System and Network Administration

init

Skyline formation@slash16.org
Pedago Team pedago@42.fr

Summary: Introduction subject to System and Network Administration

Contents

Chapter I

Foreword

Believe it or not, this project originated from a heavy drinking night. Yes, that's right, when we decided to launch these subjects and this initiation, we were totally wasted.

In the `Slash16` HQ, the Yellow Mad Monkey, after all in the team drank many bottles, among which three Grey Goose, one Absolut, two Jägers and one 7-years-old Havana Club (that one is worth mentioning), we had the beautiful idea to create some initiation subjects about system and network administration.

So, of course, we didn't write the subjects over there, even if, actually we could have, or even hold our conferences there but everyone would have ended up drunk, so bad idea..

Anyways, after so much work around a hookah, fresh mojitos, and a good Trace Urban VocalTeknix playlist to put us in the mood, here is - finally - the result!

So we hope you'll enjoy it, and don't forget, that's only the beginning!

Kisses and chocolates,

The `Slash16` team.
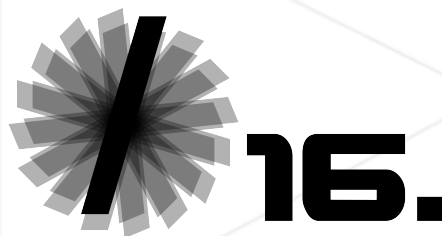
Chapter II

Introduction

`Slash16` is a network of people who are passionate about system and network administration and/or operations development (DevOps).

Our goal is also to enable a flow of knowledge across our members by setting up common projects, conferences or via any others type of activity that makes it possible to share both knowledge and professional experience.

That's why we decided to treat you with two subjects:

- An initiation subject (This one).
- A complete infrastructure creation subject, `roger-skyline-2`.

With that, you will have access, on your e-learning platform, to a bunch of videos that will help you understand the essential notions you're going to need.

Chapter III

Goals

This first project, `init`, will give you the opportunity to discover system and network basic commands, many of the services used on a server machine, as well as a few ideas of scripts that can be useful for SysAdmins on a daily basis.

Chapter IV

General instructions

You must use terminal commands only to solve all the exercices in this subject.

There are three types of questions in this project. You can identify the type of answer expected thanks to a color code:

In blue : a command

In green : a command output

In red : a deduction, written in your own words

- Create a folder for each part of this subject at the root of your repository. These folders should be named `network`, `system` and `scripts`. Write your answers in a file named after the number of the question, over two digits. For instance : The answer to the question 01 of the `network` part should be in the `network/01` file.

- Hand in your scripts as executable.

> ⚠️ The part 1 "Network" must be done on school's Macs. The part 2 and 3, "System" and "Scripting" must be done on a Debian virtual machine.

Chapter V

Mandatory part

V.1   Let's be friends

Follow `Slash16` on Facebook, Twitter and Linkedin.

V.2   Network

1. Get the `list` of the network interfaces of the machine without displaying any detail for these interfaces. Only the list of names.

2. Identify the IP address of the Ethernet interface

3. Identify the MAC address of the Wi-Fi card

4. Identifiy the default gateway in the routing table

5. Identify the IP address of the DNS that responds to the following url: `slash16.org`

6. Get the complete path of the file that contains the IP address of the DNS server you're using

7. Query an external DNS server on the `slash16.org` domain name (ie. : `google 8.8.8.8`)

8. Find the provider of slash16.org

9. Find the external IP of 42.fr

10. Identify the network devices between your computer and the slash16.org domain

11. Use the output of the previous command to find the name and IP address of the device that makes the link between you (local network) and the outside world

12. Check that the server with the `10.51.1.253` IP address is reachable from your computer.

13. Figure out the server type.

14. Use the Reverse DNS to find out the name of the server linked to the `10.51.1.81` IP address

15. What file contains the local DNS entries?

16. Make the intra.42.fr address reroute to `46.19.122.85`

V.3   System

1. In what file can you find the installed version of your Debian?

2. What command can you use to rename your system?

3. What file has to be modified to make it permanent?

4. What command gives you the time since your system was last booted?

5. Name the command that determines the state of the SSH service.

6. Name the command that reboots the SSH service.

7. Figure out the PID of the SSHD service.

8. What file contains the RSA keys that are authorized to connect via SSH?

9. What command lets you know who is connected to the System?

10. Name the command that lists the partition tables of external devices?

11. Name the command that displays the available space left on the system?

12. Figure out the exact size of each folder of /var

13. Name the command that find currently running processes

14. Run the 'tail -f /var/log/syslog' command in background

15. Find the command that kills the background command's process

16. Find the service which makes it possible to run specific tasks following a regular schedule

17. Find the command which gives the list of firewall rules

18. With the previous command, authorize only IP addresses from `10.0.0.0/8` to connect to your system

19. With the previous command, forbid all others

V.4 Scripting

1. Write a script which displays only the login, UID and Path of each entry of the /etc/passwd file.

2. Write a script which updates all the package sources, then all the packages, and then logs everything in a file named /var/log/update_script.log. Create a scheduled task for this script, once per week at 4 AM.

3. Write a script which displays the list of files from the folder given as parameter, sorted by size.

4. Write a script which monitors the modifications made to the /etc/crontab file and sends an e-mail to root if the file is modified. Create a scheduled task to run this script everyday at midnight.

```
man md5sum
```

5. Write a script which displays 42.

Chapter VI

Bonus part

No bonuses for this subject, just get it done quickly to get on to even better projects.

Chapter VII

Turn-in and peer-evaluation

Turn in your work using your `GiT` repository, as usual. Only the work that's in your repository will be graded during the evaluation. Do remember to pay attention to the names of the files and folders you hand in.