Now consider the advent of IaaS providers who have created similar virtualization platforms that you can access via the cloud. The two best-known providers are Amazon Web Services (AWS) and Microsoft Azure. AWS uses its own homegrown virtualization platform that lets you easily provision new servers, storage, and networks from a variety of preconfigured templates. Azure does essentially the same thing, but its virtualization platform is based on Hyper-V.

Both Microsoft and VMware have recently extended their virtualization platforms to seamlessly embrace cloud infrastructure. Setting this up can be complicated, but after it's done, you can include not just physical servers and storage located on your premises, but also cloud servers and storage within a single, unified cluster. Then, you can easily move virtual machines and data back and forth between your on-premises infrastructure and your cloud infrastructure.

Because cloud infrastructure is much easier to expand than on-premises infrastructure, this can dramatically the simplify growth challenges that most IT organizations face. If you outgrow your local storage, you can move some workloads up to the cloud infrastructure. If you think the growth is relatively permanent, you can then order additional local storage, and when it's installed and configured, move the workloads back to your local infrastructure. But if you think the growth is temporary, you can leave the workload in the cloud until it contracts back to its previous size, and then move it back down.

VMware's approach to this integration is called VMware Cloud. Because VMware is not itself a major cloud provider, it works in concert with other cloud providers — most notably, AWS. In short, you can use VMware Cloud to configure VMware hosts, storage, and networks on AWS and integrate these resources with your on-premises vSphere clusters. The whole thing is managed from the familiar vCenter console, so you don't need a separate team of specialists to manage the cloud side.

Microsoft's approach is pretty much the opposite of VMware's: Instead of extending the virtualization platform up into the cloud, Microsoft extends its Azure IaaS platform down to your on-premises Hyper-V environment. Its product is called Azure Stack. The end result is the same: A single virtualization platform that integrates on-premises and cloud-based servers, storage, and networking into a seamless environment.

Truthfully, building a true hybrid cloud is far more complicated than I've let on here, because there are many details that have to be accounted for when planning and implementing a true hybrid-cloud environment. Security and privacy are obviously huge concerns, and in many cases regulatory compliance is as well (especially if you're in the medical or financial industries). Backup and disaster recovery is a major issue that needs to be addressed.