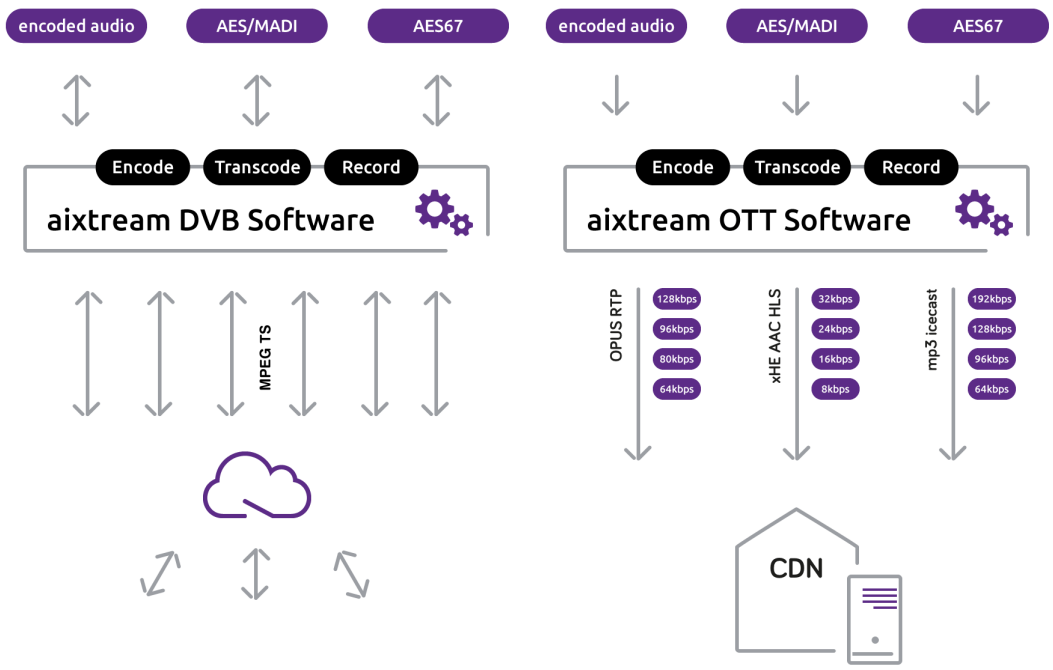
# Case Study I - Audio Streaming and DVB Mux at WDR


## The Situation

The German public broadcaster WDR (Westdeutscher Rundfunk, Cologne) is one of the largest public broadcasters in continental Europe. The WDR provides a wide-ranging selections of radio programs in various formats to the German audience. In 2020 they decided to overhaul their provisioning of web streams and DVB programs. Furthermore, an upcoming change of transmitter (and the subsequent change of their DVB workflow) presented the decision makers at WDR with a tight time limit.

After positive reports from their colleagues at HR (Hessischer Rundfunk, Frankfurt), the coordinators at WDR became intrigued by the possibilities of Ferncast's software solution aixtream. HR had been using an aixtream installation to process both their internet streaming and DVB multiplexing on the same system. WDR promised themselves a significant decrease in operational costs and complexity by having all their programs on fewer devices than before.




## The Benefits

When WDR was considering the ideal solution for their circumstances, they specifically desired these advantages:

- The option to perform **all their radio program internet streaming (Icecast and HLS) and DVB multiplexing on as few individual systems as possible** to reduce costs and complexity of logistics.
- The ability to **reuse the same signal for as many outputs as possible** to simplify the workflow and operation.
- The possibility of a **straightforward and secure backup setup**, once again to simply workflow and operation especially in those critical situations when redundancy is necessary.

## The Challenge

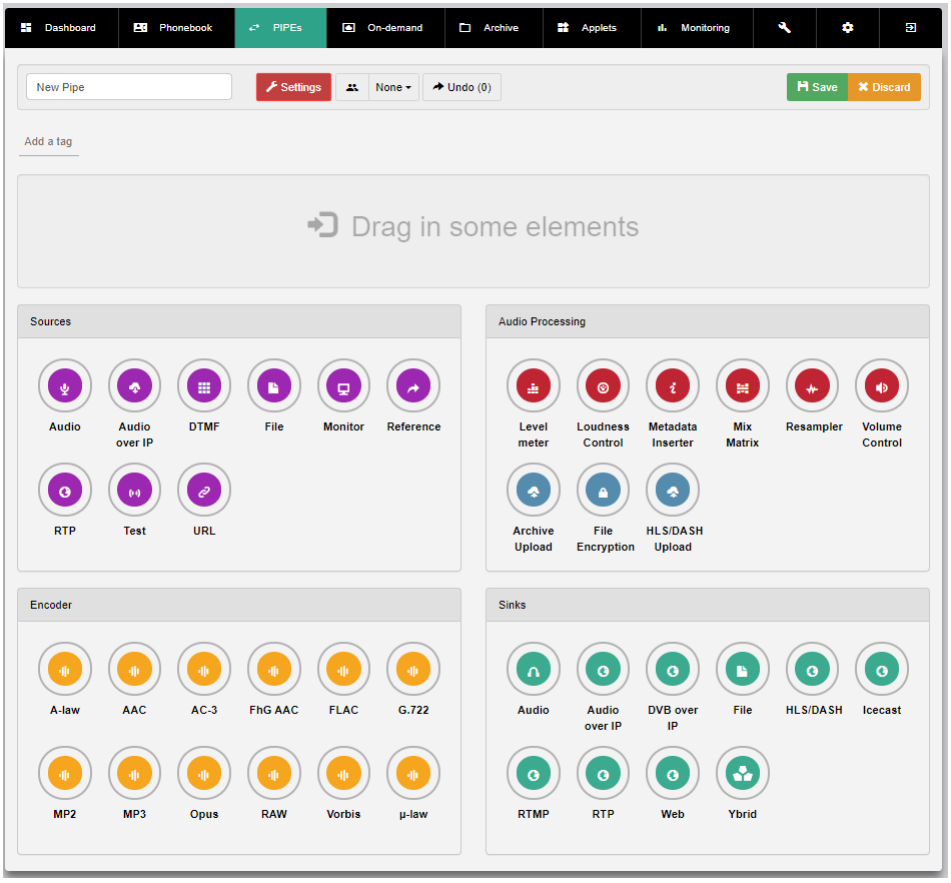
Aside from the advantages the WDR was looking for, there was one specific challenge to consider. Because there was a scheduled change of transmitter in their DVB workflow, there was only a limited amount of time to source and implement a new solution. This small window of time meant two things for the chosen solution:

1. It must be possible to **integrate it into the workflow quickly and easily**.

2. If the solution was able to be **adapted after the initial purchase**, this would be a major advantage. Since the final workflow was still to be decided, a solution that could suit or be adapted different workflows, would be ideal.
   - This proved to be necessary. Additional requirements only revealed themselves after the changeover had already begun. Some of these even required reverse engineering on the part of Ferncast.

## The Solution - aixtream

Ferncast's software solution **aixtream** proved to be the answer to these requirements. Using a setup of 2 main and 2 backup servers with **aixtream** greatly reduced the complexity of their setup. One main system was entirely dedicated to internet streaming, while the second system handled DVB as well as remaining internet streams. The two backup systems were set up to be mirrors of the main systems. In total, each main system would be handling more than 100 outputs (different destinations, formats, etc.).
For aixtream this meant handling an unprecedented number of simultaneous encodings, streams and multiplexes. A challenge that **aixtream**'s modern architecture and GUI managed to overcome after only minor adaptions.
The other challenges proposed by WDR aixtream were solved thus:



**aixtream is extremely versatile and customizable - a full input/output matrix**

- The **unique PIPE Concept** used in aixtream's GUI made it very simple to configure the connections in such a way that one signal could be used for multiple PIPEs - **one AES67 signal can be used as source for multiple Icecast and HLS streams (e. g. different bitrates) and also a part of a DVB multiplex**
- **Redundancy is kept simple for online streaming and DVB as the backup systems are perfect mirrors of their main systems** and simply perform the same operations. The CDN/client in the case of streaming or the DVB workflow at WDR then sort out which output is made available for the end consumer. If the streams and multiplexes from the primary systems fail, the backups are used instead.
- **Integrating a software solution proved very simple**. Servers and other hardware platforms for use with the software were quickly acquired (much faster than specialized audio codec hardware) and the actual software could be provided by Ferncast within hours of order.
- **aixtream's adaptability was required at multiple points**, especially for DVB. The need for specific integrations of AAC and the option to handle RDS data and PIDs in multiple different ways only became clear after the initial testing. Ferncast's development team was able to react quickly thanks to aixtream's flexible architecture.


**An example of a PIPE group set up as a DVB multiplex**