Cabling Choice

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Presentation

- What are the cabling choices
- What do the choices involve
- When should we decide and why
- Conclusion

Cabling choices

- **Cabling standards organizations will not specify a new Category 5.**

From a WG 3 Liaison report to IEEE 802.3:

“This Working Group has re-engineered and specified the Category 5/Class D Channel to accommodate the needs of IEEE 802.3, which we agreed to do in the lack of higher specified classes of transmission. We presently have a number of active projects under way and would find it difficult to justify any further work on Category 5/Class D specifications, due to its anticipated obsolescence.”

“In light of the above observations we strongly urge you to focus on the support of 10GBASE-T over channels Category 6/Class E or better, in order that we may cooperate with you in the most expedient manner.”

At the TIA TR42.7 meeting (02-05-2003) the question was asked:

"Who is interested in informally working on Category 5e to support the IEEE 10GBASE-T study group." The response was 0.

"Who is interested in informally working on Category 6 to support the IEEE 10GBASE-T study group." The response was 29 companies.

Cabling choices

- **If we choose Category 5.**

  We will have to do the work of writing a cabling specification in IEEE.

- **If we choose Category 6 and ask the cabling standards organizations to extend the frequency.**

  They will write the specifications.

- **If we choose Category 7**

  Category 7 is NOT UTP!

  Category 7 is not a recognized cabling in TIA.

What goes into a cabling specification

- **Category channel requirements**
  13 pages in TIA 568B
- **Category component requirements**
  29 pages in TIA 568B
- **Test configurations for measuring the above**
  40 pages in TIA 568B
- **Field testing requirements – Pass/Fail criteria**
  5 pages in TIA 568B
- **Field tester accuracy requirements**
  20 pages in TIA 568B

If we choose Cat 5

How do we define the cabling category?

- **We need to be able to tell the customer what to install.**
- **We will not be able to call it Category 5.**

  “Category 5: This designation applies to 100 ohm Cables whose transmission characteristics are specified up to100MHz.”

- **We will have to designate our own cabling category.**

If we choose Cat 5

How do we specify the requirements?

- **The channel requirements will need to be specified in the standard.**

  Extrapolate the Category 5 specifications.

- **Can we guarantee that previous installations or even new installations using Category 5 that is only tested to 100 MHz will work?**

  No!

- **More than likely there will be vendors available who will be offering proprietary solutions.**

If we choose Cat 5

Do we define the cabling components?

- **The channel requirements are calculated from the component specifications.**

  We will need to know the component specifications.

- **What about extending the component specifications:**

  Cables – Will require some work,
  Patch cords – a little more work,
  Connectors – and a lot more work.

- **If not - Then the channel requirements will have to be met by design.**

  Different vendor components may not interoperate.

  Achieving satisfactory performance in the field may be a trial and error.

If we choose Cat 5

How do we test the cabling?

- **We will need to define the test set-up for at least the laboratory.**

  Test configurations will extrapolate only so far.

- **Do we define field testing requirements?**

  If not, how do we know if the cabling will work at installation or for troubleshooting?

- **More than likely there will be vendors available who will be offering proprietary testing solutions.**

  Different testers may give different results.

If we choose Cat 5

What if the cabling does not work?

- **We will have to include mitigating steps in the standard if the cabling does not work:**

  Replace the patch cords

  Remove the connectors

  Unbundle the cable

  Replace the cable

  Move office closer to the wiring closet

  Call Brad Booth

If we choose Category 6

- **We put in the PAR:**

  “10GBASE-T over Category 6 or better”

- **We officially send a liaison request to the cabling standards organizations to start a project on extending the frequency limits for Category 6.**

  Both ISO and TIA said they will support this.

If we Choose Category 7

- **Category 7 just does not have the same acceptance by customers as Category 6.**

  While Category 6 grew by 30% from 2001 to 2002 to 27.4% of the World Market for new installations, Category 7 remained flat with only 0.3%.

When should we make this choice?

- **If we wait until the end of the project,**

  Then the additional work would delay deployment.

- **If we make the choice at the beginning of the project.**

  All the work that goes into defining the cabling can be done in parallel:

  - **Channel requirements**
  - **Component requirements**
  - **Test configurations**
  - **Field testing requirements**
  - **Field tester accuracy requirements**

If we choose Cat 5 at the start

- **We will need more people for the project that have the experience in cabling and <u>would</u> work on the project.**

Cabling specifications will now become part of the PHY.

If we choose Cat 6 at the start

- **The cabling standards organizations will do the work.**

  We will reference their document.

- **We will have a defined cabling infrastructure at the completion of the standard.**

  Supported by all the cabling vendors.

Conclusion

- **We will not be able to write a cabling specification in IEEE for a multi-vendor cabling infrastructure that is guaranteed to work.**
- **If we choose a cabling that is different from the cabling installation trends then we may be repeating the mistakes of the past.**

  Category 3 instead of Category 5

  Difficult to use shielded Type 1 cabling

- **If you choose Category 6 then we have the best chance of a cabling in place for 10GBASE-T.**

  It is also possible that additional improvements can be made such as reducing Alien Crosstalk.