# WORKSHOP : LINUX FROM SCRATCH (LFS 12.2)

1.    Linux From Scratch (LFS) provides an excellent foundation for understanding how to build a Linux operating system from source code. To facilitate hands-on learning, Dte of IT, CENTAIC is organizing a supervised workshop for enthusiastic volunteers of CENTAIC personnel. The time required to create a fully functional operating system is highly dependent on the specifications of the host system and the participant's proficiency level. Given this variability, we propose an alternative approach: a self-paced activity that allows each participant to work at their own pace, achieving and reporting milestones as they progress.

2. In this arrangement, participants will have access to guidance from the consultant when needed, ensuring that everyone can benefit from the experience without feeling overwhelmed. This flexible format aims to strike a balance between individual learning and support, allowing volunteers to absorb the material at their own comfort level.

3.    **Prerequisites**

   (a)   **Reference Book:** Linux From Scratch, Version 12.2 , (Gerard Beekmans, Bruce      Dubbs) 01 Sep, 2024.

   (b)   **Host System Hardware or VM Specs:**

   - x86 64 bit

   - Processor Cores: 04

   - RAM: 08GB

   - HDD: 30GB (Safe for future additions)

   (c)   **Software Specs:**

   Software compliance is verified through a script as shown in the figure.

   **(d) Basic familiarity with linux commands and CLI.**

```
livecd /run/media/gentoo/9b162f64-1b72-4cff-b365-2e36e0a34e60 # sh version-check.sh
OK:     Coreutils 9.5     >= 8.1
OK:     Bash      5.2.37 >= 3.2
OK:     Binutils  2.42    >= 2.13.1
OK:     Bison     3.8.2  >= 2.7
OK:     Diffutils 3.10    >= 2.8.1
OK:     Findutils 4.10.0 >= 4.2.31
OK:     Gawk      5.3.0  >= 4.0.1
OK:     GCC       13.3.1 >= 5.2
OK:     GCC (C++) 13.3.1 >= 5.2
OK:     Grep      3.11    >= 2.5.1a
OK:     Gzip      1.13    >= 1.3.12
OK:     M4        1.4.19 >= 1.4.10
OK:     Make      4.4.1  >= 4.0
OK:     Patch     2.7.6  >= 2.5.4
OK:     Perl      5.40.0 >= 5.8.8
OK:     Python    3.12.6 >= 3.4
OK:     Sed       4.9     >= 4.1.5
OK:     Tar       1.35    >= 1.22
OK:     Texinfo   7.1.1  >= 5.0
OK:     Xz        5.6.2  >= 5.0.0
OK:     Linux Kernel 6.6.51 >= 4.19
OK:     Linux Kernel supports UNIX 98 PTY
Aliases:
OK:     awk  is GNU
OK:     yacc is Bison
OK:     sh   is Bash
Compiler check:
OK:     g++ works
OK: nproc reports 8 logical cores are available
```

## 3. Planned Milestones.

Following is the list of envisaged milestones for reporting ease.

- **MS00** Introduction to the process
- **MS01** Preparation of host system
- **MS02** Downloading and validating source Files
- **MS03** Building Cross tool-chain and temporary tools
- **MS04** Building additional Temporary tools: chroot
- **MS05** Building LFS System
- **MS06** Configuration of newly built system
- **MS07** Boot configuration
- **MS08** First Boot

**Note:** It would roughly require 10-15 working days with 2-3 hrs per day commitment using a mid-level laptop.