TECHNOLOGY CAMP

DAY 3 : CLOUD COMPUTING

AWS Virtual Private Cloud

Session 4

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Teacher Lesson Plan

Session Name:

AWS Virtual Private Cloud

Summary:

In this lesson, you will learn how to use Amazon Web Services (AWS) to build a Virtual Private Cloud (VPC) and then connect to that VPC using an Android mobile device.

Time Allotment:

65 minutes

Learning Objectives:

- *Learn How to Login to AWS*
- *Build a Virtual Private Cloud in AWS*
- *Learn how to connect to the AWS VPC using and Android mobile device*

Supplies:

- *Scrap paper / notepad to take notes*
- *Laptop / computer with Internet access*
- *Android Tablet (provided)*
- *AWS Login Credentials (provided)*

Learning Activities:

- **(5 minutes) - Session overview**

  Students will learn how to login to AWS, build a Virtual Private Cloud in AWS, and how to connect to the AWS VPC using and Android mobile device.

  Discuss how AWS allows for the development of a Virtual Private Cloud and how using a VPC can allow you to connect more securely to cloud resources.

- **(4 minutes) – What is a Virtual Private Cloud?**

  Amazon Virtual Private Cloud (Amazon VPC) enables you to launch AWS resources into a virtual network that you've defined. This virtual network closely resembles a traditional network that you'd operate in your own data center, with the benefits of using the scalable infrastructure of AWS. – Amazon Web Services (https://docs.aws.amazon.com/vpc/latest/userguide/what-is-amazon-vpc.htm)

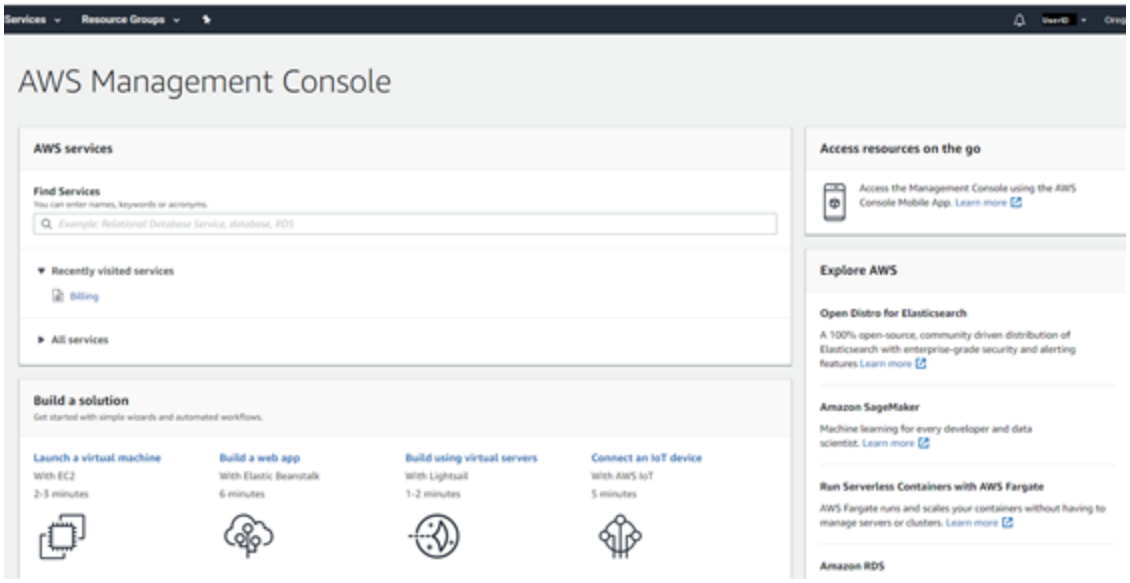
  Discuss why it would be desirable to have a private cloud within which to run instances rather than just creating instances in the public cloud as we did in the Google Cloud Platform lesson.

- **(6 minutes) - Video : MicroNugget - What is Amazon VPC?**

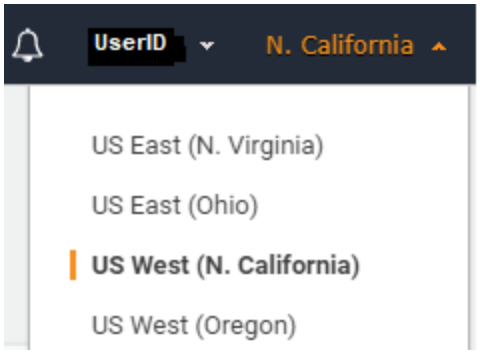
  https://www.youtube.com/watch?v=rv7-ec9Wt_U

- **(5 minutes) - Lab: Login to AWS**
  - *Quick safety talk about the use of laptops*
  - *Provide students with password to student account (password will be provided)*
  - *https://aws.amazon.com/*
  - *Remind students to follow along with the demonstration and that they will have time at the end of the lesson to work and experiment.*
  - *Confirm that everyone is logged into AWS before beginning the lesson.*

- **(15 minutes) – Demonstration: Build a Virtual Private Cloud in AWS**
  1. *After logging in, you will be on the AWS Management Console*

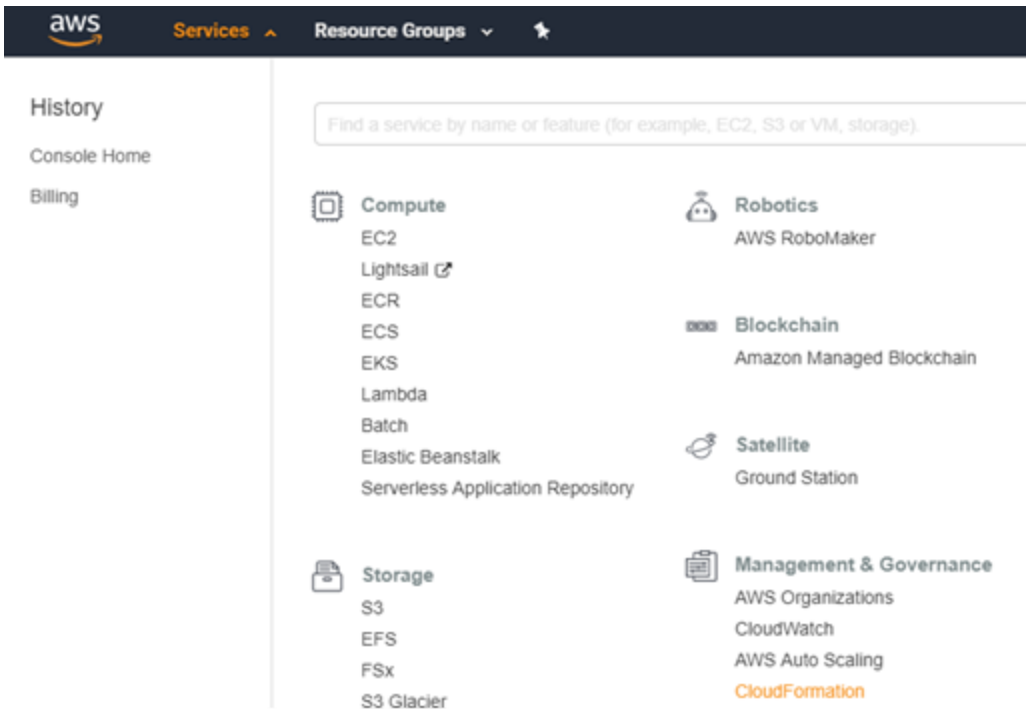


2. *Select the region for your VPN server from dropdown in upper right*

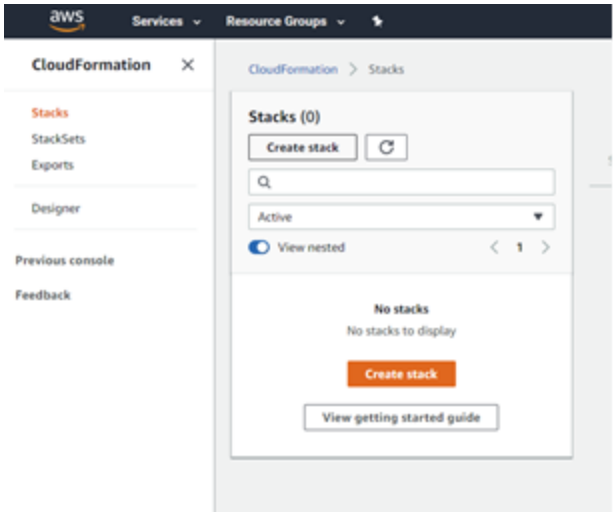


Discuss the considerations of lag when selecting a VPN server location

3. *Select Services from the upper left of the top menu bar and then Cloud Formation from the pop out menu*

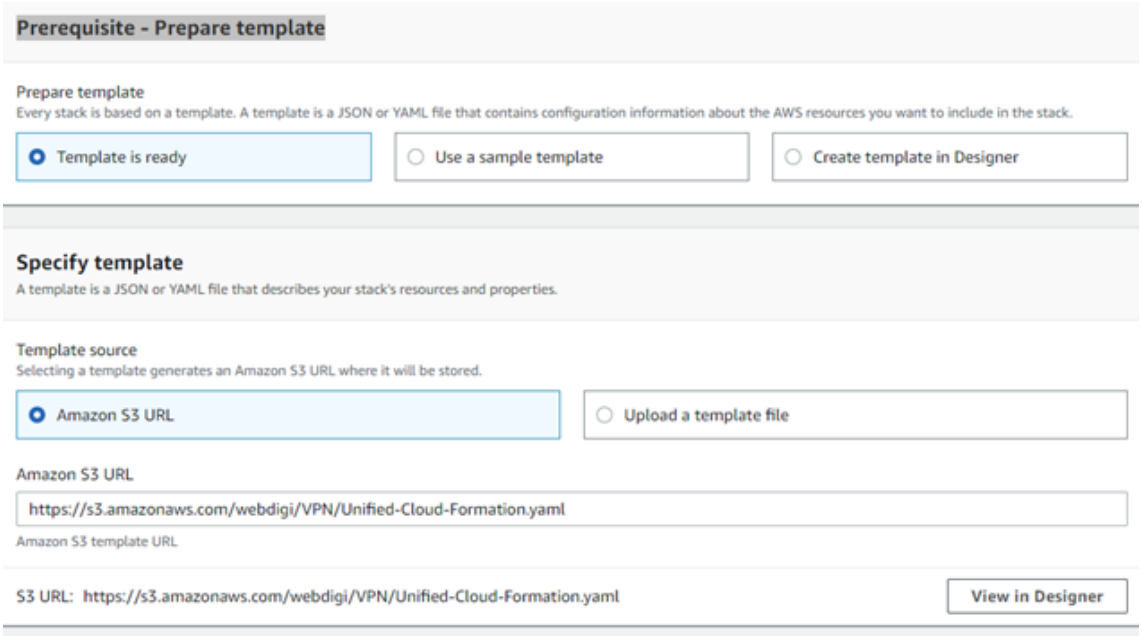


4. *From the CloudFormation Screen, select the Create stack button*

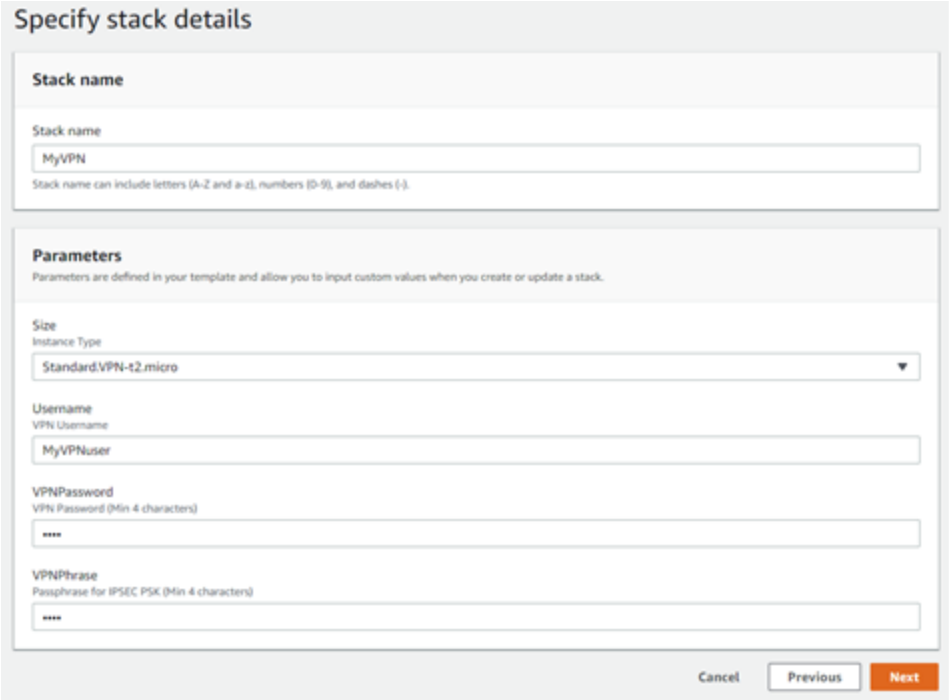


5. *On the Create stack screen, confirm Prerequisite - Prepare template is set to Template is ready and Specify template is set to Amazon S3 URL, then paste the*

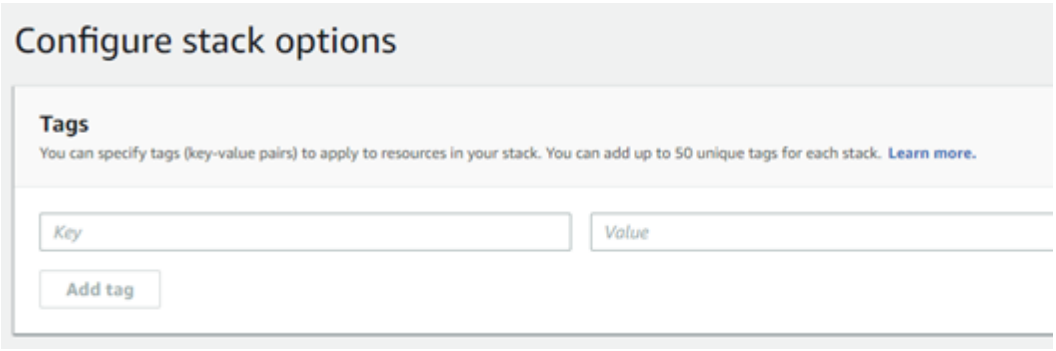
link from the template.txt file in the resources folder into the Amazon S3 URL field and select next



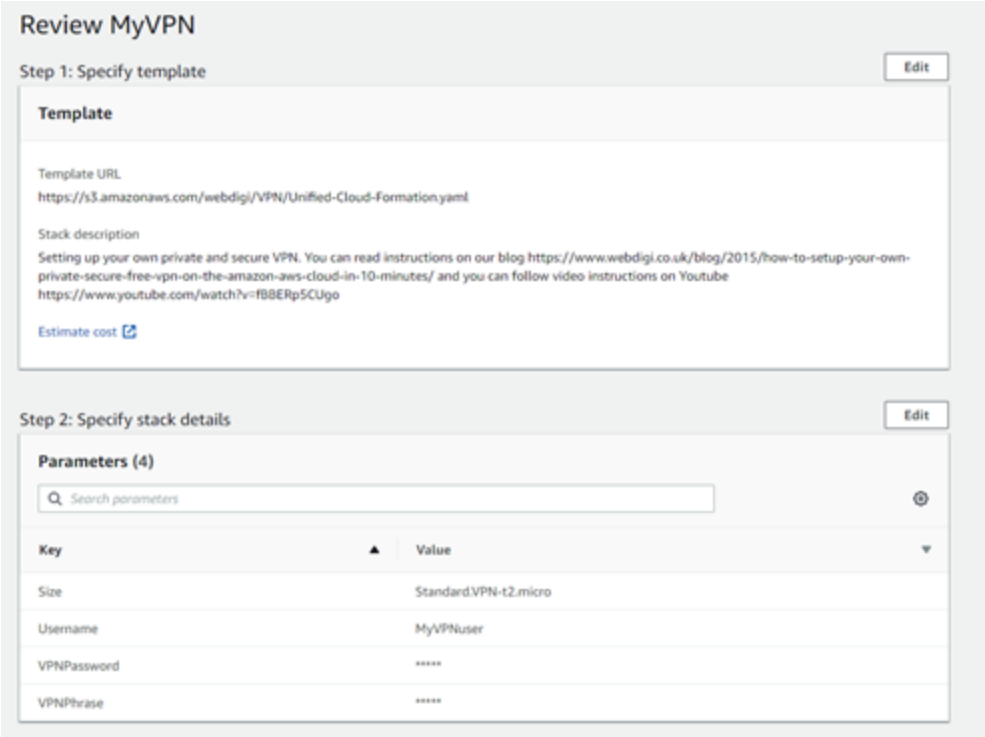
6. *Complete the fields in the Specify stack details screen and then select next*
    i. *Stack name: Provide a name to identify this VPN*
    ii. *Parameters*
        a. *Size-select micro to minimize costs*
        b. *Username-provide a username to access the VPN*
        c. *VPNPassword-set a password*
        d. *VPNPhrase-another type of password to be used for IPSEC connections*



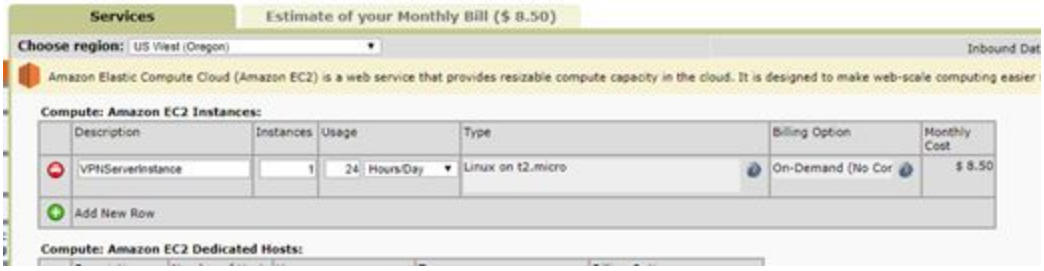
7. *The Configure stack options screen will be displayed, for this lesson we won't make any changes, select Next*



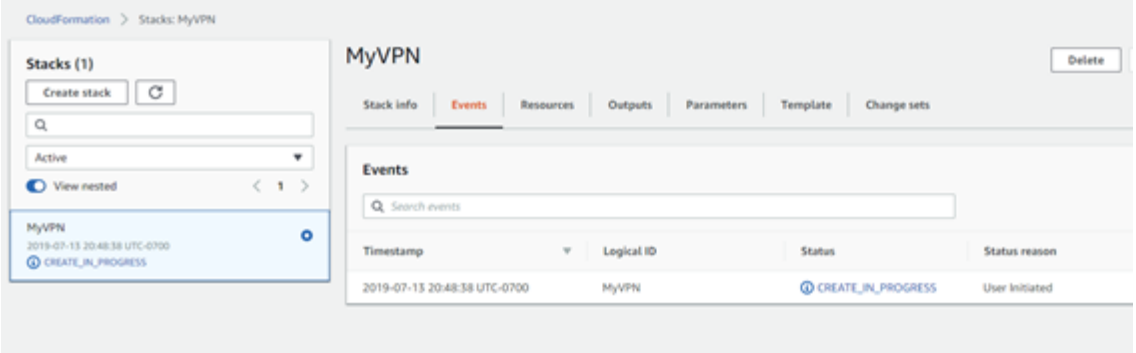
8. *On the Review MyVPN screen, confirm all details. You can also use the edit button at the top right of each section if you need to make any changes. Once you are satisfied with the configuration, select Create stack (bottom of screen).*



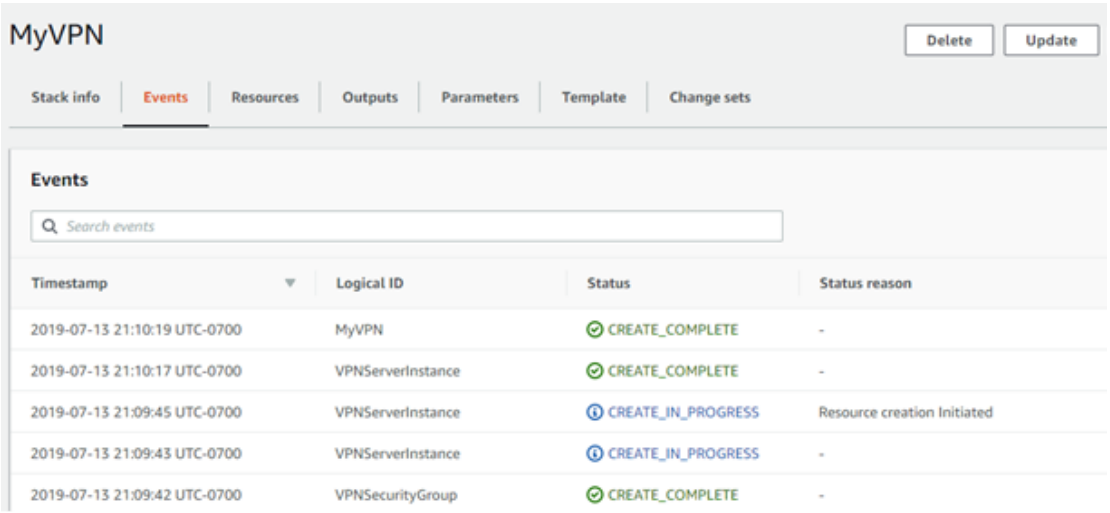
Note: You can click on the Estimate cost link to open a new tab that provides a monthly estimated cost for the configuration requested. (Changing regions may alter costs)



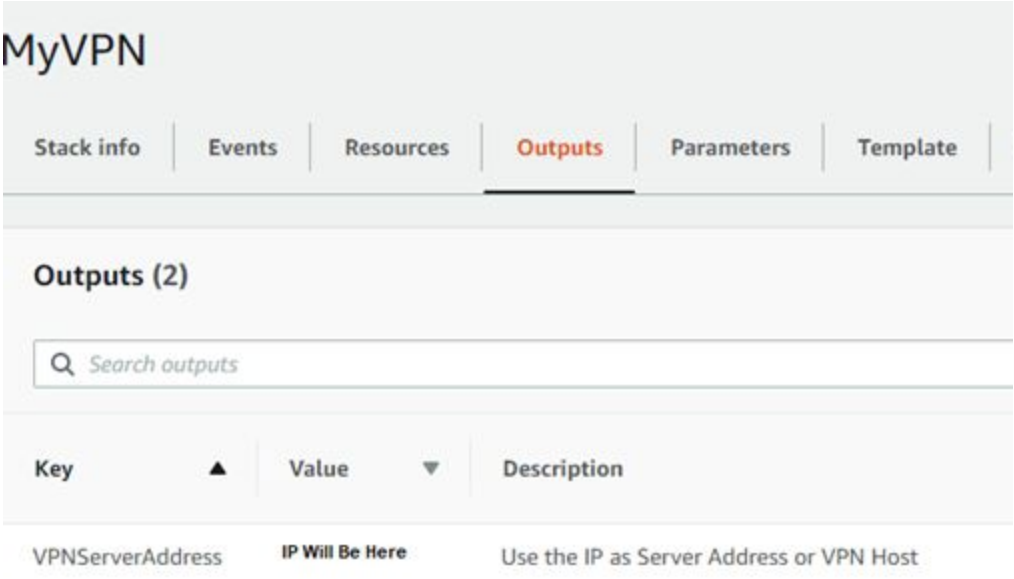
9. *The stack create process will begin. Notice that the MyVPN Events table has already begun to populate at the right.*



10. *Once the create process is complete, you will see a screen as follows*

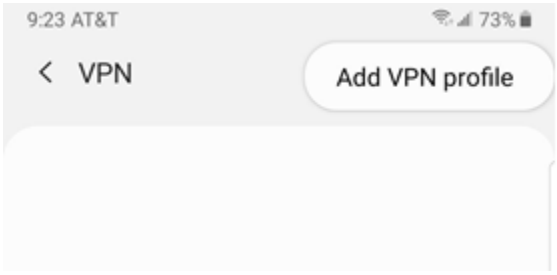


11. *Navigate to the Outputs tab and note the IP address of the VPN Server. (You will need this information to configure the VPN on your mobile device in the next lesson).*

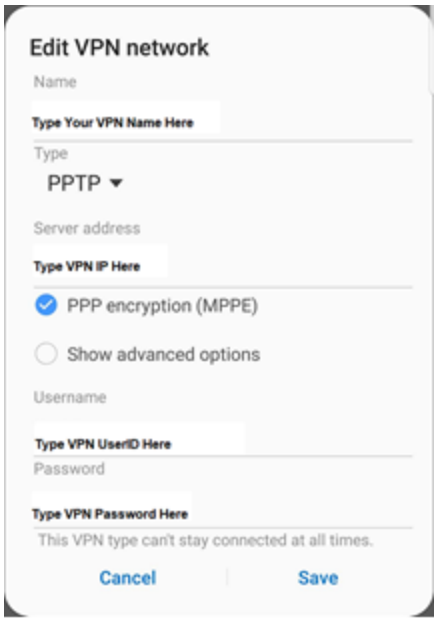


12. *Confirm that all students have successfully completed the lesson before continuing.*

- **(10 minutes) – Demonstration: Connect to AWS VPC via Mobile**
    1. *On Android Mobile Device select Settings>Connections>More connection settings>VPN*
    2. *From the VPN screen select the 3 dot menu in the upper right and select Add VPN profile*

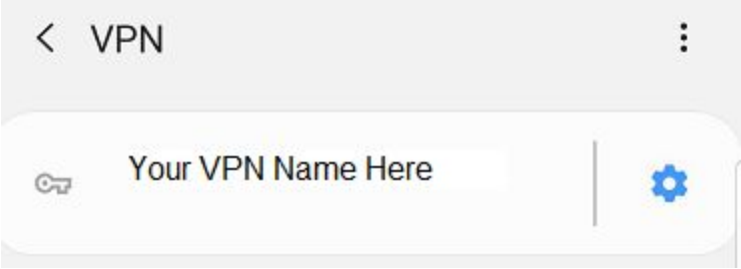


3. *On the Edit VPN Network Menu complete the fields as below and select save*



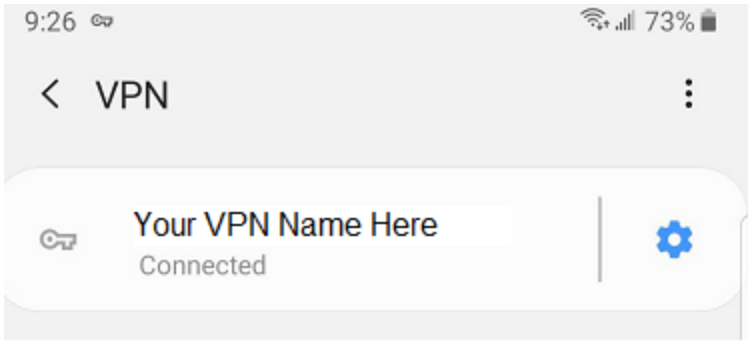
This lesson uses PPTP, but you can have students click on the dropdown to see the other options. Remind students that they also created and IPSEC passphrase when configuring their VPN stack.

4. *Once the VPN is added, it will appear in the VPN screen.*



5. *Select the name of your VPN and then select Connect on the Connect to {Your VPN Name) window*

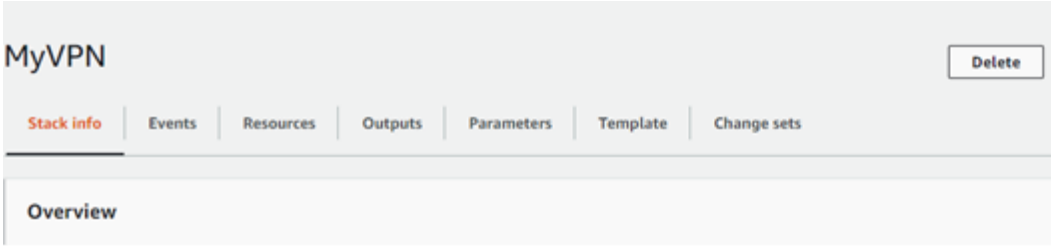
6. *Confirm the connection when you are returned to the key icon in the top notification bar and the word Connected below the name of your VPN.*



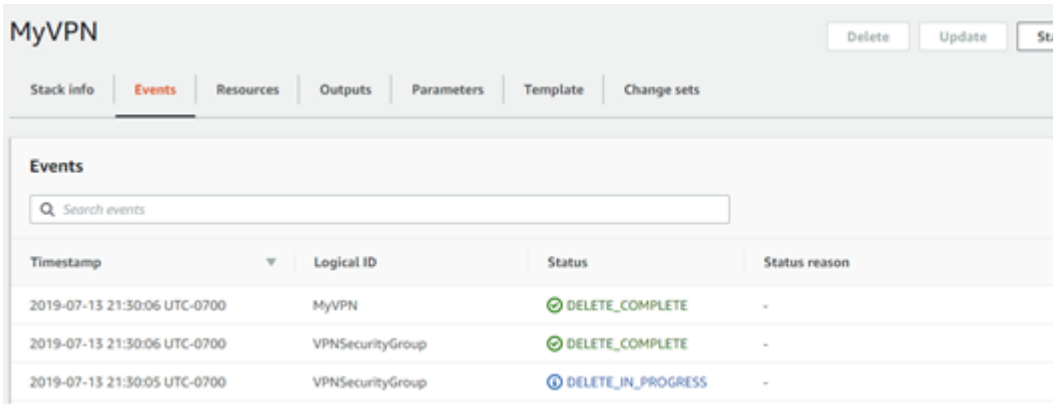
7. *Have students open the Chrome browser on their mobile device and type "what is my ip address" in the search box. Scroll down below the ads and you will see the IP address of the VPN displayed as "Your public IP address"*

8. *Have students return to the VPN screen on their mobile device Settings>Connections>More connection settings>VPN and click on the gear icon next to their VPN Name to remove the VPN from their mobile device.*

9. *Advise students the lesson is complete. Have them return to their AWS account and please Delete the VPN by clicking the Delete button on the upper right of the CloudFormation>Stacks:{Student's VPN name}*



10. *Wait for the delete process to complete then confirm by clicking on the Events tab. The delete will be confirmed as follows:*



11. *Confirm that all students have successfully completed the lesson before continuing*

- **(15 minutes) – Activity: Try It**
  - *Build your own VPN*
  - *Connect to a mobile device*
  - *Experiment with using the advanced options on the mobile device and note the results.*
  - *Attempt to connect with a different device*
- **(5 minutes) Closing / Wrap-up**
  - *How to Login to AWS*

- *Build a Virtual Private Cloud in AWS*
- *How to connect to the AWS VPC using and Android mobile device*

- **(1 minutes) - What's next?**

  Inform students that they are finished with Cloud Computing day of the camp. Students can head back to the cafeteria to be picked up by their parents, and remind them to be back tomorrow for another fun day of learning. Day 4 is all about Internet-of-Things with Raspberry Pi.