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**Broadband Deployment and Lifecycle Resource Management
Part 5: Customer Network Infrastructures
Sub-part 1: Homes (single-tenant)**

WORKING DRAFT 1



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44 Intellectual Property Rights

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51 can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web
52 server) which are, or may be, or may become, essential to the present document.

53 Foreword

54 This European Standard (EN) has been produced by ETSI Technical Committee Access, Terminals and Transmission,
55 Multiplexing (ATTM).

56 The present document is part 5, sub-part 1 of a multi-part deliverable covering lifecycle resource management of
57 broadband deployment as identified below:

58 **EN 305 174 series: Broadband Deployment and Lifecycle Resource Management**

59 EN 305 174-1: Overview, common and generic aspects

60 EN 305 174-2: ICT sites

61 EN 305 174-3: Core networks

62 EN 305 174-4: Access networks

63 Sub part 1: Fixed access networks

64 Sub part 2: Mobile access networks

65 **EN 305 174-5: Customer network infrastructures**

66 **Sub part 1: Homes (single-tenant)**

67 Sub part 2: Office premises (single-tenant)

68 Sub part 4: Multi-tenant premises (residential and commercial)

69 EN 305 174-6: Cable networks

70 EN 305 174-7: Sustainable Digital Multiservice (“Smart”) Cities

71 EN 305 174-8: Management of end-of-life of ICT equipment

72

National transposition dates

| | |
|--|-----------------|
| Date of adoption of this EN: | 1 October 2014 |
| Date of latest announcement of this EN (doa): | 31 January 2015 |
| Date of latest publication of new National Standard or endorsement of this EN (dop/e): | 31 July 2015 |
| Date of withdrawal of any conflicting National Standard (dow): | 31 July 2015 |

73

74

75 Modal verbs terminology

76 In the present document "shall", "shall not", "should", "should not", "may", "need not", "will", "will not", "can" and
77 "cannot" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of
78 provisions).

79
80 "must" and "must not" are NOT allowed in ETSI deliverables except when used in direct citation.

81 Introduction

82 The increasing interaction between the different elements of the Information Communication Technology (ICT) sector
83 (hardware, middleware, software and services) supports the concept of convergence in which:

- 84 • multi-service packages can be delivered over a common infrastructure;
- 85 • a variety of infrastructures is able to deliver these packages;
- 86 • a single multi-service-package may be delivered over different infrastructures.

87 As a result of this convergence, the development of new services, applications and content has resulted in:

- 88 • an increased demand for bandwidth, reliability, quality and performance, with a consequent increase in the demand
89 for power which has implications for cost and, in some cases, availability;
- 90 • an associated continuous evolution of ICT equipment.

91 It is therefore important to consider the environmental viability of all network elements necessary to deliver the required
92 services in terms of the management of their operational aspects i.e. energy management (including energy efficiency)
93 and the management of the End-of-Life (EoL) of the ICT equipment.

94 NOTE: the term "environmental viability" is used while recognising that well established treatments of "sustainability" feature three separate viability
95 objectives (environmental, economic and social). For the purposes of the EN 305 174 series, only operational aspects of environmental viability are
96 considered. A wider approach to environmental viability takes other factors into account including the use of raw materials and avoidance of
97 hazardous substances in the construction of infrastructure or ICT equipment - these factors are not considered.

98 New technologies and infrastructure strategies are expected to enable operators to decrease the energy consumption, for
99 a given level of service, of their existing and future infrastructures thus decreasing their costs. This requires a common
100 understanding among market participants that only standards can produce.

101 The EN 305 174 series specifies the general engineering of various broadband infrastructures to enable the most
102 effective energy management (and management of other resources) and the appropriate measures for EoL treatment of
103 ICT equipment. Certain of the standards may specify requirements for interoperability.

104 The present document is part 5, sub-part 1 of a multi-part deliverable and specifies requirements for customer network
105 infrastructures within homes (single-tenant) as recipients of broadband deployment.

106 The present document been produced by ETSI Technical Committees Access, Terminals, Transmission and
107 Multiplexing (ATTM) and Cable in close collaboration with CENELEC via the Installations and Cabling Co-ordination
108 Group (ICCG).

109 1 Scope

110 The present document is part 5, sub-part 1 of a multi-part deliverable which specifies the general engineering of various
111 broadband infrastructures to enable the most effective energy management (and management of other resources) and the
112 appropriate measures for EoL treatment of ICT equipment.

113 The present document specifies the requirements for resource management of customer network infrastructures within
114 homes (single-tenant), as recipients of broadband services, as a combination of:

- 115 • energy management;
- 116 • EoL of ICT equipment by reference to EN 305 174-8.

117 2 References

118 References are either specific (identified by date of publication and/or edition number or version number) or
119 non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the
120 referenced document (including any amendments) applies.

121 Referenced documents which are not found to be publicly available in the expected location might be found at
122 <http://docbox.etsi.org/Reference>.

123 NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee
124 their long term validity.

125 2.1 Normative references

126 The following referenced documents are necessary for the application of the present document.

- | | | |
|-----|-----|---|
| 127 | [1] | European Commission, DG-JRC Code of Conduct on Energy Consumption of Broadband 128 Equipment |
| 129 | [2] | CENELEC EN 50173-4: "Information technology - Generic cabling: Homes" |
| 130 | [3] | CENELEC EN 50173-6: "Information technology - Generic cabling: Homes" |
| 131 | [4] | CENELEC EN 50174-2: "Information technology - Cabling installation: Planning and installation 132 practices inside buildings" |
| 133 | [5] | CENELEC EN 50174-2 Clause 10: "Information technology - Cabling installation: Planning and 134 installation practices inside buildings: Homes" |
| 135 | [6] | CENELEC EN 50491-6-1: "General requirements for Home and Building Electronic Systems 136 (HBES) and Building Automation and Control Systems (BACS) -- Part 6: <i>Design, planning and 137 installation</i> " |
| 138 | [7] | ETSI TS 103 247: "Singlemode Optical Fibre System Specifications for Home Cabling" |
| 139 | [8] | ETSI TS 105 175-1: "Plastic Optical Fibre System Specifications for 100 Mbit/s and 1 Gbit/s" |
| 140 | [9] | Commission Regulation (EC) No 1275/2008: 17 December 2008, implementing Directive 141 2005/32/EC of the European Parliament and of the Council with regard to "ecodesign 142 requirements for standby and off mode electric power consumption of electrical and electronic 143 household and office equipment" |

144 2.2 Informative references

145 The following referenced documents are not necessary for the application of the present document but they assist the
146 user with regard to a particular subject area.

- 147 [i.1] CENELEC EN 50174-1: "Information technology - Cabling installation: Installation specification
148 and quality assurance"
- 149 [i.2] CENELEC EN 50174-3: "Information technology - Cabling installation: Installation planning and
150 practices outside buildings"
- 151 [i.3] CENELEC EN 50491 series: "General requirements for Home and Building Electronic Systems
152 (HBES) and Building Automation and Control Systems (BACS)"
- 153 [i.4] ISO/IEC 11801-4: "Information technology - Generic cabling for customer premises: Part 4:
154 Homes"
- 155 **EDITORS NOTE:** to be completed during the development of the document

156 3 Definitions, symbols and abbreviations

157 *Definitions and abbreviations extracted from ETSI deliverables can be useful when drafting documents and can be*
158 *consulted via the **Terms and Definitions Interactive Database (TEDDI)** (<http://webapp.etsi.org/Teddi/>).*

159 3.1 Definitions

160 For the purposes of the present document, the following terms and definitions apply:

161 **access network:** functional elements (that is equipment and infrastructure) that enable communication between an
162 operator site (OS) and a customer network

163 **access provider:** operator or other entity providing the means to enable external telecommunications service provision
164 to a subscriber
165 [SOURCE: EN 50700:2014, 3.1.1 and EN 50174-3:2014, 3.1.2]

166 **broadband:** telecommunications service capable of providing more than 2 048 kbit/s (Recommendation ITU-T I.113
167 [XX]) full-rate capacity in at least one direction
168 NOTE: ISDN is not considered to be a broadband technology and is not addressed in the present document.

169 **cable access network:** access network provided by cable operators comprising optical fibre and metallic cabling
170 provided direct connection to customer premises

171 **customer network:** functional elements (that is equipment and infrastructure) that enable communication between a
172 network interface unit (NIU), network termination point (NTP) or external network interface (ENTI), as appropriate,
173 and one or more pieces of terminal equipment (TE)

174 **End-of-Life (EoL):** established point in a product life cycle after a period of primary use atnd at which a decision is
175 required with regard to reuse, recycling or disposal

176 **end-use IT equipment:** terminal equipment (TE) of a fixed access network, user equipment (UE) of a mobile access
177 network or network interface unit (NIU) of a cable access network

178 **External Network Test Interface (ENTI):** point in or near the customer premises (inside or outside the customer
179 network) accessible to the fixed access network operator for testing purposes

180 **fixed access network:** access network provided by telecommunications operators comprising optical fibre and metallic
181 cabling provided direct connection to customer premises

182 **ICT equipment:** equipment providing data storage, processing and transport services
183 NOTE: a combination of Information Technology Equipment and Network Telecommunications Equipment

184 **ICT site:** site containing structures or group of structures dedicated to the accommodation, interconnection and
185 operation of ICT equipment together with all the facilities and infrastructures for power distribution and environmental
186 control together with the necessary levels of resilience and security required to provide the desired service availability

187 **information technology equipment (ITE):** equipment providing data storage, processing and transport services for
188 subsequent distribution by network telecommunications equipment (NTE)

- 189 **network data centre (NDC):** data centre embedded within the core network
 190 NOTE: a network data centre of a cable access network may be termed a master head-end
- 191 **network distribution node (NDN):** grouping of NTE equipment within the boundaries of an access network providing
 192 distribution of service from an operator site (OS)
 193 NOTE: where all the network telecommunications equipment (NTE) at a given location is under common governance, any supporting infrastructure
 194 for power distribution and environmental control together with the necessary levels of resilience and security required to provide the desired service
 195 availability is included as part of the NDN
- 196 **network telecommunications equipment (NTE):** equipment between the boundaries of, and dedicated to providing
 197 direct connection to, core and/or access networks
- 198 **Network Termination Point (NTP):** physical point(s) at which a subscriber is provided with access to the operator
 199 network (this may be co-located with an external network test interface)
- 200 **operator site (OS):** premises accommodating network telecommunications equipment (NTE) providing direct
 201 connection to the core and access networks and which may also accommodate information technology equipment (ITE)
 202 NOTE 1 to entry: an operator site that is only connected to the core network is considered as a network data centre
 203 NOTE 2 to entry: an operator site of a cable access network may be termed a local head-end
- 204 **service provider:** operator of any service that furnishes telecommunications content (transmissions) delivered over
 205 access provider facilities
 206 Note 1 to entry: The access provider and the service provider can be a single entity.
 207 [SOURCE: EN 50700:2014, 3.1.20 and EN 50174-3:2014, 3.1.15]
- 208 **subscriber:** identifiable entity within the premises that requires or may require a direct connection to the access
 209 network
- 210 **terminal equipment (TE):** awaiting information from STF 516 WG2
- 211 EDITORS NOTE: to be completed during the development of the document

212 3.2 Symbols

213 For the purposes of the present document, the symbols given in EN 305 174-1 and the following:

214 XXXX XXXXXX

215 EDITORS NOTE: to be completed during the development of the document
 216

217 3.3 Abbreviations

218 For the purposes of the present document, the following abbreviations apply:

| | | |
|-----|---------|---|
| 219 | ATTM | Access, Terminals and Transmission, Multiplexing |
| 220 | BCT | Broadcast Communications Technology |
| 221 | CCCB | Command, Control and Communications in Buildings |
| 222 | CENELEC | European Committee for Electrotechnical Standardization |
| 223 | CP | Customer Premises |
| 224 | EoL | End-of-Life |
| 225 | ICT | Information Communications Technology |
| 226 | NDC | Network Data Centre |
| 227 | NTP | Network Termination Point |
| 228 | OS | Operator Site |
| 229 | TE | Terminal Equipment |
| 230 | TRX | Transceiver Equipment |

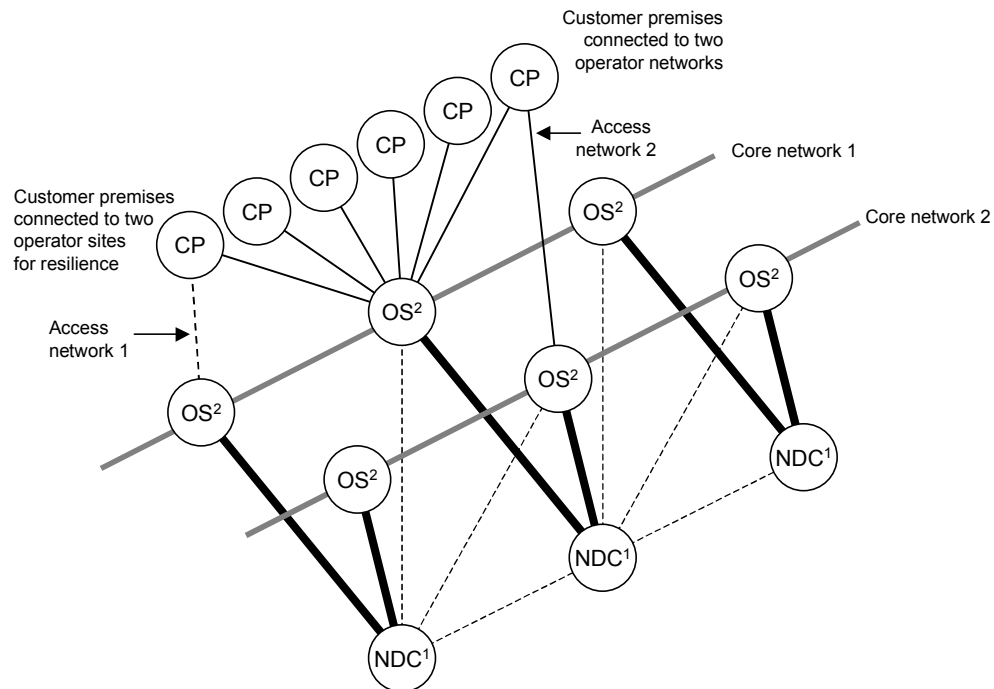
231 EDITORS NOTE: to be completed during the development of the document
 232

233 4 Homes (single-tenant)

234 4.1 Broadband deployment to customer premises

235 4.1.1 General

236 Figure 1 is a technology-agnostic diagram depicting a segment of a broadband network showing the interconnection of
 237 ICT sites and customer premises installations for fixed access networks. In principle, every operator network can
 238 contain any number of each of these elements and may be connected to any number of other operator networks.



239 ¹ For cable access networks this is termed "Master head-end/OS"

240 ² For cable access networks this is termed "Local head-end/OS"

NOTE: for cable operator access networks the equivalent to OS and NDC are addressed in EN 305 174-6

241 **Figure 1 - Network sub-systems of fixed broadband access network infrastructure**

242 Broadband provision is an enabling technology capable of supporting a reduction of global energy consumption (for
 243 example, by providing facilities such as home working and video conferencing to reduce travel demands). For this
 244 reason, it may not be the case that the total energy consumption of broadband networks will be reduced, though the
 245 application of effective energy efficiency measures will minimise any increases due to predicted service evolution.

246 The scale of reductions in energy consumption and/or improvements of energy efficiency is:

- 247 • dependent on the network sub-systems;
- 248 • generally greater at the design stage rather than following improvements to existing infrastructures.

249 The potential reductions in energy consumption and/or improvements of energy efficiency in ICT sites as described in
 250 EN 305 174-2 are expected to be substantial but apply in only a relatively small number of locations and may prove
 251 vital where availability of power is restricted. These clearly defined premises are provided with appropriate Key
 252 Performance Indicators (KPIs) to determine relative performance levels in terms of energy efficiency.

253 By comparison to ICT sites the saving at the various network distribution nodes and within the cabling infrastructures
 254 of the individual access networks may be very much smaller but the aggregation of those saving may outweigh the
 255 energy efficiency gains elsewhere due to the very large number of customers, thus justifying their consideration and
 256 implementation. The communities served by customer networks are the recipients of the "energy efficiency enabling"
 257 technologies provided by broadband services and the relevant parts of this multi-part document serves to indicate
 258 strategies/approaches that maximise the opportunities presented.

259 Within customer premises, it is generally the customer rather than the operator that funds the energy costs. Potential
 260 reductions in energy consumption may well be identifiable in design terms but they are generally not individually
 261 quantifiable due to the diversity of customer networks.

262 4.1.2 Telecommunications services within homes

263 Historically, telecommunications services within homes (and customer premises in general) have been grouped as:

- 264 • Broadcast Communications Technology (BCT);
- 265 • Command, Control and Communications in Buildings (CCCB);
- 266 • Information Communications Technology (ICT).

267 A non-exhaustive list of the specific services in each group is listed in Table 1.

268

Table 1 - Services and applications

| | | Applications | | |
|-----------------------|---|--------------|------|-----|
| | | BCT | CCCB | ICT |
| BCT services | | | | |
| Entertainment | Television and radio | • | | • |
| ICT services | | | | |
| Entertainment | Still and video images | | | • |
| | Audio (dedicated players, tablets, etc.) | | | • |
| | Gaming (solo and shared) | | | • |
| Socio-cultural | Tele-learning | | | • |
| | Tele-working, cooperative working | | | • |
| | Home banking | | | • |
| | On-line procurement | | | • |
| Communications | Telephony (voice and video) | | | • |
| | Integration with mobile phones | | | • |
| | e-mail | | | • |
| | Internet access | | | • |
| Health and well-being | Homecare | | | • |
| | Remote assistance | | | • |
| | Remote monitoring | | | • |
| | Tele-medicine | | | • |
| CCCB services | | | | |
| | Security: Anti-intrusion | • | | • |
| | Security: Access control | • | | • |
| | Safety: Ambient control (e.g. fire, gas, ...) | • | | • |
| | Motor control (e.g. rolling shutter) | • | | • |
| | Lighting (scenarios) | • | | • |
| | Programming and controlling white goods | • | | • |
| | Energy management and load control | • | | • |

269

270 It is important to differentiate between the “service” delivered in the home and the “application” used to deliver it. For
 271 example, many people receive television (a BCT service) via their personal computers or tablet device using “wired” or
 272 wireless Ethernet connection (an ICT application). Similarly, homes connected to cable access networks may use
 273 DOCSIS (a BCT application) to communicate data (an ICT service). However within the home, the distribution of the
 274 ICT services within DOCSIS is generally implemented via a ICT application.

275 CCCB services have, until recently, been dominated by CCCB applications which have tended to be proprietary with
 276 each one implemented using a particular infrastructure design. The reluctance of the CCCB industry to adopt a
 277 common infrastructure has restricted the concept of pre-cabling within homes - which is a foundation of the generic
 278 cabling concept adopted by both BCT and ICT applications.

279 The extension of Ethernet applications to support remotely powered devices - using the standardised 4-pair balanced
 280 cabling infrastructure already specified for ICT applications - has resulted in a massive increase in the number of
 281 services that the ICT applications can support. Future development include the use of 1-pair applications, also providing
 282 remote powering, which will allow support for devices to support the “Internet of Things” and which are integral to
 283 Sustainable Digital Multi-Service (“Smart”) City concepts.

284 This convergence of delivery of ICT and CCCB services using common applications and a common cabling
 285 infrastructure provides the opportunity for the holistic management of the entire home environment - including energy
 286 management.

287 As can be seen in Table 1, BCT applications are restricted to the delivery of BCT services by virtue of their coaxial
 288 cabling background - but are important due to their dominance in the market. However, ICT applications are capable of
 289 support all the service types. Standards have been developed to specify the design and installation of generic cabling
 290 for these applications (see clause 5).

291 For this reason, clause 6 of the present document focuses on the following aspects:

- 292 • the planning of pathways and spaces within the home to maximise the opportunities for energy management (see
 293 6.2.1);
- 294 • the selection of terminal equipment to maximise the opportunities for resource management (see 6.2.2);
- 295 • the design of cabling infrastructure to maximise the opportunities for interoperability of equipment in support of
 296 resource management (see 6.3.1);
- 297 • the requirements for energy performance of operator-owned customer premises equipment providing the BCT and
 298 ICT applications to and from the premises (see 6.4);
- 299 • the requirements for End-of-Life of the operator-owned customer premises equipment (see 6.5).

300 5 Standardisation review for homes (single-tenant)

301 5.1 General

302 With regard to the distribution of BCT and ICT services to spaces within customer premises, homes are unique for the
 303 following general reasons:

- 304 • there are limited or non-existent cabling infrastructures within the home for the distribution of external network
 305 telecommunications services or internally generated information technology services;
- 306 • residents are either willing to physically move within the home, or install service-specific wireless systems to
 307 access ICT services;
- 308 • residents tend to situate their living space(s) according to the availability of the BCT services - although the
 309 increasing use of ICT applications to deliver BCT services is reducing this aspect;
- 310 • the ongoing development of BCT services places increasing performance on the cabling to support their
 311 transmission throughout the home.

312 However, neither the growth of ICT applications within the home or the advent of access to BCT services using ICT
 313 applications has resulted in the large scale re-installation of home cabling infrastructures as a means of distribution
 314 since:

- 315 • aesthetic considerations have prominence in homes;
- 316 • refurbishment of the building structures is uncommon;
- 317 • residents expect **temporal** flexibility in access to services.

318 Instead there has been a substantial investment in wireless infrastructures within the home to provide those ICT
 319 applications.

320 In order for home to benefit from an holistic approach to energy management it is necessary to plan the pathways and
 321 spaces within the home to:

- 322 • accommodate the cabling necessary for ICT applications to support the evolving range of energy management
 323 devices (and the changes in devices) supported - these devices will comprise both wired and wireless solutions;
 324 • to centralize the accommodation of equipment that is necessary to monitor and control the key areas of energy
 325 consumption within the home.

326 5.2 Cabling planning and installation

327 5.2.1 EN 50174 series

328 EN 50174 series standards specify requirements for the planning and installation of installations of telecommunications
 329 cabling - independent of the cabling media involved. In relation to the present document, these media comprise
 330 metallic and optical fibre cabling including but not restricted to:

- 331 • balanced copper cabling in accordance with EN 50173-4;
 332 • other metallic cables in accordance with the EN 50491 standards (which are considered to be standards supporting
 333 application-specific implementations of CCCB cabling);
 334 • coaxial cabling in accordance with EN 50173-4;
 335 • all-silica multimode optical fibre cabling in accordance with EN 50173-4;
 336 • all-silica singlemode optical fibre cabling in accordance with EN 50173-4 and ETSI TS 103 247;
 337 • plastic optical fibre cabling in accordance with ETSI TS 105 175-1 series.

338 EN 50174-1 specifies requirements for the development of installation specification and quality plans to support the
 339 installations. EN 50174-2 specifies requirements for the installation planning and practices for telecommunications
 340 cabling inside buildings (and EN 50174-3 specifies such requirements outside buildings).

341 Within EN 50174-2, the general requirements for all premises are supplemented by specific requirements applicable to
 342 single-tenant homes. The requirements of clause 6.2.1 of the present document make reference to specific aspects of EN
 343 50174-2.

344 5.3 Cabling design

345 5.3.1 EN 50173-4

346 EN 50173-4 specifies the requirements for generic, structured, cabling for use in home (single-tenant) to support the
 347 distribution of both ICT and BCT services to rooms and, more generally, coverage areas. The cabling media comprise
 348 balanced and coaxial metallic and optical fibre implementations.

349 The requirements of the present document are based on those of EN 50173-4 but include additional requirements as
 350 specified in clause 6.3.1.

351 5.3.2 EN 50173-6

352 As indicated in 4.1.2, CCCB services are generally able to be delivered by ICT applications .

353 This had led to the removal of CCCB cabling concepts within the EN 50173-4 standards published before 2016.
 354 Instead, these concept of distributed building services was developed as defined in EN 50173-6. Distributed building
 355 services are any, including ICT services, which serve purposes that are non-user specific.

356 For example, EN 50173-4 specifies the distribution of outlets around the home for connection to user equipment
 357 such as personal computers and televisions whereas EN 50173-6 specifies the distribution of connection points for
 358 wireless access points (serving many other devices) and door access controls, environmental control etc (which are
 359 not user-specific).

360 EN 50173-6 specifies the requirements for generic, structured, cabling for use in all premises to support the distribution
 361 of distributed building services. These services cover a wide range of applications and include support for future
 362 developments for 1-pr applications in support of Internet of Things applications. As such they are integral to support
 363 Sustainable Digital Multi-Service (“Smart”) City concepts.

364 The cabling media comprise balanced and coaxial metallic and optical fibre implementations.

365 The services supported by cabling in accordance with EN 50173-6 are commonly also those supported by remote
366 powering of the terminal devices. The provision of power of up to ~30 W per 4-pair balanced cable has been specified
367 in conjunction with 10/100/1000BASE-T applications since 2009. This approach is now being extended to 95 W per 4-
368 pair balanced cable is the objective of IEEE 802.3bt (expected to be published in 2018). and will include 10GBASE-T
369 as a supported application.

370 The emergence and further development of remote powered devices encourages the use of cabled infrastructure
371 installations since:

- 372 • both existing residents and developers of new homes will recognize the benefits of being able to control and
373 provide power to a wide range of equipment (for example, surveillance systems, door access control, environmental
374 control system) that can be managed from a central location and via a common infrastructure;
- 375 • residents will see an increase in equipment without the need for external power supplies and with a common
376 connection style (EN 60603-7 series, also known as the RJ-45).

377 The requirements of the present document are based on those of EN 50173-6 but include additional requirements as
378 specified in clause 6.3.1.

379 5.3.3 EN 50491-6-1

380 The EN 50491 series of standards is entitled “General requirements for Home and Building Electronic Systems (HBES)
381 and Building Automation and Control Systems (BACS)” and contains requirements for HBES devices including EN
382 50491-6-1 covering planning and installation.

383 HBES is a generic term applicable to all telecommunication services within a home which are as CCCB, BCT and ICT
384 and also as HBES Classes:

- 385 • CCCB services are sometimes referred to as HBES Class 1;
- 386 • BCT services are sometimes referred to as HBES Class 3;
- 387 • ICT services are sometimes referred to as HBES Class 2.

388 EN 50491-6-1 requires the application of EN 50174-2 but contains additional planning guidance for specific groups of
389 services and terminal devices.

390 6 Requirements for homes (single-tenant)

391 6.1 General

392 6.2 General engineering to support energy management

393 6.2.1 Design

394 **Editors NOTE: This sub-clause is to be based upon the application of EN 50174-2 for homes**

395 6.2.1.1 Pathways

396 Additional requirements will include specifics in relation to:

- 397 • explanation of the application of SCP in EN 50173-6 to support energy management devices
- 398 • connection of devices to Smart meters etc.

399 6.2.1.2 Spaces

400 Additional requirements will include specifics in relation to:

- 401 • explanation of the application of SCP in EN 50173-6 to support energy management devices
- 402 • any additional dimension requirements for PHDs

403 6.2.2 Operation

404 The principal strategy to be adopted involves:

- 405 • the use of devices in accordance with the Energy Efficient Ethernet project;
 - 406 • the use of low consumption visual interfaces;
 - 407 • the use of common visual interfaces (acting as displays for ICT and BCT services, independent of the type of
 - 408 application used to deliver the BCT service);
 - 409 • not just using standby modes for attached devices (opting to turn them off instead).
- 410 NOTE: the future provision of equipment meeting the requirements of European Commission Regulation (EC) No 1275/2008 will
- 411 assist in observing this strategy.

412 6.3 General engineering to support interoperability

413 6.3.1 Cabling infrastructure

414 **Editors NOTE:** This sub-clause is to be based upon the application of EN 50173-4 and EN 50173-6.

415 **Editors NOTE:** Text in italics is base text from TR 105 174-5-1 and has not yet been developed further.

416 Additional requirements will include specifics in relation to:

- 417 • Media selection from EN 50173-4 (optical fibre is additional);

418 *The opportunity presented by PoE suggests that optical fibre in the home may not be as advantageous as one*

419 *might think despite the ultimate bandwidth limitations of the copper cabling specified in EN 50173-4 (specified*

420 *today to support 1000BASE-T, Class D).*

- 421 • cabling performance in EN 50173-4 (Class E_A , rather than Class D);

422 *The use of high bandwidth broadband deployment to support true “home working” (enabling effective*

423 *“telepresence”) allows the “carbon footprint” of employees to be reduced.*

424 *A variety of studies, including those undertaken in the United Kingdom by The Carbon Trust, shows that home*

425 *working provides substantial beneficial impact.*

426 *An increased focus by employers on “mobility”, requiring equivalent access to corporate networks, applications*

427 *and tasks independent of the location from which they are accessed , recognises home working as offering*

428 *reductions in both capital and operational expenditure in terms of office space, corporate infrastructure and*

429 *energy consumption. However, true mobility requires provision of high speed broadband delivery which can*

430 *replicate, effectively, the office-based environment in the remote location.*

431 *The implementation of wireless access technologies to allow portable access to information technology services*

432 *rather than duplicating equipment .*

- 433 • explanation of distribution requirements for TOs and BOs
- 434 • explanation of the application of SCP in EN 50173-6 to support energy management devices

435 *We offer significant opportunities to reduce energy consumption (e.g. light and heating levels in unoccupied*

436 *areas) which can be further enhanced by integration with broadband delivery to monitor and control energy*

437 *usage via those systems.*

438 *As energy costs rise, the opportunity exists to re-focus on potential energy savings offered by information*

439 *technology solutions. The ability to monitor, in real time, the energy usage in the home, either as a total or more*

440 *specifically as related to individual circuits (lighting, heating) or components (ovens, refrigerators) and to*

441 *display this information using a common visual interface using an ICT application both within the home or*

442 *remotely may contribute significantly to the reduction of energy consumption within the home.*

- 443 •

444

445 6.4 Energy performance of customer premises equipment

446 **Editors NOTE:** This sub-clause is to be based upon the application of EU DG JRC Code of Conduct on Energy Consumption of Broadband
447 Equipment

448 **Editors NOTE:** The following text from TR 105 174-5-1 and has not yet been developed further.

449 The connection between the operators access network and the home distributor as shown in Figure 4 (or the equivalent
450 in non-generic cabling) is provided by network access cabling and some type of network telecommunication equipment
451 as shown in Figure 2.

452 The network telecommunications equipment typically comprises a passive interface (ENTI) and an optional item of
453 apparatus. The apparatus may be specific to the network operator (OSE) or may be operator independent (OIE) as
454 described in the following examples:

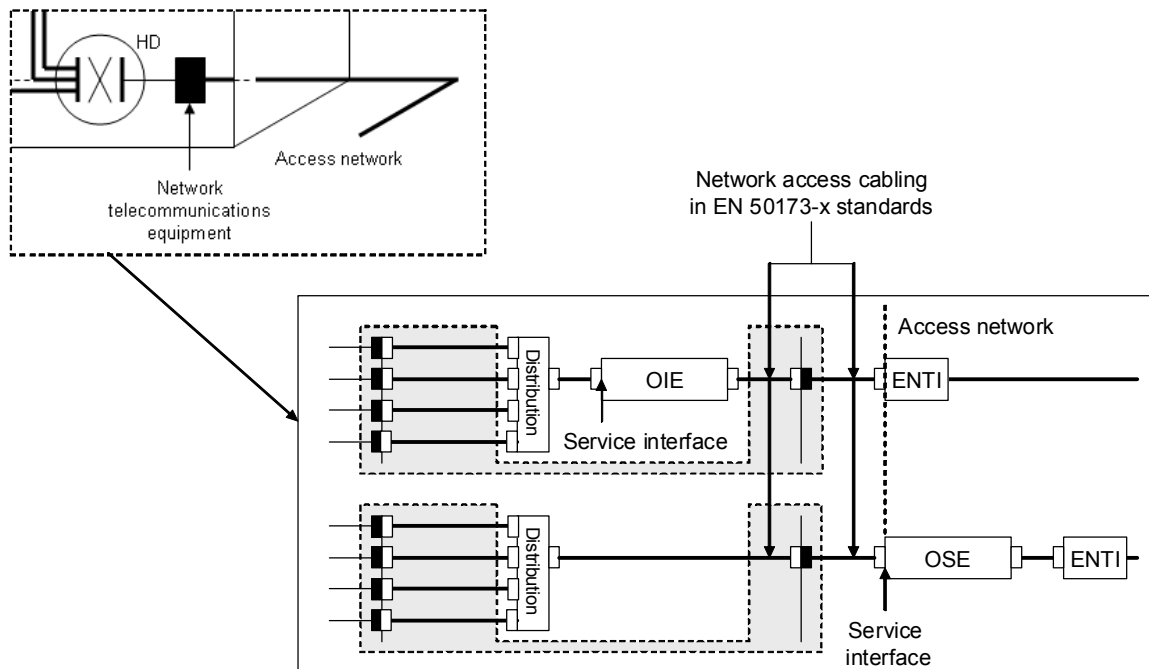
- 455 • OIE: DSL modem, FTTH modem (where interoperability standard exists).

456 Note: See ETSI TS 102973

- 457 • OSE: CATV modem, FTTH modem (where no interoperability standard exists);

458 The OSE is part of the access network whereas the OIE is part of the customer premises infrastructure.

459



460

461 **Figure 2 - Network access cabling and equipment**

462 In most cases the OIE, or some part of it, may be powered from the access network. In some cases the OSE may be
463 powered from the customer premises.

464 For this reason, the energy efficiency of the access network takes into account any power required to maintain the
465 functionality at the service interface, whether or not it is part of the access network (and is covered in Part 4 of this
466 multi-part document).

467 The EU Code of Conduct on Energy Consumption of Broadband Equipment [1] provides a framework for ensuring
468 operational energy efficiency consumption of network telecommunication equipment.

469 6.5 Managing EoL of customer premises equipment

470 **Editors NOTE:** This sub-clause will refer to EN 305 174-8.

471 Annex A: xxx (informative)

472 **Editors NOTE:** The following text from TR 105 174-5-1 and has not yet been developed further.

473 A.1 General

| | |
|---|---|
| application | system, with its associated transmission method that is supported by telecommunications cabling (this corresponds to a Layer One application in the OSI 7-layer model) |
| broadcast communication technology (BCT) application | system, with its associated transmission method using the HF band (3 MHz to 30 MHz), the VHF band (30 MHz to 300 MHz) and the UHF band (300 MHz to 3000 MHz) dedicated to the transmission of sound radio, TV and two-way data services, as well as for in-home inter-networking (<i>EN 50173-1</i> [Error! Reference source not found.] <i>modified</i>) |
| BCT service | the transmission of sound radio, TV and two-way data (<i>EN 50173-1</i> [Error! Reference source not found.] <i>modified</i>) |
| control, command and communications in building (CCCB) application | system, with its associated transmission method dedicated to providing appliance control and building control (<i>EN 50173-1</i> [Error! Reference source not found.] <i>modified</i>) |
| CCCB services | appliance control and building control (<i>EN 50173-1</i> [Error! Reference source not found.] <i>modified</i>) |
| information communication technology (ICT) applications | system, with its associated transmission method for the communication of information |
| ICT services | creation, communication dissemination, storage and management of information |
| network convergence | the ability of a network, by virtue of the applications it supports, to deliver multiple ICT, BCT and CCCB services |

474

475

| | |
|------|---|
| BACS | Building Automation and Control Systems |
| BO | Broadcast Outlet |
| CATV | Cable television |
| DTE | Data Terminal Equipment |
| ENTI | External Network Termination Interface |
| HBES | Home and Building Electronic Systems |
| HD | Home Distributor |
| MDI | Media-Dependent Interface |
| OIE | Operator Independent Equipment |
| OSE | Operator Specific Equipment |
| SHD | Secondary Home Distributor |
| TO | Telecommunications Outlet |

476

477 A.2 Generic cabling designs in accordance with EN 50173-4

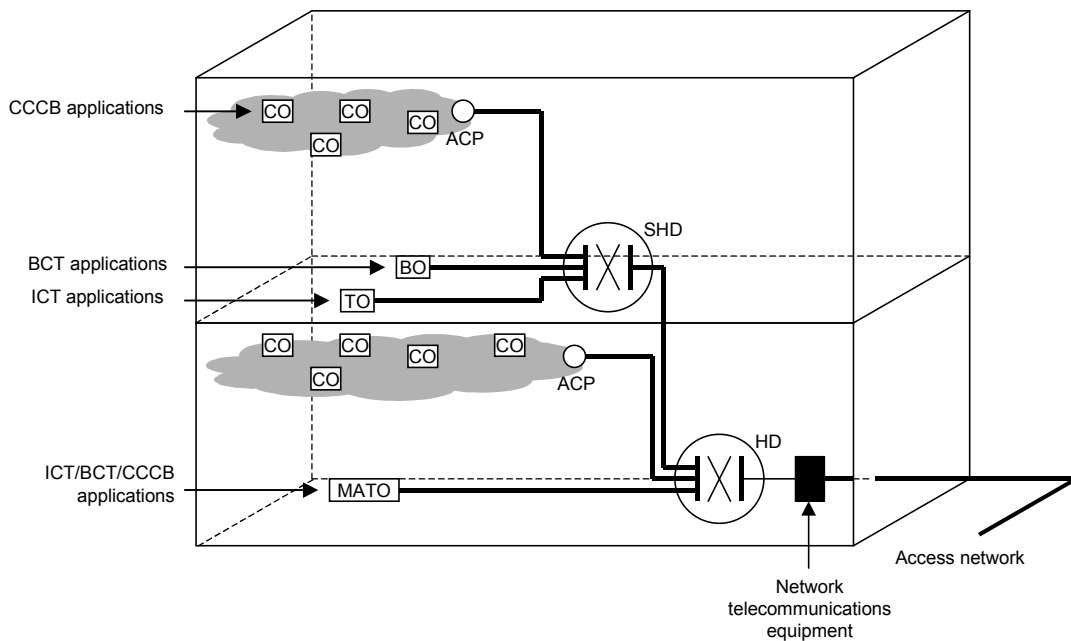
478 Note EN 50173-4 [2], first published in 2007, has a similar scope to that of ISO/IEC 15018 produced by
 479 ISO/IEC JTC1 SC25. However, the two documents contain different requirements and are therefore not
 480 identical at a technical level.

481 Infrastructure layers

482 EN 50173-4 specifies two layers of infrastructure as shown in Figure 3 (*modified from EN 50173-4*). Both layers are
 483 fed from a Home Distributor (HD) or, if the dimensions of the home, its configuration or the complexity of the network
 484 supports their use, Secondary Home Distributors (SHD) as shown in Figure 4 (*modified from EN 50173-4*). Figure 4
 485 (*modified from EN 50173-4*) shows that generic cabling of EN 50173-4 not only provides distribution of broadband
 486 services delivered over cabled media via the access network but also supports the reception of BCT services using
 487 antennae.

488 It should be noted that within multi-tenant premises the network telecommunications equipment and access network
 489 cabling shown in Figure 3 and Figure 4 may be replaced by other equipment and a private backbone cabling
 490 infrastructure operated by the premises owner or other party.

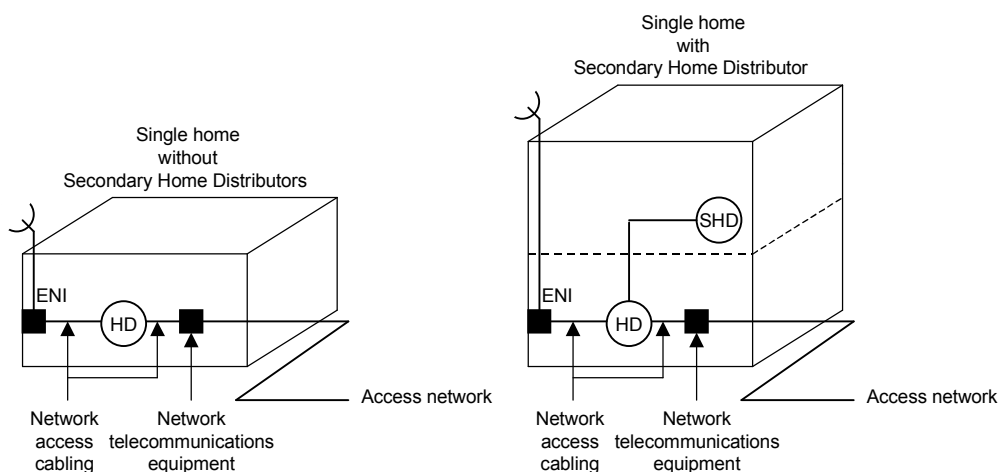
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492

493

Figure 3 - Dual layer infrastructure of EN 50173-4



494

495 Figure 4 - Examples of generic cabling within the home according to EN 50173-4

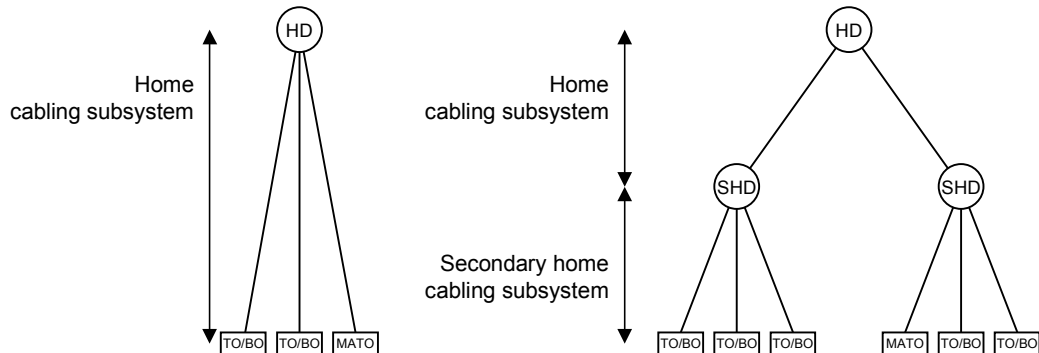
496 The provision of ICT and BCT services is achieved by the connection of:

- 497 • terminal equipment (e.g. telephones, computers and television receivers) at the Telecommunications Outlet (TO)
- 498 and Broadcast Outlet (BO) respectively - both of which adopt a point-to-point star topology to the relevant
- 499 distributor;

500 • the relevant system equipment at the HD/SHD as shown in Figure 5 (as in EN 50173-4).

501 Note the Multi-Application Telecommunications Outlet (MATO) is a co-location of BO, TO and ACP/CO.

502



503

504

Figure 5 - BCT/ICT cabling topologies of EN 50173-4

505 The ICT and CCCB infrastructures are implemented using balanced cabling. There is a common minimum
506 transmission performance between the HD (or SHD) and the TO and ACP (defined as Class D of EN 50173-1).

507 NOTE: EN 50173-4:2007 [2] does not include support for optical fibre as a cabling medium in the home. See
508 Annex B for details of proposals in this area.

509 Class D cabling of EN 50173-1 is capable of supporting applications up to and including 1000BASE-T and
510 incorporating power distribution to the TO or ACP in accordance with IEEE 802.3at.

511 Although the BCT infrastructure may be implemented using coaxial cabling or balanced cabling, the ultimate objective
512 of network convergence is achieved by delivering both CCCB and BCT services using ICT applications.

513

514 Other annexes (as required)

515

516 History

| Document history | | |
|-------------------------|------------|--|
| <Version> | <Date> | <Milestone> |
| V0.0.1 | 04/10/2016 | Skeleton |
| V0.0.2 | 08/02/2017 | Working draft matching 01/17 drafts of 305 174 documents and following clarification of scope in January 2017. |
| | | |

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