Problem Statement

tl;dr – Current seccomp filters are large and slow

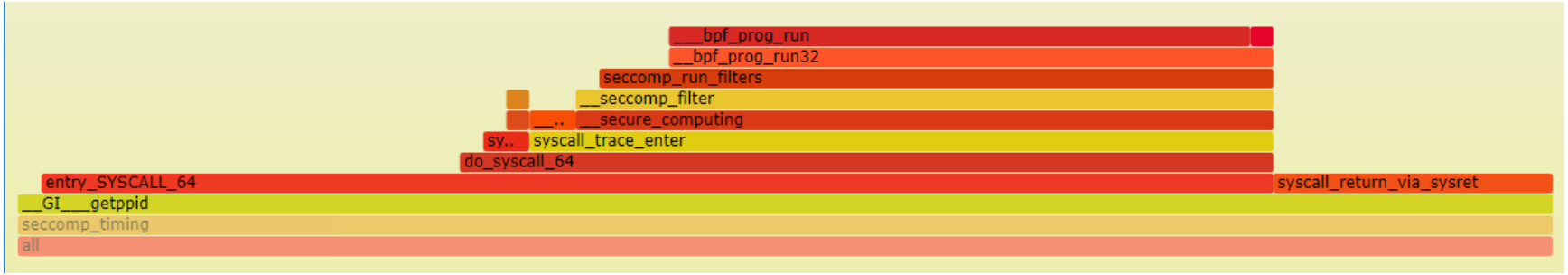
- Containers/Userspace – large seccomp whitelists
- Kernel and libseccomp – preference toward smaller filters
- Libseccomp currently – sequential “if equal” statements

```
if ($syscall == 42)
    action ALLOW;
```

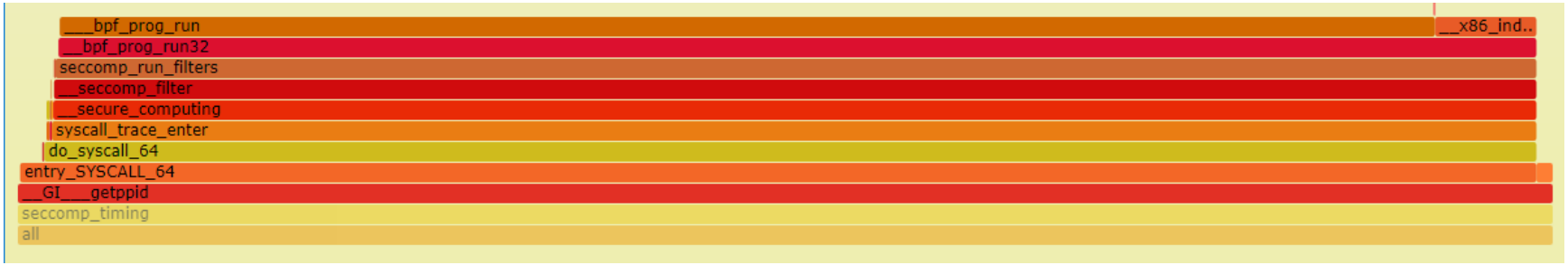
- Default docker filter – 300+ cBPF instructions to process read() syscall

Example – Docker's Default Libseccomp Filter

getppid() performance in a large filter



At the front of the filter



At the end of the filter

Proposed Solution – Binary Tree

- Libseccomp shall generate a cBPF binary tree for large filters

```
if ($syscall > 100)
        if ($syscall > 150)
                if ($syscall == __NR_prctl)
                        action ALLOW;
                if ($syscall == __NR_sysctl)
                        action ALLOW;
        else # $syscall <= 150
                # other syscall ifs
else # $syscall <= 100
        # other syscall ifs
#default action
action KILL;
```

- *All* syscalls in the filter can now be evaluated in 13 or less cBPF instructions!

Performance Comparison for a 300-Syscall Filter