PrimeGrid's
Woodall Prime Search

On 21 Dec 2007, 10:09:30 UTC, PrimeGrid's Woodall Prime Search found the 33rd and largest known to date Woodall prime:

$$3752948 * 2^{3752948} - 1$$

Woodall numbers are of the form: $W_n = n \cdot 2^n - 1$. Woodall numbers that are prime are called Woodall primes. For more information, please see "Woodall prime" in The Prime Glossary (http://primes.utm.edu/glossary).

The prime is 1,129,757 digits long and will enter Chris Caldwell's "The Largest Known Primes Database" (http://primes.utm.edu/primes) ranked 1st for Woodall primes and 13th overall. It's the first found mega-digit prime using LLR.

The discovery was made by Matthew J. Thompson of the United States using an Intel P4 @ 2.8 GHz with 512 MB RAM. This computer took almost 15 hours and 11 minutes to complete the primality test.

The prime was verified on 24 Dec 2007, 1:10:44 UTC, by an AMD Athlon64 X2 3600+ with 2G GB RAM. This computer took a little over 24 hours 55 minutes to test.

The credits for the discovery are as follows:

1. Matthew J. Thompson (United States), 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

The prime will be listed as $938237 * 2^{3752950} - 1$. This is $938237 * 2 * 2 * 2^{3752948} - 1$ which is $3752948 * 2^{3752948} - 1$. Entry in "The Largest Know Primes Database" can be found here: http://primes.utm.edu/primes/page.php?id=83407

This is PrimeGrid's third Woodall prime. Since the search began, just over 134,000 tests have been completed by 4524 users using 9149 computers.

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 - especially Brian Rodenkirk, Lennart Vogel, Joseph M. Osiecki, Geoffrey Reynolds, and Paul Underwood.

Additional thanks to all the sievers who prepared the work for PrimeGrid: http://www.primegrid.com/orig/forum_thread.php?id=690

PrimeGrid's Woodall Prime Search will continue to search for even larger Woodall Primes. To join the search please visit PrimeGrid: http://www.primegrid.com

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About PrimeGrid

Rytis Slatkevicius, the developer of PerlBOINC - a Perl-language-based port of the BOINC platform, created PrimeGrid as a test project for PerlBOINC. PrimeGrid's first sub-project was in cryptography as it participated in the RSA Factoring Challenge. While it no longer participates in the challenge, PrimeGrid continues to expand its functionality. Currently the project is running the following sub-projects:

- Primegen: generating a public sequential prime number database
- Twin Prime Search: searching for gigantic twin primes of the form $k*2^n + 1$ and $k*2^n - 1$.
- Cullen-Woodall Search: searching for mega primes of forms $n*2^n + 1$ and $n*2^n - 1$.
- 3*2^n-1 Search: searching for mega primes of the form $3*2^n - 1$.
- Prime Sierpinski Project: helping Prime Sierpinski Project solve the Prime Sierpinski Problem.

For more information, please visit PrimeGrid: http://www.primegrid.com

About BOINC

BOINC (Berkeley Open Infrastructure for Network Computing) 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.

For more information, please visit BOINC: http://boinc.berkeley.edu