



Standardised precabbling, the efficient road to secure and reliable home networks

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 - Two topologies,
 - Up to four cables,
 - A new connector for balanced cables.
- o The standards body for in-house cabling.
- o What are the costs for precabbling?



Communications media for the home

- o Wireless: many methods, also reaching beyond the home.
- o Infrared: the more user, the more co-ordination is needed.
- o Powerline: no new cable, but ...
- o Copper: the main resource for transmission in the home.
- o POF: **the** medium for homes?



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General reasons for communications cables

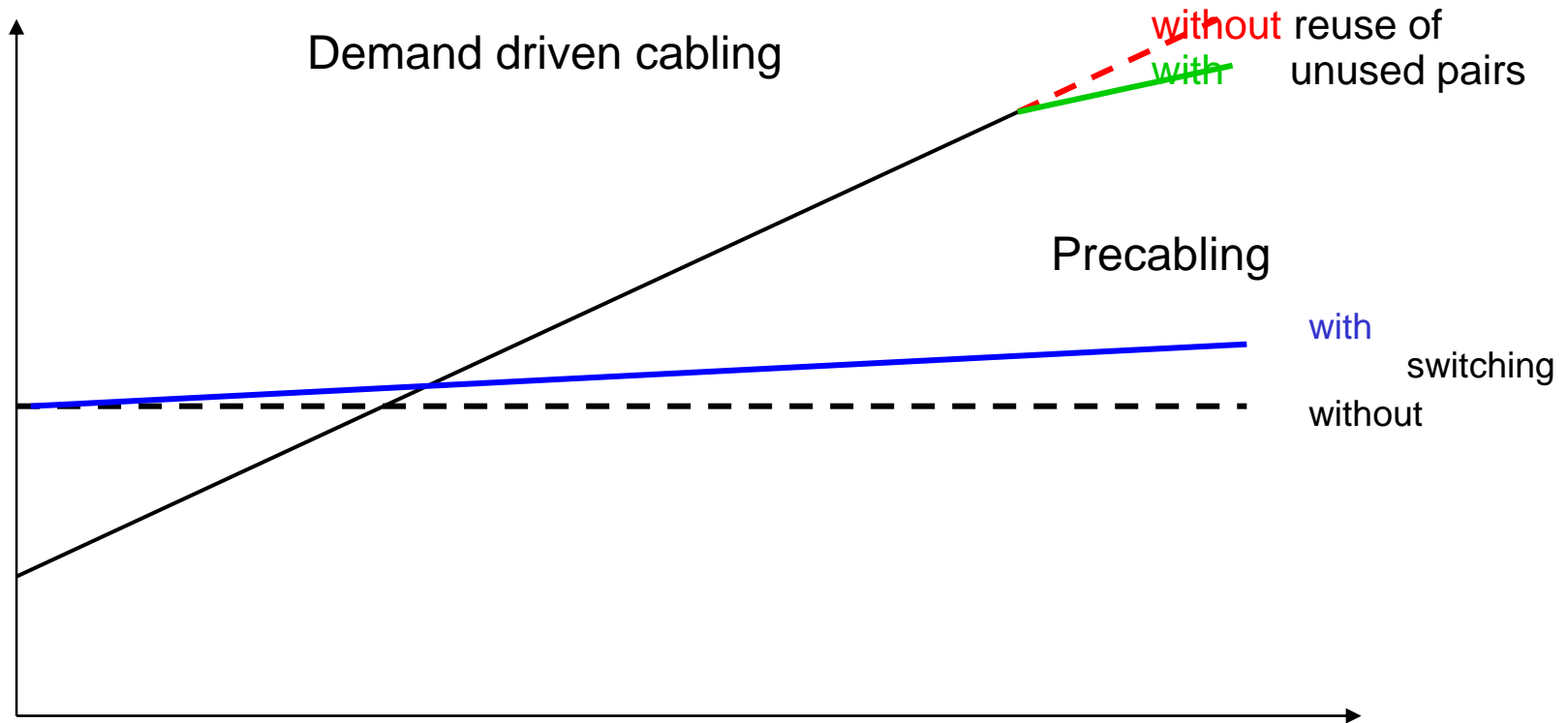
- Wireless: a scarce resource, to be dedicated to moving targets.
- Infrared: does not penetrate walls.
- Powerline: not apt for many kinds of information.
- Communications cables: secure, safe, reliable.

Specific reasons for communications cables

- Harder to overhear and to influence
 - You need to masquerade a man, not only a wireless message.
- better EMC: oneself and neighbours are not disturbed.
- Easier access control.
- Reliable transmission.
- Power transfer to end-system.



Cost of precabbling versus demand driven cabling



Precabbling requires one international standard

- Precabbling only pays off, when the installed today still is the “correct cable”, tomorrow & available at the right place.
- Application equipment is sold worldwide and needs to find the same transmission performance anywhere in the world.
- Homes are tailored to the user and his environment and still need to support all applications the inhabitant wants.



Intelligent Home : 3 times the effect of network externalities

Application 1, Application 2, . . . Application n



Stable Interface



Endsystem 1, Endsystem 2, . . . Endsystem n



Stable Interface



Network 1, (Network 2, Network 3)

Planning confidence and offering of product/services increase market growth



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Applications



Computer

10/100BASE-T

1394 Serial Bus

Telephone



ISDN

Analog

xDSL



TV

TV

Cable TV

SAT-TV

“Convergence”



Lighting

HVAC

Security

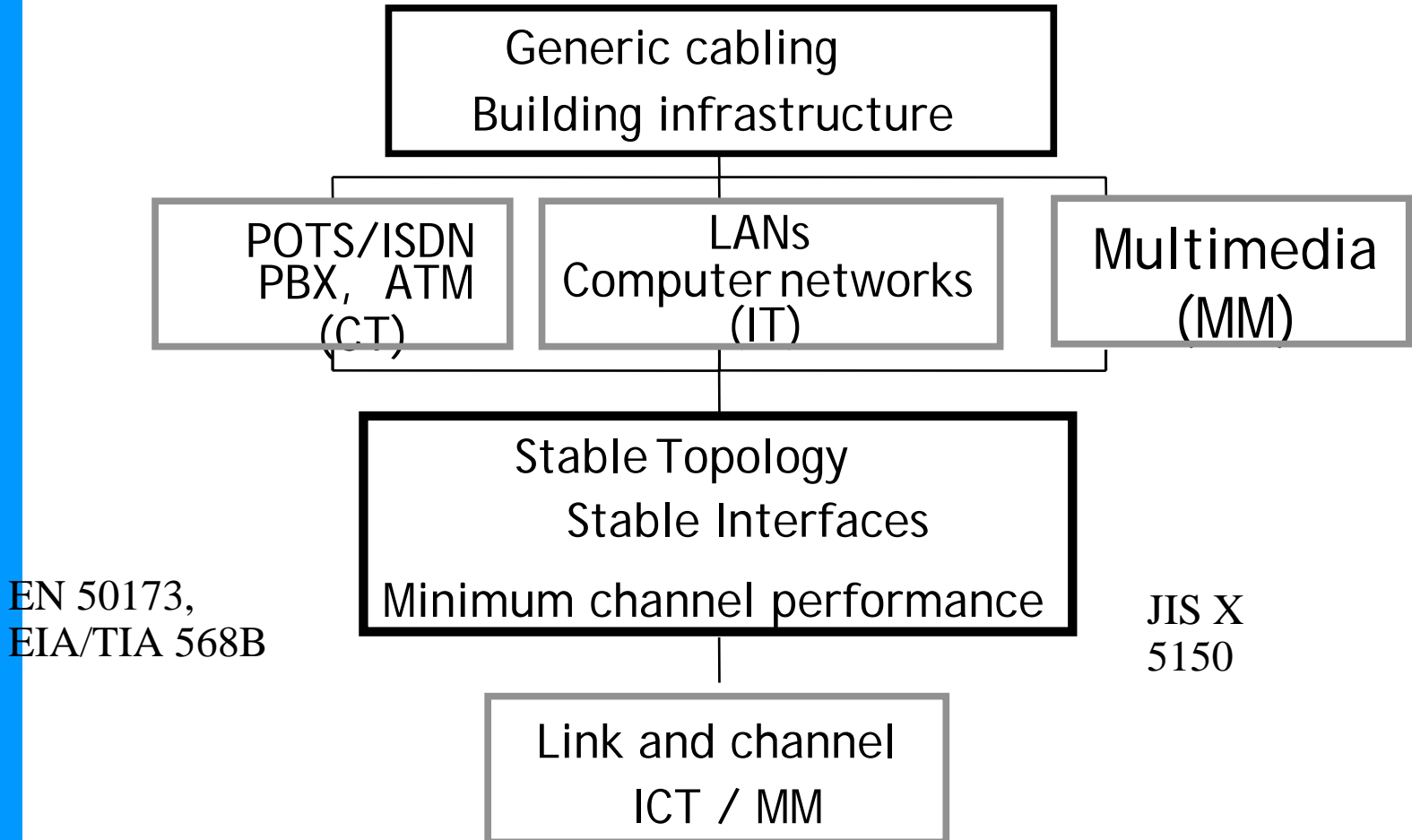
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ISO/IEC 11801: used world wide

Cabling and applications have different life cycles





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Some cabling standards for offices

EN 50173

2003-01 2nd Edition

Information Technology - Generic cabling systems

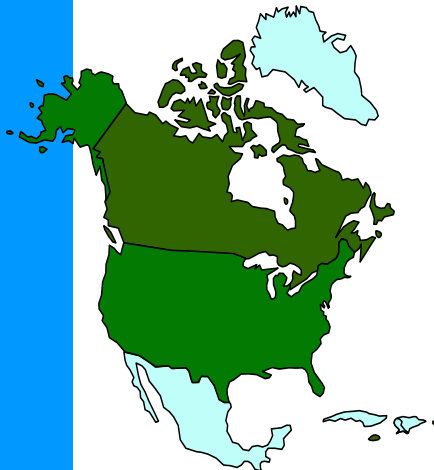
Informationstechnik - Anwendungsneutrale Verkabelungssysteme

Technologies de l'information - Systèmes génériques de câblage

EIA / TIA 568 (B)

2003

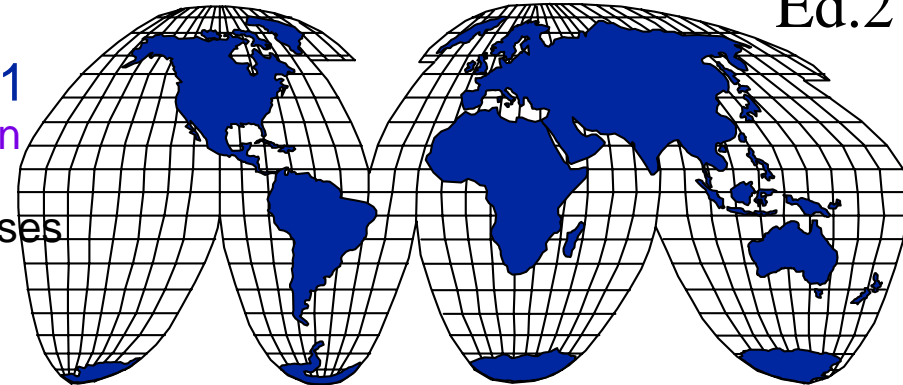
Commercial building tele-communications cabling standard



ISO / IEC 11801

2002-09 2nd Edition

Generic cabling for customer premises



**JIS
X5150
Ed.2**



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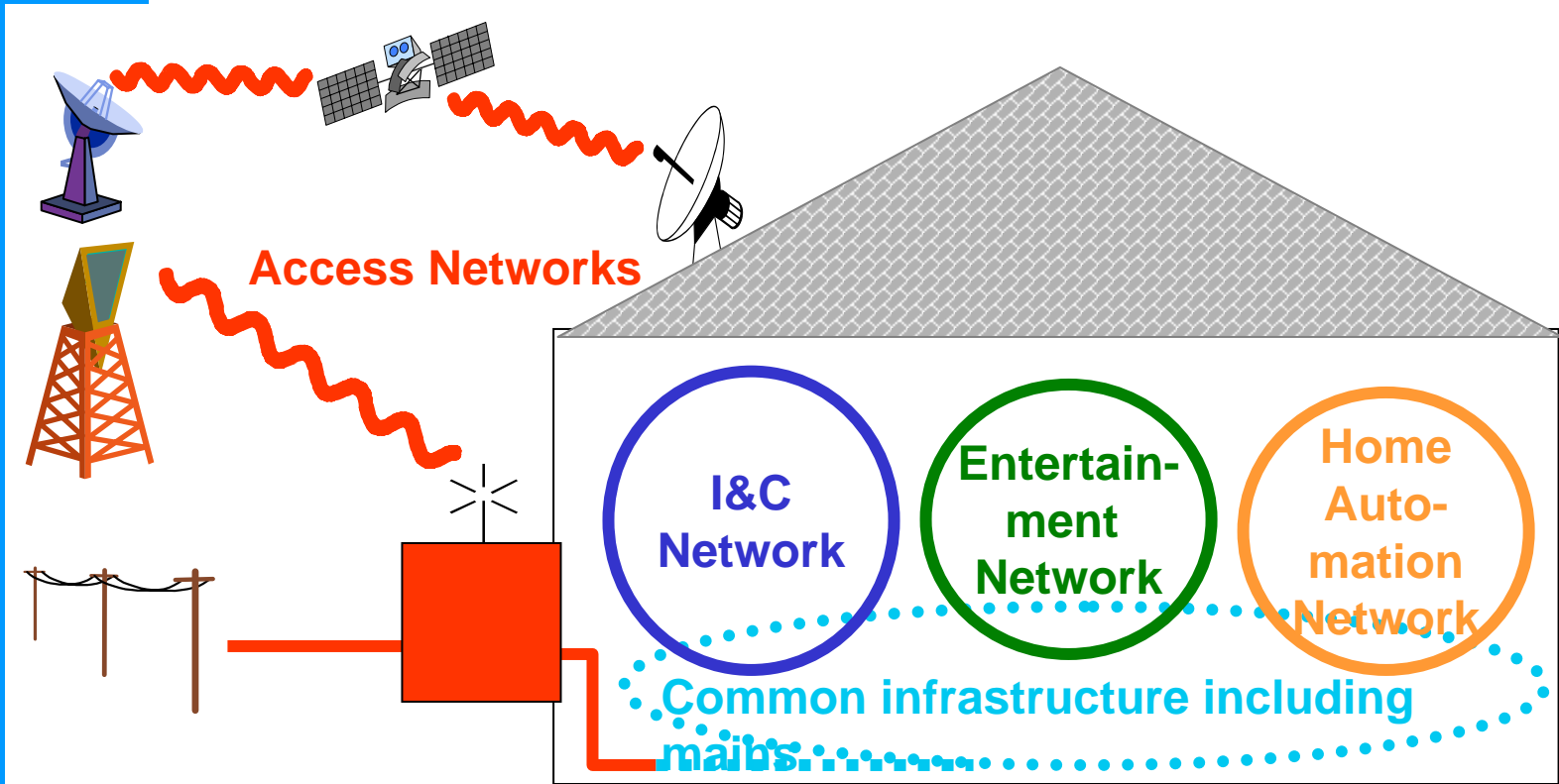
ISO/IEC 11801: Channel classes

- Permanent link/channel Klasse A up to 100 kHz
- Permanent link/channel class B up to 1 MHz
- Permanent link/channel class C up to 16 MHz
- Permanent link/channel class D up to 100 MHz
- Permanent link/channel class E up to 250 MHz
- Permanent link/channel class F up to 600 MHz
- Optical Fibre Class OF-300 up to 300 m
- Optical Fibre Class OF-500 up to 500 m
- Optical Fibre Class OF-200 up to 2000 m



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Starting with 4 Networks at Home



Source: Parks Associates, Siemens ZT IF IK, ZT SRI

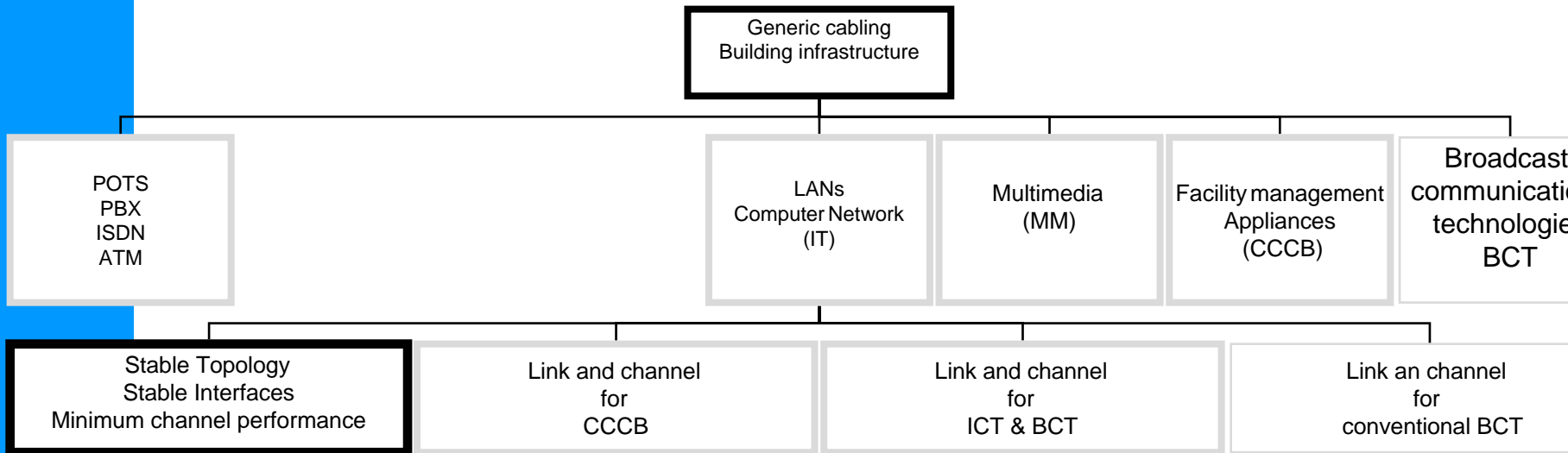
Separate networks for Communications, Information, Entertainment / Multimedia and Home Automation converge. Barriers to mains get lower.



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ISO/IEC 15018: principles of ISO/IEC 11801 provide market success

Cabling and applications have different life cycles





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ISO/IEC 15018: channels/links

- CCCB in coverage area: ≤ 100 kHz
1 pair free topology @ 0,7 A /conductor
- CCCB to ACP: suitable for class D: ISO/IEC 11801
- ICT channel: ≤ 100 MHz \rightarrow Class D: ISO/IEC 11801
- ICT with cable and connector sharing: class E (11801)
- BCT channel balanced: ≤ 1 GHz
- BCT channel coaxial: ≤ 3 GHz
 ≤ 1 GHz, when sufficient long term
- Optical channels: for further study



BCT-B coupling attenuation BCT-C screening attenuation

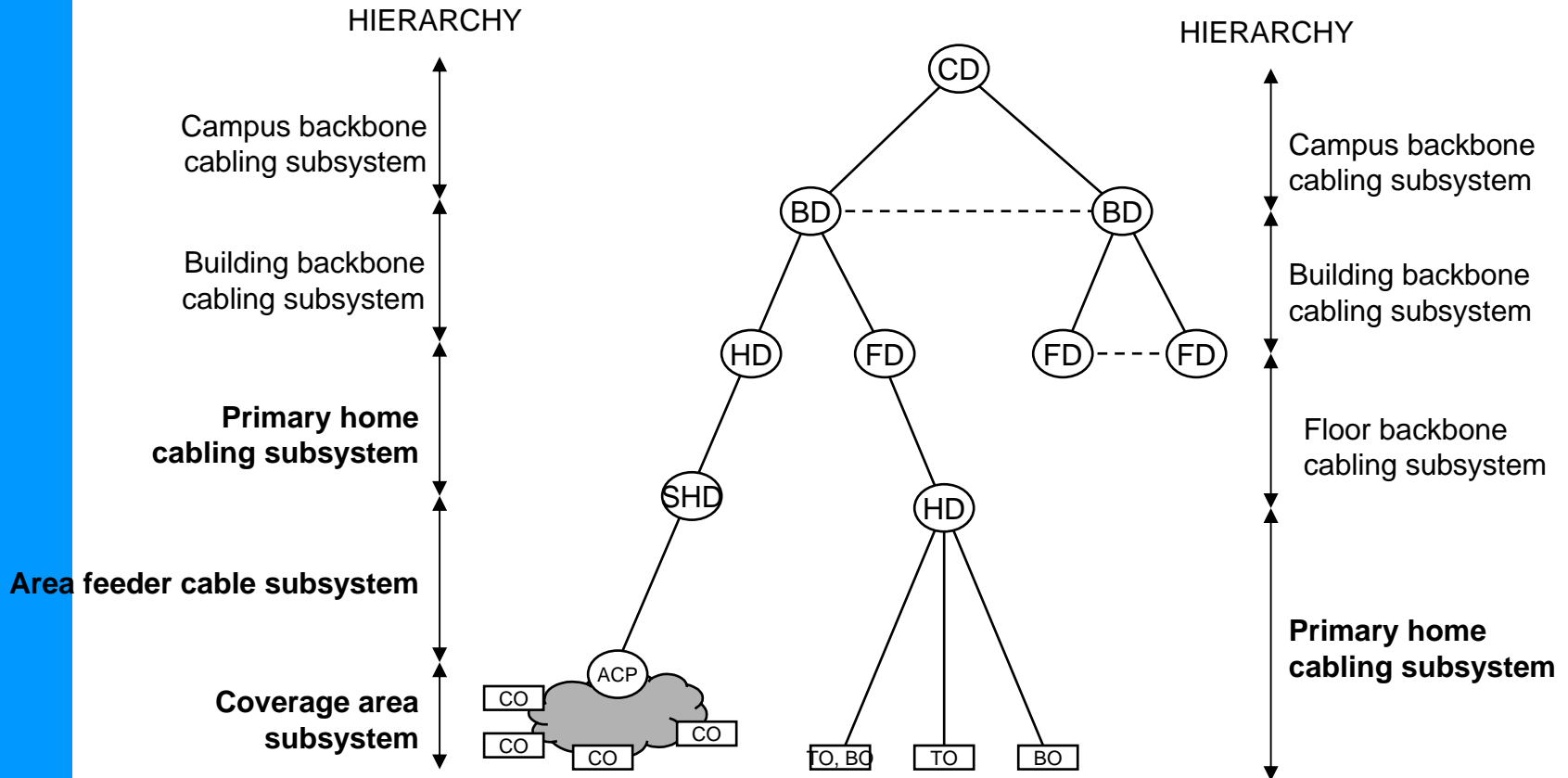
	BCT-B		BCT-C	
	H	L	H	L
@ MHz	dB	dB	dB	dB
$30 \leq f \leq 300$	85	75	85	75
$300 \leq f \leq 470$	80	75	80	75
$470 \leq f \leq 1\ 000$	75	65	75	65
$1\ 000 \leq f \leq 3\ 000$			55	50

H: higher immunity, L lower immunity



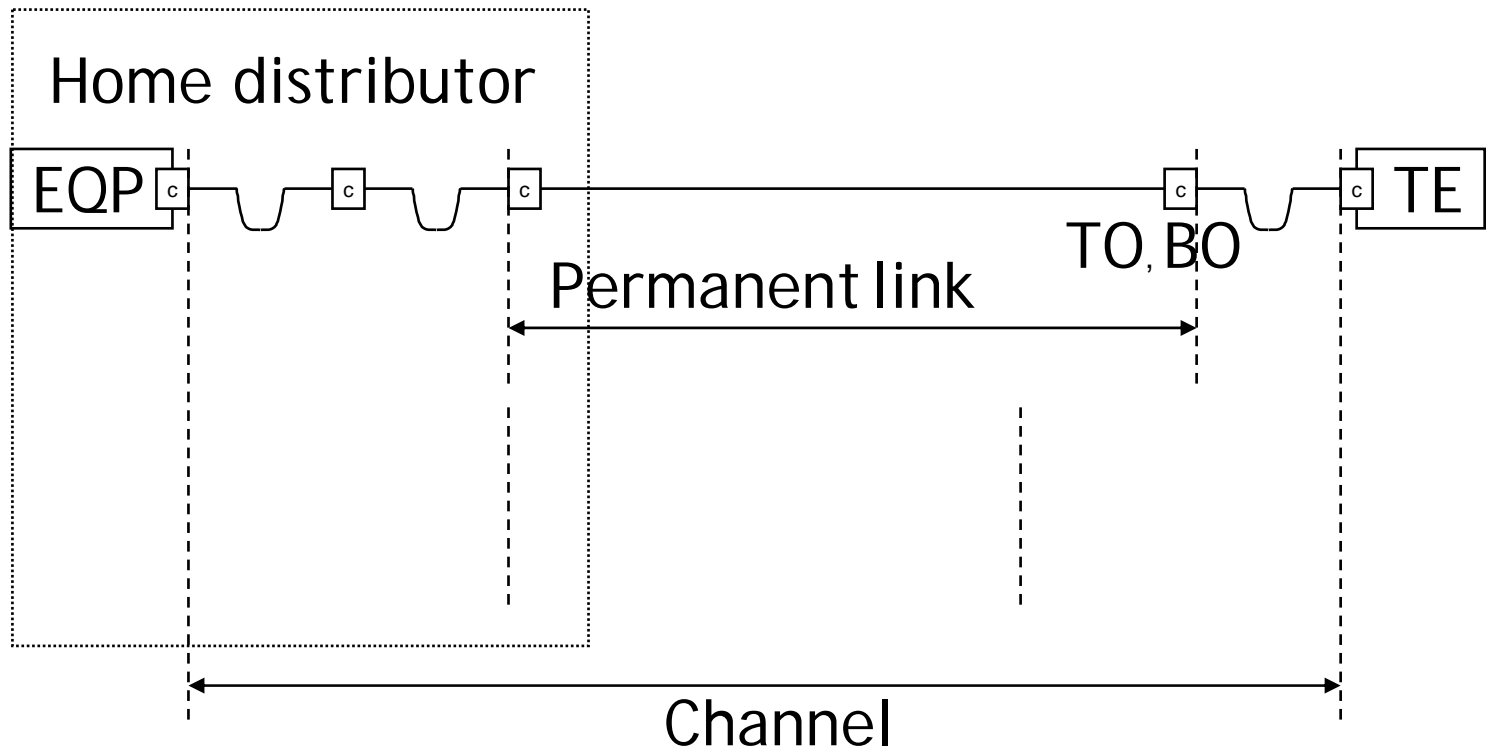
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Hierarchical Structure of homecabling

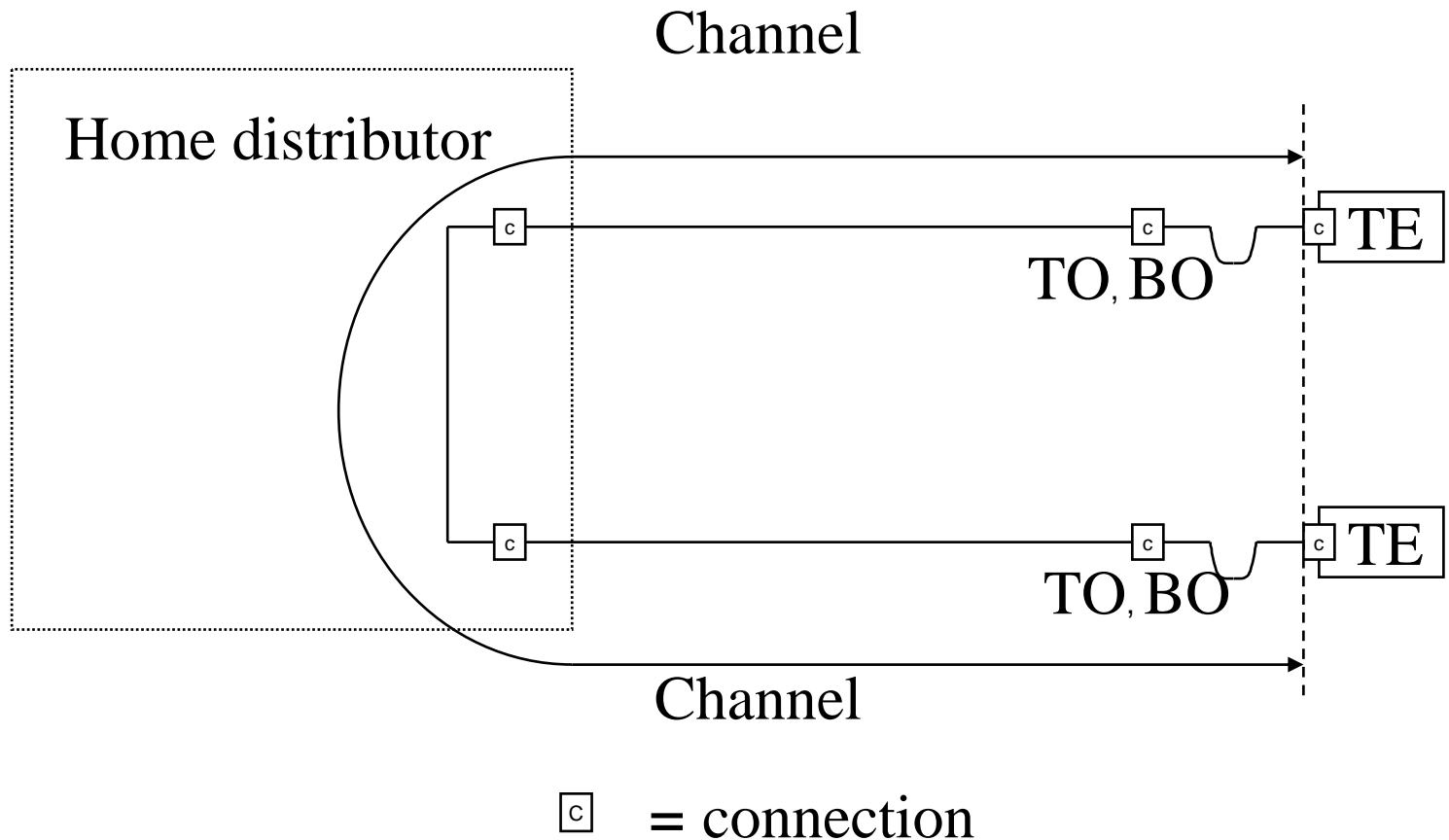




Channels & permanent links in the home 1

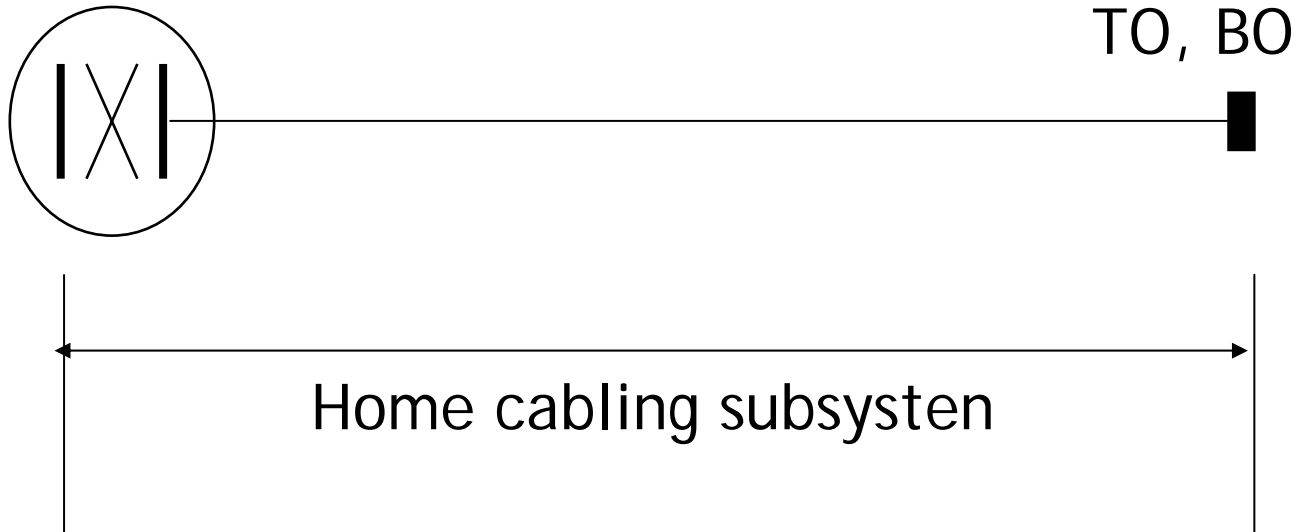


Channels & permanent links in the home 2



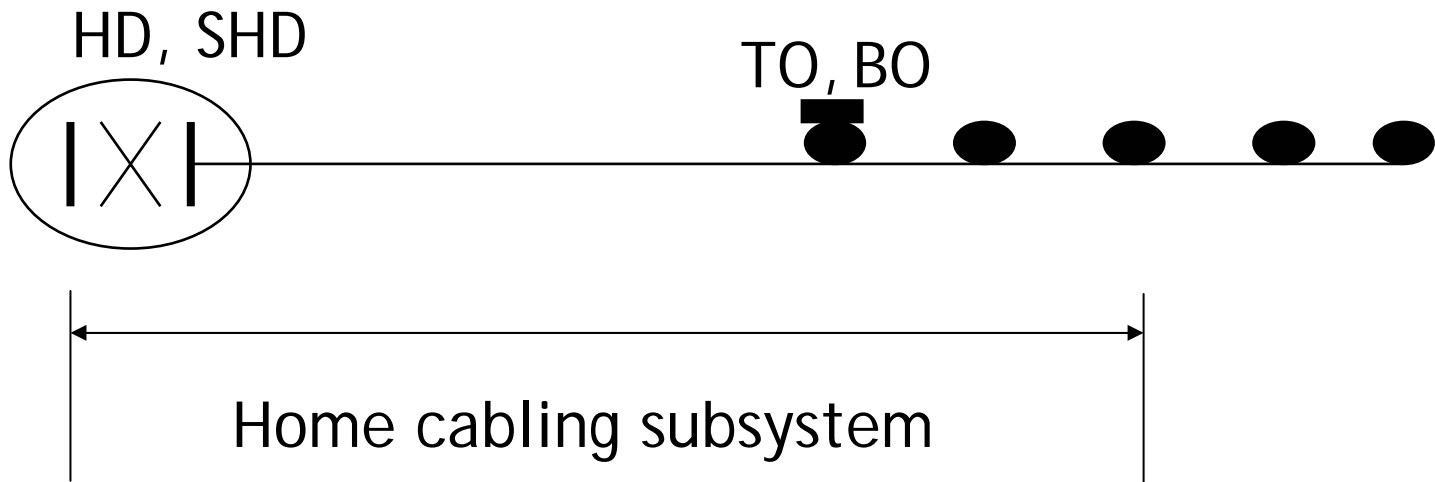
ICT & BCT cabling in the “room”

HD, SHD



High-performance channels may be implemented at high frequencies only point to point.

The standard does not limit the freedom of implementation



- Potential location for TO/BO
- With guaranteed channel performance, thus within the standard.

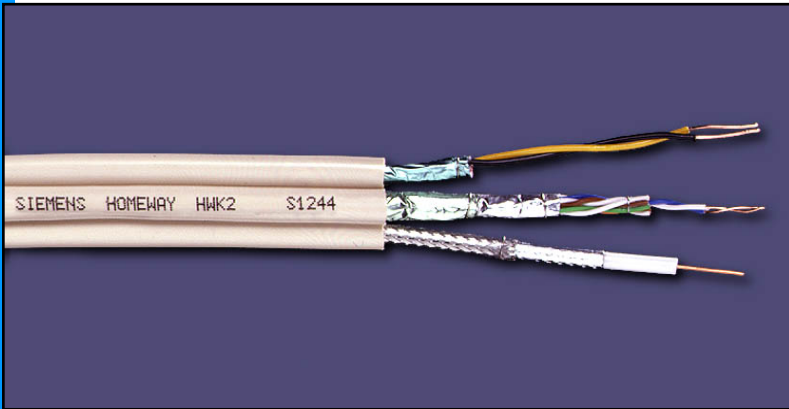


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HomeWay®

Cable:

- TV cable (13 dB)
- Data cable (Category 5), shielded
- *EIB* cable



Connector:

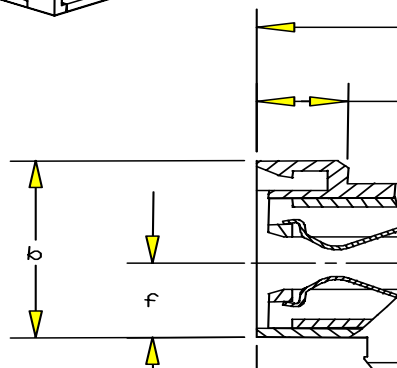
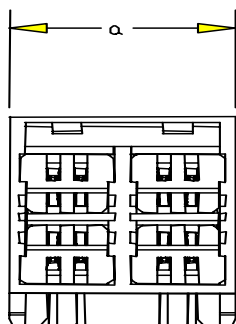
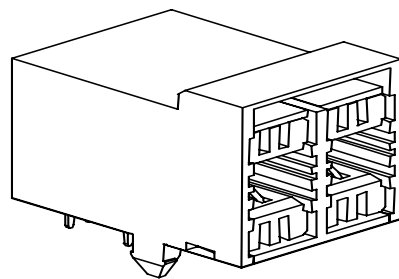
- Telephone
- Data (PC-Network)
- TV/Radio (SAT-TV)





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Connector IEC 61076-3-104





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Connector IEC 61076-3-104

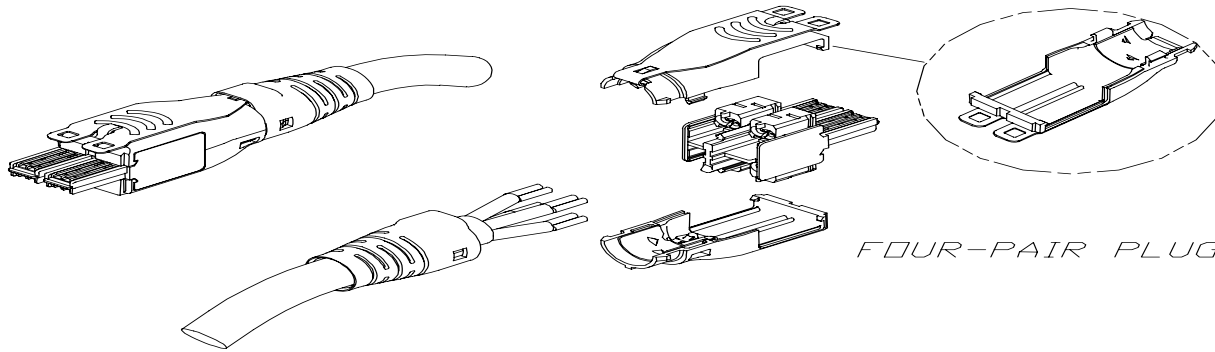




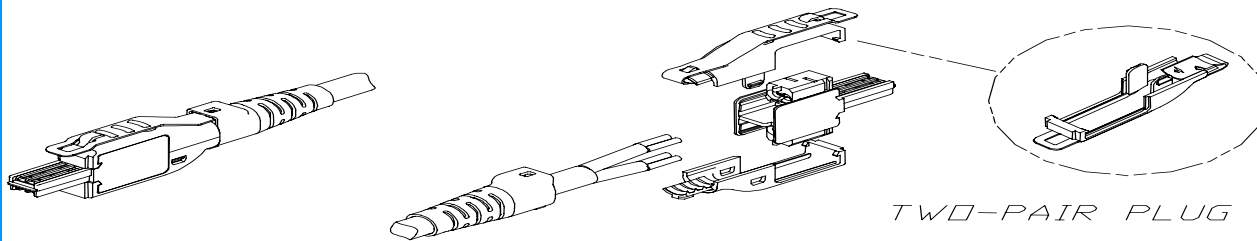
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Connector IEC 61076-3-104

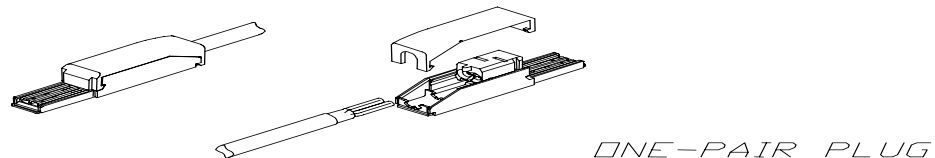
EXAMPLES: PLUG VARIANTS



FOUR-PAIR PLUG



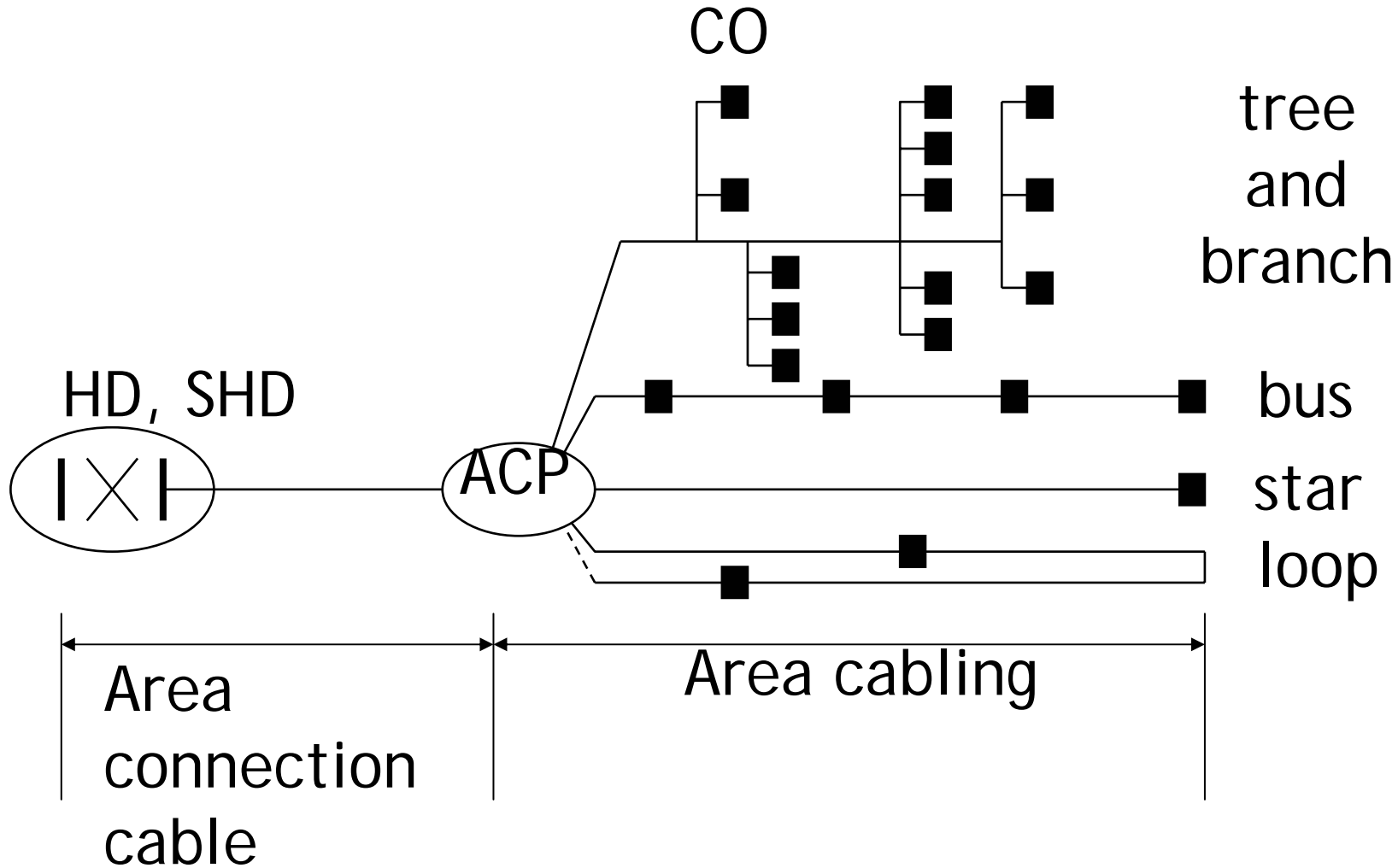
TWO-PAIR PLUG



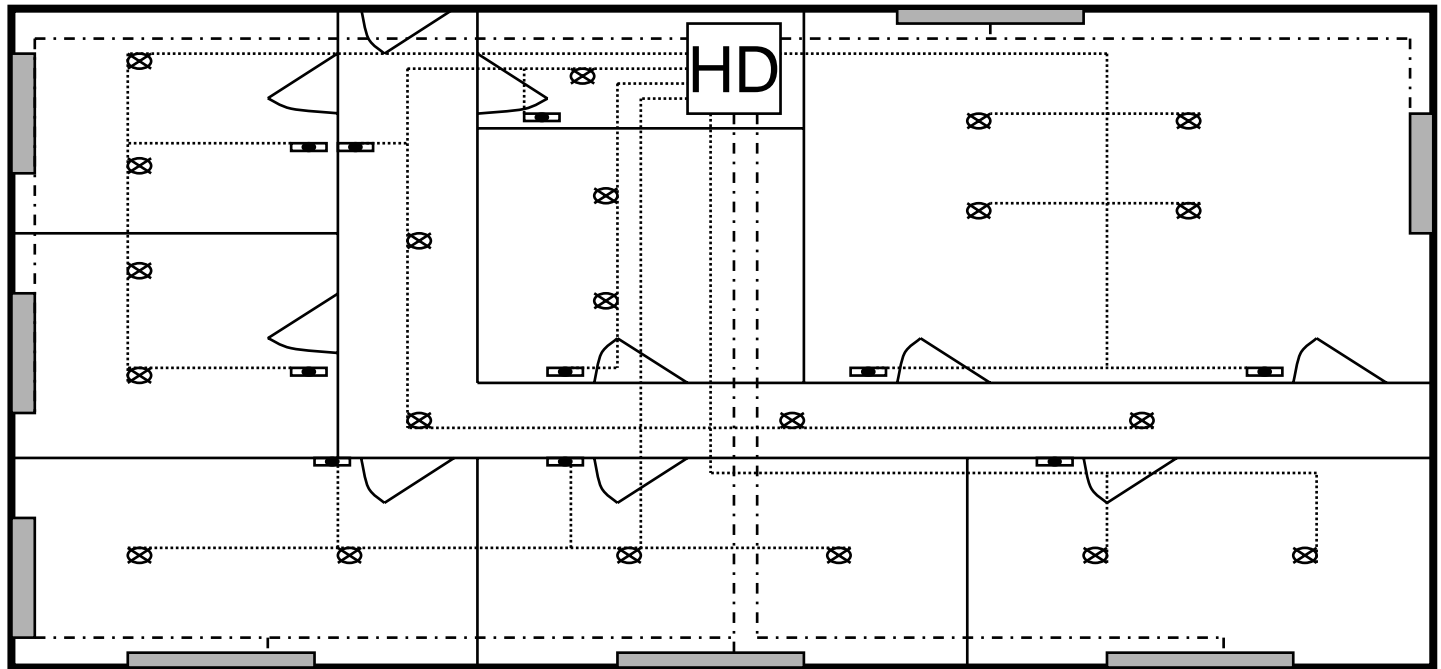
ONE-PAIR PLUG



CCCB cabling structure in the room



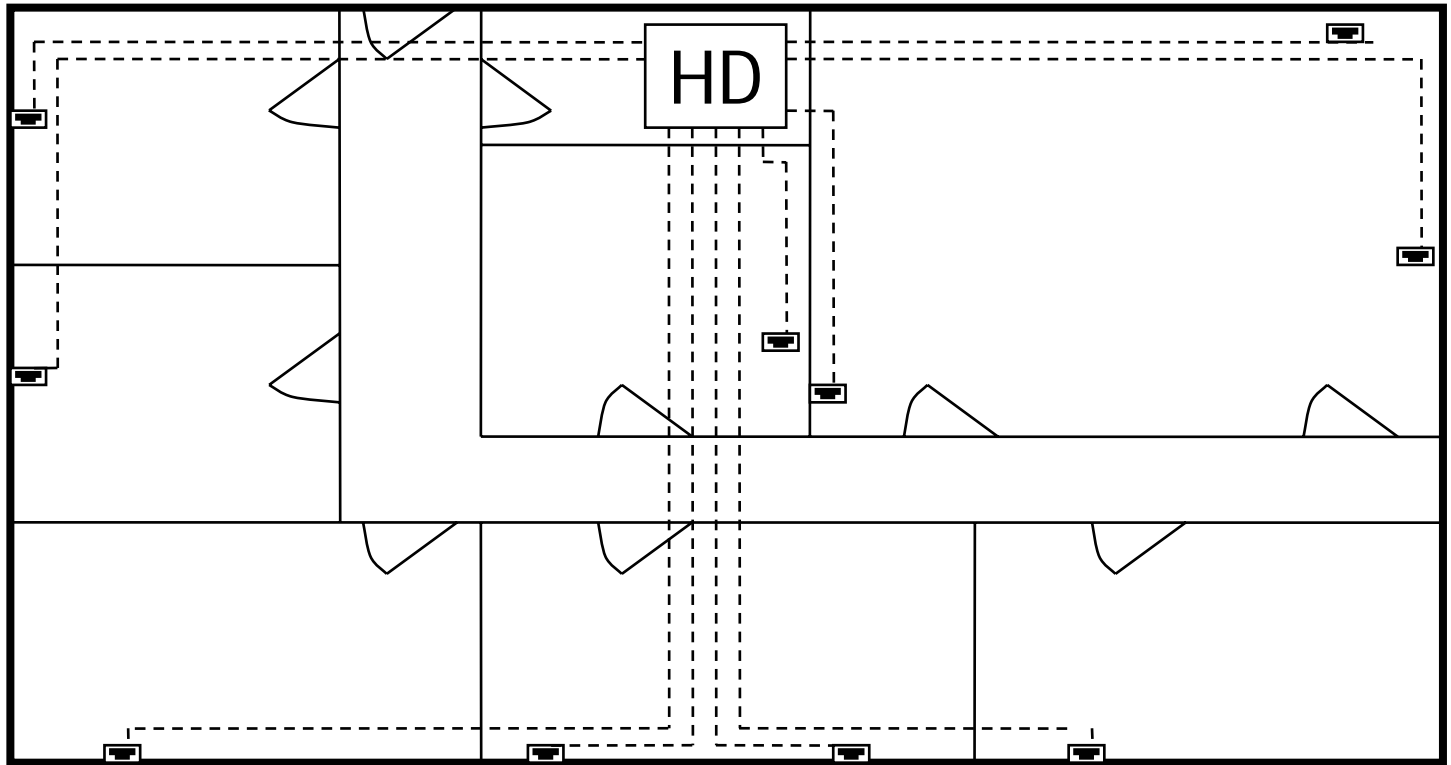
Example typical CCCB cabling topologies



- ⊗ CO (lighting/smoke detector)
- ▬ CO (switch and/or other door side features e.g.thermostats etc.)
- ▬ CO (HVAC or window-side features e.g. sensors, shutter actuators)
- - - CCCB cable for HVAC window-side COs
- CCCB cable for lighting/smoke detector COs



typical ICT cabling topologie

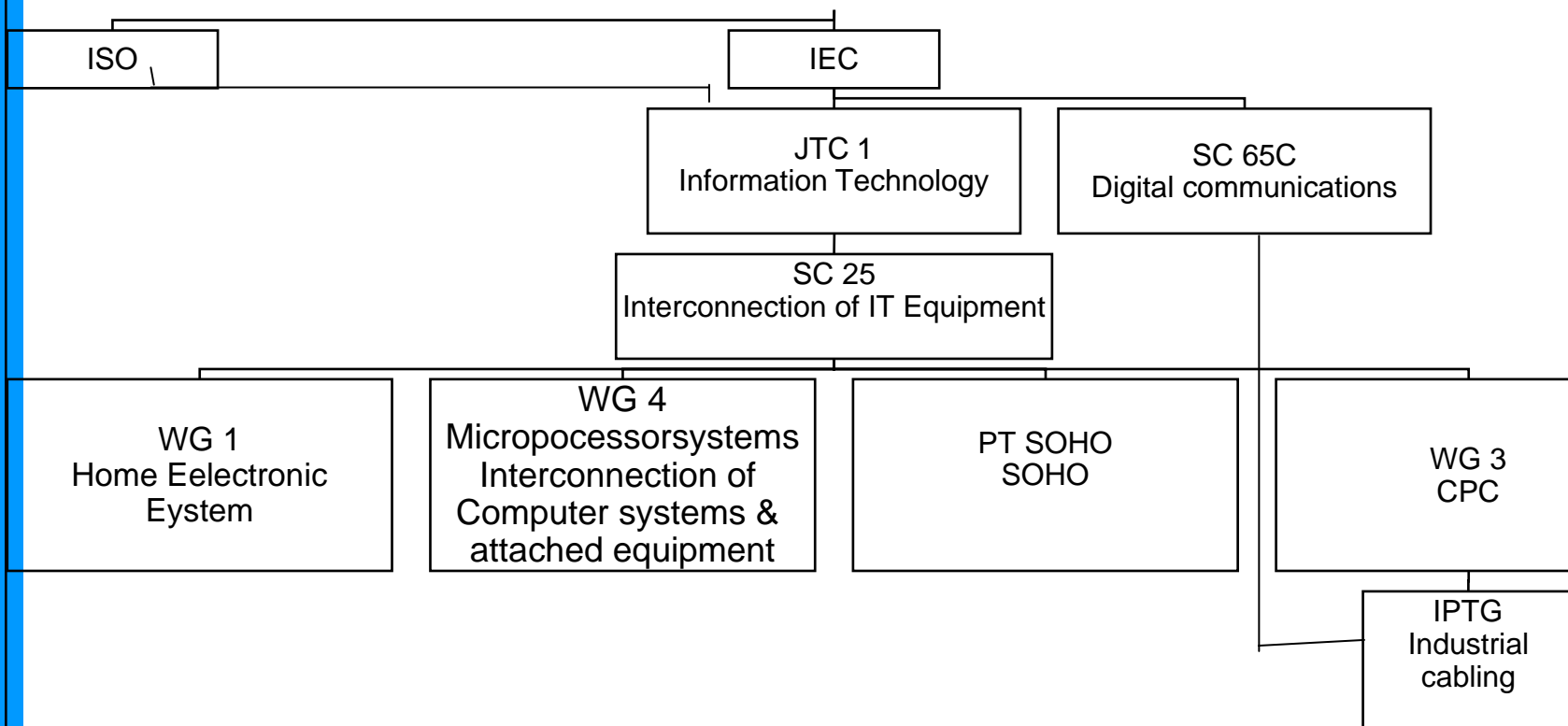


-  Telecommunications outlet (TO)
-  ICT cable



ISO/IEC JTC 1/SC 25 Structure

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Magnitude of cost 1

- o Futureproof infrastructure: larger distributors, deep boxes, precabing meeting ISO/IEC 15018 for all application groups: appr. € 800 to € 1.600 for a mansion (building conventions of Central Europe).
- o This replaces a conventional TV & Telephone cabling: ca. € 100 bis € 200.
- o This decreases the cost for protection against sabotage, masquerade and for malfunction.
 - Each false alarm, may cost € 80.



Magnitude of cost 2

- o This villa offers:
 - Connection points for TV, Telephon, PC in every room.
 - Connection points for CCCB may be activated where ever wanted.
 - Support for additional application equipment and functions without „construction, dirt, ..“
 - Secure and reliable in-house communications



Magnitude of cost 3

- o Each house needs to be calculating individuality. The cost for a conventional solution needs to be subtracted.
- o The price performance ratio increases with the elegance of the solution.
- o It still pays off to start small.
- o The appetite grows during the meal.
- o You can satisfy it, without extra construction work and security risks
- o There is no limit to luxury.



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I am happy to answer your questions.



**Also feel free to consult the SC 25
Homepage: <http://sc25.iec.ch/>
and to contact me directly**