



Securing and Filtering Data by User in Tableau Whitepaper

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I. Introduction

Not all data is meant to be seen by all people. For example, you might need security rules that restrict data shown by region or management level. Restricting data by user is sometimes referred to as “row level security.”

Similar to parental controls on your TV, Tableau provides ways to restrict, or filter, what data appears in visualizations based on the audience. However, the mechanisms for restricting access are not obvious and Tableau’s default is to make all the data in a report visible to everyone looking at it.

In this whitepaper, we discuss four common methods that can be used in Tableau for securing and filtering data by user, along with associated requirements and step-by-step instructions for each.

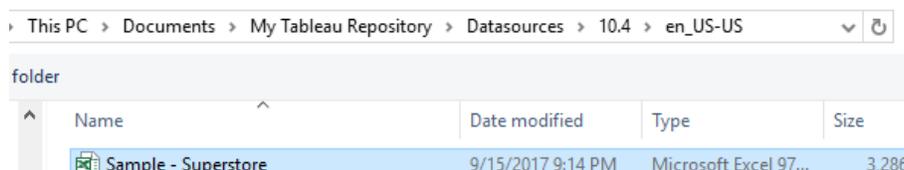
II. Methods for Securing Data in Tableau

Securing data in Tableau can be accomplished multiple ways depending on whether you have Tableau Server and Tableau Desktop or just Tableau Desktop.

The four methods for securing and filtering data by user are:

1. Use Tableau Server Groups and a workbook filter (requires Tableau Server)
2. Tableau’s built-in user filters (requires Tableau Server)
3. Join to a Security Table
4. Use database security to restrict access (requires a database that supports this)

To follow along with the instructions below, use Tableau’s Sample-Superstore data that is included with every release of Tableau.





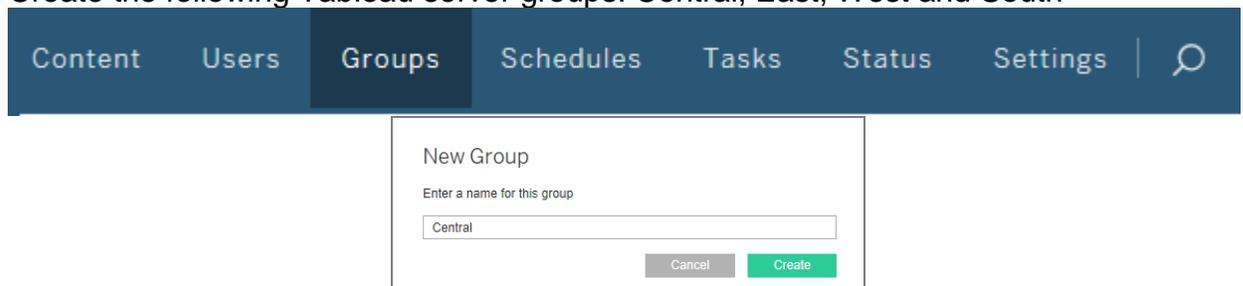
III. Method 1

Method 1: Use Tableau Server Groups and a Workbook Filter (requires Tableau Server)

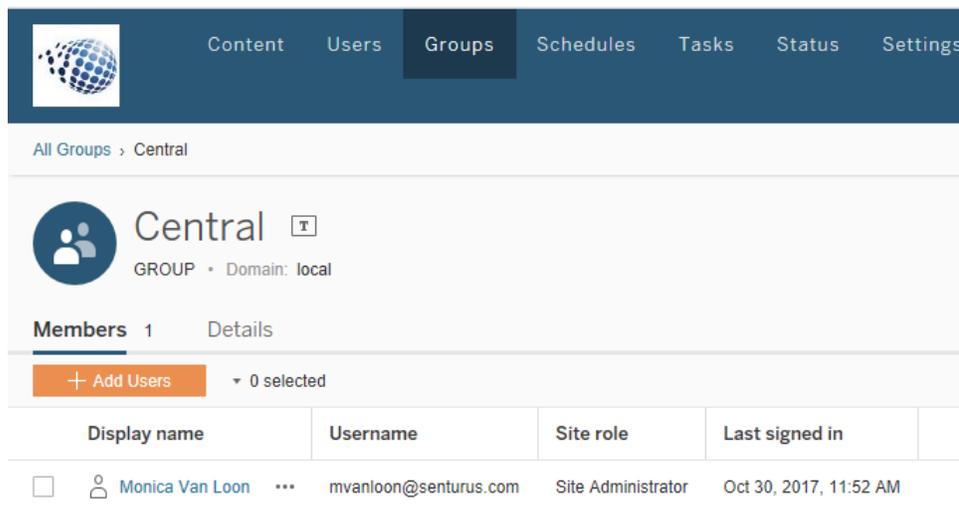
In Tableau Server, use Groups to secure data. Users are assigned to groups and a calculated field is used to determine which group the user is a member of. This calculated field can be used to filter the data displayed in your Tableau worksheets. Groups can have one level of security (**Region** in the example below) or data access can be based on multiple fields, such as **Region and Segment**.

To create your own groups to filter and secure data, use Tableau’s *Sample - Superstore* and follow the steps below:

1. Create the following Tableau server groups: Central, East, West and South

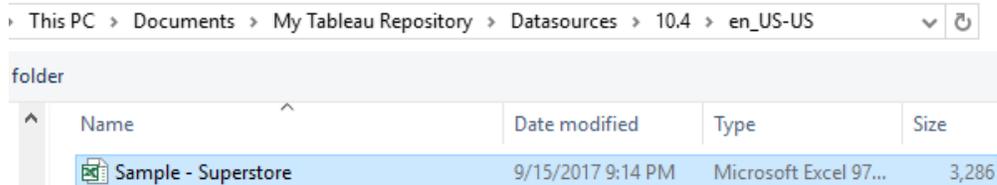


2. Assign one or more users to each group using *Add Users*:

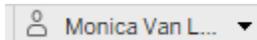




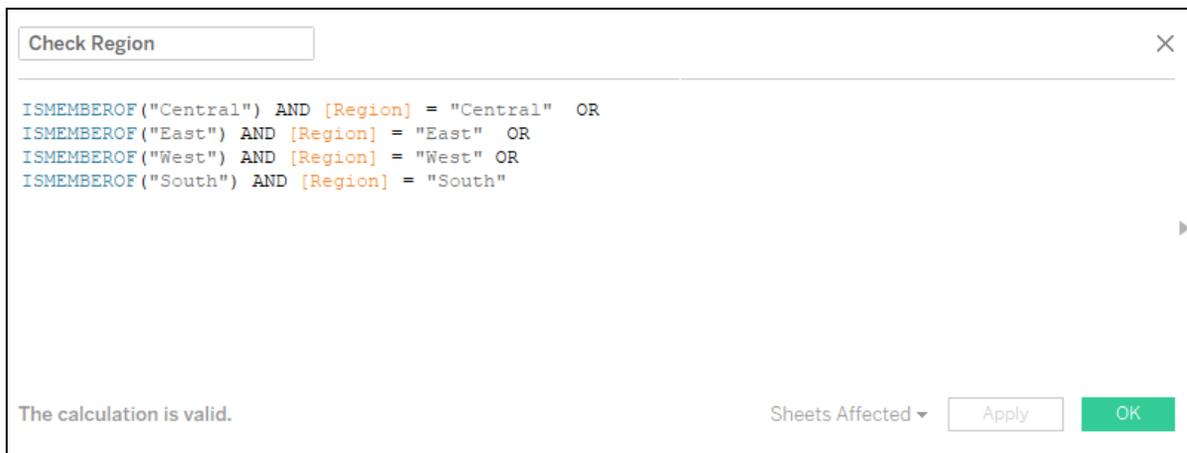
3. Create a Tableau workbook using the Excel file *Sample - Superstore* as your data source.



4. From the **Server** tab at the top of your workbook, log into Tableau Server. At the bottom of your screen you will see a silhouette icon next to the name you are logged in as:



5. From the **Analysis** tab at the top of your Tableau worksheet choose **Create Calculated Field**. Use the syntax depicted below:



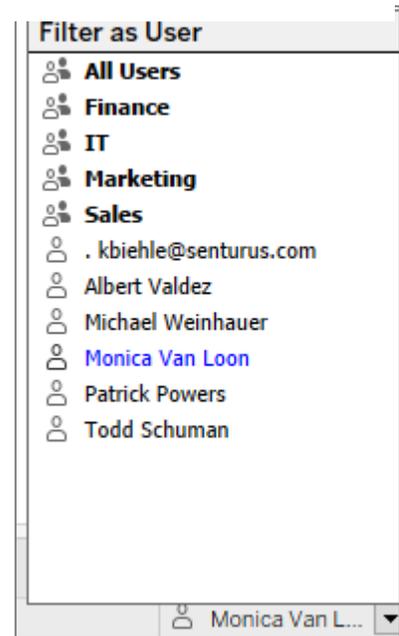
Drag the newly created **Check Region** calculated field to the Filters Card. Do this for every worksheet you need to secure.

6. Select **True** in the filter. Now your worksheet looks at the Tableau Server User ID and displays the correct data based on the calculated field.

NOTE: When publishing the workbook to Tableau Server make sure **Web Editing** is set to **No** and **Download** is set to **No**. Otherwise, users could remove the filter and see all of the data.



BONUS: To test what data each user has access to, go to the silhouette at the bottom of the user box and click on the down triangle. Here you can switch user names and see how the worksheet would look to another user.



IV. Method 2

Method 2: Tableau User Filters (requires Tableau Server)

If you don't have access to create and modify Tableau Server Groups, you can restrict data with Tableau User Filters. User Filters are easy to create in Tableau Desktop and are best for stable or small user communities because they need to be maintained.

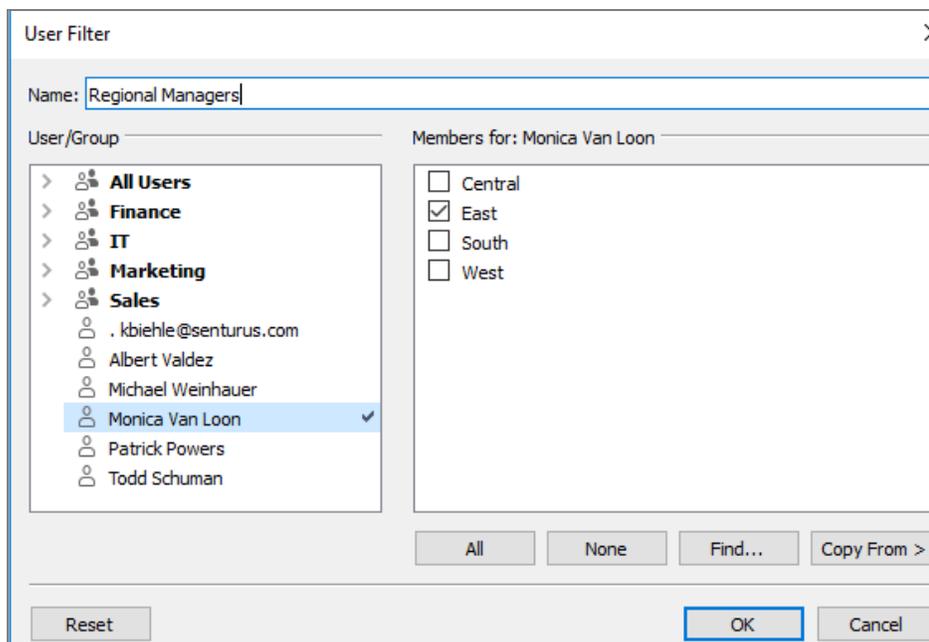
1. In Tableau Desktop, open a workbook using Sample-Superstore.xls. Or, you can create a new workbook.
2. Verify you are logged into Tableau Server. If not, go to **Server – Sign-in** at the top of your workbook. To verify, look at the bottom of your screen: you should see your Tableau Server ID as shown:





3. Navigate to the worksheet you want to apply a filter to.
4. Select **Server > Create User Filter**. Then select the field you want to use for filtering the view. For our example, we will use **Region**.
5. In the **User Filter** dialog box, type a name for the set of rules you are creating.
6. We will call this user filter **Regional Managers**.
7. In the list on the left, select a User/Group. On the right, under **Members for**: select what you want the selected users to see. Do this for each Tableau Server user.

In the example below, Monica Van Loon is the manager of the Eastern region, so in the member list on the right, only East is selected.



BONUS: If your Tableau Server is set up for email, User Filters can be combined with Subscriptions.



V. Method 3

Join to a Security Table

You can also filter data by joining your actual data to a user defined security table. In this scenario, a separate table is created that has the Tableau Username in one column and a Security Key in the second column. This security key must also be present in the data table (Sample - Superstore – Orders in this example). This security key can be anything you want to use to restrict the data. In the example below, we chose **Region** as our security key to restrict the data.

NOTE: This Security Table could be an Excel spreadsheet with two columns, but it would be more secure if it were a database table.

Example of securing data by joining to a security table:

1. Connect to your data table. For this scenario we will use *Sample – Superstore Orders*.
2. Connect to your Security Table. We're using an Excel spreadsheet with two columns, **Username** and **Region**. Join the **Orders** table to the Security Table using an INNER JOIN on `Orders.Security_Key = Security_Table.Security_Key`. In the example below, **Region** in **Orders** is joined to **Region** in the **Security Table**.

The screenshot shows the Tableau interface. On the left, the 'Connections' pane lists 'Sample - Superstore' (Excel) and 'Security Table' (Excel). The 'Security Table' is selected. Below it, the 'Sheets' pane shows 'Security Table' and 'New Union'. On the right, the 'Orders+' view shows a join between 'Orders' and 'Security Table'. A 'Join' dialog box is open, showing the 'Inner' join type selected. The dialog box contains the following table:

Data Source		Security Table	
Region	=	Region (Security Table)	
Add new join clause			



3. Create a Calculated Field named **Check User**, comparing the field **Username** in the Security Table to the user logged into Tableau Server using the **Username()** function in Tableau.

Example of the Calculated Field:

The screenshot shows the 'Check User' dialog box in Tableau. The title bar reads 'Check User'. The main text area contains the formula `[Username]=USERNAME()`. Below the text area, it says 'The calculation is valid.' At the bottom right, there are three buttons: 'Sheets Affected' (with a dropdown arrow), 'Apply', and 'OK'.

4. Use the Calculated Field as a Data Source Filter. Select the checkbox for *True*.

The screenshot shows the 'Filter [Check User]' dialog box. It has three tabs: 'General', 'Condition', and 'Top'. The 'General' tab is selected. Under 'Select from list', the 'Select from list' radio button is selected. Below this is a search box with the text 'Enter search text'. There are three checkboxes: 'Null' (unchecked), 'False' (unchecked), and 'True' (checked). Below the checkboxes are three buttons: 'All', 'None', and 'Exclude' (which is unchecked). At the bottom, there is a 'Summary' section with the following text: 'Field: [Check User]', 'Selection: Selected 1 of 3 values', 'Wildcard: All', 'Condition: None', and 'Limit: None'. At the very bottom are three buttons: 'Reset', 'OK', and 'Cancel'.



5. Publish the Data Source to Tableau Server.
6. To ensure the security policy is enforced, all user workbooks must connect to the Published Data Source that is filtered for the logged in user.

VI. Method 4

Use Database Security to Restrict Data

You can also filter the data presented to your users by always prompting them to enter a username and password to log into a database. The database's security can then be used to secure the data.

Most modern databases like Oracle and Microsoft SQL Server have built-in security mechanisms. In Oracle, it's called *role based security*. Database administrators assign permissions to tables and views. Then they assign these permissions to a *role*, which is in turn granted to the users. Tableau forces users to log into the database so these security policies are enforced.

NOTE: There are some caveats and potential gotchas around how users are authenticated. Click on the link to view a matrix from Tableau, which does a good job of describing them: https://onlinehelp.tableau.com/current/server/en-us/security_data.htm

VII. Conclusion

Report creation can, and should, be an efficient process. Ideally, you want to create one dashboard with filters that ensure the right data is shown to the right people. But getting this functionality to work properly can be tricky. The correct way to secure your Tableau content depends on numerous factors such as:

- Your environment (Tableau Server or not)



- Your access to Tableau Server (can you create groups)
- The number of users you need to set up (user filters must be maintained)
- Your access to a database that supports security

Hopefully, after reviewing the methods and steps above, you can make the choice that works best in your Tableau environment.

For more details and how to distribute your Tableau content, read our blog [Six Ways to Publish and Share Tableau Content](#).

VIII. About Senturus

Founded in 2001, Senturus is a nationwide consulting firm focused exclusively on business analytics. We design and implement systems that provide organizations with reliable data across business units so they can quickly get strategic insights. Senturus offers a robust suite of services from system architecture and roadmaps to BI tool assessments and training on Cognos, Tableau, Microsoft and TM1. A tool agnostic team of world-class business and technical experts, we bridge the gap between business and IT. Senturus has helped over 1000 clients in a wide range of industries to achieve self-service analysis, agile reporting and timely data that result from well designed business analytics. To learn more about Senturus, visit <http://www.senturus.com>.