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InfoWorld's top 10 emerging enterprise technologies

Which of today's newest shipping technologies will triumph over the long haul? Here are our best guesses

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This new behavior is going to change a lot of how people work on computers, in ways that should give applications dramatically new utility.

Early iCloud users quickly got used to having their documents available on whatever device they happen to have in hand, for example. That allows automatic backup, of course, but it also creates an expectation of being able to work on anything anywhere. Windows 8 goes even further, letting you pick up where you left off in a document or a task.

Imagine a travel management app that handles your expenses, tickets, and itinerary across your devices -- no more copying and pasting information from one source to another. You can easily imagine your smartphone being your CPU, syncing to data and other resources at hand, such as network storage, a local keyboard, a local monitor, and nearby network, as well as passing on tasks to tablets and PCs when you move to one of them. That's the kind of seamless mobility we can begin to imagine with these fabric-oriented syncing capabilities in the OS and in apps.

When you work this way, the notion of emailing yourself documents, copying files between computers, and otherwise manually managing your context seems old-fashioned. When you couple that automatic syncing of data and metadata with the fact that context such as location, available input methods, presentation constraints, motion, Internet accessibility, and sensor-driven data, you get true user-centric computing.

The "sync fabric" model of computing has profound implications for apps, security models, and other technology approaches we've all gotten comfortable with. The fabric paradigm may finally do away with the endpoint notion that has bedeviled computer security since the work-at-home and laptop trends began, forcing a better approach to identity management and authentication in a world where the device is a variable, not a constant, as it was in the heyday of the office PC.

Then there's the issue of the user experience and the need for applications and back-end services to adjust as the user moves among the fabric of devices. Context awareness must be built in, so the app adjusts as the user changes devices. Yet that awareness also opens new possibilities for applications that developers are just beginning to imagine.

If that sounds like a science-fiction version of the cloud, it is. But just as many sci-fi fantasies have become real, so too is the notion of a computing fabric that we can tap into and move through. iCloud and Windows 8 are merely the first, early examples. --*Galen Gruman*

2. Software-defined networks

Like ancient coral reefs, data center networks have grown slowly and inexorably over time and calcified. While servers and storage have benefited from software abstractions that support dynamic

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management, networks have remained hardware-bound and static. Almost a virtue for decades, their resistance to change has now become a major roadblock on the road to cloud computing.

The technology that promises to remove that roadblock is software-defined networking (SDN). SDN drapes a software layer over switch and router hardware that serves as both a centrally managed control plane and a platform for innovation. SDN isn't network virtualization, though network virtualization will certainly be one of its by-products. Rather, SDN is a way to "program the network" -- that is, it allows cloud providers and ISVs to build new networking capabilities the rest of us can draw on.

The leading example of SDN today is OpenFlow, but OpenStack's Quantum, Juniper's QFabric, EMC VMware's virtual network APIs, and NEC's ProgrammableFlow also take an SDN approach. In the case of OpenFlow, the network programming layer is an open protocol that is supported by a growing number of network hardware vendors. A key selling point is that OpenFlow requires no changes to the switching hardware, nor does it require that all traffic through the switch be managed through the OpenFlow protocol. It is designed to work within existing network infrastructures.

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