

Materials

- Water jug with cut top and hole punctured at bottom
- **(Optional)** Hose leading from hole at bottom that can direct/control outflow
- Tub to collect water
- Water cups/nozzle/garden hose/some source of water, both bursty and flow

Procedure/Video Flow

- Introduce the analogy of water as data, and the flow of data as a data **'stream'** ("It's useful to think of data as...")
- Normal flow of data/water with input(s) at top and outflow at bottom (say, a router to a database server with multiple clients) - low waterline and continuous flow
- Router jug acting as buffer, can **'soak'** (puns are definitely intended here) up bursty flow (water cups) with the queue (waterline) and transmit it orderly (FIFO - First In First Out)
- What happens when the waterline rises... why does it rise?
 - Outflow slows down (lots of traffic at server)
 - Lots of inflow
- Dropping of packets as spilling of water (the first one in gets dropped - unfair, but alerts to dropping most quickly)
 - Where do the dropped packets go? -> They're gone. The router doesn't care, nor does it alert anyone (*the router may log how many packet it has to drop*)
 - Eventually the sender will realize the the receiver is not getting these packets, and it will slow down its traffic (acknowledgement)
 - The core internet is "best effort", and the responsibility of packet loss is on the edge of the internet

Things to point out/talk about

- Water is a common analogy for **'streams'** (hence the name), including data streams and electric **'current'** (again, the name)... we will be using lots of water-related puns

Script

- Hello, I shall be describing store and forward routing... using water!
- Water is commonly used as an analogy to concepts such as data streams and electric current. Here I shall be using the former analogy, along with my amazing contraption.
- The water (in here, trust me it's in here) is data, the flow of water a data stream, and this cut bottle a router.
- The top of the bottle signifies intake from clients and the bottom straw an output to, say, a database server.
- Everything in the middle, the capacity of the bottle, signifies the internal buffer of a router, which stores the water (data) before forwarding it to the output
- *Demonstrate*
 - Queue, normal flow
 - Increased flow, filling up
 - Pause to show queue
 - Output traffic congested
 - New client burst
 - Packet dropping