

Компиляция и установка ядра Linux x86_64

```
user@debian1: ~/linux-6.17-rc4
user@debian1:~$ uname -a
Linux debian1 6.12.43+deb13-amd64 #1 SMP PREEMPT_DYNAMIC Debian 6.12.43-1 (2025-08-27) x86_64 GNU/Linux
user@debian1:~$ wget https://git.kernel.org/torvalds/t/linux-6.17-rc4.tar.gz
--2025-09-07 06:40:36-- https://git.kernel.org/torvalds/t/linux-6.17-rc4.tar.gz
Resolving git.kernel.org (git.kernel.org)... 172.105.64.184, 2a01:7e01:e001:937:0:1991:8:25
Connecting to git.kernel.org (git.kernel.org)|172.105.64.184|:443... connected.
HTTP request sent, awaiting response... 301 Moved Permanently
Location: https://git.kernel.org/pub/scm/linux/kernel/git/torvalds/linux.git/snapshot/linux-6.17-rc4.tar.gz [following]
--2025-09-07 06:40:36-- https://git.kernel.org/pub/scm/linux/kernel/git/torvalds/linux.git/snapshot/linux-6.17-rc4.tar.gz
gZ
Reusing existing connection to git.kernel.org:443.
HTTP request sent, awaiting response... 200 OK
Length: unspecified [application/x-gzip]
Saving to: 'linux-6.17-rc4.tar.gz'

linux-6.17-rc4.tar.gz      [          ] 241.95M  26.7MB/s   in 9.8s

2025-09-07 06:40:46 (24.7 MB/s) - 'linux-6.17-rc4.tar.gz' saved [253704523]

user@debian1:~$ tar -xf linux-6.17-rc4.tar.gz
user@debian1:~$ cd linux-6.17-rc4/
user@debian1:~/linux-6.17-rc4$
```

Исходное состояние: Debian 13.1 с ядром 6.12.43.

Загружены исходники самого нового ядра 6.17-rc4.

```
user@debian1: ~/linux-6.17-rc4
* Runtime Testing
*
Runtime Testing (RUNTIME_TESTING_MENU) [Y/n/?] y
Dhrystone benchmark test (TEST_DHRV) [N/m/y/?] n
Linux Kernel Dump Test Tool Module (LKDTM) [N/m/y/?] n
Min heap test (TEST_MIN_HEAP) [N/m/y/?] n
64bit/32bit division and modulo test (TEST_DIV64) [N/m/y/?] n
mul_u64_u64_div_u64() test (TEST_MULDIV64) [N/m/y/?] n
Self test for the backtrace code (BACKTRACE_SELF_TEST) [N/m/y/?] n
Self test for reference tracker (TEST_REF_TRACKER) [N/m/y/?] n
Red-Black tree test (RBTREE_TEST) [N/m/y/?] n
Reed-Solomon library test (REED_SOLOMON_TEST) [N/m/y/?] n
Interval tree test (INTERVAL_TREE_TEST) [N/m/y/?] n
Per cpu operations test (PERCPU_TEST) [N/m/?] n
Perform an atomic64_t self-test (ATOMIC64_SELFTEST) [N/m/y/?] n
Test functions located in the hexdump module at runtime (TEST_HEXDUMP) [N/m/y/?] n
Test kstrto*() family of functions at runtime (TEST_KSTRTOX) [N/m/y/?] n
Test bitmap_*() family of functions at runtime (TEST_BITMAP) [N/m/y/?] n
Test functions located in the uuid module at runtime (TEST_UUID) [N/m/y/?] n
Test the XArray code at runtime (TEST_XARRAY) [N/m/y/?] n
Test the Maple Tree code at runtime or module load (TEST_MAPLE_TREE) [N/m/y/?] n
Perform selftest on resizable hash table (TEST_RHASHTABLE) [N/m/y/?] n
Perform selftest on IDA functions (TEST_IDA) [N/m/y/?] n
Test module loading with 'hello world' module (TEST_LKM) [N/m/?] n
Test module for compilation of bitops operations (TEST_BITOPS) [N/m/y/?] n
Test module for stress/performance analysis of vmalloc allocator (TEST_VMALLOC) [N/m/y/?] n
Test BPF filter functionality (TEST_BPF) [N/m/?] n
Test find_bit functions (FIND_BIT_BENCHMARK) [N/m/y/?] n
Test firmware loading via userspace interface (TEST_FIRMWARE) [N/m/y/?] n
sysctl test driver (TEST_SYSCTL) [N/m/y/?] n
udelay test driver (TEST_UDELAY) [N/m/y/?] n
Test static keys (TEST_STATIC_KEYS) [N/m/?] n
Test DYNAMIC_DEBUG (TEST_DYNAMIC_DEBUG) [N/m/y/?] n
kmod stress tester (TEST_KMOD) [N/m/?] n
module kallsyms find_symbol() test (TEST_KALLSYMS) [N/m/?] (NEW)
Test memcat_p() helper function (TEST_MEMCAT_P) [N/m/y/?] n
Test heap/page initialization (TEST_MEMINIT) [N/m/y/?] n
Test freeing pages (TEST_FREE_PAGES) [N/m/y/?] n
Test floating point operations in kernel space (TEST_FPU) [N/m/y/?] n
Test clocksource watchdog in kernel space (TEST_CLOCKSOURCE_WATCHDOG) [N/m/y/?] n
Test module for correctness and stress of objpool (TEST_OBJPOOL) [N/m/?] n
#
# configuration written to .config
#
user@debian1:~/linux-6.17-rc4$ nproc
4
user@debian1:~/linux-6.17-rc4$ make -j4
```

Создан новый `.config` на основе того что уже есть для старого ядра + выполнена команда **make localmodconfig** – для уменьшения количества модулей при компиляции до минимума.

```
user@debian1: ~/linux-6.17-rc4
CC      arch/x86/boot/video.o
CC      arch/x86/boot/video-mode.o
CC      arch/x86/boot/version.o
CC      arch/x86/boot/compressed/string.o
CC      arch/x86/boot/compressed/cmdline.o
CC      arch/x86/boot/video-vga.o
CC      arch/x86/boot/video-vesa.o
CC      arch/x86/boot/compressed/error.o
CC      arch/x86/boot/video-bios.o
OBJCOPY arch/x86/boot/compressed/vmlinux.bin
RELOCS  arch/x86/boot/compressed/vmlinux.relocs
CPUSTR  arch/x86/boot/cpustr.h
HOSTCC  arch/x86/boot/compressed/mkpiggy
CC      arch/x86/boot/cpu.o
CC      arch/x86/boot/compressed/cpuflags.o
CC      arch/x86/boot/compressed/early_serial_console.o
CC      arch/x86/boot/compressed/kaslr.o
CC      arch/x86/boot/compressed/ident_map_64.o
CC      arch/x86/boot/compressed/idt_64.o
AS      arch/x86/boot/compressed/idt_handlers_64.o
AS      arch/x86/boot/compressed/mem_encrypt.o
CC      arch/x86/boot/compressed/pgtable_64.o
CC      arch/x86/boot/compressed/sev.o
CC      arch/x86/boot/compressed/sev-handle-vc.o
CC      arch/x86/boot/compressed/acpi.o
CC      arch/x86/boot/compressed/tdx.o
AS      arch/x86/boot/compressed/tdcall.o
CC      arch/x86/boot/compressed/tdx-shared.o
CC      arch/x86/boot/compressed/mem.o
CC      arch/x86/boot/compressed/efi.o
CC      arch/x86/boot/compressed/misc.o
ZSTD22  arch/x86/boot/compressed/vmlinux.bin.zst
MKPIGGY arch/x86/boot/compressed/piggy.S
AS      arch/x86/boot/compressed/piggy.o
LD      arch/x86/boot/compressed/vmlinux
ZOFFSET arch/x86/boot/zoffset.h
OBJCOPY arch/x86/boot/vmlinux.bin
AS      arch/x86/boot/header.o
LD      arch/x86/boot/setup.elf
OBJCOPY arch/x86/boot/setup.bin
BUILD  arch/x86/boot/bzImage
Kernel: arch/x86/boot/bzImage is ready (#1)

real    8m41.157s
user    30m38.114s
sys      2m41.939s
user@debian1:~/linux-6.17-rc4$
```

Успешная компиляция.

```
user@debian1: ~/linux-6.17-rc4
user@debian1:~/linux-6.17-rc4$ sudo make modules_install
[sudo] password for user:
SYMLINK /lib/modules/6.17.0-rc4/build
INSTALL /lib/modules/6.17.0-rc4/modules.order
INSTALL /lib/modules/6.17.0-rc4/modules.builtin
INSTALL /lib/modules/6.17.0-rc4/modules.builtin.modinfo
INSTALL /lib/modules/6.17.0-rc4/kernel/arch/x86/events/rapl.ko
SIGN    /lib/modules/6.17.0-rc4/kernel/arch/x86/events/rapl.ko
XZ      /lib/modules/6.17.0-rc4/kernel/arch/x86/events/rapl.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/arch/x86/crypto/aesni-intel.ko
SIGN    /lib/modules/6.17.0-rc4/kernel/arch/x86/crypto/aesni-intel.ko
XZ      /lib/modules/6.17.0-rc4/kernel/arch/x86/crypto/aesni-intel.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/arch/x86/crypto/ghash-clmulni-intel.ko
SIGN    /lib/modules/6.17.0-rc4/kernel/arch/x86/crypto/ghash-clmulni-intel.ko
XZ      /lib/modules/6.17.0-rc4/kernel/arch/x86/crypto/ghash-clmulni-intel.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/kernel/configs.ko
SIGN    /lib/modules/6.17.0-rc4/kernel/kernel/configs.ko
XZ      /lib/modules/6.17.0-rc4/kernel/kernel/configs.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/fs/binfmt_misc.ko
SIGN    /lib/modules/6.17.0-rc4/kernel/fs/binfmt_misc.ko
XZ      /lib/modules/6.17.0-rc4/kernel/fs/binfmt_misc.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/fs/mbcache.ko
SIGN    /lib/modules/6.17.0-rc4/kernel/fs/mbcache.ko
XZ      /lib/modules/6.17.0-rc4/kernel/fs/mbcache.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/fs/configfs/configfs.ko
SIGN    /lib/modules/6.17.0-rc4/kernel/fs/configfs/configfs.ko
XZ      /lib/modules/6.17.0-rc4/kernel/fs/configfs/configfs.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/fs/ext4/ext4.ko
SIGN    /lib/modules/6.17.0-rc4/kernel/fs/ext4/ext4.ko
XZ      /lib/modules/6.17.0-rc4/kernel/fs/ext4/ext4.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/fs/jbd2/jbd2.ko
SIGN    /lib/modules/6.17.0-rc4/kernel/fs/jbd2/jbd2.ko
XZ      /lib/modules/6.17.0-rc4/kernel/fs/jbd2/jbd2.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/fs/autofs/autofs4.ko
SIGN    /lib/modules/6.17.0-rc4/kernel/fs/autofs/autofs4.ko
XZ      /lib/modules/6.17.0-rc4/kernel/fs/autofs/autofs4.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/crypto/cts.ko
SIGN    /lib/modules/6.17.0-rc4/kernel/crypto/cts.ko
XZ      /lib/modules/6.17.0-rc4/kernel/crypto/cts.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/crypto/xts.ko
SIGN    /lib/modules/6.17.0-rc4/kernel/crypto/xts.ko
XZ      /lib/modules/6.17.0-rc4/kernel/crypto/xts.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/crypto/cryptd.ko
SIGN    /lib/modules/6.17.0-rc4/kernel/crypto/cryptd.ko
XZ      /lib/modules/6.17.0-rc4/kernel/crypto/cryptd.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/lib/crc/crc16.ko
SIGN    /lib/modules/6.17.0-rc4/kernel/lib/crc/crc16.ko
```

Установка скомпилированных модулей.

```
user@debian1: ~/linux-6.17-rc4
INSTALL /lib/modules/6.17.0-rc4/kernel/net/netfilter/x_tables.ko
SIGN /lib/modules/6.17.0-rc4/kernel/net/netfilter/x_tables.ko
XZ /lib/modules/6.17.0-rc4/kernel/net/netfilter/x_tables.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/net/netfilter/xt_tcpudp.ko
SIGN /lib/modules/6.17.0-rc4/kernel/net/netfilter/xt_tcpudp.ko
XZ /lib/modules/6.17.0-rc4/kernel/net/netfilter/xt_tcpudp.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/net/8021q/8021q.ko
SIGN /lib/modules/6.17.0-rc4/kernel/net/8021q/8021q.ko
XZ /lib/modules/6.17.0-rc4/kernel/net/8021q/8021q.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/net/wireless/cfg80211.ko
SIGN /lib/modules/6.17.0-rc4/kernel/net/wireless/cfg80211.ko
XZ /lib/modules/6.17.0-rc4/kernel/net/wireless/cfg80211.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/net/llc/llc.ko
SIGN /lib/modules/6.17.0-rc4/kernel/net/llc/llc.ko
XZ /lib/modules/6.17.0-rc4/kernel/net/llc/llc.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/net/rfkill/rfkill.ko
SIGN /lib/modules/6.17.0-rc4/kernel/net/rfkill/rfkill.ko
XZ /lib/modules/6.17.0-rc4/kernel/net/rfkill/rfkill.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/net/vmw_vsock/vsock.ko
SIGN /lib/modules/6.17.0-rc4/kernel/net/vmw_vsock/vsock.ko
XZ /lib/modules/6.17.0-rc4/kernel/net/vmw_vsock/vsock.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/net/vmw_vsock/vmw_vsock_vmci_transport.ko
SIGN /lib/modules/6.17.0-rc4/kernel/net/vmw_vsock/vmw_vsock_vmci_transport.ko
XZ /lib/modules/6.17.0-rc4/kernel/net/vmw_vsock/vmw_vsock_vmci_transport.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/net/vmw_vsock/vmw_vsock_virtio_transport_common.ko
SIGN /lib/modules/6.17.0-rc4/kernel/net/vmw_vsock/vmw_vsock_virtio_transport_common.ko
XZ /lib/modules/6.17.0-rc4/kernel/net/vmw_vsock/vmw_vsock_virtio_transport_common.ko.xz
INSTALL /lib/modules/6.17.0-rc4/kernel/net/vmw_vsock/vsock_loopback.ko
SIGN /lib/modules/6.17.0-rc4/kernel/net/vmw_vsock/vsock_loopback.ko
XZ /lib/modules/6.17.0-rc4/kernel/net/vmw_vsock/vsock_loopback.ko.xz
DEPMOD /lib/modules/6.17.0-rc4
user@debian1:~/linux-6.17-rc4$ sudo make install
INSTALL /boot
run-parts: executing /etc/kernel/postinst.d/initramfs-tools 6.17.0-rc4 /boot/vmlinuz-6.17.0-rc4
update-initramfs: Generating /boot/initrd.img-6.17.0-rc4
run-parts: executing /etc/kernel/postinst.d/zz-update-grub 6.17.0-rc4 /boot/vmlinuz-6.17.0-rc4
Generating grub configuration file ...
Found linux image: /boot/vmlinuz-6.17.0-rc4
Found initrd image: /boot/initrd.img-6.17.0-rc4
Found linux image: /boot/vmlinuz-6.12.43+deb13-amd64
Found initrd image: /boot/initrd.img-6.12.43+deb13-amd64
Warning: os-prober will not be executed to detect other bootable partitions.
Systems on them will not be added to the GRUB boot configuration.
Check GRUB_DISABLE_OS_PROBER documentation entry.
Adding boot menu entry for UEFI Firmware Settings ...
done
user@debian1:~/linux-6.17-rc4$
```

Установка скомпилированного ядра.

```
user@debian1: ~
user@debian1:~$ user@debian1:~$
user@debian1:~$ uname -a
Linux debian1 6.17.0-rc4 #1 SMP PREEMPT_DYNAMIC Sun Sep  7 06:59:30 EDT 2025 x86_64 GNU/Linux
user@debian1:~$
```

Состояние системы после перезагрузки: Новое ядро успешно загрузилось и работает.