

fairwaves

smart radio software

Open-source software for commercial
telecom baseband

**This is a short version of
the presentation.**

**Full version was presented at
SDR'11-WinnComm-Europe
and is available upon request.**

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Sergey Portnoy, Chairman of the Board

Presentation contents

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About Fairwaves LLC

- Moscow based company, **founded in Jan 2011** by Alexander Chemeris and Sergey Portnoy.
- Provides **software and hardware development services** in the area of SDR.
- Owns **world-leading IP** in LDPC error-correcting codes, smart antenna systems and wavelet filtering of RF signals.
- **Alexander Chemeris, CEO**, holds Master degree in Computer Science and during last 6 years was involved in various projects on VoIP, video-conferencing and wireless technologies as senior engineer, project manager and consultant, including many open-source projects.
- **Prof. Dr. Sergey Portnoy, Chairman of the Board**, received doctoral degree in 1992 for his achievements in cascaded modulation and coding schemes, nowadays known as OFDM. For the last 20 years he has been building wireless networks and promoting wireless access in Russia. At this moment he holds positions of WiMAX Forum Regional Director, Chairman of the board of ZAO Cedicom (equipment distribution), VP Strategy of ZAO Antares (emerging LTE operator).

Why open-source?

- Save money for companies
- Make the industry more efficient
- Stimulates and simplifies innovation
- Improves security and stability



Existing open-source software

- **GnuRadio**
 - The oldest and the most known open-source project in the area of SDR.
 - A framework, not an end-user solution.
 - Licensed under GPLv3, copyright assigned to FSF.
 - Uses mixed C & Python approach.
 - Community development model.
- **OpenBTS**
- **OsmocomBB**

Existing open-source software

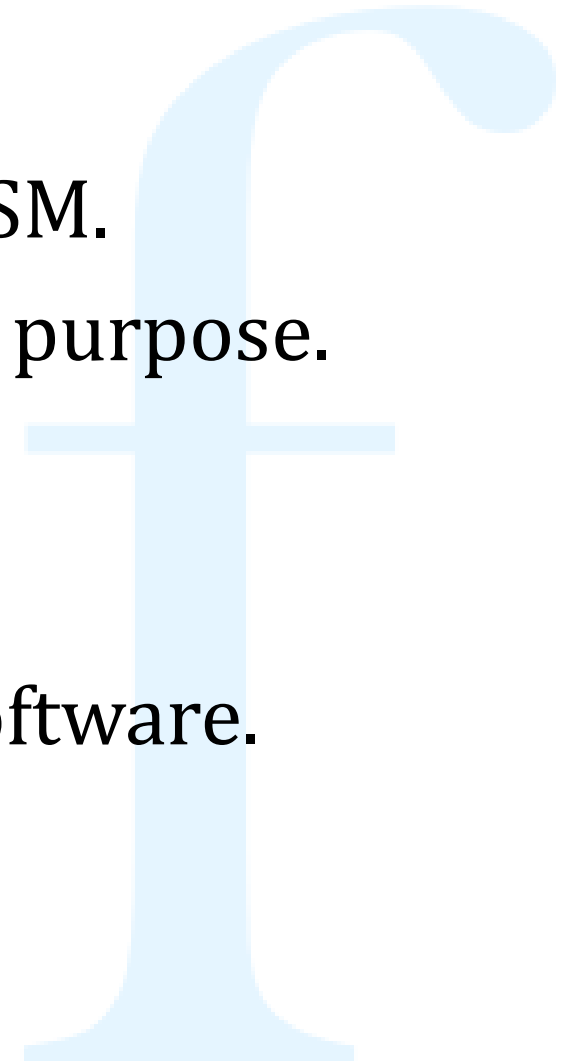
- GnuRadio
- OpenBTS
 - Open-source GSM BTS (base station).
 - Dual-licensed under AGPLv3 and proprietary license.
 - Open-source version copyright assigned to FSF.
 - Written in C++.
 - Single company development model.
- OsmocomBB

Existing open-source software

- GnuRadio
- OpenBTS
- OsmocomBB
 - Mobile phone side GSM baseband.
 - Licensed under GPLv2
 - Contributor's copyright preserved.
 - Written in C.
 - Community development model.

Issues with commercial use

- OpenBTS and OsmocomBB
 - Great software if you want GSM.
 - Hard to re-use for a different purpose.
- GnuRadio
 - Generic enough.
 - Hard to use in commercial software.



Issues with GnuRadio commercial use

- Non-trivial to extend with proprietary modules.
- Non-trivial to embed in a proprietary system.
- GPL is not understood well in commercial world, leads to FUD.
- Almost non-existent documentation.
- Python+C split is hard for a newcomer.
- Not very well suited for digital systems.
- No good IDE.
- Weak commercial support.
- PHY processing only.



Solutions?

- Clearly define how to create proprietary systems:
 - Use LGPL instead of GPL or create clear IPC API.
 - Provide examples how to use with proprietary software.
- Clear and comprehensive documentation.
- Only C/C++ (no Python).
- Commercial support with indemnification.
- Complete L1+L2 stacks (at least examples).
- Own IDE or integration with IDEs.

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