STREAMIT

In-store audio by Streamit

Written by Gerard Hollemans

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The author is hugely indebted to his colleagues at Streamit as the e-book is entirely based on the collective knowledge of the Streamit staff. He should be considered to be more the editor than the author.

Disclosures: Streamit has business relations with some of the companies mentioned in this e-book.

Please feel free to post this e-book on your blog or email it to whomever you believe would benefit from reading it. Thank you.

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1 THE ORDER THAT NEVER CAME

Today Streamit has dozens of customers serving hundreds of retailers and retail chains around the world with thousands of our in-store audio devices. That has a history of lessons worth sharing.

It all started with the Lukas, an internet radio receiver, that is designed to be used by elderly to listen to church services transmitted over the internet. Its built-in (mono) speaker and large accessible push buttons for presets makes operation as easy as making toast. Since the start of Streamit in 2003 more than 15.000 have been sold, but in 2006 a new application appeared at the horizon.

It was then, in 2006, that Alcas wanted 100 Lukas devices. The people of Alcas, now Mood Media, intended to use them for music in stores. Delivery through the internet became an option and the Lukas could be the music player. But this application was indeed just at the horizon as questions started to mount during the 'engagement period' that followed. All kinds of changes were required, e.g., the RCA connectors were fine, but the built-in speaker could go.

In Streamit fashion it was decided to do it well or not do it at all and the idea of a dedicated professional internet radio device for in-store audio was born. In the months that followed, this took shape as requirements were turned into specification. Imagine the surprise and disappointment when Alcas broke off the engagement and, for reasons unknown to us, chose a different player for their solution. Of the initial 100 Lukas devices, Alcas bought only 10.

But the idea of a professional internet radio device for in-store audio did not leave us. We contacted other in-store audio providers and discussed the proposition with them. In particular Ad Roland of Media Tools helped us understand the context of use and the requirements. It became clear that the Streamit proposition would be a powerful and gaming shifting one.

1 THE ORDER THAT NEVER CAME

In this e-book we will explain the questions and options for in-store audio via internet. We will describe considerations and possibilities, but we will not discuss legal issues. And for good reasons:

- Legal frameworks and their financial implications are different everywhere. It would be impossible to cover this topic comprehensively and adequately in this e-book.
- Laws and regulations regarding music over the internet are changing all the time. The e-book would be obsolete before it is even finished.

As an exception, encryption is presented and discussed, but that will have to wait.

2 A GAMESHIFTING PROPOSITION

As we discussed the proposition of a generic professional internet radio player, it became clear to us that this was a novel approach in the market of in-store audio. Every in-store audio provider had its own player and while this is expensive and presents many complex issues, they did not want to part with them.

Would it be enough to differentiate on the quality of the supplied music program and price? Well, we cannot help with the differentiation on the quality of the supplied music program, but we can help with price. By sourcing a player from a supplier that has many more customers, you benefit from standardization and economy of scale. And scale is what you need to get a breakthrough in price.

> “Differentiate only on the quality of the supplied music program and price?”

Streamit proposes to standardize on a professional internet radio player to lower cost. This helps to improve margin and/or price offering to the in-store audio customer. It also helps the in-store audio provider on what he is good at: The right music for the right customer.

So, no differentiation on the player at all? Well, branding is still an option. Streamit then serves as OEM and the front of the player can be customized. Any color, any print.

3 STREAMING OVER THE INTERNET, BUT HOW?

Using the internet as a transport medium raises questions, some of which can only be answered by 'it depends'. So, let's see on what it depends, then.

For one, the bit rate must be chosen. How many bits per second should the audio stream be for sufficient quality and how many bits per second can the audio stream be, given the internet connection. That question can only be answered after the audio format has been chosen.

3.1 The audio format

The audio format is the method by which the digital audio is compressed. There are several options, most notably MP3, WMA, and AAC. Let's address each of them in turn:

- WMA is a Microsoft format that has many versions and advanced features. This in combination with documentation that 'has its limitations' makes it a complex audio format to support in all its possibilities and variations. For that reason we support WMA streams, but we do not recommend to use it.
- To date MP3 is the most well-known audio format in the world. As one of the earliest audio formats to become available to the public and being supported by many (hardware) players, it became popular and a common household name. Most people do not even know that technically, it is MPEG1 layer 3. While still popular, it has been surpassed in terms of audio quality per bit, for example by the more advanced versions of AAC.
- While AAC comes in different versions, like WMA, it is not nearly as difficult to support. The standard version AAC (AAC-LC) is comparable to MP3 and found in many products today: Apple products, game consoles, mobile phones, etc. The more advanced AAC+ (HE-AAC) and eAAC+ (HE-AAC v2) are currently less widely adopted. In all cases AAC+ delivers better quality than MP3 at the same bit rate. Put differently: The same quality uses a lower bit rate (read: bandwidth, storage space).

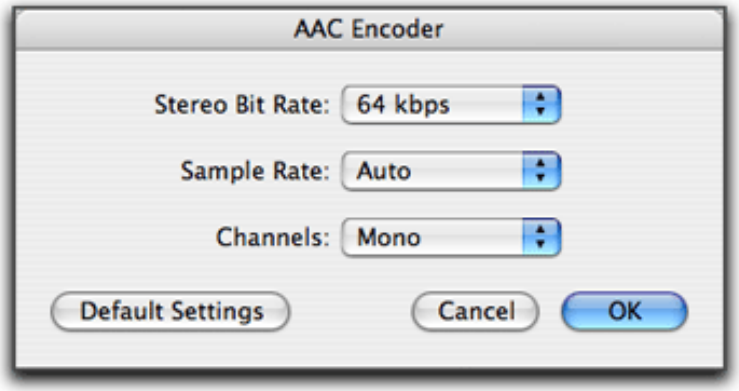
Used audio codecs

3 STREAMING OVER THE INTERNET, BUT HOW?

3.2 Bit rate

It was already introduced and referred to: The bit rate of the audio. For any given audio format, more bits means more quality. This leads many who start with streaming audio to use high bit rates initially. Particularly former DJs and broadcast professionals have this tendency. There are some moderating factors for the bit rate, though.

- The ears of the audience: The higher quality achieved at higher bit rates (added value) is hard to hear at some point, particularly if the audience consists of non-professional shoppers with their minds on other things.
- The audio installation at the playout location: Not in all shops will the best amplifier and speakers be installed. This is a limiting factor for the audio quality.
- Mono or stereo audio: Even if the installation is of good quality, stereo may or may not make sense. Recreating the stereo sound in stores is practically never possible. If stereo audio is encoded, more bits are needed than if mono is used.
- Available bandwidth: There is no point in clogging the internet connection of retailers with audio at bit rates that cannot be sustained. Eventually the audio will start to stutter.



Generally speaking experienced professional in-store audio providers use 64kbps mono for AAC. Note though, that local conditions can greatly influence this choice. For example, when the bandwidth is sufficient but unreliable, a less efficient audio format may perform better. This can be understood as follows: If you summarize your message in one word (highly efficient audio format) and that words gets lost, your entire message is lost. If you use more words (less efficient audio format), you may lose a few and still be understood. We know of one in-store audio provider who uses 32kbps mono MP3 and has a happy customer nonetheless.

> “Professional in-store audio providers use 64kbps mono for AAC”

In the most extreme case, the internet connection can be lost alltogether. Yet the show must go on, so Streamit internet radio devices fall back to music that is stored on an SD card. It plays tracks from the playlist that corresponds to the stream that was played, randomly selecting tracks from the playlist if so instructed.

4 STORE-AND-FORWARD

Notice Branded Media, an Amsterdam-based in-store audio provider, recognized the potential of the Streamit internet radio devices. Yet, their perspective on streaming and the use of the SD card was a different one. The audio was to be downloaded to the SD card and played from there instead of being streamed from the internet. This is called Store-and-Forward. Now Store-and-Forward deserves a little more detail than this, so here it goes:

On a central Store-and-Forward server the playlists and the corresponding tracks are prepared and made available for the different players. The players have an onboard task schedule, more on that later, that instructs them to contact the server and download the playlists. This typically takes place during the night. Based on the identity of the device, the Store-and-Forward server sends the playlists specifically for that device.

Next, the device reads the playlists that have just been downloaded and checks if it has all the tracks on the SD card that are used in the playlists. Tracks that are not on the SD card are downloaded from the Store-and-Forward server. In case the download of a track fails for some reason, e.g. a bad internet connection, the device will try again after 5 minutes[1]. If after three times it still fails to download a missing track, or if time runs out (morning has come and music should be played), the device will try to get the missing tracks again the next time round.

Just as there are tracks used by the downloaded playlists that are not on the SD card, there are tracks on the SD card that are not in used by the playlists. As long as there is space on the SD card, there is no need to remove them. The tracks are left on the card as future playlists may use them again, saving another download.

[1] Unless the device gets a downright 404 (Not found), then it is smart enough not to try again.

4 STORE-AND-FORWARD

Saving on downloads can be achieved also by pre-loading. Instead of sending the device with an empty SD card to the store, it is loaded with tracks that will be used by playlists now or later.

Preserving tracks on the card that may be used later means that download after download new tracks are added to the SD card. Without countermeasures, the SD card will eventually be full. To prevent that, the device detects if the card is almost full and starts to clean up, removing tracks that are not used by any of the playlists on the card.

Automatic clean up can work against the pre-loading, when tracks that have been pre-loaded are removed just because they are not used by the playlists that are on the card at that moment. A special 'keep file' refines the automatic cleanup process. It contains a list of tracks that should not be removed by the automatic cleanup process.

The SD card could be removed from the device, exposing the tracks. If this is expected, a special cover can be screwed onto the device making it harder to remove the card. If this is not sufficient, the tracks on the card can be encrypted, making them useless outside the device, even with the decryption key.

Store-and-Forward enables the device to operate without using the network and the internet connection. So it does not access the network when it shouldn't. This can be sustained for a long period of time as the SD card can hold enough music to let it play for weeks.

Streaming:

Store-and-Forward:

5 THE ONGOING DISCUSSION: STREAMING OR STORE-AND-FORWARD

There are pros and cons to both Streaming and Store-and-Forward for audio distribution over the internet. The final choice depends on the situation at hand. For example, the financial cost of Streaming or Store-and-Forward may differ due to copyright laws, and these laws are different everywhere. To help make a choice, here are the advantages and disadvantages.

5.1 Advantages of Streaming

- Setting up a stream to be played by an internet radio device is relatively easy.
- Changing the stream on the fly is possible.
- The time at which certain music or a commercial is played, can be determined exactly.

5.2 Advantages of Store-and-Forward

- The use of internet for distribution of audio is less dependent on the quality and bandwidth of the internet connection of the stores.
- During store opening times the internet connection is 100% available for mission critical uses, e.g., the cash register.

"Flexibility?
Or no internet during day time?"

Fallback:

Streaming clearly depends on the quality and bandwidth of the internet connection. Where the large audio buffer of Streamit's in-store audio player Lisa already handles interruptions, the automatic fallback to the SD card tops it off.

6 INTERMEZZO: THERE'S MUSIC, COMMERCIALS, AND . . . COMMERCIALS

It can be sufficient to have the same commercials inserted in the music in all stores. This is straightforward for both Streaming and Store-and-Forward. To have commercial A be played in some stores and commercial B in other stores, is a different matter.

Store-specific or not, the Streamit internet radio devices support playing commercials at a different volume than music, the volume difference being configurable per device.

6.1 Store-specific commercials using Store-and-Forward

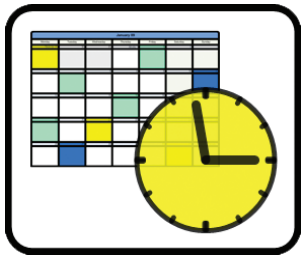
For Store-and-Forward different playlists can be created and sent to the different devices. The complexity of implementing this approach depends on the audio distribution platform. Streamit's Audio Distribution Platform supports this process by separating the music playlist from the commercials, so that a single music playlist can be combined with different commercials and the server automatically creates the required playlists.

6.2 Store-specific commercials using Streaming

To stream different commercials to different devices requires either multiple streams (not desirable), or a special audio stream server that generates the stream on the fly, inserting the right commercials for the right device. Streamit's Audio Distribution Platform is such an audio server, supporting the same separation between music playlists and commercials as for Store-and-Forward.

7 PLAN & DO: SCHEDULING

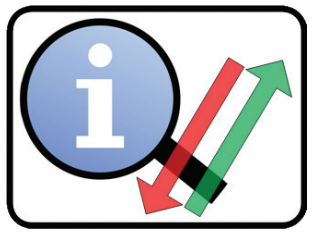
Getting playlists for Store-and-Forwards is just one example of a task that must be performed by the device at a given time.



Starting to play in the morning and software update (yes, remotely) are two more. In short, for some uses the device needs a scheduler and the in-store audio provider a means to control the task schedule. Preferably, the task schedule can be determined and updated remotely and the device retrieves the task schedule regularly and executes the planned tasks. Streamit devices support this.

8 CHECK & ACT: MONITORING

Knowing that all goes as planned is reassuring, knowing about an issue before the customer calls, is equally useful. Devices should report when there is a problem, but that is not enough.



'No news is good news' does not apply, it may also mean that internet connection is lost completely, or that a particular task is not executed at all. Devices therefore need to report that tasks are executed and 'check in' regularly to confirm a working connection to the internet.

This regular reporting provides a 'return channel' to send commands to the device when corrective action is required. Monitoring without the option to act is at least frustrating. Yet, a broken internet connection remains beyond remote repair.

Monitoring

Apparaten | Instellingen

Devices that didn't respond for the last [ ] Go Serial [ ] Go

Serial:	Location:	Date:	Status:
ad2c0	[redacted]	10 oktober 2011 16:49	
254B0	[redacted]	10 oktober 2011 09:49	
ECF40	[redacted]	10 oktober 2011 08:49	
ED630	[redacted]	10 oktober 2011 15:49	
9F8B0	[redacted]	10 oktober 2011 09:49	
98f40	[redacted]	10 oktober 2011 08:49	
270B0	[redacted]	10 oktober 2011 07:49	
B92C0	[redacted]	10 oktober 2011 16:49	
0422F	[redacted]	10 oktober 2011 16:49	
670B0	[redacted]	10 oktober 2011 08:49	
cdcc0	[redacted]	10 oktober 2011 16:49	

9 INTERMEZZO: LISA REPORTING FOR DUTY

The order that never came brought with it the idea for a dedicated professional internet radio device for in-store audio. This matured into the SIR: Streamit internet radio. This platform served well into 2013 when it was replaced by the Lisa: Listening In-Store Audio.

	Basic	Plus	Ultimate
Streaming	√	√	√
Store-and-Forward			√
Audio formats	MP3	MP3, AAC, AAC+ and Ogg Vorbis	MP3, AAC, AAC+ and Ogg Vorbis
Large audio buffer	√	√	√
Scheduling[1.]	√	√	√
Monitoring	√	√	√

Notes:

1. The Lisa retrieves a complete schedule, possibly containing several tasks, from the server and executes those tasks at the indicated times and days, including repetition if required. I.e., the Lisa does the actual scheduling by itself. No connection to the server is required for the scheduling to work, except for when the schedule is retrieved.
   On the Streamit website more details can be found on the LISA.

9 INTERMEZZO: LISA REPORTING FOR DUTY

9.1 Reliability

Having the right features is one thing, delivering a reliable performance is quite another. This is a clear point of differentiation that the Lisa devices have compared to consumer internet radios. Reliability is also the reason that Wi-Fi is not available on the Lisa.

Testimony to the reliability of the Streamit devices is one in-store audio provider that uses them completely stand-alone, using no internet connection at all. Their reliability and the possibility to control playback from the SD card through scheduling, tipped the balance in favor of the Streamit devices.

9.2 Security

A particular challenge to the Lisa is presented by IT managers. They are generally not too fond of devices in their network making connection to the internet and being remotely configurable. Questions that arise are: “What changes are needed for the network configuration?” and “Is the remote configuration secure?”

The Lisa adapts to the network quite flexibly. It can operate using DHCP as well as fixed IP settings. Streams are received over port 80, the same port as web browsers use. The Lisa can make use of a proxy server with authentication if needed. For sending monitoring data and getting its configuration the Lisa uses ports 4444 and 9999 respectively. All in all, very little if any changes to the existing network configuration are needed to get the Lisa working.

The remote configuration is restricted to a fixed set of instructions and operates on a pull basis. In other words, the Lisa always takes the initiative to get instructions. That, combined with the fact that the Lisa does not run an internal web server, provides security against remote access by unwanted persons.

10 AUDIO DISTRIBUTION AND MANAGEMENT PLATFORM

Regardless how well the Lisa devices match their purpose, with just players there is no in-store audio solution. In the explanation above, it has become clear that a distribution and management platform is required:

- PLAN: A central place to configure and manage streams and devices
- DO: Source of
  - device configuration
  - playlists
  - content (streams, tracks, commercials)
  - task schedules
  - software update
- CHECK: Central place to monitor the operation of all devices deployed in the field
- ACT: Interface to send remote tasks to devices when intervention is desired

This type of platform would be required for each in-store audio provider, which is unattractive. It means that each in-store audio provider who is willing to adopt the Streamit approach and devices, will be busy building a platform first. Creating such a platform is a costly project and requires considerable technical knowledge about IP networking and streaming, among other things. It would be far better if the same approach could be used here as was used for the devices: Standardize, share the cost benefit, and concentrate on music, the core of the proposition to retailers.

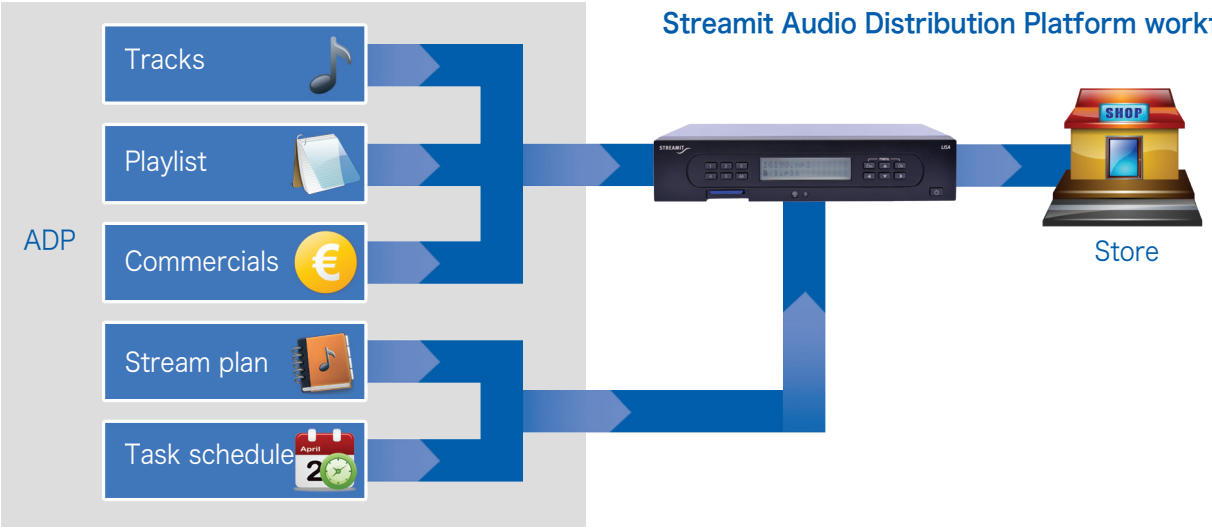
10 AUDIO DISTRIBUTION AND MANAGEMENT PLATFORM

With this in mind, Streamit set out to develop such a platform, and dubbed it Streamit Audio Distribution Platform (ADP). It offers the functionality required for In-store Audio Streaming and Store-and-Forward and has meanwhile proven itself in practice. An in-store audio provider can choose to use the hosted version of the Audio Distribution Platform or purchase the Audio Distribution Platform and place it in its own network, each option has its own pricing structure.

- Using the hosted version of the Audio Distribution Platform the operational cost is shared with other users. There is a monthly fixed fee for the operational cost and a variable fee for the generated data traffic.
- When purchasing the Audio Distribution Platform and placing it in your own network, the operation and data traffic are your own concern. What remains is a flat fee for support, maintenance and updates.

Whichever form is chosen, the combination of Streamit Lisa devices and Audio Distribution Platform enables in-store audio providers to deliver a cost-effective and complete solution to customer, almost overnight.

Streamit Audio Distribution Platform workflow:



11 HOWTO: Using the Audio Distribution Platform for Store-and-Forward

We would like to use Store-and-Forward as an example of working with the Audio Distribution Platform[1]. Before we dive into the setup of Store and Forward, the overall workflow is as follows:

- Get an account on the Audio Distribution Platform
- Set up Store-and-Forward
- Configure the device to work with the Audio Distribution Platform
- Ship the device to / install the device at the customer's location
- Monitor the device operation

With this in mind, let's turn to the setup of Store-and-Forward. There are few things as simple as using a toaster but frankly, using Audio Distribution Platform for Store-and-Forward is not one of them. Still, it is not nearly rocket science and to show that, the configuration of a Store-and-Forward setup is described below.

First of all, there are four main components to any setup on the Audio Distribution Platform:

- Stream plan: This is the plan that defines the start, sequence of tracks and commercials and the end of the audio that is played by the device. It is used for streams (Streaming as well as Store-and-Forward) that are generated by the Audio Distribution Platform.
- Task schedule: This contains the tasks that the device needs to perform, including updating of the playlists and starting and stopping playback.
- Device: The device itself needs to be known on the Audio Distribution Platform (e.g., to couple streams to it) and has some settings like the volume of music relative to commercials and whether tracks should be played at random when playing from the SD card.
- Playout location: This ties all elements together, the stream plan, the task schedule and the device.

Main components

Stream plan:

Task schedule:

Device (Lisa):

Playout location:

[1] Warning, this chapter may read like a manual

11 HOWTO: USING THE AUDIO DISTRIBUTION PLATFORM FOR STORE-AND-FORWARD

11.1 Stream plan

Before setting it all up, the components of the stream plan (music tracks, playlists[1], and commercials) need to be uploaded to the Audio Distribution Platform. This is done through an FTP connection. The next step is the creation of the stream plan.

Setting up the stream plan requires the most thought. It defines the playlists and commercials that are played throughout the day, the heart of what is delivered to the customer. The playlists and commercials are set up separately and then merged by the Audio Distribution Platform into a stream.

The stream plan starts with creating a new stream and choosing the stream type, Store-and-Forward in this case. Then each playlist that must be played is added, including start time and end time. Scheduling of commercials works the same way as scheduling playlists, except that these are planned per commercial rather than per playlist. Of course there are powerful configuration options (e.g., defining repetition over weekdays) and advanced topics, but these are beyond the scope of this e-book.

The Audio Distribution Platform will merge the planned playlists and commercials into a stream of the desired type, in the case of this example a Store-and-Forward stream. The device needs to get a task schedule telling it when to update the playlists and download missing tracks. This is discussed in the next part.

The Lisa can have multiple presets, be it regular streams or Store-and-Forward programs. These are placed in groups for easy assignment to devices. Therefore a group of presets is created and the newly created Store-and-Forward stream is assigned to that group as preset 1.

Notes:

1. Yes, playlists are uploaded, not created on the Audio Distribution Platform. In-store audio providers have specialized software for that and there is no single solution for playlist creation that would satisfy them all. Hence, the 'interface' between these software packages and the Audio Distribution Platform is the playlist as 'defined' on Wikipedia.

11.2 Task schedule

A task schedule is created simply by adding one by one the tasks that should be executed. An example might look like this:

Task	Parameter	Time	Repetition
Update task schedule	-	00:30	daily
Update playlists	-	01:00	daily
Play playlist	1	08:55	daily
Power	off	18:05	daily

This task schedule downloads a new task schedule every day, to enable making changes to the task schedule, e.g., when opening times change. Then every day at 1 o'clock in the morning the playlists are retrieved and music tracks are downloaded if needed (see chapter 4: Store-and-Forward for details).

Finally, playlist 1 (in this example there is only one playlist) is started in the morning, switching on the device as necessary. At the end of the day the Lisa is powered off, waiting for the next round.

11.3 Device

To prepare the device part, two things need to be done: The device needs to be registered at the Audio Distribution Platform so that the Audio Distribution Platform knows the device and can provide it the right settings, playlists, etc. The device needs to be told to get its configuration from the Audio Distribution Platform.

Registering the Lisa on the Audio Distribution Platform is straightforward. In the corresponding form at least the serial number of the Lisa needs to be entered. We also add the monitoring and let the Lisa report once every 15 minutes. Furthermore we disable the random playback when playing from card. Random playback from the SD card is useful when falling back from a stream, but it would disrupt the carefully constructed Store-and-Forward playlists.

To instruct the Lisa to connect to the Audio Distribution Platform for configuration, there are two options. One is to place a configuration file on the card (no need to unpack the Lisa, more on this in chapter: 12 Configuration from card later), the other method is to connect the Lisa to a PC once and configure it with the Lisa Configuration Tool (downloadable from the Streamit website).

11.4 Playout location

A playout location is created to connect the pieces: The group of presets, the task schedule and the device. In addition the time zone and some administrative information like the address and telephone number is added.
More advanced features, such as commercials that are specific for a particular playout location, are beyond the scope of this e-book and can be found in the Audio Distribution Platform user manual.
Now all is in place and the device can be switched on to download the configuration and schedule from the Audio Distribution Platform and perform as planned in the task schedule. As promised: More complex than using a toaster, but certainly not rocket science.

The device is ready to be shipped to and installed at the customer's premises, which concludes this chapter.

12 CONFIGURATION FROM CARD

As became clear from the detailed description, using the ADP requires unpacking the device and hooking it up to a PC to instruct it to use the Audio Distribution Platform. Then it has to be repackaged to be sent to the customer. One of our customers complained and said that this procedure was too time consuming for the large number of Streamit devices they were shipping.

We took this comment to heart and implemented a method to use the SD card for configuration. A plain text file containing the configuration in key-value pairs is placed in the root of the SD card and named config.scf. This file is then read and the Lisa is configured accordingly.

The workflow to configure the Lisa to work with the Audio Distribution Platform without unpacking it:

- Get an account on the Audio Distribution Platform
- Set up Store-and-Forward
- Put the configuration for the Lisa on the SD card
- Ship the device to the customer's location, install the device at and insert the prepared SD card
- Monitor the device operation

13 INTERNATIONAL ROLL OUT

The initial contacts for in-store audio were in the Dutch market. The close contacts among parties in this market and positive word of mouth had a snowball effect. New and also international customers were contacting Streamit for its in-store audio solution and new languages were required. Meanwhile the Lisa now supports Dutch, English, German, French, and Spanish.

An expanding clientele brings new requirements to the table. Tally Weijl, the internationally operating fashion retailer from Switzerland, is an example of that happening. Their in-store audio is arranged internally and they already had a streaming partner. What they needed were devices for playback of the music and a corresponding management platform. Building their own was not an option, but the Audio Distribution Platform was 'oversized'. Again the Streamit in-store audio proposition was extended.

14 DEVICE PORTAL

When the music Streaming or Store-and-Forward is already in place, there is still a need to manage the internet radio devices. However, there is no need for a full Audio Distribution Platform, as that has too much on offer. A more lean solution is desired.

Parallel to the in-store audio market, Streamit was operating in the AV-installation market. In this market the traditional FM tuner is increasingly often replaced by an internet radio device. Fortunately, many free-to-air radio and music stations are available as an internet stream as well. All that is needed is a service to program the internet radio devices with the internet radio and music streams. This concept could later be extended to serve as a broker between customers and music providers, offering music streams without commercials as a paid-for service.

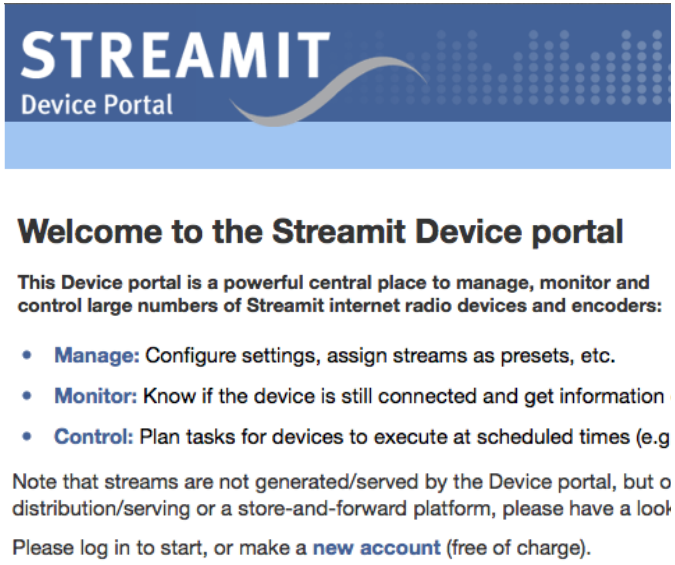
ChannelService, as it was called, is Streamit's portal to program internet radio devices to internet radio and music streams. This came a long way to serve the needs of Tally Weijl. It was decided to extend ChannelService with scheduling and monitoring functionality. In addition, the possibility to edit multiple devices at once was added to easily apply configuration changes to large numbers of devices.

Being designed as a consumer-facing web application from day one, ChannelService has a more user- friendly interface than the Audio Distribution Platform, although it does not have all of its features (no Streaming or Store or Forward functionality). Nevertheless it has become a powerful platform to centrally configure, manage, monitor and control large numbers of internet radio devices.

Because of this extension of ChannelService and putting the ambition of 'music brokering' on ice, the role of ChannelService as the actual source of content has decreased. It has been decided to further optimize the interaction and menu organisation of ChannelService for internet radio device management and to rename ChannelService to Device portal.

Interesting link:

▸▸ Visit the Streamit device portal: https://devices.streamit.eu

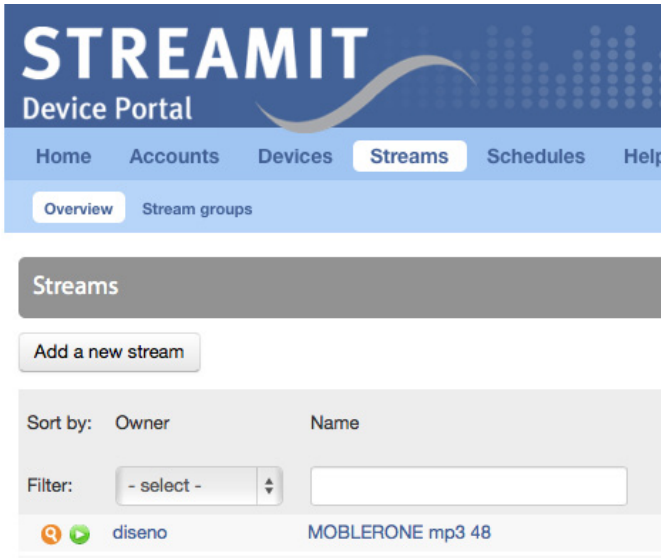


15 HOWTO: USING THE DEVICE PORTAL

Use of the Streamit Device portal has the following overall workflow:

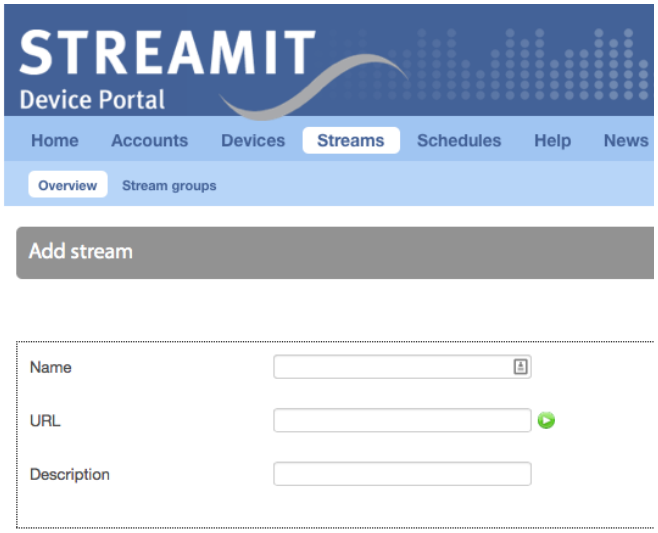
- Get an account on the Device portal, this is free of charge
- Add a stream to be played by the device
- Create a task schedule for the device
- Register and configure the device
- Ship the device to / install the device at the customer's location
- Monitor the device operation.

Adding a stream and configuring the device are detailed below.



15.1 Configuration of a stream[1]

Streams on Device portal are little more than pointers to the actual streams. The actual stream must be generated and distributed on a different platform or streaming server. The function of Device portal is comparable to that of a dictionary more than that of a source. This is made clear by the form to add a new stream: It is little more than the URL of the actual stream.



[1] Warning, this chapter may read like a manual

15.2 Create a task schedule

A task schedule contains the tasks that the device needs to perform, including starting and stopping playback. To create a schedule takes no more than filling in the corresponding form. One-by-one the tasks can be added to the schedule. See the table for an example.

A daily update of the schedule allows to easily adjust the schedule on the device if that is required. In the morning the device starts playing stream 1 automatically. In case the store employees forget, the device is switched off at 23.00 automatically, ready for the next day.

Task	Para-meter	Time	Repetition
Update task schedule	-	00:30	daily
Play stream	1	08:55	daily
Power	off	23:00	daily

15.3 Configuration of a device

The device needs to be registered and configured at the Device portal so that the Device portal knows the device and can provide it the right configuration and task schedule. Fill the new device form with the necessary information, most importantly:

- Device serial number
- Monitoring interval (how often should the Lisa check in to report)
- Schedule to be used

Next, the stream(s) should be assigned as presets to the device. This is done on a separate tab, simply clicking on the streams that should be assigned as presets.
Fortunately, the device is pre-programmed to work with the Device portal, so no further configuration of the device is required. This means that device registration and configuration are now complete. Actually, the whole setup is done and the device can be shipped to and installed at the customer's premises.

16 COMPARING: THE AUDIO DISTRIBUTION PLATFORM AND THE DEVICE PORTAL

Now that Streamit has two platforms, the Audio Distribution Platform (ADP) and the Device portal, one may wonder when to use which. A simple comparison table should clear this up:

	Device portal	ADP
Device management	√	√
Scheduling	√	√
Monitoring	√	√
Streaming	Own streaming server required	√
Store-and-Forward	Own SAF server required[1.]	√
Insert commercials	-	√[2.]

Even though these two platforms are available, some in-store audio providers choose to implement their own platform. There are various reasons for this, e.g., integration with other software that is used during operation. Streamit devices have an open and well-documented interface that enables integration in other platforms.

Notes:

1. Setting up a simple SAF (Store-and-Forward) server is well-documented and can be done in under 30 minutes.

2. Commercials can be inserted in all streams that the Audio Distribution Platform generates. Commmercials cannot be inserted into streams that are not generated on the Audio Distribution Platform but externally. Such streams are redistributed untouched by the Audio Distribution Platform.

17 NEW DEVELOPMENTS

Since our start in 2006 in the in-store audio market many things have been realized: Dedicated and optimized internet radio devices for in-store audio (Lisa), an Audio Distribution Platform (device management and content distribution), a Device portal (device management) and sales to many internationally operating in-store audio providers, both small and large. Still development has not come to an end.

Long-anticipated geographical market segments are taking off, as several parties in the United States and Asia have decided to adopt Streamit's solution for in-store audio. They are implementing the necessary steps to roll out in significant numbers.

Next to market development, there still is product development. For example, the connection to the Lisa for monitoring and commands will become live. Instant access to the current state of the Lisa and the possibility to send commands at any time. Technically this is not straight forward, but that is not going to hold us back.

What other developments the future will bring? We cannot tell, but we're eager to confront the challenges and embrace the opportunities. Are you with us?

18 ABOUT STREAMIT

STREAMIT

Streamit is a Dutch company specialized in the development and marketing of equipment and platforms for video and audio streaming over the internet. Streamit is known for its innovative audio and STL solutions for in-store music providers, retail chains, churches and broadcasters worldwide. We develop our products for niche markets where quality and specific requirements cannot be met by standard consumer solutions.

Address: Streamit BV, Langendijk 7, 5652 AX Eindhoven, The Netherlands

Email: info@streamit.eu

Web: https://www.streamit.eu

Phone: +31 40 2556036