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 provides 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 person using the report. In the case of our example, these attributes might be:

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

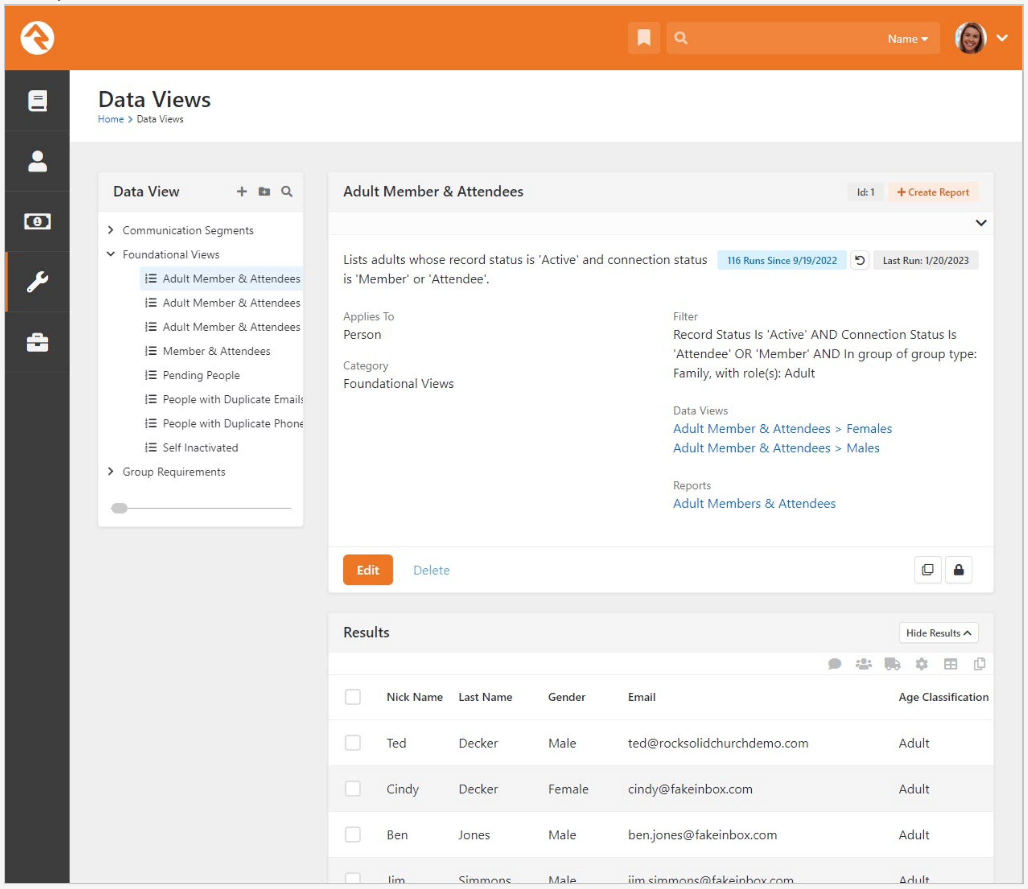
Once you create your handy report for your leader, it's very likely they'll be back asking for further changes. Perhaps now they want another report with the same logic but only showing females. In most systems you'll have to start over and make a copy with the addition of the new criteria. Now you have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



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

Data Views
Adult Member & Attendees > Females
Adult Member & Attendees > Males

Reports
Adult Members & Attendees

Nick Name	Last Name	Gender	Email	Age Classification
Ted	Decker	Male	ted@rocksolidchurchdemo.com	Adult
Cindy	Decker	Female	cindy@fakeinbox.com	Adult
Ben	Jones	Male	ben.jones@fakeinbox.com	Adult
Jim	Simmons	Male	jim.simmons@fakeinbox.com	Adult

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 reporting tools.

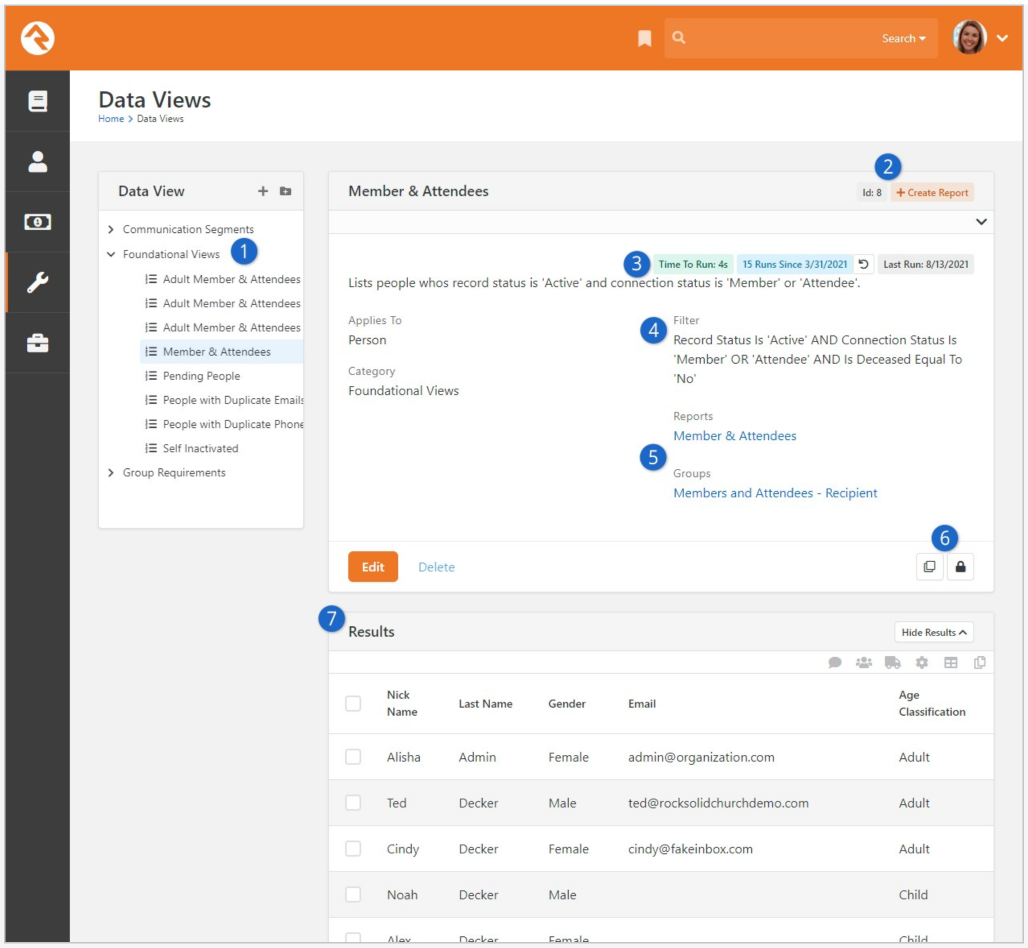
Filtering Using Data Views

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 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



Lists people whos 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 'Member' OR 'Attendee' AND Is Deceased Equal To 'No'

Reports
Member & Attendees

Groups
Members and Attendees - Recipient

Nick Name	Last Name	Gender	Email	Age Classification
Alisha	Admin	Female	admin@organization.com	Adult
Ted	Decker	Male	ted@rocksolidchurchdemo.com	Adult
Cindy	Decker	Female	cindy@fakeinbox.com	Adult
Noah	Decker	Male		Child
Alex	Decker	Female		Child

1 **Categories**
Data views are organized into hierarchical categories. Categories help you sort and organize your data views.

2 **Id and Create Report**
The Id of the data view is displayed here for reference. You can also click the `Create Report` button to start creating a report using the data view. We'll explain creating reports in the next chapter below.

3 **Run Details**
How this area looks will change depending on the activity, or lack of activity, associated with a data view. In this example we can see:

- **Time to Run -** This label shows how long it took to retrieve the data. This is a great way to identify potential performance issues.
- **Runs Since -** Here you can see how many times the data view has been run since the displayed date. This is an easy way to get a sense of how frequently the data view is used.
- **Reset -** Click the ⟲ button to reset the *Runs Since* field. This will set the count of runs back to zero, as of today's date.
- **Last Run -** This displays the most recent date that the data view was run. If the date is very far in the past, you might examine if the data view is needed anymore. Removing unused data views may help system performance but will also ensure a tidy system in general.

4 **Data View Filter Summary**
This is an automatically generated summary of the filters used in this data

view. We'll talk more about these filters below.

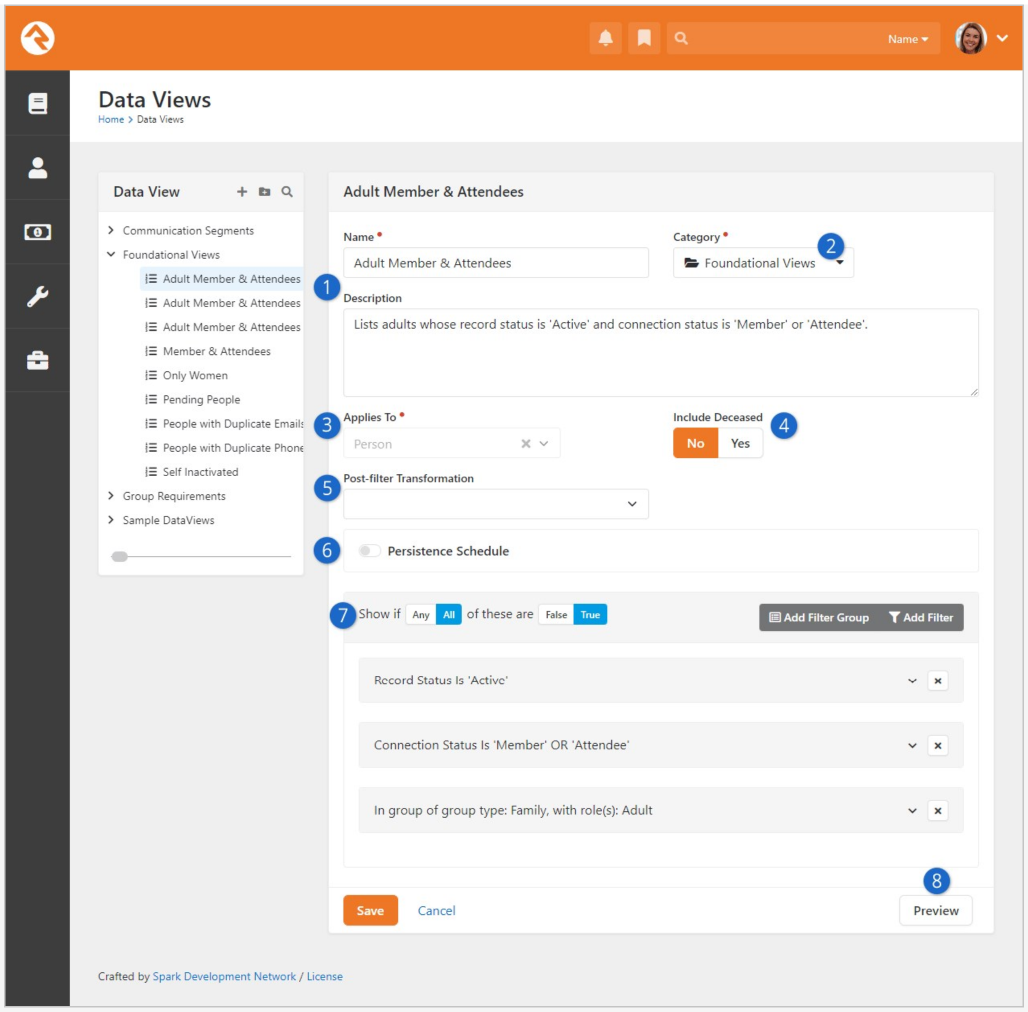
5 **Data Views / Reports**
In this area you can easily see which other data views, reports or group syncs are using this data view. If you make any changes to the data view, these items will be impacted.

6 **Copy / Security**
The icon will create a new data view that is a copy of this one. You can also click the icon to change security permissions for this data view.

7 **Results**
These are the actual results of your data view configuration, according to the filters you've added. We'll go over filters in more detail below. Note that the results are in their own block, so you can do things like launch workflows for the items listed.

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.

Editing a Data View



Adult Member & Attendees

Name * Adult Member & Attendees

Category * Foundational Views

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

Applies To * Person

Include Deceased [✓ No] Yes

Post-filter Transformation

Persistence Schedule

Show if Any [✓ All] of these are False [✓ True]

Record Status Is 'Active'

Connection Status Is 'Member' OR 'Attendee'

In group of group type: Family, with role(s): Adult

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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. These details may not seem important now, but your future self will be thanking you.

2 **Category**
A category should already be assigned when you first create the data view, but you can change it here if needed.

3 **Applies To**
Technically, this field is where you specify the *entity* the data view is referencing. This tells Rock what filter options you have, which we'll discuss below. Most of the time you'll probably use either 'Person' or 'Group', but you're not limited to those.

4 **Include Deceased**
This field will appear for data views that apply to people. If this is enabled, people who are marked as deceased in Rock will be included in the data view's results. In most cases this will be disabled.

5 **Post-filter Transformation**
This is where you can optionally select one of the following post-filter transformations:

- Allowed Check-In

- Allowed Check-In Children
- Children
- Family Members
- Father
- Giving Leader
- Grandchild
- Grandparent
- Head of Household
- Mother
- Parents
- Spouse

For more details see the Post-Filter Transformations section below.

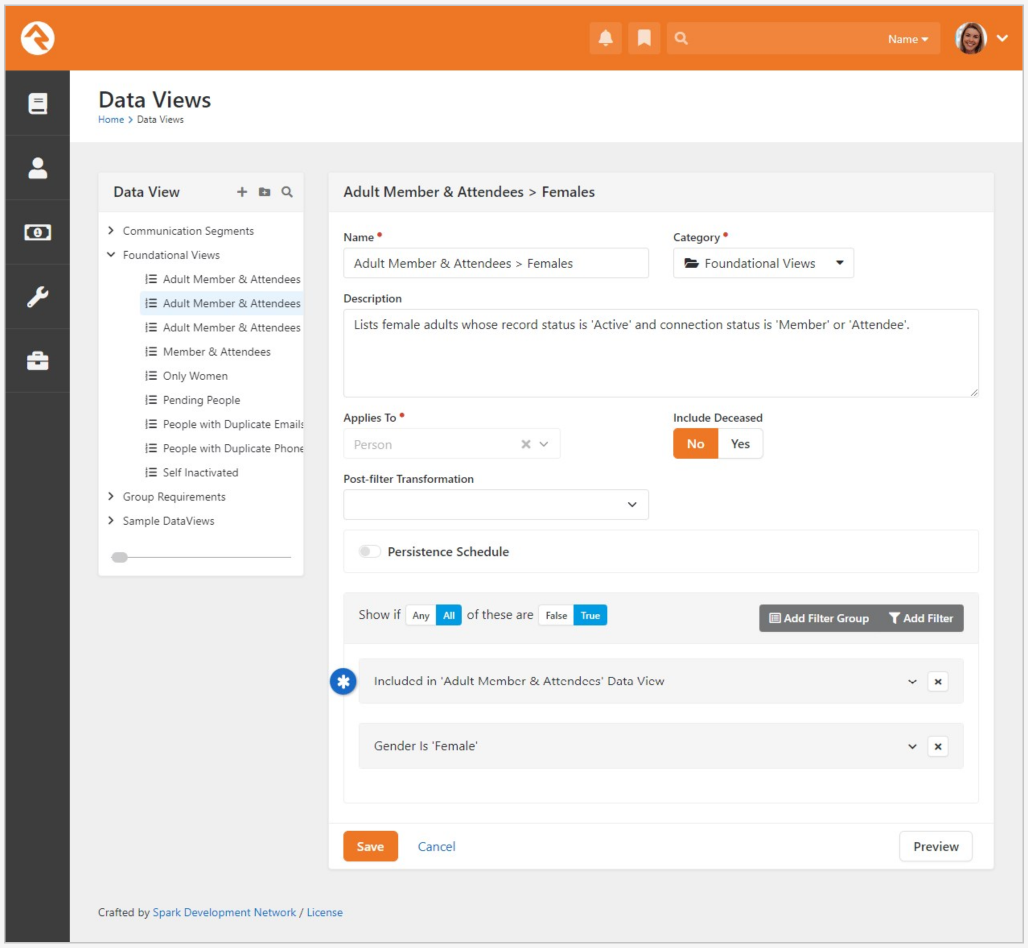
6 **Speed Settings**
Here you can choose to set a *Persistence Schedule*. To learn more about these settings, see the Persisting Data Views section below.

7 **Filters**
This is where you create the filters that are used to define your criteria for limiting records. We'll dive into how the filter area is used in later sections below.

8 **Preview**
To help check your work you can select the `Preview` button. This will show only the first 15 rows of data returned by your filters.

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* data view, with the addition of the female gender filter. Clicking the `Edit` button, you'll see the data view strategy at work.

Female Members and Attendees


Data Views

Home > Data Views

Data View

- Communication Segments
- Foundational Views
  - Adult Member & Attendees
  - Adult Member & Attendees
  - Adult Member & Attendees
  - Member & Attendees
  - Only Women
  - Pending People
  - People with Duplicate Emails
  - People with Duplicate Phone
  - Self Inactivated
- Group Requirements
- Sample DataViews

Adult Member & Attendees > Females

Name: Adult Member & Attendees > Females

Category: Foundational Views

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

Applies To: Person

Include Deceased: [✓ No] Yes

Post-filter Transformation:

Persistence Schedule

Show if Any [✓ All] of these are False [✓ True]

Included in 'Adult Member & Attendees' Data View

Gender Is 'Female'

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Notice how the first criterion is *Included in Data View: Adult Members & Attendees*? That says, "Take all of the filter criteria from the *Adult Members & Attendees* data view and apply it here." Since that logic was already built, all we needed to do here was add the 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 neither of these conditions are 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.

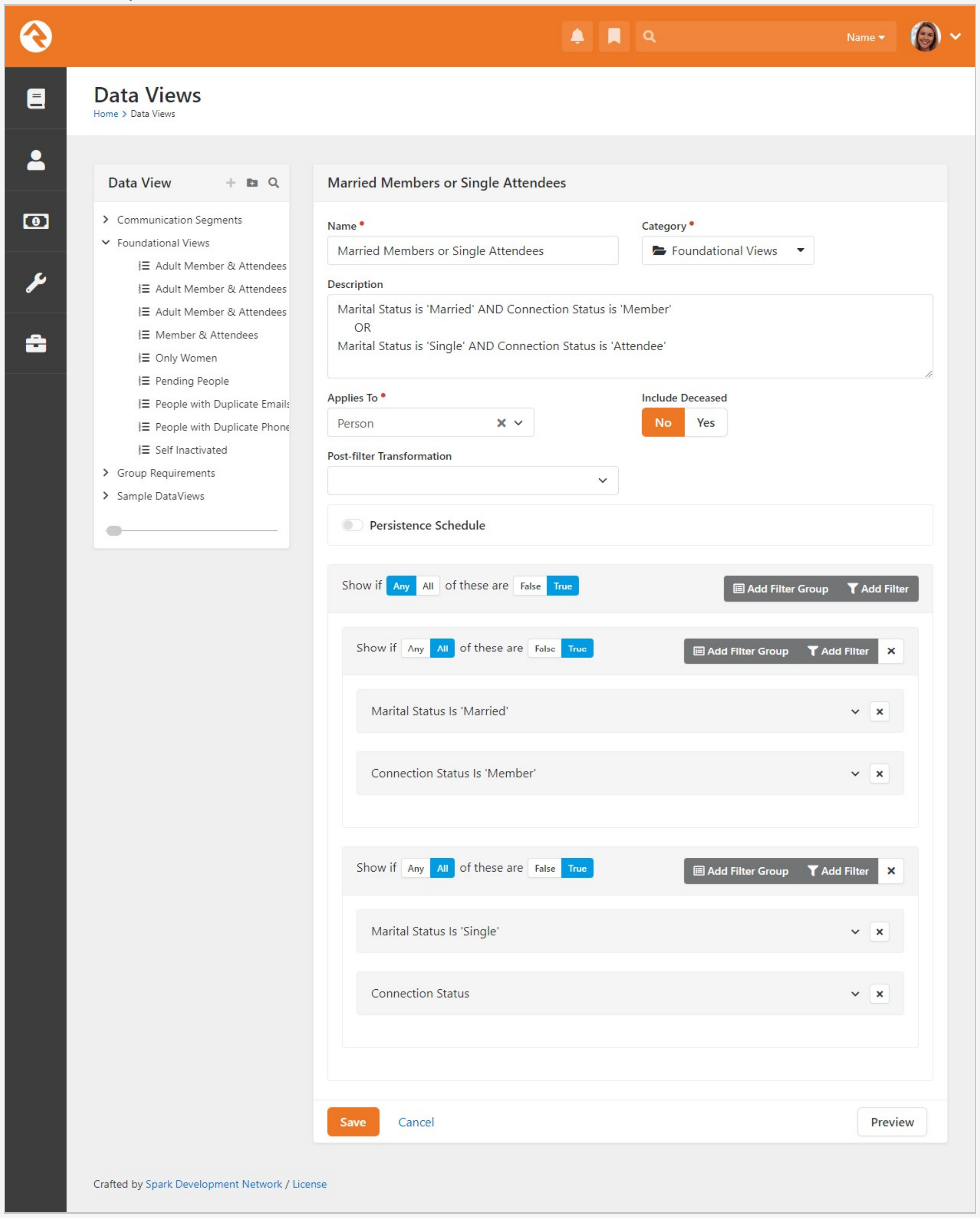
- **Any:** This setting means that if *Any* of the filter criteria is true then display the record. It's like inserting the word *OR* between each criterion.

> 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:

Filter Groups



Data Views

Home > Data Views

Data View

- Communication Segments
- Foundational Views
  - Adult Member & Attendees
  - Adult Member & Attendees
  - Adult Member & Attendees
  - Member & Attendees
  - Only Women
  - Pending People
  - People with Duplicate Emails
  - People with Duplicate Phone
  - Self Inactivated
- Group Requirements
- Sample DataViews

Married Members or Single Attendees

Name: Married Members or Single Attendees

Category: Foundational Views

Description:
Marital Status is 'Married' AND Connection Status is 'Member'
OR
Marital Status is 'Single' AND Connection Status is 'Attendee'

Applies To: Person

Include Deceased: No

Post-filter Transformation:

Persistence Schedule

Show if Any of these are True
- Show if All of these are True
  - Marital Status Is 'Married'
  - Connection Status Is 'Member'
- Show if All of these are True
  - Marital Status Is 'Single'
  - Connection Status

Note how we have two filter groups where if *Any* of them is true the record is selected. They in turn have criteria that must *All* match.

Post-Filter Transformations

The Post-Filter Transformation gives you the option to "flip" the results of a Data View 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 give you the children of those selected. To provide as much flexibility as possible, Rock allows you to transform data views by applying the following transformations:

- Allowed Check-In

- Allowed Check-In Children
- Children
- Family Members
- Father
- Giving Leader
- Grandchild
- Grandparent
- Head of Household
- Mother
- Parents
- Spouse

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 people 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 Persistence is enabled, 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).

When you persist a Data View, keep in mind that the statistical data (Time to Run, Runs Since, and Last Run) may not update as frequently as you'd expect. These values usually change only when the Data View's results are updated, not when the persisted results are being used. In other words, retrieving data from a persisted Data View doesn’t require it to be re-run, so the run statistics aren't always updated. Most of the time, the Data View will only be truly re-run when the job recalculates its contents, and that’s when you can generally expect the statistics to change.

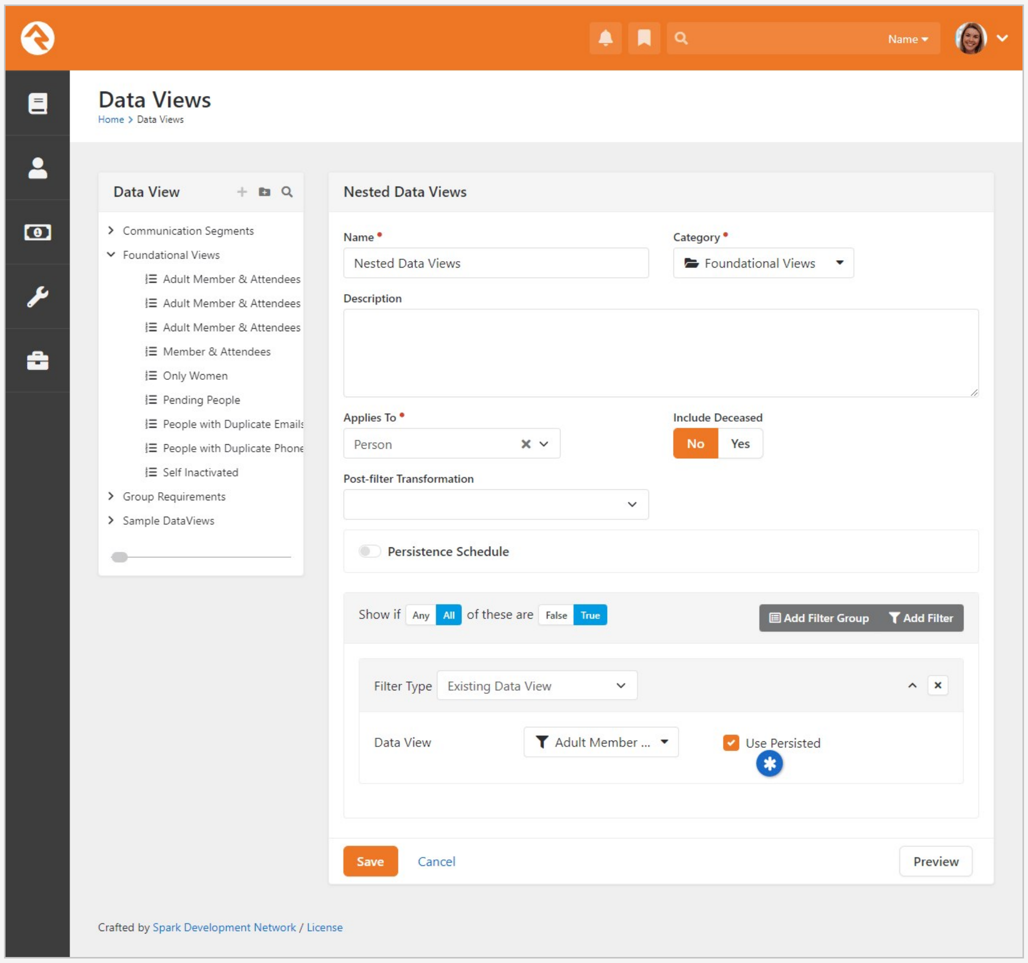
Since Rock isn't calculating the contents of these Data Views every time you load it, that does mean that the list might be out of date by up to the interval you specify. For instance, let's say that you have a very involved data view that, among other requirements, requires that the people in it are 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 Persistence Interval of "2 Hours". 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 two 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 the *Enable Persistence* setting disabled.

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 two hours. 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



Name: Nested Data Views

Category: Foundational Views

Description:

Applies To: Person

Include Deceased: [✓ No] Yes

Post-filter Transformation:

Persistence Schedule

Show if Any [✓ All] of these are False [✓ True]

Filter Type: Existing Data View

Data View: Adult Member ...

[✓ Use Persisted]

Since "Adult Member & Attendees" is now persisted and only calculated every two hours, then whenever you load a Data View that references it (with "Use Persisted" selected as shown) the list of Adult Members and Attendees might be as much as two hours old. Hopefully nobody stopped being a member/attendee that quickly, but if they did, they could continue showing up in 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.

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* "Persistence Interval".

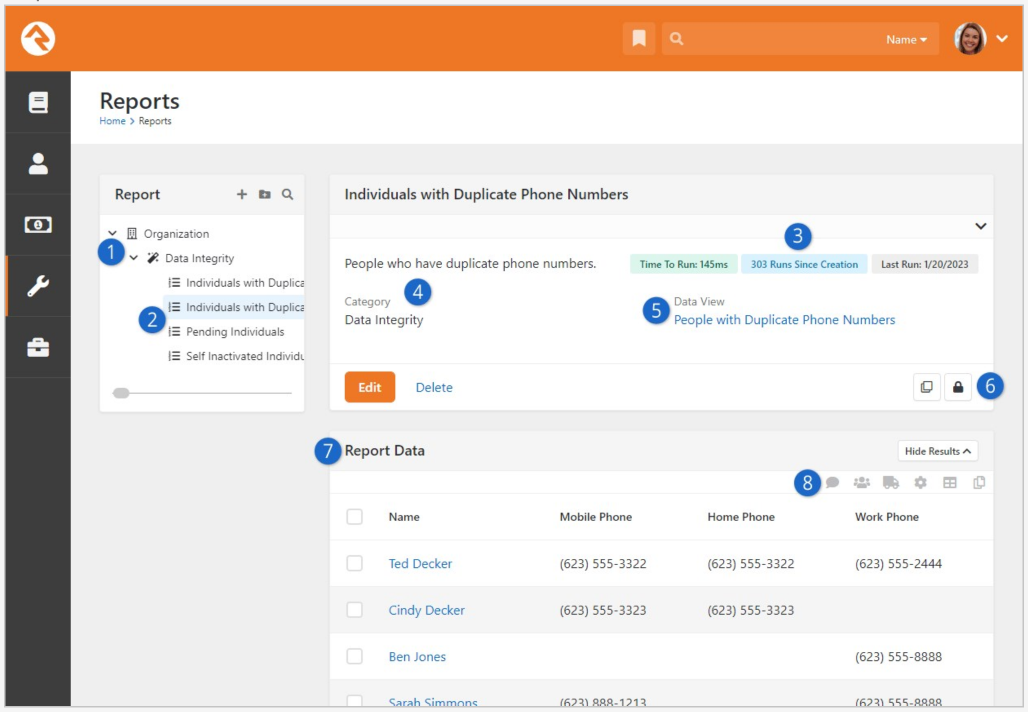
Displaying Data Using Reports

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.

Report Details



Individuals with Duplicate Phone Numbers

People who have duplicate phone numbers.

Time To Run: 145ms | 303 Runs Since Creation | Last Run: 1/20/2023

Category
Data Integrity

Data View
People with Duplicate Phone Numbers

Report Data

Name	Mobile Phone	Home Phone	Work Phone
Ted Decker	(623) 555-3322	(623) 555-3322	(623) 555-2444
Cindy Decker	(623) 555-3323	(623) 555-3323	
Ben Jones			(623) 555-8888
Sarah Simmons	(623) 888-1213		(623) 555-8888

1 **Categories**
Reports are organized into hierarchical categories.

2 **Report List**
List of reports for the selected category.

3 **Report Metrics**
At a glance you can see how long the report takes to run, how many times it has been run and the date on which it was last run. This information is great for ensuring the report is performant and is actually being used.

4 **Report Details**
The details for the selected report.

5 **Data View**
A link to the data view that drives this report.

6 **Security**
Reports can be secured to limit who can view them.

7 **Results**
The report results.

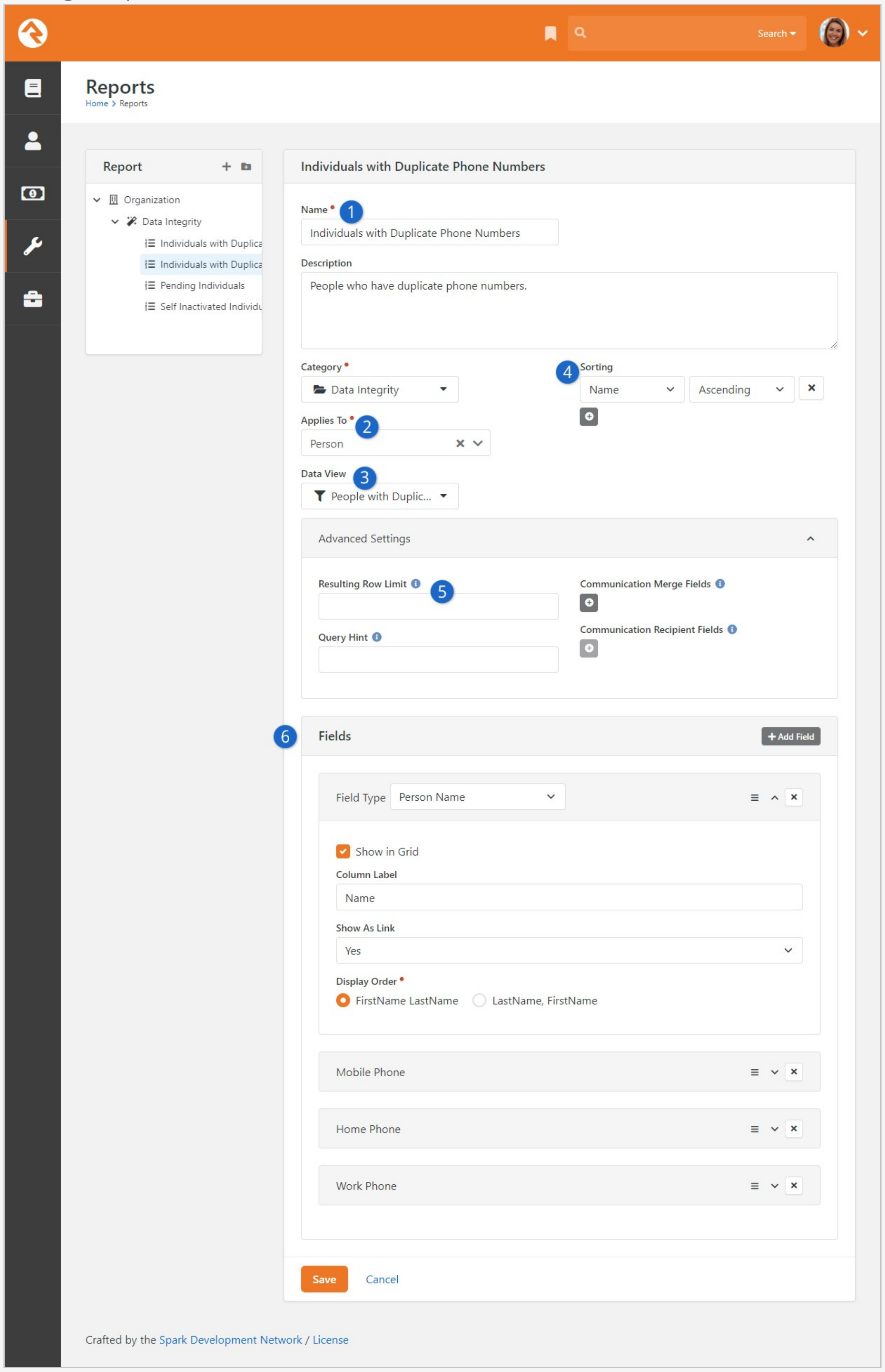
8 **Grid Actions**
The data from reports can be used to send communications, export to Excel, or other actions appropriate to the entity they refer to.

Creating A Report

Let's jump right in and take a look at a report. For our example, we'll look at a report that gives the name and phone numbers of individuals with duplicate phone numbers.

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

Report
Organization
Data Integrity
Individuals with Duplica
Individuals with Duplica
Pending Individuals
Self Inactivated Individu

Individuals with Duplicate Phone Numbers

Name * 1
Individuals with Duplicate Phone Numbers

Description
People who have duplicate phone numbers.

Category *
Data Integrity

4 Sorting
Name | Ascending

Applies To * 2
Person

Data View 3
People with Duplic...

Advanced Settings

Resulting Row Limit 5

Communication Merge Fields

Query Hint

Communication Recipient Fields

6 Fields

Field Type: Person Name

Show in Grid ✓

Column Label
Name

Show As Link
Yes

Display Order *
[✓ FirstName LastName] LastName, FirstName

Mobile Phone

Home Phone

Work Phone

Save Cancel

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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 **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.

5 **Resulting Row Limit**
If needed, you can limit the number of records that are displayed on your report.

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 Lava column.

Below 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

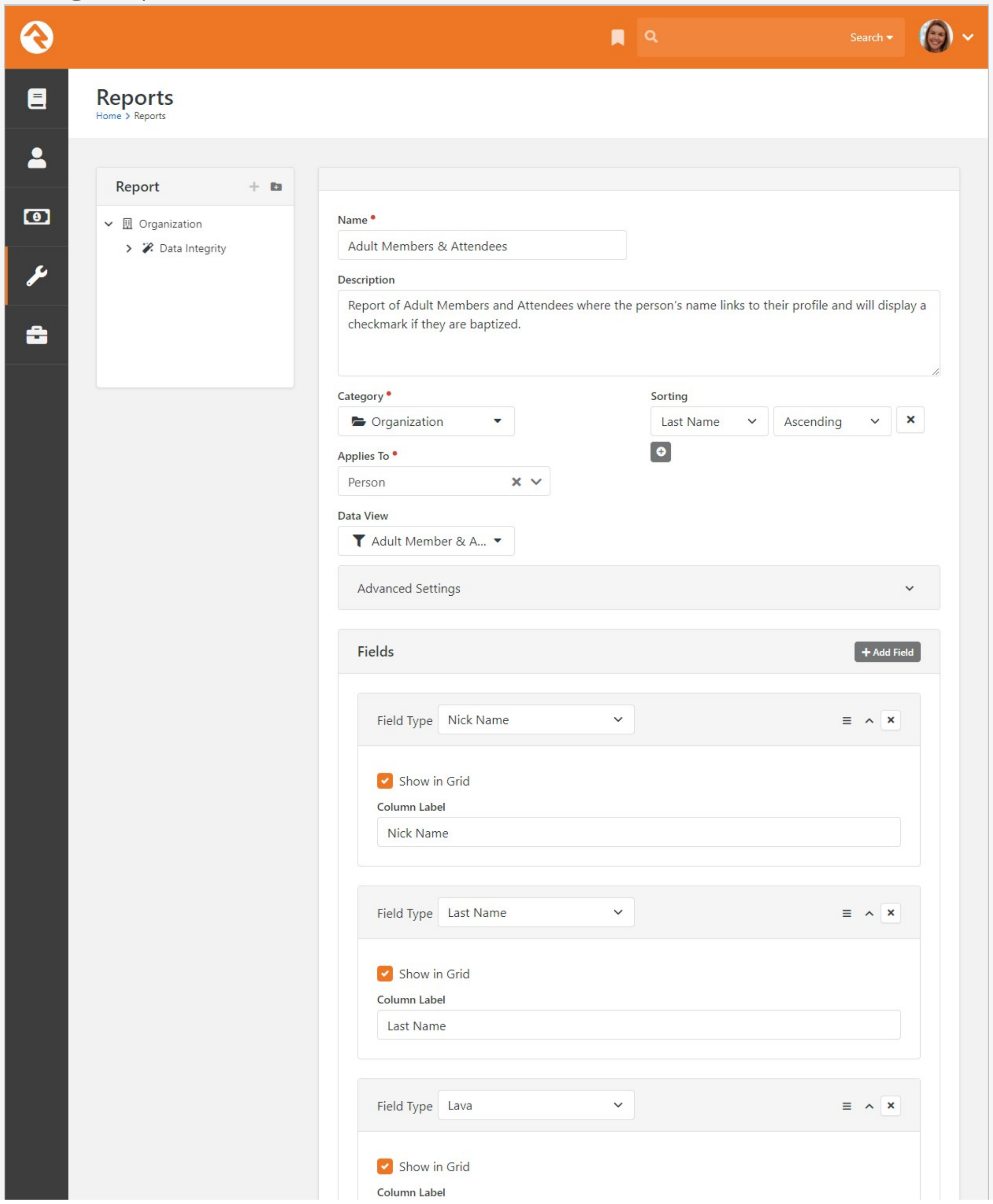
```
{% if BaptismDate != null %}
    <i class="fa fa-check"></i>
{% endif %}
```

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



Name: Adult Members & Attendees

Description: Report of Adult Members and Attendees where the person's name links to their profile and will display a checkmark if they are baptized.

Category: Organization

Sorting: Last Name, Ascending

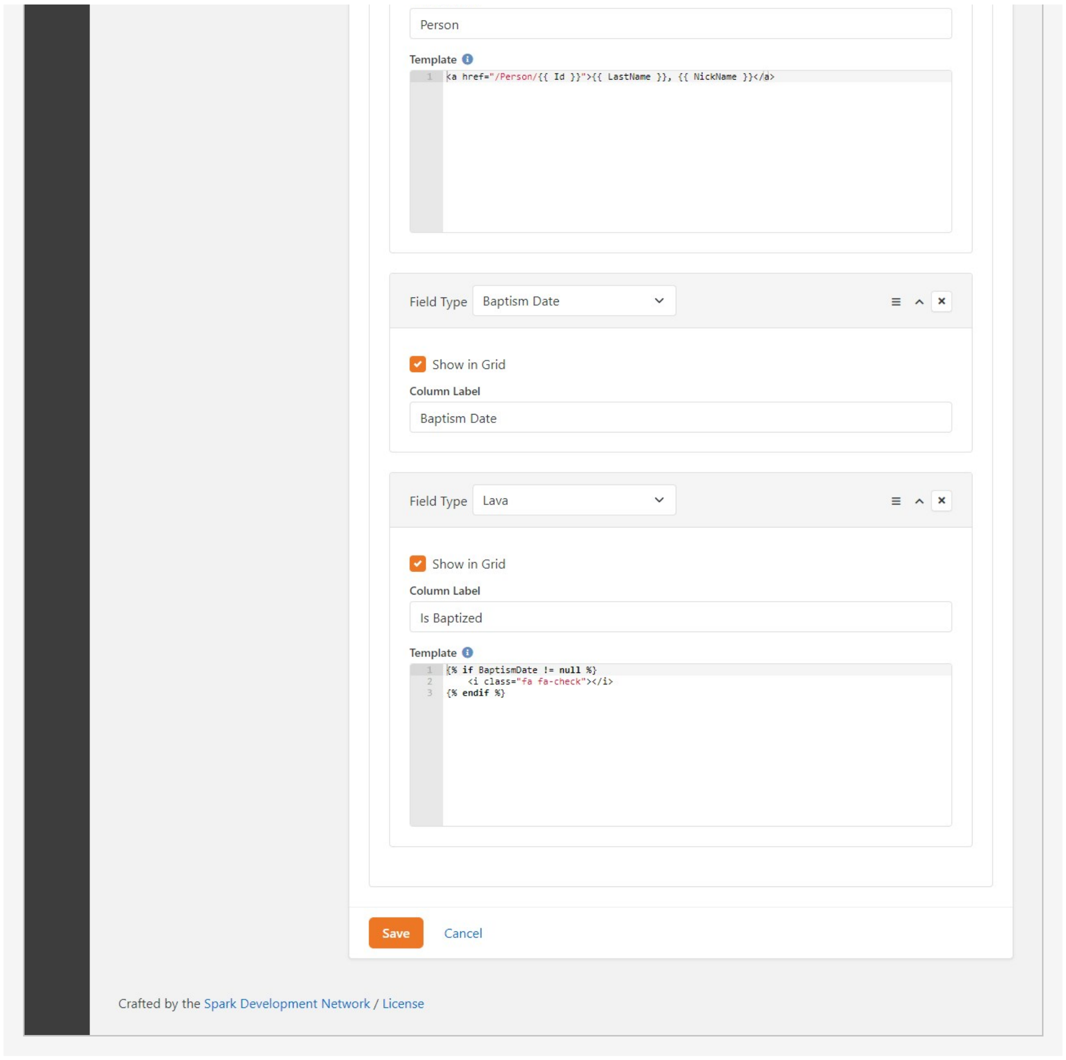
Applies To: Person

Data View: Adult Member & A...

Field Type: Nick Name
- [x] Show in Grid
Column Label: Nick Name

Field Type: Last Name
- [x] Show in Grid
Column Label: Last Name

Field Type: Lava
- [x] Show in Grid
Column Label


Person

Template

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

Field Type: Baptism Date

☑ Show in Grid

Column Label: Baptism Date

Field Type: Lava

☑ Show in Grid

Column Label: Is Baptized

Template

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

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 `Rock 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 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 secure.

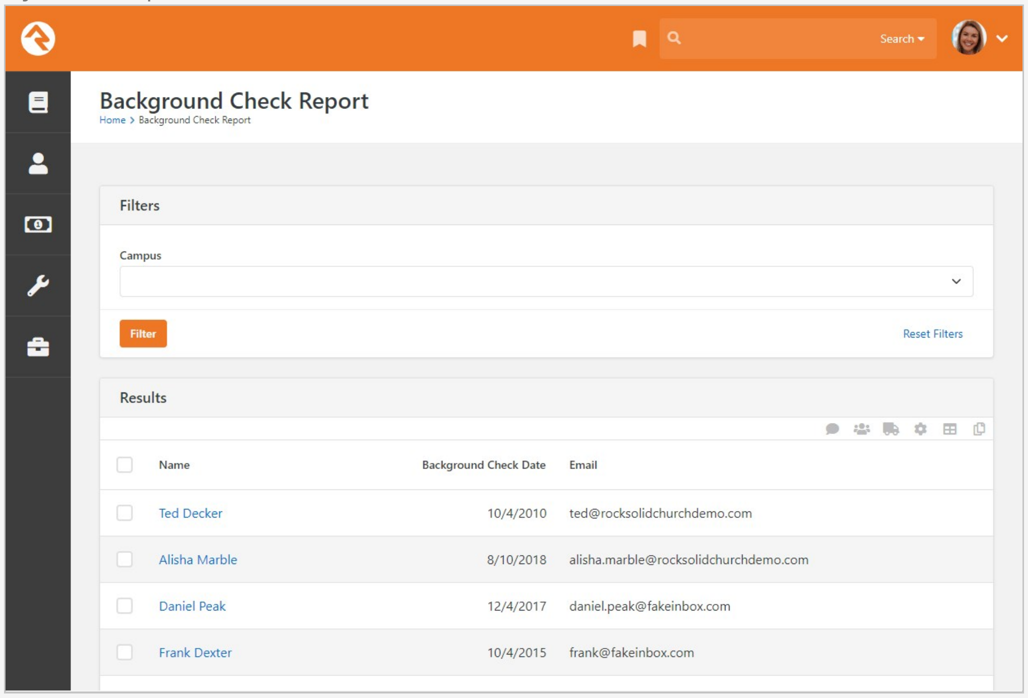
As you can see, planning is important in developing data views and reports. You want to ensure that the individuals who can view the report are identified, and that provisions are made so that sensitive information does not inadvertently leak.

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 that's expired or about to expire. 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 filters of the report's underlying data view and allows the person viewing the report to modify them. Let's see our report in action.

Dynamic Report Block



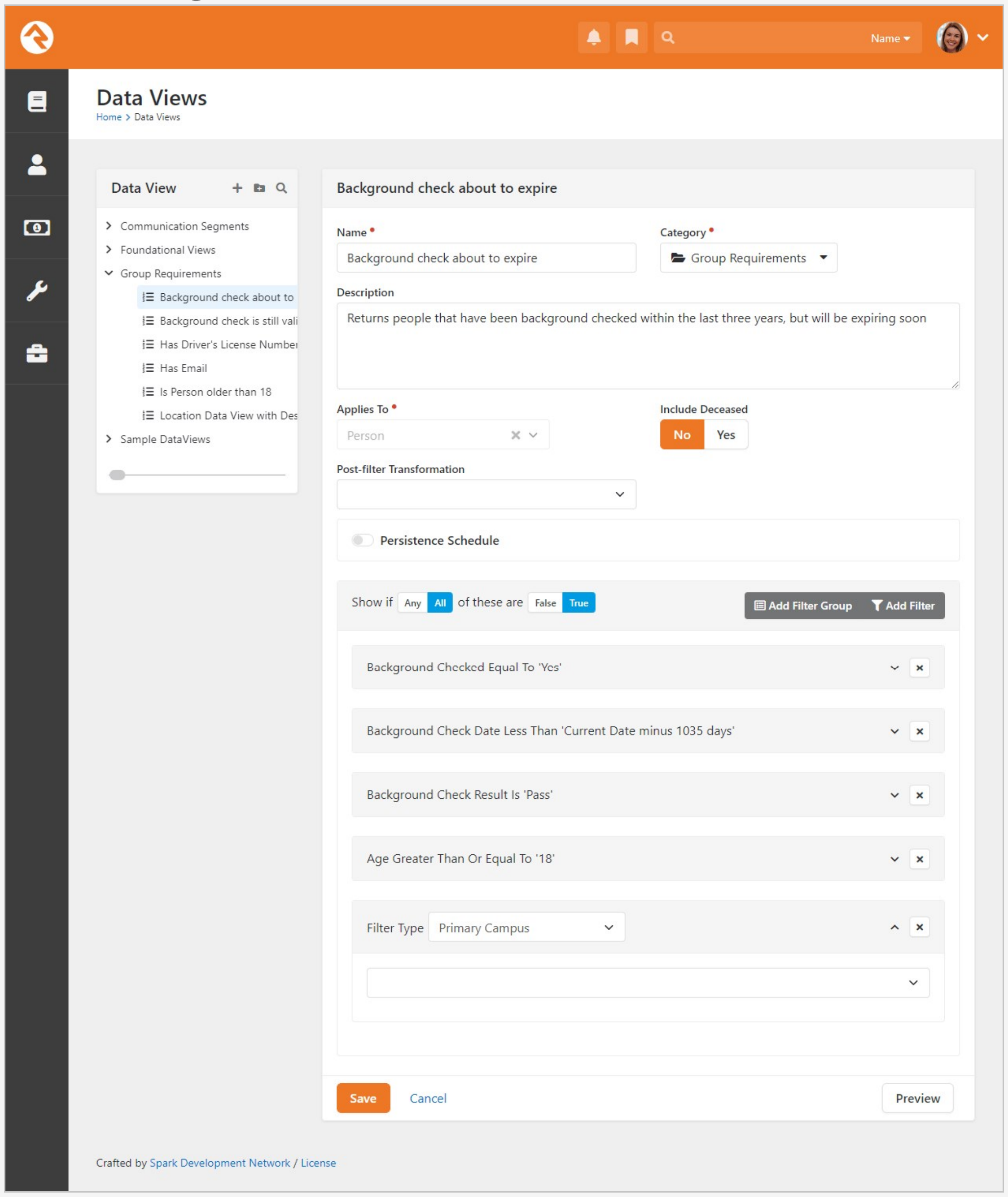
	Name	Background Check Date	Email
	Ted Decker	10/4/2010	ted@rocksolidchurchdemo.com
	Alisha Marble	8/10/2018	alisha.marble@rocksolidchurchdemo.com
	Daniel Peak	12/4/2017	daniel.peak@fakeinbox.com
	Frank Dexter	10/4/2015	frank@fakeinbox.com

As you can see, the block looks like the standard report grid with the addition of a filter from the data view near the top. 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 a few 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."

Data View Configuration



Background check about to expire

Name: Background check about to expire

Category: Group Requirements

Description: Returns people that have been background checked within the last three years, but will be expiring soon

Applies To: Person

Include Deceased: [✓ No] Yes

Post-filter Transformation:

Persistence Schedule

Show if Any [✓ All] of these are False [✓ True]

- Background Checked Equal To 'Yes'
- Background Check Date Less Than 'Current Date minus 1035 days'
- Background Check Result Is 'Pass'
- Age Greater Than Or Equal To '18'
- Filter Type: Primary Campus

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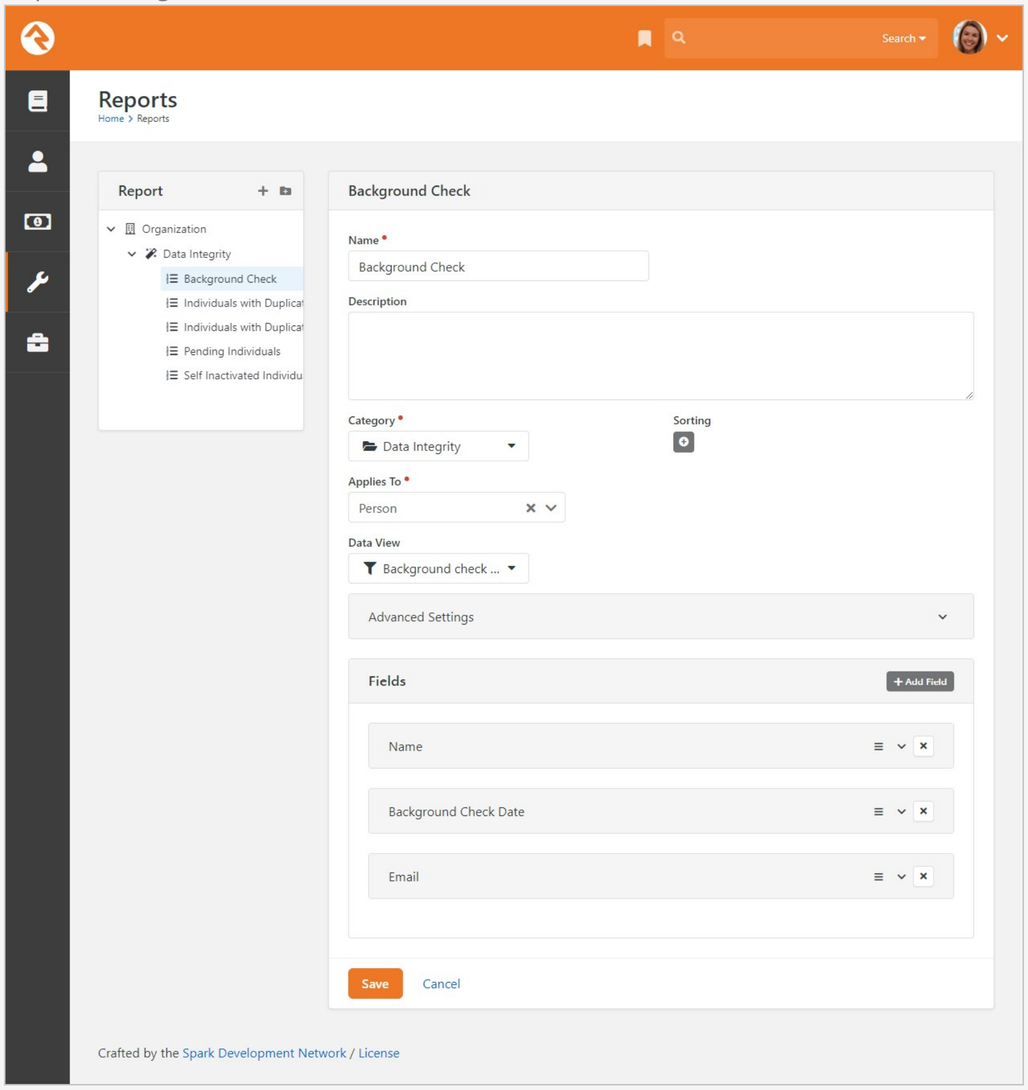
Create Report

Next, we create the report under `Tools > Reports`. Here we add in the columns we'd like to display on the report. Nothing new here.

Report Configuration



Background Check

Name *
Background Check

Description

Category *
Data Integrity

Sorting

Applies To *
Person

Data View
Background check ...

Advanced Settings

Fields
+ Add Field

Name

Background Check Date

Email

Save Cancel

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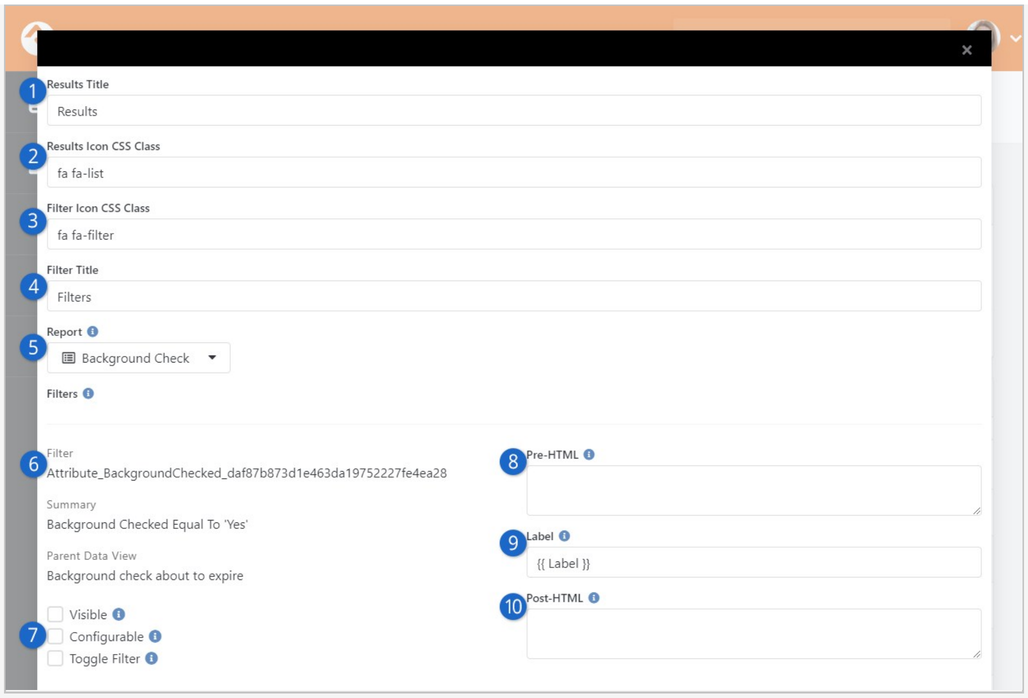
Set Up Dynamic Report

Finally, we’re ready to add our *Dynamic Report* block. After creating a new page and adding the block, we can set the block's settings. Below is a screenshot of what's possible.

Block Settings for Dynamic Report


Results Title

Results

Results Icon CSS Class

fa fa-list

Filter Icon CSS Class

fa fa-filter

Filter Title

Filters

Report

Background Check

Filters

Filter
Attribute_BackgroundChecked_daf87b873d1e463da19752227fe4ea28

Summary
Background Checked Equal To 'Yes'

Parent Data View
Background check about to expire

Visible
Configurable
Toggle Filter

Pre-HTML

Label

{{ Label }}

Post-HTML

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 person using the report can specify which filters are used:

- **Visible:** This tells the block whether the filter should be shown to the person for them to modify. In our sample we're only letting them change the campus, so only the campus filter would have this checked.

- **Configurable:** Determines if the person 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 person 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.

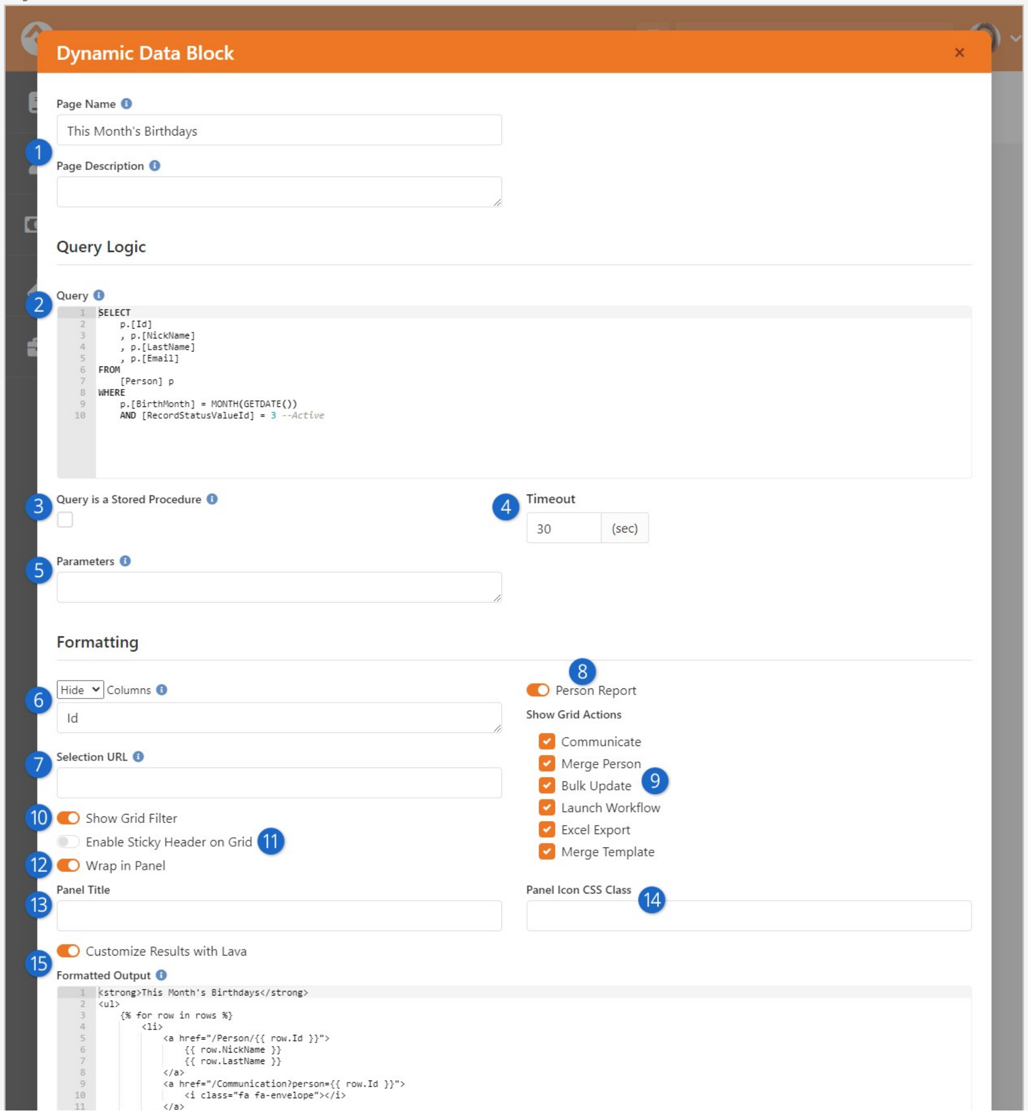
As you can see, the *Dynamic Report* block is very flexible and powerful. Once you create your first one, you'll find it's one of the most popular tools in your toolbox.

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 Using Rock` guide 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



Page Name: This Month's Birthdays

Query:

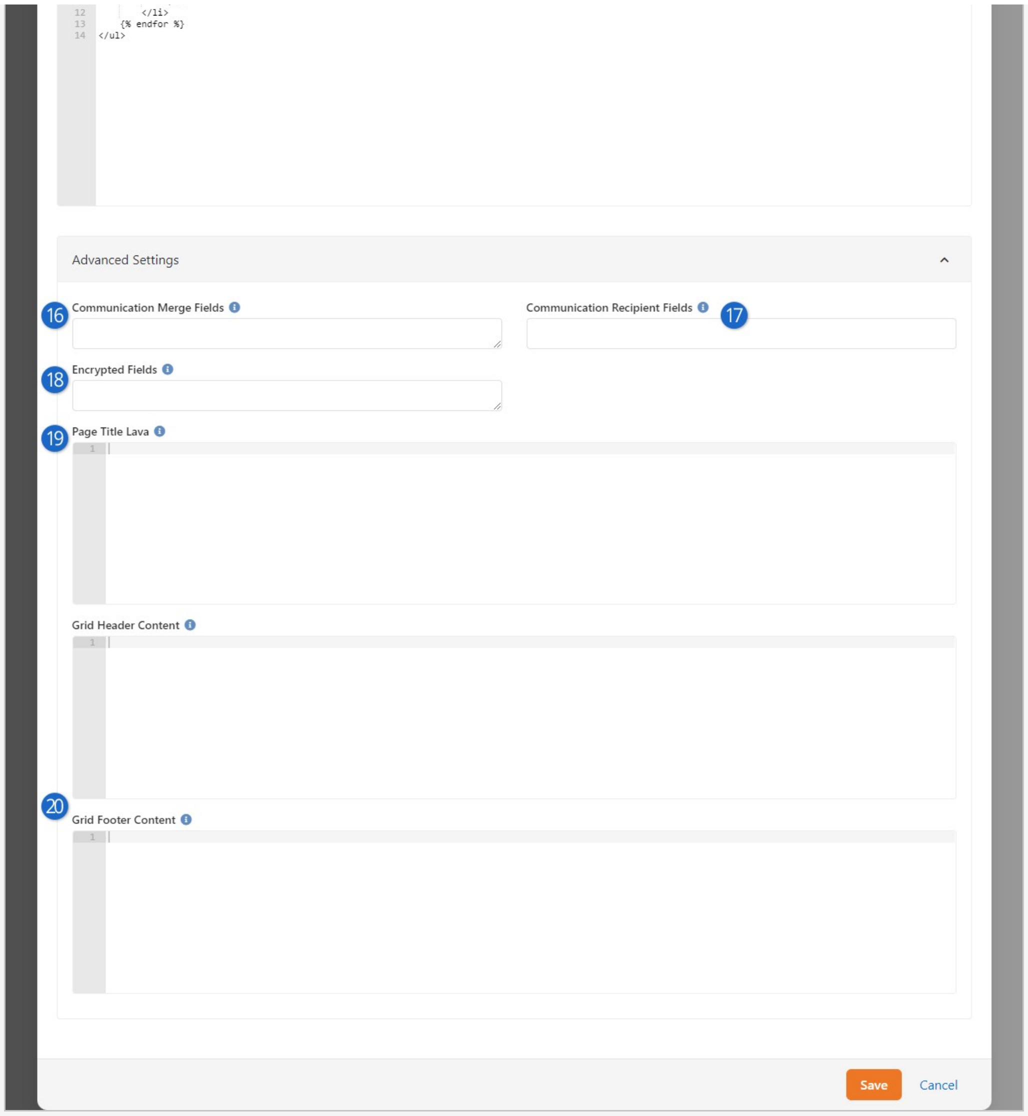
```
SELECT
    p.[Id]
    , p.[NickName]
    , p.[LastName]
    , p.[Email]
FROM
    [Person] p
WHERE
    p.[BirthMonth] = MONTH(GETDATE())
    AND [RecordStatusValueId] = 3 --Active
```

Timeout: 30 (sec)

Hide Columns: Id

Formatted Output:

```
<strong>This Month's Birthdays</strong>
<ul>
    {% for row in rows %}
        <li>
            <a href="/Person/{{ row.Id }}">
                {{ row.NickName }}
                {{ row.LastName }}
            </a>
            <a href="/Communication?person={{ row.Id }}">
                <i class="fa fa-envelope"></i>
            </a>
```


```
    </li>
  {% endfor %}
</ul>
```

1 **Page Name/Description**
This allows you to reset the title and description of the page from within the block. The ability to do this is controlled by a block setting.

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, as opposed to using a straight SQL statement. This allows Rock to configure any parameters needed for the stored procedure.

4 **Timeout**
As a safeguard against queries that take too long to run, you can specify the length of time (in seconds) before the query times out and is stopped.

5 **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 section.

6 **Show/Hide Columns**
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.

7 **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}`.

8 **Person Report**
If your query returns a list of people, you'll want to enable this option. This will add several feature options that are specific to listing individuals. 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. You'll see additional options for *Communicate*, *Merge Person*, *Bulk Update* and *Launch Workflow* if the *Person Report* option is enabled.

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 **Enable Sticky Header on Grid**
When your output is a grid, enabling this means that the grid's headers will stay visible on the screen as you scroll down the list of results.

12 **Wrap in Panel**
You can enable this setting to automatically display the results of your query in a panel. This is a quick and easy way to get results that look good without needing to provide custom formatting.

13 **Panel Title**
This field is only visible if *Wrap in Panel* is enabled. Here you can provide the title that will appear above the results in the panel.

14 **Panel Icon CSS Class**
Like the *Panel Title* setting, you'll only see this if *Wrap in Panel* is enabled. Here you can provide the icon that will appear above the results in the panel, next to the title.

15 **Customize Results with Lava (Formatted Output)**
By default, the query will be shown 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. The *Formatted Output* area will only display if *Customize Results with Lava* is enabled.

16 **Communication Merge Fields**

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

17 **Communication Recipient Fields**
This is where you can specify which column(s) contain a Person Id field, to use as the recipient for a communication. You don't need to use this if your query has a Person Id column named "Id".

18 **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: a Decrypt filter is available in the *Text Filters* section of the `Lava` manual.

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

20 **Grid Header/Footer Content**
If you're showing a grid, this allows you to set the grid's header or footer content with Lava. Just like the Page Title Lava, you can use data from the result set(s).

Source From the Example

Below is an example like the one 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 %}
```

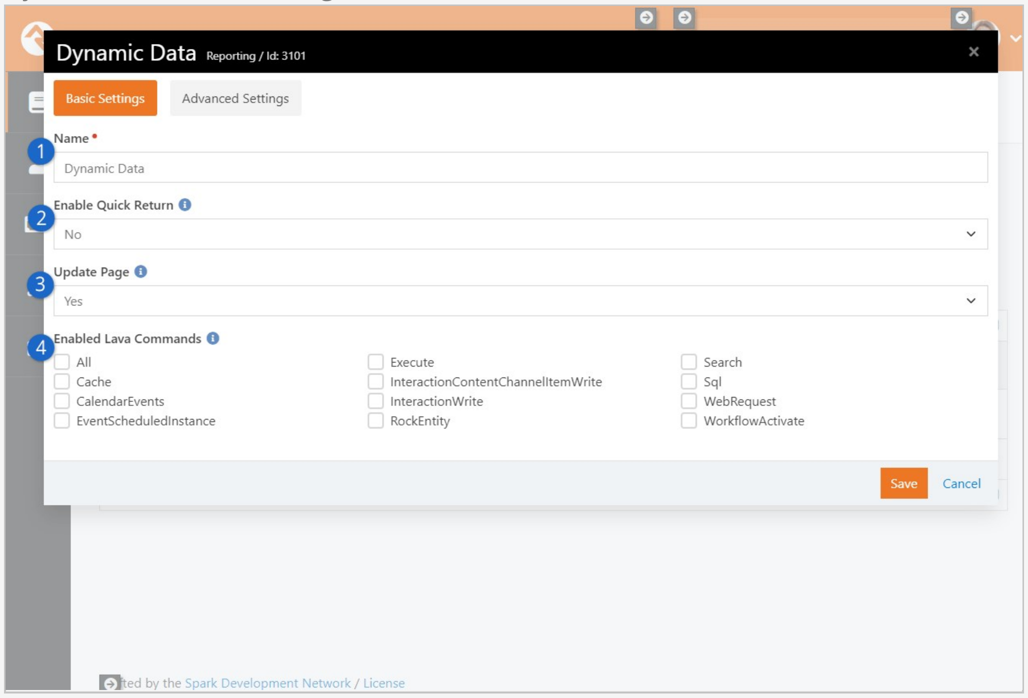
Important! When writing your query, it is important the [Id] field for the person starts with a capital 'I'. If not, links to send communications will not work.

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!

Now that you're familiar with how to set up the Dynamic Data block, you might want to know about the block settings that are available.

Dynamic Data Block Settings


Dynamic Data Reporting / Id: 3101
Basic Settings
Advanced Settings
Save
Cancel
ted by the Spark Development Network / License

Name *
Dynamic Data

Enable Quick Return
No

Update Page
Yes

Enabled Lava Commands

☐ All	☐ Execute	☐ Search
☐ Cache	☐ InteractionContentChannelItemWrite	☐ Sql
☐ CalendarEvents	☐ InteractionWrite	☐ WebRequest
☐ EventScheduledInstance	☐ RockEntity	☐ WorkflowActivate

1. **Name**
   In most cases the default name will work, but you can change the name of the block if you want to.
2. **Enable Quick Return**
   If this is enabled then people who visit this page will have it added to their Quick Returns bookmarks. If you have multiple Dynamic Data blocks on the same page, only one of them should have this enabled.
3. **Update Page**
   This setting, when enabled, lets you change the page's Name and Description by editing the block as described above.
4. **Enabled Lava Commands**
   You may need to enable one or more of these if you're including Lava in your Dynamic Data block.

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 person'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!

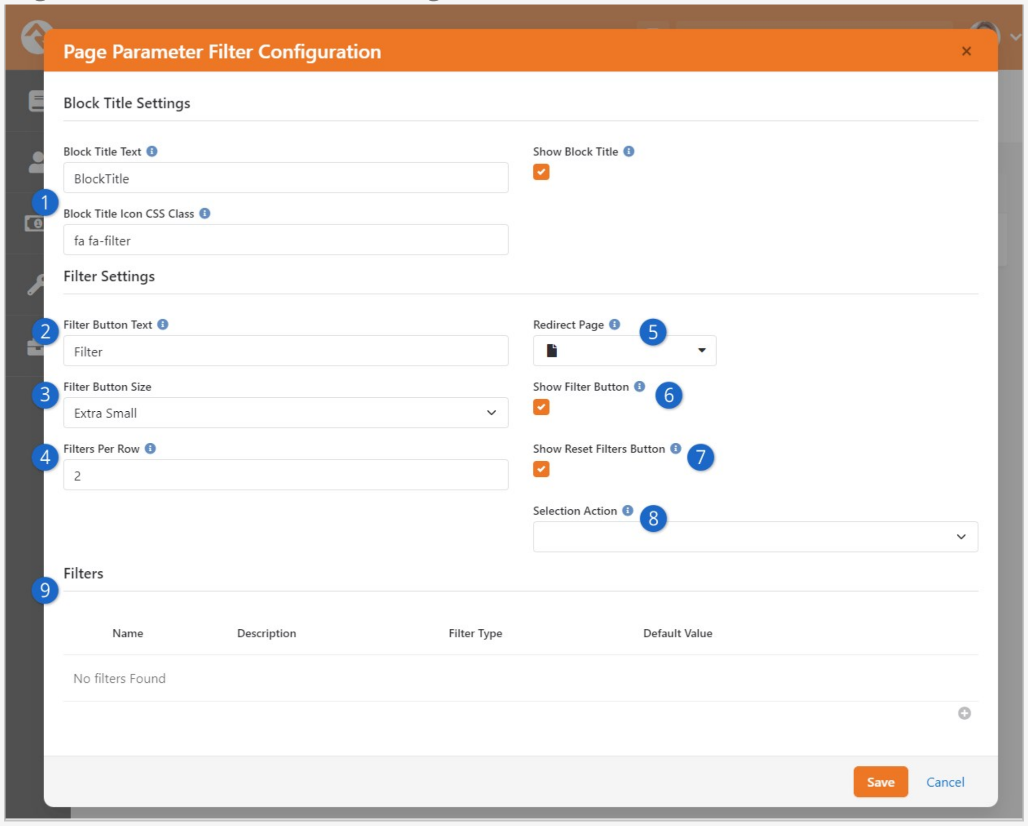
Page Parameter Filter Block

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



Block Title Text: BlockTitle	Show Block Title: ✓
Block Title Icon CSS Class: fa fa-filter	
Filter Button Text: Filter	Redirect Page
Filter Button Size: Extra Small	Show Filter Button: ✓
Filters Per Row: 2	Show Reset Filters Button: ✓
	Selection Action

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 Filters` 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 Filter Button**
If enabled, the `Filter` button will be visible. Typically, you'll only want to hide the button if the *Selection Action* (see below) is set to *Update Page*.

7 **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.

8 **Selection Action**
If you select *Update Block*, then the Page Parameter Filter block itself will be automatically updated to recognize selections the person makes. This might be useful if some of your page parameters rely on values from other page parameters.

Selecting *Update Page* will automatically update all blocks on the page to reflect the person's selection. *Update Page* also updates the URL with the selected parameter, so it has the same effect as clicking the `Filter` button.

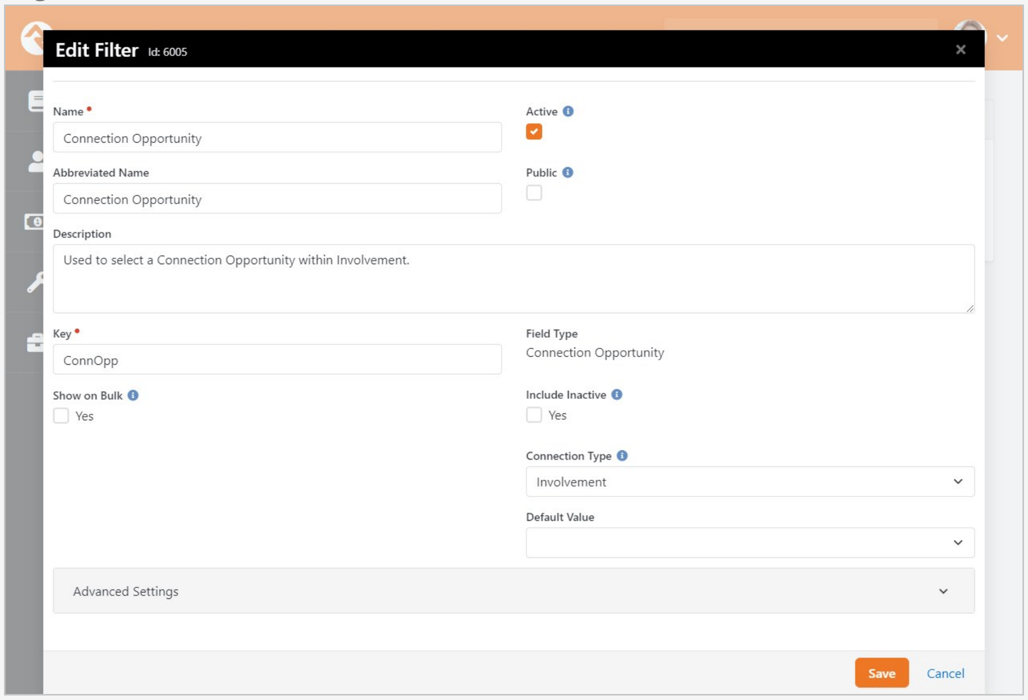
Leaving this blank will do nothing.

9 **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


Edit Filter Id: 6005

Name *
Connection Opportunity

Active
✓

Abbreviated Name
Connection Opportunity

Public

Description
Used to select a Connection Opportunity within Involvement.

Key *
ConnOpp

Field Type
Connection Opportunity

Show on Bulk
Yes

Include Inactive
Yes

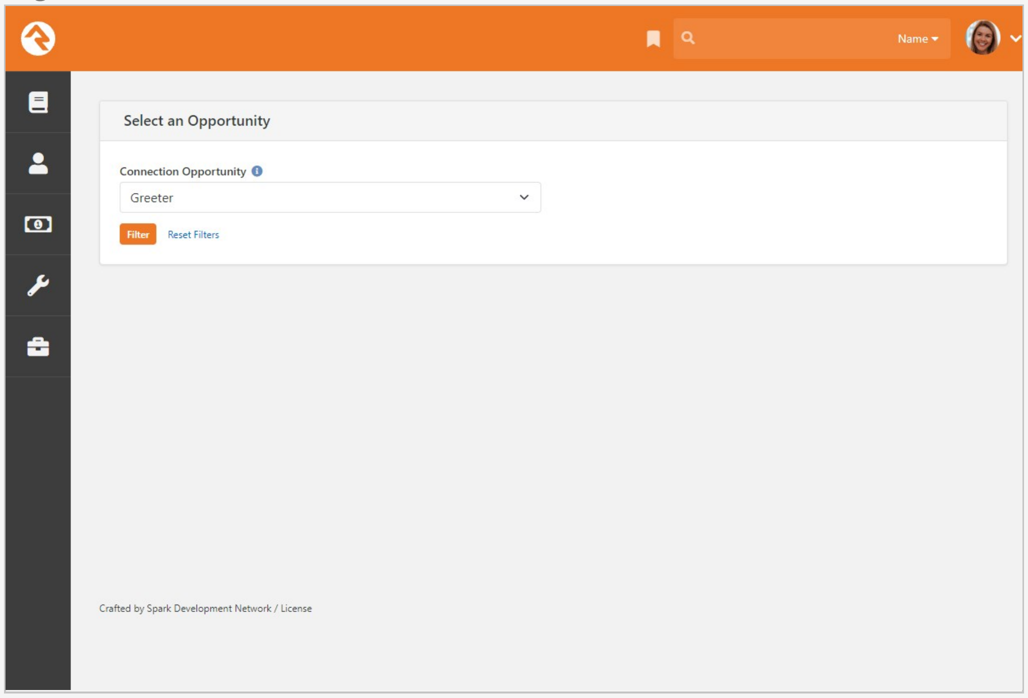
Connection Type
Involvement

Default Value

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.

Page Parameter Filter - Select Value



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
```

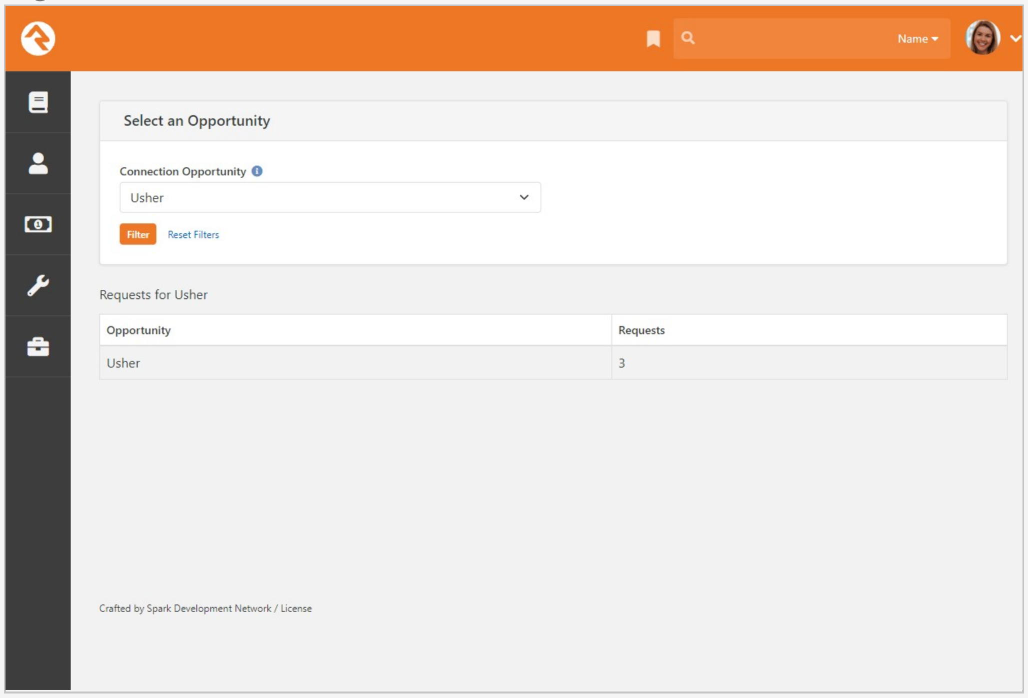
If you configured the block to redirect people to a different page, then the filter information will be appended to the URL of the target page in the same way. This can be very useful if the target page has a block that expects this information to already be in the URL, which won't happen until after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



Requests for Usher

Opportunity	Requests
Usher	3

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See our `Lava` documentation for more information.

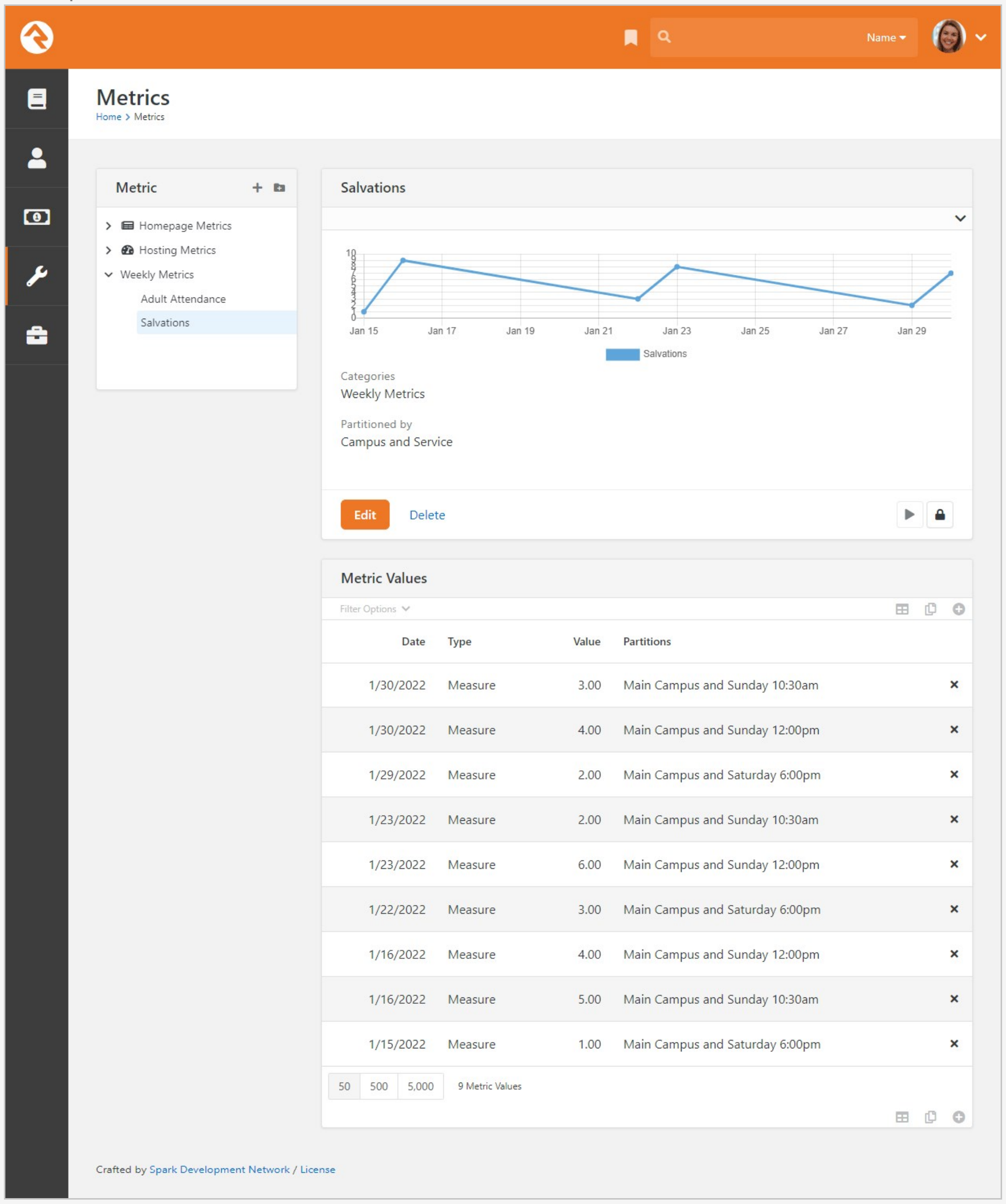
Metrics

> "What’s measured improves."
>
> -Peter Drucker

Using metrics can help provide your organization with 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.

Example Metric



Metrics

Salvations

Categories
Weekly Metrics

Partitioned by
Campus and Service

Metric Values

Date	Type	Value	Partitions
1/30/2022	Measure	3.00	Main Campus and Sunday 10:30am
1/30/2022	Measure	4.00	Main Campus and Sunday 12:00pm
1/29/2022	Measure	2.00	Main Campus and Saturday 6:00pm
1/23/2022	Measure	2.00	Main Campus and Sunday 10:30am
1/23/2022	Measure	6.00	Main Campus and Sunday 12:00pm
1/22/2022	Measure	3.00	Main Campus and Saturday 6:00pm
1/16/2022	Measure	4.00	Main Campus and Sunday 12:00pm
1/16/2022	Measure	5.00	Main Campus and Sunday 10:30am
1/15/2022	Measure	1.00	Main Campus and Saturday 6:00pm

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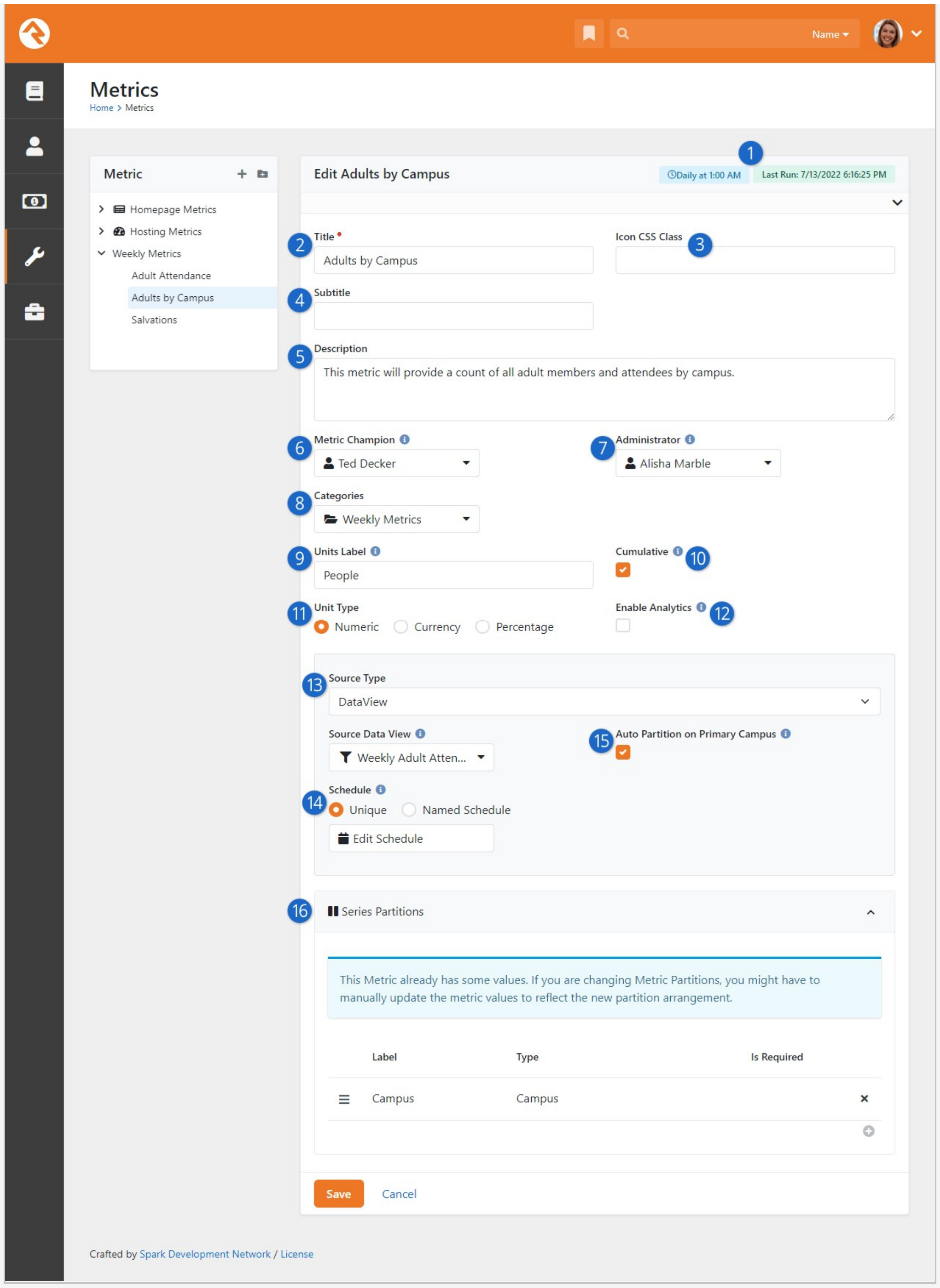
Anatomy of a Metric

Metrics are defined with categories, very similar to data views and reports. 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 metric with callouts for each field.

Metric Edit



Metrics

Home > Metrics

Edit Adults by Campus

Daily at 1:00 AM

Last Run: 7/13/2022 6:16:25 PM

Title *: Adults by Campus

Icon CSS Class:

Subtitle:

Description: This metric will provide a count of all adult members and attendees by campus.

Metric Champion: Ted Decker

Administrator: Alisha Marble

Categories: Weekly Metrics

Units Label: People

Cumulative: ✓

Unit Type: [✓ Numeric] Currency Percentage

Enable Analytics: ☐

Source Type: DataView

Source Data View: Weekly Adult Atten...

Auto Partition on Primary Campus: ✓

Schedule: [✓ Unique] Named Schedule

Series Partitions

This Metric already has some values. If you are changing Metric Partitions, you might have to manually update the metric values to reflect the new partition arrangement.

Label	Type	Is Required
Campus	Campus	

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1 **Schedule and History**
At the top of the page, you can see the current schedule this metric is running on, and the last time the Metric was run.

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

3 **Icon CSS Class**
The CSS class of the icon you wish to associate with 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.

4 **Subtitle**
The subtitle will be shown on graphs and charts.

5 **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 measured, 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.

6 **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.

7 **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.

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

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

10 **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.

11 **Unit Type**
Metrics can track different types of data, so you can use the *Unit Type* setting to tell Rock you're working with numbers, currency or percentages. What you choose here will determine how the metric values appear in different areas, like on the metric's chart. For instance, if you select *Percentage* then the y-axis on the chart will show 10%, 20%, etc.

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

13 **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 will be used to 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 that could be used for metrics. To learn more about Lava, go to https://community.rockrms.com/lava.

14 **Schedule**
The metric schedule helps determine how often this metric is calculated. When used with the SQL, Lava and Data View source types, this field will actually tell Rock when to automate the harvesting of metric values.

15 **Auto Partition on Primary Campus**
Data View source types don't support partitions, with one exception. If your data view returns people, and if you only have a single Partition of type Campus, you can select this option to have the metric return people by campus.

16 **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 set up as many partitions as you feel necessary (but more than two can get a bit complex).

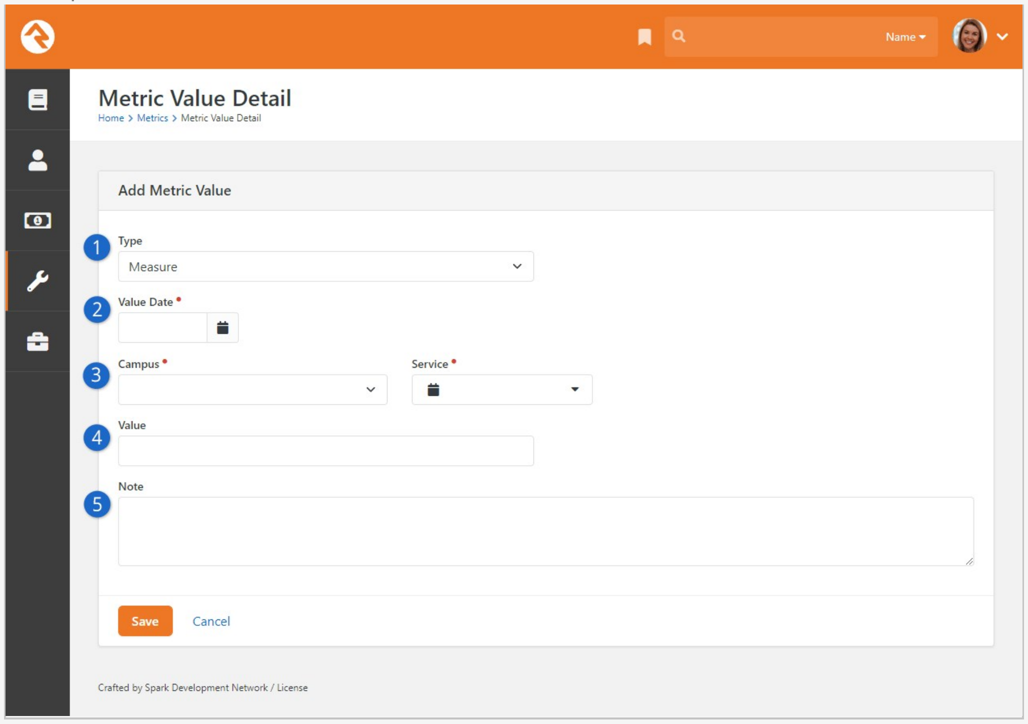
Supercharge Your Metrics with Lava

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.

Example Metric


Metric Value Detail

Home > Metrics > Metric Value Detail

Add Metric Value

Type: Measure

Value Date *

Campus *

Service *

Value

Note

Save Cancel

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1 **Type**
The first entry denotes if this is a measure or a goal. More on the difference between these two below.

2 **Value Date**
The date that the value is for.

3 **Series Partitions**
If you configured any series partitions, you'll need to select their values here. In this example there are partitions for Campus and Service.

4 **Value**
The metric measure or goal value.

5 **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 1st and the other for December 31st.

Metric Charts

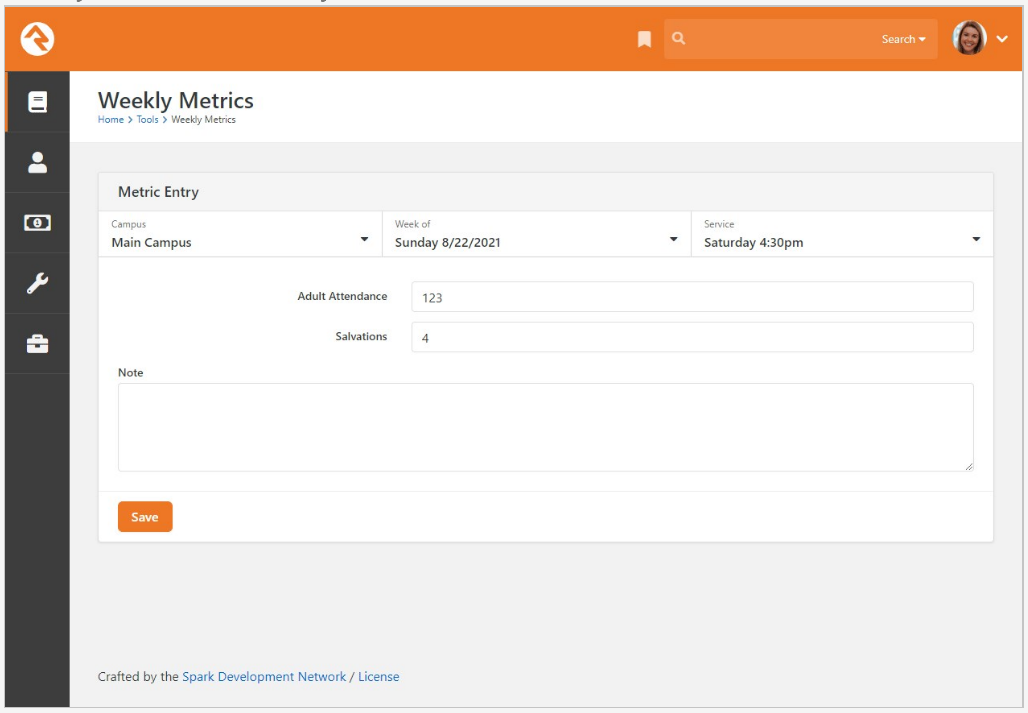
The easiest way to view metrics values is to look at the charts that appear above the metric definition. This will show you all of the values entered for the metric. You can edit the *Metric Detail* block's settings to change what the chart shows and how it looks.

If you would like to have more options for displaying metrics, take a look at the Metrics Dashboards chapter below.

Service Metric Entry

You'll often have the need to enter metrics that follow the partition pattern of "Campus > Sunday Date > Service Time". 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`. Click the drop-down menus along the top of the block to select the service for which you want to add metrics.

Weekly Service Metric Entry



Campus: Main Campus
Week of: Sunday 8/22/2021
Service: Saturday 4:30pm
Adult Attendance: 123
Salvations: 4
Note:

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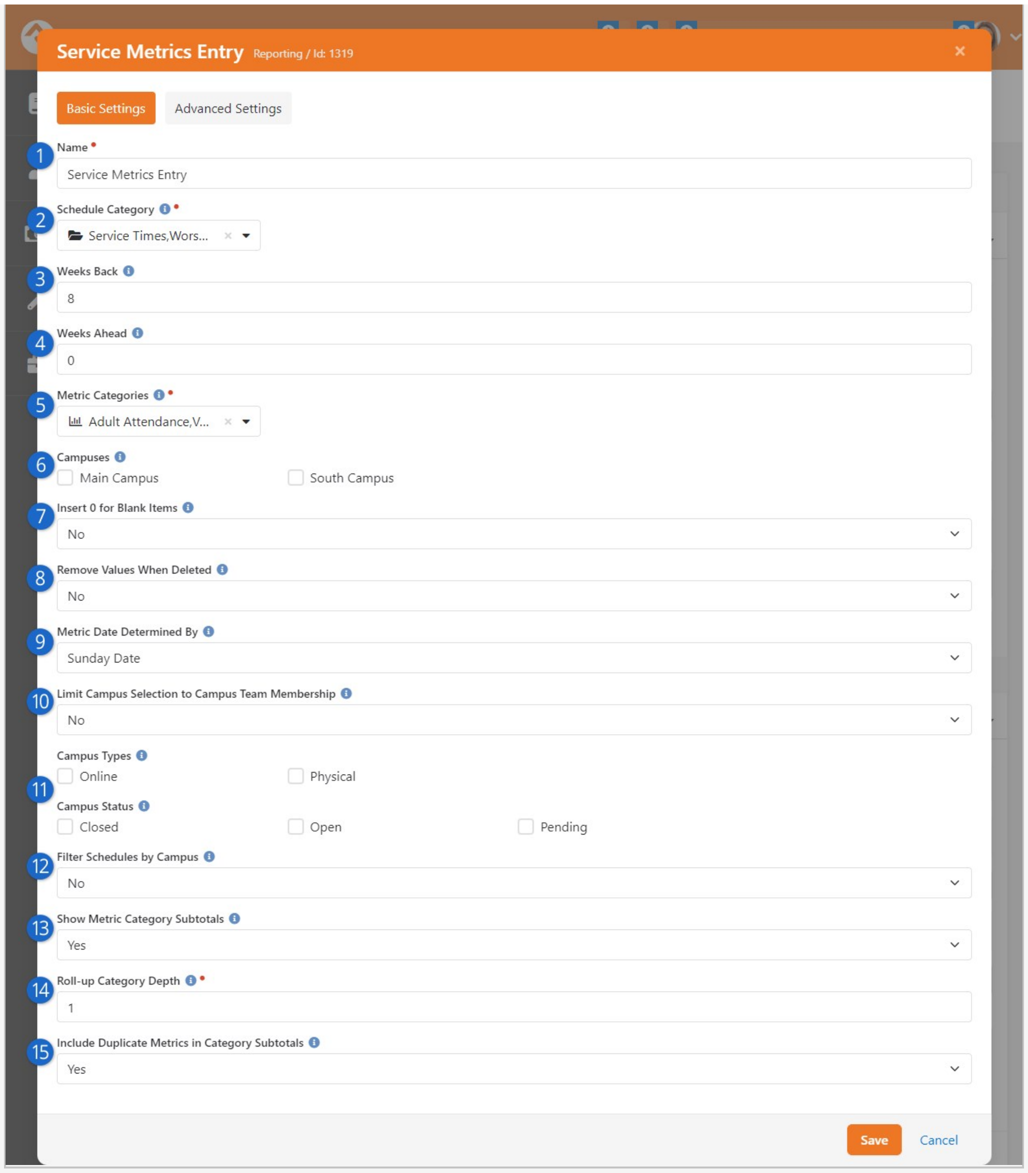
Pictured below, there are several block settings that allow you to configure the block, the metrics you wish to enter and how the metric date should be determined.

Weekly Metrics Entry - Block Settings



Service Metrics Entry Reporting / Id: 1319

Basic Settings | Advanced Settings

1 Name: Service Metrics Entry

2 Schedule Category: Service Times,Wors...

3 Weeks Back: 8

4 Weeks Ahead: 0

5 Metric Categories: Adult Attendance,V...

6 Campuses: Main Campus, South Campus

7 Insert 0 for Blank Items: No

8 Remove Values When Deleted: No

9 Metric Date Determined By: Sunday Date

10 Limit Campus Selection to Campus Team Membership: No

11 Campus Types: Online, Physical
Campus Status: Closed, Open, Pending

12 Filter Schedules by Campus: No

13 Show Metric Category Subtotals: Yes

14 Roll-up Category Depth: 1

15 Include Duplicate Metrics in Category Subtotals: Yes

Save | Cancel

1 **Name**
You probably won't need to change this, but if you want to customize the block's name you can do so here.

2 **Schedule Category**
This is where you'll identify the schedule category that has your service times.

3 **Weeks Back**
For this block, you don't need to scroll through a list of every service you've ever had. Still, it's likely you'll need to add metrics for services in the recent past. This setting lets you control how far back, in weeks, you can enter service metrics.

4 **Weeks Ahead**
Similar to the above setting, you can control how far ahead metrics can be entered for a service. A value of zero, as shown in the screenshot, won't let you select any services beyond the current week.

5 **Metric Categories**

This setting determines which metrics will be entered on the page. In this example, the weekly metrics of "Adult Attendance" and "Salvations" have been selected in the block's settings, allowing fields for those metrics to appear on the page for data entry.

6 **Campuses**
You can optionally limit this block to one or more campuses. If no campuses are selected, then metrics can be entered for any campus.

7 **Insert 0 for Blank Items**
When it comes to metrics, there can be a pretty big difference between a blank/empty value and an actual zero. If this setting is enabled, any blank values will automatically be replaced with a "0" by Rock when you save.

8 **Remove Values When Deleted**
If enabled, metrics that already exist will be deleted if you remove the number from the entry page. This would result in a blank value, so the metric will not be deleted if you've enabled the *Insert 0 for Blank Items* option above.

9 **Metric Date Determined By**
This setting determines what date to use when adding the metric. 'Sunday Date' will use the selected Sunday date from the page. 'Day from Schedule' will use the first day that's configured from the schedule selected above. When using 'Day from Schedule' remember that Sunday is the last day of the week.

10 **Limit Campus Selection to Campus Team Membership**
If you have Campus Teams set up then you can enable this setting to narrow down the list of campuses to only the ones where the person is part of the Campus Team.

11 **Campus Type and Status**
Selecting options here will limit the campuses available for entry according to their Type and Status. For instance, you might only want to show *Physical* campuses that are *Open*.

12 **Filter Schedules by Campus**
Enabling this will restrict the Schedules available to only those associated with the campus. This only applies if you have Campus Schedules configured.

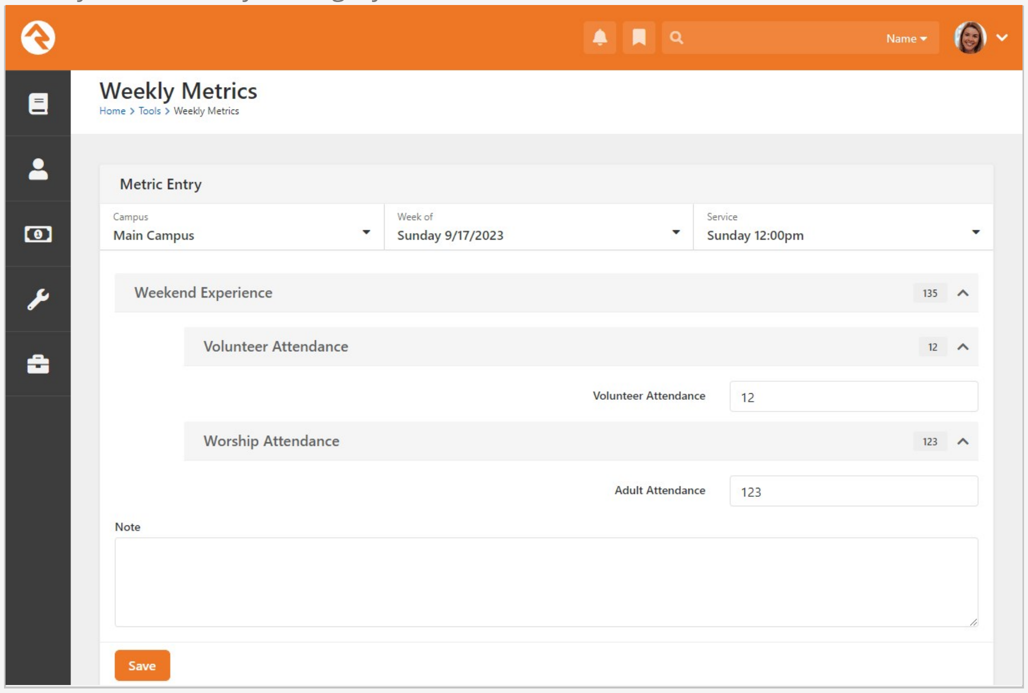
13 **Show Metric Category Subtotals**
As pictured below, you can enable this to sum up metric values by category. Higher-level categories would provide a sum of the child categories beneath it.

14 **Roll-up Category Depth**
This setting determines how far up in the category tree you should go (1 = parent, 2 = grandparent, etc.) when entering metrics.

15 **Include Duplicate Metrics in Category Subtotals**
A single metric can be in more than one category. This setting determines if it should be counted more than once when it appears in multiple categories.

Below, you'll find an alternative view of the *Weekly Metrics* page, showcasing the activation of some of the optional block settings mentioned earlier. Specifically, the options related to the metric categories.

Weekly Metrics Entry - Category Subtotals



Campus	Week of	Service
Main Campus	Sunday 9/17/2023	Sunday 12:00pm

Weekend Experience 135

Volunteer Attendance 12

Volunteer Attendance: 12

Worship Attendance 123

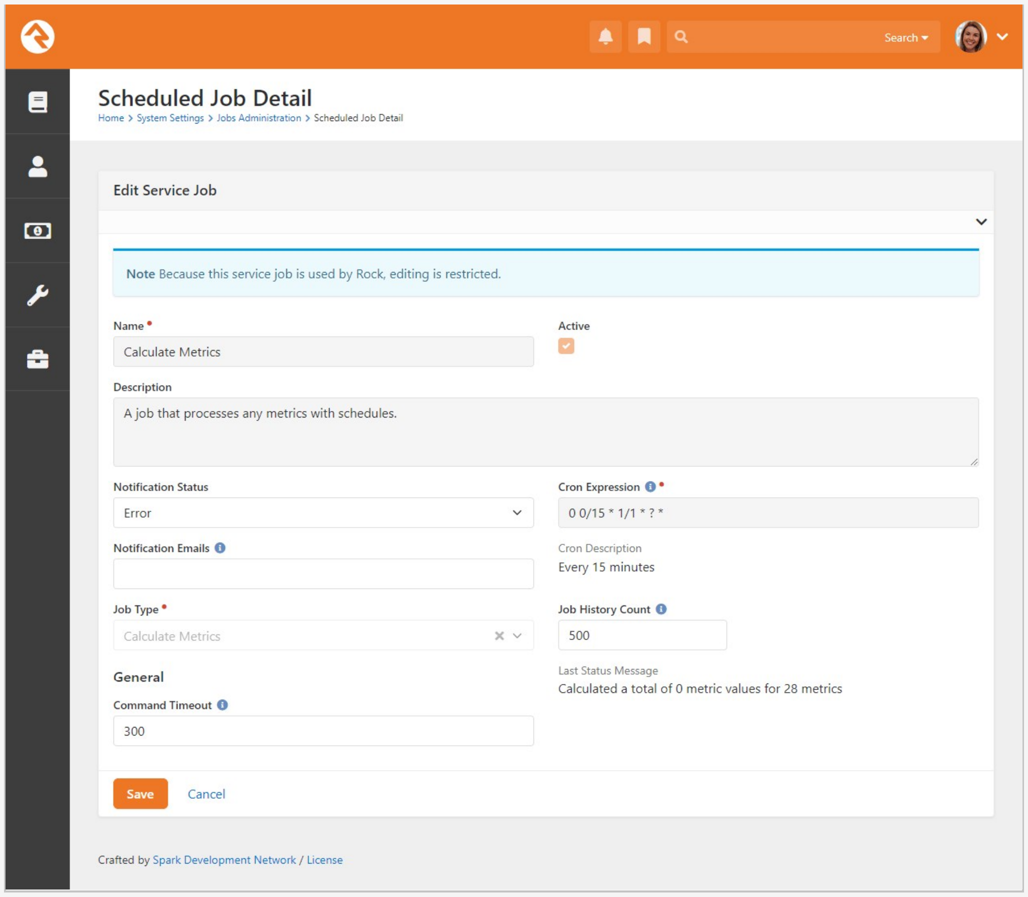
Adult Attendance: 123

Note

Calculating Metrics

Metric values can be added using the methods described above. However, metrics that use a *Source Type* of SQL, Data View or Lava can be automatically calculated based on a schedule you provide when editing or creating the metric. The calculations are performed when the *Calculate Metrics* job is run. As pictured below, this job runs once every 15 minutes to process any metrics that need to be calculated based on their schedule. If you have a SQL metric that takes a long time to process, you can adjust the *Command Timeout* job setting to allow the calculation to be completed.

Calculate Metrics Job



Scheduled Job Detail

Home > System Settings > Jobs Administration > Scheduled Job Detail

Edit Service Job

Note Because this service job is used by Rock, editing is restricted.

Name *	Calculate Metrics
Active	✓
Description	A job that processes any metrics with schedules.
Notification Status	Error
Cron Expression *	0 0/15 * 1/1 * ? *
Notification Emails	
Cron Description	Every 15 minutes
Job Type *	Calculate Metrics
Job History Count	500
Last Status Message	Calculated a total of 0 metric values for 28 metrics

General

Command Timeout	300

Save Cancel

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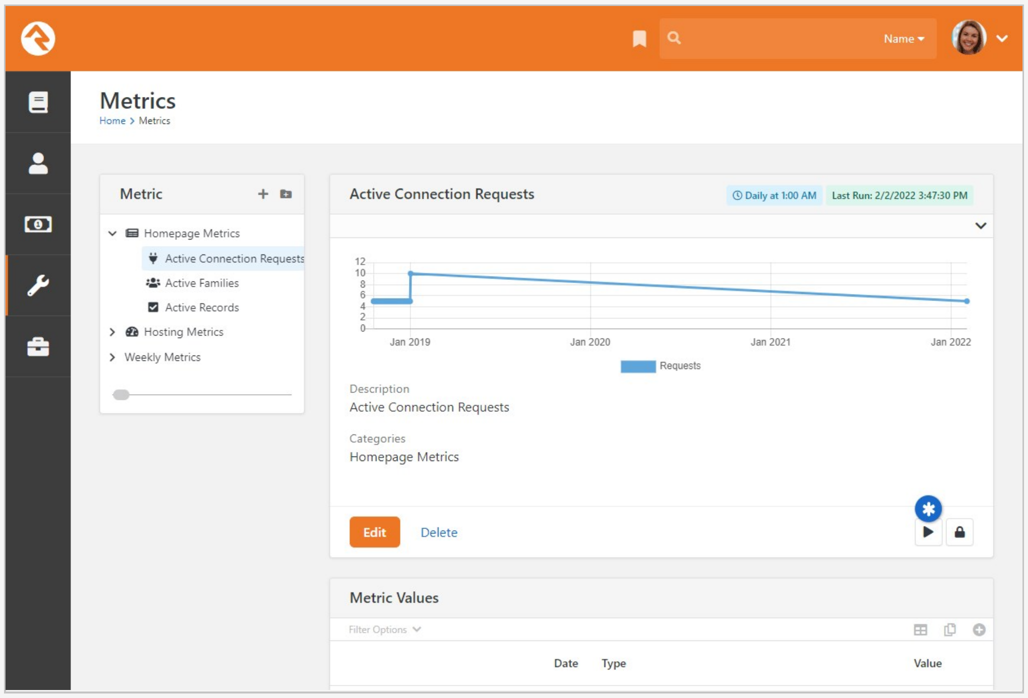
Metrics can also be calculated on demand, rather than waiting for the Calculate Metrics job to calculate the metric based on its schedule. Simply click the ▶ button pictured below to calculate any metric that uses SQL, Data View or Lava as its *Source Type*. Manually calculating a metric in this way will not disrupt the schedule on which it normally calculates.

Calculate Metrics Run Now



Description
Active Connection Requests

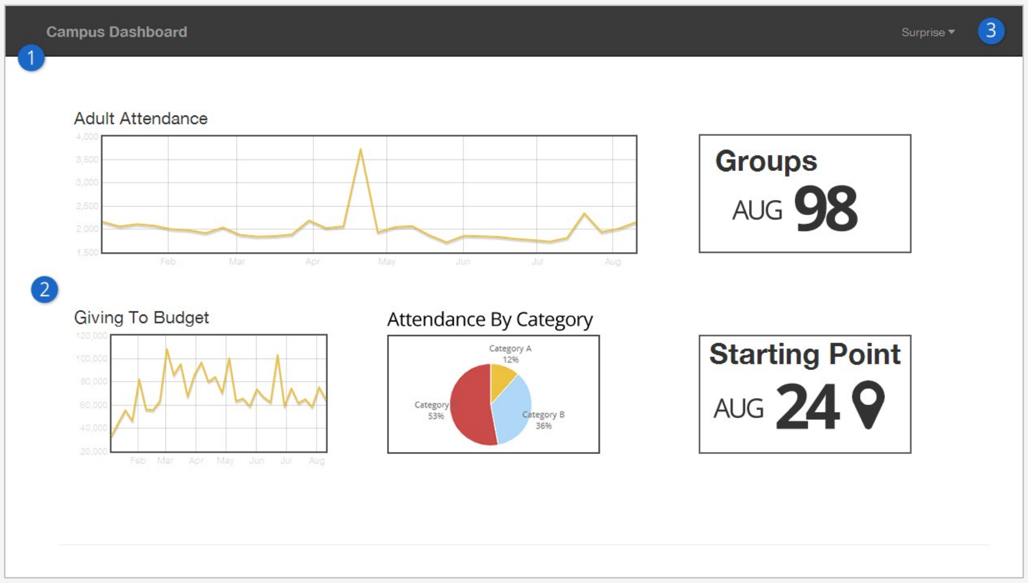
Categories
Homepage Metrics

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 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.

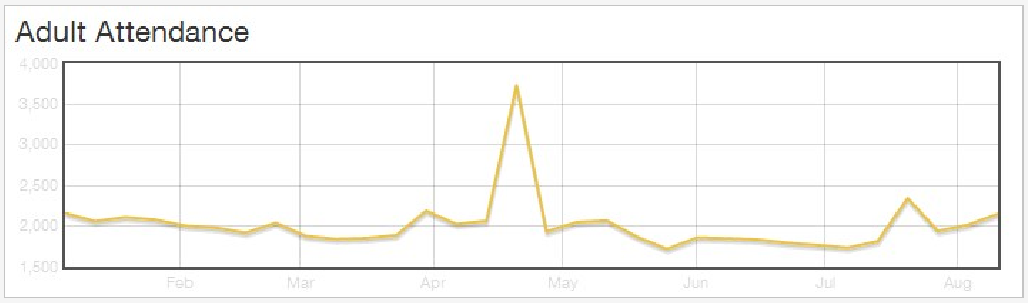
3. **Context Setter**
While optional, a context setting on the page allows you to filter the metric values by their *Series Partition*. Many times, this is a campus selector or group selector.

Dashboard Blocks

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

Line Chart

Line Chart

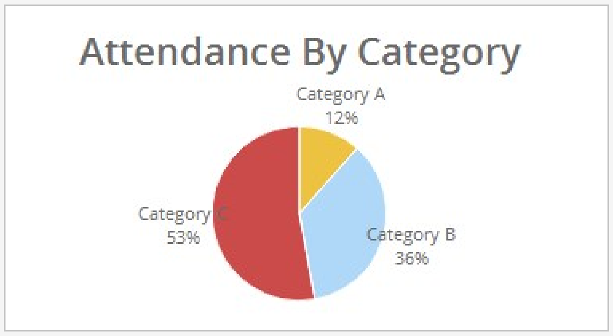


This block displays a line chart for the selected metric. Options include:

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	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

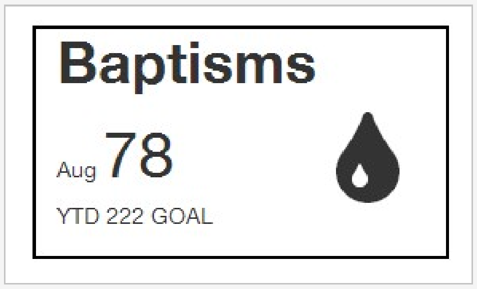


This block displays a pie chart for a given metric. Options include:

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 Type	Determines what metric value types should be displayed on the chart, goals and/or measures.
Metrics	The metrics to use for the chart. Each metric will represent one slice of the pie chart.
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 Dashboard Widget

Lava Dashboard Widget



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	The number of Bootstrap columns the chart should use for its width. (A

Title	Description
Width	Bootstrap row, by default, has 12 columns.)
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.
Lava Template	The Lava template to render the output for display.

See our `Lava` documentation for more information.

Under Construction

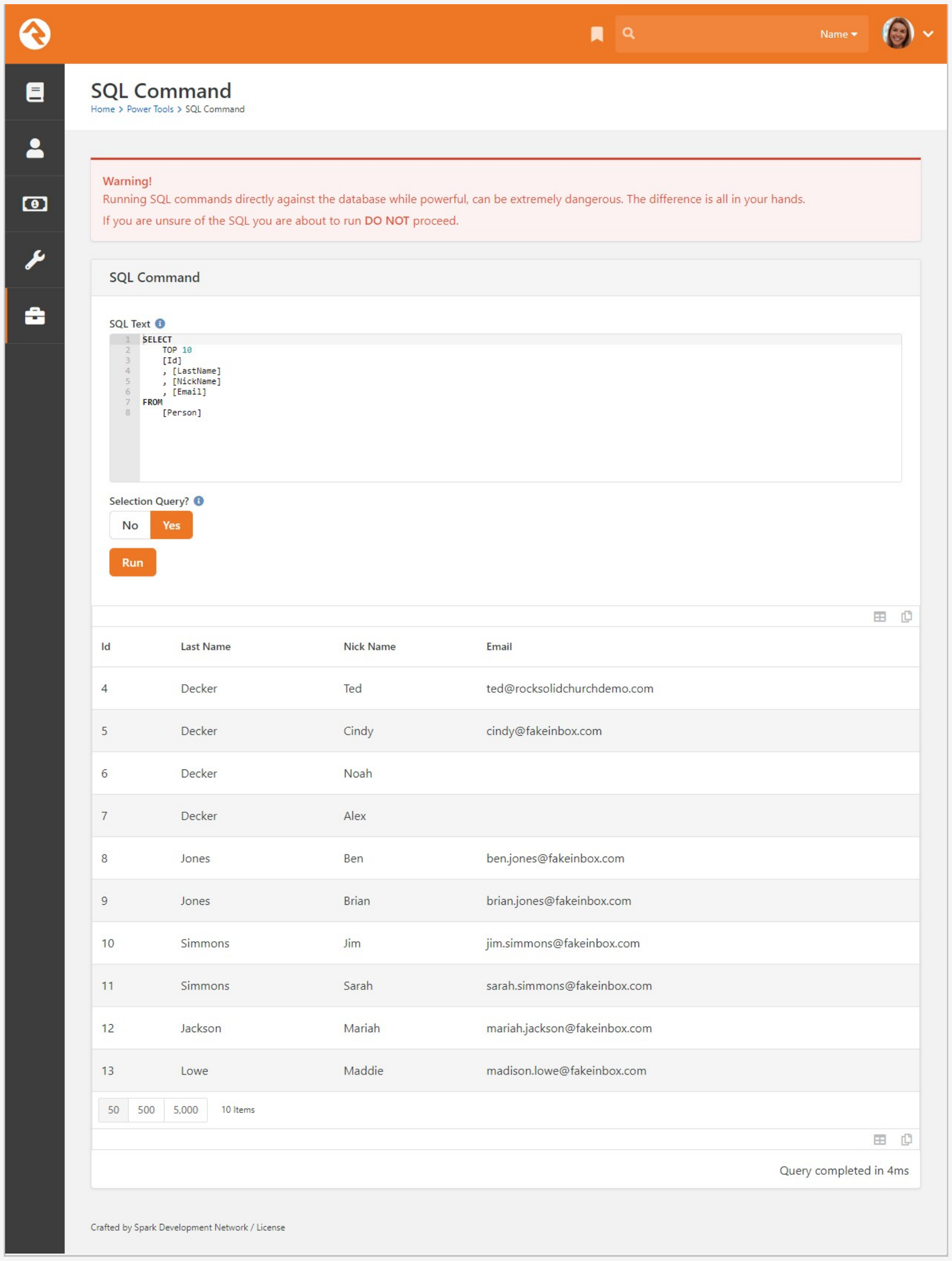
Work is still being done on the metrics dashboard features. Expect changes that may impact configuration settings. Feel free to play with these features but don't roll them out in production just yet.

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 software like 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



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

```
SELECT
    TOP 10
    [Id]
    , [LastName]
    , [NickName]
    , [Email]
FROM
    [Person]
```

Selection Query? No [✓ Yes]

Id	Last Name	Nick Name	Email
4	Decker	Ted	ted@rocksolidchurchdemo.com
5	Decker	Cindy	cindy@fakeinbox.com
6	Decker	Noah	
7	Decker	Alex	
8	Jones	Ben	ben.jones@fakeinbox.com
9	Jones	Brian	brian.jones@fakeinbox.com
10	Simmons	Jim	jim.simmons@fakeinbox.com
11	Simmons	Sarah	sarah.simmons@fakeinbox.com
12	Jackson	Mariah	mariah.jackson@fakeinbox.com
13	Lowe	Maddie	madison.lowe@fakeinbox.com

50 500 5,000 10 Items

Query completed in 4ms

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For additional details check out the `Rock Admin Hero Guide`.

Business Intelligence

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