



TAKING OFF WITH REPORTING

Welcome

There's no use putting data into a system if you can't get it back out. In fact, the tools to report and display your data are much more important than the entry tools. Rock's reporting and analytics tools were some of the first features to hit the drawing board. We based them on years of real-world experiences – previous successes and lessons learned. We hope that you'll take the time to not only learn how to drive the tools, but more importantly, how to build a successful reporting strategy that provide consistent and reliable results.

Let's get started.

If You're Only Going To Read One Chapter

OK, now that we have your attention... Before diving into the tools let's start with a discussion on strategy. It's tempting to want to start writing your first report. But trust us - this chapter will save you countless hours and the embarrassment that comes from delivering conflicting and incorrect reports.

The usual workflow for application reporting goes something like this:

1. Get a request for a report.
2. Write the report per the request.

Seems pretty logical, right? This is actually a great strategy if you only get one report for the lifecycle of the application. Well, that's never going to happen! We all know you'll need to write hundreds of reports over the lifetime of the application. The problem is that many of these reports will have lots of similar requirements, with just small differences. Eventually, you'll end up wasting a good amount of time writing almost the same reports. If you're not careful, some of them might even conflict with each other. So why not slow down and create a strategy of re-usable reporting components? Ok, that sounds like a plan!

When designing Rock, we resisted the urge to rush and make a traditional ad-hoc reporting tool. We looked back at the years of lessons learned (embarrassingly enough there are many of them) and designed an architecture that allows you to build a reporting strategy.

What Makes Up a Report?

There are two facets to any report: filter and display criteria. Consider this example. Your organization's leader walks in your door and asks for a list of attendees over the age of 18 who began attending within the last two years. They would like to have the names, contact information and the number of times they have attended. Using this example, let's look at each of the facets of reporting.

1. **Filter Criteria:** These are the criteria that limit the results to display. They answer the "Who" part of the request. In the case of the example, the criteria would be:
 - a. Attendees
 - b. Greater than 18 years of age
 - c. Began attending in the last two years
2. **Display Criteria:** Once the results are filtered you must display them, with the necessary attributes, to the user. In the case of our example, these attributes might be:

- i. Name
- ii. Phone
- iii. Email
- iv. Address
- v. Number of Times Attended

Once you create your handy report for your leader, it's very likely they'll be back asking for further changes. Perhaps now they want another report with the same logic but only showing females. In most systems you'll have to start over and make a copy with the addition of the new criteria. Now you have two very similar reports to maintain.

With Rock, we have deliberately chosen to split the filter and display activities in reporting. You create your filters by defining *Data Views*. You then create your display by creating *Reports* that use the *Data Views*.

Reporting Strategy

The strategy part of reporting comes from the definition of your *Data Views*. It will be tempting to quick-write a very specific data view for each report. Consider, though, that data views can extend and build off of each other. For instance, you might create a data view that filters *Adult Members & Attendees* and then create a new data view that uses this view and adds the criteria of female gender. You've now created two views that can be used for the report at-hand AND in future reports. What's more, if you ever need to redefine what makes an *Adult Member & Attendee*, you can change it in one place and all reports that are built off of that view will get the new definition. These two data views are available out-of-the-box with Rock. Consider the results of these views on the Rock sample data in the figure below.

Sample Data View

Data Views

[Home](#) > [Data Views](#)

[Add Category](#) [Data View](#)

- Communication Segments
- Foundational Views
 - Adult Member & Attendee**
 - Adult Member & Attendee
 - Adult Member & Attendee
 - Children
 - Customer View
 - Member & Attendees
 - Pending People
 - Self Inactivated
 - Test Less Than
- Group Requirements

Adult Member & Attendees

Lists adults whose record status is 'Active' and connection status is 'Member' or 'Attendee'.

Applies To
Person

Category
Foundational Views

Filter
Record Status is 'Active' AND Connection Status is 'Attendee' or 'Member' AND In group of group type: Family, with role(s): Adult AND Is Deceased is False

Data Views
[Adult Member & Attendees > Females](#)
[Adult Member & Attendees > Males](#)

Reports
[Test](#)

[Edit](#) [Delete](#)

Results

Hide Results ^

<input type="checkbox"/>	Nick Name	Last Name	Gender	Email	Age Classification
<input type="checkbox"/>	Jyoti	Misra	Male	jr@hisemail.net	Unknown
<input type="checkbox"/>	Bruce	Wu	Male	phwujc@yahoo.com	Unknown
<input type="checkbox"/>	Cindy	Chang	Female	cindy1775@yahoo.com	Unknown
<input type="checkbox"/>	Ted	Decker	Male	ted@rocksolidchurchdemo.com	Unknown
<input type="checkbox"/>	Cindy	Decker	Female	cindy@fakeinbox.com	Unknown

Before starting any report, you should ask yourself:

- What, if any, criteria filter in this report might be reusable in future reports?
- What data views have I already defined that I can start with for this report?

Warning:

You can take the concept of reusable data views too far. Be sure to strike a balance between what is reusable and being overly complex.

Don't worry - we've only scratched the surface of Rock's tools. Now let's get our hands dirty learning about creating data views and reports as well as learning about Rock's other tools.

Filtering Using Data Views

The bulk of your reporting will happen in Data Views. Data Views are a way to select and filter records based on any field in the system. And by any, we mean any! For the most part, you'll be creating views that display individuals and sometimes groups. Data Views are not limited to just these two entities though. You can write a Data View for any type of data in Rock including financial transactions (aka giving), metrics, page views, etc.

Let's start out by looking at a couple of the Data Views that come out-of-the-box. Data Views are configured under `Tools > Data Views`.

Below is a figure of the default list of data views. Over time you'll collect plenty of data views. To help you organize them we allow you to create a hierarchical directory of categories. The use of categories again becomes a part of your reporting strategy. What good is a reusable data view if you can't find it when you need it?

Anatomy of a Data View

The screenshot shows the 'Data Views' section of a software interface. On the left is a sidebar with icons for navigation. The main area is titled 'Data Views' and contains a list of categories and a detailed view for 'Adult Member & Attendees'. The interface includes a search bar at the top right, a user profile icon, and a 'Data Views' section with a list of categories. The 'Adult Member & Attendees' category is selected, showing a list of data views and a 'Results' section with a table of data.

1 Categories
Data views are organized into hierarchical categories.

2 Data View Listing
Listing of data views in a category.

3 Data View Details
Details of a data view.

4 Data View Filter Summary
Note the filter summary. This is an automatically generated summary of the filters used to create the data view.

5 Data Views / Reports
Other data views and reports that are used by the current data view.

6 Security
You can easily secure your data views to limit access to them.

7 Results
The filtered results of your data view.

Now let's drill into the first data view called *Adult Members & Attendees*. As you

probably guessed, this view filters adults who have the connection status of *Member* or *Attendee*. It also only returns only active records. Click the **Edit** button to see how this data view is configured.

The screenshot shows the 'Editing a Data View' interface. The sidebar on the left contains navigation icons and a list of views under 'Foundational Views', with 'Adult Member & Attendee' selected. The main panel is titled 'Data Views' and contains an 'Edit Data View' form. The form has the following sections:

- Name** (1): A text field containing 'Adult Member & Attendees'.
- Description** (2): A text area containing 'Lists adults whose record status is 'Active' and connection status is 'Member' or 'Attendee'.'
- Category** (3): A dropdown menu set to 'Foundational Views'.
- Applies To** (4): A dropdown menu set to 'Person'.
- Post-filter Transformation** (5): A dropdown menu.
- Filters** (6): A list of four filters, each with a dropdown and a red 'X' button to remove it:
 - Record Status is 'Active'
 - Connection Status is 'Member' or 'Attendee'
 - In group of group type: Family, with role(s): Adult
 - Is Deceased Equal To False

At the bottom of the form are 'Save', 'Cancel', and 'Preview' buttons. The 'Preview' button is highlighted with a blue circle and the number 5.

1 Name / Description

The name and description of the data view. We highly recommend writing a detailed description for your data view. Be sure to include how you intend the data view to be used.

2 Category

The category the data view is assigned to.

3 Applies To

The entity type that you will be filtering (e.g. person, group, campus, etc.)

4 Filters

The filters used to define your criteria for limiting records.

5 Preview

To help check your work you can select the 'Preview' button. This will show the first 15 rows returned by your filters.

6 Post-filter Transformation

This is where you can optionally select one of the following post-filter

transformations:

- Children
- Family Members
- Father
- Grandchild
- Grandparent
- Mother
- Parents
- Spouse

Next, let's look at the `Adult Members & Attendees > Females` Data View. Initially you might expect to see a lot of the same criteria as the previous *Adult Members & Attendees* view with the addition of the female gender filter. Clicking the `Edit` button you'll see the data view strategy at work. Notice how the first criterion is *Include in Adult Members & Attendees* Data View? That says, "Take all of the filter criteria from the *Adult Members & Attendees* view and add it here." Then, all we need to do is add the additional gender filter.

Now, let's say in the future you'd like to enhance the definition of *Adult Members & Attendees* by ensuring that the age of the individual is over 18. You can add this to the base view and it will dynamically apply to all subsequent views that use it.

Age Classifications

Speaking of the ages of individuals... Rock allows for simple and quick filtering on whether an individual is an Adult or a Child using the Age Classification property. This property is available as a Person filter type when creating Data Views and as a Field Type when creating Reports (more on that in the next chapter). In Rock, an adult is anyone over the age of 18 or marked as an adult in one or more families. A child is anyone less than 18 or a child in all families. If either of these conditions is not met, the individual is marked as Unknown. Rock calculates age each time a person is saved, and re-calculates it every time the Rock Cleanup job is run.

Any vs All

At the top of the filter group you'll notice a setting that says *Show if Any/All of these are true*. You might be wondering what's the difference between *Any* and *All*. Let's define each:

- **All:** This means that each of the filter criteria must be true in order for a record to be displayed. One helpful trick is to read through each filter and insert the word *and* in between each. So for a record to display in the *Adult Members & Attendee* view, a record must: have a record status of active AND a connection status of member or attendee AND must be an adult in a family.
- **Any:** This setting means that if *Any* of the filter criteria is true then display the record. It's like inserting the word *OR* between each criterion.

If You Forget:

If you forget the difference, read the *Filter* summary on the data view detail view. It writes out the criteria inserting *AND* or *OR* for you.

Filter Groups

For complex views you may need to include both *AND* and *OR* type logic into your view. Filter groups give you this option. Say for instance you need to create a view that shows individuals who are married *AND* a member *OR* who are single *AND* an attendee. That data view would be configured like this:


[illegible]

Post-Filter Transformations

Last Updated: 7/7/2020

with ease. For example, if your Data View includes the kids attending summer camp, selecting the *Parent* transformation will find the parents of those kids. If your Data View includes *Adult Members & Attendees*, choosing the *Children* transformation will select the children of those selected. To give you as much flexibility as possible, Rock allows you to transform data views by children, father, grandchild, grandparents, mother, parents, spouse or family members.

Securing Data Views

There will be Data Views that you want to limit access to. Note that you can control who has access to Data Views. To change the default security on a Data View click the  button on the data view details screen.

You can also check the access for Data View categories. This allows you to modify the security for all Data Views in that category.

Taking Security Further

Controlling who has access to Data Views is important. But you also need to limit who can make new Data Views with certain criteria. You can limit what filters are available to specific users and groups under

`Admin Tools > System Settings > Data Filters`. Here you'll see a list of available filters with the ability to change who has access to use each filter.

When filtering on the attributes of an entity (like person attributes), normal attribute security will be used in controlling access.

You can also control security on the Data View transforms. This can be configured under

`Admin Tools > System Settings > Data Transformations`.

Let's Go Farther:

You can create your own post filter transforms and custom filters. Doing this does take some programming knowledge but it's possible. See our developer docs for more information.

Persisting Data Views

Sometimes when you have an extremely large or complex Data View, it can take a long time for Rock to filter down to just the records you're interested in. This can be critical when you're relying on the information in the data view for reports, for workflow actions (using *Lava*) and just to keep the load on your server as low as possible. This is especially true when you have data views referencing several other data views.

Persisted Data Views to the rescue! If you provide a number of minutes in the *Persisted Schedule Interval* at the top of your Data View, then Rock will only calculate the records in the list as frequently as you specify. That means that when you click on the data view, Rock already knows what records are in the list and can provide them extremely quickly. (Calculating the contents of persisted data views is what the *Update Persisted*

Dataviews job does, in case you were wondering).

Since Rock isn't calculating the contents of these Data Views every time you load it, that does mean that the list might be out of date by up to however many minutes you specify. For instance, let's say that you have a very involved data view that, among other requirements, requires that the people in it are members of a certain group. But it's such an involved data view that it takes quite some time to load, so you set a Persisted Schedule Interval of 120 minutes. If Ted Decker matches all of the filters, then he will show up in the Data View when it's calculated, as expected (along with anyone else who matches all the filters). Now, if Ted leaves the group that you have to be a member of to be included in that Data View, it's possible that he will continue showing up in that Data View for up to 2 hours; the next time that persisted Data View will be re-evaluated.

Usually it's not extremely important that your Data Views be absolutely accurate up to the second, so that might not be a big deal. But if you're relying on a data view for something that needs to truly reflect the absolute latest data, then you should leave that *Persisted Schedule Interval* setting blank.

Nested Persisted Data Views

Now, let's look deeper at nested Data Views and how it works when they're persisted. Let's say that we make "Adult Member & Attendees" a Persisted Data View - it's going to be calculated every 120 minutes. Let's also say that we have another Data View that has a filter that specifies that the people must also be in the "Adult Member & Attendees" Data View. (Usually you'd have other filters as well, naturally). It would look something like this:

Nested Data Views

Data Views

[Home](#) > [Data Views](#)

[Add Category](#)
[Data View](#)

- Communication Segments
- Foundational Views
 - Adult Member & Attendee:
 - Adult Member & Attendee:
 - Adult Member & Attendee:
 - Groups studying Genesis
 - Member & Attendees
 - Parent Data View**
 - Pending People
 - People with Duplicate Email
 - People with Duplicate Phor
 - Self Inactivated
 - tagged
- Group Requirements

Edit Data View

Id: 17 [+ Create Report](#)

Name *

Post-filter Transformation

Description

Category *

Applies To

Show if ☐ Any ☒ All of these are ☐ False ☒ True

[Add Filter Group](#)
[Add Filter](#)

Filter Type

Data View
☒ Use Persisted

[Save](#)
[Cancel](#)
[Preview](#)

Crafted by the [Spark Development Network](#) / License

Since "Adult Member & Attendees" is now persisted and only calculated every 120 minutes, then whenever you load a Data View that references it and chooses "Use Persisted" as shown, the list of Adult Members and Attendees might be as much as 2 hours old. Hopefully nobody stopped being a member/attendee that quickly, but if they did, they could continue showing up on this Data View until the next time the nested Data View is calculated.

Put another way: if a Data View has persisted child data views, it will use the **persisted version** of the child data view if "Use Persisted" is enabled as shown.

In general, it would be much faster to persist a data view if "Use Persisted" is enabled on its child data views. However, its accuracy is limited to the child data view that had the *longest* "Persisted Schedule Interval".

Displaying Data Using Reports

Now that we've selected the records we need, we're ready to define how we want our report to display. Usually this means adding fields to our report. Let's see how this is done.

Reuse Is Good:

Separating the filtering from the display also has the added benefit that reports with separate display features can use the same filtering logic. In many systems you would have to redefine the same filters twice. This is a lot of extra work, and it's a nightmare to keep consistent over time.

You define your reports under `Tools > Reports`. Like their Data View cousins, reports are also organized using hierarchical categories.

Reports
Home > Reports

+ Add Category + Report

- Organization 1
- Data Integrity
- Adult Members and Attendees 2
- Background Check
- Test

Adult Members and Attendees

Shows a list of all adults who have a connection status of member or attendee.

Edit Delete 3 Data View 4

Report Data 6

Hide Results ^

Email	Gender	Last Name	Name
jr@hisemail.net	Male	Misra	Jyoti Misra
phwujc@yahoo.com	Male	Wu	Bruce Wu
cindy1775@yahoo.com	Female	Chang	Cindy Chang
ted@rocksolidchurchdemo.com	Male	Decker	Ted Decker
cindy@fakeinbox.com	Female	Decker	Cindy Decker
ben.jones@fakeinbox.com	Male	Jones	Ben Jones
jim.simmons@fakeinbox.com	Male	Simmons	Jim Simmons

1 Categories

Reports are also organized into hierarchical categories..

2 Report List

List of reports for the selected category.

3 Report Details

The details for the selected report.

4 Data View

A link to the data view that drives this report.

5 Security

Reports can be secured to limit access to who can view them.

6 Results

The report results.

7 Grid Actions

The data from reports can be used to send communications, export to Excel, or other actions appropriate to the entity they refer to.

Creating A Report

Let's jump right in and see how we create a new report. For our example, we'd like to create a report we can use to learn the names and faces of our members and

attendees. The figure below shows what this report would look like. The callouts for the figure explain the various steps used in the creation of our report.

Editing a Report

Reports

Home > Reports

+ Add Category + Report

Organization

Data Integrity

Test

Name 1

Adult Members & Attendees

Description

Shows all adult members that have a connection status of member or attendee

Category 2

Organization

Sorting 5

Name

Ascending

Applies To 3

Person

Data View 4

Adult Member & ...

Advanced Settings

Resulting Row Limit 4

Query Hint

Communication Merge Fields

Communication Recipient Fields

Fields 6

+ Add Field

Field Type

Person Name

Show in Grid

Column Label

Name

Display Order

FirstName LastName

LastName, FirstName

Show As Link

Yes

Save Cancel

Crafted by the [Spark Development Network](#) / License

1 Name / Description

First we give our report a name and description. We highly recommend that you spend some time writing a clear description that tells what the report does and how it should be used.

2 Applies To

Next, select what type of entity you are writing a report for. In most cases this will be *Person* but, like Data Views, you can report on anything.

3 Data View

Now that you have selected the entity, you'll see a list of Data Views you can use as the source for your report.

4 Resulting Row Limit

If needed, you can limit the number of records that are displayed on your report.

5 Sorting

You can sort your report by any field you add in either ascending or descending order. You can even choose to sort on more than one field at a time.

6 Fields

Finally you'll add the fields you want to display on your report. You can determine for each field whether or not you want it to display in the grid. You might be thinking, "If it's not on the grid where else would I see it?" If you don't check this button, the field will still be available when you export the report to Excel from the bottom of the grid. This is helpful for supporting information that is not needed very often.

The Power Of Lava

You'll notice that one of your field options is *Lava*. Lava is a templating engine that allows you to customize the way data is presented. With this field type you can mix and match data in lots of different ways.

One Caveat:

Every field you would like to use in your Lava must be included in your report. For instance, if you want to use the *First Visit* date in your Lava, you have to have that field in your report already. (You can disable showing the field in the grid if you wish). You would access your First Visit column using a Lava Merge Field of the name of the column you want to reference, eliminating any spaces. In this case, information in the "First Visit" column would be displayed using the Lava Merge Field `{{ FirstVisit }}`. Also, you can't reference one Lava column's value from another.

Here are a few examples: Last Name, Nick Name

```
{{ LastName }}, {{ NickName }}
```

Last Name, Nick Name as a link to the 'Person Profile' page

```
<a href="/Person/{{ Id }}">{{ LastName }}, {{ NickName }} </a>
```

If baptized, show field as a checkmark

```
{% if BaptismDate != null %}  
  <i class="fa fa-check"></i>  
{% endif %}
```

For some fields (like Phone Number), use the dot notation to get the property you want

```
{{ Phone.NumberFormatted }} unlisted: {{ Phone.IsUnlisted }}
```

Let's pull this all together: this setup would create a report where the person's name links to their profile, and display a check mark if they are baptized:

Editing a Report

Home > Reports

Add Category

Report

Organization

Adult Members & Attendees

Name
Adult Members & Attendees

Description

Category
Organization

Sorting

Applies To
Person

Data View
Adult Member & ...

Advanced Settings

Fields

Field Type: Nick Name

☐ Show in Grid

Column Label
Nick Name

Field Type: Last Name

☐ Show in Grid

Column Label
Last Name

Field Type: Lava

☒ Show in Grid

Column Label
Person

Template

```
1 <a href="/Person/{{ Id }}">{{ Lastname }}, {{ Nickname }} </a>
```

The screenshot shows a configuration window for report fields. It contains two field settings:

- Field Type:** Baptism Date
 - ☐ Show in Grid
 - Column Label:** Baptism Date
- Field Type:** Lava
 - ☒ Show in Grid
 - Column Label:** Is Baptized
 - Template:**

```

1 {% if BaptismDate != null %}
2   <i class="fa fa-check"></i>
3 {% endif %}

```

At the bottom of the configuration window are 'Save' and 'Cancel' buttons. Below the window, a footer reads: 'Crafted by the [Spark Development Network](#) / License'.

We should point out that usually you could simply use the stock *Person Name* field to create a linked name formatted this way, without using Lava. But if you wanted to link to an alternate person profile page, this would give you full control over doing that.

You can find out more about Lava on the [Rock RMS learning website](#).

If you want more information on using Lava in merge documents, you'll find that in the [Admin Hero Guide](#).

Let's Go Farther:

You can also create your own custom report fields with some developer knowledge. See our [developer docs](#) for all the details.

Persisted Data Views in Reports

As you'd expect from our earlier discussion, if your report is based on a Persisted Data View, the report should display much more quickly than if the Data View wasn't persisted. That's because it's not having to figure out which rows to display- that's already been calculated, so it'll just use that list.

And if your report is based on a persisted Data View that also references *other* data views, it doesn't actually matter (at the report level) whether those nested Data Views are persisted or not. That's because the "top level" Data View that the report is using, is

persisted. So it's not actually having to go and look up those nested Data Views at all in order to generate the report. Neat, huh?

Securing Report Data

It's important to know that anyone with access to a report will be able to view all the data in that report. This includes data they wouldn't normally be able to access elsewhere in Rock. In effect, report data bypasses the person's security rights. That might sound alarming at first, but don't worry. Rock was intentionally designed this way, and we have some suggestions for securing your data.

First, you might be wondering why security is not applied to report data. If Rock were forced to apply a person's security to the rows returned in a report, there would be two problems:

1. Sometimes you want to bypass security for valid reasons. For instance, let's say you have a report that lists people who have donated to your organization so you can send handwritten thank you cards. This report doesn't show specific gifts, but does use giving data to list the individuals. The person tasked with writing the cards probably doesn't have access to financial data in Rock. If the person's security were applied to the data in the report, the report would not give them results because it references financial data. Now they can't do their job and the only solution is to give them security they don't need.
2. Performance. Let's say your report provides a list of group members and their group. If security were enabled, the system would need to run a security check for each row in the report to see if the person viewing the report has access to the group. Remember, the security on a group is hierarchical on group structure, group member role and on the group type. All of those areas would need to be evaluated. You can see how quickly this adds up, even to the point where the report will time out before results can be returned.

So, what should you do?

It starts with the report's author. The author is responsible for considering the security of the data they're providing. However, keep in mind that security is enforced at the time of authoring. For instance, when building a data view the author can't exclude groups that they don't have access to. If group data is displayed in the report then those groups will appear on the report, which might not be desired.

Also, don't forget you can also apply security to the reports themselves. Limiting access to the report ensures the data it contains can only be viewed by the intended individuals.

Another approach is to look for configurations outside of reporting that might provide the security you need. For instance, if there is a certain type of group you're concerned with (like a recovery group) make sure those groups are all of a specific group type. Then you can "apply security" by limiting the group types shown in your report. You're not actually doing anything with security, but adjusting your configuration in this way can help ensure sensitive data stays secured.

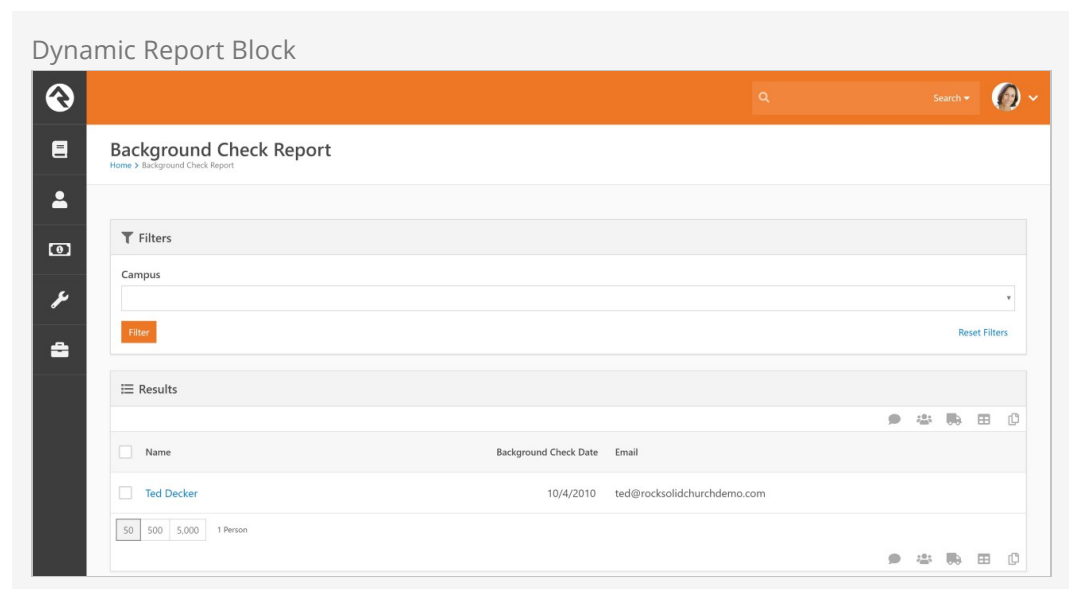
As you can see, planning is important in developing data views and reports. You want to ensure that the individuals who can view the report are identified, and that provisions

are made so that sensitive information does not inadvertently leak.

Dynamic Report Block

As you create reports you may find that you need to duplicate Data Views and Reports to solve similar problems. For instance, your organization may want a list of people who have a background check expiring in the next 30 days. Let's say the report will be used at each of your campuses. You might be tempted to create a data view and report for each campus, but there is an easier way.

Rock provides a block entitled *Dynamic Report* that shows a specific report but also allows you to display specific filters of the report's underlying data view and allow the user to modify them. Let's see our report in action with the use case of our class.



As you can see, the block looks like the standard report grid with the addition of a filter list from the data view. Let's walk through the steps to recreate this.

Create Data View

The first step is to create the data view under `Tools > Data Views` that will drive the report. Here we have two filters: campus and our background check logic. Notice that we leave the campus blank. This basically says "show any campus," which will be our "default."

- 1 Results Title**
The title text to use for the results grid.
- 2 Results Icon CSS Class**
The CSS icon to use for the same grid.
- 3 Filter Icon CSS Class**
The CSS icon to use for the filter panel.
- 4 Filter Title**
The title text for the filter panel.
- 5 Report**
The report we created in step 2.

Filters:

After selecting a report, Rock will look at the data view for that report and list its filters. Each filter includes the following options:

- 6 Filter**
The data in "Filter" is what can usually be used in a URL parameter to pre-set a filter where you'd type text. For instance, a "First Name" field might show a filter of `Property_FirstName`, in which case a URL like `/page/123/?Property_FirstName=Ted` would pre-fill and pre-filter the report for people with a first name of Ted. (Note that *Campus* and *Campuses* are special cases; since these aren't text boxes, try using `?CampusId=1` or `?CampusId=1,2` to set these.

- 7 Options:**

For each filter in your Data View, you'll be able to configure these options which control whether the user can specify which filters are used:

- **Visible:** This tells the block whether the filter should be shown to the user for them to modify. In our sample we let them change the campus but not the background check date.
- **Configurable:** Determines if the user should be allowed to modify the criteria of the filter. At first you might think this odd, as when would you ever not want to allow the criteria to change, but it'll make sense when combined with the next option.
- **Toggle Filter:** This setting will show the filter with a checkbox next to it. Unchecking the box will disable the filter entirely.

8 Pre-HTML

This is HTML which will be shown before the filter option at the top of the Dynamic Report block. You can use this to group controls together in a well, or change their widths using Bootstrap classes, for instance.

9 Label

The text you put here will determine what title the user will see associated with the filter. The default value of `{{ Label }}` will display the title of the filter from the source Data View filter

10 Post-HTML

This is HTML which will be shown after the filter option at the top of the Dynamic Report block. You can use this together with PreHTML to create some neat effects and change the layout of your filters.

The *Dynamic Report* block allows you to control the filtration of multiple data views. If your report uses a data view that is based on another data view, you can set your filter to look at only the top-level data view or to use both.

As you can see, the *Dynamic Report* block is very flexible and powerful. Once you create your first one, you'll find it's one of the most popular tools in your toolbox.

Dynamic Data Block

You should be able to use data views and reports to meet most of your reporting requirements. If you have a special requirement that can't be met, or you prefer a different user experience than what reports provide, there is the Dynamic Data block.

When you add a dynamic data block to a page (see the [Designing and Building Websites with Rock](#) for details on adding blocks to pages), you have the ability to craft the display of filtered data. Let's walk through the various options of this block.

Dynamic Data Block

The screenshot shows the 'Dynamic Data Block' configuration window. It includes a sidebar with navigation icons and a main configuration area. The configuration area has several sections: 'Page Name' and 'Page Description' at the top; a 'Query' section with a text area containing an SQL query; a 'Query is a Stored Procedure' section with a checkbox; a 'Hide' section with a 'Columns' dropdown; a 'Parameters' section with a text area; a 'Person Report' section with a checkbox; a 'Show Grid Actions' section with checkboxes for 'Communicate', 'Merge Person', 'Bulk Update', 'Excel Export', and 'Merge Template'; a 'Show Grid Filter' section with a checkbox; a 'Formatted Output' section with a text area containing HTML/PHP code; a 'Page Title Lava' section with a text area; and a 'Save' button at the bottom right. Numbered callouts (1-13) point to specific fields: 1. Page Name, 2. Query, 3. Query is a Stored Procedure checkbox, 4. Hide Columns dropdown, 5. Selection URL, 6. Parameters, 7. Communication Merge Fields, 8. Person Report checkbox, 9. Communicate checkbox, 10. Show Grid Filter checkbox, 11. Formatted Output, 12. Page Title Lava, 13. Encrypted Fields.

1 Page Name/Description

This allows you to reset the title and description of the page from within the block.

2 Query

This is the SQL query or stored procedure call (more on procedures below) for defining the data to be displayed. SQL is a standard reporting language used by most databases. There are plenty of resources online for learning its syntax.

3 Query is a Stored Procedure

This setting tells Rock that you will be calling a stored procedure vs a straight SQL statement. This allows Rock to configure any parameters needed for the stored procedure.

4 Column Display

By default all the columns returned by the SQL query or stored procedure will be displayed. This setting allows you to specify that only some columns should be shown, or some columns should be hidden. This is

helpful if your SQL defines several columns that you want to be displayed when exporting to Excel, but you want a limited subset to display on the page.

5 Selection URL

The url someone is redirected to when they click on a row in the grid. Any column's value can be used in the url by including it in braces. For example, if the grid includes an *Id* column that contains *Person Ids*, you can link to the Person view, by specifying a value here of '~/Person/{Id}'.

6 Parameters

When using stored procedures, you can pass in parameters to create dynamic filters. More on this feature is covered below in the *Extra Power from Stored Procedures*.

7 Communication Merge Fields

List any field you want to be available on the communications page as merge fields.

8 Person Report

If your query returns a list of people, you'll want to check this box. It will enable several features that are specific to listing individuals. For instance, the grid will contain a link to the communications page. Be sure that your query returns the *Id* field so that these features will work as planned.

9 Show Grid Actions

Lets you pick which grid actions are available on the dynamic report.

10 Show Grid Filter

This setting will create and show a series of filters for the grid. Rock will attempt to create a filter for each column on the grid.

11 Formatted Output

By default, the query will be show as a grid on the page. If you'd prefer, you can provide a Lava template that will be used to transform the data into your own custom layout. This is incredibly powerful because you can start to create your own *mini-applications* using these dynamic data blocks for displaying data.

12 Page Title Lava

This allows you to set the page's title with Lava. You can also use data from the result set(s).

13 Encrypted Fields

This option allows a report to decrypt any fields that are returned from the query as encrypted values. For example, if you create a report that displays Social Security Numbers and those numbers are stored in a person attribute with the SSN field type, the values in the report will be encrypted. Adding the SSN value to the *Encrypted Fields* will result in the values being decrypted before being displayed in the report. (Note: an Decrypt filter is available in the *Text Filters* section of the [Lava](#) manual.

Source From the Example

Below is the source from the sample above.

SQL

```
SELECT [Id], [NickName], [LastName], [Email]
FROM [Person]
WHERE
    [BirthMonth] = MONTH(GETDATE()) AND [BirthDay] = DAY(GETDATE())
    AND [RecordStatusValueId] = 3
```

Lava

```
Today's Birthdays

{% for row in rows %}

    •

    {{ row.NickName }}
    {{ row.LastName }}

{% endfor %}
```

Important! When writing your query it is important the the [Id] field for the person starts with a capital 'I'. If not links to send communications will not work.

That Figure Is More Than An Example...

The settings for the example above will list out all the people in the database whose birthday is the current date as a bulleted list linked to send an email. Throw that on your internal homepage and go buy yourself a coffee!

Extra Power from Stored Procedures

OK, we're going to geek out here for a second... By using SQL Server Stored Procedures, it can get even more powerful. When calling a stored procedure you can pass the procedure any of the query string parameters from the URL. For instance, if the page the block is placed on is accessed from the URL:

<https://<your server>/page/123?GroupID=12>

You can pass the value of the GroupId to your stored procedure as a parameter. The stored procedure can then use this value to help return relevant data (say group members for the group).

You can also pass in the current user's person id field. This allows you to further personalize the data to the person requesting the page. Just think of all the fun you can have with this block!

In order to make this all work, you'll need to define each of the parameters you want passed to your stored procedure in the *Parameters* field discussed above. Rock will look for each of these parameters in the URL's query string and, if found, pass in the value to the procedure. If you would like the current person's id to pass in you'll likewise need to add in the parameter *CurrentPersonId*.

Inception Time:

This functionality gets truly powerful when you have dynamic data blocks calling dynamic data blocks. So, you might have one dynamic data block that lists every serving group in your database. Then it links to a different page passing the selected group id, with a dynamic data block that shows the group members. Using the Lava template option, all of this can be designed to make the pages look like custom application logic. BAM

Page Parameter Filter Block

The Page Parameter Filter block is an easy way to add some powerful functionality to your pages. In short, it works by adding page parameters to a URL according to selections made within the block itself. For instance, if the block is used to select a Connection Opportunity, then the URL will be updated with a page parameter that holds the GUID of the selected opportunity. With the GUID present in the URL, it can now be referenced by other blocks or features.

Configure Block Settings

When the block is first added to a page it won't have any functionality until it's configured. The block settings you'll use to do this are described below.

Page Parameter Filter - Block Settings

Page Parameter Filter Configuration

Block Title Settings

Block Title Text

BlockTitle

Block Title Icon CSS Class

fa fa-filter

Show Block Title

☒

Filter Settings

Filter Button Text

Filter

Filter Button Size

Extra Small

Filters Per Row

2

Redirect Page

Show Reset Filters Button

☒

Does Selection Cause Postback

☐

Filters

Name

Description

Filter Type

Default Value

No filters Found

1 Block Title Settings

Similar to other blocks, you can customize the options for the block's title area using the fields provided.

2 Filter Button Text

By default, the button to apply the filter is labeled as "Filter" but can be customized to your liking.

3 Filter Button Size

The size of the filter and reset buttons can be changed here. The default value is "Extra Small" but you can also select "Small" or "Normal" to make the buttons slightly larger.

4 Filters Per Row

This setting controls how many filters are displayed in a single row within the block. This doesn't impact anything if you have only one filter.

5 Redirect Page

If you provide a page here, the person will be redirected to that page as soon as they click the filter button. The URL for the target page will include page parameters for the selected filters (see next section for details).

6 Show Reset Filters Button

You can choose to hide the `Reset Filters` button if needed. This will keep the filter's information in the URL after it has been applied.

7 Does Selection Cause Postback

If enabled, selecting a filter will force a PostBack, recalculating other available selection options. This is particularly useful for values determined by SQL.

8 Filters

This is where you'll add the filters that should be available for selection in the block. Adding filters to this block is like adding attributes to an entity. We'll look more closely at an example in the next section below.

Adding and Using Filters

If you've ever added an attribute to a person, group or other entity, then you're already familiar with adding filters to this block. As pictured below, these filters use many of the same fields as attributes.

Page Parameter Filter - Create New Filter

Add Filter

Name *

Connection Opportunity

Active ⓘ

☒ Yes

Abbreviated Name

Connection Opportunity

Public ⓘ

☐ Yes

Description

Used to select a Connection Opportunity within Involvement.

Key *

ConnOpp

Field Type

Connection Opportunity ▼

Show on Bulk ⓘ

☐ Yes

Include Inactive ⓘ

☐ Yes

Connection Type ⓘ

Involvement ▼

Default Value

▼

Advanced Settings

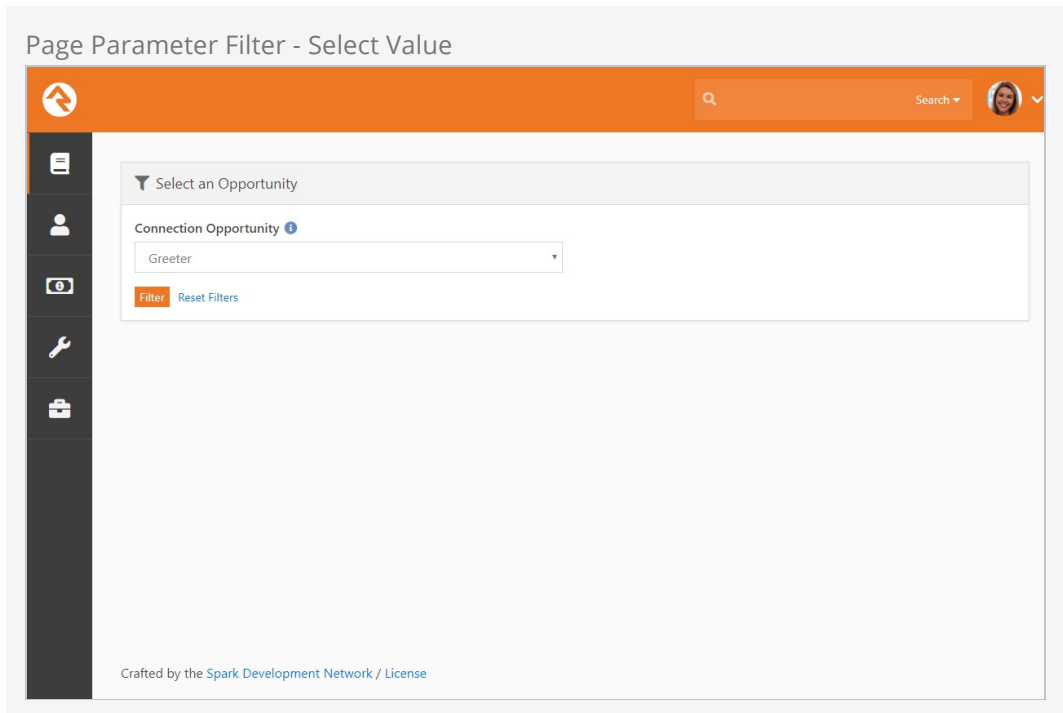
▼

Save

Cancel

The Key value you choose for the filter will appear as the name of the parameter in the URL after the filter is applied. You'll need to reference this value later, so try to pick something unique and descriptive.

In the example pictured above we've added a filter with a field type of "Connection Opportunity". As a result, a person accessing the page will be prompted to select a specific opportunity. We're only using a single filter here, but you can add as many filters as you need. Each filter functions independently from the others, so you can use a variety of different field types.



Now that a value has been selected the person should click the filter button to apply it. Depending on your setup, the filter button will do different things. It might redirect the person to a new page, or it could cause data to change in another block on the same page. In any case, it will update the URL with the filter's Key and the value of the person's selection.

Using our connection opportunity example, you can see below how the Key ("ConnOpp") and the GUID (of the "Greeter" opportunity) have been added to the URL.

```
Before:
https://rocksolidchurchdemo.com/page/123

After:
https://rocksolidchurchdemo.com/page/123?ConnOpp=6A7935B2-A97D-4F9D-82B3-4F835533325F
```

If you configured the block to redirect people to a different page, then the filter information will be appended to the URL of the target page in the same way. This can be very useful if the target page has a block that expects this information to already be in the URL, which won't happen until after the person clicks the filter button.

Page Parameters and Lava

When combined with Lava, this block becomes a powerful tool that can be used in a variety of ways. All you need to do is add `{{ 'Global' | PageParameter:'ConnOpp' }}` to a workflow, report or anywhere else Lava is used. Just replace "ConnOpp" with the Key for your filter, and the doors are open.

Some blocks, like the HTML Content block, will need to have the RockEntity command enabled for this Lava to work. Pictured below is a basic example of an HTML block using the GUID of a connection opportunity to display the number of requests in the opportunity.

Page Parameter Filter - Use in HTML

The screenshot shows a web application interface with an orange header and a dark sidebar. The main content area has a light gray background. At the top of the main area, there's a section titled 'Select an Opportunity' with a dropdown menu showing 'Usher'. Below the dropdown are two buttons: 'Filter' (orange) and 'Reset Filters' (blue). Underneath, there's a section titled 'Requests for Usher' containing a table with two columns: 'Opportunity' and 'Requests'. The table has one row with 'Usher' in the first column and '3' in the second column. At the bottom of the main area, there's a footer that says 'Crafted by the Spark Development Network / License'.

Select an Opportunity

Connection Opportunity ⓘ

Usher

Filter Reset Filters

Requests for Usher

Opportunity	Requests
Usher	3

Crafted by the Spark Development Network / License

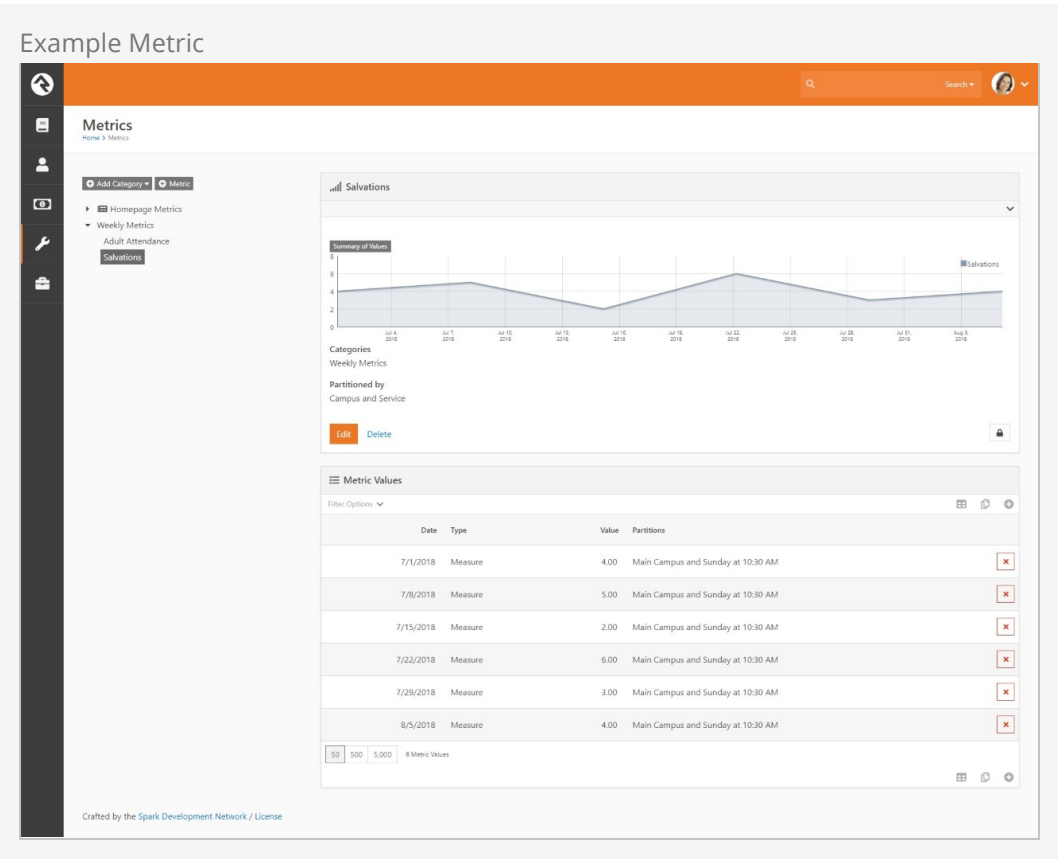
See our [Lava](#) documentation for more information.

Metrics

"What's measured improves." – Peter Drucker

Using metrics can help provide your organization a framework for improvement by tracking key performance indicators. Metrics describe what's going on under the hood of your organization.

Rock includes a full set of features for tracking and displaying metrics. First let's walk through how we define metrics and then we'll look briefly at how we can present metrics in some useful ways.



Anatomy of a Metric

Metrics are defined very similar to data views and reports with categories. This allows you to organize them in a way that makes sense for your organization. One thing that is unique about metrics is that they can be linked to more than one category. This allows you to re-use them in several areas of your metric hierarchy.

So how do we create a new metric? Administrating metrics is done under [Tools > Metrics](#). For our example we'll create a new metric that displays the number of adult members and attendees we've had each week. Here are the details of the completed metrics with callouts for each field.

Metric Edit

Metric Edit

Home > Metrics

Add Category
Metric

Homepage Metrics
Weekly Metrics
Adult Attendance
Salvations

Edit Adult Attendance

Not Scheduled
Never Run

1 Title
2 Icon CSS Class

3 Subtitle

4 Description

5 Metric Champion
6 Administrator

7 Categories

8 Units Label
9 Cumulative
10 Enable Analytics

11 Source Type
Source Data View
12 Schedule
13 Series Partitions

Save Cancel

Crafted by the Spark Development Network / License

1 Title / Subtitle / Description

Be sure to provide detailed titles and descriptions for your metrics that not only make sense to you, but also to those who will be using the metrics in the future.

2 Icon CSS Class

The CSS class of the icon you wish to associate to the metric. This is used in the display of the metric. Rock uses the [Font Awesome](#) icon set by default, but any CSS based icon set can be used if properly configured.

3 Subtitle

The subtitle will be shown on graphs and charts.

4 Description

You'll be tempted to just skip right over this field, but you'll regret that in the future. No matter how obvious you feel this metric is future you is screaming for you to add details about what is being measure, how it's calculated, any filter specifics (like only members), etc. Be kind to future you and document as much as you can. When you're done, go ahead and thank yourself ahead of time.

5 Metric Champion

One of the keys to good metrics is good documentation. In that regard we've worked hard to be sure that metrics become self-documenting. The metric champion allows you to note the person in your organization who is responsible for confirming that this metric is meeting its goals.

6 Metric Administrator

The metric administrator is the individual in your organization who is responsible for ensuring that the metric data is entered correctly and is valid.

7 Categories

This field allows you to link your metric to one or more categories.

8 Units Label

The y-axis label describes the units of what is being measured (people, groups, money, etc.)

9 Cumulative

Some metrics make sense to compare year-to-date, others - not so much. For instance, it's often helpful to look at year-to-date values for adult members and attendees. But a metric that tracks attendance for a service or event often does not make sense to evaluate the same way. This field allows Rock to know if cumulative comparisons make sense for this specific value.

10 Enable Analytics

Check this box if you want the metrics to be made available for use by analytic tools such as Power BI.

11 Source Type

The source type defines how the metrics will be entered into the system. The options are:

- Manual: Metric values will be entered in manually.
- SQL: A SQL statement will be run to populate the values. Once you select this option a SQL entry input will be displayed. The help menu for the SQL field provides in-depth information on how your SQL should be formatted.
- Data View: A data view will be executed and the count of its values will be added to the metric with the date it was run. The help field here also displays information on configuring your data view.

- **Lava:** Lava entity commands will generate the values. When you select this option, a Source Lava field will be displayed. This is where you add your Lava code. The help menu offers examples of Lava commands that could be used for metrics, as well as the results they generate. To learn more about Lava, go to <https://community.rockrms.com/lava>.

12 **Schedule**

The metric schedule helps determine how often this metric is calculated. When used with the SQL and data view source types, this field will actually tell Rock when to automate the harvesting of metric values.

13 **Series Partitions**

For simple metrics you're done, you can skip this section. Often times though you want to break your metrics down by campus, or maybe campus then service time. Setting up series partitions allows you to do just that. You always get the date partition (that's free) but you can setup as many partitions as you feel necessary (but more than 2 can get a bit complex).

Supercharge Your Metrics with Lava

Using Lava as the data source for your metrics is powerful. With Lava entity commands you can now access data from external systems and include it in your reporting. For example, you can use the web request command to make remote API calls and pull bank account balances from your accounting system, data from Planning Center, or info from Church Metrics. When it comes to Lava and reporting, the sky is the limit! To learn more about Lava, go to <https://community.rockrms.com/lava>.

Entering Metric Values

There are two types of metric values you can enter. Each one is discussed in detail below.

Metric Value Detail
Home > Metrics > Metric Value Detail

Add Metric Value

- Type**
Measure
- Value Date**
[Date Picker]
- Campus** [Dropdown] **Service** [Dropdown]
- Value**
[Text Input]
- Note**
[Text Area]

Save **Cancel**

Crafted by the [Spark Development Network](#) / License

- Type**
The first entry denotes if this is a measure or a goal. More on the difference between these two below.
- Value Date**
The date that the value is for.
- Series Partitions**
If you configured any series partitions you'll need to select their values here.
- Value**
The metric measure or goal value.
- Note**
A note for the value. This is a great place to document special outliers (like Christmas or Easter) or additional data (like the week's sermon title).

Measures

Measures are the actual values for a metric. In most cases they contain a date/time and a value. You also have the option to provide a note. This is helpful to explain outliers or special situations.

Goals

It's often good to track goals for your metrics. This lets you see how well you're actually doing. Goals can be entered with broad date ranges if you want. For instance, if you'd like to set a single goal value for the entire year, you could simply add two goal values.

One for January 1 and the other for December 31.

Metric Charts

The easiest way to view metrics values is to look at the charts that appear above the metric definition. This will show you all of the values entered for the metric. If you would like to have more options for displaying metrics, take a look at the metric dashboard capabilities below.

Service Metric Entry

You'll often have the need to enter metrics that follow the partition pattern of "Campus > Sunday Date > Service Time" pattern. We've created a simple entry page for you to enter these types of metrics into. You'll find this page under [Intranet > Weekly Metrics](#).

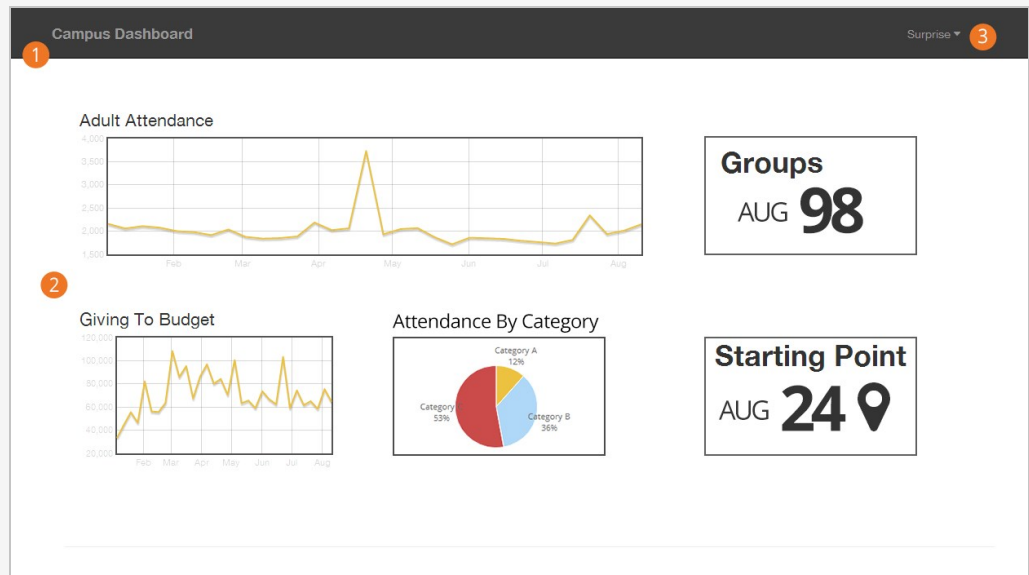
There are several block settings to allow you to configure the block and select the metrics you wish to enter.

Metrics Dashboards

We've seen that metrics provide a limited graphing capability for viewing their values. What if you want to create enhanced dashboards for viewing your metrics? Rock ships with several blocks to help you create rich dashboards based off of metrics.

Anatomy of a Dashboard

Dashboard Parts



1 Theme

While dashboard blocks can be placed on any page in Rock we do ship with a special theme designed for dashboards called Dashboard Stark. This is a very basic starter theme for you to use as a starting point for creating your own. When you do create new dashboard themes we highly recommend you prefix their name with *Dashboard* to help keep them grouped together in lists.

2 Dashboard Widgets

The widgets are simply Rock blocks on the page. We discuss each type of block below in detail.

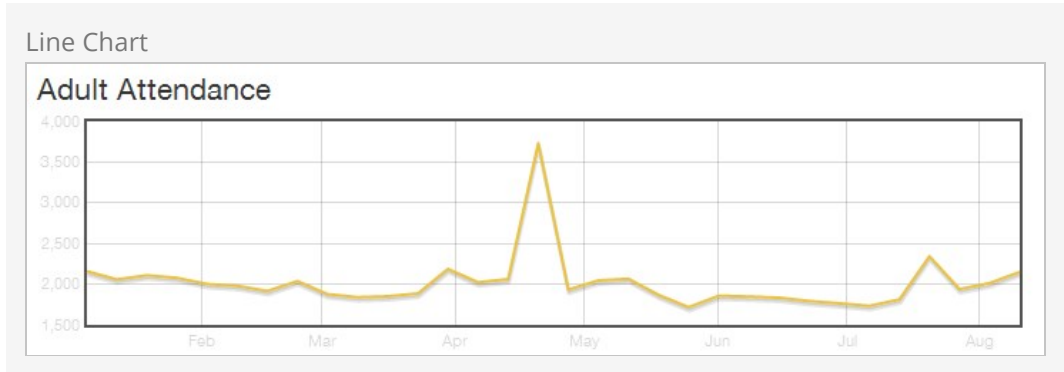
3 Context Setter

While optional, a context setting on the page allows you to filter the metric values by their *Series Partition*. Many times this is a campus selector or group selector.

Dashboard Blocks

Rock ships with several dashboard widget blocks. Each of these blocks is shown below.

Line Chart

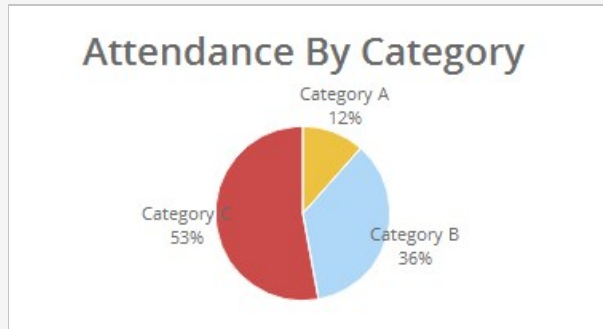


This block displays a line chart for the selected metric. Options include:

Title	Description
Name	This is the block name. It is not displayed anywhere on the output of the block.
Title	The title that is displayed for the metric.
Subtitle	The subtitle for the metric.
Column Width	The number of Bootstrap columns the chart should use for its width. (A Bootstrap row, by default, has 12 columns.)
Chart Style	The chart style to use. These styles are defined under Admin Tools > General Settings > Defined Types > Chart Styles .
Metric Value Types	Determines what metric value types should be displayed on the chart, goals and/or measures.
Metric	The metric to use for the chart.
Partition Filter	Determines how the chart will get the series partition value. It can be either hard coded or determined from the page context.
Date Range	Determines which values are displayed on the graph.
Detail Page	This optional setting will determine which page will be loaded when the graph is clicked.

Pie Chart

Pie Chart



This block displays a pie chart for a given metric. Options include:

Title	Description
Name	This is the block name. It is not displayed anywhere on the output of the block.
Title	The title that is displayed for the metric.
Subtitle	The subtitle for the metric.
Column Width	The number of Bootstrap columns the chart should use for its width. (A Bootstrap row, by default, has 12 columns.)
Chart Style	The chart style to use. These styles are defined under Admin Tools > General Settings > Defined Types > Chart Styles .
Metric Value Types	Determines what metric value types should be displayed on the chart, goals and/or measures.
Metric	The metrics to use for the chart. Each metric will represent one slice of the pie chart.
Partition Filter	Determines how the chart will get the series partition value. It can be either hard coded or determined from the page context.
Date Range	Determines which values are displayed on the graph.
Detail Page	This optional setting will determine which page will be loaded when the graph is clicked.

Lava



This block renders the metric values using a Lava template. Options include:

Title	Description
Name	This is the block name. It is not displayed anywhere on the output of the block.
Title	The title that is displayed for the metric.
Subtitle	The subtitle for the metric.
Column Width	The number of Bootstrap columns the chart should use for its width. (A Bootstrap row, by default, has 12 columns.)
Chart Style	The chart style to use. These styles are defined under <code>Admin Tools > General Settings > Defined Types > Chart Styles</code> .
Round Values	Round Y values to the nearest whole number. For example, display 25.00 as 25.
Metric	The metrics to use for the chart.
Partition Filter	Determines how the chart will get the series partition value. It can be either hard coded or determined from the page context.
LavaTemplate	The Lava template to render the output for display.
Detail Page	This optional setting will determine which page will be loaded when the graph is clicked.

See our `Lava` documentation for more information.

Under Construction:







Work is still being done on the metrics dashboard features. Expect changes that may impact configuration settings. Feel free to play with these features but don't roll them out in production just yet.

SQL Command

While not technically a reporting tool, the SQL Command page ([Admin Tools > Power Tools > SQL Command](#)) allows you to execute a SQL statement right in the browser. This makes it possible for administrators and developers to perform many tasks without requiring SQL Server Management Studio.

Warning:

Special Care should be taken with this tool, since it does permit UPDATES to your database. Since it is possible to quickly wipe out swaths of data, access to this page/block should be minimized to people with something to lose in return.



SQL Command

Home > Power Tools > SQL Command

Warning!

Running SQL commands directly against the database while powerful, can be extremely dangerous. The difference is all in your hands.
If you are unsure of the SQL you are about to run **DO NOT** proceed.

SQL Command

SQL Text ⓘ

```
1 SELECT
2   TOP 20
3   [Id],
4   [Lastname],
5   [Nickname],
6   [Email]
7 FROM
8   [Person]
9
```

Selection Query? ⓘ

Id	Last Name	Nick Name	Email
1	Admin	Alisha	alishalongemailaddressasyoucansee@rocksolidchurchdemo.com
21	Misra	Jyoti	jr@hisemail.net
22	Wu	Bruce	phwujc@yahoo.com
23	Chang	Cindy	cindy1775@yahoo.com
24	Anonymous	Giver	
119	Decker	Ted	ted@rocksolidchurchdemo.com
120	Decker	Cindy	cindy@fakeinbox.com
121	Decker	Noah	
122	Decker	Alex	

Business Intelligence

Rock's Business Intelligence features are so cool, they deserve their own book!