

The logo for RDS2, featuring the letters 'RDS' in a bold, yellow, sans-serif font, followed by a black '2' that has a 3D effect with a white highlight on its top edge.

as a real data service

From simple radio protocol to hydride data channel

RDS

Launched in 1984 as an FM receiver control

Main task : Identification and Localization

- ❑ PI code and PS-Name
- ❑ AF – alternative frequencies / mobile usage
- ❑ TP and TA – bits as a replacement for ARI
- ❑ PTY – number
- ❑ Decoder control (DI)- bits

West-European oriented service and character set.

Low bit rate, net 421.8 bit/second

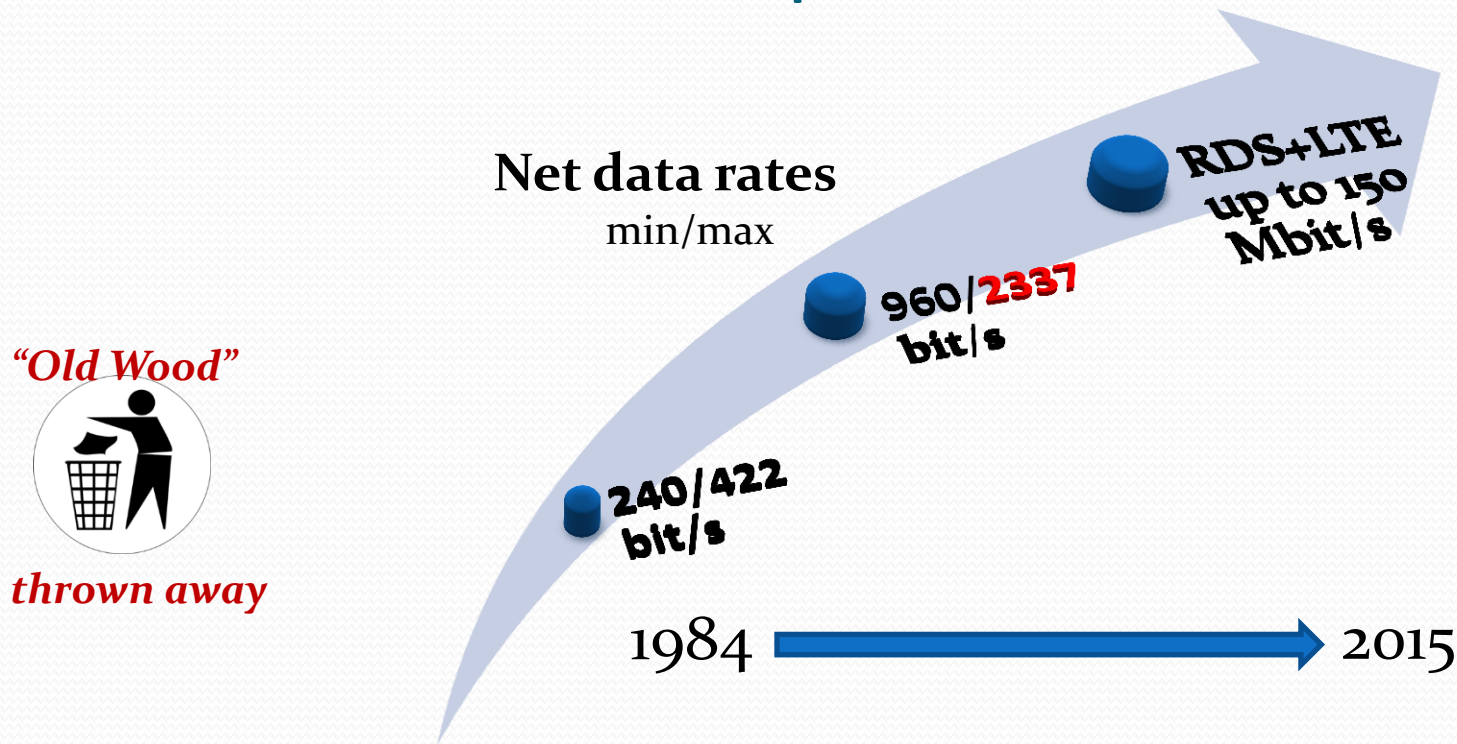
Data services from the 90's.

- ❑ Radiotext
- ❑ Paging (Killed by mobile phone and SMS)
- ❑ TMC
- ❑ Various alerting the population

TMC has developed as the killer application, and is also in countries in use where no other RDS functions are used.

The capacity limit for data services has already been reached in early 2000's.

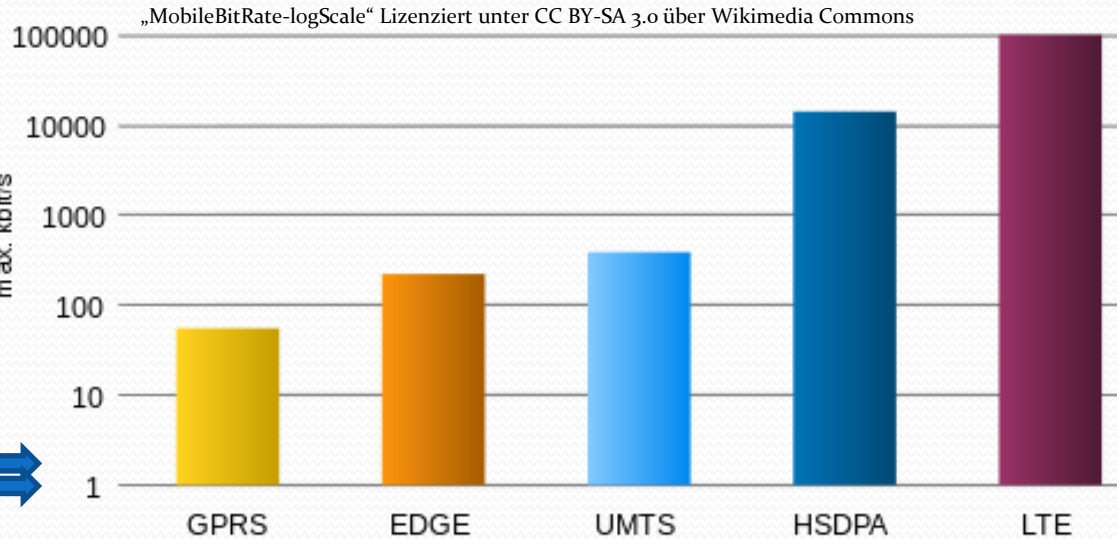
RDS2 is faster, leaner and more cosmopolitan.



In addition to the EBU-Latin character set, **RDS2** supports UTF-8.

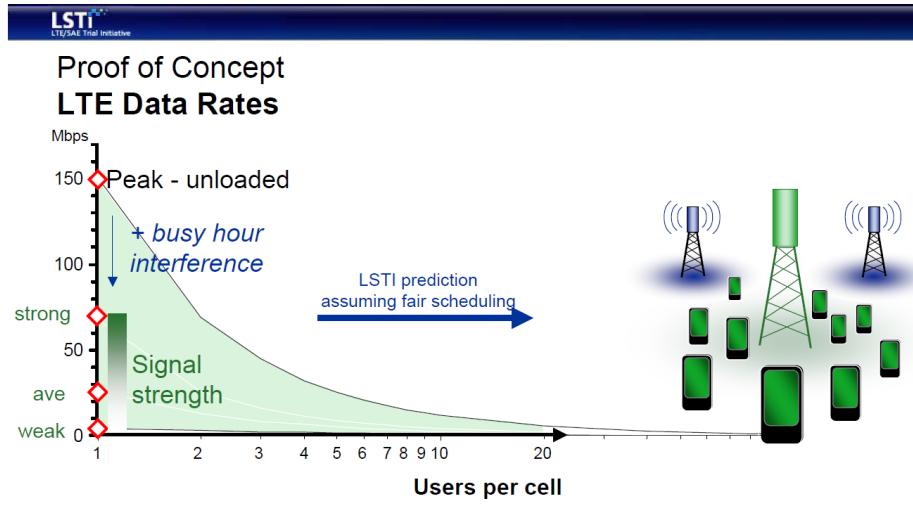
русский 한국의 اردو हिन्दी العربية 中国

Mobile (Internet) Data



RDS2
RDS1 →

BUT:
UMTS and LTE is a **shared medium**, as it is known by the WLAN:
Requires only a single consumer; then the downstream capacity can get up to 150 Mbit/s near the antenna.
Are there multiple users, they **must share the available bandwidth**.
Also with the distance to the antenna goes the data throughput down (Graphic: LSTI forum).

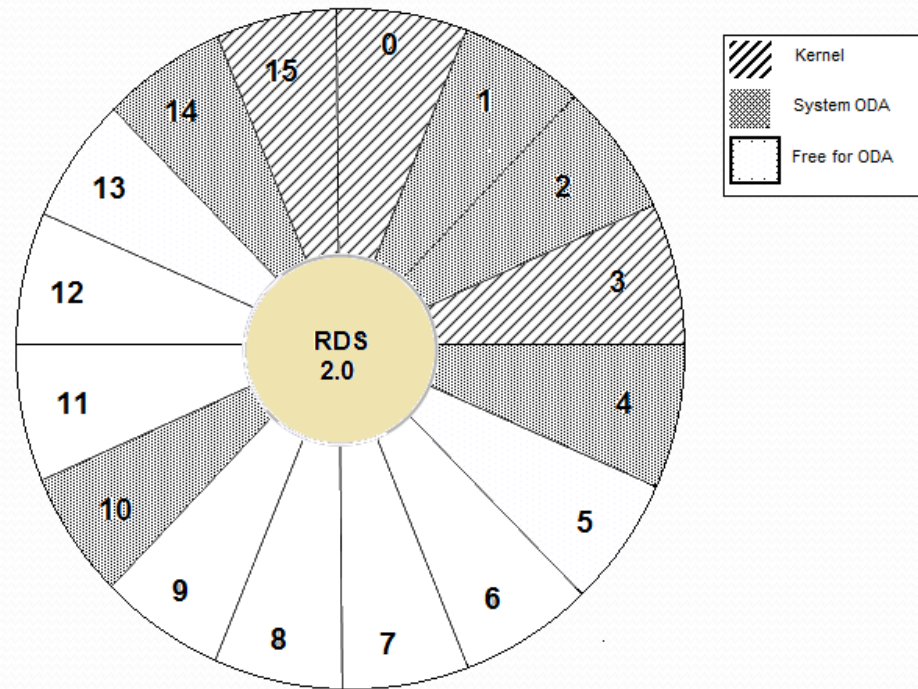


Save mobile bandwidth and save cost use **RDS2** with FM

The ODA technology

All radio stations have the possibility to broadcast **simultaneously 8 data services.**

Modern radios, such as smart phones or car radios can handle this. Similar to plugins in the browser or apps, these applications can be loaded and updated. We are no longer dependent on special hardware.

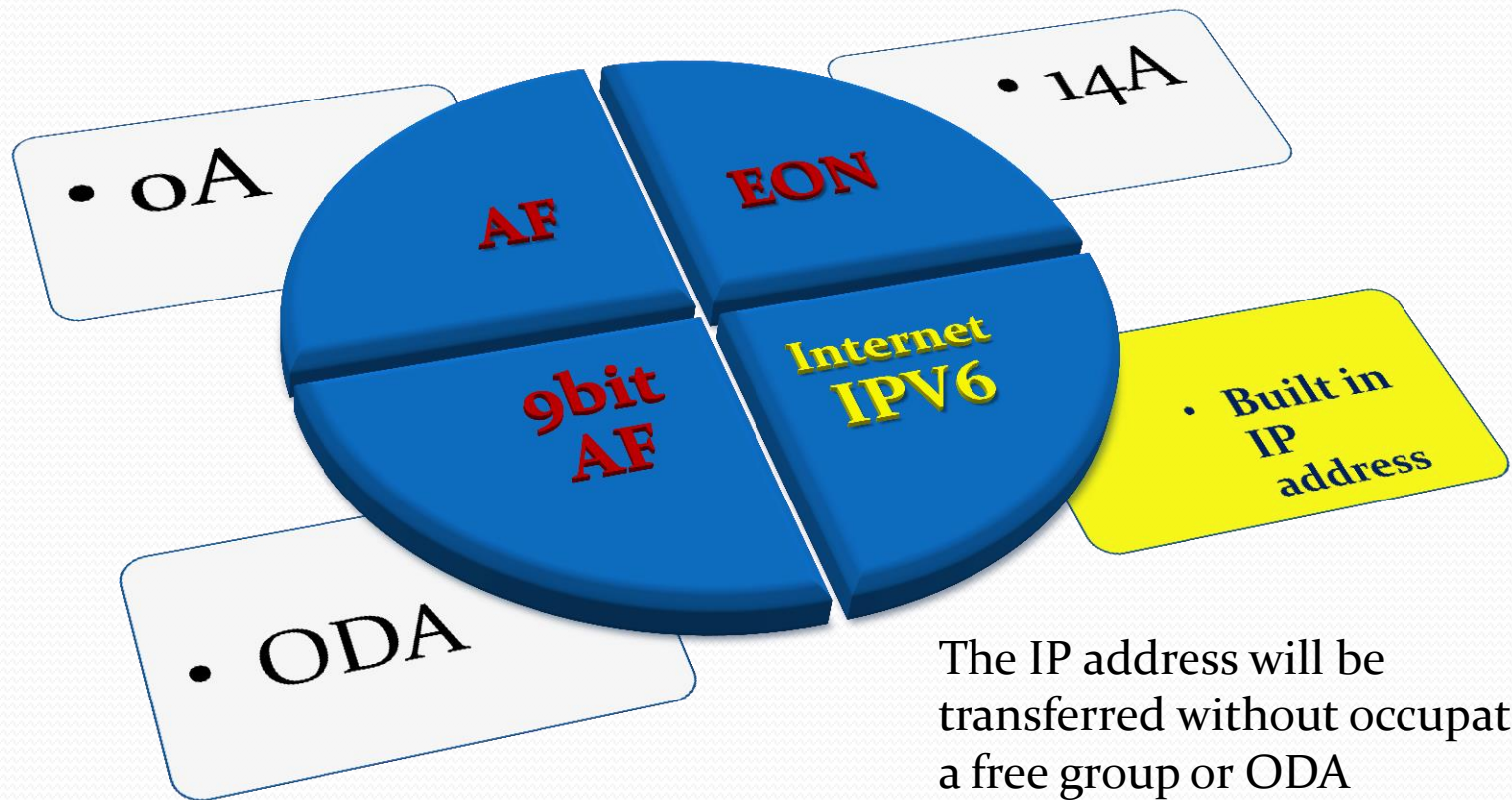


The Group Wheel: 8 groups can be used freely.

With **RDS2** you can link to other frequencies, programs or into the Internet.

RDS2 Linking Structure

You have 4 options to link your services.



The IP address will be transferred without occupation a free group or ODA

New feature: AF & EON at 65 MHz or 76 MHz (e.g. Brazil) and built-in Internet address

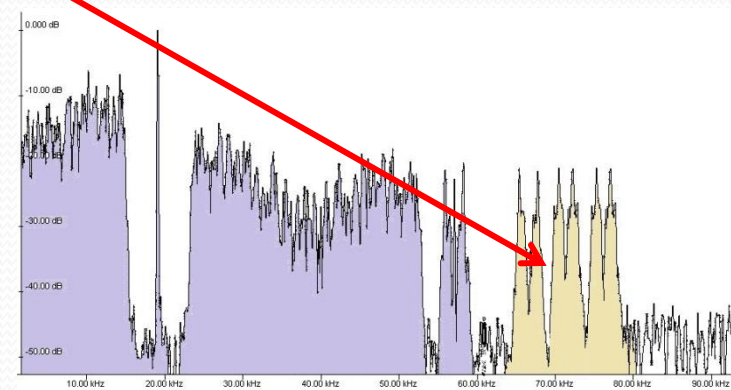
Internet link – IPV6 and ports

A typical IPV6 address has 18 bytes:

[2001:0db8:85a3:08d3:1319:8a2e:0370:7344]:8580

This will be transferred on the additional carrier in background virtually placed as a double compressed 15B Group that will not pass into the real RDS data stream. It is in a format that not need external decoding. The address may be used by combined chips also internally.

In combination with WLAN, UMTS, LTE or BT-Gateway can switch into the internet. E.g. a car radio with connected smartphone, or a simple radio receiver with WiFi chip on a hotspot.



Each encoder can transmit an own different internet address like AF list. Thereby the Internet can be used like a kind of alternative frequency. No URL needed.

FM-RDS2 and Internet

hybrid radio

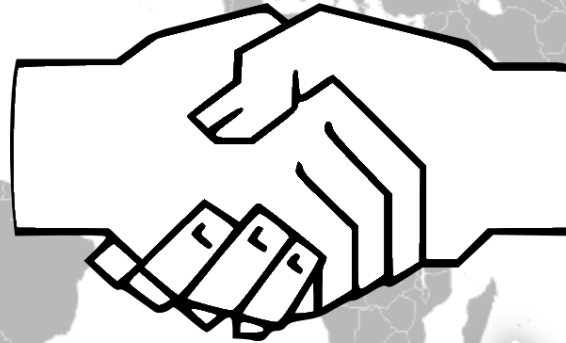
RDS2

World Broadcast Web

WBW

World Wide Web

WWW



real time - trigger
1 to n broadcast
free receivable
small data channel



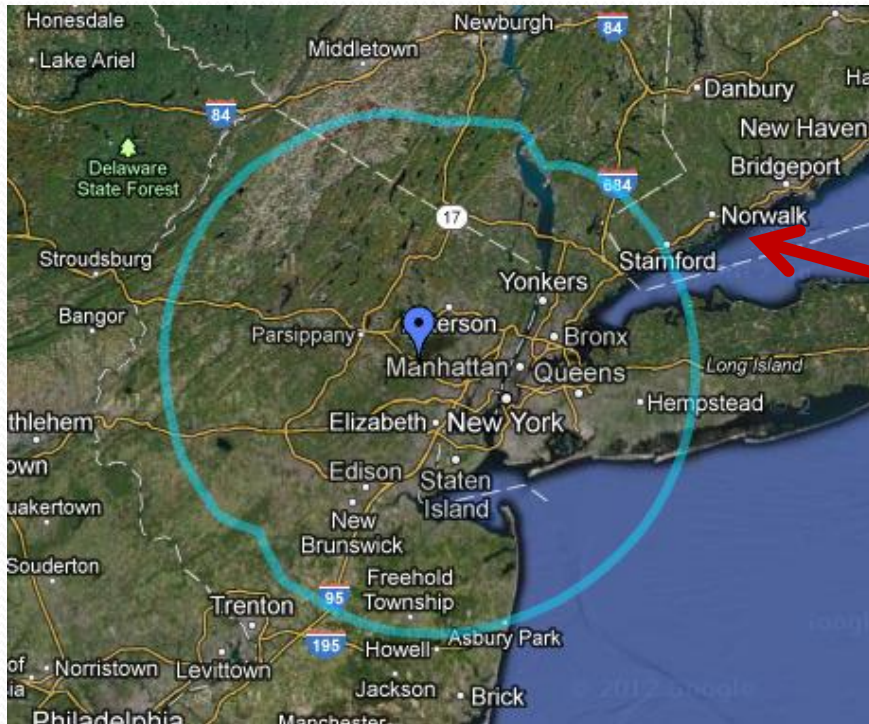
on call - triggered
1:1 connection
transmission costs
mass data available

Worldwide perfect service as desired

The infrastructure is available worldwide and will massively extend.

Coverage limits ?

Example:



What to do if you hear daytime



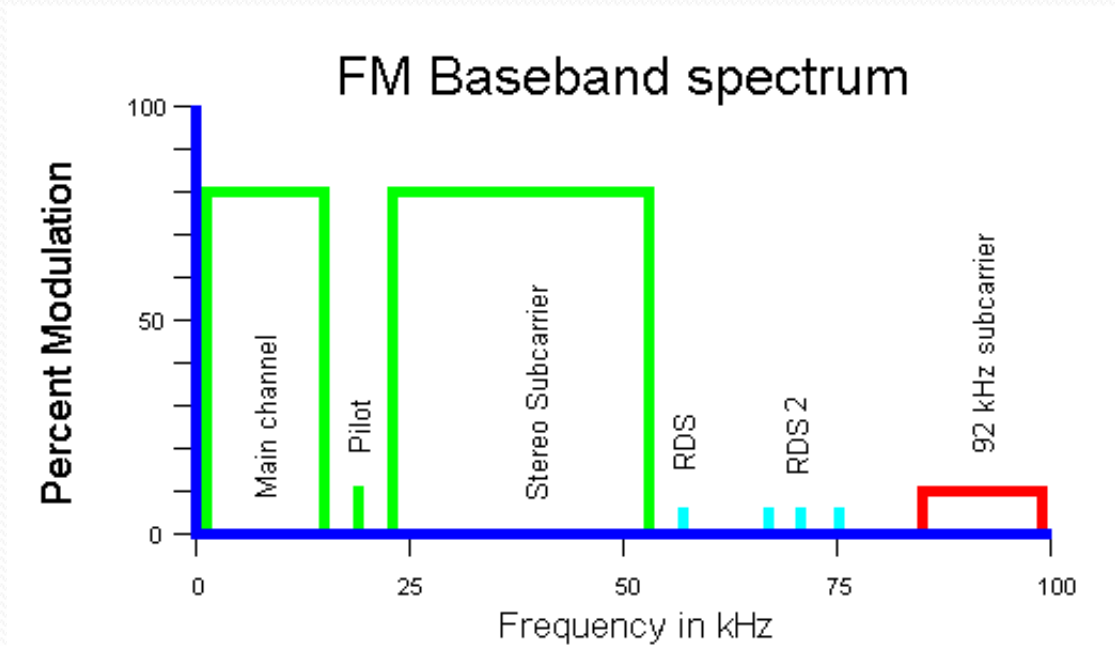
and you live in Norwalk?

You need a simulcast fallback like DAB to FM in Europe.

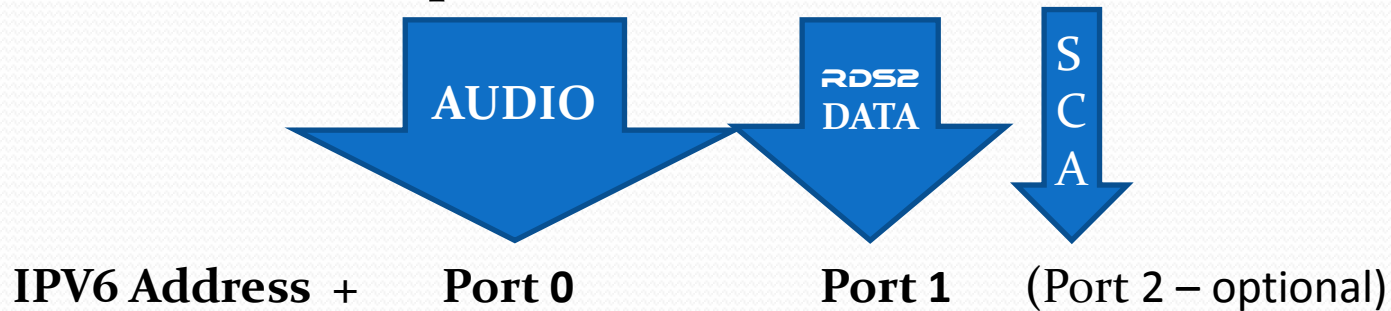
The problem is already solved: simulcast plays today almost all radio stations on the Internet.

With **RDS2** and the correct server structure everything is there. Also the RDS data can flow further through Internet. It requires no extra App or player, the receiver controls everything.

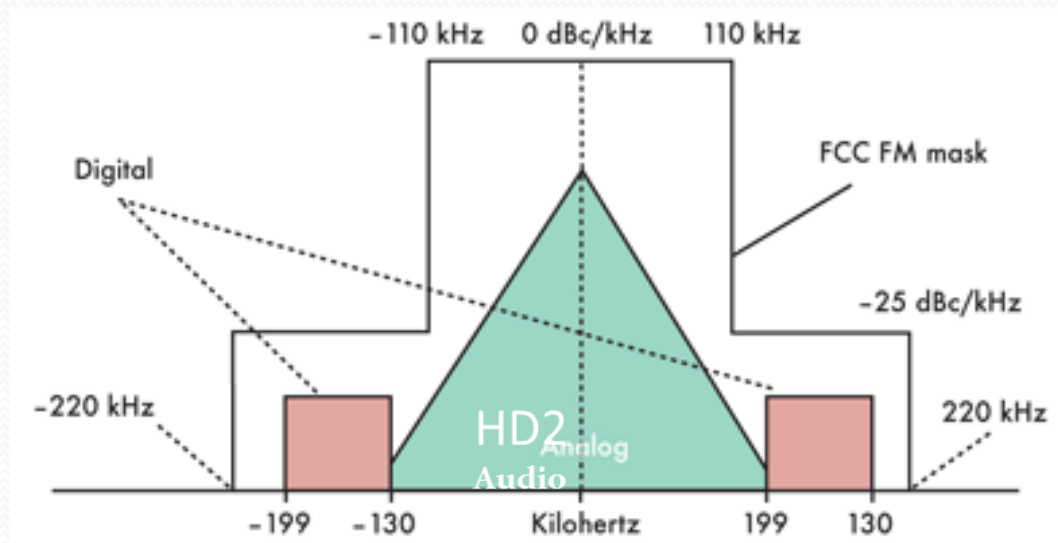
Internet as fallback for FM Radio



RDS2 FM ports on internet with US SCA extension



Internet as fallback for HD-Radio (FM)



RDS2 FM ports on internet with HD-Radio



IPV6 Address + Port 0

Port 1

Port 2

Port 3

Port 4

Each channel has the right fallback, the listener must not go over the analog part

What everyone needs, and what everyone gets soon anyway.



My Smartphone or connected car has nearly all what I want
FM – Radio and Internet in one package

I need just the **RDS2** chip & protocol

The future is near the market is clear....

USA & EU & others:

Connected Cars to Make Up 20% of Global Market by 2019

One in five passenger vehicles will be connected in the next four years, according to Juniper Research

June 3, 2015

Juniper Research is a hi-tech analyst company based in Hampshire, U.K.

By 2020, advanced mobile technology will be ubiquitous around the globe, unlocking the potential for mass-scale transformation. Smartphone subscriptions will have more than doubled and **70% of the world's population will be using smartphones.**

Ericsson Mobility Report 2015

.... and the Radio is fm

Almost 80% of smartphone subscriptions added during 2015–2020 will be from Asia Pacific, the Middle East and Africa – e.g.

India

With more than 200 FM stations, India offers a wide choice of FM station to listeners. But a majority consume radio content on devices that are not traditional radio sets. **Millions of people use their mobile phones to listen to FM programmes** and most of the low-end phones sold in the market now come with this feature.

Source: BBC *world-asia-india-26028381*

Brazil opens the band 75,2-87,5 MHz for FM

Advantages of Extended FM is the expanding of the number of stations available to the public. Also much of the population is used to radio in FM receivers present in phone handsets, those who already have the extended bandwidth and a **simple reprogramming of the FM radio of smartphones** facilitate access to the new "FM". (today : Apps for Japan FM 76-90 MHz and European 87.5-108 MHz)

Source: *Digital Radio FM Europe*

**Smartphone becoming the “phone-radio-TV-mp3-player-WWW”
i.e. the universal communicator.**

Thank You

