**AWS Report**

*AWS config list: https://github.com/wenhuizhang/kconfig-safety-check/tree/master/config\_files/aws*

*Tool usage: "./bin/kconfig-safety-check -p X86\_64 -c ./config\_files/aws/\* -m show\_fail -e prod"*

1. **Amazon Linux v2: config-4.14.275-207.503.amzn2.x86\_64**

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| Plaintext wenhui.zhang@n231-227-105:~/kconfig-safety-check$ ./bin/kconfig-safety-check -p X86\_64 -c ./config\_files/aws/config-4.14.275-207.503.amzn2.x86\_64 -m show\_fail -e prod [+] Special report mode: show\_fail [+] Kconfig file to check: ./config\_files/aws/config-4.14.275-207.503.amzn2.x86\_64 [+] Detected architecture: X86\_64 [+] Detected kernel version: 4.14 =========================================================================================================================  option name | type |desired val | decision | reason | check result ========================================================================================================================= CONFIG\_SLAB\_FREELIST\_RANDOM |kconfig| y |ELISA\_safety, Intel|Memory management:Heap:Use after free| FAIL: "is not set" CONFIG\_SLAB\_MERGE\_DEFAULT |kconfig| n |ELISA\_safety, Intel|Memory management:Heap:Use after free| FAIL: "y" CONFIG\_SHUFFLE\_PAGE\_ALLOCATOR |kconfig| y |ELISA\_safety, Intel|Memory management:Heap:Use after free| FAIL: not found CONFIG\_REFCOUNT\_FULL |kconfig| y |ELISA\_safety|Kernel Memory reference count: Use after free| FAIL: "is not set" CONFIG\_GCC\_PLUGIN\_STRUCTKLEAK |kconfig| y |ELISA\_safety|GCC, plugins, Stack memory:Uninitialized variables| FAIL: not found CONFIG\_GCC\_PLUGIN\_STRUCTLEAK\_BYREF\_ALL |kconfig| y |ELISA\_safety|GCC, plugins, Stack memory:Uninitialized variables| FAIL: not found CONFIG\_INIT\_STACK\_ALL |kconfig| y |ELISA\_safety|Stack memory:Uninitialized variables| FAIL: not found CONFIG\_STACKPROTECTOR |kconfig| y |ELISA\_safety, Intel|Stack memory:Stack overflow| FAIL: not found CONFIG\_STACKPROTECTOR\_STRONG |kconfig| y |ELISA\_safety, Intel|Stack memory:Stack overflow| FAIL: not found CONFIG\_GCC\_PLUGIN\_STACKLEAK |kconfig| y |ELISA\_safety|Stack memory:Stack overflow| FAIL: not found CONFIG\_PAGE\_POISONING |kconfig| y |ELISA\_safety|Stack memory:Stack overflow| FAIL: "is not set" CONFIG\_PAGE\_POISONING\_NO\_SANITY |kconfig| n |ELISA\_safety|Stack memory:Stack overflow| FAIL: not found CONFIG\_DEBUG\_SG |kconfig| y |ELISA\_safety|Driver: Heap overflow| FAIL: "is not set" CONFIG\_KMEM |kconfig| n | Intel |Kernel Memory:Kernel corruption of user space memory| FAIL: not found CONFIG\_DEVMEM |kconfig| n |ELISA\_safety, Intel|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_DEVPORT |kconfig| n |ELISA\_safety, Intel|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_ACPI\_CUSTOM\_METHOD |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_LEGACY\_PTYS |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_HIBERNATION |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_KEXEC |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_HARDENED\_USERCOPY\_FALLBACK |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: not found CONFIG\_HARDENED\_USERCOPY\_PAGESPAN |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_COMPAT\_BRK |kconfig| n |ELISA\_safety|Heap memory:R/W access to memory allocated to another software element| FAIL: "is not set" CONFIG\_USERFAULTFD |kconfig| n |ELISA\_safety|Heap memory:R/W access to memory allocated to another software element| FAIL: "y" CONFIG\_DEBUG\_WX |kconfig| y |ELISA\_safety|Kernel Memory:W+X access to memory pages| FAIL: "is not set" CONFIG\_BPF\_UNPRIV\_DEFAULT\_OFF |kconfig| n |ELISA\_safety|Branch Target Buffer:Side Channel Attacks| FAIL: "y" CONFIG\_LIVEPATCH |kconfig| n |ELISA\_safety| Live Patch | FAIL: "y" CONFIG\_DEVKMEM |kconfig| y |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_SECURITY\_WRITABLE\_HOOKS |kconfig| n |ELISA\_security|Linux Security Module| FAIL: "y" CONFIG\_SECURITY\_PATH |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set" CONFIG\_LSM\_MMAP\_MIN\_ADDR |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "65536" CONFIG\_STATIC\_USERMODEHELPER |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set" CONFIG\_STATIC\_USERMODEHELPER\_PATH |kconfig| y |ELISA\_security|Linux Security Module| FAIL: not found CONFIG\_DEFAULT\_SECURITY\_DAC |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set" CONFIG\_SECURITY\_APPARMOR |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set"  [+] Config check is finished: 'OK' - 21 (suppressed in output) / 'FAIL' - 35 |

2. **Amazon Linux v2: config-5.10.109-104.500.amzn2.x86\_64**

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| Plaintext wenhui.zhang@n231-227-105:~/kconfig-safety-check$ ./bin/kconfig-safety-check -p X86\_64 -c ./config\_files/aws/config-5.10.109-104.500.amzn2.x86\_64 -m show\_fail -e prod [+] Special report mode: show\_fail [+] Kconfig file to check: ./config\_files/aws/config-5.10.109-104.500.amzn2.x86\_64 [+] Detected architecture: X86\_64 [+] Detected kernel version: 5.10 =========================================================================================================================  option name | type |desired val | decision | reason | check result ========================================================================================================================= CONFIG\_SLAB\_MERGE\_DEFAULT |kconfig| n |ELISA\_safety, Intel|Memory management:Heap:Use after free| FAIL: "y" CONFIG\_REFCOUNT\_FULL |kconfig| y |ELISA\_safety|Kernel Memory reference count: Use after free| FAIL: not found CONFIG\_GCC\_PLUGIN\_STRUCTKLEAK |kconfig| y |ELISA\_safety|GCC, plugins, Stack memory:Uninitialized variables| FAIL: not found CONFIG\_GCC\_PLUGIN\_STRUCTLEAK\_BYREF\_ALL |kconfig| y |ELISA\_safety|GCC, plugins, Stack memory:Uninitialized variables| FAIL: not found CONFIG\_INIT\_STACK\_ALL |kconfig| y |ELISA\_safety|Stack memory:Uninitialized variables| FAIL: not found CONFIG\_GCC\_PLUGIN\_STACKLEAK |kconfig| y |ELISA\_safety|Stack memory:Stack overflow| FAIL: not found CONFIG\_PAGE\_POISONING |kconfig| y |ELISA\_safety|Stack memory:Stack overflow| FAIL: "is not set" CONFIG\_PAGE\_POISONING\_NO\_SANITY |kconfig| n |ELISA\_safety|Stack memory:Stack overflow| FAIL: not found CONFIG\_DEBUG\_SG |kconfig| y |ELISA\_safety|Driver: Heap overflow| FAIL: "is not set" CONFIG\_KMEM |kconfig| n | Intel |Kernel Memory:Kernel corruption of user space memory| FAIL: not found CONFIG\_DEVMEM |kconfig| n |ELISA\_safety, Intel|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_DEVPORT |kconfig| n |ELISA\_safety, Intel|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_ACPI\_CUSTOM\_METHOD |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_LEGACY\_PTYS |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_HIBERNATION |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_KEXEC |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_HARDENED\_USERCOPY\_FALLBACK |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_HARDENED\_USERCOPY\_PAGESPAN |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_COMPAT\_BRK |kconfig| n |ELISA\_safety|Heap memory:R/W access to memory allocated to another software element| FAIL: "is not set" CONFIG\_USERFAULTFD |kconfig| n |ELISA\_safety|Heap memory:R/W access to memory allocated to another software element| FAIL: "y" CONFIG\_DEBUG\_WX |kconfig| y |ELISA\_safety|Kernel Memory:W+X access to memory pages| FAIL: "is not set" CONFIG\_BPF\_UNPRIV\_DEFAULT\_OFF |kconfig| n |ELISA\_safety|Branch Target Buffer:Side Channel Attacks| FAIL: "y" CONFIG\_LIVEPATCH |kconfig| n |ELISA\_safety| Live Patch | FAIL: "y" CONFIG\_DEVKMEM |kconfig| y |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_SECURITY\_WRITABLE\_HOOKS |kconfig| n |ELISA\_security|Linux Security Module| FAIL: "y" CONFIG\_LSM\_MMAP\_MIN\_ADDR |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "65536" CONFIG\_STATIC\_USERMODEHELPER |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set" CONFIG\_STATIC\_USERMODEHELPER\_PATH |kconfig| y |ELISA\_security|Linux Security Module| FAIL: not found CONFIG\_DEFAULT\_SECURITY\_DAC |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set" CONFIG\_SECURITY\_APPARMOR |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set"  [+] Config check is finished: 'OK' - 26 (suppressed in output) / 'FAIL' - 30 |

3. **Ubuntu 18.04: config-5.4.0-1071-aws-ubuntu-18.04**

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| Plaintext wenhui.zhang@n231-227-105:~/kconfig-safety-check$ ./bin/kconfig-safety-check -p X86\_64 -c ./config\_files/aws/config-5.4.0-1071-aws-ubuntu-18.04 -m show\_fail -e prod [+] Special report mode: show\_fail [+] Kconfig file to check: ./config\_files/aws/config-5.4.0-1071-aws-ubuntu-18.04 [+] Detected architecture: X86\_64 [+] Detected kernel version: 5.4 =========================================================================================================================  option name | type |desired val | decision | reason | check result ========================================================================================================================= CONFIG\_SLAB\_MERGE\_DEFAULT |kconfig| n |ELISA\_safety, Intel|Memory management:Heap:Use after free| FAIL: "y" CONFIG\_REFCOUNT\_FULL |kconfig| y |ELISA\_safety|Kernel Memory reference count: Use after free| FAIL: "is not set" CONFIG\_GCC\_PLUGIN\_STRUCTKLEAK |kconfig| y |ELISA\_safety|GCC, plugins, Stack memory:Uninitialized variables| FAIL: not found CONFIG\_GCC\_PLUGIN\_STRUCTLEAK\_BYREF\_ALL |kconfig| y |ELISA\_safety|GCC, plugins, Stack memory:Uninitialized variables| FAIL: not found CONFIG\_INIT\_STACK\_ALL |kconfig| y |ELISA\_safety|Stack memory:Uninitialized variables| FAIL: not found CONFIG\_GCC\_PLUGIN\_STACKLEAK |kconfig| y |ELISA\_safety|Stack memory:Stack overflow| FAIL: not found CONFIG\_PAGE\_POISONING\_NO\_SANITY |kconfig| n |ELISA\_safety|Stack memory:Stack overflow| FAIL: "y" CONFIG\_DEBUG\_SG |kconfig| y |ELISA\_safety|Driver: Heap overflow| FAIL: "is not set" CONFIG\_BUG\_ON\_DATA\_CORRUPTION |kconfig| y |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_KMEM |kconfig| n | Intel |Kernel Memory:Kernel corruption of user space memory| FAIL: not found CONFIG\_DEVMEM |kconfig| n |ELISA\_safety, Intel|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_DEVPORT |kconfig| n |ELISA\_safety, Intel|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_ACPI\_CUSTOM\_METHOD |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_LEGACY\_PTYS |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_HIBERNATION |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_KEXEC |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_HARDENED\_USERCOPY\_FALLBACK |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_HARDENED\_USERCOPY\_PAGESPAN |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_COMPAT\_BRK |kconfig| n |ELISA\_safety|Heap memory:R/W access to memory allocated to another software element| FAIL: "is not set" CONFIG\_USERFAULTFD |kconfig| n |ELISA\_safety|Heap memory:R/W access to memory allocated to another software element| FAIL: "y" CONFIG\_BPF\_UNPRIV\_DEFAULT\_OFF |kconfig| n |ELISA\_safety|Branch Target Buffer:Side Channel Attacks| FAIL: "y" CONFIG\_LIVEPATCH |kconfig| n |ELISA\_safety| Live Patch | FAIL: "y" CONFIG\_DEVKMEM |kconfig| y |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_SECURITY\_WRITABLE\_HOOKS |kconfig| n |ELISA\_security|Linux Security Module| FAIL: not found CONFIG\_LSM\_MMAP\_MIN\_ADDR |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "0" CONFIG\_STATIC\_USERMODEHELPER |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set" CONFIG\_STATIC\_USERMODEHELPER\_PATH |kconfig| y |ELISA\_security|Linux Security Module| FAIL: not found CONFIG\_DEFAULT\_SECURITY\_DAC |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set"  [+] Config check is finished: 'OK' - 28 (suppressed in output) / 'FAIL' - 28 |

4. **Ubuntu 20.04: config-5.13.0-1022-aws-ubuntu-20.04**

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| Plaintext wenhui.zhang@n231-227-105:~/kconfig-safety-check$ ./bin/kconfig-safety-check -p X86\_64 -c ./config\_files/aws/config-5.13.0-1022-aws-ubuntu-20.04 -m show\_fail -e prod [+] Special report mode: show\_fail [+] Kconfig file to check: ./config\_files/aws/config-5.13.0-1022-aws-ubuntu-20.04 [+] Detected architecture: X86\_64 [+] Detected kernel version: 5.13 =========================================================================================================================  option name | type |desired val | decision | reason | check result ========================================================================================================================= CONFIG\_SLAB\_MERGE\_DEFAULT |kconfig| n |ELISA\_safety, Intel|Memory management:Heap:Use after free| FAIL: "y" CONFIG\_REFCOUNT\_FULL |kconfig| y |ELISA\_safety|Kernel Memory reference count: Use after free| FAIL: not found CONFIG\_GCC\_PLUGIN\_STRUCTKLEAK |kconfig| y |ELISA\_safety|GCC, plugins, Stack memory:Uninitialized variables| FAIL: not found CONFIG\_GCC\_PLUGIN\_STRUCTLEAK\_BYREF\_ALL |kconfig| y |ELISA\_safety|GCC, plugins, Stack memory:Uninitialized variables| FAIL: not found CONFIG\_INIT\_STACK\_ALL |kconfig| y |ELISA\_safety|Stack memory:Uninitialized variables| FAIL: not found CONFIG\_GCC\_PLUGIN\_STACKLEAK |kconfig| y |ELISA\_safety|Stack memory:Stack overflow| FAIL: not found CONFIG\_PAGE\_POISONING\_NO\_SANITY |kconfig| n |ELISA\_safety|Stack memory:Stack overflow| FAIL: not found CONFIG\_DEBUG\_SG |kconfig| y |ELISA\_safety|Driver: Heap overflow| FAIL: "is not set" CONFIG\_BUG\_ON\_DATA\_CORRUPTION |kconfig| y |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_KMEM |kconfig| n | Intel |Kernel Memory:Kernel corruption of user space memory| FAIL: not found CONFIG\_DEVMEM |kconfig| n |ELISA\_safety, Intel|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_DEVPORT |kconfig| n |ELISA\_safety, Intel|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_ACPI\_CUSTOM\_METHOD |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_LEGACY\_PTYS |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_HIBERNATION |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_KEXEC |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_HARDENED\_USERCOPY\_FALLBACK |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_HARDENED\_USERCOPY\_PAGESPAN |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_COMPAT\_BRK |kconfig| n |ELISA\_safety|Heap memory:R/W access to memory allocated to another software element| FAIL: "is not set" CONFIG\_USERFAULTFD |kconfig| n |ELISA\_safety|Heap memory:R/W access to memory allocated to another software element| FAIL: "y" CONFIG\_BPF\_UNPRIV\_DEFAULT\_OFF |kconfig| n |ELISA\_safety|Branch Target Buffer:Side Channel Attacks| FAIL: "y" CONFIG\_LIVEPATCH |kconfig| n |ELISA\_safety| Live Patch | FAIL: "y" CONFIG\_DEVKMEM |kconfig| y |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: not found CONFIG\_SECURITY\_WRITABLE\_HOOKS |kconfig| n |ELISA\_security|Linux Security Module| FAIL: not found CONFIG\_LSM\_MMAP\_MIN\_ADDR |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "0" CONFIG\_STATIC\_USERMODEHELPER |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set" CONFIG\_STATIC\_USERMODEHELPER\_PATH |kconfig| y |ELISA\_security|Linux Security Module| FAIL: not found CONFIG\_DEFAULT\_SECURITY\_DAC |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set"  [+] Config check is finished: 'OK' - 28 (suppressed in output) / 'FAIL' - 28 |

5. **Ubuntu 22.04: config-5.15.0-1004-aws-ubuntu-22.04**

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| Plaintext wenhui.zhang@n231-227-105:~/kconfig-safety-check$ ./bin/kconfig-safety-check -p X86\_64 -c ./config\_files/aws/config-5.15.0-1004-aws-ubuntu-22.04 -m show\_fail -e prod [+] Special report mode: show\_fail [+] Kconfig file to check: ./config\_files/aws/config-5.15.0-1004-aws-ubuntu-22.04 [+] Detected architecture: X86\_64 [+] Detected kernel version: 5.15 =========================================================================================================================  option name | type |desired val | decision | reason | check result ========================================================================================================================= CONFIG\_SLAB\_MERGE\_DEFAULT |kconfig| n |ELISA\_safety, Intel|Memory management:Heap:Use after free| FAIL: "y" CONFIG\_REFCOUNT\_FULL |kconfig| y |ELISA\_safety|Kernel Memory reference count: Use after free| FAIL: not found CONFIG\_GCC\_PLUGIN\_STRUCTKLEAK |kconfig| y |ELISA\_safety|GCC, plugins, Stack memory:Uninitialized variables| FAIL: not found CONFIG\_GCC\_PLUGIN\_STRUCTLEAK\_BYREF\_ALL |kconfig| y |ELISA\_safety|GCC, plugins, Stack memory:Uninitialized variables| FAIL: not found CONFIG\_INIT\_STACK\_ALL |kconfig| y |ELISA\_safety|Stack memory:Uninitialized variables| FAIL: not found CONFIG\_GCC\_PLUGIN\_STACKLEAK |kconfig| y |ELISA\_safety|Stack memory:Stack overflow| FAIL: not found CONFIG\_PAGE\_POISONING\_NO\_SANITY |kconfig| n |ELISA\_safety|Stack memory:Stack overflow| FAIL: not found CONFIG\_DEBUG\_SG |kconfig| y |ELISA\_safety|Driver: Heap overflow| FAIL: "is not set" CONFIG\_BUG\_ON\_DATA\_CORRUPTION |kconfig| y |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_KMEM |kconfig| n | Intel |Kernel Memory:Kernel corruption of user space memory| FAIL: not found CONFIG\_DEVMEM |kconfig| n |ELISA\_safety, Intel|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_DEVPORT |kconfig| n |ELISA\_safety, Intel|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_ACPI\_CUSTOM\_METHOD |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_LEGACY\_PTYS |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_HIBERNATION |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_KEXEC |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_HARDENED\_USERCOPY\_FALLBACK |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_HARDENED\_USERCOPY\_PAGESPAN |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_COMPAT\_BRK |kconfig| n |ELISA\_safety|Heap memory:R/W access to memory allocated to another software element| FAIL: "is not set" CONFIG\_USERFAULTFD |kconfig| n |ELISA\_safety|Heap memory:R/W access to memory allocated to another software element| FAIL: "y" CONFIG\_BPF\_UNPRIV\_DEFAULT\_OFF |kconfig| n |ELISA\_safety|Branch Target Buffer:Side Channel Attacks| FAIL: "y" CONFIG\_LIVEPATCH |kconfig| n |ELISA\_safety| Live Patch | FAIL: "y" CONFIG\_DEVKMEM |kconfig| y |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: not found CONFIG\_SECURITY\_WRITABLE\_HOOKS |kconfig| n |ELISA\_security|Linux Security Module| FAIL: not found CONFIG\_LSM\_MMAP\_MIN\_ADDR |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "0" CONFIG\_STATIC\_USERMODEHELPER |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set" CONFIG\_STATIC\_USERMODEHELPER\_PATH |kconfig| y |ELISA\_security|Linux Security Module| FAIL: not found CONFIG\_DEFAULT\_SECURITY\_DAC |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set"  [+] Config check is finished: 'OK' - 28 (suppressed in output) / 'FAIL' - 28 |

6. **SUSE 15: config-5.3.18-59.37-default-aws-suse-15**

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| Plaintext wenhui.zhang@n231-227-105:~/kconfig-safety-check$ ./bin/kconfig-safety-check -p X86\_64 -c ./config\_files/aws/config-5.3.18-59.37-default-aws-suse-15 -m show\_fail -e prod [+] Special report mode: show\_fail [+] Kconfig file to check: ./config\_files/aws/config-5.3.18-59.37-default-aws-suse-15 [+] Detected architecture: X86\_64 [+] Detected kernel version: 5.3 =========================================================================================================================  option name | type |desired val | decision | reason | check result ========================================================================================================================= CONFIG\_SLAB\_MERGE\_DEFAULT |kconfig| n |ELISA\_safety, Intel|Memory management:Heap:Use after free| FAIL: "y" CONFIG\_REFCOUNT\_FULL |kconfig| y |ELISA\_safety|Kernel Memory reference count: Use after free| FAIL: not found CONFIG\_GCC\_PLUGIN\_STRUCTKLEAK |kconfig| y |ELISA\_safety|GCC, plugins, Stack memory:Uninitialized variables| FAIL: not found CONFIG\_GCC\_PLUGIN\_STRUCTLEAK\_BYREF\_ALL |kconfig| y |ELISA\_safety|GCC, plugins, Stack memory:Uninitialized variables| FAIL: not found CONFIG\_INIT\_STACK\_ALL |kconfig| y |ELISA\_safety|Stack memory:Uninitialized variables| FAIL: not found CONFIG\_GCC\_PLUGIN\_STACKLEAK |kconfig| y |ELISA\_safety|Stack memory:Stack overflow| FAIL: not found CONFIG\_PAGE\_POISONING |kconfig| y |ELISA\_safety|Stack memory:Stack overflow| FAIL: "is not set" CONFIG\_PAGE\_POISONING\_NO\_SANITY |kconfig| n |ELISA\_safety|Stack memory:Stack overflow| FAIL: not found CONFIG\_DEBUG\_SG |kconfig| y |ELISA\_safety|Driver: Heap overflow| FAIL: "is not set" CONFIG\_BUG\_ON\_DATA\_CORRUPTION |kconfig| y |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_KMEM |kconfig| n | Intel |Kernel Memory:Kernel corruption of user space memory| FAIL: not found CONFIG\_DEVMEM |kconfig| n |ELISA\_safety, Intel|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_DEVPORT |kconfig| n |ELISA\_safety, Intel|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_ACPI\_CUSTOM\_METHOD |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_LEGACY\_PTYS |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_HIBERNATION |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_KEXEC |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_HARDENED\_USERCOPY |kconfig| y |ELISA\_safety, Intel|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_HARDENED\_USERCOPY\_FALLBACK |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: not found CONFIG\_HARDENED\_USERCOPY\_PAGESPAN |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: not found CONFIG\_COMPAT\_BRK |kconfig| n |ELISA\_safety|Heap memory:R/W access to memory allocated to another software element| FAIL: "is not set" CONFIG\_USERFAULTFD |kconfig| n |ELISA\_safety|Heap memory:R/W access to memory allocated to another software element| FAIL: "y" CONFIG\_DEBUG\_WX |kconfig| y |ELISA\_safety|Kernel Memory:W+X access to memory pages| FAIL: "is not set" CONFIG\_BPF\_UNPRIV\_DEFAULT\_OFF |kconfig| n |ELISA\_safety|Branch Target Buffer:Side Channel Attacks| FAIL: "y" CONFIG\_LIVEPATCH |kconfig| n |ELISA\_safety| Live Patch | FAIL: "y" CONFIG\_DEVKMEM |kconfig| y |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_SECURITY\_WRITABLE\_HOOKS |kconfig| n |ELISA\_security|Linux Security Module| FAIL: "y" CONFIG\_LSM\_MMAP\_MIN\_ADDR |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "0" CONFIG\_STATIC\_USERMODEHELPER |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set" CONFIG\_STATIC\_USERMODEHELPER\_PATH |kconfig| y |ELISA\_security|Linux Security Module| FAIL: not found CONFIG\_DEFAULT\_SECURITY\_DAC |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set"  [+] Config check is finished: 'OK' - 25 (suppressed in output) / 'FAIL' - 31 |

7. **CentOS 8: config-4.18.0-305.el8.x86\_64-aws-centos-8**

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| Plaintext wenhui.zhang@n231-227-105:~/kconfig-safety-check$ ./bin/kconfig-safety-check -p X86\_64 -c ./config\_files/aws/config-4.18.0-305.el8.x86\_64-aws-centos-8 -m show\_fail -e prod [+] Special report mode: show\_fail [+] Kconfig file to check: ./config\_files/aws/config-4.18.0-305.el8.x86\_64-aws-centos-8 [+] Detected architecture: X86\_64 [+] Detected kernel version: 4.18 =========================================================================================================================  option name | type |desired val | decision | reason | check result ========================================================================================================================= CONFIG\_SLAB\_FREELIST\_HARDENED |kconfig| y |ELISA\_safety, Intel|Memory management:Heap:Use after free| FAIL: "is not set" CONFIG\_SLAB\_MERGE\_DEFAULT |kconfig| n |ELISA\_safety, Intel|Memory management:Heap:Use after free| FAIL: "is not set" CONFIG\_REFCOUNT\_FULL |kconfig| y |ELISA\_safety|Kernel Memory reference count: Use after free| FAIL: "is not set" CONFIG\_GCC\_PLUGIN\_STRUCTKLEAK |kconfig| y |ELISA\_safety|GCC, plugins, Stack memory:Uninitialized variables| FAIL: not found CONFIG\_GCC\_PLUGIN\_STRUCTLEAK\_BYREF\_ALL |kconfig| y |ELISA\_safety|GCC, plugins, Stack memory:Uninitialized variables| FAIL: not found CONFIG\_INIT\_STACK\_ALL |kconfig| y |ELISA\_safety|Stack memory:Uninitialized variables| FAIL: not found CONFIG\_BPF\_UNPRIV\_DEFAULT\_OFF |kconfig| y |ELISA\_safety|Kernel Memory:Isolation of critical code| FAIL: not found CONFIG\_SCHED\_STACK\_END\_CHECK |kconfig| y |ELISA\_safety, Intel|Stack memory:Stack overflow| FAIL: "is not set" CONFIG\_GCC\_PLUGIN\_STACKLEAK |kconfig| y |ELISA\_safety|Stack memory:Stack overflow| FAIL: not found CONFIG\_PAGE\_POISONING |kconfig| y |ELISA\_safety|Stack memory:Stack overflow| FAIL: "is not set" CONFIG\_PAGE\_POISONING\_NO\_SANITY |kconfig| n |ELISA\_safety|Stack memory:Stack overflow| FAIL: not found CONFIG\_DEBUG\_SG |kconfig| y |ELISA\_safety|Driver: Heap overflow| FAIL: "is not set" CONFIG\_KMEM |kconfig| n | Intel |Kernel Memory:Kernel corruption of user space memory| FAIL: not found CONFIG\_DEVMEM |kconfig| n |ELISA\_safety, Intel|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_DEVPORT |kconfig| n |ELISA\_safety, Intel|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_ACPI\_CUSTOM\_METHOD |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_LEGACY\_PTYS |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_HIBERNATION |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_KEXEC |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_HARDENED\_USERCOPY\_FALLBACK |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_HARDENED\_USERCOPY\_PAGESPAN |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: not found CONFIG\_COMPAT\_BRK |kconfig| n |ELISA\_safety|Heap memory:R/W access to memory allocated to another software element| FAIL: "is not set" CONFIG\_USERFAULTFD |kconfig| n |ELISA\_safety|Heap memory:R/W access to memory allocated to another software element| FAIL: "y" CONFIG\_DEBUG\_WX |kconfig| y |ELISA\_safety|Kernel Memory:W+X access to memory pages| FAIL: "is not set" CONFIG\_BPF\_UNPRIV\_DEFAULT\_OFF |kconfig| n |ELISA\_safety|Branch Target Buffer:Side Channel Attacks| FAIL: not found CONFIG\_LIVEPATCH |kconfig| n |ELISA\_safety| Live Patch | FAIL: "y" CONFIG\_DEVKMEM |kconfig| y |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_SECURITY\_WRITABLE\_HOOKS |kconfig| n |ELISA\_security|Linux Security Module| FAIL: "y" CONFIG\_SECURITY\_PATH |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set" CONFIG\_LSM\_MMAP\_MIN\_ADDR |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "65535" CONFIG\_STATIC\_USERMODEHELPER |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set" CONFIG\_STATIC\_USERMODEHELPER\_PATH |kconfig| y |ELISA\_security|Linux Security Module| FAIL: not found CONFIG\_DEFAULT\_SECURITY\_DAC |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set" CONFIG\_SECURITY\_APPARMOR |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set"  [+] Config check is finished: 'OK' - 22 (suppressed in output) / 'FAIL' - 34 |

8. **Debian 10: config-4.19.0-16-cloud-amd64-aws-debian-10**

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| Plaintext wenhui.zhang@n231-227-105:~/kconfig-safety-check$ ./bin/kconfig-safety-check -p X86\_64 -c ./config\_files/aws/config-4.19.0-16-cloud-amd64-aws-debian-10 -m show\_fail -e prod [+] Special report mode: show\_fail [+] Kconfig file to check: ./config\_files/aws/config-4.19.0-16-cloud-amd64-aws-debian-10 [+] Detected architecture: X86\_64 [+] Detected kernel version: 4.19 =========================================================================================================================  option name | type |desired val | decision | reason | check result ========================================================================================================================= CONFIG\_SLAB\_MERGE\_DEFAULT |kconfig| n |ELISA\_safety, Intel|Memory management:Heap:Use after free| FAIL: "y" CONFIG\_SHUFFLE\_PAGE\_ALLOCATOR |kconfig| y |ELISA\_safety, Intel|Memory management:Heap:Use after free| FAIL: not found CONFIG\_GCC\_PLUGIN\_STRUCTKLEAK |kconfig| y |ELISA\_safety|GCC, plugins, Stack memory:Uninitialized variables| FAIL: not found CONFIG\_GCC\_PLUGIN\_STRUCTLEAK\_BYREF\_ALL |kconfig| y |ELISA\_safety|GCC, plugins, Stack memory:Uninitialized variables| FAIL: not found CONFIG\_INIT\_STACK\_ALL |kconfig| y |ELISA\_safety|Stack memory:Uninitialized variables| FAIL: not found CONFIG\_BPF\_JIT\_ALWAYS\_ON |kconfig| y |ELISA\_safety|Kernel Memory:Isolation of critical code| FAIL: "is not set" CONFIG\_BPF\_UNPRIV\_DEFAULT\_OFF |kconfig| y |ELISA\_safety|Kernel Memory:Isolation of critical code| FAIL: not found CONFIG\_GCC\_PLUGIN\_STACKLEAK |kconfig| y |ELISA\_safety|Stack memory:Stack overflow| FAIL: not found CONFIG\_PAGE\_POISONING |kconfig| y |ELISA\_safety|Stack memory:Stack overflow| FAIL: "is not set" CONFIG\_PAGE\_POISONING\_NO\_SANITY |kconfig| n |ELISA\_safety|Stack memory:Stack overflow| FAIL: not found CONFIG\_DEBUG\_SG |kconfig| y |ELISA\_safety|Driver: Heap overflow| FAIL: "is not set" CONFIG\_KMEM |kconfig| n | Intel |Kernel Memory:Kernel corruption of user space memory| FAIL: not found CONFIG\_DEVMEM |kconfig| n |ELISA\_safety, Intel|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_DEVPORT |kconfig| n |ELISA\_safety, Intel|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_ACPI\_CUSTOM\_METHOD |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_LEGACY\_PTYS |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_HIBERNATION |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_KEXEC |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "y" CONFIG\_HARDENED\_USERCOPY\_FALLBACK |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_HARDENED\_USERCOPY\_PAGESPAN |kconfig| n |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_COMPAT\_BRK |kconfig| n |ELISA\_safety|Heap memory:R/W access to memory allocated to another software element| FAIL: "is not set" CONFIG\_USERFAULTFD |kconfig| n |ELISA\_safety|Heap memory:R/W access to memory allocated to another software element| FAIL: "y" CONFIG\_BPF\_UNPRIV\_DEFAULT\_OFF |kconfig| n |ELISA\_safety|Branch Target Buffer:Side Channel Attacks| FAIL: not found CONFIG\_LIVEPATCH |kconfig| n |ELISA\_safety| Live Patch | FAIL: "y" CONFIG\_DEVKMEM |kconfig| y |ELISA\_safety|Kernel Memory:Kernel corruption of user space memory| FAIL: "is not set" CONFIG\_SECURITY\_WRITABLE\_HOOKS |kconfig| n |ELISA\_security|Linux Security Module| FAIL: not found CONFIG\_INTEL\_TXT |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set" CONFIG\_LSM\_MMAP\_MIN\_ADDR |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "65536" CONFIG\_STATIC\_USERMODEHELPER |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set" CONFIG\_STATIC\_USERMODEHELPER\_PATH |kconfig| y |ELISA\_security|Linux Security Module| FAIL: not found CONFIG\_DEFAULT\_SECURITY\_DAC |kconfig| y |ELISA\_security|Linux Security Module| FAIL: "is not set"  [+] Config check is finished: 'OK' - 25 (suppressed in output) / 'FAIL' - 31 |