

# Power-Saving for £0

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# The Problem

- Computers often left on all the time, regardless of whether they are in use
- Changing people's behaviour is difficult
- Need an automatic power-saving mechanism

# The Goal

- Reduce power consumption
- When PCs are idle
- Without risking losing data
- At no cost

# Use Built-In Windows Capabilities?

- Hibernate?
  - Excellent power reduction
  - Serious problems in network environments
- Standby?
  - Good power reduction
  - Same problems with network environments
- Power down hard disks?
  - In practice, did nothing
- Stores settings for the current user!

# Use Third-Party Utilities?

- Cost
- Client utilities
  - e.g. LocalCooling
  - All limited to underlying Windows capabilities = same problems
- Centrally-managed utilities
  - Can only schedule = less aggressive

# Conclusions

- Shut down
- But only when nobody is logged in
- Not very aggressive, but safe
  - Excellent for walk-up computers
- Can be done with batch files and freeware utilities for £0

# How It Works

- Setup batch file:
  - Create a scheduled task to run power-saving batch file (as the System user) after N minutes idle
  - Copy power-saving batch file somewhere local
  - Also copy two freeware utilities
- Power-saving batch file:
  - Determine whether anybody is logged in
  - If not, shut down

# Possible Problems

- Some people may legitimately need to opt out
  - Running grid applications with nobody logged in
  - Acting as a server
  - So supply a discretionary opt-out mechanism
- Psshutdown flagged as dangerous
- NOT a problem: erroneously shutting down when somebody is logged in

# Our Results

- No problems
- Statistics:
  - Shutdowns per day:  $\sim 4,500$
  - Total computers participating:  $\sim 3,500$
  - Average daily downtime: 28,000 hours
  - Average daily MW (assuming 100 W): 2.8 MW
  - Average daily kg CO<sub>2</sub> (0.43 kg/kW): 1,200 kg

# Want to Try It?

E-mail me: [lisa.nelson@liverpool.ac.uk](mailto:lisa.nelson@liverpool.ac.uk)

Or go to

<http://pcwww.liv.ac.uk/powerdown>