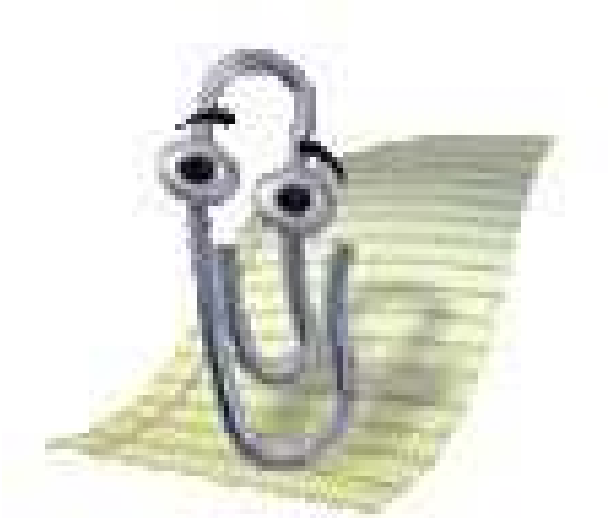
CASTEP on a Playstation?

Can gamers save scientific computing?

The desktop PC

- We in TCM are currently benefiting from the desktop PC (really a workstation) becoming a commodity
- What probably should cost 10K, is costing us about 1K
- This is a real bonus!
- What is driving this?

Why have workstations become cheap?



- Bells and whistles on wordprocessors etc? Yes
- Games? Yes
- CASTEP? NO

Will this still work?

- Speech recognition? Maybe
- Games? Yes
- CASTEP? Sadly, still NO

Games to the rescue

- Modern games are simulations of (un)reality

- Just as we can never have a big enough computer to run CASTEP, games will always be able to use more processing power

- Computer graphics need many of the operations we need for QM codes: FFTs and linear algebra

- Can we use that cheap power?

GAMESS on a Playstation

has a commodity-off-the-toy-shelf (COTTS) strategy

- They ported GAMESS to a Sony Playstation 2
- Their first attempt was comparable (or better in some cases) with a PIII 600MHz
- The Computational Chemistry group at the University of Illinois
- There are problems with cache size and representation of doubles

The NCSA Playstation cluster

- 65 PS2 compute nodes, 4 user login nodes and 1 test node. All nodes run Sony Linux for PS2 (ported from Red Hat to the Emotion Engine CPU)
- They got up to 900MFLOPS on matrix multiply (theoretically should be 4.8 GFLOPS per Emotion Engine)
- The key is to use the vector units properly