

Applications

MPICH, Open-MPI, etc.

OpenSHMEM, UPC, CAF, X10,
Chapel, etc.

Parsec, OCR, Legions, etc.

Burst buffer, ADIOS, etc.

UCX

UC-P (Protocols) - High Level API

Transport selection, cross-transport multi-rail, fragmentation, operations not supported by hardware

Message Passing API Domain:
tag matching, rendezvous

PGAS API Domain:
RMAs, Atomics

Task Based API Domain:
Active Messages

I/O API Domain:
Stream

UC-T (Hardware Transports) - Low Level API
RMA, Atomic, Tag-matching, Send/Recv, Active Message

Transport for InfiniBand VERBs
driver

RC

UD

XRC

DCT

Transport for
Gemini/Aries
drivers

GNI

Transport for intra-node host memory communication

SYSV

POSIX

KNEM

CMA

XPMM

Transport for
Accelerator Memory
communication

GPU

UC-S
(Services)

Common utilities

Utilities

Data
structures

Memory
Management

OFA Verbs Driver

Cray Driver

OS Kernel

Cuda

Hardware