DX Summit, ClubLog, VOACAP and skimmers, what next?

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What's in it for you?

- Life and innovation in the online world
- The Cloud and Big Data,
  what's in it for me?
- Potential of real-time SDR networks
- The future of SDR GUI software
- "Low-hanging fruits" (maybe?)

Living in the online world

- Virtually all the world's info and media is online
- Mobile devices means anyone can reach anyone, anywhere, anytime
- Young people are extremely internet- and computer-savvy
- Cloud computing puts a supercomputer in your pocket
- As a result, barriers to entry are melting away, and every service provider is vulnerable to competition and disruption. This transformation happens at the speed of light.
- Power shifted to consumers, and expectations have never been higher. Today, great products win. This applies to our hobby, too.

New services driven by innovation

- Individuals and small teams have a massive impact
  - **DX Summit** (OH2AQ to OH8X + team)
  - **Reverse Beacon Network** (PY1NB, F5VIH/SV3SJ, N4ZR, KM3T, W3OA + contributors)
  - **ClubLog** (G7VJR + team)
  - **VOACAP Online** (OH6BG, OH8GLV, HZ1JW + contributors)
  - **CW Skimmer + Skimmer Server + RTTY Skimmer Server** (VE3NEA)
  - **HamSphere** (5B4AIT + team)
  - **CQContest.Net** (Team R4W) – online contest server
  - **ON4KST Chat** (ON4KST)
  - **Logbook of the World** (ARRL)
  - **Jaguar GUI** to Perseus SDR (IPA + team)
- They can create new ideas, experiment, fail, try again and get their successes to a global mass.

Technological trends and applications

- New technology has a feedback loop:
  - the tools re-shape the hobby
  - the hobby shapes the tools
- Continuously design content to meet new requirements
- Successful apps = they solve **problems** and have great **user interfaces**
- Problems the apps solve:
  - **DX Summit**: If you hear a DX on the band, what is the easiest & fastest way to let others know about it?
  - **VOACAP Online**: If I see a new country on DX Summit, how do I know where and when to work it most easily?

1. The Cloud
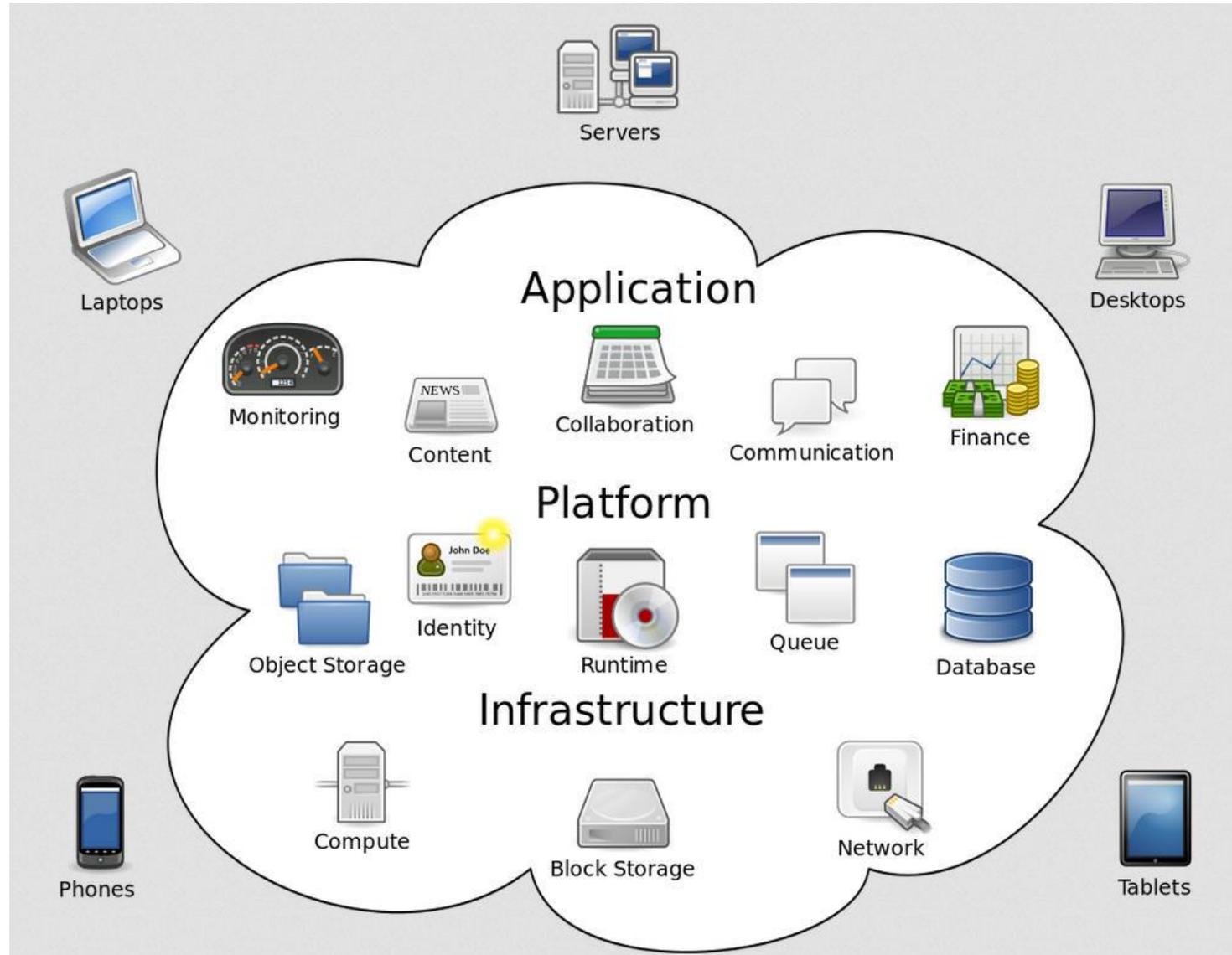
What's and where's the cloud? Are we in the cloud now?!

- Cloud computing means storing and accessing data and programs over the Internet instead of your computer's hard drive.
- **Examples of cloud software for the mass**:
  - Microsoft Office 365 & Google Docs (text processing, spreadsheet, presentations)
  - Microsoft OneDrive & Google Drive & F-Secure younited (cloud storage and file backup)
- **Examples of cloud services for ham radio**:
  - VOACAP Online API (prediction returned as JSON data e.g. for DX Summit)
  - QRZ.com API (callsign data queries returned as XML)
  - ClubLog API (embedded tools for websites: e.g. OQRS, Online QSL Requests, charts, DXCC queries and more)
  - Online Contest Server (cqcontest.net, ex .ru)
  - Logbook of the World

2. The Big Data

- At its core, big data is about being able to move quickly from **data** to **knowledge** to **action**.
- Big Data? Simply put, it is using data to **spot trends** and **make decisions** that impact your operations.
- Big Data is about **Volume**, **Variety** and **Velocity**
  - so **large in volume**, so **diverse in variety** or **moving with such velocity**, that traditional modes of data capture and analysis are insufficient.
    - Large in volume = e.g. data to be collected from various sources
    - Diverse in variety = e.g. data may be available in many non-compatible formats
    - Moving with such velocity = e.g. on Internet, everything happens in (near-)real-time
  - By combining data from various sources gives added value
- The importance of **visualization**!

Sources of Big Data in Ham Radio

- **Case 1: HF Predictions and Spot Data**
  - Sources:
    - VOACAP Online
    - ClubLog "Historical Prediction Data"
    - RBN daily spot data (real-time + "historical")
    - DX Summit spot data (real-time + search)
    - Public contest logs: e.g. CQWW
    - Various (telnet-based) DX clusters
    - Real-time SDR networks: monitoring, gathering and analysis of propagation data; resource sharing

Sources of Big Data in Ham Radio

- **Case 2: Resources supporting the hobby (DXing & Contesting)**
  - To keep track of DX trends, you will have to follow many sources: Twitter following interesting people & teams, RSS newsfeeds, blogs, newsletters, websites, HF propagation services, real-time spotting services, telnet-based DX clusters
  - The use of SDRs in monitoring the bands; automatic detection of stations; access to real-time monitoring networks via Internet
  - Keep personal logbooks in cloud (e.g. LoTW or ClubLog) to keep track of DXCC countries, counties, grid squares, IOTAs, SOTAs and much more
  - Get support in applying for all the awards of the world
  - Get QSL support: access to QSL designers & vendors, OQRS, LoTW, QSL managers, label printing,…
  - **HOW and WHERE (WHEN/WHY) these different players can be brought together (following the principle of DATA to KNOWLEDGE to ACTION)?**

Real-time SDR networks via Internet

- As the SDR technology is becoming increasingly cheaper, networks of SDRs (RX and even transceivers) can be created (W3LPL?)
- The nodes of the networks can be geographically widely distributed
  - E.g. in different parts of the world, or in a particular region, or in a country.
  - Envision a network of remote-controlled SDRs located in Northern Finland, Western Finland, Eastern Finland, Southern Finland, and Åland – each equipped with selectable RX/TX antennas, and each site can be monitored simultaneously. As a bonus, each site runs one or more (RTTY/CW) Skimmer Servers, reporting to one common place/site.
- Each node can have one or more SDRs
- Each node can be controlled & used simultaneously from one or more locations; exchange of online/recorded monitoring data
- **It's all about ACCESS**: Private; closed for-fee; public. Networked communities of SDR operators.

The future of SDR GUI software

- Most of the current SDR GUI software tries to imitate the look-and-feel and typical functions of an ordinary physical receiver

- You simply don't get the most out of your SDR system with such "general-purpose" designs. Highly task-oriented designs give better results.

  - Examples of general-purpose GUIs: Perseus or HDSDR. Basic functions: tuning in to one frequency at a time; Simple recording and play-back facilities; Waterfall and spectrum displays.

  - Jaguar, a new-generation GUI for Perseus SDR. Some highlights: Focus on audio quality (lots of various filter configurations, multiple notch filters); Continuous 8-minute wide-band recording; Various techniques to work on recordings; Frequency lists; Focus on accurate frequency readings; Space weather services, Monitoring of TA channels; Frequency previews; Basic built-in audio editor; Built-in web browser; Automated logging facilities; Scheduled wide-band/audio clip recordings; Cloud services for audio clips; Remote control among networked Jaguar users.

Jaguar: Wideband TA Channel Monitoring
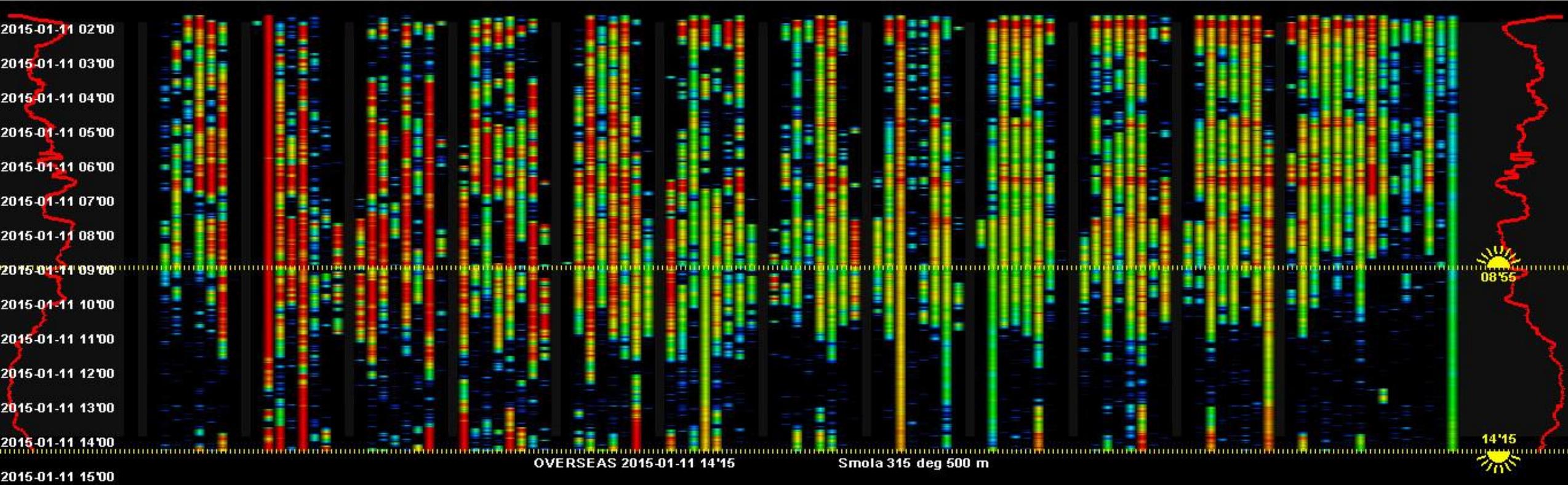
Jaguar: Space Weather & TA Channel Monitoring
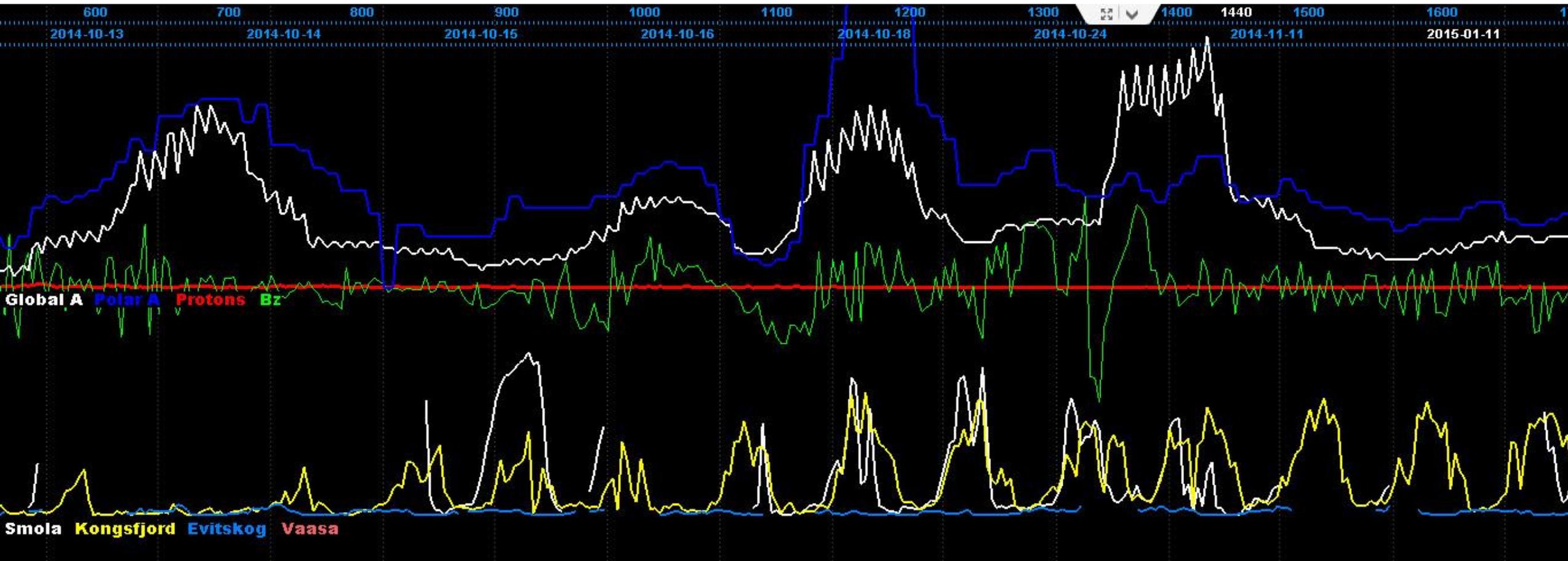
"Low-hanging fruits" (maybe?)

1. Chat rooms @ DX Summit
2. DX Summit + Skimmer spots
3. Online grayline maps
4. Open-source callsign parser
5. Propagation center @ DX Summit

#1: Chat rooms @ DX Summit

- DX Summit, a center of all things related to spots
- People need a channel to communicate verbally with each other for chasing a DX, making skeds, or sharing spots
  - A talk function similar to that of telnet-based DX clusters
- Chats or announcements can be private, semi-private or public
- The user can have multiple chats on different channels
- Who are these people creating channels: mutual friends, people in the same region; general talk among all; topic-specific channels
- Requires a handle (=nickname e.g. callsign)

#2: DX Summit and Skimmer spots

- DX Summit, a world-wide pool of all spots (remember Big Data?)
- Some users want to keep DX Summit kosher – pure and unspoiled, which means "no Skimmer spots"
- How about a user-settable option to view Skimmer spots?
  - Sources: RBN, geographical skimmer clusters (e.g. Nordic skimmers), individual private skimmers
  - Option to choose the source / the combination of sources
- The question is the quality and filtering of spots:
  - Skimmers do make copying mistakes (3 classes of spots), needs a way to more rigorous validation
  - No floods of the same spot, needs a way to filter out dupes
  - → Need to be tackled

#3: Online grayline maps

- In azimuthal equidistant projection (for low-band predictions) à la GeoClock
- In cleartext, please?
  - all points on the map are at proportionately correct distances from the center point, and
  - all points on the map are at the correct azimuth (direction) from the center point
- To set the time and date; to set the center of the map
- To see terminator lines at the horizon, D layer, and F layer
- To make animations; to calculate sunrise/sunset & midnight at 2 locations, with visualization; VOACAP prediction overlay
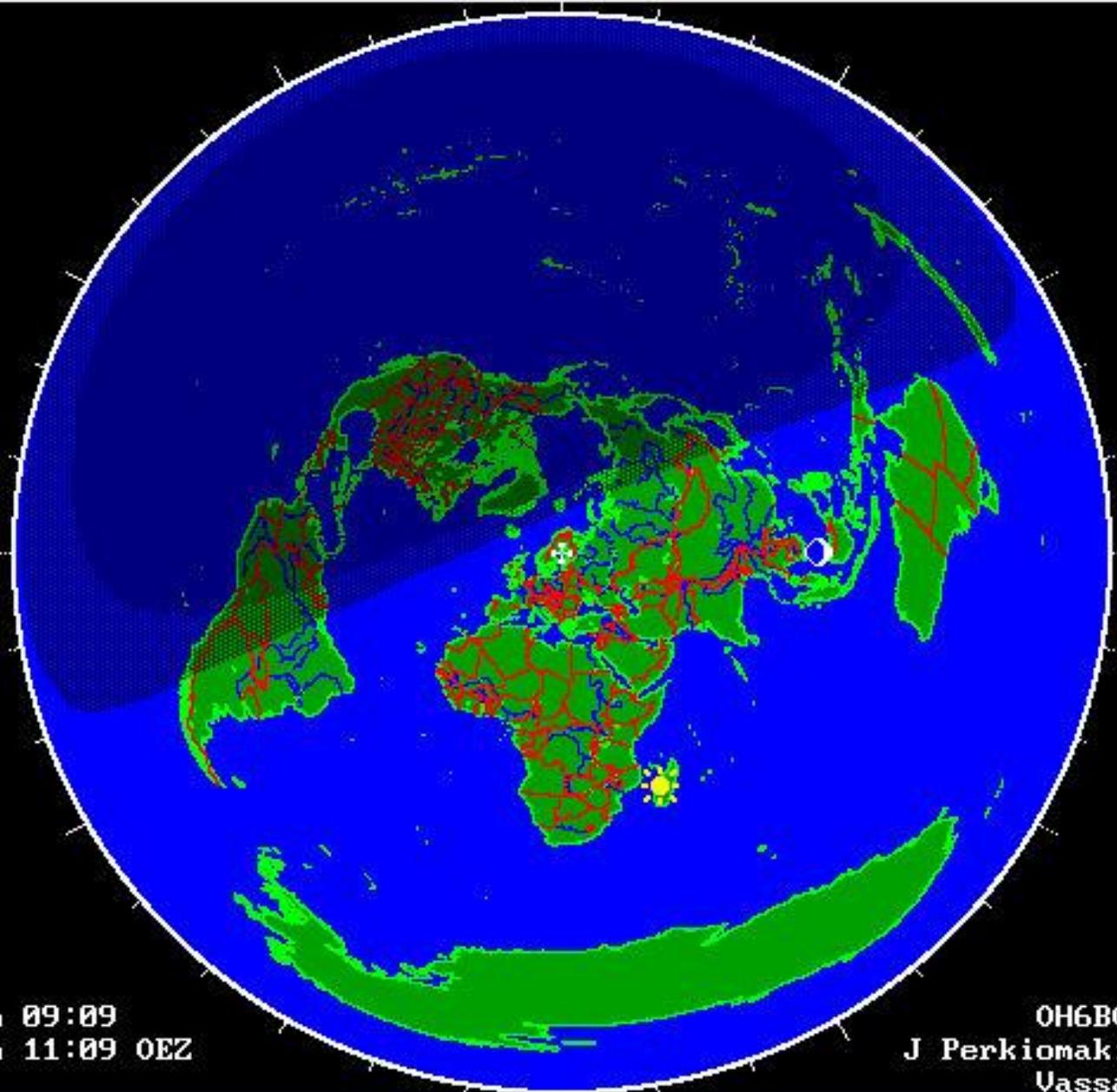
#4: Open-source callsign parser

- Your location data (= coordinates) and that of the DX are extremely critical components in any high-quality, personalized online ham-radio service
  - HF propagation predictions
    - VOACAP Online : Google Maps!; RBN/DX Summit spots: cannot be utilized without a parser!
  - Sunrise/sunset calculations
  - Distance and direction calculations
- CTY.DAT is available but the source code to leverage this resource is not readily available, let's in PHP or JavaScript or Perl
- QRZ.COM and others gather exact location data, and offer it, too, via an API; restrictions for free use.
- DX Summit: a proprietary callsign parser

#5: Propagation center @ DX Summit

- A full-fledged toolbox of propagation prediction tools and tailored grayline maps for DX and Contest purposes
- There is still a lot of untapped potential for VOACAP (W6ELProp?) prediction data
  - Overlaying coverage area predictions on Google Maps
  - Creating 24-hour all-band coverage maps by one click
  - Creating productive prediction charts for contest purposes (historical & VOACAP)
  - Creating an online prediction component which can be added on any website
    - E.g. for the websites of DXpeditions
  - Using Big Data by extracting historical spot data from RBN/DX Summit databases and use it to support HF predictions (especially low bands)
  - Offering a free API to developers and websites, using JSON
  - DX Summit: Help users work their missing countries with DX Summit spots pool and the prediction tools (sp/lp). Requires the user's list of missing countries, location, and an alert/highlight mechanism.

Left table — Zones 1–20:

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Left table — Zones 21–40:

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Questions?

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