

# From Grid Computing to Cloud Computing: Experiences on Virtualization Technology

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**Abstract.** In recent years, we see a great change from grid computing to cloud computing. Cloud computing is among the most popular words in computing today. As technology foundation, virtualization technology (VT) becomes a re-emerging technology. It is a decoupling technique that separates system software from hardware platform, while making applications to run pervasively. Many academic institutes and research labs from industries have devoted great efforts in various related aspects. In 2007, Chinese Ministry of Science and Technology initialized a basic research project (the 973 project) with 6 universities and 2 research institutes, aimed at various topics related to VT-based computing systems, such as VT architecture design philosophy, VT design for a single computing system, VT design for multiple computing systems, user environment for VT, security, reliability and trust issues related to VT, as well as performance evaluation and benchmarking for VT-based computing systems. In this talk, we will give insight for this project. Our experiences on VT research are discussed in detail, including power management, virtual machine live migration, memory/IO virtualization, and desktop virtualization.