Roles in RadioDNS Hybrid Radio

24th February 2022

Introduction

RadioDNS publishes a set of hybrid radio open technology standards to enable metadata and content to flow over IP from radio stations to radio receivers (mostly, but not exclusively, in vehicles). Open standards are durable, scaleable, link to authentic sources of data, and allow for a plurality of providers to interoperate.

The purpose of this document is to describe how that plurality of providers are linked together to enable metadata and content to flow from radio stations to end-users.

Examples of how Standards, Services and Technology, and Products relate to each other

RadioDNS does not, itself, provide any technology that is involved in that flow of metadata (beyond an initial DNS lookup). Instead, we support, with standards and infrastructure, an ecosystem of companies providing competing but interoperable solutions.

This plurality of organisations involved with moving metadata around in accordance with the RadioDNS standards can seem confusing, so this document explains what each organisation does, and the different options available to broadcasters and receiver manufacturers.

In this document, "metadata" means both metadata (like now playing information) and content (like visuals)

Key Roles

There are essentially five key roles in the RadioDNS ecosystem:

Broadcaster

The organisation responsible for the radio service, and the owner of any associated metadata.
The broadcaster can **either** put the metadata into the format specified by RadioDNS and make it available for retrieval, **or** they can pass it (using a proprietary structure and interface) to a service provider.

Service Provider

The organisation taking the broadcaster's metadata, putting it into the formats specified by RadioDNS and making it available for retrieval.
A service provider often does this for multiple broadcasters (and multiple radio services).
Some Service Providers may also provide the same, or more metadata, via a proprietary interface. Some broadcasters act as their own service providers.

Technology Provider

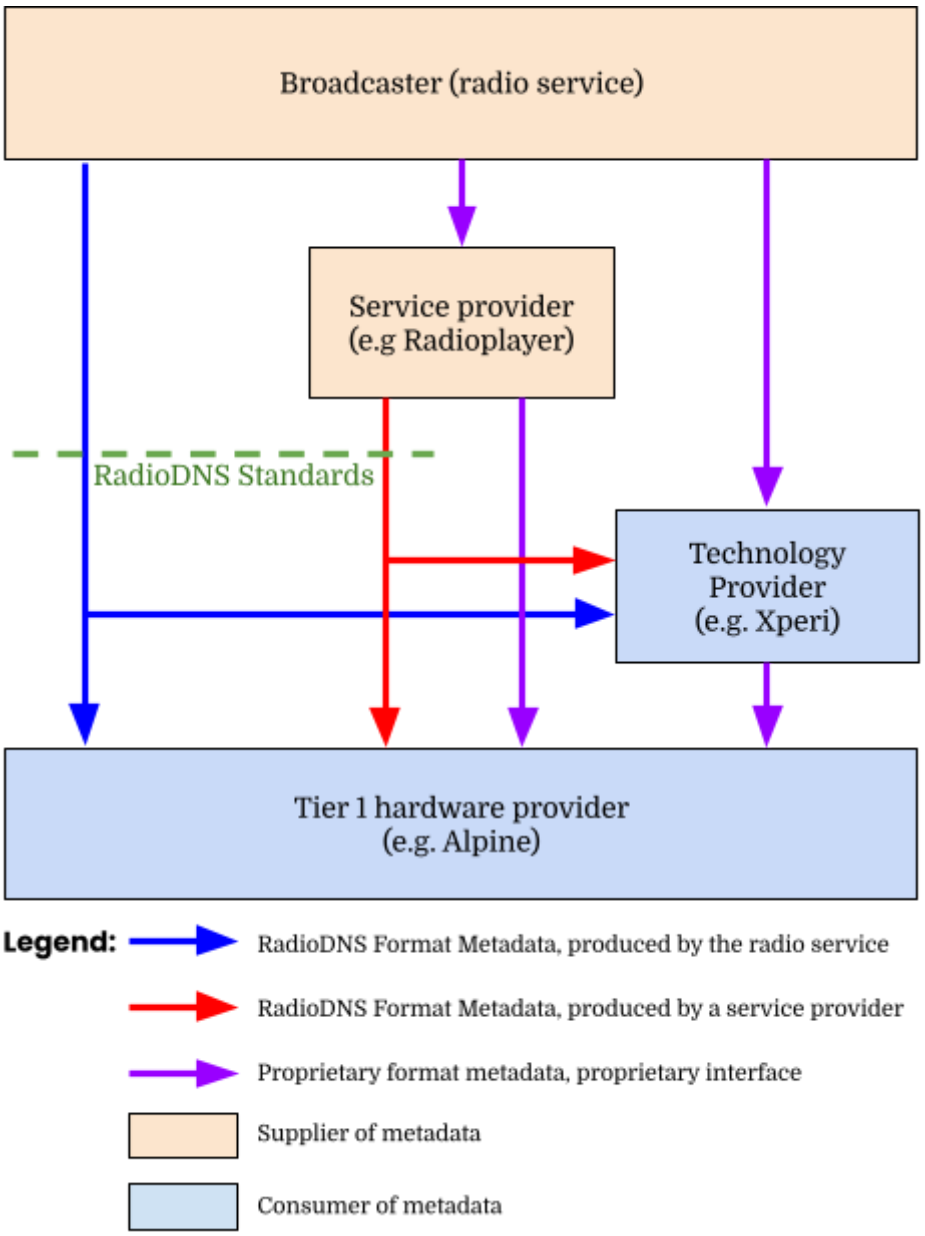
The organisation retrieving metadata from multiple broadcasters, either directly or from the broadcasters' service providers, and putting it into the right format for the receiver in the vehicle.
Some Technology Providers may also implement proprietary interfaces directly to broadcasters, and merge in metadata received via RadioDNS with metadata from other sources.

Hardware Provider

The organisation that provides the receiver hardware (and associated software) that goes into the vehicle. These may be automakers or automaker suppliers, commonly referred to to as “Tier 1” providers.
Hardware implemented by some Tier 1 Hardware Providers may receive metadata using RadioDNS directly from broadcasters/service providers, or it may receive metadata from a technology provider.

RadioDNS

Manages the radiodns.org zone, which contains all the DNS records which translate broadcast radio parameters into Fully Qualified Domain Names (FQDNs) and allows the location of trusted and verified IP services associated with broadcast.
Defines technical standards which describe the different applications (e.g. Service and Programme Information) used to transport metadata and content from radio stations to end-user devices.
Defines standard agreements under which metadata & content provided by radio stations can be used by either technology providers and/or end-user devices.
RadioDNS is not otherwise involved with the movement of metadata from radio stations to technology providers or end-user devices.



Supporting Different Models

The RadioDNS standards support all the different permutations of broadcasters, service providers, technology providers and hardware providers.

Metadata sources accessed using the RadioDNS standards are always discovered through means of a DNS lookup, regardless of whether that's direct from a broadcaster or from a service provider.

Once the metadata source is discovered, the structure of metadata is also identical, regardless of whether that's direct from a broadcaster or from a service provider.

Interoperability

The RadioDNS standards mean that there can be a plurality of service providers and technology providers providing competing services, and that if a manufacturer or a broadcaster wants to change providers, it does not materially affect the metadata available.

This reduces the risk in the hybrid radio framework from the failure of any single organisation, and means the time to recover from a failure is much shorter (and less costly).

It also reduces the investment and ongoing maintenance needed to implement and operate proprietary interfaces. Once the RadioDNS standards are implemented by a broadcaster or manufacturer, this will work across a much larger range of service providers and metadata sources.

Fair Use and Licensing

RadioDNS recommends that Broadcasters (directly or via their Service Provider) apply a licence for use to their metadata, to remove any ambiguities about what constitutes fair use of data.

RadioDNS provides a standard template licence (https://radiodns.org/terms/metadata/1.0) which we recommend using.

However, a broadcaster is free to apply any licence of their choosing, recognising that manufacturers may choose not to use their metadata if the terms of the licence are unclear or onerous to review.

Authentication

RadioDNS recommends that as much metadata as possible is made freely available (although subject to licensing, as described above) to allow scalable growth of hybrid radio services.

Functionality exists for a broadcaster to issue a unique identifier ("Client ID") to each manufacturer to give them controlled access to additional metadata, potentially based on a bilateral agreement between them. It should be recognised that this creates additional effort for both broadcaster and manufacturer to administer, so it's application should be relative to the value of the metadata it covers.