Data Security and Encryption

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UK Data Service

Presentation Structure

- What is the UK Data Service?
- Data Security
  - Passwords
  - Encryption
  - Encryption programmes
  - Data Disposal
- Hands on Exercises

What is the UK Data Service?

- Funded by the ESRC
- Single point of access to a wide range of secondary social science data
- We provide support and training for data creators with accessing, managing, sharing and using data
- Delivered by staff based at universities across the UK (Essex, Manchester, Leeds, Southampton, Edinburgh & UCL)
- UK Data Archive – manages the UK Data Service and curates the data

Data Security

Protect data from unauthorised

- Access
- Use
- Change
- Disclosure
- Destruction

Who knows who is watching, listening or attempting to access your data…

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Data Security Strategy

- Control access to computers:
  - use passwords and lock your machine when away from it
  - run up-to-date anti-virus and firewall protection
  - power surge protection
  - utilise encryption
    - on all devices: desktops, laptops, memory sticks, mobile devices
    - at all locations: work, home, travel
  - restrict access to sensitive materials e.g. consent forms and patient records
  - personal data need more protection – always keep them separate and secure

- Control physical access to buildings, rooms and filing cabinets

- Properly dispose of data and equipment once your project is finished

Passwords

- Strong passwords are crucial
- Avoid using weak or easy to guess passwords and reusing passwords
- Consider password managers, complex passwords or stringing words together to create stronger passwords
- But, remember that you need to be able to remember the passwords!
- **Why does this matter?**
- No matter how good the encryption is that you use if you use a weak password the encryption will offer little protection

https://howsecureismypassword.net (*Never use real passwords)

Password Security

HOW SECURE IS MY PASSWORD?

●●●●●●●●

Your password would be cracked

INSTANTLY

Why not try Dashlane to create and remember stronger passwords? It's free!

“Password”

Password Security

HOW SECURE IS MY PASSWORD?

It would take a computer about

27 UNDECILLION YEARS

to crack your password

Dashlane can help you remember all of your secure passwords - and it's free!

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Encryption

- Encryption is the process of encoding digital information in such a way that only authorised parties can view it.

- Basic principles
  - Applies an algorithm that makes a file unreadable
  - Needs a ‘key’ of some kind (passphrase or / and file) to decrypt

- Some types of encryption provide greater protection than others, the type and level of encryption used should correspond to the sensitivity of the data being protected.

- As a general rule, more bits equals stronger encryption, therefore, 256-bit encryption is stronger than 128-bit encryption.

Encryption

- When using encryption 128-bit encryption should be the minimum level used.

- **Always** encrypt personal or sensitive data
  - = anything you would not send on a postcard
  - e.g. moving files, such as interview transcripts
  - e.g. storing files to shared areas or insecure devices

- The UK Data Service recommends Pretty Good Privacy (PGP)
  - More complicated than just a password, but much more secure
  - Involves use of multiple public and private keys

Encryption Software

Encryption software can be easy to use and enables users to:

- encrypt hard drives, partitions, files and folders
- encrypt portable storage devices such as USB flash drives

VeraCrypt

BitLocker

Axcrypt

FileVault2

We will run through demonstrations of all of these later, time permitting!

VeraCrypt

VeraCrypt

- Derivative of TrueCrypt (now defunct)
- Multi-platform encryption software (Windows, Mac and Linux)
- Full disk and container encryption
- Advanced features
- Free and open source
- Tutorial: https://www.youtube.com/watch?v=Ogm9QHQpFqU

BitLocker

BitLocker

- This is standard on selected editions of Windows
- It can encrypt disk volumes and USB devices
- It can also perform ‘whole computer’ encryption
- If you have Windows installed you can unlock a drive that has been encrypted using BitLocker even if you do not have the programme installed on your computer
- BitLocker is compatible only with Windows OS and is proprietary
- Tutorial: https://www.youtube.com/watch?v=y4Iosu-Yfsw

FileVault2

FileVault2

- This is standard on Apple Macs
- Full disk or drive encryption
- The password can be linked to your iCloud account to unlock the Mac hard drive if you forget your password
- Proprietary
- Uses XTS-AES-128 encryption
- Tutorial: https://www.youtube.com/watch?v=JIZ9EFMS0ic

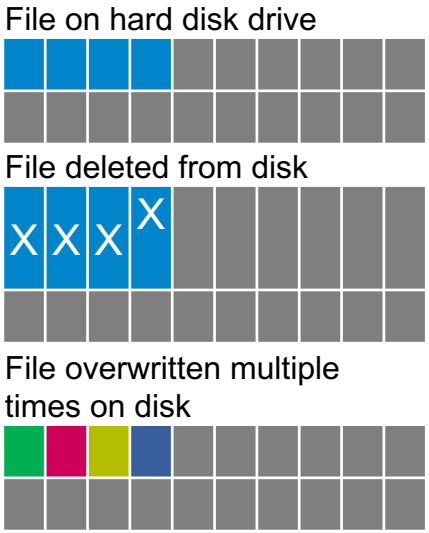
Axcrypt

Axcrypt

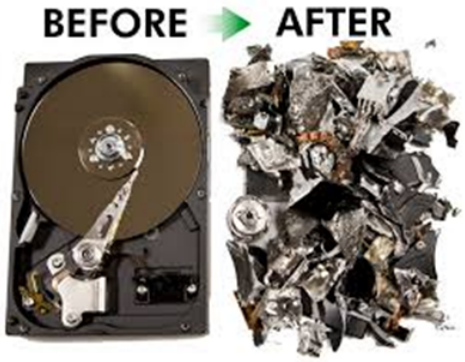
- Open source
- File-level encryption
- Works only on Windows
- Includes ‘digital shredding’ ability
- Tutorial: https://www.youtube.com/watch?v=ACcRlnsoYZg

Data Disposal

- When you delete a file from a hard drive, it is still retrievable (even after emptying the recycle bin)



- Even reformatting a hard drive is ***not*** sufficient
- Files need to be overwritten multiple times with random data for best chances of removal
- The **only** sure way to ensure data is irretrievable is to physically destroy the drive (using an approved secure destruction facility)



Data Disposal Software

- **BCWipe** - uses ‘military-grade procedures to surgically remove all traces of any file’
  - Can be applied to entire disk drives

- **AxCrypt** - free open source file and folder shredding
  - Integrates into Windows well, useful for single files

- Physically destroy portable media, as you would shred paper

Hands on Exercises

Contact

Collections Development and Producer Relations team
UK Data Service
University of Essex
ukdataservice.ac.uk/help/get-in-touch