PrimeGrid's
Generalized Fermat Prime Search

On 4 May 2016, 10:57:07 UTC, PrimeGrid's Generalized Fermat Prime Search found the Generalized Fermat mega prime:

$$1615588^{262144}+1$$

The prime is 1,627,477 digits long and enters Chris Caldwell's "The Largest Known Primes Database" (http://primes.utm.edu/primes) ranked 5th for Generalized Fermat primes and 44th overall.

The discovery was made by Brook Harste of the United States using an NVIDIA GeForce GTX 980 Ti in an Intel(R) Core(TM) i7-3820 CPU @ 3.60GHz with 16GB RAM, running Microsoft Windows 10 Professional. This GPU took about 17 minutes to probable prime (PRP) test with GeneferOCL4. Brook is a member of the Aggie The Pew team.

The prime was verified on 8 May 2016, 15:28:12 UTC by Róbert Borbély of Hungary using an AMD Cypress in an Intel(R) Core(TM) i7-4770 CPU @ 3.40GHz with 16GB RAM, running Microsoft Windows 10 Professional. This GPU took about 1 hour and 36 minutes to probable prime (PRP) test with GeneferOCL4.

The PRP was confirmed prime by an Intel(R) Core(TM) i7-3770 CPU @ 3.40GHz with 16 GB RAM, running Windows 7 Ultimate. This computer took about 20 hours 2 minutes to complete the primality test using LLR.

The credits for the discovery are as follows:

1. Brook Harste (United States), discoverer
2. PrimeGrid, et al.
3. AthGFNSieve, sieve program developed by David Underbakke
4. GFNSvCUDA , sieve program developed by Anand Nair
5. GeneferOCL4, probable prime program developed by Yves Gallot
6. LLR, primality program developed by Jean Penné

Entry in "The Largest Know Primes Database" can be found here:
https://primes.utm.edu/primes/page.php?id=121619

Using a single PC would have taken years to find this prime. So this timely discovery would not have been possible without the hundreds of volunteers who contributed their spare CPU cycles. A special thanks to everyone who offered their advice and/or computing power to the search - especially Yves Gallot, Iain Bethune, David Underbakke, Anand Nair, Mark Rodenkirch and Geoff Reynolds who were major forces in moving the project forward. Also, thank you to all the sievers, especially Honza Cholt and Jim Breslin. A final thanks to Michael Goetz for porting to BOINC.

The Generalized Fermat 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, 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