PrimeGrid's
Proth Prime Search

On 27 Dec 2008 23:01:43 UTC, PrimeGrid's first Fermat divisor in the Proth Prime Search project was discovered:

$$651*2^{476632}+1 \text{ Divides } F(476624)$$

It is only the 6th found Fermat divisor of 2008 and 270th overall. The prime is 143,484 digits long and is the 8th largest Fermat Number divisor in Chris Caldwell's "The Largest Known Primes Database" (http://primes.utm.edu/primes). Incidentally, it ranks 3rd in "weighted" Fermat Number divisors.

The discovery was made by Eric Ueda of the United States using an Intel C2Q Q6600 @ 2.40 GHz with 1 GB RAM. This computer took almost 4 minutes 43 seconds to test. Eric is a member of TeAm AnandTech.

The prime was verified on 27 Dec 2008 23:56:34 UTC, by Jeff Smith of Canada using an Intel C2Q Q9450 @ 2.66 GHz with 2 GB RAM. This computer took almost 4 minutes 20 seconds to test. Beta-guy is a member of team Canada.

The credits for the discovery are as follows:

1. Eric Ueda (United States), discoverer
2. PrimeGrid, et al.
3. Srsieve, sieving program developed by Geoff Reynolds
4. LLR, primality program developed by Jean Penné

Entry in "The Largest Know Primes Database" can be found here:
http://primes.utm.edu/primes/page.php?id=86060

OpenPFGW, a primality program developed by Chris Nash & Jim Fougeron, was used to check for Fermat Number divisibility (including generalized and extended) using the following settings: -gxo –a2 651*2^{476632}+1. For more information about Fermat and Generalized Fermat Number divisors, please see Wilfrid Keller's sites:

- http://www.prothsearch.net/fermat.html
- http://www1.uni-hamburg.de/RRZ/W.Keller/GFNfacs.html

There were no Generalized or extended Generalized Fermat Number divisors.

The Proth Prime Search is done in collaboration with the Proth Search project. This search looks for primes in the form of $k*2^n+1$. With the condition $2^n > k$, these are often called Proth primes.   PrimeGrid is searching odd k<1200 for n<5M as well as odd 1200<k<10000 for n<2M.

Using a single PC would have taken years to find this prime. So this timely discovery would not have been possible without the thousands of volunteers who contributed their spare CPU cycles. A special thanks to everyone who contributed their advice and/or computing power to the search - especially all the sievers who work behind the scenes to make a find like this possible.

PrimeGrid's Proth Prime Search will continue to search for more primes. To join the search please visit PrimeGrid: http://www.primegrid.com

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About PrimeGrid

PrimeGrid is a distributed computing project, developed by Rytis Slatkevičius, which utilizes BOINC and PRPNet to search for primes. PrimeGrid's primary goal is to bring the excitement of prime finding to the "everyday" computer user. Simply download the software and let your computer do the rest. Participants can choose from a variety of prime forms to search. With a little patience, you may find a large or even record breaking prime.

BOINC

The Berkeley Open Infrastructure for Network Computing (BOINC) is a software platform for distributed computing using volunteered computer resources. It allows users to participate in multiple distributed computing projects through a single program. Currently BOINC is being developed by a team based at the University of California, Berkeley led by David Anderson.

This platform currently supports projects from biology to math to astronomy. For more information, please visit BOINC: http://boinc.berkeley.edu

PRPNet

PRPNet is a distributed Client/Server application, developed by Mark Rodenkirch, which can be used to manage and perform primality and probable prime tests on a list of candidate numbers. The PRPNet Client uses LLR, Phrot, or PFGW to perform these tests.

For more information, please visit PrimeGrid's PRPNet forum thread: http://www.primegrid.com/forum_thread.php?id=1215

For more information about PrimeGrid and a complete list of available prime search projects, please visit: http://www.primegrid.com