



Annex A – Schedule of Requirements

This document contains the requirements for the requested contract.

By submitting your tender for this assignment, you declare that you unconditionally agree to ALL requirements for the assignment.

Requirements

1.1 Requirements for the tendering procedure

- Req. 1 The publication with accompanying Procurement Documents is not a contract and cannot be interpreted as such. You agree that reference to the tender documents implies all descriptions, instructions, requirements, etc. as described in words and all additional appendices, such as this document.
- Req. 2 There are no costs attached to your tender for the NPO, regardless of whether any negotiations lead to the conclusion of an agreement. In the pre-contractual phase, you bear your own costs. As long as no agreement has been reached and a written agreement signed by both parties has not been concluded, there is no obligation on the NPO and there is no obligation to compensate for any damages or costs. *.Aan uw*
- Req. 3 The NPO reserves the right to stop the tender in whole or in part, temporarily or permanently. You are not entitled to the reimbursement of any costs incurred in the context of this call for tenders even in these circumstances. Any damages are also at your own risk.
- Req. 4 In case you are eligible for being awarded the contract, you agree that the NPO reserves the right to request official evidence after the provisional award. If these supporting documents do not correspond with what is stated in the declarations, the firm shall be excluded from the award, without the right to reimbursement of any costs.
- Req. 5 Your tender must be constructed according to the description of instructions from the Tender Documents.
- Req. 6 The NPO assumes that the person who submits your tender is authorized to legally represent your company.
- Req. 7 Tenders and all further communications, including the communications required during the term of the contract, must take place in the English language.
- Req. 8 You must be familiar with and agree to the assessment methodology used by the NPO.
- Req. 9 No information that becomes available in the context of this assignment shall be passed on by your company to third parties, with the exception of partners, subcontractors and/or auxiliaries to be engaged by this company for the present project; in such a case, you shall remain responsible for adherence to the confidentiality requirement by the partners, subcontractors and/or auxiliaries to be engaged.



- Req. 10 Your tender must have a period of validity of at least 90 days after the date on which the tenders must be submitted at the latest. During this period, your tender has the nature of an irrevocable offer.
- Req. 11 In the event of summary proceedings, you agree that you will extend the period of validity of your tender with a minimum of two weeks after the date of the judgment in the summary proceedings.
- Req. 12 All the information submitted by your company must be completed truthfully and can be fulfilled by you. The NPO reserves the right to compensation in the event of incorrect and/or incomplete information and/or the inability to execute what has been offered by a tenderer.
- Req. 13 Tendering parties must not use or reproduce any past, current or future logos of NPO or otherwise make reference to NPO without the prior written consent of NPO other than to the extent required in order to prepare the tender.

1.2 Information security requirements

- Req. 14 The contractor must use a safe way of product development in which standard security tests (such as vulnerability checks, fuzzing and pen testing) are part of the development process and new versions are only released when no further problems have been detected.
- Req. 15 An important pillar of information security is the monitoring of standardized processes related to security. We want to receive the process description including elaboration of the Configuration Management process (An IT architecture diagram of the entire solution including all components).
- Req. 16 The Contractor must apply an escalation procedure for breaches of information security and must report security incidents to NPO without delay.
- Req. 17 The Contractor must handle data breaches in accordance with Annex IV of the processing agreement.
- Req. 18 The Contractor must guarantee that no data from the NPO can end up with another customer and vice versa.
- Req. 19 NPO Information Security: NPO attaches great importance to protecting information. The Contractor must take note of and comply with NPO's information security policy. This has been translated into ten policy principles and can be found on NPO.
- Req. 20 Appropriate measures: The Contractor must take demonstrable, appropriate, and proportionate technical and organizational security measures to ensure the availability, integrity, and confidentiality of the service.
- Req. 21 Risk management: The Contractor must be transparent about risks that directly and/or indirectly relate to NPO's information, systems and/or services.
- Req. 22 Right to audit: NPO has the right to conduct an (independent) audit at the contractor into the design, existence and functioning of information security measures.



- Req. 23 The solution must comply with the relevant frameworks and guidelines of the General Data Protection Regulation (GDPR).

FUNCTIONAL REQUIREMENTS

1.3 Requirements for Core Engine

- Req. 24 Consistent behavior for all features on all mandatory devices specified in 1.14 and 1.15
- Req. 25 In order to keep the player as light and fast as possible it must provide the ability to dynamically load just the features, or modules, needed.
- Req. 26 Automatic and smart Pre-Loading and Buffering. Depending on the device and network connection, the Core Player will select the optimal bitrate and resolution to minimize rebuffering errors.
- Req. 27 Ability to automatically select the supported CODEC in a manifest. For example, a single manifest can have multiple CODEC's. The Core Player must automatically select the supported codec by the device and ignore the CODEC that is not supported by the device.
- Req. 28 The hosted parts of the player, and all its dependencies (API Key Server, other backend services, etc.), must have an uptime of at least 99.98%. Must be included in the SLA.
- Req. 29 Core Player must be deployable on Amazon Web Services.
- Req. 30 The ability to translate / customize error messages from the Player.

1.4 Requirements for Basic Control

- Req. 31 It must be possible to control, or query the status of, all functionality below via an automation hook (SDK or API) to control it from a webpage or application.
- Req. 32 Ability for skinning the UI via CSS and custom images.
- Req. 33 Multiple aspect ratio support: For example, rotated / portrait (9x16) video. Content recorded with a mobile phone in portrait mode must be displayed correctly in portrait mode.
- Req. 34 Picture in Picture. When watching a VOD stream, a second stream for (e.g. NPO1 Live) must be able to play as a smaller overlay. The user is able to toggle between the two streams.
- Req. 35 Ability for the user to select automatic or manual video quality settings (e.g. bitrate).
- Req. 36 Support for multi audio tracks. The player must support multi audio streams from the manifest and support additional audio streams outside the manifest.



- Req. 37 Stream navigation: Play, Pause, Stop, Skip x sec. forwards and backwards, Fast Forward, Fast Reverse.
- Req. 38 Switch to full screen width. In case of a portrait mobile device, apply auto rotation.
- Req. 39 Use of physical buttons on the device to control basic functions such as volume and start/stop of stream.
- Req. 40 Auto play enable / disable.
- Req. 41 Support for progress/slider bar to show progress and search through the stream.
- Req. 42 Offline Playback.

1.5 Requirements for Playlist and Soft-parts

- Req. 43 Playlist functionality across platform SDKs. It must be possible to seamlessly playout multiple segments based on multiple stream IDs and timecode markers.
- Req. 44 Pre-loading of streams. When the end of a content stream is reached, play the next content stream.

1.6 Requirements for Audio – Only

- Req. 45 “Minimal player”. The player UI only shows navigation controls (So no black/empty video window or cover etc.).
- Req. 46 “Invisible player”. The player must be entirely being controlled via the API. The UI is not visible.
- Req. 47 Play in the background. The Player must play and continue a stream when used in an inactive tab in case of a browser, or an application in the background.
- Req. 48 After pausing a livestream: Ability to either continue to live or continue from time of pause.

1.7 Requirements for Subtitles and Timed Metadata

- Req. 49 Ability to overlay subtitles onto the video stream.
- Req. 50 Ability to set the style settings for the subtitles that come with the manifest or subtitle file. For example, the end-user must be able to change the font size.
- Req. 51 Timeline with (image) markers (Live and VOD) & Scrubbing with .vtt or .bif thumbnails.
- Req. 52 Support for time-controlled graphics and text overlay.
- Req. 53 Support for WebVTT.
- Req. 54 Support for EBU-TT-D.
- Req. 55 Support for TTML / DFXP.



Req. 56 Support for ID3 Timed Metadata.

Req. 57 Support for CUE tags.

1.8 Requirements for Content Protection

To playback video streams protected with Digital Rights Management (or DRM) technology the following are required:

Req. 58 Support for Google Widevine.

Req. 59 Support for Microsoft PlayReady.

Req. 60 Support for Apple FairPlay.

Req. 61 Support for AES-128 encryption.

1.9 Requirements for Advertising

Req. 62 Ad support VAST 4.1

Req. 63 Server-Side Ad Insertion.

Req. 64 Client-Side Ad Insertion.

Req. 65 Ad Scheduling and Targeting.

Req. 66 Prefetch VAST/VMAP tag.

Req. 67 Skippable and non-skippable ads.

Req. 68 Overlay Ads on web.

1.10 Requirements for Information Security

Req. 69 The player and related backend services must be GDPR compliant.

Req. 70 All data gathered or used by the player must reside in the EU.

Req. 71 Only functional cookies (or essential cookies) are allowed.

Req. 72 Use of API-keys. Broadcasters or users from the player are given a unique (API) key. It shall only be possible to use the player and play the streams given this unique key.

Req. 73 API-key management. Keys are managed centrally via a web interface.

Req. 74 API-key management. Keys are managed centrally via an API.

Req. 75 Adding or deleting API-Keys will affect within minutes.

Req. 76 Whitelist domain for Player. For additional (legal) control the player must only allow streams from whitelisted domains and or IP ranges. Domains and or IP-ranges are managed centrally via a web interface.



1.11 Requirements for Analytics (QoE)

To get an insight in the performance of the Player, it must gather and send information to a central repository for analytic purposes. In this way the viewers' "last mile" experience can be monitored and it will help us to constantly fine-tune our eco system.

- Req. 77 The QoE dashboard needs to be able to show data on a real-time basis.
- Req. 78 The DATA must be GDPR compliant.
- Req. 79 The DATA must be stored in the EU.
- Req. 80 Monitoring and alerting: Alerting needs to be available so we can get alerts when abnormal behaviour is detected, action can be taken, and web care can be notified. We must be able to set up our own alerts. Primary channels for alerting are SLACK and e-mail.
- Req. 81 Data retention: It must be possible to go back over a minimum period of 90 days in the dashboard provided by the supplier.
- Req. 82 API: The possibility to frequently retrieve DATA via API calls in order to export DATA to NPO's own data lake.
- Req. 83 Custom metadata: The NPO needs to be able to add a minimum of 10 custom metadata fields for NPO specific cases so this metadata can be used as a filter in the dashboard.
- Req. 84 Ability to limit certain users to certain data in the dashboard of the QoE tool.
- Req. 85 Parameters to report on giving insights for Performance of the Player:
 - Total Start-up time
 - Player Start-up Time
 - Video Start-up Time
 - DRM Load Time
 - Seek Time
- Req. 86 Basic stream events to report on navigation behaviour:
 - StreamStart (A streamStart is triggered when the actual requested stream starts playing).
 - StreamComplete (A streamComplete is triggered when the stream is completed).
 - StreamAdpause (A streamAdpause is triggered when an advertisement is completed).
 - StreamAdStart (When ads are being played prior to the actual requested stream, a streamAdStart event is triggered. No information on the advertisement itself is registered, only the fact that an ad is being played).



- StreamAdComplete (A streamAdComplete is triggered when an advertisement is completed).
- StreamWaypoint (During continuous playing of a stream, a waypoint is triggered for every 30 seconds of playtime).
- StreamLoad (The stream recorder will register a streamLoad when a player is loaded).
- StreamResume (A streamResume is triggered when the stream is resumed after the stream was paused),
- StreamPause (A streamPause is triggered when the stream is paused).
- StreamSeek (A user can also decide to skip part of the stream. The Topspin tracker will register a streamSeek event that needs to register from where in the stream the user starts seeking and where it ends).
- StreamFullscreen (A streamFullscreen event is triggered when the user decides to access the player in fullscreen mode).
- StreamWindowed (A streamWindowed event is triggered when the user leaves fullscreen mode).

Req. 87 Parameters to report on giving insights into Technical aspects:

- Browser details
- CDN Provider
- Country
- Domain
- Internet Service Provider
- AS Number
- LIVE / VOD / DVR
- Platform
- Device Class
- Operating System
- Player Software
- Player Software Version
- Stream Format
- Video Title
- Video Codec

Req. 88 Parameters to report on giving insights into Debugging:

- Error Percentage



- Top Errors
- Start Failures
- Rebuffering Percentage
- Buffering Time

Req. 89 Parameters to report on giving insights into Video Quality:

- Streamtype (HLS, DASH, SMOOTH)
- Video Bitrate
- Video Bitrate Heatmap

Req. 90 Parameters to report on giving insights in the Platform/Device Comparison

- Countries
- Player Software
- Player Software Versions
- Player Technologies
- Browsers and browser version
- Platforms
- Domains
- View Time

Req. 91 Parameters to report on giving insights into the Audience:

- Plays
- Play Attempts
- Unique Users
- Concurrent Viewers
- Total Page Loads
- Total Hours watched
- Impression List
- Viewing Time

TECHNICAL REQUIREMENTS

1.12 Supported Stream Protocols

Req. 92 Requirements for Supported Stream Protocols:

- VoD or on-demand



- Live streams
- DVR or near-live streams
- HTTP Live Streaming (HLS)
- MPEG Dynamic Adaptive Streaming over HTTP (DASH)
- Microsoft Smooth Streaming
- CMAF streams with support for low latency
- Icecast-audiostreams

1.13 Supported Codecs

Req. 93 Requirements for Supported Codecs:

- Advanced Video Coding (AVC)
- High Efficiency Video Coding (HEVC)
- VP9 CODEC
- AOMedia Video 1 (AV1)
- AAC, MP3 and MP4
- UHD, HDR HLG, HDR10, HDR10+, Dolby Vision if supported by device

1.14 Supported Browsers

Req. 94 Requirements for minimum Supported Browser versions:

- | | |
|---------------------------|----|
| - Google Chrome | 87 |
| - Mozilla Firefox | 84 |
| - Apple Safari | 10 |
| - Microsoft Edge | 44 |
| - Microsoft Edge Chromium | 84 |

New releases for all mandatory browsers must be supported within a maximum period of 1 month after being released by its vendor. See SLA.

1.15 Supported Devices

Req. 95 Requirements for minimum Supported Device version:

- | | |
|--|--------------|
| - iPhone and iPad | iOS 10 |
| - AppleTV | tvOS 10 |
| - Airplay | iOS 11.4 |
| - Native SDK for all above iOS device | |
| - Android Phone and Tablet | Android 7 |
| - AndroidTV, Android OS based Smart TVs | Android TV 9 |
| - Native SDK for all above Android devices | |
| - Chromecast | Cast API v3 |
| - Samsung TV | TIZEN 3.0 |
| - LG TV WebOS | TV SDK 3.5.0 |
| - HbbTV | HbbTV 2.0.1 |



New releases for all mandatory browsers must be supported within a maximum period of 1 month after being released by its vendor. See SLA.

1.16 Commercial requirements

- Req. 96 Your tender must be drawn up in the English language and the rates quoted must be in Euros, excluding VAT.
- Req. 97 The cost structure must be set up in accordance with the description in the 'Price form' document.
- Req. 98 The total amount of your tender must be fixed and includes all costs, as and insofar as applicable, but not exhaustively: implementation, aftercare, overheads, travel and other costs..

Billing and Payment of the selected party

- Req. 99 You must email your invoices in PDF format to the NPO general billing address: invoicing@npo.nl Your invoices must meet the requirements described in this document: <https://over.npo.nl/download/nl/145>
- Req. 100 Payment will be made by NPO within thirty (30) days after receipt of the invoice.
- Req. 101 In case of a credit invoice, you should enter the Invoice Number and PO Number of the corresponding debit invoice.
- Req. 102 In the case of a credit invoice, enter the Invoice Number and the Commitment Number of the corresponding debit invoice.

1.17 Legal requirements

- Req. 103 You must fully and unconditionally comply with the attached Terms and Conditions. This means that only the NPO conditions are applicable. Your tender must not (partly) refer to other legal terms and conditions, even if these were not in contradiction to the NPO terms.
- Req. 104 You must fully and unconditionally comply with the attached draft (framework) agreement.
- Req. 105 You must agree to the agreement having a term of 4 years and that it is expected to commence on 09-11-2021. The agreement has an extension option of 2 times 2 years.
- Req. 106 If you tender as a (main) contractor and you list in your tender (a) certain subcontractor(s), you are bound to using said subcontractor(s) in accordance with the provisions of the tender. (Main) contractors must vouch for the tenders of subcontractors.
- Req. 107 The execution of subcontracting activities is only permitted if the client has given written permission.



- Req. 108** As main contractor, you bear full responsibility for the activities of your subcontractors. You are responsible for communications on behalf of and to the subcontractor. Invoicing of subcontracting activities must be carried out by the main contractor.
- Req. 109** You must realize that the NPO also acts as a government. You must accept this special position of the government as client. The NPO shall retain its powers to take legal action under public law when the agreement is fulfilled.
- Req. 110** The Contractor must guarantee that he will make every effort during the term of the agreement to prevent violation of international social standards. The fundamental labour standards of the International Labour Organisation (ILO) are laid down in the conventions on:
- the abolition of forced labour and slavery (29, 105)
 - safeguarding discrimination at work and on appeal (100, 111)
 - the abolition of child labour (138, 182)
 - the freedom of trade unions and the right to collective bargaining (87, 98)
- Human rights from the Universal Declaration of Human Rights (UVRM) and its effects in binding treaties (such as BuPo and Esocul) that are relevant to work and business. No further refinement is made.