IETF P2P Mechanisms

Wes Eddy / TSV AD
MTI Systems
wes@mti-systems.com

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Purpose Today

- The TSV area includes several WGs working on protocols that assist in building P2P apps
- Think about the P2P protocol/mechanism toolset being developed in IETF:
  - Much of the work is being done in TSV Area WGs
  - Is the toolbox complete for building P2P apps and services? What's missing?
  - Does it meet needs of users, providers, etc?

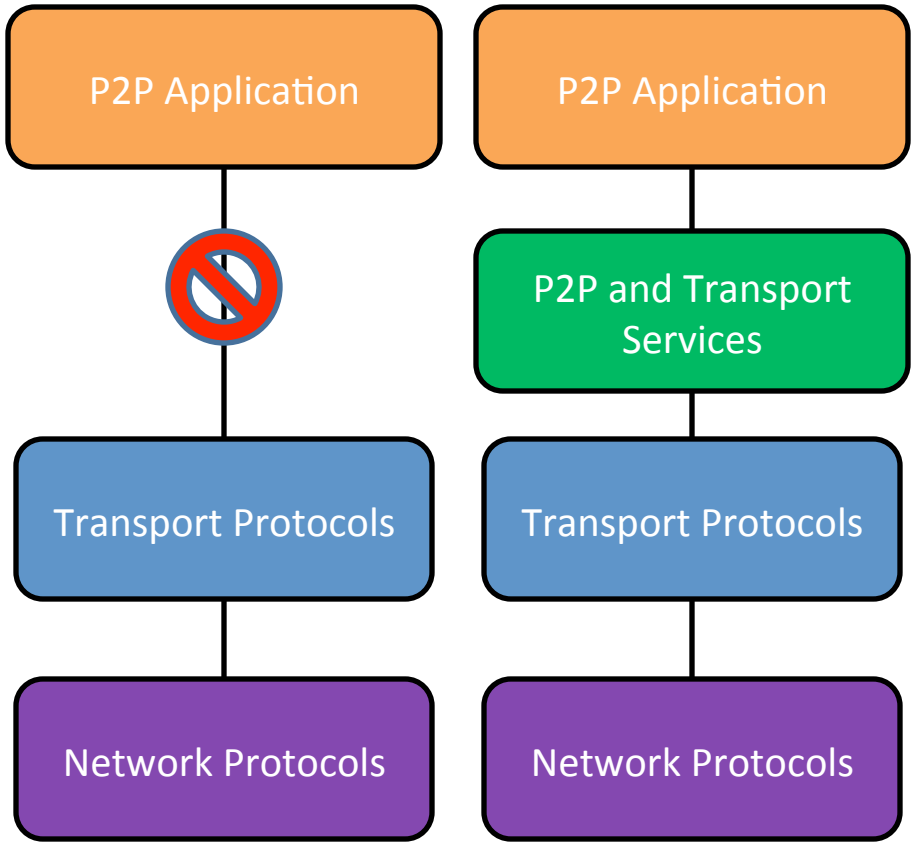
Primary P2P IETF/IRTF Groups

- Suggest reading: “The Peer-to-Peer Invasion”, IETF Journal, volume 6, issue 1, June 2010:
  - http://isoc.org/wp/ietfjournal/?p=1746#more-1746

- IETF P2P WGs:
  - TSV Area:
    - P2P-Focused: ALTO, DECADE, LEDBAT, PPSP
    - P2P-Related: BEHAVE (for STUN, TURN, NAT behavior)
  - RAI Area:
    - P2P-Focused: P2PSIP
    - P2P-Related: MMUSIC (for ICE)
- IRTF – P2PRG

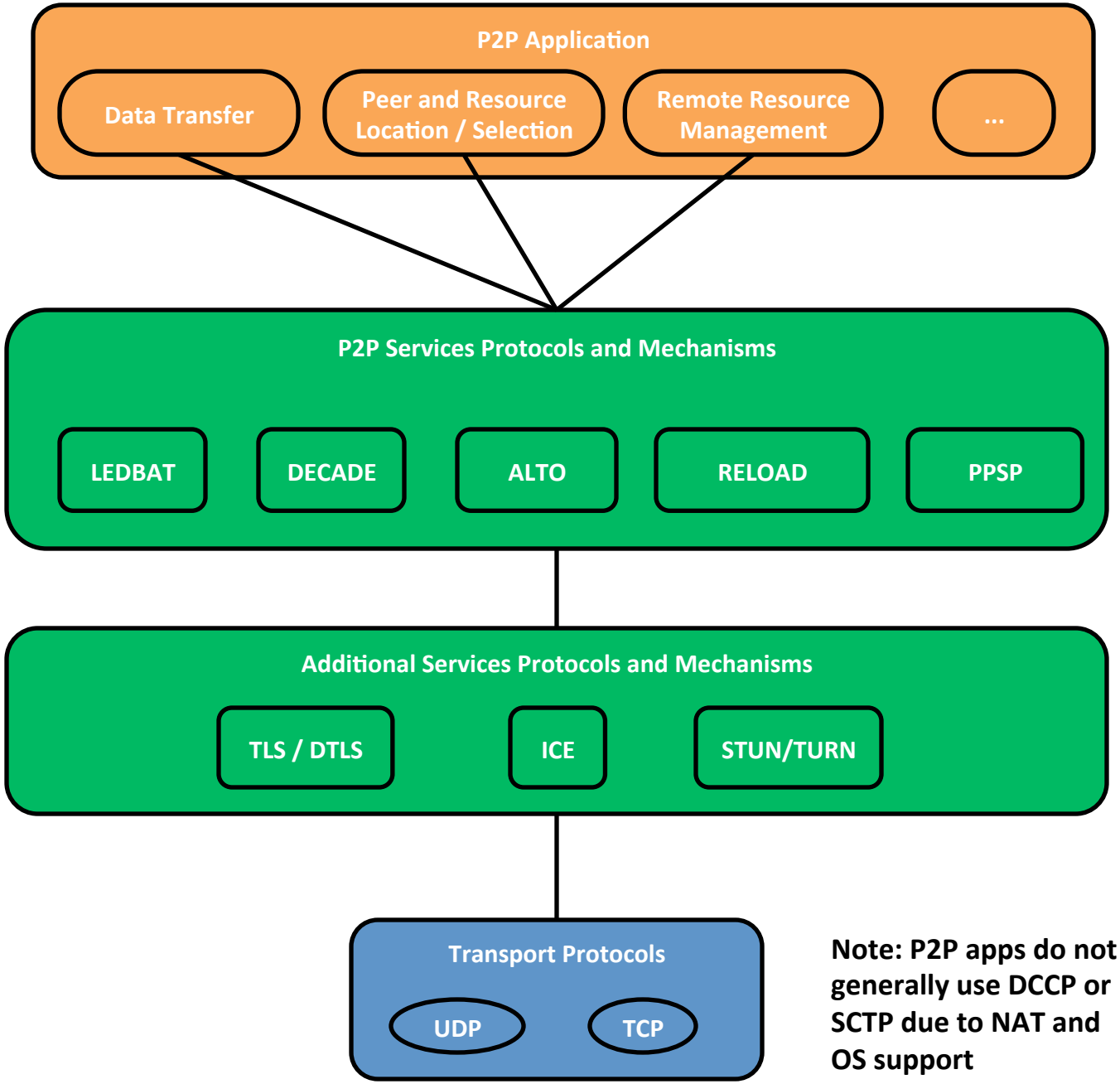
Building P2P Applications

- Typically not just simply run directly over transport protocols
- Other protocols and libraries providing additional services sit in between



Note

- The diagrams in this presentation are simple approximations
  - The semantics aren't strong
  - Don't take them literally

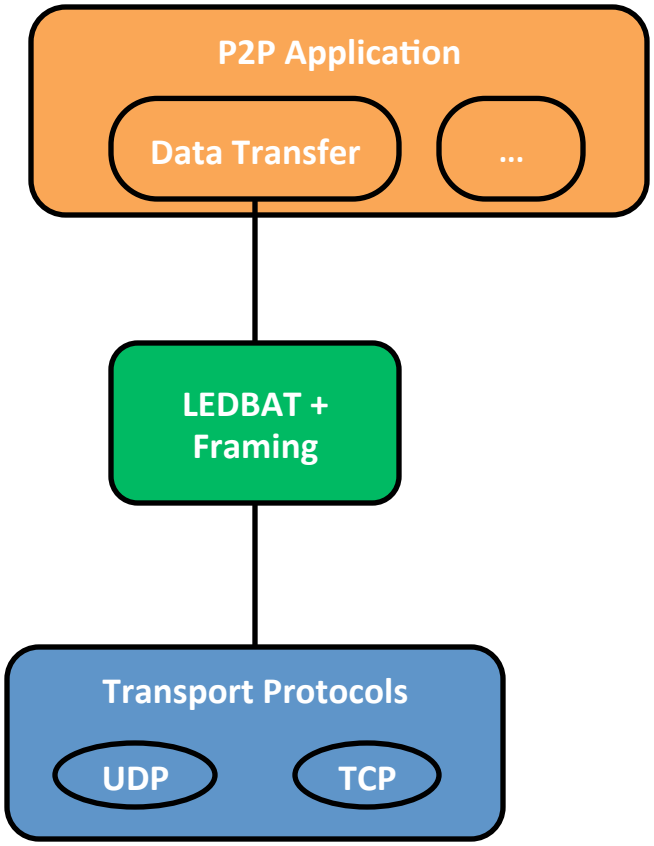


Note: Some apps also need reputation and identity management, among other functions

Note: P2P apps do not generally use DCCP or SCTP due to NAT and OS support

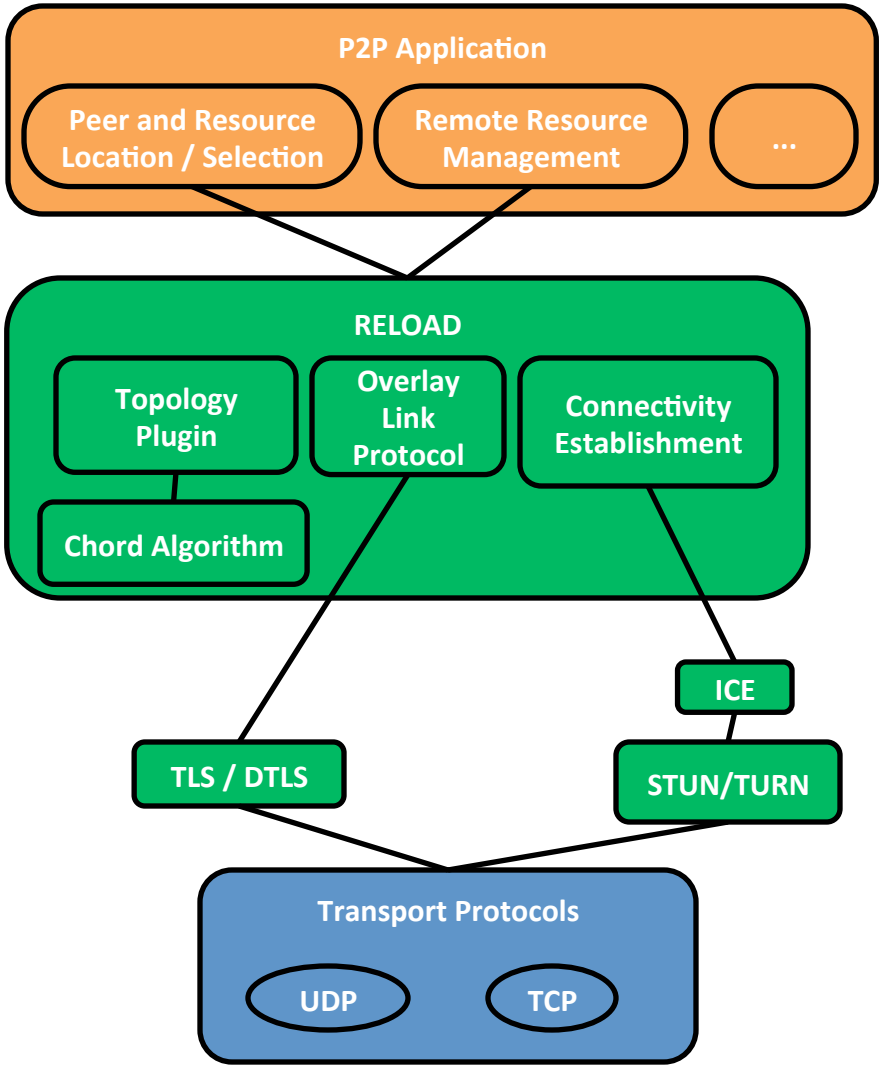
LEDBAT

- Pretty much finished
- Goals:
  - Develop an experimental congestion control mechanism that minimizes delay impact on other competing traffic (so bulk transfers can coexist peacefully with delay-sensitive real-time traffic)
  - Generic algorithm, not specific to a given transport framing



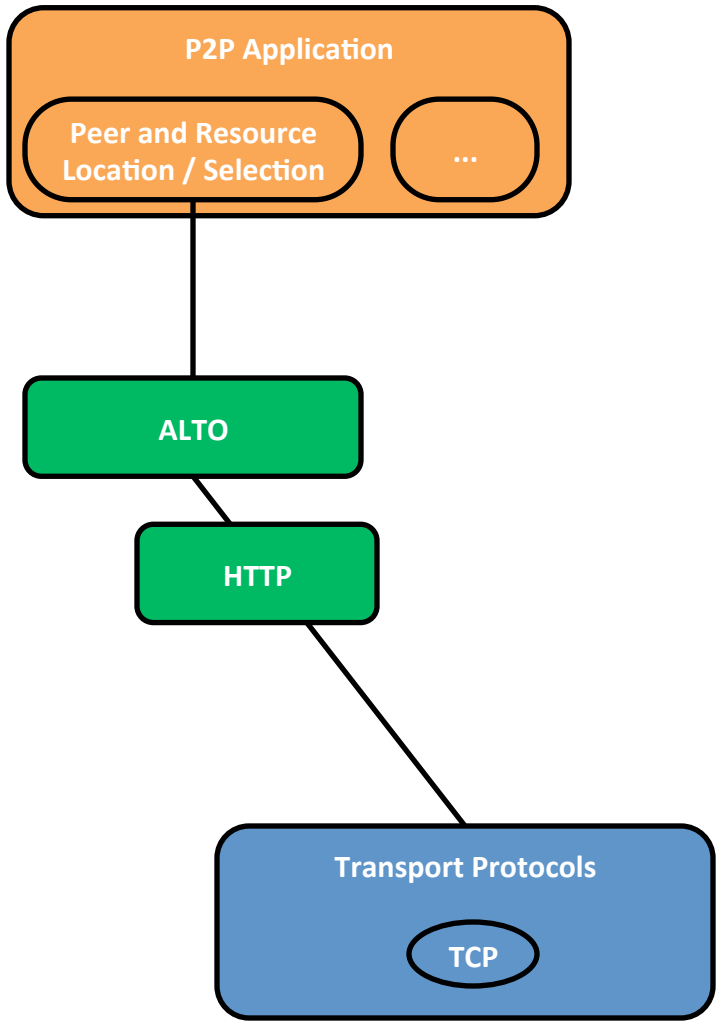
P2PSIP - RELOAD

- Mature spec; WGLC; implementations exist
- Charter Goals:
  - Develop distributed resource location protocol to avoid need for centralized SIP servers
  - Work through NATs
- Develops the RELOAD (REsource LOcation and Discovery) Protocol
  - Flexible overlay network protocol
  - Can support applications other than P2PSIP
  - NAT and firewall traversal via ICE



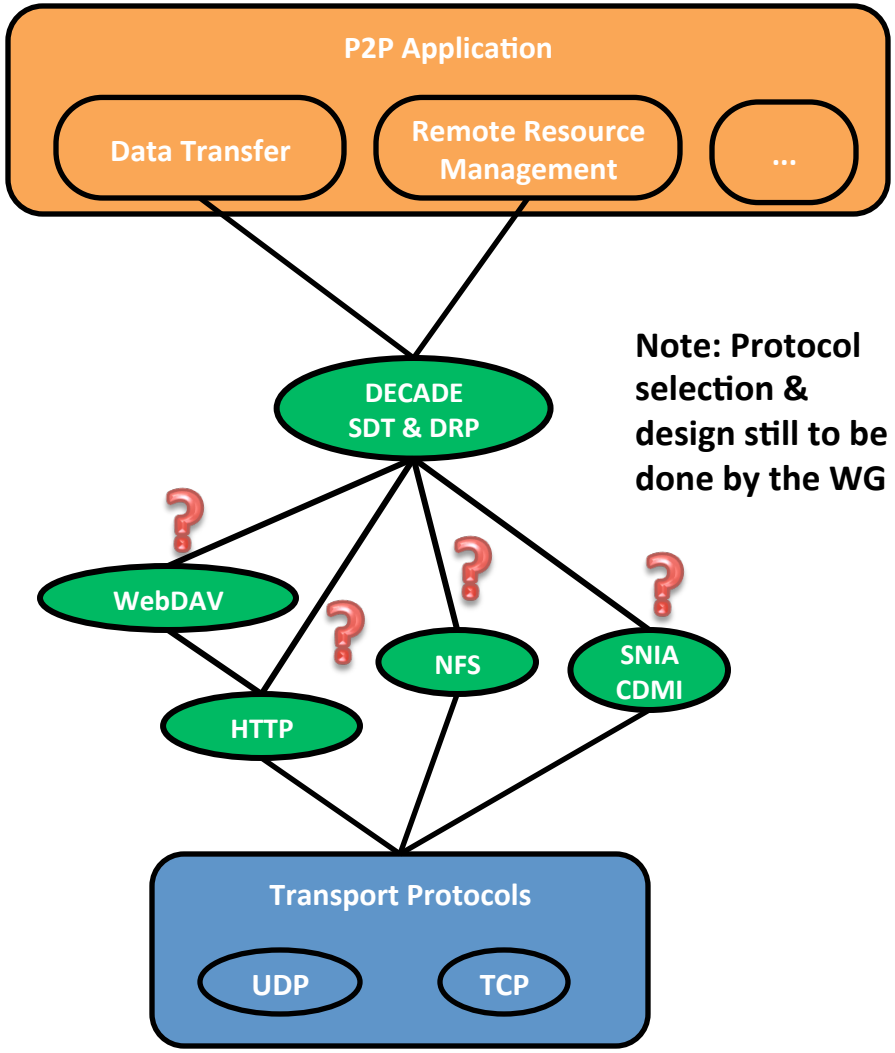
ALTO

- Maturing spec; implementations exist
- Service to provide information supporting more intelligence in choosing among lists of peers
- Inform applications of network preferences for various aspects of peer selection



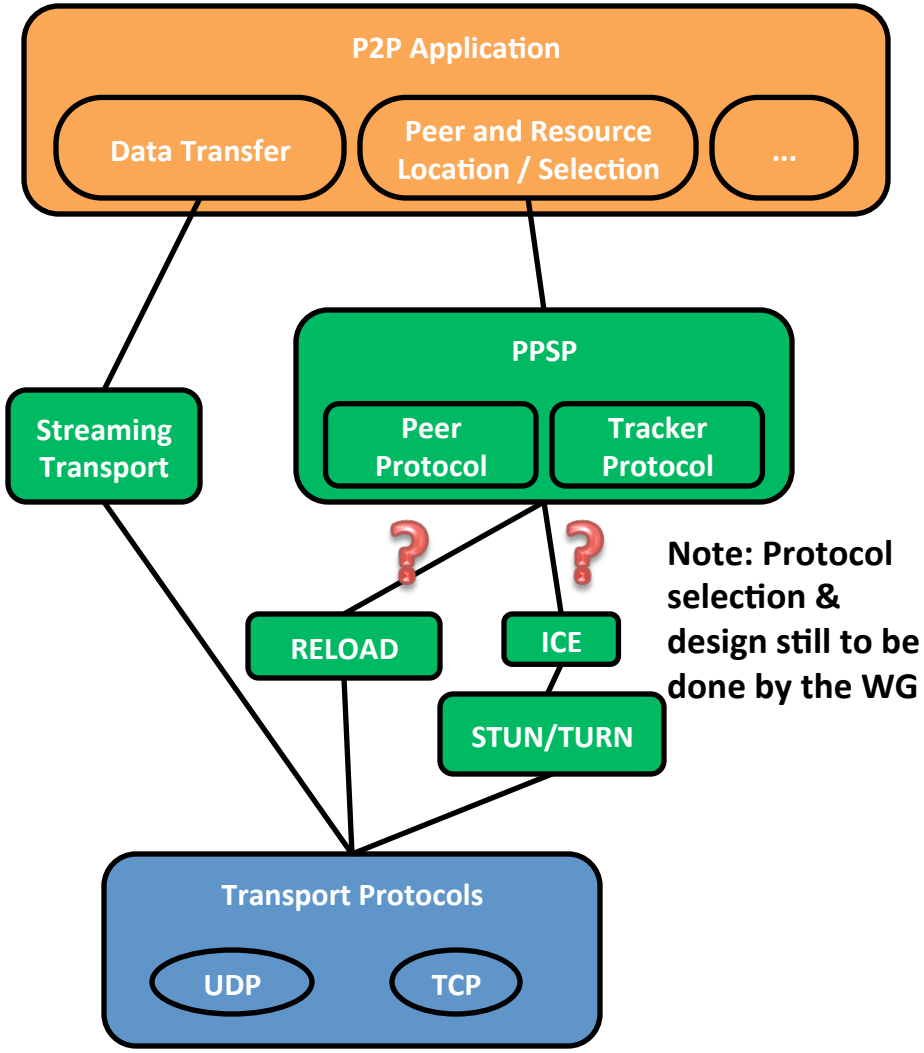
DECADE

- Work in progress
- Caching for P2P applications
- Allow content to be stored beyond the “last-mile” and avoid bottlenecks at the edge

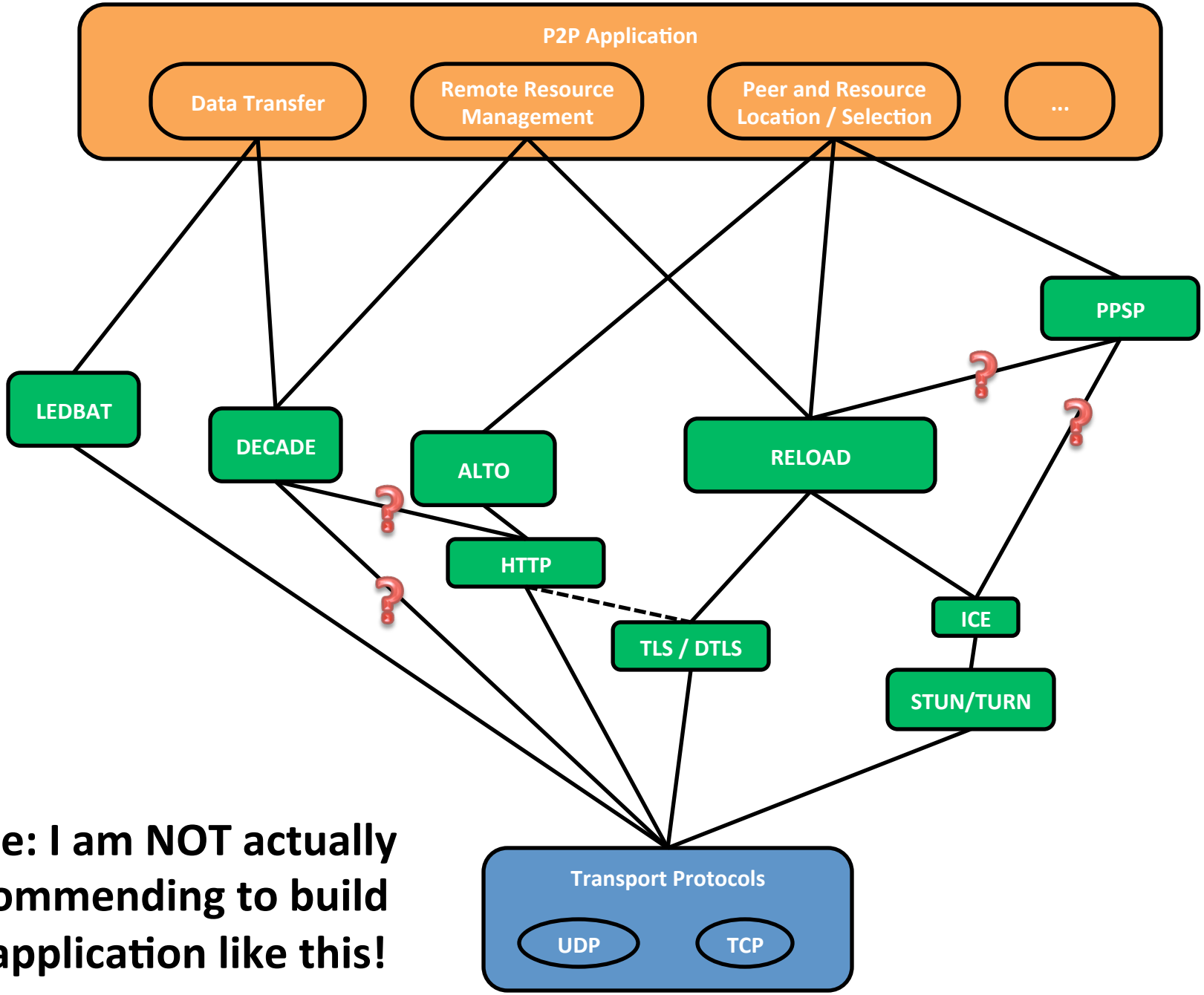


PPSP

- Work in progress
- Goals:
  - Reduce difficulties in deploying infrastructure in CDNs and ISP P2P caches for N different protocols
  - Support nodes that may be either mobile or otherwise have limited resources
- Includes:
  - Signaling protocol between tracker and peers
  - Signaling protocol between peers



Synthesis ...



Note: I am NOT actually recommending to build an application like this!

Thoughts

- There isn't a lot of coupling or dependencies between our P2P WGs
  - NOTE: PPSP and DECADE are still early and may leverage other work done in other WGs

- Not a clear long-term "architecture" yet for you to build actual classes of P2P applications using IETF technologies