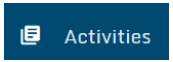
Water Tank flooding hands on

Formal Methods for Secure Systems - A.A. 2019/2020
25 May 2020

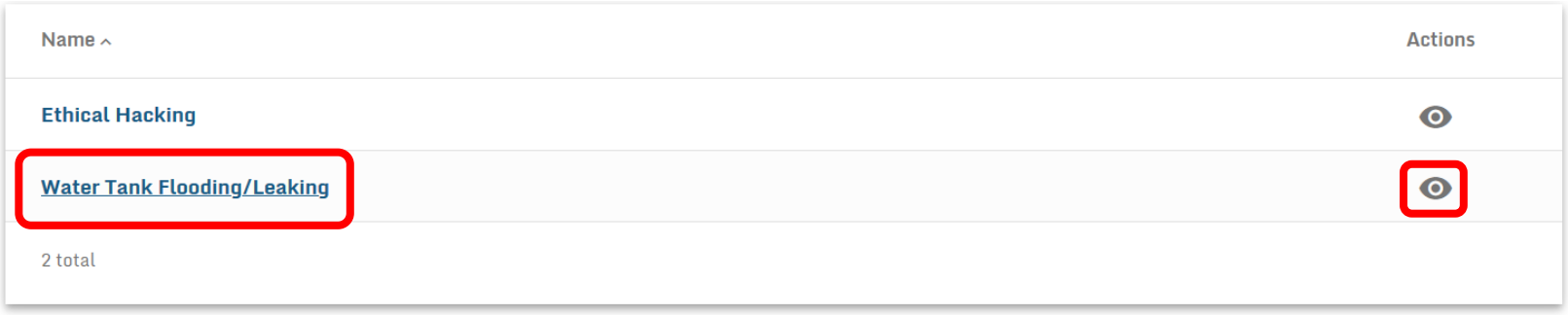
The cyber range platform: CYBERWISER.eu

1. The CYBERWISER.eu cyber range platform is going to be developed in the scope of the CYBERWISER.eu European Project;
2. The purpose of the CYBERWISER.eu platform is **to form** multidisciplinary and highly skilled **experts** in the **cybersecurity** field;
3. Users can act both as **attacker** and **defender**, in different and highly configurable **scenarios;**
4. A **scenario** is composed by:
    a. A set of **virtual resources** simulating a real network;
    b. The **software** running on such resources.
5. **To each scenario it is possible to associate one or more cyber range exercise**. Users are asked to complete the exercise, by interacting with the virtualized environment, to acquire additional knowledge;
6. The CYBERWISER.eu platform is entirely **web-based**.

How to reach the CYBERWISER.eu platform

1. Open a browser (FireFox, Chrome, Safari or Edge) and go to the following address: *https://clusting.itc.unipi.it/* ;
2. Login to the CYBERWISER.eu platform using the credentials which you should have received;
3. In the **left** menu, click on "*Activities*": 

4. You should see "*Water Tank Flooding/Leaking*", click on the *eye* icon, on the **right**: 



CYBERWISER.eu workspace

Water Tank Flooding/Leaking

A cyber training scenario for the Water Tank Flooding/Leaking lab

Topics

Cyber-Physical system security
19-May-20, 09:46

Exploit a web application managing a water tank cyber-physical system.

At the end of the lab, please **fill the following questionnaire:** bit.ly/cyberrange09

Fill the questionnaire at the end!

Documents

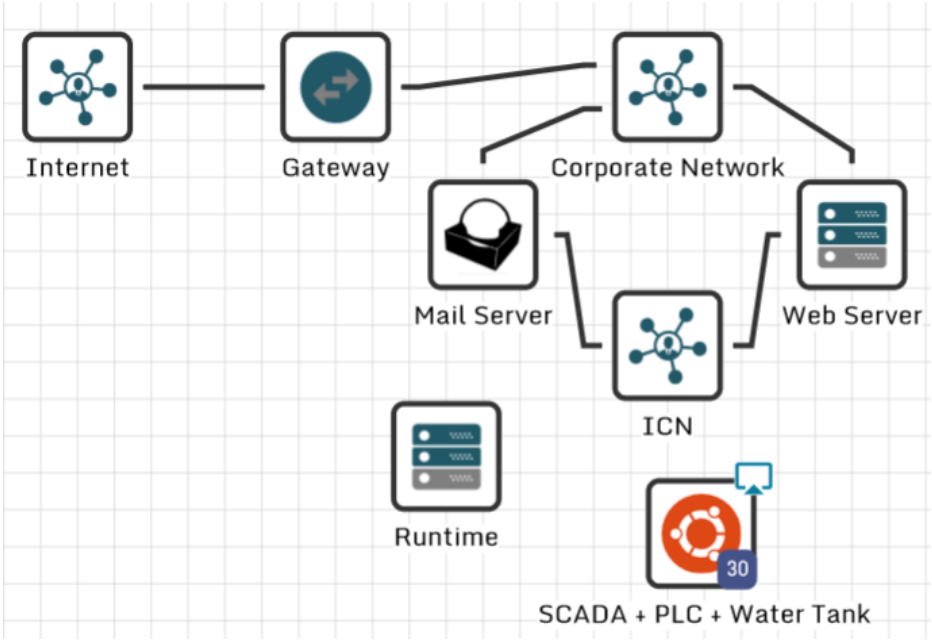
No documents to display.

Scenario Environments

Water Tank Flooding/Leaking

Access to the cyber range

Scenario: Network Topology

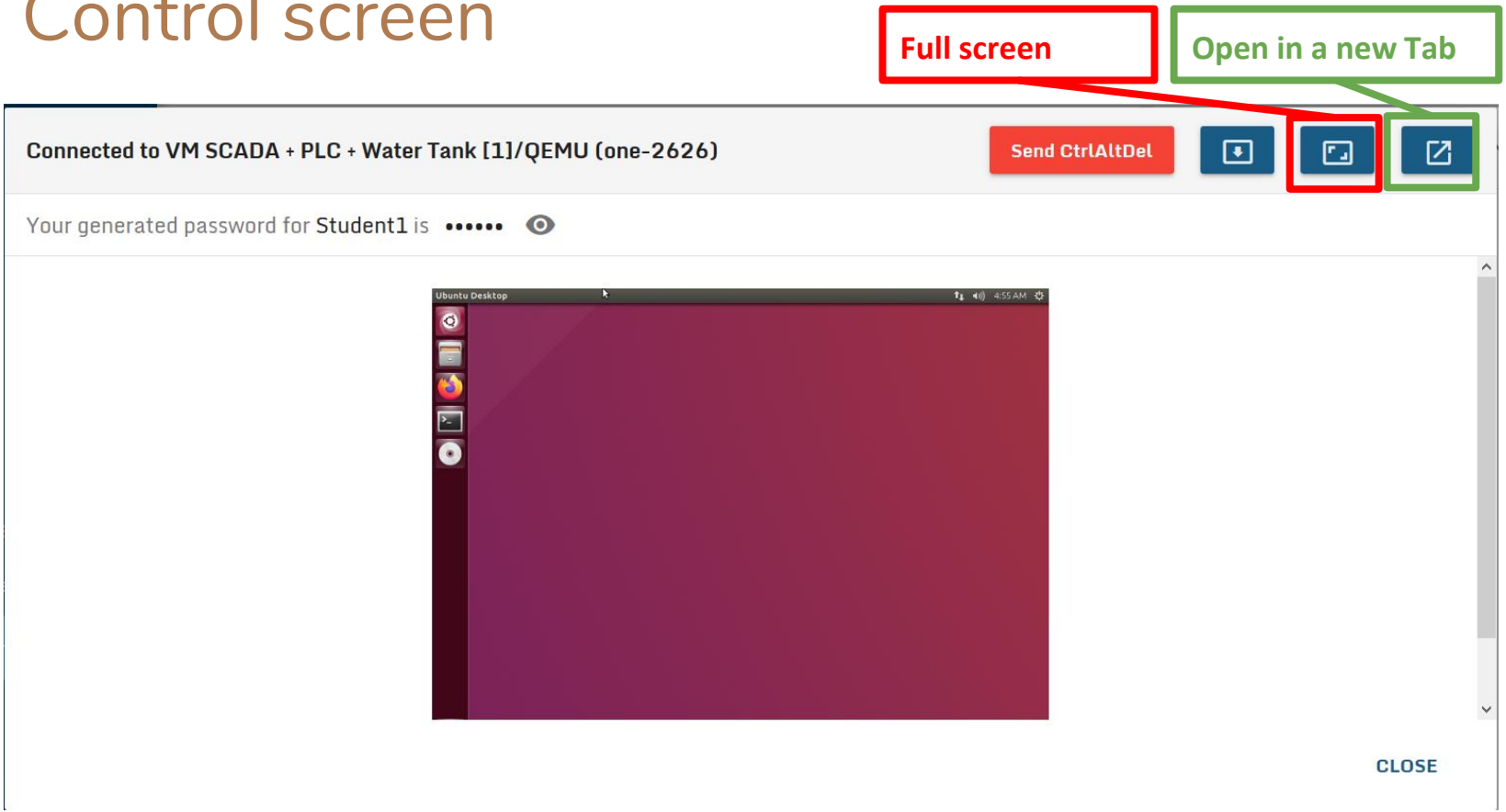


CYBERWISER.eu cyber range

1. You have the right to access to two VMs called "***SCADA + PLC + Water Tank***". You can access it with the little screen icon on the top right of each VM icon:

2. The login credentials for both are:
    a. Login: student
    b. Password: student

Control screen



Scenario: How to use the VM

- ***"SCADA + PLC + Water Tank"***:
  - You have a full access to an Ubuntu 16.04 Desktop machine, on which a web server is running. The web server controls the Water Tank management system.
  - Open a Browser and connect to localhost on port 5000: ***http://localhost:5000***
  - Try to cause a water flooding!

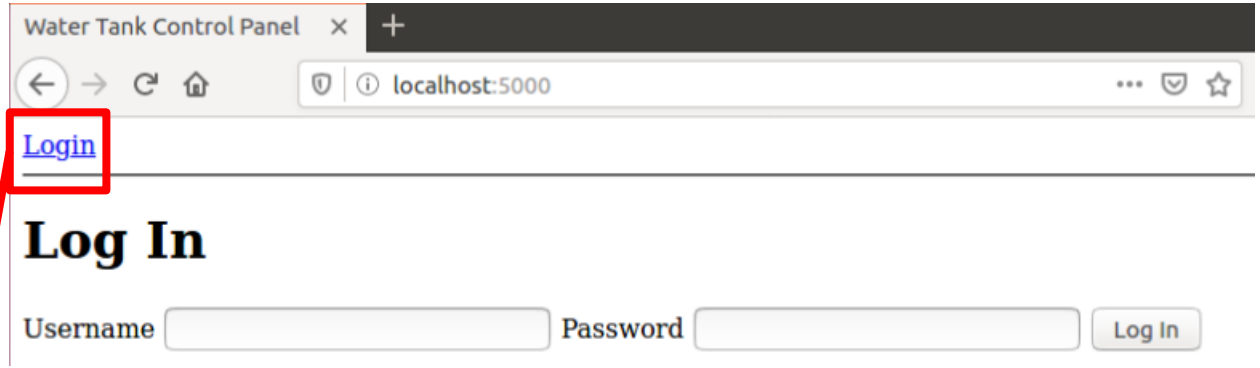
* Depending on your keyboard layout, open a terminal (on both VMs) and write:

`setxkbmap it` (for the Italian keyboard)

`setxkbmap us` (for the us keyboard)

Exercise (part 1)

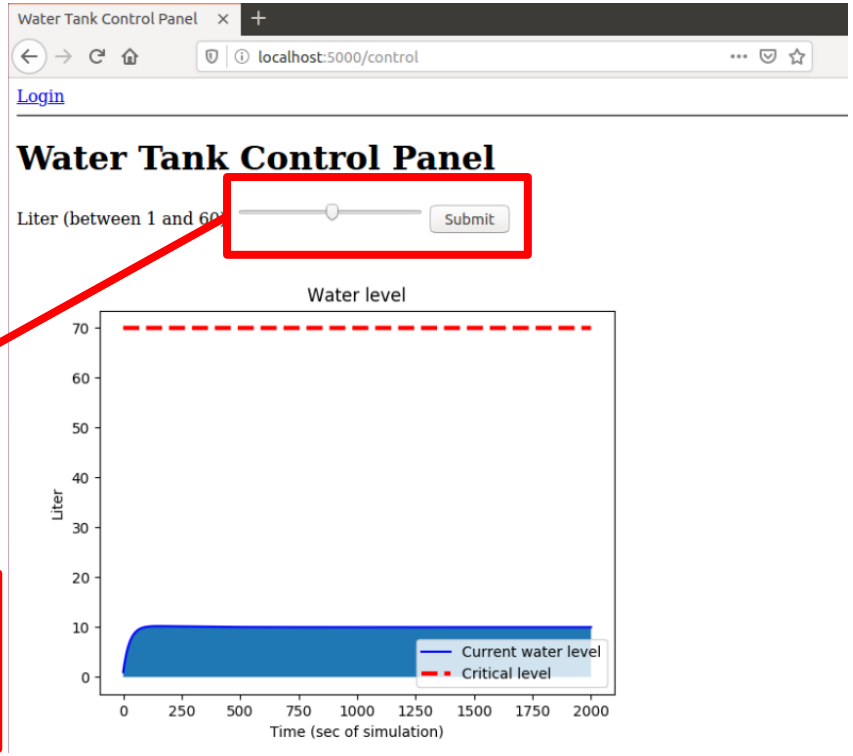
1. Obtain **admin** credentials



You can always go back to the login page using this link

Exercise (part 2)

2. Cause a **water leaking**, by overflowing water tanking with a value higher than the maximum admitted water level, or **water flooding**, by pouring the water tank

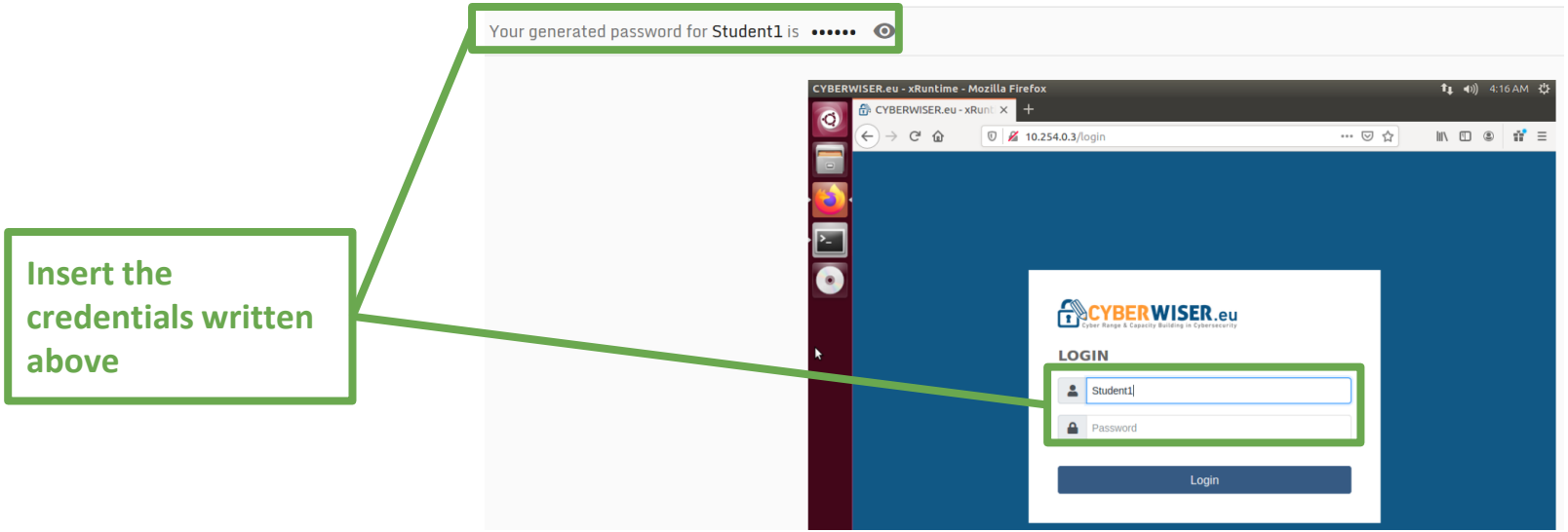


You can set the water level using this control bar (Pressing "Submit" will take some time to run again the simulation)

Hints (1)

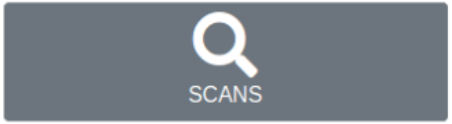
If you are stuck with the exercise, you have the ***Vulnerability Assessment Tool*** at your disposal:

- Open a tab of the Browser and go to: http://10.254.0.3



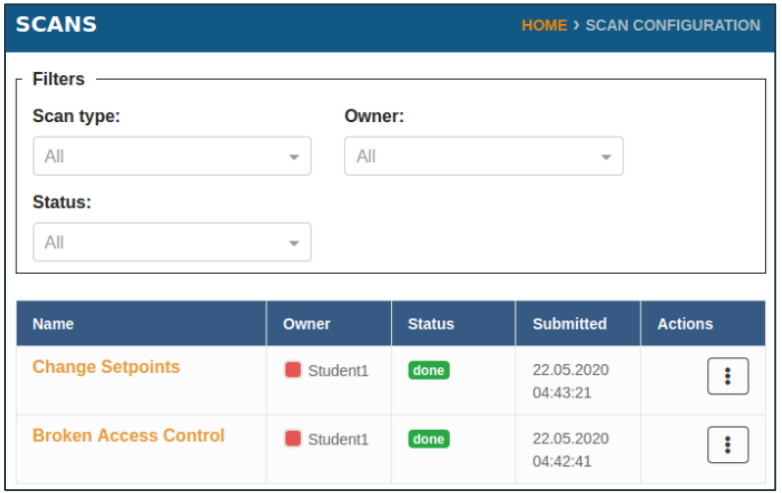
Hints (2)

Select **SCANS**:



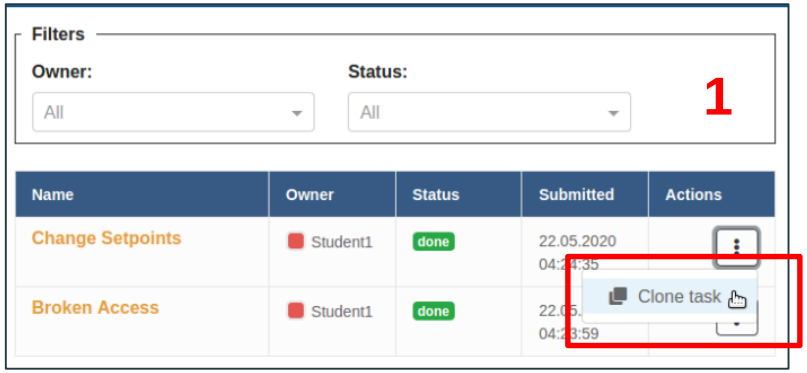
You have 2 vulnerability scans at your disposal:

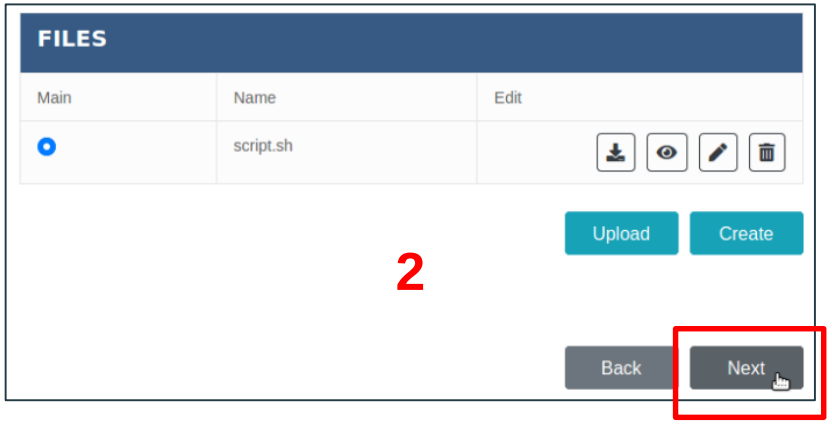
1. Broken Access:
   - Scan the web application for we vulnerabilities in the login management;
2. Change Setpoints:
   - Scan the water tank control page for weakness in the input management;

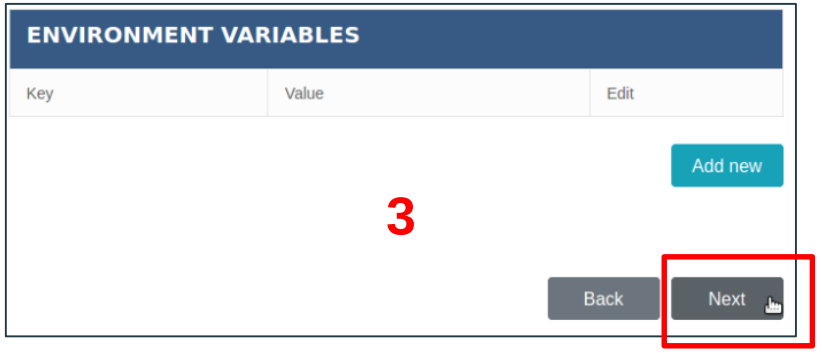


Hints (3)

To use one of the scans:







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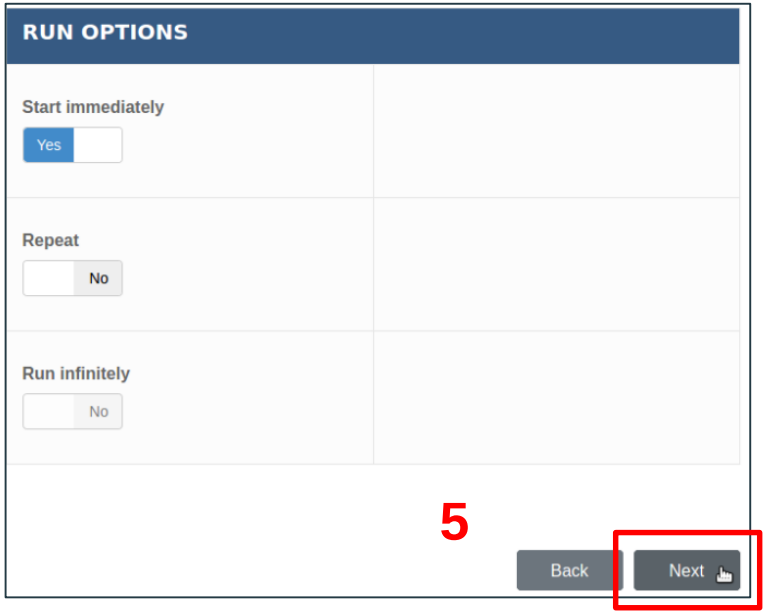

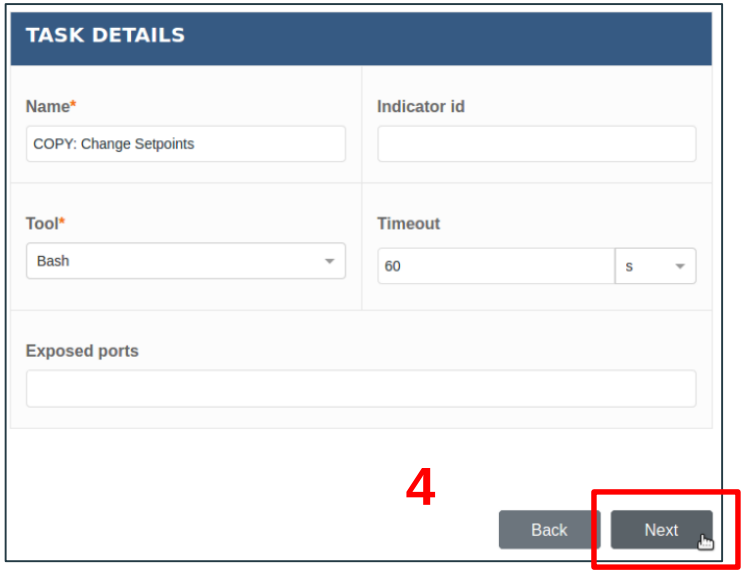

Hints (3)

1. **Reload the Browser page;**

2. Check results:

Evaluation questionnaire

- When you completed all the three exercises don’t turn off the VMs, just close the Browser tabs!
- Before exiting the room, open a new Tab on the browser and go to the following address:
  - **bit.ly/cyberrange09**
- Fill the questionnaire to evaluate your experience on the CYBERWISER.eu platform;
- The questionnaire is completely anonymous.