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\* \* \*

## # User Defined Reduction Operators¶

The following functions are public APIs exposed by NCCL to create and destroy custom reduction operators for use in reduction collectives.

### ## ncclRedOpCreatePreMulSum¶

```
[ncclResult_t](types.html#c.ncclResult_t "ncclResult_t")
`ncclRedOpCreatePreMulSum`([ncclRedOp_t](types.html#c.ncclRedOp_t
"ncclRedOp_t")*_ op_, void*_ scalar_,
[ncclDataType_t](types.html#c.ncclDataType_t "ncclDataType_t") _ datatype_,
[ncclScalarResidence_t](types.html#c.ncclScalarResidence_t
"ncclScalarResidence_t") _ residence_, [ncclComm_t](types.html#c.ncclComm_t
"ncclComm_t") _ comm_)¶
```

Creates a new reduction operator which pre-multiplies input values by a given scalar locally before reducing them with peer values via summation. Both the input values and the scalar are of type `_datatype_`. For use only with collectives launched against `_comm_` and `_datatype_`. The `_residence_` argument indicates whether the memory pointed to by `_scalar_` should be dereferenced immediately by the host before this function returns (`ncclScalarHostImmediate`), or by the device during execution of the reduction collective (`ncclScalarDevice`). Upon return, the newly created operatorâ€™s

handle is stored in `_op_`.

```
## ncclRedOpDestroy
```

```
[ncclResult_t](types.html#c.ncclResult_t "ncclResult_t")
```

```
`ncclRedOpDestroy` ([ncclRedOp_t](types.html#c.ncclRedOp_t "ncclRedOp_t") _  
op_, [ncclComm_t](types.html#c.ncclComm_t "ncclComm_t") _ comm_)
```

Destroys the reduction operator `_op_`. The operator must have been created by `ncclRedOpCreatePreMul` with the matching communicator `_comm_`. An operator may be destroyed as soon as the last NCCL function which is given that operator returns.

[Next ]([../nccl1.html "Migrating from NCCL 1 to NCCL 2"](#)) [  
Previous]([types.html "Types"](#))

\* \* \*

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