Laboratorio di Amministratore di Sistema

3. Progettazione di una rete

3A: il cablaggio strutturato

Università di Venezia – Facoltà di Informatica
feb-mag 2013 - A. Memo

ver 2.1

Objectives

1. Sistemi di cablaggio strutturato

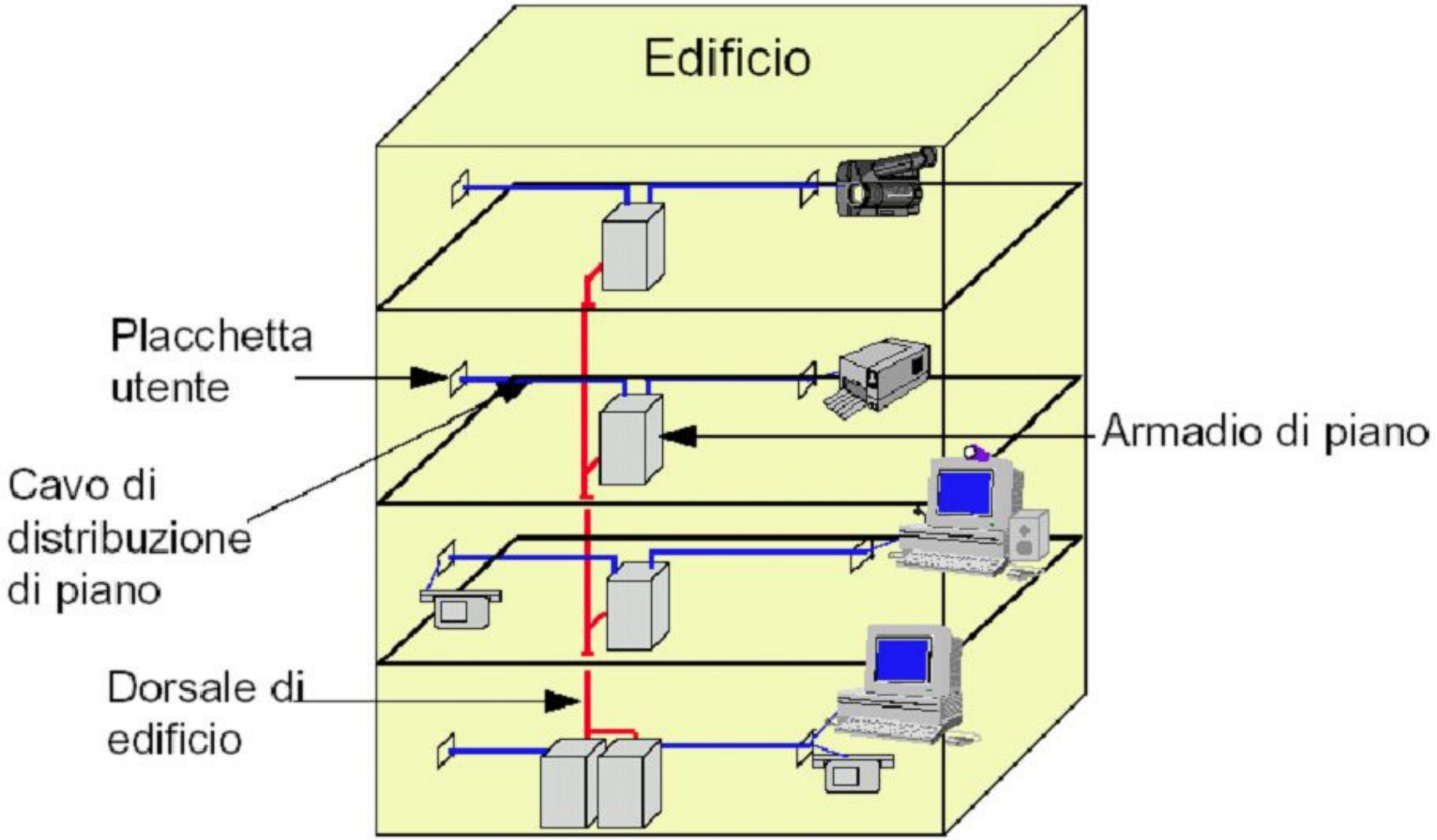
- 2. terminologia

3. dispositivi passivi

4. Sistema di connessione

Structured Cabling Systems

Il Cablaggio strutturato è un metodo per creare un sistema di cablaggio organizzato che può essere facilmente compresi e gestiti da installatori , amministratori di rete e qualsiasi altra tecnico abile con i cavi

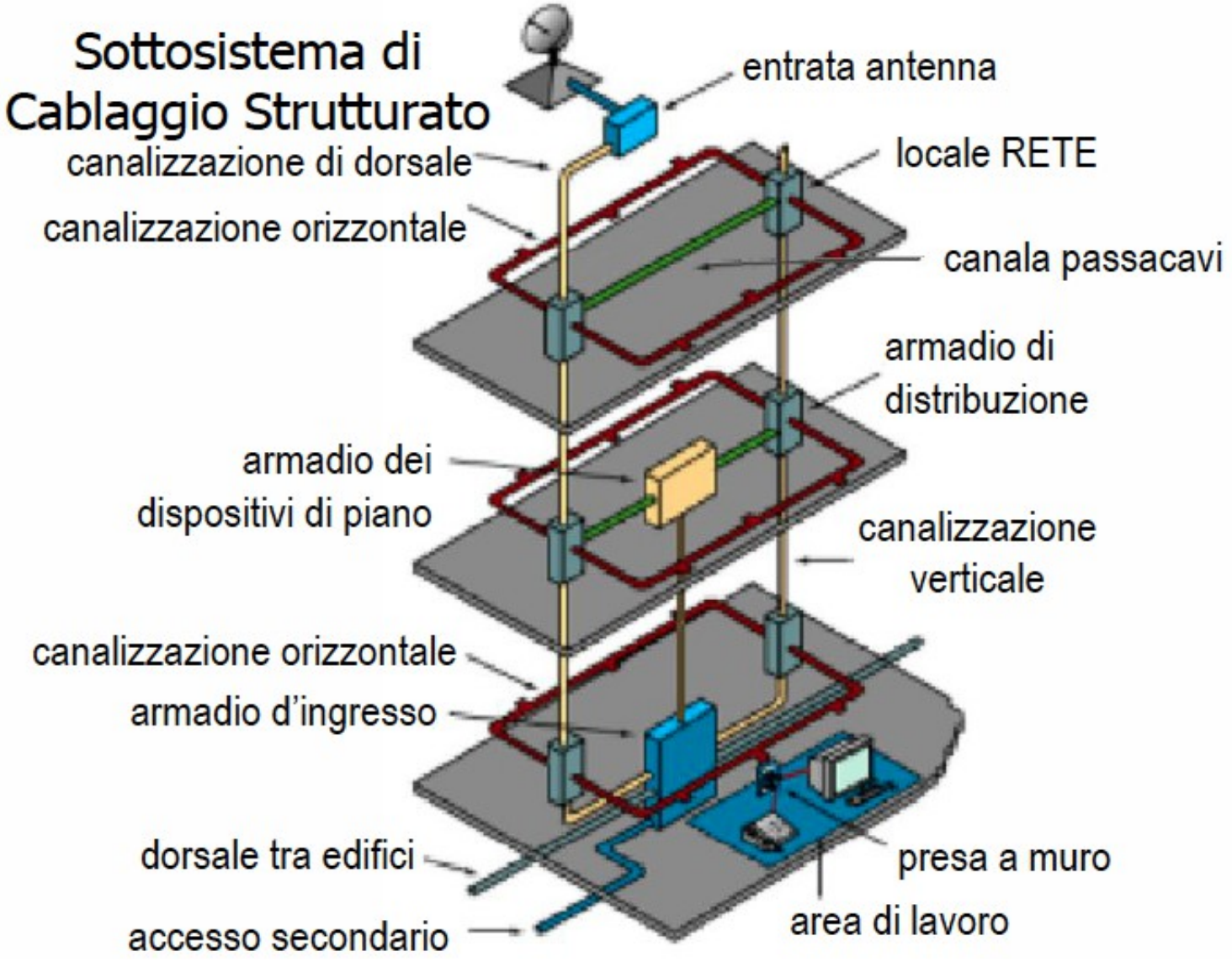


Structured Cabling Systems

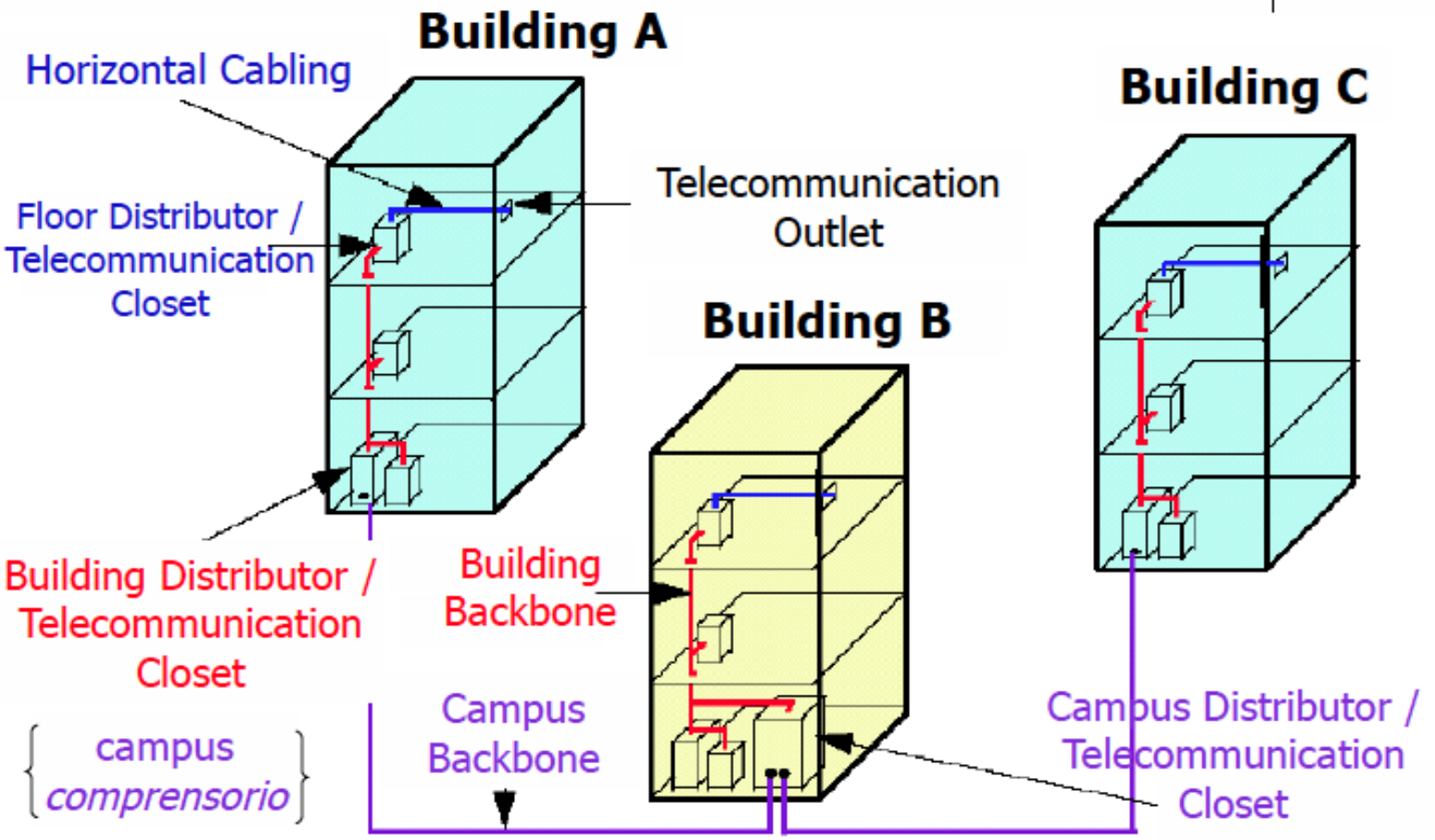
Regole di cablaggio strutturato per reti LAN

- aspetto per una soluzione di connettività completa
- piano per la crescita futura
- mantenere la libertà di scelta per i venditori

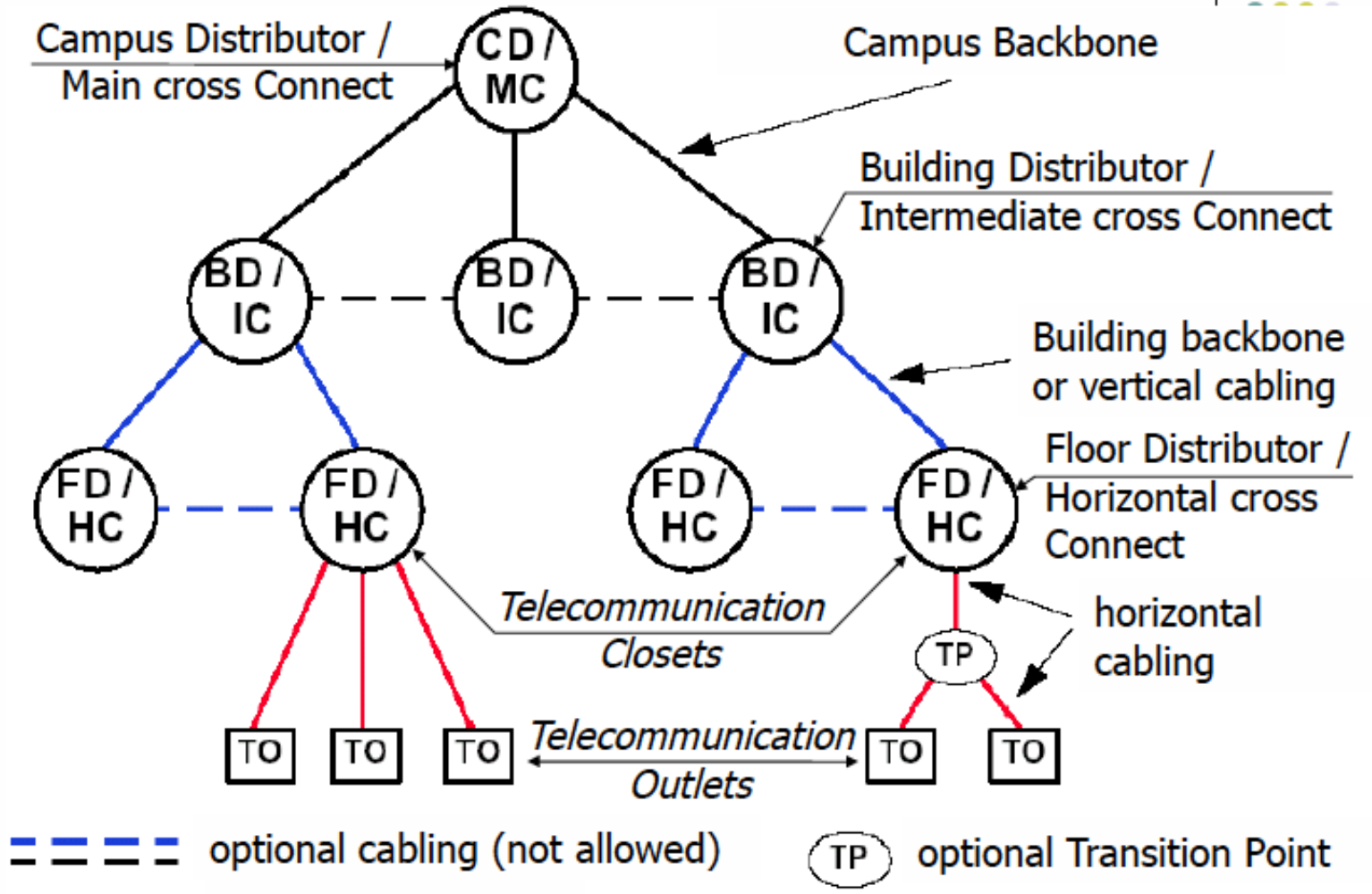
Sottosistema di Cablaggio Strutturato



Subsystems of Structured Cabling
a larger example

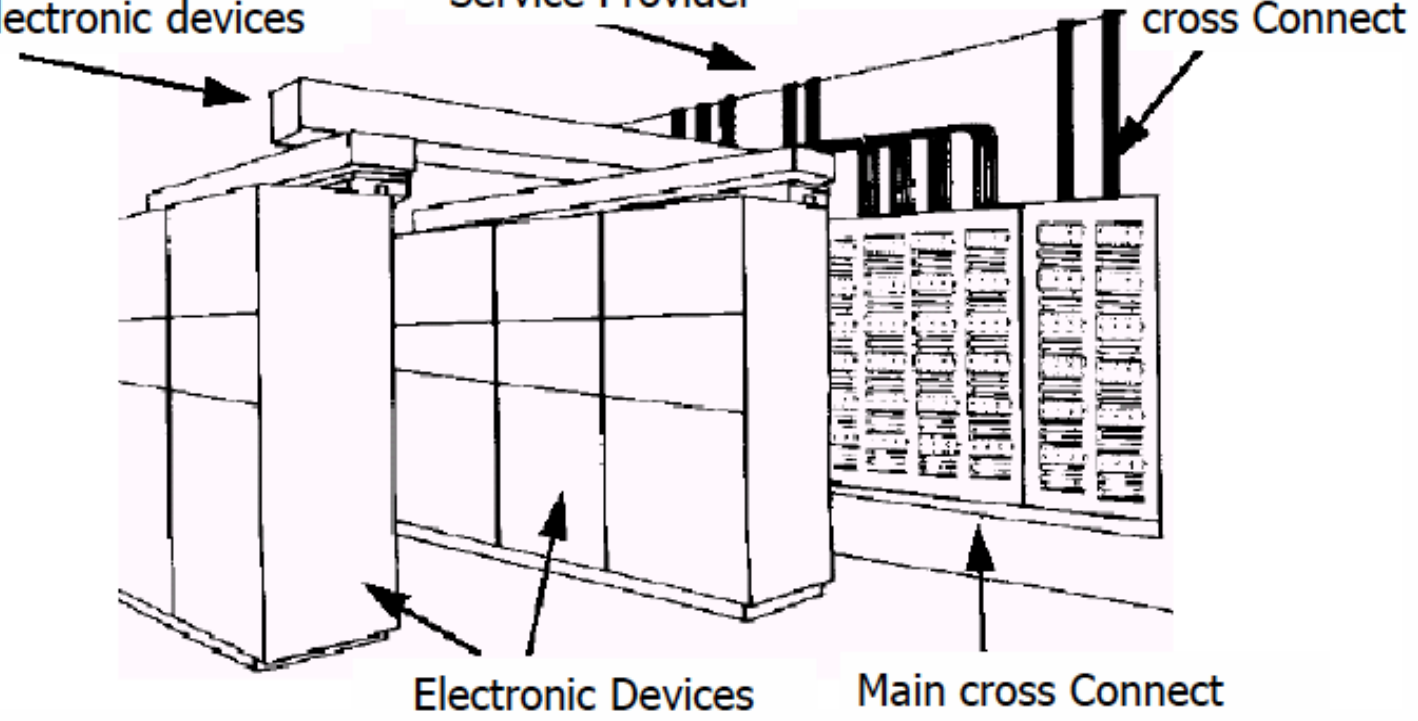


Cabling logical diagram



Campus Equipment Room

more complex than Telecommunication Closet



Telecommunications Room

Patch Panel (front)

Distribution Rack

Raceways

- Una pista è un canale che contiene cavi. Le Raceways includono condotti elettrici comuni , cavo speciale o ladder racks, sistemi di cavi nel pavimento , e canali in plastica o metallo.

Telecommunication Closet

Patch Panel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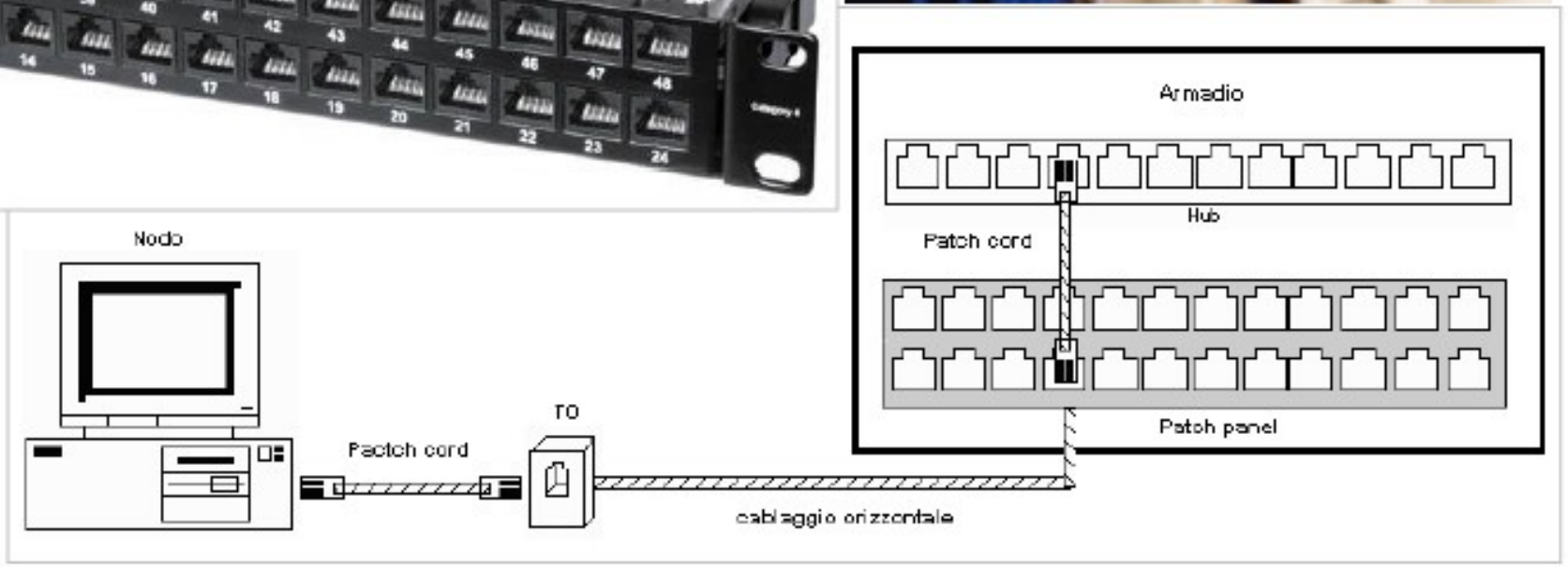
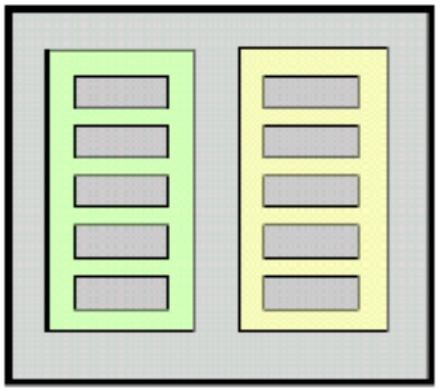
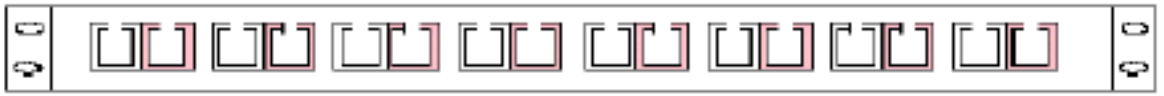

Armadio
Hub
Patch cord
Patch panel
Nodo
TO
Pactch cord
cablaggio orizzontale

Patch panel and Patch Cord

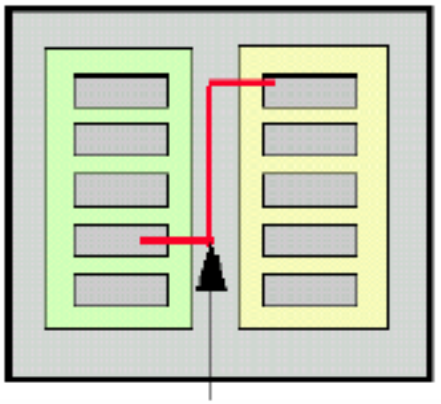


Panel with telephonic cross-connect

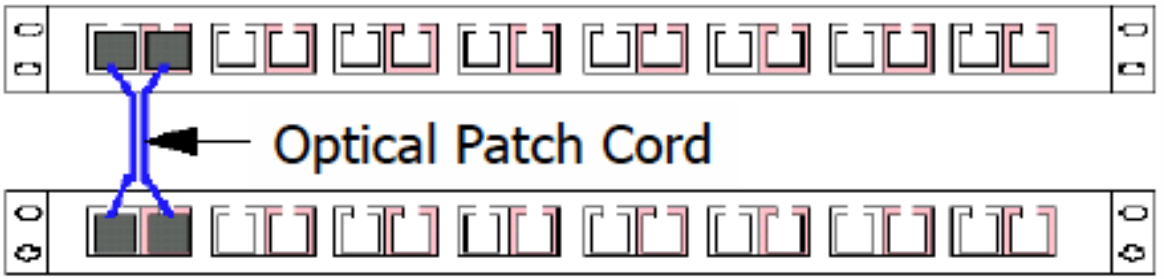
Panel for UTP cables with 16 RJ45



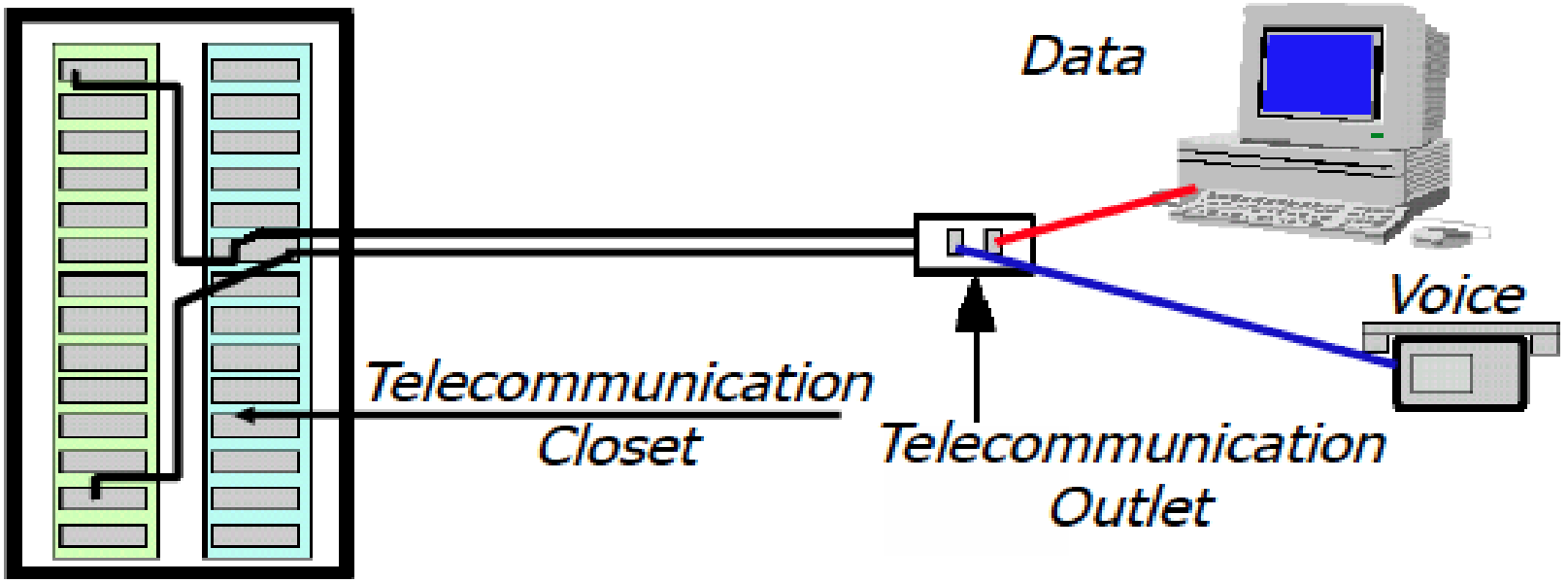
Panel for optical fiber with 16 SC connectors



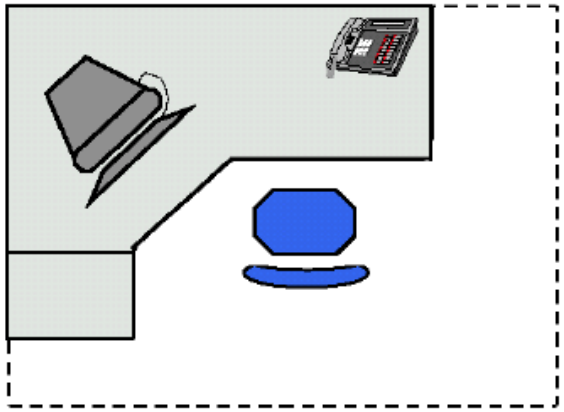
Patch Cord



Patch panel and Patch Cord

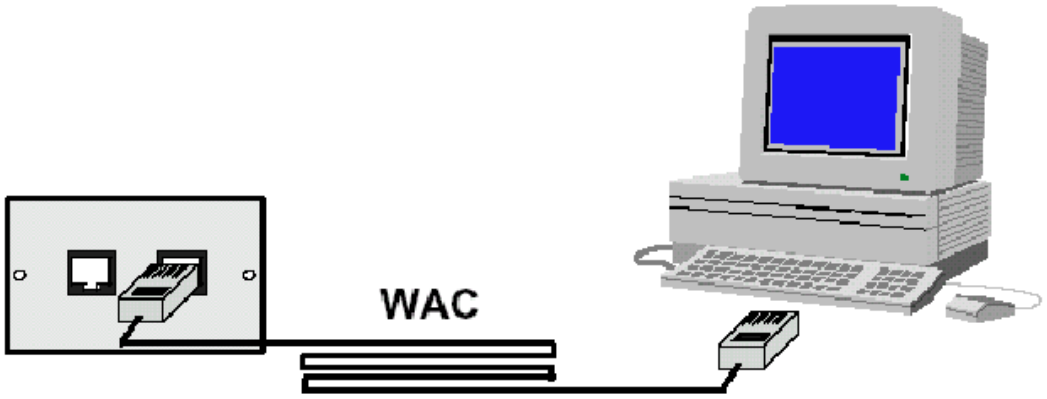


Working area

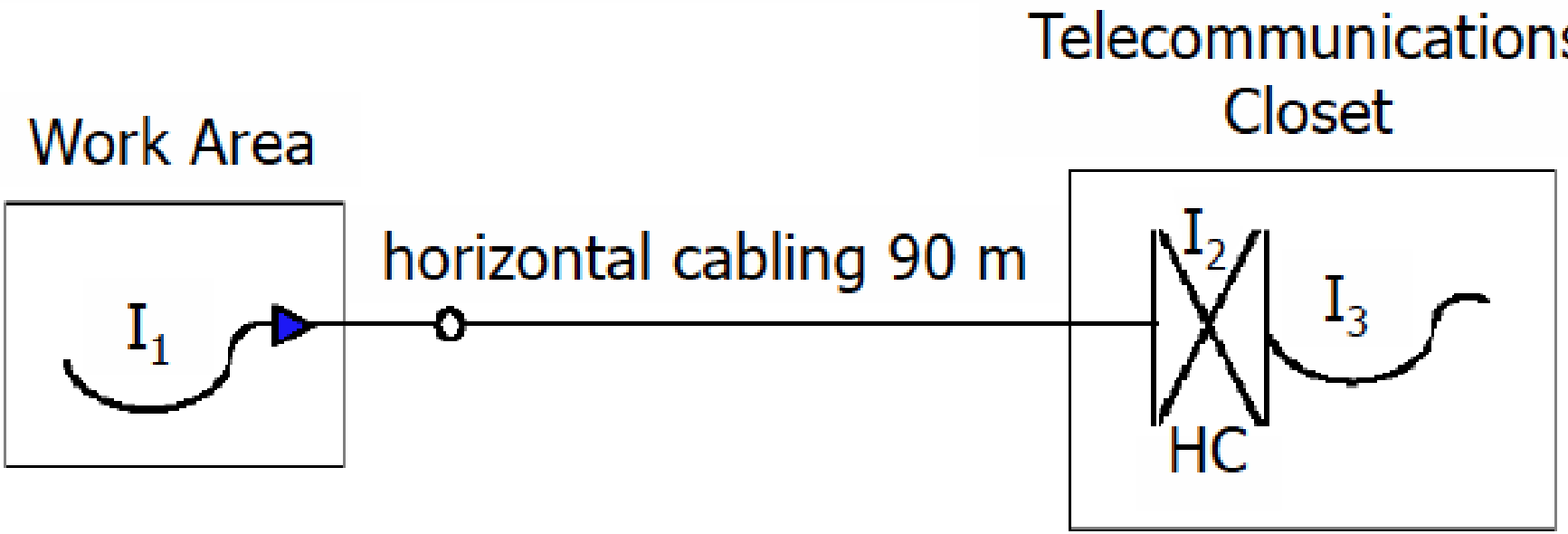


- area di lavoro
- almeno due vie d'uscita
- circa 10 m2

- Patch
- Max 90m di distanza



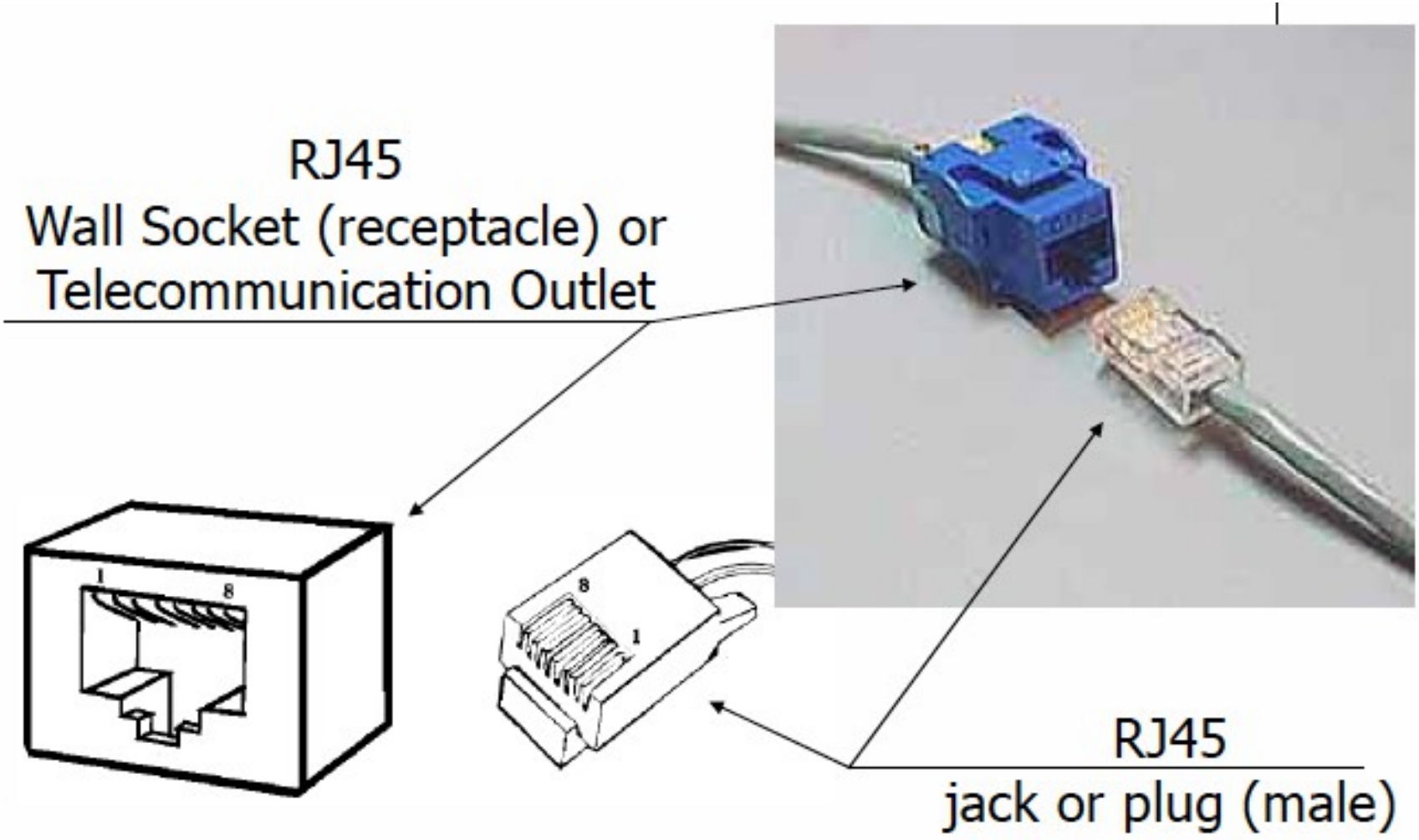
Horizontal Cabling



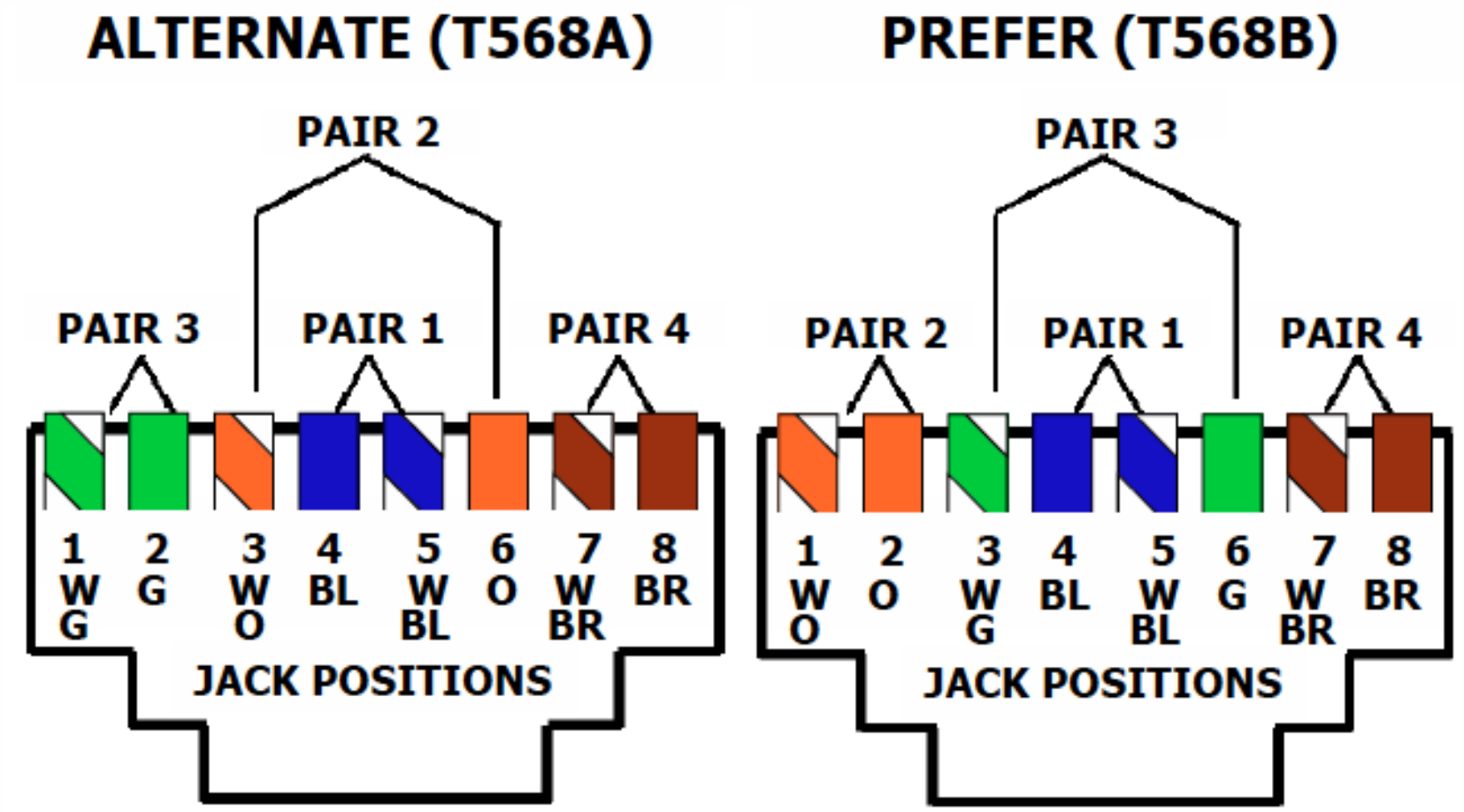
$$I_1 + I_2 + I_3 = 10 \text{ m}$$

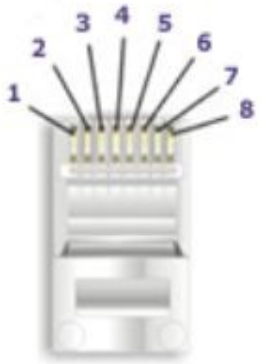
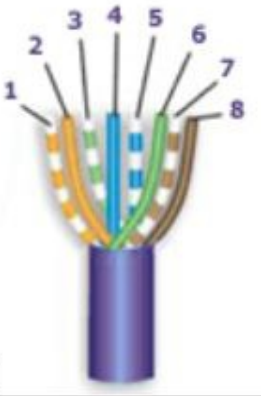
X = cross-connect	I_1 = work area cable
▶ = telecommunication outlet	I_2 = patch cord
—o— = transition point	I_3 = equipment cable

RJ45: socket and plug



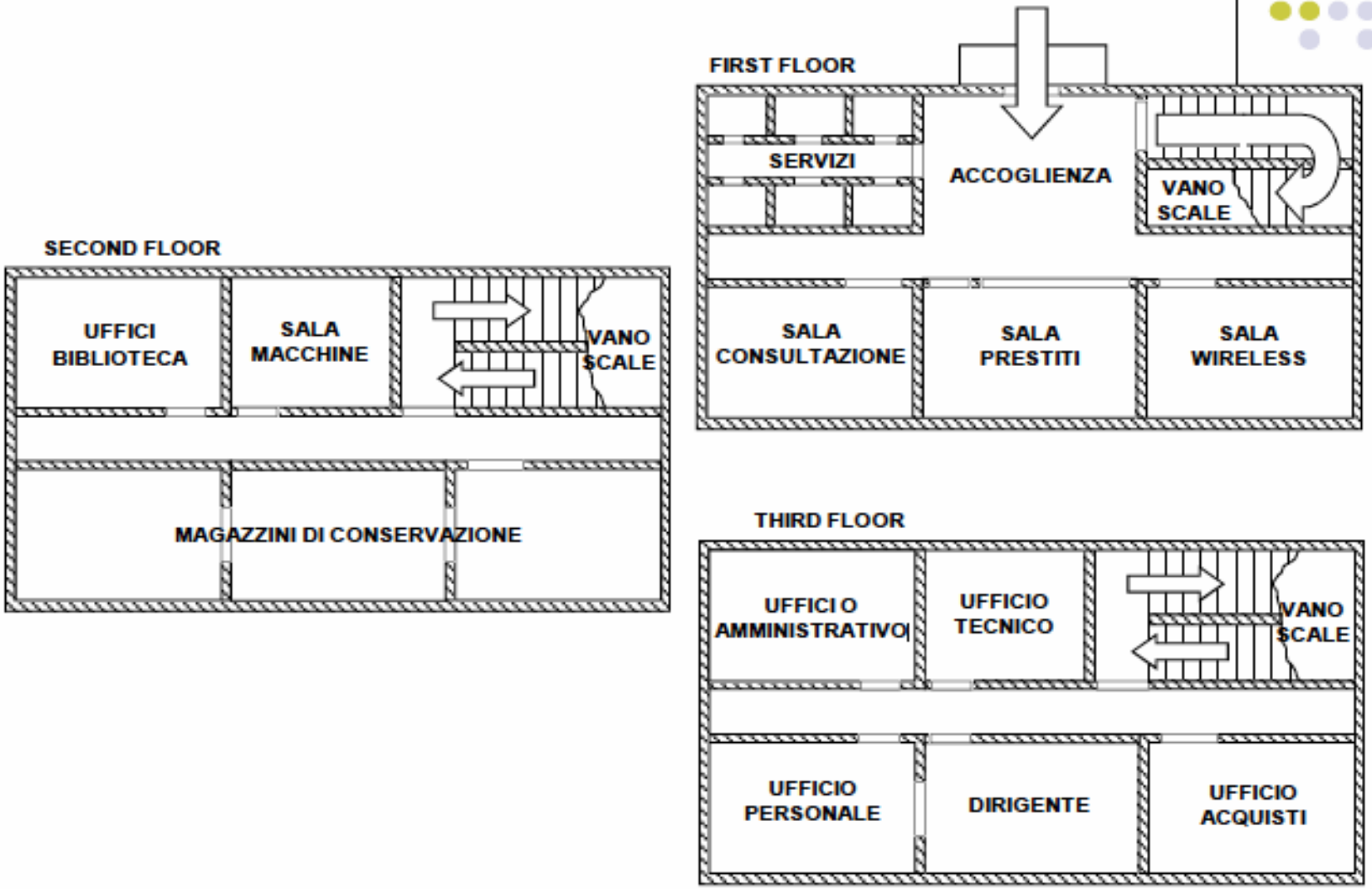
TIA/EIA Standard



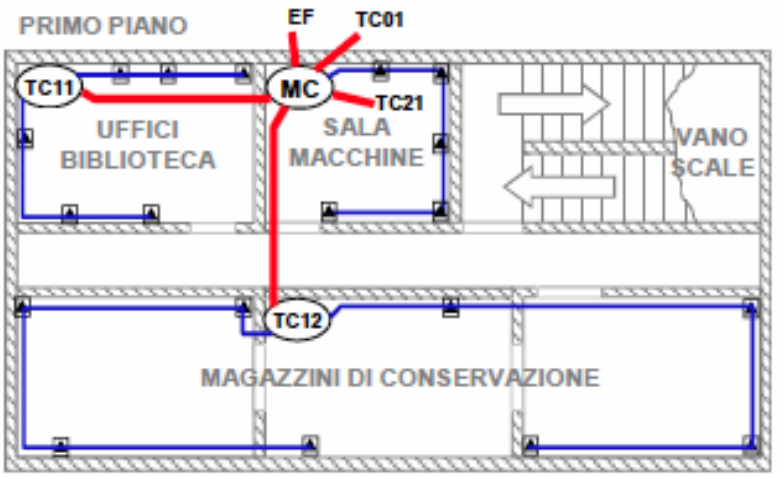
568B			
 	Coppia	Filo	Pin
	1 Blu/Bianco	Blu/Bianco	5
		Blu	4
	2 Arancio/Bianco	Arancio/Bianco	1
		Arancio	2
	3 Verde/Bianco	Verde/Bianco	3
		Verde	6
	4 Marrone/Bianco	Marrone/Bianco	7
		Marrone	8

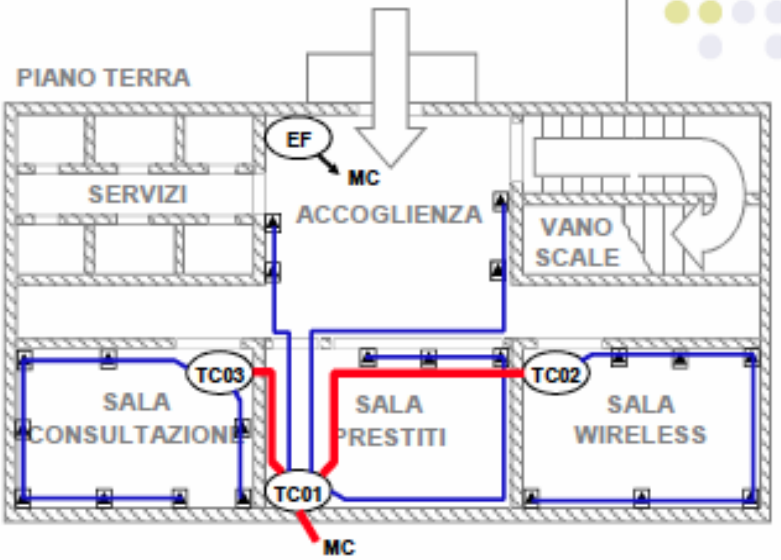
La parte slida del filo è chiamato "ring"
e il filo striscia si chiamano "tip".

Document: *1. Topology*



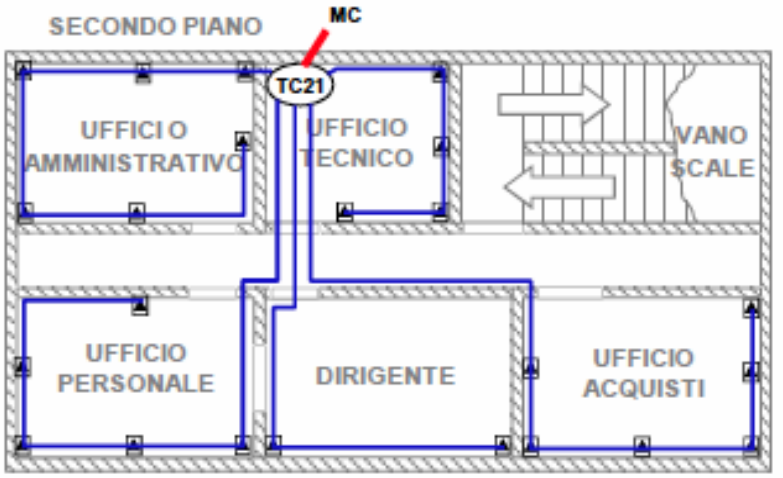
Document: *2. Cabling layout*



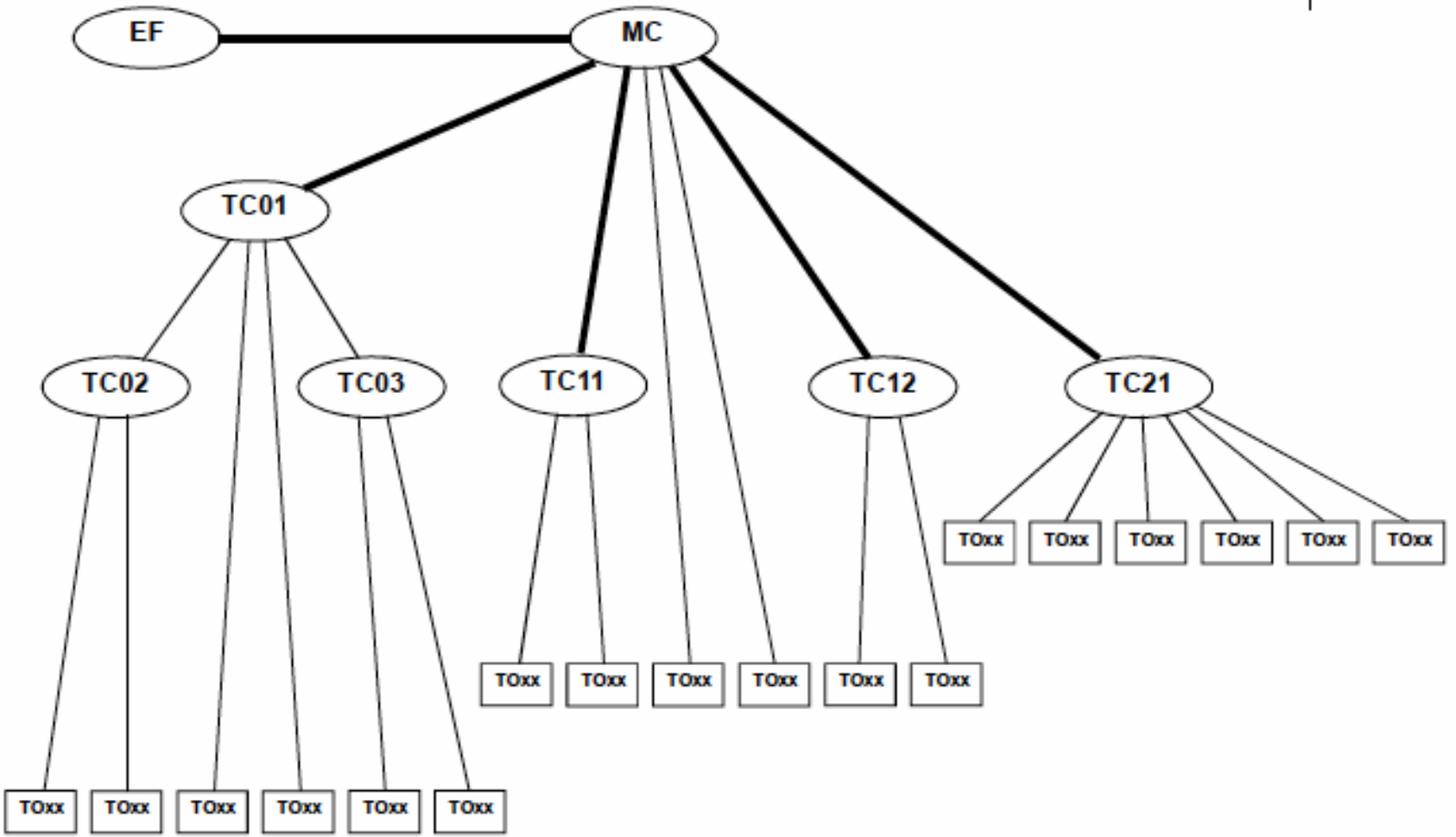


LEGENDA

MC	Main cross Connect
EF	Entrance Facility
TC01	Telecommunication Closet PT (Prestiti+Accoglienza)
TC02	Telecommunication Closet PT (Wireless)
TC03	Telecommunication Closet PT (Consultazione)
TC11	Telecommunication Closet PP (Biblioteca)
TC12	Telecommunication Closet PP (Magazzino)
TC21	Telecommunication Closet SP (all the Officies)
	Backbone Pathway
	Horizontal Pathway

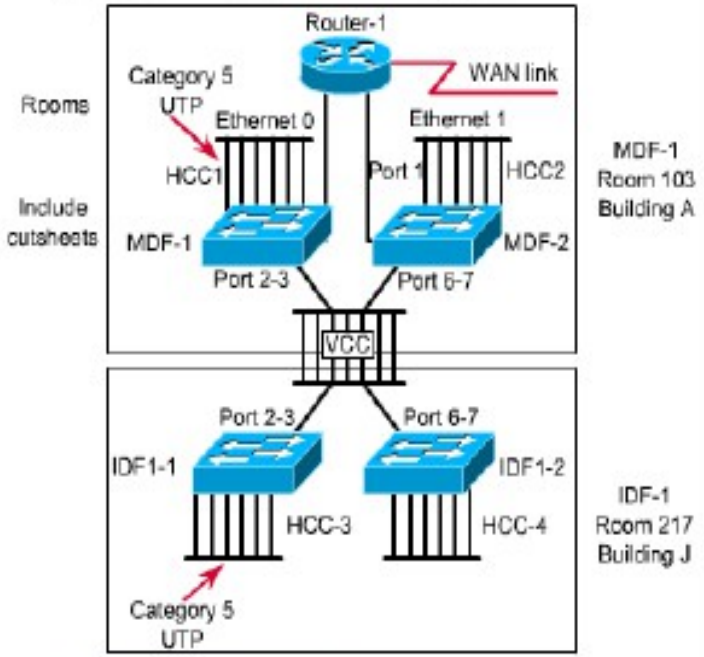


Document: *3. Logic Diagram*

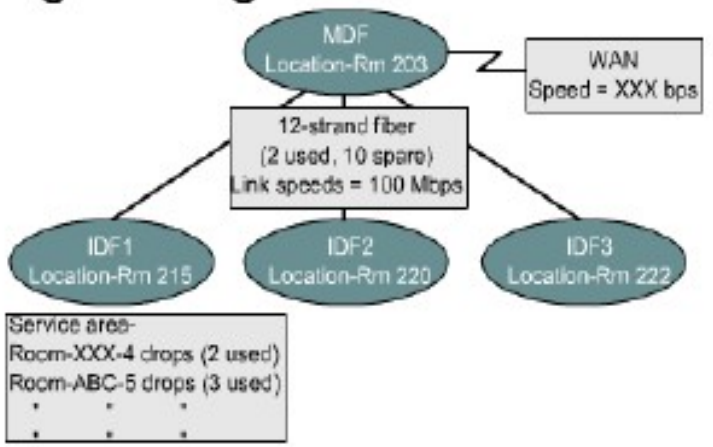


Documentation: *alternative view*

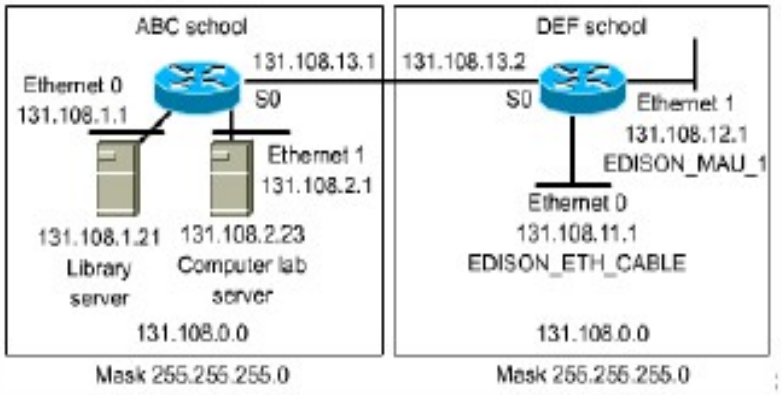
Physical Network Maps



Logical Diagram



Addressing MAPs



Cut Sheet

IDF1 Location-Rm XXX

Connection	Cable ID	Cross Connection Paired#/Port#	Type of Cable	Status
IDF1 to Rm 203	203-1	HCC1/Port 13	Category 5 UTP	Used
IDF1 to Rm 203	203-2	HCC1/Port 14	Category 5 UTP	Not used
IDF1 to Rm 203	203-3	HCC2/Port 3	Category 5 UTP	Not used
IDF1 to MDF	IDF1-1	VCC1/Port 1	Multimode fiber	Used
IDF1 to MDF	IDF1-2	VCC1/Port 2	Multimode fiber	Used

Document:
4. Media 5. Connectors

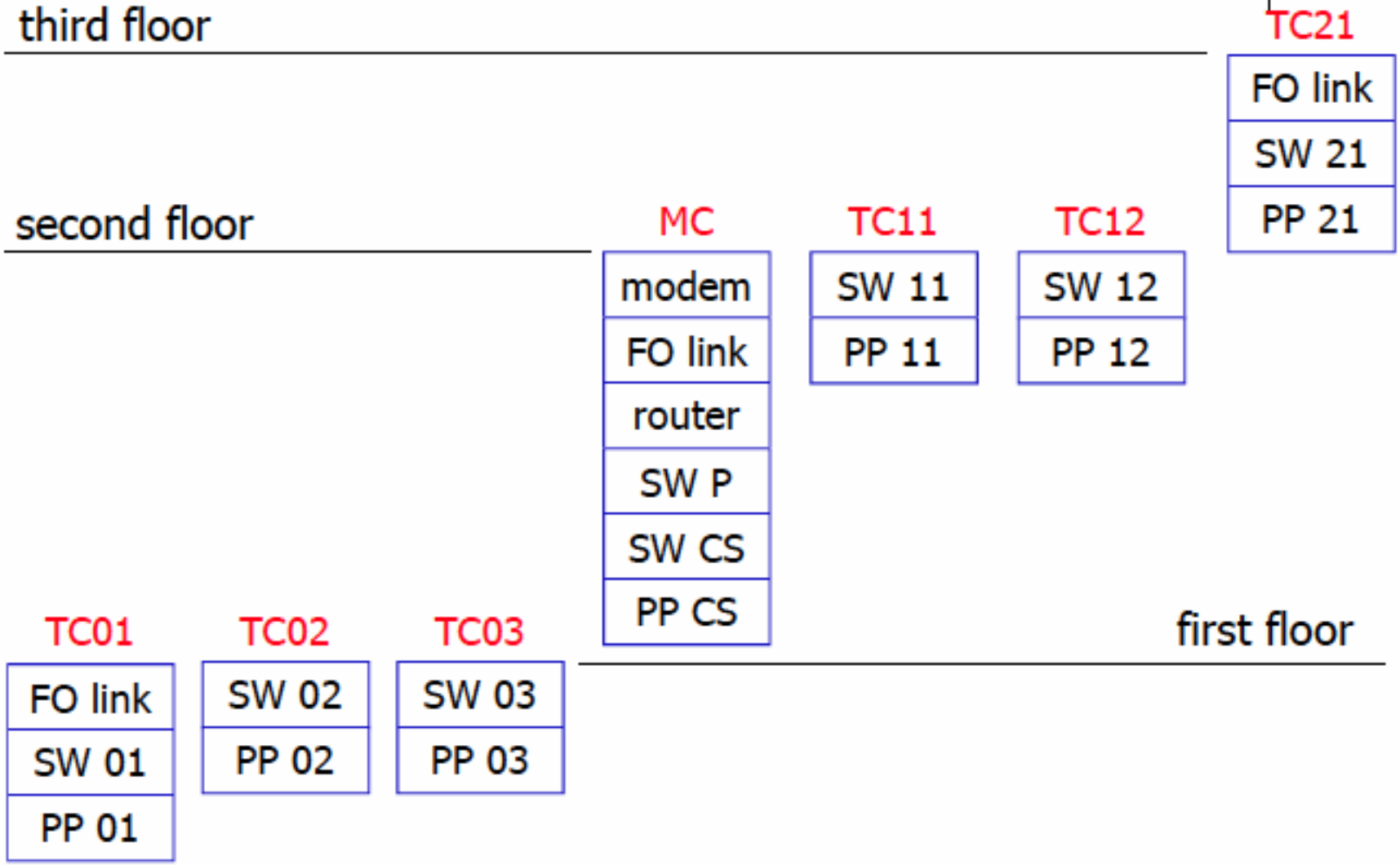
MEDIA

from EF	to MC	multimodal optical fiber
from MC	to TC01	multimodal optical fiber
from MC	to TC21	multimodal optical fiber
from MC	to TC1x	UTP cable, cat.5
from TC01	to TC02	UTP cable, cat.5
from TC01	to TC03	UTP cable, cat.5
from TCxx	to TOxx	UTP cable, cat.5

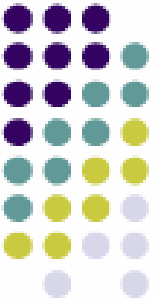
CONNECTORS

Optical Fiber: ST
UTP: RJ45 (TIA 568B)

Document:
6. Telecommunication Closet

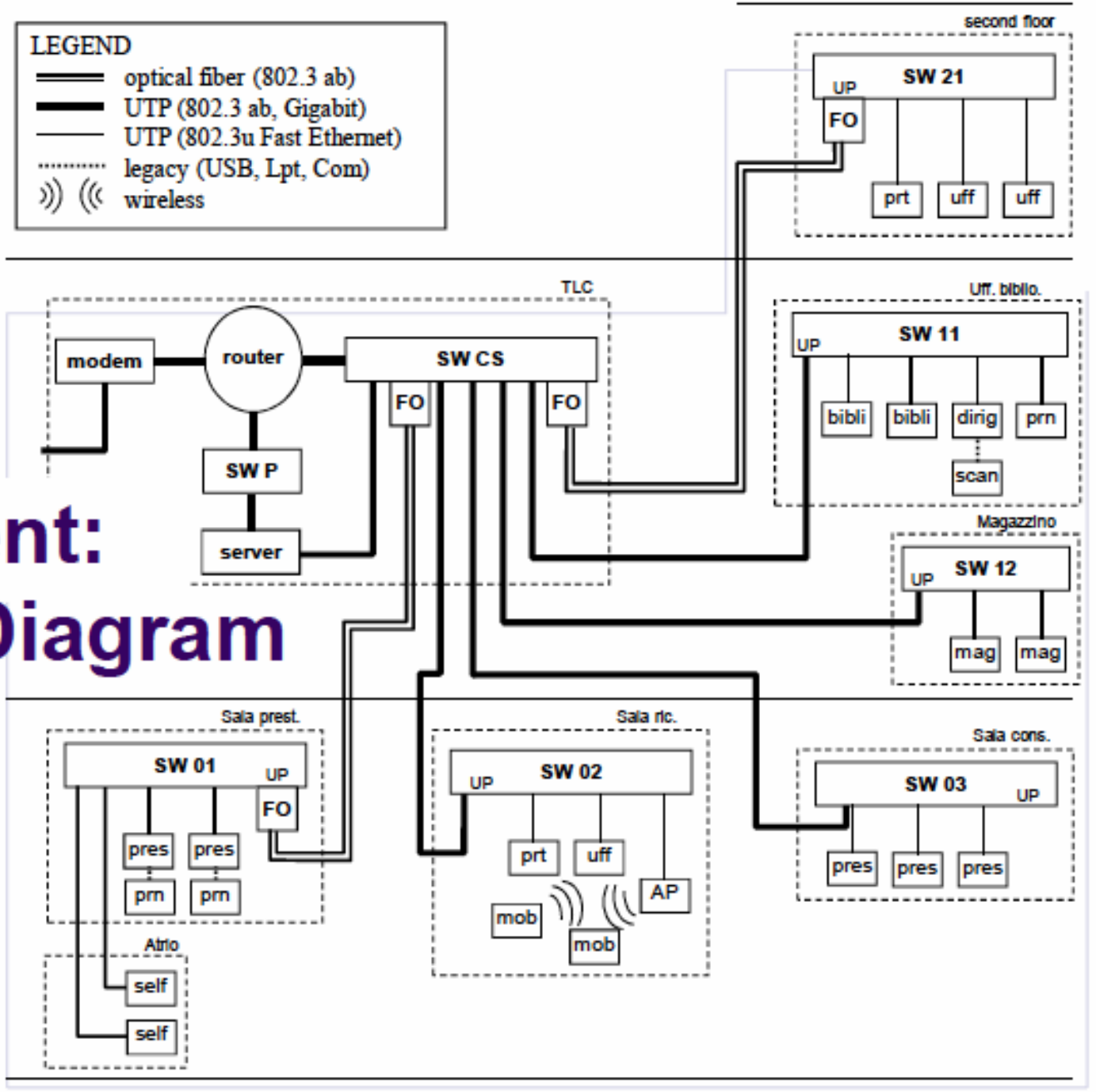


Document:
7. Cross Connection



position	connection	patch	description
PP CS-1	EF	modem	ISP connection
PP CS-2	PP 01-1	SW CS-1	uplink to SW01
PP CS-3	PP 01-2	SW CS-2	uplink to SW02
PP CS-4	PP 01-3	SW CS-3	uplink to SW03
PP CS-5	PP 01-4	SW CS-4	uplink to SW04
.....	.....	.....	.....
PP CS-xx	TOxx	SW CS-xx	to a Telcom. Outlet
----	modem	router	patch from modem to router
----	router	SW CS-yy	patch from router to switch

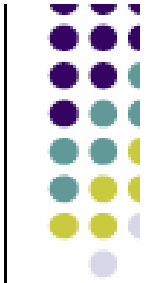
Document:
8. LAN Diagram



Document:
9. Active Devices Specifications

▫	modem	allow data to be transmitted over WAN technology, provided from ISP
▫	router	network layer device with two Gigabit Ethernet interfaces and one to connect *modem*
▫	SWP	Gigabit Ethernet switch, 8 ports
▫	SWCS	Gigabit Ethernet switch, 16 ports
▫	SWxx	n° 6 FastEthernet switches, 48 ports, and one/two Gigabit Ethernet p update
▫	FO	n° 4 transceivers FO-ST ← → RJ 45
▫	server	• CPU Intel P4 3 GHz, 1 MB cache • RAM DDR 1GB ECC • 4 x HD 80 GB SCSI/RAID5 • CD/DVD ROM SCSI • 2 x NICs Gigabit Ethernet • monitor LCD 15"

Document: 10. IP address



IP address	subnet mask	Default Gateway	MAC address	host name	description
192.168.1.0					Network ID
192.168.1.1	255.255.255.0		xx-xx-xx-xx-xx-xx	Router01	static IP of router
192.168.1.2	255.255.255.0	192.168.1.1	xx-xx-xx-xx-xx-xx	Server01	static IP of server
192.168.1.32	255.255.255.0	192.168.1.1	xx-xx-xx-xx-xx-xx	Cons01	Consultation
.....	.....	.....	.....	.....	
192.168.1.81	255.255.255.0	192.168.1.1	xx-xx-xx-xx-xx-xx	Cons50	Cons
192.168.1.96	255.255.255.0	192.168.1.1	xx-xx-xx-xx-xx-xx	Pre01	
.....	.....	.....	.....	...	
192.168.1.105	255.255.255.0	192.168.1.1	xx-xx-xx-xx-xx-xx		
192.168.1.128	255.255.255.0	192.168.1.1	xx-xx-x		
.....	.....	.....			
192.168.1.137	255.255.255.0	192.168.1			
192.168.1.159	255.25				

La certificazione di rete

- Solo rete dati senza collegamento telefonico

dichiarazione di conformità (legge 46/90)

- Rete dati base + telefonia ridotta (fino a 2 linee urbane)

niente

- Rete dati base + telefonia (più di 2 linee urbane)

progetto, conformità e autorizzazione min. 2° grado

- Rete dati estesa (wireless o fibre ottiche o più di 400 punti rete)

progetto, conformità e autorizzazione min. 1° grado

Richiesta specifica di certificazione ISO/IEC

Ultime info

Link normativi di categoria:

- http://www.assotel.it/formazione/pubblicazioni/080601_CC_Legge109.pdf
- http://www.assotel.it/normativa/nazionale_tlc.asp

Documentazione di rete

- http://www.networkdocumentation.com
- http://www.bo.infn.it/~brasolin/Lan/