

THINKING ABOUT NETWORKS

MIDTERM: Design and Implement a Network

My network uses the ITP radio station to broadcast messages. The idea is to get an idea of how many people are listening to the radio station by sending out messages addressed to me and seeing how many people pass on those messages.

NETWORK CHARACTERISTICS

Nodes:

The nodes of the network are ITP students.

1. I am the originator of the message
2. The DJs are propagators of the message
3. The general student body are the carriers of the message
4. I am the final destination of the message

Protocols:

The protocols used by the network are:

1. e-mail addresses for DJs so that I can contact them
2. Streaming over RTP for the broadcast section of the network
3. Name and face recognition at ITP for the message to get back to me

Transport:

1. The first two parts of the network - from me to the DJs and from the DJs to me will take place on the Internet/Internal LAN.
2. The last part of the network moves from person to person by word of mouth or using any communications tools at the person's disposal, where they have an address for me.

Contents:

What is being passed over the network is a message. The message originates as an mp3, and then is transmitted first as a stream and then from person to person.

Each message is a short formal message in the form of a public service announcement that asks the audience to pass on a message that makes no sense without context:

"Your attention please. This is public service announcement from ITP Radio. Please pass the following message to Dee Harvey. The answer she requires is: "message". I will repeat the message."

The ten messages were:

12 ⁿ	55	small-world networks
7	600	linear editing
4th amendment		Voice over IP
tunnelling	1064	

Addresses:

The addresses in the network are those of ITP - first names if you are the only one of your name and surnames if many of you share the same first name. I used my surname for just for sureness as there has previously been some confusion between Dee and Dedi.

The ways those addresses can be reached are various, depending on acquaintances - e-mail, phone, IM. You can also rely on seeing somebody and passing the message to them directly, but this is not a very reliable or timely way of reaching them.

Topology:

The topology of the network is something like an umbrella with a cloud underneath and then many undetermined paths to the source.

The path from me to the DJs is a simple star network. From the DJs to the audience is a broadcast network. The path from any one audience member to me is undetermined - they may not have any way of getting a message to me without going through someone else. Although the student list is always open to them.

STACK

Application layer: Sending nodes use either e-mail (me) or iTunes (DJs) to send on their messages

Transmission layer: The content is sent through the system using e-mail protocols, RTP streaming, or social connections

Physical layer: My transmission is built on top of the computer networks, social networks, and space



PREDICTIONS AND DISCUSSION

My network was designed to test whether people were listening to ITP Radio and if they were prepared to act on what they heard there by passing on a message.

Predictions:

I sent out ten separate messages over the course of a week.

I predicted that about half the messages would reach me, as I had asked each DJ to play each message several times, the archive would ensure the messages were replayed, and there were many possible people who could pass on the messages.

In reality 4 messages reached my ears, including one that came twice.

I predicted that any individual message would be passed on within 24 hours of its being broadcast and this turned out to be the case.

I predicted that the longest route that would be used would be from me to the DJ to the Netwaves to the audience to the list and/or e-mail. In the event every person that passed on a message waited until they saw me in person.

The other message made its way back to me through a route I had not considered. The DJ didn't have time to do his show, but had loaded his message into his iTunes. It got from his iTunes to his Shuffle and he kept hearing it repeated all that day. So he repeated it to me.

Results on another pair of DJs are inconclusive: one said he would play the messages but appears not to have and has not been forthcoming on what actually happened; the other has not been in touch at all. The messages "Small-World Networks" and "Tunnelling" are unlikely to have been sent.

3 points of total failure, and a possible five.

3. ITP Radio - ITP Radio was broke for most of Tuesday and this put two shows out of commission. Bye bye to messages "Linear Editing" and "4th Amendment".

5 definite points of failure, a possible 7. Fully half the messages were never broadcast, and this figure may be as high as 70%

4. ITP People - The three remaining messages reached my ears.

Monday @ 16.36 Jeff Gray told me "7". He had heard it broadcast on Sunday evening between 6 and 8.

Tuesday @ 12.32 I heard what I believe was "1064". It was too indistinct to make out. But I knew what it said. It was being played live.

Tuesday @ 16.10 Chris Cummings told me "55". He heard it on his own Shuffle and never even broadcast it.

Tuesday @ 5.05 Spencer told me "six hundred and something". He had half heard it when he played it on his show that afternoon when I had heard it myself.

Conclusions:

In building this network I learnt that people don't make reliable nodes and that what can seem like a lot of redundancy can be very little when there is no incentive for people to pass along a message.

I also learnt that cryptic messages may not travel well, in that people won't remember them and won't feel they're important. I steered away from using anything that sounded urgent for fear of making people think that there was some kind of family emergency, so something like "tell Dee to ring home" was not an option.

All of the people who passed on messages were two of the following: in Thinking About Networks, DJs, friends. I was unsurprised to learn that people are more likely to pass on messages to people they know.

What was more interesting was to learn that people are more likely to pass on a message in this kind of network if they know what's going on. The main thing I would change if I ran this network again would be to announce my plan to the list and to ask people to listen for messages and pass them on.

I might even put a grid on the white board and make it into a kind of radio bingo.

Running this network another time I might try to make it more reliable by putting out the messages myself and not relying on other people to send them, although this might make it hard to have them quite as evenly spread through the broadcast week.