparkler Application Configuration

This appendix helps you debug configuration issues in Sparkler. For additional information about Sparkler configuration, see the section Task 3: Configure Sparkler earlier in this document. For reference information, see Appendix B: Sparkler Configuration Parameters and Appendix D: Sparkler Endpoints.

The general method for debugging is to enable and use the Sparkler status page. If the status page has not been enabled in the `sparkler.xml` configuration file, the status page will display the following message:

```
Status page disabled. Set configuration parameter 'sparkler.app.statuspage'
to 'true' to enable.
```

To get to the Sparkler status page, in your browser, enter the following URL:

```
https://SparklerHostName:8443/SparklerPath/status
```

- `SparklerHostName` is the hostname where Sparkler is deployed
- `SparklerPath` is where the Tomcat web App is deployed. Usually this will be `sparkler`.

Sparkler errors and debug messages are logged in Tomcat's `catalina.out` file. In Windows, this file is located in the following folder:

```
Tomcat-install/logs/catalina.outtall/logs/catalina.out
```

On Linux, this is usually in the following location:

```
/usr/share/tomcat7/logs/catalina.out
```

You might need to be an administrator (Windows) or root (Linux) to view this file.

In most instances, the status page should suffice for debugging and there will be no need to view the log files directly.

Testing the Sparkler Consumer Secret

In your browser, enter the following URL:

```
https://SparklerHostName:8443/SparklerPath/status
```

On success, you see the consumer secret displayed in the list of parameters. This value will appear in black and have all but the last four digits masked:

```
sparkler.sfdc.consumersecret***************5639
```

If `sparkler.sfdc.consumersecret` is not set, you will see the parameter highlighted in red:

```
sparkler.sfdc.consumersecret
```

Set the `sparkler.sfdc.consumersecret` configuration parameter in the `sparkler.xml` file. Tomcat detects that the file was modified and restarts the application automatically. If Tomcat does not restart automatically, restart it manually.

Testing the Trusted Ticket for Sparkler

In your web browser, enter the following URL:

```
https://SparklerHostName:8443/SparklerPath/status
```

On success, you will see the following at the end of the status page:

```
Tableau Server Connection: [ok]
```

The sections that follow describe various error conditions that might arise when you perform these tests.

Issue: Using Self-Signed SSL Certificate that has not been added to Java

Without additional configuration, Sparkler cannot communicate with Tableau Server if it has been configured with SSL using self-signed SSL certificates. If this is the case, you will see an exception like the following at the bottom of the status page:

```
Tableau Server Connection: [fail]
Reason: unable to find valid certification path to request targets
```

Follow the steps under Configure Sparkler to Use Tableau Server Self-Signed SSL Certificates.

Issue: SSL Certificate CN does not match Tableau Server Host Name

If your SSL certificate does not match the hostname Sparkler is using to communicate with Tableau Server, you see a message like the following at the bottom of the status page:

```
Tableau Server Connection: [fail]
Reason: hostname in certificate didn't didn't match
```

Check the `sparkler.tableau.host` environment variable and update it as necessary to match the SSL certificate.

Issue: Incorrect Trusted Ticket Site ID

If you have an incorrect trusted ticket site name, you see an HTTP 302 redirect message at the bottom of the status page:

```
Tableau Server Connection: [fail]
Reason: Invalid trusted ticket response. HTTP response: 302 Found
```

Verify that the `sparkler.tableau.trustedTicketSiteId` environment variable has been set to a valid site ID. Tip: View the site in Tableau Server and look at the URL.

Issue: Incorrect Trusted Ticket Username

If you have an incorrect trusted ticket username, you see an error that indicates `-1` as the value of the ticket:

```
Tableau Server Connection: [fail]
Reason: Invalid trusted ticket. ticket=-1
```

Verify that the `sparkler.tableau.test.userName` environment variable is set to the name of a valid Tableau Server user.

Issue: Incorrect Trusted Ticket Configuration in Tableau Server

If the host where the Sparkler app is running not correctly listed as a trusted ticket host or gateway in the Tableau Server configuration, you see `-1` as the value of the trusted ticket:

```
Tableau Server Connection: [fail]
Reason: Invalid trusted ticket. ticket=-1
```

Review the recommendations in Appendix G: Debugging Tableau Server Trusted Tickets.

Issue: Incorrectly Configure Trusted Ticket Host

If the trusted ticket host is incorrectly configured, you see an exception like the following:

```
Name or service not known

Tableau Server Connection: [fail]
Reason: tableauserverx.mycomany.com: nodename nor servname provided, or not
known
```

Verify the value of the `sparkler.tableau.host` environment variable to ensure that it is correct.

Salesforce Canvas App Previewer

When the Salesforce page is loaded, the Salesforce Canvas App Previewer sends a request to Sparkler using the consumer secret and the shared encoding key. Sparkler will decode this request and log the results.

If Sparkler and Salesforce are correctly configured, you see log entries like the following. (In some cases, entries have been truncated to save space.)

```
2015-02-17 11:47:03,086 DEBUG (http-bio-8443-exec-32)
[org.apache.http.client.protocol.RequestAddCookies.process:122] - CookieSpec
selected: best-match
2015-02-17 11:47:03,087 DEBUG (http-bio-8443-exec-32)
[org.apache.http.client.protocol.RequestAuthCache.process:75] - Auth cache
not set in the context
2015-02-17 11:47:03,087 DEBUG (http-bio-8443-exec-32)
[org.apache.http.impl.conn.PoolingHttpClientConnectionManager.requestConnecti
on:215] - Connection request: [route: {s}-
>https://sbseabizx1001.tableausandbox.com:443][total kept alive: 1; route
allocated: 1 of 2; total allocated: 1 of 20]
...
```

```
2015-02-17 11:47:03,162 DEBUG (http-bio-8443-exec-32)
[org.apache.http.wire.wire:86] - http-outgoing-1 <<
"r0bi4Wbyp1M66CN7k4tUXFYN"
2015-02-17 11:47:03,162 DEBUG (http-bio-8443-exec-32)
[org.apache.http.impl.conn.PoolingHttpClientConnectionManager.releaseConnecti
on:276] - Connection [id: 1][route: {s}-
>https://sbseabizx1001.tableausandbox.com:443] can be kept alive for 5.0
seconds
2015-02-17 11:47:03,162 DEBUG (http-bio-8443-exec-32)
[org.apache.http.impl.conn.PoolingHttpClientConnectionManager.releaseConnecti
on:282] - Connection released: [id: 1][route: {s}-
>https://sbseabizx1001.tableausandbox.com:443][total kept alive: 1; route
allocated: 1 of 2; total allocated: 1 of 20]
```

Issue: Sparkler Consumer Secret Set Incorrectly

If `sparkler.sfdc.consumerSecret` is incorrectly set, you see the following on the Salesforce page:

```
SPARKLER ERROR: Salesforce.com consumer secrets did not match.
```

Issue: Sparkler Consumer Secret Not Set

If `sparkler.sfdc.consumerSecret` is not set, you will see the following on your Salesforce page:

```
SPARKLER ERROR: Salesforce.com consumer secret was not set in Sparkler.
```

Appendix G: Debugging Tableau Server Trusted Tickets

In order for Sparkler to acquire trusted tickets from Tableau Server, Tableau Server must trust the IP addresses for any gateways and for the host used by Sparkler. You configure these as trusted IP addresses as described under Task 5: Set Up Tableau Server Trusted Tickets.

Debugging Trusted Tickets

If Sparkler can communicate with Tableau Server but cannot acquire a trusted ticket, it will receive a value of `-1`. This may be because not all IP addresses are trusted.

To see which IP addresses are being seen by Tableau Server during trusted ticket requests, you must read the Apache Access Logs in your Tableau Server install. Apache Access logs are generally located in the following folder:

```
c:\ProgramData\Tableau\Tableau Server\data\tabsvc\logs\httpd\
```

Entries in the log will look like the following example:

```
10.1.5.213 - - [06/Jan/2015:19:29:52 -0800] 80 "POST /trusted HTTP/1.1"
"154.99.5.133, 10.1.5.213" 200 24 "58" 46800 VKyoMArlFc0AAAvAeSUAAAGh
```

In the example, the first IP address (`154.99.5.133`) is the address of the host. This value must be listed the `wgserver.trusted_hosts` Tableau Server configuration variable.

The second IP address (`10.1.5.213`) is the address of the gateway. This value must be listed in the `gateway.trusted` Tableau Server configuration variable.

To make these settings, use the `tabadmin set` command, as in the following example:

```
cd c:\Program Files\Tableau\Tableau Server\8.2\bin
tabadmin set gateway.trusted "10.1.5.210, 10.1.5.211, 10.1.5.212, 10.1.5.213"
tabadmin configure
tabadmin restart
```

In this example, the first three addresses in `gateway.trusted` were already set, and the fourth is the new one.

Appendix H: Connecting to Tableau Server via SSL Proxy

If Tableau Server is does not have SSL enabled, but communication to the server is handled via an SSL proxy, then the proper request headers must be set by the proxy to ensure that all Tableau Server links and redirects are generated properly. Details on addressing this configuring can be found at the following Knowledge Base article:

http://kb.tableau.com/articles/issue/cannot-connect-via-ssl-proxy

Appendix I: Connecting to Tableau Online with SAML

Sparkler can be used to embed Tableau Online views in VisualForce pages without using trusted tickets, provided both Salesforce and Tableau Online are configured to use SAML with the same Identify Provider (IdP). The exact details of this configuration will vary depending on your IdP and fall outside the scope of this document. In summary, this is what you need:

1. Tableau Online must be configured for SAML. You can access SAML configuration settings accessed by logging into your Tableau Online site with an administrator account and navigating to **Settings** > **Authentication**. Follow the instructions on the page and your IdP's documentation to configure Tableau Online with your IdP and to enable users for single sign-on.
2. Salesforce must also be configured to provide single sign-on with SAML, using the same IdP. For instructions, see Configuring SAML Settings for Single Sign-On on the Salesforce site at https://help.salesforce.com/apex/HTViewHelpDoc?id=sso_saml.htm.

For more information, see Site Authentication in the Tableau Online documentation at http://onlinehelp.tableau.com/current/online/en-us/help.htm#authentication_ovw.htm.

Once users can authenticate with both Tableau Online and Salesforce using SAML, Sparkler can be used to embed views without using trusted tickets. To use Sparkler, open the `sparkler.xml` configuration file and check the following settings:

- `sparkler.tableau.useTrustedTickets`. Set to `false`. (This is the default.)
- `sparkler.tableau.host`. Set to the host name for your Tableau Online site, such as `online.tableau.com`. Do not preface the host name with `https://`.
- `sparkler.tableau.port`. Set to 443. (Tableau Online runs SSL on port 443.)
- `sparkler.tableau.isSecure`. Set to `true`. (Tableau Online runs SSL.)
- `sparkler.tableau.siteRoot`. Set to the path to your site, such as `/#/site/mysitename`. You can see this path in the URL when you are logged into Tableau Online.

You can now embed views in VisualForce pages without specifying any server or login parameters in the page itself. When users load a view for the first time in Salesforce, they might be prompted by Tableau Online for their email address. However, they will not be prompted for additional login information aside from their initial Salesforce credentials. Subsequent views will not make additional prompts.

Appendix J: Additional Information

Tableau Software Online Help

- Tableau Desktop documentation
  http://onlinehelp.tableausoftware.com/current/pro/online/en-us/help.htm
- Tableau Server documentation:
  http://onlinehelp.tableausoftware.com/current/server/en-us/help.htm
- Publishing Workbooks to Tableau Server:
  http://onlinehelp.tableau.com/current/pro/online/en-us/publish_workbooks_howto.html
- Obtaining an SSL Certificate for Tableau Server
  http://kb.tableau.com/articles/knowledgebase/creating-ssl-certificate-and-key-tableau-server
- Tableau URL Actions
  http://onlinehelp.tableau.com/current/pro/online/mac/en-us/actions_url.html
- Tableau Server Trusted Authentication
  http://onlinehelp.tableau.com/current/server/en-us/trusted_auth.htm
- Tableau Server with Proxy Servers
  http://onlinehelp.tableau.com/current/server/en-us/proxy.htm
- Building Parameterized Filters
  http://onlinehelp.tableau.com/current/pro/online/mac/en-us/parameters_filters.html

Other Tableau Resources

- Tableau Salesforce Connector
  http://www.tableau.com/about/blog/2013/3/new-tableau-8-good-selling-salesforce-and-tableau-21507
- Sparkler/Tableau Server/Salesforce Canvas Solution
  http://community.tableau.com/thread/141178
- Using Parameterized Filters in Embedded Vizzes
  http://kb.tableau.com/articles/knowledgebase/view-filters-url

Salesforce.com Documentation

- Canvas framework document:
  http://www.salesforce.com/us/developer/docs/platform_connectpre/Canvas_framework.pdf

- Salesforce Canvas App Visual Force Reference
  http://www.salesforce.com/us/developer/docs/platform_connect/Content/canvas_app_vf_component_ref.htm

- Salesforce VisualForce Global Variables
  http://www.salesforce.com/docs/developer/pages/Content/pages_variables_global.htm

OpenSSL Commands

- The Most Common OpenSSL Commands
  https://www.sslshopper.com/article-most-common-openssl-commands.html