

# Medus Labs

## Application Overview

This application allows you to create and manage ‘labs’ for the purposes of learning how to use all of the services and infrastructure available on Amazon Web Services. Each lab is made up of a group of 1 to 30 users, and each user will have a unique login. When using this application, you can also delete individual labs, users within them, and erase any leftover work, like items stored in an S3 Bucket. The following is a guide to using the application.



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# Setup Guide

## Installation

Medus Labs has been designed to be cloud native, and easily manageable for any end user. At present, the distribution of the application is via a valid AWS AMI (Amazon Machine Image) for use with AWS EC2.

Navigate to your AWS Console, and select the EC2 service. Click 'Launch Instance' to begin the process.

When prompted for an AMI to use, use the search facility and select the 'medus-labs' image.

1. Choose AMI

2. Choose Instance Type

3. Configure Instance

4. Add Storage

5. Add Tags

6. Configure Security Group

7. Review

Step 1: Choose an Amazon Machine Image (AMI)

Cancel and Exit

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace; or you can select one of your own AMIs.


Q medus-labs

Quick Start (0)

My AMIs (1)

AWS Marketplace (3)

Community AMIs (1)

 medus-labs-1.0 - ami-0c53f757a8d399254

Root device type: ebs   Virtualization type: hvm   ENA Enabled: Yes

Select

64-bit (x86)

Once selected, it is best to create a new IAM role. Click 'Create new IAM Role' to take this action.

Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

Number of instances ⓘ1Launch into Auto Scaling Group ⓘ

Purchasing option ⓘ☐ Request Spot instances

Network ⓘvpc-497a7232 (default)Create new VPC

Subnet ⓘNo preference (default subnet in any Availability Zone)Create new subnet

Auto-assign Public IP ⓘUse subnet setting (Enable)

Placement group ⓘ☐ Add instance to placement group

Capacity Reservation ⓘOpenCreate new Capacity Reservation

IAM role ⓘmedus-labs-adminCreate new IAM role

Shutdown behavior ⓘStop

Enable termination protection ⓘ☐ Protect against accidental termination

Monitoring ⓘ☐ Enable CloudWatch detailed monitoringAdditional charges apply.

Tenancy ⓘShared - Run a shared hardware instanceAdditional charges will apply for dedicated tenancy.

Elastic Inference ⓘ☐ Add an Elastic Inference acceleratorAdditional charges apply.

T2/T3 Unlimited ⓘ☐ EnableAdditional charges may apply

Select the relevant AWS Service - In this case, EC2.

## Create role

1 2 3 4

### Select type of trusted entity

**AWS service**  
EC2, Lambda and others

**Another AWS account**  
Belonging to you or 3rd party

**Web identity**  
Cognito or any OpenID provider

**SAML 2.0 federation**  
Your corporate directory

Allows AWS services to perform actions on your behalf. [Learn more](#)

### Choose the service that will use this role

#### EC2

Allows EC2 instances to call AWS services on your behalf.

#### Lambda

Allows Lambda functions to call AWS services on your behalf.

API Gateway	CodeDeploy	EKS	Kinesis	S3
AWS Backup	Comprehend	EMR	Lambda	SMS
AWS Support	Config	ElastiCache	Lex	SNS


Next, you are required to assign a policy to the new IAM role you are creating. This is heavily customisable, but selecting the 'AdministratorAccess' policy will ensure the application works effectively.

## Create role

1 2 3 4

### ▼ Attach permissions policies









Choose one or more policies to attach to your new role.

Create policy 

Filter policies ▼

Q Search

Showing 541 results

	Policy name ▼	Used as	Description
<input checked="" type="checkbox"/>	 AdministratorAccess	Permissions policy (2)	Provides full access to AWS services an...
<input type="checkbox"/>	 al-d3-terraform-policy	Permissions policy (1)	Policy allowing assume role for terraform
<input type="checkbox"/>	 al-s3-policy	Permissions policy (2)	Test S3 Policy
<input type="checkbox"/>	 AlexaForBusinessDeviceSetup	None	Provide device setup access to AlexaFo...
<input type="checkbox"/>	 AlexaForBusinessFullAccess	None	Grants full access to AlexaForBusiness ...
<input type="checkbox"/>	 AlexaForBusinessGatewayExecution	None	Provide gateway execution access to Al...
<input type="checkbox"/>	 AlexaForBusinessNetworkProfileServicePolicy	None	This policy enables Alexa for Business t...
<input type="checkbox"/>	 AlexaForBusinessReadOnlyAccess	None	Provide read only access to AlexaForBu...

Once you proceed, you will be given the opportunity to review the role. We would advise giving the newly created IAM role a name which is easily distinguishable to prevent confusion in the future.

# Create role

## Review

Provide the required information below and review this role before you create it.

Role name\* medus-labs-admin

Use alphanumeric and '+=, @-\_' characters. Maximum 64 characters.

Role description Allows EC2 instances to call AWS services on your behalf.

Maximum 1000 characters. Use alphanumeric and '+=, @-\_' characters.

Trusted entities AWS service: ec2.amazonaws.com

Policies  AdministratorAccess 

Permissions boundary Permissions boundary is not set

No tags were added.

Once the role has been created, you'll be taken back to the 'Configure Instance Details' pane. Click the small 'refresh' icon next to 'Create new IAM role' and select the new role which will now appear in the dropdown selection.

Proceed until the 'Configure Security Group' section. It is vital to add a new rule (HTTP) to ensure you can access the UI of the Medus Labs application. Once added, your rules should look similar to the below:










### Step 6: Configure Security Group

Assign a security group: ☒ Create a new security group

☐ Select an existing security group

Security group name: cirrus\_formation\_security\_group

Description: launch-wizard-1 created 2018-10-08T15:46:33.760+01:00

Type 	Protocol 	Port Range 	Source 	Description 	
SSH 	TCP	22	Custom  0.0.0.0/0	e.g. SSH for Admin Desktop	
HTTP 	TCP	80	Custom  0.0.0.0/0, ::/0	e.g. SSH for Admin Desktop	
<div>Add Rule</div>					

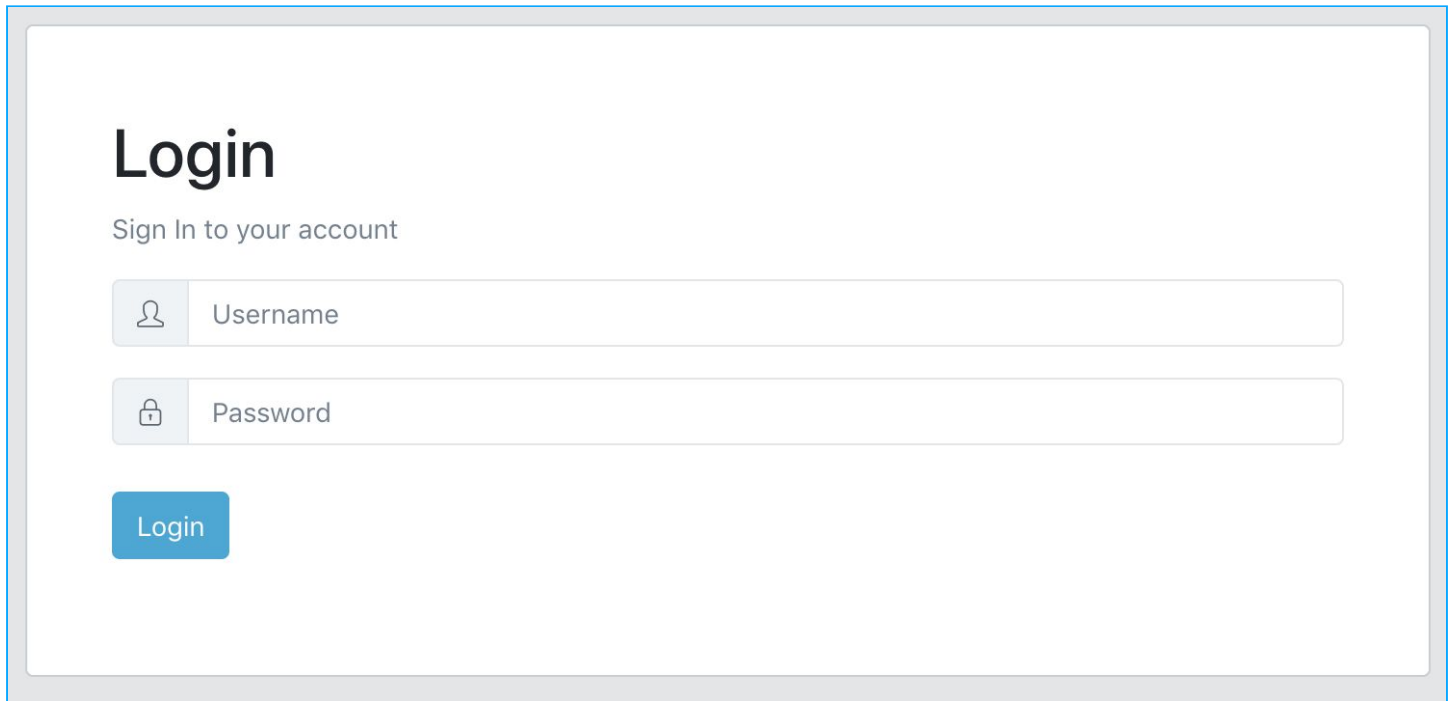
Once the EC2 has built and is deemed as 'running' in the AWS Console, navigate to:

`http://<EC2 IPv4 Address>:8080` (the EC2 IPv4 address is visible on the AWS Console).

Once the application is running, the last step is to configure the application with your AWS Access Keys. This is a secure way of allowing the application to integrate with your AWS Environment. To achieve this, open an SSH connection to your EC2, and execute "aws configure", providing the required details.

Once complete, the application is ready to use.

## Signing in

A screenshot of a login form titled "Login". Below the title is the text "Sign In to your account". There are two input fields: the first is labeled "Username" with a person icon, and the second is labeled "Password" with a lock icon. Below these fields is a blue "Login" button.

**Login**

Sign In to your account

Login

When you first access the application you will immediately be redirected to the login page. The default username is admin, and the default password can be found in a newly generated S3 bucket on the AWS Console. It is not possible to create a user or set of credentials from this login page.

### Navigation Bar

Upon logging in, you are first presented with the dashboard. From here you can navigate to the four main areas of the application: Users, Labs, Accounts and Cleanup.

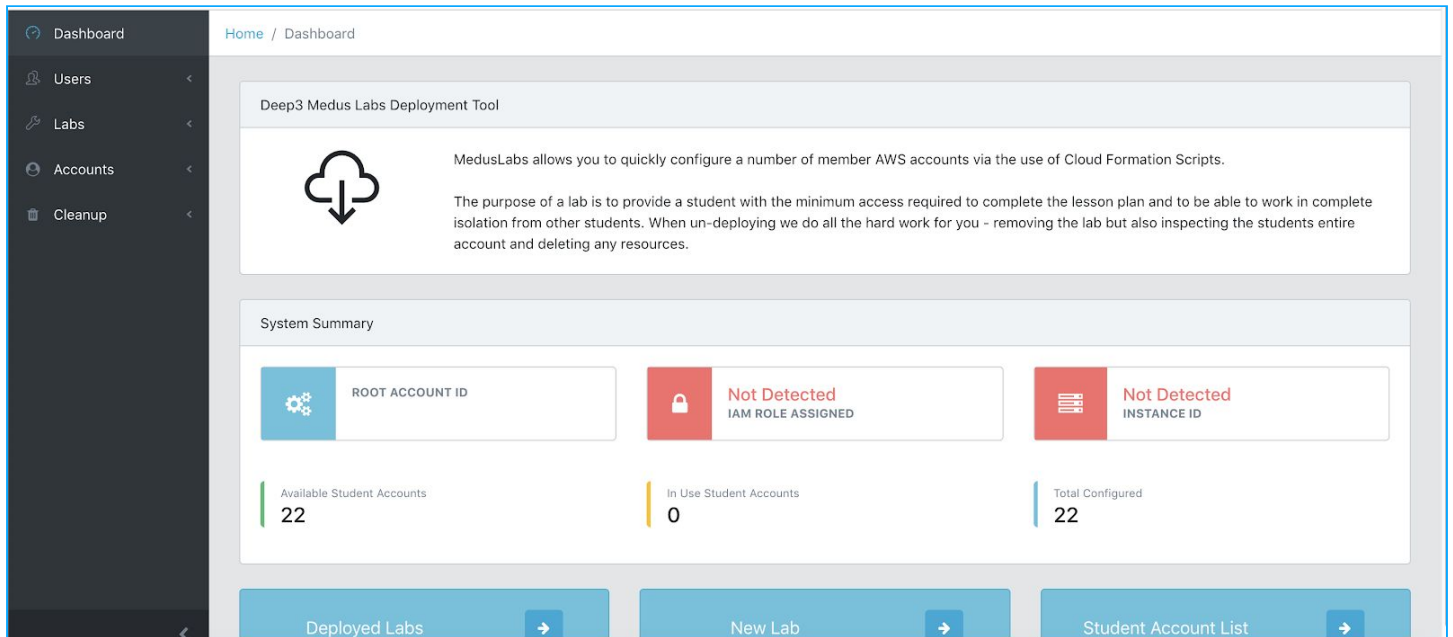
The Users page provides a list of all users who have access to the application, as well as the ability to edit or delete them. Initially this list will contain just the admin. You can also create more application user / a set of credentials from this page. Please note that users refers to users registered with this application, **NOT** the AWS accounts generated in the accounts area of the application.

The Labs pages allow you to create, monitor and delete labs. A 'lab' is a specific environment in which student accounts are allocated. Each lab has a theme, usually tailored toward a certain aws technology. For more information on Labs please consult the relevant section of this documentation

The Accounts pages allow you to create and list accounts for student use / allocation into labs. Doing this requires an email address client that allows the + operator. Please note that it is not possible to delete a generated AWS account via this application - it can only be emptied of data. For more information on Accounts please consult the relevant section of this documentation

The Cleanup page allows you delete all the data from the application - contents of s3 buckets, saved data with other Amazon Services and so on. This can be considered a kind of factory reset. For more information on Cleanup please consult the relevant section of this documentation

# Dashboard



The dashboard is the landing page upon each signin. On first sign-in this page is empty of any student accounts.

Once populated, the System Summary card offers a brief snapshot of the application including AWS configurables Root Account ID, the IAM Role of the account and the instance ID. There is also a summary of the available student accounts - either **Available** or **In Use**.

The root account ID refers to AWS Account of the admin user, not any of the accounts generated via the application.

# Users

To set up other users for this application you need to navigate to the Users > Create page.

User

Create

Please supply a username and password to use when creating the new User.

Username:

Username

Password:

Password

Password Verification:

Password Verification

Submit

Once the form is submitted the user is primed for general use. The root account ID will be identical to that of the admin, and the user will have all the privileges granted to the administrator. Due caution should be exercised in this regard as this means any created user can wipe clean the data in the application.

The created user will have to supply a new password of their choosing once they've logged in.

Password Expired

The password for this account has expired. Please set a new Password.

Password:

Password

Password Verification:

Password Verification

Submit

The created user(s) along with the original admin user are now viewable in the list tab. From here you can edit a username and password or delete a user altogether.



Users		
<b>Users</b> The following users have been created on this system. All users have full access, enabling them to deploy and undeploy labs, view logs and create other users as required.		
Id	Username	Actions
1	admin	<a href="#">Edit</a> <a href="#">Delete</a>
2	testing1212	<a href="#">Edit</a> <a href="#">Delete</a>

# Accounts


Medus Labs allows for and automates the deployment of multiple AWS accounts, primarily for short term, lab style usage. Each AWS account requires a unique email address, but using an email provider with the ‘+’ operator enabled streamlines this process, meaning only a single base email address is required to create 1-9 accounts. The use of AWS organisations allows one parent account to create these accounts ( referred to in this application and guide as student accounts). For more information on AWS Organisations please visit <https://aws.amazon.com/organizations/faqs/>.

These student accounts are full AWS accounts that live under the umbrella of the parent account. It is possible to login to any of these generated accounts (known as ‘switching role’ on the AWS console) from the AWS console, and has associated logs in CloudFormation for debugging and troubleshooting purposes.

There is a default limit on the number of accounts that can be created, which is set at 9. To create more in a single instance / against one parent account you will need to raise a support case with AWS. The AWS support team usually respond and deal with a case such as this in under 24 hours.

## Setting Up New Accounts

### Number of Students

 Number of students

The default for a new account is 9. If you exceed this limit you will need to create a support case with AWS to raise the limit.

### Email Addresses


Each AWS account requires a VALID unique email address.

If you fail to use valid emails for generating student accounts then you will have serious issues when you come to delete the accounts!

As a workaround for this we will auto-generate emails in the format of:

- youremail+RANDOMID@yourdomain.com
- youremail+ABCDE@yourdomain.com
- youremail+VWXYZ@yourdomain.com

This requires your email address client to support the + option when generating emails. [Gmail supports this by default](#), if you are unsure if your email client supports this feature try sending a test email, if it doesn't the easiest option is to quickly create a gmail account for the member accounts to use.

 Email

Create

Opting to create new accounts will redirect you to the account creation modal. All that needs to be supplied is an email address which has a + operator supporting provider, and the number of accounts you wish to create. Once successfully created, the student accounts will be visible in the List tab:

Account	AWS Account ID
AWSLabsAccount 1	653641107383
AWSLabsAccount 1	738046251894
AWSLabsAccount 1	784068573597
AWSLabsAccount 10	836296355426
AWSLabsAccount 11	579620622192
AWSLabsAccount 12	148261647506
AWSLabsAccount 13	222442387547
AWSLabsAccount 14	558098001826

It should be noted that at this point these accounts are not strictly usable - none of them have an IAM user account assigned to them that would allow them to make use of AWS services. As part of the lab deployment process, an IAM user account is created and assigned to each account selected to be included in the new lab. This IAM user will, as previously mentioned, have restricted permissions so that students cannot perform actions outside the scope of a given lesson plan. For more information on IAM users please visit <https://aws.amazon.com/iam/faqs/?nc=sn&loc=5>.

# Labs

Labs are pre-formed scripts that allow us to load student accounts into a specific environment. The two labs provided by default are EC2Lab & Lexlab. Amazon EC2 is a cloud computing service and Lex is a chatbot service. Deploying a lab passes control of the account's permissions to the lab itself, restricting its permissions to the smallest set necessary, in the EC2 case only allowing minimal EC2 access and no access to any other AWS service. More 'labs' can be added by adding scripts to the cloudFormationScripts directory in the API. Describing the process of creating a script is out of scope for this guide.

There are no preconfigured labs loaded by default in Medus Labs. You must deploy and delete each one manually. Each lab requires at least one student to be assigned to it. One student account can not be assigned to two concurrent labs.

## New Lab

Labs

### Deploy a new lab

Labs are pre-formed scripts that allow is to build the student accounts into a specific environment. Each lab has a theme that makes up part of a lesson plan, maybe focusing on a specific AWS technology or just giving the student the ability to create and destroy cheap EC2 Instances.

When a lab is deployed it takes control of creating the student user and restricting their permissions to the smallest set required, this helps you keep your lessons on track and prevents students accidentally creating big AWS bills.

Lab Name	Description	Actions
ec2lab	Creates an Ec2Lab	<button>Deploy</button>
lexlab	Creates a LexLab	<button>Deploy</button>
testlab	Testing lab includes a user and some permissions, intended for quick testing of lab deployment	<button>Deploy</button>

Opting to deploy a new lab will provide you with a list of the possible, loaded lab scripts available for selection. Clicking deploy will take you to the deployment modal:

DEPLOY LAB

Please select the number of student accounts you need.

1

Select between 1 and 7

Please select the region you would like to deploy to.

EU (Frankfurt)

For more information about AWS regions click [here](#).

SubmitClose

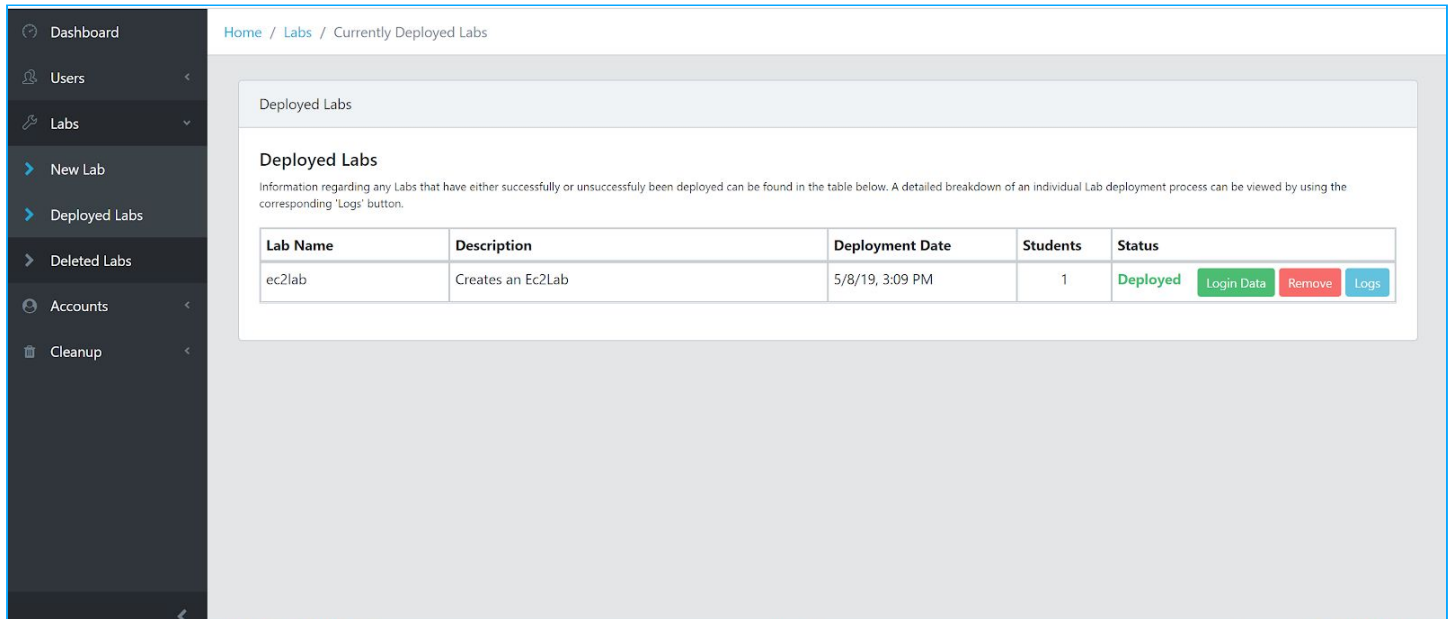
The list of available regions for a lab corresponds to the regions where the service associated with a given lab is available. For more information on AWS regions please visit here:

<https://docs.aws.amazon.com/awsconsolehelpdocs/latest/gsg/getting-started.html#select-region>

A lab may fail to deploy for numerous reasons, most commonly due to too many requests being made from a single account at once. For more detailed troubleshooting information on why a lab did not successfully deploy, you can consult the logs tab for a failed lab, or check the Cloudformation logs which will have more in depth logging information. For more information on AWS Cloudformation please visit here:

<https://aws.amazon.com/blogs/devops/view-cloudformation-logs-in-the-console/>

Once successfully deployed, the lab is viewable in the deployed labs section:



Home / Labs / Currently Deployed Labs

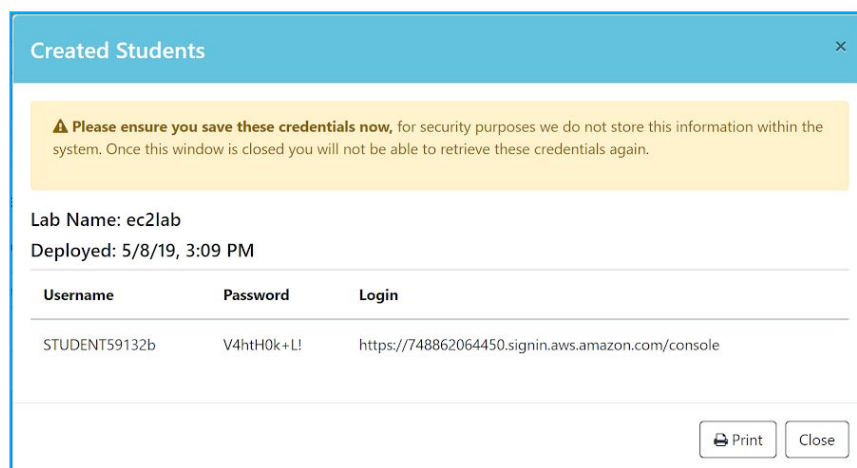
Deployed Labs

Information regarding any Labs that have either successfully or unsuccessfully been deployed can be found in the table below. A detailed breakdown of an individual Lab deployment process can be viewed by using the corresponding 'Logs' button.

Lab Name	Description	Deployment Date	Students	Status
ec2lab	Creates an Ec2Lab	5/8/19, 3:09 PM	1	Deployed <span>Login Data</span> <span>Remove</span> <span>Logs</span>

Note the Login Data button in the status column. Clicking on this button will reveal a modal window displaying all of the lab's student accounts login information: A randomly generated Username, Password, and console link to navigate to login. From here the students will have full use of an AWS account with its associated permissions.

This lab login data is viewable once only. It is therefore advisable to print out this data and distribute it to the students using the lab environment as it can not be recovered. If a student or student loses their login details the only course of action is to remove the lab to make their accounts available for use in another lab.



Created Students

**⚠ Please ensure you save these credentials now,** for security purposes we do not store this information within the system. Once this window is closed you will not be able to retrieve these credentials again.

Lab Name: ec2lab  
Deployed: 5/8/19, 3:09 PM

Username	Password	Login
STUDENT59132b	V4htH0k+L!	<a href="https://748862064450.signin.aws.amazon.com/console">https://748862064450.signin.aws.amazon.com/console</a>

Print Close

As noted in the screengrab above, the details are not stored within the application itself as this would represent a significant vulnerability

### Deleting a Lab

Once a lesson has concluded, you can navigate to the deployed labs section and delete an individual lab, and make the student accounts allocated to it available for use in another lab. This will also prevent students from continuing to use the accounts. Conversely if the lab is not deleted then students will be free to use the IAM accounts indefinitely, and their accounts cannot be reallocated. The application has no timeout feature, and no labs will be deleted automatically. It is the responsibility of the user to manage these resources within the application.

Deleting Lab

Are you sure you wish to undeploy this lab and reset the associated student accounts?

Submit

Cancel

The removal of a lab is not instantaneous; it will take time to coordinate the reset with AWS. A lab will appear as **removing** in the deployed labs sections whilst this is in progress:

Status

Removing

Logs

Once this process has finished the lab will no longer be viewable in the deployed labs section. It can then be viewed in the deleted labs section. Any resources used within the accounts in a deleted lab have been cleared.

Deleted Labs				
Deleted Labs				
Once a Lab is deleted, the enviroment within which it existed is cleaned. This process includes the deletion of any created resources, including user accounts. A detailed breakdown of an individual Lab's historical events can be viewed by using the corresponding 'Logs' button.				
Lab Name	Description	Deployment Date	Students	
lexlab	Creates a LexLab	5/8/19, 2:39 PM	6	<div>Deleted</div> <div>Logs</div>

# Cleanup

The Cleanup section of the website allows you to perform a factory reset on the application. This will clear the application of generated AWS accounts, and any resources they may have used. It will also remove all deployed labs. This process is irreversible, so it is recommended that you verify you have no further use for the accounts nor the resources stored within them. This is also another reason not to give students direct access to the Medus-Labs application.

## Delete all Data

To delete all stored data, please use the button below. This will not be possible unless you have administrator level permissions.

Note: This is not the tool to delete an individual lab or user. This instead deletes all data stored with Amazon Web Services, effectively giving this application a clean slate. If you are not the head of the organisation utilising Medus Labs, please check first that they want what is in effect a factory reset, not an individual lab or user to be deleted. Individually deleted data elements still have their logs that can be viewed for troubleshooting purposes.


THE DELETION OF THIS DATA IS FINAL AND IRREVERSIBLE. USERS, LABS AND GENERATED STUDENTS CANNOT BE RETRIEVED ONCE REMOVED FROM AMAZON WEB SERVICES STORAGE

DELETE ALL

The deletion of all AWS resources is done in sequence, one after the other. A modal window is displayed illustrating the number of accounts successfully deleted:

### Clean All Data Request Sent

All data from the Medus Labs Application is being deleted. This includes EC2 Keys, users and labs.

**No. of Accounts Successfully Cleaned:** Processing... 

Close