

## PrimeGrid's Generalized Fermat Prime Search

On 8 Feb 2011 09:38:57 UTC, PrimeGrid's PRPNet found the largest known Generalized Fermat mega prime:

$$145310^{262144} + 1$$

The prime is 1,353,265 digits long and enters Chris Caldwell's "The Largest Known Primes Database" (<http://primes.utm.edu/primes>) ranked 1st for Generalized Fermat primes and 23rd overall.

The discovery was made by Ricky L Hubbard of the United States using an AMD PHENOM II X6 1090t @ 3.2GHz with 8GB RAM, running Windows 7. This computer took about 11 hours to probable prime (PRP) test with GenefX64 and 48 hours and 15 minutes to complete the primality test using pfgw64. Ricky is a member of the AMD Users team.

The prime was verified on 10 Feb 2011, by an Intel Q6600 @ 2.4 GHz with 2 GB RAM, running 64 bit Windows XP Professional. This computer took a little over 50 hours 8 minutes to complete the primality test using pfgw64.

The credits for the discovery are as follows:

1. Ricky L Hubbard (United States), discoverer
2. PrimeGrid, et al.
3. AthGFNSieve, sieve program developed by David Underbakke
4. GenefX64, probable prime program developed by David Underbakke
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=98160>

This is only the 2nd known GFN prime at  $N=262144$ . 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 9th 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>

# PrimeGrid's Generalized Fermat 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](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>