PrimeGrid's
Generalized Fermat Prime Search

On 19 Nov 2011 14:03:58, PrimeGrid's PRPNet found the largest known Generalized Fermat mega prime:

$$75898^{524288}+1$$

The prime is 2,558,647 digits long and enters Chris Caldwell's "The Largest Known Primes Database" (http://primes.utm.edu/primes) ranked 1st for Generalized Fermat primes and 13th overall.

The discovery was made by Michael Goetz of the United States using an NVIDIA GeForce GTX 460 in an Intel Core2 Q6600 @ 2.4GHz system with 8GB RAM, running 64 bit Windows 7. The GPU took just under 5 hours to probable prime (PRP) test with GeneferCUDA. The CPU completed the primality test using pfgw64 in a little over 8 days! Michael is a member of the SETI.USA team.

The prime was verified concurrently by an Intel Xeon 5410 @ 2.33GHz with 16GB RAM, running Windows Server 2003 x64. This computer took 7 days, 17 hours, and 26 minutes to complete the primality test using pfgw64. Prior to pfgw64's completion, an additional PRP test was conducted using GenefX64. This test took 44 hours and 11 minutes to complete.

The credits for the discovery are as follows:

1. Michael Goetz (United States), discoverer
2. PrimeGrid, et al.
3. AthGFNSieve, sieve program developed by David Underbakke
4. GeneferCUDA, probable prime program developed by Shoichiro Yamada
5. PFGW, primality program developed by Chris Nash & Jim Fougeron with maintenance and improvements by Mark Rodenkirch

Entry in "The Largest Know Primes Database" can be found here:
http://primes.utm.edu/primes/page.php?id=103235

This is the 1st known GFN prime at N=524288. 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 David Underbakke, 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 PRPNet'ers who contributed to this effort.

This is PrimeGrid's 18th mega prime. 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