EN4720: Security in Cyber-Physical Systems
Exercise — Authorization

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Index No: XXXXX

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This is an individual exercise!
Due Date: 19 May 2023 by 11.59 PM

This exercise has to be carried out using a Linux-based PC/virtual machine. Read all the instructions and questions before attempting the exercise. Add answers under each question in the Questions section and submit the resulting PDF.

Instructions

1. Understand how linux users and groups work.

2. Understand how linux file ownership and permissions work.

3. Answer the questions given below.

Questions

For all the questions in this section, add a screenshot of the terminal (including all the commands you ran to perform the task) unless specified otherwise. The evaluator should be able to see each step that you followed to perform each task. In all screenshots, the areas marked (which are unique to your terminal display) in Figure 1 (the sample answer to Question 1) must be visible.
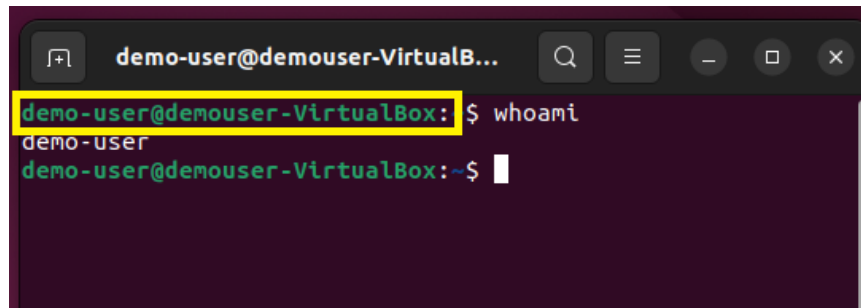
1. View the currently logged in user.

Figure 1: Sample Terminal Output

2. Create a sub directory as excercise4. Create a text file resolutions.txt with "Hello World" text in the file and store the file in the newly created directory as exercise4/resolutions.txt. Dump the file to the terminal using the `cat` command.

    Your answer here

3. Create two new user accounts as alice and bob.

    Your answer here

4. Create a group as friends and add alice and yourself (currently logged in user) to the group friends

    Your answer here

5. Make sure your (currently logged in user's) home directory has execute permissions for all the users.

    Your answer here

6. Become (log in as) one of your new user accounts (alice or bob). You can simply `su -` to the alternate user.

    Your answer here

7. As the new user, confirm that you can view the file by dumping the content to the terminal. Try adding a new item to the resolutions.txt file. Why can't you modify the file as the new user?

    Your answer here

8. Note that the permissions on a newly created file allow all users on the system to read the file. Assume that you want to keep resolutions.txt file private. Modify the file's permissions, such that read access for others is removed.

    Your answer here

9. Using the other new account (if you used *alice* before, now use *bob*), confirm that other users on the system are not able to read your resolutions.txt file by trying to dump the file to the terminal.

   Your answer here

10. Compose a short shopping list in your preferred text editor, or using the command line. Store the file as exercise4/shopping.txt. Change the group owner of the file to *friends*.

    Your answer here

11. As the alternate user *alice*, confirm that you can view the file. Also, note that you can modify the file, by adding an additional item to the shopping list. Dump the file content to the terminal to show that the new item is added.

    Your answer here

12. Recall that your other new account (*bob*) is not a member of the group *friends*. Try becoming *bob* and repeat the previous steps. You should be able to view, but not modify, the file.

    Your answer here

    Provide analytical answers to the questions below. Screenshots are not required.

13. What are the challenges that organizations face during the cyber security authorization process, and how can they be overcome?

    Your answer here

14. How do different cyber security authorization frameworks differ from one another, and what are the key considerations that organizations should take into account when choosing a framework to follow?

    Your answer here

15. What are the most common vulnerabilities that may be identified during the cyber security authorization process, and how can organizations address them?

    Your answer here