What are your computer resources doing at night?

3D Rendering is one of those tasks that can really tax the abilities of a desktop PC - even the latest crop of PC's fully tricked out with all the memory they can handle can still take many hours to render a single frame of an animation - and that image is only one of hundreds required for one minute of smooth animation (at the usual 30 frames per second, it would take 1800 renderings for that one minute of animation).

For quite a few years, high-end rendering systems had the ability to share the rendering effort among several computers on your network. Each machine would render some of the frames or a portion of the image (under the direction of a single co-ordinating workstation), and then the pieces would simply be pulled together into a single file.

The incredible computer-generated special effects in movies like 'Titanic' use this type of 'rendering farm' all the time - a rendering farm made up of 105 Linux machines and 55 Windows NT machines in that case.

The Internet has now made possible connecting not only your available local network computers, but computers with available resources all over the world! You may be aware of the SETI project - the Search for Extra Terrestrial Intelligence (popularized in the movie 'Contact'). The project scans the skies for radio waves, and then their computers crunch all the data collected in order to pinpoint likely candidates for a more thorough investigation.

Well, now anyone can loan their unused computing resources to the search. As of this writing, 3,577,264 people *(editor - please update this number with the info at http://setiathome.berkeley.edu/totals.html before publishing)* have chosen to do just that. When their computers are not being used, the software downloads a small portion of the SETI data, crunches it, and returns it to SETI.

The power of this arrangement is mentioned on the SETI@home site (setiathome.berkely.edu): "The most powerful computer, IBM's ASCI White, is rated at 12 TeraFLOPS and costs $110 million. SETI@home currently gets about 15 TeraFLOPs and has cost $500K so far." A TeraFLOP is A trillion floating point operations per second - a high-end PC gets just under 100 Million (so it would take roughly 150,000 full-time high-end PC's on-line 24 hours per day to equal SETI@home's current capacity).

The popular and powerful Internet search engine Google.com has asked 500 users to test it's 'google toolbar' which, in addition to providing instant browser access to their search tools also monitors your computer for idle processing time which is donated to Stanford University's "Folding @Home" project. Folding @Home tries to figure out how genetic information is converted into proteins to better understand disease and prospective medicines.

There are similar resource-sharing sites. www.mersenne.org does a brute force search for very large prime numbers (they have found five new prime numbers so far). members.ud.com/projects/cancer/ computes the shape of 3.5 billion molecules to find candidates for cancer drugs.

Storage Resources

Another resource that can be shared using the Internet as the delivery mechanism is disk storage. Napster made this method famous, but it is also used by team collaboration products like Gnutella, Freenet and Mojo Nation.

Of course, all of these methods must take into account the fact that most of these 'loaned' machine resources will not be available much of the time. Computers may be otherwise busy, turned off or off-line - so files or file fragments must be copied to many locations to assure full-time availability.

One interesting possibility that would ease the burden on most system administrators is on-line off-site backups using this technology. With encryption and file fragmentation, file fragments could be distributed to the hard drives of willing participants. Some service bureaus have offered this service already. As bandwidth continues to increase and compression technologies improve, the service will be more common, more affordable, and more practical.

Although I may be willing to loan my computer resources to SETI, I am certainly not willing to share them with another corporation - not without appropriate compensation, anyway. An integral part of making resource sharing a reality in the business world is to implement a system of automatic micro-payments (payments of a fraction of a penny, or perhaps a few cents) and micro-deposits as a component. Some folks might be willing to loan some spare disk space in return for payments, or for in-kind exchange of off-site backups. Of course, both security and resource consumption controls also need to be a part of the system.

Would you be willing to share computing resources in return for on-line, off-site backups? - e-mail me at mhogan@id-8.com.

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