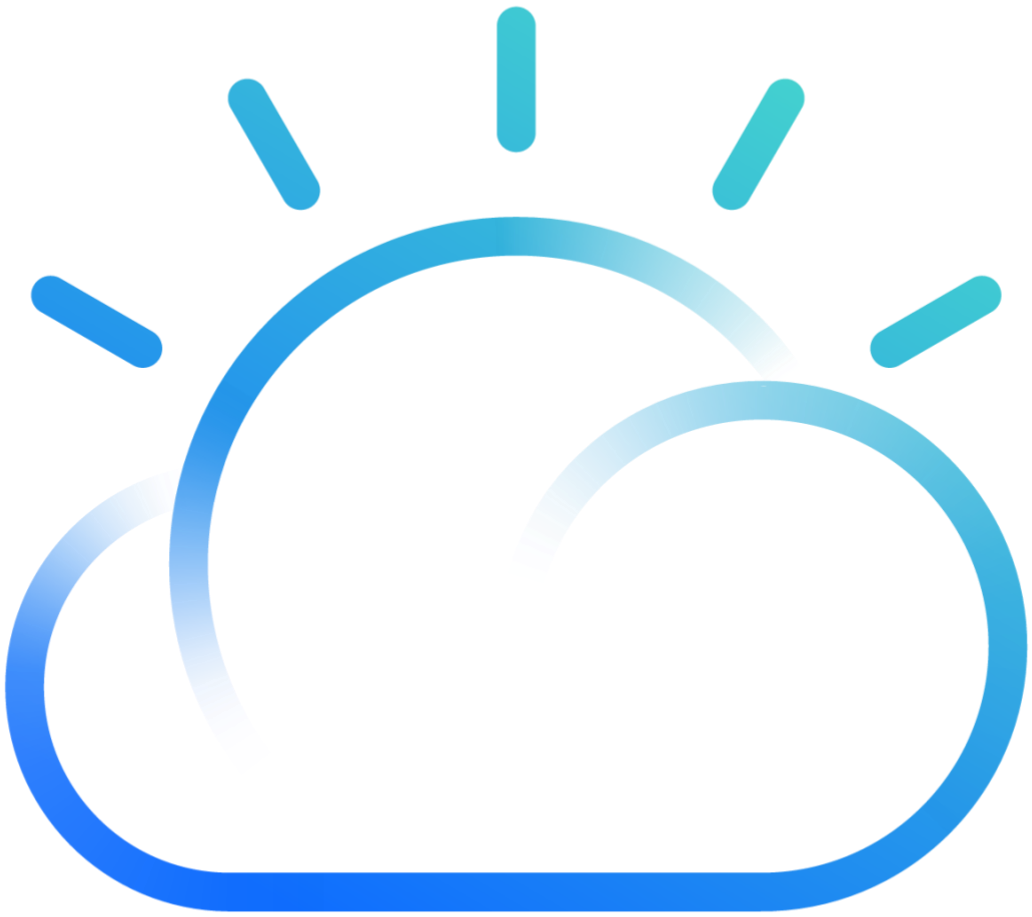
AI Lab Challenge 1

Obtain IBM Cloud account and install Node-RED



Contents

Preface

Overview

As you begin your journey into the IBM Cloud, IBM's premier platform as a service (PaaS) where all services reside, take a moment and watch the following video. It will give you a good idea of IBM's platform and the steps outlined in this document.

- How to setup your IBM Cloud.

We recommend that you register for the IBM Cloud from home or your office. Often doing it as a class all at once, through a single gateway prompts the security settings for IBM Cloud to delay or not verify your account thinking that it is a hack.

Estimated Time to Complete: 30 mins

Objectives

There are 2 Milestones you must complete:

1. Obtain an IBM Cloud account
2. Create a Node-RED Service

Tools

IBM Cloud

The IBM® cloud platform combines platform as a service (PaaS) with infrastructure as a service (IaaS) to provide an integrated experience. The platform scales and supports both small development teams and organizations, and large enterprise businesses.

Node-RED

Node-RED is a flow-based development tool for visual programming developed originally by IBM for wiring together hardware devices, APIs and online services as part of the Internet of Things. Node-RED provides a web browser-based flow editor, which can be used to create JavaScript functions.

Milestone 1: Obtain an IBM Cloud account

Milestone Overview

This lab requires you to complete two Milestones:

1. **Obtain an IBM Cloud account**
2. Create a Node-RED Service

In this Milestone we will create an IBM Cloud account.

Steps

1. Open the IBM Cloud website: https://cloud.ibm.com in a web browser.
2. Click Create an IBM Cloud Account.
3. Fill out the form with requested information. Note that you must use a valid email address, because IBM Cloud sends you an email to verify your account.
4. Click Create Account.

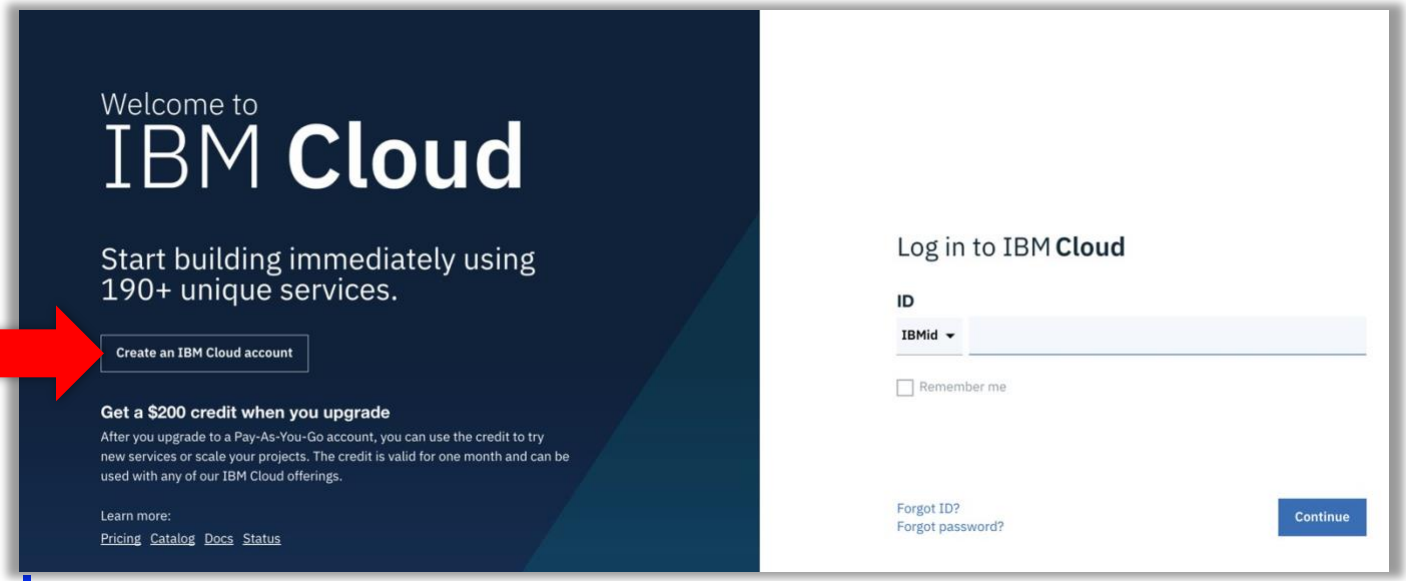


Figure 1-1 **IBM Cloud frontpage**

5. Complete the steps as prompted.
6. Log back into IBM Cloud.
7. Click **Catalog**.

Figure 1-2 **IBM Cloud website menu.**

Milestone 2: Create a Node-RED Service

Milestone Overview

This lab requires you to complete two Milestones:

1. Obtain an IBM Cloud account
2. **Create a Node-RED Service**

In this Milestone we will locate the Node-RED service on the IBM Cloud. We will then provision the service and walkthrough the configurations.

Node-RED began as a visual tool for wiring the Internet of Things and quickly evolved into development code-less environment especially useful to quickly assemble flows of services. Node-RED is available as open source and has been implemented by the IBM Emerging Technology organization. Node-RED provides a browser-based flow editor that makes it easy to wire together flows using the wide range of nodes in the palette. Flows can be then deployed to the runtime in a single-click. While Node-Red is based on Node.js, JavaScript functions can be created within the editor using a rich text editor. A built-in library allows you to save useful functions, templates or flows for re-use.
Node-RED is included in the Node-RED app in IBM Cloud, but you can also deploy it as a stand-alone Node.js application. Node-RED is not just used for IoT applications, but it is a generic event-processing engine. For example, you can use it to listen to events from http, web sockets, TCP, Twitter and more and store this data in databases without having to program much if at all. You can also use it for example to implement simple REST APIs.

You can find more labs to perform by referring to Github:
https://github.com/watson-developer-cloud/node-red-labs

Find the Node-RED Starter in the IBM Cloud catalog

Follow these steps to create a Node-RED Starter application in the IBM Cloud.

1. Log in to IBM Cloud.
2. Open the Catalog (1) and search for **node-red** (2).
3. Click on the **Software** tab (3).
4. Click on the **Node-RED App** tile (4).

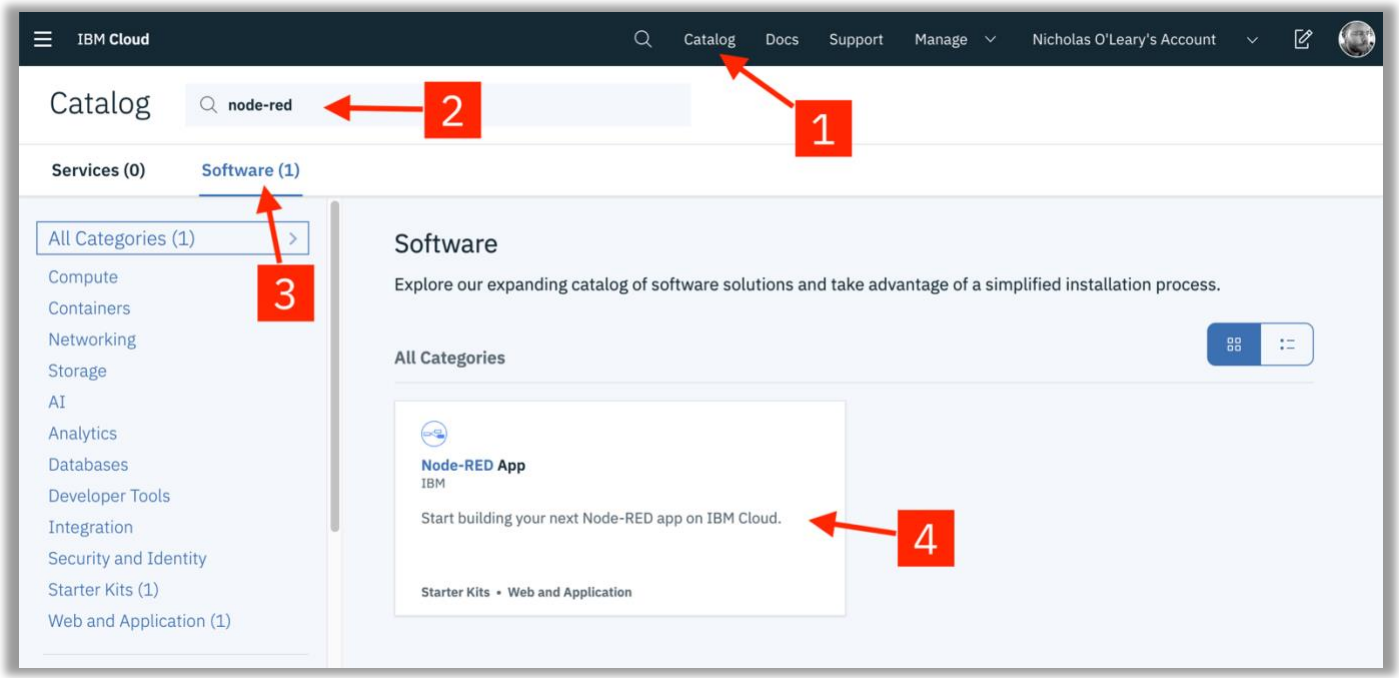


Figure 2-1 **Node-RED in Catalog**

This will show you an overview of Node-RED and what it provides.

5. Click on the **Create app** button (1) to continue.

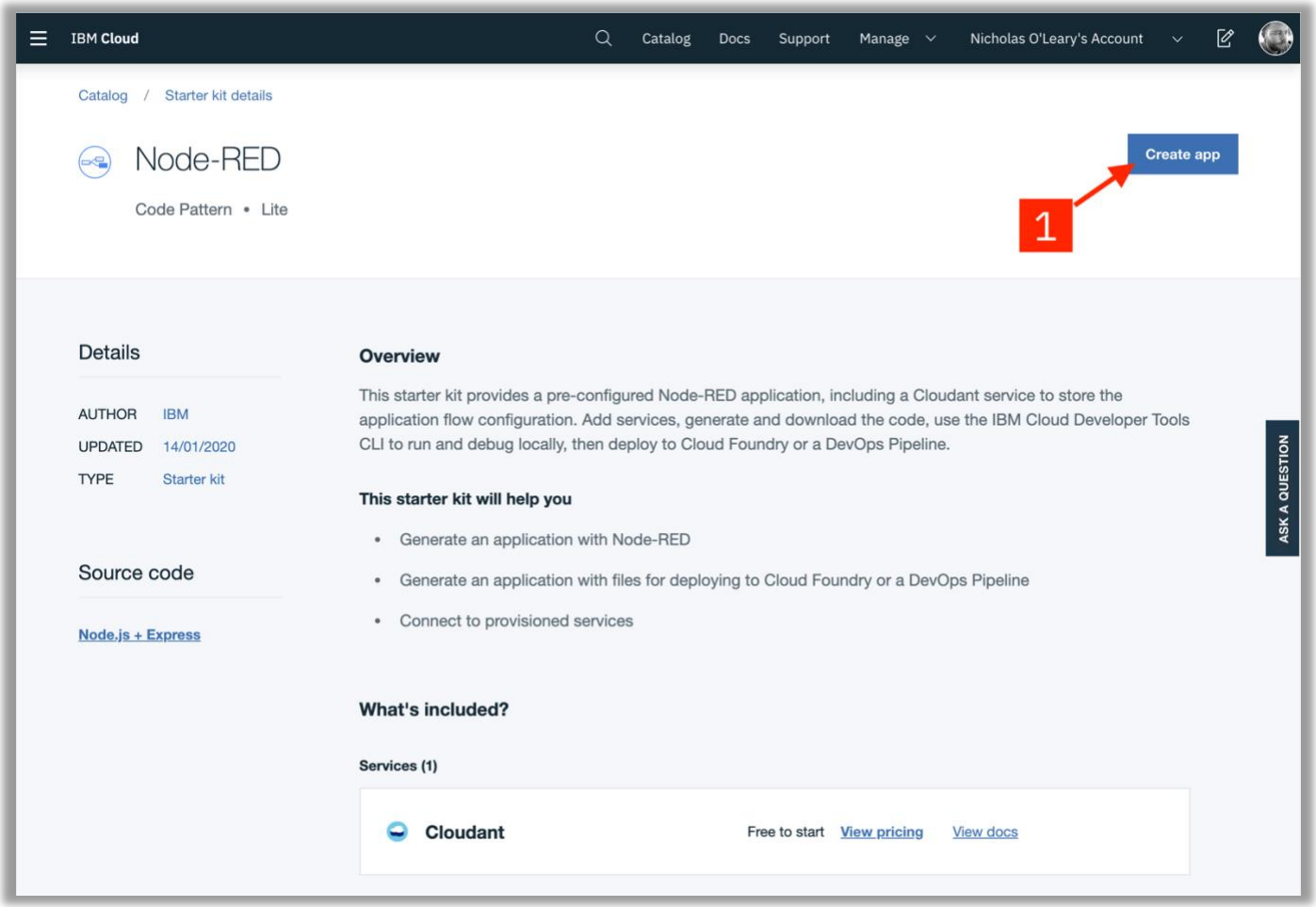


Figure 2-2 **Create Node-RED service**

Configure your application

Now you need to configure the Node-RED Starter application.

6. On the *App details* page, a randomly generated name will be suggested – Node RED SSLPD Replace that string with a name meaningful to you (no spaces). This will become part of the application URL. ***Note:*** If the name is not unique, you will see an error message and you must enter a different name before you can continue.
7. The Node-RED Starter application requires an instance of the *Cloudant database service* to store your application flow configuration. Select the region (2) the service should be created in and what pricing plan it should use. ***Note:*** You can only have one Cloudant instance using the Lite plan. If you have already got an instance, you will be able to select it from the **Pricing plan** select box (3). You can have more than one Node-RED Starter application using the same Cloudant service instance.
8. Click the **Create** button (4) to continue. This will create your application, but it is not yet deployed to IBM Cloud.

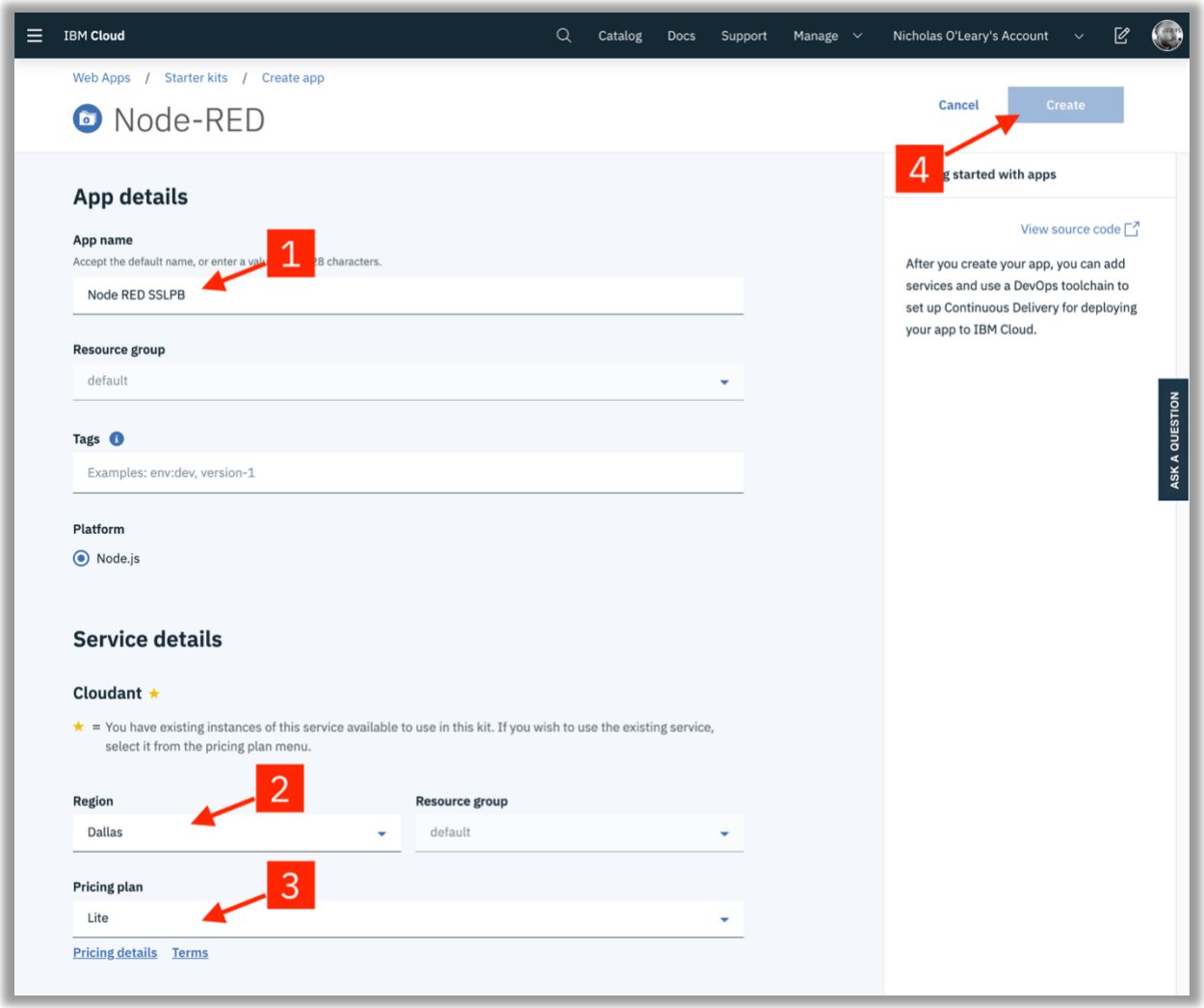


Figure 2-3 **Node-RED Configuration**

Enable the Continuous Delivery feature

At this point, you have created the application and the resources it requires, but you have not deployed it anywhere to run. This step shows how to setup the Continuous Delivery feature that will deploy your application into the **Cloud Foundry** space of IBM Cloud.

9. On the next screen, click the **Deploy your app** button (1) to enable the *Continuous Delivery* feature for your application.

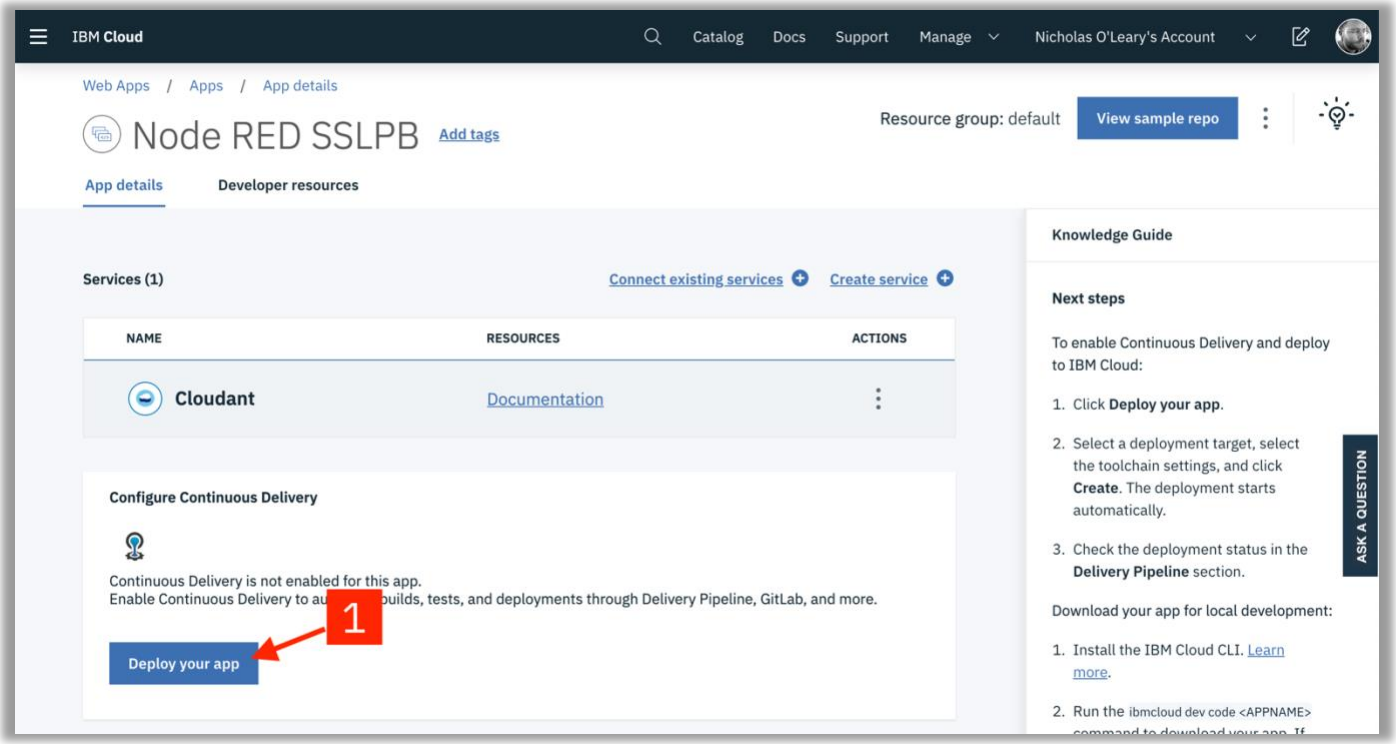


Figure 2-4 **Deploy Node-RED App**

10. You will need to create an **IBM Cloud API** key to allow the deployment process to access your resources. Click the **New** button (1) to create the key. A message dialog will appear. Read what it says and then confirm and close the dialog.

11. The Node-RED Starter kit only supports deployment to the **Cloud Foundry** space of IBM Cloud. Select the **region** (2) to **deploy your application to**. This should match the region you created your Cloudant instance in.
12. Select the **region** (3) to create the **DevOps toolchain**.
13. Click **Create** (4). This will take you back to the application details page.

Figure 2-5 **Link service to DevOps toolchain**

14. After a few moments, the Continuous Delivery section will refresh with the details of your newly created Toolchain. The Status field of the Delivery Pipeline will show **In progress**. That means your application is still being built and deployed.
15. Click on the **In progress** link to see the full status of the Delivery Pipeline.

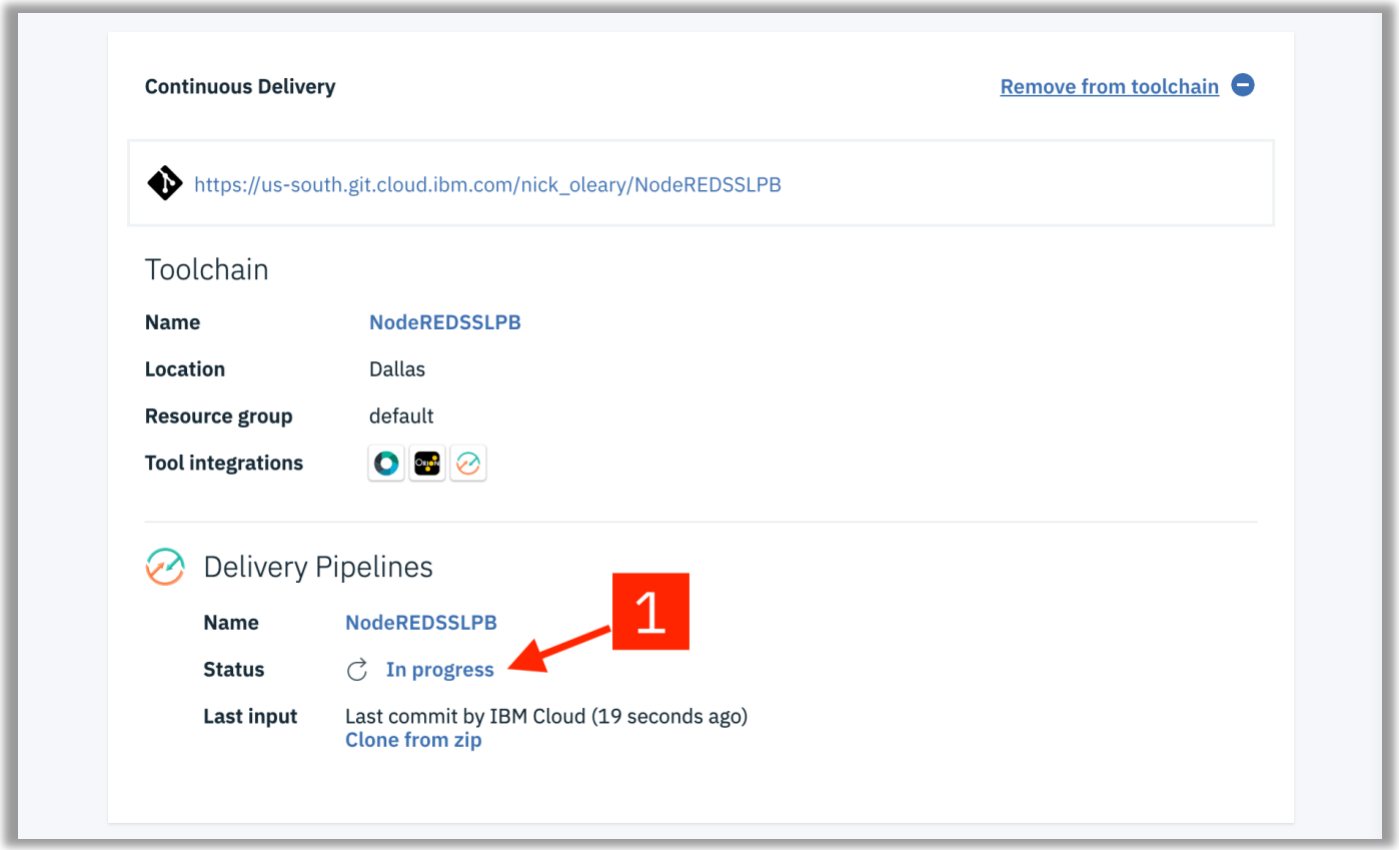


Figure 2-6 **Toolchain Delivery Pipelines**

16. The Deploy stage will take a few minutes to complete. You can click on the **View logs and history** link to check its progress. Eventually the Deploy stage will go green to show it has passed. This means your Node-RED Starter application is now running.

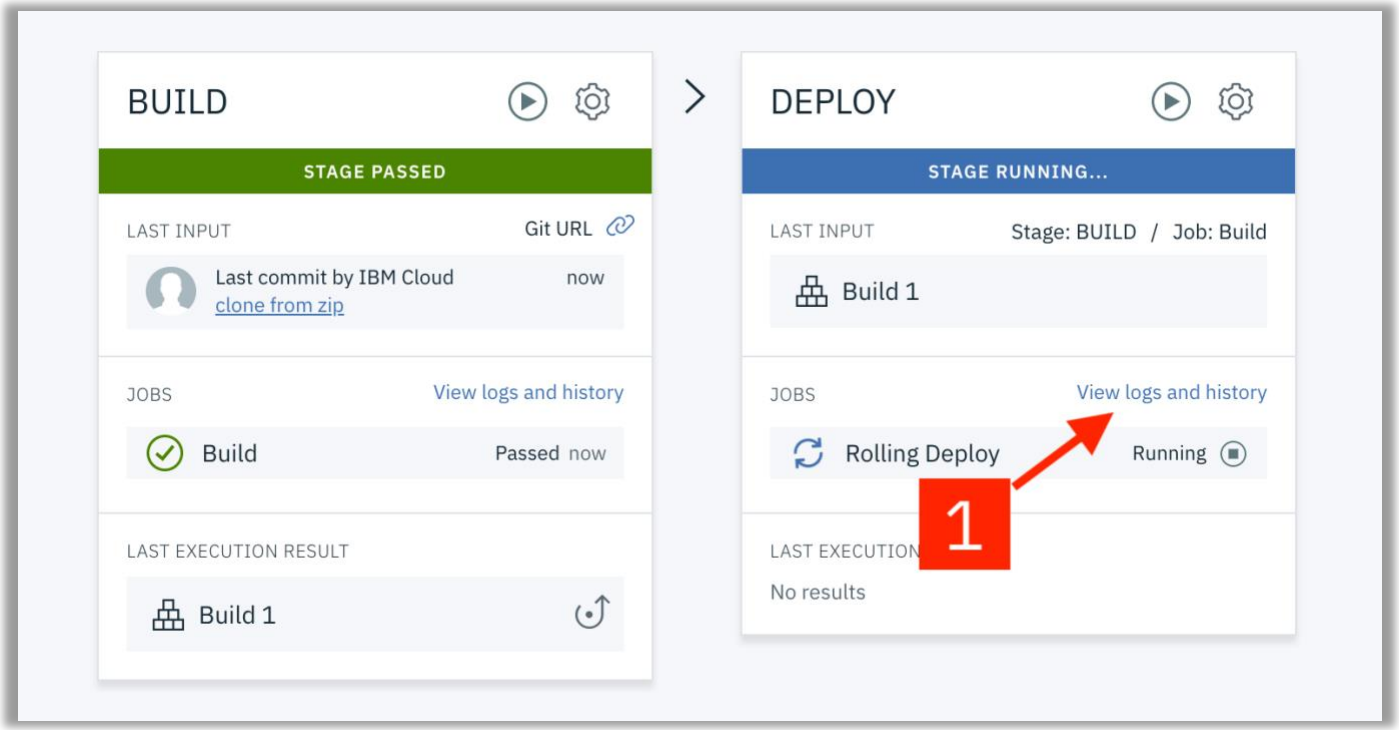


Figure 2-7 **Delivery Pipeline**

Open the Node-RED application

Now that you've deployed your Node-RED application, let's open it up!

17. Open your IBM Cloud Resource list by selecting the sidebar menu (1) and then selecting **Resource List** (2).

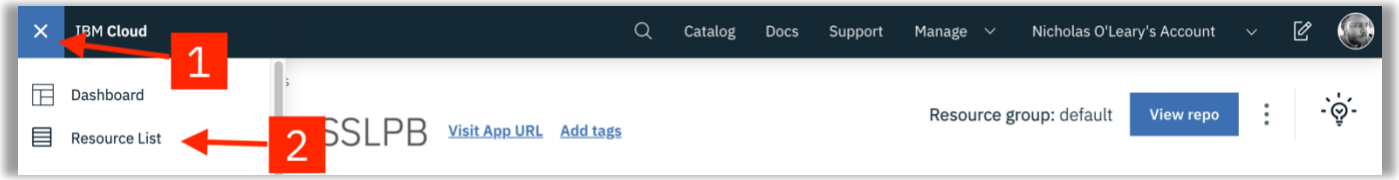


Figure 2-8 **Dashboard – Navigation to Resouce List**

18. You will see your newly created Node-RED Application listed under the **Apps** section (1). You will also see a corresponding entry under the **Cloud Foundry apps** section (2). Click on this Cloud Foundry app entry to go to your deployed application's details page.

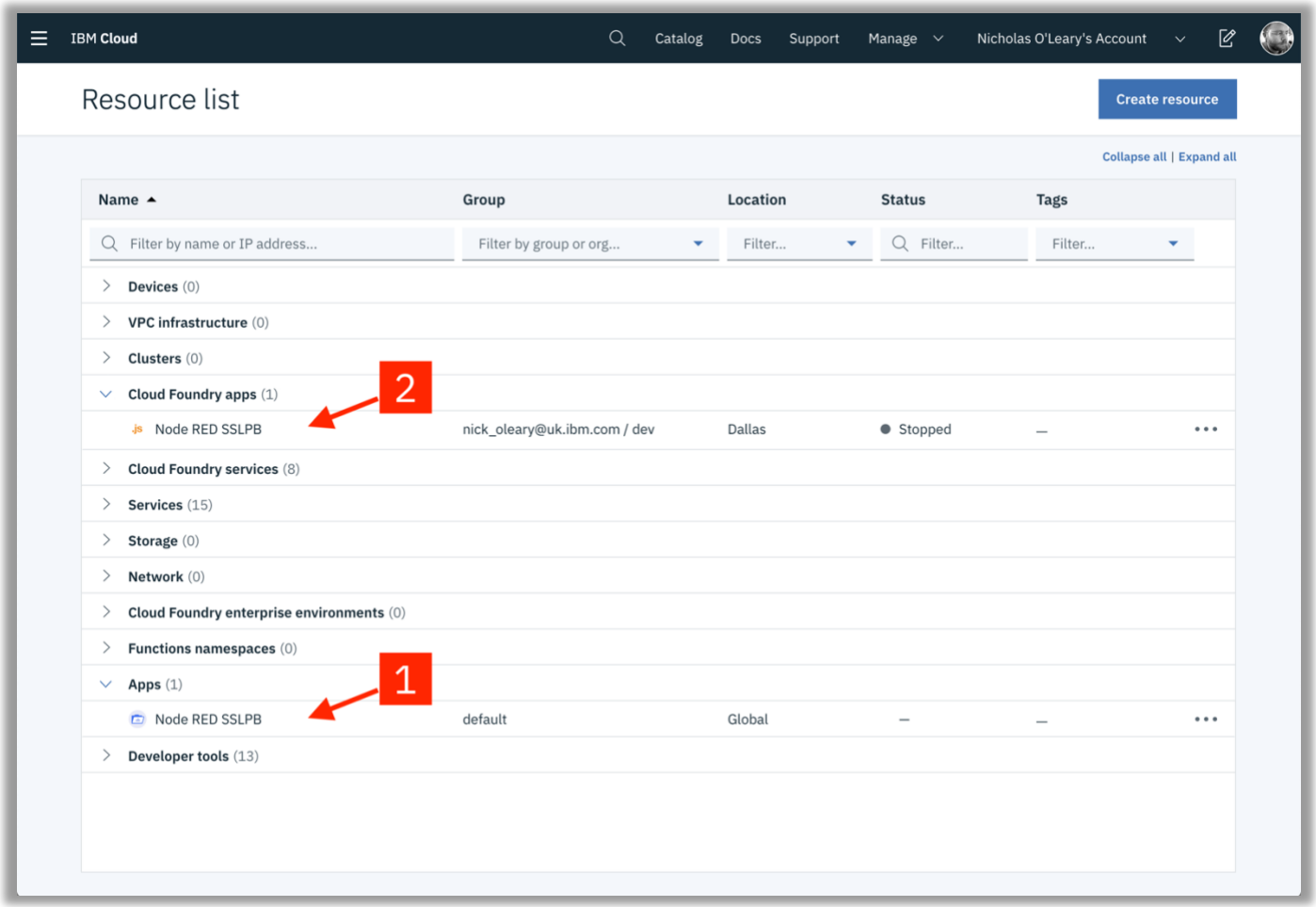


Figure 2-9 **Resource List**

19. From the details page, click the **Visit App URL** link to access your Node-RED Starter application.

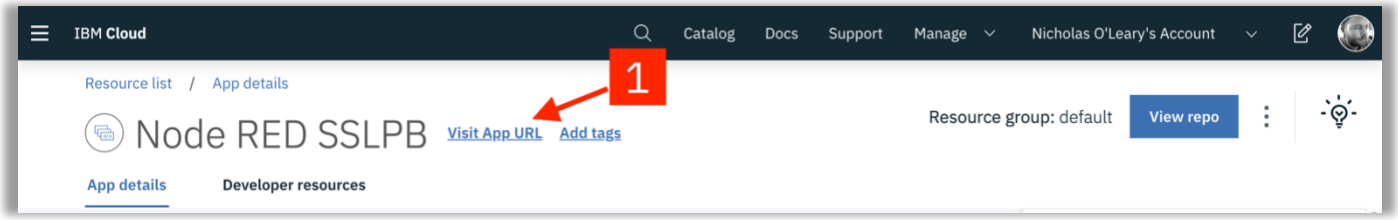


Figure 2-10 **Visit Node-RED App URL**

Configure your Node-RED application

The first time you open your Node-RED app, you'll need to configure it and set up security.

20. A new browser tab will open with the Node-RED start page.

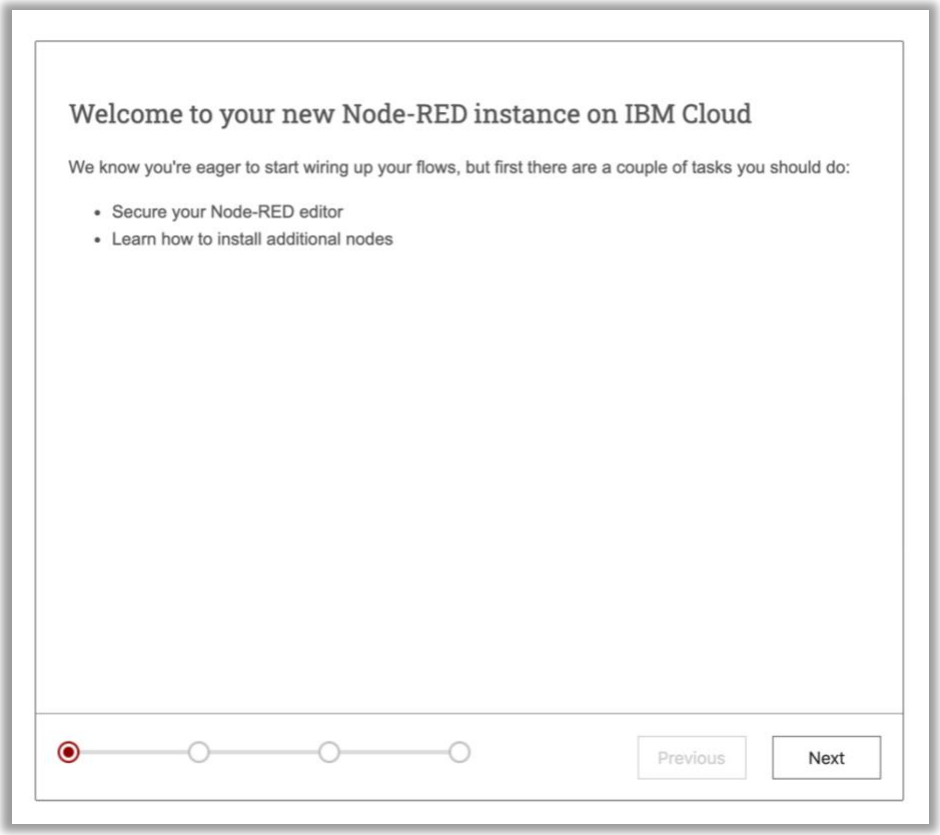


Figure 2-11 **Node-RED Welcome Screen and Configuration Wizard**

21. On the initial screen, click **Next** to continue.
22. Secure your Node-RED editor by providing a **username** and **password**. If you need to change these at any point, you can either edit the values in the Cloudant database, or override them using *environment variables*. The documentation on nodered.org describes how to do this. Click **Next** to continue.
23. The final screen summarizes the options you've made and highlights the environment variables you can use to change the options in the future. Click **Finish** to proceed.

24. Node-RED will save your changes and then load the main application. From here you can click the **Go to your Node-RED flow editor** button to open the editor.

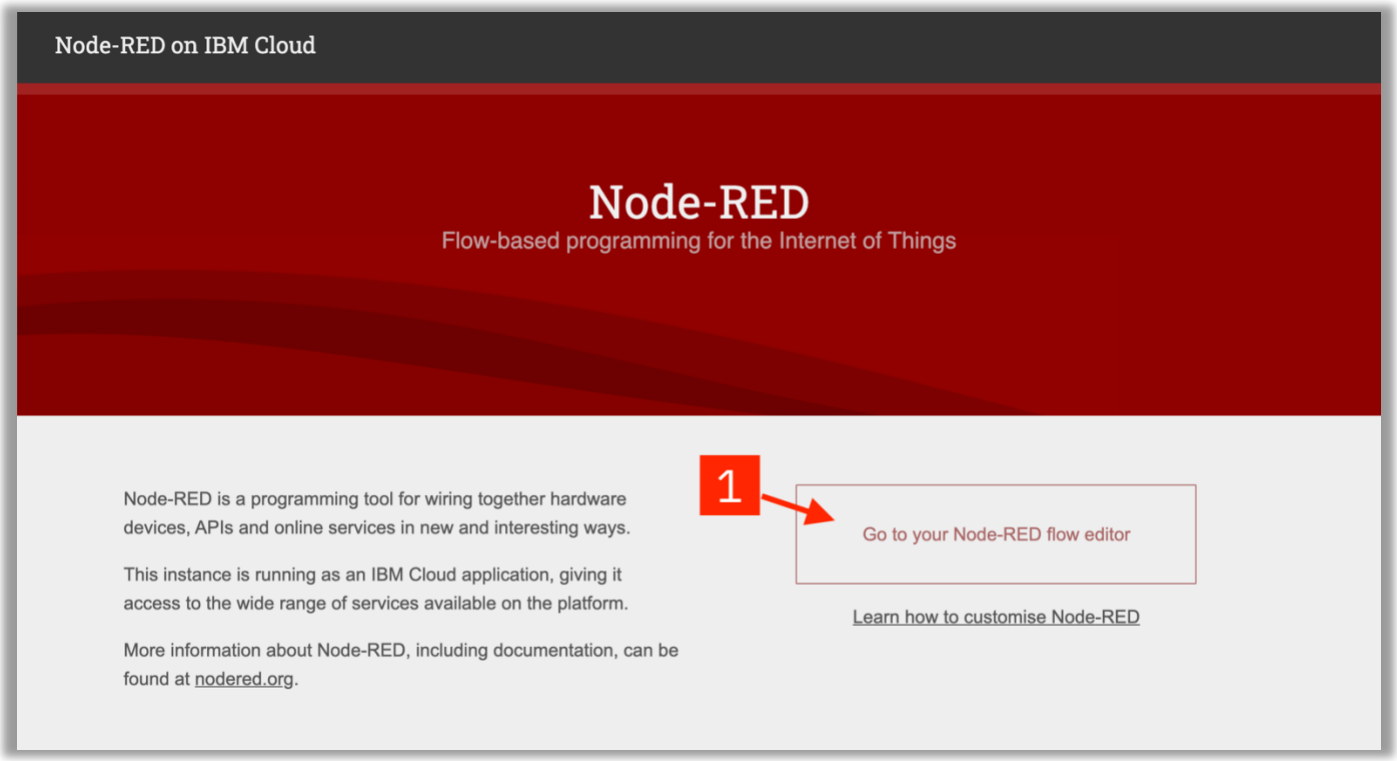


Figure 2-12 **Navigate to Node-RED Flow Editor**

The Node-RED editor opens showing the default flow.

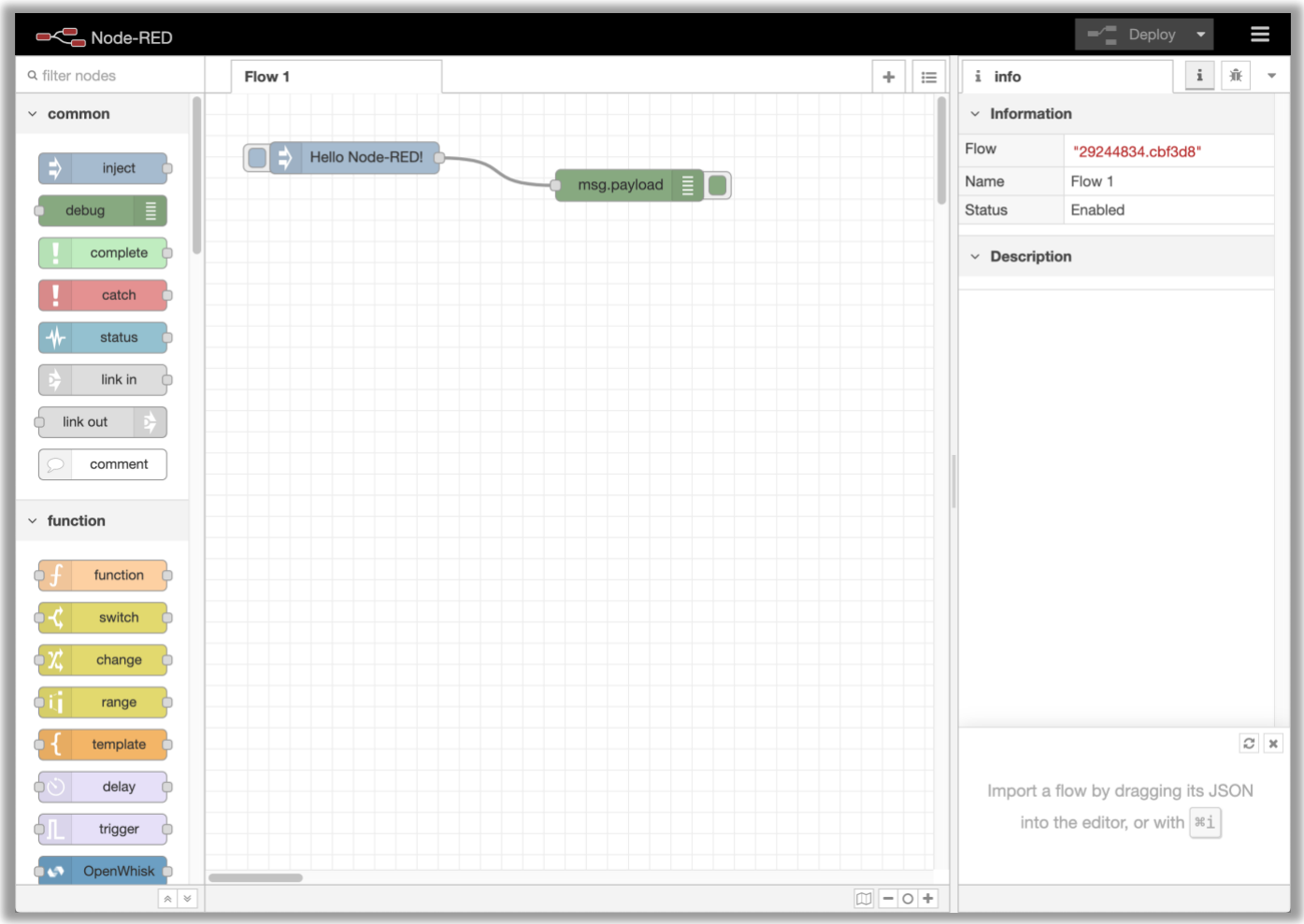


Figure 2-13 **Node-RED Flow Editor**

Milestone Summary

You have now successfully provisioned and configured your Node-RED service. You will find additional information about configuring Node-RED in Appendix A. In future labs, we will continue using Node-RED and build on the skills learned in this activity.

Appendix A: Add extra nodes to your Node-RED palette

Node-RED provides the palette manager feature that allows you to install additional nodes directly from the browser-based editor. This is convenient for trying nodes out, but it can cause issues due to the limited memory of the default Node-RED starter application.
The recommended approach is to edit your application's package.json file to include the additional node modules and then redeploy the application.
This step shows how to do that in order to add the **node-red-dashboard** module.

1. On your application's details page, click the url in the Continuous Delivery box. This will take you to a git repository where you can edit the application source code from your browser.

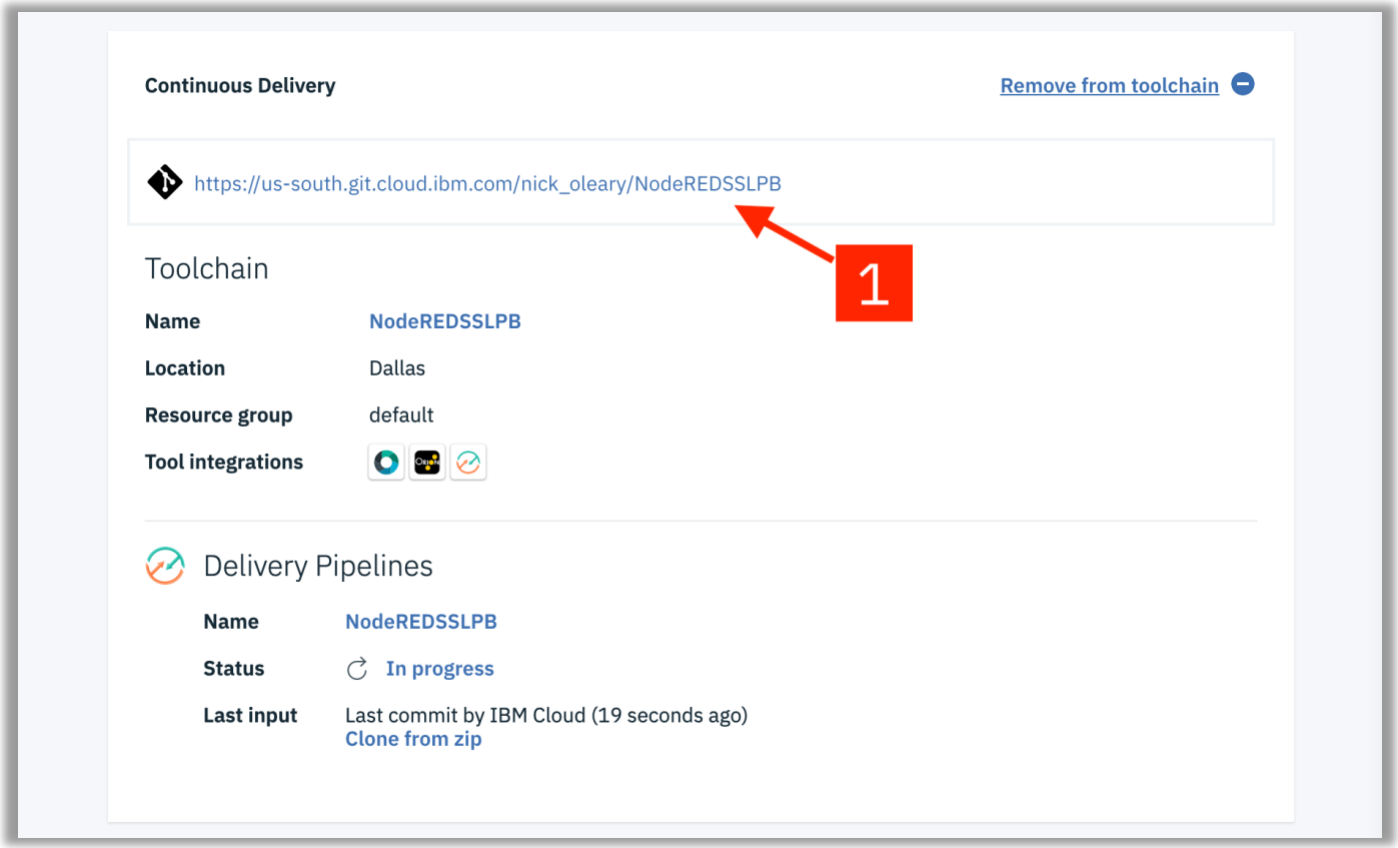


Figure 3-1 **Node-RED Details page – Navigate to Continuous Delivery URL**

2. Scroll down the list of files and click on **package.json**. This file lists the module dependencies of your application.

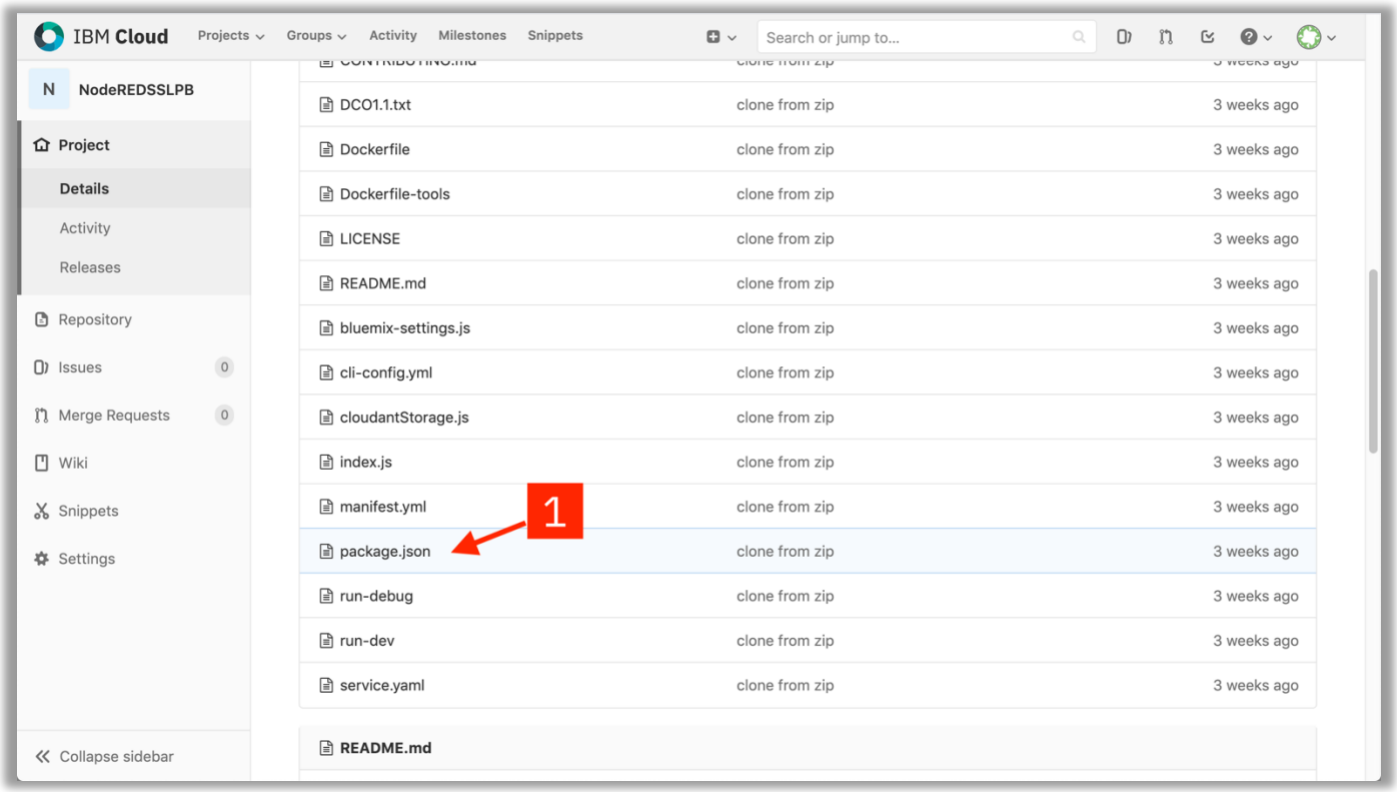


Figure 3-2 **Explore Project Details – Locate package.json**

3. Click the **Edit** button

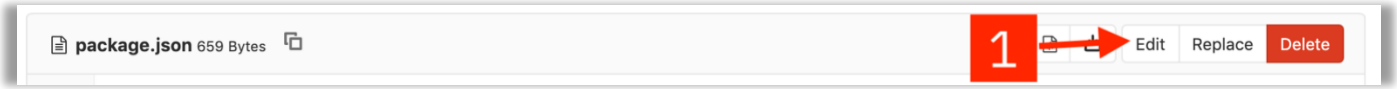


Figure 3-3 **Edit json**

4. Add the following entry to the top of the dependencies section (1):

   "node-red-dashboard": "2.x",

Note: Do not forget the comma (,) at the end of the line to separate it from the next entry.
Add a **Commit message** (2) and click **Commit changes** (3)

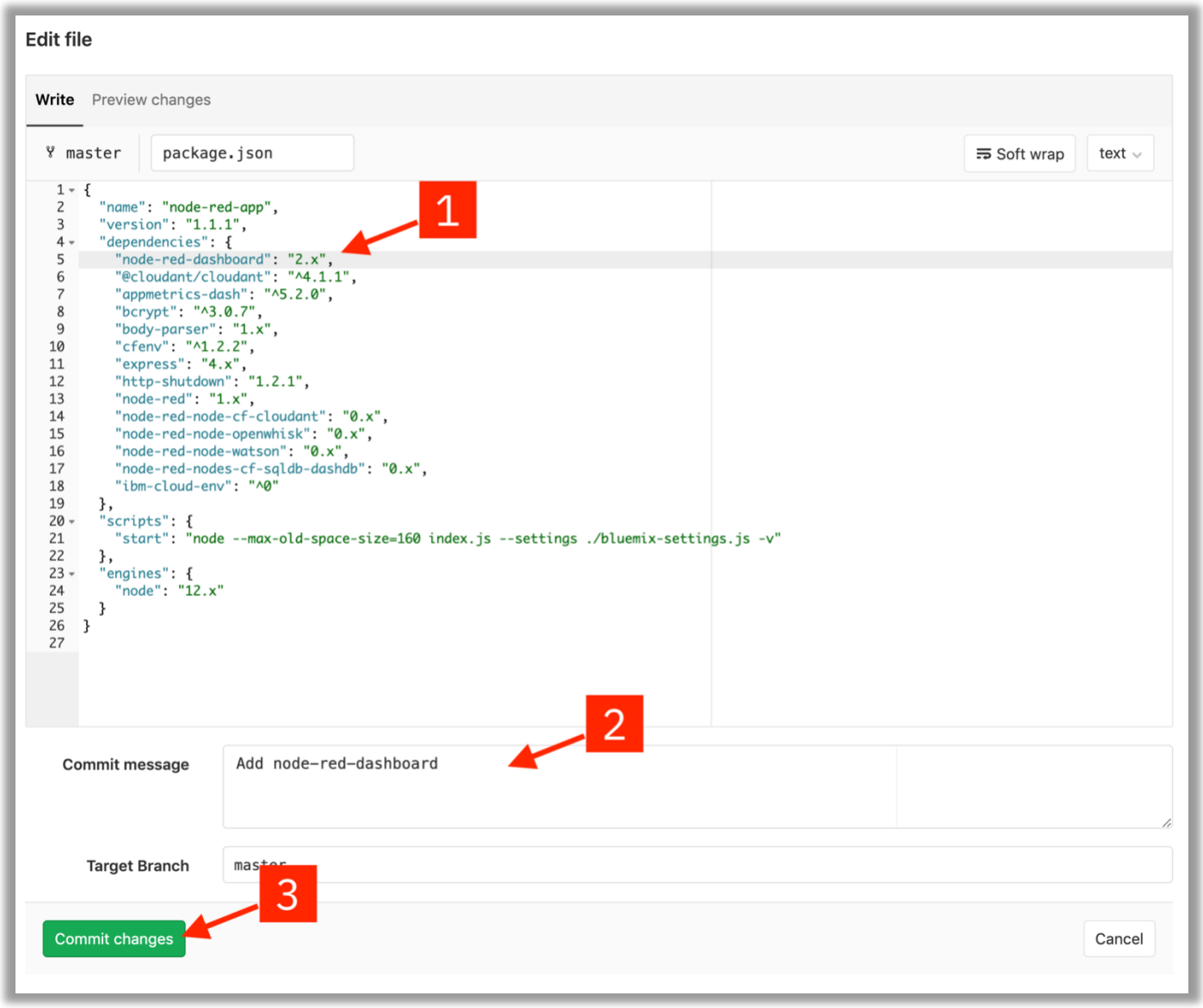


Figure 3-4 **Manipulate Code and Commit changes**

At this point, the Continuous Delivery pipeline will automatically run to build and deploy that change into your application. If you view the Delivery Pipeline you can watch its progress. The Build section shows you the last commit made (1) and the Deploy section shows the progress of redeploying the application (2).

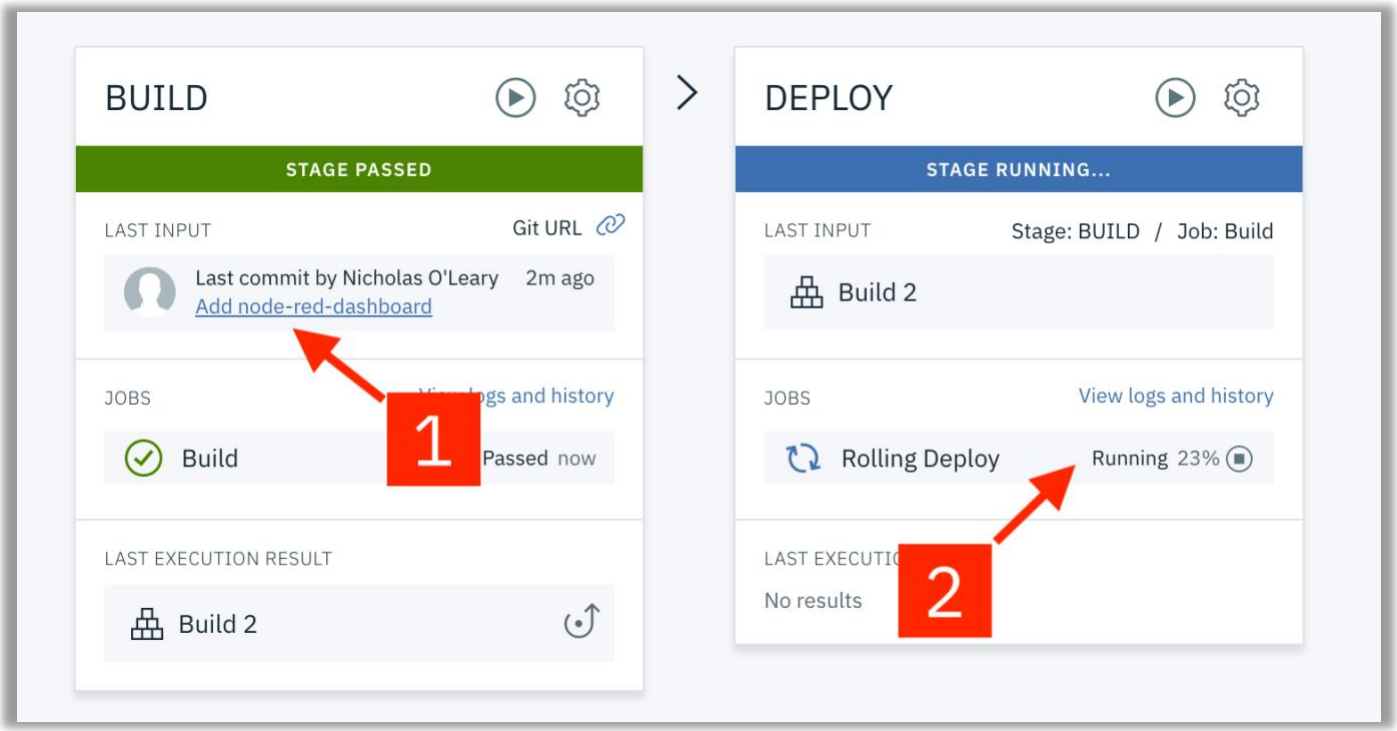


Figure 3-5 **Delivery Pipeline**

5. Once the Deploy stage completes, your application will have restarted and now have the node-red-dashboard nodes preinstalled.

Summary

Congratulations! You have now created a Node-RED application that is hosted in the IBM Cloud. You have also learned how to edit the application source code and automatically deploy changes.