

Google taking data centers to the sea, files patents

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Google has again broken the mold with its filing of patents for what it calls "water-based data centers." As the name implies, Google is looking to build data centers that use ocean water for power and cooling. In addition, the same patent confirms Google's development of a "container-based data center," describing "crane-removable modules" to power the computing platforms.

The floating data centers would be located 3 to 7 miles from shore, in 50 to 70 meters of water, according to Data Center Knowledge. If perfected, this approach could be used to build 40 megawatt data centers that don't require real estate, property taxes, utility bills, or electrical cooling. This comes after a patent for a "portable data center" inside a shipping container, which Google began developing in 2003.

The design incorporates the Pelamis "Wave Energy Converter" units, which use the motion of ocean surface waves to create electricity and can be combined to form "wave farms." The largest existing project uses seven units to generate about 5 megawatts of power. Diagrams from Google's patent application indicate the company wants to go above and beyond with plans to combine 40 or more Pelamis units to produce 40 megawatts of power- more than enough to power a data center.

With power sources covered, the next step was to find a reliable cooling method that could rely on the ocean water as well. The patent documents describe a cooling system based on sea-powered pumps and seawater-to-freshwater heat exchangers. While there would obviously be limited on-site staff to fix any over-heating or power-failure issues, Google must make sure their ideas are solid and work over the long-term.

On the connectivity front, Google plans to partner with five other companies in building an "undersea communications cable" across the Pacific, which could provide high-speed connectivity to new Google data centers in Asia and other places. Being located in places such as Asia, as well as being located in the ocean may raise privacy concerns as well- being it would be "up-in-the-air" regarding who governs this data and how it should be used. U.S. territorial waters typically extend 12 nautical miles, but other nations' claims range from 3 miles (Singapore) to 200 miles .

No matter how they do it, the prospect is a good one. It's a great idea overall- one that could significantly reduce the cost and headaches associated with land-based data centers. The technology is still probably a little ahead of its time, and the kinks will indefinitely be worked out, but it's definitely one of those "I never thought of that" situations. Of course, Google did.