

# Sample Notes File

Miscellaneous notes for BasicTransport implementation:  
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- \* Flow control:
  - \* Just blast?
  - \* Receiver driven (preparation for Homa)?
  - \* Parameter specifies # of outstanding bytes.
- \* Retransmission:
  - \* Receiver requests retransmit if offset of fully-received data hasn't advanced for a while. "firstMissingByte"
  - \* Sender can PING if it hasn't received response
- \* RPC garbage collection:
  - \* Timer based: e.g. 100 us?
  - \* Or, when next RPC comes in?
  - \* Or, when last byte sent (but what if it's never requested)?
- \* Session setup:
  - \* None on server: just use unique RPC ids
- \* When to abort?
  - \* Client aborts if too much time elapses with no packets from server
  - \* Server aborts if too much time elapses with no packets from client?
- \* Are client and server hints needed?
  - \* For now, just use a hash table: lookup takes only 7-8 ns
  - \* But, what about the cost of \*creating\* an entry for each incoming RPC?
- \* Packet types:
  - \* DATA:
    - \* RPC id (client + seq)
    - \* Packet id
    - \* Packet length?
    - \* RPC length
    - \* Ack id
- \* GRANT:
  - \* RPC id
  - \* Offset: all bytes before this may be sent. 0 offset can be used as an "ACK"
- \* RESEND:
  - \* Offset: resend packet containing this byte
- \* PING:
  - \* Means client thinks RPC has stalled, needs to hear from server
- \* How to distinguish packets intended for client versus server?
- \* How to keep track of out-of-order packets? It's a pity that the driver already copies the data once, then we still have a bunch of fragmented packets. Modify Buffer to help with this?
  - \* Keep map of ooo packets, indexed by offset.
- \* Check on synchronization issues:
  - \* Must lock in getSession?
- \* Change the way Received objects work? E.g. assume packet is stolen by default? Or, assume the caller must copy data out (this might not work if packet is out of order, so it can't be added to a buffer immediately).
- \* Handle ackDeltas.
- \* Add service locator options for things like network bandwidth and round trip time.
- \* Must we sometimes defer sending a request or response because the driver has no buffers available?
- \* What happens if all receive buffers become full?
- \* What if DATA packet arrives after ALL\_DATA?

# Text Editor Example

## Specialized:

```
void insertChar(Cursor cursor,  
               char c);  
void backspace(Cursor cursor);  
void delete(Cursor cursor);  
void deleteSelection(  
    Selection selection);  
...
```

## General-purpose:

```
void insert(Position position,  
           String newText);  
void delete(Position start,  
           Position end);
```