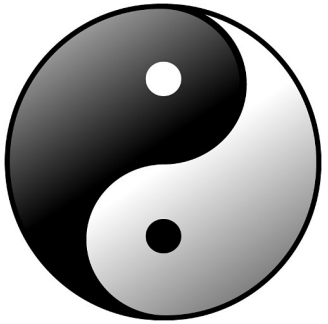
# 12 Years With SIP And Kamailio
## - Sharing Some of My Experiences



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# Outline

- Getting started with Kamailio for new users
- Sharing some of my experiences
- Versitility of Kamailio as proxy and 'SBC'
- Kamailio+RTPEngine to provide some B2B capabilities – media control

# Work With SIP and Kamailio

- Built VoIP systems for encrypted audio+video calls etc.: client side SIP stack and SIP server
- Used Kamailio for
  - Registration, dialog control, accounting, authentication
  - Presence
  - Routing logic
  - Dispatcher / redirect server
  - NAT traversal / media relay
  - Some 'SBC' functionalities
  - ...

# Driving Kamailio

- Low level SIP knowledge is a must to
  - get the SIP messages right
  - ensure correct routing
  - fix interop problems from non-compliant devices
- Gives you a lot of control on the SIP messages
- Using Kamailio is like programming on a SIP platform
- Very different from Asterisk/FreeSwitch/SBCs

# Getting Started with Kamailio

- The SIP 'bible': RFC3261
- Start from example cfg file as template
- Try it out – the most effective way to learn
- Troubleshoot: logging; debugging facilities; captures e.g. tcpdump etc.
- When getting stuck, you can always check the source code – the beauty of open source!

# Getting Help and Training

- Very responsive and helpful community
  - sr-users mailing list
  - Ask specific questions
  - Describe your problem clearly
    - Write it down you may end up finding the answer yourself
- Advanced Training Course
  - Best to have some experiences first
  - And most importantly ...

# Common Problems for a Proxy

- SIP messaging problems from 3rd party devices
  - Incorrect R-URI of ACK and in-dialog requests
- The temptation to fix/hide issues on Kamailio
  - Impact on other SIP devices / customers?
  - Putting the 'tweaks' under switches: what is the impact on testing/maintaining/supporting?
  - Actually, is it better to fix the 3rd party device?

# Versatility of Kamailio

- High throughput *PROXY* by heart
  - Dispatcher, routing logic …
  - Complex - many modules to provide functionalities
  - Simple - stateless mode e.g. for HA
- Kamailio as an *SBC*: Alex Balashov
  - http://www.evaristesys.com/blog/kamailio-as-an-sbc-five-years-on/
  - What do you really need from an 'SBC'?

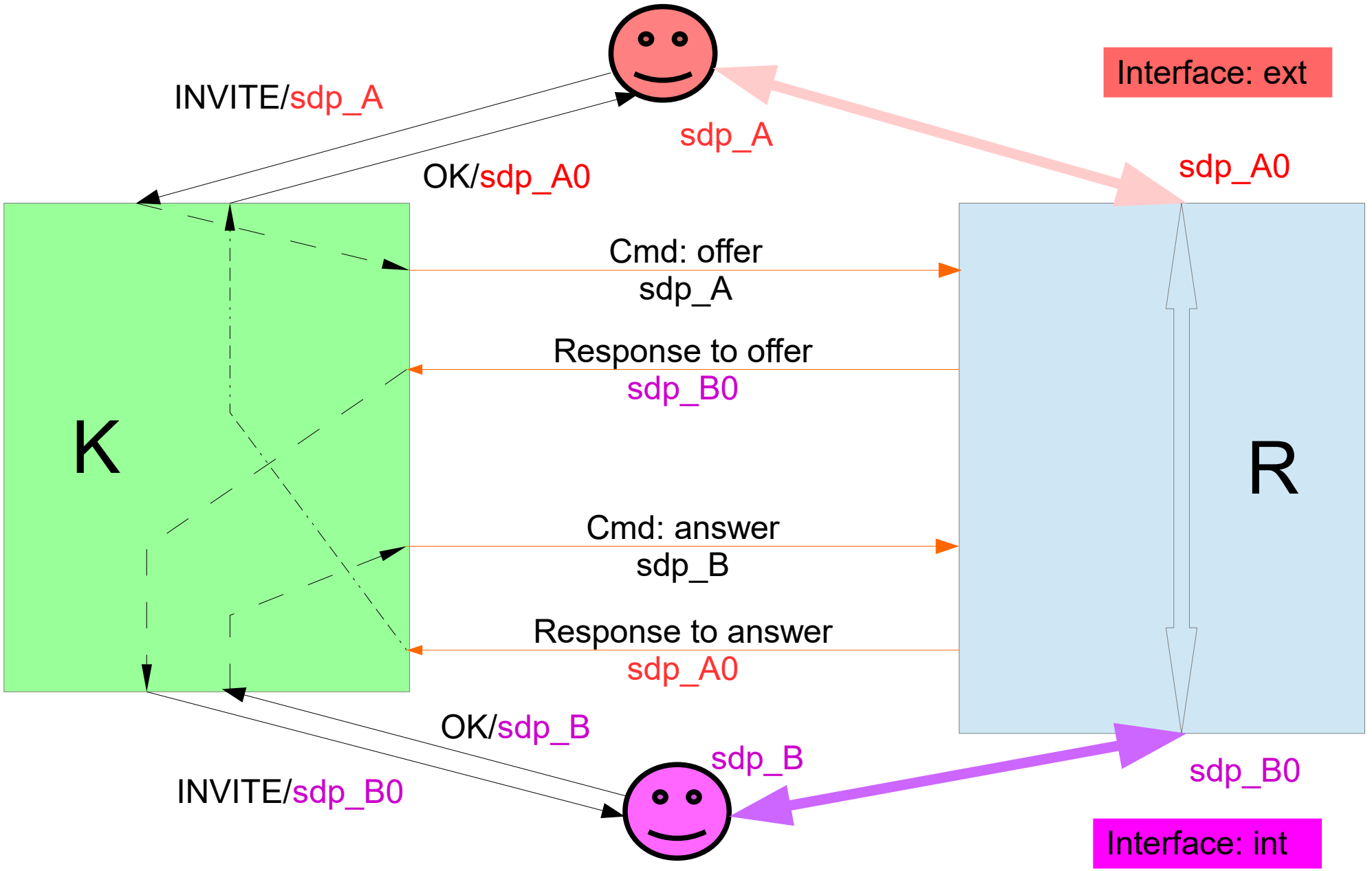
# B2B Features By Proxies

- Kamailio
  - Topology hiding modules – still a proxy
  - Dialog module – can send BYE
  - UAC module – not quite a proxy any more
- RTPEngine
  - High throughput using Kernel mode
  - Media handling: e.g. en/decryption, transcoding...
  - Separate call legs that can be processed differently

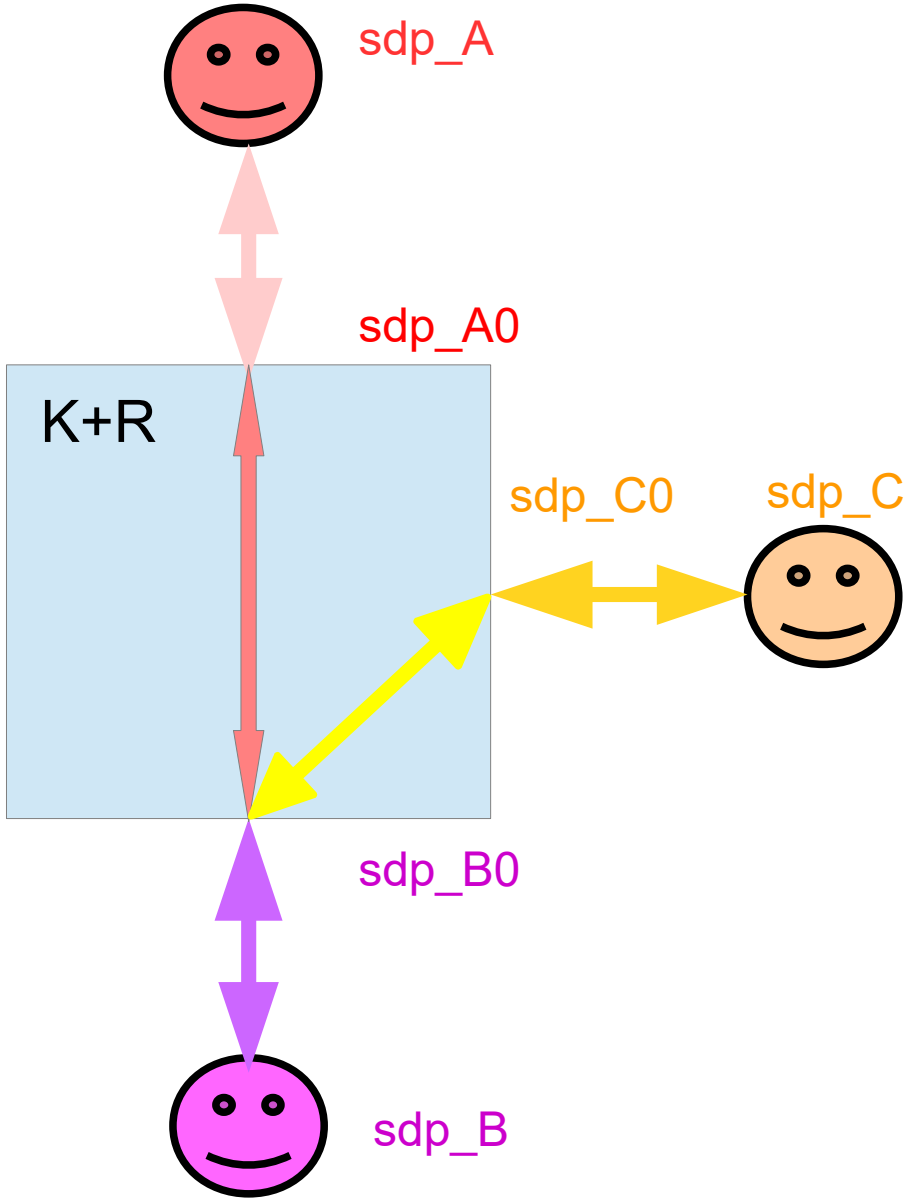
# Call Handling By K+R

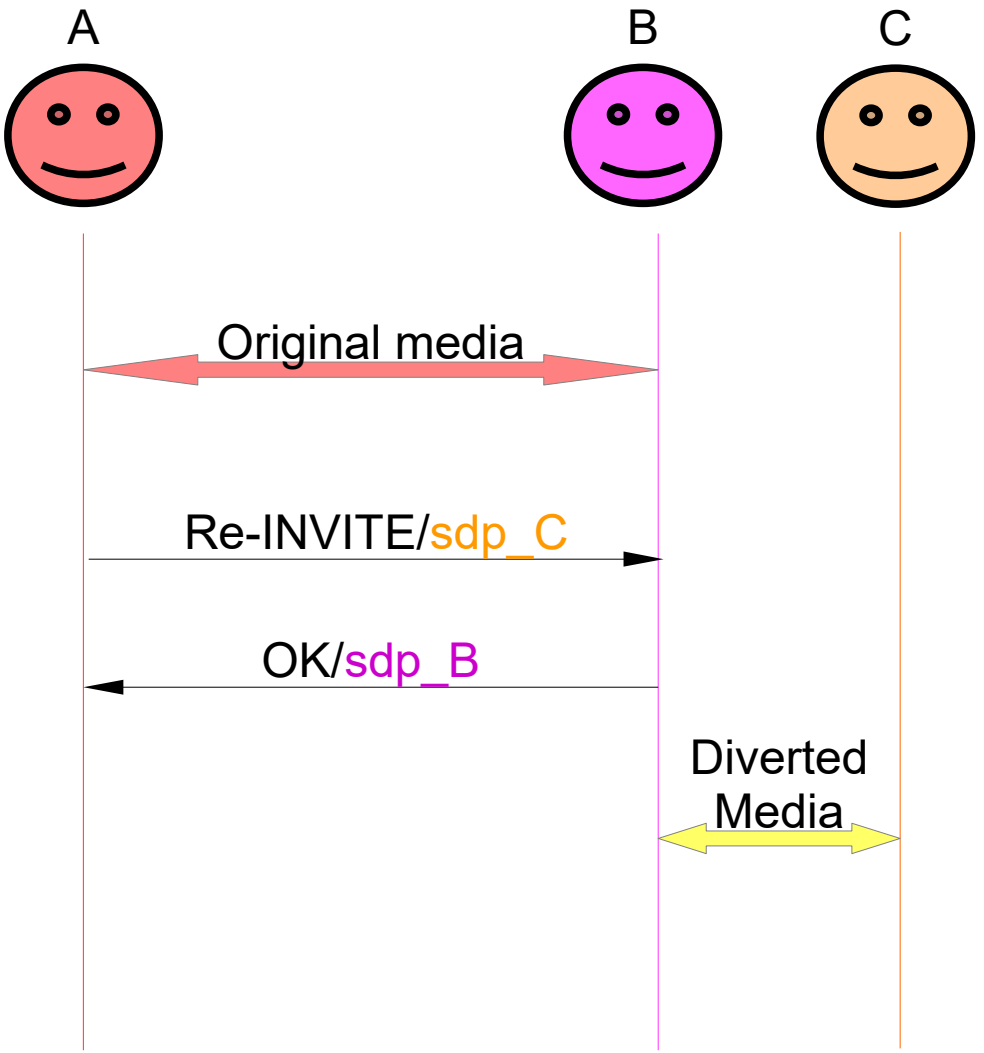
- Kamailio handles SIP signalling
  - Media session negotiation: SIP/SDP
- RTPEngine handles media
  - Modifies SDP payloads to insert itself in the media stream
  - Create and bridge call legs: RTP etc.

# Example1: Call Establishment



# Example2: Media Diversion



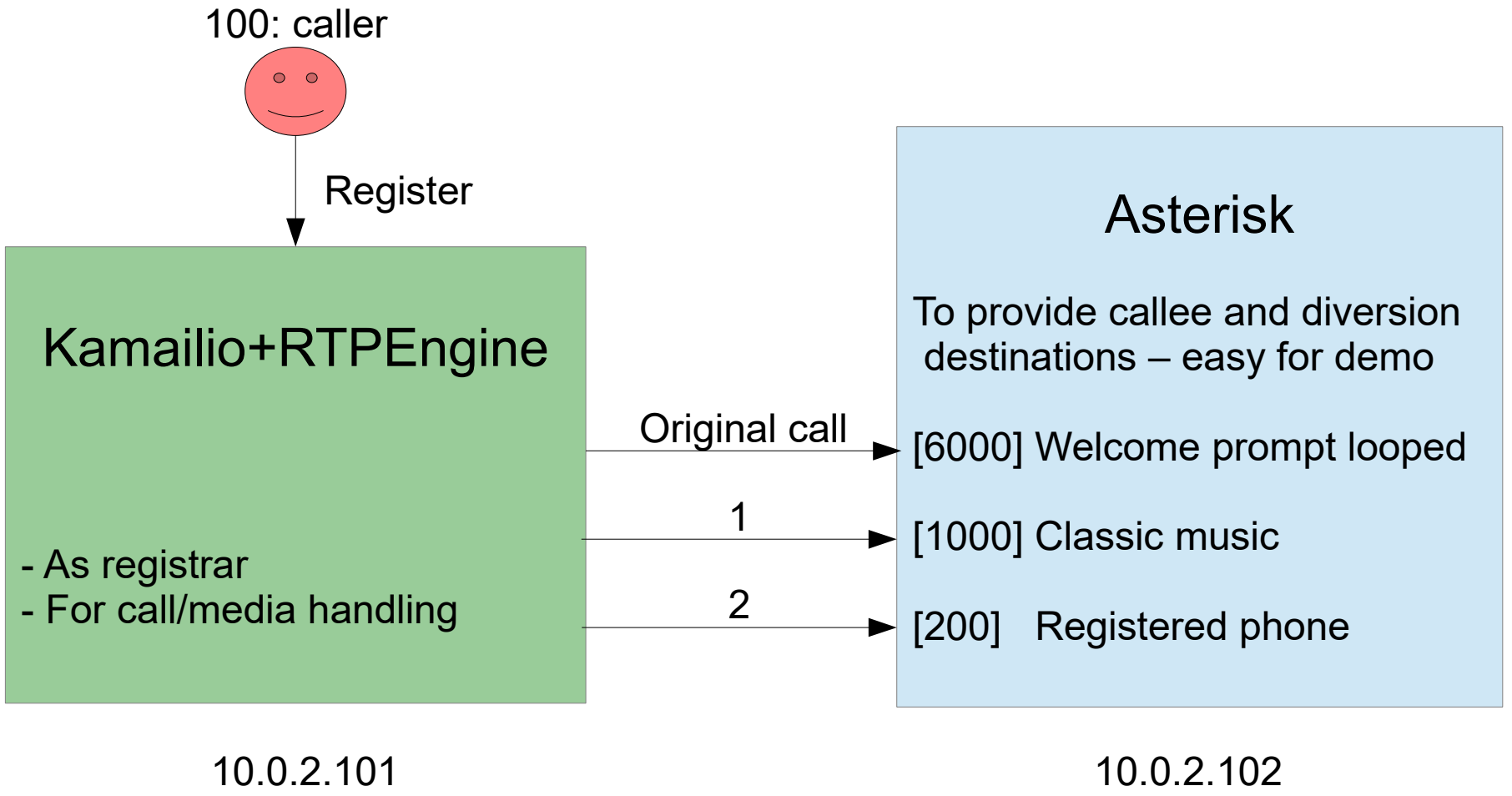
# Obvious Observations

- RTPEngine creates and bridges call legs
- RTPEngine manoeuvres the media on commands from Kamailio
- RTPEngine doesn't care/know what Kamailio has received
- So Kamailio can trigger actions on media
  - Even if it didn't receive the SIP messages
- UAC module can be used to create new media end point

# Use Cases

- Use proxies (K+R) to modify media streams without introducing other components
  - Maintain the high throughput of proxies
  - No external support needed as all done internally
  - Can happen on any trigger
- What Can You Do With It
  - Call a 3rd party during a call
  - Put angry caller in 'quiet room' (plays classic music)
  - Play ads to caller on timer (every a few minutes)
  - Anything better?

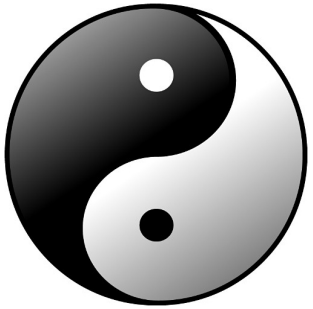
# Demo


100: caller
Register
Kamailio+RTPEngine
- As registrar
- For call/media handling
Original call
1
2
Asterisk
To provide callee and diversion destinations – easy for demo
[6000] Welcome prompt looped
[1000] Classic music
[200] Registered phone
10.0.2.101
10.0.2.102

# Finally ...

- Questions?
- Better ideas?

*Thank you!*



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