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* * *

TypesÂ¶

The following types are used by the NCCL library.

ncclComm_tÂ¶

`ncclComm_t`Â¶

NCCL communicator. Points to an opaque structure inside NCCL.

ncclResult_tÂ¶

`ncclResult_t`Â¶

Return values for all NCCL functions. Possible values are :

`ncclSuccess`Â¶

(`0`) Function succeeded.

`ncclUnhandledCudaError`Â¶

(`1`) A call to a CUDA function failed.

`ncclSystemError`Â¶

(`2`) A call to the system failed.

`ncclInternalError`Â¶

(`3`) An internal check failed. This is due to either a bug in NCCL or a memory corruption.

`ncclInvalidArgument`Â¶

(`4`) An argument has an invalid value.

`ncclInvalidUsage`Â¶

(`5`) The call to NCCL is incorrect. This is usually reflecting a programming error.

`ncclRemoteError`Â¶

(`6`) A call failed possibly due to a network error or a remote process exiting prematurely.

`ncclInProgress`Â¶

(`7`) A NCCL operation on the communicator is being enqueued and is being progressed in the background.

Whenever a function returns an error (neither ncclSuccess nor ncclInProgress), NCCL should print a more detailed message when the environment variable [NCCL_DEBUG](../env.html#nccl-debug) is set to â€œWARNâ€•.

ncclDataType_tÂ¶

`ncclDataType_t`Â¶

NCCL defines the following integral and floating data-types.

`ncclInt8`Â¶

Signed 8-bits integer

`ncclChar`Â¶

Signed 8-bits integer

`ncclUint8`Â¶

Unsigned 8-bits integer

`ncclInt32`Â¶

Signed 32-bits integer

`ncclInt`Â¶

Signed 32-bits integer

`ncclUint32`Â¶

Unsigned 32-bits integer

`ncclInt64`Â¶

Signed 64-bits integer

`ncclUint64`Â¶

Unsigned 64-bits integer

`ncclFloat16`Â¶

16-bits floating point number (half precision)

`ncclHalf`Â¶

16-bits floating point number (half precision)

`ncclFloat32`Â¶

32-bits floating point number (single precision)

`ncclFloat`Â¶

32-bits floating point number (single precision)

`ncclFloat64`Â¶

64-bits floating point number (double precision)

`ncclDouble`Â¶

64-bits floating point number (double precision)

`ncclBfloat16`Â¶

16-bits floating point number (truncated precision in bfloat16 format, CUDA 11 or later)

`ncclFloat8e4m3`Â¶

8-bits floating point number, 4 exponent bits, 3 mantissa bits (CUDA >= 11.8 and SM >= 90)

`ncclFloat8e5m2`Â¶

8-bits floating point number, 5 exponent bits, 2 mantissa bits (CUDA >= 11.8

and SM >= 90)

ncclRedOp_tÂ¶

`ncclRedOp_t`Â¶

Defines the reduction operation.

`ncclSum`Â¶

Perform a sum (+) operation

`ncclProd`Â¶

Perform a product (*) operation

`ncclMin`Â¶

Perform a min operation

`ncclMax`Â¶

Perform a max operation

`ncclAvg`Â¶

Perform an average operation, i.e. a sum across all ranks, divided by the number of ranks.

ncclScalarResidence_tÂ¶

`ncclScalarResidence_t`Â¶

Indicates where (memory space) scalar arguments reside and when they can be dereferenced.

`ncclScalarHostImmediate`Â¶

The scalar resides in host memory and should be derefenced in the most immediate way.

`ncclScalarDevice`Â¶

The scalar resides on device visible memory and should be dereferenced once needed.

ncclConfig_tÂ¶

`ncclConfig_t`Â¶

A structure-based configuration users can set to initialize a communicator; a newly created configuration must be initialized by NCCL_CONFIG_INITIALIZER.

`NCCL_CONFIG_INITIALIZER`Â¶

A configuration macro initializer which must be assigned to a newly created configuration.

`blocking`Â¶

This attribute can be set as integer 0 or 1 to indicate nonblocking or blocking communicator behavior correspondingly. Blocking is the default behavior.

`cgaClusterSize`Â¶

Set Cooperative Group Array (CGA) size of kernels launched by NCCL. This attribute can be set between 0 and 8, and the default value is 4 since sm90 architecture and 0 for older architectures.

`minCTAs`Â¶

Set the minimal number of CTAs NCCL should use for each kernel. Set to a positive integer value, up to 32. The default value is 1.

`maxCTAs`Â¶

Set the maximal number of CTAs NCCL should use for each kernel. Set to a

positive integer value, up to 32. The default value is 32.

`netName`Â¶

Specify the network module name NCCL should use for network communication. The value of netName must match exactly the name of the network module (case-insensitive). NCCL internal network module names are â€œIBâ€• (generic IB verbs) and â€œSocketâ€• (TCP/IP sockets). External network plugins define their own names. The default value is undefined, and NCCL will choose the network module automatically.

`splitShare`Â¶

Specify whether to share resources with child communicator during communicator split. Set the value of splitShare to 0 or 1. The default value is 0. When the parent communicator is created with splitShare=1 during ncclCommInitRankConfig, the child communicator can share internal resources of the parent during communicator split. Split communicators are in the same family. When resources are shared, aborting any communicator can result in other communicators in the same family becoming unusable. Irrespective of whether sharing resources or not, users should always abort/destroy all no longer needed communicators to free up resources.

ncclSimInfo_tÂ¶

`ncclSimInfo_t`Â¶

This struct will be used by ncclGroupSimulateEnd() to return information about the calls.

`NCCL_SIM_INFO_INITIALIZER`Â¶

NCCL_SIM_INFO_INITIALIZER is a configuration macro initializer which must be assigned to a newly created ncclSimInfo_t struct.

`estimatedTime`Â¶

Estimated time for the operation(s) in the group call will be returned in this attribute.

[Next](ops.html "User Defined Reduction Operators") [Previous](p2p.html "Point To Point Communication Functions")

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[theme](https://github.com/rtfd/sphinx_rtd_theme) provided by [Read the

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