Electronic Communication

LECTURE 5 – COMPSCI111/111G S1 2017

Today’s lecture

Looking at how different types of electronic communication work
- Email
- Instant messaging
- Forums

Issues with electronic communication
- Spam
- Netiquette
- Security issues
- Authenticating users

Email

Electronic Mail; a system for sending and receiving messages over the Internet

An asynchronous means of communication

Necessary to know the address of the recipient in order to send an email message

Email - history

1960s: initially, people would leave messages for each other on a mainframe
- However, there was no way to send messages to people using other mainframes

1969: ARPANET connected mainframes together, providing the foundation for email

1972: Ray Tomlinson sends the first email, with addresses using the @ symbol

1976: email makes up 75% of ARPANET’s traffic
Email - addresses

tom@auckland.ac.nz

Local part of the address, often a username

Domain name of the email server

Email - protocols

Protocol: a standard for communicating

These email protocols are used by email clients (e.g. Outlook, Apple Mail) to send and receive email

- Webmail services such as Gmail and Hotmail use the same protocols

POP3 – Post Office Protocol v3:

- Emails downloaded from the server to the email client. Emails are then deleted from the server
- No Internet connection needed to read downloaded messages
- Disadvantages:
  - If messages are deleted in the email client, then they are lost forever
  - Difficult to access your email from different devices

Email – composing

Recipient

Carbon Copy (CC)

Blind carbon copy (BCC)

Subject

Headers

Message body

Email - protocols

IMAP – Internet Message Access Protocol:

- Downloads a copy of emails to the email client and keeps emails on the server
- Emails can only be read when online, although most email clients can store a copy for offline access
- Provides other helpful features such as folders
- Designed to allow users to access their emails from multiple devices
Email - protocols

SMTP - Simple Mail Transfer Protocol:
- Used to send emails from an email client via the email server

Sender's mail server ➔ SMTP ➔ Recipient's mail server

Server uses DNS to find recipient mail server's IP address

auckland.ac.nz ➔ 136.216.159.127

Email - spam

Unsolicited, bulk email containing promises of money, fame, free prizes etc.
- Name comes from the Monty Python Spam sketch

A major problem; in 2010, approx. 80% of emails were spam

Some spam emails contain attachments or links that can infect a computer with malware

Most email providers have spam filters that divert spam emails to the Junk folder

Email - privacy

Email is not a very secure means of communication
- Can be read in transit
- Can be read by the mail server administrator or stolen from the mail server

Email in employment
- Generally, employers reserve the right to read your emails on the company’s email system

Making email more secure
- Email encryption tools such as PGP
- Some email clients have encryption functionality
- Keep your account details secure and use 2FA

Email - spam

Unsolicited Electronic Messages Act 2007
- Aim: reduce the harm caused by spam, require an unsubscribe feature and deter people from sending spam

s6: the Act regulates commercial electronic messages; any message that promotes a good or service
- s5: electronic message is any message sent using a telecommunications service (eg. email, fax, text)

s8: the Act applies to anyone who lives or does business in NZ
Email - spam

The Act prohibits:

- s9: sending an unsolicited commercial electronic message with a NZ link
- s10: sending a commercial electronic message without sender information
- s11: sending a commercial electronic message without an unsubscribe function

Penalties include:

- Fines of up to $200,000
- Payment of compensation to people affected by the spam

Instant messaging

Sender’s IM client connects to the server

Client tells the server that you are online, gives server list of contacts

Server stores: your IP address, list of your contacts

Instant messaging

Instant Messaging (IM) is a way of immediately sending messages over the Internet

A synchronous means of communication

In 2015, there were around 3.2 billion IM accounts. Whatsapp and FB Messenger were the most popular IM apps.

Some IM apps offer end-to-end encryption for conversations (eg. Telegram, FB Messenger)
Instant messaging
Once connected, sender and recipient can chat without needing the server

Forums
Forums are an online discussion group about a particular topic
A form of asynchronous communication
Different kinds of forums:
- Class forum for COMPSCI111/111G S1 2017
- Apps have forums where users can help each other (e.g., OpenOffice forum)
- Forums for discussing different topics (e.g., forum on airplanes)

Parts of a forum
Moderator: a forum user who can edit, delete or move posts or threads to help keep the forum tidy and organised
Issues - attachments

An attachment is a file that is included within an email message, IM message or even a forum post.

Attachments may contain malicious content so never open an attachment unless you are sure it is from a reliable source.

- Another precaution is to scan the attachment using an anti-virus program.

Attachments have been the main way that Cryptolocker ransomware has spread.

Issues – Netiquette

Etiquette on the Internet; what is socially acceptable when communicating online.

Examples:
- Having a greeting and signature in your emails
- Not using your cellphone in libraries and quiet spaces

Some reading:
- [http://www.fap.org/rfc/rfc1855.html](http://www.fap.org/rfc/rfc1855.html)

Issues - misrepresentation

People can misrepresent themselves using electronic communication.

- Phishing emails claiming to be from your bank
- False profiles on dating apps and social media

Always worth double-checking a message with the purported sender if you’re suspicious.

Summary

Email was invented in 1972. Three main protocols: POP3, IMAP, SMTP.

IM and forums are other forms of electronic communication.

Issues with electronic communication:
- Spam
- Attachments containing malware
- Senders misrepresenting themselves
- Securing communications using encryption, protecting account details, 2FA
- Netiquette