

PrimeGrid's Generalized Cullen/Woodall Prime Search

On 8 October 2016, 21:01:14 UTC, PrimeGrid's PRPNet found the largest known generalized Cullen prime:

$$682156*79^{682156}+1$$

*Generalized Cullen numbers are of the form: $n*b^n+1$. Generalized Cullen numbers that are prime are called generalized Cullen primes. For more information, please see "Cullen prime" in The Prime Glossary (<http://primes.utm.edu/glossary>).*

The prime is 1,294,484 digits long and enters Chris Caldwell's "The Largest Known Primes Database" (<http://primes.utm.edu/primes>) ranked 1st for generalized Generalized Cullen and Generalized Cullen-Woodall primes and 83rd overall.

The discovery was made by Franz-Xaver Harvanek of Austria using an Intel(R) Core(TM) i7-5960X CPU @ 3.00GHz with 32GB RAM, running Microsoft Windows 7 Ultimate. This computer took 3 hours and 44 minutes to complete the primality test using LLR.

The credits for the discovery are as follows:

1. Franz-Xaver Harvanek (Austria), discoverer
2. PrimeGrid, et al.
3. MultiSieve, sieve program developed by Mark Rodenkirch
4. gcwsieve, sieve program developed by Geoff Reynolds
5. LLR, primality program developed by Jean Penné

Entry in "The Largest Known Primes Database" can be found here:

<http://primes.utm.edu/primes/page.php?id=122349>

Base 79 was one of 15 prime-less generalized Cullen bases below $b=121$ that PrimeGrid is searching. The remaining bases are 13, 25, 29, 41, 47, 49, 53, 55, 69, 73, 101, 109, 116 & 121.

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, to all the PRPNet'ers who contributed to this effort, and especially to all the sievers who work behind the scenes to make a find like this possible.

PrimeGrid's Generalized Cullen/Woodall Prime Search will continue seeking primes for other primeless bases. To join the search please visit PrimeGrid:

<http://www.primegrid.com>

PrimeGrid's Generalized Cullen/Woodall Prime Search

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, www, 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>