Linux Distribution Hackathon

CNLL/University of Saida

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Preparation

You need to setup, prior to the challenge, the following minimal environment:

- A machine or two with linux installed
- a virtual environment (VirtualBox) with at least one VM installed.
- Needed development and configurtaion Tools.
- Setup a default user account: **user1** and password: **user1**
- install and start ssh server: **openssh**

Challenge 1: Building Linux Kernel

This challenge is to identify skills in getting the kernel code, installing the configuration and development tools and environments and tesing the compiled kernel.

1. Source code
2. Configuration process
3. Compilation
4. Testing with existing Distribution
5. propose and deploy a framework for testing and validation puropose of the proposed kernel. Explain how to setup the testing environment.

Challenge 2: Minimal Linux Live Distros for x86/ARM

Building a minimal linux live with the following requierements :

- no graphical interface
- must include C/C++ and python for development purpose
- must run a tiny webserver
- Compile on the x86 and ARM platforms.
- test in a virtualized environment and on RaspberryPI.
- Device Driver Development/Configuration and kernel's integration : SPI
  SPI-Device-Driver

The following distribution is given as an example :
https://github.com/ivandavidov/minimal

Challenge 3: Building customized Linux Distro
Fennec start

- **Scope & definition :** define the scope of the target disto to build. You need to consider specificities for the targed disto (The Fennec). For instance, among other specifications that you will define, it must support the arabic language.
  However, being aware of the difficulties to define and integrate a number of specifications that will identifiy the Fennec Distribution among others, the challenge will be gradual with a beta version of the Fennec that will evolve to the final 1.0 version of the distro.

- **Packaging system:** at least two packaging systems must be considered and discussed with apt as the madatory one.

- **Kernel configuration** - following the challenge 1.

- **Define the basis for the distribution :** you will need a shell, the core utilities and a CLI editor.
  File System with encryption capacities
  cf LFS (Linux from scratch)
  cf LSB (Linux Standard Base)
  dependencies.

- **X-Window system:** KDE vs Gnome
  it must be light ….

- **Pick applications::** …

Challenge 3: Building customized Linux Distro
Testing and Validation

For testing and validation purpose, you need to provide a framework with bechmarking tools to test and validate the compiled kernel and the distro.

Challenge 4: Automation (1)

The proposed distributions that you succeeded to build (MLL or Cutomized full distribution) will be tested in a scalabe virtual campus environment using automation tools.

On the top of the virtualisation solution that you have adopted, the following environment eededs to be setup:

- **vm1** : a firewall with a needed networks interfaces (to LAN, to WAN, to DMZ). — Build from the MLL.
- **vm2** : hosts a web and ftp servers host. — Build from the MLL.
- **vm3 to vm10** : as a LAN nodes. — using FENNEC.

Challenge 4: Automation (2)

This last challenge will concerne the autormation in a virtual environment using for example:

- **Vagrant** (cf : https://www.vagrantup.com/)
  What is Vagrant?
  "Vagrant is the command line utility for managing the lifecycle of virtual machines. Isolate dependencies and their configuration within a single disposable and consistent environment."

- **Ansible** (cf : https://ansible.com)
  What is Ansible?
  "Ansible is an open source IT automation engine that automates provisioning, configuration management, application deployment, orchestration, and many other IT processes. It is free to use, and the project benefits from the experience and intelligence of its thousands of contributors."