10GBASE-T: Economic Feasibility

Presented by:

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With Assistance from:

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Economic Feasibility Factors

- Device Cost
- Cable Type
- Connector Type

Hard Costs

- System Manufacturing Complexity
- On-going Maintenance

Soft Costs

Total Solution Is More Than Just Silicon Cost

Matching Up With Alternatives

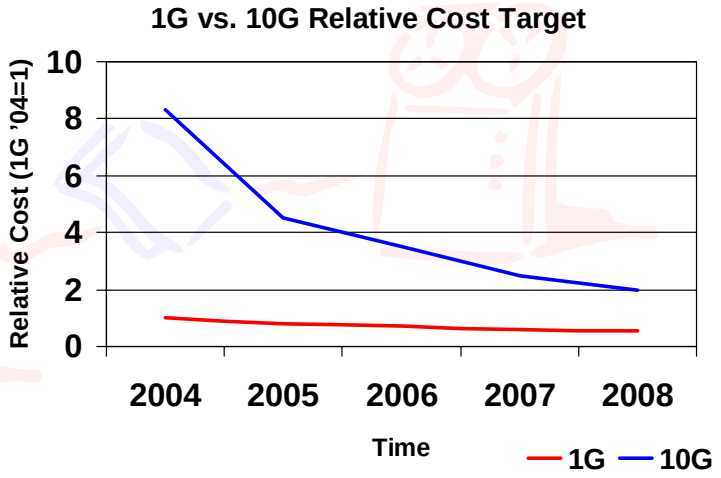
- **Economic Feasibility Depends on Perspective**
- **Comparison is not just with Copper Alternative**

1000BASE-T ← **10GBASE-T** → **10G Fiber Optics**

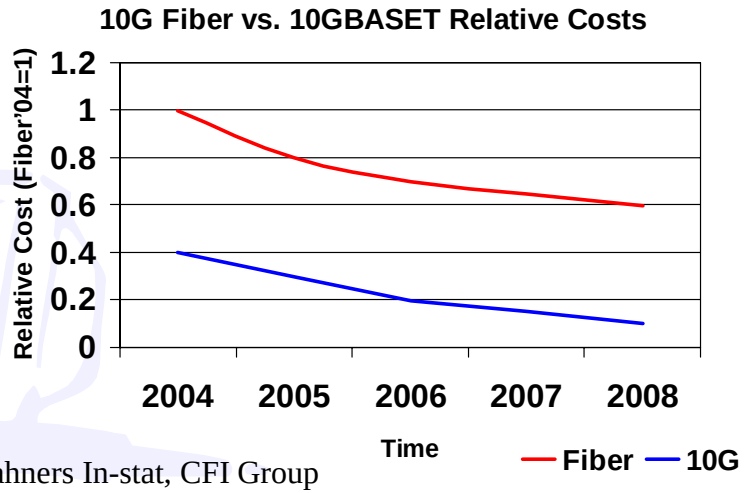
Performance of Fiber At the Cost of Copper

Device Cost

- **10GBASE-T vs. 1000BASE-T**
  - **Absolute cost will be 8-9x and trend toward 2-3x**
  - **Cost per gigabit will start at 0.8x**



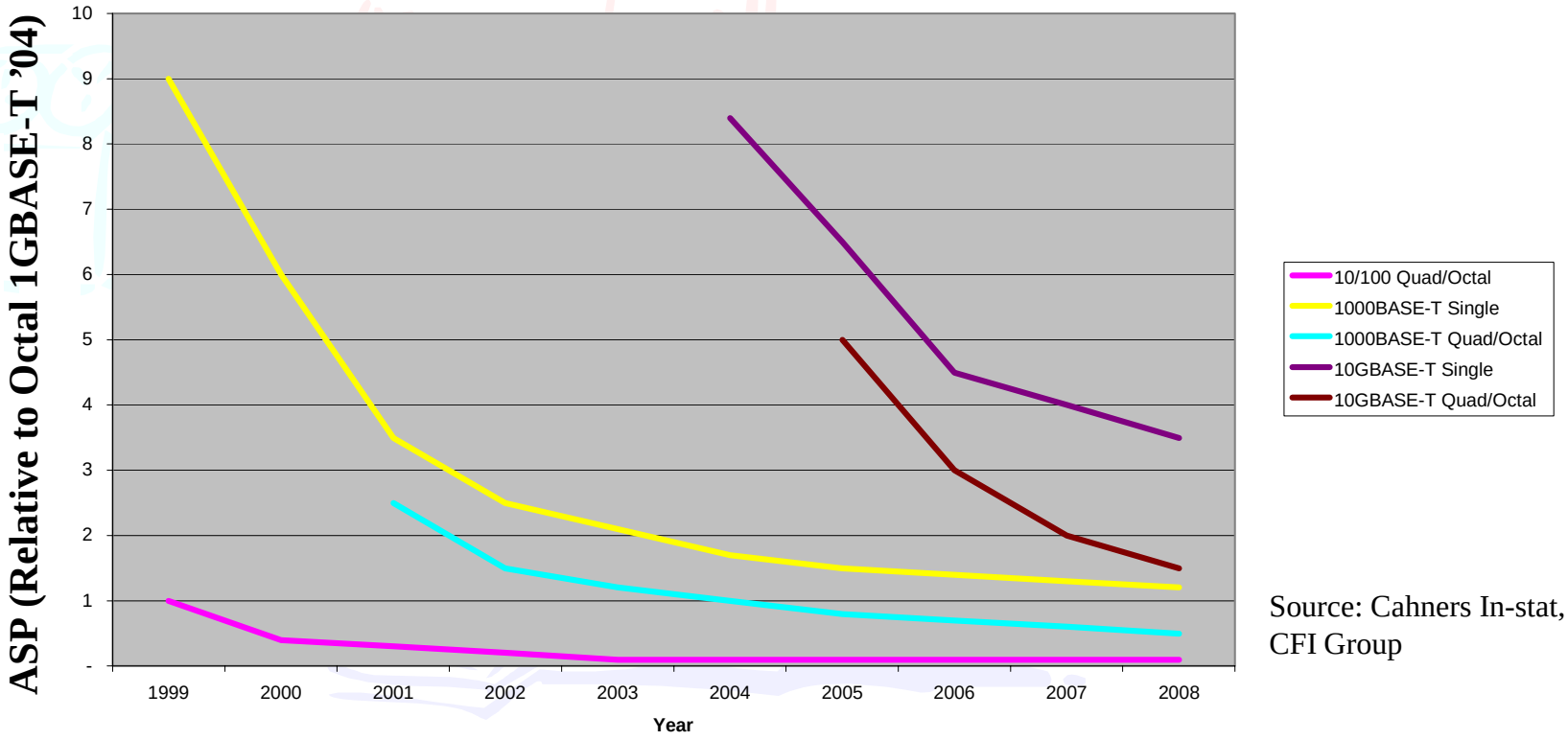
- **10GBASE-T vs. Fiber Solution**
  - **E-only vs. EOE**
  - **Absolute cost will target 0.4x fiber and trend to 0.10x**



Source: Cahners In-stat, CFI Group

Device Costs

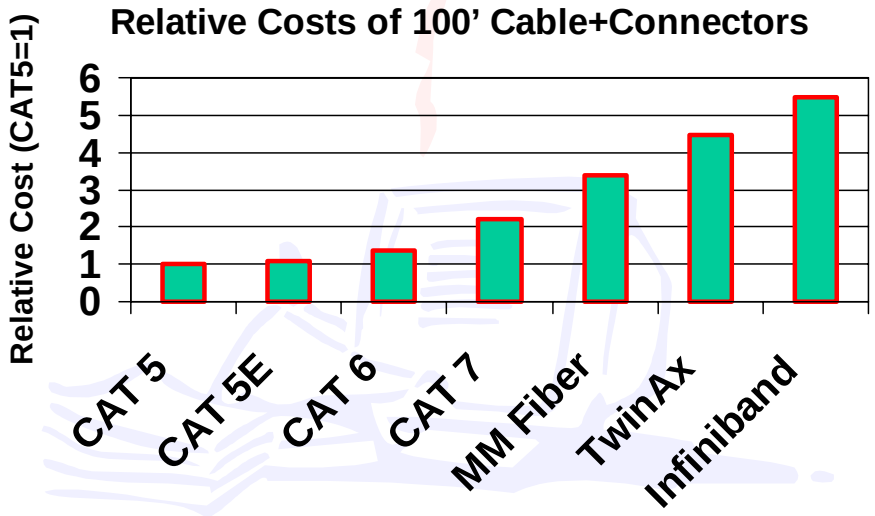
- **Like its predecessors, 10GBASE-T benefits from silicon efficiencies**
  - **Using standard, low-power process; integration of multiple transceivers; broad market potential**



Source: Cahners In-stat, CFI Group

Cable and Connector Types

- Use of installed cable creates minimal incremental cost
- Cost differential between types of cable is large
- Need to determine effect on overall solution cost

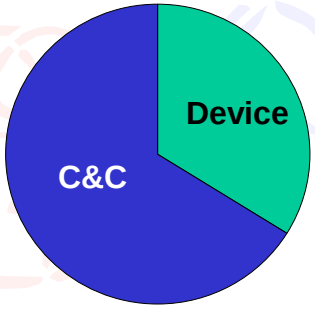


Source: L-com, CDW, CFI Group

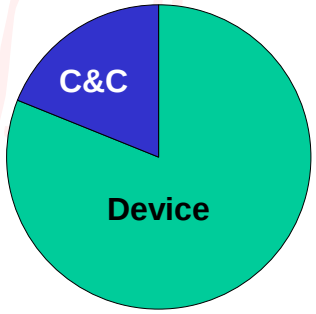
Cable and Connector Types

- **10GBASE-T vs. 1000BASE-T**
  - **Installed base of cable most likely**
  - **New install cost dominated by device vs. C&C**

New 1G Installation



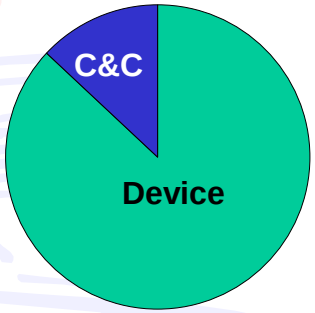
New 10GCu Installation



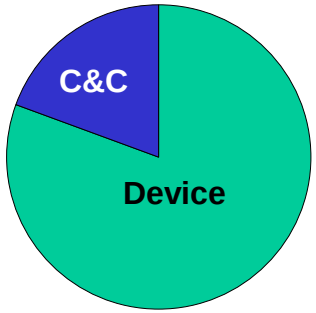
Cuts Cost Differential

- **10GBASE-T vs. Fiber**
  - **Less likely to have installed cable**
  - **Total cost dominated by device in both cases**

New 10G Fiber Install



New 10GCu Installation



Cost Differential Remains Constant

Manufacturing & Maintenance

- **Soft costs still can be major driver of economic feasibility**
- **10GBASE-T soft costs lower than fiber alternative**
  - **No “clean room” module assembly**
  - **More automated system manufacturing**
  - **Less power consumption and board space**
  - **No fiber optics connector cleaning issues**
- **Goal of 10GBASE-T is to approximate 1000BASE-T soft costs so differential will be negligible**

Other “Economic” Considerations

- **Packaging and Module Integration**
- **Power Considerations**
- **Process Discussion**
- **Cost of EMI compliance**
- **Compatibility with 1000BASE-T**
- **Continue to Verify and Track Hard and Soft Costs**

For Consideration in Study Group

Summary

- Total cost of ownership is more than device cost
- Comparison against both 10G fiber as well as multiple 1GCu are valid
- Most relevant comparison is with 10G fiber solution
  - Even at start, cost of ICs will be a fraction of fiber costs
  - Cost of cable will be much less and approach zero, if installed base is used
  - Soft costs such as manufacturing and on-going maintenance are low
- 10GBASE-T has feasibility even compared to 1GCu
  - Draws on same cost reduction curve; lower cost/Gb
  - Benefits from standard silicon manufacturing process
  - Can possibly leverage same cable base