# IEEE802.3at Task Force

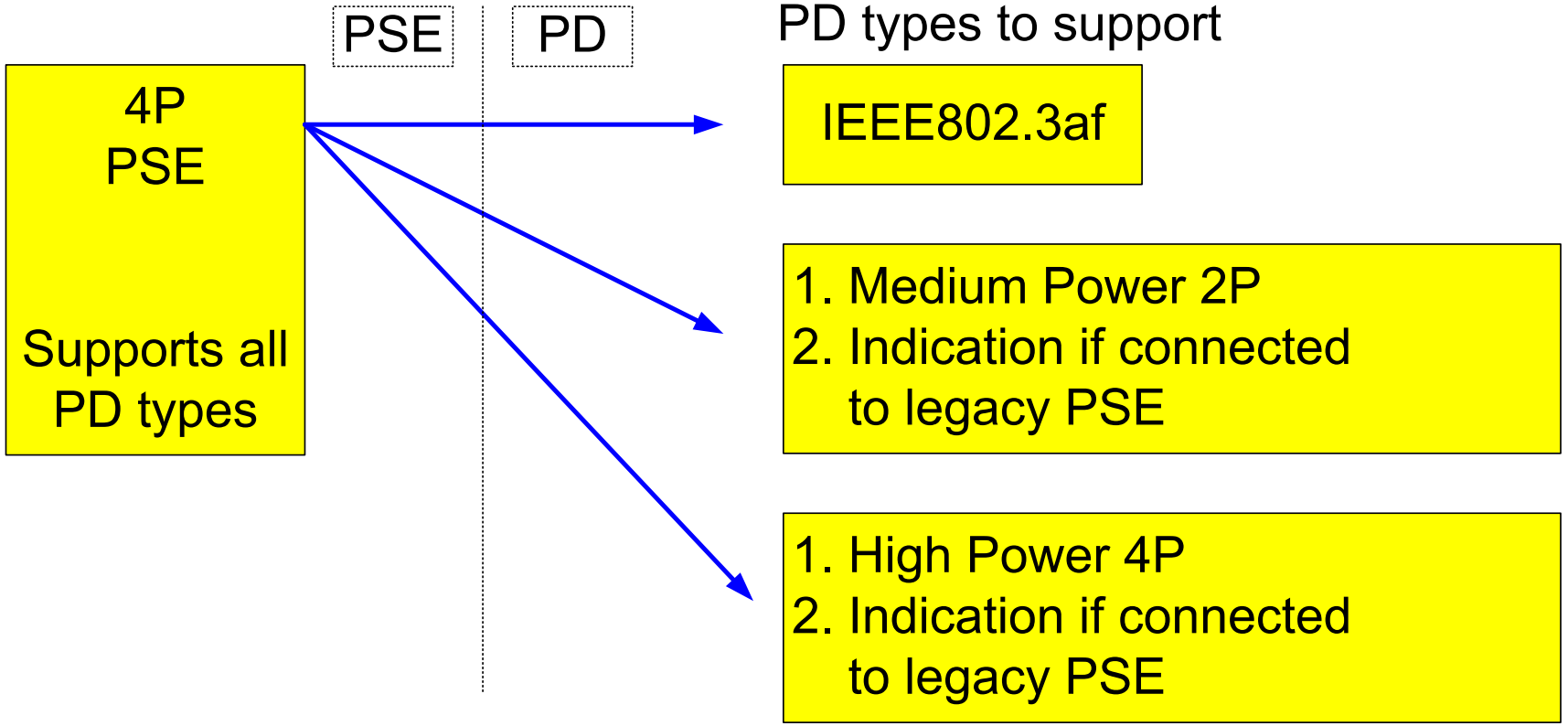
# Power Feeding Method-
# What is the best system decision?

Chandler AZ, Jan 2006

Yair Darshan

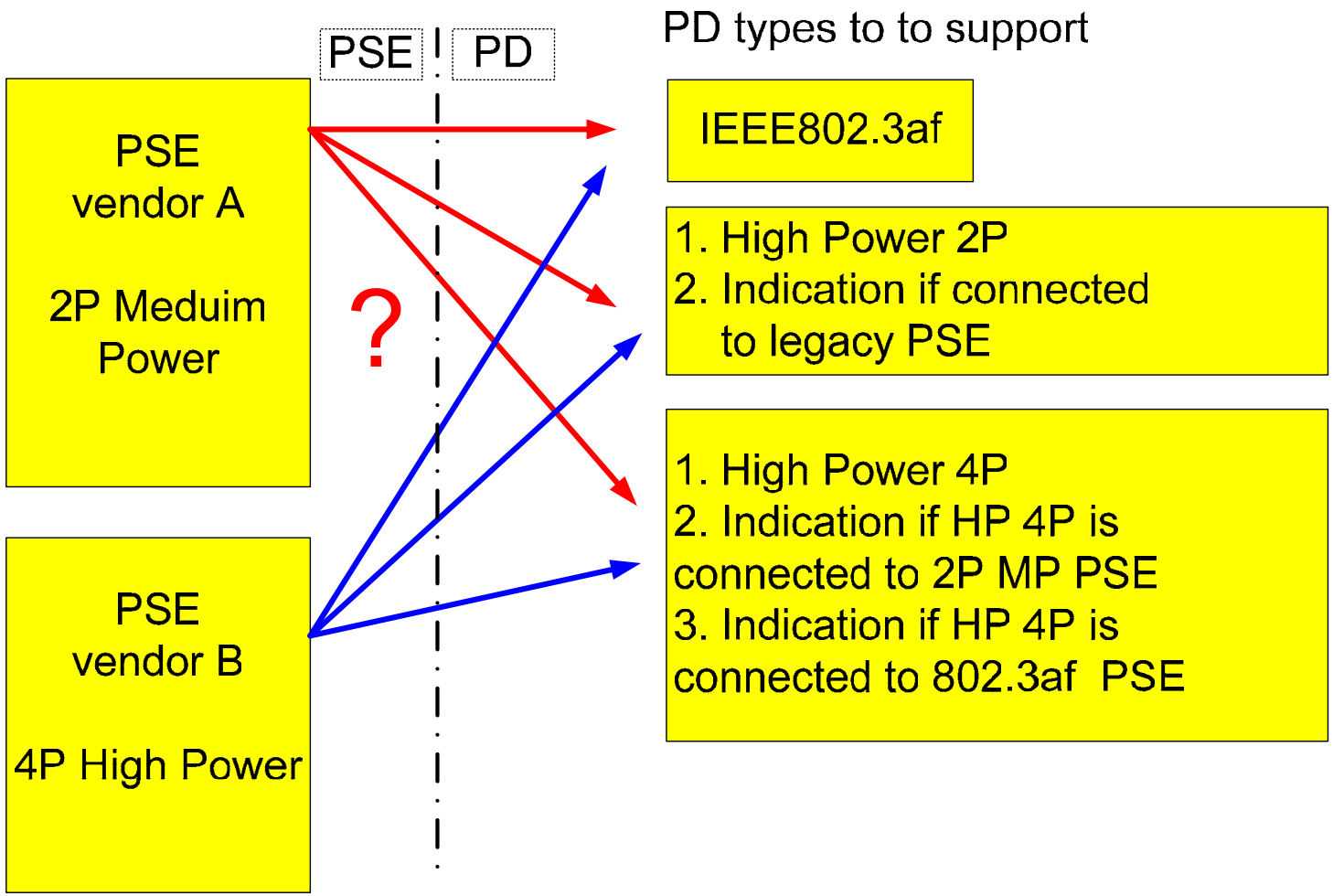
PowerDsine

# Concept#1: 4-pairs High Power PSE




Objective: 30W min, TBD max.

# Concept #2: 4-pairs HP & 2-pairs MP PSE




Objective: 30W min, TBD max.

# Analysis of the PD side

- PD power feeding type is defined by the vendor according to its power needs
- There is a consensus that PD can be either
  - 2P MP
  - 4P HP
  - 802.3af
- Conclusion: the PD is not the issue in the feeding method debate

# Analysis the PSE side

- The disagreement is on the PSE side.
- There is a consensus that 4P PSE should be supported in the standard
- The disagreement is around the question if to allow 3rd PSE type (2P Medium Power) that will support:
  - Only half of the max power of 4 pairs
  - Over 2 pairs

# IEEE802.3at status

- On September 2005 we had consensus that we should use Concept #1 only (4P PSE only).
- On November 2005 the issue was opened up again
- In the following slides a summary of the arguments raised for each concept is presented

# 4P PSE only
# or
# 2P MP PSE (Type 3 PSE) in addition to 4P PSE (Type 2 PSE)

## Pros and Cons

# 2P MP PSE – Immediate vs. Long-term

Pros

- “I have a customer that want it now”

Cons

- The standard is built for the long term
  - There is no 200Mb/s standard

# 2P MP PSE – Complexity

Pros

- 2P MP can be easily defined as a subset of 4P high power system

Cons

- Added complexity for PD indication. Now 4P PD connected to 2P MP will fail too..
- More complex signals are required in classification
- Other potential interoperability issues need to be investigated prior to the decision of adding 2P MP support to the standard

# 2P MP PSE – Power limitation

Pros

- There is a market for MP (~25W) suitable for 2P MP PSEs.

Cons

- With current data transformer technology and RJ45 connectors technology size/space current can not be more than 400mA/2P which is 36.8W/4P or 18.4W/2P at the PD
  - Not enough for 25W applications
  - Significantly increasing the data transformer size would limit our market size
- RJ45 connector maximum current capability is another open issue.

# 2P MP PSE – Market Acceptance

## Pros

- Designers will do it anyway so it is better to support it in the standard

## Cons

- Those who did proprietary and/or pre-standard solutions eventually aligned themselves to the 802.3af standard.

# 2P MP PSE – Penetration and Cost (pros)

Pros

- Adding 2P MP will speed the penetration of 802.3at
  - Existing IEEE802.3af PSEs can be easily modified to support pre-standard 2P MP PSEs
- It cost less than 4P PSE
  - For IT managers that for sure will have only 2-pair PD's that require more than 13W but less than what the maximum 2-pairs medium power PSE's can provide

# 2P MP PSE – Penetration and Cost (cons)

Cons

- IT managers
  - Already took some time to get 802.3af into the market.
  - Now with the new project: Which PSE type to use 2P MP or 4P?
    - Is it enough for my PDs or it will be not sufficient for the next 6month / Year?
  - Most would eventually use 4P to cover all potential applications
- Vendors would have to keep different inventory, support etc…
- The end result would be
  - Lower quantities and increased solution price
  - Confusion in the market
  - Slower adaptation curves for BOTH

# Current sharing and Current balancing

- Location of current sharing and current balancing is not related to the power feeding method
  - Current sharing is always required in 4P system
  - If (I>350-400mA) then current balancing is required in 2P and 4P systems for the same 802.3af data transformer size/space.
  - If data transformer size is increased for supporting higher current per conductor then current balancing is not required. (may limit some applications)
- *Location is a question of who is going to suffer more due to the additional power dissipation*

# Summary

- There is no place for three PSE types
  - 2P, IEEE802.3af PSE
  - 2P, Medium Power PSE
  - 4P, High Power PSE
- Only 4 pairs concept addresses all High Power market needs (all PDs type)
- Allowing 4P PoEp PSE and 2P PoEp PSE would result in
  - Dilution of all PSE types (af, 2PMP, 4PHP)
  - Causing lower quantities and increased solution price,
  - Confusion in the market
  - Potential of bad reputation for the PoE technology – some PDs (2P MP) will not work..
  - Slower adaptation curves for BOTH.

# Discussion