



## P2P Video for Wikipedia

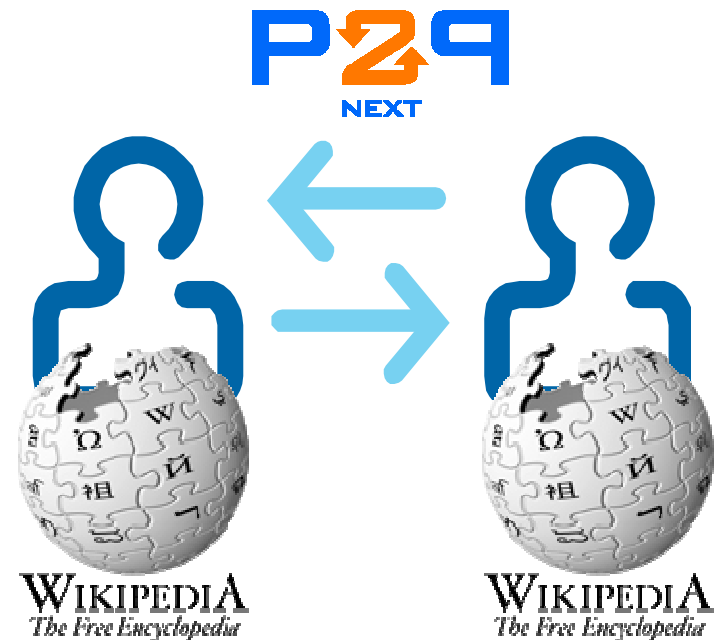
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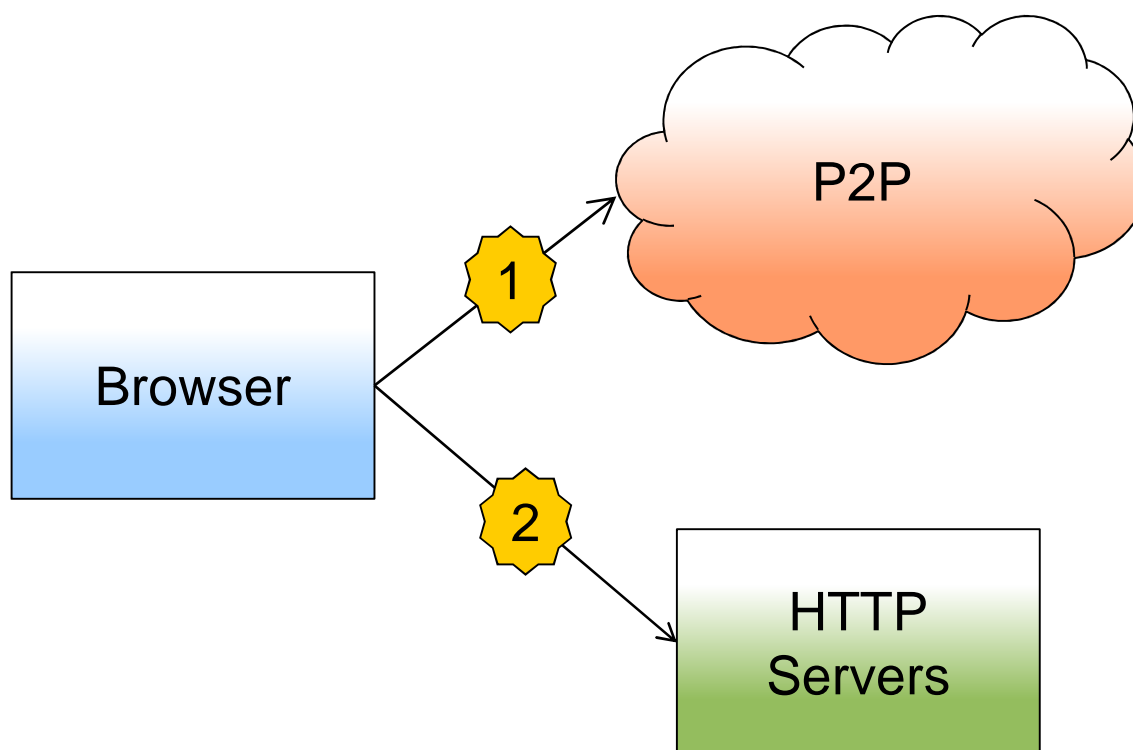
## ■ Introduction

- Putting video on Wikipedia requires lots of bandwidth
- Idea: Use Peer-to-Peer
  - Viewers donate bandwidth while watching
  - Open for any bandwidth donation
- Use P2P-Next platform:
  - P2P video-on-demand (and live)
  - Open source (EU research project)
  - Use proven BitTorrent technology



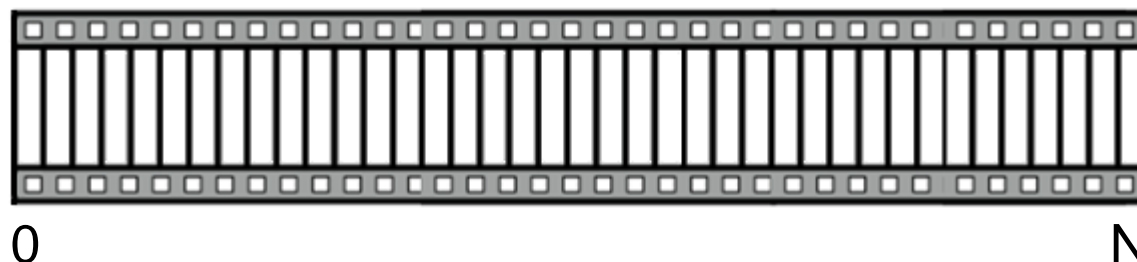
## ■ Goals

- Browser prefers P2P for video
- Fallback to HTTP
- Little changes to Wiki infrastructure



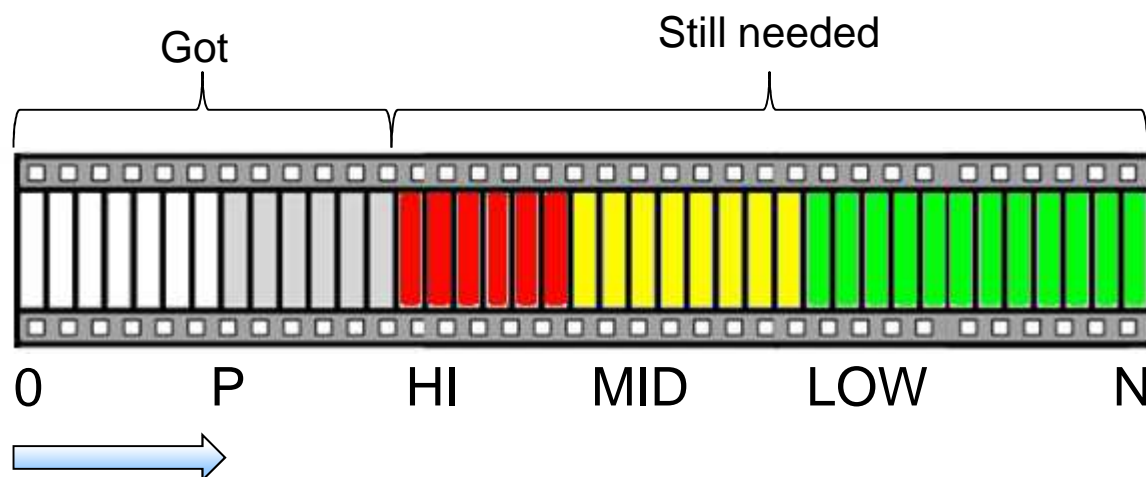
## ■ BitTorrent basics

- Content divided into fixed-sized **pieces**: 0..N



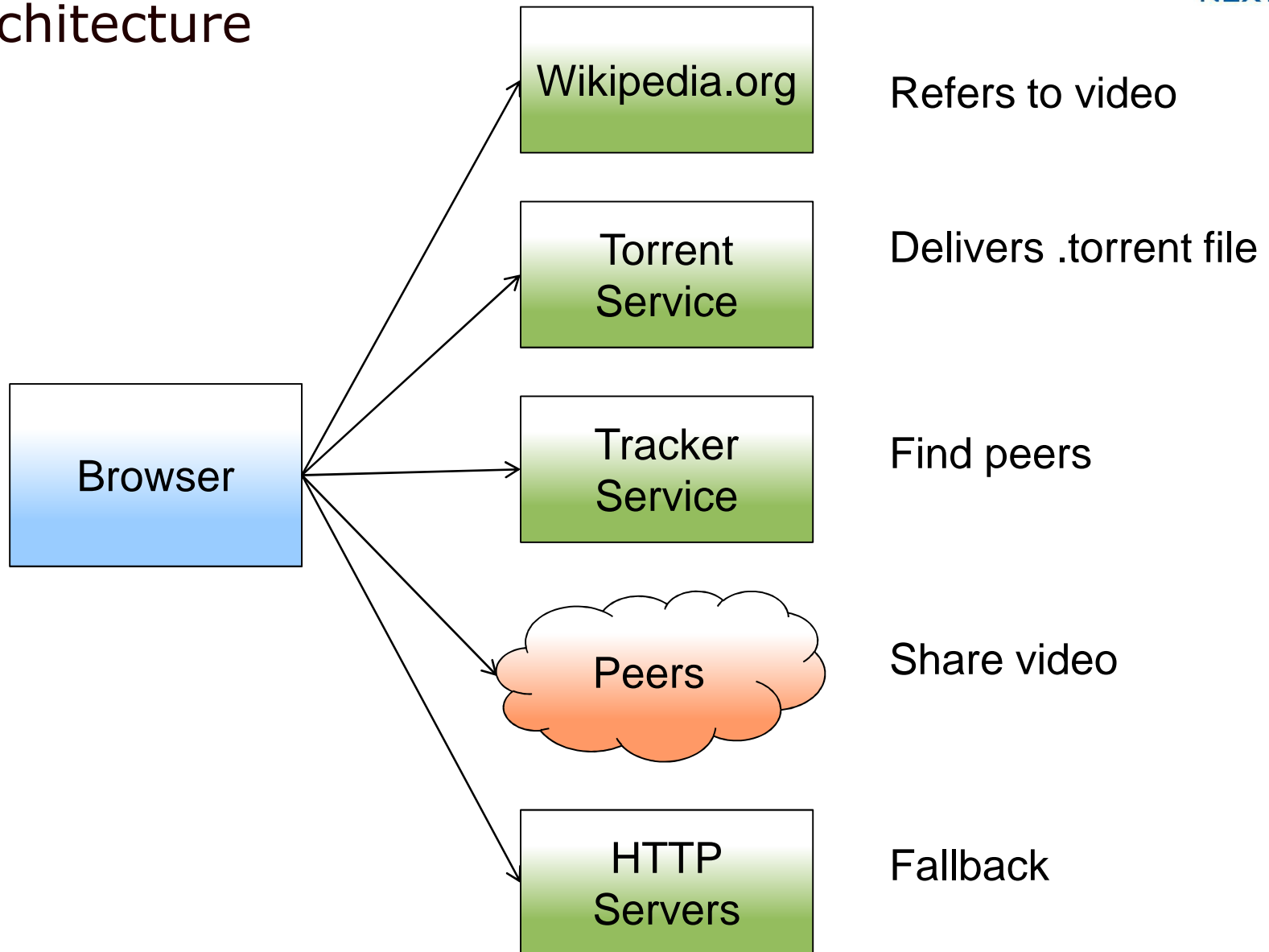
- Clients exchange pieces following economic model
  - Rarest-first (Low Supply -> High demand)
  - **Not in order!**
- Bootstrap and security data in **.torrent file**:
  - Address of peer **tracker**
  - Cryptographic **hash** of every piece (integrity checking)

## ■ P2P-Next video-on-demand



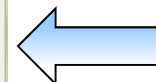
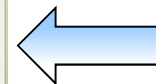
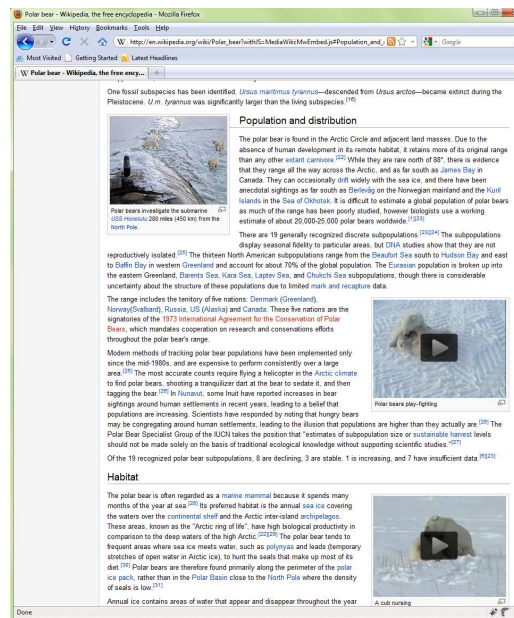
- Divide set of needed pieces into:
  - **High**: always, in-order
  - **Mid**: if no high, rarest-first
  - **Low**: if no high or mid, rarest first
- Use new **Give-to-Get** algorithm for uploading
  - Upload to best forwarders

## ■ Architecture

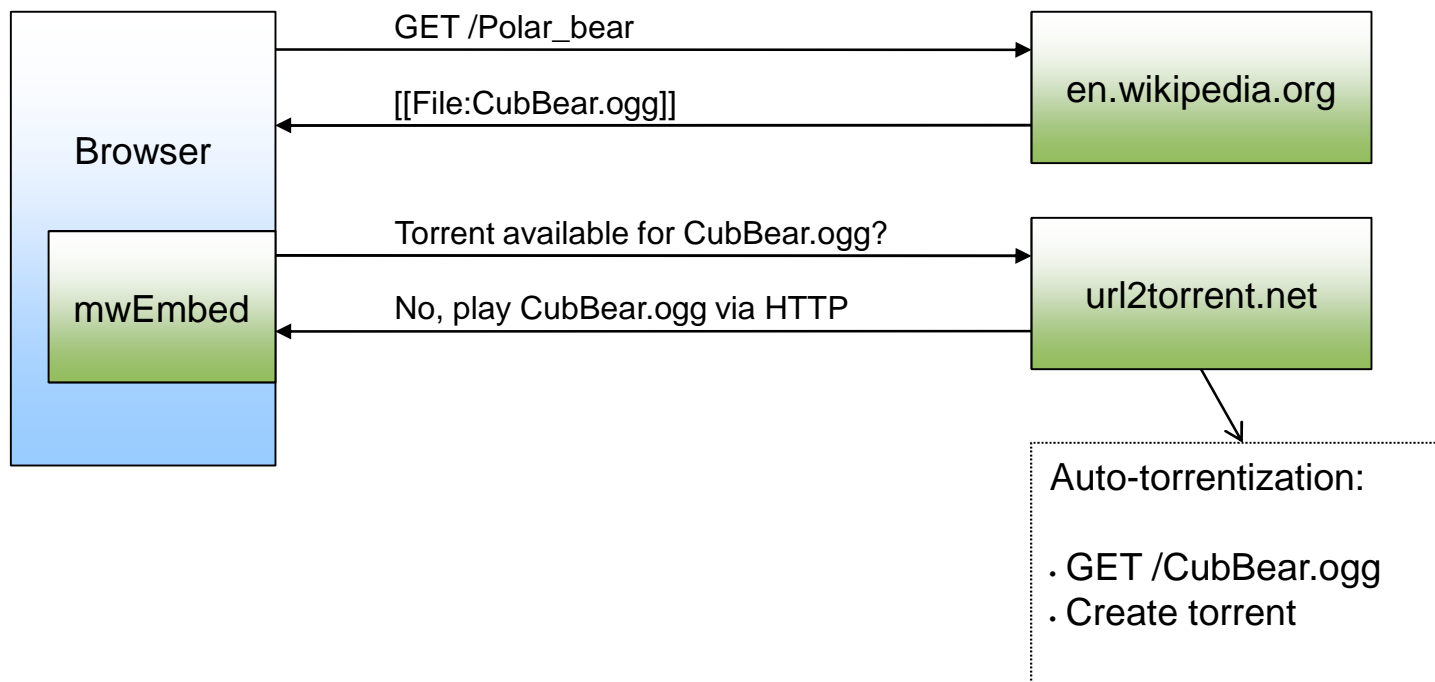


# End-user perspective

- Install SwarmPlayer
  - [swarmplayer.p2p-next.org](http://swarmplayer.p2p-next.org)
- Visit Wikipedia page with special flag:
  - [en.wikipedia.org/wiki/Polar\\_bear?withJS=MediaWiki:MwEmbed.js](http://en.wikipedia.org/wiki/Polar_bear?withJS=MediaWiki:MwEmbed.js)
  - Or enable “mwEmbed support” in Preferences/Gadgets
- Press Play!

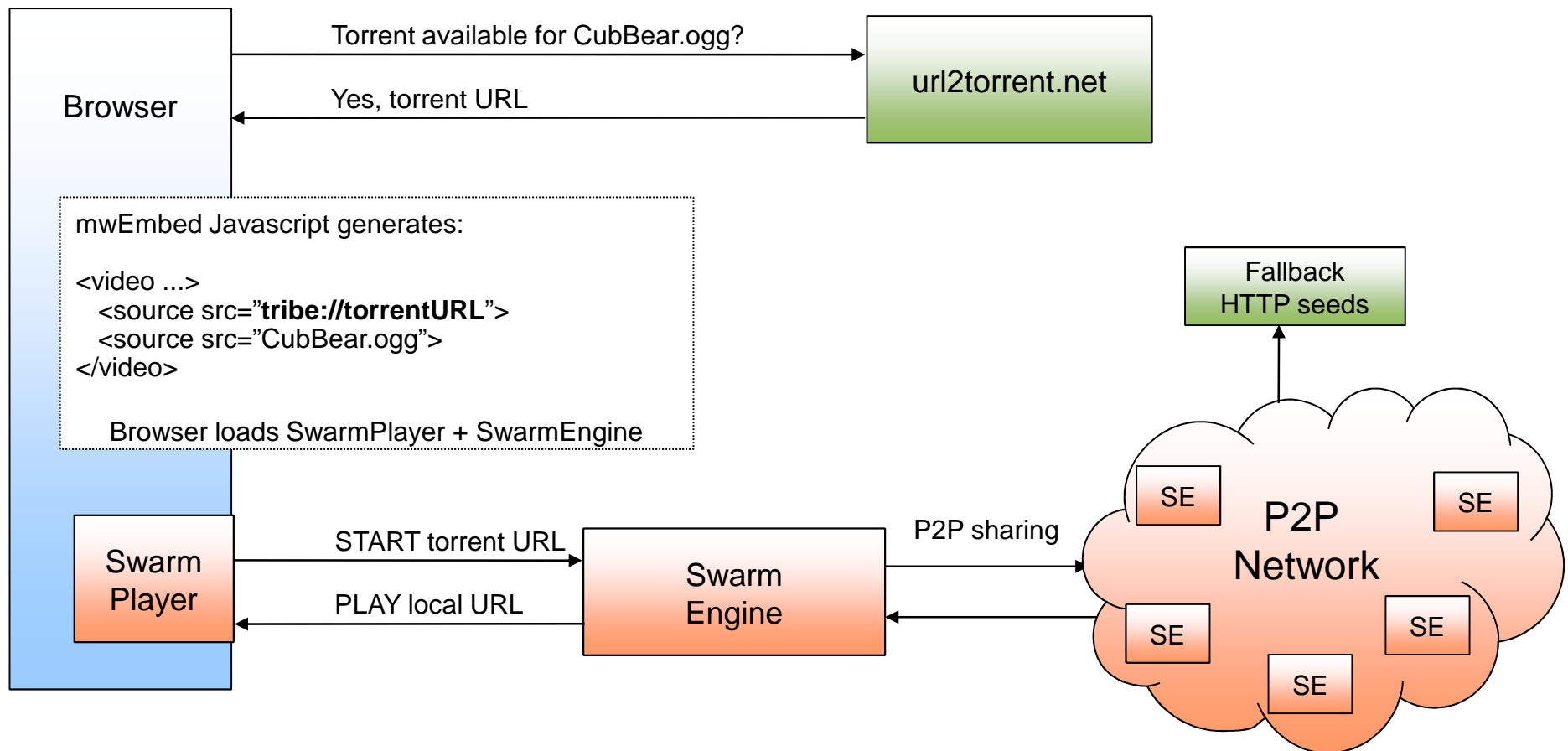


## ■ Under the hood: First visitor





# Under the hood: Next visitor



## ■ Implementation

- `<video>`
  - `<source src="tribe://torrentURL">`
  - `<source src="CubBear.ogg">`
- MediaWiki `mwEmbed` triggers SwarmPlayer:
  - Javascript-based extension for Firefox +
  - Python-based P2P-Next engine
  - Also IE8 solution
- Robust:
  - Fallback to HTTP if P2P fails
  - Or if P2P can't download fast enough ( $<$  bitrate)



## ■ Summary

- More info, sources, binaries?
  - Visit [swarmplayer.p2p-next.org](http://swarmplayer.p2p-next.org)!
- Acknowledgements
  - **European Community's** Seventh Framework Programme in the P2P-Next project under grant agreement no 216217.



