Database-as-Service

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Welcome to the Splice Machine Database Service!

Welcome to Splice Machine, the database platform for adaptive applications that manage operational processes. This site contains documentation for our **Managed Database Service in the Cloud**, which includes Release 2.7 of the Splice Machine Database.

Getting Started With our Database Service

Getting started with our database is as simple as can be; just follow these steps, and you can be up and running in less than an hour:

1. **LOG INTO SPLICE MACHINE** → Log in directly, or use your Google or Amazon ID.
2. **CREATE DATABASE CLUSTER** → Adjust 4 sliders for your processing and storage needs; your database cluster is ready within 15 minutes.
3. **LOAD YOUR DATA** → Copy data to S3, then perform a fast import. Time required varies with dataset size. Our Zeppelin Simple Example provides a quick example.
4. **QUERY AND UPDATE YOUR DATABASE** → Use Zeppelin notebooks to quickly update, query, and display results graphically, without coding.

Next Steps

Easy next steps you can take to become more proficient with your new database system:

- Our About the Splice Machine Database Service topic introduces this edition of Splice Machine and links to main documentation pages related to the service.
- Spend some time learning more about creating and using Zeppelin notebooks, which you can use to prepare and run SQL DDL and DML, stored procedures, Java, Scala, and Python and Spark-SQL programs with Splice Machine data, all without writing code.
- Spend a few minutes with our Cloud Manager Interface, which you can use to modify your cluster configuration, administer your account, set up events, and review database usage.
- Check this documentation web for best practices, usage tips, developer guides, and reference material

About the Splice Machine Database Service

With the *Splice Machine Cloud Manager*, configuring a new cluster is as easy as using a few sliders to set compute units for OLTP and OLAP processing, allocate storage, and schedule backup frequency and retention. Splice Machine does the rest. You can seamlessly scale out from gigabytes to petabytes of data when needs or data volumes change, and the same configurator adds or subtracts resources dynamically. You pay only for what you use. You can then:

- Power your applications on a scale-out, ANSI SQL database
- Power apps with simultaneous OLAP & OLTP workloads
- Ingest millions of records and process thousands of transactions in nanoseconds
- Elastically scale resources as needed
- We've got you covered – availability, backups, monitoring and alerts

Service Configuration

You only need to understand a few key concepts to configure your service:

- A **Splice Unit** is a measure of processing work; one unit currently translates (approximately) to 2 virtual CPUs and 16 GB of memory. When you provision a new Splice Machine cluster, you can select the number of Splice Units you want to use for OLAP and OLTP workloads. The minimum number of Splice Units required for your cluster changes when you update the amount of data you want to access or the amount processing power you want to use.
- The space allocated for your **Internal Dataset**, which is data that you're storing within your database. Note that as this size increases, the number of Splice Units required (especially OLTP Splice Units) can also increase.
- The space allocated for your **External Dataset**, which is data stored externally that you can access from your database using features such as external tables and VTI. Note that as this size increases, the number of OLAP Splice Units required can also increase.

Use our Database-Service documentation to quickly walk through provisioning your database cluster, loading your data, and querying your data in notebooks, all in less than an hour. Once you're ready, our documentation offers:

Available Tools

In addition to easy connectivity with almost any Business Intelligence tool, Splice Machine includes:

- An integrated *Zeppelin Notebook* interface. Zeppelin notebooks are like text documents, but with code that can be executed and of which the output can be rendered as tables, reports and beautiful graphs. This enables you to prepare and run SQL DDL and DML, stored procedures, Java, Scala, and Python and Spark-SQL programs with Splice Machine data. Splice Machine comes pre-configured with a set of notebooks to get started, load data and see examples of the work that can be done with the RDBMS.
- Our JDBC and ODBC drivers allow you to connect third-party business intelligence tools to your database.
- You can also take advantage of machine learning, streaming, and other services that you can access from our predesigned notebooks, your own notebooks, or code written by your developers.

Learn More

Our documentation provides:

- Complete descriptions of our Cloud Manager dashboard
- Numerous Tutorials about connecting with other tools, using various programming languages with Splice Machine, ingesting data efficiently, and so on.
- An introduction to Using Zeppelin with Splice Machine
- A wealth of Developer's Guide information and our SQL Reference Manual

You can visit our company web site to learn about what our Cloud-Managed Database-as-Service (DBaaS) can do for your company.

Service Overview

Our Database Service is a subscription-based service, hosted in the Cloud. We take care of managing your cluster services, and you can focus on working with our scalable, dual-engine database.

This is a DB-Service-Only topic! Learn about our products

Service Availability

Splice Machine's target Service availability commitment is 99.9% per calendar month, excluding scheduled downtime. You can expect the following:

- Splice Machine will deliver product updates with minimal, scheduled downtime.
- Splice Machine can recover your database from a stored backup after receiving your request to do so.
- Splice Machine can resize your cluster with minimal downtime.

Support for Your Service

Splice Machine provides two support options, as shown in the following table:

Support Type	Pricing	Support Feature	Description	Details
Standard Support	Free	Coverage Hours	Monday-Friday 9am-6pm Pacific time	(subject to local holidays)
		System Impaired	Significant issues with speed, quality, or funtionality of Service.	< 12 business hours
		Other Issues	General queries and guidance requests	< 24 business hours
Business Support	As per contract Includes SLA	Coverage Hours	24 hours a day, 7 days a week, 365 days a year	
		Production System Down	Complete loss of Service on Production cluster.	< 1 hour
		Production System Impaired	Significant issues with speed, quality, or funtionality of Service on Production cluster.	< 4 hours
		Production System Down	Significant issues with speed, quality, or funtionality of Service on non-production cluster.	< 12 hours

Support Type	Pricing	Support Feature	Description	Details
		Other Issues	General queries and guidance requests	< 24 business hours

Service Level Agreement (SLA)

Our *business support agreement* includes a *Service Level Agreement (SLA)* that specifies our commitment to a target Service availability of 99.9% per calendar year, excluding scheduled downtimes.

Service Terms

Subscription fees are payable monthly in advance on the 1st of the month, pro-rated for any partial months. We'll charge your credit card or withdraw payment by ACH on the first of each month, until your service is cancelled. See your license agreement for more details.

Database Service User Interface

This is a DB-Service-Only topic! Learn about our products

In addition to our our database, the Splice Machine Database Service includes all of the tools you need to create your cluster, load data into your database, query and manipulate your database, and create visual representations of your query results, as described here:

UI Component	Description
Dashboard	The Splice Machine Dashboard or **Cloud Manager** is your entry point to your Database Service. You can register and log into your account here, as well as accessing the other managers described in this table.
Cluster Manager	Use the Cluster Manager to create new clusters and to monitor the health of your clusters.
Notebooks Manager	Apache Zeppelin notebooks make it easy to query your database and apply various visualizations to the results of your queries. We've created several notebooks that will help you to quickly become productive and to see how easy it is to create your own notebooks.
Database Console	The Database Console is a browser-based tool that you can use to monitor database queries on your cluster in real time. The Console UI allows you to see the Spark queries that are currently running in Splice Machine on your cluster, and to then drill down into each job to see the current progress of the queries, and to identify any potential bottlenecks. If you see something amiss, you can also terminate a query.
Events Manager	Our **Events Manager** allows you to examine events that have occurred on your cluster.
Account Manager	The Splice Machine Account Manager is where you manage your users, your profile, and your billing information.

Release Notes for the Splice Machine Database-as-a-Service Product

This is a DB-Service-Only topic! Learn about our products

This topic includes any release notes that are specific to the Splice Machine *Database-as-Service* product, in these sections:

Most of the information about changes in the Splice Machine database that underlies this product are found in the Splice Machine database release notes.

Features Not Yet Available

These features are not yet available, but will be very soon:

- TLS is not yet enabled for JDBC connections.
- VPC Settings are not yet enabled but will be in a near future release.
- You currently cannot cancel queries that are running through Zeppelin or JDBC tools; you can use the Spark User Interface to cancel Spark queries.

Current Limitations

These limitations exist in this release, and will be removed in the near future:

- On a JDBC connection, individual queries or actions will time out after one hour; you can run long-running queries within a Zeppelin notebook.
- Updating of CPU, Memory, and Disk usage graphs for clusters is currently limited: the updates are happening only intermittently.

Important Notes

These are important notes about issues you need to be aware of when using our Database Service:

- The timestamps displayed in Zeppelin will be different than the timestamps you see in the Splice Machine Spark User Interface, depending upon your time zone.
- Although Splice Machine backs up your database regularly, it does not back up your Zeppelin Notebook changes; please export your Notebooks regularly if you make changes.

Splice Machine Cloud Manager

This guide helps you to get registered with and start using the Splice Machine Cloud Manager

You can initiate a chat session with one of our support specialists by clicking this chat icon, which you'll see on Cloud Manager screens.

Here are the topics included in this guide:

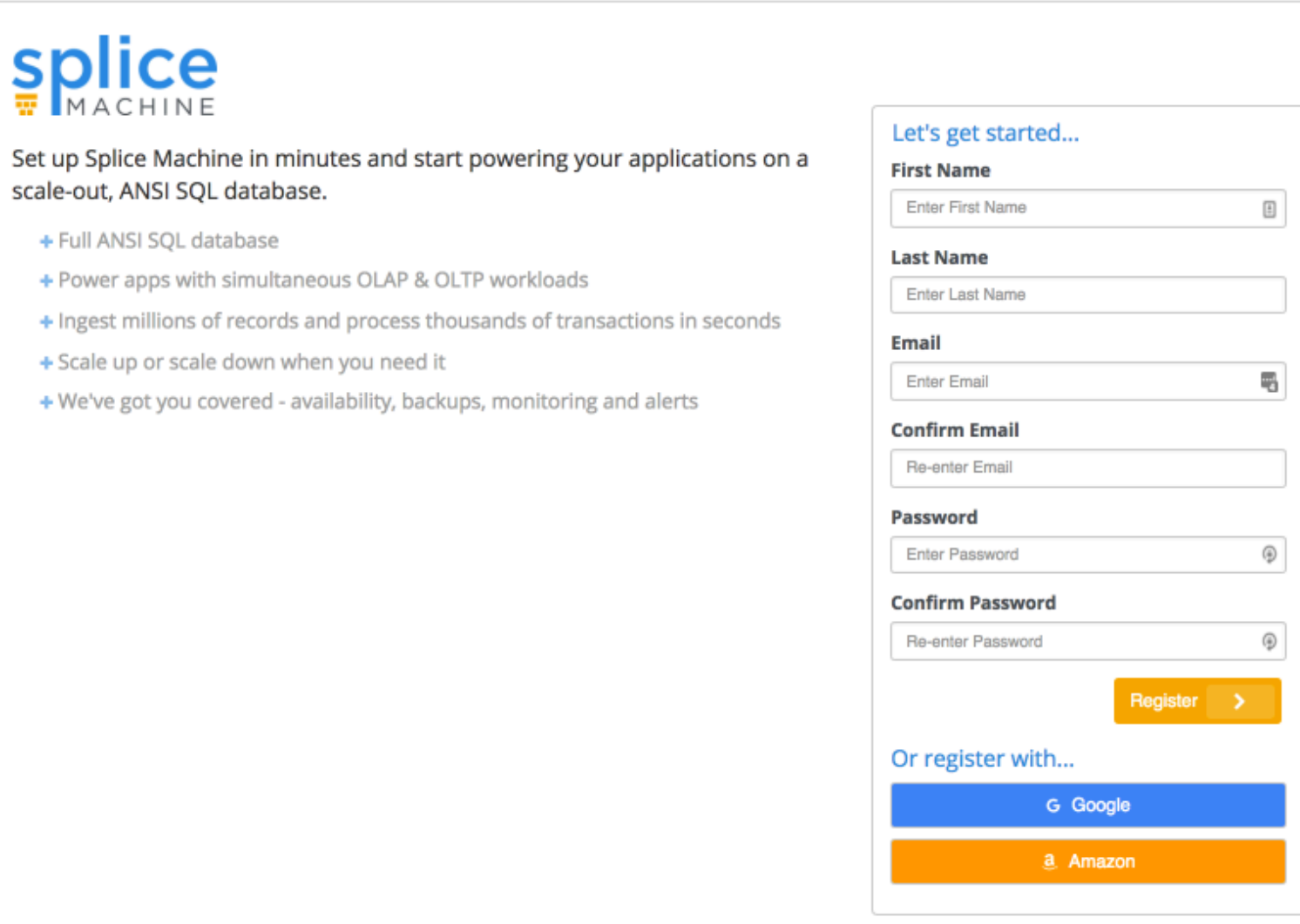
Topic	Description
Navigating Your Dashboard	Your **Dashboard** is the entry point to the Splice Machine Cloud Manager. From here, you can create new clusters, access existing clusters, manage your account, review notifications, update your profile, and log out.
Registering	Shows you how to complete the first step of using your database service: registering as a user of the Splice Machine Cloud Manager.
Logging In	Shows you how to log into the Splice Machine Cloud Manager once you've registered.
Creating a New Cluster	Follow this steps in this topic to quickly become productive with your clustered database. In only a few minutes, you'll have your cluster up and running, and will be able to load and work with your data.
Loading Your Data	You can load your data into Splice Machine from an AWS S3 bucket: » If you don't yet know how to create an S3 bucket or upload data to a bucket, please check our Uploading Data to an S3 Bucket tutorial. » You may need to configure IAM permissions to allow Splice Machine to access your bucket; see our Configuring an S3 Bucket for Splice Machine Access tutorial. » Once you've got your data in a bucket, you can follow our Importing Data Tutorial to load that data into Splice Machine. Also note that the S3 directory you specify for the log of record import issues (the *bad record* directory), must be write-accessible using the same AWS credentials that apply to the input directory, i.e. the bad record directory must allow the same access key/secret key pair.

Topic	Description
Using the DB Console	The **Splice Machine Database Console** is a browser-based tool that you can use to monitor database queries on your cluster in real time. The Console UI allows you to see the Spark queries that are currently running in Splice Machine on your cluster, and to then drill down into each job to see the current progress of the queries, and to identify any potential bottlenecks. If you see something amiss, you can also terminate a query. The DB Console is available for all Splice Machine products; you access the Splice DB Console for the Database-as-Service product by clicking the **DB Console** link in your Cluster Management dashboard, or by following the link sent to you by Splice Machine when your cluster was originally created.  The **DB Console** link in your Cluster Management dashboard allows you to monitor Splice Machine jobs running on your cluster. If you are running non-Splice jobs, you'll need to use a different console to monitor them; you'll find a link to this **External Spark Console** in the bottom left corner of your cluster dashboard.
Using the Notebooks Manager	One of the great features of our database service is the ease with which you can use Apache Zeppelin notebooks to interact with your database. Our **Notebooks Manager** provides convenient access to your notebooks, and to information about using Zeppelin. This tutorial walks you through using a notebook created by Splice Machine that: » Creates a schema and the tables in your database to store the TPCH-1 benchmarks data. » Loads the data from an S3 bucket into your database. » Runs any or all of the TPCH-1 queries
Managing Your Account	Use our Account Manager to manage your company profile, billing, and users.
Reviewing Event Notifications.	Use our Events Manager to review notification messages that have been sent to your account.

Cloud Manager User Registration

This page describes the Splice Machine Cloud Manager registration page.

The registration screen is straightforward and familiar:



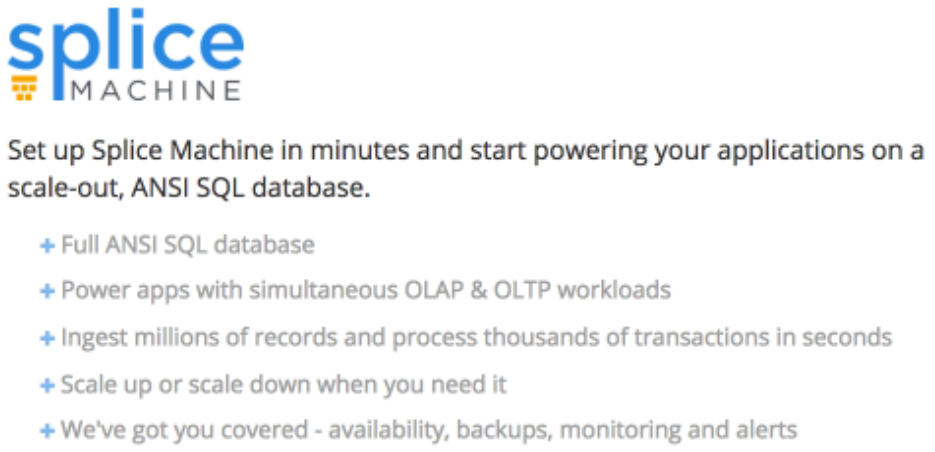
You can use your Google or Amazon account information to register, or you can manually register by following these steps:

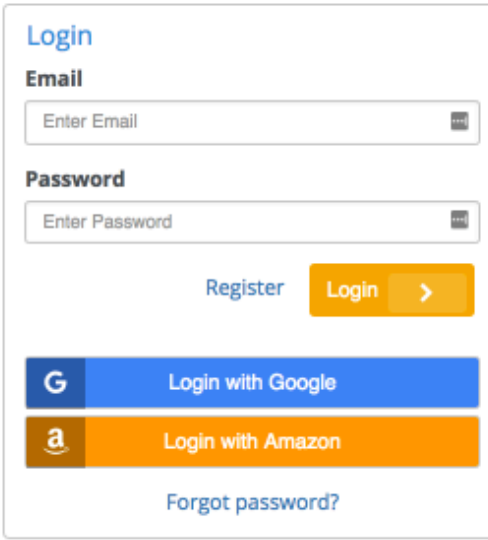
1. Enter your first and last name.
2. Enter and then confirm the email address you want to use for logging into the Splice Machine Cloud Manager.
3. Enter and then confirm the password you want to use for logging into the Splice Machine Cloud Manager.
4. Click the **Register** button.

Once you've successfully registered, you'll land on the *Create New Cluster* screen; we've created a tutorial to quickly walk you through Creating a Cluster topic.

Logging in to the Splice Machine Cloud Manager

This page describes the Splice Machine Cloud Manager Login page.





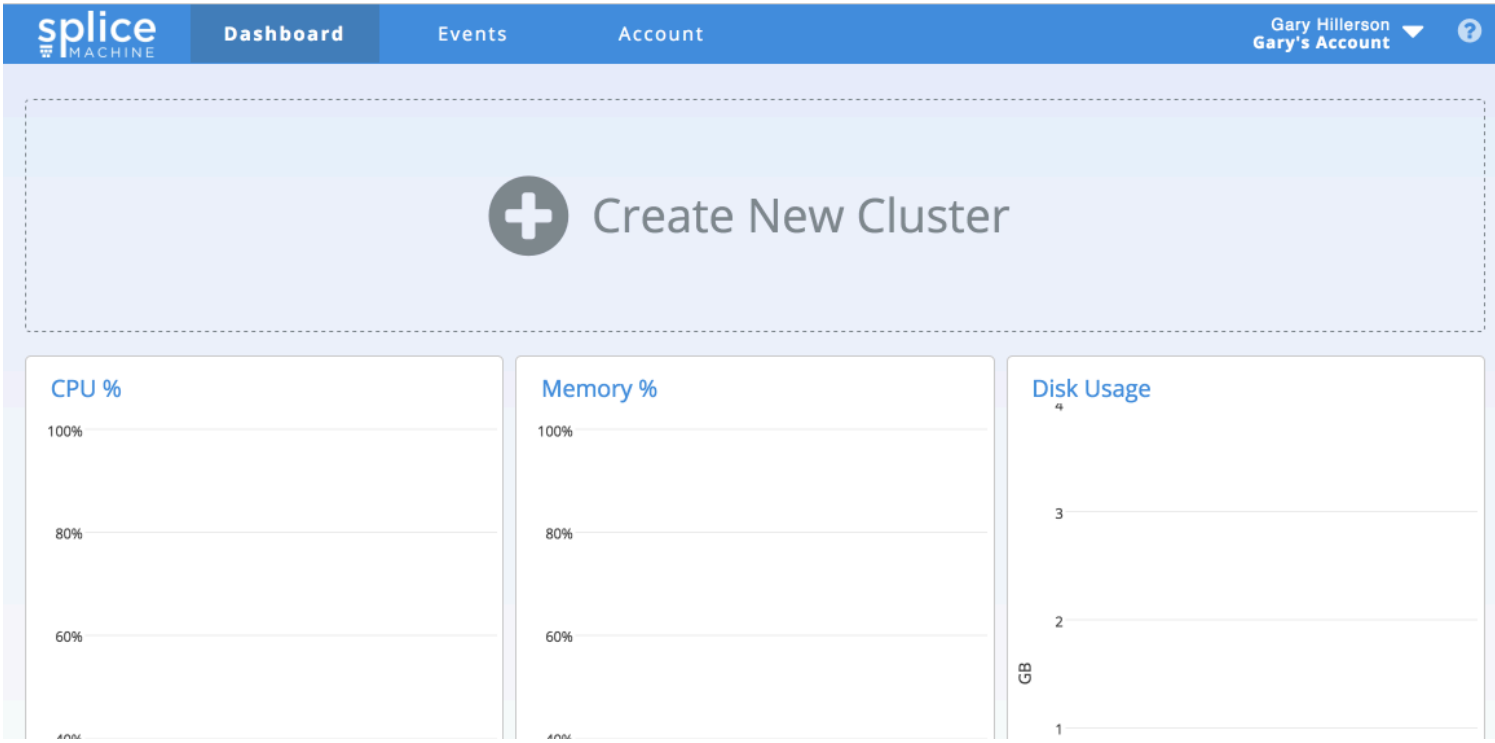
If you've already registered with the Splice Machine Cloud Manager, you can enter your registered email address and password, and click the **Login** button; alternatively, you can log in using your Google or Amazon credentials.

If you've not yet registered with the Splice Machine Cloud Manager, you'll need to register, which will also log you in. Click the **Register** button and fill in the registration form.

After successfully logging in, you'll land on your dashboard page.

Creating a New Splice Machine Cluster

When you first visit your new Splice Machine Cloud Manager dashboard, you'll see the initial dashboard view, which prompts you to create a new cluster:

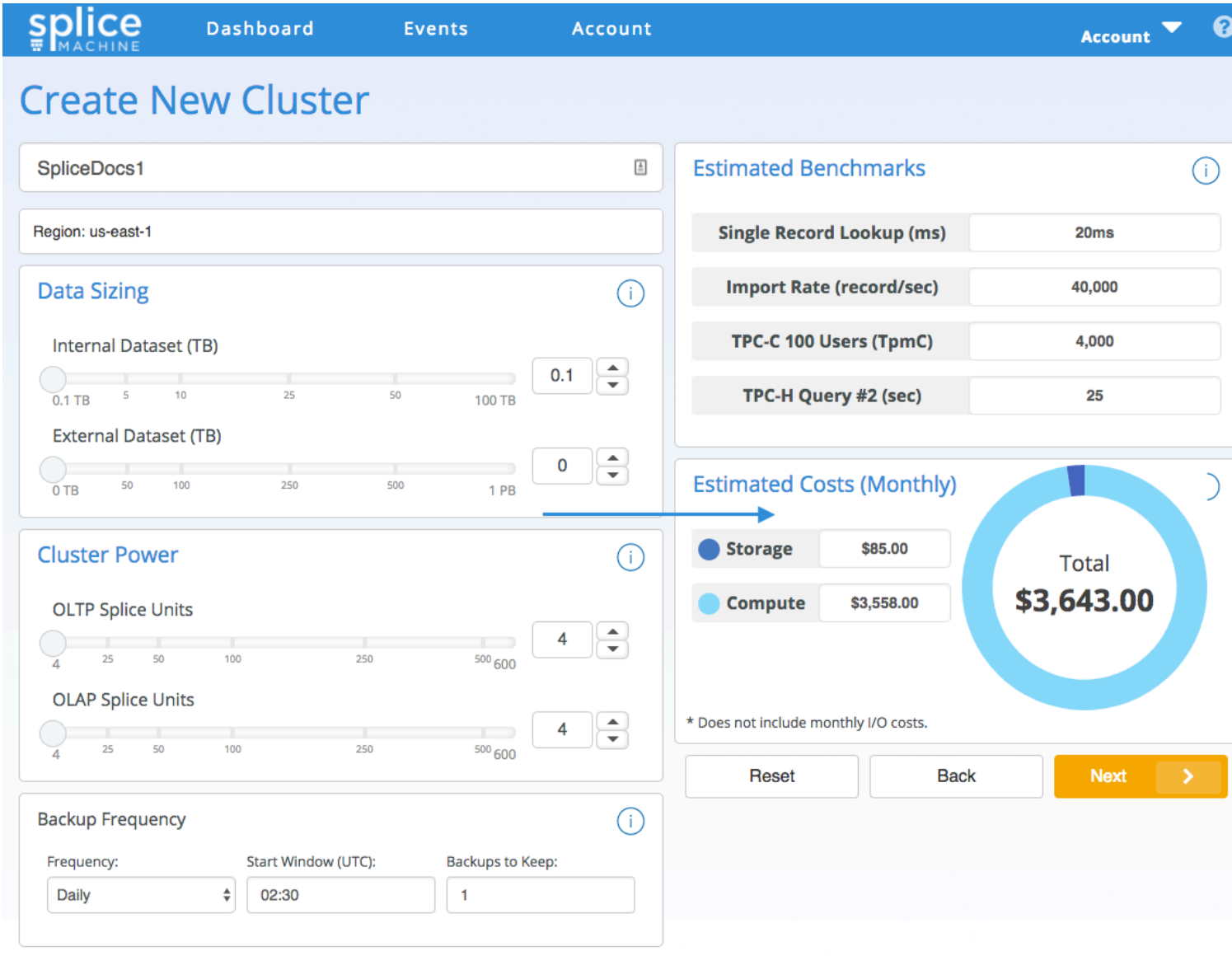


Click **Create New Cluster** to start the process of provisioning your Splice Machine cluster. You'll then need to:

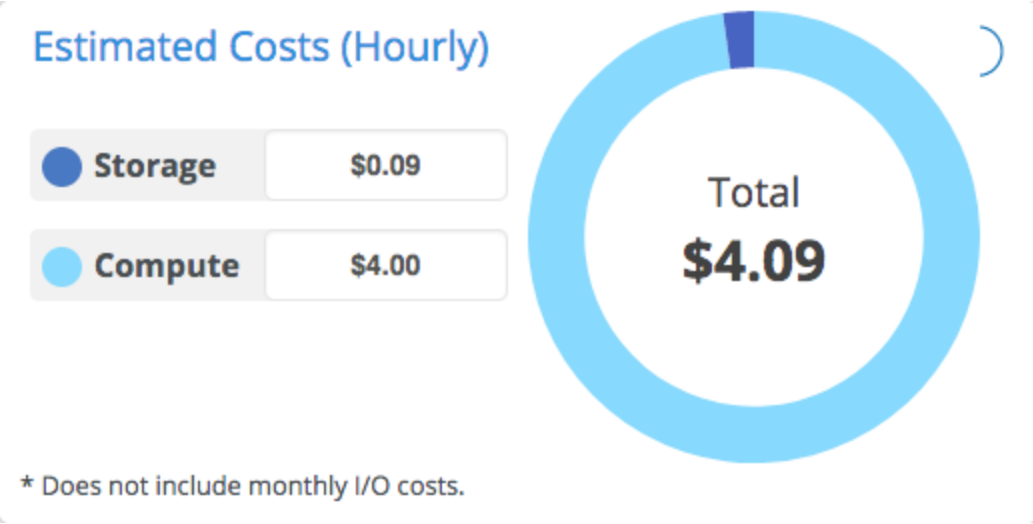
1. Configure Cluster Parameters for data sizing, cluster power, and backup frequency.
2. Configure Cluster Access for your users.
3. Set Up Payment for your Splice Machine cluster.
4. Start Using Splice Machine!

Configure Cluster Parameters

You use the **Create New Cluster** screen to provision your cluster:



If you have subscribed to Splice Machine via the AWS Marketplace, your costs will be estimated on an hourly basis instead of a monthly basis:



Screen Help

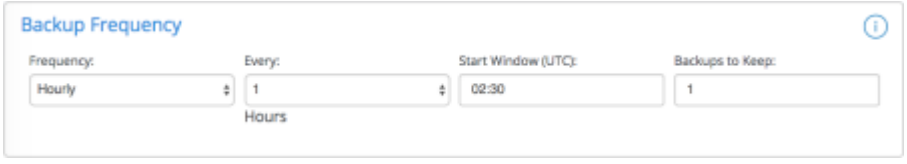
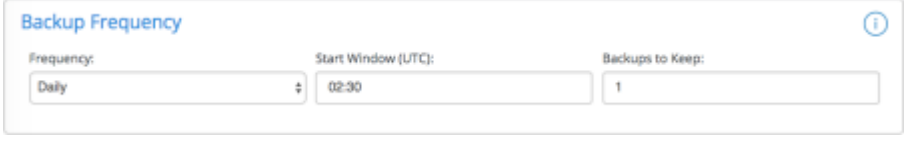
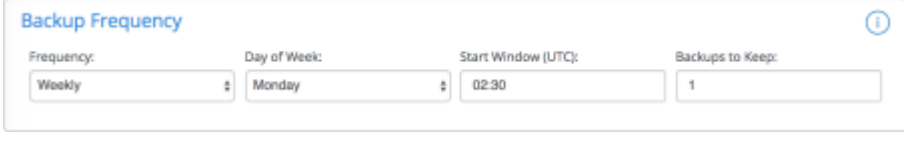
Many of the components of the **Create Cluster** screen, like most of our Cloud Manager screens, include small information buttons (i) that you can click to display a small pop-up that describes the components.

About the Cluster Parameters

You'll notice several sliders that you can adjust to modify the configuration of your cluster. As you move these sliders, you'll see how the estimated monthly costs for your cluster change. Here are explanations of the adjustments you can make to your cluster provisioning:

NOTE: Note that you can come back and modify your cluster configuration in the future, so you're not stuck forever with your initial settings.

	`Cluster Name`	Supply whatever name you want for your Splice Machine cluster.
	`Region`	You can select in which AWS region your cluster will reside by clicking the previously selected region name, which drops down a list of choices.
Data Sizing	`Internal Dataset (TB)`	Move the slider to modify your estimate of how large your database will be. `Internal Dataset` is the amount of data that you will be storing within your Splice Machine database.
	`External Dataset (TB)`	Move the slider to modify your estimate of how large your external dataset will be. `External Dataset` is the amount of data the you will be accessing from external data sources, using features such as external tables and our virtual table interface.

Cluster Power	`OLTP Splice Units`	Move the slider to modify your estimate of how much processing power you need for transactional query processing. More OLTP units means more region servers in your cluster.
	`OLAP Splice Units`	Move the slider to modify your estimate of how much processing power you need for analytical query processing. More OLAP units means more Spark executors.
Backup Frequency	`Frequency`	Select how frequently you want Splice Machine to back up your database. You can select `Hourly`, `Daily`, or `Weekly`; each selection displays additional backup timing and retention options: Hourly:  Daily:  Weekly: 

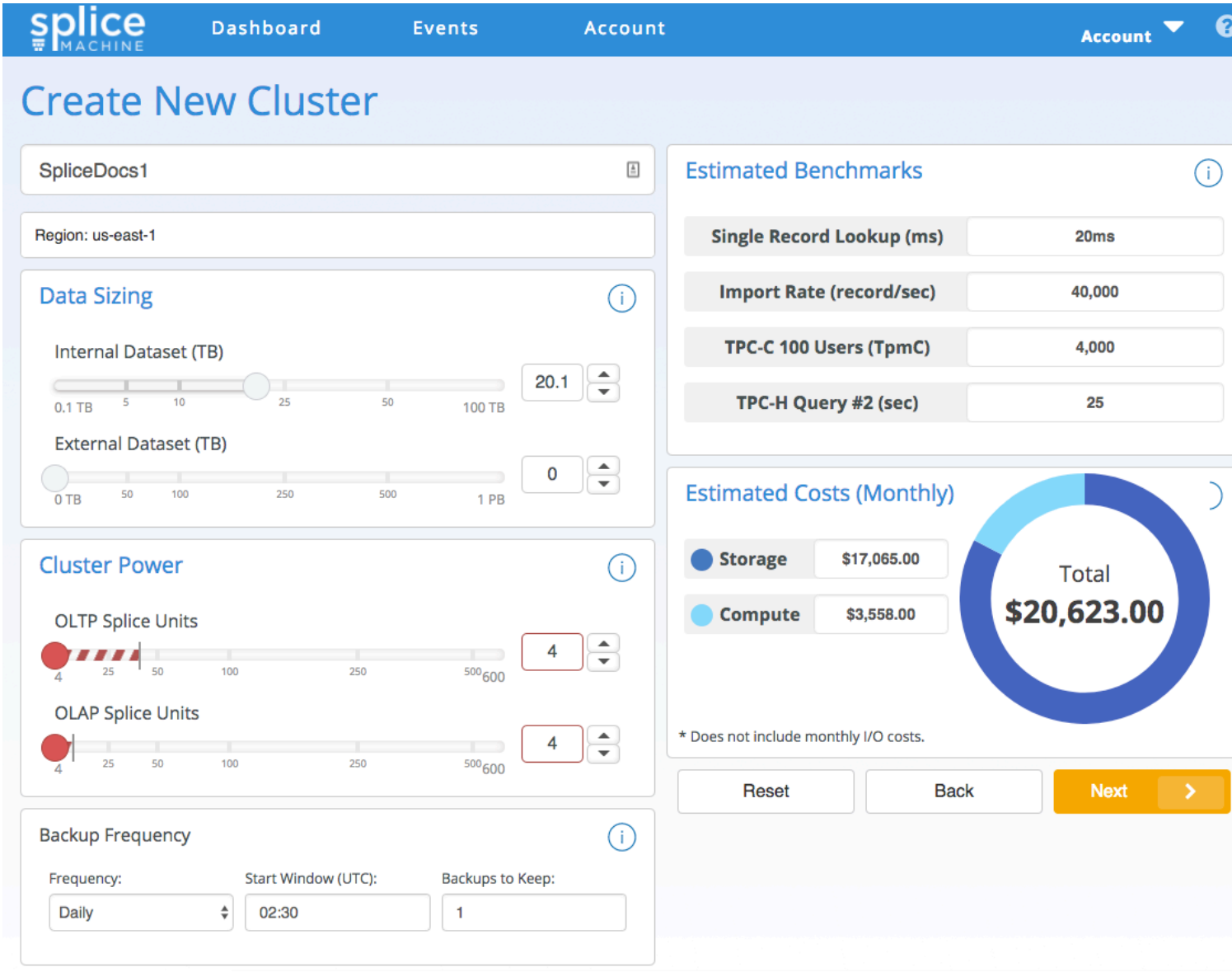
A *Splice Unit* is a measure of processing work; one unit currently translates (approximately) to 2 virtual CPUs and 16 GB of memory.

Modifying Cluster Parameters

We recommend that you spend a few minutes experimenting with modifying the cluster parameters; you'll notice that as you increase various values, the estimated monthly cost of your cluster changes.

When you're satisfied with your cluster configuration parameters, click the **Next** button to set up access to your cluster.

You'll notice that when you increase some values, Splice Machine may indicate that the current setting for a parameter clashes with a change that you've made. For example, in the following image, we have increased the **Internal Dataset** size to 20 TB, and as a result the **Cluster Power** values are no longer adequate to support that large a dataset, as indicated by the striping:

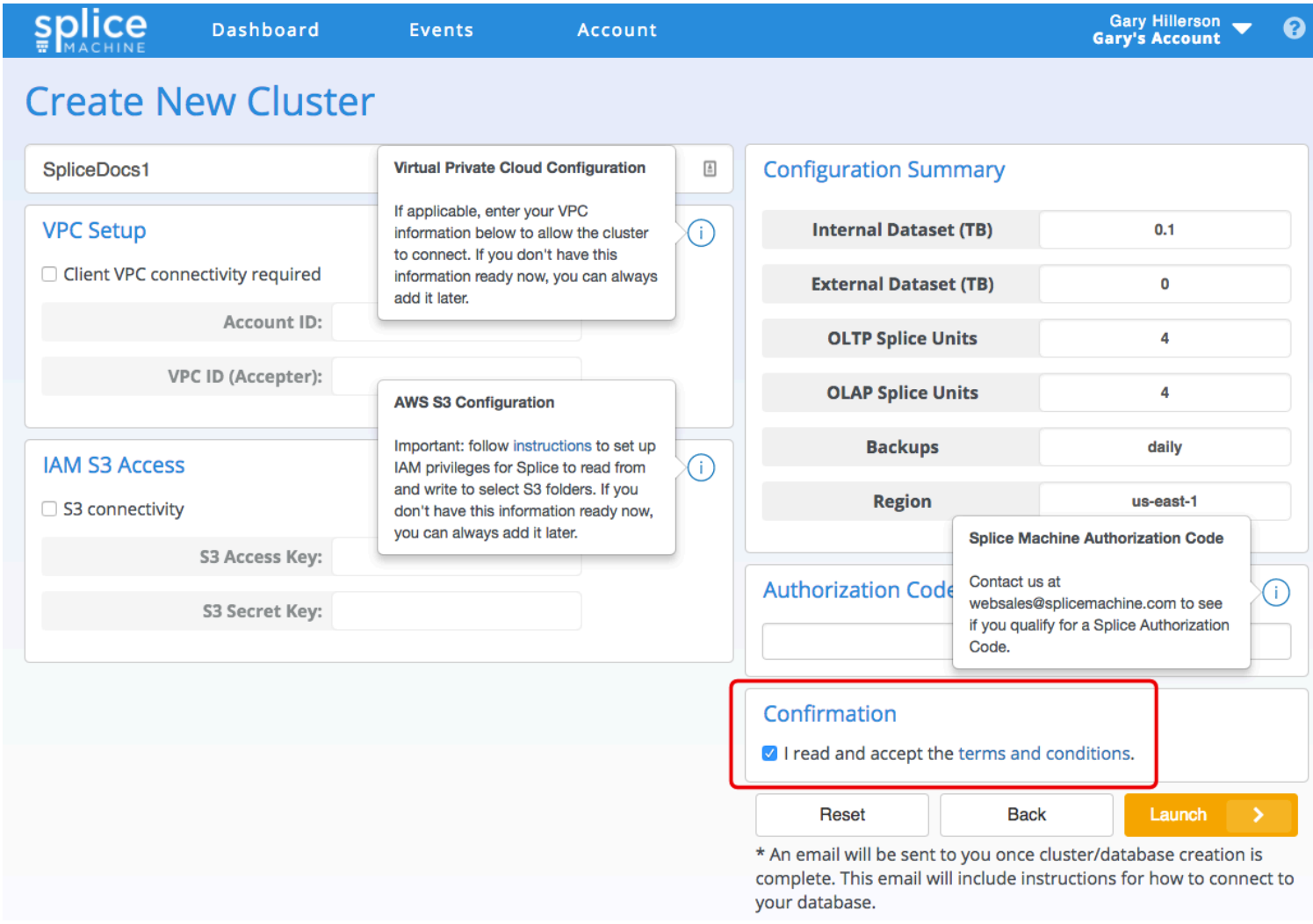


Splice Machine will not allow you to create your cluster if any of your values clash. You can click the vertical bar at the end of the striping to instantly set the parameter to the required value.

NOTE: If you don't correct the required setting and attempt to advance to the **Next** screen, you'll see an error message and will be unable to advance until you do correct it.

Configure Cluster Access

Once you've configured your cluster, click the **Next** button to display the **Cluster Access** screen. The following image includes displays of the pop-up help information displays for the different access methods:



You can set your cluster up for access to your Amazon Virtual Private Cloud (VPC) access by selecting the `Client VPC connectivity required` option and providing your VPC account ID.

You need to configure AWS Identity and Access Management (IAM) for your cluster to allow Splice Machine to access selected S3 folders; this is described in our Configuring an S3 bucket for Splice Machine Acces tutorial.

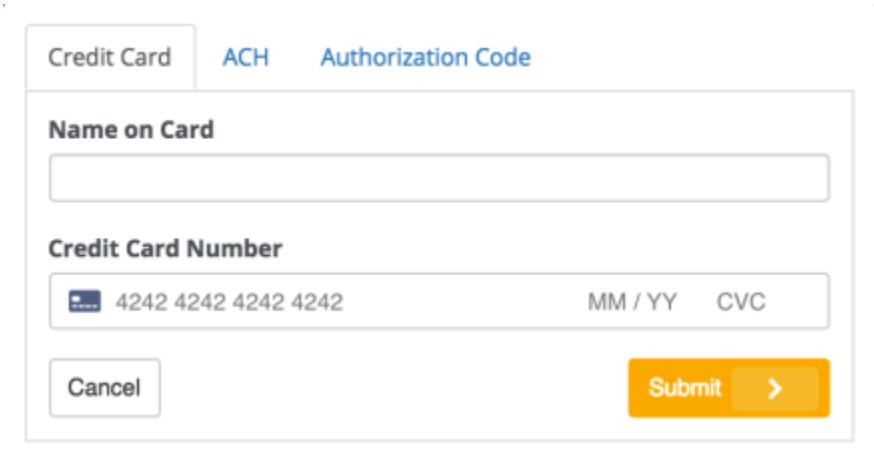
> For more information about Amazon VPC, see https://aws.amazon.com/vpc/.
>
> For more information about Amazon IAM, see https://aws.amazon.com/iam/.

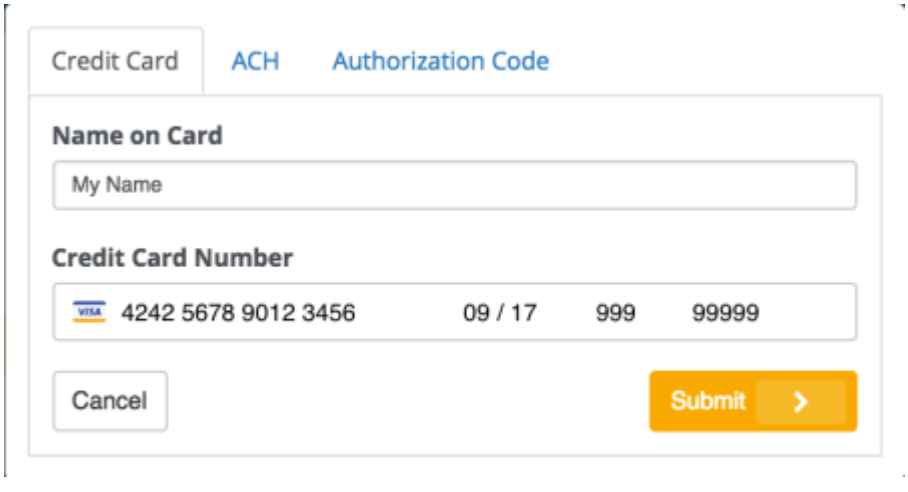
After setting up any access methods, please confirm that you `accept our terms and conditions`, then click the **Launch** button, which will take you to the **Payment** screen, unless you've subscribed to Splice Machine from the Amazon Marketplace or have already set up a payment method for your account.

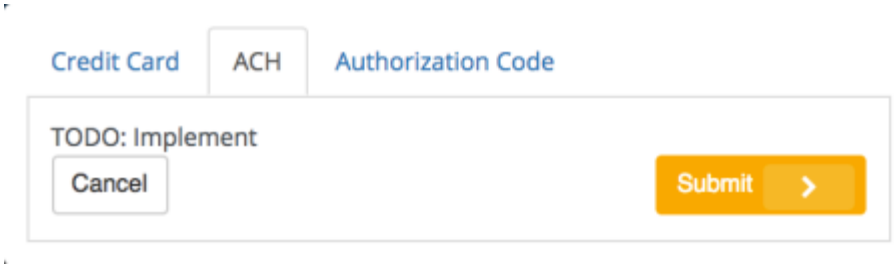
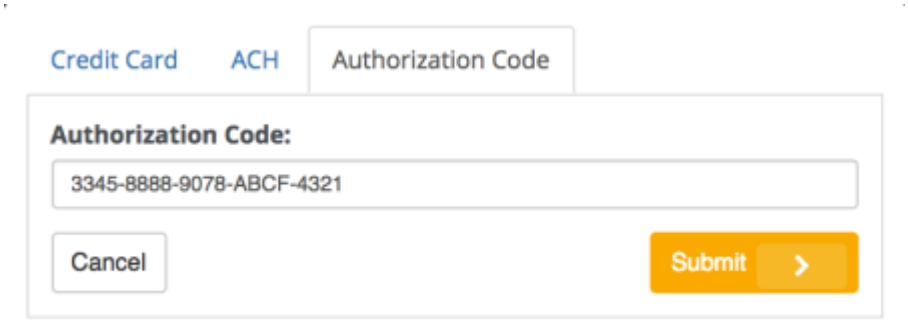
Set Up Payment

When you click the **Launch button**, then one of these actions happens:

- If you subscribed to Splice Machine via the AWS Marketplace, or you already have a payment method set up on your account, you'll land on your dashboard and will be notified when your cluster has been initialized.
- If you don't yet have a payment method set up, you'll land on the **Payment** screen, in which you can elect to use on of three payment methods:

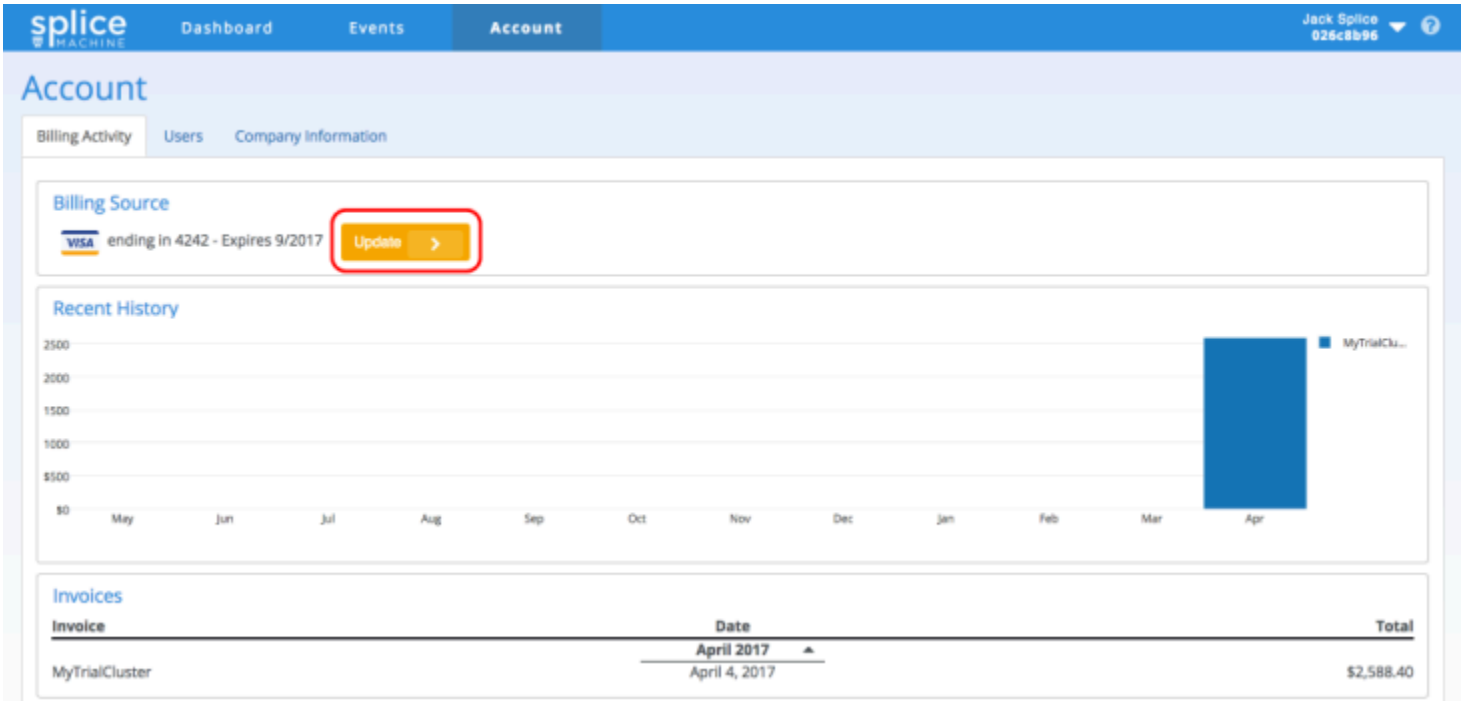


Credit Card	

ACH Electronic Transfer	
Authorization Code	

Modifying Payment Information

If you ever need to change your Splice Machine payment information, you can update it in the **Billing Activity** tab of the **Account** screen; just click the **Update** button to revisit the **Payment** screen:



NOTE: If you've purchased Splice Machine through Amazon Marketplace, change your billing credentials in the Marketplace instead.

Start Using Your Database!

After your cluster spins up, which typically requires about 10 minutes, you can load your data into your Splice Machine database and start running queries.

The easiest way to get going with your new database is to use our Zeppelin Notebook interface, with which you can quickly run queries and generate different visualizations of your results, all without writing any code. We've provided a number of useful Zeppelin tutorials, including one that walks you through setting up a schema, creating tables, loading data, and then running queries.

Note that your data must be in an AWS S3 bucket before you can import it into your Splice Machine database:

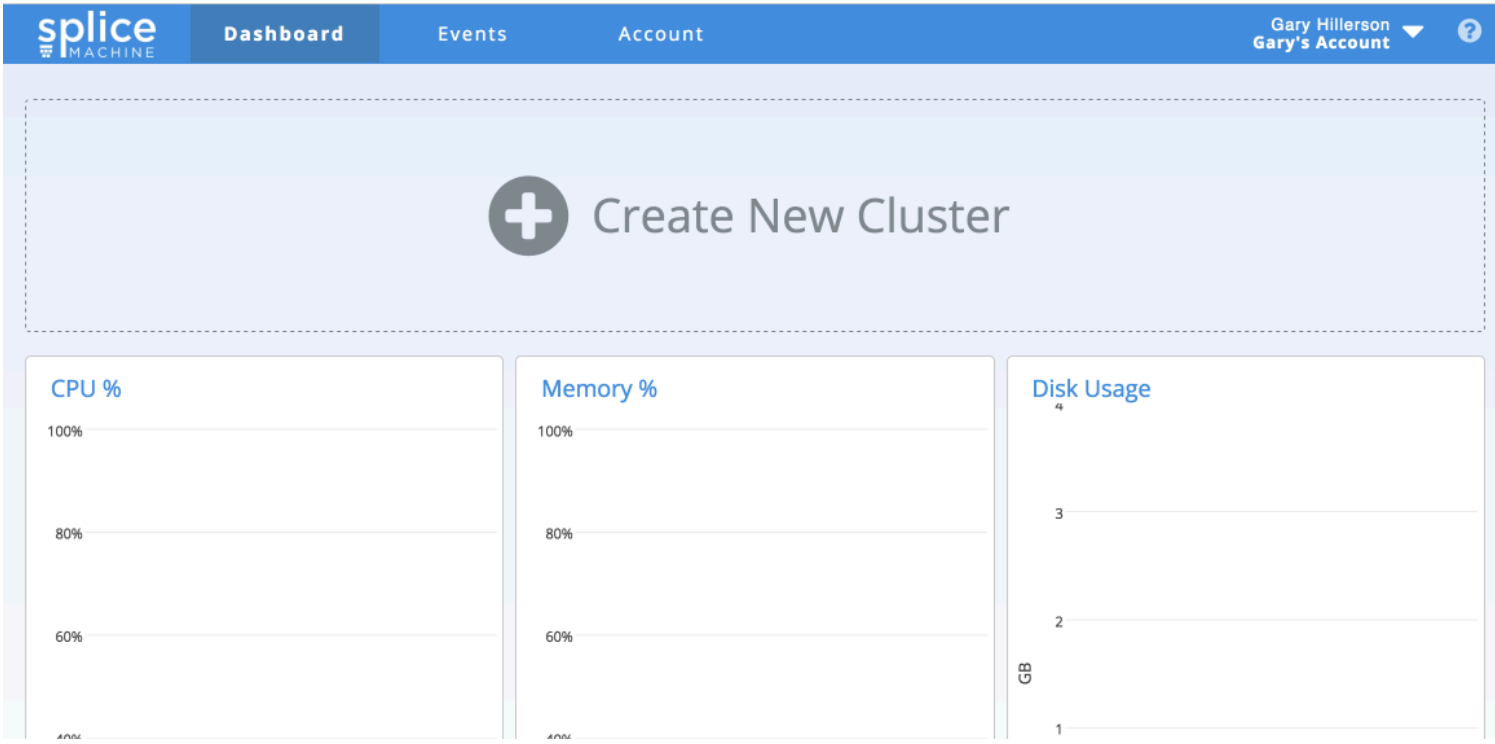
- If you don't yet know how to create an S3 bucket or upload data to a bucket, please check our Uploading Data to an S3 Bucket tutorial.
- You may need to configure IAM permissions to allow Splice Machine to access your bucket; see our Configuring an S3 Bucket for Splice Machine Access tutorial.
- Once you've got your data in a bucket, you can follow our Importing Data Tutorial to load that data into Splice Machine.

Exploring Your Cloud Manager Dashboard

This topic describes the actions you can initiate from your Splice Machine dashboard, which include:

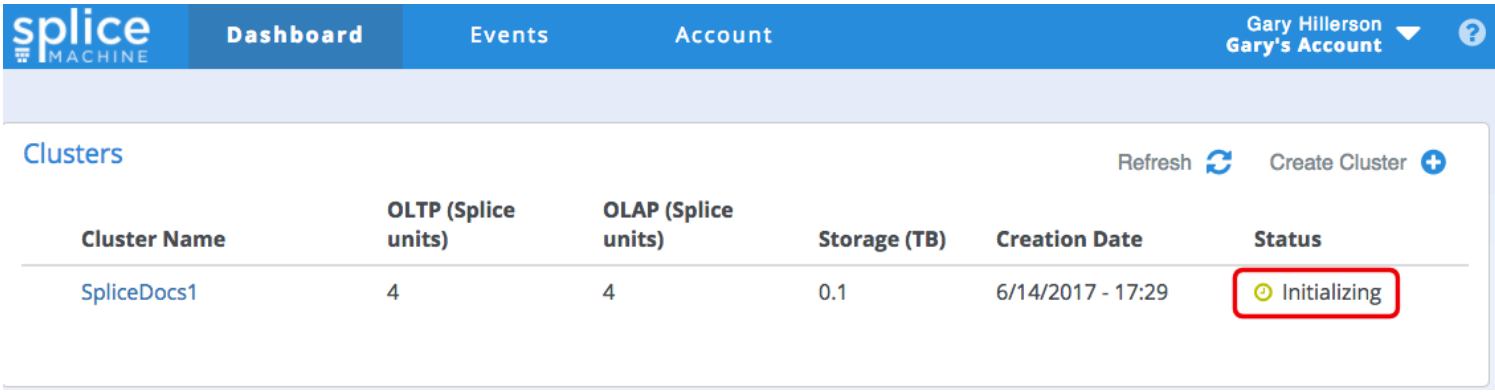
Creating a New Cluster

Click the large **Create New Cluster** button to start the process of creating a new cluster. This process, which requires just a few minutes, is described in detail in our Creating a New Cluster topic.



Viewing and Managing Your Clusters

When you create a new cluster, you land back on this Dashboard screen, which shows you the status of your current clusters. In the following image, we've created our first Splice Machine cluster, which is currently *Initializing*.



Once your new cluster is initialized, its status changes to *Active*, and you receive an email message from Splice Machine notifying you that your cluster is ready. At that point, you can click the cluster name (e.g. *SpliceDocs1*) to use the *Cluster Management* screen for that cluster.

NOTE: If you have multiple clusters associated with your account, each will be listed in your dashboard. Simply click or tap a cluster name to jump to its management screen.

Managing a Cluster

This topic describes the actions you can initiate from the **Cluster Management** screen, which include:

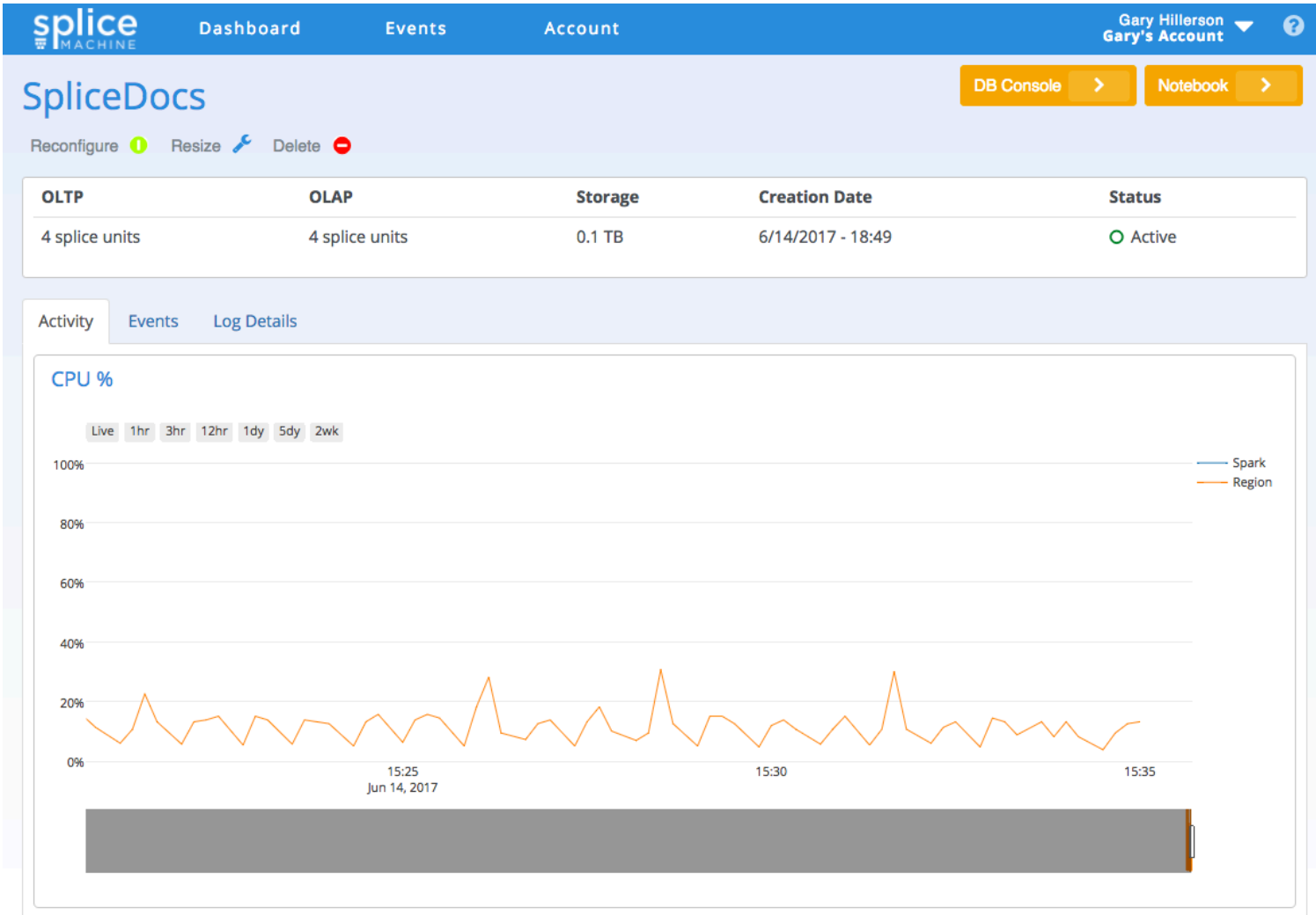
- Viewing the cluster's CPU, Disk, and Memory Usage
- Reconfiguring cluster access
- Resizing your cluster
- Deleting your cluster
- Using Zeppelin and the Database Console with your cluster

The Cluster Management Screen

You can access the **Cluster Management** screen for any cluster in your Dashboard by simply clicking the name of the cluster.

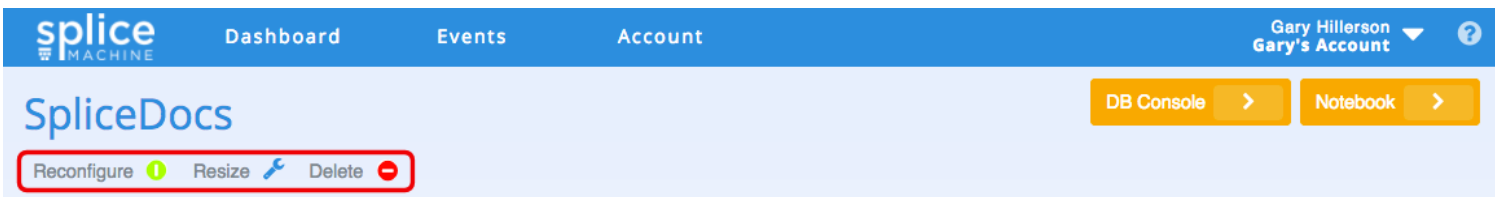
This screen displays information about the cluster, and includes three panels that display a graph of resource usage over time. There are three similar resource usage graphs displayed:

- CPU Percentage Used (shown in the following image)
- Disk Usage
- Memory Usage



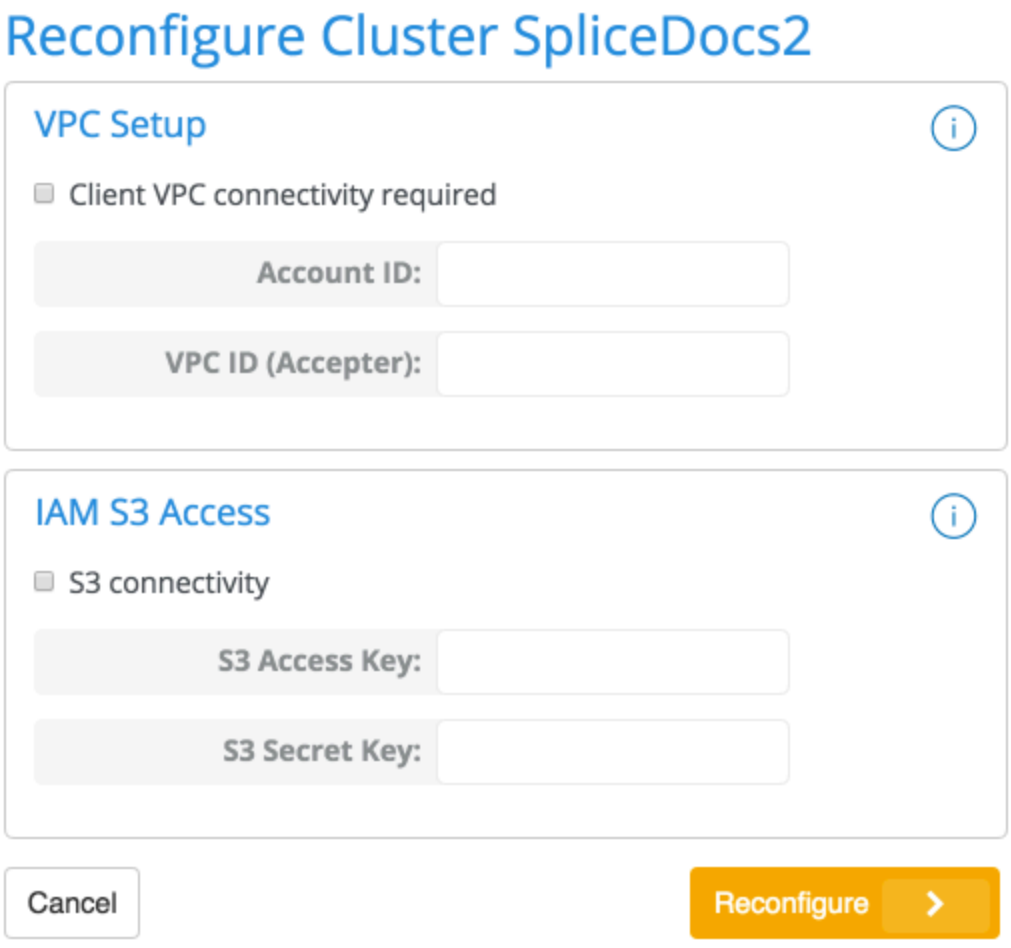
Modifying Your Cluster

Your dashboard features three cluster modification choices; you can Reconfiguring, Resizing, or Deleting your cluster by clicking one of the buttons near the top-left of your Dashboard screen:



Reconfiguring Your Cluster

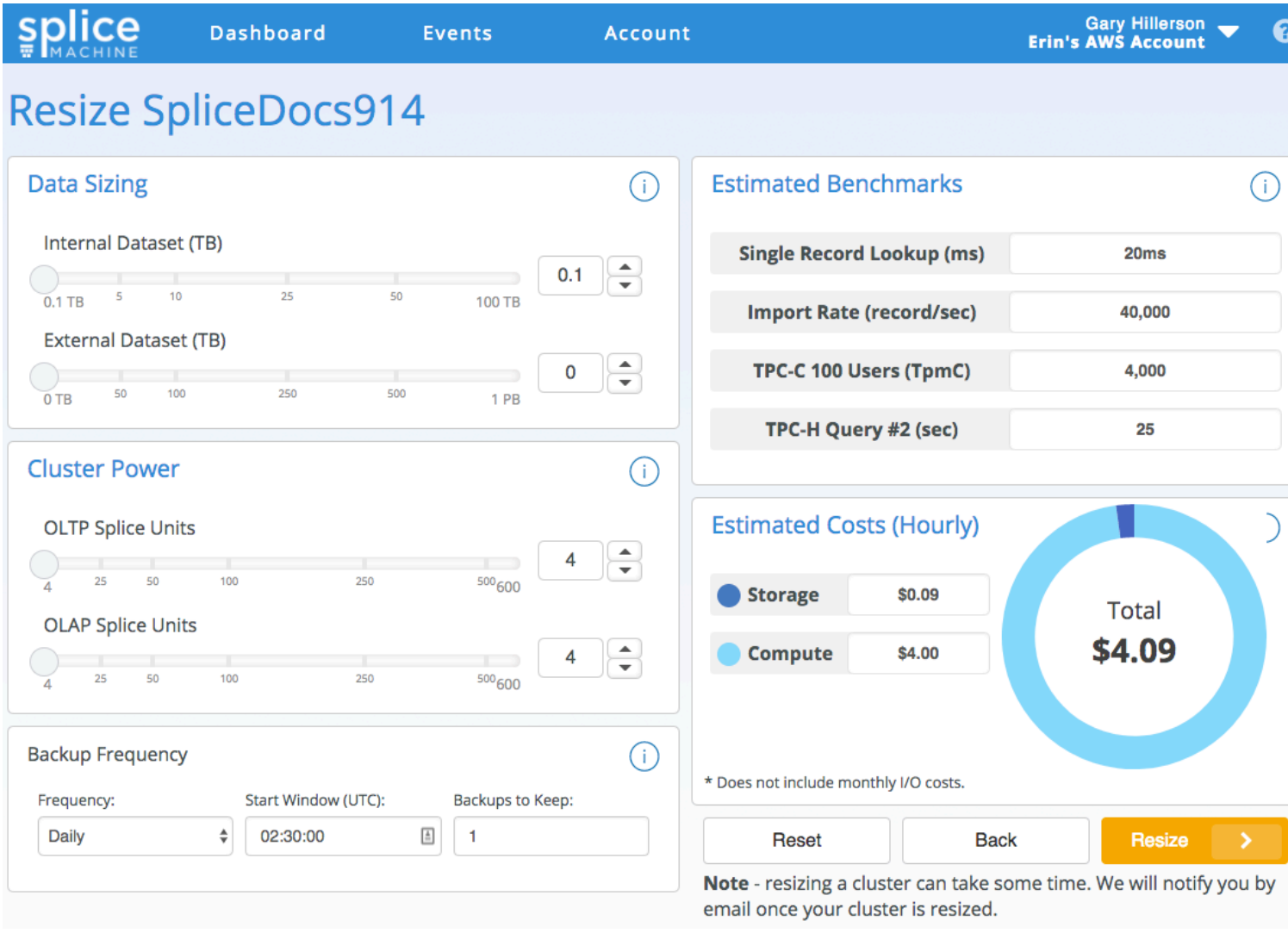
To reconfigure your cluster, click the **Reconfigure** button; the cluster reconfiguration screen displays:



You can modify your VPC and/or IAM configuration information in this screen. Once you've entered your new information, click the **Reconfigure** button to update your configuration and return to your Cluster Management screen.

Resizing Your Cluster

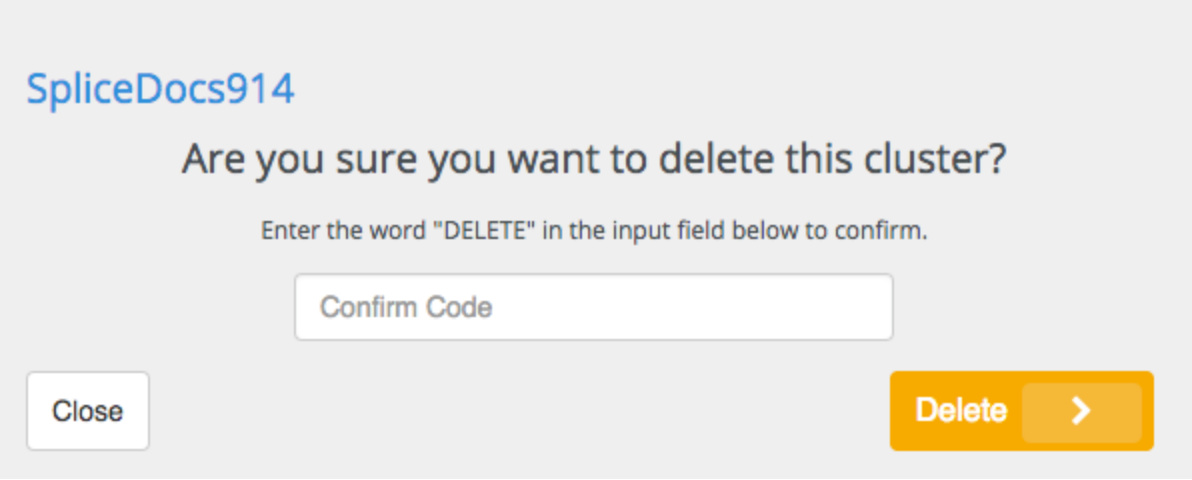
To resize your cluster, click the **Resize** button. The Resize Cluster screen, which is pretty much identical to the Create New Cluster screen, displays:



You can adjust your cluster parameters, then click the **Resize** button, which will return you to your Cluster Management screen, where you'll see the status of your cluster set to *Updating*.

Deleting Your Cluster

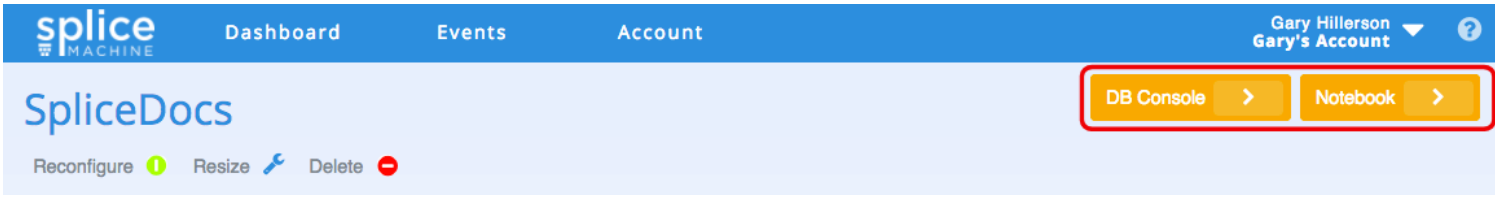
To delete your cluster, click the **Delete** button. You'll be ask to confirm the deletion:



After confirming that you want to do so, your cluster will be deleted, and its status in your dashboard will show as *Deleted*.

Working With Your Database

Your dashboard includes buttons with which you can access two different means of working with your database; you can launch the **DB Console** or the Apache Zeppelin **Notebook** interface by clicking one of the buttons near the upper-right corner of the Dashboard screen:

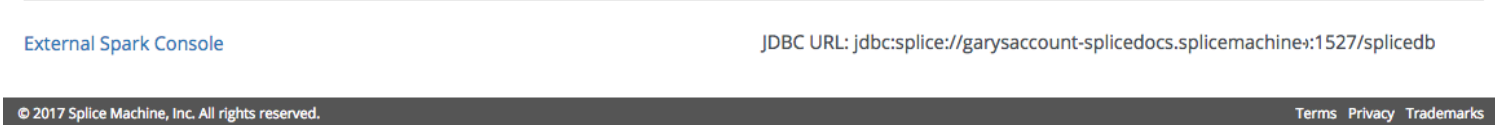


Click the **DB Console** button to land on our Database Console interface.

Click the **Notebook** button to land on our Zeppelin Notebook interface.

Connecting to Your Database with JDBC

At the very bottom of the Cluster Management screen, below the three graph panels, is the URL you can use for a JDBC connection with your database service:



The same JDBC link was emailed to you in the message from Splice Machine letting you know that your cluster creation was successful.

Managing Your Splice Machine Account

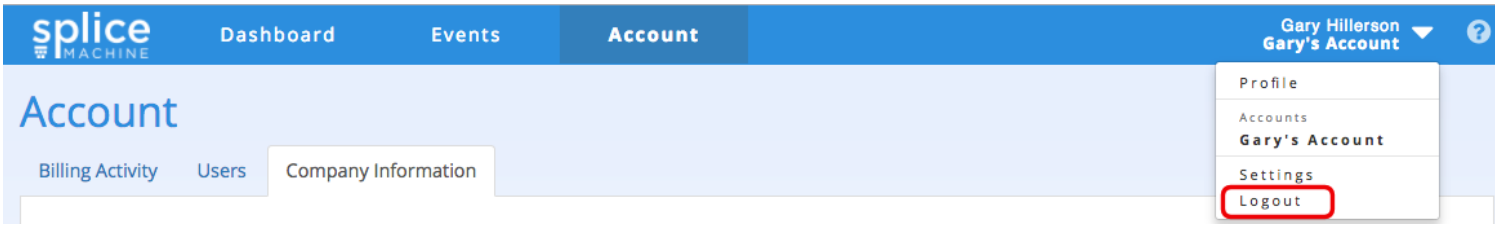
This is a DB-Service-Only topic! Learn about our products

This topic describes the actions you can perform from the Account tab and Account drop-down in your Dashboard, which include:

- Logging Out of Your Account
- Reviewing and Updating Your Billing Information
- Viewing and Updating Your User Profile and Password
- Viewing and Adding Users
- Reviewing and Updating Your Company Information

Logging Out of Your Account

To log out of your Cloud Manager account, click the Account Drop-down arrow in the upper-right of your dashboard screen, and select **Logout**:



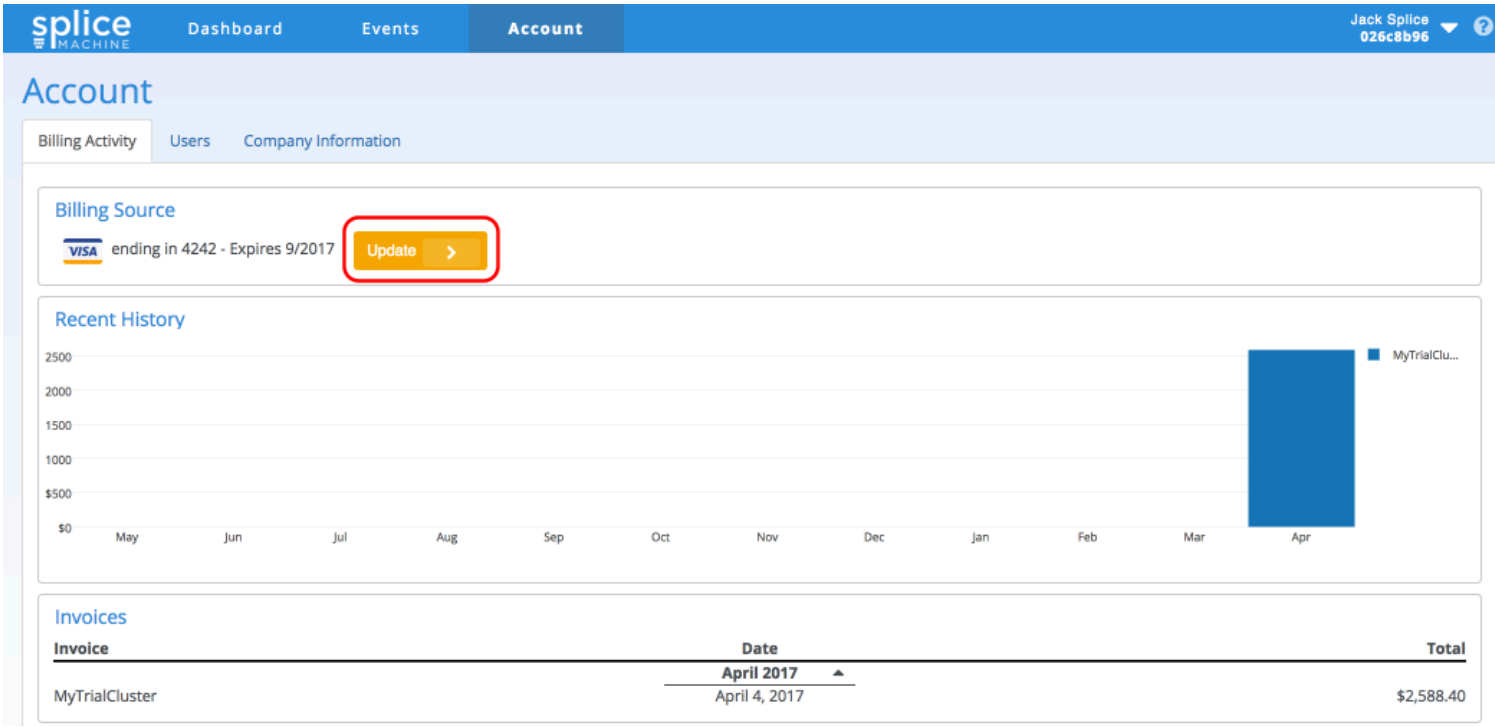
You'll be logged out and will land back on the Splice Machine Cloud Manager **Login** page.

Reviewing and Updating Your Billing Information

If you subscribed to Splice Machine via the AWS Marketplace, your billing is handled by AWS, not Splice Machine. Your *Account Management* screen will not contain a **Billing Activity** tab; this section does not apply to you.

To display billing information for your account, select the **Billing Activity** tab in a Cloud Manager screen. You can see billing details for each month of each year that your account has been alive. You can also hover over one of the bars representing a cluster to see exactly how much that cluster cost in a month (as shown for July in the image below).

If you have provisioned more than one cluster in your account, each cluster is shown in a different color in the billing detail graphic, as shown below.



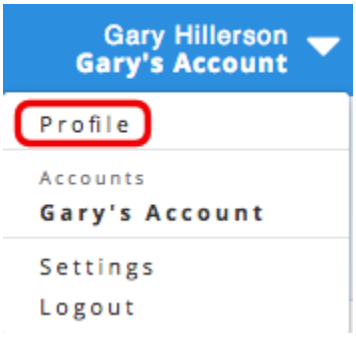
To update your payment source, click the **Update** button.

Prorated Monthly Billing

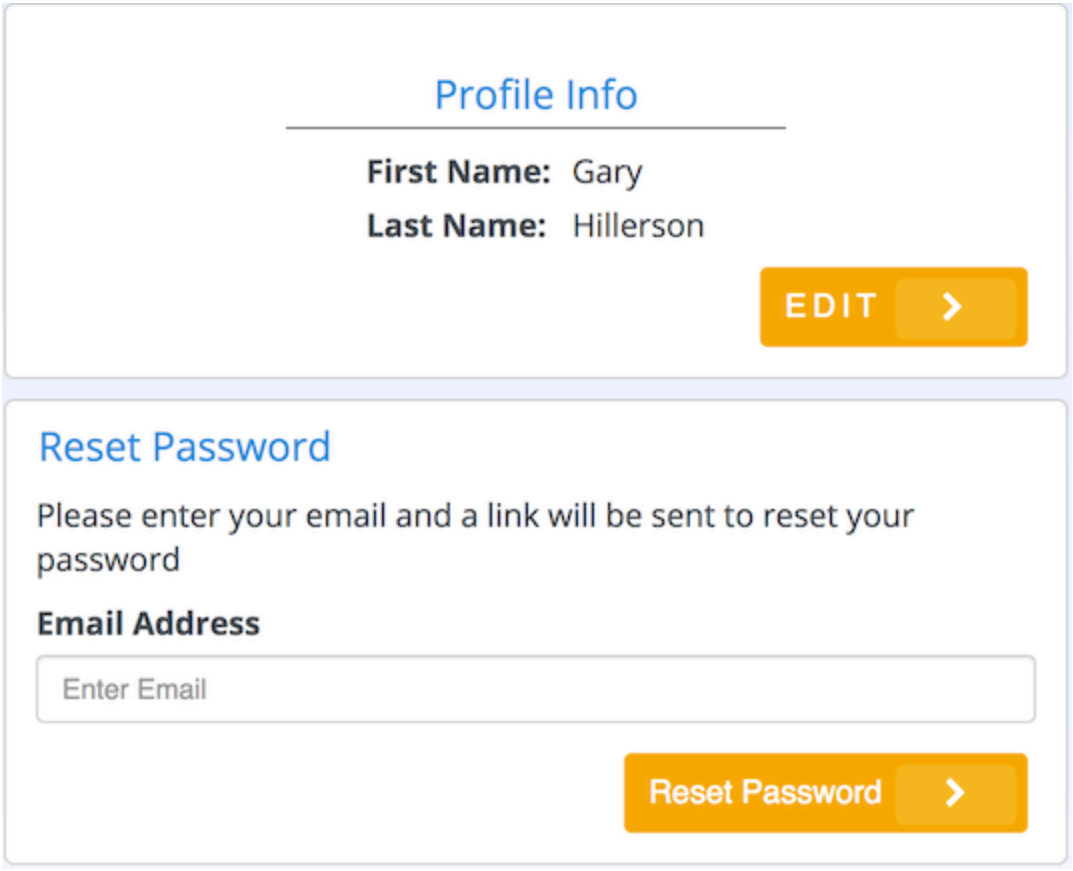
Splice Machine bills for our database service on a prorated monthly basis; any adjustments for deleting or downsizing your cluster(s) are applied to future bills or cluster purchases.

Viewing and Updating Your User Profile and Password

You can review or edit your profile information by selecting **Profile** from the click the Account Drop-down:



The **Profile** screen displays:

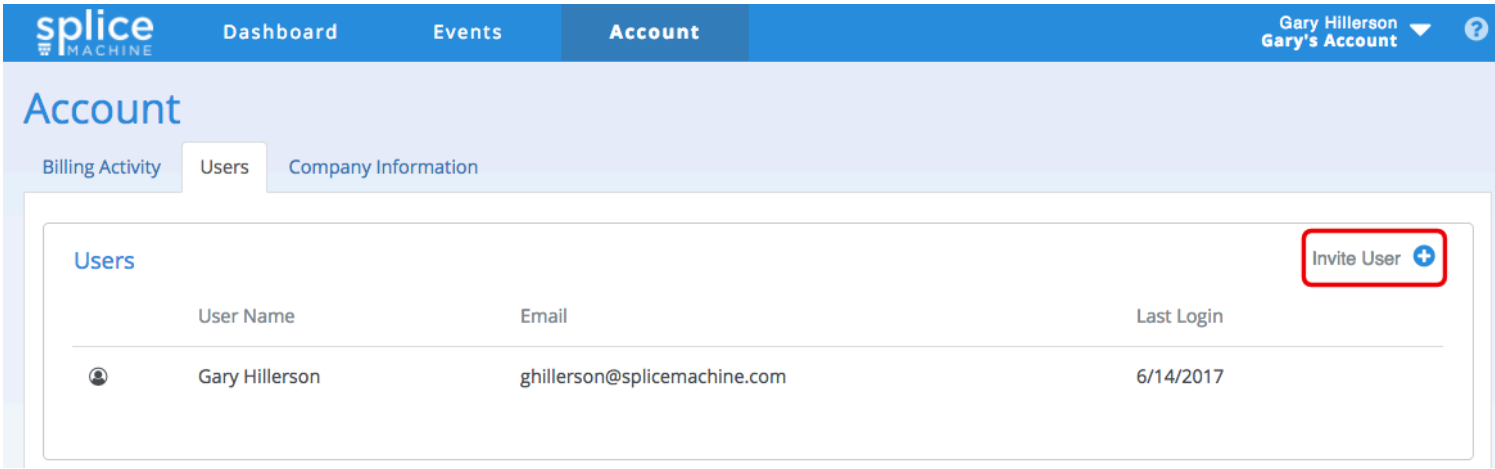


You can edit your name information by clicking the **EDIT** button in the Profile Info panel.

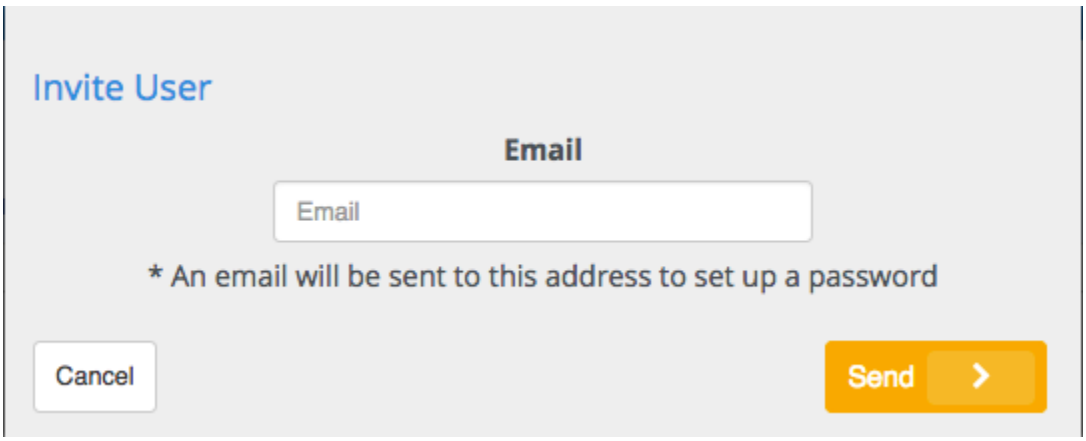
You can reset your account password by entering your email address and then clicking the **Reset Password** button. You'll receive an email from Splice Machine that contains a link you can use to reset your password.

Viewing and Adding Users

To display the names and log-in information for the users of your database service, select the **Users** tab in your Cloud Manager screen. The *Users* screen displays:

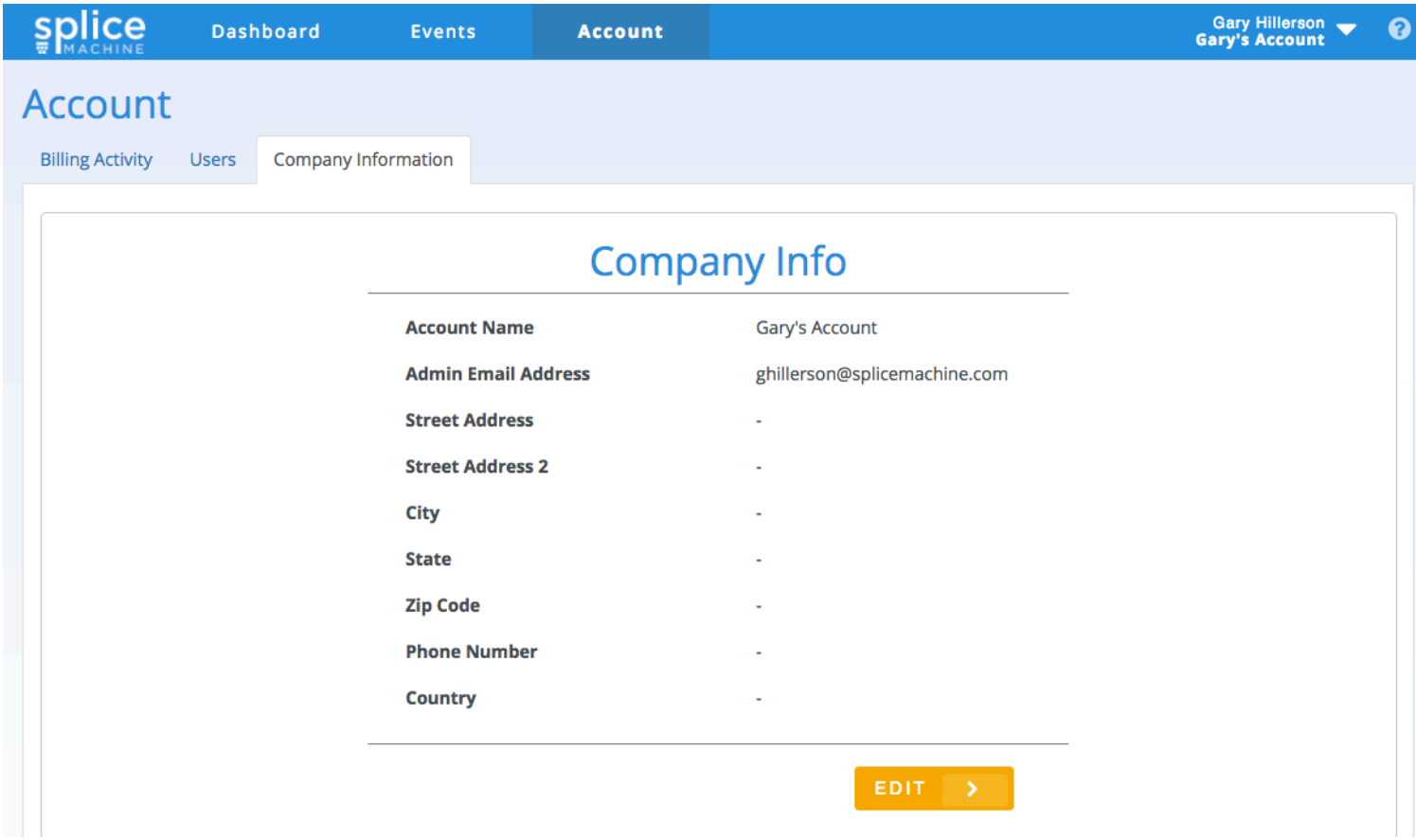


To add another user, click the **Invite User +** button in the *Users* screen. Then enter the new user's email address in the *Invite User* screen and click the **Send** button. We'll send an email inviting that person to set up a password to access your database.



Reviewing and Updating Your Company Information

To display the company information associated with your account, select the **Users** tab in your Cloud Manager screen. The *Company Information* screen displays:



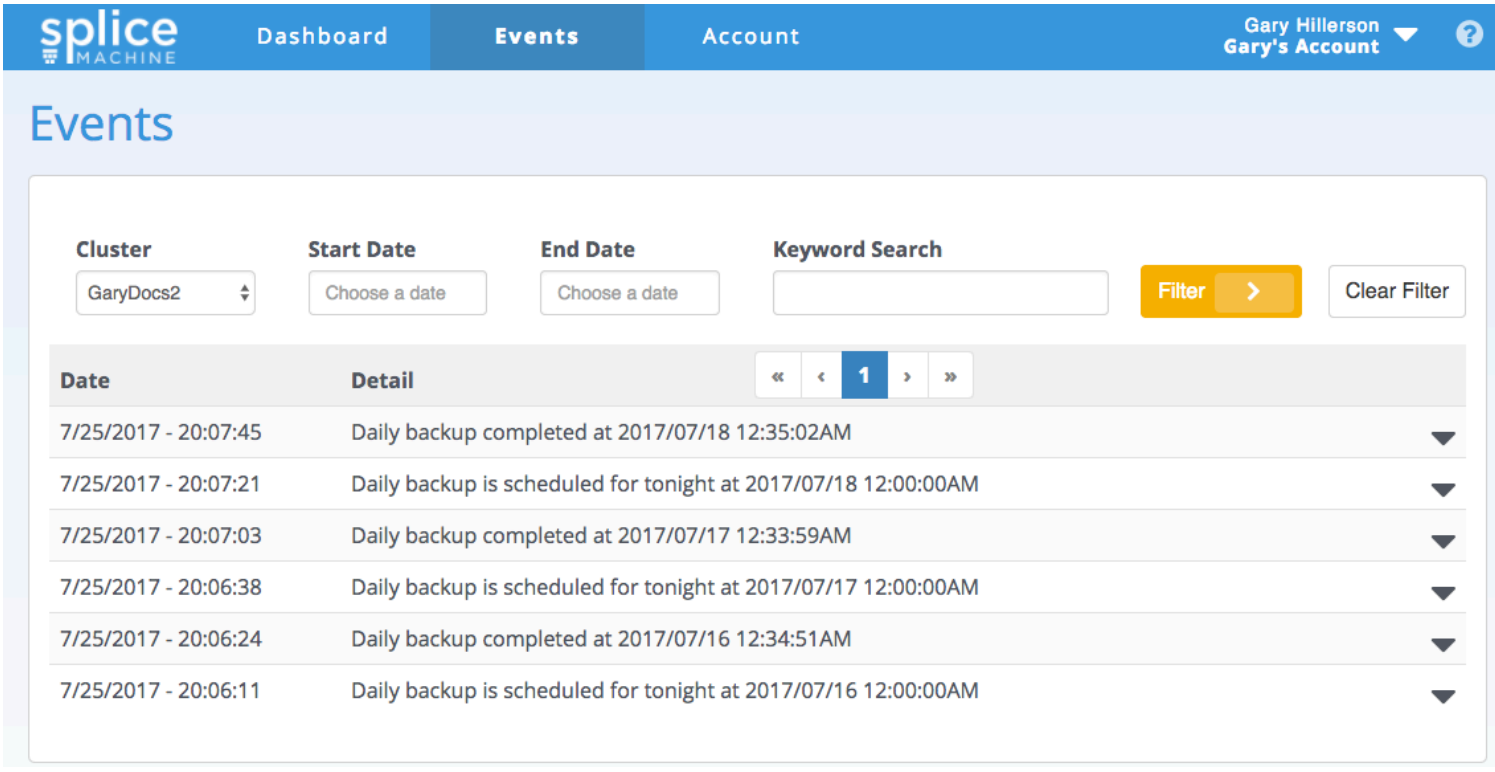
To edit the company information associated click the **Edit** button.

Managing Your Event Notifications

This is a DB-Service-Only topic! Learn about our products

This topic describes the Splice Machine Events Manager, which allows you to examine notification messages sent to your cluster.

Here's a screenshot of a partially populated **Events Manager screen:**



You can initiate these actions in the Events Manager:

- Display messages for one specific cluster, or all of your clusters; in the screenshot above, events are displayed for the cluster named *GaryDocs2*.
- Filter which messages are displayed; enter filter criteria, then click the **Filter** button. You can filter on:
  - A start date.
  - An end date.
  - A keyword or exact phrase.

  You can filter on a start date or end date on its own, or combine them together to specify a date range. You can also combine a date or date-range filter with a keyword filter to find only events that meet the combined criteria.
- You can click the **Clear Filter** button to clear any filters and display all of your notification messages.

- Click the < (Prev), > (Next), << (First), or >> (Last) buttons to move through multiple screenfuls of messages.
- Click the arrow to the right of a message to display the full or shortened version of the message.

Using Zeppelin Notebooks

This is a DB-Service-Only topic! Learn about our products

This guide helps you to get started with using Zeppelin notebooks to interact with your Splice Machine database.

Topic	Description
Getting Started with Zeppelin	Introduces you to using Zeppelin with your Splice Machine database.
Zeppelin Usage Notes	Specific usage notes for creating Zeppelin notebooks to use with Splice Machine..
A Simple Tutorial	Walks you through a quick and simple tutorial that shows you how to use Zeppelin notebooks to load and query data, and apply different visualizations to the results.

Getting Started with Zeppelin

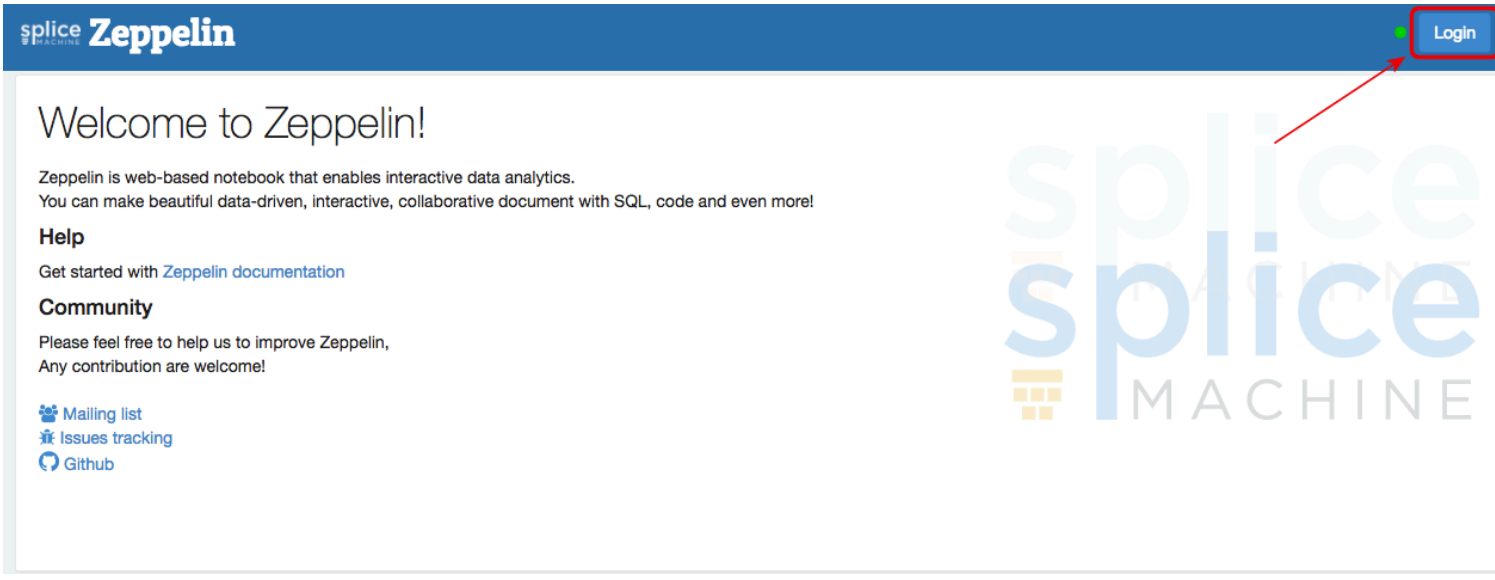
This is a DB-Service-Only topic! Learn about our products

This topic helps you to get started with using Zeppelin with your Splice Machine database.

NOTE: We strongly encourage you to visit the Zeppelin documentation site to learn about creating, modifying, and running your own Zeppelin notebooks.

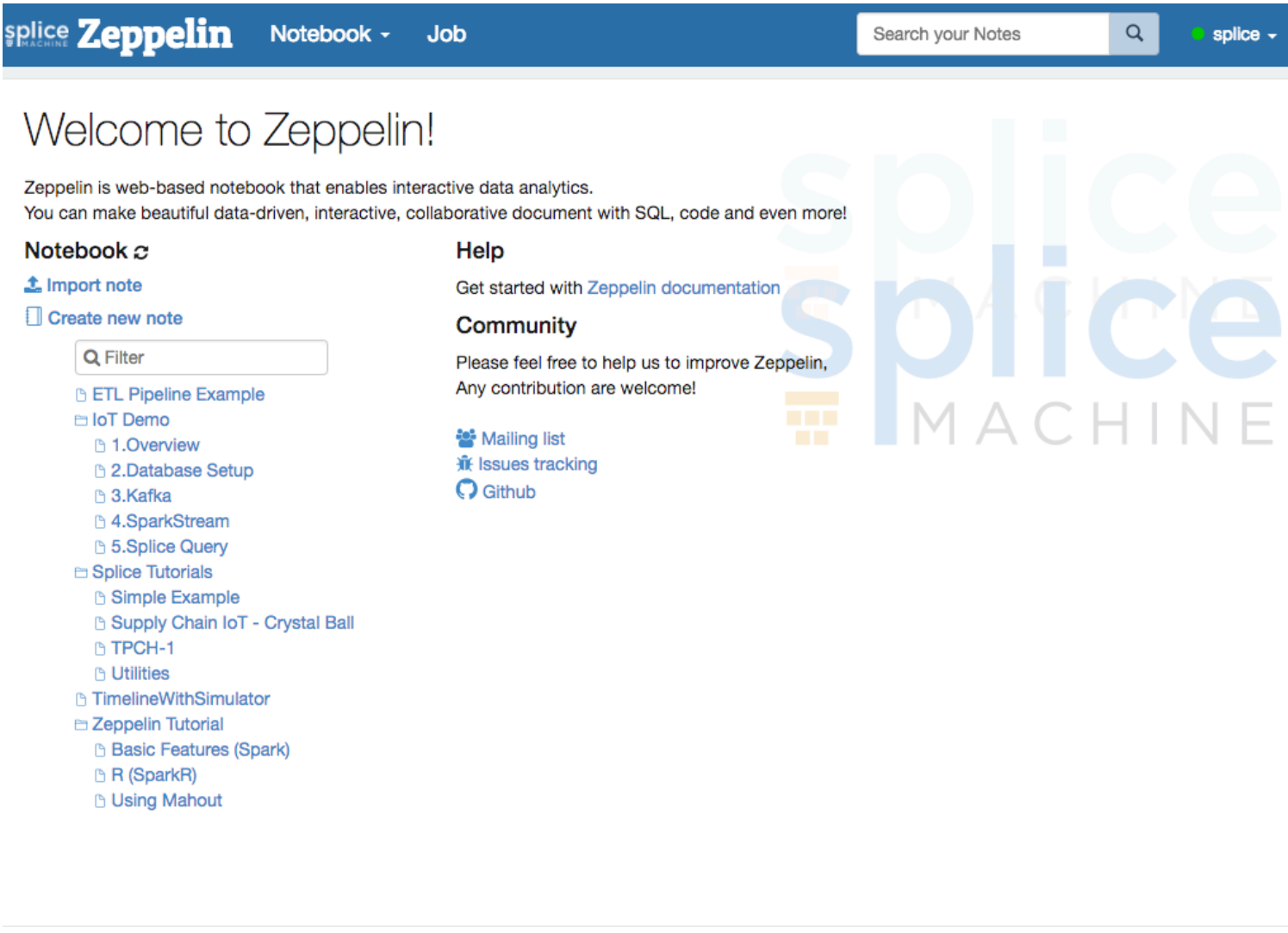
The Zeppelin Dashboard

When you click the **Notebook** button in your Cluster Management dashboard, you land on the Zeppelin welcome page. To start using Zeppelin with your database service, you need to log in to your database by clicking the **Login** button.



Use the same user ID and password to log into Zeppelin as you use to log into your database.

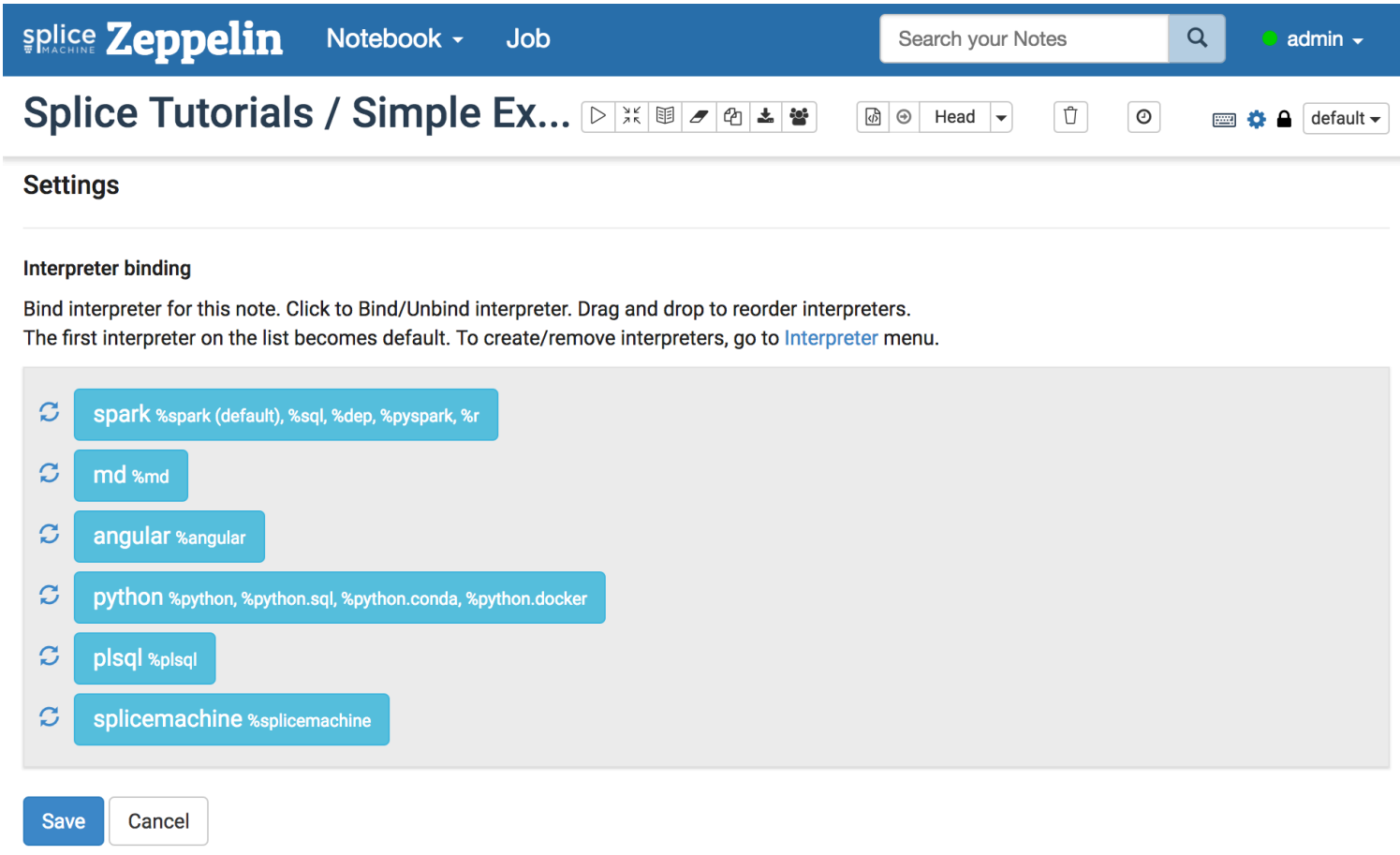
When you log into Zeppelin for your database, you'll land on the Zeppelin dashboard, which displays the list of available notebooks. As you can see, notebooks can be organized in folders.



Splice Machine has already created a number of useful notebooks; we suggest that you try running some of them to get a feel for what Zeppelin can do: click a notebook name, and you'll land on the notebook page in Zeppelin. From there, you can run all or portions of the notebook, modify its content, and create new notebooks. Our next topic, A Simple Tutorial, uses the our **Simple Example** tutorial.

First Notebook Run: Save Interpreter Bindings

The first time that you run any Zeppelin notebook, you need to bind any interpreters needed by the notebook. For our tutorials, these are preconfigured for you; all you need to do is click the Save button:



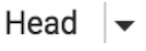
NOTE: If you neglect to save its bindings, the notebook will not run. And again: you only need to do this one time for each notebook that you run.

The Zeppelin Note Toolbar

Zeppelin displays a toolbar at the top of each note that provides convenient access to a number of options:

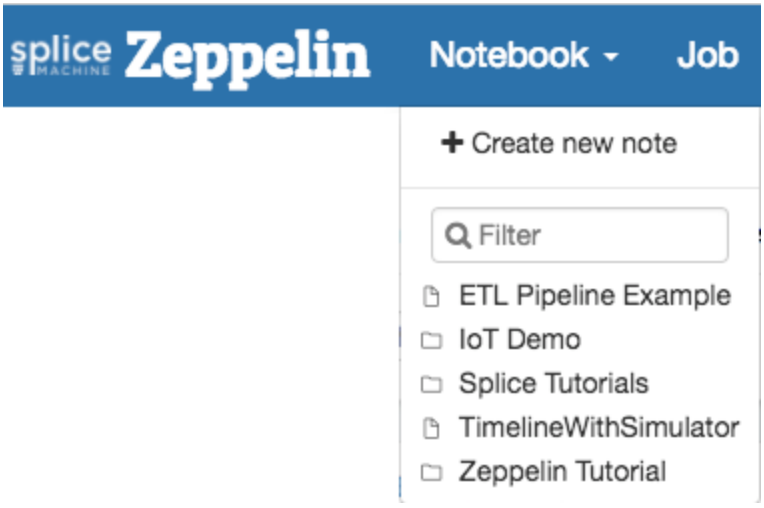
The following table describes the toolbar buttons:

▷	Executes all of the paragraphs in the note, in display-order sequence.

	Shows or hides the code sections of the paragraphs in the note.
	Shows or hides the result sections of the paragraphs in the note.
	Clears the result sections of the paragraphs in the note.
	Clones the current note.
	Exports the current note in JSON format. **NOTE:** The code and result sections of all paragraphs are exported; you might want to clear your results before exporting a note.
	Switches between personal and collaboration modes.
	Commits changes that you've made to the content of the current note (and allows you to add a commit note).
	Displays the revision you're currently viewing, and lets you select from available revisions.
	Deletes the note.
	Schedules execution of the note, using CRON syntax.

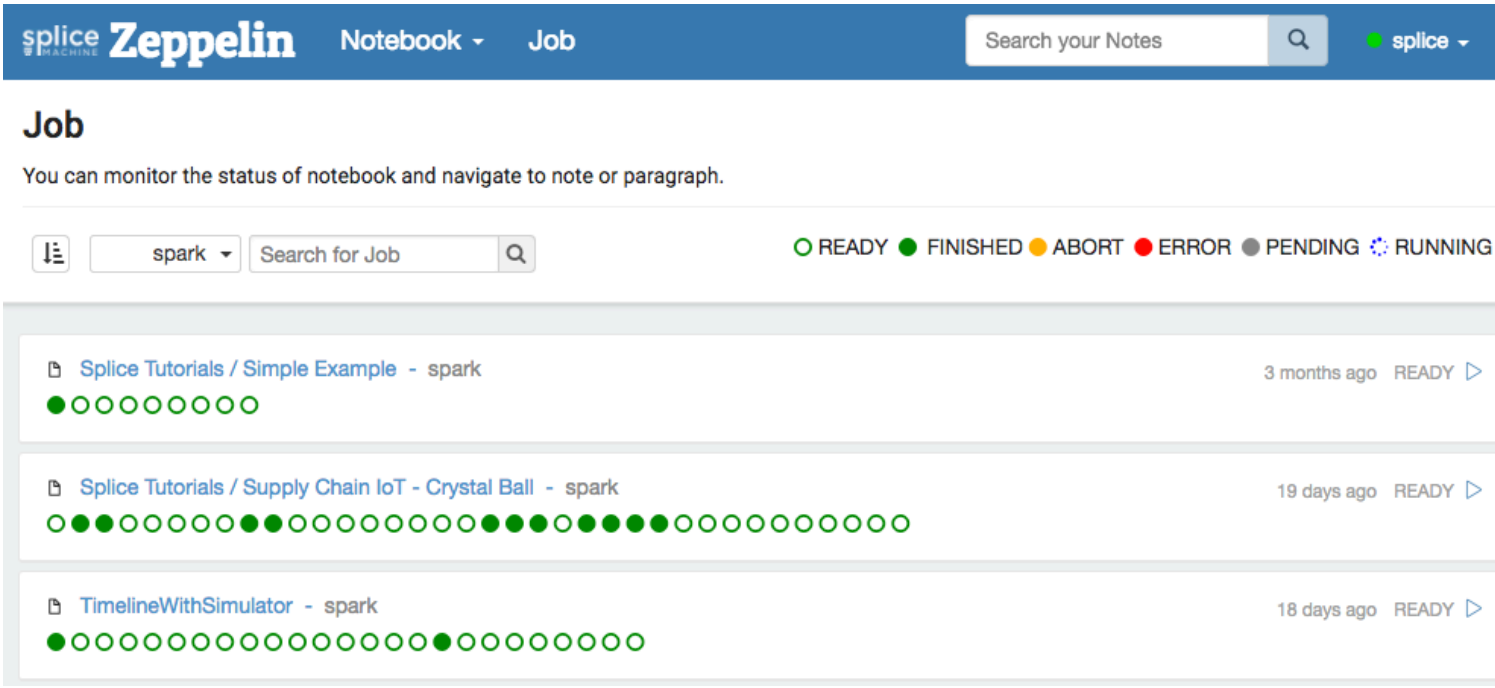
The Zeppelin Drop-Down Menu

When you're working in Zeppelin, you can quickly jump to another notebook or create a new note by clicking the **Zeppelin** drop-down menu:



Monitoring Job Status

You can monitor the status of any Zeppelin notebook job(s) running in your cluster by clicking the **Job** button at the top of the Zeppelin screen. This displays a list of the notebook jobs that are running and have run on your cluster.



From the **Job** screen, you can:

- Monitor all jobs associated with your account.
- Filter which jobs are displayed.
- Search for notebooks.

- Start, Pause, or Terminate a running job.
- Click a notebook job name to navigate to that notebook.

Creating Notebooks

Be sure to view our Usage Notes page for important information about creating Zeppelin notebooks to use with Splice Machine.

Zeppelin Usage Notes

This is a DB-Service-Only topic! Learn about our products

This page currently contains exactly one tip about using Zeppelin with Splice Machine; this will grow into a loose collection of tips over time.

Use Full Classpath!

If you're coding a Zeppelin notebook in Java, you must specify the full class of imported classes, such as `java.sql.Timestamp`; otherwise, an error occurs.

For example, this generates an error:

```
%spark
import java.util.Date
import java.sql.
{Connection, Timestamp}
classOfTimestamp
classOffoo
val tt = Timestamp.valueOf("2261-12-31 00:00:00")
class foo extends Object { val xx: Timestamp = Timestamp.valueOf("2261-12-31 00:00:00")
}

import java.util.Date
import java.sql.{Connection, Timestamp}
res12: Classjava.sql.Timestamp = class java.sql.Timestamp
res13: Classfoo = class foo
tt: java.sql.Timestamp = 2261-12-31 00:00:00.0
<console>:13: error: not found: type Timestamp
val xx: Timestamp = Timestamp.valueOf("2261-12-31 00:00:00")
^
<console>:13: error: not found: value Timestamp
val xx: Timestamp = Timestamp.valueOf("2261-12-31 00:00:00")
^
ERROR
```

The error is resolved by specifying the full classpath:

```
%spark
import java.util.Date
import java.sql.
{Connection, Timestamp}
classOfTimestamp
classOffoo
val tt = Timestamp.valueOf("2261-12-31 00:00:00")
class foo extends Object { val xx: java.sql.Timestamp = java.sql.Timestamp.valueOf("226
1-12-31 00:00:00") }

import java.util.Date
import java.sql.{Connection, Timestamp}
res14: Classjava.sql.Timestamp = class java.sql.Timestamp
res15: Classfoo = class foo
tt: java.sql.Timestamp = 2261-12-31 00:00:00.0
defined class foo
FINISHED
```

A Simple Zeppelin Tutorial

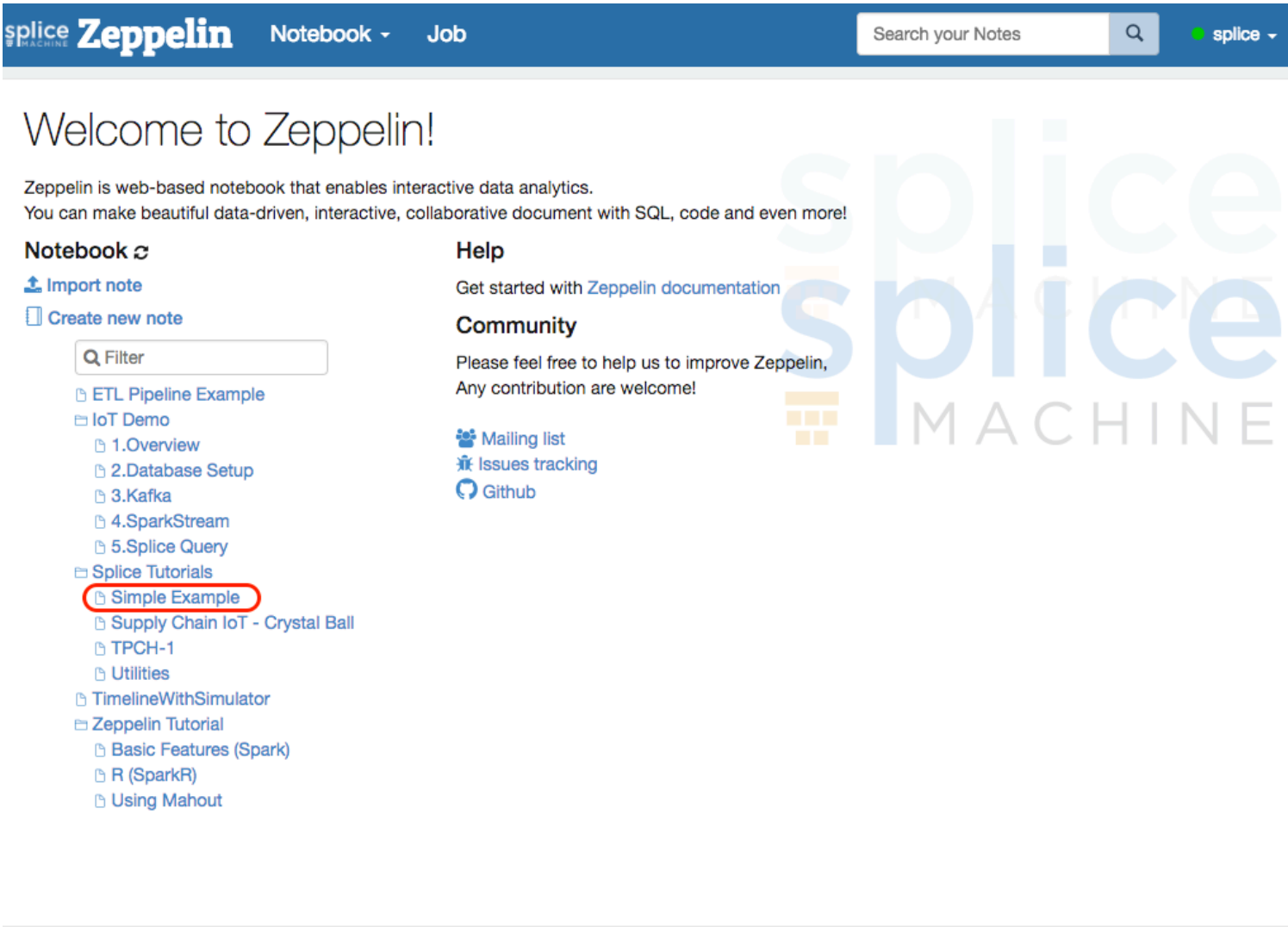
This is a DB-Service-Only topic! Learn about our products

This topic walks you through using a very simple Zeppelin notebook, to help you learn about using Zeppelin with Splice Machine.

NOTE: Our Getting Started with Zeppelin page provides a very brief overview of using Zeppelin; If you're new to Zeppelin, we strongly encourage you to visit the Zeppelin documentation site to learn about creating, modifying, and running your own Zeppelin notebooks.

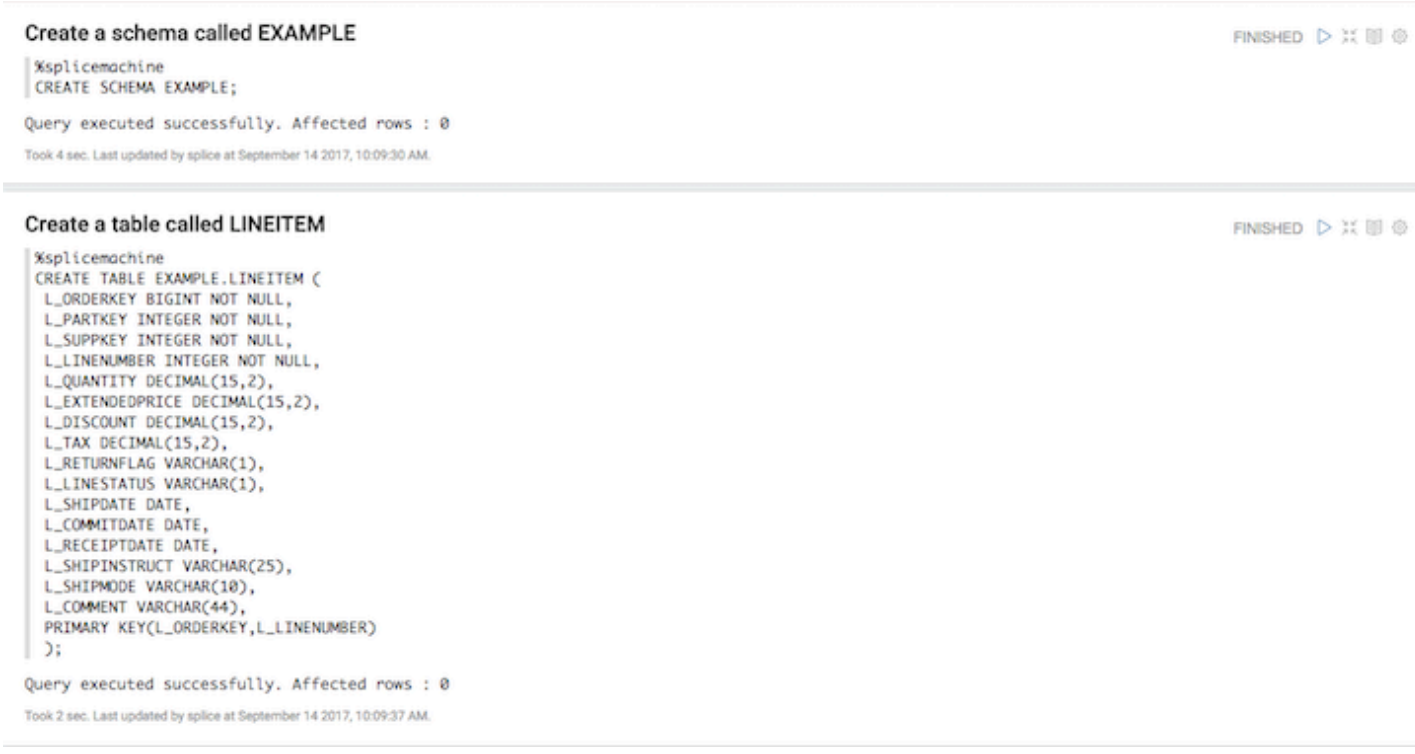
Running the Tutorial Notebook

You can access this Zeppelin notebook by clicking the Basics (Spark) link under Zeppelin Tutorials on the Zeppelin Dashboard page:



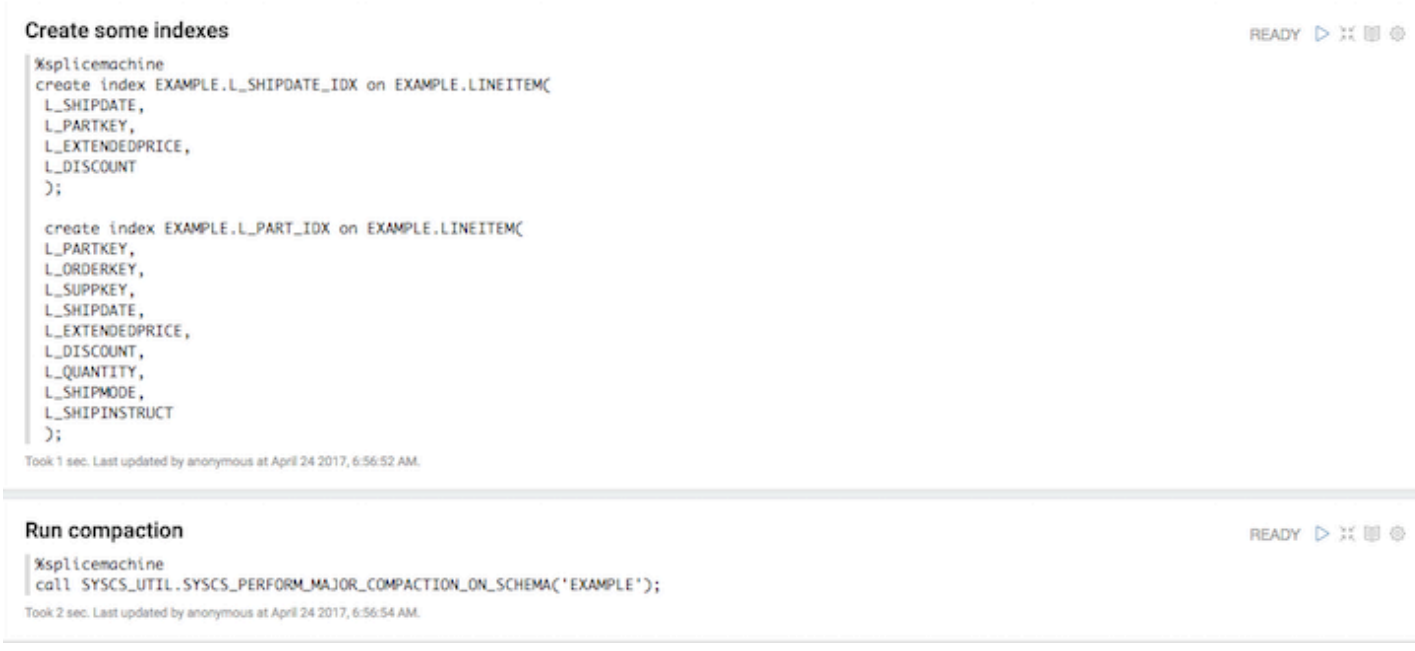
Once you've opened the tutorial, you can run each step (each Zeppelin *paragraph*) by clicking the **Ready** button that you'll see on the right side of each paragraph. This example includes these steps:

» Click the first **READY** button to create the schema and a table:

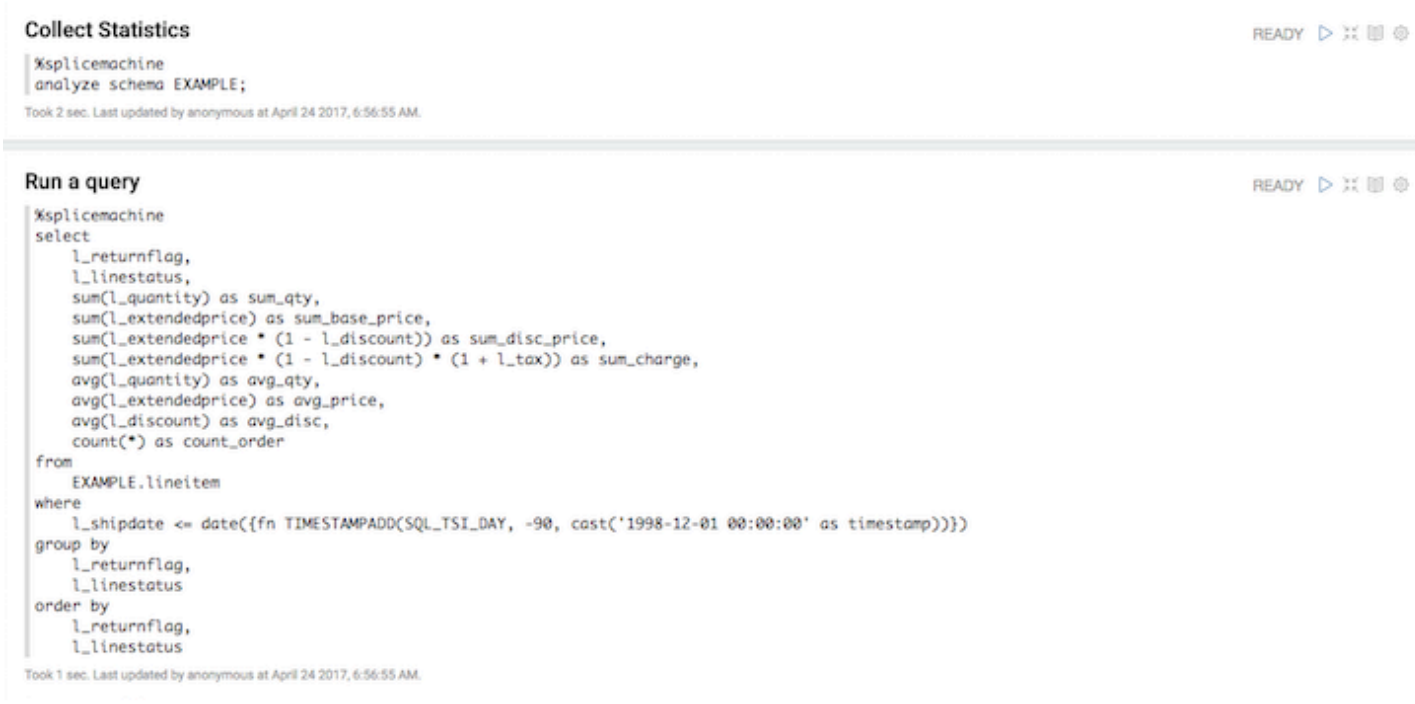


- Import data (in this case, TPCH1 benchmark data) into the table, then verify the data load by counting the number of records in the table:

- Create indexes on the table, and then run compaction on the data, which is always a good idea after updating a large number of records:



- Collect statistics, to improve query planning, and then run a query:



After the query runs, you can take advantage of Zeppelin's built-in visualization tools to display the query results in various graphical and tabular formats.

When you click the **READY** button, Zeppelin runs the paragraph that loads your data and subsequently displays the *Finished* message.

NOTE: If you see *Error* instead of *Finished*, it usually means that you've forgotten to set SpliceMachine interpreter as the default.

Apply Different Visualizations to Your Results

Zeppelin provides a wealth of data visualization tools you can use. In the example below, we have modified the presentation of query results to use different visualizations by clicking different visualization icons in the output pane. You can define and modify the values of variables that you use in your queries; for example, the `maxAge` and `marital` values in the examples below: