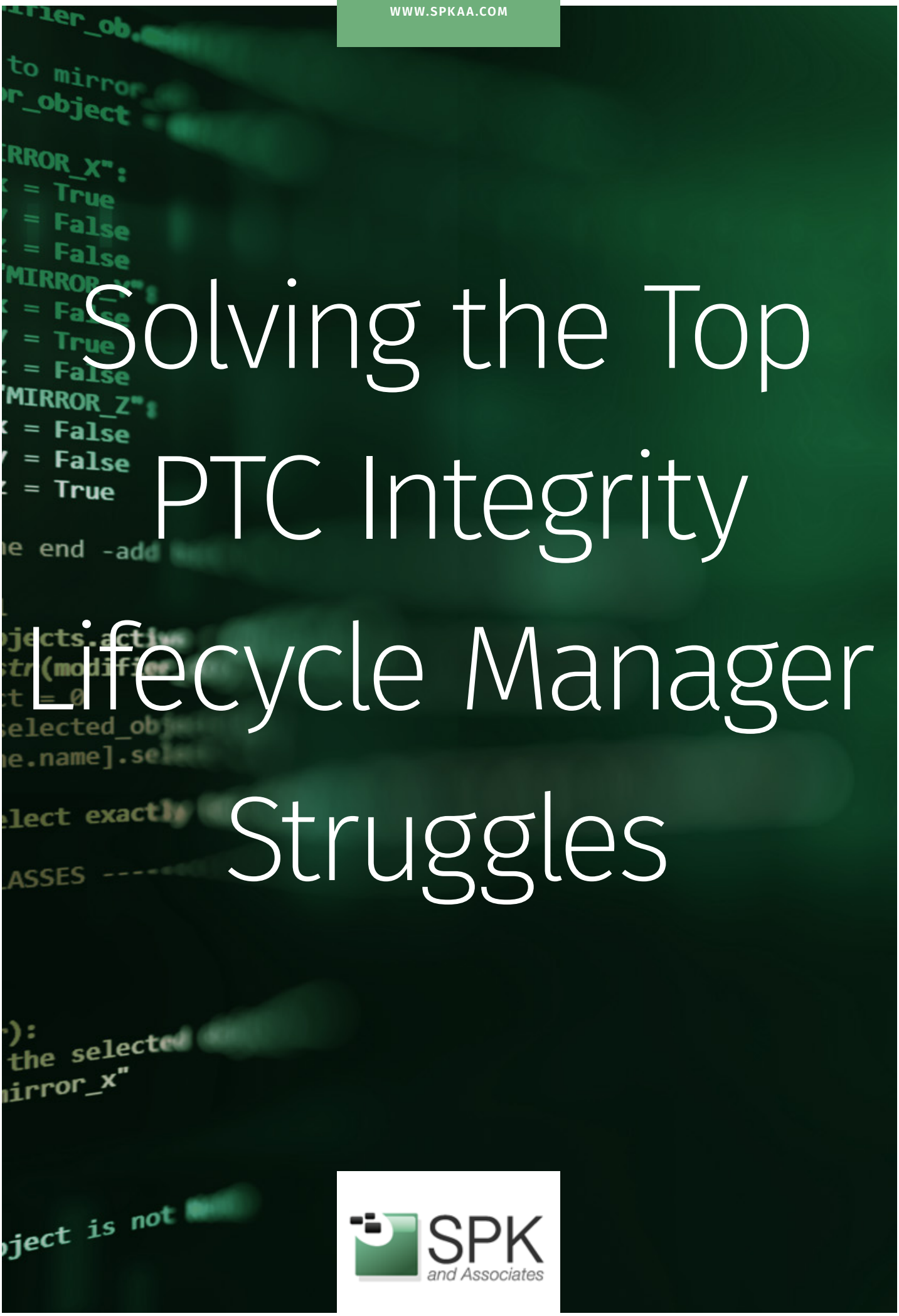


Solving the Top PTC Integrity Lifecycle Manager Struggles

SPK and Associates

Introduction

Over the past few years at SPK, we published many articles on PTC Integrity Lifecycle Manager topics. Our intention was to provide real, hands-on help for PTC Integrity users and managers.

We asked ourselves the question: "What are some of the most common tasks that people using PTC Integrity Lifecycle Manager might struggle with?"

This eBook contains a collection of some of the most popular blog articles gathered together for your convenience. The topics include:

1. How Test Management works in PTC Integrity Lifecycle Manager
2. What a viewSet is, and how you can create or update your own viewSets
3. An in-depth discussion on Metrics within PTC Integrity Lifecycle Manager including:
    - how metrics are generated
    - how to gather metrics together into a report
    - how to visually display your metrics in a chart
    - how to put reports, charts and other artifacts like queries together to build dashboards

Enjoy!

Chapter 1: An Overview of PTC Integrity Test Management

Major portions of any PTC Integrity Solution are the test artifacts.

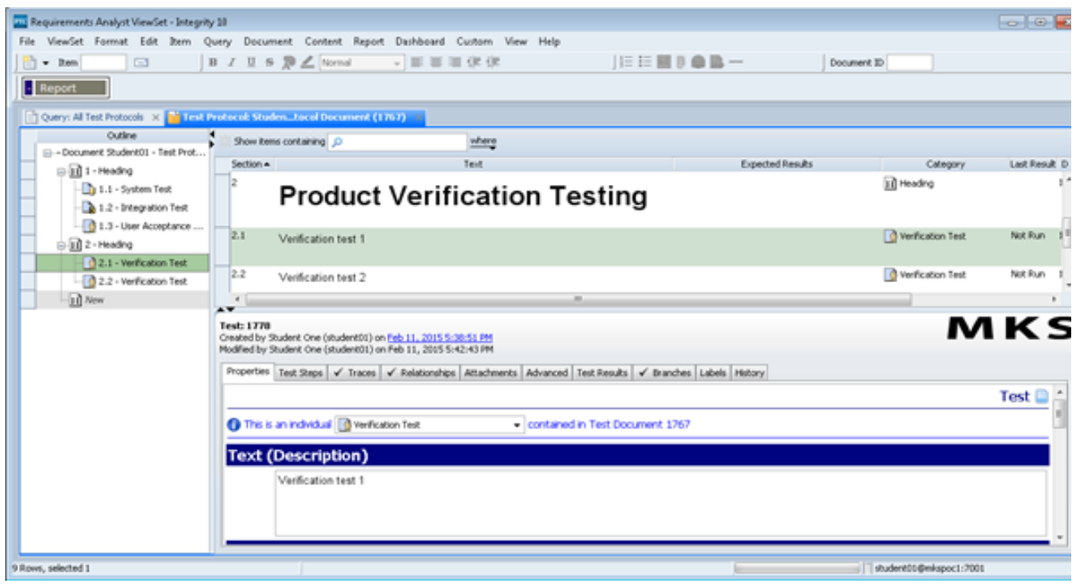
Many customers when they initially start to look at PTC Integrity Lifecycle Manager are generally looking at it as way of managing their requirements, or as a way of maintaining compliance in highly regulated industry verticals like automotive or medical devices.

What's often overlooked is how you can use your PTC Integrity Lifecycle Manager, to not only manage your test cases, but plan your test strategies, lay out your testing objectives and execute your tests and manage the results.

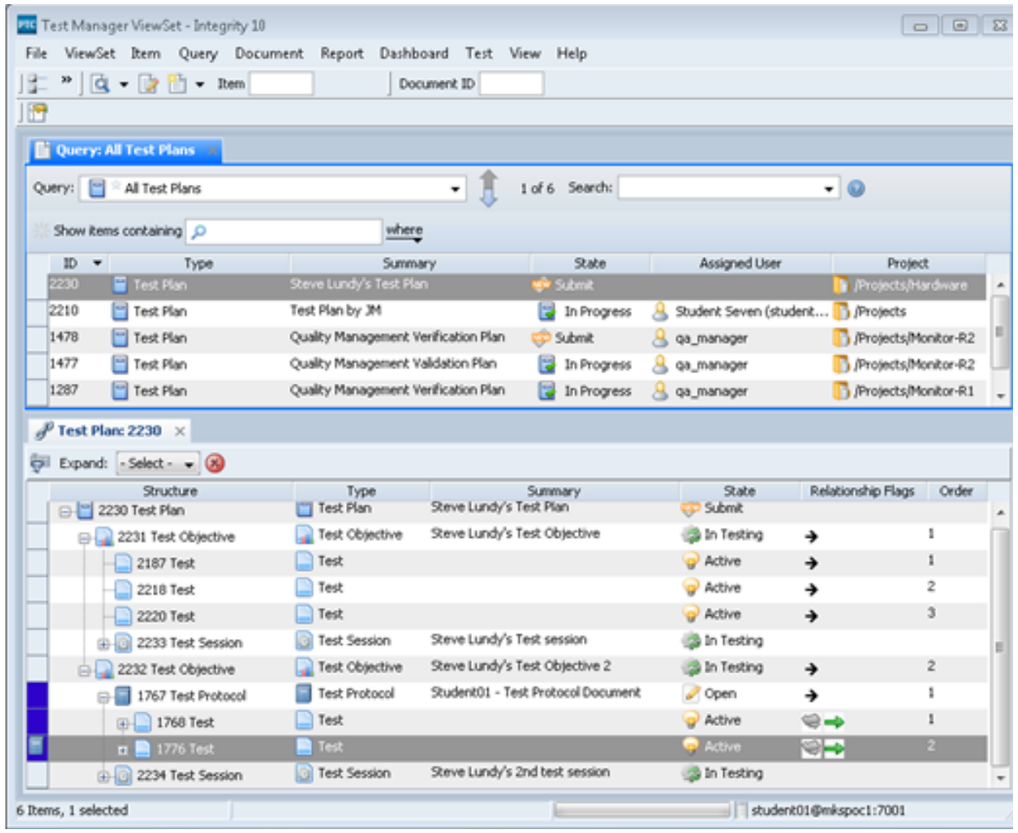
What I am going to talk about in this article is how PTC Integrity Lifecycle Manager addresses testing within their solutions. As with most of my articles I'm writing this with an eye on the Medical Device solution, but the concepts apply to other PTC Integrity Lifecycle Manager solutions as well.

Testing, according to PTC Integrity, is broken down into three main tasks. These tasks are Test Authoring, Test Planning, and Test Execution. I will discuss each of these in more detail below:

1. Test Authoring: This is where you create and maintain your Test Protocol documents (including your Test Steps). A Test Protocol document is a document domain that is made up of the Test Protocol document item and the Test content item. Test Steps are items that you can use to further define what happens within your individual Tests. By using the Test Protocol document to define your tests, you gain the advantage to being able to trace your individual test directly back to your requirements and design documents without the need for a complex integration between third party tools.

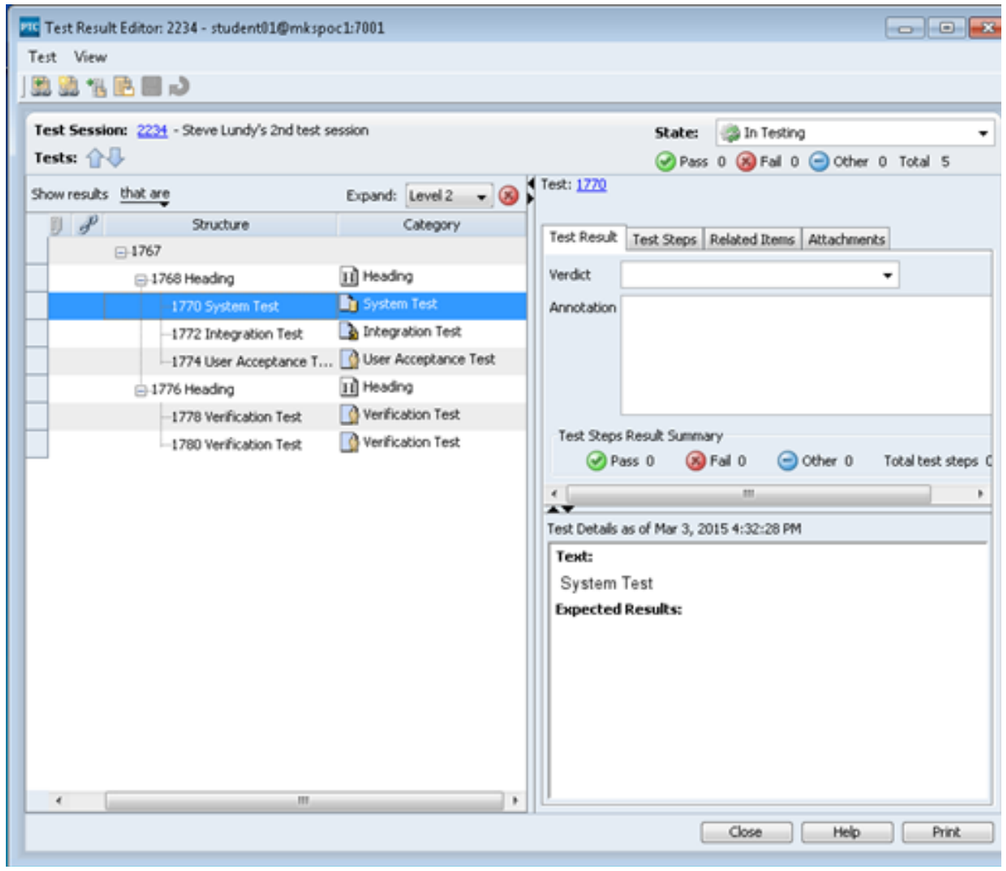


2. Test Planning: In this phase you are basically determining what tests you want to execute as part of your testing strategy. The Test Protocol document(s) are essentially the master list of all the possible test cases you potentially can use in your testing. In your test planning phase you decide on your testing objectives, and determine which of the tests from your Test Protocol documents you are going to use to achieve those objectives. In this phase you create use the Test Plan item type to hold all of the Test Objectives. From within the Test Objective item you can choose which Tests to add to you Test Objective that are referenced from your Test Protocol document(s).



3. Test Execution: In this phase you are basically executing your Test Plan. This is achieved by creating Test Sessions against the one or more of the Test Objectives found in your test plan. Test Sessions can be as small as a single test case from one test objective, or it can be as large as you want to make it. A Test Session is intended to be all the Tests that a given Tester would be able to execute in a single "sitting" when he/she is performing testing. The results the Tester gathers are entered using the

Test Result editor. Furthermore you can tie results of your testing through the Test Protocol document directly back to your Requirements and Design specifications. This means you can report on the requirement, the corresponding design as well as the corresponding testing and view the results of that testing.

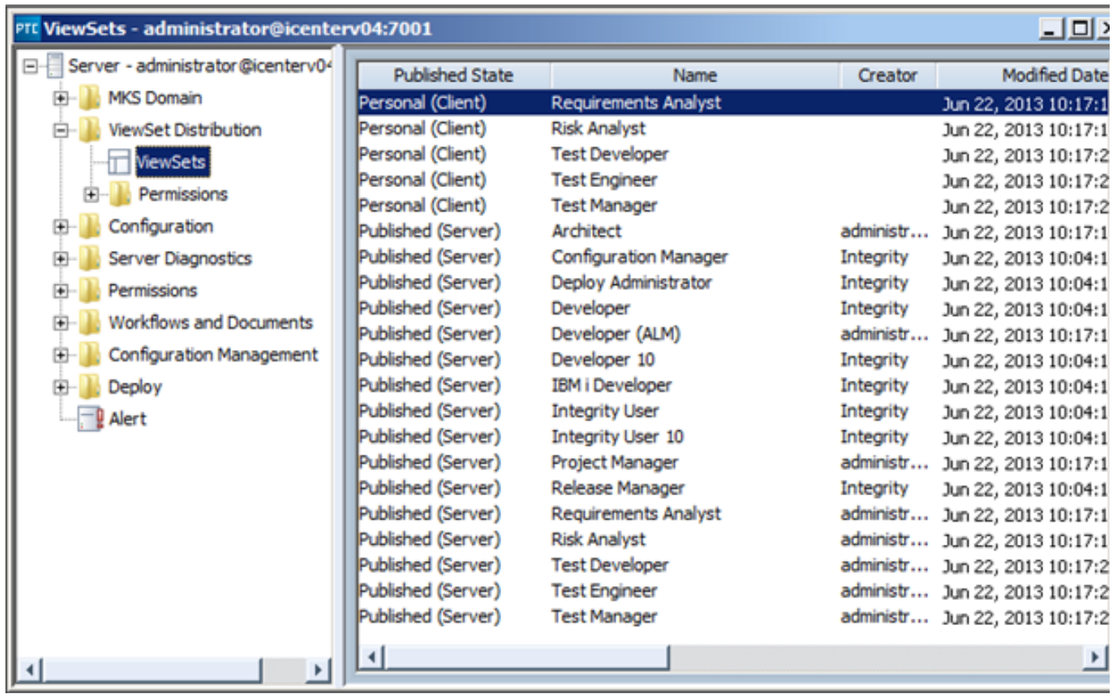


As you can see, your standard PTC Integrity solution out of the box, offers a pretty comprehensive methodology for handling your organization's testing needs. The advantage of using your PTC Integrity solution for not only handling your requirements but your testing as well, means that you have a tight method of maintaining control over your entire product release cycle without having to try to reach across several systems trying to make sense of data that is not necessarily compatible.

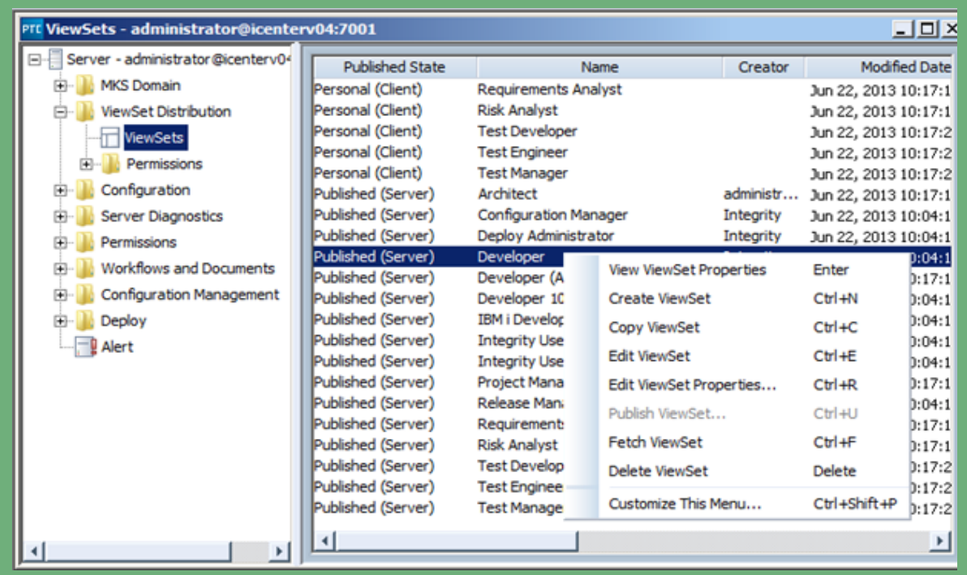
Chapter 2: How to create ViewSets in PTC Integrity.

Within PTC Integrity, a viewSet is a collection of views that persist each time the user opens and closes the PTC Integrity Client. Integrity offers the ability for administrators to pre-configure viewSets for distribution throughout their local user communities. Using viewSets administrators can provide a more custom experience for their users based on their tasks or roles within the PTC Integrity Client. For example, a Tester would prefer an interface tuned to meet their specific needs in being able to easily access Test Protocol Documents, Test Plans, and Test Objectives as well as to execute Test Sessions and enter Test Results into the system. On the other hand, someone who is responsible for Authoring and maintaining Requirements will not require having Test artifacts at their fingertips. In this article we will take a look at how viewSets can be created and/or customized for your local users.

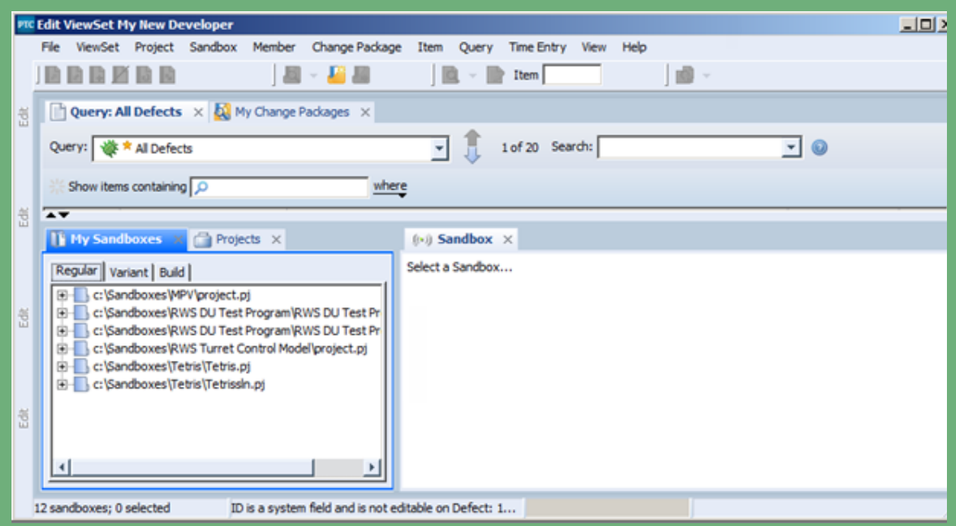
When it comes to creating a new viewSet it is always best to start with an existing viewSet, copy it and perform any customizations on it you need to, before it is published on your production server. On the PTC Integrity Administration client, the ViewSet Distribution function will show a list of all of the available viewSets that have been published on the server as well as those that have been downloaded to the current desktop.



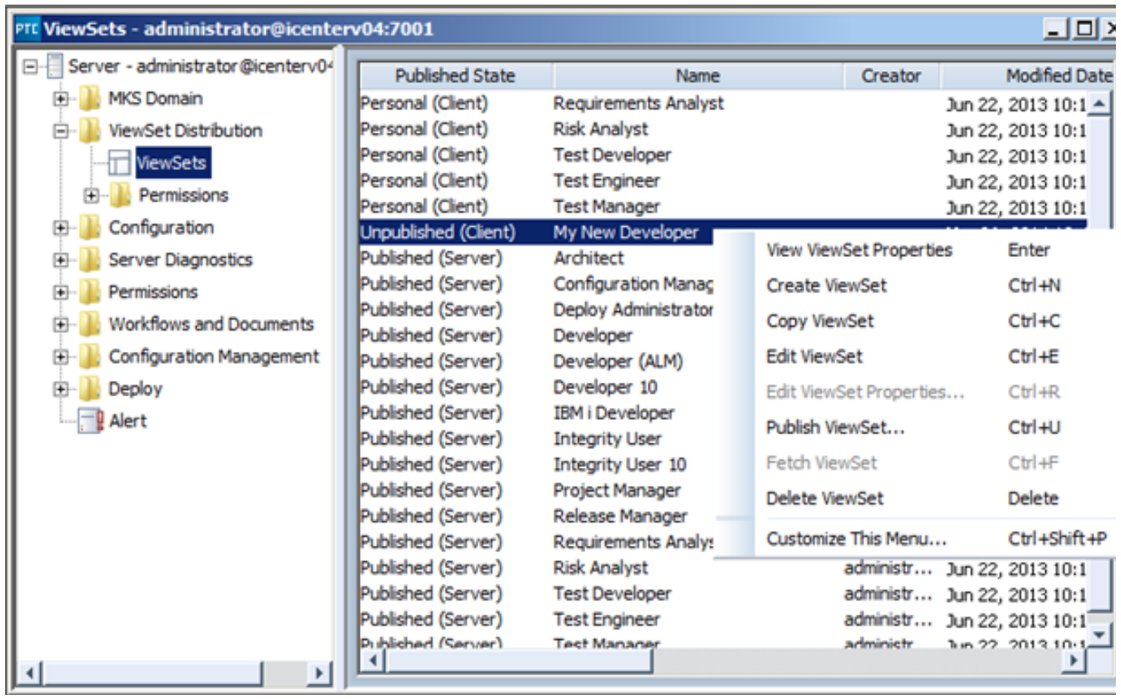
You can edit or create a copy of any of the existing viewSets shown in the image below by right clicking on the desired viewSet and making the appropriate selection:



The Edit or Copy operation will create an unpublished copy of the viewSet and then open that copy in an Edit ViewSet window:

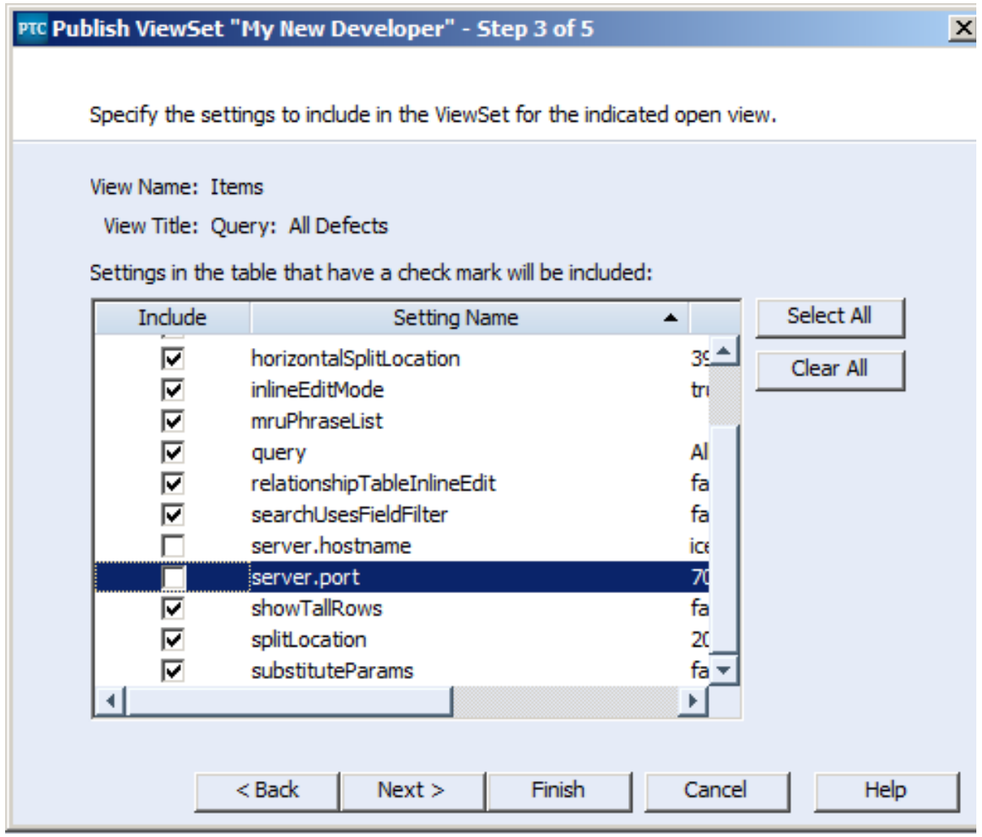


You can use this Edit ViewSet window to make any changes you need to the viewSet copy. When you are finished you can publish this viewSet by right clicking on the unpublished copy, and selecting Publish ViewSet:



The Publish ViewSet wizard will guide you through the steps necessary to publish the viewSet. You will be prompted to confirm such properties as:

1. The Name of the viewSet
2. The Description
3. Whether or not the viewSet is optional or Mandatory (do users have to download it or not)
4. Are the users allowed to customize the viewSet to meet their own needs
5. The permissions
6. A list of settings, the most important of which are server.hostname and server.port. Both of these properties should be blank if you are using a separate staging and production environment locked together. If these two settings remain selected users downloading them will find themselves logging into your Staging environment by default.



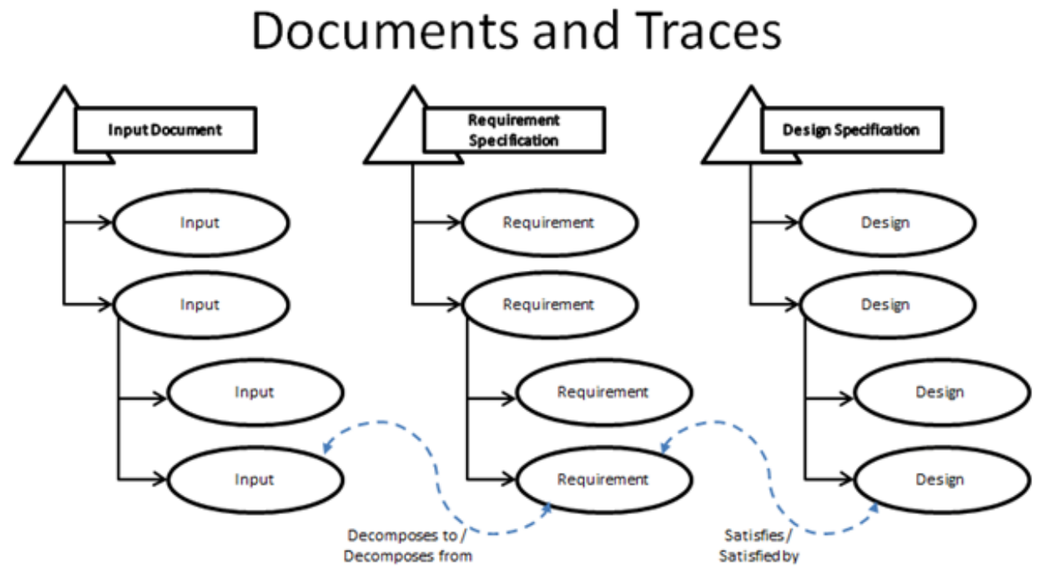
7. When you are done with the various settings, selecting the Finish button will publish this viewSet to the PTC Integrity server, and make it available to the users of that server.

Note: If you prefer you can import a given viewSet directly to your regular PTC Integrity client make your changes to that viewSet, then using the operations described above copy and publish that viewSet.

Chapter 3: How Metrics are Generated

In any type of Requirements management or development system, the ability to track metrics on what is being done is an important component of knowing where you are in your delivery cycle. This article will be the kick off in a series of articles that will discuss how we can create, track and use various types of metrics to manage your delivery cycle in PTC Integrity.

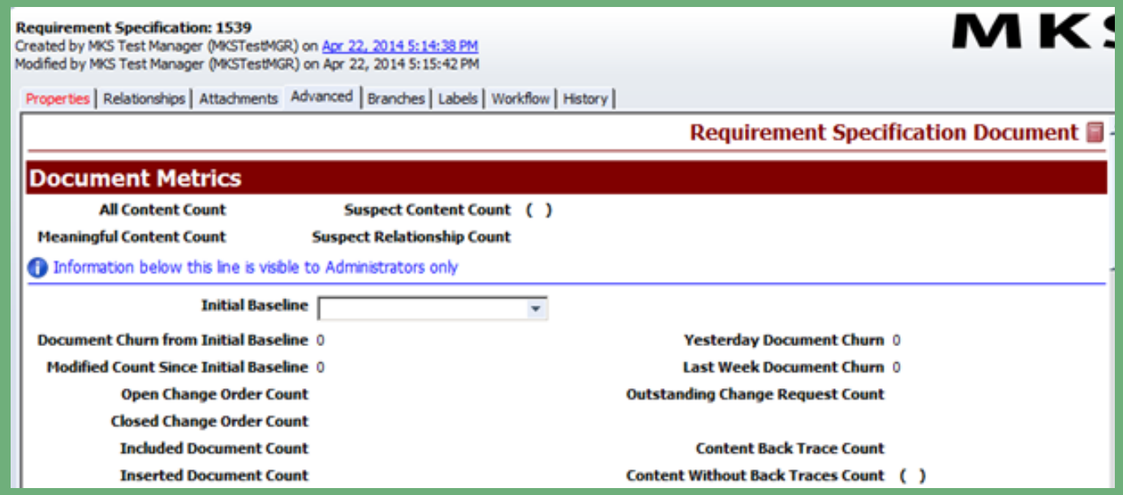
First of all we will talk about trace relationship reporting in PTC Integrity. Trace relationships are used in PTC Integrity to link document content to other document content, either inside or outside a given document domain. The diagram below describes the trace relationships between the main three document domains that handle input, requirements and design content.



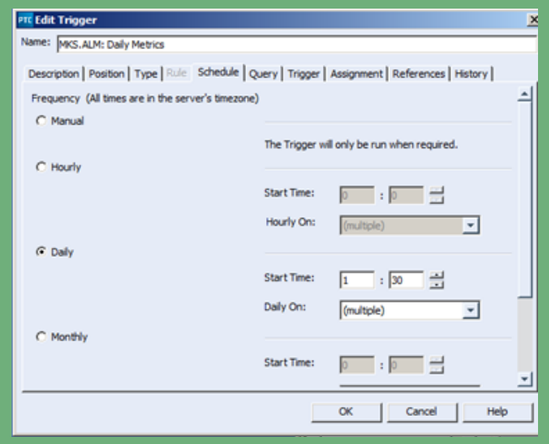
Input will “Decompose to” one or more requirements which in turn are “Satisfied by” the design. These are referred to as forward or downstream relationships. Likewise, the design “Satisfies” one or more requirements, the requirement “Decomposes from” the input in what is generally referred to as a backwards or upstream relationship. It is also possible to trace laterally within the same document type using peer traces like “Is Related to”.

Traceability metrics are about ensuring content items from the various documents are properly traced through the documents. Out of the box PTC Integrity, to ensure full traceability, counts back traces.

For example, how many Requirement content items are related back to Input content items. Typically this type of tracing is recorded on the document item itself through a series of special fields as shown below.



The computations stored in these fields are the results of the metrics trigger that comes with the out of the box solutions from PTC. Solutions like the ALM solution or the Med Device solution. This trigger is scheduled to perform calculations on items contained within active projects within PTC Integrity. By default it is scheduled to run on a daily basis, but that can be adjusted to be daily, weekly or monthly. In my next



article I will show how you can use these metrics to create a simple report to demonstrate how this metrics can be used to determine the state of a project in PTC Integrity.

Chapter 4: How to Gather Metrics Together in a Report

In this chapter I will build on Chapter 3 by showing how you can leverage the traceability metrics that come with PTC Integrity to build a simple report to demonstrate the traceability coverage in your active projects. The report we are going to build is a simple back trace report as follows:

ABC Financial, Inc. — Simple Back Trace Repor

Back Traces on all documents from Active Projects

Dec 12, 2014

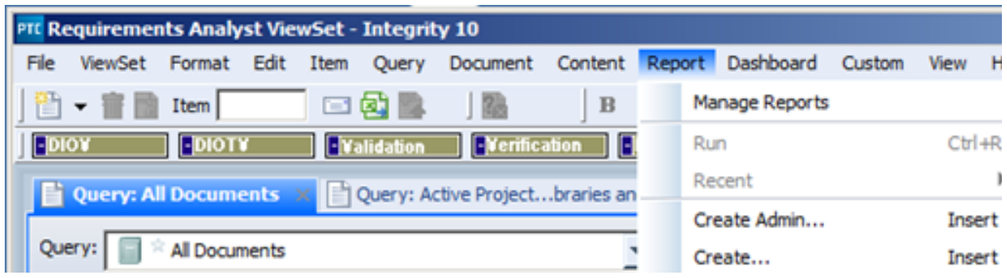
Document Short Title	ID	All Content Count	Meaningful Content Count	Content Back Trace Count	Content Without Back Traces Count
Type: Design Specification					
Component Design Specification	1112	17	15	6	
Feature Design Specification	1113	11	10	4	
Timing Design Specification	1114	5	4	2	
Usage Design Specification	1115	8	6	6	
Layout Design Specification	1116	5	5	0	
Feature Design Specification	1384	10	9	0	
Timing Design Specification	1385	5	4	0	
Usage Design Specification	1386	8	6	0	
Layout Design Specification	1387	5	5	0	
Component Design Specification	1500	17	15	0	1
Testing New Category Restraints	1601	1	1	0	
Testing constraints	1606	1	1	0	
Testing constraints	1609	1	1	0	
Document Count 13		All Content 94	Meaningful Content 82	Back Traces 18	Without Back Traces 6

This report performs the following activities:

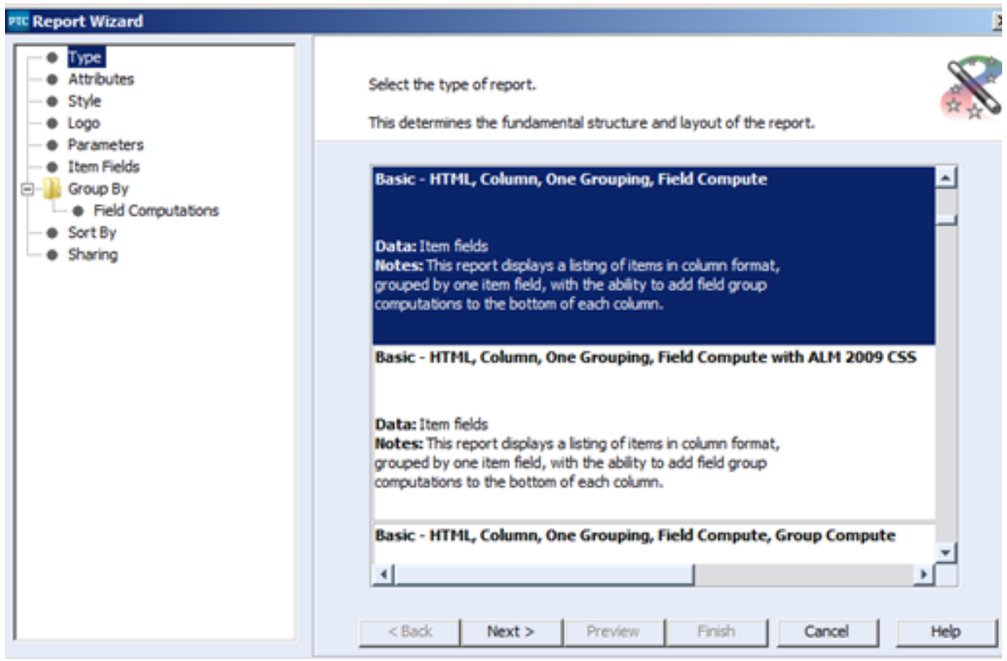
1. It performs a query on the database to retrieve all of the document items in the database.
2. It groups those results by Item type.
3. Then it provides totals for each group of documents. Above we can see 13 Design Specification documents, as well as totals for all of the various content metrics.

Next I will take you step by step through the process of building this report using the PTC Integrity Report wizard. Perform the following steps to build this report:

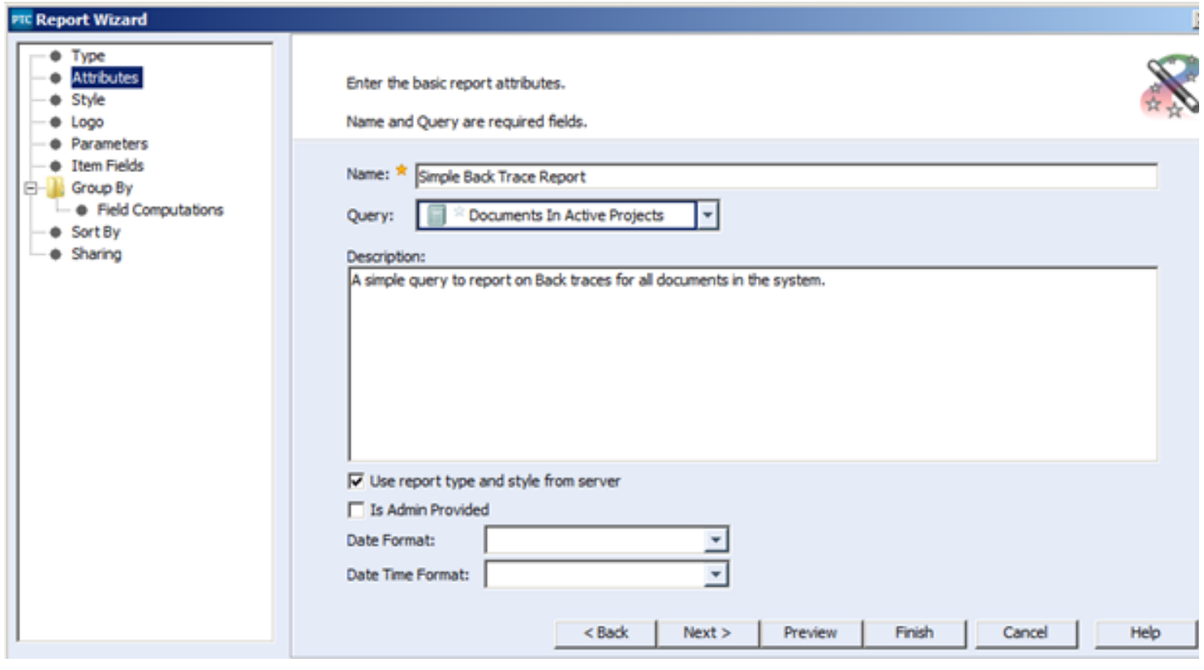
1. From the Report menu in your PTC Integrity, select "Create..." If the Report menu or the "Create..." option does not exist, you may have to customize your ViewSet to make it visible. The "Create Admin..." option should only be used if you are a member of the Administrator group, and you are looking to build a system supported report for use across your entire PTC Integrity instance. In this case I just want to build a report for myself, and maybe a friend.



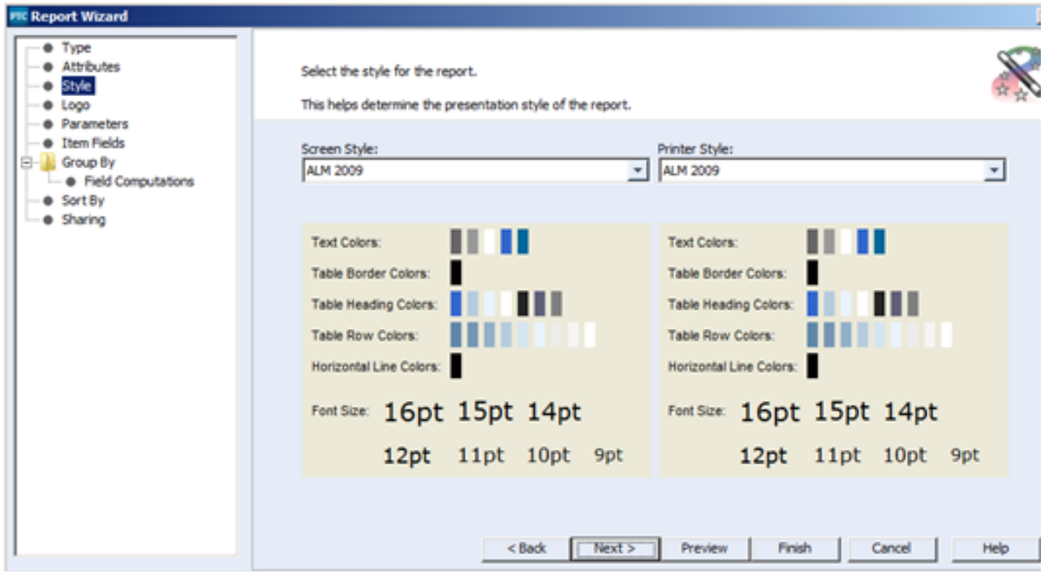
2. This will open the PTC Integrity Report Wizard. The first thing you do when you are creating a new report is to select the type of report you want to produce. These types are called Report Recipes. In this case we select the "Basic – HTML, Column, One Grouping, Field Compute"



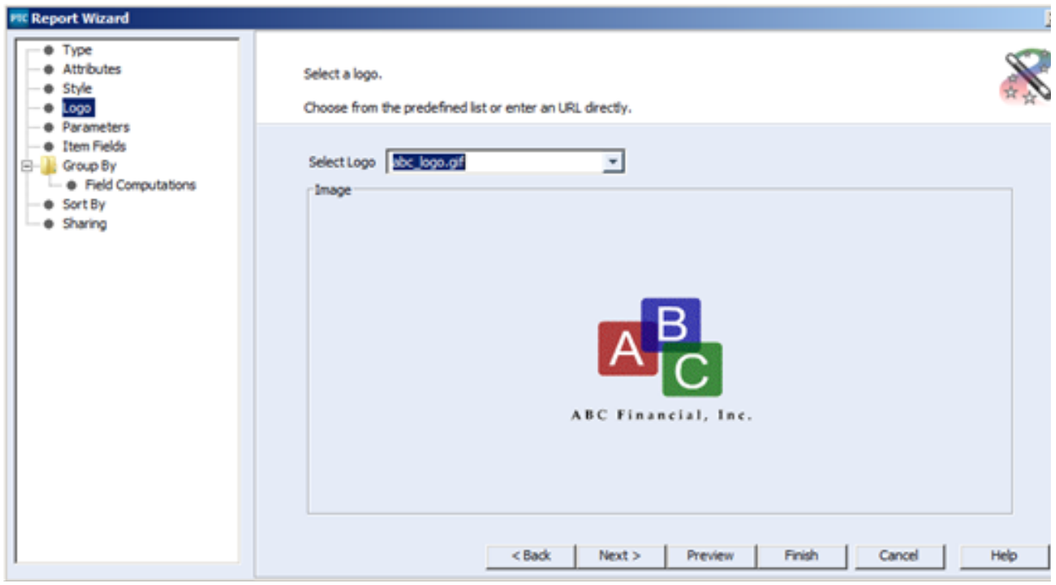
3. After selecting the "Next >" button we fill in attributes like a Name for the Report, the query you want to base your report on. In this case we use the Admin provided query: "Documents In Active Projects," and a simple description. In this case the report we are creating is for our own use, so the "Is Admin Provided" check box we'll leave alone. (This option is only active when you belong to the administrator group.)



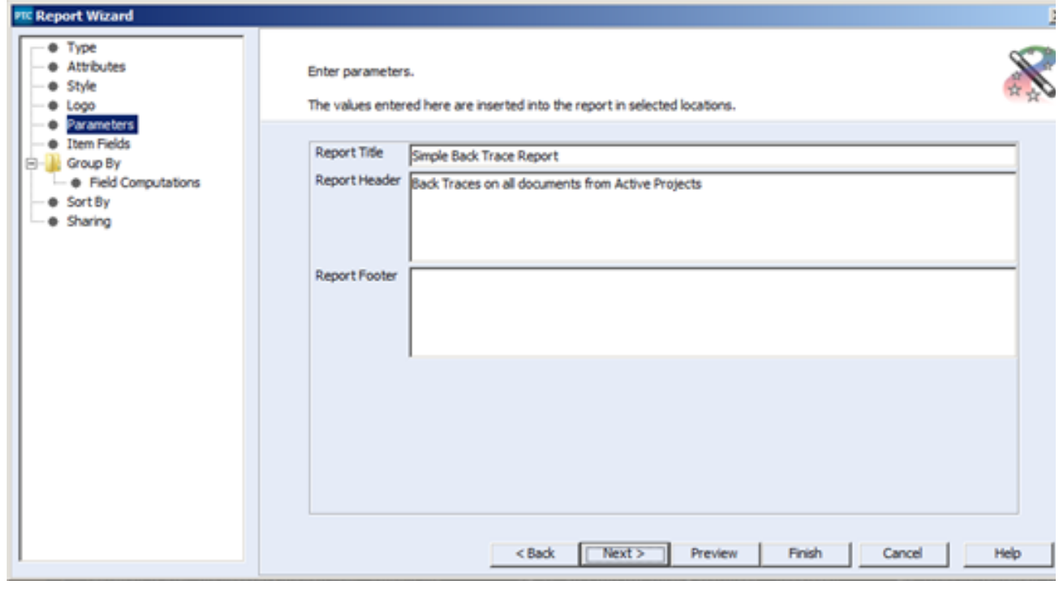
4. On the Next panel, you select the style that can be applied to the HTML report. There are several basic styles available for your convenience. In this case I selected ALM 2009 for both the screen display and when the report is printed out.



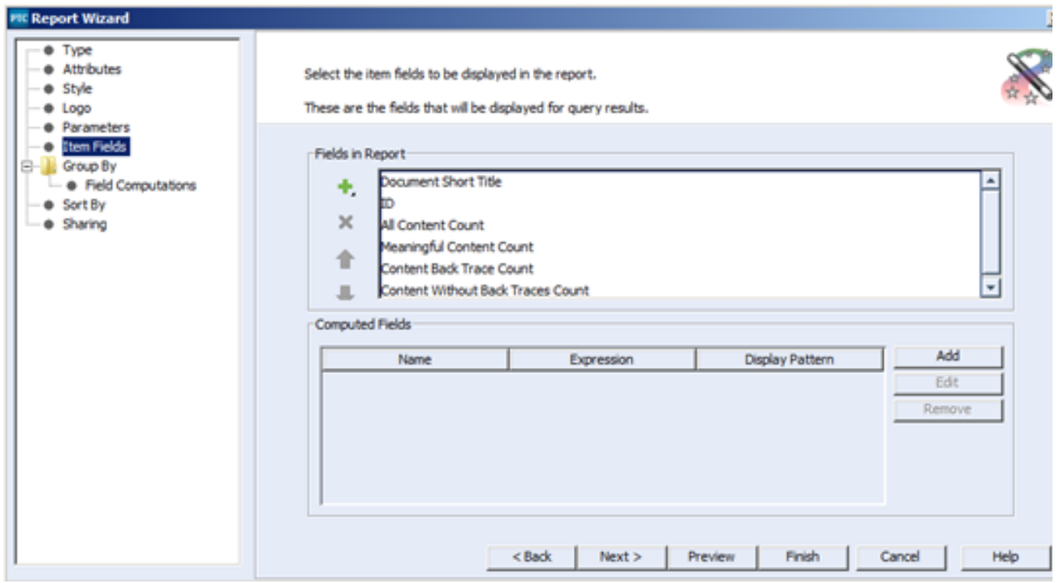
5. In the next panel, you can select an image already stored on your server as a logo for your report.



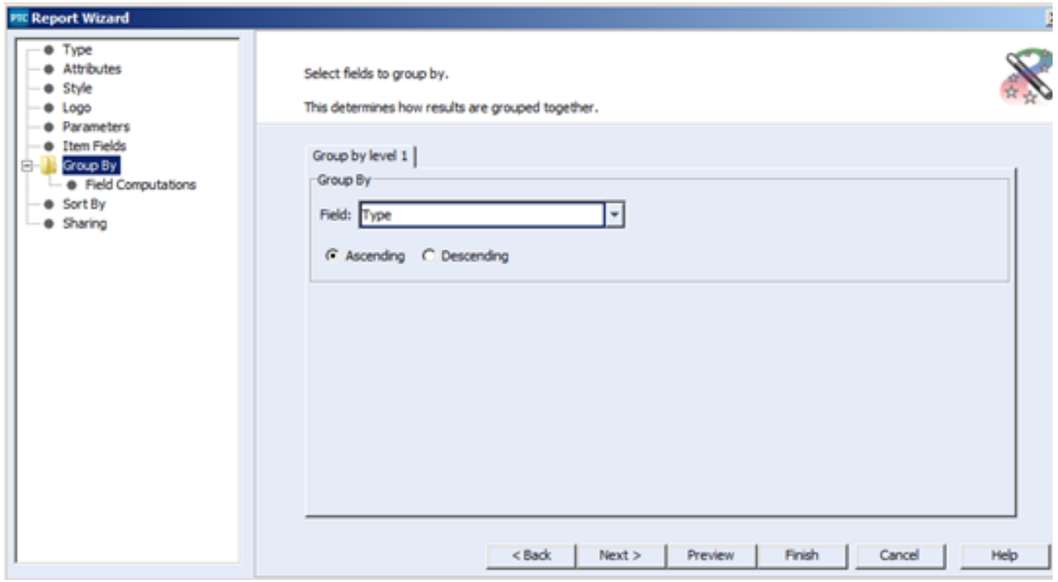
6. Next you can set up a title, a header and a footer that will be displayed on your report as follows:



7. After that, we select the fields that we included in the report above.

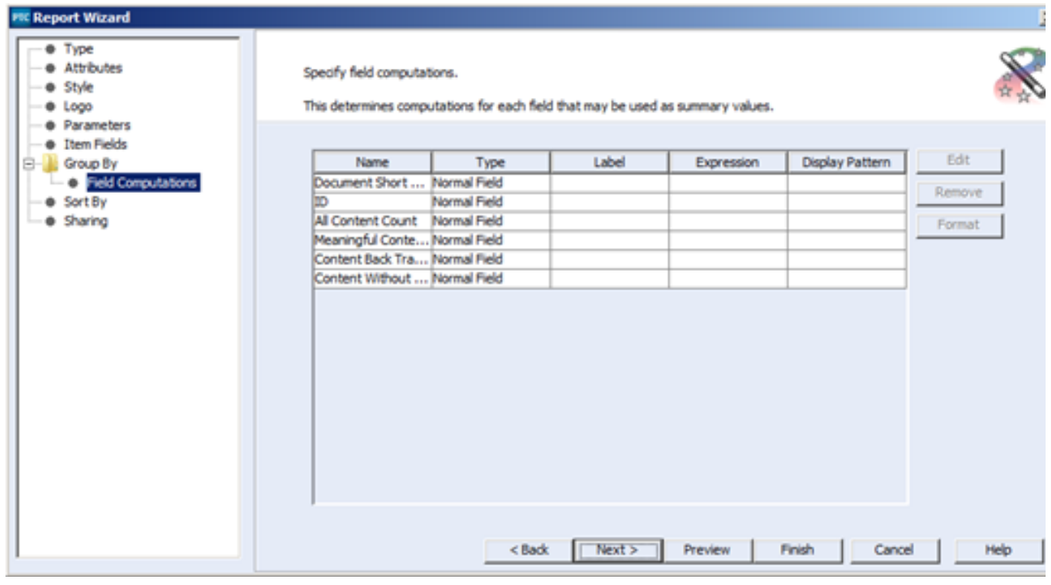


8. The group by option will group all results returned from the query by the values of the field specified in the Group By field. In our case we are going to group the results by the Type field. Since the query

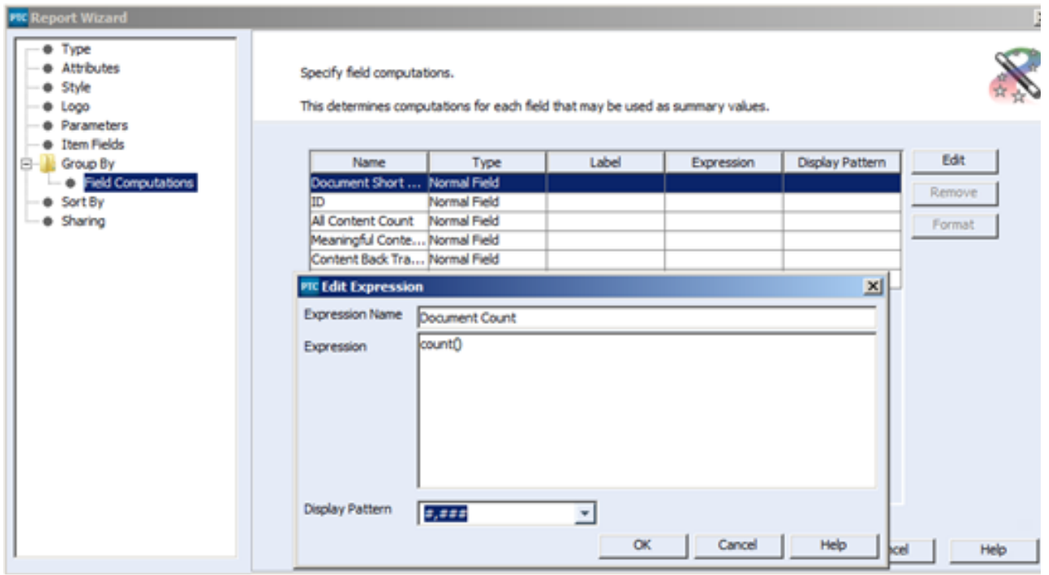


we specified will only be returning items of that are documents, the values for Type will be restricted to values such as “Design Specification”, “Requirements Specification” and “User Needs”. That means that the report will be broken up such that all returned “Design Specifications” will be together, all “Requirement Specifications” will be together and all “User Needs” will be together.

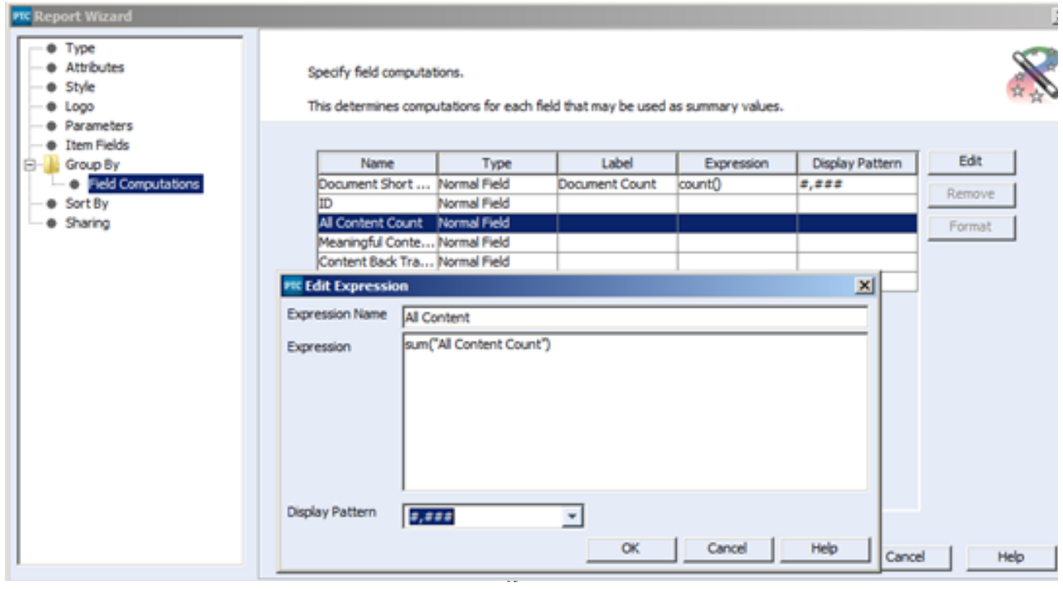
9. On the next panel, we have the option of performing computations on the columns of data within each grouping.



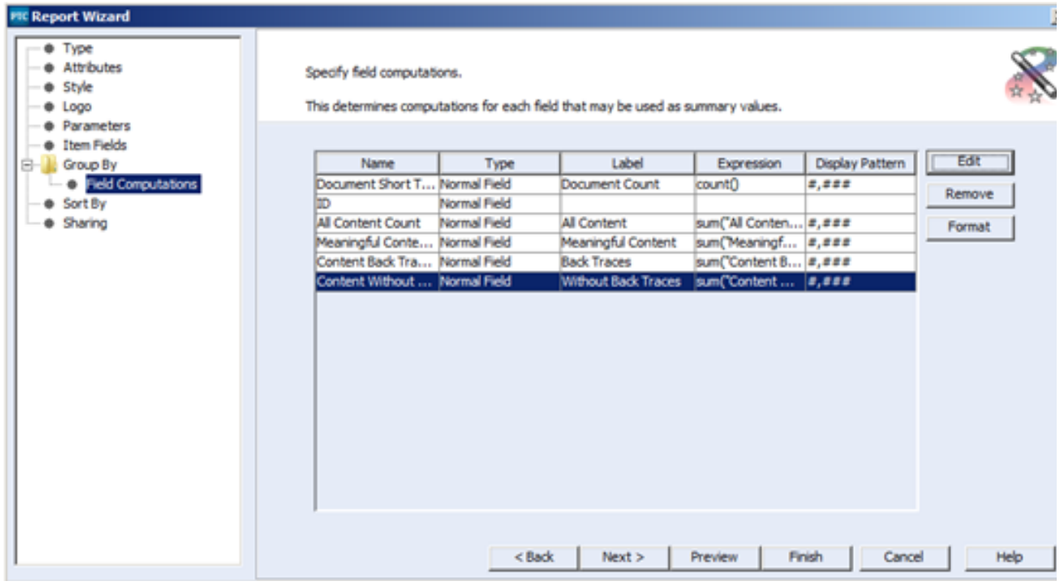
10. For the first computation, we will simply count all of the “Document Short Titles”. To do this we first select the line with Document Short Title, and then select the edit button. This will open the Edit Expression dialog, where we can name the expression, set up the computation, and set a display pattern for the resulting integer.



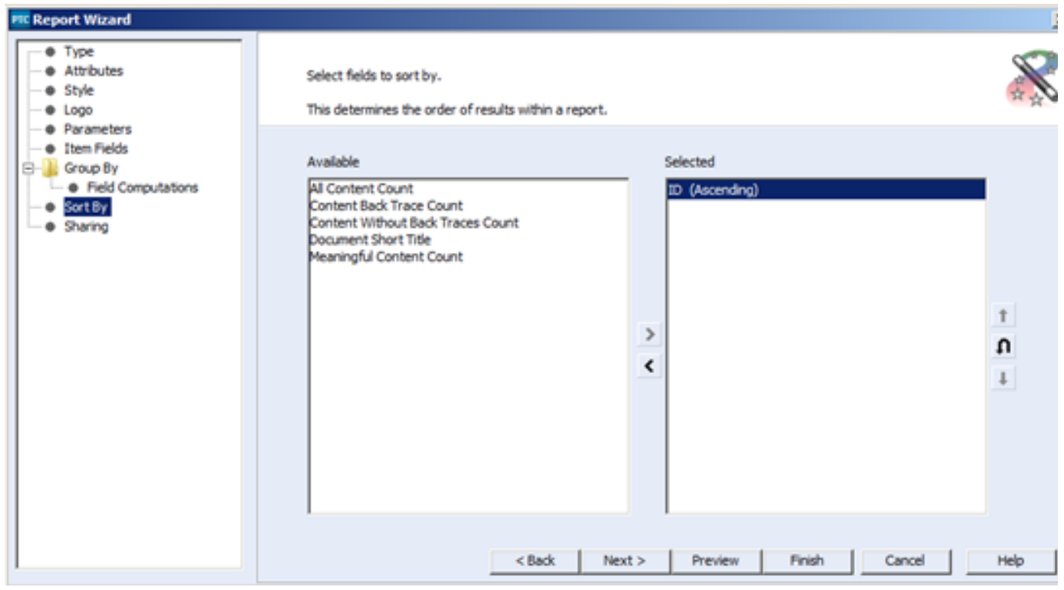
11. For the next computation, we want to add up all of the integers in the All Content Count column. In this case we will use the “sum()” function to add up all the values in the named field.



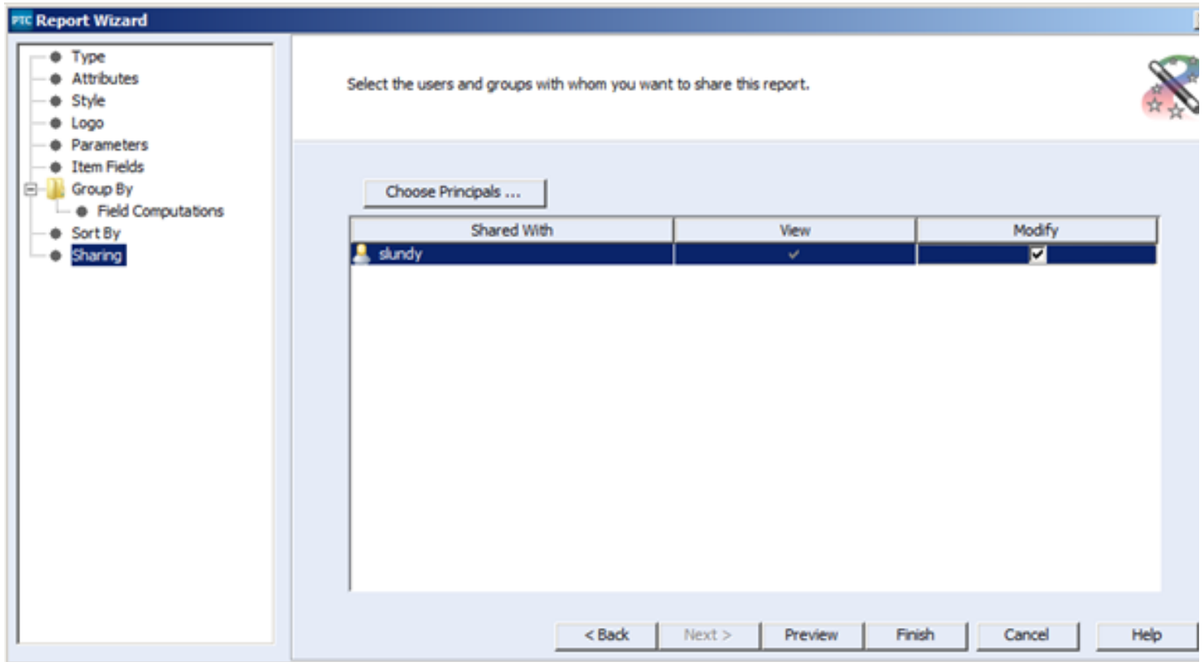
12. Similarly we will use the sum function to create totals for each of the columns, “Meaningful Content Count,” “Content Back Trace Count” and “Content Without Back Traces Count.”



13. Next comes the “Sort By” panel. Since this report is grouping the major items together already, sorting is probably less important. In this case I simply sorted the items by their IDs.



14. The final panel is the Report Sharing panel. Using the Choose Principals button you can elect to share your new report with specific individuals and/or groups through-out your organization. You can even delegate to individuals permissions to make changes to the report. In this case I simply shared the report with myself alone.



This report was just one example of what you can do with the reporting that comes with PTC Integrity. In this case, I believe the ability to report on what has been properly traced in PTC Integrity will go a long way in determining whether or not you are ready to deliver whatever product you are using PTC Integrity to deliver.

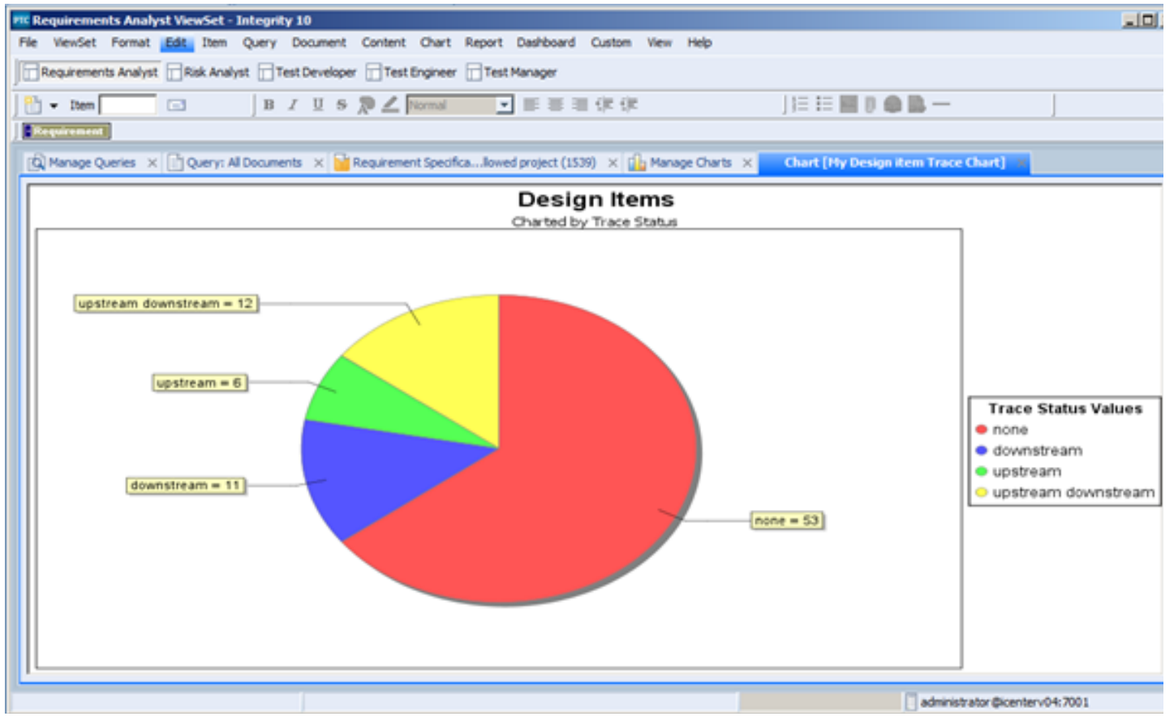
In my next blog article, I will describe how to build a chart with PTC Integrity as opposed to a report.

Chapter 5: How to Visually Display Your Metrics in a Chart

In the previous chapter, I discussed how we can calculate trace report metrics, and then gather them into a report. In this chapter I am going to discuss how we can gather metrics similar to those described in chapter 4 and put them into a chart format. This time though we are going to use a field called Trace Status and chart what items have upstream, downstream as well as items that have horizontal traces.

The particular chart we are going to build is going to retrieve all the Design content items in the database, and then chart them based on the selected Trace Status Value.

The chart we are going to build will look as follows:



Like the report in the previous article, the chart will perform the following activities:

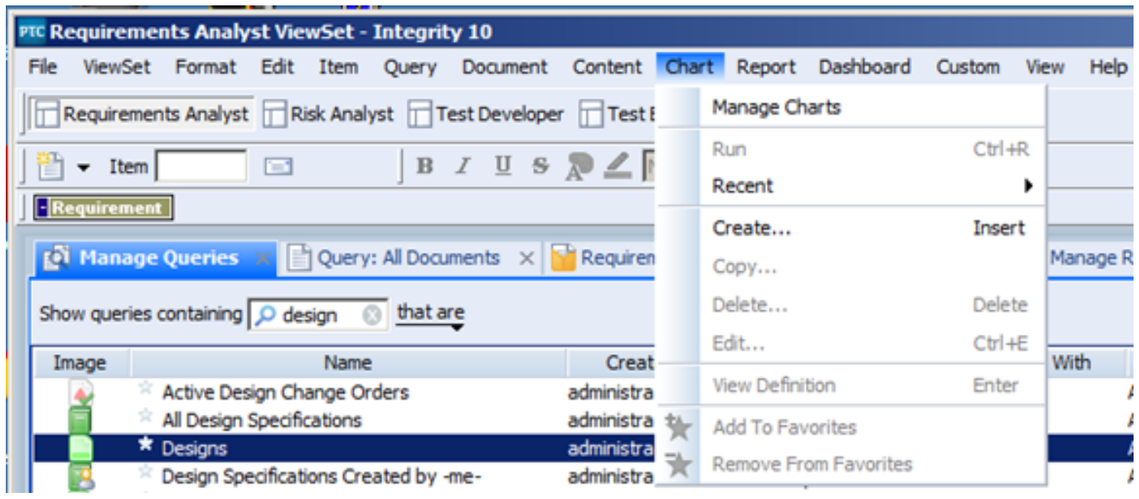
1. It performs a query on the database to retrieve all of the Design items currently in the system.
2. It then groups those results by the selected Trace Status values

3. Then it presents the results as a pie chart.

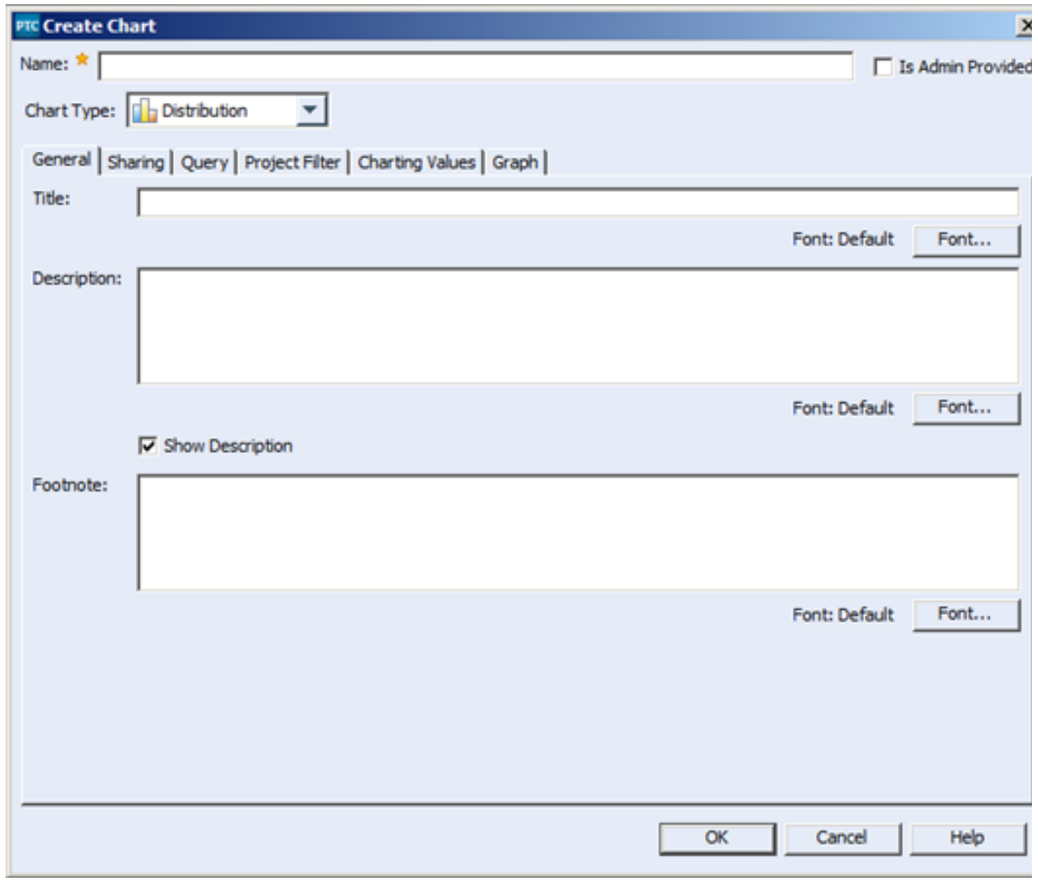
Next I will take you step by step through the process of building this chart.

Perform the following steps to build this chart:

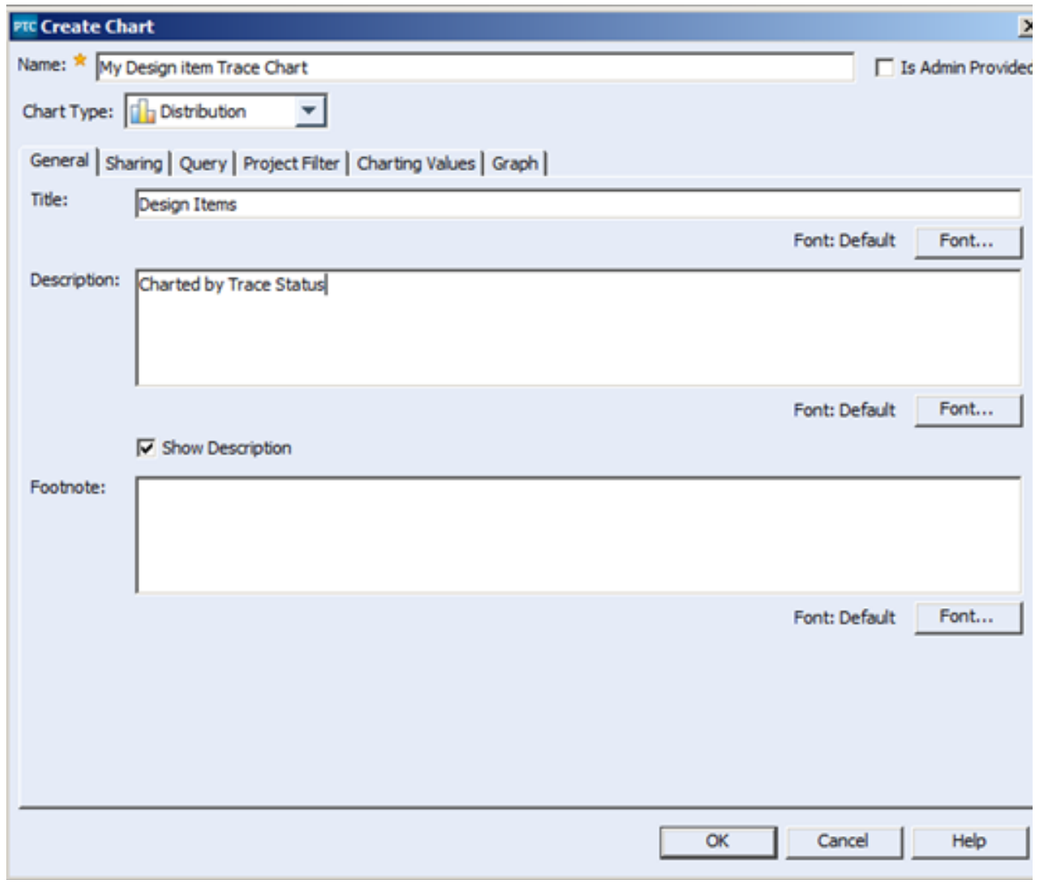
1. From the main menu bar on your Integrity Client select Chart -> Create… to create a new Chart on your system. If the “Chart” menu or the “Create…” does not exist, you may have to customize your ViewSet to make it visible. The “Create Admin…” option should only be used if you are a member of the Administrator group and you are looking to build a system based chart that will be used across the entire Integrity instance. In this case I just want to build the Chart for myself and maybe my teammates.



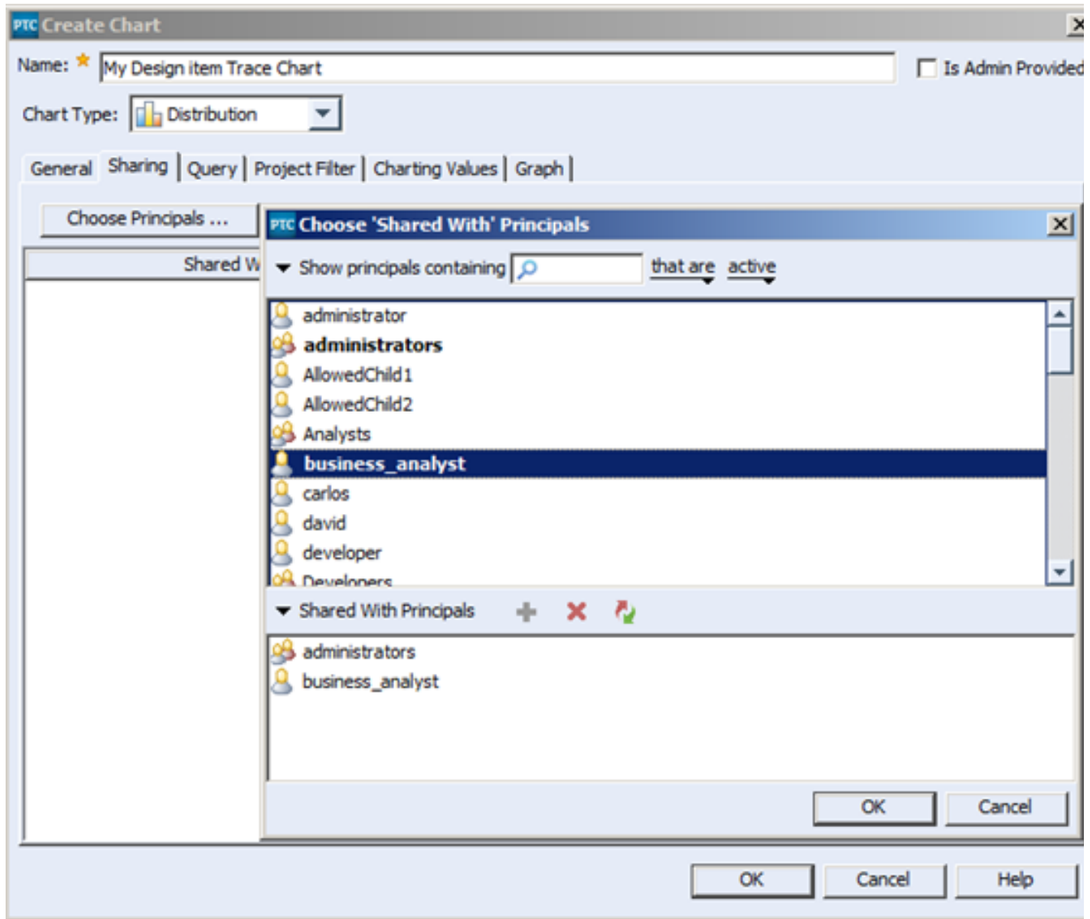
2. This will open the Create Chart dialog from which you can create your new Chart.



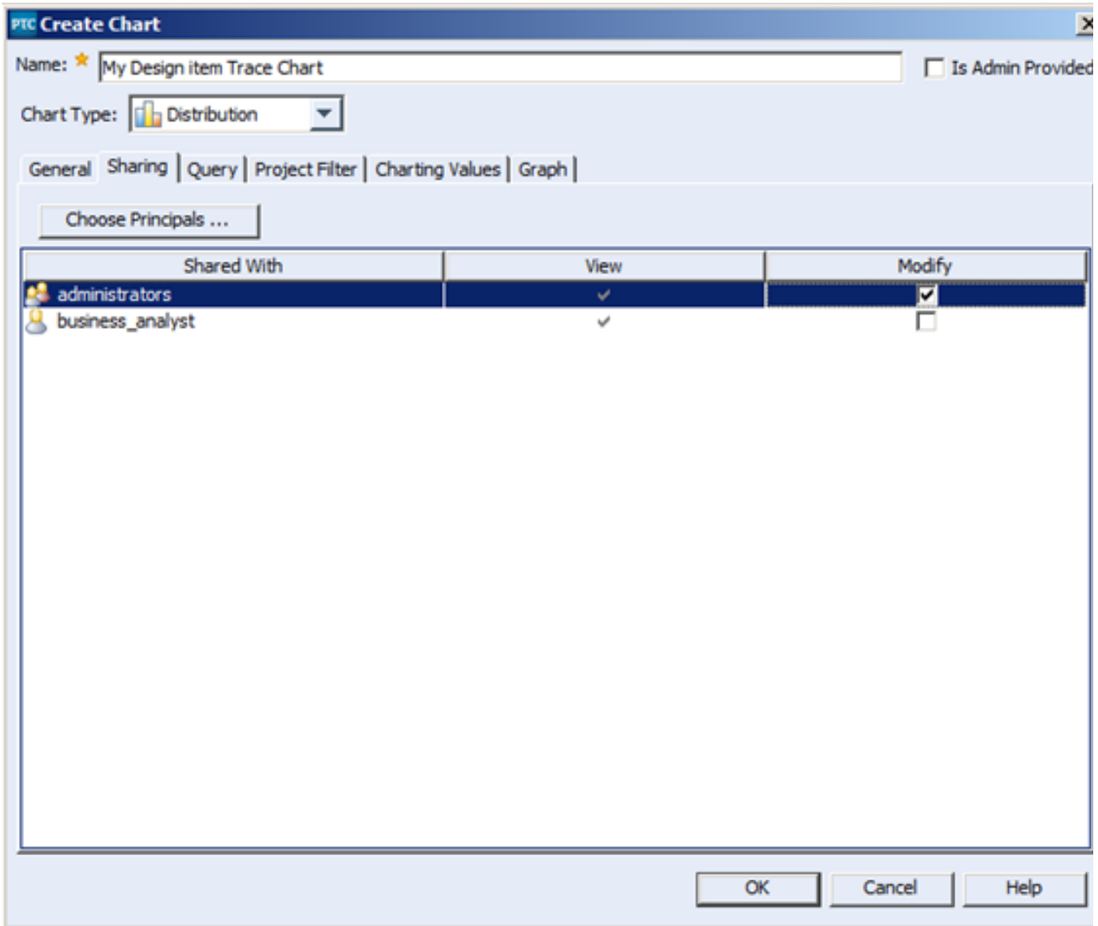
3. Provide a name for your chart, this is how it will be known across the system. Also specify a title and a description.



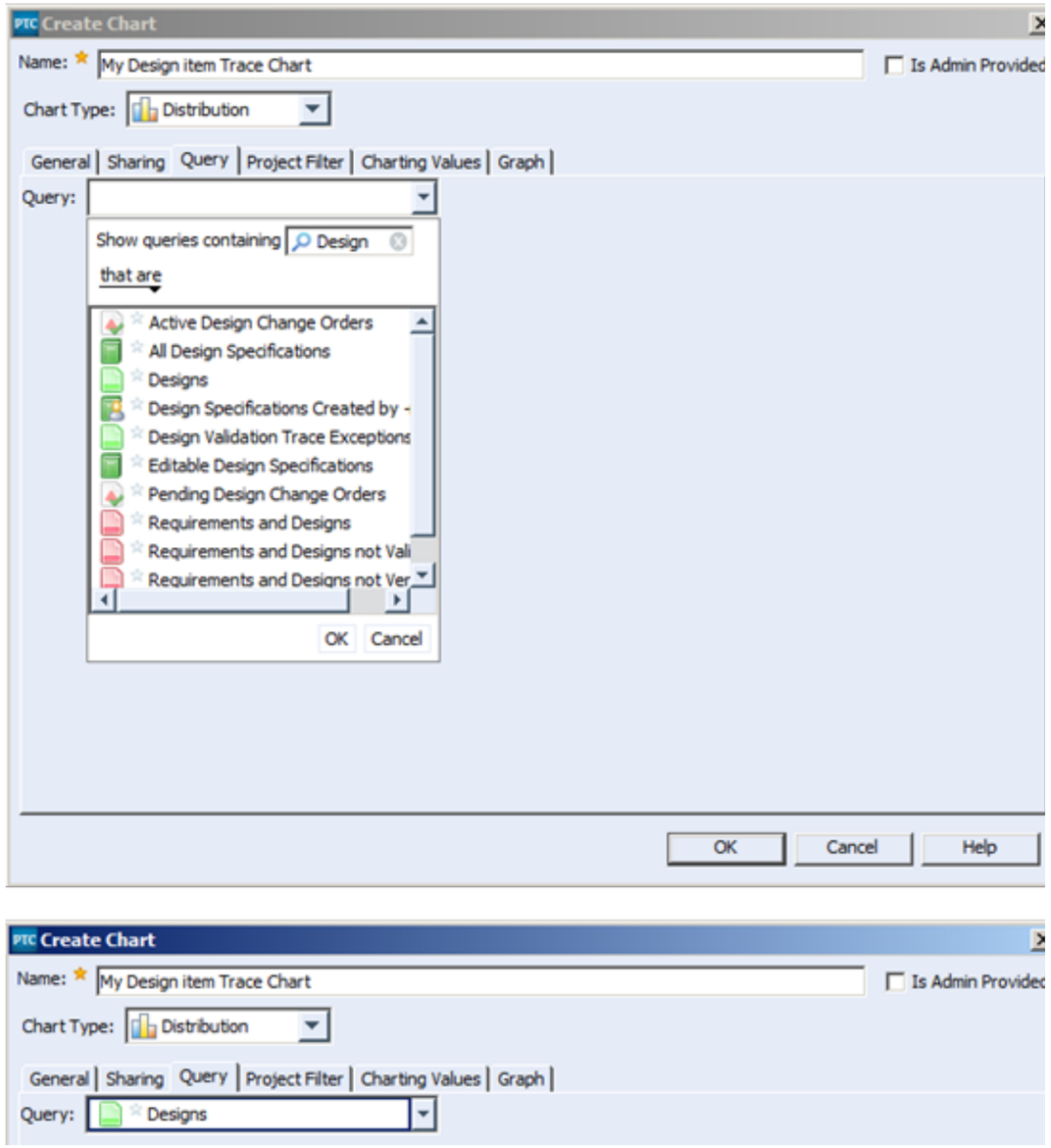
4. Next we will go to the sharing tab, select the “Choose Principals…” and select to whom we would like to share the chart with. You can select specific individuals or groups to whom you could potentially share your chart with. Some Integrity systems may be configured to prevent end users from sharing your new chart globally through the “Everyone” group.



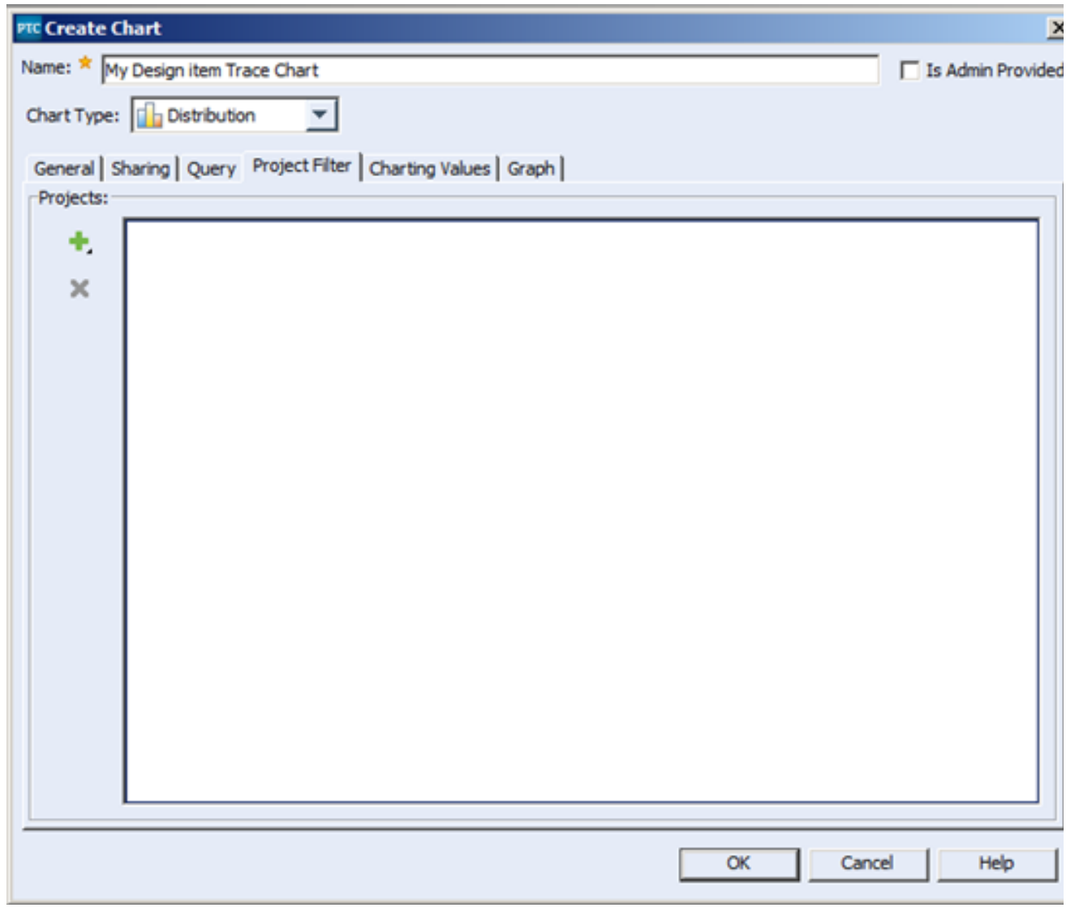
5. The select users and groups in the Shared with list, at this point only able to View the chart in question. By selecting on the “Modify” checkbox, I have allowed anyone in the Administrator’s group to have modify privileges on the Chart.



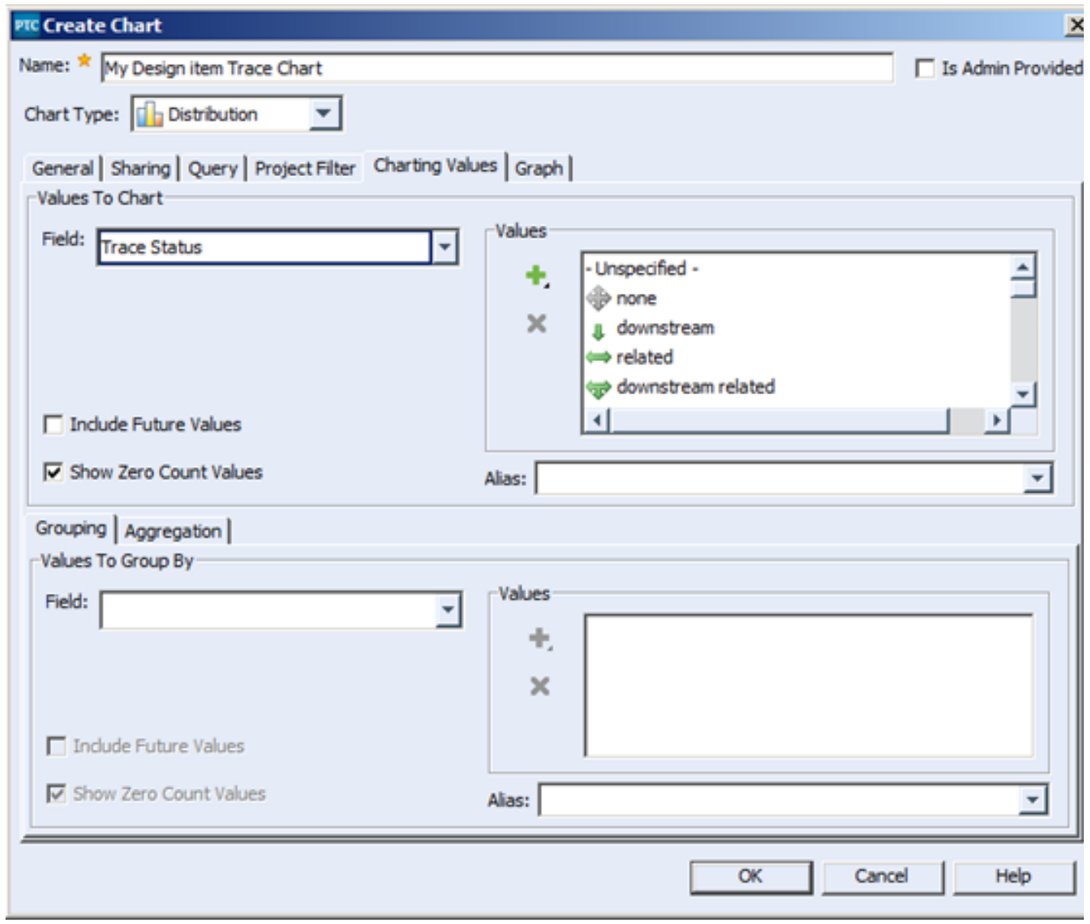
6. Next select the Query tab. From the query dropdown list type “Design” into the “Show queries containing filter” to more easily find the “Designs” query. The Designs query is a system designed query provided with the Med Device Solution. This query will be used to retrieve the items we are going to chart.



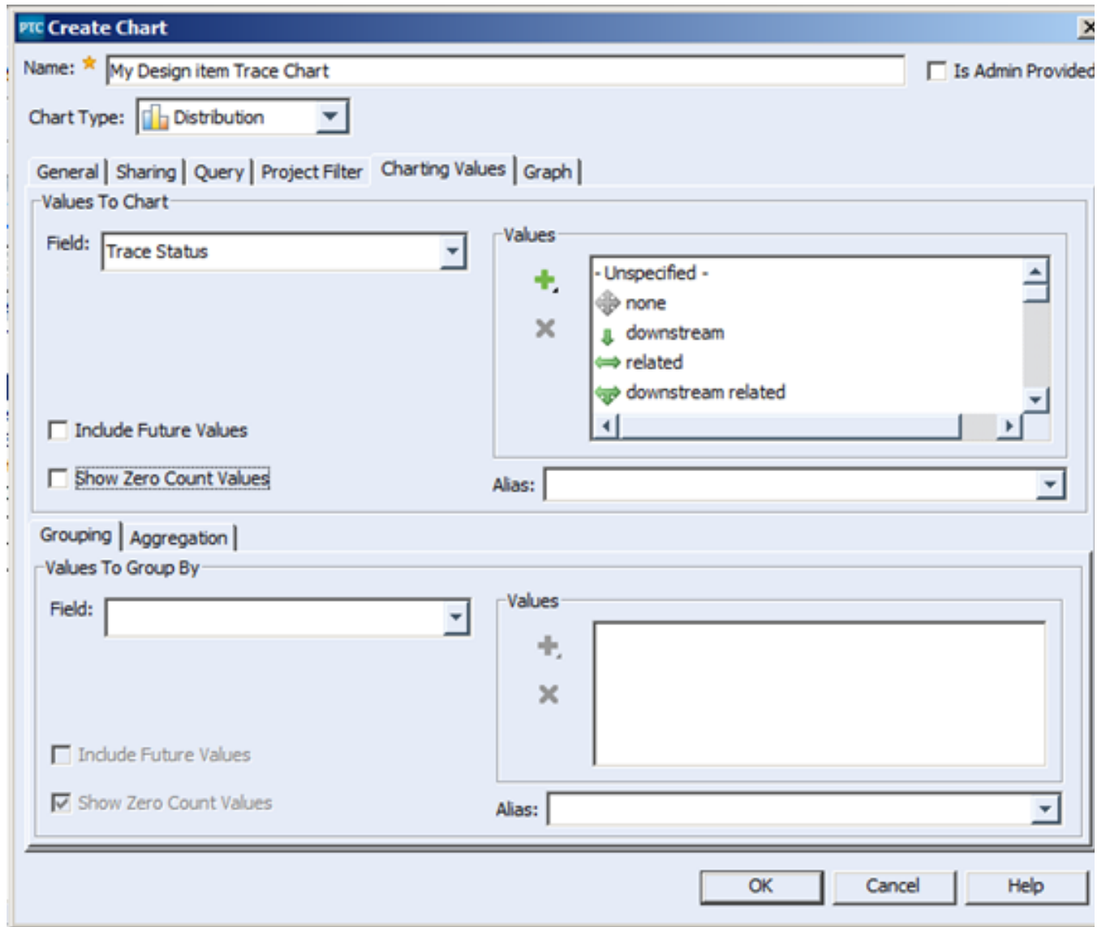
7. The next tab is the Project Filter tab. By applying a project filter to your chart, you can restrict the items filter out the items displayed in your chart based on the selected project values. In this case we are simply going to leave this blank.



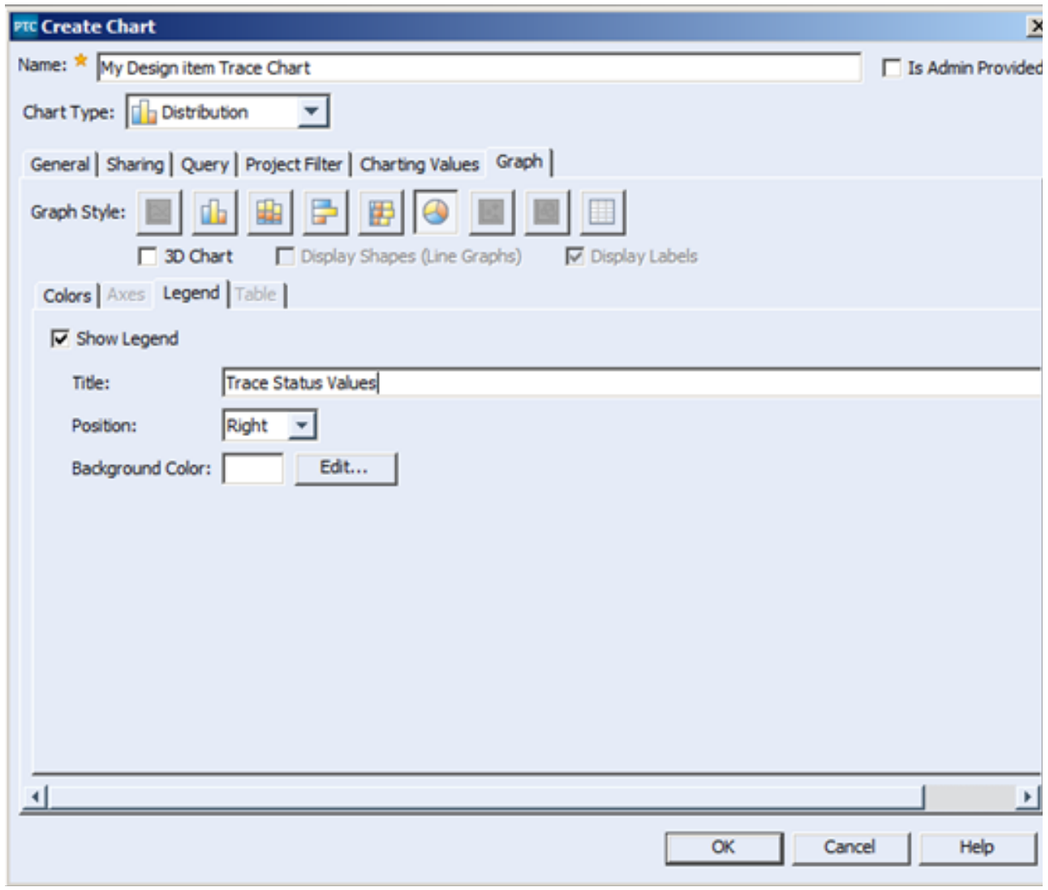
8. The next tab is the Charting Values tab. In this tab we specify the field we wish to chart, as well as the values we wish to represent within the chart. In this case we will be charting the field “Trace Status” and we will be selecting every possible value that can be represented in that field.



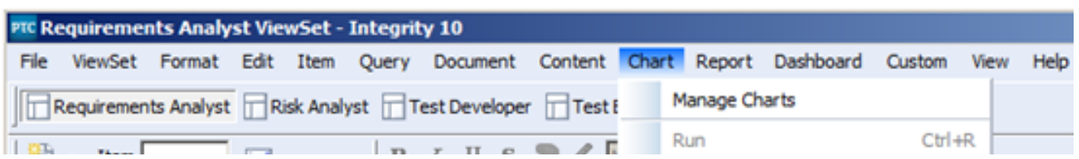
9. The next thing we are going to do is to deselect the “Show Zero Count Values” check box. This means that the new chart we create will only chart the values where it has values to report, in this case helping us de-clutter the overall chart.



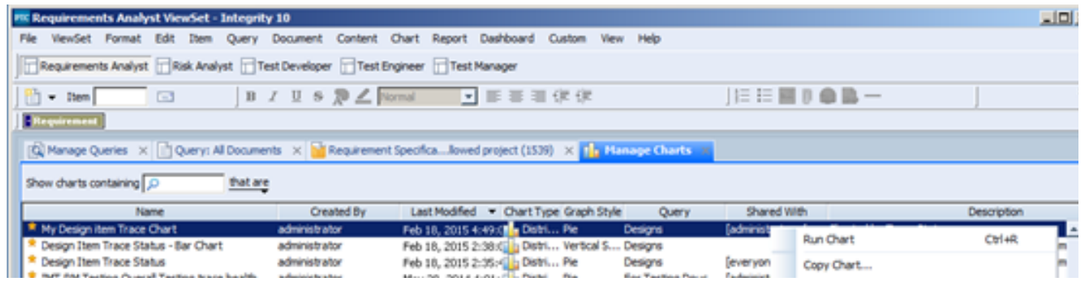
10. The last tab is the Graph tab. In this tab we can select the type of chart we want to display, whether to display it in 3D or not. You can also define your own custom colours, as well as entitling the legend. In this case we are going to go with a two dimensional pie chart, with only the standard colours, and with the Legend entitled as follows:



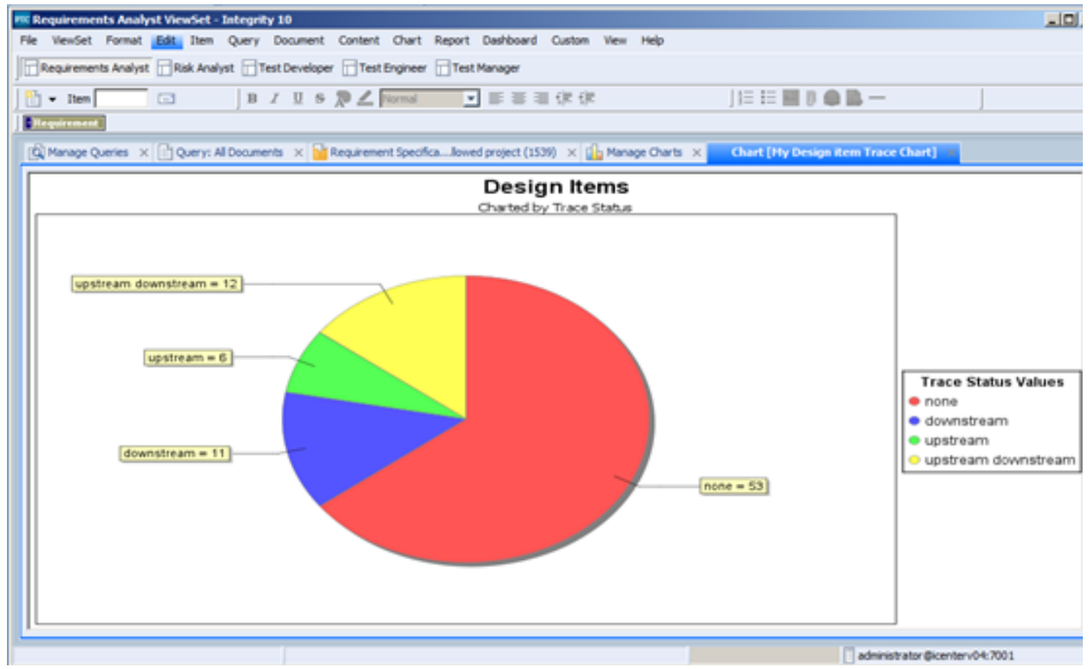
11. Finally select OK to create the chart.
12. Once the chart has been created you can run the chart from the Manage Charts window. You can open this window by selecting the menu Chart -> Manage Charts



13. This will open up Manage Charts window in the Integrity Client, and from there it is a simple matter to run the desired chart:



14. And the Final report, of course looks like this:



This chart is just one example of what you can do with charting in PTC Integrity. If you were to couple this report with similar reports across all of your PTC Integrity documents you can get a complete picture of what your system looks like. Not to mention that if you were to select any individual piece of the pie chart above you can drill down to the items that make up that slice.

In my next blog article I am going to discuss how you can pull together Reports, Charts and even saved queries into more comprehensive dashboards that will present data in a fast and easy way for an overall interpretation of your product under development.

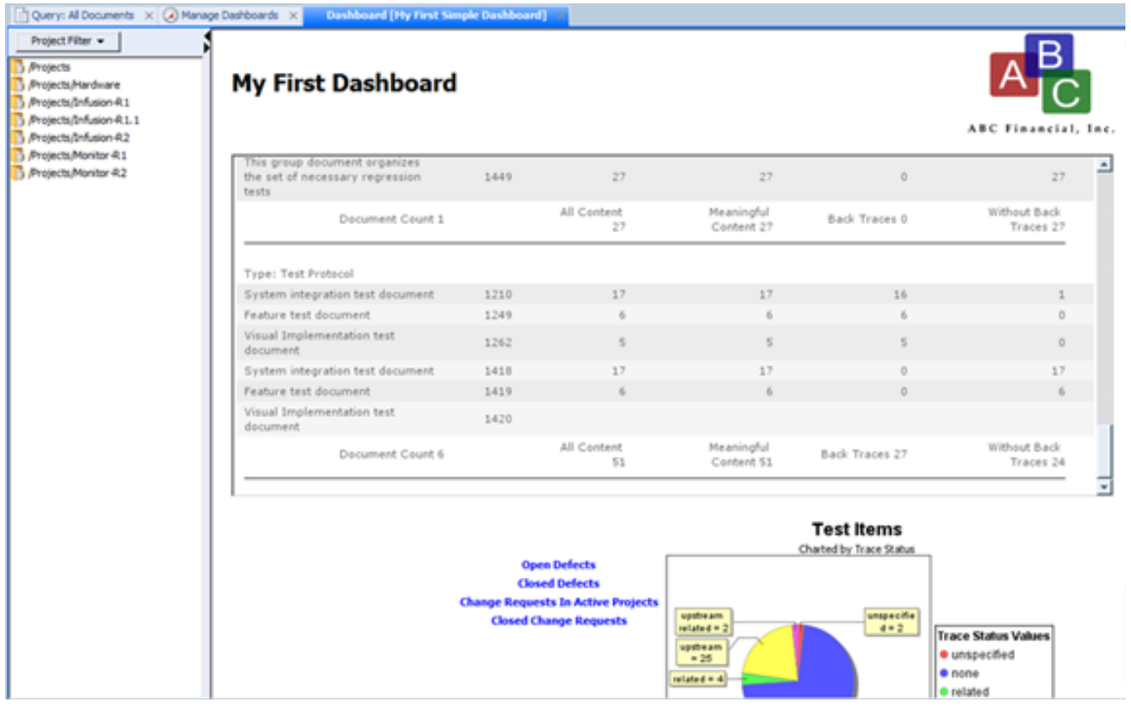
Chapter 6: How to Build Dashboards

In this chapter, we will discuss how you can take various charts, reports and queries and put them together to build a PTC Integrity dashboard.

A dashboard is a static, defined view comprised of the following components; embedded charts, embedded reports, images, labels and links to queries, reports and other Web sites. They can be useful in viewing a given collection of components as a single unit, but are especially useful to provide a high-level overview of your project(s) in your PTC Integrity Lifecycle Manager solution.

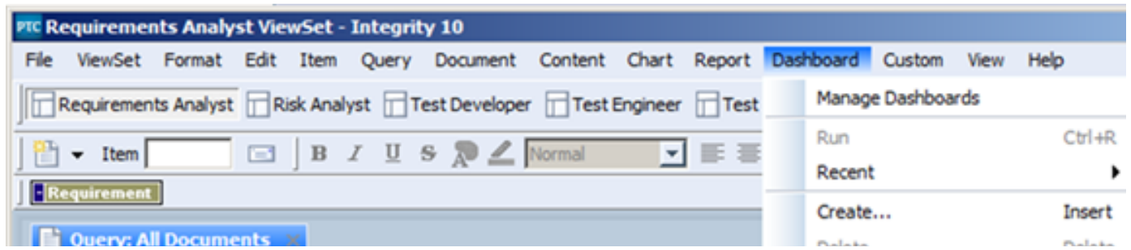
In this blog article, I'm going to show you how you can take objects like the charts and reports we built in previous blog articles as well as queries and use them to build a dashboard in PTC Integrity Lifecycle Manager.

The dashboard we are going to build will look as follows:

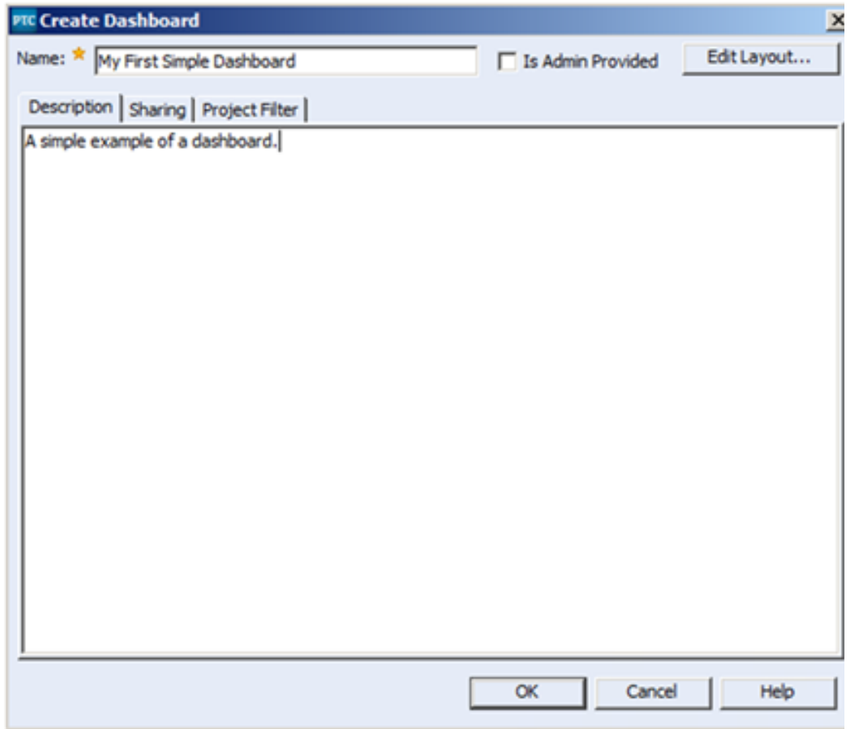


Next I will take you through a step by step process of how to build this dashboard. Perform these steps to build this dashboard:

1. From the main menu bar on your Integrity Client select Dashboard -> Create

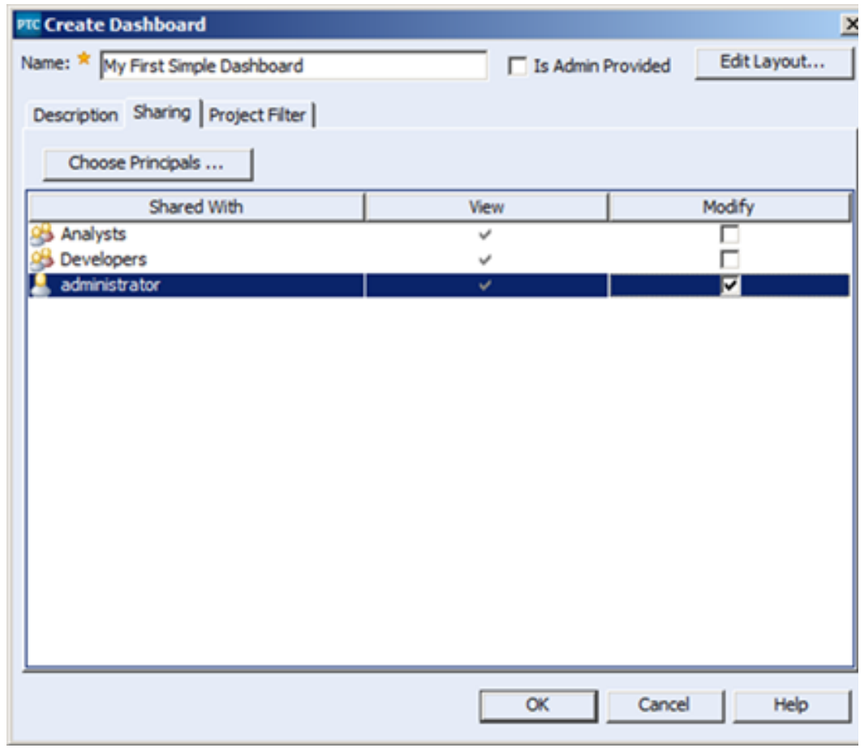


2. This will take you to the Create Dashboard dialog where we can enter in the various pieces of metadata to describe the Dashboard. We can use the Name and Description to provide information to the user about what the dashboard is and what it does. **Note:** *The "Is Admin Provided" checkbox is only active*



when the user creating the dashboard is a member of the Administrator group in your PTC Integrity Lifecycle Manager system. The "Is Admin Provided" checkbox is useful if your intent is to create dashboards to be used across your entire system to support your development processes. Individuals creating dashboards for their own use and for the use of their specific team would not require the "Is Admin Provided" functionality.

3. The Sharing tab is used to determine who has access to view the dashboard, as well as who has the ability to make changes to the dashboard. You can use the Choose Principals button, to select users and groups who can fulfil those roles. In this case I have made myself, the administrator, the only person who can make changes to the Dashboard, but anyone who is a member of the Analysts group or the Developers group has the ability to run the dashboard.



4. The Project filter tab allows you to set up filters based on selected projects to help narrow down the result set displayed in the objects that make up the dashboard. The Filter Type radio buttons allow you to apply whatever filters you choose in either a restrictive or non-restrictive fashion. The different types of filters are as follows:

A. The Filter Type of Open means that whatever filters you choose apply are merely a default suggestion, users are allowed to include results from any project outside the current project.

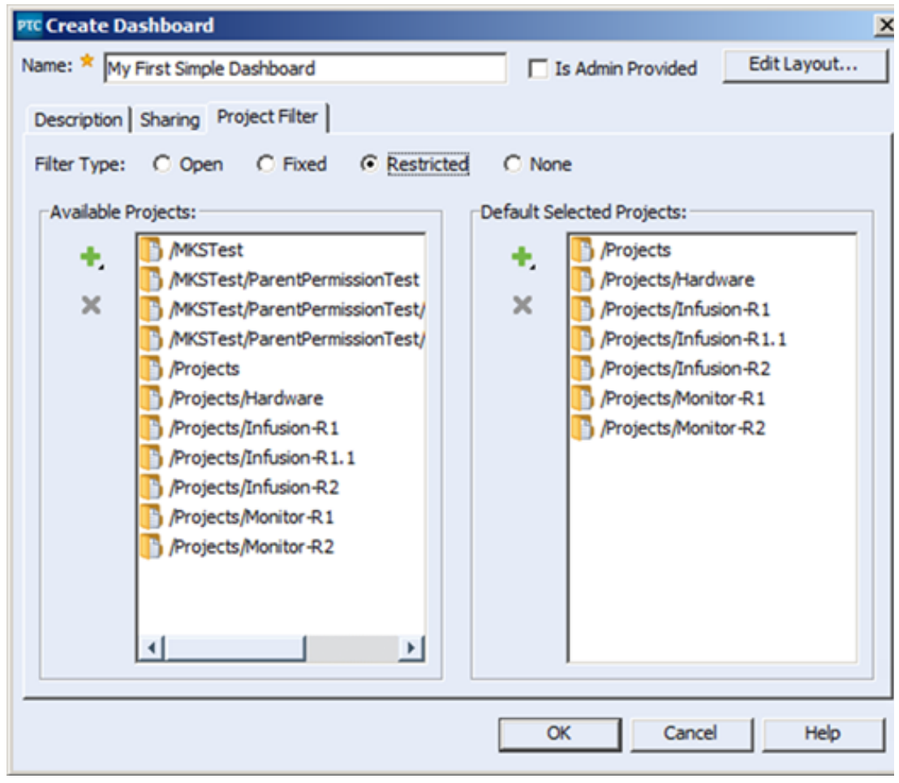
B. The Filter Type of Fixed means that the dashboard will only display results within the set of selected projects, and that's it.

C. The Restricted filter type will provide the user with a default selection of projects that the user can run the dashboard on, but using this filter type will also allow them to expand on that default filter selection to include more results, but only as far as the filter restriction allows.

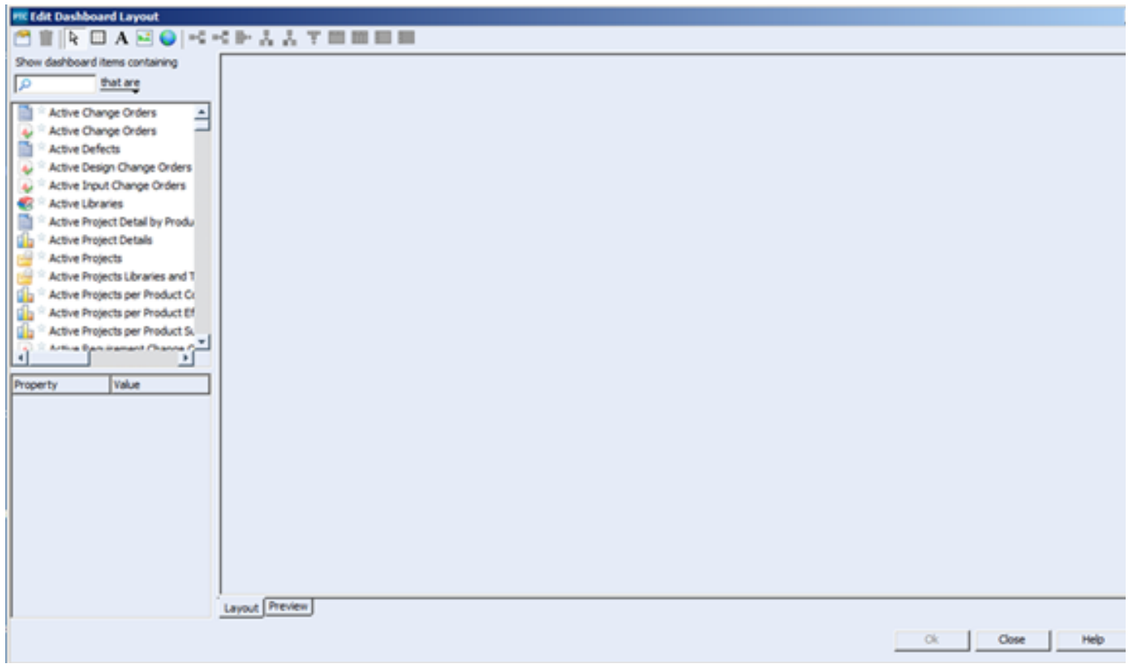
D. Finally, the Filter Type of None means that there is basically no filtering defined for the dashboard, all the results retrieved by the displayed Reports and Charts will be automatically run and displayed. This filter type is useful when the objects you've chosen to include in your dashboard are built with specific queries that retrieve a narrow result set.

NOTE: If you do not include filters, and choose to include objects in your dashboard with non-specific queries you run the risk of creating performance difficulties.

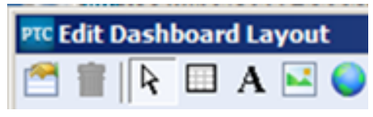
In this case I have chosen to build my dashboard using the Restricted filter type. By default when my dashboard runs the results will be restricted to only those specific projects located under the /Projects tree. If the user chooses to they can add results from any of the specified projects in the /MKSTest tree.



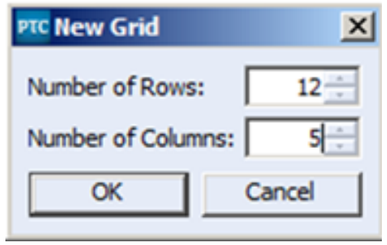
5. The next step is to actually lay out the objects you would like to see on your dashboard. To do this you use the "Edit Layout..." This will bring up the Edit Dashboard Layout dialog as shown below:



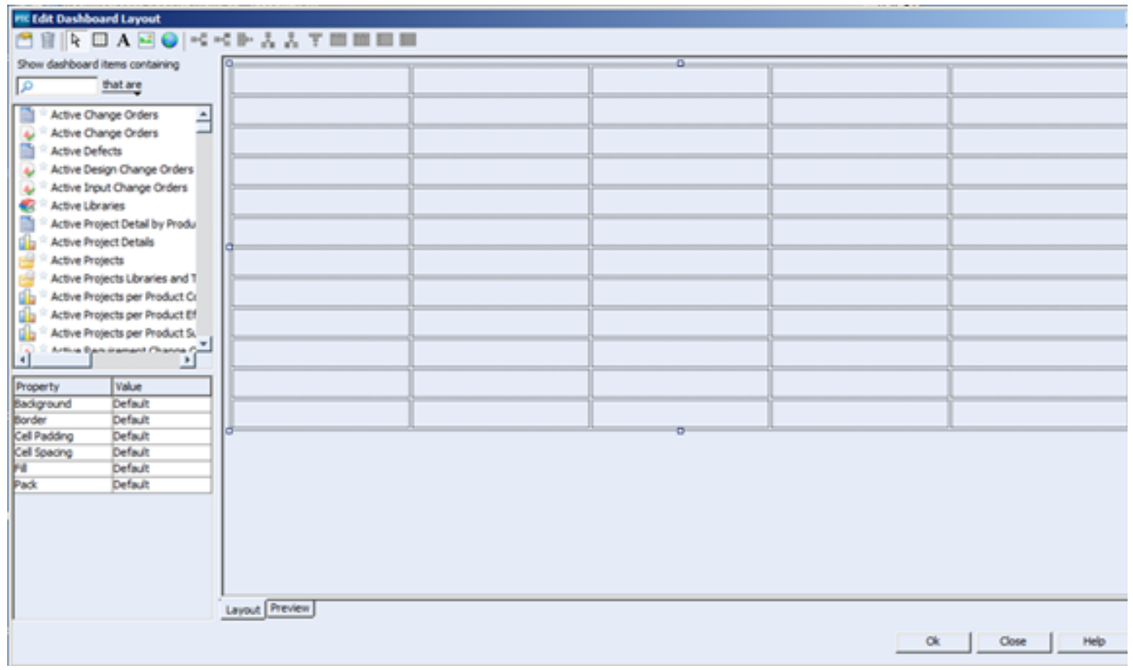
6. Before we can place any objects on the dashboard, we first need to define a grid to place them on. Select the Grid icon from the upper left hand corner of the Edit Dashboard Layout dialog:



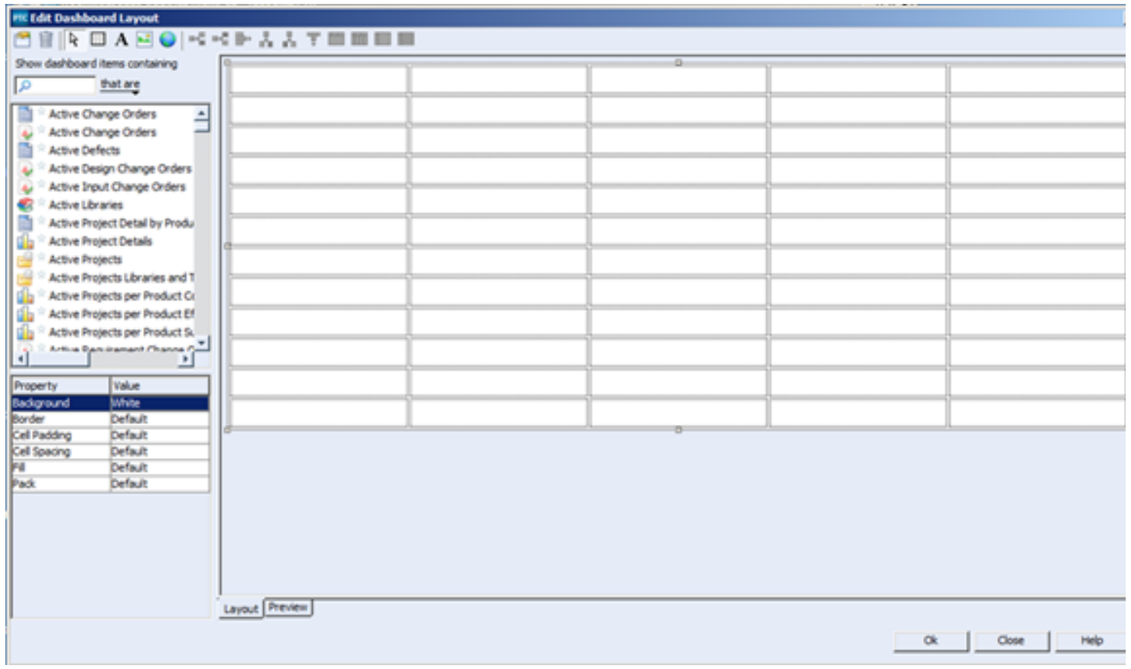
Then click within the layout pane of the Edit Dashboard Layout dialog. You will be presented with the New Grid dialog. From here you can define the initial dimensions of your grid in rows and columns. In this case I am going to create a grid with 5 columns and 12 rows. Don't worry if you don't get the columns and rows correct the first time, there are controls for adjusting your columns and rows.



7. The following grid is now inserted into the Layout pane:

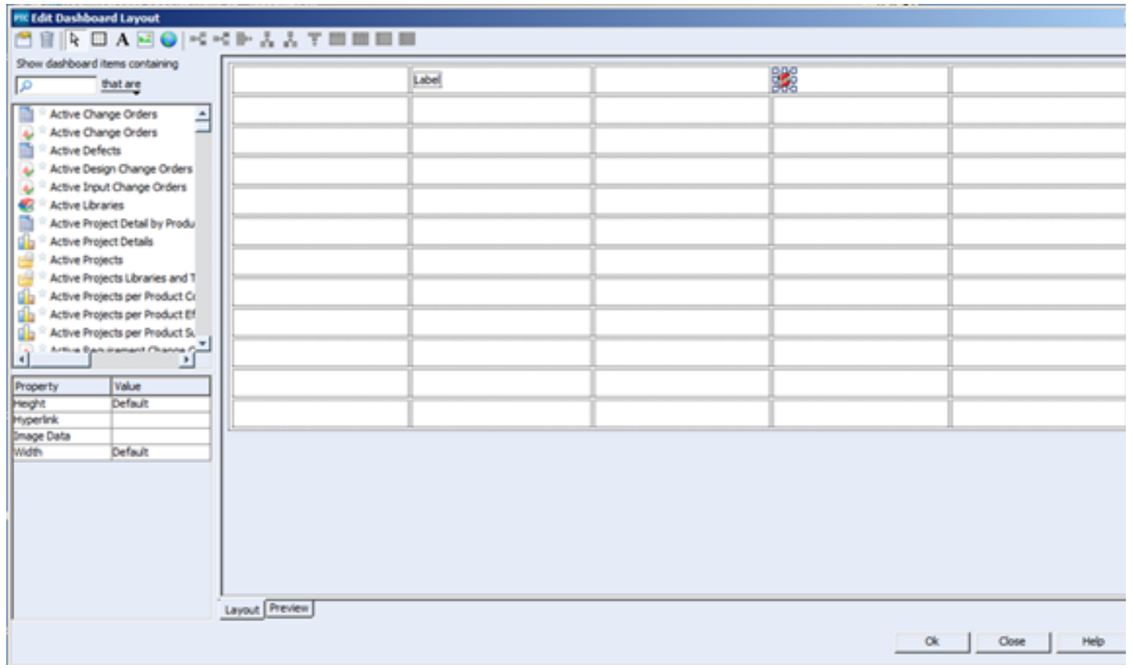


8. The first thing to notice is that grid as a whole is highlighted, and there is a set of properties on the lower left hand side of the Edit Dashboard Layout dialog associated with that selected grid. I'm going to change the Background of the grid to white.



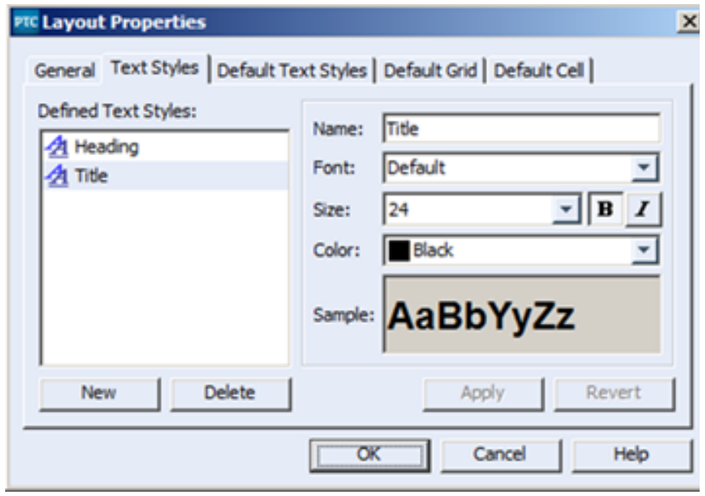
9. Now we can start adding objects to the grid to create the look and feel of the dashboard. The first thing I am going to do is to add my dashboard a title and my corporate icon to the dashboard. To do this I use the Label and Image icons respectively

I click on the icon in question, and drag the label and image objects onto my grid;



Next I select the items in question, and update the properties for each. For the Label field I enter “My First Dashboard” in the Text property, and for the Text style I pick “Title.”

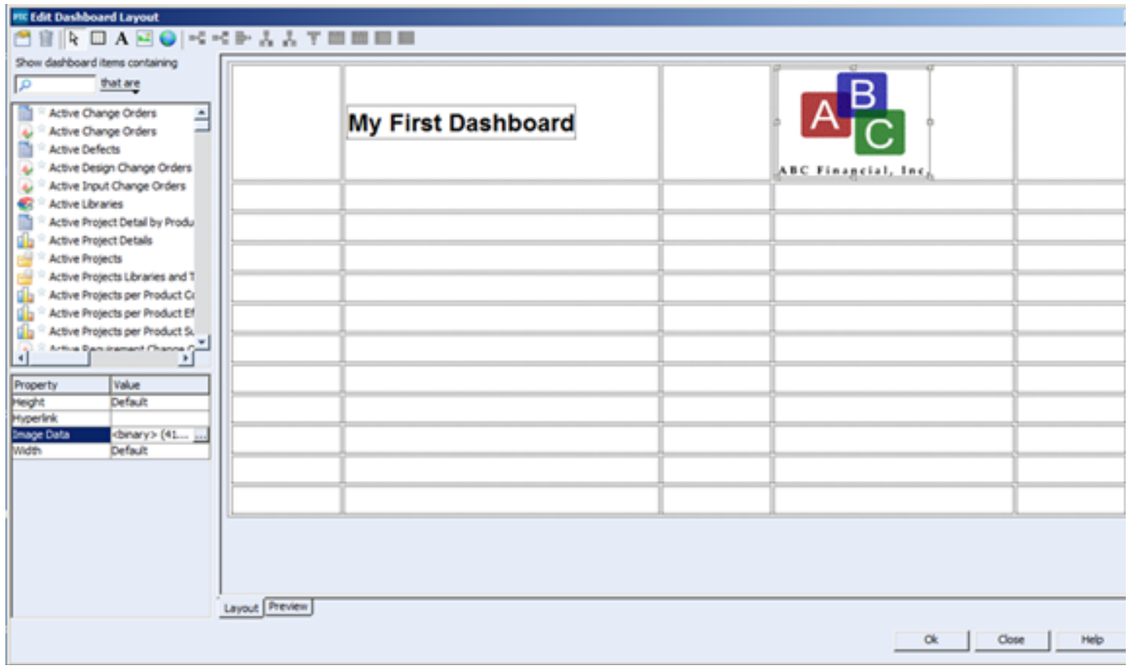
NOTE: You may have to create the Text Style “Title” yourself. Open the Layout Properties dialog and on the Text Styles tab, select the “New” button and define the new style as follows:



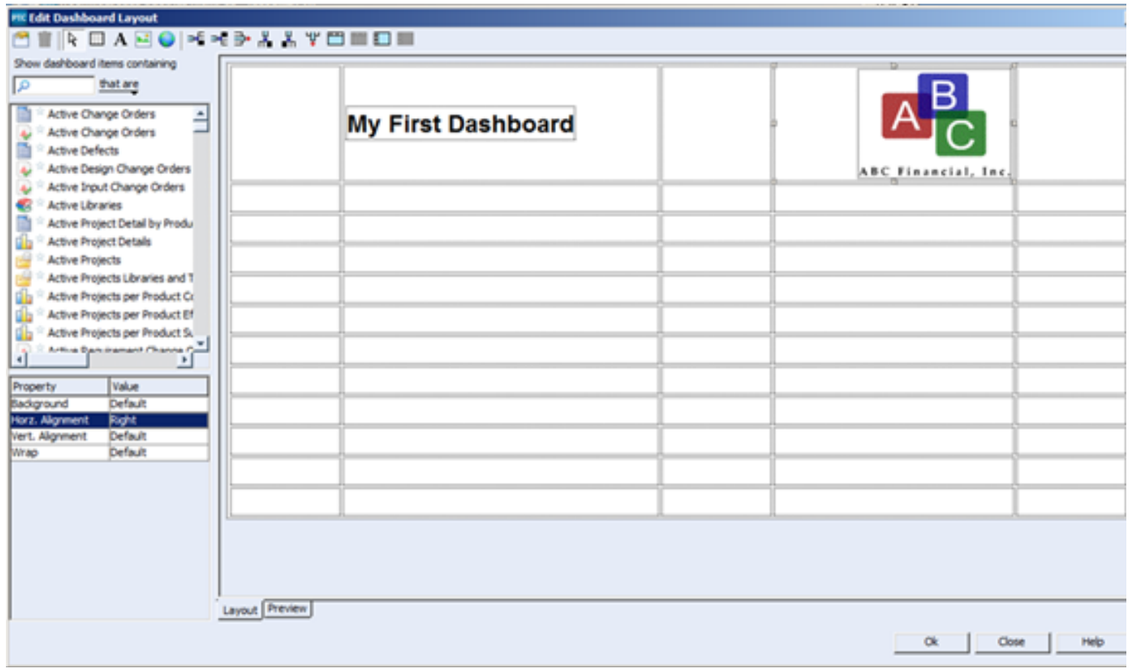
Note: On the cell containing the Title, you’ll have to set the Wrap property to false.

Once you’ve finished with the Label properties, you can move on to the image properties. Select the image icon you dragged into the grid to adjust the image properties. What I want to do here is to display my corporate icon. To do this I select the Image Data property field and click on the little browse icon, from there I can choose my icon from my local filesystem.

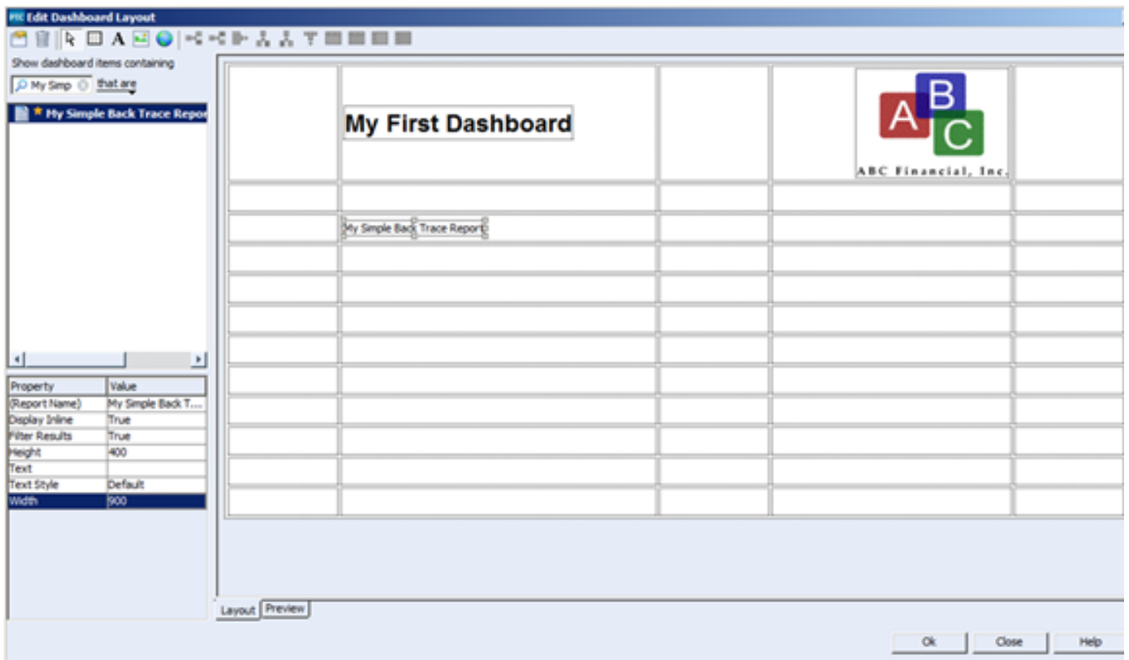
Once the Title and the logo have been added, my grid should look like this:



10. Next I will update the cell properties where my logo resides to ensure that it is right justified.

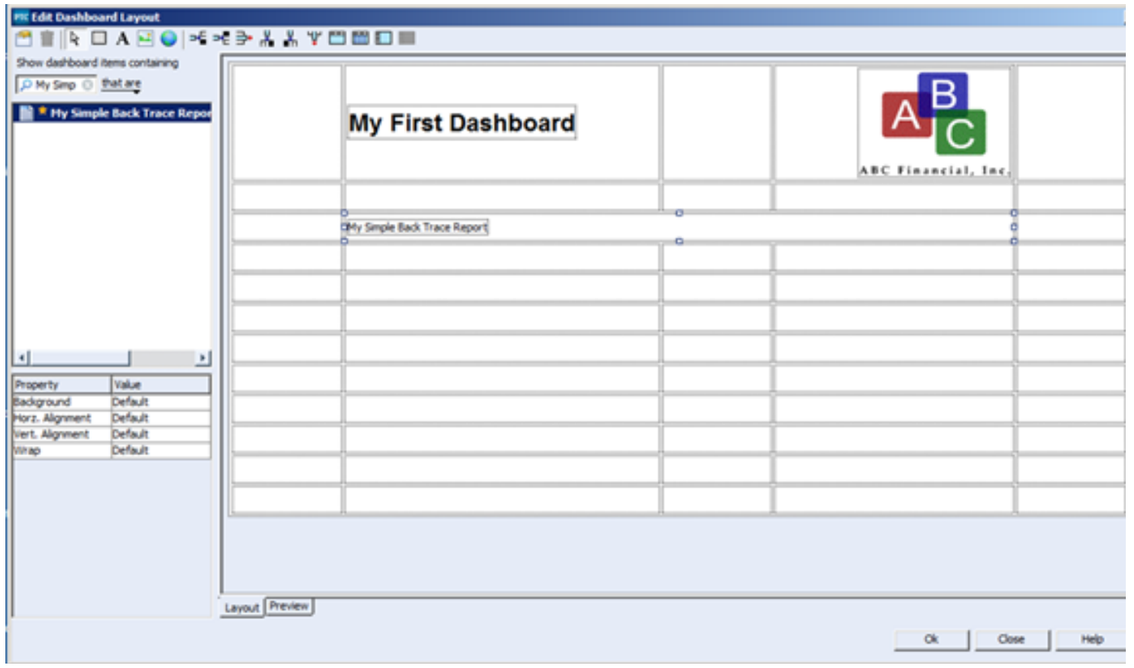


11. Next I will add the report “My Simple Back Trace Report”. To do this I will find the object in the Show dashboard items containing box. I can narrow down the size of the list by typing the title of the report I am looking for in the filter field provided. Once I have found the object I am looking for I can simply drag and drop it into the appropriate destination. Also note how I have updated the image properties:

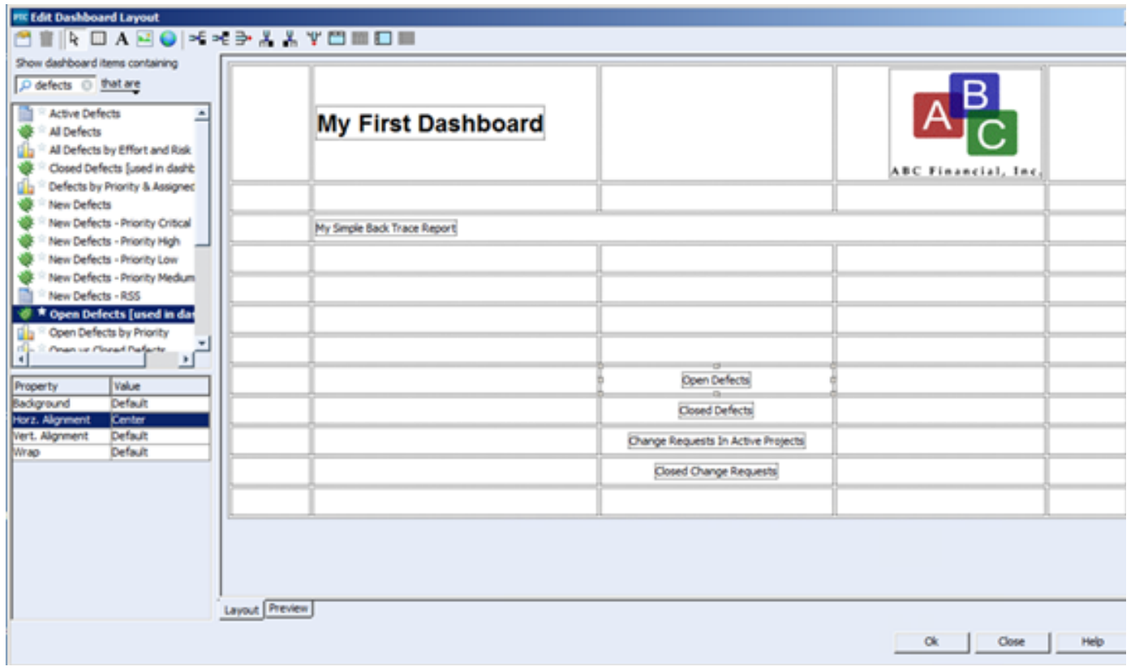


SOLVING THE TOP PTC INTEGRITY MANAGER STRUGGLES

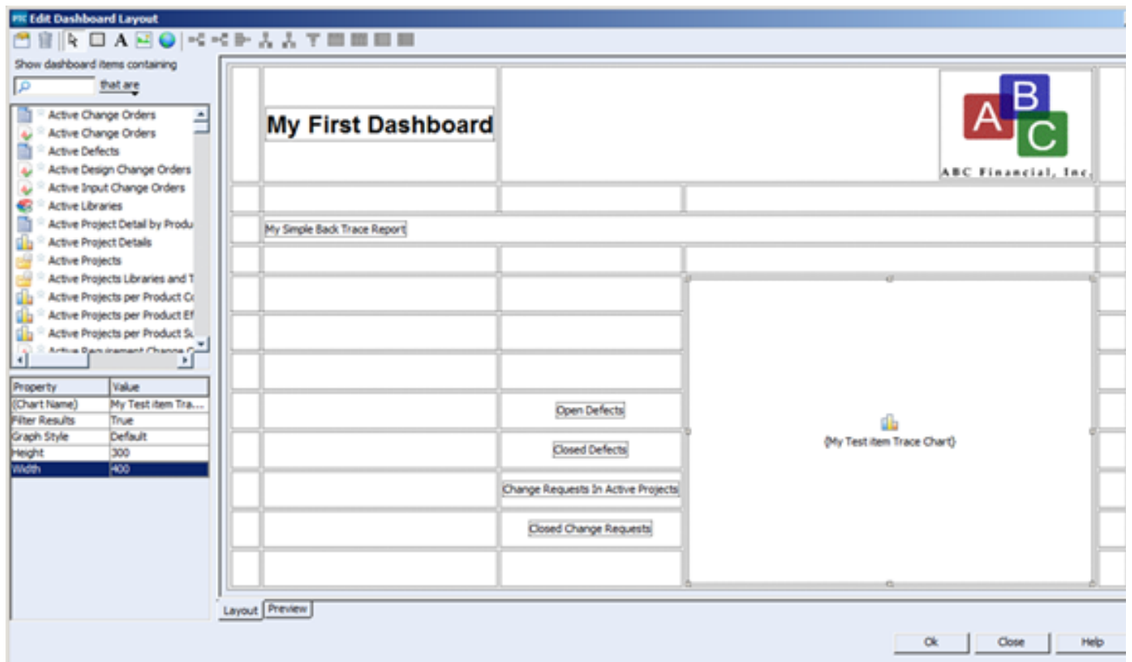
12. Since I want my report to span across the entire width of the report, minus the exterior columns of course, I need to merge the three interior columns into one column. To do this I start by selecting the cell where my report resides and then using the merge column icon I merge the cells together.drag and drop it into the appropriate destination. Also note how I have updated the image properties:



13. Next we will add the four queries to the grid. To do this we simply find the queries in the Show Dashboard items containing list and drag them onto the grid as follows:

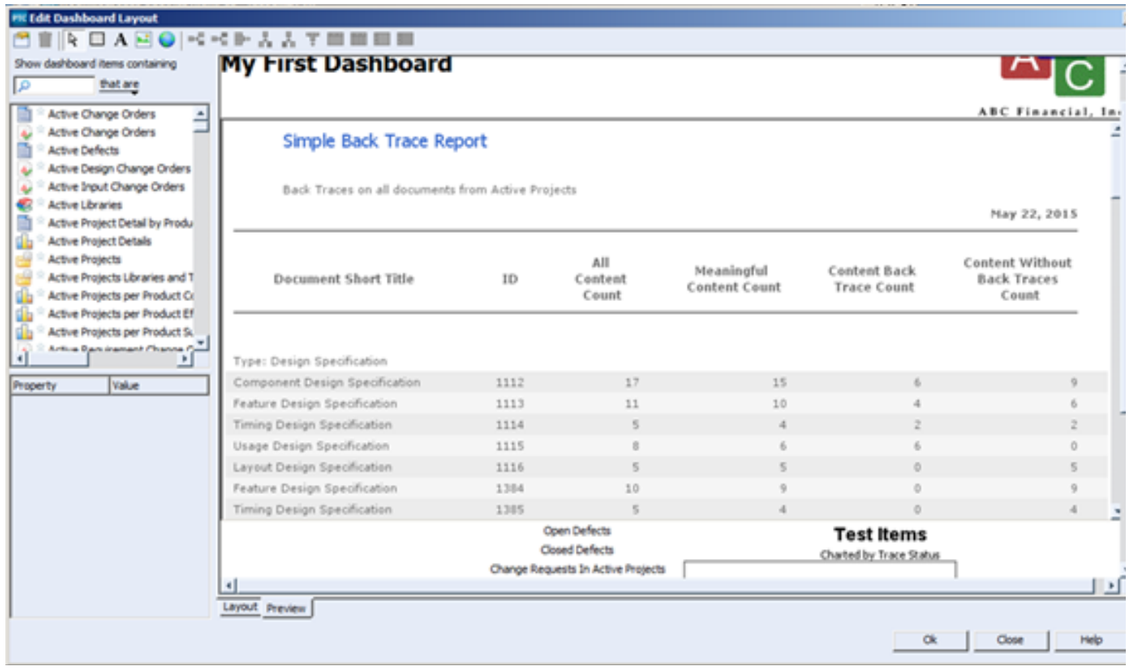


14. Next the chart called “My Test item Trace Chart” needs to be added to the grid. Unlike reports, charts will take up space immediately on the grid. Therefore, we will place the chart and use the merge row button so the chart appears to the right of the list of queries as one object as follows:



In order to make things fit better, I set the height and width to be 300 x 400 respectively.

15. If we were to preview the report as it stands right now, you’ll notice how the objects in the report do not appear to be spaced as nicely as they appear in the grid:

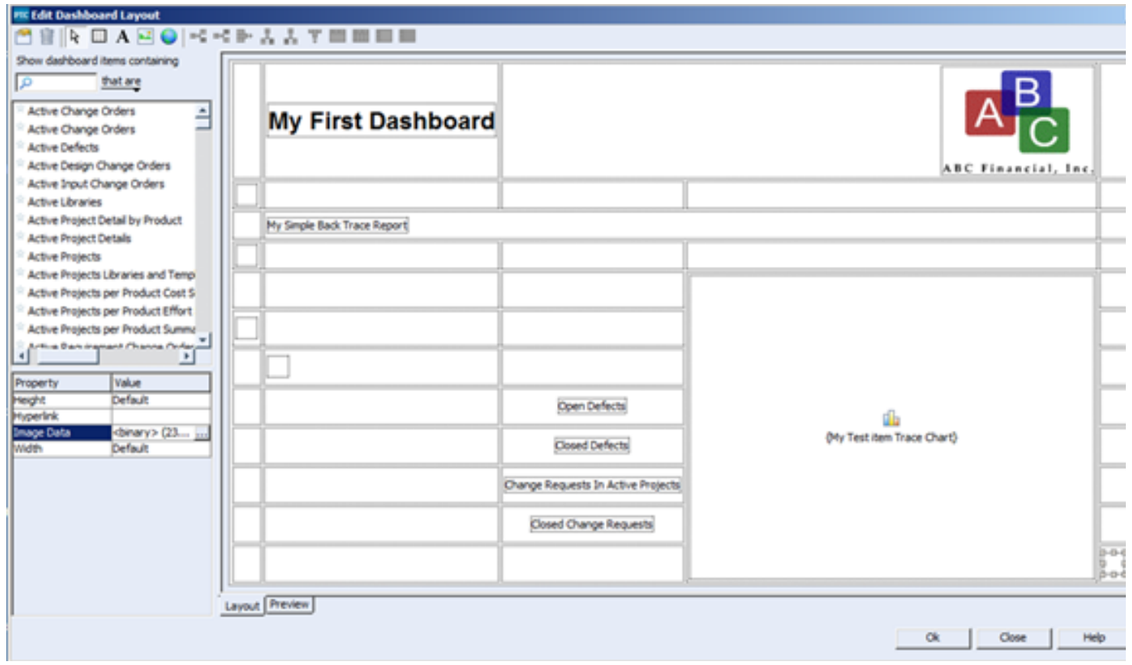


The problems in the dashboard are as follows:

- There is no right or left margin.
- There is no space between the title and logo line and the report.
- There is no space between the bottom of the report and the queries and Test Chart.
- The list of queries does not appear to be centered on the left margin of the chart.

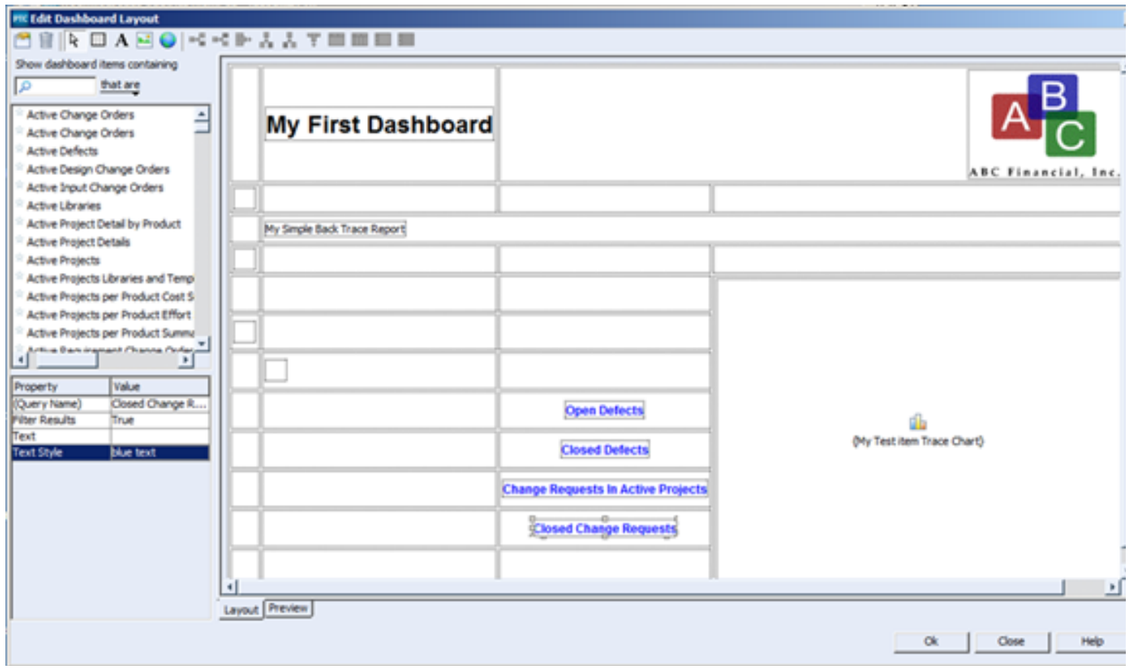
To resolve these issues, we need to introduce invisible spacers into the Dashboard. These spacers can be accomplished by Label boxes where the text matches the background, or you can use some pre-defined spacer images that can be found on your PTC Integrity server. You can ask your administrator to send you

a copy of these. For my purposes I am going to use a 20×20.png image file as a spacer, and I placed five of them on the grid as follows:

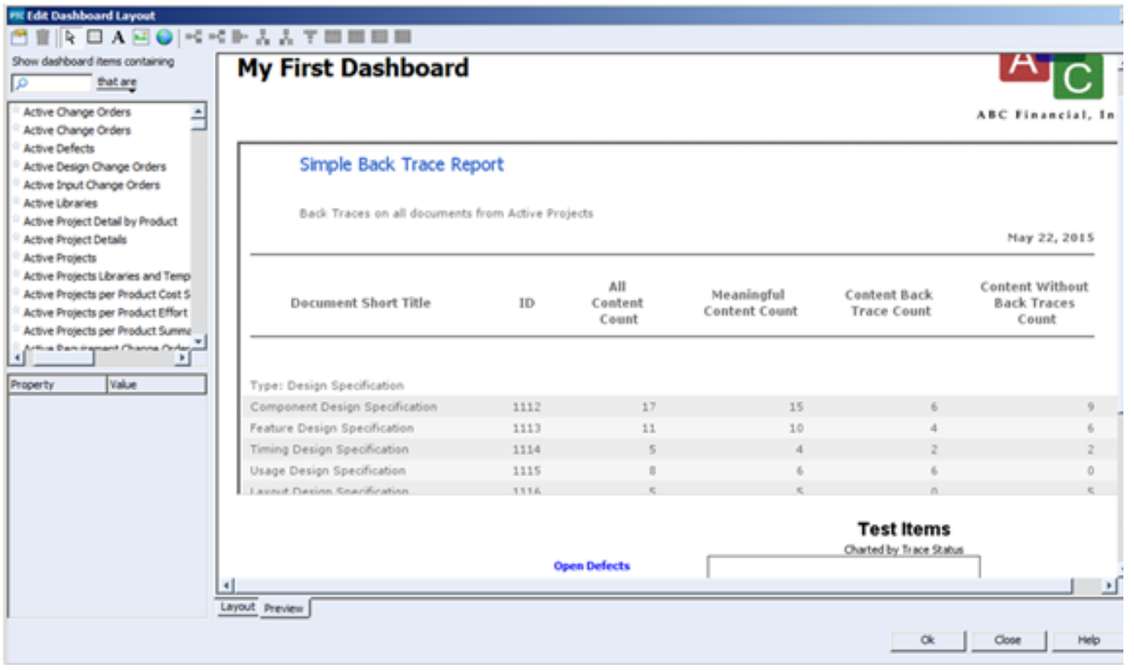


Note: In this case I set the height and width of the report to be 350 x 900 respectively. I did this to make the objects fit better on the grid.

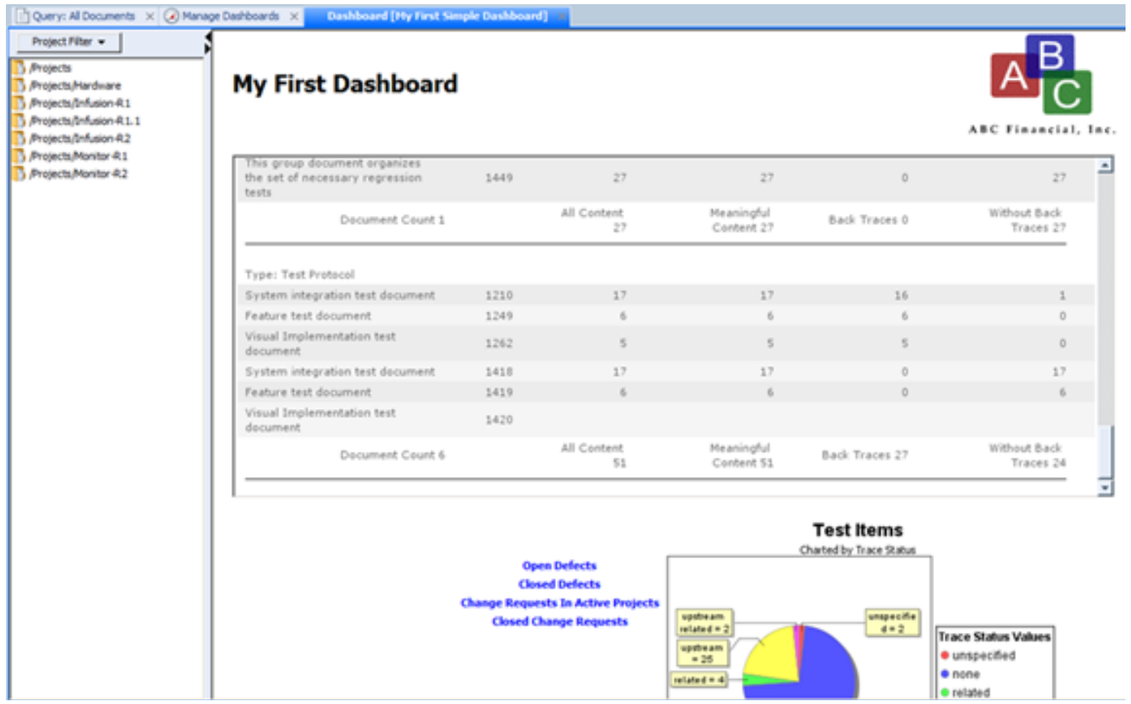
16. Lastly, in order to make queries look more like hyperlinks, I created a simple blue text style to change the text colours of the query names.



17. When we look at the report in the preview pane we now see this:



18. Once you've saved the Layout and saved new Dashboard, you can execute it from the Manage Dashboards list. The dashboard should look as follows:



Note: You may need to select the grid as a whole and set the Pack property to "True" in order to achieve the actual presentation shown here.

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