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Matching Media Choices to Business Needs



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Historical Quotes

- “Ethernet will never run effectively on twisted pair cabling”
- “Fibre will replace copper as the medium of choice in the home run segment by the end of the year”
c1990



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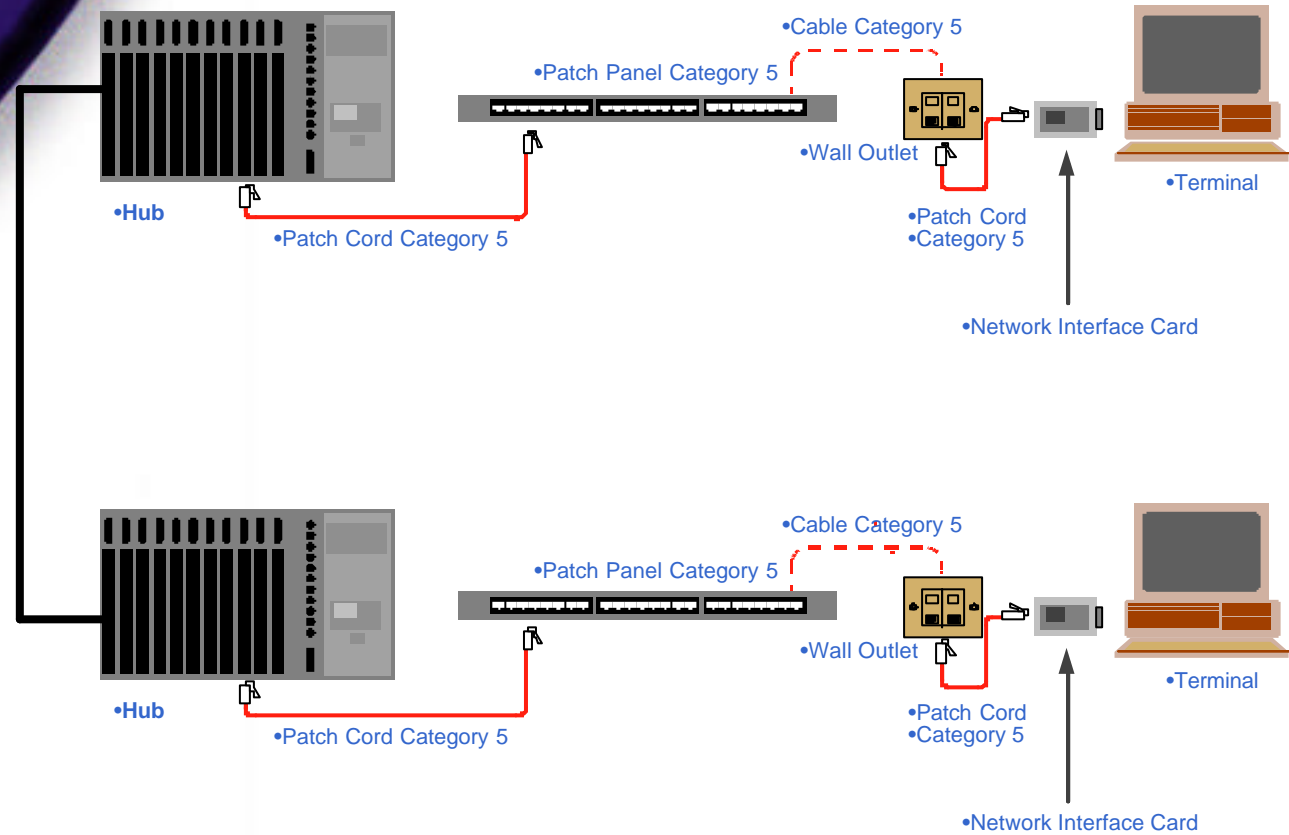
More Recent Quotes

- “Cat 5 will deliver enough bandwidth for the foreseeable future”
c1999
- “Everyone should install Cat 6, Cat5 is strategically obsolete”
c2000



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Media Options c1995





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62.5/125 Fibre

- “FDDI grade”
- 160/500 MHz.km
- 300m “Centralised architecture”



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Category 5

- Specified in early 1990's
- Applications support up to FDDI over copper
- 100 MHz nominal bandwidth
- Test - Wire Map, Length, Attenuation and NEXT
- Ratified specifications



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Gigabit Ethernet

- Once Gigabit Ethernet emerged cabling systems required review.
- US - TSB 95 - TIA 568-A-5
- ISO - Class D 2000
- Fibre



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What are the options in 2001?

■ Backbone

– Copper

- Various Flavours

– Fibre

- MM 62.5/125
- MM 50/125
- SM



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What are the options in 2001?

- Horizontal
 - Copper
 - Several Flavours
 - Fibre
 - MM 50/125 or 62.5/125
 - SM
 - Wireless



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“New Cat 5”

- Addendum to ISO 11801
EN 50173 and TIA 568A
- “simultaneous bi-directional transmission”
- Adds new test parameters
- Impacts installed cable testing -
no component changes
- Interconnect Model



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Category 5e

- Addendum to EIA 568A
- “simultaneous bi-directional transmission”
- “improvements in cabling technology”
- Component changes
- ~ 3dB better *NEXT + *ACR
- 100 MHz bandwidth



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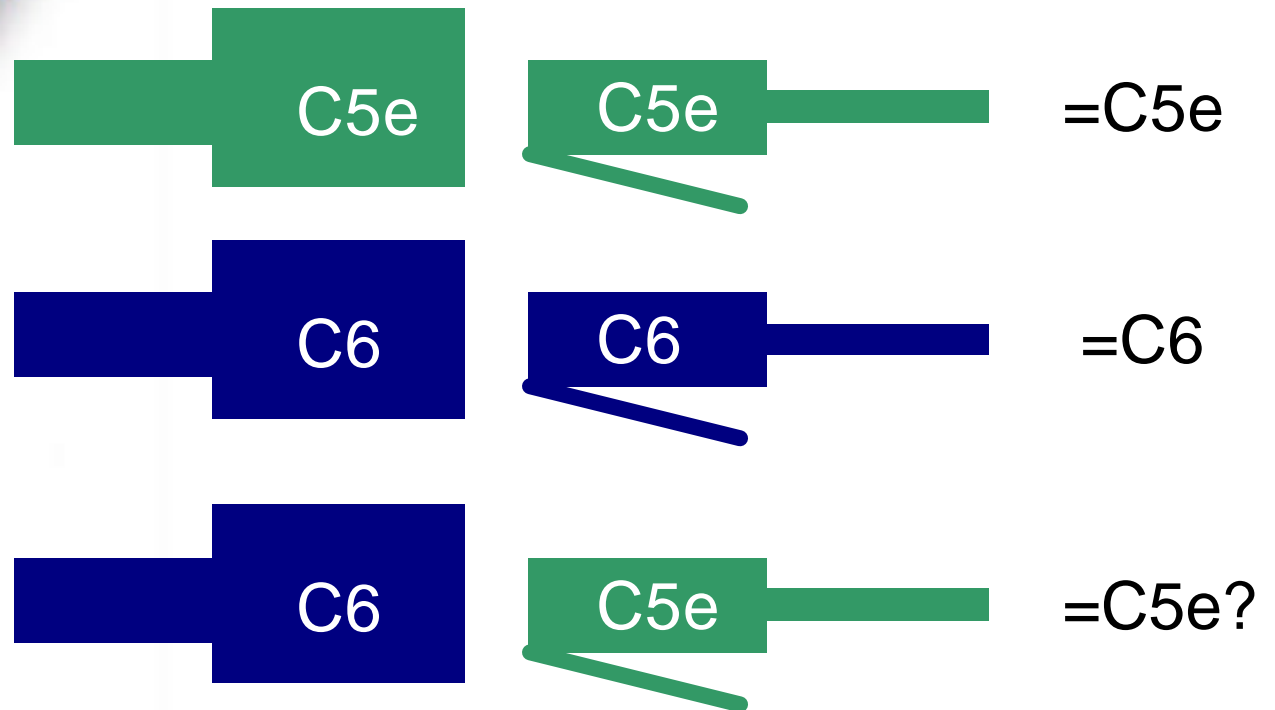
Category 6

- +ve PSACR < 200MHz
- Tested to 250MHz
- 4 pair "RJ45" based
- Channels "technically stable"
- Insertion Loss Deviation
- Backwards compatibility



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Backwards Compatibility





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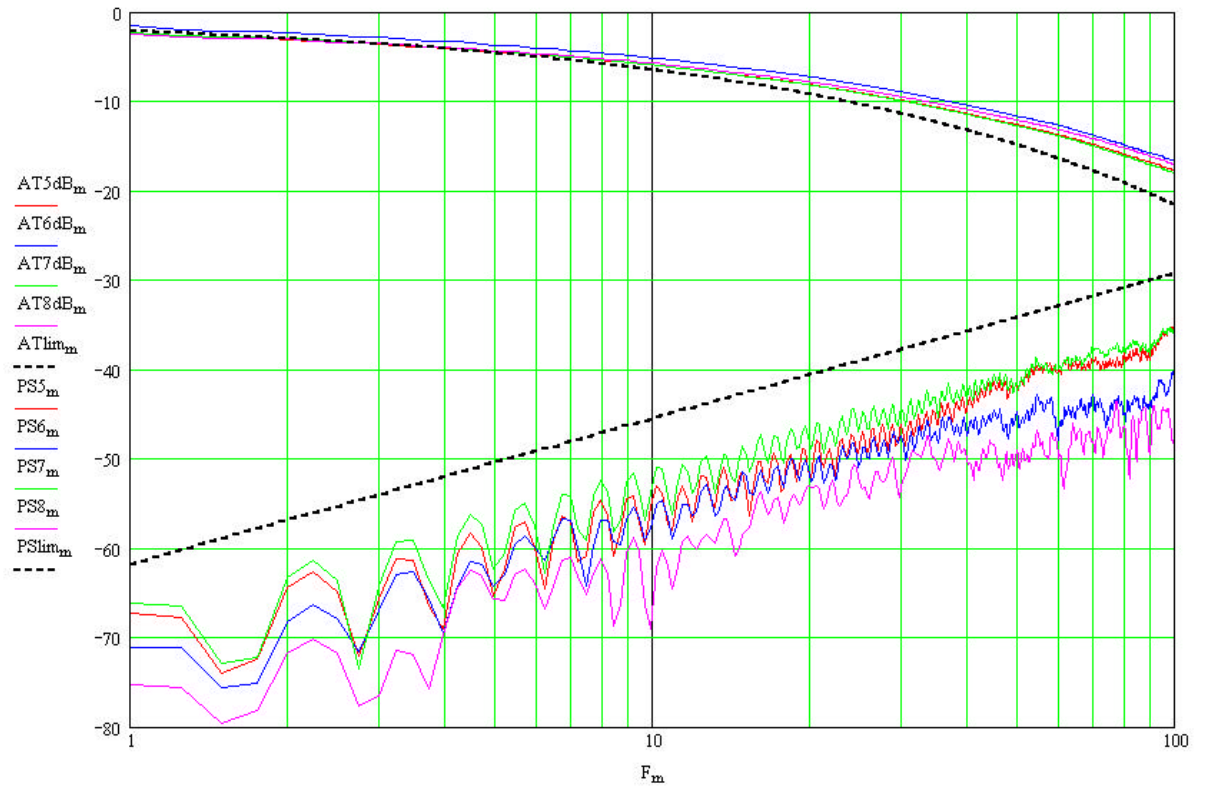
Category 6

- Backwards Compatibility
- Same plug both ends?
- Active equipment interface
- Potential Problems with Fast Ethernet



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Backwards Compatibility





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Category 7

- +ve PSACR < 600 MHz
- 2 pair
- 4 pair < 475 MHz ?
- Testing in field?
- Applications?



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62.5/125 MM Fibre

- 200/500 MHz.km
- Extended distance for GbE over FDDI Grade



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50/125 Fibre

- 500/500 MHz.km
- Improved distance for GbE
- No cost penalty
- Same hardware



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Copper to the desk

Data rate



>1 Gbps Cat 6

≤ 1 Gbps Cat 5e



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FTTD

- Cost falling
- Voice?
- “Fibre to the work area”



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FTTD

- Options

New “categories” of MM fibre

OM1

OM2

OM3



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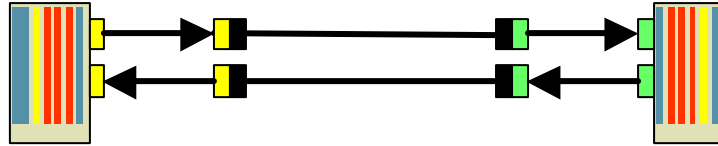
Fibre Backbone

	< 1Gb	> 1Gb
<200 m	50/125 or 62.5/125	?
<500 m	50/125	SM
<1500 m	SM	(SM > 200 Mb)
<2000 m	SM	



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10 Gigabit Ethernet



- switched operation only
- star topology
- support 10Gb/s Ethernet and 9.584640Gb/s SONET
- 2000 m, 10000 m and 40000 m over SMF
- 100 m over existing MMF

	Range	OF	Wavelength	Cable	Protocol	
Legacy support	< 35 m	MMF	850	OM1	Serial	SAN
	< 69 m	MMF	850	OM2	Serial	
	< 300 m	MMF	850	OM3	Serial	
Legacy support	< 300 m	MMF	1300	OMx	WWDM	LAN
	< 10000 m	SMF	1310	OS1	Serial	
	< 40000 m	SMF	1550	OS1	Serial	M/WAN



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Wireless

- Flexible
 - Hot desks
 - Warehouse
- Limited data rates
- Concerns over interference



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EN 50173 – when?

- SE complete
- 6MP began July '01
- 3MV begins Q1 '02
- Publication Q3 '02



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ISO 11801 – when?

- 2nd CD now
- FCD Q3 '01
- FDIS Q1 '02
- Publication Q3 2002



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TIA 568B – when?

- 3 parts
- B1 General – published
- B2 TP Spec – published*
- B3 Fibre – imminent

* No Cat 6 in this!



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Optimising the design

- Campus Backbone
 - SM Data
 - Copper Voice
- Building Backbone
 - MM subject to caveats
 - SM – dark?
 - Copper Voice



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Optimising the design

- Horizontal

- C5e or C6
- 50/125 to CP's?



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Conclusions

- Blending technologies
- Applied cost benefits
- Choosing what works for your environment