D418 IMPORTANT QUESTIONS AND RESPONSES: GNS3

Note: You can get some help from info@infoseclearning.com.

**Q 1:** The instructions for the lab environment state that after 8 weeks all progress is deleted, and I should export my project just in case. I am not able to export my project as I run out of disk space. Is there anything I can do to fix this?

**R1**: While there is no official method to export the GNS3 project, the virtual host machine on which GNS3 is running does have a connection to the Internet, so a workaround would be to export the project to a cloud storage drive that you may have access to. You would need to utilize a cloud-based client like OneDrive, Google Cloud, or iCloud.

**Q2:** I had a question about ACL's on EXOS. Anything I permit and apply will deny everything. I assume ACLs are implicit deny and go in order when applying rules but it will deny everything when I apply permit first. Do you have any more guidelines outside of the EXOS documentation because that's a little vague?

**R2:** When designing your ACLs in EXOS, you have to decide if you want to use static ACL's which will require the creation of a policy file, or dynamic ACLs which can be entered at the command line. I will assume from you description that you created a dynamic ACL.

When creating a dynamic ACL you have to consider each rule as a separate ACL, unlike Cisco where and ACL contains multiple Access Control Entry (ACE) rules, EXOS wants a separate ACL per rule.

Here is an example:

Dynamic ACL Example:

|  |  |  |  |
| --- | --- | --- | --- |
| create access-list permitLocalTraffic "source-address 10.1.1.10/32; destination-address 10.1.1.  0/24;" "permit;"  create access-list denySpecificServer "source-address 10.1.1.10/32; destination-address 192.168  .1.20/32;" "deny; count denyServer"  create access-list permitRemoteNetwork "source-address 10.1.1.10/32; destination-address 192.16  8.1.0/24;" "permit;"  create access-list denyCatchAll " " "deny; count denyAll;"    #Commands must be run in order with 'last' keyword, or use other ordering keyworks, to acheive appropriate evaluation order   |  | | --- | | last |  |  | | --- | | last |  |  | | --- | | last |   configure access-list add permitLocalTraffic port 1 ingress configure access-list add denySpecificServer port 1 ingress configure access-list add permitRemoteNetwork port 1 ingress |

configure access-list add denyCatchAll last port 1 ingress

If you are interested in creating static ACL here is a resource that should assist you with the creation of the policy file:<https://extremeportal.force.com/ExtrArticleDetail?an=000083345>

Remember that EXOS is running on a Linux distribution with a basic BASH type shell so you will be able to use vim as a text editor in the EXOS appliance to create said policy file and it must end with the extension .pol

For more EXOS ACLs, ask your Instructor for the **EXOS\_ACL\_Solutions\_Guide.pdf** document.

**Q3:** How do I reset the lab?

**R3:** Ask your Instructor for the PDF entitled, **Resetting a PERSISTENT Lab.pdf**.

**Q4:** Is a Firewall required?

**R4:** No, as long as you have a plan to proof the test cases.

**Q5:** Can you point me in the right direction for resources on EXOS switch configuration setups?

**R5:** Ask your Instructor for the **EXOS\_Quick\_Guide.pdf.**

**Q6:** Are there examples of completed projects?

**R6:** Check the [Capstone Excellence Archive.](https://westerngovernorsuniversity.sharepoint.com/sites/capstonearchives/excellence/Pages/UndergraduateInformation.aspx) Use your browser’s find-on-page feature to search for ‘Network Engineering’. Click the student’s name to see the project’s Abstract and scroll down to the Capstone Written Report link, which you can then click to view the project’s Functionality Report.

**Q7:** I don't understand how to make a default route from the vyos router to the NAT cloud.

**R7:** Try the following command in the config mode: set protocol static route 0.0.0.0/0 dhcp-interface (name of the interface i.e. eth0)

**Q8:** I am getting a lot of errors trying to get the playbook to run correctly. [May I have] the Ansible Documentation?

**R8:** Here are the links:

* Ansible EXOS Platform Options: <https://docs.ansible.com/ansible/latest/network/user_guide/platform_exos.html>
* Ansible VyOS Platform Options:

<https://docs.ansible.com/ansible/latest/network/user_guide/platform_vyos.html>

* EXOS: Getting Started with Ansible using GNS3: [https://github.com/extremenetworks/ansibleextreme/blob/master/GettingStartedwithAnsibleusingGNS3.md](https://github.com/extremenetworks/ansible-extreme/blob/master/GettingStartedwithAnsibleusingGNS3.md)

**Q9:** For the NTP server, can that be the perimeter router? I.E. The router reaches Google for time

(8.8.8.8). This way I can make the router the NTP master in the network. Is this also the case for a DHCP server? I was planning on making one of the network devices the DHCP server but the requirements were vague on that.

**R9:** You should be able to utilize any appliances or end devices as needed in your design. These features are found in the VyOS environment, or you could choose to employ one of the Ubuntu or Windows systems for your servers.

**Q10**: I'm seeing three different virtual machines to select from. Which one should I pick?

**R10:** I would recommend using the first VM WGU-D418-GNS3.

**Q11:** I have created my virtual environment but my PCs are getting shut down automatically due to RAM I believe. Is there any way I can fix this? Should I cut down on the number of PCs in my topology? If so, do I need to create another approval form since my topology will change?

**R11:** Your design is over-taxing the available computing resources in the GNS3 environment. You are correct in that if you reduce the number of devices, you will have better performance. Send a revised Topic Approval Form to your Instructor for review and approval. You will upload the new Topic Approval Form with your Task 2 work.

**Q12:** My nodes in my network are not getting an internet connection. Is there a specific method in getting this to work? The VMware has an internet connection but not the GNS3 project nodes. I have attempted to set up the router but with no success.

**R11:** You will need to use the NAT Cloud to reach the Internet. Use it as if were the connection to the Internet.

**Q13:** I've completed all items under Task 2 except for the banner automation, task 3, on EXOS devices. The banner isn't appearing even though the netmiko debug log isn't showing any errors after exos\_banner\_script.py runs. It may be important to note - if I run the same commands manually on the EXOS devices, L3-SWS-01 and L3-SWS-02, the banner is accepted and it appears.

**R13:** You should be able to forgo the security banner on the EXOS L3 switch and use your multiple routers instead to satisfy the rubric. The EXOS switch has an issue with automating the banner; there is no current workaround except to automate multiple routers with the banner and not the switches. In other words, the L3 switches (EXOS) can have some things automated but not their banners. When the task calls for multiple devices, this does not mean it has to multiple types of devices. You can automate multiple routers to satisfy the requirements.

**Q14:** Issues with Internet connectivity within GNS3 . . .

**R14:** Enabling passwordless SSH access for EXOS switches:

**Step 1: Create the user account and enable SSH on the device to be automated:**

1. (EXOS switch): create account admin <user\_name> <password>
2. (EXOS switch): enable ssh2
3. (EXOS switch): show switch management | grep SSH

Step 2: Create an SSH Key Pair and copy the public key to the device to be automated

1. (Ansible master): ssh-keygen -t rsa -C “<user\_name>@<IP\_of\_switch>”

**\*Note:(do this once only for the entire performance assessment)**

1. (Ansible master): scp id\_rsa.pub <user\_name>@<IP\_of\_switch>:<key\_name>.ssh

\***Note: id\_rsa.pub is usually found in the */home/<user\_name>/.ssh/* directory so you may need to reference it in your scp command**

**Step 3: Bind the SSH Key to the user account and verify it is on the device to be automated:**

1. (EXOS switch): configure sshd2 user-key <key\_name> add user <user\_name>
2. (EXOS switch): show sshd2 user-key
3. (EXOS switch): show sshd2 user-key <key\_name> users

**Step 4: Verify the SSH access is working without a password:**

1. (Ansible\_master): ssh <user\_name>@<IP\_of\_switch>
2. If successful, type: save and then exit

**Verify the Extreme EXOS Ansible plugin collection is installed:**

1. (**Ansible\_master):** ansible-galaxy collection install extreme.exos \*Link to Ansible FAQ for EXOS: <https://github.com/extremenetworks/ansible-extreme/tree/master>

**Q15:** I'm just having trouble with setting multiple VLANs on a switch, I am unable to create a vlan on the same ip range. I also need help with setting up the wireless router (openwrt router). I know I need to edit the network file but don't know which parts to edit.

**R15:** Each VLAN must be on its own subnet, no two VLANs can share a subnet. VLANs are layer 2 versions of a broadcast domain, and subnets are layer 3 versions of a broadcast domain, so each VLAN can only have one subnet.

Wireless routers are not an option for GNS3, even though OpenWrt is available it will not function in the simulator as a wireless AP; it will only function as a wired router. Unfortunately, wireless is not an option for the GNS3 environment yet.

**Q16**: Now that I have successfully completed D418, I would like to obtain a personal copy of the network project files for my portfolio. How do I go about doing this?

**R16**: You can use the export feature of GNS3 to export the project into the VM hosting the GNS3 environment and then use it to connect to your preferred cloud storage and copy the exported file to it.

**Q17:** Is there any way around this issue of WGU OneDrive not having enough space to hold the file? Can I expand the WGU OneDrive storage?

**R17**: I don’t think you can add more storage to your WGU cloud storage, but if you have your own cloud storage (iCloud, Dropbox, Google Drive) you can access those cloud storages and export your data to one of those. Otherwise, I don’t think you will be able to export the GNS3 files.

**Q18:** How do I program a Python script that can conform to Extreme EXOS syntax to update the login banner. I am getting errors every single time.

**R18:** I believe that you don’t have to automate the login banner for the EXOS switch, because of the actions required to create a banner for EXOS, you won’t be able to automate it without running into issues. The task of automating multiple devices could be met by automating more than one device of the same type, such as the VyOS router. This is a bit of a loophole for the task, but it should satisfy the requirements.