COMPSCI 111 / 111G

An introduction to practical computing

Electronic Communication

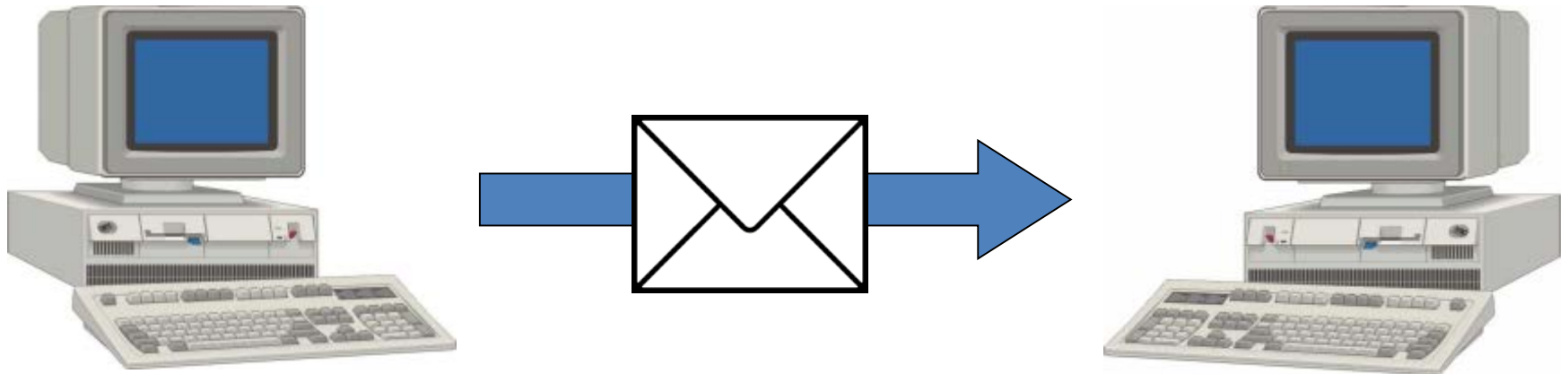Email, instant messaging, forums

What is e-mail?

Electronic mail

- System for sending and receiving message over the Internet

Asynchronous system

- Messages are sent and received some time later
- Just like physical letters, but faster
- Normally takes seconds

Must know the address of the recipient

Electronic mail (e-mail)

Started very early (late 1960's)

Before the Internet

Multiple people shared the same machine, no computers in office

People left messages for other users

Typical 1960s office
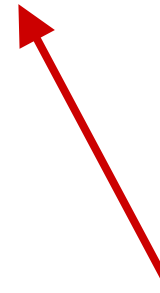

http://en.wikipedia.org/wiki/Email

First network email

Ray Tomlinson
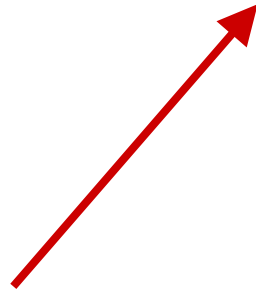
- – Send first email message from one computer to another over network (1971)
- – Used the @ sign for email addresses

http://openmap.bbn.com/~tomlinso/ray/firstemailframe.html

Email Address

Understanding the address

`localpart@domainname`

**The local part of the address
Often a username**

**The domain name where the mail
server is located**

e.g.   `stefan.wender@auckland.ac.nz`

Composing an email message

Compose the message

- Use an application or webmail
- 'From' sender is easily faked.
- Mail goes to all recipients (To,Cc, Bcc) but other recipients don't see Bcc address.
- Spam filter might catch mail with blank subject.
- Signature is not legally binding.

source address

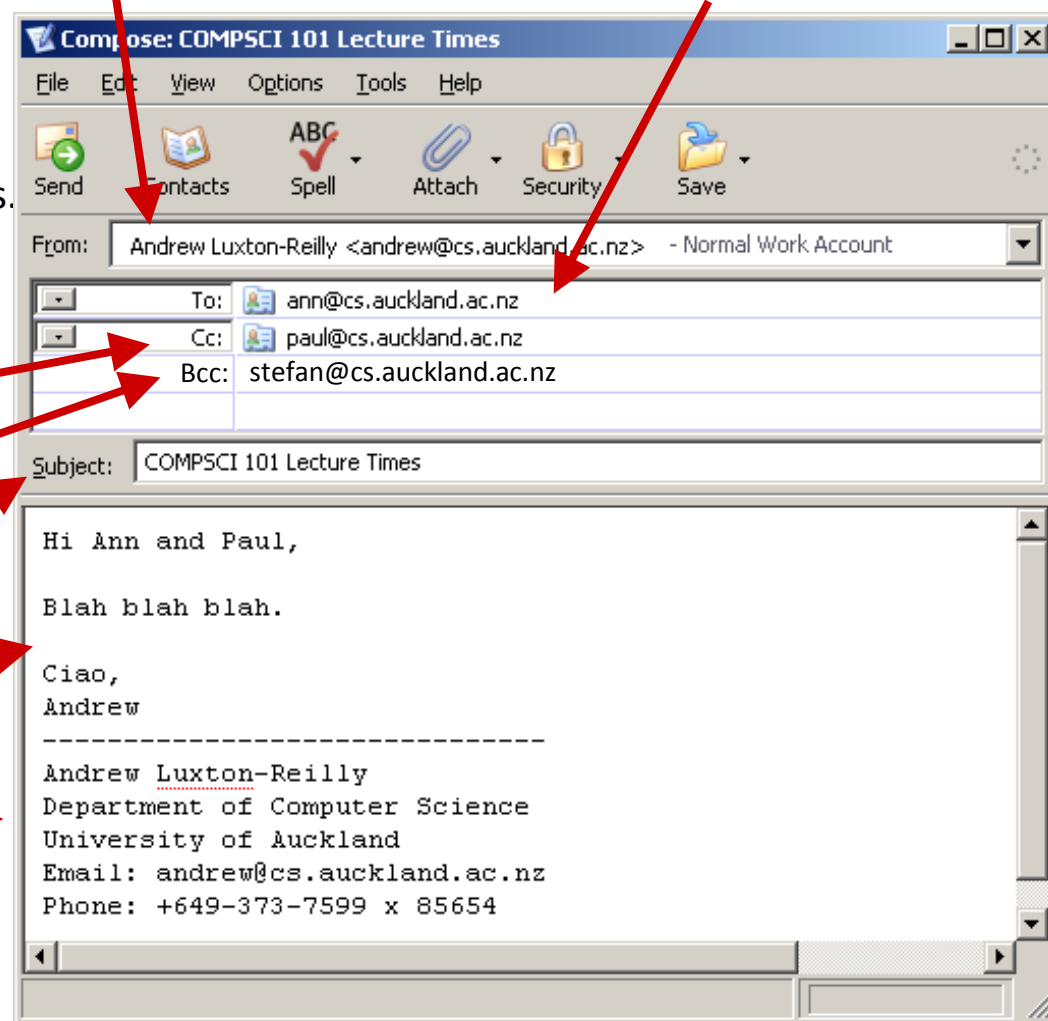**destination address**

carbon copy

blind carbon copy

subject

message body

signature

Compose: COMPSCI 101 Lecture Times

File   Edit   View   Options   Tools   Help

Send   Contacts   Spell   Attach   Security   Save

From: Andrew Luxton-Reilly <andrew@cs.auckland.ac.nz>   - Normal Work Account

To: ann@cs.auckland.ac.nz
Cc: paul@cs.auckland.ac.nz
Bcc: stefan@cs.auckland.ac.nz

Subject: COMPSCI 101 Lecture Times

Hi Ann and Paul,

Blah blah blah.

Ciao,
Andrew

Andrew Luxton-Reilly
Department of Computer Science
University of Auckland
Email: andrew@cs.auckland.ac.nz
Phone: +649-373-7599 x 85654
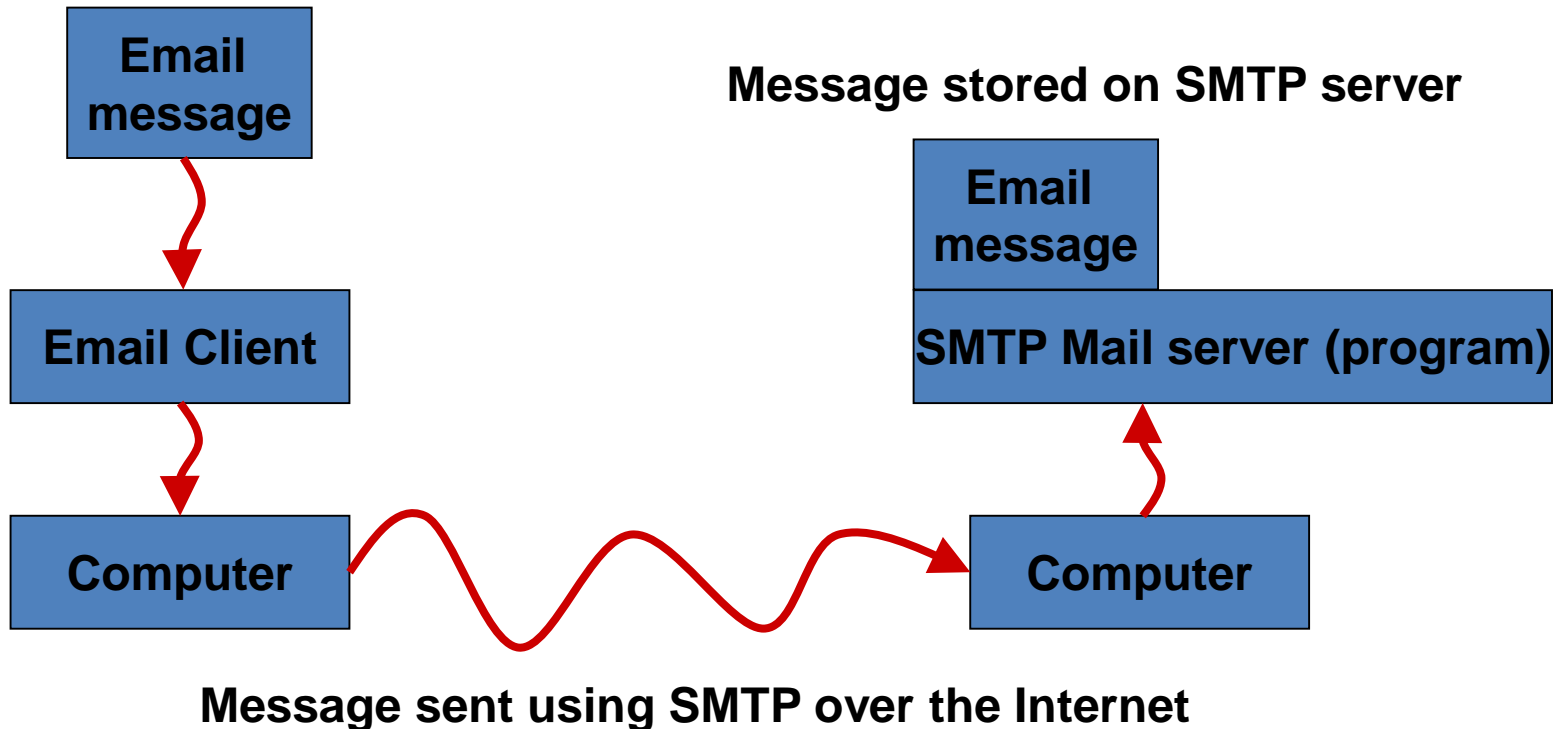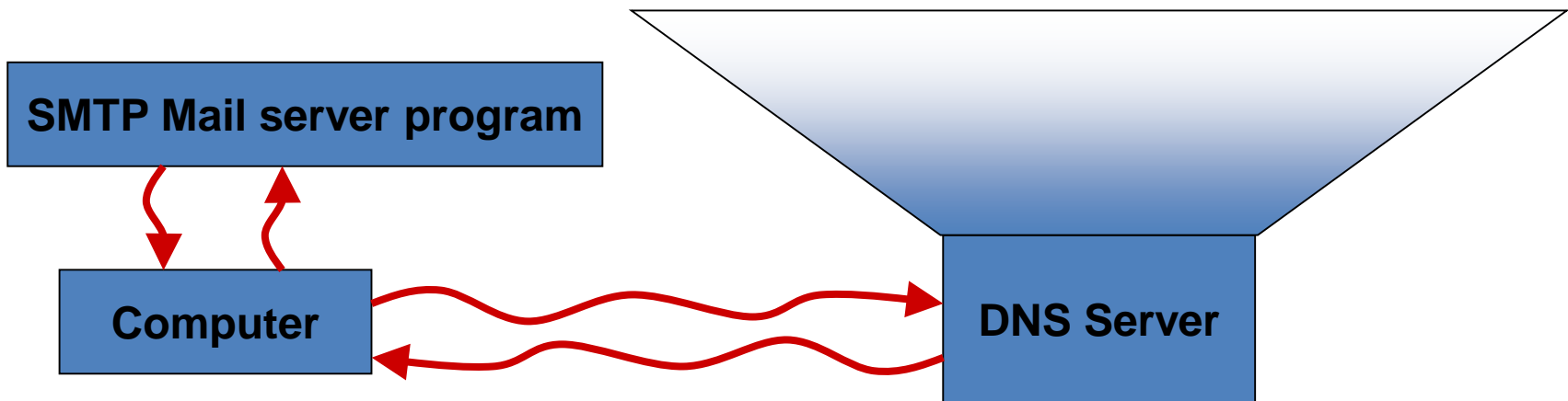
Sending an email message (1)

Program sends the email message to mail server

- Uses Simple Mail Transfer Protocol (SMTP)
- Usually located at your Internet service provider (ISP)

Email message

Message stored on SMTP server

Email Client

Email message

SMTP Mail server (program)

Computer

Computer

Message sent using SMTP over the Internet

Sending an email message (2)

SMTP server contacts the Domain Name System Server to find address of mail server

Name	IP address
...	...
mailhost-vip.auckland.ac.nz	130.216.159.124
...	

SMTP Mail server program

Computer

DNS Server

Sending an email message (3)

SMTP server sends the email message to destination mail server

mail.cs.auckland.ac.nz
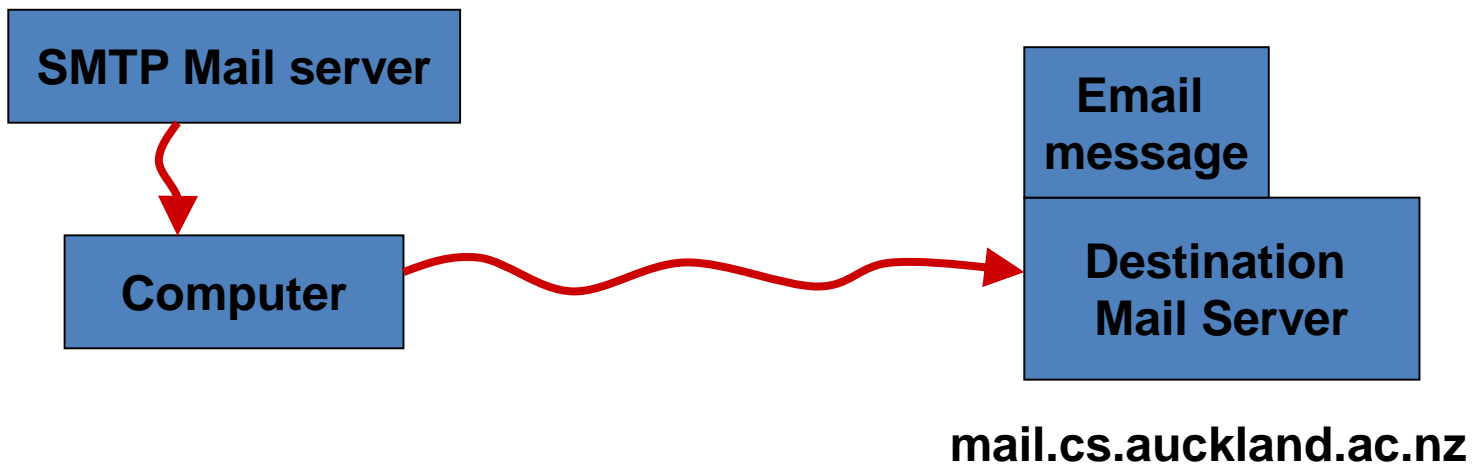
Sending an email message (4)

User collects mail from mail server

- Different protocols for collecting mail
- POP3 (Post Office Protocol 3)
- IMAP (Internet Message Access Protocol)

Message stored on mail server

Email message

Email Client

Email message

Mail Server

Computer

Computer

Message received using POP3 or IMAP protocol
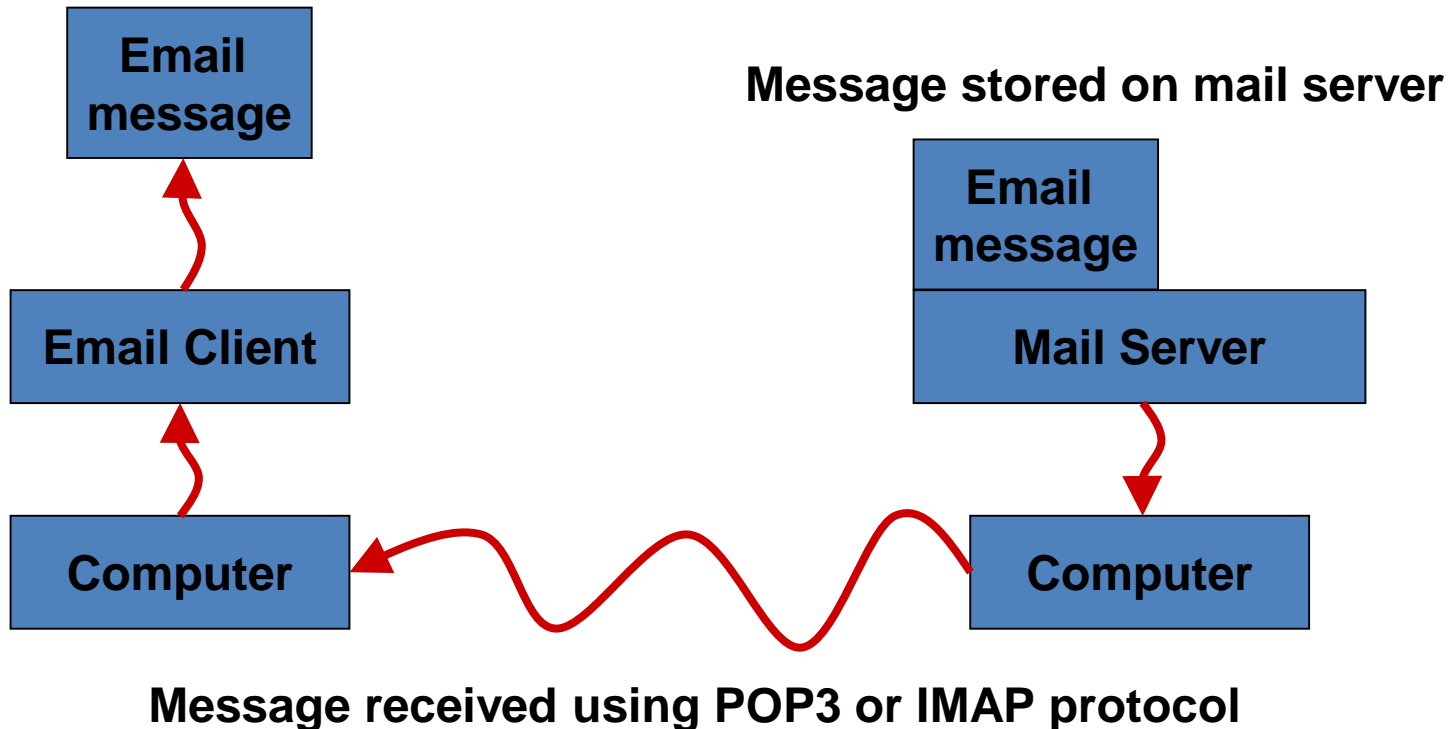
POP3 versus IMAP

POP3 *(derived from Post Office Protocol 3)*

- – Email is downloaded from server to local computer
  and deleted from the server after download

- – No Internet connection necessary to read the downloaded messages

- – If local computer is erased, the messages are lost

IMAP *(Internet Mail Access Protocol)*

- – Email is kept on server

- – Email client just shows what messages are on the server
  and downloads them on demand (not deleting them). Possible to
  download only partially, e.g. only the subject line.

- – Email can usually only be read when connected to the Internet

- – email clients can be set to maintain a local copy for offline

- – Good to access email messages from different machines

Gmail

- Web interface for email (similar to Hotmail, Yahoo!)
- Started early 2000s
- 900 million users as of May, 2015.
- Sophisticated search facilities, both for content and contacts.
- Different views available (e.g. conversation views)
- Chat, hangout added later
- Problems for user: phishing, targeted ads, tries to get you do other things (e.g. use google+)

Privacy and email

Messages pass through many machines

- Can be read by others while in transit

Messages are stored on the destination mail server

- Can be accessed by the administrator of the system

- Misdirected email might be automatically send to administrator

- Backup copies might be made automatically be the mail server

Legality

- Illegal to read physically posted mail (Federal crime in the USA)

- Perfectly legal to read email messages

- Many major companies in USA check employees email (25% - 75% depending on the survey)

Spam and Scam

What is spam?

- Advertising emails, named after canned meat via an old Monty Python Sketch
- Unsolicited, bulk email (message send to thousands of people)
- Spamming is illegal, but enforcement is difficult
- About 100 billion spam email messages per day (2013)
- Many email clients provide spam filters

Scam via email?

- Emails promising money, free gadgets, prizes
- Hoaxes: made-up stories, asking you to forward mails, pay money.
- Phishing: acquire sensitive information by masquerading as a trustworthy entity (e.g. as your bank, or your mail provider)

New Zealand Spam Law

Unsolicited Electronic Messages Act 2007

- Prohibits unsolicited commercial electronic messages with a New Zealand link.
- Requires commercial electronic messages to include accurate information about the person who authorised the sending of the message, as well as a working unsubscribe facility to enable the recipient to instruct the sender that no further messages are to be sent.
- Prohibits address-harvesting software used to create address lists for sending unsolicited commercial electronic message.
- Deters people from using information and communication technologies inappropriately.

Electronic mail covered by the Act:

- Email
- Fax
- Instant messaging
- Text and image based messages of a commercial nature sent to mobile phones

Exercises

1) What does asynchronous communication mean?

2) Give an example of an asynchronous system of communication, other than email.

3) Explain, as simply as possible, what SMTP is used for.

4) Which protocol can be used to download your messages to your local machine so you can read your email when you are not connected to the Internet?

5) What is spam?

Instant messaging (IM)
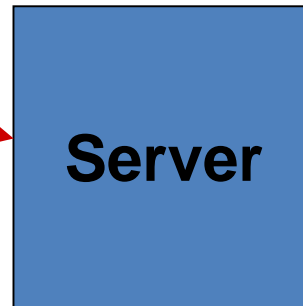
Synchronous system of communication

- List of contacts
- Displays contacts that are currently online
- Messages are sent immediately in real time
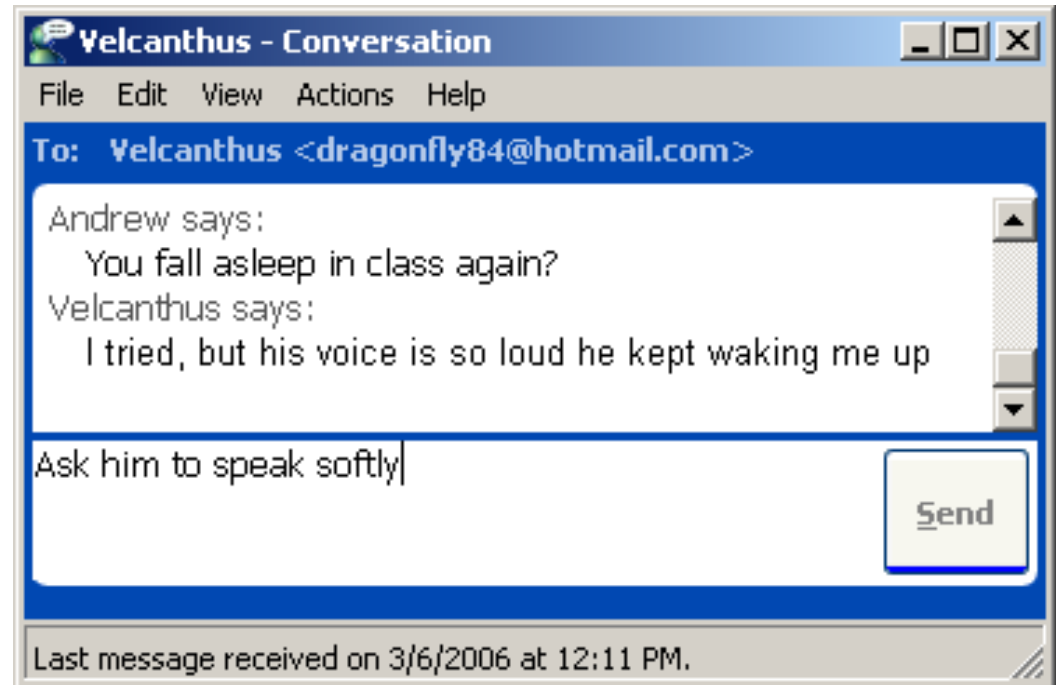
Chat system (1)

Start up the chat client: Set the status to "online"

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

Server

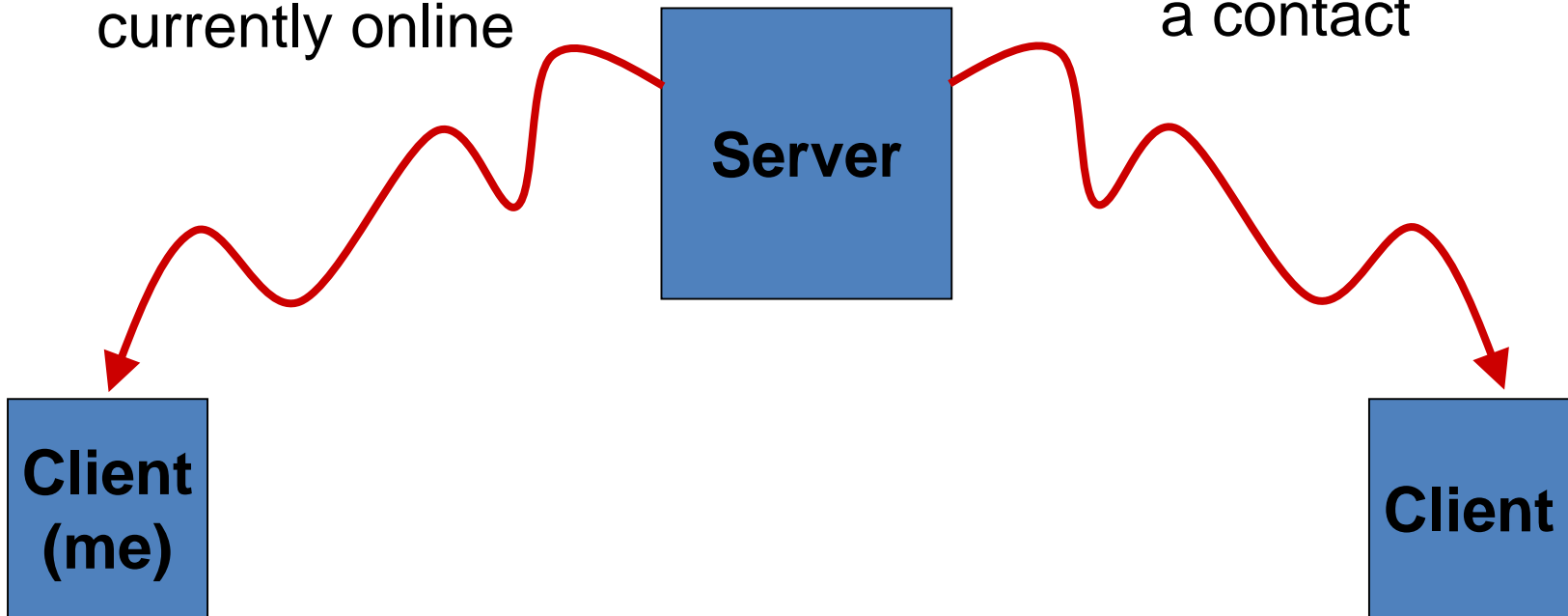Server stores:
your IP address, list of your contacts

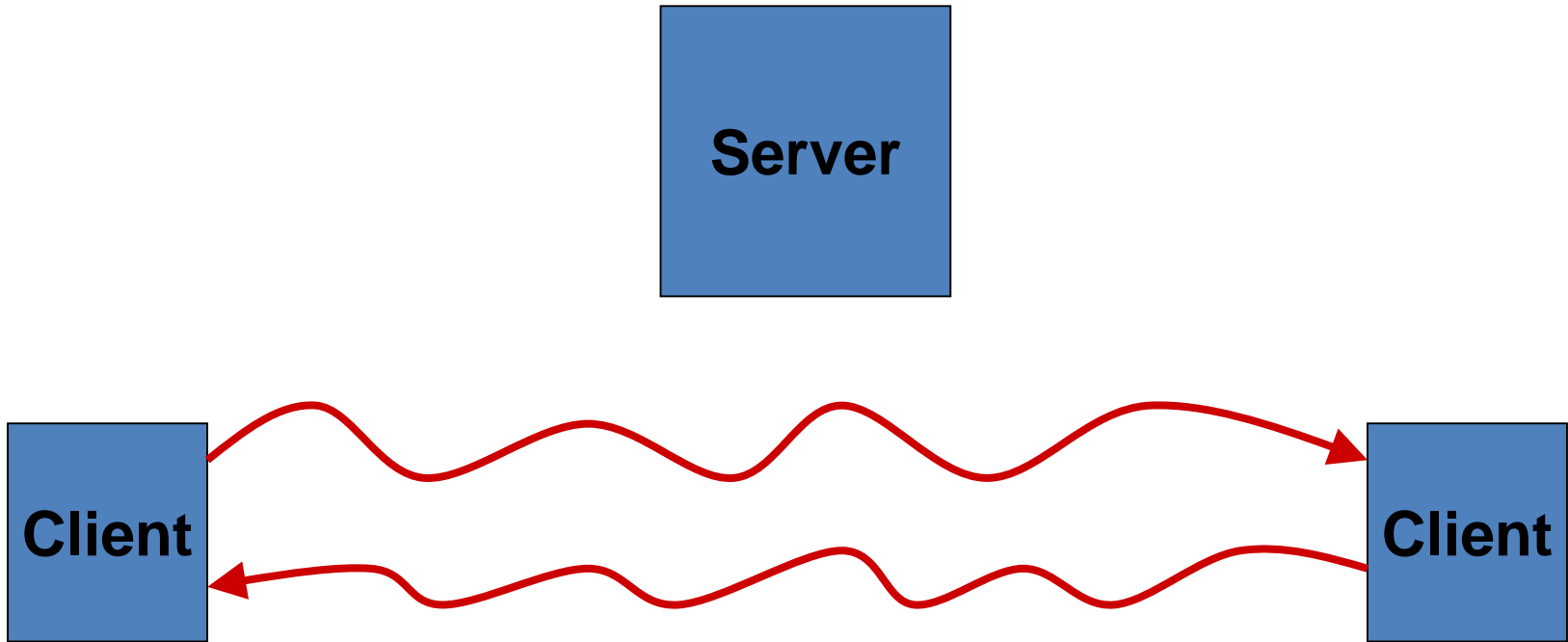**Client (me)**

Client

Chat system (2)

Server responds

Server sends IP addresses of all your contacts that are currently online

Server sends your IP address to anyone that lists you as a contact

Server

Client (me)

Client

Chat system (3)

Clients can chat to each other without the server

Common chat systems

Chat Systems
- ICQ (from 1996)
- MSN
- Yahoo
- Google Chat and Hangout
- Skype messages
- Facebook Chat/Messenger
- WhatsApp, WeChat, Viber, etc.

Applications used as clients
- Many
- Some clients allow user to connect to multiple chat systems (e.g. Miranda IM)
- WhatsApp (contortion of ``What's up?") allows for cross-platform instant messaging

Chat rooms
- Anyone in the same "room" can see the same chat

Instant Messengers

- **Users Transitioning from Email and SMS**
- **WhatsApp**
    - 600 million active users (August 2014)
    - 20 billion sent messages/day (April 2014)
    - Acquired by Facebook in February 2014 for $19 billion
- **WeChat**
    - 438 million active users (August 2014), 70 million outside China
- **Viber**
    - Instant messaging and VoIP calls, also to landline
    - 280 million registered users
- **Google Hangouts**
    - Integrated into Gmail
    - Allows chat, voice calls and video calls
- **Facebook Messenger**
    - 500 million users (November 2014)
    - Text and voice

Dangers

Any electronic communication

- You cannot easily know who a person is
- People misrepresent themselves

Who they say they are

Who they really are

Attachments

File that is attached to a message

– Usually sent via email

– Not secure

– better send a link to the file than the file itself (much smaller, more likely to arrive) E.g. use dropbox, google drive

Attachments may contain dangerous files

– Malware: Spyware, viruses etc.

– Particularly dangerous:
executable attachments (.exe, .com)

– Other seemingly harmless file types may also contain executable code

– Never open an attachment you cannot trust

Forums

Message board

- Asynchronous communication
- Discussion group
- Online communities
- **COMPSCI 111 SS C 2016**

Moderator

- Administrator with ability to edit, delete, move messages

Thread

- An online conversation
- Message with replies

USENET (started 1980)

- Huge system of public forums
- Over 50,000 newsgroups

"Good manners" on the Internet

Netiquette (Etiquette on the Net)

- How to behave politely
- How to avoid pitfalls
- Understanding cultural norms, understanding online communities

Some Reading

- http://www.101emailetiquettetips.com/
- http://www.faqs.org/rfcs/rfc1855.html
- http://www.albion.com/netiquette/

  http://en.wikipedia.org/wiki/Netiquette

Summary

Email can be used to send messages to email addresses

- Asynchronous communication
- Usually not secure, i.e. can be read by other people
- Can be misused for spam and scam
- Used to send files as attachments
- Can be misused to distribute spyware, malware, viruses

Instant messaging

- Synchronous communication
- Usually also not very secure
- Used to see if friends are online
- Good to chat with other people
- Chat rooms allow to chat with many people at the same time

Forums

- "Electronic discussion group", usually moderated,
- larger and more stable than chat rooms

More Exercises

6) Under what conditions can you open an email attachment safely?

7) What does CC stand for and what does it do?

8) What does BCC stand for and what does it do?

9) What is a thread?

10) What is a forum?