

ISO/IEC 11801-5:2017-11 (E)

Information technology - Generic cabling for customer premises - Part 5: Data centres

CONTENTS

FOREWORD	6
INTRODUCTION	8
1 Scope	10
2 Normative references	10
3 Terms, definitions and abbreviated terms	11
3.1 Terms and definitions	11
3.2 Abbreviated terms	13
4 Conformance	13
5 Structure of the generic cabling system	14
5.1 General	14
5.2 Functional elements	14
5.3 General structure and hierarchy	14
5.4 Cabling subsystems	16
5.4.1 General	16
5.4.2 Network access cabling subsystem	16
5.4.3 Main distribution cabling subsystem	16
5.4.4 Intermediate distribution cabling subsystem	16
5.4.5 Zone distribution cabling subsystem	16
5.4.6 Design objectives	17
5.5 Accommodation of functional elements	17
5.6 Interfaces	17
5.6.1 Equipment interfaces and test interfaces	17
5.6.2 Channels and links	18
5.7 Dimensioning and configuring	19
5.7.1 Distributors	19
5.7.2 Redundancy	20
5.7.3 External network interface	21
5.7.4 Cables	22
5.7.5 Equipment cords	22
5.7.6 Patch cords and jumpers	22
5.7.7 Equipment outlets	22
5.7.8 LDP	23
5.7.9 Building entrance facilities	23
5.8 Earthing and equipotential bonding	23
6 Channel performance requirements	23
6.1 General	23
6.2 Environmental performance	25
6.3 Transmission performance	25
6.3.1 General	25
6.3.2 Balanced cabling	25
6.3.3 Optical fibre cabling	25

7	Link performance requirements	26
7.1	General.....	26
7.2	Balanced cabling	26
7.3	Optical fibre cabling	26
8	Reference implementations	26
8.1	General.....	26
8.2	Balanced cabling	26
8.2.1	Assumptions.....	26
8.2.2	Zone distribution cabling.....	27
8.2.3	Cabling between distributors.....	30
8.2.4	Network access cabling	33
8.3	Optical fibre cabling	35
8.3.1	General	35
8.3.2	Component choice	35
8.3.3	Dimensions.....	36
9	Cable requirements	36
9.1	General.....	36
9.2	Balanced cables	36
9.3	Optical fibre cables	36
10	Connecting hardware requirements	36
10.1	General requirements	36
10.1.1	Overview	36
10.1.2	Location	36
10.1.3	Design.....	37
10.1.4	Operating environment	37
10.1.5	Mounting	37
10.1.6	Installation practices	37
10.1.7	Marking and colour coding	37
10.2	Connecting hardware for balanced cabling.....	37
10.2.1	General requirements	37
10.2.2	Performance marking.....	37
10.2.3	Mechanical characteristics.....	37
10.3	Connecting hardware for optical fibre cabling.....	38
10.3.1	General requirements	38
10.3.2	ENI requirements.....	38
10.3.3	EO requirements	38
10.3.4	Optical fibre assignments at the EO.....	39
10.3.5	Other connecting hardware	39
11	Requirements for cords and jumpers	39
11.1	Jumpers.....	39
11.2	Balanced cords	39
11.3	Optical fibre cords.....	39

Annex A (normative) Combination of balanced cabling links.....	40
A.1 General.....	40
A.2 Requirements	40
Annex B (informative) Usage of high density connecting hardware within optical fibre cabling.....	41
B.1 General.....	41
B.2 Use cases for high density connecting hardware.....	41
Annex C (informative) Examples of structures in accordance with ISO/IEC 11801-5	45
C.1 General.....	45
C.2 Data centre minimum configuration	46
C.3 End of Row concept.....	47
C.4 Middle of Row concept.....	48
C.5 Top of Rack concept	49
C.6 End of Row and Middle of Row concept with redundancy	50
C.7 Top of Rack concept with redundancy	51
C.8 End of Row concept with full redundancy	52
C.9 Top of Rack concept with redundancy	53
Annex D (informative) Examples of networking architectures	54
D.1 General.....	54
D.2 Data centre fabric fat-tree	54
D.3 Data centre fabric full-mesh	55
D.4 Data centre fabric interconnected meshes	55
D.5 Data centre fabric centralized switch.....	56
D.6 Data centre fabric virtual switch	57
Bibliography.....	58

Figure 1 – Relationships between the generic cabling documents produced by ISO/IEC JTC 1/SC 25	8
Figure 2 – Structure of generic cabling within a data centre	15
Figure 3 – Hierarchical structure of generic cabling within a data centre	15
Figure 4 – Example of accommodation of functional elements	17
Figure 5 – Test and equipment interfaces	19
Figure 6 – Connection of functional elements providing redundancy	21
Figure 7 – Examples of external service cabling connections to the ENI	22
Figure 8 – Example of a channel with four connections	24
Figure 9 – Example of a system showing the location of cabling interfaces	25
Figure 10 – Zone distribution cabling models	28
Figure 11 – Cabling model between distributors using Class E _A to F _A	31
Figure 12 – Cabling model between distributors using Class I and II	31
Figure 13 – Network access cabling models.....	34
Figure A.1 – Examples of combination of different links	40
Figure B.1 – Examples of high density connecting hardware within main distribution cabling and intermediate distribution cabling.....	42
Figure B.2 – Examples of high density connecting hardware at the LDP and EO within zone distribution cabling	44

Figure C.1 – Key for Figures C.2 through C.9	45
Figure C.2 – Example of a minimum configuration	46
Figure C.3 – Example of End of Row configuration	47
Figure C.4 – Example of Middle of Row configuration	48
Figure C.5 – Example of Top of Rack configuration.....	49
Figure C.6 – Example of End of Row configuration with redundancy	50
Figure C.7 – Example of Top of Rack configuration with redundancy	51
Figure C.8 – Example of End of Row configuration with full redundancy	52
Figure C.9 – Example of Top of Rack configuration with full redundancy.....	53
Figure D.1 – Fat-tree example	54
Figure D.2 – Full-mesh example	55
Figure D.3 – Interconnected mesh example	56
Figure D.4 – Centralized switch example	56
Figure D.5 – Virtual switch example.....	57
 Table 1 – Zone distribution cabling – length assumptions for balanced cabling using Classes E _A to F _A	29
Table 2 – Zone distribution cabling – length assumptions for balanced cabling using Classes I and II.....	30
Table 3 – Zone distribution channel length equations for Classes	30
Table 4 – Cabling between distributors – length assumptions for balanced cabling using Classes E _A to F _A	31
Table 5 – Cabling between distributors – length assumptions for balanced cabling using Classes I and II	32
Table 6 – Length equations for cabling between distributors	32
Table 7 – Network access cabling channel equations.....	35
Table 8 – Connecting hardware of the type used at the EO	37