

aprs.fi – a modern APRS web site

June 14, 2008

30th Nordic VHF/UHF/SHF-meeting

Sappee, Finland

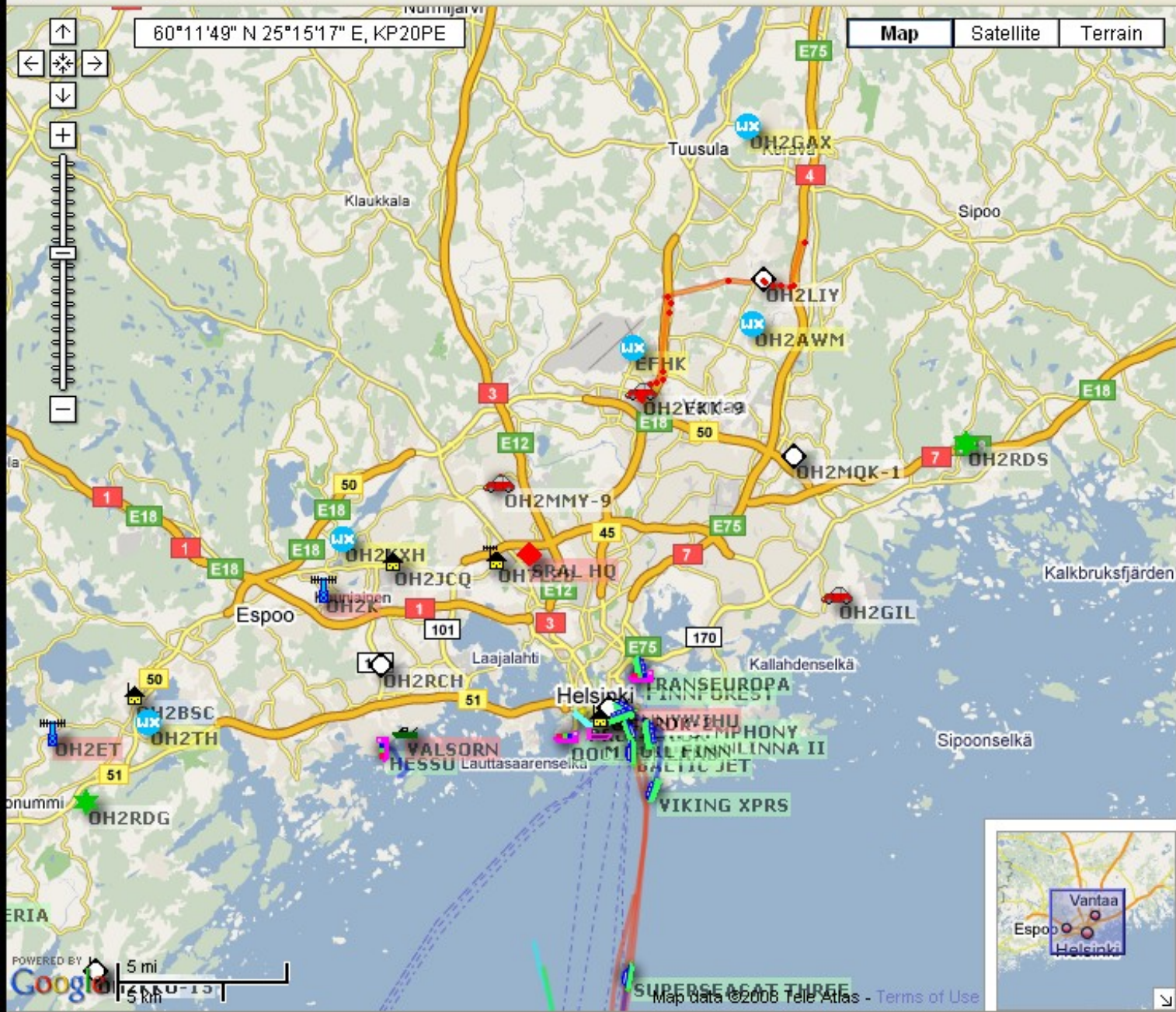
Heikki Hannikainen, OH7LZB <hessu@he.fi>

What's going to follow...

- Introduction
- Big features
- Little features
- What's hidden behind the scenes
- Innocent Questions & Fanatic Answers

What is aprs.fi ?

- An APRS web service, much like findu.com, implemented during 2006-2007 using modern web technology
- Collects APRS packets from the Internet-based APRS-IS network, puts them in a big database, and shows the data on a fancy web site



Maps - oh7lzb - Log out

Show last: 1 hour

Track callsign: [Clear / Show all] [?]

Address, city or Locator: [Clear] [?]

Wx: 14.8°C 52% 1009 mbar 1.4 m/s S

- Other views:
- Station info
 - Raw packets
 - Beacon packets
 - Messages - Bulletin board
 - Prefix browsing
 - Google Earth KML [?]
 - Options (new!)

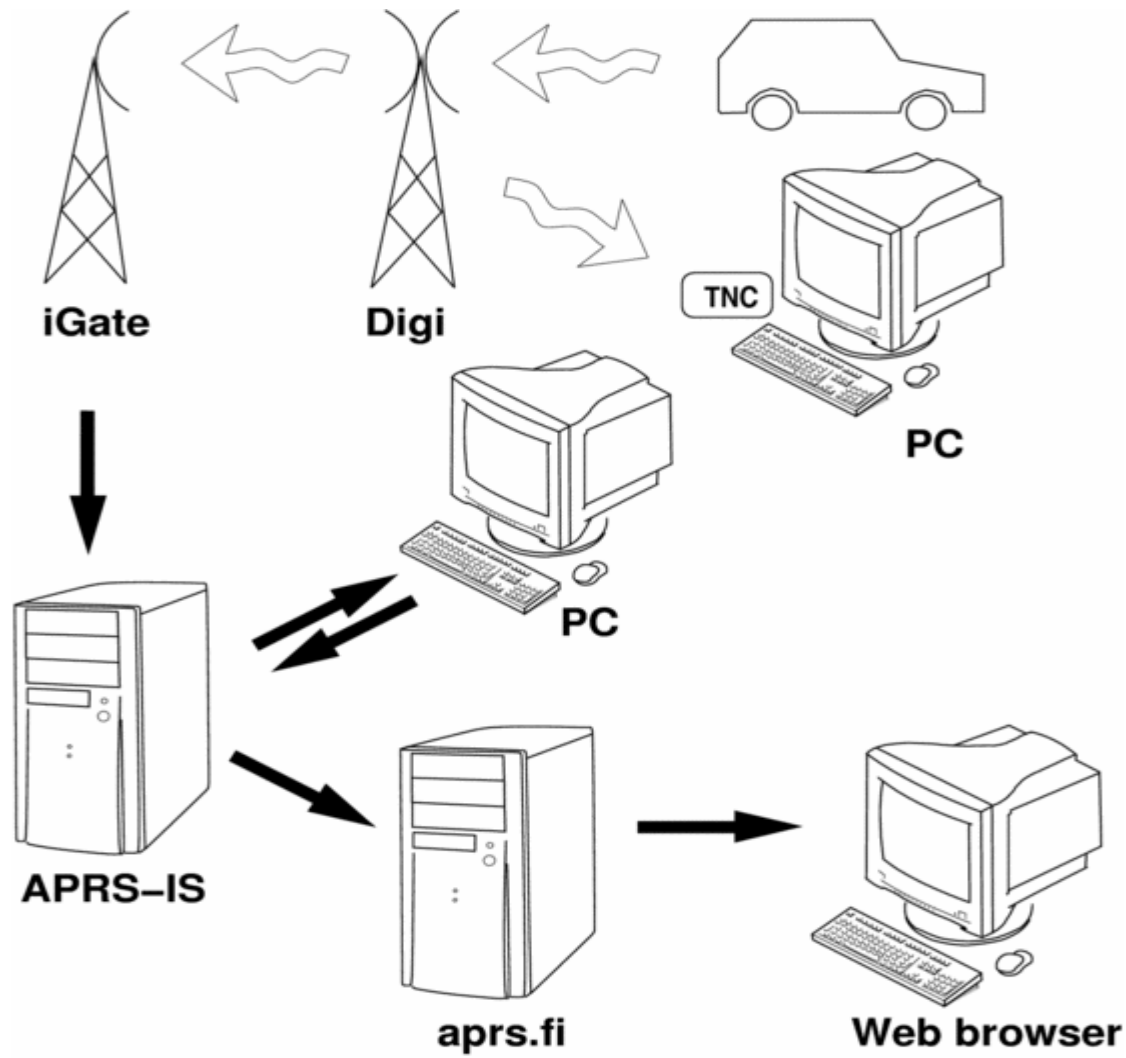
Information:

Blog · APRS stations currently moving · Database statistics · Linking to aprs.fi · AIS sites · Change log · Planned changes · Credits and thanks

idle

 **What's up on aprs.fi**
How to authenticate licensed
May 22, 2008

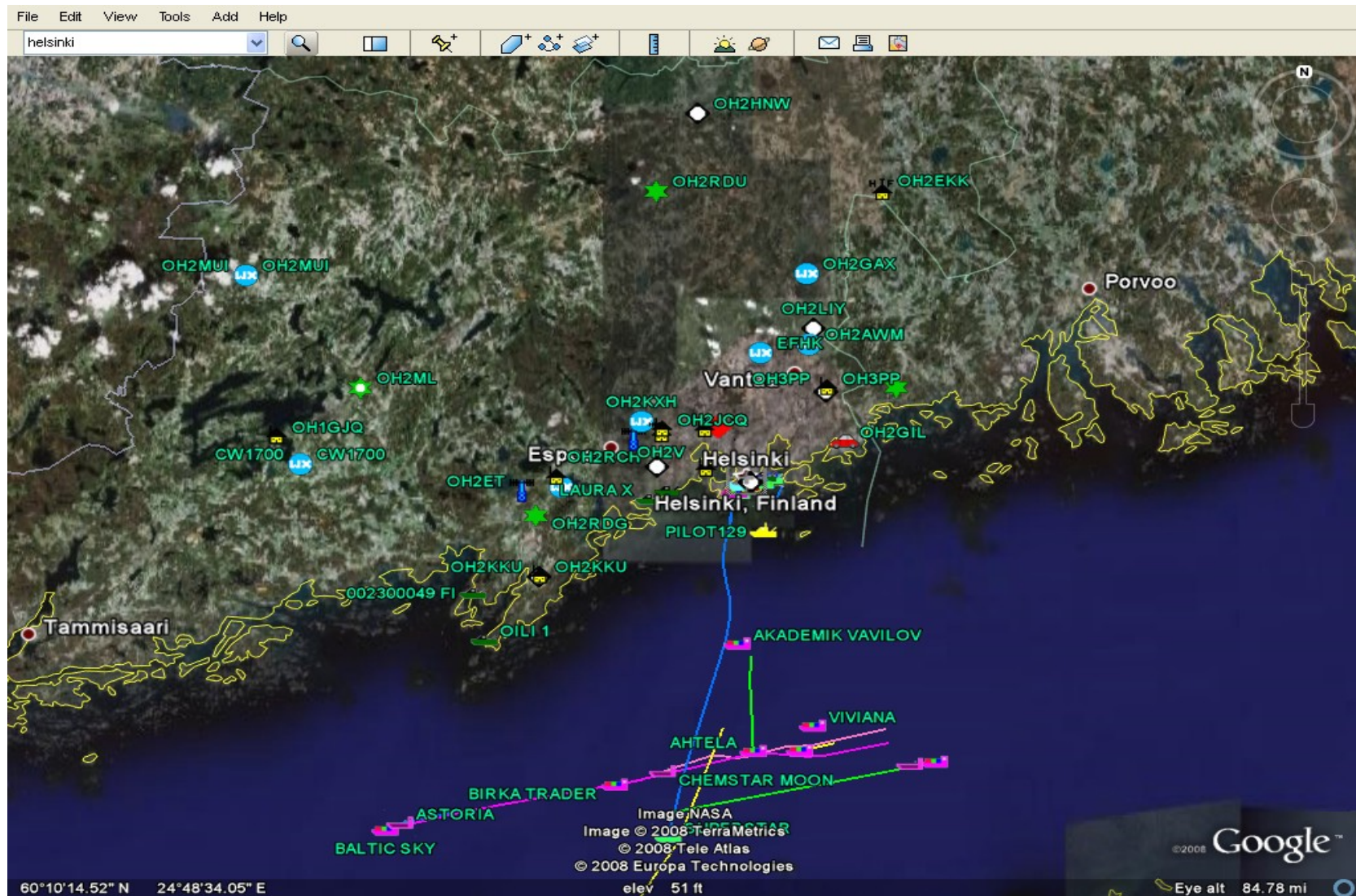
Quick APRS overview (maybe?)



Big features

- Real-time tactical view, updates automatically
- Works more like an application than a web page
- Good map coverage, thanks to Google Maps
- Multilingual: cs da de el en es fi fr it ja nb nl pl pt sv tr - <http://aprs.fi/translate/> yourself!
- Configurable, remembers your preferred view and measurement/coordinate format

Amazing 3D effects



Install <http://earth.google.com/> and click on the Google Earth KML link.

<http://aprs.fi/> - Heikki Hannikainen, OH7LZB

Smaller features...

- Stores 6 months of APRS position history
- Searching by callsign, wildcards (*?)
- Searching by address, city, country, even in your native language:

<http://aprs.fi/?addr=東京都>

- Maidenhead locator lookups – both ways
- Statistics, graphs, weather reports
- Station information and statistic pages
- APRS activity graphs

Data storage

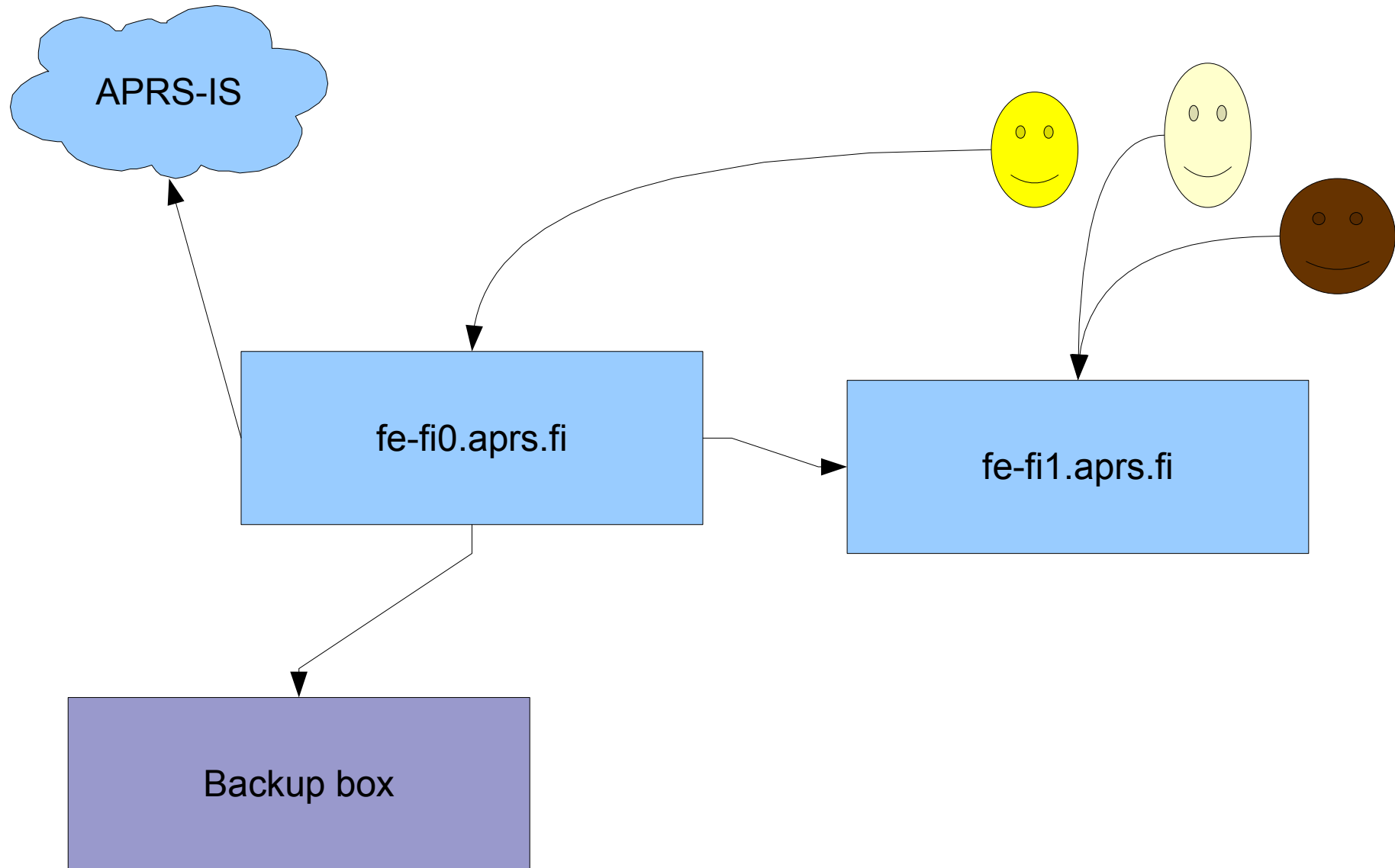
- Storage times:
 - 365 days of weather reports
 - 180 days of APRS position data
 - 30 days of beacons and bulletins
 - 14 days of APRS messages
 - 2 days of raw packets
- Only 40 Gbytes of disk space required, + a few gigs for logs, 4 to 8 gigs of memory

Embedding aprs.fi

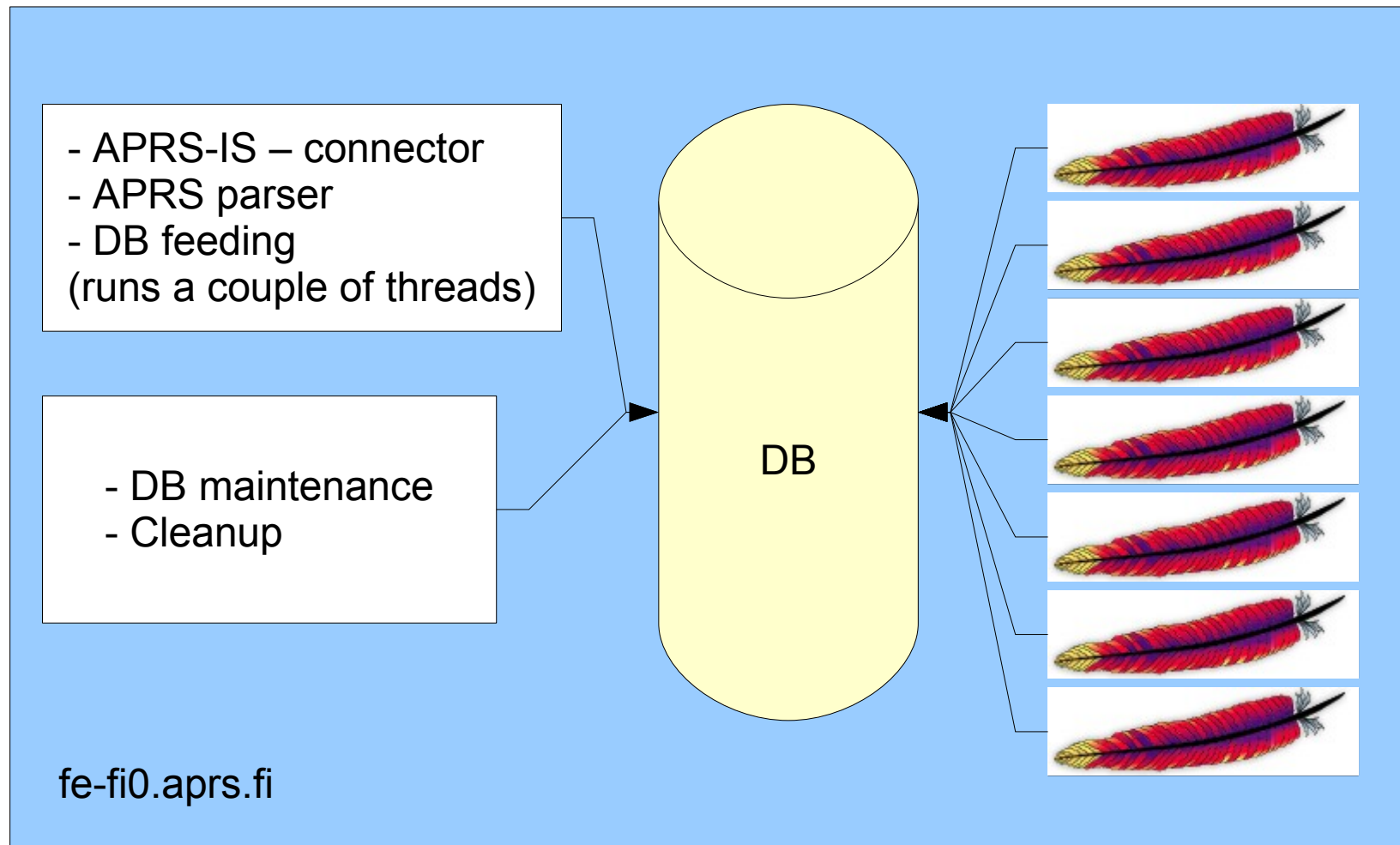
```
<script type="text/javascript">  
he_track = "OH7LZB-9";  
</script>  
<script type="text/javascript" src="http://aprs.fi/js/embed.js">  
</script>
```

- **Very easy to put a live APRS view on your own web page**
- **See <http://aprs.fi/page/embed> for instructions**
- **Examples:**
 - <http://www.hb9tql.ch/>
 - <http://w7lus.camstreams.com/>

Behind the scenes – big picture



Software architecture



Behind the scenes - technology

- Implemented in multiple scripting languages (Perl, PHP, Python), web UI is implemented with AJAX technology, plenty of Javascript to do the map magic
- Open-source SQL database with replication and spatial extensions
- No real HA yet, just load balancing, but planning to do automatic failover

Ham::APRS::FAP

- Finnish (Fabulous) APRS Parser
- Open source: Perl license, GPL or Artistic
- Written by Tapio Sokura, OH2KKU
- Published on the CPAN
- Probably the most complete, stable and fast APRS packet parser available as free software
- Got me started on aprs.fi – I could avoid the trouble of APRS parsing

Cool views with airplanes

- <http://aprs.fi/N399SB>
- <http://www.uppsalafk.com/segel/index.htm>
- These are mostly amateur radio operators, who have installed APRS transmitters in their planes
- The Uppsala guys have applied special licenses for unattended stations (beacon/repeater-like), which permits having trackers on gliders which are not being flown by hams

AIS - Automatic Identification System

- “APRS for ships” - only better
- 9600 bit/s GMSK on two marine VHF channels
- Decoded by ShipPlotter, which feeds aprs.fi
- 160 MHz 9600 bit/s capable FM receiver needed
- ADS-B and ACARS provide similar data for commercial aircraft, data available on the net, but I won't redistribute it for hysterical and legal reasons, most of it is not real-time

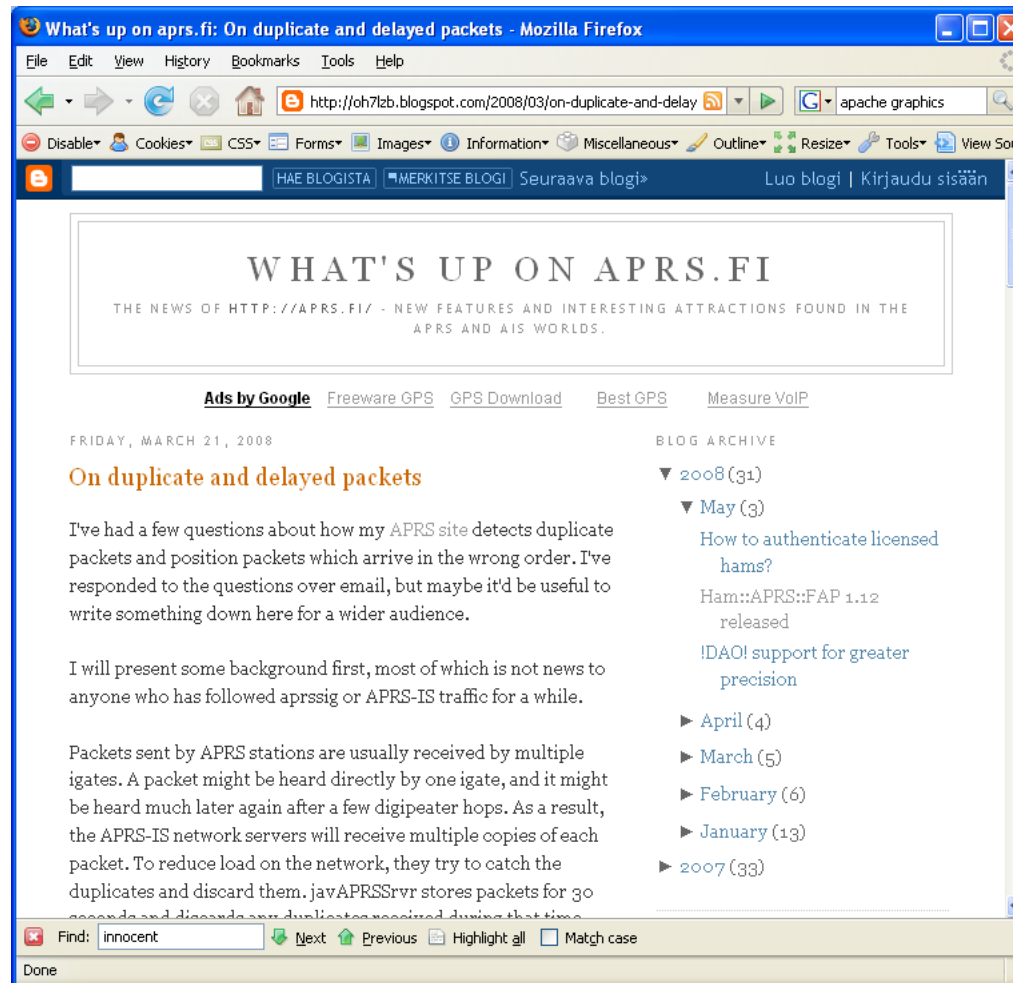
It's getting popular!

- Over 6000 visits by over 4000 unique visitors per day (spring 2008)
- Most users come back over and over again, still gaining new visitors (summer is usually quiet, though)
- Google Analytics statistics
- Google ads, earning enough to pay for hosting and some of the hardware, but not getting rich
- Lots of happy visitors make a happy developer!

It's getting busy!

- Some 100 HTTP hits per second on the web servers generated by 300 concurrent viewers every evening
- 130 000 tracking targets in database, 10k weather stations
- 12k tracking targets update within 30 minutes
- 250 weather reports, 150 new positions per minute
- 30 APRS packets per second on average

News on the blog



<http://oh7lzb.blogspot.com/> - there's a link on aprs.fi

<http://aprs.fi/> - Heikki Hannikainen, OH7LZB

Q & A

- How?
- Why?
- Improvement ideas?