



**Technical market dialogue response request
for
DVB Platform**

NRK MA2748/14E

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Introduction

Norwegian Broadcasting Corporation Ltd, subsequently named NRK, has initiated a procurement process with the goal to replace our current system for DVB distribution. NRK is seeking to simplify the seven current distribution platforms, into one main platform and one spare, redundant platform to achieve more stability, high uptime, flexibility and bit efficiency.

As an initial part of this process, we have initiated a technical market dialogue in order to map out existing and new technologies, which could be used in the new solution.

Apart from the basic DVB functionality, NRK will focus on standardization, integration, SLA's, user friendliness and modularity.

1.1 General

NRK is the public broadcasting corporation in Norway with main responsibility to produce and distribute radio and television programs for the entire Norwegian population. NRK also delivers a comprehensive portfolio of Internet, mobile and text-TV content. Presently NRK has approximately 3500 employees.

NRK has a nationwide activity and organization, including 11 regional offices and is the country's largest media company.

NRK TV has a market share of over 40%, distributed over three channels. NRK1 is Norway's largest channel with a daily market share of 32%.

NRK radio has a market share of over 60% of national listeners. Distribution is on FM, DAB, Internet and apps for handheld devices.

NRK is one of Norway's largest web content providers on and is currently the third largest internet site in Norway. Weekly up to 2,5 million unique users generate up to 65 million page hits and with a substantial growth rate, especially in multimedia content.

NRK already offers an extensive internet service both live and on-demand content in varying formats.

In January 2014, up to 1 million unique weekly users played about 5 million programs on our on-demand service. NRK estimates that the total volume of streaming will surpass 100 petabytes in 2014.

In total NRK reaches 88% of the population in Norway each day.

For more information about the activities, please visit www.nrk.no.

1.2 Technical market dialogue overview

In a constant strive to use state-of-the-art solutions, NRK wants to replace our current DVB system with the goal of establishing a more dense, bit rate efficient, flexible, stable distribution system with off the shelf components, and sufficient redundancy.

As a governmental body governed by public law, NRK is required to comply with the Public Procurement Act and is therefore under obligation to follow the rules and regulations for public procurement.

A technical market dialogue is initiated in order to acquire the necessary market information to

develop a specification for the subsequent public procurement process for a system to replace the current DVB distribution system.

Primarily NRK wants to open a dialogue with suppliers with relevant experience to related Broadcast systems as described in the following chapters and who would be interested in taking part in the subsequent qualification and procurement process and thus being willing to share their knowledge and experience on this matter.

2. The current DVB distribution system

NRKs current seven DVB distribution platforms are reflected by the drawing below. NRK has got four TV services with national coverage. These are named NRK1, NRK2, NRK Super/NRK3 (time shared) and NRK Sign language. In addition there are ten regional TV services, which give a total of fourteen TV services. Our running DVB system splits NRK1 into 11 different services. NRK1 (National feed incl. Oslo region news) and 10 regional services named after which region they belong to, e.g. NRK1 Nordnytt (news of Northern Norway). Regional switching is implemented by PMT manipulation.

In addition to the TV services there are twenty eight radio services. The radio services are encoded in a separate system and will be fed to this system over ASI. The encoders for radio encoding shall not be a part of this project.

| DTH SD (2006) | IPTV (2007) | DTT (2007) | DTH HD (2010) |
|---|--|---|--|
| <p>4 + 10 TV services</p> <p>NRK1 (Regionalized) NRK2 NRK Super / NRK3 NRK1 Tegnspråk <i>NRK1 HD (SAT HD remux)</i></p> <p>11x News Regions</p> <p>14 radio services</p> <p>NRK P1 NRK P2 (Nordnytt) NRK P3 NRK Klassisk NRK Sami NRK mP3 NRK Nyheter NRK Folkemusikk NRK Været til sjøs NRK Super NRK P1+ NRK Jazz NRK Sport NRK P13</p> | <p>17 TV services</p> <p>SD</p> <p>NRK1 Regional x11 NRK2 NRK Super / NRK3 NRK1 Tegnspråk</p> <p>HD</p> <p>NRK1 NRK2 NRK Super / NRK3</p> <p>27 radio services</p> <p>NRK P1 x15 NRK P2 NRK P3 NRK Alltid Nyheter NRK mP3 NRK Klassisk NRK Sami Radio NRK Folkemusikk NRK Super NRK P1+ NRK Jazz NRK P13 NRK Sport</p> | <p>4 + 10 TV services</p> <p>NRK1 (Regionalized) NRK2 NRK Super / NRK3 NRK Tegnspråk</p> <p>11x News Regions</p> <p>27 radio services</p> <p>NRK P1 x15 NRK P2 NRK P3 NRK Alltid Nyheter NRK mP3 NRK Klassisk NRK Sami Radio NRK Folkemusikk NRK Super NRK P1+ NRK Jazz NRK P13 NRK Sport</p> | <p>3 TV services</p> <p>NRK1 HD NRK2 HD NRK Super / NRK3 HD</p> |
| MPEG-2 video MPEG-1 L2 audio Statistical multiplex PMT switching | H.264 video HE-AAC v1 audio Dolby Digital 5.1 Fixed BR SDI Baseband switching | H.264 video HE-AAC v1 audio HE-AAC 5.1 Statistical multiplex PMT switching | H.264 video MPEG-1 L2 audio Dolby Digital 5.1 Statistical multiplex |
| <p>DTH SD Reserve (2010)</p> <p>4 TV-services 14 radio services</p> <p>No encoding for regions</p> | <p>DTT / DTH HD Reserve (2008/2010)</p> <p>4 TV services(DTT) / 3 TV services (SAT HD) 27 radio services(DTT)</p> <p>No encoding for regions</p> | | |

NRK's main goal is to simplify this distribution platform, to one main platform and one spare platform to achieve more stability, flexibility and bit efficiency.

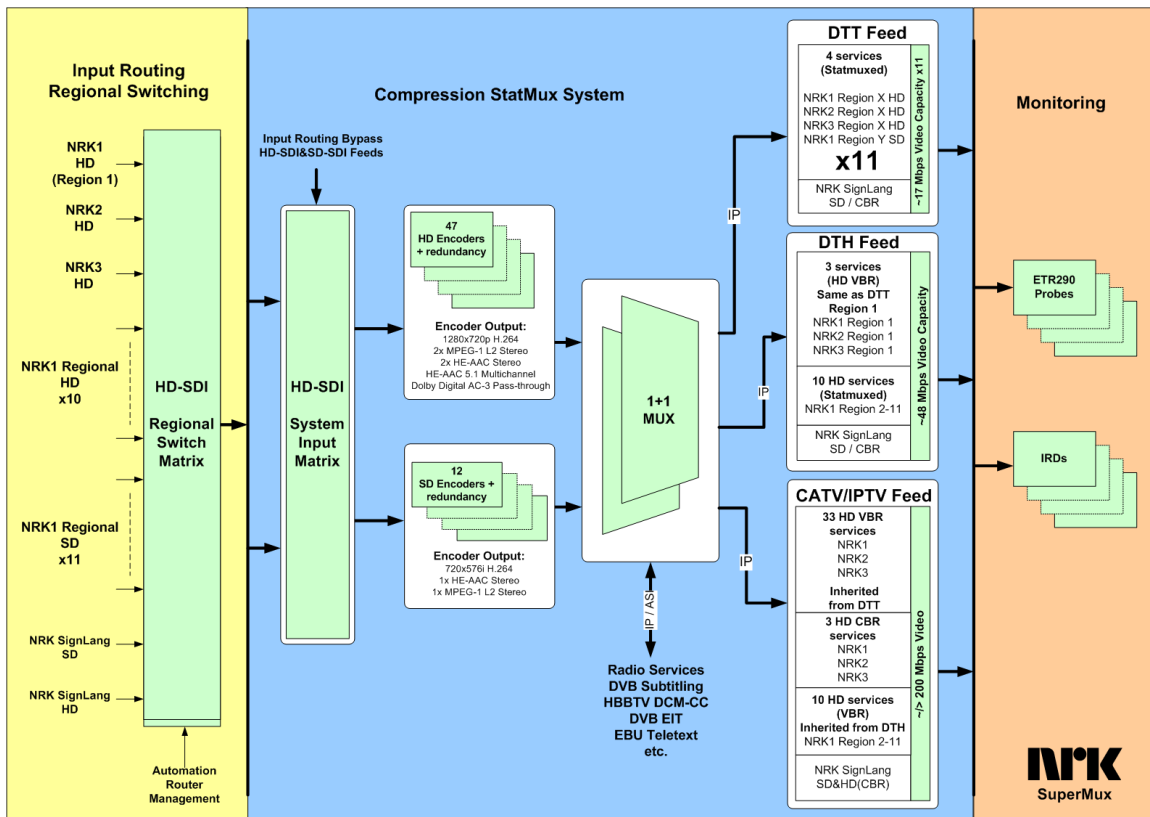
3. Technical Market dialogue

3.1 High level requirements

Below you will find NRK's preliminary design made to envisage how it may be solved. This market dialogue will be used to test if this is feasible and realistic within the current timeframe.

- The new DVB system should, as a minimum be able to but not be limited to, provide all services as referred to in drawing no.1, from one single mux platform.

- A new system should be Modular, Flexible, userfriendly and it should support standard Interfaces. The encoding and multiplexing must be considered as high broadcast quality
- Open standards are required.
- The new system shall be provided as a complete system from one supplier
- Drawing no.2 below depicts a total scope of how the new system **could** work. **The blue part is the scope of this RFI and the subsequent RFQ.**



- The left (yellow) part depicts the SDI-switching, which has been planned to provide a seamless Regional switching. It is one of our key goals to remove the PMT switching, and any other methods that will lead to changes on the platform. The left (yellow) and the right (orange) part are not in the scope of this RFI, but it is included in the drawing to enhance total system understanding.
- The middle (blue) part is the DVB solution design, based upon the DTT delivery. The idea is to reuse the audio, video and data components for the different networks where applicable. One TV service should therefore just require one encoder even if it is being output to all networks.
- DTT feed: The DTT network has got a bit rate of 20.6 Mbps reserved for audio, video and data components in each of the 11 regions. This will allow about 17 Mbps for video alone. It is crucial to utilize the region bandwidth as much as possible. To fulfil this we will create 11 individual statistically multiplexed groups of video, each containing the required TV, radio and data services for the different regions.

Note: The service NRK Sign language will be encoded with a static bitrate and would just require one encoder.

The other four TV services in each TV region shall be statistically multiplexed. The neighbouring version of NRK1 shall be encoded as SD. This will require 33 HD encoders

and 11 SD encoders.

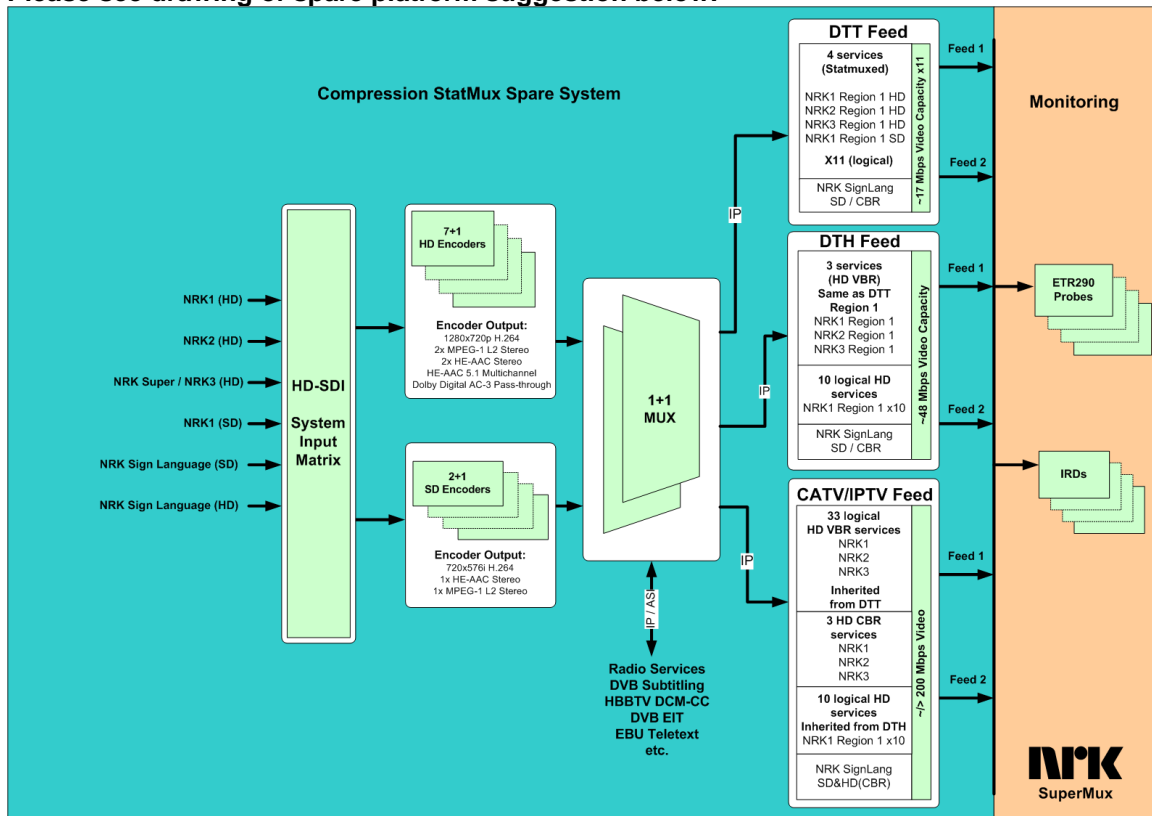
- DTH feed: The bitrate limitation of a DVB-S2 transponder prevents us from putting all the statmuxed DTT TS's into the DTH feed. For DTH, our idea is to reuse one of the statistically multiplexed groups from DTT (Oslo region). We will then be left with a bit rate of approximately 30 Mbps available for the 10 remaining regional services. These 10 services will be encoded as one statmux group, which requires 10 more HD encoders. The effective TS bitrate for the DTH feed will become around 54 Mbps.
- IPTV & CATV Feed:

There is no actual defined bitrate limitation related to these networks. The CATV/IPTV network feed will be a bouquet of all the encoded services. The effective TS output bitrate will become approximately 230 Mbps. This does not fit into a single DVB ASI interface, so we may consider to split into two output TS's. We may even add NRK Sign language in HD to the TS's. The IPTV networks will however require that the bitrate does not run too high pr. SPTS encoded TV service. The maximum allowed video bitrate, requested by the network operators (xDSL limitation), for IPTV networks is 8 Mbps pr. SPTS. The VBR encoded services in must have a guaranteed maximum bitrate higher than this limit to ensure an optimal video quality. To fulfil the IPTV requirement we therefore plan to offer the 3 main services, NRK1, NRK2 and NRK Super/NRK3 encoded as CBR 8 Mbps. The regional content for these three services will become equal to region 1. The remaining regions in the IPTV bouquet will be inherited from the regional services group in the DTH feed, which will have their maximum video peak bit rate limited set to max eight Mbps.

Spare DVB Platform

The scope also includes one spare, redundant platform that must have similar functions as the main platform; however, the spare platform shall only contain enough encoders to provide the feeds from nationwide content, which means no regional services.

Please see drawing of spare platform suggestion below.



- Audio Handling: Different network operators requires different audio formats on their STB's. It must be expected that each HDTV service will contain one stereo and one multichannel audio stream. Any combination of MPEG-1L2/HE-AAC stereo and DolbyDigital 5.1/HE-AAC 5.1 must be supported. Additional TV services for visually impaired commentary are planned to be included. This requires that each HD encoder must support 4 stereo carriers, HE-AAC 5.1 encoding and Dolby Digital 5.1 pass-through simultaneously. This will utilize up to 8 HD-SDI embedded audio pairs.
- Audio handling: all Dolby encoding is handled externally, so the encoder must support pass-through of the Dolby stream.
- Synchronization: It is required that the system uses one single PCR common for all output feeds. E.g. DVB subtitling components shall be shared across the regionalized services and those must be referred to the same PCR.
- Management System: NRK is asking for one single, state of the art, user friendly end-to-end management system, which can handle all parts of the technical configuration.
- Full flexibility for regional individual program scheduling.
- Off-the shelf components, low degree of custom development.
- Integration to adjacent systems: As Integration with other systems is also important, open standards on all external interfaces are preferred.

3.2 Technical Challenges:

Based on how we have envisaged a possible design and how it may be solved, these are amongst the technical challenges that we are interested in verifying:

- Please confirm if your company can deliver all parts of the system outlined in the blue part of the drawing from the RFI, or just parts of it, within year 2015.
- In case of redundancy switching to a spare platform, please suggest switching method on IP and/or ASI.
- Reusing the same encoded audio- and video-components requires a good way to split these out on the different feeds. Creating one Master TS, which again are being remuxed to several feeds, may be one solution. NRK believes that there may be even better ways to solve this in an encoder/mux IP multicast configuration. Please suggest your recommended way of solving this issue.

3.3 Commercial challenges

- Price models – What structure and variations can NRK expect?
- Identify the most important cost drivers and emphasize important tradeoffs we can make to reduce cost.

3.3.1 References

- Is there any examples on reference customers that are comparable to NRK that have whole- or part of solutions that might be interesting for NRK to evaluate?

3.4 Other areas of interest

NRK acknowledge and appreciate that the systems covering this market may have different approaches and may solve the functional challenges in different ways. We would like to improve our understanding of possible solutions and the market situation.

- If you see this as relevant, we would like you to propose optional DVB-mux solution for OTT expansion. Include approximately 15 live OTT services as an added output.

3.5 Scope and theme of the dialogue

It is our intention that the technical market dialogue will provide NRK with information about technological solutions that are established in the market and developments in the near future.

The dialogue will not include discussion of eligibility requirements, selection criteria and award criteria nor will we include discussions of factors that may distort or otherwise affect competition for deliveries.

Accordingly, the dialogue will not include discussions nor commitments of detailed / specific price, beyond general conditions such as to identify cost-driving elements.

3.6 Execution of the remaining part of the dialogue

NRK will carry out the remaining part of the technical market dialogue as follows:

1. Suppliers submit a short (two - three pages) RFI-response document with proposals to the above areas of interest and challenges.
Please refer to section 4.4 for guidance.
2. Based on the received RFI documents, the Power presentations held at the public meeting and our general understanding of the proposed solution, NRK will choose a number of proposals, which need further investigation and 1:1 meetings. We will contact these suppliers as soon as possible to book a 1:1 meeting. Please remember that you may still be absolutely relevant for a future contract even if you are not invited to a 1:1 meeting. NRK needs to restrict resources used in this process to be effective and we may have sufficient knowledge of your proposal already.
3. 1:1 meetings are scheduled to be held in August

With the use of this technical market dialogue, NRK will strive to fulfill basic requirements of equal treatment set out in the rules and regulations of public procurement, so that it is sought not to give any supplier a particular competitive advantage by:

- Influenced the design of requirements specification
- Influenced the design of the tender documents
- Achieve greater insight about the actual conditions
- Achieve a greater understanding of NRK's wishes

NRK will try to avoid providing information or use the information received in a manner that provides a competitive advantage. Information advantages can be offset by giving the same information to other suppliers and give them sufficient time to submit a tender based on the information.

Suppliers should therefore be able to participate in this market dialogue in assurance that the principle of equal treatment will apply. It is important to emphasize that it is not mandatory to participate in this dialogue and the following competition will be open to everyone.

4. Administrative provisions

Below you will find the administrative provisions for the suppliers.

4.1 Announcement

This prior announcement has been published 30.05.2014 at www.mercell.no (reference NRK-MA2748-14E) and at www.doffin.no as well as at TED (www.ted.publications.eu.int/official)

The Procurement announcement will be conducted separately after the completion of technical marketing dialogue. The announcement will probably be made in Q1 2015.

4.2 Time plan

The dialogue is scheduled to be completed after the tentative and overall milestone schedule as given in the table below.

| Activity | Date |
|---|--|
| Announcement of Prior notice | 30 th May 2014 |
| Deliver written questions before public info meeting | 12 th June 2014 10:00 AM CET |
| Public information meeting with the registered suppliers (ref. section 3.6) | 17 th June 2014 10:00 AM CET |
| Deliver written preliminary proposal/answer | 30 th June 2014 10:00 AM CET |
| Possible bi-lateral meeting with selected relevant potential suppliers | 1 st August 2014 |
| Scheduled announcement of Tender notice | Q1 2015 |

Final time schedules for the actual acquisition will be announced in the qualification-/Tender documents.

4.3 Communication regarding the dialogue

NRK manages its procurement processes and market dialogues in Merccell Pro Portal (www.mercell.no).

This will include the announcement, which this document is attached, the suppliers' registration to participate in the dialogue, following the dispatch of information and documentation, and submission of any documentation from the suppliers.

For questions about the use of the Merccell portal, please referred to Merccell Support on telephone +47 21 01 88 61 / +47 21 01 88 00 or e-mail: pro.norge@mercell.com

4.4 Your required response to the RFI

Please confirm the download of this document, and confirm whether you intend to submit a proposal by using the button "I want to respond" or not. The portal will be reopened with the new deadline.

In order to streamline further investigations into this matter, NRK will ask the suppliers to submit a short response document (2 – 3 pages) with preliminary proposals to the above areas of interest and challenges – sections 3.2 to 3.4.

To ease the reading, we encourage you to keep the same structure in your response and to include a summary of your proposals.

We ask you to use the communication module to send us your response as soon as possible but no later than the deadline described in section 4.2.

4.5 Cost of participation

Suppliers participate and prepare presentations at their own expense and risk. NRK thus assumes no financial responsibility for the invested effort or other costs in connection with the preparation of an application for participation or the participation in the competition as such.