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Can P2P solve mass distribution problems?

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Case Study: Video Streaming with P2P

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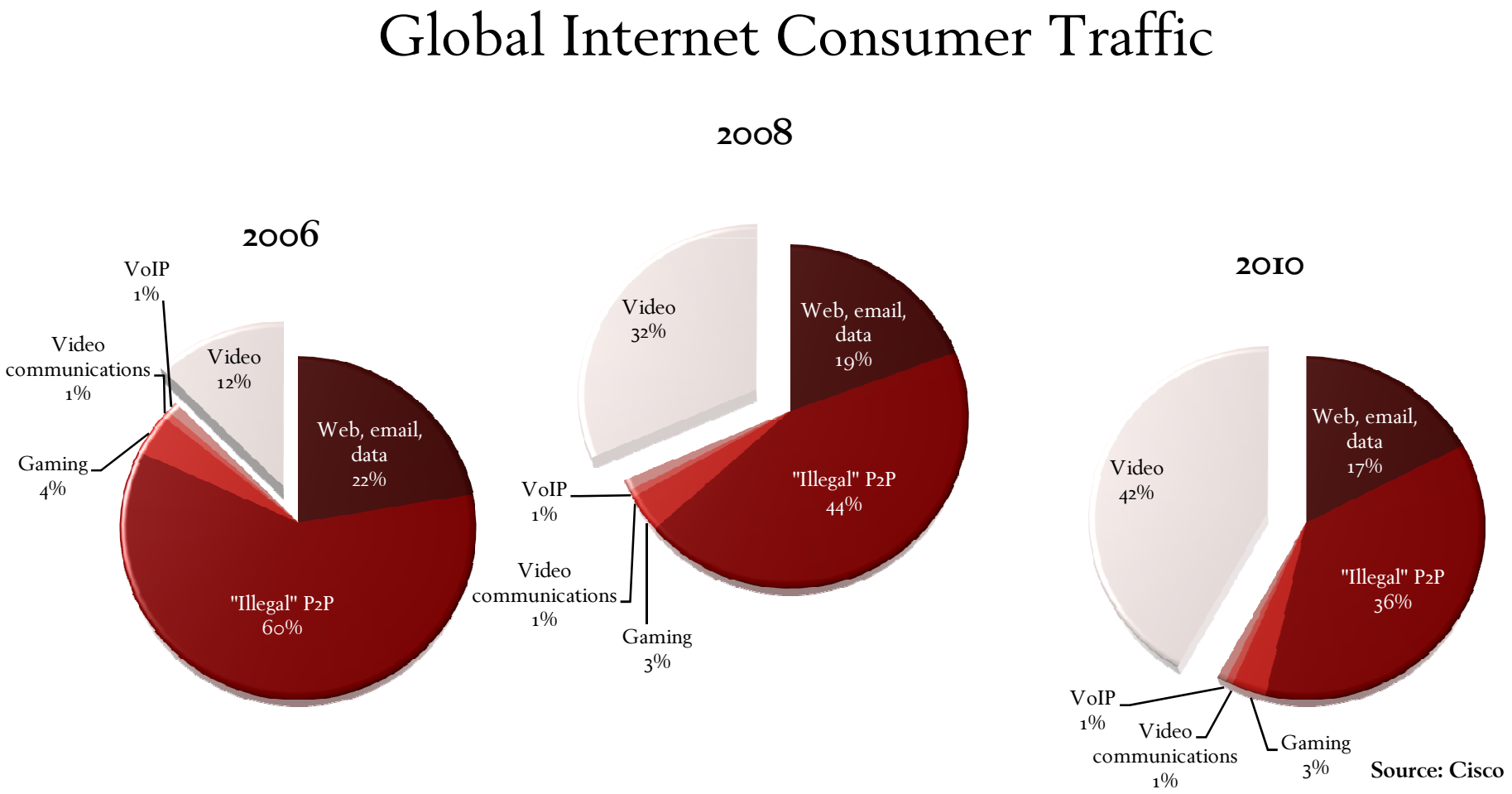
Is video traffic a big deal?



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Today's streaming problem

Video streaming over Internet is:

- Expensive
- Can only reach a limited number of viewers
- Suffers from quality problems

Caused by bottlenecks on Internet – Lowest capacity link determines quality

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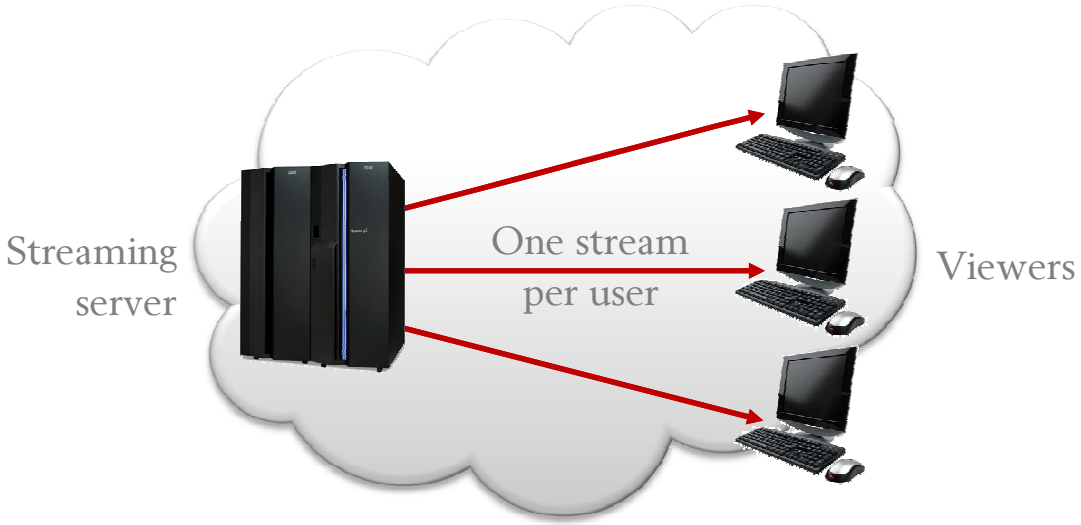
Video streaming today

- Standard Unicast Streaming Setup
- Characteristics:
  - Very high bandwidth costs
  - Scales poorly due to Internet architecture limitations
  - Requires high server capacity



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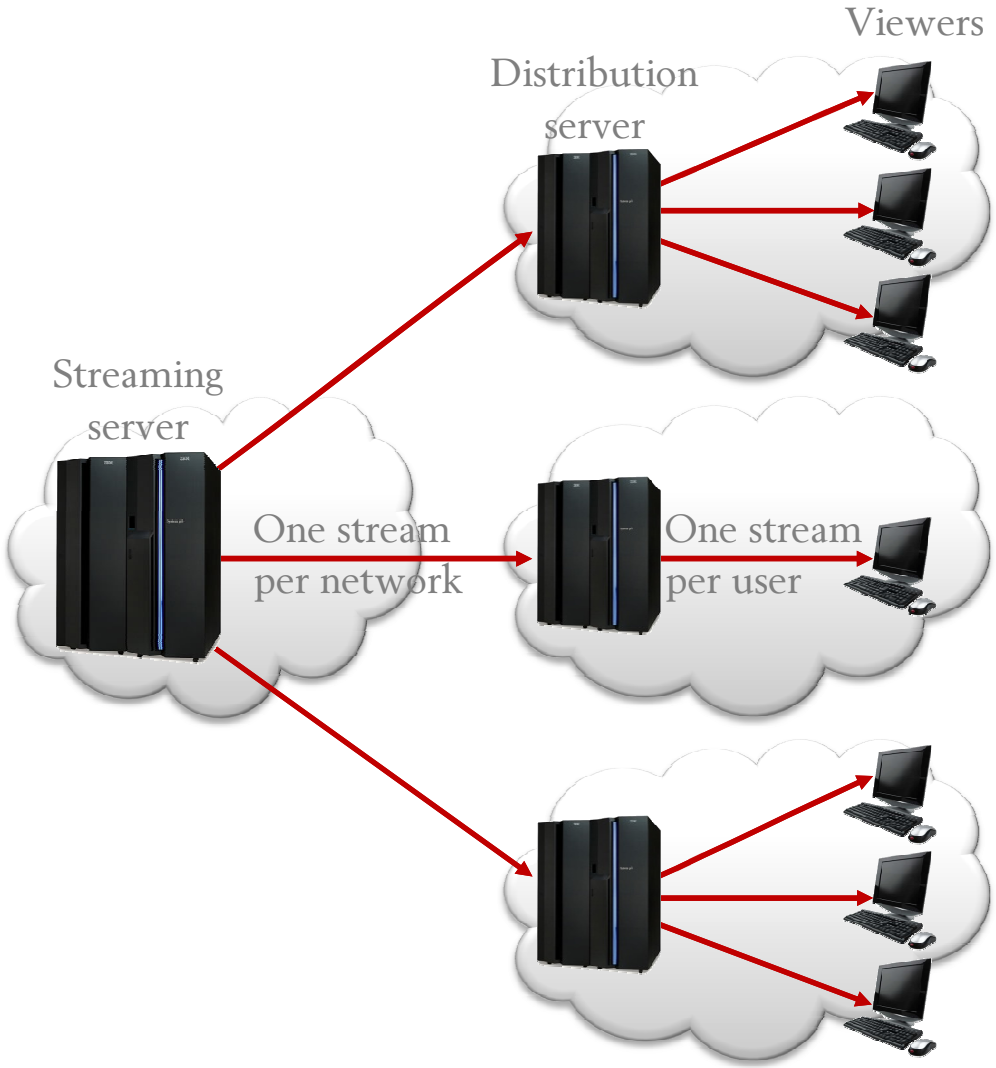
The CDN approach

- Putting a server in every ISP's network
- Trying to circumvent Unicast limitations
- Characteristics:
  - Consumes less but still high bandwidth
  - Scales better but still limited
  - Costly due to high Distribution Server costs



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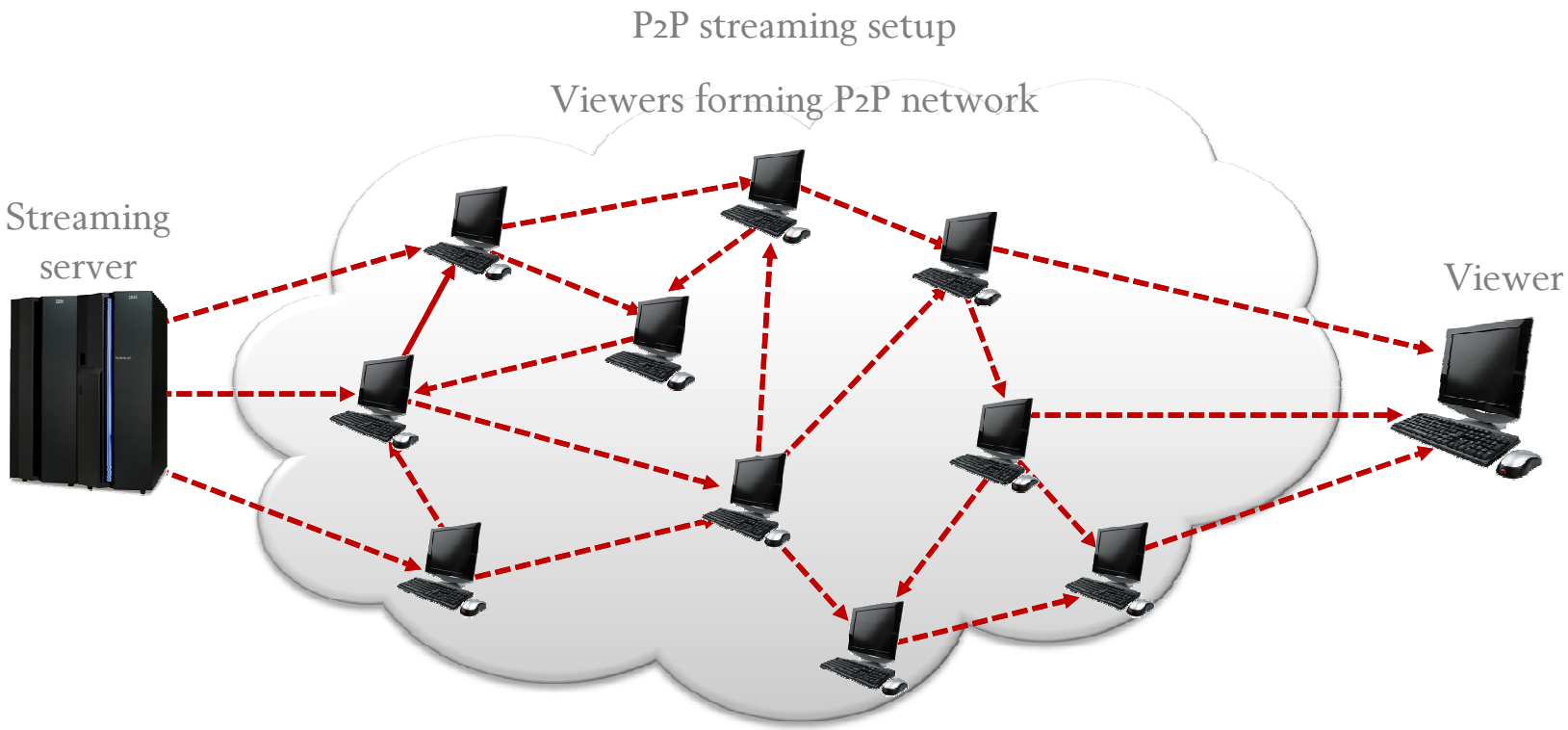
The P2P alternative



Characteristics:

- Consumes very little bandwidth (up to 98% savings)
- Scales almost infinitely
- Reliability is better than in single server solution
- Low maintenance costs

Good and Bad P2P

- So, P2P is an interesting alterative. Why not just use BitTorrent?
- Huge number of nodes → P2P must be carefully implemented
- Major question in P2P: Who should send to who?
- Different algorithms gives radically different bandwidth savings, quality and traffic loads

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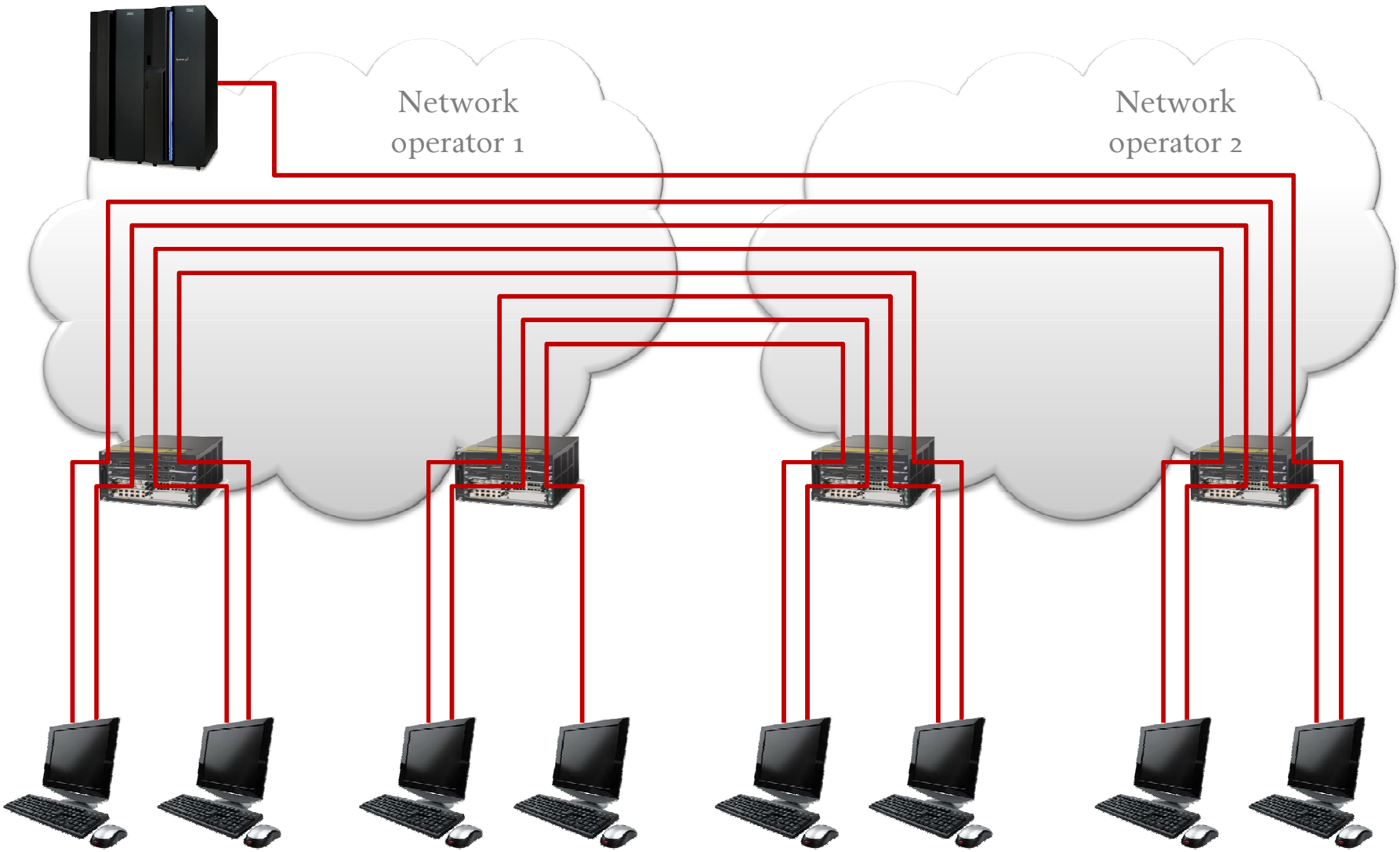
Topology oblivious P2P (BitTorrent etc)



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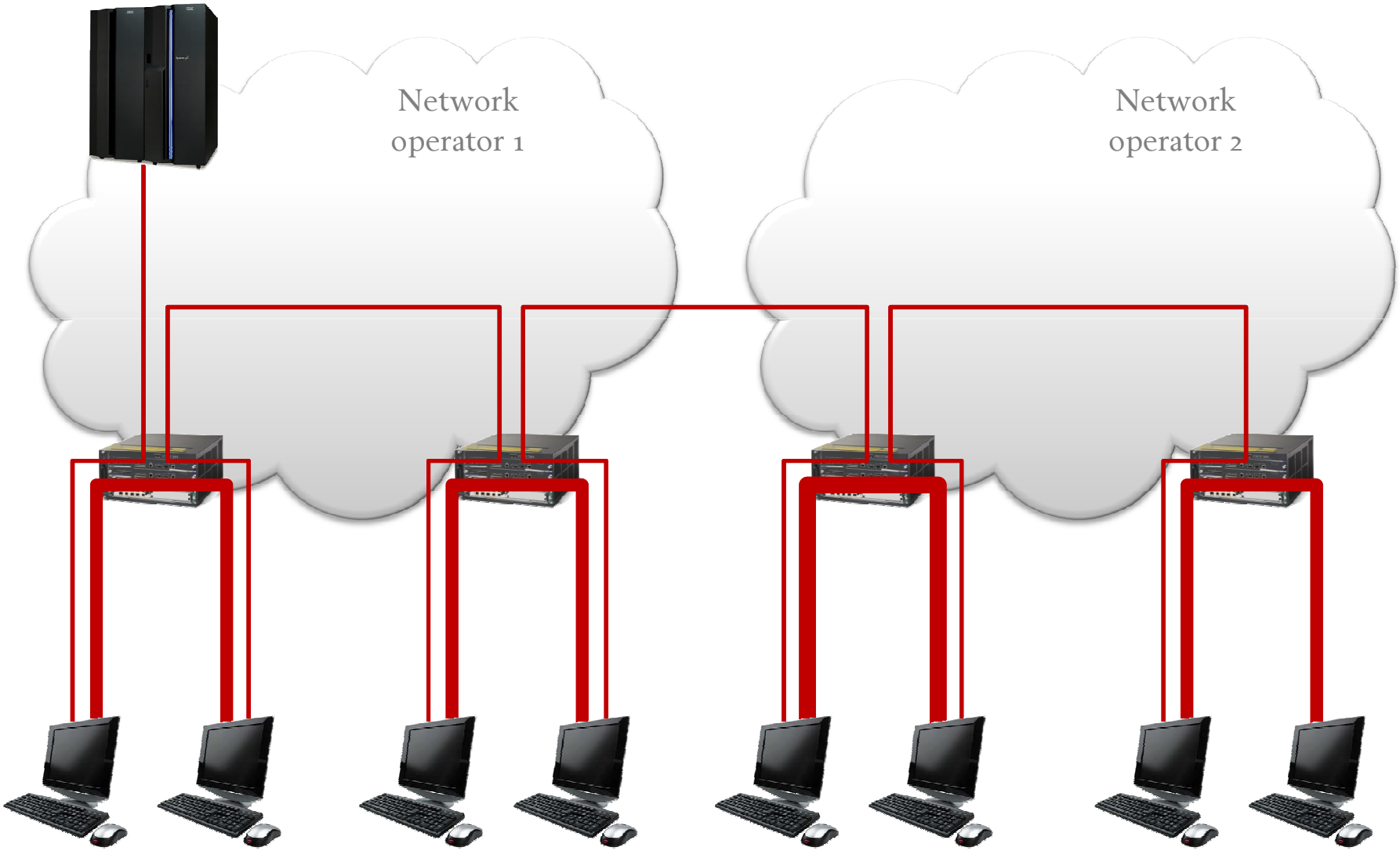
Locality aware P2P



Things to look for in a P2P Streaming Solution

- How much peers upload is utilized?
- How is network topology used?
- How are peer failures handled?
- Is the peer application a polite guest?
- Is the solution data agnostic?

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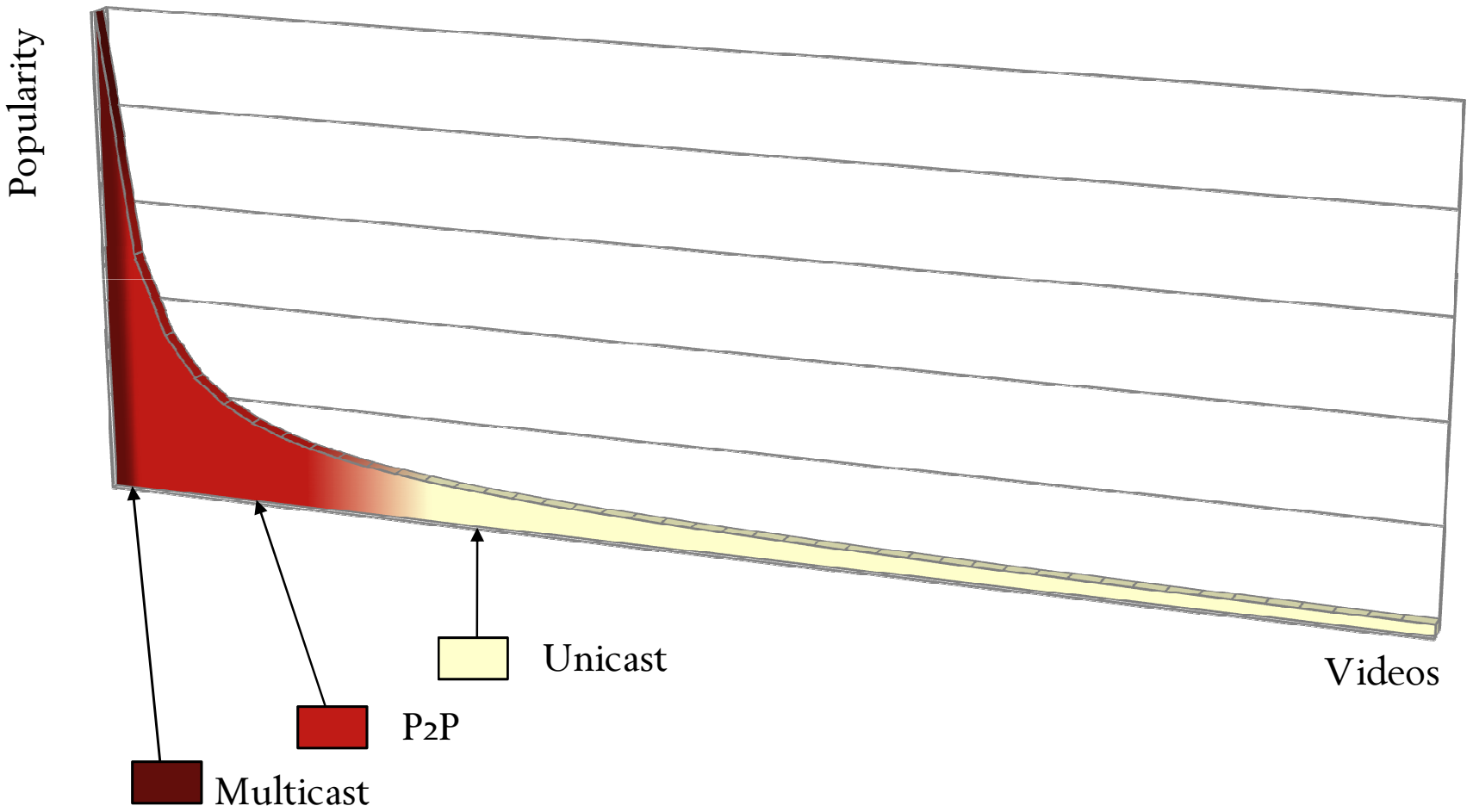
P2P in the Streaming Puzzle



P2P Streaming Summary

- P2P is not the solution for all video distribution problems
- Correctly implemented P2P can solve major bottlenecks problems
- P2P works best for popular content and flash crowds
- P2P Streaming will co-exist with multicast and unicast solutions

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Future P2P Trends

Network P2P Caching

- Sending the same data to network neighbours = bad idea
- A P2P cache can reduce overall traffic by 30% and cut traffic peaks
- We believe P2P caching will be a standard component in tomorrows Internet – built into routers on all levels

P2P Storage

- On demand P2P streaming solutions already transports and stores data
- Why not expose this as a more general storage solution?
- P2P will outperform central storage since you're closer to the data

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