

Back to the future for computers: A return to the 1980s?

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A presentation at the Optical Fiber Communication Conference and Exposition/National Fiber Optic Engineers Conference (OFC/NFOEC) in San Diego on March 24 will examine the technologies that will emerge in the next three to four years to power warehouse-scale computing data centers, upon which companies such as Google, Amazon, Microsoft, Yahoo, Facebook, and many more are increasingly relying.

The advent of distributed, massive-scale "cloud computing" today is something of a return to the early 1980s, when computing was of a different sort. Rather than individual desktop or laptop machines, which are the current norm, computers were usually time-shared among multiple users working on "dumb" terminals connected to a central machine—often located in some remote corner of the building.

Cloud computing basically makes use of the Internet to connect remote users to massive, warehouse-scale data centers that house large networks of processors and memory for crunching and storing data. These warehouse data centers promise to lower computing costs by sharing resources and taking advantage of economies of scale, says Network Architect Cedric Lam of [Google](#), and they will relieve users of the hassles of maintaining and upgrading equipment and backing up their data.

But the real advantage of this type of computing, adds Lam, is portability. "Users enjoy the convenience of accessing their data from

anywhere and at any time, so long as they have a network connection," he says.

At OFC/NFOEC 2010, Lam will discuss the optical [interconnects](#) and other optical networking technologies that will emerge in the next few years. Low-cost, high-bandwidth and high-density [optical fiber](#) interconnects are essential for this type of computing because they make it possible to lower [power consumption](#) and increase connectivity among individual processors within the clusters of connected computers in the warehouses. Optical connectivity is also used for the ultra-long-haul transport of information between data centers.

On the long-haul side, what will be most important in the next few years, Lam says, is maximizing the capacity of existing and newly installed optical lines, and minimizing the need for OEO regenerators over long distances. He says this may be accomplished by exploring new optical spectra besides the traditional C-band, and new ways to carry information, e.g. using new modulation formats and signal processing techniques to improve spectral efficiency and tolerances to transmission impairments.

Provided by Optical Society of America

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