Requirements For Printing Protocols from Nashua

1394 PWG

- Access Control
  - Fair Access
  - Determine How Many Logins
- In Order Data Delivery
- Flow Control
- Guaranted Delivery
  - Error Detection
  - Correction/Recovery
- Multiple Independant Channels
- Single Channel is Bi-Directional
- PDL, Application, OS Independent
- Standard Will Allow Concurrent Operation of Multiple Protocols

How SBP-2 Relates to the Requirements For Printing Protocols from 6/23/97

1394 PWG

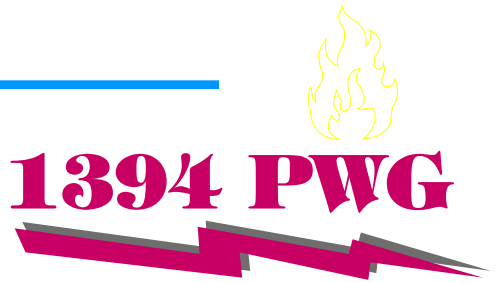
- Access Control -
  - Login
    - Password in Login
  - Fair Access
    - Not explicitly part of SBP-2
  - Determine How Many Logins
    - Login_query & Login_query_response returns max_logins. Since managment ORB login not required to determine max_logins
- In Order Data Delivery
  - Not explicit. PWG Device Profile could require In Order ORB processing.

How SBP-2 Relates to the Requirements For Printing Protocols from 6/23/97

- Flow Control
  - Implicit. Target Fetch Agent controls data flow.
- Guaranteed Delivery
  - 1394 Asynchronous transmission is guaranted using ACKnowledged data transfer.
  - Error Detection
    - CRC error and SBP-2 status block.
  - Correction/Recovery
    - Basic mechanisim is to re-fetch

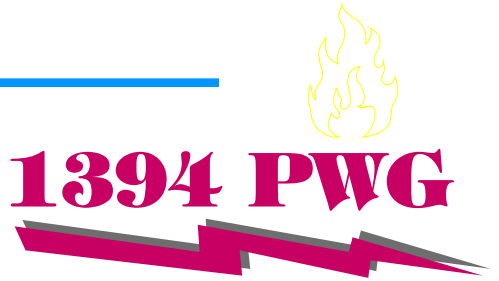
Can Learn About Error Detection and Recovery from Work Being Done on OHCI

How SBP-2 Relates to the Requirements For Printing Protocols from 6/23/97



- Single Channel is Bi-Directional
  - Yes... Sort Of. Half Duplex. Direction bit in the Command ORB. Not truely bi-directional communication path. Transport is assymetrical, optimized for well bounded mass storage data transfers.
- Multiple Independant Channels
  - No. Fetch Engine is really only 1 Channel lack of True bi-directional complicates this.
- PDL, Application, OS Independent
  - Yes. Data format Independant.

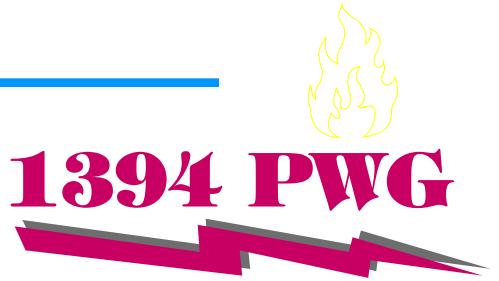
How SBP-2 Relates to the Requirements For Printing Protocols from 6/23/97



- Standard Will Allow Concurrent Opertion of Multiple Protocols.
  - SBP-2 Does not Prevent it. Function Discovery Should be Defined to Allow it

- Is Well Defined Job Boundaries a Requirement?

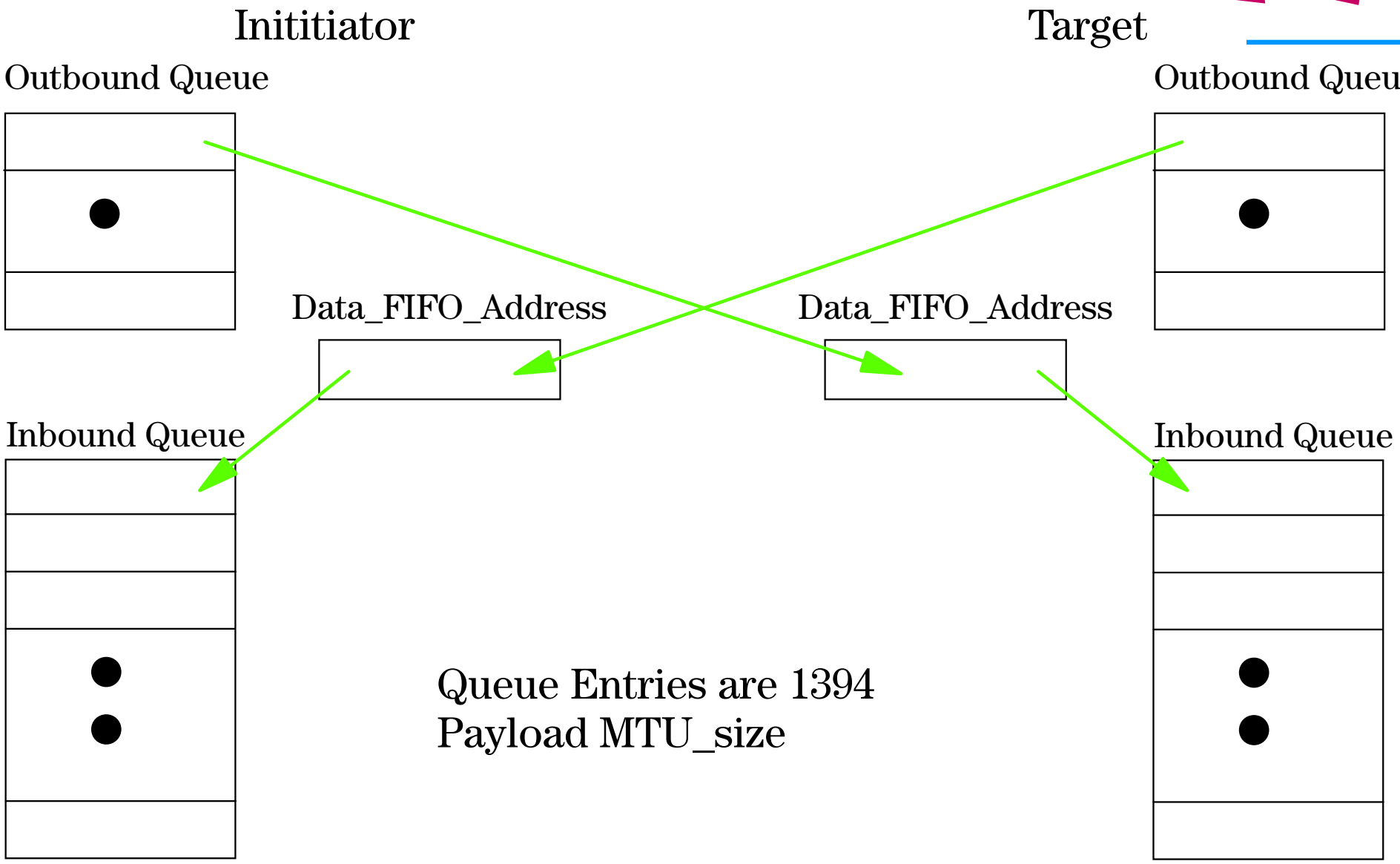
How SBP-2 Relates to the Requirements For Printing Protocols from 6/23/97 Conclusion



- SBP-2 is an efficiant transport protocol and is optimized for 1394 DMA shared memory access.
- Lack of a true bi-directional communication path makes it difficult to adapt to multiple independant logical channels.
  - Could use Dual Login "Targiator", one fetch agent in Initiator and one in Target?
  - Multiple Target Fetch agents?

Is there an appropriate alternative?

Another Idea



Another Idea - Pros & Cons

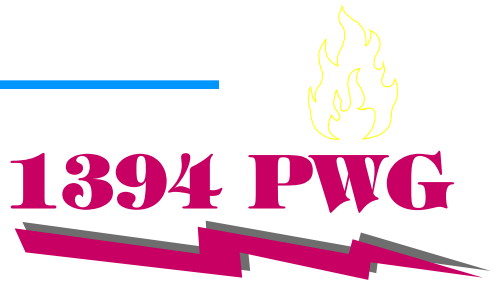
1394 PWG

+ Borrowed From IP1394
+ Sort of FCP like
+ True Bi-directional Communication
+ Efficiant 1394 Unified Block Write Transactions
+ Simple, Easy To Explain and Speciify

– Does Not Take Advantage of 1394 Shared Memory
– Do Packets Need Additional Header Info? If so could have higher header to playload overhead Vs. SBP-2 ORB to payload overhead.
– Now Need Flow Control.

✓ Could Actually Still Fetch If You Really Wanted To?

Another Idea Continued

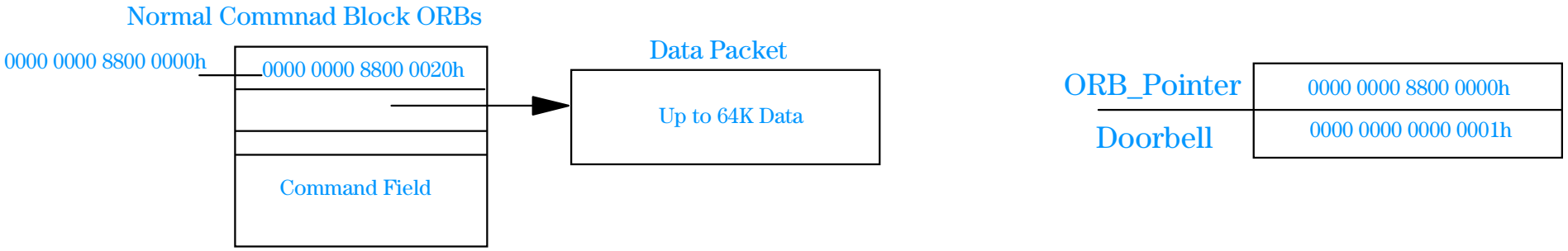


- Retain SBP-2 "Style" Features We Like
  - LoginMethod
  - Login Query
  - Reconnect Method
- Use 1284.4 style CBT Scheme?

What About A Hybred?

1394 PWG

Data Mover Path



Command, Control & Status Path