



P2P Video for Wikipedia

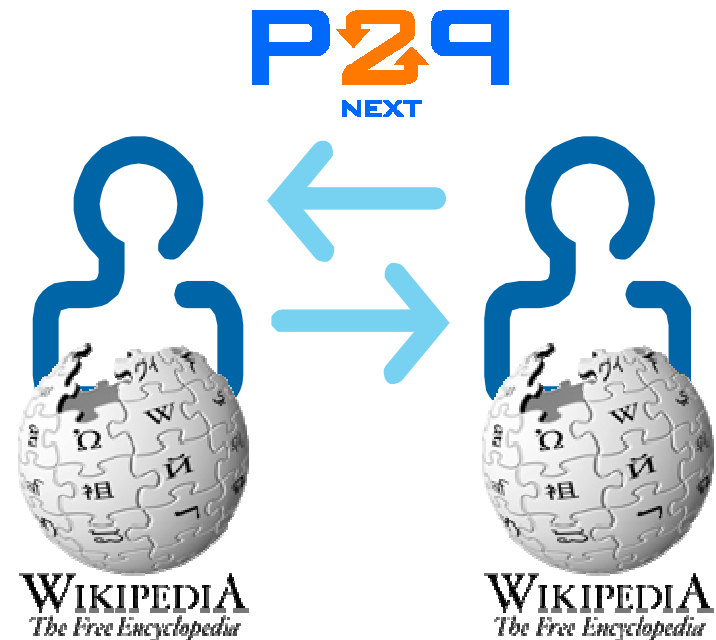
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P2P-Next / Delft University of Technology[†]

Wikimedia Foundation, Inc. [‡]

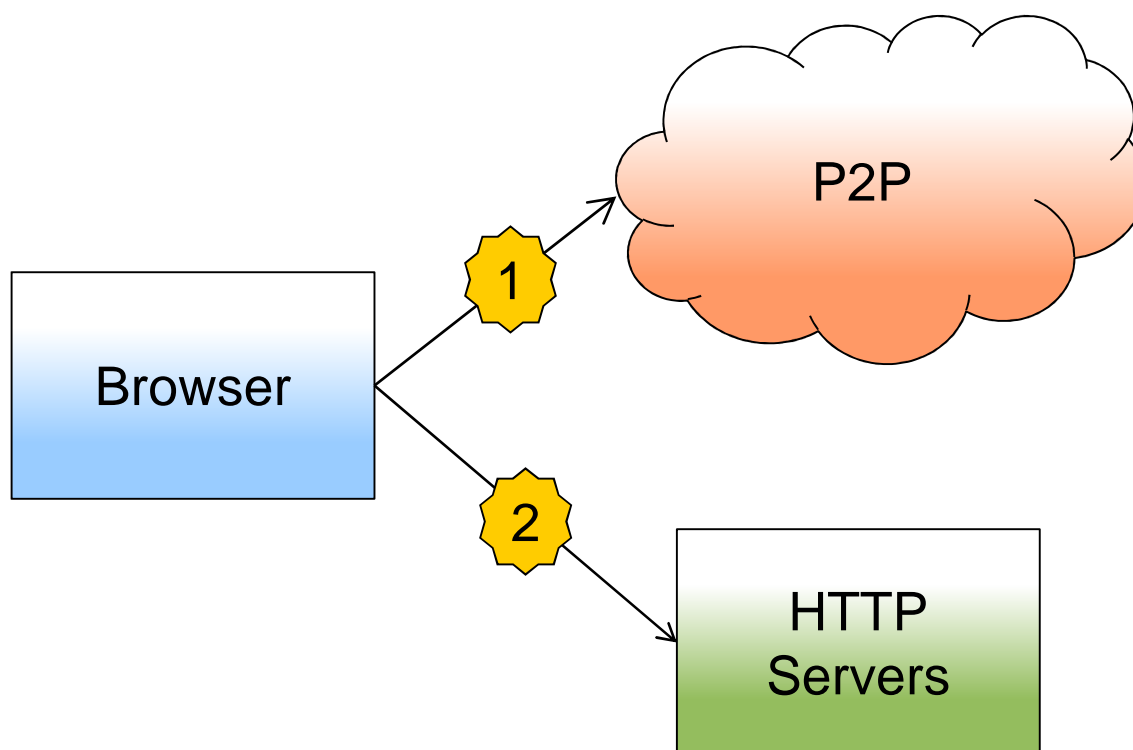
■ Introduction

- 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



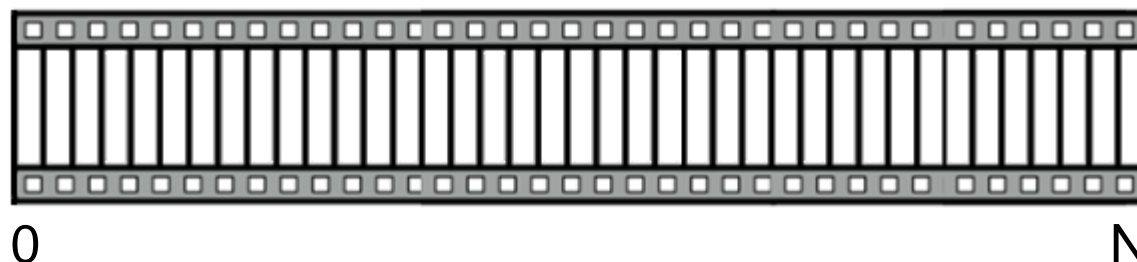
■ Goals

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



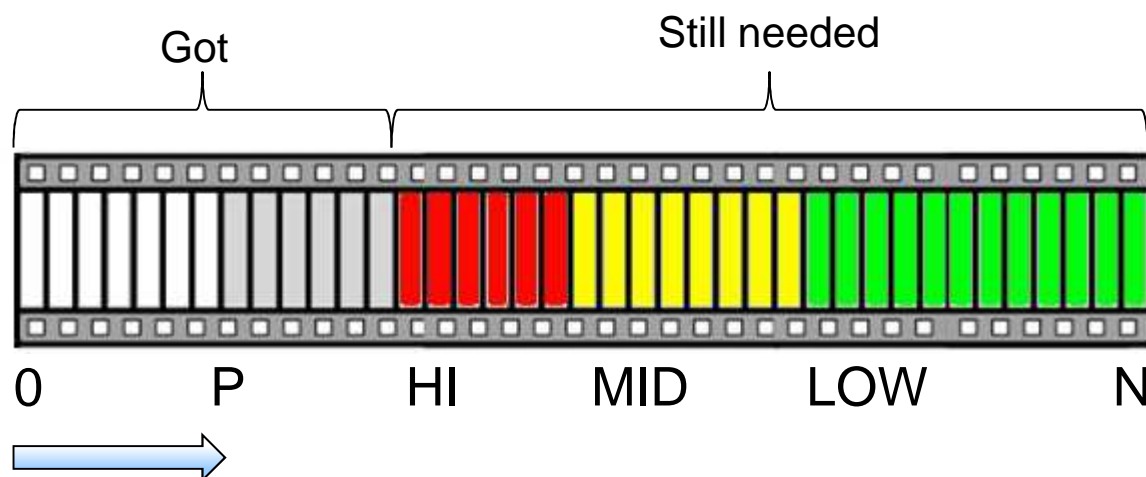
■ BitTorrent basics

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



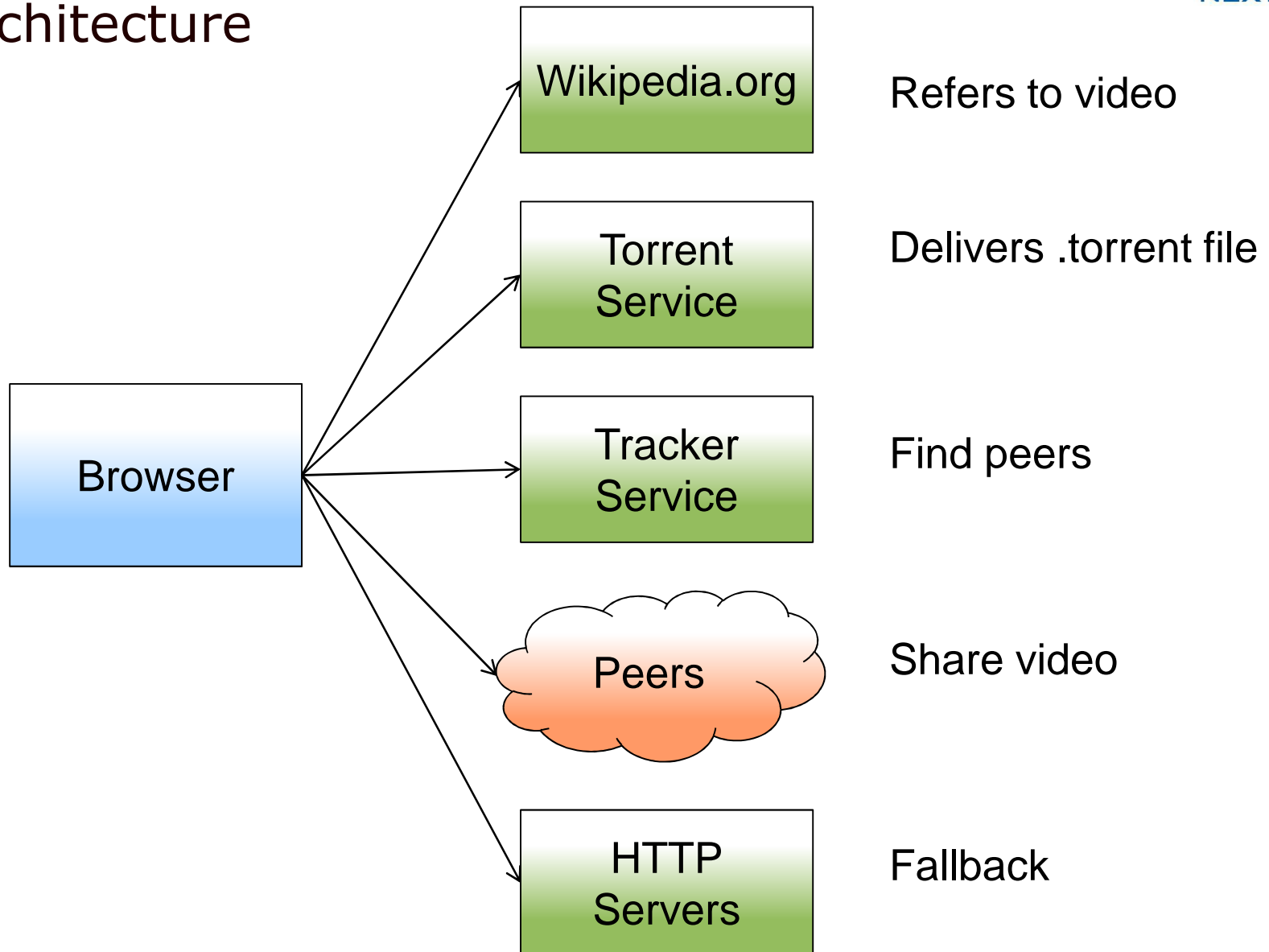
- Clients exchange pieces following economic model
 - Rarest-first (Low Supply -> High demand)
 - **Not in order!**
- Bootstrap and security data in **.torrent file**:
 - Address of peer **tracker**
 - Cryptographic **hash** of every piece (integrity checking)

■ P2P-Next video-on-demand



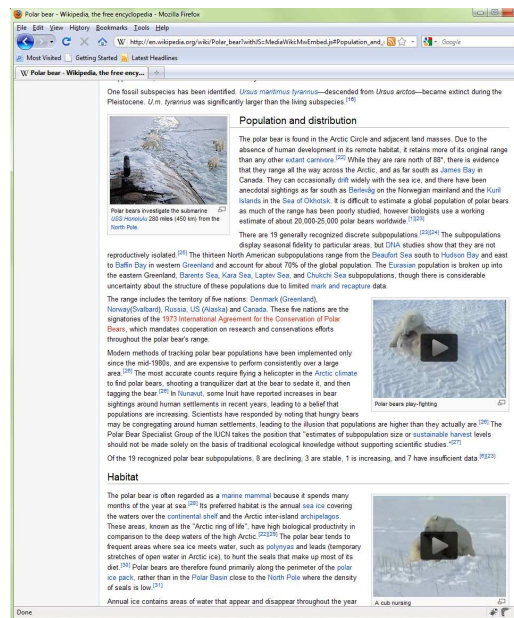
- Divide set of needed pieces into:
 - **High:** always, in-order
 - **Mid:** if no high, rarest-first
 - **Low:** if no high or mid, rarest first
- Use new **Give-to-Get** algorithm for uploading
 - Upload to best forwarders

Architecture

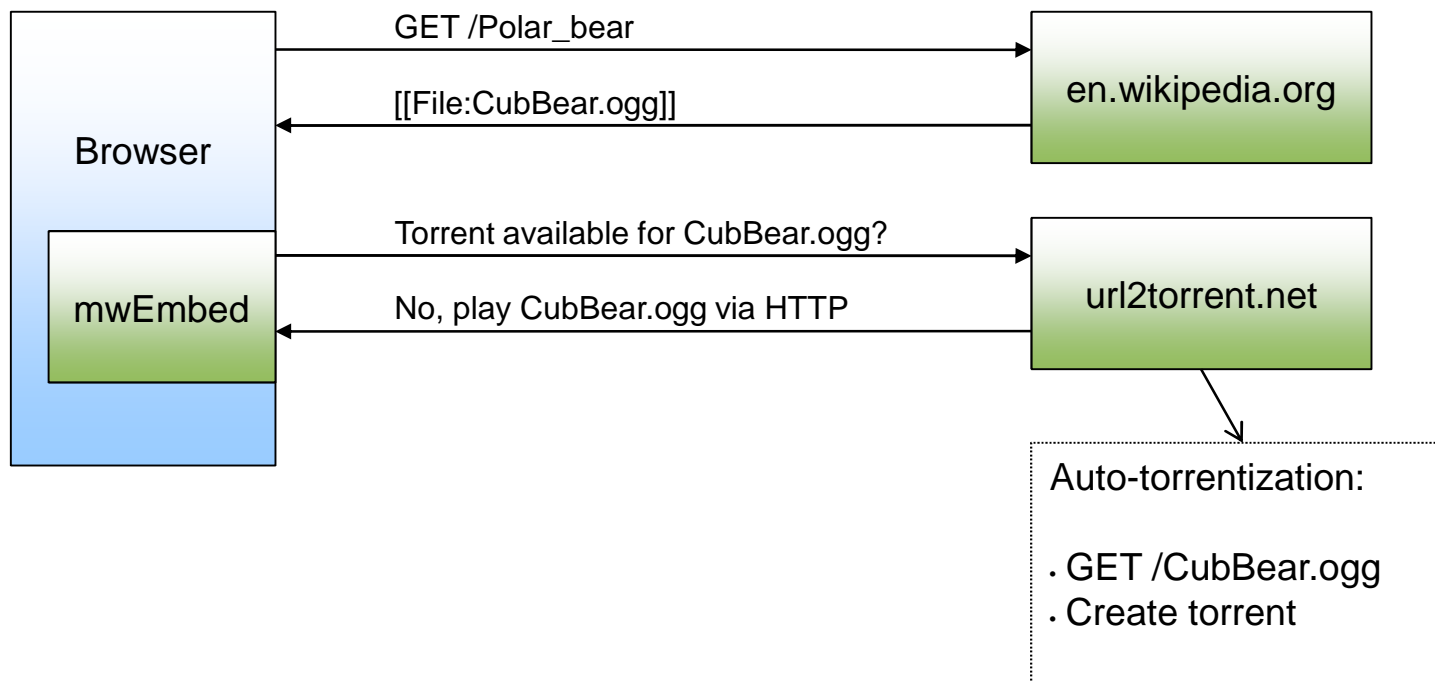


End-user perspective

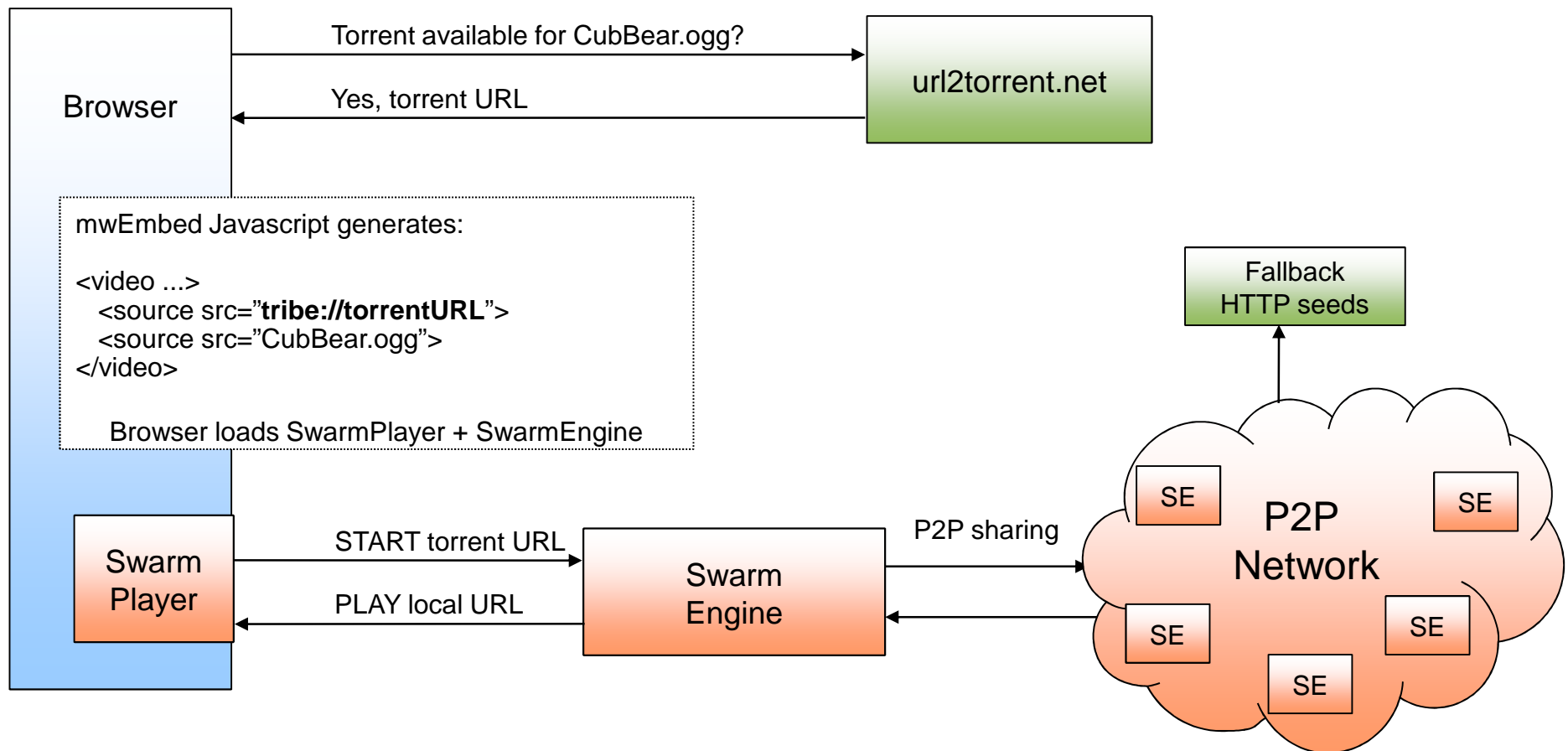
- Install SwarmPlayer
 - swarmplayer.p2p-next.org
- Visit Wikipedia page with special flag:
 - en.wikipedia.org/wiki/Polar_bear?withJS=MediaWiki:MwEmbed.js
 - Or enable “mwEmbed support” in Preferences/Gadgets
- Press Play!



■ 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!
- Acknowledgements
 - **European Community**'s Seventh Framework Programme in the P2P-Next project under grant agreement no 216217.



Demo

