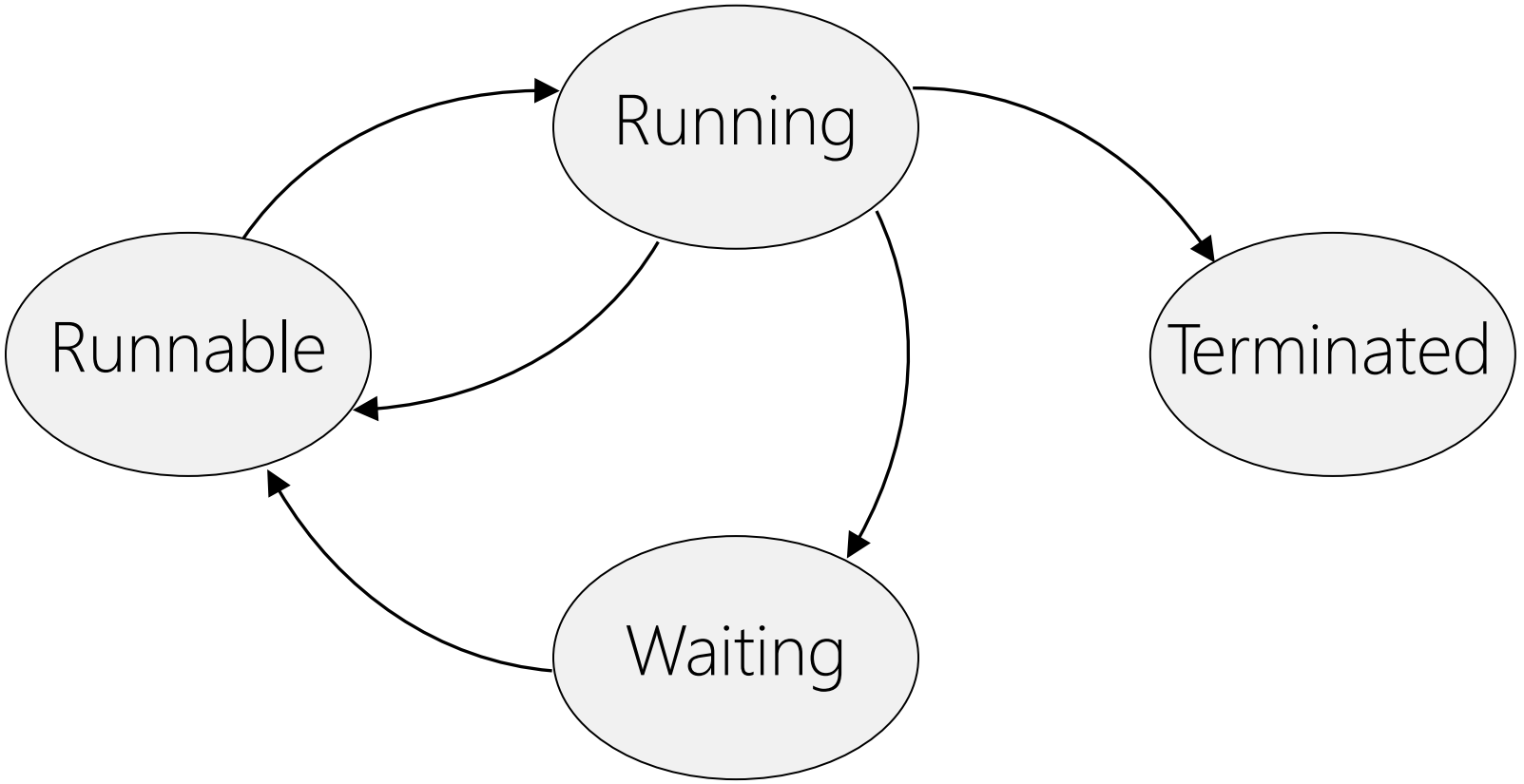
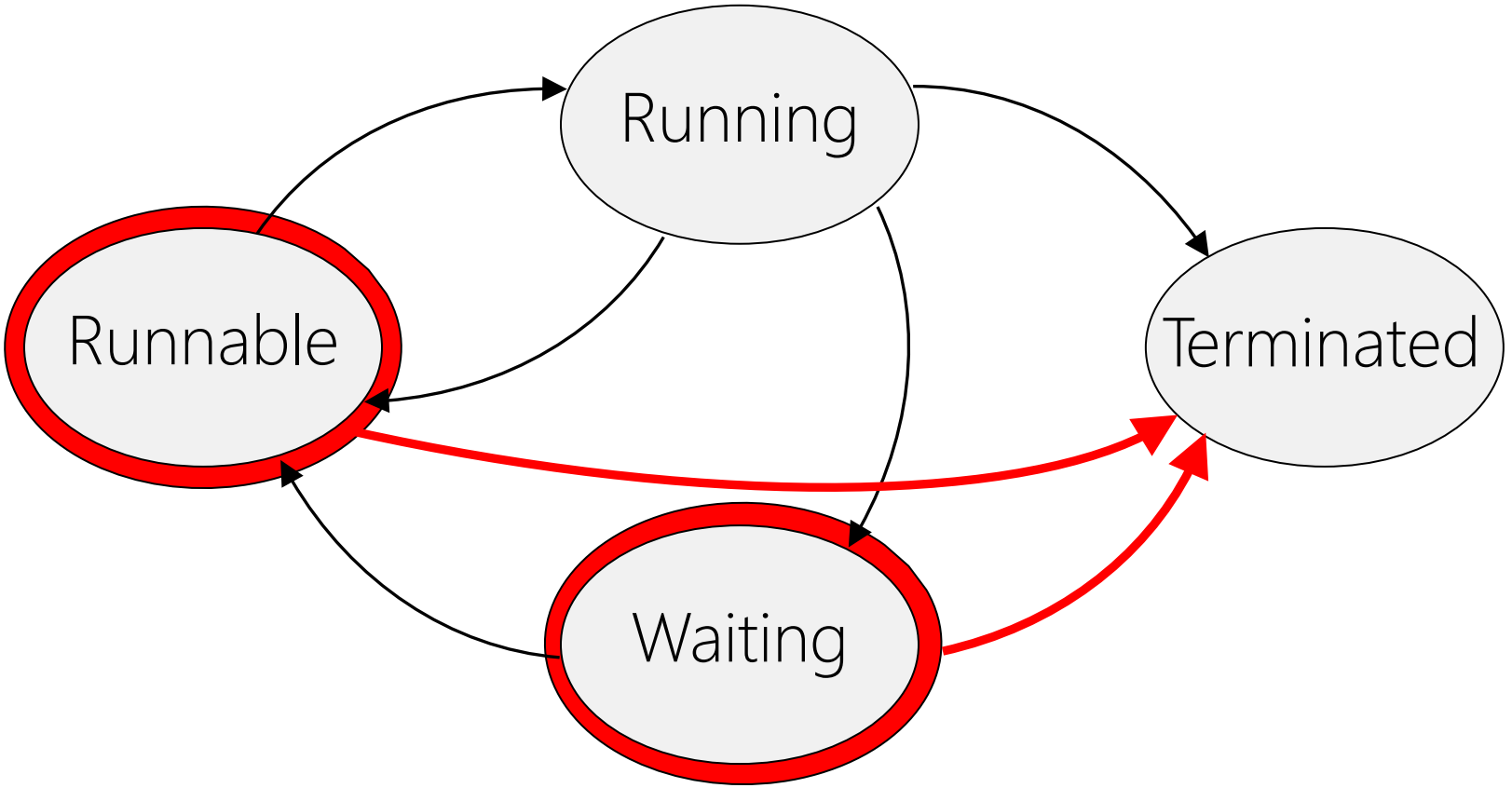
These state diagrams assume that a process can only reach the "Terminated" state from the "Running" state. How could a process in the "Runnable" or "Waiting" state transition to the "Terminated" state?



User could kill process before the process has called exit()!

Ex: Control-C a process

Ex: kill -9 1831



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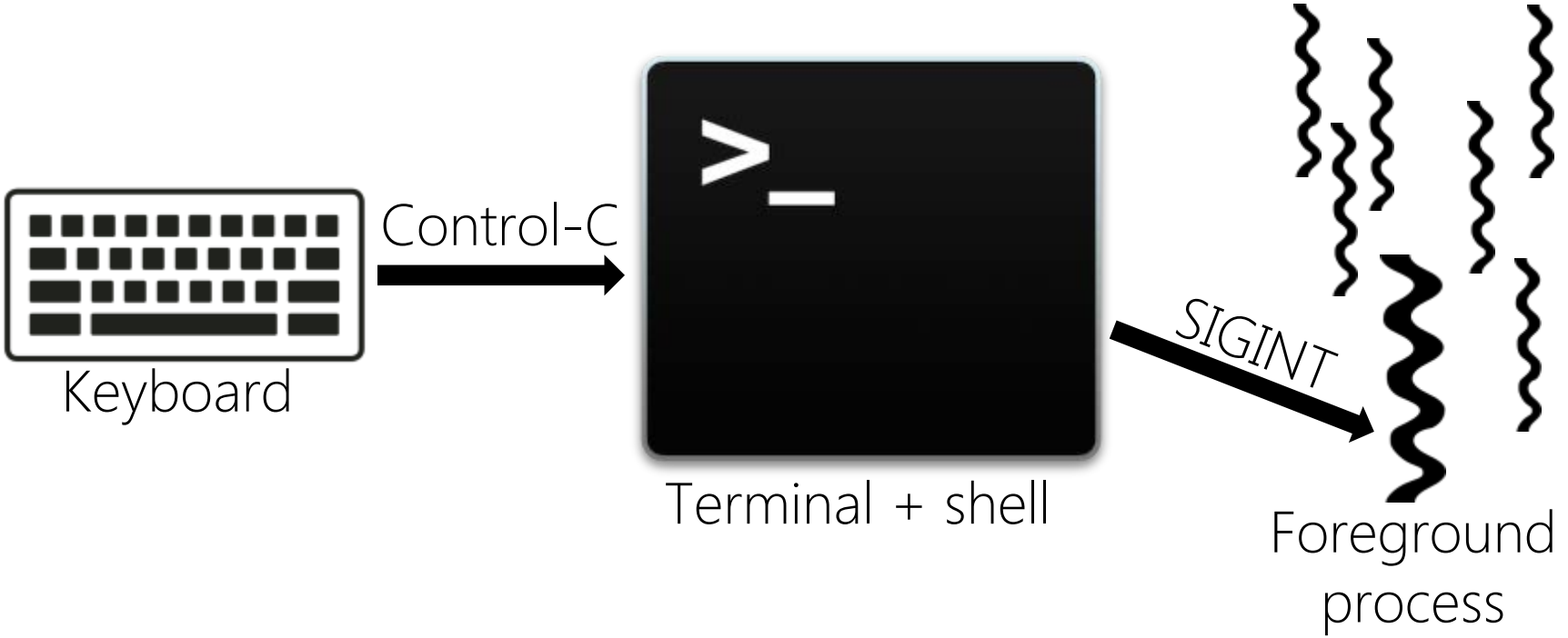
Ex: Control-C a process → Generates SIGINT

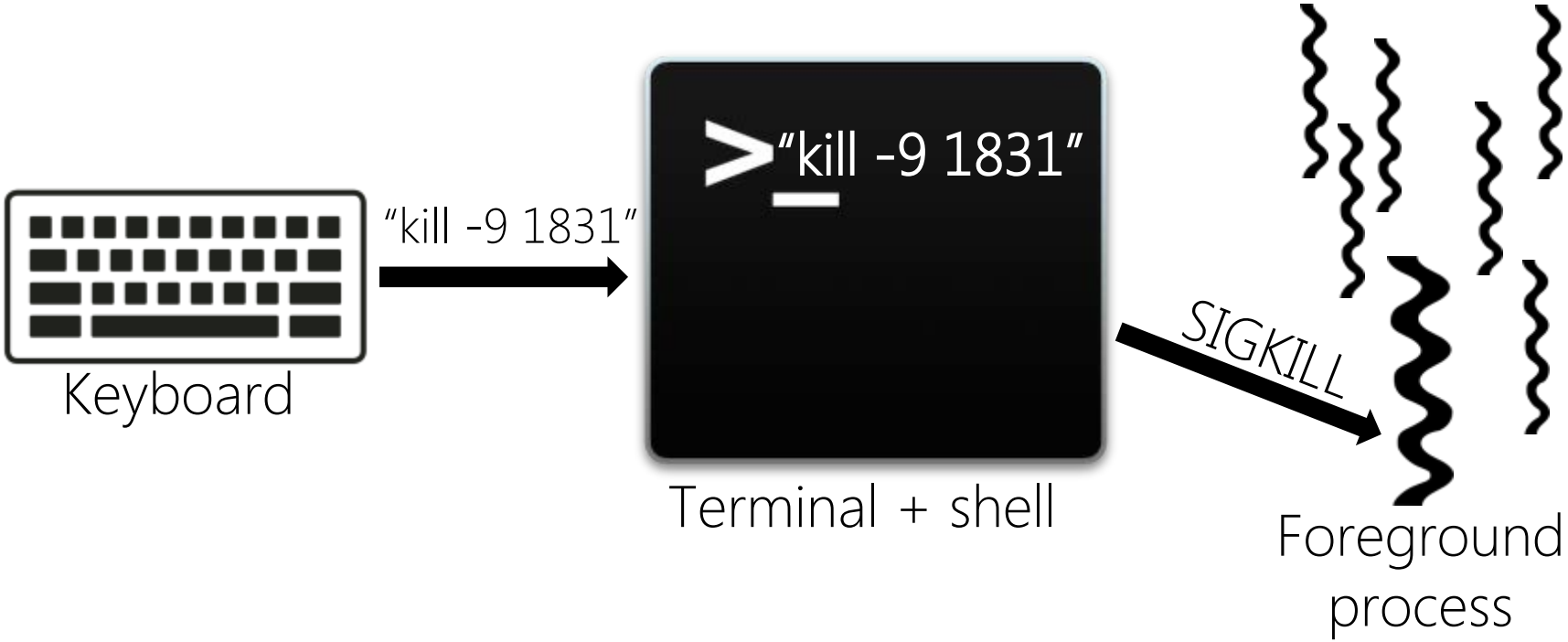
Ex: kill -9 1831



User could kill process before the process has called exit()!

Ex: Control-C a process → Generates SIGINT

Ex: kill -9 1831 → Generates SIGKILL



Define a simple C function that, when invoked, will eventually cause a stack overflow. Then describe how the stack overflow might lead to data corruption of heap objects.

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unsigned int factorial(unsigned int n){
    if(n == 1){
       return 1;
    }else{
       return n * factorial(n-1);
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}
factorial(6); //Works as expected.
factorial(0); //Disaster strikes!
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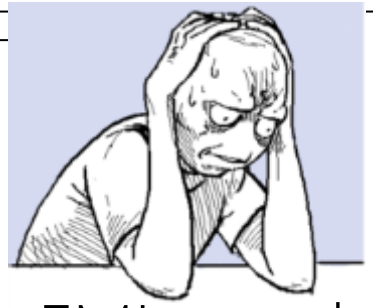
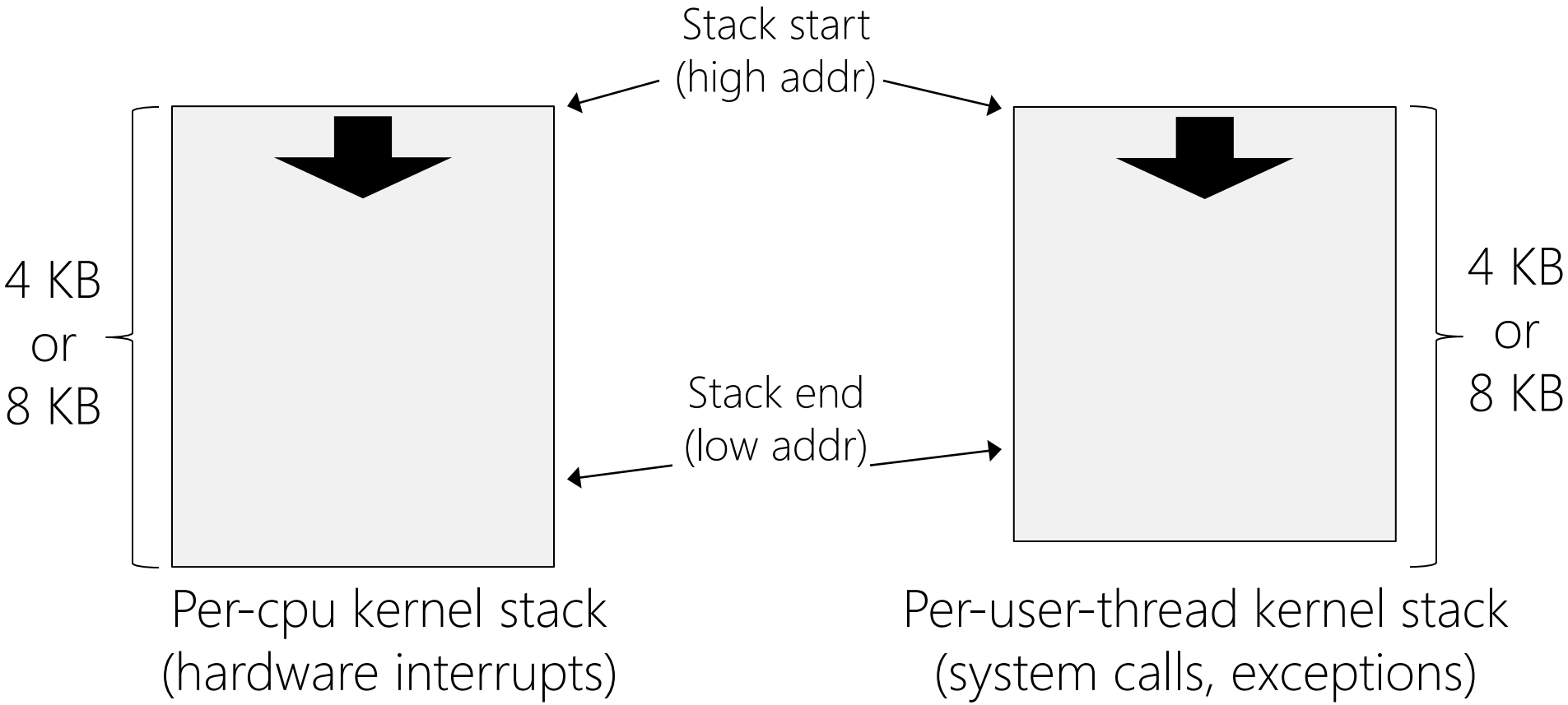
On a 32-bit machine,
0-1 = 4294967295



The FML number

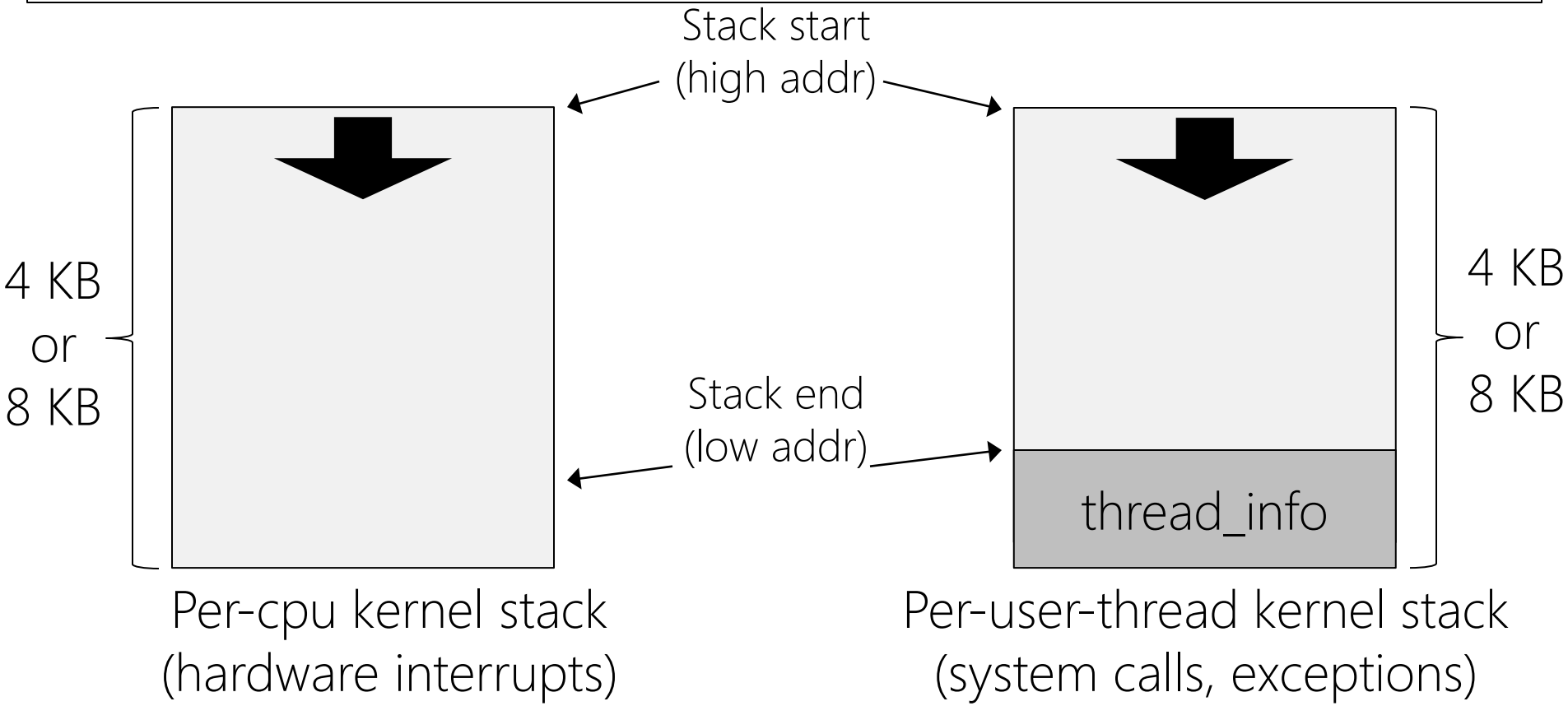
Integer underflow!

Case study: Linux kernel



Case study: Linux kernel

Linux kernel stack overflow when mounting ISO9660 image: "We use a long chain of unique inode references (100+). Because the resolution of the chain is implemented via recursive functions, we explode the kernel stack." https://code.google.com/p/google-security-research/issues/detail?id=88



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