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SERIES J: Cable networks and transmission of television, sound programme and other multimedia signals

Correspondence between CableLabs DOCSIS Specifications and ITU-T J-series Recommendations

Supplement 10 to ITU-T J-series Recommendations

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Summary

Supplement 10 to the ITU-T J-series Recommendations clarifies the relationship between the multiple generations of CableLabs DOCSIS specifications and the ITU-T J-series of DOCSIS-based Recommendations.

History

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FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

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2 References

2.1 ITU-T Recommendations

[ITU-T J.112 (03/1998)]	Recommendation ITU-T J.112 (Edition 1, 1998), *Transmission systems for interactive cable television services*.
[ITU-T J.112 Annex B (03/2001)]	Recommendation ITU-T J.112 (Edition 1.2, 2001), *Transmission systems for interactive cable television services*, Annex B: *Data-over-cable service interface specifications: Radio-frequency interface specification*.
[ITU-T J.112 Annex B (03/2004)]	Recommendation ITU-T J.112 (Edition 1.5, 2004), *Transmission systems for interactive cable television services*, Annex B: *Data-over-cable service interface specifications: Radio-frequency interface specification*.
[ITU-T J.122 (12/2007)]	Recommendation ITU-T J.122 (2007), *Second-generation transmission systems for interactive cable television services – IP cable modems*.
[ITU-T J.125 (04/2004)]	Recommendation ITU-T J.125 (Edition 1, 2004), *Link privacy for cable modem implementations*.
[ITU-T J.125 (12/2007)]	Recommendation ITU-T J.125 (Edition 2, 2007), *Link privacy for cable modem implementations*.
[ITU-T J.222.0]	Recommendation ITU-T J.222.0 (2007), *Third generation transmission systems for interactive cable television services – IP cable modems: Overview*.
[ITU-T J.222.1]	Recommendation ITU-T J.222.1 (2007), *Third generation transmission systems for interactive cable television services – IP cable modems: Physical layer specification.*
[ITU-T J.222.2]	Recommendation ITU-T J.222.2 (2007), *Third generation transmission systems for interactive cable television services – IP cable modems: MAC and Upper Layer protocols*.
[ITU-T J.222.3]	Recommendation ITU-T J.222.3 (2007), *Third generation transmission systems for interactive cable television services – IP cable modems: Security services*.
[ITU-T J.224 (07/2019)]	Recommendation ITU-T J.224 (2019), *Fifth-generation transmission systems for interactive cable television services – IP cable modems*.

[ITU-T J.224 (05/2020)] Recommendation ITU-T J.224 (2020), *Fifth-generation transmission systems for interactive cable television services – IP cable modems*.

[ITU-T J.224 (10/2022)] Recommendation ITU-T J.224 (2022), *Fifth-generation transmission systems for interactive cable television services – IP cable modems*.

[ITU-T J.225 (05/2020)] Recommendation ITU-T J.225 (2020), *Fourth-generation transmission systems for interactive cable television services – IP cable modems*.

[ITU-T J.225 (10/2022)] Recommendation ITU-T J.225 (2022), *Fourth-generation transmission systems for interactive cable television services – IP cable modems*.

2.2 CableLabs Specifications

[DOCSIS RFI] Cable Television Laboratories, Inc., SP-RFI-I03-980202, DOCSIS Radio Frequency Interface Specification, February 2, 1998.

[DOCSIS BPI] Cable Television Laboratories, Inc., SP-BPI-I01-970922, DOCSIS Baseline Privacy Interface Specification, September 22, 1997.

[DOCSIS RFIv1.1] Cable Television Laboratories, Inc., SP-RFIv1.1-I05-000714, DOCSIS 1.1 Radio Frequency Interface Specification, July 14, 2000.

[DOCSIS BPI+ I05] Cable Television Laboratories, Inc., SP-BPI+-I05-000714, DOCSIS Baseline Privacy Interface Specification Plus, July 14, 2000.

[DOCSIS RFIv2.0-I02] Cable Television Laboratories, Inc., SP-RFIv2.0-I02-020617, DOCSIS 2.0 Radio Frequency Interface Specification, June 17, 2002.

[DOCSIS BPI+I12] Cable Television Laboratories, Inc., SP-BPI+-I12-050812, DOCSIS Baseline Privacy Interface Specification Plus, August 12, 2005.

[DOCSIS MULPIv3.0] Cable Television Laboratories, Inc., CM-SP-MULPIv3.0-I04-071805, MAC and Upper Layer Protocols Interface Specification, May 18, 2007.

[DOCSIS PHYv3.0] Cable Television Laboratories, Inc., CM-SP-PHYv3.0-I04-071805, DOCSIS 3.0 Physical Layer Specification, May 18, 2007.

[DOCSIS SECv3.0] Cable Television Laboratories, Inc., CM-SP-SECv3.0-I03-070223, DOCSIS 3.0 Security Specification, February 23, 2007.

[DOCSIS CM-OSSIv3.0] Cable Television Laboratories, Inc., CM-SP-OSSIv3.0-I03-070505, DOCSIS 3.0 Cable Modem OSSI Specification, May 5, 2007.

[DOCSIS MULPIv3.1-I23] Cable Television Laboratories, Inc., CM-SP-MULPIv3.1-I23-220328, MAC and Upper Layer Protocols Interface Specification, March 28, 2022.

[DOCSIS MULPIv3.1-I19] Cable Television Laboratories, Inc., CM-SP-MULPIv3.1-I19-191016, MAC and Upper Layer Protocols Interface Specification, October 16, 2019.

[DOCSIS MULPIv3.1-I18] Cable Television Laboratories, Inc., CM-SP-MULPIv3.1-I18-190422, DOCSIS 3.1 MAC and Upper Layer Protocols Interface Specification, April 22, 2019.

[DOCSIS PHYv3.1-I19] Cable Television Laboratories, Inc., CM-SP-PHYv3.1-I19-211110, DOCSIS 3.1 Physical Layer Specification, November 10, 2021.

[DOCSIS PHYv3.1-I17] Cable Television Laboratories, Inc., CM-SP-PHYv3.1-I17-190917, DOCSIS 3.1 Physical Layer Specification, September 17, 2019.

[DOCSIS PHYv3.1-I16] Cable Television Laboratories, Inc., CM-SP-PHYv3.1-I16-190121, DOCSIS 3.1 Physical Layer Specification, January 21, 2019.

[DOCSIS CM-OSSIv3.1-I22] Cable Television Laboratories, Inc., CM-SP-CM-OSSIv3.1-I22-220216, DOCSIS 3.1 Cable Modem OSSI Specification, February 16, 2022.

[DOCSIS CM-OSSIv3.1-I16] Cable Television Laboratories, Inc., CM-SP-CM-OSSIv3.1-I16-190917, DOCSIS 3.1 Cable Modem OSSI Specification, September 17, 2019.

[DOCSIS CM-OSSIv3.1-I15] Cable Television Laboratories, Inc., CM-SP-CM-OSSIv3.1-I15-190422, DOCSIS 3.1 Cable Modem OSSI Specification, April 22, 2019.

[DOCSIS SECv3.1-I10] Cable Television Laboratories, Inc., CM-SP-SECv3.1-I10-211110, DOCSIS 3.1 Security Specification, November 10, 2021.

[DOCSIS SECv3.1-I08] Cable Television Laboratories, Inc., CM-SP-SECv3.1-I08-190917, DOCSIS 3.1 Security Specification, September 17, 2019.

[DOCSIS SECv3.1-I07] Cable Television Laboratories, Inc., CM-SP-SECv3.1-I07-110117, DOCSIS 3.1 Security Specification, January 11, 2017.

[DOCSIS CCAP-OSSIv3.1-I24] Cable Television Laboratories, Inc., CM-SP-CCAP-OSSIv3.1-I24-220518, DOCSIS 3.1 CCAP™ OSSI Specification, May 18, 2022.

[DOCSIS CCAP-OSSIv3.1-I15] Cable Television Laboratories, Inc., CM-SP-CCAP-OSSIv3.1-I15-190422, DOCSIS 3.1 CCAP™ OSSI Specification, April 22, 2019.

[DOCSIS CCAP-OSSIv3.1-I17] Cable Television Laboratories, Inc., CM-SP-CCAP-OSSIv3.1-I17-191204, DOCSIS 3.1 CCAP™ OSSI Specification, December 4, 2019.

[DOCSIS CCAP-OSSIv4.0-I07] Cable Television Laboratories, Inc., CM-SP-CCAP-OSSIv4.0-I07-220629, DOCSIS 4.0 CCAP Operations Support System Interface Specification, June 29, 2022.

[DOCSIS CCAP-OSSIv4.0-I01] Cable Television Laboratories, Inc., CM-SP-CCAP-OSSIv4.0-I01-190815, DOCSIS 4.0 CCAP Operations Support System Interface Specification, August 15, 2019.

[DOCSIS CM-OSSIv4.0-I06] Cable Television Laboratories, Inc., CM-SP-CM-OSSIv4.0-I06-220302, DOCSIS 4.0 Cable Modem Operations Support System Interface Specification, March 02, 2022.

[DOCSIS CM-OSSIv4.0-I01] Cable Television Laboratories, Inc., CM-SP-CM-OSSIv4.0-I01-190815, DOCSIS 4.0 Cable Modem Operations Support System Interface Specification, August 15, 2019.

[DOCSIS MULPIv4.0-I05] Cable Television Laboratories, Inc., CM-SP-MULPIv4.0-I05-220328, DOCSIS 4.0 MAC and Upper Layer Protocols Interface Specification, March 28, 2022.

[DOCSIS MULPIv4.0-I01] Cable Television Laboratories, Inc., CM-SP-MULPIv4.0-I01-190815, DOCSIS 4.0 MAC and Upper Layer Protocols Interface Specification, August 15, 2019.

[DOCSIS PHYv4.0-I05] Cable Television Laboratories, Inc., CM-SP-PHYv4.0-I05-220328, DOCSIS 4.0 Physical Layer Specification, March 28, 2022.

[DOCSIS PHYv4.0-I01] Cable Television Laboratories, Inc., CM-SP-PHYv4.0-I01-190815, DOCSIS 4.0 Physical Layer Specification, August 15, 2019.

[DOCSIS SECv4.0-I04] Cable Television Laboratories, Inc., CM-SP-SECv4.0-I04-220328, DOCSIS 4.0 Security Specification, March 28, 2022.

[DOCSIS SECv4.0-I01] Cable Television Laboratories, Inc., CM-SP-SECv4.0-I01-190815, DOCSIS 4.0 Security Specification, August 15, 2019.

3 Definitions

3.1 Terms defined elsewhere

None.

3.2 Terms defined in this Supplement

None.

4 Abbreviations and acronyms

This Supplement uses the following abbreviations and acronyms:

DOCSIS Data-Over-Cable Service Interface Specifications

5 Conventions

None.

6 Correspondence between CableLabs DOCSIS Specifications and ITU-T J-series Recommendations

There is a different interpretation of the multiple generations of cable modem specifications or Recommendations between ITU-T and CableLabs. To clarify these respective interpretations, the following tables provides the correspondence between ITU-T Recommendations/generations and the CableLabs specifications/generations.

Until the 3rd generation of ITU Recommendations (equal to DOCSIS 3.0 – 3rd generation), ITU-T Study Group 9 (SG9) and CableLabs agreed that ITU-T SG9 Recommendations will not be maintained in synchronization with the various editions of the respective specifications.

See Table 1.

Table 1 – 1st, 2nd and 3rd generation of ITU-T DOCSIS-related Recommendations (equivalent to DOCSIS 1.0, 1.1, 2.0 and 3.0)

ITU generation	ITU-T Recommendations	CableLabs Specifications	CableLabs generation
1st generation	[ITU-T J.112 (03/1998)] [ITU-T J.125 (04/2004)]	[DOCSIS RFI] [DOCSIS BPI]	DOCSIS 1.0 – 1st generation
	[ITU-T J.112 Annex B (03/2001)] [ITU-T J.125 (12/2007)]	[DOCSIS RFIv1.1] [DOCSIS BPI-I05]	DOCSIS 1.1 – 2nd generation of 1.0
2nd generation	[ITU-T J.122 (12/2007)] [ITU-T J.112 Annex B (03/2004)]	[DOCSIS RFIv2.0-I02] [DOCSIS BPI+I12]	DOCSIS 2.0 – 2nd generation of RFI
3rd generation	[ITU-T J.222.0 (12/2007)] [ITU-T J.222.1 (07/2007)] [ITU-T J.222.2 (07/2007)] [ITU-T J.222.3 (11/2007)]	[DOCSIS MULPIv3.0] [DOCSIS PHYv3.0] [DOCSIS CM-OSSIv3.0] [DOCSIS SECv3.0]	DOCSIS 3.0 – 3rd generation

For the 4th generation of ITU-T Recommendations (equal to DOCSIS 3.1 – 5th generation in CableLabs) ITU-T SG9 and CableLabs agreed to maintain in synchronization the various editions of the respective specifications, every time a new important release was issued by CableLabs.

See Table 2.

The following text from [ITU-T J.225 (05/2020)], describes the enhancements introduced with DOCSIS 3.1.

The DOCSIS 3.1 specifications introduce a number of features that increase the capability and application of the technology:

1) The use of orthogonal frequency division multiplexing (OFDM) in both upstream and downstream increasing the transmission efficiency (bits/hertz) over single carrier quadrature amplitude modulation (QAM). This enables higher bandwidth capacity over the same amount of spectrum over previous generations of DOCSIS technology with the potential for 10 Gbps service tiers over coax.
2) The specification of multiple modulation profiles enabling cable modems to operate at different modulation orders and to dynamically optimize the transmission capacity for the channel conditions it is experiencing. This improves the operational efficiency by not constraining all cable modems to operate at the lowest modulation order supported by the network.

3) The specification of full-band spectrum capture that enables analysis of the full spectrum as measured from the cable modem enabling sophisticated proactive diagnostics of network issues prior to customer impacting events.

4) The specification of additional security features to enhance the robustness of the DOCSIS network in the face of malicious cyberattacks.

Table 2 – 4th generation of ITU-T DOCSIS-related Recommendations (equivalent to DOCSIS 3.1)

ITU generation	ITU-T Recommendations	CableLabs Specifications	CableLabs generation
4th generation	ITU-T J.225 (05/2020)	[DOCSIS CCAP-OSSIv3.1-I17] [DOCSIS CM-OSSIv3.1-I16] [DOCSIS MULPIv3.1-I19] [DOCSIS PHYv3.1-I17] [DOCSIS SECv3.1-I08]	DOCSIS 3.1 – 5th generation
	ITU-T J.225 (10/2022)	[DOCSIS CCAP-OSSIv3.1-I24] [DOCSIS CM-OSSIv3.1-I22] [DOCSIS MULPIv3.1-I23] [DOCSIS PHYv3.1-I19] [DOCSIS SECv3.1-I10]	

For the 5th generation of ITU-T Recommendations (equal to DOCSIS 4.0 – 6th generation in CableLabs), ITU-T SG9 and CableLabs agreed to maintain in synchronization the various editions of the respective specifications every time a new important release was issued by CableLabs.

See Table 3.

The following text from [ITU-T J.224 (05/2020)] describes the enhancements introduced with DOCSIS 4.0.

The DOCSIS 4.0 specifications introduce a number of features that increase the capability and application of the technology:

1) The specification of a full duplex (FDX) mode of operation enabling the concurrent use of spectrum for both upstream and downstream transmission, greatly increasing the upstream capacity. This provides the ability to provide symmetric multi-gigabit services over coax.

2) The specification of a frequency division duplex (FDD) mode of operation supporting legacy high-split and also providing extended splits up to 684 MHz in an operational band plan which is referred to as Ultra-high Split (UHS). The FDD mode of operation also introduces expansion of usable downstream spectrum up to 1794 MHz.

3) The specification of additional security features to enhance the robustness of the DOCSIS network in the face of malicious cyberattacks.

Table 3 – 5th generation of ITU-T DOCSIS-related Recommendations (equivalent to DOCSIS 4.0)

ITU generation	ITU-T Recommendations	CableLabs Specifications	CableLabs generation
5th generation	[ITU-T J.224 (07/2019)]	[DOCSIS CCAP-OSSIv3.1-I15] [DOCSIS CM-OSSIv3.1-I15] [DOCSIS MULPIv3.1-I18] [DOCSIS PHYv3.1-I16] [DOCSIS SECv3.1-I07]	DOCSIS 4.0 – 6th generation
	[ITU-T J.224 (05/2020)]	[DOCSIS CCAP-OSSIv4.0-I01] [DOCSIS CM-OSSIv4.0-I01] [DOCSIS MULPIv4.0-I01] [DOCSIS PHYv4.0-I01] [DOCSIS SECv4.0-I01]	
	[ITU-T J.224 (10/2022)	[DOCSIS CCAP-OSSIv4.0-I07] [DOCSIS CM-OSSIv4.0-I06] [DOCSIS MULPIv4.0-I05] [DOCSIS PHYv4.0-I05] [DOCSIS SECv4.0-I04]	

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