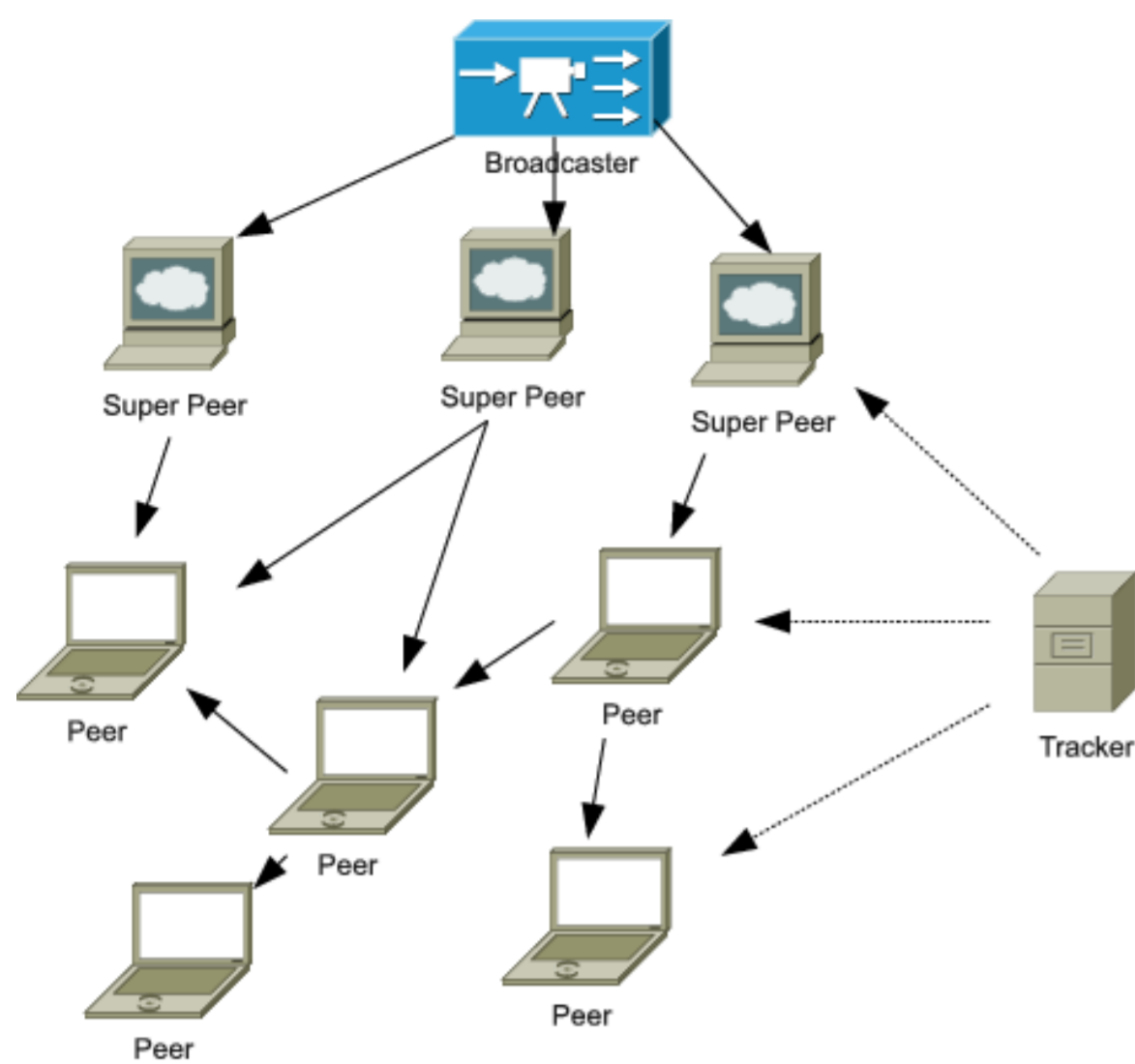


Simulation of P2P TV System Using OMNeT++

Arkadiusz Biernacki

TU Chemnitz, Germany; Silesian University of Technology, Poland

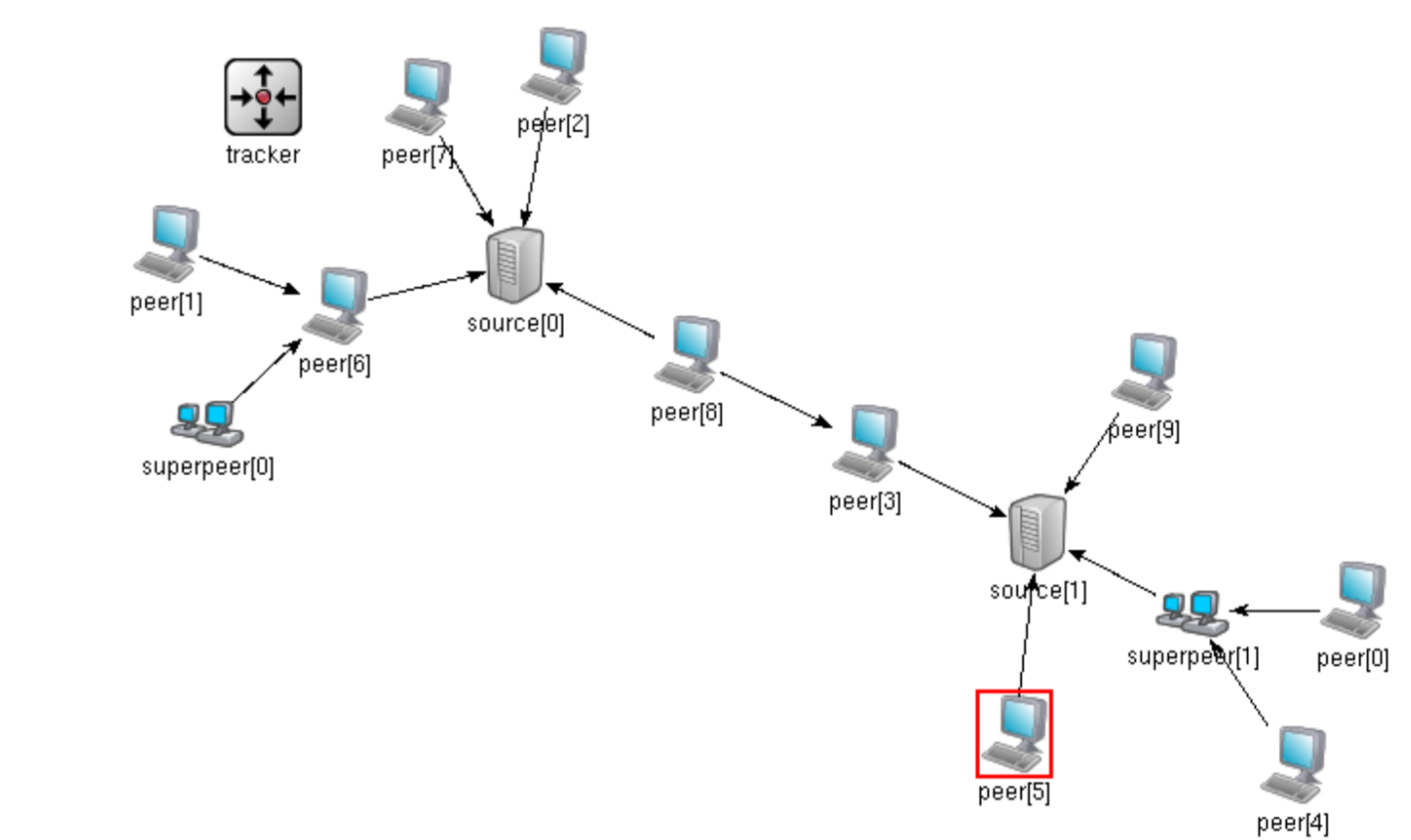
P2P TV system architecture



- ▶ Broadcaster – responsible for content to be distributed
- ▶ Super-peers – peers with good bandwidth capacity, help in the initial distribution of the content
- ▶ Peers – forwarding and endpoint functions
- ▶ Tracker – limited management of the system

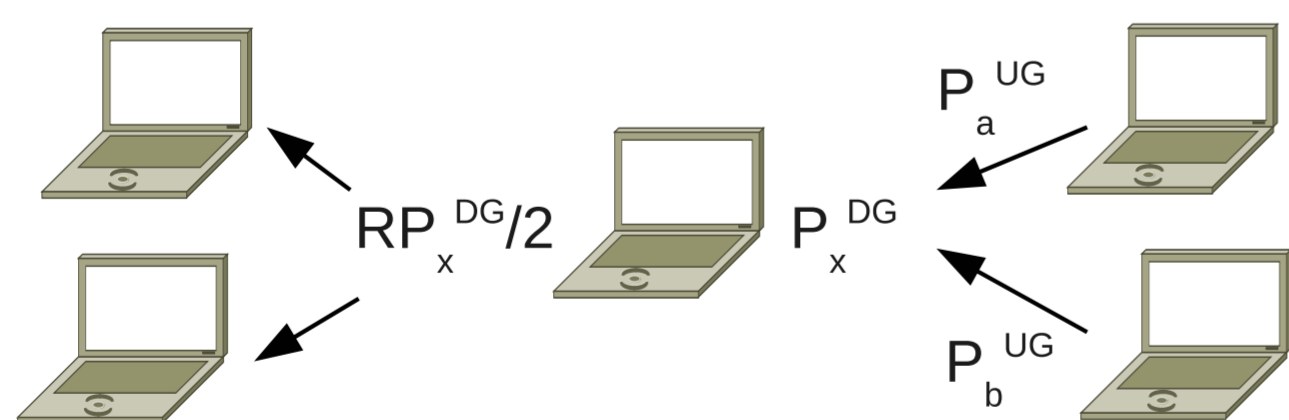
Implementation

- ▶ OMNeT++ implementation
- ▶ Simulation set-up: 160 peers, 32 super-peers, 8 broadcasters and a single tracker
- ▶ Dynamic topology creation
- ▶ Audio-video traffic represented as a state of nodes pairs
- ▶ Aim: analysis of the influence of the maximum number of allowed connections on the goodput of peers.

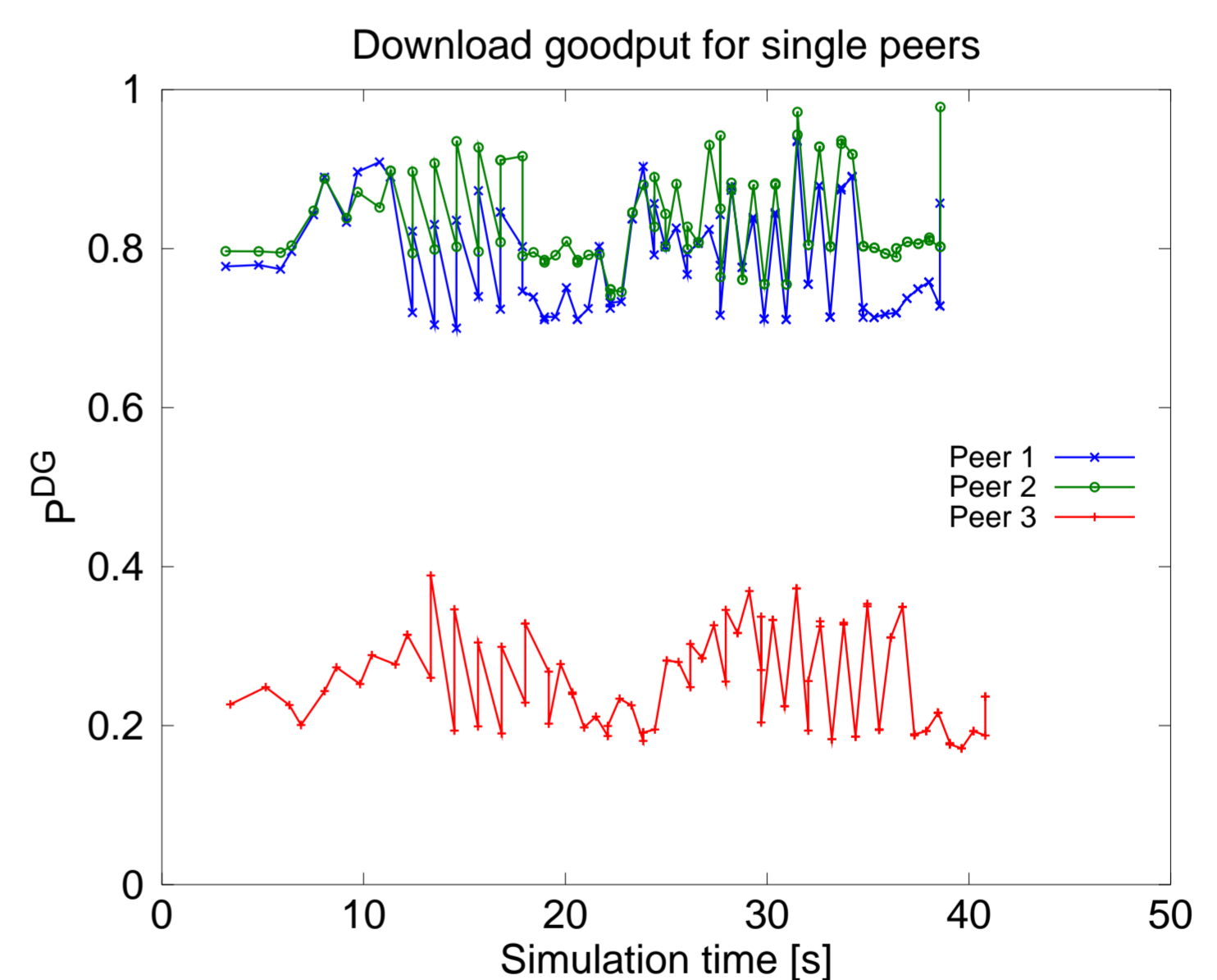


Performance metrics

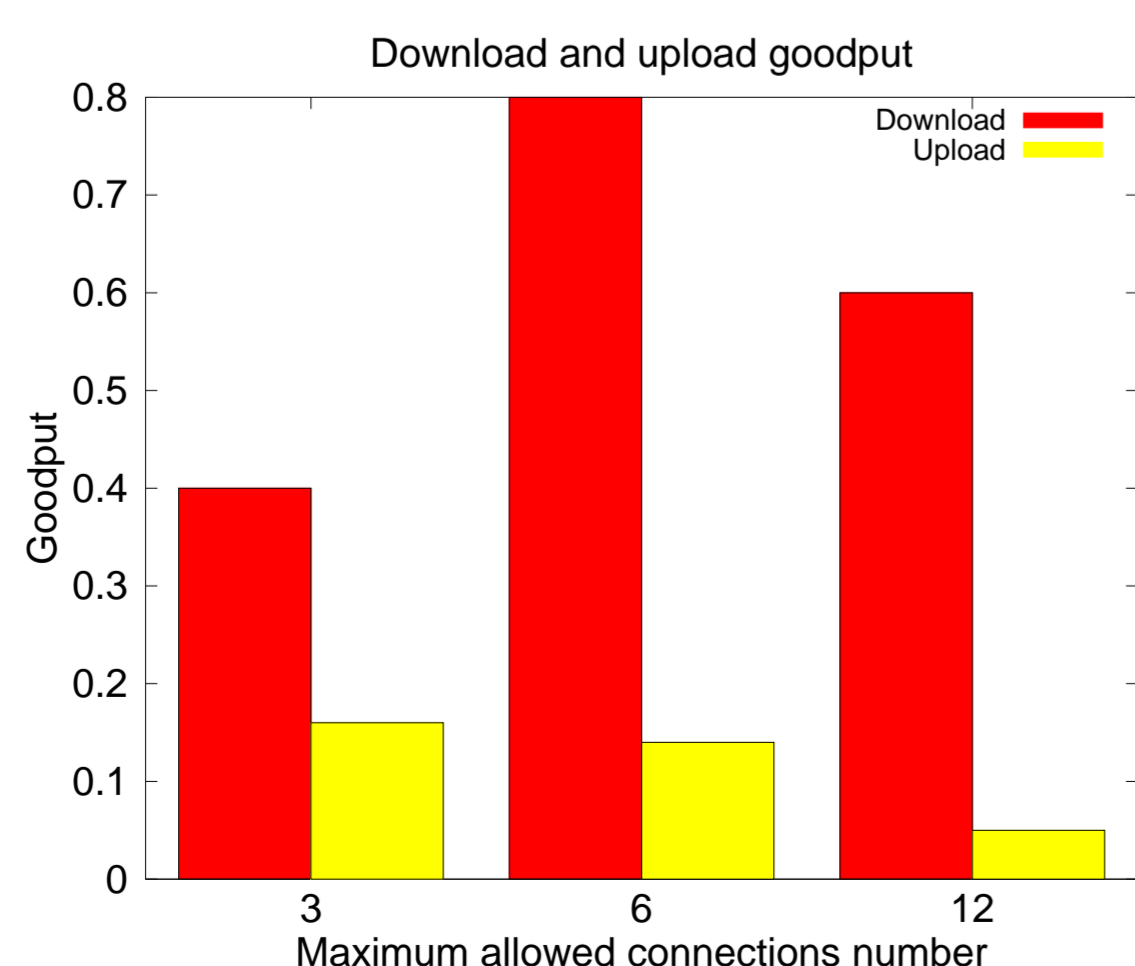
- ▶ Download goodput P^{DG} and upload goodput P^{UG}
 - ▶ P^{DG} for a broadcaster is 1
 - ▶ P^{DG} for a peer $\in [0, 1]$
 - ▶ Usually super-peer $P^{DG} >$ peer P^{DG}
 - ▶ $P^{UG} = RP^{DG}/n$,
 - n – number of current uploads,
 - R – stream repeatability coefficient
 - ▶ P^{DG} of a peer depends on P^{UG} of uploading peers



Results: transient behaviour



Results: average goodput



Conclusions

- ▶ Implementation of P2P TV system key elements taken into account different node types and asymmetry of their links
- ▶ Ability to perform small-scale simulations with different level of measurement granularity
- ▶ Further work: implementation of the underlying network using INET