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| **Cable**LabsSpecification Engineering Change (EC) Form | | | | | | | | | | | | |
| **EC Tracking Information (Blue fields to be completed by CableLabs only)** | | | | | | | | | | | | |
| **Project** | DOCSIS | **Status** | | N | | **Identifier** | MULPIv3.1-N-18.1939-14 | | | | **Version** | 14 |
| **Affected Specification** | | | CM-SP-MULPIv3.1-I16-180926 | | | | | | | | | |
| **ECR Date** | | | 8/9/2018 | | **Comment Period End Date** | | | 8/16/2018 | **Severity** | **Change Type** | | |
| **ECO Date** | | | 12/13/2018 | | **Comment Period End Date** | | | 12/20/2018 | **Non-Critical** | **Minor** | | |
| **ECN Date** | | | 12/20/2018 | | **Cert Wave No** | | |  | **Critical** | **Major** | | |
| **ECN Effective Date** | | |  | | **Overall Type of Change (Tech/Edit/Both)** | | | | Both | | | |

to obtain latest issued Specification Word version, click the following: <https://community.cablelabs.com/wiki/display/TECHPUBS/DOCSIS+Spec+Current+Issued>

to submit ec, email completed form to: [docsis\_ec@cablelabs.com](mailto:docsis_ec@cablelabs.com)

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| **specification document details** | | | | | |
| **Document EC is written against:**   **Issued Version #** I15 | | | | | |
| **author information** | | | | | |
| **Primary Author** | | **First** Greg **Last** White | | **Country** | USA |
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| **Additional Contributors** | | Karthik Sundaresan, Bob Briscoe, David Pullen, Tong Liu, Elias C Reyes, Niki Pantelias, Victor Hou, Ram Ranganathan, Barak Hermesh, Tom Henderson, LLD WG (see full list in description) | | | |
| **engineering change document details** | | | | | |
| **Title of EC** | | Low Latency Support | | | |
| **Date sent to CableLabs** | | 7/18/18 |  | | |
| **ec revision history** | | | | | |
| **Date of revised EC** | | 7/26 : Misc Updates , 8/2 : QP updates , 8/9 terms, AQP , diagram updates, 8/16 Diagram updates, DQCoupled AQM text, annex for IAQM, chap 7 reorg, 8/24 Misc Cleanup, Annex Updates, 9/27 QP and IQAM updates, 11/8 Misc Cleanup, 11/21 Latency Reporting, 11/29 Cleanup, 12/6 AQP Exp Diagram, 12/13 cleanup | | | |
| **Brief description of revision** | |  | | | |
| **detailed proposed changes** | | | | | |
| Sections Affected | 2, 3, 4, 5.1, 5.2.4.x, 7.x, Annex C.x, Annex M, Annex N (new), Annex O (new) | | | | |
| REQs Affected |  | Test Plans Affected | |  | |

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| **Does this EC request a new TLV or sub-TLV number?** Yes \_\_\_  See embedded change detail for TLV table templates. |
| **Does this EC request a new *or* revised figure or graphic?**  Yes \_\_\_  If yes, attach all graphic files and list those attached files in the table below. NOTE: Graphics submitted are to be editable except for UML diagrams. |

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| other related engineering changes (list all the apply) | | |
| The following EC(s) are recommended to be processed in conjunction with this document: | | |
| **EC#** | **Title of EC** | **Affected Document** |
| CCAP-OSSIv3.1-x-18.1940-x | LLD Support via updated AQP table (DOCSPEC-1138) | CCAP-OSSIv3.1-I12 |

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| **This Engineering Change has the following file(s) attached.** | |
| **Type of Attachment(s)** (Visio, Word, txt, .yang, etc.) | **File Name of Attachment(s)** |
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**NOTE! IMPORTANT EC AUTHOR INSTRUCTIONS:**

**For an ECR to advance to ECO status:**

- Requirements Affected section of the embedded DOCSIS-SpecDetailChange.docx must be completed.

**For an ECO to advance to ECN status:**

- If applicable, compiled MIB files and final Schema docs must be attached before requested changes can move to ECN status and noted as attachments in the table above.

- The **REQ Change Details**  table in the embedded change details document MUST be completed.

**DETAILED DESCRIPTION OF PROBLEM:**

The LLD project aims to Enable lower latency DOCSIS upstream and downstream forwarding with high DOCSIS bandwidth efficiency. Low Latency DOCSIS attacks the two main causes of latency in the network, buffering delay and media access delay.

This EC Introduces support for Low Latency services within the D3.1 specifications. A Dual Queue Coupled AQM structure for Service Flows and a Proactive Grant Service are introduced in this ECR

**Contributors** : Low Latency DOCSIS Working group at CableLabs. (LLD WG)

CableLabs : Greg White, Karthik Sundaresan, Bob Briscoe, Tom Henderson

Broadcom : Dave Pullen, Niki Pantelias , Victor Hou, Lisa Denney, Margo Dolas

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Arris : Ram Ranganathan, Tony Cotter, Jeff Howe

Casa : Hongbiao Zhang,

Nokia : Nathalie Tal,

Cox : Bill Wall, Jeff Finklestein

Comcast : Sebnem Ozer,

Videotron : Thomas Foerster

LGI/VirginMedia : Ade Brittain

other WG participants

**CHANGE DETAILS FOR THE SPECIFICATION:**

Complete Engineering Change details **for the specification are** contained in the following embedded file:



**CHANGE DETAILS FOR THE TEST PLAN (ATP):**

Complete Engineering Change details **for the test plan are** contained in the following embedded file:

ATP test cases will be develop in a following ECR

**End of Request**

**Additional Instructions to EC Author**