PC649: MSc (IT) Summer Internship

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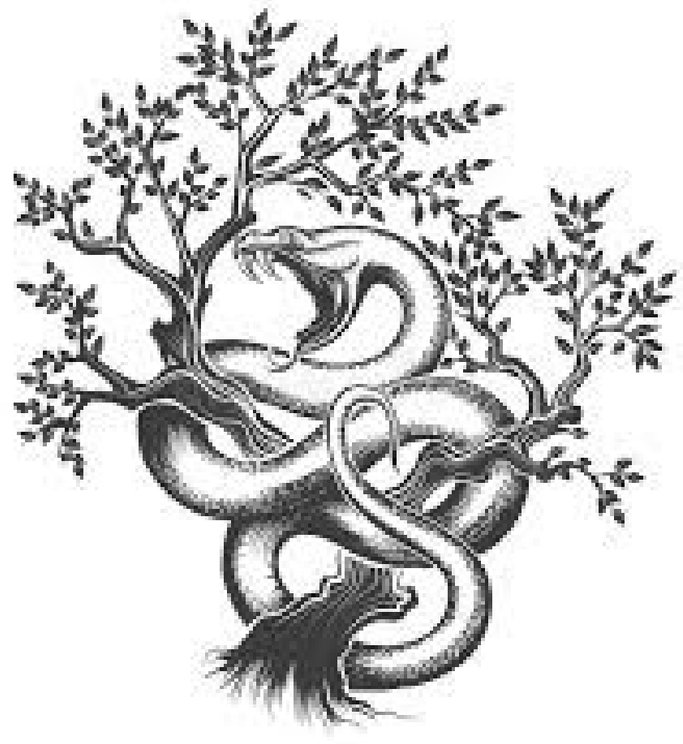


Snake-on-a-Tree Algorithm

Source code: https://github.com/202012055/summer_internship/tree/master/snake-on-a-tree

Whats is it ????

- It is a novel algorithm for making only some files available for accessing.
- It works by manipulating the file permissions on any unix-like OS.
- To make the process efficient we only change the minimum number of file permissions.
- For Example: if no file in the sub-tree of a dir is public then we can just remove the executable permission on the dir and then no process will be able to climb down that dir.
- The end result looks like a snake(a series of revoked permissions) on a tree(file-heirerchy) so i named it snake-on-a-tree.

Implementation

- The algorithm is implemented as a bash script library.
- It is needed to be sourced by the user script.
- It exports 3 functions:
  1. setROOT

     Sets the root of the tree on which other functions act.

     Takes 1 arg, a path to dir.
  2. makePublic

     Makes that dir/file public.

     Takes 1 arg, a path relative to ROOT.
  3. makePrivate

     Makes that dir/file private.

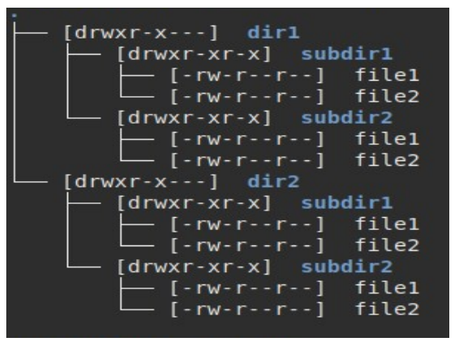
     Takes 1 arg, a path relative to ROOT.

Limitations

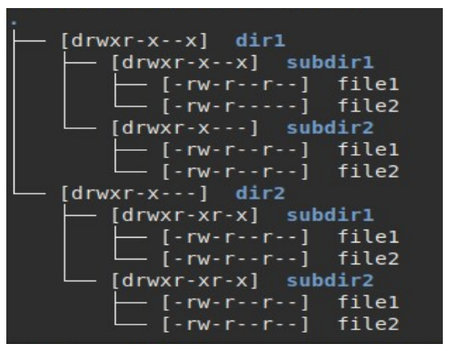
- This algorithm only works on static file-heirerchy.
- If the tree's structure is changed then the resulting structure might not be secure and most likely will not be understood by the later runs of the algorithm.
- To circumvent this problem reapply all the permissions and make the tree consistent again, but it is a very expensive opperation.

In-Action

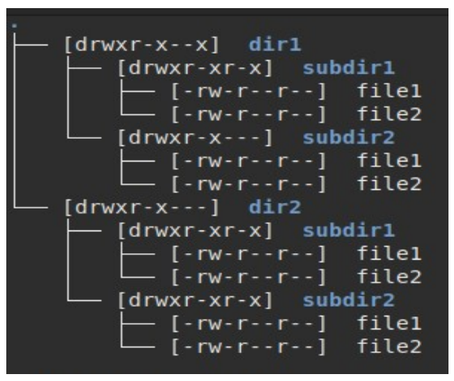
1. Initial Tree: every thing is private



2. after making dir1/subdir1/file1 public



3. after making dir1/subdir1 public



4. after making dir1 private