The power-hungry internet: energy use keeps rising

As internet use grows, the power used to run computer servers is concerning US and European policymakers. A recent survey estimates that electricity consumption by data centres, which house servers, doubled between 2000 and 2005. They accounted for 1 per cent of global electricity usage in 2005. Western European consumption accounted for a quarter of this figure and was growing slightly faster than the global average.

The study calculated growth in power consumption by data centres in the period 2000-2005. Direct consumption was calculated by multiplying the number of servers by their typical power consumption. Indirect power consumption, i.e. air circulation, cooling, communications and power transmission losses, was estimated to be about the same as direct usage.

For the years 2000 and 2005, trade data were used to calculate the numbers of servers in use, and power consumption per unit of the six most popular servers was obtained for each major type:

- High end servers. There were 66,000 in use worldwide at around 5000W per unit in 2000. At 59,000, there were fewer servers in 2005, but they consumed a little more electricity at 8000W per unit.
- Mid-range servers. There were 1,800,000 at 425W per unit in 2000, and 1,250,000 at 600W per unit in 2005.
- Volume servers. The number of these doubled from 12,250,000 (185W) in 2000 to 26,000,000 (at 225W) in 2005. Almost 80 per cent of the increased power usage was caused by the sharp increase in the number of local, low-end servers, as individual modern units use only slightly more power than older models.

Over the 5 years, total global electricity use rose by 19 per cent, and the proportion used by data centres doubled. In 2005, the total demand from energy centres was equivalent to the output of around 17 power stations. The US and Western Europe account for two-thirds of this consumption, but growing Asian economies such as China and India saw annual consumption increasing by 23 per cent, compared with the global average of 16.7 per cent. Western Europe accounts for 27 per cent of global energy consumption by data centres, and annual consumption increased by around 18 per cent.

More use of ‘blade’ servers is expected to decrease the power consumption per unit, as these can provide all-inclusive services such as cooling and networking, which have previously been provided separately. More efficient server configurations should also reduce the physical number of servers required.

Even so, as demand for IT services increases, a 76 per cent increase in global power consumption at data centres is predicted by 2010. Significant reductions are possible but may require changes to market and industry practices, possibly legislated, to emphasise cost savings made by using an energy efficient unit over the immediate purchase and installation cost of new equipment.

The author stresses that the study only looks at the direct electricity used by data centres, and does not attempt to changes to economical structures enabled by internet use, which can be substantial in many cases.


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Themes: Climate change and energy, Sustainable consumption and production