PrimeGrid's
Extended Sierpinski Problem Prime Search

On 25 November 2021, 03:19:26 UTC, PrimeGrid's Extended Sierpinski Problem found the Mega Prime:

$$202705*2^{21320516}+1$$

The prime is 6,418,121 digits long and will enter Chris Caldwell's "The Largest Known Primes Database" (http://primes.utm.edu/primes) ranked 13th overall. This find eliminates k=202705; 8 k's remain in the Extended Sierpinski Problem.

The discovery was made by Pavel Atnashev of Russia using an Intel(R) Xeon(R) E5-2695 v2 CPU @ 2.40GHz with 16GB RAM running Tiny Core Linux. This computer took about 10 hours, 59 minutes to complete the primality test using LLR2. Pavel Atnashev is a member of Ural Federal University.

Credits for the discovery are as follows:

1. Pavel Atnashev (Russia), discoverer
2. PrimeGrid, et al.
3. Srsieve, sieving program developed by Geoff Reynolds
4. LLR, primality program developed by Jean Penné
5. LLR2, primality program developed by Pavel Atnashev
6. OpenPFGW, a primality program developed by Chris Nash & Jim Fougeron with maintenance and improvements by Mark Rodenkirch

Entry in "The Largest Known Primes Database" can be found here:
https://primes.utm.edu/primes/page.php?id=133011

OpenPFGW, a primality program developed by Chris Nash & Jim Fougeron, was used to check for Fermat Number divisibility (including generalized and extended). For more information about Fermat and generalized Fermat Number divisors, please see Wilfrid Keller's sites:

- http://www.prothsearch.com/fermat.html
- http://www.prothsearch.com/GFNfacs.html

No generalized and extended generalized Fermat number divisors were discovered with this prime find.

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.

The Extended Sierpinski Problem Prime Search will continue to seek even larger 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 and currently managed by Tyler Bredl, Scott Brown, Ulrich Fries, Michael Goetz, Michael Gutierrez, Dao Heng Liu, Reginald McLean, Rytis Slatkevičius, Roman Trunov, and Christian Wallbaum.

PrimeGrid utilizes BOINC and PRPNet to search for primes with the primary goal of bringing 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 client/server application written by Mark Rodenkirch that is specifically designed to help find prime numbers of various forms. It is easily ported between various OS/hardware combinations. PRPNet does not run each PRP test itself, but relies on helper programs, such as LLR, PFGW, phrot, wwww, and genefer to do the work.

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