

All signatures are tagged by message type.

We're assuming node-to-node messages are always in order.

With every message, send our current timestamp. This serves as a promise that we won't introduce any new transactions with a timestamp earlier than that timestamp.

VerifiableBroadcast(msg):

- Broadcast(|vbc|: msg)
- For every other node: Receive(|vbc-ok|, message)
- Broadcast(|vbc-alloc|: msg, all |vbc-ok| signatures received)

HandleVerifiableBroadcast(Handler):

- Receive(|vbc| -> msg)
- Send(|vbc-ok|, signed(msg))
- Receive(|vbc-alloc| -> msg, all signatures)
- Verify all signatures => every other node saw the same message
- Handler(msg)

IntroduceTransaction(x):

- If x.name in set of my currently introducing transactions or others' currently introducing transactions:
- Return Fail
- Else:
- t <- current time
- VerifiableBroadcast(|intro|, t, x)
- For every other node: Receive(|intro-response|)
  - If any fail: set return value to Fail
- VerifiableBroadcast(|canpublish|, x, all signed OKs/Fails)

HandleIntroduction():

- Receive |intro| -> t, x
- If x.name in set of my currently introducing transactions or others' currently introducing transactions:
- Send('|intro-response|', signed(OK, x))
- Else:
- Send(|intro-response|, signed(Fail, x))

HandleCanPublish(x, signatures):

- Verify all signatures & make sure they're all "OK"s
- (Remember x)

When at some point I have a transaction x in my currently OK'd transactions whose timestamp  $t \leq \min$  of (min of timestamps of all others' currently introducing transactions, min over when we last heard from each server)