

## **Technologies that Enhance Cloud Computing Performance**

**David S. L. Wei**  
Fordham University  
USA

In the past, cloud computing was just a buzzword, but now it is real. Key features of cloud computing include elasticity, on-demand self-service, broad network access, and resource pooling. These features enable clouds to provide cost-effective services to myriads of variety of users around the world. To offer centralized services in such multi-tenanted clouds, performance is the most important issue that needs to be addressed. In addition to employing high computing power multi-processors, virtualization is a key technology in building high performance cloud infrastructure. Virtualization technology consolidates multiple virtual machines (VMs) on a single underlying physical machine via virtual machine monitor (VMM), such as Xen, KVM, VMware and Hyper-V, etc. In such virtualized computing environments, key challenges include i) keeping performance isolation among VMs to enable cloud service providers to offer quality of service guarantee to the users, ii) developing optimal VM consolidation schemes that minimize the usage of CPU, storage, and network resources, and iii) tackling the vulnerabilities introduced by virtualization. To address these three challenging issues, in this talk, we focus our discussions on the technologies of VM consolidation, performance isolation, vCPU scheduling, and cloud forensics.