MMF ad hoc December review 100G Next Gen

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What we have so far:

- A spreadsheet model allowing relative cost (or power) vs coverage to be estimated.
  - 3 'camps' on the reach distribution we need to target:
    - long reaches justified by convolving cable distributions:
      - ~90% of switch-switch links <140m
    - survey data on existing data centres
      - ~90% of switch-switch links <100m
    - Confusion, as expressed on the reflector
      - E.g. new data centre designs will use shorter link designs to be able to use higher rate standard parts; mega data centres are bigger, so must have longer links.

- Presentations to the study group showing the benefits of FEC and Tx and Rx equalization on MMF performance, and some estimate of power burn
  - and 1 presentation proposing a 100m reach objective on MMF

What's needed for the MMF objective?

- A reach objective, and maybe an MMF type too
- We need to show **technical feasibility**
  - we don't need a complete solution
- We need to show **broad market potential**
  - E.g. broad applicability, multiple vendors/users.
- We need to show **economic feasibility**
  - Reasonable cost for performance, taking into consideration known cost factors and installation costs
  - We don't need to provide a precise calculation of lowest cost

- And we need to show **compatibility, distinct Identity**

A proposition:

- For the sake of a starting point, let's use the 100m on MMF reach proposal in King_02_1111
  - If you agree with the 100m reach objective, how can you strengthen the presentation ?
  - If you disagree with the 100m reach objective, what changes (with supporting evidence) can you make to the presentation for you to be able to support ?

# Back up

MMF objective - options

- MMF objective – option 1
  - '4x25G, 100m on MMF'
    - All server to switch, ~90% of existing switch to switch channels
    - An increasing proportion of future, smaller data centers
      - (5000 sq.ft. ~ 50 m max reach)
    - Without FEC, this would require Tx and some Rx EQ, and involve some development risk and added test cost compared to a 70m OM4 reach for example

- MMF objective – option 2
  - '4x25G, 100m on MMF, supported with FEC
    - With a 2-3 dB optical coding gain FEC this would be a relatively low risk and uncontroversial standards development, enabling for example
      - MMF PMD without FEC: ~50m on OM4
      - Same PMD with FEC: 100m on OM4
      - Same PMD with FEC: 150m on new MMF with halved CD

- Others ?

Estimated relative cost vs reach - preliminary
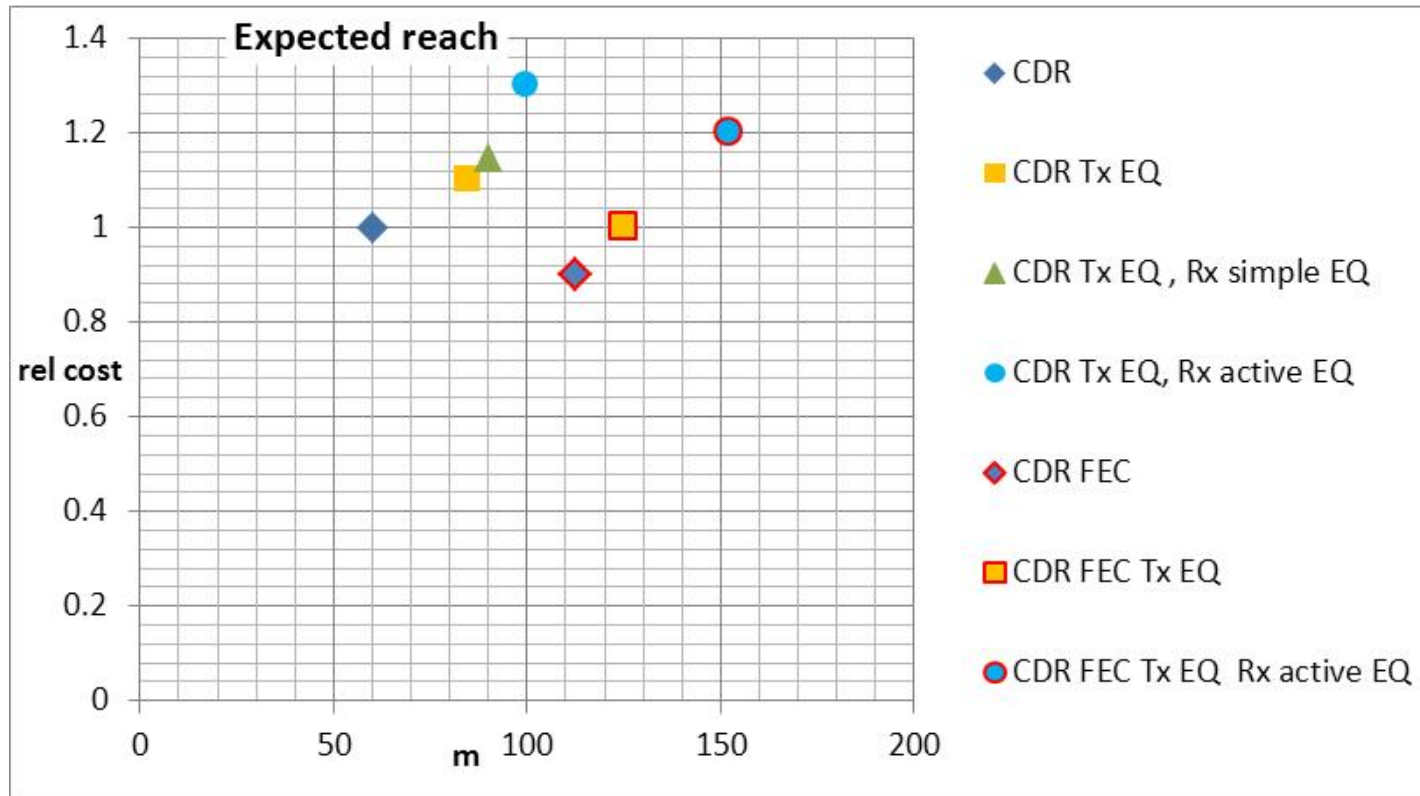
- Expected reach numbers based on King_01_1111 , approximate cost numbers based on estimated set up and test time. Where a range of reach values were estimated (eg for slow or fast risetimes) a mid point was taken.

- Noted: FEC is very cost effective performance enhancer

Estimated relative cost vs coverage – preliminary
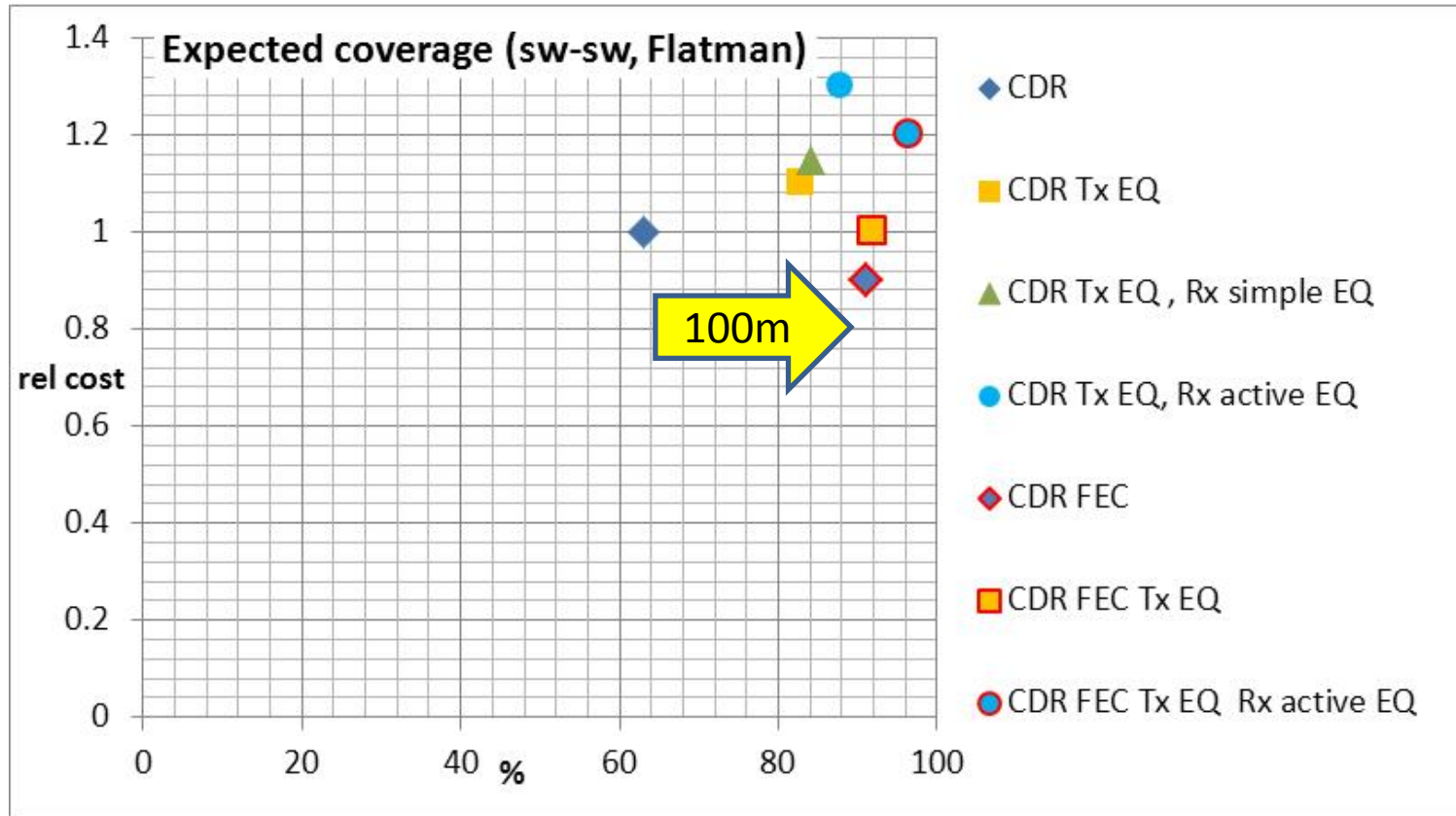
- Same examples, but plotted against % coverage of switch to switch links (Flatman_01_0911)

MMF objectives – dependence on 'mR4'

- A very preliminary study using the 'Kolesar Kalculator' shows that adding an 'mR4' PMD objective (medium reach SMF) may reduce total cost of modules ~ 10-15% lower , based on projected LR4 module costs at reasonable volume.

    - 100m SR4 reach, LR4 cost is 3x SR4 cost; mR4 is ~2x SR4; switch–switch distribution from Flatman_01_0911

    - The adoption of an mR4 objective doesn't seem to make a significant difference to the reach objective sweet spot for SR4