PrimeGrid's
Prime Sierpinski Problem

On 17 September 2017, 21:30:08 UTC, PrimeGrid's Prime Sierpinski Problem project eliminated k=168451 by finding the mega prime:

$$168451*2^{19375200}+1$$

The prime is 5,832,522 digits long and will enter Chris Caldwell's "The Largest Known Primes Database" (http://primes.utm.edu/primes) ranked 13th overall. 9 k's now remain in the Prime Sierpinski Problem (2 of which are being searched as part of Seventeen or Bust). This is the third largest prime found by PrimeGrid.

Until the Prime Sierpinski Project shut down in 2014, this search was a collaboration between Primegrid and the Prime Sierpinski Project. This discovery would not have been possible without all the work done over the years by the Prime Sierpinski Project.

The discovery was made by Ben Maloney of Australia using an Intel(R) Core(TM) i5-6400 CPU @ 2.70GHz with 16GB RAM running Windows 10 Professional Edition. This computer took about 2 days, 15 hours, 11 minutes to complete the primality test using LLR. Ben is a member of the Free-DC team.

The prime was verified on 23 September 2017 00:58:27 UTC by user "cnoize" using an Intel(R) Xeon(R) E5-2640 CPU @ 2.50GHz with 8GB RAM, running Windows Server 2008R2. This computer took about 6 days, 7 hours, 19 minutes to complete the primality test using LLR. Cnoize is a member of Team China, and the system was participating in the Gridcoin team.

Credits for the discovery are as follows:

1. Ben Maloney (Australia), discoverer
2. PrimeGrid, et al.
3. Srsieve, sieving program developed by Geoff Reynolds
4. LLR, primality program developed by Jean Penné
5. 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:

http://primes.utm.edu/primes/page.php?id=123905

The Prime Sierpinski Project was administered by Harsh Aggarwal and Lars Dausch.

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

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

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the search - especially all the sievers who work behind the scenes to make a find like this possible.

The Prime Sierpinski Problem project will continue to search for more primes. To join the search please visit PrimeGrid: http://www.primegrid.com

About PrimeGrid

PrimeGrid is a distributed computing project, developed by Rytis Slatkevičius and currently administered by Iain Bethune, James Breslin, Scott Brown, Ulrich Fries, Charley Gielkens, Michael Goetz, Roger Karpin, Rytis Slatkevičius, and Van Zimmerman.

PrimeGrid is hosted by Rackspace, and their generous contributions have helped make this project possible.

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