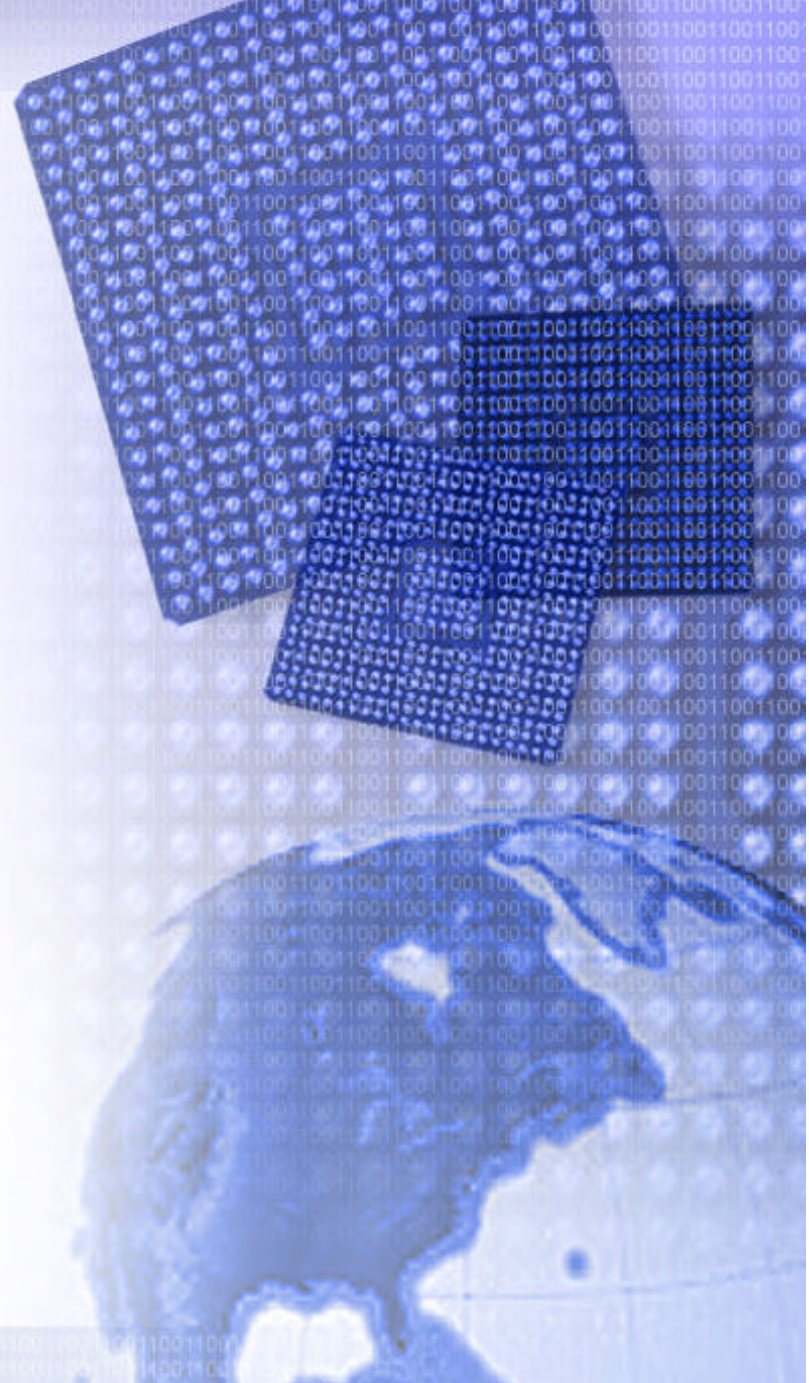




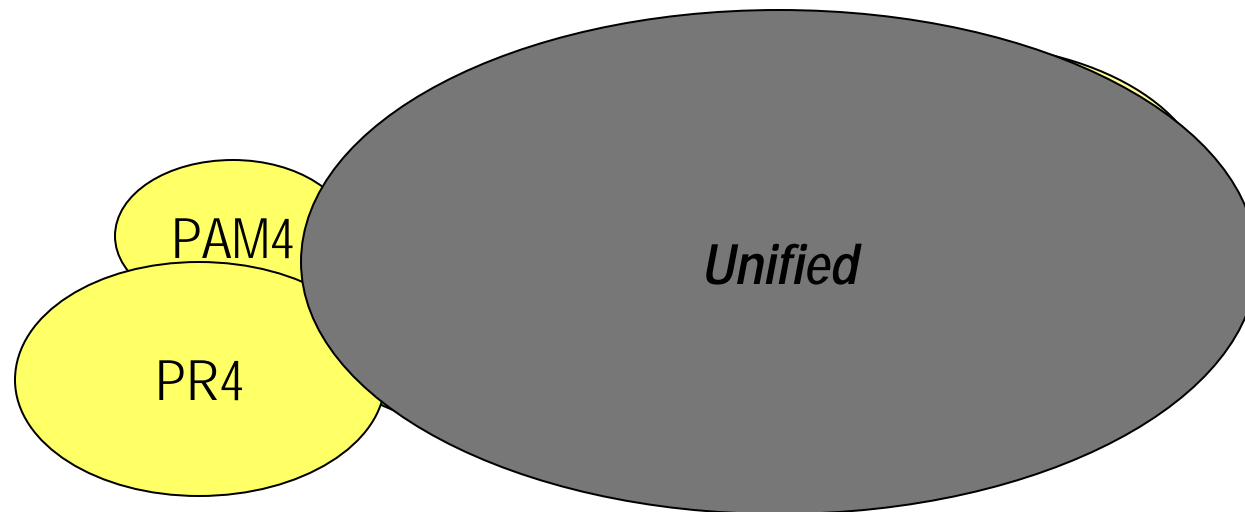
Choose Signaling Method First

Justin Gaither
Xilinx



Where are we?

- Multiple camps limiting consensus



Signaling proposals

- Unified (NRZ/Duobinary)
 - Xilinx - anderson_01_1104.pdf
 - IBM – abler_01_0904.pdf
 - LSI – liu_01_0904.pdf
 - Vitesse – multiple
 - Lucent – adamiecki_01_1104.pdf, sinsky_01_0904.pdf
- PAM4
 - Agere – brink_02_0704.pdf
 - Synopsys -
- PR4
 - Intel – altmann_02_0904.pdf



Vote Signaling First

- Signaling spreadsheet as a tool to select signaling method will be uncorrelatable
 - Different signaling methods, simulators, assumptions will have too many variances
 - This was shown in anderson_01_1104.pdf
- Choosing Channel first creates a multi-dimensional problem.
 - By selecting Signaling method, the problem is reduce to 1 dimension (how much complexity must be added to support specific channel)
- Any Signaling method can solve a channel given sufficient complexity.
 - Bad Channels increase power and complexity for all signaling methods
- There is a plurality in support/contribution of one signaling method.



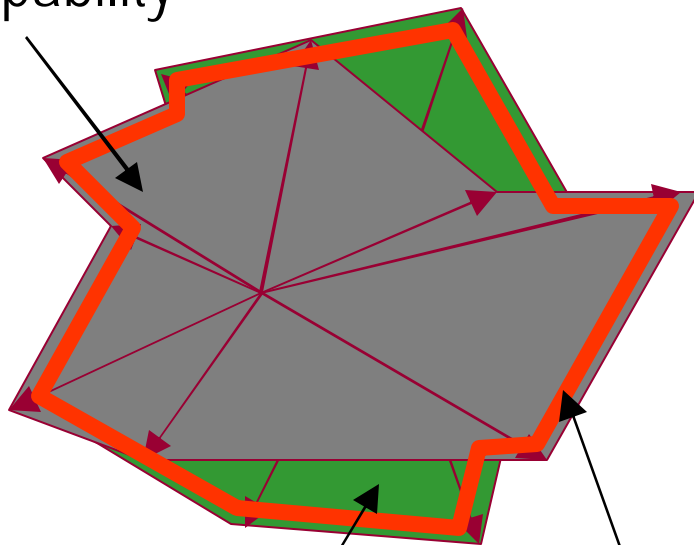
Why Unified Signaling

- Large industry support behind Unified Signaling
 - Showing feasibility over many of the channels of interest
- Reduced industry support for PAM4, lack of information on PR4
- Multiple vendors have shown NRZ and Duobinary Receivers working over most channels of interest.
 - Working with similar DFE, FFE taps, similar complexity.
- Consensus that C_d tap in TX equalizer is acceptable
- For feasibility we only need to show a single compliant architecture can solve the channel in order to be feasible.
(lower burden of proof)



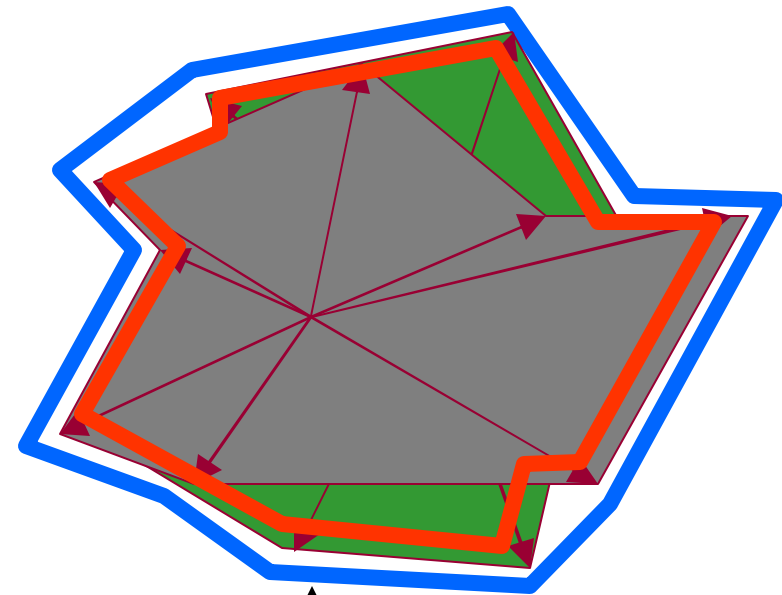
Channel Problem Spaces vs. Transceiver Solution Spaces

Reasonable
NRZ Reference Rx
Capability



Reasonable
DB Rx Reference
Capability

Allowed
Channel Space



Required Transceiver
Implementable by either NRZ or DB

Channel Comparison

- Use signaling spreadsheet to analyze channel impact tradeoffs.
 - Easily analyze cost in complexity & power for each legacy channel
 - Channels are not competing against each other, they are only competing against complexity they require.
 - Simpler problem to solve

