Below is the candidate technical exercise we discussed. This consists of a series of technical questions with potentially multiple “right” answers.

Please generate any scripts or files needed to answer the questions and provide relevant documentation so we can understand how to use them and your thought process.

When complete, please store the deliverables in a GitHub repository and provide us with the link to review it.

If you have any questions about the requirements or the deliverable, please don’t hesitate to ask. We typically ask for these to be delivered within 48 hours. We look forward to reviewing your project.

**Linux Administration Skills Assessment**

1. Write a shell script that displays "man", "bear", "pig", "dog", "cat", and "sheep" to the screen with each appearing on a separate line. Try to do this in as few lines as possible.
2. Write a shell script to check to see if the file "/etc/shadow" exists. If it does exist, display "Shadow passwords are enabled." Next, check to see if you can write to the file. If you can, display "You have permissions to edit /etc/shadow." If you cannot, display "You do NOT have permissions to edit /etc/shadow."
3. Modify the previous script so that it accepts the file or directory name as an argument instead of prompting the user to enter it.
4. You have a Linux server running Postgres or MySQL. Your database storage volume is approaching 95% usage. Describe a strategy to remediate this without downtime.
5. A database lives in a private subnet inaccessible to the world. There is a gateway Linux instance in a public subnet that has network access to the database.
    a. What do you need to provide the gateway’s administrator in order to access the database from your laptop on the Wi-Fi at a cafe?
    b. In as much detail as possible: What do you need from the gateway’s administrator to complete the connection?
6. Write a command that will recursively search a directory structure, locate all occurrences of files with .log extension and display the sum of those file sizes.
7. You are monitoring the growth rate of an export file called "fooack" as it is being generated. You want to see the file size in KB every 5 seconds on standard output. There may be other files in this directory with "fooack" in the name. The file in question will be the only file that is growing.
    a. Write a command or script that will allow you to automatically monitor the growth rate as described above.

**Database Skills Assessment**

1. What is the following an example of? What will the output consist of? In what file format will the output be displayed?

    **aws rds describe-db-instances --query="DBInstances[].DBInstanceIdentifier"**

2. You are working with the following MySQL table. "id" is the primary key

   CREATE TABLE FOO (

   id int,

   load_date datetime,

   name varchar(255)

   );

   Write queries to answer the following:

   - Determine if there are any duplicate rows in the table and display the duplicate values and their counts.
   - Determine, using a self-join, what the 2nd largest maximum date is for load_date (YYYY-MM-DD, not the datetime value) and the count of those rows.

3. Write a bash script that will copy all MySQL user databases, not system databases, from an RDS instance to a separate MySQL instance already in place on a Linux server. Assume the linux server has access to the RDS instance and vice-versa. Use best practices.

   **NOTE:** in this case, you will not know how many user databases there are or their names.

   **NOTE:** You must assume that the target server will not have space to dump some of the larger tables to disk.

   - Source instance "this-is-aws.abcdefg.us-east-1.rds.amazone.com"
   - Source admin user "admin"
   - Source admin password "admin123"
   - Target host “10.10.10.11”
   - Target admin user "root"
   - Target admin password "root123"

4. Describe the steps necessary to create a read replica of a MySQL RDS instance on an EC2 Linux server already running MySQL. Use bin-log replication. **No downtime is permitted**. Use best practices.

5. Describe the steps required to migrate an RDS instance from a public VPC in AWS account "A" to a private VPC in account "B". Some downtime is ok. No data loss is acceptable. At the end of this migration, all apps will point to the RDS instance in account “B” and pick up where they left off.