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Unused PC Power to Run Grid for Unraveling Disease

... By STEVE LOHR

> The World Community Grid will be introduced by I.B.M. to utilize the untapped computing power from personal computers to help unlock the genetic mysteries of diseases.

I.B.M. plans today to announce a project to harness untapped computing power from millions of personal computers to help unlock the genetic mysteries of illnesses like AIDS, Alzheimer's disease, malaria and cancer.

The project, called the World Community Grid, was developed in collaboration with the National Institutes of Health, the World Health Organization, the United Nations and other organizations, and represents a significant step in the use of the Internet to foster collaborative scientific research. The goal is to combine computer resources and the shared knowledge of researchers to accelerate the pace of scientific discovery.

Dr. Eric Jakobsson, who heads the Biomedical Information Science and Technology Initiative at the National Institutes of Health, said, "This program is both a sizable commitment of computing resources and an encouraging sign of progress in moving toward a community model for biomedical computing."

To succeed, the community grid project will require a willingness by millions of volunteers to contribute the unused computing capacity of their personal computers.

Its ambitions and its backing by I.B.M. and others are unusual, but the approach is not new. The spread of the Internet and steady advances in processing power and software have made it possible to assemble networks of far-flung machines that can take on daunting scientific problems.

A comparatively simple but well-known distributed computing effort is the SETI@home program, begun in 1999, which uses the spare power of personal computers to scan radio signals for signs of extraterrestrial intelligence.

Grid computing technology could be useful for all kinds of scientific problems that require vast computing and can be broken up into small chunks for processing. But biology and medicine are ideal areas, the project participants say, given the increasing use of computers in the search for genetic markers for disease and in seeking clues to the basic processes of life.

The new network's resources will be devoted to a series of problems chosen by a 17-member advisory board. Its first mission will be the Human Proteome Folding Project, directed by the Institute for Systems Biology, a nonprofit research organization in Seattle. The proteome project seeks to identify all the proteins in the human body and their functions.

At the Institute for Systems Biology, the community grid will be used to compute how new genes fold into proteins and then match those shapes against a three-dimensional protein database, looking for similarities. That could provide important clues about what a specific gene actually does in the body - and those clues could, in turn, help scientists understand disease, move toward the discovery of drugs or solve biological puzzles.

"This is a perfect problem for this kind of computing," said Dr. Leroy Hood, president of the Institute for Systems Biology, "and it could have a big impact on biology."

Researchers wishing to take advantage of the grid must agree to keep their research and software tools in the public domain.

Several other projects have sought to harness the power of personal computers to explore areas like the evolution of disease-causing bacteria and to identify chemical compounds that show promise against smallpox. I.B.M. was a sponsor of the smallpox project last year, along with the Defense Department.

"The hope is that the World Community Grid project can expand the impact of this kind of computing to a much broader set of applications," said Ian Foster, a computer scientist at the Argonne National Laboratory near Chicago.

Those wishing to join the grid project and donate computer time will be able to download software from a Web site, www.worldcommunitygrid.org. When the machine is turned on but not in use, the program will use it as part of the computing grid.

I.B.M. is financing the grid project as a permanent charitable program that will cost it several million dollars a year, a spokesman said. The results will be gathered at an I.B.M. data center in Boulder, Colo. Software for assembling the computing power from the PC's is to be supplied by United Devices of Austin, Tex.

The advisory board includes Dr. Jakobsson of the National Institutes of Health, Mr. Foster of the Argonne laboratory and representatives from the United Nations, the World Health Organization, the Mayo Clinic, Oxford University, the California Institute of Technology and the Centers for Disease Control and Prevention.

"Our hope is that the problems to be addressed will be determined by the world's community of scientists," said Carol Kovac, general manager of the health care and life sciences business at I.B.M.