



# TEST REPORT SEAPATH YOCTO

Receiver: SEAPATH

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# Chapter 1. List of supported equipment

## 1.1. Virtualization

- Welotec
  - [RSAPC Mk2](#)

## 1.2. Containerization

- Aaeon
  - [ARM I.MX8P-2G](#)

# Chapter 2. Introduction

The purpose of this document is to certify the correct operation of the open source real-time operating system for virtualizing IEDs: SEAPATH, a project under the governance of the Linux Foundation Energy.

A series of tests has been carried out on a range of equipment from several vendors, in order to certify SEAPATH on them. Certified in virtualization functions, security, real-time functionality and network latency of IEC61850 Sampled Values.

# Chapter 3. Welotec

## 3.1. RSAPC Mk2

### 3.1.1. Setup Information

- **kernel version:** Linux-6.1.112-rt43-mainline-rt-x86\_64-with-glibc2.39 #1 SMP PREEMPT\_RT Mon Oct 14 00:55:35 UTC 2024
- **boot options:** BOOT\_IMAGE=/bzImage root=PARTUUID=40fd63a5-0614-41cf-a6bb-fcd238c50af1 efi=runtime rootwait console=ttyS0,115200 console=tty0 audit=0 slab\_nomerge slub\_debug=ZF rootfstype=ext4 page\_poison=on spec\_store\_bypass\_disable=auto mds=full,nosmt mce=0 page\_alloc.shuffle=1 rng\_core.default\_quality=500 init=/sbin/init.sh default\_hugepagesz=1G hugepagesz=1G skew\_tick=1 rcutree.kthread\_prio=10 kvm.halt\_poll\_ns=0 isolcpus=4-N nohz\_full=4-N rcu\_nocbs=4-N
- **CPU architecture:** x86\_64
- **Number of physical CPUs:** 8
- **RAM:** 65588860 kB

### 3.1.2. System Capabilities and Hardening

- Purpose of the tests
  - Virtualization
    - Check processor support for hardware virtualization technologies (Intel VT-x or AMD-V)
    - Ensure hardware virtualization is enabled in UEFI settings
    - Verify KVM kernel module is enabled
  - Network
    - Ensure network drivers are operational
    - Verify SEAPATH's network infrastructure tools, such as OpenVSwitch, are operational
  - Clustering
    - If the machine is part of a cluster
  - Update
    - Ensure that the system is upgradable using SWUpdate

#### Tests common security for yoctoCI

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00106 | Check /etc/passwd permissions                             | PASS    |
| SEAPATH-00107 | Check /etc/shadow permissions                             | PASS    |
| SEAPATH-00108 | Check /etc/syslog-ng/ca.d/cacert.pem permissions          | PASS    |
| SEAPATH-00049 | Check /etc/ssh/ssh_host_ed25519_key permissions           | PASS    |
| SEAPATH-00090 | Check /etc/ssh/ssh_host_rsa_key permissions               | PASS    |
| SEAPATH-00193 | All directories writable by all users have the sticky bit | PASS    |
| SEAPATH-00194 | All directories writable by all users are owned by root   | PASS    |
| SEAPATH-00195 | Ceph OSD are owned by ceph                                | PASS    |
| SEAPATH-00196 | No unexpected file has setuid/setgid enabled              | PASS    |
| SEAPATH-00200 | Check for files with no user or group                     | PASS    |
| SEAPATH-00088 | root password was randomized at boot                      | PASS    |
| SEAPATH-00089 | root password is randomized at each boot                  | PASS    |
| SEAPATH-00091 | root password is encrypted as sha512                      | PASS    |
| SEAPATH-00092 | bash timeout is set read-only to 300s                     | PASS    |
| SEAPATH-00093 | sshd forbids setting environment variables                | PASS    |
| SEAPATH-00094 | sshd server time-out is set to 300s of client inactivity  | PASS    |
| SEAPATH-00095 | shadow encrypts passwords with SHA512 by default          | PASS    |
| SEAPATH-00096 | shadow encryption uses at least 65536 rounds              | PASS    |
| SEAPATH-00097 | pam password authentication uses sha512 with 65536 rounds | PASS    |
| SEAPATH-00098 | password set to expire after 90 days                      | PASS    |
| SEAPATH-00099 | 'su' is denied  | PASS    |
| SEAPATH-00100 | /etc/securetty is empty                                   | PASS    |

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00101 | PAM securetty module is active in 'login' policy                      | PASS    |
| SEAPATH-00157 | PATH env. variable is correctly set                                   | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SECURITY_YAMA is enabled                   | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : DEBUG_WX is enabled                        | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SECURITY_DMESG_RESTRICT is enabled         | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : PAGE_TABLE_ISOLATION is enabled            | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : RETPOLINE is enabled                       | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : LEGACY_VSYSCALL_NONE is enabled            | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : STATIC_USERMODEHELPER is enabled           | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : USERFAULTFD is disabled                    | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : X86_VSYSCALL_EMULATION is disabled         | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : MODIFY_LDT_SYSCALL is disabled             | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : DEVMEM is disabled                         | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : USELIB is disabled                         | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : KEXEC is disabled                          | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : BINfmt_MISC is disabled                    | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : ALLOW_DEV_COREDUMP is disabled             | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : PROC_KCORE is disabled                     | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : KALLSYMS is disabled                       | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SLUB_DEBUG_ON is enabled                   | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SLAB_FREELIST_RANDOM is enabled            | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SLAB_FREELIST_HARDENED is enabled          | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SLUB_DEBUG_ON is enabled                   | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : HARDENED_USERCOPY is enabled               | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : FORTIFY_SOURCE is enabled                  | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : PAGE_POISONING is enabled                  | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SHUFFLE_PAGE_ALLOCATOR is enabled          | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : RANDOMIZE_KSTACK_OFFSET_DEFAULT is enabled | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : INIT_ON_ALLOC_DEFAULT_ON is enabled        | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : INIT_ON_FREE_DEFAULT_ON is enabled         | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : CC_HAS_AUTO_VAR_INIT_ZERO is enabled       | PASS    |
| SEAPATH-00050 | Linux kernel 'gcc_plugins' : GCC_PLUGIN_LATENT_ENTROPY is enabled     | PASS    |
| SEAPATH-00050 | Linux kernel 'gcc_plugins' : GCC_PLUGIN_RANDSTRUCT is enabled         | PASS    |
| SEAPATH-00008 | Linux cmdline 'hardening' : slab_nomerge is enabled                   | PASS    |
| SEAPATH-00008 | Linux cmdline 'hardening' : slub_debug is ZF                          | PASS    |
| SEAPATH-00008 | Linux cmdline 'hardening' : page_poison is on                         | PASS    |
| SEAPATH-00008 | Linux cmdline 'hardening' : spec_store_bypass_disable is auto         | PASS    |
| SEAPATH-00008 | Linux cmdline 'hardening' : mds is full,nosmt                         | PASS    |
| SEAPATH-00008 | Linux cmdline 'hardening' : mce is 0                                  | PASS    |
| SEAPATH-00008 | Linux cmdline 'hardening' : page_alloc.shuffle is 1                   | PASS    |



| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00008 | Linux cmdline 'hardening' : rng_core.default_quality is 500   | PASS    |
| SEAPATH-00158 | sudo policy is installed for group operator (operator)  | PASS    |
| SEAPATH-00159 | sudo policy is installed for group maintenance-N1 (maint-n1)  | PASS    |
| SEAPATH-00160 | sudo policy is installed for group maintenance-N3 (maint-n3)  | PASS    |
| SEAPATH-00161 | sudo policy is installed for group cluster administrator (admincluster)                               | PASS    |
| SEAPATH-00162 | sudo policy is installed for group system administrator (adminsys)                                    | PASS    |
| SEAPATH-00163 | sudo policy is installed for group ansible (ansible)  | PASS    |
| SEAPATH-00164 | sudo requires password for group operator (operator)  | PASS    |
| SEAPATH-00165 | sudo requires password for group maintenance-N1 (maint-n1)  | PASS    |
| SEAPATH-00166 | sudo requires password for group maintenance-N3 (maint-n3)  | PASS    |
| SEAPATH-00167 | sudo requires password for group administrator (admincluster)   | PASS    |
| SEAPATH-00168 | sudo requires password for group super-administrator (adminsys)                                       | PASS    |
| SEAPATH-00169 | sudo requires password for group ansible (ansible)  | PASS    |
| SEAPATH-00029 | pam namespaces configured for login   | PASS    |
| SEAPATH-00037 | /tmp namespaces configured  | PASS    |
| SEAPATH-00036 | pam namespaces configured for sshd  | PASS    |
| SEAPATH-00103 | /usr/bin/sudo exists  | PASS    |
| SEAPATH-00104 | /usr/bin/sudo belongs to group privileged   | PASS    |
| SEAPATH-00105 | /usr/bin/sudo has permissions 4750  | PASS    |
| SEAPATH-00143 | /etc/sudoers include noexec directive   | PASS    |
| SEAPATH-00144 | /etc/sudoers include requiretty directive   | PASS    |
| SEAPATH-00145 | /etc/sudoers include use_pty directive  | PASS    |
| SEAPATH-00146 | /etc/sudoers include umask=0027 directive   | PASS    |
| SEAPATH-00147 | /etc/sudoers include ignore_dot directive   | PASS    |
| SEAPATH-00148 | /etc/sudoers include env_reset directive  | PASS    |
| SEAPATH-00149 | /etc/sudoers include passwd_timeout=1 directive   | PASS    |
| SEAPATH-00150 | /etc/sudoers - all commands require authentication  | PASS    |
| SEAPATH-00151 | /etc/sudoers - no rule target root user   | PASS    |
| SEAPATH-00152 | /etc/sudoers - EXEC option is not used  | PASS    |
| SEAPATH-00153 | /etc/sudoers - rules are not defined by negation  | PASS    |
| SEAPATH-00154 | /etc/sudoers - commands are not specified without arguments   | PASS    |
| SEAPATH-00155 | /etc/sudoers - no command is specified with wildcard argument   | PASS    |
| SEAPATH-00156 | /etc/sudoers - /etc/sudoers is owned by root:root with 0440 permissions                               | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/admincluster - all commands require authentication                                     | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/admincluster - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/admincluster - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/admincluster - rules are not defined by negation                                       | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/admincluster - commands are not specified without arguments                            | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/admincluster - no command is specified with wildcard argument                          | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/admincluster - /etc/sudoers.d/admincluster is owned by root:root with 0440 permissions | PASS    |

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00150 | /etc/sudoers.d/operator - all commands require authentication                                     | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/operator - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/operator - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/operator - rules are not defined by negation                                       | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/operator - commands are not specified without arguments                            | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/operator - no command is specified with wildcard argument                          | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/operator - /etc/sudoers.d/operator is owned by root:root with 0440 permissions     | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/maint-n3 - all commands require authentication                                     | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/maint-n3 - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/maint-n3 - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/maint-n3 - rules are not defined by negation                                       | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/maint-n3 - commands are not specified without arguments                            | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/maint-n3 - no command is specified with wildcard argument                          | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/maint-n3 - /etc/sudoers.d/maint-n3 is owned by root:root with 0440 permissions     | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/privileged - all commands require authentication                                   | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/privileged - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/privileged - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/privileged - rules are not defined by negation                                     | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/privileged - commands are not specified without arguments                          | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/privileged - no command is specified with wildcard argument                        | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/privileged - /etc/sudoers.d/privileged is owned by root:root with 0440 permissions | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/adminsys - all commands require authentication                                     | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/adminsys - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/adminsys - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/adminsys - rules are not defined by negation                                       | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/adminsys - commands are not specified without arguments                            | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/adminsys - no command is specified with wildcard argument                          | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/adminsys - /etc/sudoers.d/adminsys is owned by root:root with 0440 permissions     | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/snmp - all commands require authentication   | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/snmp - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/snmp - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/snmp - rules are not defined by negation   | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/snmp - commands are not specified without arguments                                | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/snmp - no command is specified with wildcard argument                              | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/snmp - /etc/sudoers.d/snmp is owned by root:root with 0440 permissions             | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/maint-n1 - all commands require authentication                                     | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/maint-n1 - no rule target root user  | PASS    |

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00152 | /etc/sudoers.d/maint-n1 - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/maint-n1 - rules are not defined by negation                                       | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/maint-n1 - commands are not specified without arguments                            | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/maint-n1 - no command is specified with wildcard argument                          | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/maint-n1 - /etc/sudoers.d/maint-n1 is owned by root:root with 0440 permissions     | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/cockpit - all commands require authentication                                      | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/cockpit - no rule target root user   | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/cockpit - EXEC option is not used  | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/cockpit - rules are not defined by negation  | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/cockpit - commands are not specified without arguments                             | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/cockpit - no command is specified with wildcard argument                           | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/cockpit - /etc/sudoers.d/cockpit is owned by root:root with 0440 permissions       | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/emergadmin - all commands require authentication                                   | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/emergadmin - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/emergadmin - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/emergadmin - rules are not defined by negation                                     | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/emergadmin - commands are not specified without arguments                          | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/emergadmin - no command is specified with wildcard argument                        | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/emergadmin - /etc/sudoers.d/emergadmin is owned by root:root with 0440 permissions | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/admin - all commands require authentication  | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/admin - no rule target root user   | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/admin - EXEC option is not used  | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/admin - rules are not defined by negation  | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/admin - commands are not specified without arguments                               | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/admin - no command is specified with wildcard argument                             | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/admin - /etc/sudoers.d/admin is owned by root:root with 0440 permissions           | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/ansible - all commands require authentication                                      | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/ansible - no rule target root user   | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/ansible - EXEC option is not used  | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/ansible - rules are not defined by negation  | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/ansible - commands are not specified without arguments                             | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/ansible - no command is specified with wildcard argument                           | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/ansible - /etc/sudoers.d/ansible is owned by root:root with 0440 permissions       | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.modules_disabled is set properly  | PASS    |
| SEAPATH-00109 | sysctl-hardening - dev.tty.ldisc_autoload is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - fs.protected_fifos is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - fs.protected_regular is set properly   | PASS    |

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00109 | sysctl-hardening - fs.protected_hardlinks is set properly                   | PASS    |
| SEAPATH-00109 | sysctl-hardening - fs.protected_symlinks is set properly                    | PASS    |
| SEAPATH-00109 | sysctl-hardening - fs.suid_dumpable is set properly                         | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.dmesg_restrict is set properly                    | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.kptr_restrict is set properly                     | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.perf_event_paranoid is set properly               | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.randomize_va_space is set properly                | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.sysrq is set properly                             | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.unprivileged_bpf_disabled is set properly         | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.yama.ptrace_scope is set properly                 | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.perf_event_max_sample_rate is set properly        | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.perf_cpu_time_max_percent is set properly         | PASS    |
| SEAPATH-00109 | sysctl-hardening - vm.mmap_min_addr is set properly                         | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.pid_max is set properly                           | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.panic_on_oops is set properly                     | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.accept_redirects is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.accept_source_route is set properly      | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.log_martians is set properly             | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.rp_filter is set properly                | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.secure_redirects is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.send_redirects is set properly           | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.shared_media is set properly             | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.accept_redirects is set properly     | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.accept_source_route is set properly  | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.log_martians is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.rp_filter is set properly            | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.secure_redirects is set properly     | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.send_redirects is set properly       | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.shared_media is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.icmp_echo_ignore_broadcasts is set properly       | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.icmp_ignore_bogus_error_responses is set properly | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_invalid_ratelimit is set properly             | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_max_syn_backlog is set properly               | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_rfc1337 is set properly                       | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_syn_retries is set properly                   | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_synack_retries is set properly                | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_syncookies is set properly                    | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_timestamps is set properly                    | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.ip_local_port_range is set properly               | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_challenge_ack_limit is set properly           | PASS    |

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.accept_ra is set properly                | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.accept_ra_defrtr is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.accept_ra_pinfo is set properly          | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.accept_redirects is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.accept_source_route is set properly      | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.autoconf is set properly                 | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.dad_transmits is set properly            | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.forwarding is set properly               | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.max_addresses is set properly            | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.router_solicitations is set properly     | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.use_tempaddr is set properly             | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.accept_ra is set properly            | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.accept_ra_defrtr is set properly     | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.accept_ra_pinfo is set properly      | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.accept_redirects is set properly     | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.accept_source_route is set properly  | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.autoconf is set properly             | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.dad_transmits is set properly        | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.forwarding is set properly           | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.max_addresses is set properly        | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.router_solicitations is set properly | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.use_tempaddr is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.netfilter.nf_conntrack_max is set properly             | PASS    |
| SEAPATH-00109 | sysctl-network - net.netfilter.nf_conntrack_tcp_loose is set properly       | PASS    |
| SEAPATH-00176 | Check kptr_restrict is set to 2   | PASS    |
| SEAPATH-00177 | Check dmesg_restrict is set to 1  | PASS    |
| SEAPATH-00178 | Check pid_max is set to 4194304   | PASS    |
| SEAPATH-00179 | Check perf_cpu_time_max_percent is set to 1                                 | PASS    |
| SEAPATH-00180 | Check perf_event_max_sample_rate is set to 1                                | PASS    |
| SEAPATH-00181 | Check perf_event_paranoid is set to 3                                       | PASS    |
| SEAPATH-00182 | Check randomize_va_space is set to 2  | PASS    |
| SEAPATH-00183 | Check sysrq is set to 0   | PASS    |
| SEAPATH-00184 | Check unprivileged_bpf_disabled is set to 1                                 | PASS    |
| SEAPATH-00185 | Check panic_on_oops is set to 1   | PASS    |
| SEAPATH-00186 | Check kernel.yama.ptrace_scope is set to 2                                  | PASS    |
| SEAPATH-00187 | Check suid_dumpable is set to 0   | PASS    |
| SEAPATH-00188 | Check protected_fifos is set to 2   | PASS    |
| SEAPATH-00189 | Check protected_regular is set to 2   | PASS    |
| SEAPATH-00190 | Check protected_symlinks is set to 1  | PASS    |
| SEAPATH-00191 | Check protected_hardlinks is set to 1                                       | PASS    |

| Test ID       | Tests  | Results |
|---------------|--|---------|
| SEAPATH-00192 | Check modules_disabled is set to 1             | PASS    |
| SEAPATH-00082 | /var/log is mounted on a separate partition    | PASS    |
| SEAPATH-00085 | syslog-ng can not acquire new privileges       | PASS    |
| SEAPATH-00086 | syslog-ng capabilities are bounded             | PASS    |
| SEAPATH-00087 | syslog-ng system calls are filtered            | PASS    |
| SEAPATH-00050 | Linux kernel 'misc' : EFI_PARTITION is enabled | PASS    |
| SEAPATH-00050 | Linux kernel 'reporting' : EDAC is enabled     | PASS    |
| SEAPATH-00050 | Linux kernel 'usb' : USB_OHCI_HCD is enabled   | PASS    |
| SEAPATH-00050 | Linux kernel 'usb' : USB_EHCI_HCD is enabled   | PASS    |
| SEAPATH-00050 | Linux kernel 'usb' : USB_XHCI_HCD is enabled   | PASS    |
| SEAPATH-00171 | no RT throttling triggered                     | PASS    |
| SEAPATH-00078 | no paging error                                | PASS    |
| SEAPATH-00079 | no rcu stall                                   | PASS    |
| SEAPATH-00080 | no backtraces                                  | PASS    |
| SEAPATH-00075 | kernel is PREEMPT RT                           | PASS    |
| SEAPATH-00076 | kernel is realtime                             | PASS    |
| SEAPATH-00081 | kernel is >= 4.19.106                          | PASS    |
| SEAPATH-00083 | syslog-ng service is running                   | PASS    |
| SEAPATH-00084 | /var/log/syslog is used as log target          | PASS    |
| SEAPATH-00102 | no systemd services have failed                | PASS    |
| SEAPATH-00170 | no systemd syntax warning                      | PASS    |

- number of tests: 209
- number of failures: 0

### Tests hypervisor functionality for yoctoCI

| Test ID       | Tests  | Results |
|---------------|--|---------|
| SEAPATH-00027 | auditd is inactive                                     | PASS    |
| SEAPATH-00028 | Current CPU supports 'no-execute'                      | PASS    |
| SEAPATH-00028 | Current CPU supports 'Intel virtualization'            | PASS    |
| SEAPATH-00028 | Current CPU supports 'hugepages'                       | PASS    |
| SEAPATH-00028 | Current CPU supports '64bit'                           | PASS    |
| SEAPATH-00044 | Check /etc/syslog-ng/cert.d/clientcert.pem permissions | PASS    |
| SEAPATH-00045 | Check /etc/syslog-ng/cert.d/clientkey.pem permissions  | PASS    |
| SEAPATH-00030 | iommu enabled in passthrough mode                      | PASS    |
| SEAPATH-00031 | iommu is loaded  | PASS    |
| SEAPATH-00032 | iommu is populated                                     | PASS    |
| SEAPATH-00050 | Linux kernel 'iommu' : INTEL_IOMMU is enabled          | PASS    |
| SEAPATH-00050 | Linux kernel 'iommu' : AMD_IOMMU is enabled            | PASS    |
| SEAPATH-00050 | Linux kernel 'iommu' : AMD_IOMMU_V2 is enabled         | PASS    |



| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00050 | Linux kernel 'iommu' : IOMMU_IOVA is enabled                      | PASS    |
| SEAPATH-00050 | Linux kernel 'iommu' : DMAR_TABLE is enabled                      | PASS    |
| SEAPATH-00050 | Linux kernel 'ovs' : OPENVSWITCH is enabled                       | PASS    |
| SEAPATH-00050 | Linux kernel 'ovs' : OPENVSWITCH_GRE is enabled                   | PASS    |
| SEAPATH-00050 | Linux kernel 'ovs' : OPENVSWITCH_VXLAN is enabled                 | PASS    |
| SEAPATH-00050 | Linux kernel 'ovs' : OPENVSWITCH_GENEVE is enabled                | PASS    |
| SEAPATH-00050 | Linux kernel 'ovs' : TRIM_UNUSED_KSYMS is disabled                | PASS    |
| SEAPATH-00050 | Linux kernel 'ovs' : NET_IPGRE is enabled                         | PASS    |
| SEAPATH-00050 | Linux kernel 'dpdk' : UIO is enabled                              | PASS    |
| SEAPATH-00050 | Linux kernel 'dpdk' : VFIO_PCI is enabled                         | PASS    |
| SEAPATH-00050 | Linux kernel 'hardware' : IGB is enabled                          | PASS    |
| SEAPATH-00050 | Linux kernel 'hardware' : TIGON3 is enabled                       | PASS    |
| SEAPATH-00050 | Linux kernel 'hardware' : R8169 is enabled                        | PASS    |
| SEAPATH-00050 | Linux kernel 'hardware' : E1000 is enabled                        | PASS    |
| SEAPATH-00050 | Linux kernel 'hardware' : E1000E is enabled                       | PASS    |
| SEAPATH-00050 | Linux kernel 'hardware' : X86_PKG_TEMP_THERMAL is enabled         | PASS    |
| SEAPATH-00050 | Linux kernel 'ceph' : AIO is enabled                              | PASS    |
| SEAPATH-00050 | Linux kernel 'ceph' : TMPFS is enabled                            | PASS    |
| SEAPATH-00050 | Linux kernel 'ceph' : MD is enabled                               | PASS    |
| SEAPATH-00050 | Linux kernel 'kvm' : KVM is enabled                               | PASS    |
| SEAPATH-00050 | Linux kernel 'kvm' : KVM_INTEL is enabled                         | PASS    |
| SEAPATH-00050 | Linux kernel 'kvm' : KVM_VFIO is enabled                          | PASS    |
| SEAPATH-00003 | libvirtd service is running                                       | PASS    |
| SEAPATH-00035 | openvswitch service is running                                    | PASS    |
| SEAPATH-00038 | lspci 3.6.2+ is available   | PASS    |
| SEAPATH-00140 | rootfs is readonly mounted  | PASS    |
| SEAPATH-00141 | /etc is mounted as overlayfs                                      | PASS    |
| SEAPATH-00141 | /home is mounted as overlayfs                                     | PASS    |
| SEAPATH-00141 | /usr/lib/python3.12/site-packages/pycache is mounted as overlayfs | PASS    |
| SEAPATH-00141 | /var/cache is mounted as overlayfs                                | PASS    |
| SEAPATH-00141 | /var/lib is mounted as overlayfs                                  | PASS    |
| SEAPATH-00141 | /var/spool is mounted as overlayfs                                | PASS    |
| SEAPATH-00142 | Kernel OVERLAY_FS is set  | PASS    |
| SEAPATH-00018 | KVM device available  | PASS    |
| SEAPATH-00019 | Qemu for x86-64 available   | PASS    |
| SEAPATH-00020 | Libvirtd service is running                                       | PASS    |
| SEAPATH-00021 | IPv4 NAT is available   | PASS    |
| SEAPATH-00022 | IPv6 NAT is available   | PASS    |

- number of tests: 51
- number of failures: 0

## Tests hypervisor security for yoctoCI

| Test ID       | Tests  | Results |
|---------------|--|---------|
| SEAPATH-00033 | /etc/group is consistent                                       | PASS    |
| SEAPATH-00034 | /etc/group does not include extra group                        | PASS    |
| SEAPATH-00006 | Audit subsystem is disabled on cmdline                         | PASS    |
| SEAPATH-00009 | Kernel Page Table Isolation is enabled on kernel configuration | PASS    |
| SEAPATH-00004 | libvirtd can not acquire new privileges                        | PASS    |
| SEAPATH-00005 | libvirtd capabilities are bounded                              | PASS    |
| SEAPATH-00125 | libvirtd system calls are filtered                             | PASS    |
| SEAPATH-00039 | openvswitch user is created and locked                         | PASS    |
| SEAPATH-00040 | openvswitch user is part of hugepages group                    | PASS    |
| SEAPATH-00041 | openvswitch user is part of vfio-net group                     | PASS    |
| SEAPATH-00042 | ovs-vswitchd is running as user openvswitch                    | PASS    |
| SEAPATH-00043 | ovsdb-server is running as user openvswitch                    | PASS    |
| SEAPATH-00126 | ovs-vswitchd system calls are filtered                         | PASS    |
| SEAPATH-00127 | ovsdb-server system calls are filtered                         | PASS    |
| SEAPATH-00047 | /etc/passwd is consistent                                      | PASS    |
| SEAPATH-00048 | /etc/passwd does not include extra user                        | PASS    |
| SEAPATH-00046 | /etc/shadow is consistent                                      | PASS    |
| SEAPATH-00015 | Vulnerabilities sysfs entry exist                              | PASS    |
| SEAPATH-00017 | System is not vulnerable to : meltdown                         | PASS    |
| SEAPATH-00017 | System is not vulnerable to : l1tf                             | PASS    |
| SEAPATH-00017 | System is not vulnerable to : spectre_v1                       | PASS    |
| SEAPATH-00017 | System is not vulnerable to : spectre_v2                       | PASS    |
| SEAPATH-00012 | admin user exists  | PASS    |
| SEAPATH-00013 | admin has a password   | PASS    |
| SEAPATH-00014 | admin is sudoers   | PASS    |
| SEAPATH-00023 | SPICE protocol is not installed                                | PASS    |

- number of tests: 25
- number of failures: 0

## Tests update for yoctoCI

| Test ID       | Tests  | Results |
|---------------|--|---------|
| SEAPATH-00007 | grub password is set                               | PASS    |
| SEAPATH-00077 | boot partition is only readable by root            | PASS    |
| SEAPATH-00115 | /dev/upgradable_bootloader exists                  | PASS    |
| SEAPATH-00116 | /dev/upgradable_rootfs exists                      | PASS    |
| SEAPATH-00117 | /dev/upgradable_bootloader points to inactive bank | PASS    |
| SEAPATH-00118 | /dev/upgradable_rootfs points to inactive bank     | PASS    |



- number of tests: 6
- number of failures: 0

### 3.1.3. ANSSI-BP28 Compliance

Matrix include/ANSSI-BP28-M-Recommendations.csv for yoctoCI

| Requirement    | Test id       | Status |
|----------------|---------------|--------|
| ANSSI-BP28-R30 | SEAPATH-00033 | PASS   |
|                | SEAPATH-00034 | PASS   |
|                | SEAPATH-00046 | PASS   |
|                | SEAPATH-00047 | PASS   |
|                | SEAPATH-00048 | PASS   |
| ANSSI-BP28-R31 | SEAPATH-00088 | PASS   |
|                | SEAPATH-00089 | PASS   |
|                | SEAPATH-00091 | PASS   |
| ANSSI-BP28-R53 | SEAPATH-00200 | PASS   |
| ANSSI-BP28-R54 | SEAPATH-00193 | PASS   |
|                | SEAPATH-00194 | PASS   |
|                | SEAPATH-00195 | PASS   |
| ANSSI-BP28-R68 | SEAPATH-00091 | PASS   |
|                | SEAPATH-00095 | PASS   |
|                | SEAPATH-00096 | PASS   |
|                | SEAPATH-00097 | PASS   |
| ANSSI-BP28-R80 | SEAPATH-00003 | PASS   |
|                | SEAPATH-00020 | PASS   |
|                | SEAPATH-00035 | PASS   |
|                | SEAPATH-00083 | PASS   |
|                | SEAPATH-00125 | PASS   |
|                | SEAPATH-00126 | PASS   |
|                | SEAPATH-00127 | PASS   |

Matrix include/ANSSI-BP28-MI-Recommendations.csv for yoctoCI

| Requirement    | Test id       | Status |
|----------------|---------------|--------|
| ANSSI-BP28-R1  | SEAPATH-00015 | PASS   |
|                | SEAPATH-00017 | PASS   |
|                | SEAPATH-00028 | PASS   |
|                | SEAPATH-00030 | PASS   |
|                | SEAPATH-00031 | PASS   |
|                | SEAPATH-00032 | PASS   |
|                | SEAPATH-00050 | PASS   |
| ANSSI-BP28-R11 | SEAPATH-00050 | PASS   |
|                | SEAPATH-00109 | PASS   |
|                | SEAPATH-00186 | PASS   |
| ANSSI-BP28-R12 | SEAPATH-00109 | PASS   |

| Requirement    | Test id       | Status |
|----------------|---------------|--------|
| ANSSI-BP28-R13 | SEAPATH-00109 | PASS   |
| ANSSI-BP28-R14 | SEAPATH-00109 | PASS   |
|                | SEAPATH-00187 | PASS   |
|                | SEAPATH-00188 | PASS   |
|                | SEAPATH-00189 | PASS   |
|                | SEAPATH-00190 | PASS   |
|                | SEAPATH-00191 | PASS   |
| ANSSI-BP28-R28 | SEAPATH-00082 | PASS   |
|                | SEAPATH-00140 | PASS   |
|                | SEAPATH-00141 | PASS   |
| ANSSI-BP28-R32 | SEAPATH-00092 | PASS   |
|                | SEAPATH-00094 | PASS   |
| ANSSI-BP28-R34 | SEAPATH-00033 | PASS   |
|                | SEAPATH-00034 | PASS   |
|                | SEAPATH-00046 | PASS   |
|                | SEAPATH-00047 | PASS   |
|                | SEAPATH-00048 | PASS   |
| ANSSI-BP28-R35 | SEAPATH-00033 | PASS   |
|                | SEAPATH-00034 | PASS   |
|                | SEAPATH-00039 | PASS   |
|                | SEAPATH-00046 | PASS   |
|                | SEAPATH-00047 | PASS   |
|                | SEAPATH-00048 | PASS   |
| ANSSI-BP28-R39 | SEAPATH-00143 | PASS   |
|                | SEAPATH-00144 | PASS   |
|                | SEAPATH-00145 | PASS   |
|                | SEAPATH-00146 | PASS   |
|                | SEAPATH-00147 | PASS   |
|                | SEAPATH-00148 | PASS   |
| ANSSI-BP28-R40 | SEAPATH-00151 | PASS   |
| ANSSI-BP28-R42 | SEAPATH-00153 | PASS   |
| ANSSI-BP28-R43 | SEAPATH-00154 | PASS   |
|                | SEAPATH-00155 | PASS   |
| ANSSI-BP28-R44 | SEAPATH-00156 | PASS   |
| ANSSI-BP28-R5  | SEAPATH-00007 | PASS   |

| Requirement    | Test id       | Status |
|----------------|---------------|--------|
| ANSSI-BP28-R50 | SEAPATH-00044 | PASS   |
|                | SEAPATH-00045 | PASS   |
|                | SEAPATH-00049 | PASS   |
|                | SEAPATH-00090 | PASS   |
|                | SEAPATH-00106 | PASS   |
|                | SEAPATH-00107 | PASS   |
|                | SEAPATH-00108 | PASS   |
|                | SEAPATH-00156 | PASS   |
| ANSSI-BP28-R52 | SEAPATH-00040 | PASS   |
|                | SEAPATH-00041 | PASS   |
| ANSSI-BP28-R55 | SEAPATH-00011 | ABSENT |
|                | SEAPATH-00029 | PASS   |
|                | SEAPATH-00036 | PASS   |
|                | SEAPATH-00037 | PASS   |
| ANSSI-BP28-R79 | SEAPATH-00004 | PASS   |
|                | SEAPATH-00005 | PASS   |
|                | SEAPATH-00023 | PASS   |
|                | SEAPATH-00085 | PASS   |
|                | SEAPATH-00086 | PASS   |
| ANSSI-BP28-R8  | SEAPATH-00008 | PASS   |
|                | SEAPATH-00050 | PASS   |
| ANSSI-BP28-R9  | SEAPATH-00109 | PASS   |
|                | SEAPATH-00176 | PASS   |
|                | SEAPATH-00177 | PASS   |
|                | SEAPATH-00178 | PASS   |
|                | SEAPATH-00179 | PASS   |
|                | SEAPATH-00180 | PASS   |
|                | SEAPATH-00181 | PASS   |
|                | SEAPATH-00182 | PASS   |
|                | SEAPATH-00183 | PASS   |
|                | SEAPATH-00184 | PASS   |
|                | SEAPATH-00185 | PASS   |

Matrix include/ANSSI-BP28-MIE-Recommendations.csv for yoctoCI

| Requirement    | Test id       | Status |
|----------------|---------------|--------|
| ANSSI-BP28-R10 | SEAPATH-00109 | PASS   |
|                | SEAPATH-00192 | PASS   |
| ANSSI-BP28-R29 | SEAPATH-00077 | PASS   |
| ANSSI-BP28-R36 | SEAPATH-00146 | PASS   |

| Requirement    | Test id       | Status |
|----------------|---------------|--------|
| ANSSI-BP28-R37 | SEAPATH-00005 | PASS   |
|                | SEAPATH-00084 | PASS   |
|                | SEAPATH-00085 | PASS   |
|                | SEAPATH-00086 | PASS   |
|                | SEAPATH-00125 | PASS   |
|                | SEAPATH-00126 | PASS   |
|                | SEAPATH-00127 | PASS   |
| ANSSI-BP28-R38 | SEAPATH-00104 | PASS   |
| ANSSI-BP28-R41 | SEAPATH-00152 | PASS   |
| ANSSI-BP28-R56 | SEAPATH-00196 | PASS   |
| ANSSI-BP28-R64 | SEAPATH-00004 | PASS   |
|                | SEAPATH-00005 | PASS   |
|                | SEAPATH-00085 | PASS   |
|                | SEAPATH-00086 | PASS   |
| ANSSI-BP28-R7  | SEAPATH-00030 | PASS   |
|                | SEAPATH-00031 | PASS   |
|                | SEAPATH-00032 | PASS   |
|                | SEAPATH-00050 | PASS   |
| ANSSI-BP28-R71 | SEAPATH-00082 | PASS   |
|                | SEAPATH-00083 | PASS   |
|                | SEAPATH-00084 | PASS   |
|                | SEAPATH-00102 | PASS   |
| ANSSI-BP28-R78 | SEAPATH-00039 | PASS   |
|                | SEAPATH-00040 | PASS   |
|                | SEAPATH-00041 | PASS   |
|                | SEAPATH-00042 | PASS   |
|                | SEAPATH-00043 | PASS   |
|                | SEAPATH-00085 | PASS   |
|                | SEAPATH-00086 | PASS   |

For more information, please refer to [LF Energy wiki page](#).

### 3.1.4. Virtual Machine (VM) Deployment

- Purpose of the tests
  - Deploy and test two VMs
    - One real-time and isolated
    - One non-real-time and non-isolated
  - Use VMs for
    - Real-time (cyclic test)
    - SV IEC61850 packet network latency tests

#### Tests common security for guest0

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00106 | Check /etc/passwd permissions                                 | PASS    |
| SEAPATH-00107 | Check /etc/shadow permissions                                 | PASS    |
| SEAPATH-00108 | Check /etc/syslog-ng/ca.d/cacert.pem permissions              | PASS    |
| SEAPATH-00049 | Check /etc/ssh/ssh_host_ed25519_key permissions               | PASS    |
| SEAPATH-00090 | Check /etc/ssh/ssh_host_rsa_key permissions                   | PASS    |
| SEAPATH-00193 | All directories writable by all users have the sticky bit     | PASS    |
| SEAPATH-00194 | All directories writable by all users are owned by root       | PASS    |
| SEAPATH-00195 | Ceph OSD are owned by ceph                                    | PASS    |
| SEAPATH-00088 | root password was randomized at boot                          | PASS    |
| SEAPATH-00089 | root password is randomized at each boot                      | PASS    |
| SEAPATH-00091 | root password is encrypted as sha512                          | PASS    |
| SEAPATH-00092 | bash timeout is set read-only to 300s                         | PASS    |
| SEAPATH-00093 | sshd forbids setting environment variables                    | PASS    |
| SEAPATH-00094 | sshd server time-out is set to 300s of client inactivity      | PASS    |
| SEAPATH-00095 | shadow encrypts passwords with SHA512 by default              | PASS    |
| SEAPATH-00096 | shadow encryption uses at least 65536 rounds                  | PASS    |
| SEAPATH-00097 | pam password authentication uses sha512 with 65536 rounds     | PASS    |
| SEAPATH-00098 | password set to expire after 90 days                          | PASS    |
| SEAPATH-00099 | 'su' is denied  | PASS    |
| SEAPATH-00100 | /etc/securetty is empty                                       | PASS    |
| SEAPATH-00101 | PAM securetty module is active in 'login' policy              | PASS    |
| SEAPATH-00157 | PATH env. variable is correctly set                           | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SECURITY_YAMA is enabled           | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : DEBUG_WX is enabled                | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SECURITY_DMESG_RESTRICT is enabled | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : PAGE_TABLE_ISOLATION is enabled    | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : RETPOLINE is enabled               | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : LEGACY_VSYSCALL_NONE is enabled    | PASS    |

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00050 | Linux kernel 'hardening' : STATIC_USERMODEHELPER is enabled             | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : USERFAULTFD is disabled                      | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : X86_VSYSCALL_EMULATION is disabled           | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : MODIFY_LDT_SYSCALL is disabled               | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : DEVMEM is disabled                           | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : USELIB is disabled                           | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : KEXEC is disabled                            | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : BINfmt_MISC is disabled                      | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : ALLOW_DEV_COREDUMP is disabled               | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : PROC_KCORE is disabled                       | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : KALLSYMS is disabled                         | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SLUB_DEBUG_ON is enabled                     | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SLAB_FREELIST_RANDOM is enabled              | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SLAB_FREELIST_HARDENED is enabled            | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SLUB_DEBUG_ON is enabled                     | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : HARDENED_USERCOPY is enabled                 | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : FORTIFY_SOURCE is enabled                    | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : PAGE_POISONING is enabled                    | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : RANDOMIZE_KSTACK_OFFSET_DEFAULT is enabled   | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : INIT_ON_ALLOC_DEFAULT_ON is enabled          | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : INIT_ON_FREE_DEFAULT_ON is enabled           | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : CC_HAS_AUTO_VAR_INIT_ZERO is enabled         | PASS    |
| SEAPATH-00050 | Linux kernel 'gcc_plugins' : GCC_PLUGIN_LATENT_ENTROPY is enabled       | PASS    |
| SEAPATH-00050 | Linux kernel 'gcc_plugins' : GCC_PLUGIN_RANDSTRUCT is enabled           | PASS    |
| SEAPATH-00158 | sudo policy is installed for group operator (operator)                  | PASS    |
| SEAPATH-00159 | sudo policy is installed for group maintenance-N1 (maint-n1)            | PASS    |
| SEAPATH-00160 | sudo policy is installed for group maintenance-N3 (maint-n3)            | PASS    |
| SEAPATH-00161 | sudo policy is installed for group cluster administrator (admincluster) | PASS    |
| SEAPATH-00162 | sudo policy is installed for group system administrator (adminsys)      | PASS    |
| SEAPATH-00163 | sudo policy is installed for group ansible (ansible)                    | PASS    |
| SEAPATH-00164 | sudo requires password for group operator (operator)                    | PASS    |
| SEAPATH-00165 | sudo requires password for group maintenance-N1 (maint-n1)              | PASS    |
| SEAPATH-00166 | sudo requires password for group maintenance-N3 (maint-n3)              | PASS    |
| SEAPATH-00167 | sudo requires password for group administrator (admincluster)           | PASS    |
| SEAPATH-00168 | sudo requires password for group super-administrator (adminsys)         | PASS    |
| SEAPATH-00169 | sudo requires password for group ansible (ansible)                      | PASS    |
| SEAPATH-00103 | /usr/bin/sudo exists  | PASS    |
| SEAPATH-00104 | /usr/bin/sudo belongs to group privileged                               | PASS    |
| SEAPATH-00105 | /usr/bin/sudo has permissions 4750                                      | PASS    |
| SEAPATH-00143 | /etc/sudoers include noexec directive                                   | PASS    |

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00144 | /etc/sudoers include requiretty directive   | PASS    |
| SEAPATH-00145 | /etc/sudoers include use_pty directive  | PASS    |
| SEAPATH-00146 | /etc/sudoers include umask=0027 directive   | PASS    |
| SEAPATH-00147 | /etc/sudoers include ignore_dot directive   | PASS    |
| SEAPATH-00148 | /etc/sudoers include env_reset directive  | PASS    |
| SEAPATH-00149 | /etc/sudoers include passwd_timeout=1 directive   | PASS    |
| SEAPATH-00150 | /etc/sudoers - all commands require authentication  | PASS    |
| SEAPATH-00151 | /etc/sudoers - no rule target root user   | PASS    |
| SEAPATH-00152 | /etc/sudoers - EXEC option is not used  | PASS    |
| SEAPATH-00153 | /etc/sudoers - rules are not defined by negation  | PASS    |
| SEAPATH-00154 | /etc/sudoers - commands are not specified without arguments                                   | PASS    |
| SEAPATH-00155 | /etc/sudoers - no command is specified with wildcard argument                                 | PASS    |
| SEAPATH-00156 | /etc/sudoers - /etc/sudoers is owned by root:root with 0440 permissions                       | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/ansible - all commands require authentication                                  | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/ansible - no rule target root user   | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/ansible - EXEC option is not used  | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/ansible - rules are not defined by negation                                    | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/ansible - commands are not specified without arguments                         | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/ansible - no command is specified with wildcard argument                       | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/ansible - /etc/sudoers.d/ansible is owned by root:root with 0440 permissions   | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/admin - all commands require authentication                                    | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/admin - no rule target root user   | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/admin - EXEC option is not used  | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/admin - rules are not defined by negation                                      | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/admin - commands are not specified without arguments                           | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/admin - no command is specified with wildcard argument                         | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/admin - /etc/sudoers.d/admin is owned by root:root with 0440 permissions       | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/maint-n1 - all commands require authentication                                 | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/maint-n1 - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/maint-n1 - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/maint-n1 - rules are not defined by negation                                   | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/maint-n1 - commands are not specified without arguments                        | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/maint-n1 - no command is specified with wildcard argument                      | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/maint-n1 - /etc/sudoers.d/maint-n1 is owned by root:root with 0440 permissions | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/privileged - all commands require authentication                               | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/privileged - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/privileged - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/privileged - rules are not defined by negation                                 | PASS    |



| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00154 | /etc/sudoers.d/privileged - commands are not specified without arguments                              | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/privileged - no command is specified with wildcard argument                            | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/privileged - /etc/sudoers.d/privileged is owned by root:root with 0440 permissions     | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/operator - all commands require authentication   | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/operator - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/operator - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/operator - rules are not defined by negation   | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/operator - commands are not specified without arguments                                | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/operator - no command is specified with wildcard argument                              | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/operator - /etc/sudoers.d/operator is owned by root:root with 0440 permissions         | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/admincluster - all commands require authentication                                     | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/admincluster - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/admincluster - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/admincluster - rules are not defined by negation                                       | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/admincluster - commands are not specified without arguments                            | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/admincluster - no command is specified with wildcard argument                          | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/admincluster - /etc/sudoers.d/admincluster is owned by root:root with 0440 permissions | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/adminsys - all commands require authentication   | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/adminsys - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/adminsys - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/adminsys - rules are not defined by negation   | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/adminsys - commands are not specified without arguments                                | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/adminsys - no command is specified with wildcard argument                              | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/adminsys - /etc/sudoers.d/adminsys is owned by root:root with 0440 permissions         | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/maint-n3 - all commands require authentication   | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/maint-n3 - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/maint-n3 - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/maint-n3 - rules are not defined by negation   | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/maint-n3 - commands are not specified without arguments                                | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/maint-n3 - no command is specified with wildcard argument                              | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/maint-n3 - /etc/sudoers.d/maint-n3 is owned by root:root with 0440 permissions         | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/emergadmin - all commands require authentication                                       | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/emergadmin - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/emergadmin - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/emergadmin - rules are not defined by negation   | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/emergadmin - commands are not specified without arguments                              | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/emergadmin - no command is specified with wildcard argument                            | PASS    |

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00156 | /etc/sudoers.d/emergadmin - /etc/sudoers.d/emergadmin is owned by root:root with 0440 permissions | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.modules_disabled is set properly  | PASS    |
| SEAPATH-00109 | sysctl-hardening - dev.tty.ldisc_autoload is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - fs.protected_fifos is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - fs.protected_regular is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - fs.protected_hardlinks is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - fs.protected_symlinks is set properly  | PASS    |
| SEAPATH-00109 | sysctl-hardening - fs.suid_dumpable is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.dmesg_restrict is set properly  | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.kptr_restrict is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.perf_event Paranoid is set properly                                     | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.randomize_va_space is set properly                                      | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.sysrq is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.unprivileged_bpf_disabled is set properly                               | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.yama.ptrace_scope is set properly                                       | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.perf_event_max_sample_rate is set properly                              | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.perf_cpu_time_max_percent is set properly                               | PASS    |
| SEAPATH-00109 | sysctl-hardening - vm.mmap_min_addr is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.pid_max is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.panic_on_oops is set properly   | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.accept_redirects is set properly                               | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.accept_source_route is set properly                            | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.log_martians is set properly                                   | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.rp_filter is set properly                                      | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.secure_redirects is set properly                               | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.send_redirects is set properly                                 | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.shared_media is set properly                                   | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.accept_redirects is set properly                           | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.accept_source_route is set properly                        | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.log_martians is set properly                               | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.rp_filter is set properly                                  | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.secure_redirects is set properly                           | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.send_redirects is set properly                             | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.shared_media is set properly                               | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.icmp_echo_ignore_broadcasts is set properly                             | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.icmp_ignore_bogus_error_responses is set properly                       | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_invalid_ratelimit is set properly                                   | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_max_syn_backlog is set properly                                     | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_rfc1337 is set properly   | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_syn_retries is set properly   | PASS    |

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_synack_retries is set properly                | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_syncookies is set properly                    | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_timestamps is set properly                    | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.ip_local_port_range is set properly               | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_challenge_ack_limit is set properly           | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.accept_ra is set properly                | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.accept_ra_defrtr is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.accept_ra_pinfo is set properly          | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.accept_redirects is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.accept_source_route is set properly      | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.autoconf is set properly                 | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.dad_transmits is set properly            | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.forwarding is set properly               | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.max_addresses is set properly            | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.router_solicitations is set properly     | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.use_tempaddr is set properly             | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.accept_ra is set properly            | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.accept_ra_defrtr is set properly     | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.accept_ra_pinfo is set properly      | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.accept_redirects is set properly     | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.accept_source_route is set properly  | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.autoconf is set properly             | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.dad_transmits is set properly        | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.forwarding is set properly           | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.max_addresses is set properly        | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.router_solicitations is set properly | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.use_tempaddr is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.netfilter.nf_conntrack_max is set properly             | PASS    |
| SEAPATH-00109 | sysctl-network - net.netfilter.nf_conntrack_tcp_loose is set properly       | PASS    |
| SEAPATH-00176 | Check kptr_restrict is set to 2   | PASS    |
| SEAPATH-00177 | Check dmesg_restrict is set to 1  | PASS    |
| SEAPATH-00178 | Check pid_max is set to 4194304   | PASS    |
| SEAPATH-00179 | Check perf_cpu_time_max_percent is set to 1                                 | PASS    |
| SEAPATH-00180 | Check perf_event_max_sample_rate is set to 1                                | PASS    |
| SEAPATH-00181 | Check perf_event_paranoid is set to 3                                       | PASS    |
| SEAPATH-00182 | Check randomize_va_space is set to 2  | PASS    |
| SEAPATH-00183 | Check sysrq is set to 0   | PASS    |
| SEAPATH-00184 | Check unprivileged_bpf_disabled is set to 1                                 | PASS    |
| SEAPATH-00185 | Check panic_on_oops is set to 1   | PASS    |
| SEAPATH-00186 | Check kernel.yama.ptrace_scope is set to 2                                  | PASS    |

| Test ID       | Tests  | Results |
|---------------|--|---------|
| SEAPATH-00187 | Check suid_dumpable is set to 0                | PASS    |
| SEAPATH-00188 | Check protected_fifos is set to 2              | PASS    |
| SEAPATH-00189 | Check protected_regular is set to 2            | PASS    |
| SEAPATH-00190 | Check protected_symlinks is set to 1           | PASS    |
| SEAPATH-00191 | Check protected_hardlinks is set to 1          | PASS    |
| SEAPATH-00192 | Check modules_disabled is set to 1             | PASS    |
| SEAPATH-00082 | /var/log is mounted on a separate partition    | PASS    |
| SEAPATH-00085 | syslog-ng can not acquire new privileges       | PASS    |
| SEAPATH-00086 | syslog-ng capabilities are bounded             | PASS    |
| SEAPATH-00087 | syslog-ng system calls are filtered            | PASS    |
| SEAPATH-00050 | Linux kernel 'misc' : EFI_PARTITION is enabled | PASS    |
| SEAPATH-00050 | Linux kernel 'reporting' : EDAC is enabled     | PASS    |
| SEAPATH-00050 | Linux kernel 'usb' : USB_OHCI_HCD is enabled   | PASS    |
| SEAPATH-00050 | Linux kernel 'usb' : USB_EHCI_HCD is enabled   | PASS    |
| SEAPATH-00050 | Linux kernel 'usb' : USB_XHCI_HCD is enabled   | PASS    |
| SEAPATH-00171 | no RT throttling triggered                     | PASS    |
| SEAPATH-00078 | no paging error                                | PASS    |
| SEAPATH-00079 | no rcu stall                                   | PASS    |
| SEAPATH-00080 | no backtraces                                  | PASS    |
| SEAPATH-00075 | kernel is PREEMPT RT                           | PASS    |
| SEAPATH-00076 | kernel is realtime                             | PASS    |
| SEAPATH-00081 | kernel is >= 4.19.106                          | PASS    |
| SEAPATH-00083 | syslog-ng service is running                   | PASS    |
| SEAPATH-00084 | /var/log/syslog is used as log target          | PASS    |
| SEAPATH-00102 | no systemd services have failed                | PASS    |
| SEAPATH-00170 | no systemd syntax warning                      | PASS    |

- number of tests: 181
- number of failures: 0

### Tests common security for guest1

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00106 | Check /etc/passwd permissions                             | PASS    |
| SEAPATH-00107 | Check /etc/shadow permissions                             | PASS    |
| SEAPATH-00108 | Check /etc/syslog-ng/ca.d/cacert.pem permissions          | PASS    |
| SEAPATH-00049 | Check /etc/ssh/ssh_host_ed25519_key permissions           | PASS    |
| SEAPATH-00090 | Check /etc/ssh/ssh_host_rsa_key permissions               | PASS    |
| SEAPATH-00193 | All directories writable by all users have the sticky bit | PASS    |
| SEAPATH-00194 | All directories writable by all users are owned by root   | PASS    |
| SEAPATH-00195 | Ceph OSD are owned by ceph                                | PASS    |

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00088 | root password was randomized at boot                                  | PASS    |
| SEAPATH-00089 | root password is randomized at each boot                              | PASS    |
| SEAPATH-00091 | root password is encrypted as sha512                                  | PASS    |
| SEAPATH-00092 | bash timeout is set read-only to 300s                                 | PASS    |
| SEAPATH-00093 | sshd forbids setting environment variables                            | PASS    |
| SEAPATH-00094 | sshd server time-out is set to 300s of client inactivity              | PASS    |
| SEAPATH-00095 | shadow encrypts passwords with SHA512 by default                      | PASS    |
| SEAPATH-00096 | shadow encryption uses at least 65536 rounds                          | PASS    |
| SEAPATH-00097 | pam password authentication uses sha512 with 65536 rounds             | PASS    |
| SEAPATH-00098 | password set to expire after 90 days                                  | PASS    |
| SEAPATH-00099 | 'su' is denied  | PASS    |
| SEAPATH-00100 | /etc/securetty is empty   | PASS    |
| SEAPATH-00101 | PAM securetty module is active in 'login' policy                      | PASS    |
| SEAPATH-00157 | PATH env. variable is correctly set                                   | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SECURITY_YAMA is enabled                   | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : DEBUG_WX is enabled                        | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SECURITY_DMESG_RESTRICT is enabled         | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : PAGE_TABLE_ISOLATION is enabled            | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : RETPOLINE is enabled                       | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : LEGACY_VSYSCALL_NONE is enabled            | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : STATIC_USERMODEHELPER is enabled           | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : USERFAULTFD is disabled                    | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : X86_VSYSCALL_EMULATION is disabled         | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : MODIFY_LDT_SYSCALL is disabled             | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : DEVMEM is disabled                         | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : USELIB is disabled                         | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : KEXEC is disabled                          | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : BINFMT_MISC is disabled                    | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : ALLOW_DEV_COREDUMP is disabled             | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : PROC_KCORE is disabled                     | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : KALLSYMS is disabled                       | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SLUB_DEBUG_ON is enabled                   | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SLAB_FREELIST_RANDOM is enabled            | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SLAB_FREELIST_HARDENED is enabled          | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SLUB_DEBUG_ON is enabled                   | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : HARDENED_USERCOPY is enabled               | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : FORTIFY_SOURCE is enabled                  | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : PAGE_POISONING is enabled                  | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : RANDOMIZE_KSTACK_OFFSET_DEFAULT is enabled | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : INIT_ON_ALLOC_DEFAULT_ON is enabled        | PASS    |

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00050 | Linux kernel 'hardening' : INIT_ON_FREE_DEFAULT_ON is enabled                               | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : CC_HAS_AUTO_VAR_INIT_ZERO is enabled                             | PASS    |
| SEAPATH-00050 | Linux kernel 'gcc_plugins' : GCC_PLUGIN_LATENT_ENTROPY is enabled                           | PASS    |
| SEAPATH-00050 | Linux kernel 'gcc_plugins' : GCC_PLUGIN_RANDSTRUCT is enabled                               | PASS    |
| SEAPATH-00158 | sudo policy is installed for group operator (operator)                                      | PASS    |
| SEAPATH-00159 | sudo policy is installed for group maintenance-N1 (maint-n1)                                | PASS    |
| SEAPATH-00160 | sudo policy is installed for group maintenance-N3 (maint-n3)                                | PASS    |
| SEAPATH-00161 | sudo policy is installed for group cluster administrator (admincluster)                     | PASS    |
| SEAPATH-00162 | sudo policy is installed for group system administrator (adminsys)                          | PASS    |
| SEAPATH-00163 | sudo policy is installed for group ansible (ansible)  | PASS    |
| SEAPATH-00164 | sudo requires password for group operator (operator)  | PASS    |
| SEAPATH-00165 | sudo requires password for group maintenance-N1 (maint-n1)                                  | PASS    |
| SEAPATH-00166 | sudo requires password for group maintenance-N3 (maint-n3)                                  | PASS    |
| SEAPATH-00167 | sudo requires password for group administrator (admincluster)                               | PASS    |
| SEAPATH-00168 | sudo requires password for group super-administrator (adminsys)                             | PASS    |
| SEAPATH-00169 | sudo requires password for group ansible (ansible)  | PASS    |
| SEAPATH-00103 | /usr/bin/sudo exists  | PASS    |
| SEAPATH-00104 | /usr/bin/sudo belongs to group privileged   | PASS    |
| SEAPATH-00105 | /usr/bin/sudo has permissions 4750  | PASS    |
| SEAPATH-00143 | /etc/sudoers include noexec directive   | PASS    |
| SEAPATH-00144 | /etc/sudoers include requiretty directive   | PASS    |
| SEAPATH-00145 | /etc/sudoers include use_pty directive  | PASS    |
| SEAPATH-00146 | /etc/sudoers include umask=0027 directive   | PASS    |
| SEAPATH-00147 | /etc/sudoers include ignore_dot directive   | PASS    |
| SEAPATH-00148 | /etc/sudoers include env_reset directive  | PASS    |
| SEAPATH-00149 | /etc/sudoers include passwd_timeout=1 directive   | PASS    |
| SEAPATH-00150 | /etc/sudoers - all commands require authentication  | PASS    |
| SEAPATH-00151 | /etc/sudoers - no rule target root user   | PASS    |
| SEAPATH-00152 | /etc/sudoers - EXEC option is not used  | PASS    |
| SEAPATH-00153 | /etc/sudoers - rules are not defined by negation  | PASS    |
| SEAPATH-00154 | /etc/sudoers - commands are not specified without arguments                                 | PASS    |
| SEAPATH-00155 | /etc/sudoers - no command is specified with wildcard argument                               | PASS    |
| SEAPATH-00156 | /etc/sudoers - /etc/sudoers is owned by root:root with 0440 permissions                     | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/ansible - all commands require authentication                                | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/ansible - no rule target root user   | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/ansible - EXEC option is not used  | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/ansible - rules are not defined by negation                                  | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/ansible - commands are not specified without arguments                       | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/ansible - no command is specified with wildcard argument                     | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/ansible - /etc/sudoers.d/ansible is owned by root:root with 0440 permissions | PASS    |



| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00150 | /etc/sudoers.d/admin - all commands require authentication  | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/admin - no rule target root user   | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/admin - EXEC option is not used  | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/admin - rules are not defined by negation  | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/admin - commands are not specified without arguments                                   | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/admin - no command is specified with wildcard argument                                 | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/admin - /etc/sudoers.d/admin is owned by root:root with 0440 permissions               | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/maint-n1 - all commands require authentication   | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/maint-n1 - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/maint-n1 - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/maint-n1 - rules are not defined by negation   | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/maint-n1 - commands are not specified without arguments                                | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/maint-n1 - no command is specified with wildcard argument                              | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/maint-n1 - /etc/sudoers.d/maint-n1 is owned by root:root with 0440 permissions         | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/privileged - all commands require authentication                                       | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/privileged - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/privileged - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/privileged - rules are not defined by negation   | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/privileged - commands are not specified without arguments                              | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/privileged - no command is specified with wildcard argument                            | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/privileged - /etc/sudoers.d/privileged is owned by root:root with 0440 permissions     | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/operator - all commands require authentication   | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/operator - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/operator - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/operator - rules are not defined by negation   | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/operator - commands are not specified without arguments                                | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/operator - no command is specified with wildcard argument                              | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/operator - /etc/sudoers.d/operator is owned by root:root with 0440 permissions         | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/admincluster - all commands require authentication                                     | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/admincluster - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/admincluster - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/admincluster - rules are not defined by negation                                       | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/admincluster - commands are not specified without arguments                            | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/admincluster - no command is specified with wildcard argument                          | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/admincluster - /etc/sudoers.d/admincluster is owned by root:root with 0440 permissions | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/adminsys - all commands require authentication   | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/adminsys - no rule target root user  | PASS    |

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00152 | /etc/sudoers.d/adminsys - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/adminsys - rules are not defined by negation                                       | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/adminsys - commands are not specified without arguments                            | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/adminsys - no command is specified with wildcard argument                          | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/adminsys - /etc/sudoers.d/adminsys is owned by root:root with 0440 permissions     | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/maint-n3 - all commands require authentication                                     | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/maint-n3 - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/maint-n3 - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/maint-n3 - rules are not defined by negation                                       | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/maint-n3 - commands are not specified without arguments                            | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/maint-n3 - no command is specified with wildcard argument                          | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/maint-n3 - /etc/sudoers.d/maint-n3 is owned by root:root with 0440 permissions     | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/emergadmin - all commands require authentication                                   | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/emergadmin - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/emergadmin - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/emergadmin - rules are not defined by negation                                     | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/emergadmin - commands are not specified without arguments                          | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/emergadmin - no command is specified with wildcard argument                        | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/emergadmin - /etc/sudoers.d/emergadmin is owned by root:root with 0440 permissions | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.modules_disabled is set properly  | PASS    |
| SEAPATH-00109 | sysctl-hardening - dev.tty.ldisc_autoload is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - fs.protected_fifos is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - fs.protected_regular is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - fs.protected_hardlinks is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - fs.protected_symlinks is set properly  | PASS    |
| SEAPATH-00109 | sysctl-hardening - fs.suid_dumpable is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.dmesg_restrict is set properly  | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.kptr_restrict is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.perf_event_paranoid is set properly                                     | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.randomize_va_space is set properly                                      | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.sysrq is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.unprivileged_bpf_disabled is set properly                               | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.yama.ptrace_scope is set properly                                       | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.perf_event_max_sample_rate is set properly                              | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.perf_cpu_time_max_percent is set properly                               | PASS    |
| SEAPATH-00109 | sysctl-hardening - vm.mmap_min_addr is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.pid_max is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.panic_on_oops is set properly   | PASS    |



| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.accept_redirects is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.accept_source_route is set properly      | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.log_martians is set properly             | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.rp_filter is set properly                | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.secure_redirects is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.send_redirects is set properly           | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.shared_media is set properly             | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.accept_redirects is set properly     | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.accept_source_route is set properly  | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.log_martians is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.rp_filter is set properly            | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.secure_redirects is set properly     | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.send_redirects is set properly       | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.shared_media is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.icmp_echo_ignore_broadcasts is set properly       | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.icmp_ignore_bogus_error_responses is set properly | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_invalid_ratelimit is set properly             | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_max_syn_backlog is set properly               | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_rfc1337 is set properly                       | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_syn_retries is set properly                   | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_synack_retries is set properly                | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_syncookies is set properly                    | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_timestamps is set properly                    | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.ip_local_port_range is set properly               | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_challenge_ack_limit is set properly           | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.accept_ra is set properly                | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.accept_ra_defrtr is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.accept_ra_pinfo is set properly          | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.accept_redirects is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.accept_source_route is set properly      | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.autoconf is set properly                 | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.dad_transmits is set properly            | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.forwarding is set properly               | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.max_addresses is set properly            | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.router_solicitations is set properly     | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.use_tempaddr is set properly             | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.accept_ra is set properly            | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.accept_ra_defrtr is set properly     | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.accept_ra_pinfo is set properly      | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.accept_redirects is set properly     | PASS    |

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.accept_source_route is set properly  | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.autoconf is set properly             | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.dad_transmits is set properly        | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.forwarding is set properly           | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.max_addresses is set properly        | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.router_solicitations is set properly | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.use_tempaddr is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.netfilter.nf_conntrack_max is set properly             | PASS    |
| SEAPATH-00109 | sysctl-network - net.netfilter.nf_conntrack_tcp_loose is set properly       | PASS    |
| SEAPATH-00176 | Check kpтр_restrict is set to 2   | PASS    |
| SEAPATH-00177 | Check dmesg_restrict is set to 1  | PASS    |
| SEAPATH-00178 | Check pid_max is set to 4194304   | PASS    |
| SEAPATH-00179 | Check perf_cpu_time_max_percent is set to 1                                 | PASS    |
| SEAPATH-00180 | Check perf_event_max_sample_rate is set to 1                                | PASS    |
| SEAPATH-00181 | Check perf_event_paranoid is set to 3                                       | PASS    |
| SEAPATH-00182 | Check randomize_va_space is set to 2  | PASS    |
| SEAPATH-00183 | Check sysrq is set to 0   | PASS    |
| SEAPATH-00184 | Check unprivileged_bpf_disabled is set to 1                                 | PASS    |
| SEAPATH-00185 | Check panic_on_oops is set to 1   | PASS    |
| SEAPATH-00186 | Check kernel.yama.ptrace_scope is set to 2                                  | PASS    |
| SEAPATH-00187 | Check suid_dumpable is set to 0   | PASS    |
| SEAPATH-00188 | Check protected_fifos is set to 2   | PASS    |
| SEAPATH-00189 | Check protected_regular is set to 2   | PASS    |
| SEAPATH-00190 | Check protected_symlinks is set to 1  | PASS    |
| SEAPATH-00191 | Check protected_hardlinks is set to 1                                       | PASS    |
| SEAPATH-00192 | Check modules_disabled is set to 1  | PASS    |
| SEAPATH-00082 | /var/log is mounted on a separate partition                                 | PASS    |
| SEAPATH-00085 | syslog-ng can not acquire new privileges                                    | PASS    |
| SEAPATH-00086 | syslog-ng capabilities are bounded  | PASS    |
| SEAPATH-00087 | syslog-ng system calls are filtered   | PASS    |
| SEAPATH-00050 | Linux kernel 'misc' : EFI_PARTITION is enabled                              | PASS    |
| SEAPATH-00050 | Linux kernel 'reporting' : EDAC is enabled                                  | PASS    |
| SEAPATH-00050 | Linux kernel 'usb' : USB_OHCI_HCD is enabled                                | PASS    |
| SEAPATH-00050 | Linux kernel 'usb' : USB_EHCI_HCD is enabled                                | PASS    |
| SEAPATH-00050 | Linux kernel 'usb' : USB_XHCI_HCD is enabled                                | PASS    |
| SEAPATH-00171 | no RT throttling triggered  | PASS    |
| SEAPATH-00078 | no paging error   | PASS    |
| SEAPATH-00079 | no rcu stall  | PASS    |
| SEAPATH-00080 | no backtraces   | PASS    |
| SEAPATH-00075 | kernel is PREEMPT RT  | PASS    |

| Test ID       | Tests                                 | Results |
|---------------|---------------------------------------|---------|
| SEAPATH-00076 | kernel is realtime                    | PASS    |
| SEAPATH-00081 | kernel is >= 4.19.106                 | PASS    |
| SEAPATH-00083 | syslog-ng service is running          | PASS    |
| SEAPATH-00084 | /var/log/syslog is used as log target | PASS    |
| SEAPATH-00102 | no systemd services have failed       | PASS    |
| SEAPATH-00170 | no systemd syntax warning             | PASS    |

- number of tests: 181
- number of failures: 0

### 3.1.5. Real-time testing (Cyclictest)

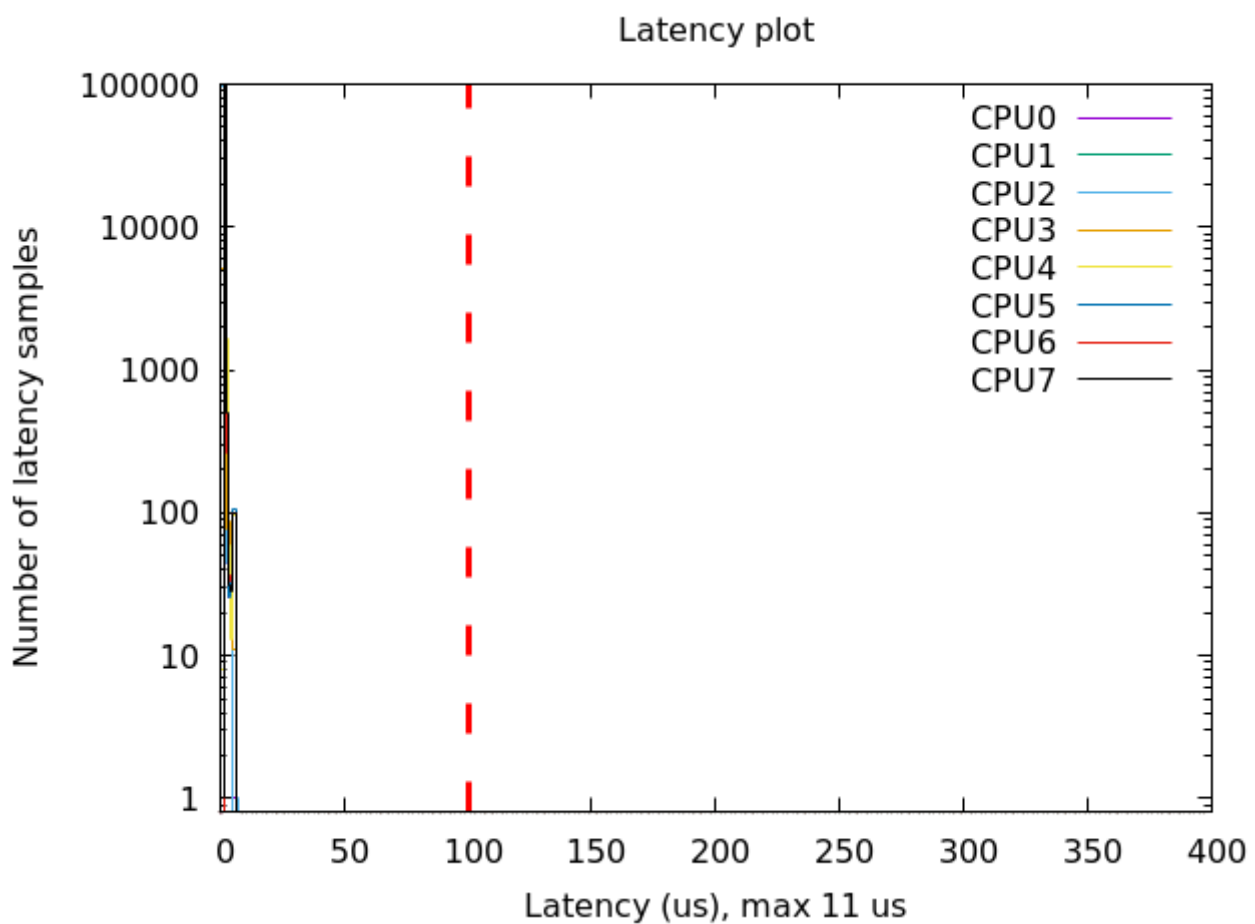
- Purpose of the test
  - Employ Cyclictest to measure real-time system latency
    - Run on isolated CPUs
    - Determine worst-case latencies

The following command is launched:

```
cyclictest -l10000 -m -Sp90 -i200 -h400 -q
```

For more information, please refer to [LF Energy wiki page](#).

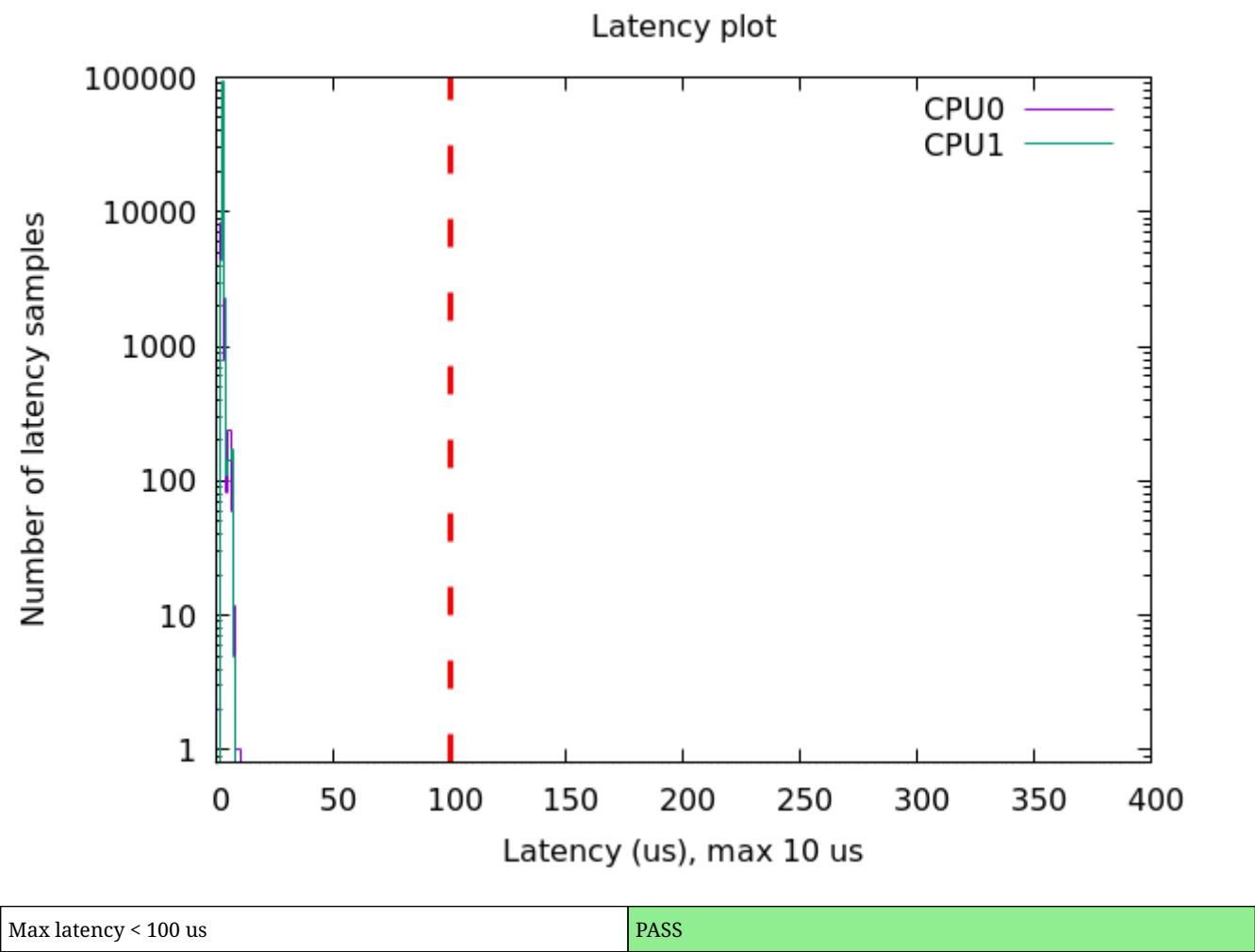
#### Hypervisor



Max latency < 100 us

PASS

Guest 0

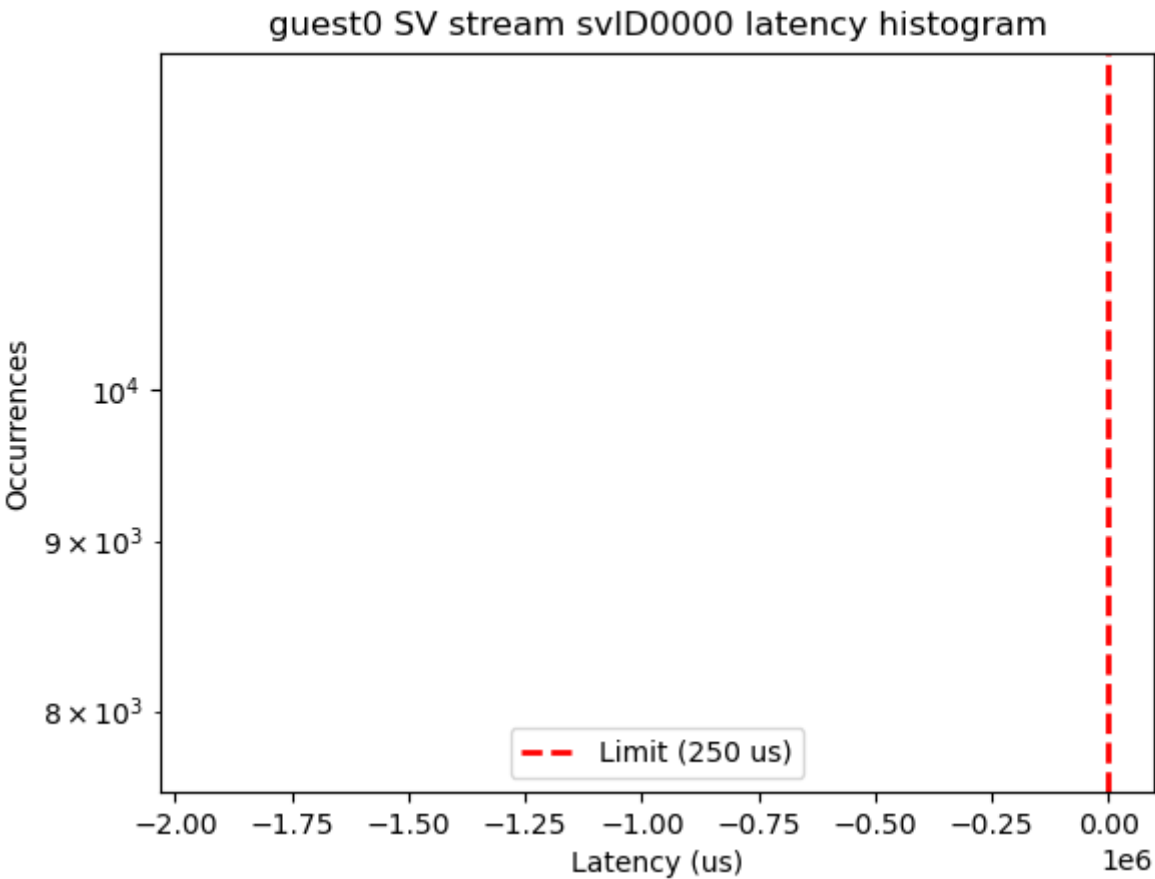


3.1.6. IEC61850 Sampled Value Latency Testing

- Purpose of the test
  - Perform SV IEC61850 packet network latency tests
  - Compute latency between publisher and VM userspace.
- Number of sent IEC61850 Sampled Values streams: 8
- Test duration: 1 minutes

Subscriber guest0

| IEC61850 Sampled Value Stream | Minimum latency | Maximum latency | Average latency |
|-------------------------------|-----------------|-----------------|-----------------|
| svID0000                      | -1934988 us     | -1931771 us     | -1933406.0 us   |



| IEC61850 Sampled Value Stream | Minimum pacing | Maximum pacing | Average pacing |
|-------------------------------|----------------|----------------|----------------|
| svID0000                      | 38 us          | 601 us         | 250.0 us       |

|                      |      |
|----------------------|------|
| Max latency < 250 us | PASS |
| SV dropped           | 0    |

# Chapter 4. Aaeon

## 4.1. ARM I.MX8P-2G

### 4.1.1. Setup Information

- **kernel version:** Linux-5.15.71-lts-next+gc79618144f69-aarch64-with-glibc2.35 #1 SMP PREEMPT Tue Sep 12 22:17:59 UTC 2023
- **boot options:** console=ttyMXC1,115200 root=/dev/mmcblk1p4 rootwait systemd.unified\_cgroup\_hierarchy=0 audit=0 slab\_nomerge slub\_debug=ZF rootfstype=ext4 init=/sbin/init.sh default\_hugepagesz=1G hugepagesz=1G skew\_tick=1 rcutree.kthread\_prio=10 ro
- **CPU architecture:** aarch64
- **Number of physical CPUs:**
- **RAM:** 1701612 kB

## 4.1.2. System Capabilities and Hardening

### Tests common security for yoctoCI-aaeon

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00106 | Check /etc/passwd permissions                                 | PASS    |
| SEAPATH-00107 | Check /etc/shadow permissions                                 | PASS    |
| SEAPATH-00108 | Check /etc/syslog-ng/ca.d/cacert.pem permissions              | PASS    |
| SEAPATH-00049 | Check /etc/ssh/ssh_host_ed25519_key permissions               | PASS    |
| SEAPATH-00090 | Check /etc/ssh/ssh_host_rsa_key permissions                   | PASS    |
| SEAPATH-00193 | All directories writable by all users have the sticky bit     | PASS    |
| SEAPATH-00194 | All directories writable by all users are owned by root       | PASS    |
| SEAPATH-00195 | Ceph OSD are owned by ceph                                    | PASS    |
| SEAPATH-00088 | root password was randomized at boot                          | PASS    |
| SEAPATH-00089 | root password is randomized at each boot                      | PASS    |
| SEAPATH-00091 | root password is encrypted as sha512                          | PASS    |
| SEAPATH-00092 | bash timeout is set read-only to 300s                         | PASS    |
| SEAPATH-00093 | sshd forbids setting environment variables                    | PASS    |
| SEAPATH-00094 | sshd server time-out is set to 300s of client inactivity      | PASS    |
| SEAPATH-00095 | shadow encrypts passwords with SHA512 by default              | PASS    |
| SEAPATH-00096 | shadow encryption uses at least 65536 rounds                  | PASS    |
| SEAPATH-00097 | pam password authentication uses sha512 with 65536 rounds     | PASS    |
| SEAPATH-00098 | password set to expire after 90 days                          | PASS    |
| SEAPATH-00099 | 'su' is denied  | PASS    |
| SEAPATH-00100 | /etc/securetty is empty                                       | PASS    |
| SEAPATH-00101 | PAM securetty module is active in 'login' policy              | PASS    |
| SEAPATH-00157 | PATH env. variable is correctly set                           | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SECURITY_YAMA is enabled           | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : DEBUG_WX is enabled                | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SECURITY_DMESG_RESTRICT is enabled | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : STATIC_USERMODEHELPER is enabled   | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : USERFAULTFD is disabled            | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : DEVMEM is disabled                 | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : USELIB is disabled                 | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : KEXEC is disabled                  | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : BINFORMAT_MISC is disabled         | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : ALLOW_DEV_COREDUMP is disabled     | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : PROC_KCORE is disabled             | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : KALLSYMS is disabled               | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SLUB_DEBUG_ON is enabled           | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SLAB_FREELIST_RANDOM is enabled    | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : SLAB_FREELIST_HARDENED is enabled  | PASS    |



| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00050 | Linux kernel 'hardening' : SLUB_DEBUG_ON is enabled                     | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : HARDENED_USERCOPY is enabled                 | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : FORTIFY_SOURCE is enabled                    | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : PAGE_POISONING is enabled                    | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : RANDOMIZE_KSTACK_OFFSET_DEFAULT is enabled   | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : INIT_ON_ALLOC_DEFAULT_ON is enabled          | PASS    |
| SEAPATH-00050 | Linux kernel 'hardening' : INIT_ON_FREE_DEFAULT_ON is enabled           | PASS    |
| SEAPATH-00050 | Linux kernel 'gcc_plugins' : GCC_PLUGIN_LATENT_ENTROPY is enabled       | PASS    |
| SEAPATH-00050 | Linux kernel 'gcc_plugins' : GCC_PLUGIN_RANDSTRUCT is enabled           | PASS    |
| SEAPATH-00050 | Linux kernel 'gcc_plugins' : GCC_PLUGIN_STRUCTLEAK_BYREF_ALL is enabled | PASS    |
| SEAPATH-00158 | sudo policy is installed for group operator (operator)                  | PASS    |
| SEAPATH-00159 | sudo policy is installed for group maintenance-N1 (maint-n1)            | PASS    |
| SEAPATH-00160 | sudo policy is installed for group maintenance-N3 (maint-n3)            | PASS    |
| SEAPATH-00161 | sudo policy is installed for group cluster administrator (admincluster) | PASS    |
| SEAPATH-00162 | sudo policy is installed for group system administrator (adminsys)      | PASS    |
| SEAPATH-00163 | sudo policy is installed for group ansible (ansible)                    | PASS    |
| SEAPATH-00164 | sudo requires password for group operator (operator)                    | PASS    |
| SEAPATH-00165 | sudo requires password for group maintenance-N1 (maint-n1)              | PASS    |
| SEAPATH-00166 | sudo requires password for group maintenance-N3 (maint-n3)              | PASS    |
| SEAPATH-00167 | sudo requires password for group administrator (admincluster)           | PASS    |
| SEAPATH-00168 | sudo requires password for group super-administrator (adminsys)         | PASS    |
| SEAPATH-00169 | sudo requires password for group ansible (ansible)                      | PASS    |
| SEAPATH-00103 | /usr/bin/sudo exists  | PASS    |
| SEAPATH-00104 | /usr/bin/sudo belongs to group privileged                               | PASS    |
| SEAPATH-00105 | /usr/bin/sudo has permissions 4750                                      | PASS    |
| SEAPATH-00143 | /etc/sudoers include noexec directive                                   | PASS    |
| SEAPATH-00144 | /etc/sudoers include requiretty directive                               | PASS    |
| SEAPATH-00145 | /etc/sudoers include use_pty directive                                  | PASS    |
| SEAPATH-00146 | /etc/sudoers include umask=0027 directive                               | PASS    |
| SEAPATH-00147 | /etc/sudoers include ignore_dot directive                               | PASS    |
| SEAPATH-00148 | /etc/sudoers include env_reset directive                                | PASS    |
| SEAPATH-00149 | /etc/sudoers include passwd_timeout=1 directive                         | PASS    |
| SEAPATH-00150 | /etc/sudoers - all commands require authentication                      | PASS    |
| SEAPATH-00151 | /etc/sudoers - no rule target root user                                 | PASS    |
| SEAPATH-00152 | /etc/sudoers - EXEC option is not used                                  | PASS    |
| SEAPATH-00153 | /etc/sudoers - rules are not defined by negation                        | PASS    |
| SEAPATH-00154 | /etc/sudoers - commands are not specified without arguments             | PASS    |
| SEAPATH-00155 | /etc/sudoers - no command is specified with wildcard argument           | PASS    |
| SEAPATH-00156 | /etc/sudoers - /etc/sudoers is owned by root:root with 0440 permissions | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/maint-n1 - all commands require authentication           | PASS    |

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00151 | /etc/sudoers.d/maint-n1 - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/maint-n1 - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/maint-n1 - rules are not defined by negation   | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/maint-n1 - commands are not specified without arguments                                | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/maint-n1 - no command is specified with wildcard argument                              | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/maint-n1 - /etc/sudoers.d/maint-n1 is owned by root:root with 0440 permissions         | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/ansible - all commands require authentication  | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/ansible - no rule target root user   | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/ansible - EXEC option is not used  | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/ansible - rules are not defined by negation  | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/ansible - commands are not specified without arguments                                 | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/ansible - no command is specified with wildcard argument                               | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/ansible - /etc/sudoers.d/ansible is owned by root:root with 0440 permissions           | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/admincluster - all commands require authentication                                     | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/admincluster - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/admincluster - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/admincluster - rules are not defined by negation                                       | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/admincluster - commands are not specified without arguments                            | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/admincluster - no command is specified with wildcard argument                          | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/admincluster - /etc/sudoers.d/admincluster is owned by root:root with 0440 permissions | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/maint-n3 - all commands require authentication   | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/maint-n3 - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/maint-n3 - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/maint-n3 - rules are not defined by negation   | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/maint-n3 - commands are not specified without arguments                                | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/maint-n3 - no command is specified with wildcard argument                              | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/maint-n3 - /etc/sudoers.d/maint-n3 is owned by root:root with 0440 permissions         | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/operator - all commands require authentication   | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/operator - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/operator - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/operator - rules are not defined by negation   | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/operator - commands are not specified without arguments                                | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/operator - no command is specified with wildcard argument                              | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/operator - /etc/sudoers.d/operator is owned by root:root with 0440 permissions         | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/adminsys - all commands require authentication   | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/adminsys - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/adminsys - EXEC option is not used   | PASS    |

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00153 | /etc/sudoers.d/adminsys - rules are not defined by negation                                       | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/adminsys - commands are not specified without arguments                            | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/adminsys - no command is specified with wildcard argument                          | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/adminsys - /etc/sudoers.d/adminsys is owned by root:root with 0440 permissions     | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/admin - all commands require authentication  | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/admin - no rule target root user   | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/admin - EXEC option is not used  | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/admin - rules are not defined by negation  | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/admin - commands are not specified without arguments                               | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/admin - no command is specified with wildcard argument                             | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/admin - /etc/sudoers.d/admin is owned by root:root with 0440 permissions           | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/emergadmin - all commands require authentication                                   | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/emergadmin - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/emergadmin - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/emergadmin - rules are not defined by negation                                     | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/emergadmin - commands are not specified without arguments                          | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/emergadmin - no command is specified with wildcard argument                        | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/emergadmin - /etc/sudoers.d/emergadmin is owned by root:root with 0440 permissions | PASS    |
| SEAPATH-00150 | /etc/sudoers.d/privileged - all commands require authentication                                   | PASS    |
| SEAPATH-00151 | /etc/sudoers.d/privileged - no rule target root user  | PASS    |
| SEAPATH-00152 | /etc/sudoers.d/privileged - EXEC option is not used   | PASS    |
| SEAPATH-00153 | /etc/sudoers.d/privileged - rules are not defined by negation                                     | PASS    |
| SEAPATH-00154 | /etc/sudoers.d/privileged - commands are not specified without arguments                          | PASS    |
| SEAPATH-00155 | /etc/sudoers.d/privileged - no command is specified with wildcard argument                        | PASS    |
| SEAPATH-00156 | /etc/sudoers.d/privileged - /etc/sudoers.d/privileged is owned by root:root with 0440 permissions | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.modules_disabled is set properly  | PASS    |
| SEAPATH-00109 | sysctl-hardening - dev.tty.ldisc_autoload is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - fs.protected_fifos is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - fs.protected_regular is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - fs.protected_hardlinks is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - fs.protected_symlinks is set properly  | PASS    |
| SEAPATH-00109 | sysctl-hardening - fs.suid_dumpable is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.dmesg_restrict is set properly  | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.kptr_restrict is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.perf_event_paranoid is set properly                                     | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.randomize_va_space is set properly                                      | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.sysrq is set properly   | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.unprivileged_bpf_disabled is set properly                               | PASS    |

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00109 | sysctl-hardening - kernel.yama.ptrace_scope is set properly                 | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.perf_event_max_sample_rate is set properly        | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.perf_cpu_time_max_percent is set properly         | PASS    |
| SEAPATH-00109 | sysctl-hardening - vm.mmap_min_addr is set properly                         | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.pid_max is set properly                           | PASS    |
| SEAPATH-00109 | sysctl-hardening - kernel.panic_on_oops is set properly                     | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.accept_redirects is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.accept_source_route is set properly      | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.log_martians is set properly             | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.rp_filter is set properly                | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.secure_redirects is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.send_redirects is set properly           | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.all.shared_media is set properly             | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.accept_redirects is set properly     | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.accept_source_route is set properly  | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.log_martians is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.rp_filter is set properly            | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.secure_redirects is set properly     | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.send_redirects is set properly       | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.conf.default.shared_media is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.icmp_echo_ignore_broadcasts is set properly       | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.icmp_ignore_bogus_error_responses is set properly | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_invalid_ratelimit is set properly             | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_max_syn_backlog is set properly               | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_rfc1337 is set properly                       | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_syn_retries is set properly                   | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_synack_retries is set properly                | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_syncookies is set properly                    | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_timestamps is set properly                    | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.ip_local_port_range is set properly               | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv4.tcp_challenge_ack_limit is set properly           | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.accept_ra is set properly                | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.accept_ra_defrtr is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.accept_ra_pinfo is set properly          | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.accept_redirects is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.accept_source_route is set properly      | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.autoconf is set properly                 | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.dad_transmits is set properly            | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.forwarding is set properly               | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.max_addresses is set properly            | PASS    |

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.router_solicitations is set properly     | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.all.use_tempaddr is set properly             | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.accept_ra is set properly            | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.accept_ra_defrtr is set properly     | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.accept_ra_pinfo is set properly      | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.accept_redirects is set properly     | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.accept_source_route is set properly  | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.autoconf is set properly             | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.dad_transmits is set properly        | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.forwarding is set properly           | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.max_addresses is set properly        | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.router_solicitations is set properly | PASS    |
| SEAPATH-00109 | sysctl-network - net.ipv6.conf.default.use_tempaddr is set properly         | PASS    |
| SEAPATH-00109 | sysctl-network - net.netfilter.nf_conntrack_max is set properly             | PASS    |
| SEAPATH-00109 | sysctl-network - net.netfilter.nf_conntrack_tcp_loose is set properly       | PASS    |
| SEAPATH-00176 | Check kptr_restrict is set to 2   | PASS    |
| SEAPATH-00177 | Check dmesg_restrict is set to 1  | PASS    |
| SEAPATH-00178 | Check pid_max is set to 4194304   | PASS    |
| SEAPATH-00179 | Check perf_cpu_time_max_percent is set to 1                                 | PASS    |
| SEAPATH-00180 | Check perf_event_max_sample_rate is set to 1                                | PASS    |
| SEAPATH-00181 | Check perf_event_paranoid is set to 3                                       | PASS    |
| SEAPATH-00182 | Check randomize_va_space is set to 2  | PASS    |
| SEAPATH-00183 | Check sysrq is set to 0   | PASS    |
| SEAPATH-00184 | Check unprivileged_bpf_disabled is set to 1                                 | PASS    |
| SEAPATH-00185 | Check panic_on_oops is set to 1   | PASS    |
| SEAPATH-00186 | Check kernel.yama.ptrace_scope is set to 2                                  | PASS    |
| SEAPATH-00187 | Check suid_dumpable is set to 0   | PASS    |
| SEAPATH-00188 | Check protected_fifos is set to 2   | PASS    |
| SEAPATH-00189 | Check protected_regular is set to 2   | PASS    |
| SEAPATH-00190 | Check protected_symlinks is set to 1  | PASS    |
| SEAPATH-00191 | Check protected_hardlinks is set to 1                                       | PASS    |
| SEAPATH-00192 | Check modules_disabled is set to 1  | PASS    |
| SEAPATH-00082 | /var/log is mounted on a separate partition                                 | PASS    |
| SEAPATH-00085 | syslog-ng can not acquire new privileges                                    | PASS    |
| SEAPATH-00086 | syslog-ng capabilities are bounded  | PASS    |
| SEAPATH-00087 | syslog-ng system calls are filtered   | PASS    |
| SEAPATH-00050 | Linux kernel 'misc' : EFI_PARTITION is enabled                              | PASS    |
| SEAPATH-00050 | Linux kernel 'reporting' : EDAC is enabled                                  | PASS    |
| SEAPATH-00050 | Linux kernel 'usb' : USB_OHCI_HCD is enabled                                | PASS    |
| SEAPATH-00050 | Linux kernel 'usb' : USB_EHCI_HCD is enabled                                | PASS    |

| Test ID       | Tests  | Results |
|---------------|--|---------|
| SEAPATH-00050 | Linux kernel 'usb' : USB_XHCI_HCD is enabled | PASS    |
| SEAPATH-00171 | no RT throttling triggered                   | PASS    |
| SEAPATH-00078 | no paging error                              | PASS    |
| SEAPATH-00079 | no rcu stall                                 | PASS    |
| SEAPATH-00080 | no backtraces                                | PASS    |
| SEAPATH-00081 | kernel is >= 4.19.106                        | PASS    |
| SEAPATH-00083 | syslog-ng service is running                 | PASS    |
| SEAPATH-00084 | /var/log/syslog is used as log target        | PASS    |
| SEAPATH-00102 | no systemd services have failed              | PASS    |
| SEAPATH-00170 | no systemd syntax warning                    | PASS    |

- number of tests: 174
- number of failures: 0

### Tests hypervisor functionality for yoctoCI-aaeon

| Test ID       | Tests  | Results |
|---------------|--|---------|
| SEAPATH-00027 | auditd is inactive                                     | PASS    |
| SEAPATH-00044 | Check /etc/syslog-ng/cert.d/clientcert.pem permissions | PASS    |
| SEAPATH-00045 | Check /etc/syslog-ng/cert.d/clientkey.pem permissions  | PASS    |
| SEAPATH-00050 | Linux kernel 'ovs' : OPENVSWITCH is enabled            | PASS    |
| SEAPATH-00050 | Linux kernel 'ovs' : OPENVSWITCH_GRE is enabled        | PASS    |
| SEAPATH-00050 | Linux kernel 'ovs' : OPENVSWITCH_VXLAN is enabled      | PASS    |
| SEAPATH-00050 | Linux kernel 'ovs' : OPENVSWITCH_GENEVE is enabled     | PASS    |
| SEAPATH-00050 | Linux kernel 'ovs' : TRIM_UNUSED_KSYMS is disabled     | PASS    |
| SEAPATH-00050 | Linux kernel 'ovs' : NET_IPGRE is enabled              | PASS    |
| SEAPATH-00050 | Linux kernel 'dpdk' : UIO is enabled                   | PASS    |
| SEAPATH-00050 | Linux kernel 'dpdk' : VFIO_PCI is enabled              | PASS    |
| SEAPATH-00050 | Linux kernel 'hardware' : IGB is enabled               | PASS    |
| SEAPATH-00050 | Linux kernel 'hardware' : TIGON3 is enabled            | PASS    |
| SEAPATH-00050 | Linux kernel 'hardware' : R8169 is enabled             | PASS    |
| SEAPATH-00050 | Linux kernel 'hardware' : E1000 is enabled             | PASS    |
| SEAPATH-00050 | Linux kernel 'hardware' : E1000E is enabled            | PASS    |
| SEAPATH-00050 | Linux kernel 'ceph' : AIO is enabled                   | PASS    |
| SEAPATH-00050 | Linux kernel 'ceph' : TMPFS is enabled                 | PASS    |
| SEAPATH-00050 | Linux kernel 'ceph' : MD is enabled                    | PASS    |
| SEAPATH-00035 | openvswitch service is running                         | PASS    |
| SEAPATH-00038 | lspci 3.6.2+ is available                              | PASS    |
| SEAPATH-00140 | rootfs is readonly mounted                             | PASS    |
| SEAPATH-00141 | /etc is mounted as overlayfs                           | PASS    |
| SEAPATH-00141 | /home is mounted as overlayfs                          | PASS    |



| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00141 | /usr/lib/python3.10/site-packages/pycache is mounted as overlayfs | PASS    |
| SEAPATH-00141 | /var/cache is mounted as overlayfs                                | PASS    |
| SEAPATH-00141 | /var/lib is mounted as overlayfs                                  | PASS    |
| SEAPATH-00141 | /var/spool is mounted as overlayfs                                | PASS    |
| SEAPATH-00142 | Kernel OVERLAY_FS is set  | PASS    |

- number of tests: 29
- number of failures: 0

### Tests hypervisor security for yoctoCI-aaeon

| Test ID       | Tests   | Results |
|---------------|---|---------|
| SEAPATH-00033 | /etc/group is consistent                              | PASS    |
| SEAPATH-00034 | /etc/group does not include extra group               | PASS    |
| SEAPATH-00006 | Audit subsystem is disabled on cmdline                | PASS    |
| SEAPATH-00008 | Slab merging is disabled on cmdline                   | PASS    |
| SEAPATH-00010 | SLUB redzoning and sanity checking enabled on cmdline | PASS    |
| SEAPATH-00039 | openvswitch user is created and locked                | PASS    |
| SEAPATH-00040 | openvswitch user is part of hugepages group           | PASS    |
| SEAPATH-00041 | openvswitch user is part of vfio-net group            | PASS    |
| SEAPATH-00042 | ovs-vswitchd is running as user openvswitch           | PASS    |
| SEAPATH-00043 | ovsdb-server is running as user openvswitch           | PASS    |
| SEAPATH-00126 | ovs-vswitchd system calls are filtered                | PASS    |
| SEAPATH-00127 | ovsdb-server system calls are filtered                | PASS    |
| SEAPATH-00047 | /etc/passwd is consistent                             | PASS    |
| SEAPATH-00048 | /etc/passwd does not include extra user               | PASS    |
| SEAPATH-00046 | /etc/shadow is consistent                             | PASS    |
| SEAPATH-00015 | Vulnerabilities sysfs entry exist                     | PASS    |
| SEAPATH-00017 | System is not vulnerable to : meltdown                | PASS    |
| SEAPATH-00017 | System is not vulnerable to : l1tf                    | PASS    |
| SEAPATH-00017 | System is not vulnerable to : spectre_v1              | PASS    |
| SEAPATH-00017 | System is not vulnerable to : spectre_v2              | PASS    |
| SEAPATH-00012 | admin user exists                                     | PASS    |
| SEAPATH-00013 | admin has a password                                  | PASS    |
| SEAPATH-00014 | admin is sudoers                                      | PASS    |
| SEAPATH-00023 | SPICE protocol is not installed                       | PASS    |

- number of tests: 23
- number of failures: 0

## Tests update for yoctoCI-aaeon

| Test ID       | Tests  | Results |
|---------------|--|---------|
| SEAPATH-00115 | /dev/upgradable_bootloader exists                  | PASS    |
| SEAPATH-00116 | /dev/upgradable_rootfs exists                      | PASS    |
| SEAPATH-00117 | /dev/upgradable_bootloader points to inactive bank | PASS    |
| SEAPATH-00118 | /dev/upgradable_rootfs points to inactive bank     | PASS    |

- number of tests: 4
- number of failures: 0



### 4.1.3. ANSSI-BP28 Compliance

Matrix include/ANSSI-BP28-M-Recommendations.csv for yoctoCI-aaeon

| Requirement    | Test id       | Status |
|----------------|---------------|--------|
| ANSSI-BP28-R30 | SEAPATH-00033 | PASS   |
|                | SEAPATH-00034 | PASS   |
|                | SEAPATH-00046 | PASS   |
|                | SEAPATH-00047 | PASS   |
|                | SEAPATH-00048 | PASS   |
| ANSSI-BP28-R31 | SEAPATH-00088 | PASS   |
|                | SEAPATH-00089 | PASS   |
|                | SEAPATH-00091 | PASS   |
| ANSSI-BP28-R53 | SEAPATH-00200 | ABSENT |
| ANSSI-BP28-R54 | SEAPATH-00193 | PASS   |
|                | SEAPATH-00194 | PASS   |
|                | SEAPATH-00195 | PASS   |
| ANSSI-BP28-R68 | SEAPATH-00091 | PASS   |
|                | SEAPATH-00095 | PASS   |
|                | SEAPATH-00096 | PASS   |
|                | SEAPATH-00097 | PASS   |
| ANSSI-BP28-R80 | SEAPATH-00003 | ABSENT |
|                | SEAPATH-00020 | ABSENT |
|                | SEAPATH-00035 | PASS   |
|                | SEAPATH-00083 | PASS   |
|                | SEAPATH-00125 | ABSENT |
|                | SEAPATH-00126 | PASS   |
|                | SEAPATH-00127 | PASS   |

Matrix include/ANSSI-BP28-MI-Recommendations.csv for yoctoCI-aaeon

| Requirement    | Test id       | Status |
|----------------|---------------|--------|
| ANSSI-BP28-R1  | SEAPATH-00015 | PASS   |
|                | SEAPATH-00017 | PASS   |
|                | SEAPATH-00028 | ABSENT |
|                | SEAPATH-00030 | ABSENT |
|                | SEAPATH-00031 | ABSENT |
|                | SEAPATH-00032 | ABSENT |
|                | SEAPATH-00050 | PASS   |
| ANSSI-BP28-R11 | SEAPATH-00050 | PASS   |
|                | SEAPATH-00109 | PASS   |
|                | SEAPATH-00186 | PASS   |
| ANSSI-BP28-R12 | SEAPATH-00109 | PASS   |

| Requirement    | Test id       | Status |
|----------------|---------------|--------|
| ANSSI-BP28-R13 | SEAPATH-00109 | PASS   |
| ANSSI-BP28-R14 | SEAPATH-00109 | PASS   |
|                | SEAPATH-00187 | PASS   |
|                | SEAPATH-00188 | PASS   |
|                | SEAPATH-00189 | PASS   |
|                | SEAPATH-00190 | PASS   |
|                | SEAPATH-00191 | PASS   |
| ANSSI-BP28-R28 | SEAPATH-00082 | PASS   |
|                | SEAPATH-00140 | PASS   |
|                | SEAPATH-00141 | PASS   |
| ANSSI-BP28-R32 | SEAPATH-00092 | PASS   |
|                | SEAPATH-00094 | PASS   |
| ANSSI-BP28-R34 | SEAPATH-00033 | PASS   |
|                | SEAPATH-00034 | PASS   |
|                | SEAPATH-00046 | PASS   |
|                | SEAPATH-00047 | PASS   |
|                | SEAPATH-00048 | PASS   |
| ANSSI-BP28-R35 | SEAPATH-00033 | PASS   |
|                | SEAPATH-00034 | PASS   |
|                | SEAPATH-00039 | PASS   |
|                | SEAPATH-00046 | PASS   |
|                | SEAPATH-00047 | PASS   |
|                | SEAPATH-00048 | PASS   |
| ANSSI-BP28-R39 | SEAPATH-00143 | PASS   |
|                | SEAPATH-00144 | PASS   |
|                | SEAPATH-00145 | PASS   |
|                | SEAPATH-00146 | PASS   |
|                | SEAPATH-00147 | PASS   |
|                | SEAPATH-00148 | PASS   |
| ANSSI-BP28-R40 | SEAPATH-00151 | PASS   |
| ANSSI-BP28-R42 | SEAPATH-00153 | PASS   |
| ANSSI-BP28-R43 | SEAPATH-00154 | PASS   |
|                | SEAPATH-00155 | PASS   |
| ANSSI-BP28-R44 | SEAPATH-00156 | PASS   |
| ANSSI-BP28-R5  | SEAPATH-00007 | ABSENT |

| Requirement    | Test id       | Status |
|----------------|---------------|--------|
| ANSSI-BP28-R50 | SEAPATH-00044 | PASS   |
|                | SEAPATH-00045 | PASS   |
|                | SEAPATH-00049 | PASS   |
|                | SEAPATH-00090 | PASS   |
|                | SEAPATH-00106 | PASS   |
|                | SEAPATH-00107 | PASS   |
|                | SEAPATH-00108 | PASS   |
|                | SEAPATH-00156 | PASS   |
| ANSSI-BP28-R52 | SEAPATH-00040 | PASS   |
|                | SEAPATH-00041 | PASS   |
| ANSSI-BP28-R55 | SEAPATH-00011 | ABSENT |
|                | SEAPATH-00029 | ABSENT |
|                | SEAPATH-00036 | ABSENT |
|                | SEAPATH-00037 | ABSENT |
| ANSSI-BP28-R79 | SEAPATH-00004 | ABSENT |
|                | SEAPATH-00005 | ABSENT |
|                | SEAPATH-00023 | PASS   |
|                | SEAPATH-00085 | PASS   |
|                | SEAPATH-00086 | PASS   |
| ANSSI-BP28-R8  | SEAPATH-00008 | PASS   |
|                | SEAPATH-00050 | PASS   |
| ANSSI-BP28-R9  | SEAPATH-00109 | PASS   |
|                | SEAPATH-00176 | PASS   |
|                | SEAPATH-00177 | PASS   |
|                | SEAPATH-00178 | PASS   |
|                | SEAPATH-00179 | PASS   |
|                | SEAPATH-00180 | PASS   |
|                | SEAPATH-00181 | PASS   |
|                | SEAPATH-00182 | PASS   |
|                | SEAPATH-00183 | PASS   |
|                | SEAPATH-00184 | PASS   |
|                | SEAPATH-00185 | PASS   |

Matrix include/ANSSI-BP28-MIE-Recommendations.csv for yoctoCI-aaeon

| Requirement    | Test id       | Status |
|----------------|---------------|--------|
| ANSSI-BP28-R10 | SEAPATH-00109 | PASS   |
|                | SEAPATH-00192 | PASS   |
| ANSSI-BP28-R29 | SEAPATH-00077 | ABSENT |
| ANSSI-BP28-R36 | SEAPATH-00146 | PASS   |

| Requirement    | Test id       | Status |
|----------------|---------------|--------|
| ANSSI-BP28-R37 | SEAPATH-00005 | ABSENT |
|                | SEAPATH-00084 | PASS   |
|                | SEAPATH-00085 | PASS   |
|                | SEAPATH-00086 | PASS   |
|                | SEAPATH-00125 | ABSENT |
|                | SEAPATH-00126 | PASS   |
|                | SEAPATH-00127 | PASS   |
| ANSSI-BP28-R38 | SEAPATH-00104 | PASS   |
| ANSSI-BP28-R41 | SEAPATH-00152 | PASS   |
| ANSSI-BP28-R56 | SEAPATH-00196 | ABSENT |
| ANSSI-BP28-R64 | SEAPATH-00004 | ABSENT |
|                | SEAPATH-00005 | ABSENT |
|                | SEAPATH-00085 | PASS   |
|                | SEAPATH-00086 | PASS   |
| ANSSI-BP28-R7  | SEAPATH-00030 | ABSENT |
|                | SEAPATH-00031 | ABSENT |
|                | SEAPATH-00032 | ABSENT |
|                | SEAPATH-00050 | PASS   |
| ANSSI-BP28-R71 | SEAPATH-00082 | PASS   |
|                | SEAPATH-00083 | PASS   |
|                | SEAPATH-00084 | PASS   |
|                | SEAPATH-00102 | PASS   |
| ANSSI-BP28-R78 | SEAPATH-00039 | PASS   |
|                | SEAPATH-00040 | PASS   |
|                | SEAPATH-00041 | PASS   |
|                | SEAPATH-00042 | PASS   |
|                | SEAPATH-00043 | PASS   |
|                | SEAPATH-00085 | PASS   |
|                | SEAPATH-00086 | PASS   |

For more information, please refer to [LF Energy wiki page](#).

Container

CONTAINER\_NAME

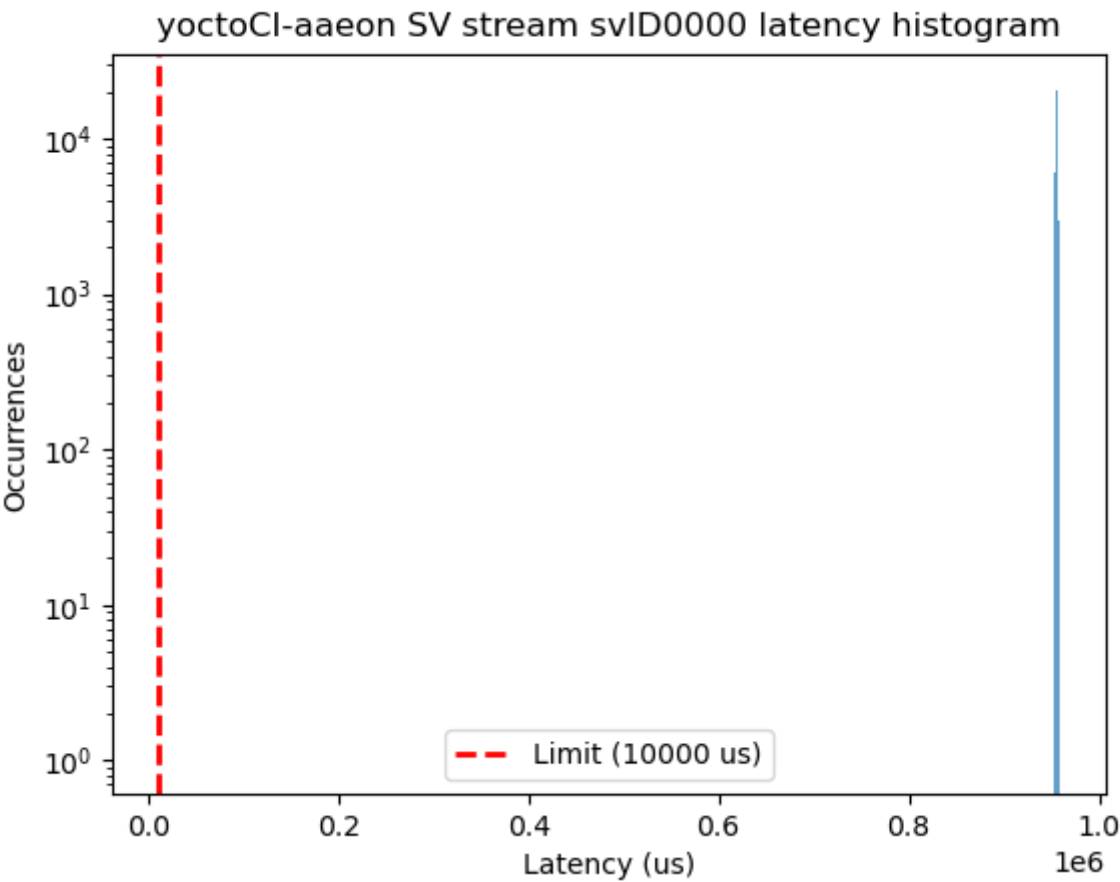
4.1.4. IEC61850 Sampled Value Latency Testing

- Purpose of the test
  - Perform SV IEC61850 packet network latency tests
  - Compute latency between publisher and container NIC.
- Number of sent IEC61850 Sampled Values streams: 8
- Test duration: 1 minutes

The latency tests for the Aaeon board are purely informative. As the Linux kernel used is not RT, high latencies are expected.

Subscriber yoctoCI-aaeon

| IEC61850 Sampled Value Stream | Minimum latency | Maximum latency | Average latency |
|-------------------------------|-----------------|-----------------|-----------------|
| svID0000                      | 953426 us       | 959753 us       | 955580.0 us     |



| IEC61850 Sampled Value Stream | Minimum pacing | Maximum pacing | Average pacing |
|-------------------------------|----------------|----------------|----------------|
|-------------------------------|----------------|----------------|----------------|

|                        |      |         |          |
|------------------------|------|---------|----------|
| svID0000               | 7 us | 3757 us | 250.0 us |
| Max latency < 10000 us |      |         | FAILED   |
| SV dropped             |      |         | 0        |

# Chapter 5. About this documentation

This documentation uses the AsciiDoc documentation generator. It is a convenient format that allows using plain-text formatted writing that can later be converted to various output formats such as HTML and PDF.

In order to generate an HTML version of this documentation, use the following command (the asciidoc package will need to be installed in your Linux distribution):

```
$ asciidoc test-report.adoc
```

This will result in a README.html file being generated in the current directory.

If you prefer a PDF version of the documentation instead, use the following command (the dblatex package will need to be installed on your Linux distribution):

```
$ asciidoctor-pdf test-report.adoc
```