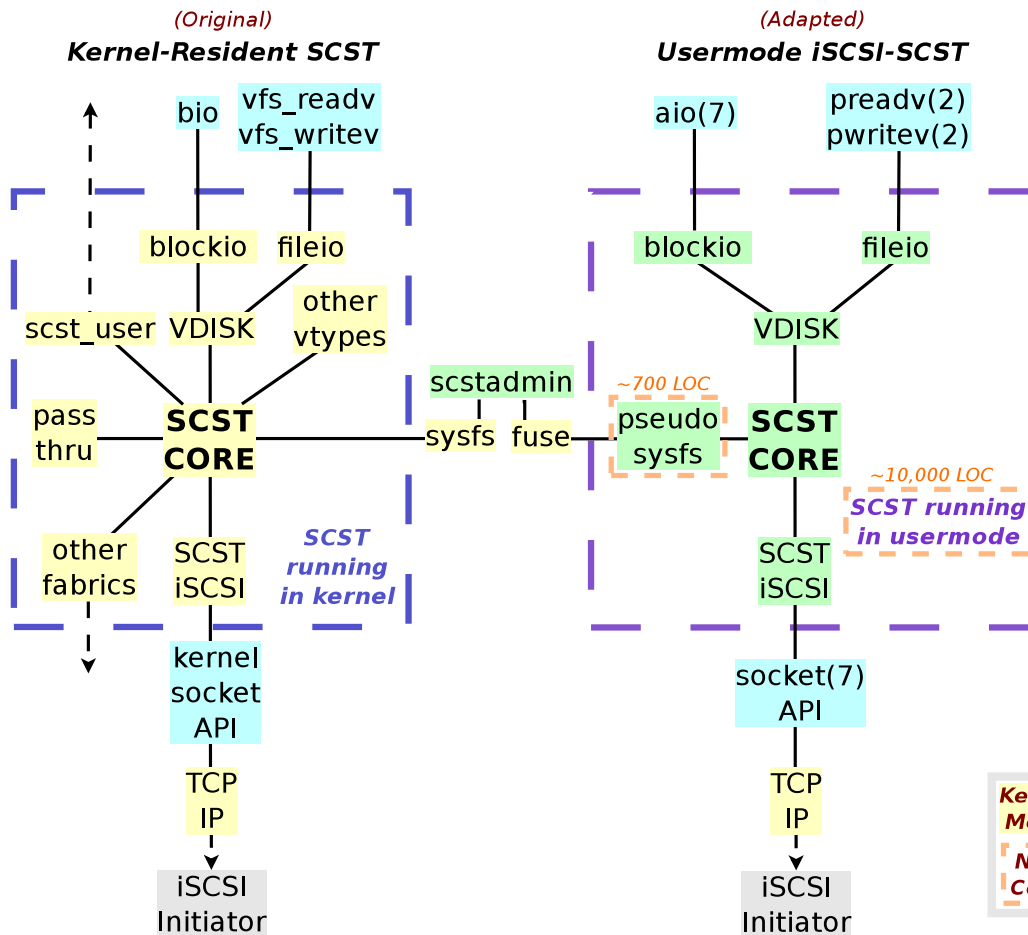**BELOW: The adaptation of the SCST iSCSI server to run in usermode reuses ~80 KLOC of a very mature and efficient implementation of the SCSI SPC/SBC command set and iSCSI protocol, with virtually no change to the existing source code.**

iSCSI Server to tcmu-runner Backstore API

Common Backstorage Support

(Original)
Kernel-Resident SCST

bio
vfs_readv
vfs_writev

blockio
fileio

scst_user   VDISK   other vtypes

pass thru

SCST CORE

other fabrics   SCST iSCSI

SCST running in kernel

kernel socket API

TCP IP

iSCSI Initiator

(Adapted)
Usermode iSCSI-SCST

aio(7)
preadv(2) pwritev(2)

blockio
fileio

VDISK

scstadmin
sysfs   fuse

~700 LOC
pseudo sysfs

SCST CORE

~10,000 LOC
SCST running in usermode

SCST iSCSI

socket(7) API

TCP IP

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.

libgfapi

libz

NEW
libspdk_nvme
libspdk_env_dpdk
librte_eal *etc.*

librados
librbd

glfs
Gluster

qcow
QEMU

spdk
Intel

ram
mmap

rbd
Ceph

tcmu-runner Backstorage API

tcmu-runner

libtcmu

ring uio

bio
vfs_readv vfs_writev

fileio   blockio   tcm-user

LIO CORE

LIO iSCSI

kernel socket API

TCP IP

iSCSI Initiator

scstu-tcmur

aio(7)
preadv(2) pwritev(2)

blockio
fileio

VDISK

Usermode SCST

SCST CORE

SCST iSCSI

socket(7) API

TCP IP

iSCSI Initiator