Endpoints Revisions Discussion Items

MPI Forum, Hybrid WG

March 24, 2014

Design Goals for the Interface

- Endpoints should be a generalization of the existing communicators concept
  - Not a new, orthogonal type of communicator

- Endpoints should be usable when initialized with SINGLE, FUNNELED, SERIALIZED, and MULTIPLE
  - If we remove the relaxes collective semantic for MPI_Comm_free(), we can only support MULTIPLE

Issue: MPI_COMM_COMPARE

- Current approach:
  - Return MPI_COMM_IDENT
  - User must check rank of identical handles to see if they are different endpoints in the same communicator
- Proposal: Add MPI_ALIASED
  - Indicates that communicator handles correspond to different ranks in the same communicator

Issue: Query number of endpoints

- Challenge: This is not straightforward, because the user could call MPI_Comm_create_endpoints() using an endpoints communicator
  - I.e. there are multiple ancestors within my MPI_COMM_WORLD process
- Query needs a point of reference, must be done with respect to a parent communicator
  - What if query is done with an ancestor communicator, rather than the immediate parent?
  - What if the parent communicator from which the endpoints communicator has been freed?
  - Answering these queries is hard, and could require MPI to do a lot of internal bookkeeping
- These are the reasons why we chose to leave a query function for a future proposal…

Straw Man Query Function

```
MPI_Comm_query_ep(MPI_Comm ref_comm, MPI_Comm ep_comm, Output?)
```

- Local-only query
  - Cannot query endpoints at a remote process
  - Intended to return the number of ranks in ep_comm that share a common parent rank in ref_comm
- What is the output?
  - Number of ranks in ep_comm that share a rank in ref_comm?
  - What if ref_comm is an endpoints communicator?
    - Return number of endpoints that share the same ancestor rank as the ep_comm handle?
  - Can you query the ref_comm or ep_comm ranks?
  - Can you query the MPI_Comm handles for these ranks?