ECE 544 Project 3: Description and Timeline

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Objective

- Design and implementation of a simple "content routing" protocol.
- Goal of the network is to fetch a content file (as identified by a unique identifier) from the nearest location at which it is currently stored
 - A content may be stored in multiple network-attached devices.
 - A client device can query the network with a content identifier and this query is automatically routed to the nearest location of the content file.
 - The device storing the content then replies by sending back the content file to the requesting device
- Project Format: Like an industry standards committee
 - Each group proposes a solution to the class
 - Class as a whole combines proposals for final draft
 - All groups implements code based on this draft



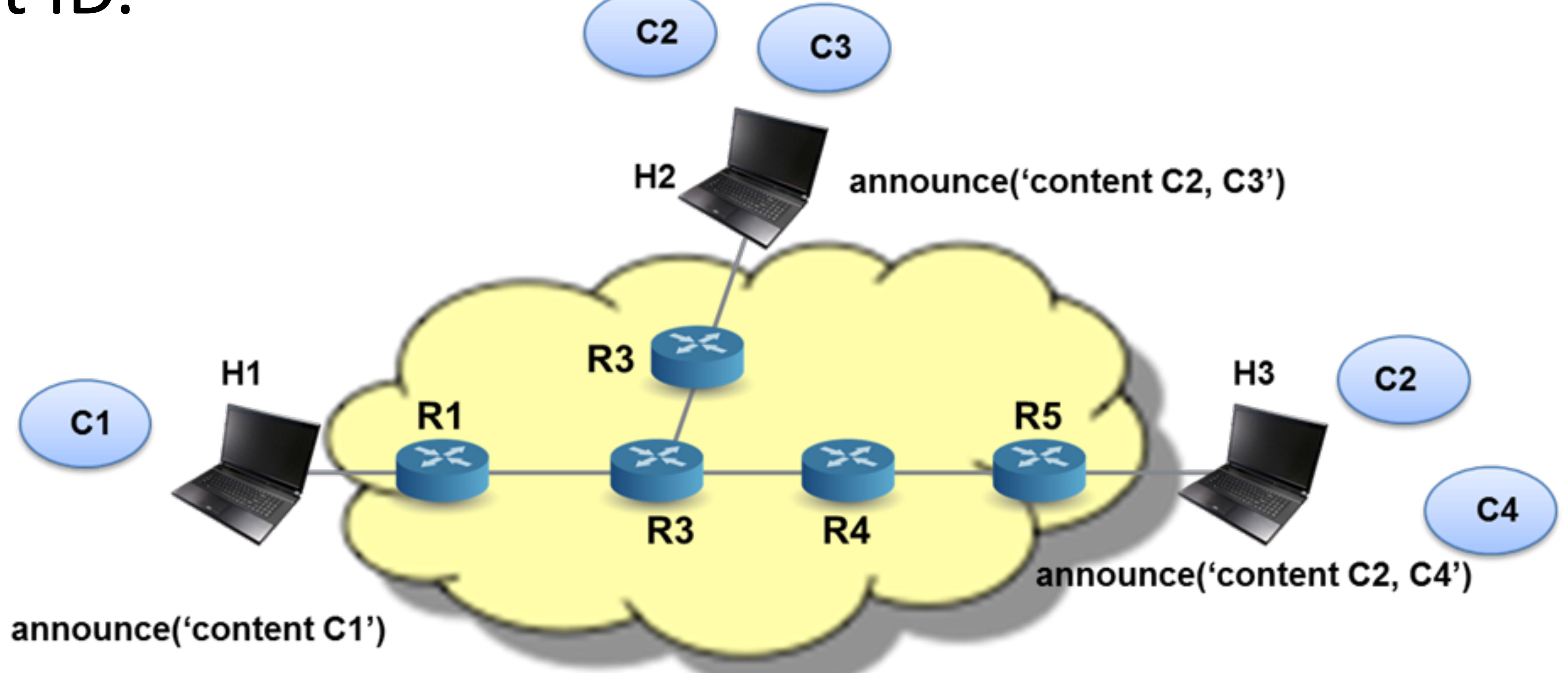


Problem Details

 Each content file will be specified by a unique content ID and can be generated at arbitrary times at any host.

 The network should support the announcement or discovery of new content files generated at a host such that other hosts can retrieve this file when they ask for by its



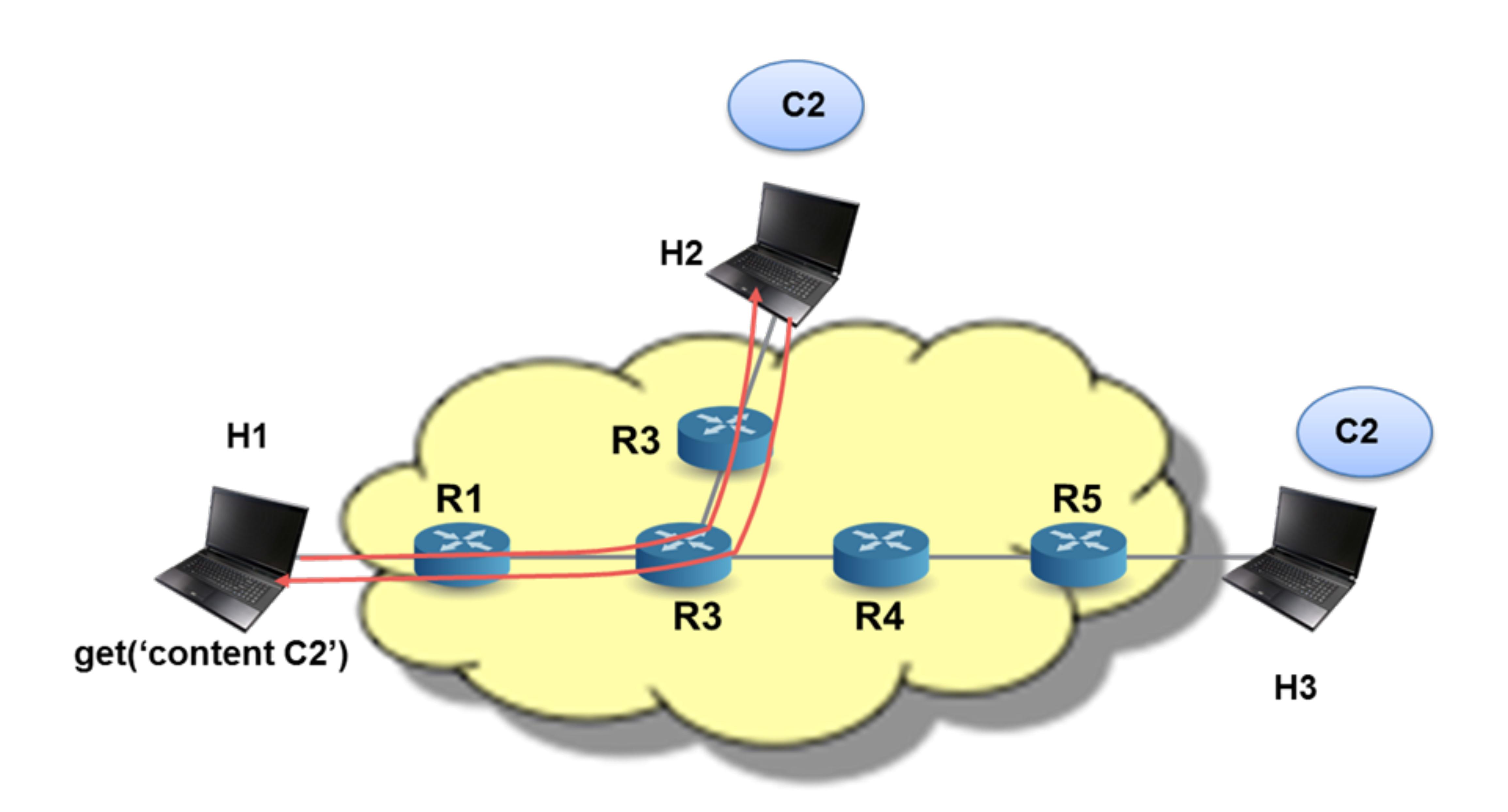






Problem Details

• The same content file can be present at multiple hosts. In such a case, the network must support the retrieval of content files from the best possible location

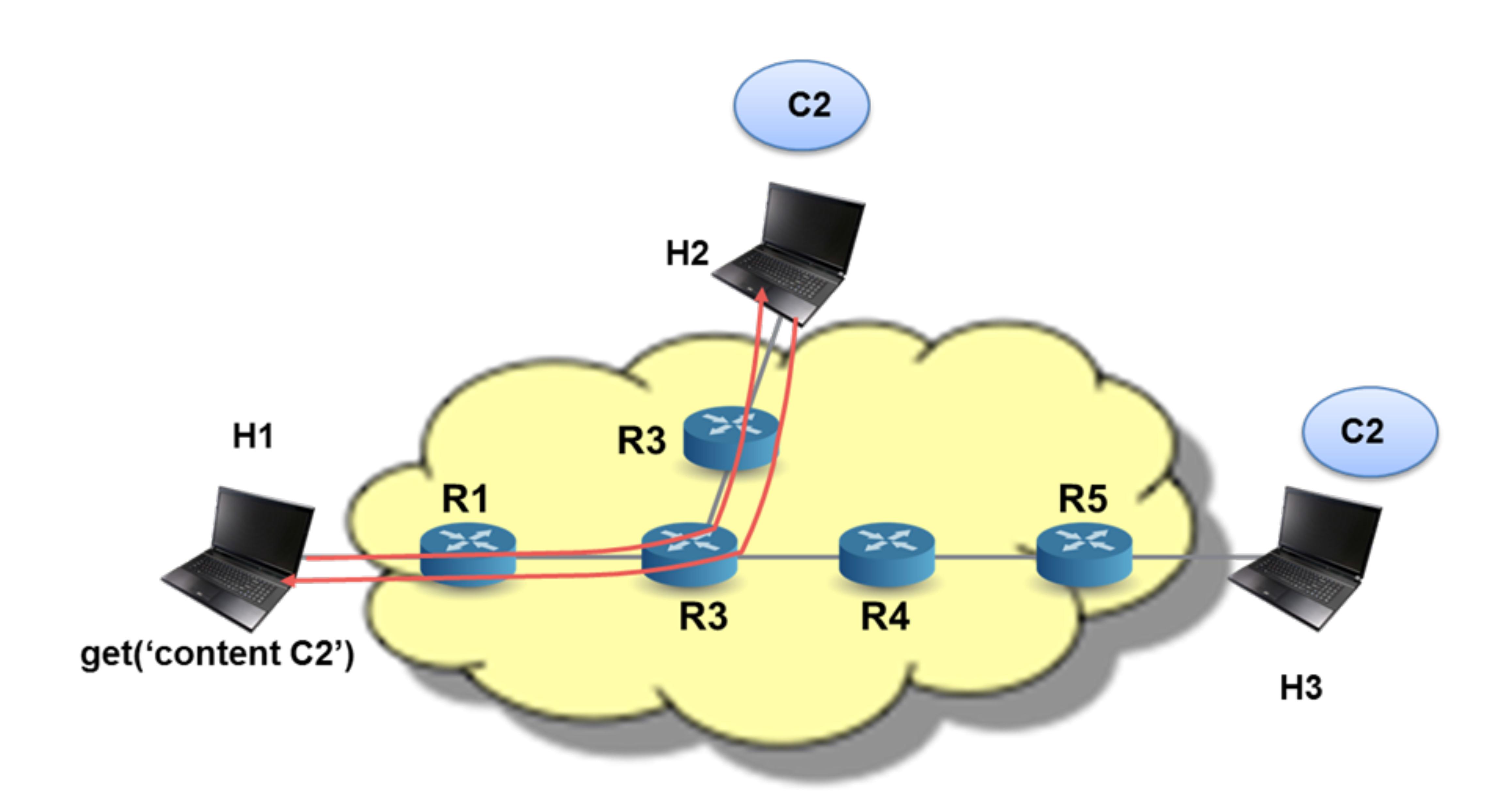






Problem Details

- The content files on a host may get deleted at arbitrary times. Similarly hosts can connect/disconnect from the network at arbitrary times.
- The network must support these dynamic changes in the distribution of contents.







Proposal Requirements

- Proposal consists of a protocol and related algorithms
- Protocol includes:
 - How to address different network elements?
 - Use only content names vs hybrid host address content location mappings?
 - Bit structure of address/names and how they are used
 - How do nodes/routers discover each other?
 - Periodic hello messages vs. hello with ACK
 - Provisioning or not for router/node failure?
 - What is the baseline routing protocol?
 - How are contents advertised?
 - How to route a content-request packet?
 - What ARQ scheme to use?
 - Packet formats to use?





Proposal Requirements

- Algorithmic component includes:
 - How content routing algorithms work?
 - How to choose the 'best', among multiple hosts having the same content?
 - How is the content actually delivered?
- Follow template available at:
 http://www.winlab.rutgers.edu/comnet2/Projects/
 documents/ECE544-2015-Project3 ProposalFormat.ppt





Project Requirements

- Each group submits a proposal with specific details on both protocol and algorithms
- Class reaches a consensus on each item after 2-3 rounds of discussions
- Each group individually implements the agreed upon protocol through codes for nodes and routers
- Final Report describes implementation specific details from each group
- Final Demonstration involves discussion on implementation design and small functionality demo on a topology assigned the day of the demo





Software Design Issues

- Scripts for creating test topologies in the Virtual Machine will be posted on the website by April 10th.
- Try to reuse relevant aspects of Projects 1 and 2.
- However do not be constrained by the code snippets we provided to you.
- The design should clearly state advantages and disadvantages of the proposed solution.
- Credits for constructive participation in the standards meetings

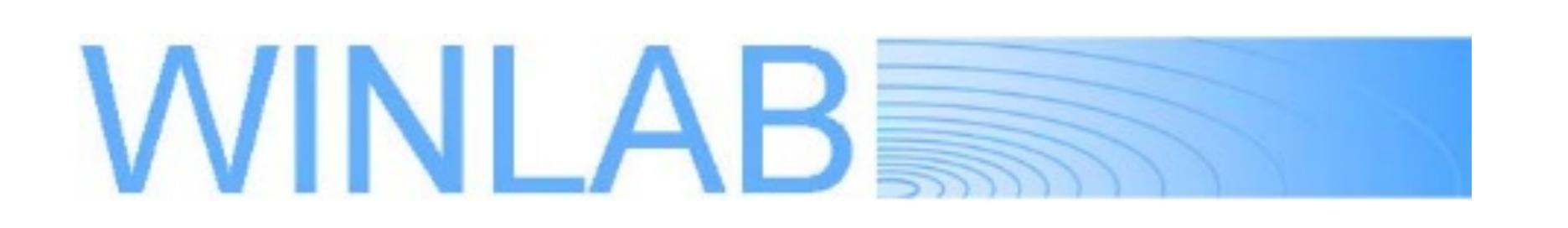




Timeline

- April 2nd: deadline for submission of design slides
- April 3rd: 1st Standards Meeting presentations by each group followed by discussion
- April 3rd: All presentations uploaded after meeting
- April 7th/8th: 2nd Standards Meeting discussion on remaining topics, voting for finalization
- April 10th: Circulation of Formal Standard Document
- April 30th : Project Report & Code Submission
- May 5th: Demo Session





1st Deadline: Draft Proposal

- PPT with details of your proposed solution covering all the requirements
- Follow the skeleton PPT provided on course site
- Add any aspects that you feel is interesting to the design of the system
- Slides from all group will be submitted by April 2nd
- April 3rd: Each group presents their slides (10-15 minutes)
 - Discuss what's the best way to do each task
 - Vote if can't reach a consensus

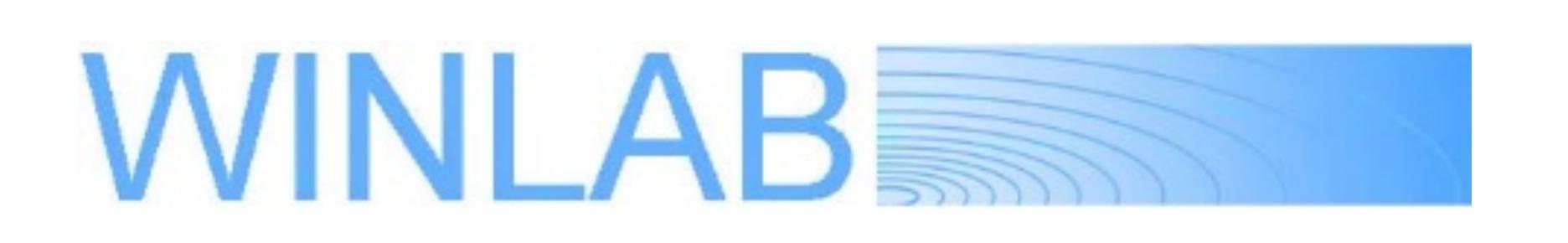




Final Submission

- All implemented code (Routers and clients)
- Include eventual compiling scripts (i.e. Makefile)
- Guide: How to run your program
- Document for Protocol implementation and Performance Evaluation.
 - Put particular emphasis on the design of your systems. Being concise is suggested. Clearly state design goals and ways this was accomplished. Use pictures to support the text.
 - It could contain, but not limited to, following topics:
 - Software design description of all components
 - Routing protocols and algorithms implementation details
 - Performance estimation/evaluation





Grades

- Participation in Standards Meetings 4%
- Final Report 10%
- Final Demo 6%



