**Source: IVAS Co-Rapporteur[[1]](#footnote-1)**

**Title: IVAS Permanent document IVAS-2: IVAS Project Plan, v.0.7.0**

**Agenda Item: 14.2**

# **1. Introduction**

This document presents the high-level project plan for the Immersive Voice and Audio Service (IVAS) codec development within 3GPP SA4. This document will be updated as necessary.

# **2. Schedule of IVAS development**

Altogether 13 companies indicated interest to submit a candidate in the IVAS project originally. There was a deadline at the SA4#115e meeting for IVAS proponents to reconfirm their interest to submit a candidate in IVAS standardization. The companies that have reconfirmed their interest to submit an IVAS codec candidate by the deadline are as follows: Dolby, Ericsson, Fraunhofer IIS, Huawei, Nokia, NTT, Orange, Panasonic, Philips, Qualcomm, VoiceAge (total 11). Also, the working assumption was declared that there will be one single joint candidate (resulting from public collaboration).

We can conclude that, on this way, the overall number of candidates is greatly reduced and likely fits into the selection testing. While qualification phase was originally planned on the basis of having 13 candidates, as a consequence of Public Collaboration, no qualification phase is likely needed with the great benefit of shortening the timeline to arrive at the IVAS codec standard.

Public Collaboration, as a key component of the updated IVAS standardization process, implies a new timeline starting in January 2020; hence older activities were put in shaded print. At the occasion of the recent update, older activities were put in shaded print.

Editor’s Note: Following the working assumption included in IVAS-6, there will be required to sign a Funding Agreement to be a proponent of a candidate codec. This FA commits the proponent to support the selection and characterization tests financially.

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| **Month** | **Meeting / date** | **Activity** |
| Sept-2017 | SA#77 (13 – 15 Sept 2017) | **Launch of IVAS standardization.** |
| Oct-2017 | SA4#95 (9 – 13 Oct 2017) | **Agreement of stable initial version of IVAS Codec Development Overview (IVAS-1)**  **Agreement of stable initial version of IVAS Project Plan (IVAS-2)**  Start work of preparing IVAS permanent documents:           Performance Requirements (IVAS-3)           Design Constraints (IVAS-4) |
| Nov-2017 | SA4#96 (13-17 Nov 2017) | Progress on IVAS permanent documents including:           Performance Requirements (IVAS-3)           Design Constraints (IVAS-4) |
| Jan-2018 | 19 Jan 2018 23:59 CET | **Indication of interest to submit a candidate** by email sent over the 3GPP SA4 Reflector. It is a necessary condition for participation to indicate interest to participate. Organizations will not be allowed to participate if no indication is made. |
| Feb-2018 | SA4#97 (5-9 Feb 2018) | Progress on IVAS permanent documents including:           Performance Requirements (IVAS-3)           Design Constraints (IVAS-4) |
| Apr-2018 | SA4#98 (9 – 13 Apr 2018) | Progress on IVAS permanent documents including:           Performance Requirements (IVAS-3)           Design Constraints (IVAS-4)  Progress on LoI for selection. |
| Jul-2018 | SA4#99 (9 – 13 Jul 2018) | Progress on IVAS permanent documents including:           Performance Requirements (IVAS-3)           Design Constraints (IVAS-4)  Progress on LoI for selection. |
| Oct-2018 | SA4#100 (15 – 19 Oct 2018) | Progress on IVAS permanent documents including:           Performance Requirements (IVAS-3)           Design Constraints (IVAS-4)  Progress on LoI for selection. |
| Nov-2018 | SA4#101 (19 – 23 Nov 2018) | Progress on IVAS permanent documents including:           Performance Requirements (IVAS-3)           Design Constraints (IVAS-4)  Progress on LoI for selection. |
| Jan-2019 | SA4#102 (28 Jan – 1 Feb 2019) | Progress on IVAS permanent documents including:           Performance Requirements (IVAS-3)           Design Constraints (IVAS-4)  Progress on LoI for selection. |
| 19 February 2019  14:00 – 16:00 CET  Host: Fraunhofer | EVS SWG Call on IVAS-4  (Tdoc submission deadline 18 February 2019 14:00 CET) | Progress IVAS-4 |
| Apr-2019 | SA4#103 (8 – 12 Apr 2019) | Progress on IVAS permanent documents including:           Performance Requirements (IVAS-3)           Design Constraints (IVAS-4)  Progress on LoI for selection. |
| Jul-2019 | SA4#104 (1 – 5 Jul 2019) | Progress on IVAS permanent documents including:           Performance Requirements (IVAS-3)           Design Constraints (IVAS-4) |
| Aug-2019 | SA4#105 (12 – 16 Aug 2019) | Progress on IVAS permanent documents including:           Performance Requirements (IVAS-3)           Design Constraints (IVAS-4) |
| Sept-2019 | EVS SWG call(s) | Progress on IVAS permanent documents including:           Performance Requirements (IVAS-3)           Design Constraints (IVAS-4) |
| Oct-2019 | EVS SWG meeting (20 October 2019) and SA4#106 (21 – 25 Oct 2019) | Progress on IVAS permanent documents including:           Performance Requirements (IVAS-3)           Design Constraints (IVAS-4) |
| Nov-Dec-2019 | EVS SWG call(s) | Progress on IVAS permanent documents including:           Performance Requirements (IVAS-3)           Design Constraints (IVAS-4) |
| Jan-2020 | SA4#107 (20-24 January 2020) | Discussion on standardization process for IVAS to resolve the deadlock |
| Apr-2020 | SA4#108e (6-9 April 2020) | Report on off-line discussions on an updated standardization process |
| May-2020 | SA4#109e (25-29 May 2020) | Discussion on details of the updated standardization process |
| June-2020 | EVS SWG call | Discussion on details of the updated standardization process |
| Aug-2020 | SA4#110e | Discussion on details of the updated standardization process |
| Nov-2020 | SA4#111e | Discussion on details of the updated standardization process |
| Feb-2021 | SA4#112e | Progress on IVAS permanent documents including:           Performance Requirements (IVAS-3)           Design Constraints (IVAS-4) |
| Apr-2021 | SA4#113e | Progress on IVAS permanent documents including:           Performance Requirements (IVAS-3)           Design Constraints (IVAS-4) |
| May-2021 | SA4#114e | Progress on IVAS permanent documents including:           Performance Requirements (IVAS-3)           Design Constraints (IVAS-4) |
| Aug-2021 | SA4#115e | Progress on IVAS permanent documents including:           Performance Requirements (IVAS-3)           Design Constraints (IVAS-4)  Progress selection phase documents   * Selection LoI * Selection Rules (IVAS-5b) * Selection Deliverables (IVAS-6b)          Selection Processing Plan (IVAS-7b)         Selection Test Plan (IVAS-8b) |
| Nov-2021 | SA4#116e | Progress on IVAS permanent documents including:           Performance Requirements (IVAS-3)           Design Constraints (IVAS-4) |
| Feb-2022 | SA4#117e | Progress on IVAS permanent documents including:           Performance Requirements (IVAS-3)           Design Constraints (IVAS-4) |
| Apr-2022 | SA4#118e | Progress on IVAS permanent documents including:         Performance Requirements (IVAS-3)   * Design Constraints (IVAS-4) * Selection Deliverables (IVAS-6)          Selection Processing Plan (IVAS-7a)         Selection Test Plan (IVAS-8a)  Finalization of Funding Agreement (FA), being part of IVAS-6   * Declaration of intention by the expected Initial Funding Parties. The declaration is needed to determine the initial payment of such Initial Funding Parties, in accordance with the FA. |
| May-2022 | May 13 | ETSI shall have received the signed Funding Agreement (FA) by the Initial Funding Parties at the latest by May 20 (Friday).  Signing the FA commits the signee to support the selection and characterization tests financially and it is required for proponents of the common candidate codec. The first payment is due after signing the FA, as indicated in the FA. |
| May-2022 | SA4#119/e | Progress on IVAS permanent documents including:         Performance Requirements (IVAS-3)         Design Constraints (IVAS-4)   * Selection Deliverables (IVAS-6)          Selection Processing Plan (IVAS-7a)         Selection Test Plan (IVAS-8a)  ETSI will report on the parties who have submitted their signed Funding Agreement (FA). Any additional received FAs will be reported similarly later. |
| Aug-2022 | SA4#120/e | Progress on IVAS permanent documents including:         Performance Requirements (IVAS-3)         Design Constraints (IVAS-4)   * Selection Rules (IVAS-5) * Selection Deliverables (IVAS-6)          Selection Processing Plan (IVAS-7a)         Selection Test Plan (IVAS-8a) |
| Nov-2022 | SA4#121/e | Finalization of IVAS permanent documents including:         Design Constraints (IVAS-4)  Progress selection phase IVAS permanent documents   * Performance Requirements (IVAS-3) * Selection Rules (IVAS-5) * Selection Deliverables (IVAS-6)          Selection Processing Plan (IVAS-7a)         Selection Test Plan (IVAS-8a) |
| Feb-2023 | Feb 17 | ETSI shall have received the signed Funding Agreement (FA) by all additional proponent companies of the single joint candidate codec at the latest by February 17, 2023 (Friday). This deadline is to allow for preparation of invoices for the second (final) payment of the FA.  Signing the FA commits the signee to support the selection and characterization tests financially and it is required for proponents of the common candidate codec. The first payment is due after signing the FA, as indicated in the FA. |
| Feb-2023 | SA4#122/e | Finalization of IVAS permanent documents including:   * Performance Requirements (IVAS-3)   Progress selection phase documents   * Selection Rules (IVAS-5) * Selection Deliverables (IVAS-6)          Selection Processing Plan (IVAS-7a)         Selection Test Plan (IVAS-8a) |
| April-2023 | SA4#123e | Progress selection phase documents   * Selection Rules (IVAS-5) * Selection Deliverables (IVAS-6)          Selection Processing Plan (IVAS-7a)         Selection Test Plan (IVAS-8a) |
| May-2023 | May 19 | All payments of the Funding Agreement (FA), including the second payment, are expected to be received by ETSI at the latest by May 19. ETSI will ensure that invoices for the payments are sent out in time, in accordance with the FA. |
| May-2023 | May 19 | Stable version (ready for signature) exists for proper legal framework among proponent companies (includes host lab, cross-check lab), listening labs, GAL to cover use of audio test material (unprocessed and processed), and test results (raw voting data). |
| May-2023 | SA4#124 | Finalization of selection phase documents   * Selection Rules (IVAS-5) * Selection Deliverables (IVAS-6)          Selection Processing Plan (IVAS-7a)         Selection Test Plan (IVAS-8a) |
| June 2023 | June 2 | Proper legal framework exists (signed) among proponent companies (includes host lab, cross-check lab), listening labs, GAL to cover use of audio test material (unprocessed and processed), and test results (raw voting data). |
| June-2023 | June 16 17:00 CEST  June 27 17:00 CEST | **Pre-release: Submission of IVAS codec candidate executable (floating-point code) for selection testing.**  **Final release: Submission (freeze) of IVAS codec candidate executable (floating-point code) for selection testing.**  **Service contract between ETSI MCC and listening labs and GAL is signed.** |
| Aug-2023 | SA4#125 | **IVAS codec selection meeting**  Two IVAS specifications: overview and floating-point are available for **information**, including C source code (floating-point) |
| Sep-2023 | TSG-SA | Approval of report on IVAS codec selection tests  Approval of IVAS codec selection  Two IVAS specifications: overview and floating-point are submitted for **information**, including C source code (floating-point) |
| Nov-2023 | SA4#126 | IVAS specifications are available for **information**, including C source code (floating-point), excluding fixed-point specification and C source code (fixed-point)  Progress on IVAS characterization permanent documents, including:   * IVAS-7b Processing Plan for Characterization Phase * IVAS-8b Test Plan for Characterization Phase |
| Dec-2023 | TSG-SA | IVAS specifications are presented for **information**, including C source code (floating-point), excluding fixed-point specification and C source code (fixed-point) |
| Feb-2024 | SA4#127 | IVAS specifications are submitted for **approval**, including C source code (floating-point), excluding fixed-point specification and C source code (fixed-point)  Finalization of IVAS characterization permanent documents, including:   * IVAS-7b Processing Plan for Characterization Phase * IVAS-8b Test Plan for Characterization Phase   Drafting of IVAS Technical Report. |
| Mar-2024 | TSG-SA | IVAS specifications are submitted for **approval**, including C source code (floating-point), excluding fixed-point specification and C source code (fixed-point).  IVAS fixed-point specification including C source code (fixed-point) is presented for **information**. |
| April-2024 | SA4#127bis | March-April-(May): characterization tests.  Drafting of IVAS Technical Report. |
| May-2024 | SA4#128 | Characterization test results are available and SA4 reviews them.  Agreement on IVAS Technical Report.  IVAS codec fixed-point specification completed and agreed, including CR to test sequence specification, including C source code (fixed-point).  Proponents deliver a detailed evaluation proving the equivalence (in terms of functionality and quality) of the fixed-point source code to be submitted for approval and the floating-point source code. |
| June-2024 | TSG-SA | **Approval** of IVAS codec fixed-point specifications, including C source code (fixed-point), including test sequences, with exception sheet for IVAS WID in Rel-18.  Approval of characterization test results.  Approval of IVAS Technical Report. |

*Editor’s Note: details of verification phase tbd.*

# **4. Revision history**

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| **Date** | **Meeting** | **Subject/Comment** | **Old** | **New** |
| 2017-10-13 | SA4#95 | Agreement of stable initial version of Project Plan (IVAS-2) |  | 0.0.1 |
| 2019-02-01 | SA4#102 | Update to end date of Dec-2020 |  | 0.0.5 |
| 2019-07-05 | SA4#104 | Update for qualification phase |  | 0.0.6 |
| 2020-11-11 | SA4#111e | Update with updated standardization process |  | 0.1.0 |
| 2021-11-10 | SA4#116e | Updated timeline |  | 0.2.0 |
| 2022-04-13 | SA4#118e | Update with Funding Agreement |  | 0.3.0 |
| 2022-05-11 | SA4#119e | Update of Funding Agreement deadline |  | 0.4.0 |
| 2022-11-17 | SA4#121 | Update with details of selection phase |  | 0.5.0 |
| 2023-04-20 | SA4#123e | Update of submission date |  | 0.6.0 |
| 2023-05-26 | SA4#124 | Addition of events after August 2023 |  | 0.7.0 |

1. Imre Varga, Qualcomm Inc.; email: ivarga@qti.qualcomm.com [↑](#footnote-ref-1)