1. Jdk is opened quite often, presumably to utilize additional functionality for security, garbage collection, etc…
2. The stat of folders opened by java is checked in most cases
3. Java uses many system calls that c does not, including clone, getrlimit, etc…

```
execve("/usr/local/java/jdk1.8.0_20/bin/java", ["java", "SysCalls"], [/*
20 vars */]) = 0
brk(0)                                  = 0x1d49000
access("/etc/ld.so.nohwcap", F_OK)      = -1 ENOENT (No such file or
directory)
mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0)
= 0x7fea624c5000
readlink("/proc/self/exe", "/usr/local/java/jdk1.8.0_20/bin/java", 4096)
= 36
access("/etc/ld.so.preload", R_OK)      = -1 ENOENT (No such file or
directory)
open("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/jli/tls/x86_64/libpthr
ead.so.0", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)
stat("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/jli/tls/x86_64",
0x7fff9dfd4710) = -1 ENOENT (No such file or directory)
open("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/jli/tls/libpthread.so.
0", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)
stat("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/jli/tls",
0x7fff9dfd4710) = -1 ENOENT (No such file or directory)
open("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/jli/x86_64/libpthread.
so.0", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)
stat("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/jli/x86_64",
0x7fff9dfd4710) = -1 ENOENT (No such file or directory)
open("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/jli/libpthread.so.0",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)
stat("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/jli",
{st_mode=S_IFDIR|0755, st_size=4096, ...}) = 0
open("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/tls/x86_64/libpthread.
so.0", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)
stat("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/tls/x86_64",
0x7fff9dfd4710) = -1 ENOENT (No such file or directory)
open("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/tls/libpthread.so.0",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)
stat("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/tls", 0x7fff9dfd4710)
= -1 ENOENT (No such file or directory)
open("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/x86_64/libpthread.so.0
", O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)
stat("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/x86_64",
0x7fff9dfd4710) = -1 ENOENT (No such file or directory)
open("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/libpthread.so.0",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)
stat("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64",
{st_mode=S_IFDIR|0755, st_size=4096, ...}) = 0
open("/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 3
fstat(3, {st_mode=S_IFREG|0644, st_size=40453, ...}) = 0
mmap(NULL, 40453, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7fea624bb000
close(3)                                = 0
```

```
access("/etc/ld.so.nohwcap", F_OK)       = -1 ENOENT (No such file or
directory)
open("/lib/x86_64-linux-gnu/libpthread.so.0", O_RDONLY|O_CLOEXEC) = 3
read(3,
"\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\200l\0\0\0\0\0\0"...,
832) = 832
fstat(3, {st_mode=S_IFREG|0755, st_size=135366, ...}) = 0
mmap(NULL, 2212904, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0)
= 0x7fea62088000
mprotect(0x7fea620a0000, 2093056, PROT_NONE) = 0
mmap(0x7fea6229f000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x17000) = 0x7fea6229f000
mmap(0x7fea622a1000, 13352, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7fea622a1000
close(3)                                 = 0
open("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/jli/libjli.so",
O_RDONLY|O_CLOEXEC) = 3
read(3,
"\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\0#\0\0\0\0\0\0"..., 832)
= 832
fstat(3, {st_mode=S_IFREG|0755, st_size=100503, ...}) = 0
mmap(NULL, 4096, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0)
= 0x7fea624ba000
mmap(NULL, 2182648, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0)
= 0x7fea61e73000
mprotect(0x7fea61e88000, 2093056, PROT_NONE) = 0
mmap(0x7fea62087000, 4096, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x14000) = 0x7fea62087000
close(3)                                 = 0
open("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/jli/libdl.so.2",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)
open("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/libdl.so.2",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)
access("/etc/ld.so.nohwcap", F_OK)       = -1 ENOENT (No such file or
directory)
open("/lib/x86_64-linux-gnu/libdl.so.2", O_RDONLY|O_CLOEXEC) = 3
read(3,
"\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\340\r\0\0\0\0\0"...,
832) = 832
fstat(3, {st_mode=S_IFREG|0644, st_size=14768, ...}) = 0
mmap(NULL, 2109704, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0)
= 0x7fea61c6f000
mprotect(0x7fea61c71000, 2097152, PROT_NONE) = 0
mmap(0x7fea61e71000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x2000) = 0x7fea61e71000
close(3)                                 = 0
open("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/jli/libc.so.6",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)
open("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/libc.so.6",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)
access("/etc/ld.so.nohwcap", F_OK)       = -1 ENOENT (No such file or
directory)
open("/lib/x86_64-linux-gnu/libc.so.6", O_RDONLY|O_CLOEXEC) = 3
```

```
read(3,
"\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0\200\30\2\0\0\0\0\0"...,
832) = 832
fstat(3, {st_mode=S_IFREG|0755, st_size=1811128, ...}) = 0
mmap(NULL, 3925176, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0)
= 0x7fea618b0000
mprotect(0x7fea61a65000, 2093056, PROT_NONE) = 0
mmap(0x7fea61c64000, 24576, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1b4000) = 0x7fea61c64000
mmap(0x7fea61c6a000, 17592, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7fea61c6a000
close(3)                                   = 0
mmap(NULL, 4096, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0)
= 0x7fea624b9000
mmap(NULL, 4096, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0)
= 0x7fea624b8000
mmap(NULL, 4096, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0)
= 0x7fea624b7000
arch_prctl(ARCH_SET_FS, 0x7fea624b8700) = 0
mprotect(0x7fea61c64000, 16384, PROT_READ) = 0
mprotect(0x7fea61e71000, 4096, PROT_READ) = 0
mprotect(0x7fea6229f000, 4096, PROT_READ) = 0
mprotect(0x7fea624c7000, 4096, PROT_READ) = 0
munmap(0x7fea624bb000, 40453)        = 0
set_tid_address(0x7fea624b89d0)       = 14033
set_robust_list(0x7fea624b89e0, 0x18)   = 0
futex(0x7fff9dfd500c, FUTEX_WAIT_BITSET_PRIVATE|FUTEX_CLOCK_REALTIME, 1,
NULL, 7fea624b8700) = -1 EAGAIN (Resource temporarily unavailable)
rt_sigaction(SIGRTMIN, {0x7fea6208e750, [], SA_RESTORER|SA_SIGINFO,
0x7fea62097cb0}, NULL, 8) = 0
rt_sigaction(SIGRT_1, {0x7fea6208e7e0, [],
SA_RESTORER|SA_RESTART|SA_SIGINFO, 0x7fea62097cb0}, NULL, 8) = 0
rt_sigprocmask(SIG_UNBLOCK, [RTMIN RT_1], NULL, 8) = 0
getrlimit(RLIMIT_STACK, {rlim_cur=8192*1024, rlim_max=RLIM_INFINITY}) = 0
brk(0)                                    = 0x1d49000
brk(0x1d6a000)                            = 0x1d6a000
readlink("/proc/self/exe", "/usr/local/java/jdk1.8.0_20/bin/java", 4096)
= 36
access("/usr/local/java/jdk1.8.0_20/lib/amd64/libjava.so", F_OK) = -1
ENOENT (No such file or directory)
access("/usr/local/java/jdk1.8.0_20/jre/lib/amd64/libjava.so", F_OK) = 0
open("/usr/local/java/jdk1.8.0_20/jre/lib/amd64/jvm.cfg", O_RDONLY) = 3
fstat(3, {st_mode=S_IFREG|0755, st_size=627, ...}) = 0
mmap(NULL, 4096, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0)
= 0x7fea624c4000
read(3, "# Copyright (c) 2003, 2013, Orac"..., 4096) = 627
read(3, "", 4096)                         = 0
close(3)                                  = 0
munmap(0x7fea624c4000, 4096)          = 0
stat("/usr/local/java/jdk1.8.0_20/jre/lib/amd64/server/libjvm.so",
{st_mode=S_IFREG|0755, st_size=16496186, ...}) = 0
futex(0x7fea61e720b0, FUTEX_WAKE_PRIVATE, 2147483647) = 0
open("/usr/local/java/jdk1.8.0_20/jre/lib/amd64/server/libjvm.so",
O_RDONLY|O_CLOEXEC) = 3
```

```
read(3,
"\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0P\237!\0\0\0\0\0"..., 832)
= 832
fstat(3, {st_mode=S_IFREG|0755, st_size=16496186, ...}) = 0
mmap(NULL, 16260648, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3,
0) = 0x7fea6092e000
mprotect(0x7fea61598000, 2093056, PROT_NONE) = 0
mmap(0x7fea61797000, 880640, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0xc69000) = 0x7fea61797000
mmap(0x7fea6186e000, 269864, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7fea6186e000
close(3)                                = 0
open("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/jli/libm.so.6",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)
open("/usr/local/java/jdk1.8.0_20/bin/../lib/amd64/libm.so.6",
O_RDONLY|O_CLOEXEC) = -1 ENOENT (No such file or directory)
open("/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 3
fstat(3, {st_mode=S_IFREG|0644, st_size=40453, ...}) = 0
mmap(NULL, 40453, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7fea624bb000
close(3)                                = 0
access("/etc/ld.so.nohwcap", F_OK)      = -1 ENOENT (No such file or
directory)
open("/lib/x86_64-linux-gnu/libm.so.6", O_RDONLY|O_CLOEXEC) = 3
read(3,
"\177ELF\2\1\1\0\0\0\0\0\0\0\0\0\3\0>\0\1\0\0\0pU\0\0\0\0\0\0"..., 832) =
832
fstat(3, {st_mode=S_IFREG|0644, st_size=1030512, ...}) = 0
mmap(NULL, 3125544, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0)
= 0x7fea60632000
mprotect(0x7fea6072d000, 2093056, PROT_NONE) = 0
mmap(0x7fea6092c000, 8192, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0xfa000) = 0x7fea6092c000
close(3)                                = 0
mprotect(0x7fea6092c000, 4096, PROT_READ) = 0
munmap(0x7fea624bb000, 40453)           = 0
mmap(NULL, 1052672, PROT_READ|PROT_WRITE,
MAP_PRIVATE|MAP_ANONYMOUS|MAP_STACK, -1, 0) = 0x7fea623b6000
mprotect(0x7fea623b6000, 4096, PROT_NONE) = 0
clone(child_stack=0x7fea624b5ff0,
flags=CLONE_VM|CLONE_FS|CLONE_FILES|CLONE_SIGHAND|CLONE_THREAD|CLONE_SYSV
SEM|CLONE_SETTLS|CLONE_PARENT_SETTID|CLONE_CHILD_CLEARTID,
parent_tidptr=0x7fea624b69d0, tls=0x7fea624b6700,
child_tidptr=0x7fea624b69d0) = 14034
futex(0x7fea624b69d0, FUTEX_WAIT, 14034, NULL) = 0
exit_group(0)                           = ?
```

% time	seconds	usecs/call	calls	errors	syscall
95.35	0.023540	7847	3	1	futex
1.12	0.000276	12	23	14	open
1.00	0.000247	247	1		execve
0.73	0.000181	8	24		mmap
0.44	0.000108	9	12		mprotect
0.28	0.000068	9	8	7	access
0.26	0.000064	32	2		readlink

```
  0.25     0.000062              7           9           6 stat
  0.17     0.000041             14           3             munmap
  0.16     0.000039              5           8             read
  0.07     0.000017              2           9             close
  0.06     0.000015              2           9             fstat
  0.06     0.000014             14           1             clone
  0.03     0.000007              2           3             brk
  0.01     0.000003              2           2             rt_sigaction
  0.01     0.000002              2           1             rt_sigprocmask
  0.01     0.000002              2           1             arch_prctl
  0.00     0.000001              1           1             getrlimit
  0.00     0.000001              1           1             set_tid_address
  0.00     0.000001              1           1             set_robust_list
------ ----------- ----------- --------- --------- ----------------
100.00     0.024689                        122          28 total
```