

50.012 Networks

Lab 1

2020 Term 6

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TECHNOLOGY AND DESIGN

(Tentative) schedule

Week	Topic	Activity
1 14 Sep	Internet overview, Application layer	Lab 1: Web proxy
2 21 Sep	Application layer	Lab 2: RESTful API
3 28 Sep	Multimedia networking and CDN	Team project starts
4 5 Oct	Transport layer principle: reliable data transfer	Lab 3: Reliable data transfer
5 12 Oct	Transport layer principle: congestion control	Project proposal presentation
6 19 Oct	TCP, recap for mid-term	Lab 4: Congestion control
7 26 Oct	Recess week	
8 2 Nov	Network layer: data plane	Mid-term: 4 Nov (Wed) 2:30 – 4pm
9 9 Nov	Network layer: control plane	Lab 5: BGP
10 16 Nov	BGP, SDN	Guest lecture (TBC)
11 23 Nov	Link layer, LAN, and data center networking	Project final presentation
12 30 Nov	Wireless & mobile networks	Lab 6: Design a small network
13 7 Dec	Wireless & mobile networks, final recap	
14 14 Dec		Final: 17 Dec (Thur.) 9am – 11am

Lab1: A Simple Web Proxy Server

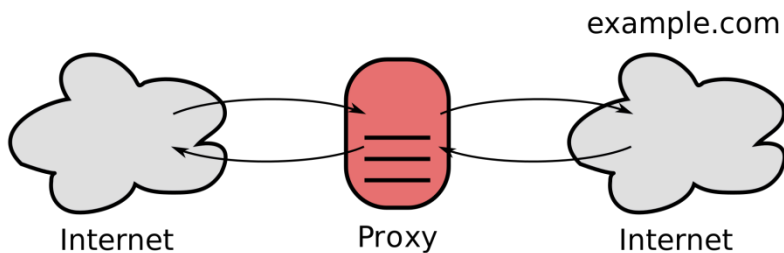
- Hand-out: September 18 (Friday)
 - Materials will be published just before the lab starts
- Hand-in: September 29 23:59 (Tue after next week)
- Late policy: **no late submission is allowed**
 - You can submit multiple times, so do submit a working version early to avoid last-minute rush
 - We will mark your last submission
- How will we spend the 2 hours on Friday morning?
 - Three **Rendezvous Points (RPs)**: 9am, 10am, 10:45am
 - Self-paced between the RPs. You may ask questions through the chat, and you are encouraged to help answer each others' questions (but do not share any of your code!)
 - We will discuss selected questions together during RPs

HTTP Proxies

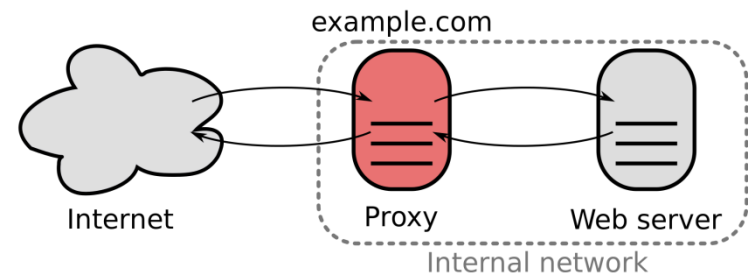
- Proxy: an entity authorized to act on behalf of another
 - An intermediate server that is performing requests for us
- A caching proxy keeps copies of resources for the client
 - E.g. results of HTTP GET queries
 - Results of non-idempotent operations are not cached, i.e. POST
- These cached results are served to subsequent queries
 - These clients do not have to be the same as original clients
 - As long as GET was requesting the same resource

Proxy architectures

- Forward (Open) Proxies
 - Content accelerators: by reducing delay and load on outgoing connections
 - Content filters / access control (or flip it: bypass filtering)
 - Content logging and eavesdropping (or flip it: accessing services anonymously)
- Reverse Proxies can also cache queries in front of servers
 - Application firewall
 - TLS acceleration
 - Distribute the load, A/B testing, and multivariate testing
 - Accelerators: Cache / compression



An open proxy



A reverse proxy