PrimeGrid's
27121 Prime Search

On 9 March 2015, 17:49:18, PrimeGrid's 27121 Prime Search, through PRPNet and in collaboration with the 12121 Search (k=27 sister project), has found the mega prime:

$$27*2^{5213635}+1$$

The prime is 1,569,463 digits long and will enter Chris Caldwell's "The Largest Known Primes Database" (http://primes.utm.edu/primes) ranked 38th overall.

The discovery was made by Hiroyuki Okazaki of Japan using an Intel(R) Xeon(R) CPU E5-2648L 0 @ 1.80GHz Processor with 64GB RAM, running Microsoft Windows 7 Ultimate. This computer took about 5 hours 5 minutes to complete the primality test using LLR. Hiroyuki is a member of the Aggie The Pew team.

The prime was verified internally.

Credits for the discovery are as follows:

1. Hiroyuki Okazaki (Japan), discoverer
2. PrimeGrid, et al.
3. Srsieve, sieving program developed by Geoff Reynolds
4. PSieve, sieving program developed by Ken Brazier and Geoff Reynolds
5. 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=119539

PrimeGrid's 27121 Prime Search is a collaboration with the 12121 Search, which was established on 5/24/2004 to search for large primes of the form 121*2^n-1. Later, on 3/1/2005, they added k=27 to their search. Their "short term" goal is to search for n up to 10M. PrimeGrid added the +1 form and searches both k's and forms together.

Fermat number divisibility (including generalized and extended) was checked by OpenPFGW using the following settings: -gxo -q27*2^5213635+1. For more information about Fermat and generalized Fermat number divisors, please see Wilfrid Keller's sites:
- http://www.prothsearch.net/fermat.html
- http://www.prothsearch.net/GFNfacs.html

27*2^5213635+1 is a Factor of xGF(5213634,7,6)
27*2^5213635+1 is a Factor of GF(5213633,8)

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 27121 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, Lennart Vogel, and John Blazek, 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 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