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Africa@home

Coming down to Earth

Jul 13th 2006

From *The Economist* print edition

Linking up computers to defeat malaria

IF MANKIND ever makes the acquaintance of an extraterrestrial alien, the chances are that first contact will come through a humble desktop computer. The SETI@home project, which searches for signs of intelligent broadcasting among the natural radio signals coming from the sky, depends for its computing power on the spare capacity of a zillion small, private machines around the world.

Although SETI@home may or may not find what it is looking for, it has unarguably started a fashion. Donating spare computer cycles to worthy causes is a cheap way of helping those who cannot afford huge piles of hardware to achieve their goals. The latest organisation to take advantage of this is one of the most worthy of all. Africa@home aims to use that spare capacity for no less a task than the defeat of malaria, a disease that kills more than 1m people a year.

Africa@home is a collaboration between the Swiss Tropical Institute, CERN (a big particle-physics laboratory also based in Switzerland) and a group of universities, including three from Africa. Its aim is to develop a long-term model of malaria epidemiology, which it can use to test different ways of combating the disease.

The institute already uses models to study the short-term dynamics of malaria transmission. However, the computing power needed to generate accurate long-term results is beyond its means. Which is where CERN comes in. Besides studying the fundamental nature of reality, the laboratory is also a huge computing centre. Indeed, it is where the world wide web was invented. And, in the wake of the web's success, it has maintained an interest in how to link up lots of small computers so that they can perform tasks beyond most large ones. Long-term epidemiology is an excellent example of such a task.

Using CERN's tools, the universities have devised a program called MalariaControl.net, which takes the institute's model and converts it into a form that can be scattered meaningfully across hundreds—or even thousands—of computers. MalariaControl.net can handle a lot of different sorts of variable, from the changing density of parasites within a human host as an infection progresses to the sort of treatment available in different places around the continent. It also looks at the relationship between parasite density in people and the rate at which humans transfer those parasites back to the mosquitoes that carry them. It can even take account of the time of year, and thus the amount of standing water around for mosquitoes to breed in. Using these variables, it can then predict the result of deploying various drugs, the likely success of methods such as insecticide-covered bed nets that are used to block transmission of the disease, and the probable impact of a vaccine, if and when one becomes available.

A test run using 500 computers has just been completed successfully and the project is now being opened to 1,000 more volunteers (the Africa@home website is accepting registrations). Those volunteers will be able to bask in the knowledge that they are helping to create a cheaper and longer-lasting way of dealing with one of the world's biggest killers. That should be some compensation for not being the first to contact little green men.

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