CS294-4
Peer-to-Peer systems

Sigcomm Trip Report
Haystacks

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http://www.cs.berkeley.edu/~kubitron/courses/cs294-4-F03

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- "New" PC this year
  - Topics: Position papers, Routing, Denial-of-Service, Measurement, Overlays, Forwarding, Miscellany, Queue Management, Traffic Engineering, Measurement, Peer-to-Peer
- Highlights:
  - Dave Clark's position paper: ICEBERG/Sahara-like composable network arch, but with intelligence. Learns from specs and assertions about problems, and proposes solutions.
  - Routing underlay for overlay nets (Princeton): Common infrastructure for measurement and configuration (too much traffic if everyone measures!)
  - Kevin Fall's Delay tolerant network arch: Data "mules" carry data for applications. Delays could be seconds to days…
  - Shrew DoS mechanism (Rice): Low-rate mechanism for disrupting TCP flows

More Sigcomm Highlights

- Soft state versus hard state analysis (UMass): Examined consistency and overhead issues for a variety of protocols along the spectrum from SS to HS
- Semantic language for trace anonymization (Princeton/ICSI): White-list-based approach of specifying what to write out combined with careful use of hashing to avoid text matching
- Morley Mao's AS-level traceroute (UCB): Accurate measure of AS's along a path. Dynamic programming sol'n combining BGP routing tables, traceroute probes, reverse DNS lookups, and BGP update messages
- Impact of DHT routing geometry on resilience and proximity (UW, USC, Intel, ICSI, UCB): How topology limits/benefits resilience and performance. We'll read this one

Haystacks

- **A "useful" analogy for our discussions…**
- **Peer-to-Peer networks are like haystacks – full of lots of information**

Gnutella, Freenet, etc.

- They find hay…
- May or may not find something
- May not find all copies
- Negative answer means nothing, not proof
- No guarantees!!
- Lightweight solution mostly useful for heavily replicated objects, like popular songs
  - Any copy is sufficient, but may not find obscure song (needle)

Tapestry, Pastry, CAN, Chord, …

- They find the needle(s)…
- If it exists, they find it
- Negative answer means it doesn't exist
- Heavyweight solution
  - More complexity
  - Necessary for object location and hash table operations

Administrivia

- Mandatory *short* paper summaries to be submitted BEFORE class
  - 2-3 sentence summary
  - 2 positive points about the paper
  - 1 negative point about the paper
- E-mail: cs294-4@oceanstore.cs.berkeley.edu
  - Not a lot of work, but will foster discussion
- Also: Please Sign up using the Enrollment link!