



CS457: Advanced OS

Assignment 2 (8 marks) -v1.0

Objective

- Learn and practice linux filesystem integrity and authenticity verification.
- Get hands-on experience on configuring and using of fsverity Kernel mechanism

Setup

1. The deadline is 26 may
2. The assignment should be delivered in a group of 3.

Task 1 – (4 marks)

Fsverity provides a kernel mechanism for transparent integrity and authenticity verification of files. At its simplest it can be used to see if a file has been modified or corrupted. Originally designed with Android installation packages (.apk) in mind it is a more efficient way of generating file hash values than standard tools (e.g. sha256sum), particularly for large files made up of several components some of which will rarely be accessed. A simple user space interface, fsverity, is provided (via the fsverity-utils package) but perhaps more useful is the set of IOCTLs which allow direct access to the kernel functionality. Custom applications for authentication, corruption checking etc. can be designed around these functions. See the kernel docs for more information on these (Documentation/filesystems/fsverity) inside your kernel source code.

Here your task is just to experience the base functionality provided by the fsverity tool. So you are required to use your lab development environment to configure and build the kernel with fs-verity subsystem enabled mainly through selecting CONFIG_FS_VERITY option during the kernel configurations. Then enable fsverity support with the filesystem itself using tune2fs command

Task 2 - (4 marks)

Create a file with your group member ids to act as a test. Then enable fsverity on that file using the fsverity tool. Update the file and try to use fsverity tool to detect that the file has been changed.

Deliverables

You need to deliver the following as an archive with the group ids that contains the following:

- You need to deliver the kernel configuration file to enable the lockdep module.
- The generated text file.
- A Screenshot from your system showing the commands and it's output for enabling the fsverity on the file as well as detecting the changes after updating it.