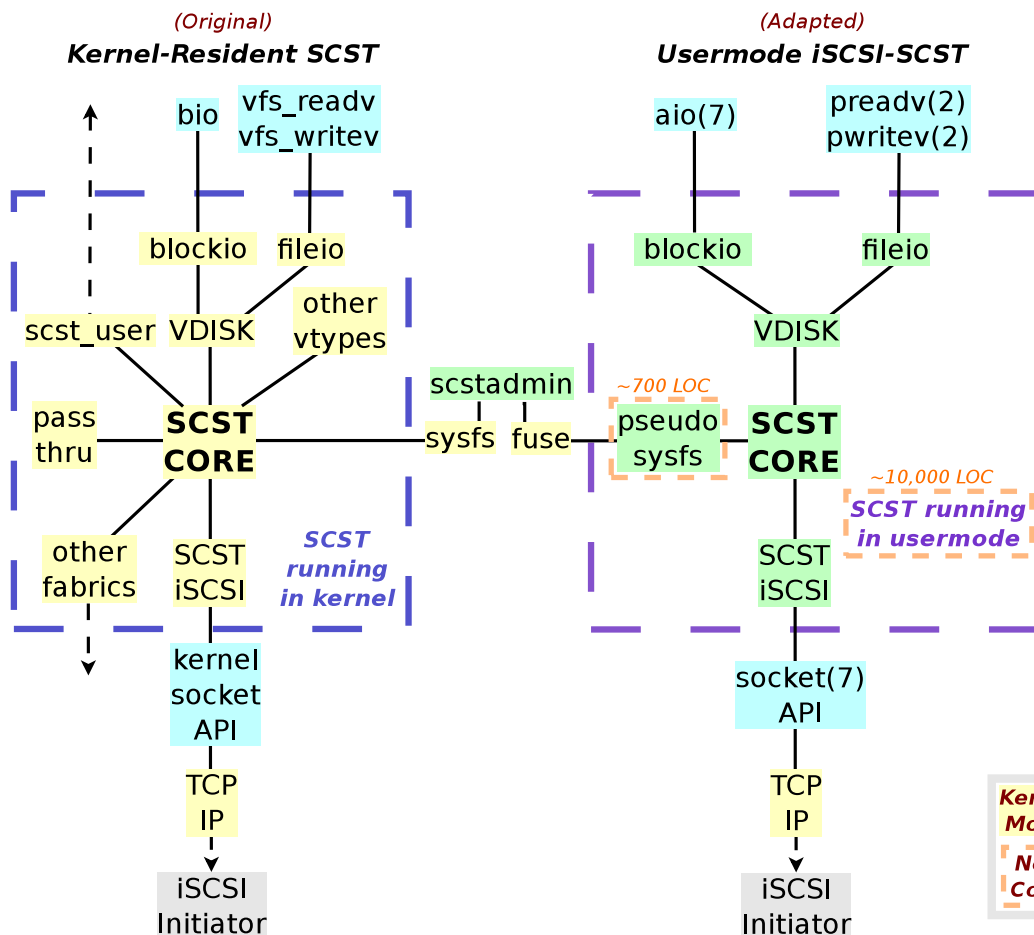**BELOW:** The adaptation of the SCST iSCSI server to run in usermode reuses ~80 KLOC of a very mature and efficient implementation of the SCSI SPC/SBC command set and iSCSI protocol, with virtually no change to the existing source code.

iSCSI Server to tcmu-runner Backstore API

(Original)
Kernel-Resident SCST

(Adapted)
Usermode iSCSI-SCST

Common Backstorage Support

NEW

libspdk_nvme
libspdk_env_dpdk
librte_eal *etc.*

libgfapi   libz   librados librbd

| bio | vfs_readv vfs_writev | | aio(7) | preadv(2) pwritev(2) | | glfs | qcow | spdk | ram | rbd |

Gluster QEMU Intel mmap Ceph

tcmu-runner Backstorage API

blockio   fileio   blockio   fileio

scst_user VDISK   other vtypes   VDISK

scstadmin

~700 LOC

pseudo sysfs

pass thru

SCST CORE   sysfs fuse

SCST CORE

~10,000 LOC

SCST running in usermode

other fabrics   SCST iSCSI

SCST running in kernel

SCST iSCSI

kernel socket API

socket(7) API

TCP IP

TCP IP

iSCSI Initiator

iSCSI Initiator

| Kernel Mode | User Mode |
| New Code | API |

RIGHT: The scstu-tcmur module drives SCST storage I/O through the tcmu-runner backstore API, enabling a common set of backstore handlers to be used for in-kernel (LIO) and usermode (SCST) iSCSI servers.

tcmu-runner

scstu-tcmur

libtcmu

| bio | vfs_readv vfs_writev | ring uio | | aio(7) | preadv(2) pwritev(2) |
| fileio | blockio | tcm-user | | blockio | fileio |

VDISK

LIO CORE

Usermode SCST

SCST CORE

LIO iSCSI

kernel socket API

SCST iSCSI

TCP IP

socket(7) API

iSCSI Initiator

TCP IP

iSCSI Initiator