Editorial

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Biographical notes: Andy Rindos is the Head of the Research Triangle Park (RTP) Center for Advanced Studies (CAS), which coordinates university relations for the IBM community in North Carolina. He is also the co-leader of the IBM Cloud Academy. Most recently, he was the World Wide CAS Leader, coordinating the activities of 29 centres across the globe. Previously, he has headed Tivoli Performance, as well as the WebSphere Technology Institute. He is an IBM Senior Technical Staff Member (STSM), an Executive Technical Resource, as well as an Adjunct Professor at NC State. He joined IBM in 1988, after receiving his PhD in Electrical Engineering (Control Theory) from the University of Maryland (College Park). Prior to IBM, he was a Neurophyisologist at the National Institutes of Health (NIH) in Bethesda MD.

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Chris Bernbrock is responsible for strategic programmes in IBM Global Education. He has 28 years of experience in sales, marketing, solutions and business development with education around the world in IBM. Prior to IBM, he taught and managed education programs in Thailand, China and California. He has an MBA from UCLA, an MA with two years of Doctoral work at UCLA in TESL/Applied Linguistics, and received his BA in Philosophy from Santa Clara University.

When the concept of cloud computing began to take shape nearly a decade ago (though the seeds of the ideas behind it were of course far older), it held out the promise of a wide variety of benefits to academia. Many of the potential benefits were transformational in nature, enabling dramatic changes in existing teaching and research paradigms, with corresponding changes in basic IT infrastructure and delivered services across campus. Centralised cloud computing facilities offered the ability to push out the most advanced educational material and services to even the most remote or impoverished school districts (given network access). And most excitingly, a cloud promised more (in services) for less (in cost).

No wonder then that universities were among the very first to adopt this new IT paradigm. For example, by 2004 (well before the term 'cloud computing' began to be universally hyped), North Carolina (NC) State University had arguably the very first teaching and research cloud up and running in production with its Virtual Computing Lab (VCL; see vcl.ncsu.edu). Originally created to satisfy the acute teaching and research needs of the campus (as well as address a number of classic problems with grid computing and other historic IT paradigms at that time), it has grown to several thousand servers now available to some 250,000 faculty, researchers and students within the University of North Carolina (UNC) System, NC Community College System and several NC K-12 school districts. Therefore, the very first paper in this pair of special issues dedicated to cloud computing in academia describes the development of Apache VCL by NC State, the open source cloud computing solution designed specifically for education and research that has been adopted by many universities across the world.

As the NC State example demonstrates, universities have historically comprised a significant portion of the first adopters of any new technology, and are often involved in its conceptualisation and development. Not surprisingly then, many more universities joined NC State in immediately embracing the cloud computing revolution. Therefore, by examining the experiences of these academic first adopters, we can obtain some of the earliest feedback on the success (or failure) of cloud computing to deliver on its promises, together with best practices (and caveats) on its implementation and uses, with suggestions for improvements and new services and delivery paradigms. As the rest of the papers in these special issues demonstrate, those experiences are quite varied but overwhelmingly positive, with a variety of cloud computing paradigms launched by universities from all across the globe. Represented here are therefore reports on academic efforts launched in France, Hungary, Japan, Jordan, Poland and the UK, as well as elsewhere in the USA. Some provide summaries of campus or regional cloud implementations, while others provide models and/or analyses of such systems. Most importantly, these papers showcase the true breadth of what a private cloud computing solution can deliver to the academic community (as opposed to sometimes overemphasised public cloud or purely virtualised hypervisor-based offerings): bare-metal (i.e., non-virtualised) high-end servers/server clusters and storage (for HPC

and Big Data research at pennies per compute hour); integration of heterogeneous cloud and cloud-like solutions within the same infrastructure; and regional clouds (across a state, province, country or other region) comprised of multi-institutional datacentres with individual access and other user policies, as well as a variety of creative economic support models.

It must also be noted that these papers flesh out the best presentations of the 1st International IBM Cloud Academy Conference (ICA CON 2012) held in Research Triangle Park, NC on April 19–20, 2012. IBM has had a long history of supporting university research and development on many fronts over the decades, and so it established the IBM Cloud Academy to support the education and research community in developing and adopting cloud computing. ICA CON was therefore established to provide this community a forum for getting together on a regular basis to share research, experiences and best practices around this new and transformational IT paradigm. And as we hope these early reports from our academic first adopters demonstrate, cloud computing is indeed delivering on many of its early promises. But as they also show, there is still more work that needs to be done to facilitate full scale campus adoption within this community.