NEWS

Dear all volunteers, our sudoku@vtaiwan system crashed around Jan 3rd, 2011. We would like to apologize to you all for the crash.

We have recovered our system. However, we still lost the login record of volunteers, including account/password, though we backup the credits of all volunteers. Since we cannot but reset the volunteer credit system, we need your help to restore your credits as follows.

1. Detach the old "sudoku@vtaiwan" project entry (in the projects folder), and then
2. attach new project "http://sudoku.nctu.edu.tw" project as a "new user", but remember to use the same name.

As long as you can register with the same name as before, we can restore your credits by adding the current saved credits back to the new system later.

Sorry for any inconvenience. And thank you very much for your continuous support.

Sudoku@vtaiwan Team , January 14th, 2011.

SUDOKU@VTAIWAN PROJECT

sudoku@vtaiwan is one of V-Taiwan projects that uses Internet-connected computers to do research in sudoku. You can participate as a volunteer by downloading and running programs on your computer .

In this project, we develops new techniques and used them to modify the program Checker (written by
Gary McGuire
). We successfully reduced the total expected computation time from 300,000 years per core to 2,417 years per core. This makes it more feasible and reasonable to use
BOINC
to solve Sudoku. Some of these new techniques are described in a paper in the
IWCG Workshop
of
TAAI 2010 conference

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SOLVE 16-CLUE SUDOKU OPEN PROBLEM IN ABOUT 2400 YEAR-CORE

Sudoku is one of the most popular games nowadays. One important question intriguing to scientists is the minimum number of clues in Sudoku puzzles with unique solutions. As of October 2009, Gordon Royle collected 49151 17-clue puzzles, among which none are isomorphic to one another (by isomorphism, we mean to translate the puzzle by simply rotating, mirroring or digits-switching). However, so far, none successfully found 16-clue puzzles or gave a proof that no 16-clue puzzles exist.

Gary McGuire , Professor of the National University of Ireland, presented a search approach to solve 16-clue puzzles. He also developed a program, called CHECKER , for trying to solve it. According to our experi mental analysis, the program requires about 300,000 years on a one-core computer equipped with CPU, Intel(R) Xeon(R) E5520 @ 2.27GHz. (Note that we will use one core to indicate the computing power.) His final comment was 'We really need a breakthrough in our understanding to make it feasible to search all. We either need to reduce the search space or find a much better algorithm for searching.' (see Scientific American, 2006)

In our recent research, we proposed some new algorithm and also fined tune the code to speed up by a factor of 128, and the code can be downloaded here . According to our experiments, our new program can solve it with one core in about 2417 years. Thus, it becomes feasible to solve the open problem. For example, if 2417 cores via BOINC are used, the open problem can be solved in one year; and if 24170 cores are used, it can in about 36 days. (Our benchmark can be downloaded here , and here are two sets, 100 grids and 10000 grids , for verification.)

Hereby, we sincerely thank you for donating your computing resources to sudoku@vtaiwan. Your contribution will greatly help solve this open problem.

V-TAIWAN PROJECT

V-Taiwan or Volunteer-Taiwan is a volunteer computing project financially supported by the National Science Council (NSC) of Taiwan. The project, to be announced over the Internet, is to apply volunteer computing to computer game applications. Currently, we have successfully used volunteer computing to solve many Connect6 openings as reported in the papers below. Among these openings, a popular one was named Mickey Mouse Opening (since the opening looks like a Mickey Mouse face).

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