# Thin Client Overview

# Overview

- Thin clients are lightweight terminals which connect over a network to a central server

- The server provides all the applications, data and processing, none of this is done on the terminal itself

- This differs from traditional PCs where the applications and data are stored on the local machine

# Key advantages

- The devices are very low cost, robust with much longer usable lifespan than PCs

- Applications only need to be installed and updated on the server. No need to individually manage each device (as with a PC)

- Data is centrally stored, so makes it easier to backup

- User access the same desktop environment, data and application from whichever terminal they connect from
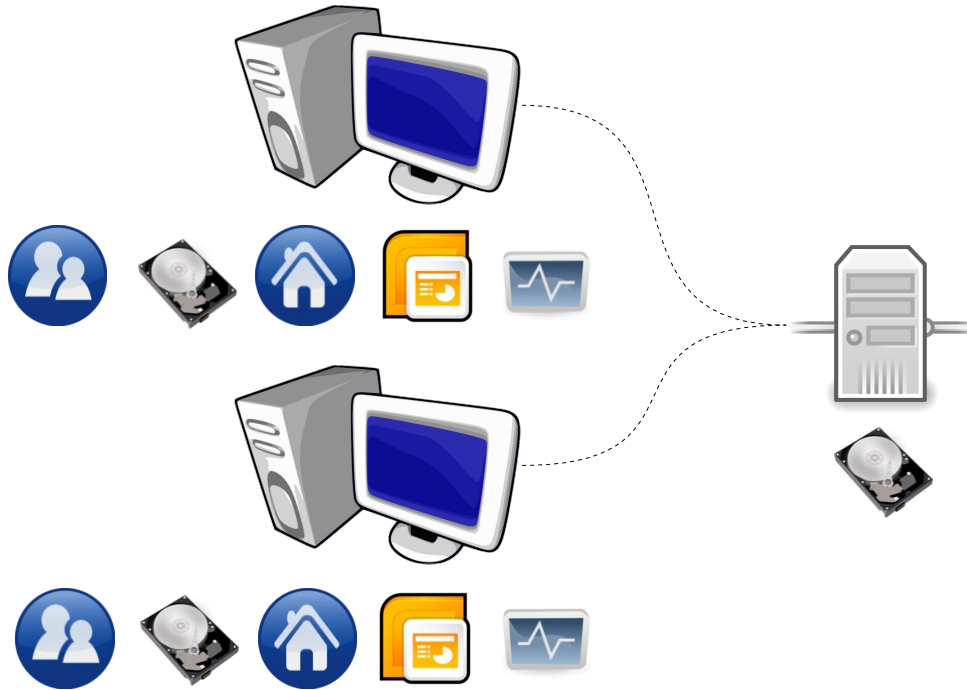
# Comparison with PCs

The next slide shows how the architecture of thin client network differs from PC based network in the following respects:

- Network coupling

- User accounts

- Data storage

- User home and desktop environment

- Applications
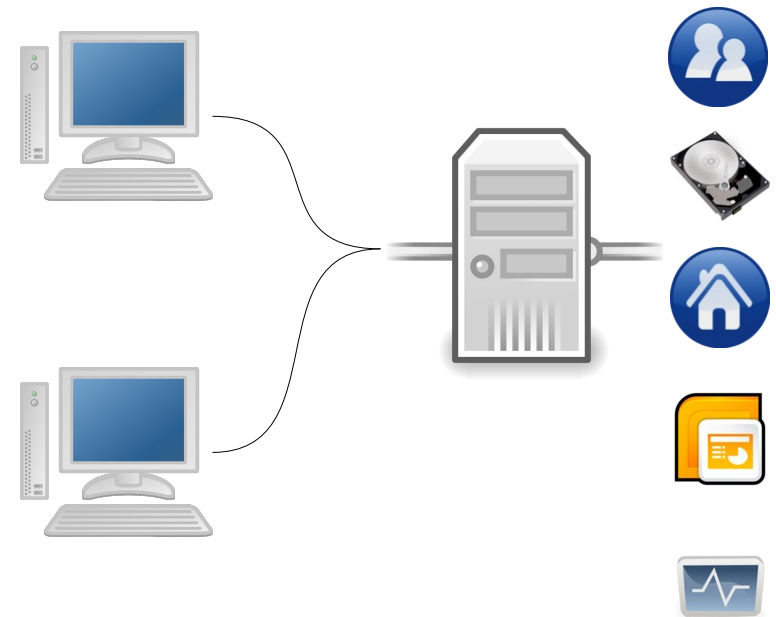
- Processing

# Traditional Standalone Architecture

# Thin Client Architecture

| Loose network coupling | | Tight network coupling |
|---|---|---|
| User has different account on each device | | Same account on every device |
| Data spread across different PCs and server | | Stored centrally on server |
| User desktop different on each device | | Same desktop environment from all devices |
| Applications installed on every device | | Applications installed on server only |
| Processing happens on local device | | Server handles all processing |

# Standalone v Thin Client: Hardware

| | Standalone | Thin Client |
|---|---|---|
| Maintenance and Support | Each device needs to be maintained separately | Client devices require no maintenance, only the network and server |
| Scalability | Low: doubling the number of PCs will double the support requirements | Very high, adding many more clients adds little to the overall support requirements |
| Performance | Varies from device to device depending on processor/memory. To increase performance each device needs to be upgraded | Performance based on the server and network. Can increase performance/capacity by adding servers |
| Security | Devices contain valuable components, so every area hosting a device must be well secured | Few valuable components within the devices (only the monitor). Data centre needs to be well secured |
| Robustness | Devices susceptible to component failure (fans, disk drives etc regularly fail) | Devices very robust (no moving parts). |
| Ergonomics | Fan noise and heat generation. | No noise, low heat. |

# Standalone v Thin Client: Software

|  | Standalone | Thin Client |
|---|---|---|
| Application management and support | Software needs to be installed/ upgraded/patched on every device | Software only needs to be managed on the server |
| Data management | Data may be distributed over all devices and moved from device to device with USB disk or CD | Data stored centrally so easy to manage and back up |
| Virus resistance | Poor (with Windows OS): every PC needs to have it's anti-virus program updated | Very high virus resistance with open source operating system. |
| System resource efficiency | Low: most of processing capacity idle and disk storage empty | Very high: centralised processing and data storage means best use can be made of all system resources |
| Usage Monitoring | Hard to report on usage as distributed across many PCs | Easy to generate usage reports |

# Standalone v Thin Client: Costs

| | Standalone | Thin Client |
|---|---|---|
| Hardware cost per seat | High | Low |
| Longevity/ replacement costs | PC generally have approx 4 year lifespan | Thin client terminals can still be useful after 8+ years. |
| Energy efficiency | Low, desktop PC (excluding monitor) is typically 100W | High – can save 60-80% on electricity costs. Thin client devices (excluding monitor) are typically 5-10W. |
| Total Cost of Ownership | High – each desktop PC requires maintenance and administration | Low – only the servers need to be maintained |

# Generic user v Identified user



| | Generic User | Identified User |
|---|---|---|
| Data Management | User needs to manage and backup their own data. Risks losing their data as can easily be deleted by other users. | Users data is kept secure under their account, can't be deleted by other users. |
| Applications | Set up according to generic preferences (or the last user) | Users can configure/setup application setting to suit them, their changes won't be lost |
| Device affinity/ownership | Users tend to use one particular physical device | User owns the desktop environment, so can use any physical machine |
| Application integration | User must log in separately to each application (and remember to log out properly) | Users can be automatically logged into the email and other systems |
| Monitoring & reporting | Cannot monitor individuals usage | Can monitor and report on individuals usage |

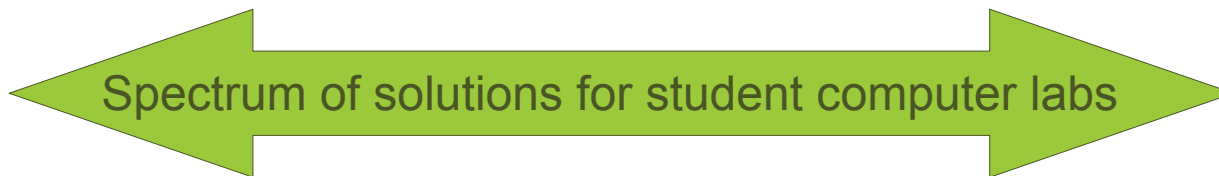# Many architectures



Standalone PC

Standard
Desktop PC



Thin Client

N-computing,
Surfboard
+ more



Ultra Thin Client

SunRay

Spectrum of solutions for student computer labs

# Summary

- A thin client system is especially useful for providing low cost computer access

- Maintenance and support is focussed on the server and network rather than the individual devices.

- Scalable, so easier to support large numbers of clients

- Old PCs can be reused as thin client devices

- More efficient usage of processing power

- Much lower Total Cost of Ownership (TCO) than PCs