PrimeGrid's
Generalized Fermat Prime Search

On 9 August 2022, 11:56:02 UTC, PrimeGrid's Generalized Fermat Prime Search found the Mega Prime:

$$1951734^{1048576}+1$$

The prime is 6,595,985 digits long and will enter 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 Kazuya Tanaka of Japan using an NVIDIA GeForce RTX 3080 Ti in an Intel(R) Core(TM) i7-9700K CPU @ 3.60GHz with 64GB RAM, running Microsoft Windows 10 Professional x64 Edition. This GPU took about 1 hour, 2 minutes to complete the probable prime (PRP) test using GeneferOCL5. Kazuya Tanaka is a member of Team 2ch.

The prime was verified on 10 August 2022, 17:39:14 UTC by Jens Katzur of Germany using an NVIDIA GeForce RTX 3070 in an Intel(R) Xeon(R) CPU X5675 @ 3.07GHz with 40GB RAM, running Linux Ubuntu. This computer took about 1 hour, 36 minutes to complete the probable prime (PRP) test using GeneferOCL5. Jens Katzur is a member of Planet 3DNow!.

The PRP was confirmed prime on 11 August 2022 by an AMD Ryzen 9 5950X @ 3.4GHz, running Linux Mint. This computer took about 51 hours, 52 minutes to complete the primality test using LLR2.

The credits for the discovery are as follows:

1. Kazuya Tanaka (Japan), discoverer
2. PrimeGrid, et al.
3. AthGFNSieve, sieve program developed by David Underbakke
4. GFNSvCUDA , sieve program developed by Anand Nair
5. GeneferOCL5, probable prime program developed by Yves Gallot
6. LLR, primality program developed by Jean Penné
7. LLR2, primality program developed by Pavel Atnashev

Entry in "The Largest Known Primes Database" can be found here:
https://primes.utm.edu/primes/page.php?id=134298

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 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