A1 - Linux administration

Administration de base du système Linux

Objectifs

- Apprendre à installer et administrer une machine Linux.
  - Installer Linux sur un poste de travail
  - Comprendre l'architecture de Linux
  - Gérer les paquetages logiciels
- Mettre en oeuvre le réseau
- Paramétrer l'interface graphique
- Sécuriser un système Linux

Matériel

- Un PC Linux par stagiaire
- Un support de cours par stagiaire

Pré-requis

- Connaissances générales en système d'exploitation.

Course Environment

- Theoretical course
  - PDF course material (in English) supplemented by a printed version for face-to-face courses.
  - Online courses are dispensed using the Teams video-conferencing system.
  - The trainer answers trainees' questions during the training and provide technical and pedagogical assistance.
- Practical activities
  - Practical activities represent from 40% to 50% of course duration.
  - Code examples, exercises and solutions
  - For remote trainings:
    - One Online Linux PC per trainee for the practical activities.
    - The trainer has access to trainees' Online PCs for technical and pedagogical assistance.
    - QEMU Emulated board or physical board connected to the online PC (depending on the course).
    - Some Labs may be completed between sessions and are checked by the trainer on the next session.
  - For face-to-face trainings:
    - One PC (Linux ou Windows) for the practical activities with, if appropriate, a target board.
    - One PC for two trainees when there are more than 6 trainees.
  - For onsite trainings:
    - An installation and test manual is provided to allow preinstallation of the needed software.
    - The trainer come with target boards if needed during the practical activities (and bring them back at the end of the course).
- Downloadable preconfigured virtual machine for post-course practical activities
- At the start of each session the trainer will interact with the trainees to ensure the course fits their expectations and correct if needed

Target Audience

- Any embedded systems engineer or technician with the above prerequisites.

Evaluation modalities

- The prerequisites indicated above are assessed before the training by the technical supervision of the traineein his company, or by the trainee himself in the exceptional case of an individual trainee.
- Trainee progress is assessed in two different ways, depending on the course:
  - For courses lending themselves to practical exercises, the results of the exercises are checked by the trainer while, if necessary, helping trainees to carry them out by providing additional details.
  - Quizzes are offered at the end of sections that do not include practical exercises to verifythat the trainees have assimilated the points presented
- At the end of the training, each trainee receives a certificate attesting that they have successfully completed the course.
  - In the event of a problem, discovered during the course, due to a lack of prerequisites by the trainee a different or additional training is offered to them, generally to reinforce their prerequisites,in agreement with their company manager if applicable.

Plan

First Day

Introduction

- Présentation de Linux
- La documentation

Installation de Linux

- Les pré-requis
- Le formatage
- Le choix des paquets

Les commandes d'administration

- L arborescence des fichiers
- Attributs des fichiers
- Commandes de gestion de fichiers et de répertoires
- Le shell
- L éditeur vi

Les scripts shell

- L exécution des scripts
- Les variables
- Les instructions de contrôle
- Les fonctions

Architecture Part 2 - Privileges, Modes and Stacks

Second Day

Les disques et les systèmes de fichiers

- Les partitions sur les disques
- Les systèmes de fichiers

La sauvegarde

- Les différents outils de sauvegarde
- La commande tar
- La commande cpio

Les applications

- La gestion des processus
- L automatisation des tâches
- syslog : la gestion des messages systèmes

Installation des applications

- Installation à partir des sources
- Les paquets RedHat
- Les paquets Debian

L'arrêt et le démarrage de Linux

- La séquence de démarrage
- Le démarrage automatique des services
- L arrêt de la machine Linux

Le réseau

- Les commandes pour configurer TCP/IP
- Démarrage de services par inetd/xinetd
- services réseaux de base : telnet, ssh, ftp, wget

L'impression

- Le système CUPS
- Administration des impressions

L environnement graphique

- X window
- KDE
- GNOME

La sécurité

- Les règles de base pour sécuriser une machine Linux
- Sécurisation des connexions

Open Portable Trusted Execution Environment (OP-TEE)

- Introduction to OP-TEE
- Key Features
- Hardware, software, and firmware requirements
- Architecture of OP-TEE
  - Components, modules, and communication channels
- Use Cases
  - Secure storage
  - Secure communication
  - Secure execution of applications
- OP-TEE build and deployment
  - Setting up the environment
  - Configuration of OP-TEE

  - Compilation of OP-TEE
- Comparison to other TEE solutions
- Trusted Applications (TA) on OP-TEE
  - The role of a TA in a secure system
  - Writing a Trusted Application
  - Loading and executing a Trusted Application within the OP-TEE runtime
  - Debugging and testing Trusted Applications
  - Communication between Trusted Applications and normal world applications
  - Best practices for creating secure Trusted Applications

Exercise: *Build and install OP-TEE*
Exercise: *Write a TA application that communicates with a normal world application*

Renseignements pratiques

Duration : 5 days
Cost : 2400 € HT