Panel 1: 
Industry Advances in Cloud Computing: Technical challenges and Business Implications

Moderator: Geng Lin, Chief Technology Officer, IBM Alliance, Cisco Systems, USA

Panelists:
- Mac Devine, Distinguished Engineer, SaaS/Cloud CTO for AIM, IBM Corporation
- Steve Diamond, Director, Intercloud Computing Product Management, Office of the CTO, Cisco Systems
- David Y. Fu, Principle Engineering Manager, Global Foundation Services, Microsoft Corporation
- Jeanna Matthews, Professor, Department of Computing Science, Clarkson University

Abstract:

In 2008, the business concept of cloud computing was recognized as a true market transformation in the IT industry. The three-tier cloud model—infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS)—is becoming widely accepted as the common taxonomy across the industry for cloud services. In 2009, the focus is now on how to solve critical technology and business issues in order to build and deliver cloud services. In other words, the discussion around clouds has shifted from “what and why” to “how and when.”

In this panel session, we invite industry technology experts and business leaders to discuss the latest technology advances and business challenges in cloud computing. The audience will have a first-hand opportunity to discuss with technology experts and business leaders on issues such as cloud middleware architecture, multi-tenant cloud service architecture, cloud-enabling network architecture, private-public cloud integration, Intercloud service interoperability, and cloud standards. The panel will also examine cloud-related business implications stemming from the fundamental technological paradigm shifts such as the cloud-centric programming model vs. the client-server programming model, network intelligence in delivering cloud services vs. network as layer-3 connectivity, Internet-scale data mining and processing vs. enterprise scale data mining and processing, just to name a few.

The audience of this panel is targeted at advanced researchers and practitioners in cloud computing.

About the moderator:

Geng Lin is the Chief Technology Officer of IBM Alliance at Cisco Systems where he is responsible for technology strategy of the joint Cisco-IBM solutions worldwide, covering the areas of data center, unified communications, video/digital media, and NMS/OSS. Prior to Cisco, he was Vice President of Software Engineering at Netopia Inc, a Motorola company. Netopia was a leader in IP broadband services and rich media applications and was acquired by Motorola. Geng has more than 16 years of industry experience in networking, Internet-based communications software and rich media solutions.

Geng is a frequent speaker at various conferences and tradeshows in communications software and distributed computing. He served on the editorial boards of two research journals in Web Services, SOA and large-scale software systems. He holds B.Sc. and M.Sc. degrees from Peking University and a Ph.D. degree from University of British Columbia, all in Computer Science.
Panel 2

From SaaS to XaaS: Evolution and Outlook of Software Cloud

Moderator: Tony Shan, Chief Architect/Strategist & Practice Lead, CTS Inc., USA

Panelists:
- Paul Hofmann, Vice President Research, SAP Labs, USA
- Ephraim Feig, President, Innovations-to-Market, USA
- Jia Zhang, Assistant Professor, Northern Illinois University, USA

Abstract:

As Software-as-a-Service (SaaS) has evolved to other cloud computing solutions such as Platform-as-a-Service (PaaS) and Infrastructure-as-a-Service (IaaS) over the last few years, a question is raised as to how it will further expand and what will constitute the cloud computing model. It can be foreseen that the engineering practices will be adopted and enabled in the strategization and operationalization of cloud computing in the enterprise environments. Now, is the engineering of cloud computing a disruptive innovation? In other words, is the discipline of cloud engineering a convergence of the traditional IT-related engineering practices, such as software engineering, systems engineering, web engineering, service engineering, and platform engineering? Or is the cloud engineering in its own domain, dealing with the unique challenges faced by the cloud computing, like multitenancy as an example?

The purpose of this panel is to present a set of perspectives to position the technologies in cloud computing in relation to established solutions and disciplines. The session will be focused on identifying the synergy and interlocks as well as interoperations, including topics on, for instance, SOA versus cloud, SQL versus Dynamo/BigTables, taxonomy, interoperability, and other relevant subjects.

About the moderator:

Tony Shan is a renowned expert and technology visionary working in the computing field for 20+ years with extensive experience and guru-level knowledge on systems designs, architecture engineering, portfolio rationalization, product development, process standardization, and SDLC. Holding three advanced degrees and multiple industry certifications as a chief/enterprise architect, he has directed the lifecycle design and development of large-scale award-winning distributed systems on diverse platforms. He has initiated advanced applied research and prototyping on emerging computing technologies and methodology, and has played a crucial role of a hands-on strategist in leading establishing IT strategies and architecture blueprints, coupled with pragmatic technology roadmaps and enterprise architecture standards/policies, for IT governance and portfolio/asset management in Fortune 100 international organizations. He serves as a mentor/advisor on leading-edge technologies in various technical committees and advisory boards, and teaches courses as an adjunct professor. In addition to dozens of top-notch refereed technical publications, he has co-authored over 10 books on next-generation technologies. He is a member of numerous professional associations and honorary society, a frequent keynote speaker and Chair/Panel/Advisor/Organizing Committee in prominent conferences/workshops, an editor/editorial advisory board member of respected IT research journals/books, and a founder of several user groups and forums.
Panel 3

Application Clouds: Deployment, Testbeds, Benchmarking, and Practices

Moderator: Dejan Milojicic, HP Labs, USA

Abstract:

Cloud Computing is changing the data centers and computing models paradigm. However, most of the Cloud Computing discussions today revolve around defining it at the high level. In this panel, we will discuss the use of today’s examples of Cloud Computing infrastructure and services. In particular, we will focus on the deployments of Cloud Computing, the testbeds, and the benchmarking. This panel will address some real deployment issues, such as cost, return on investment, supporting clouds, developing and using cloud software stack, etc. We will also discuss and compare clouds deployments among themselves as well with other technologies in the past, such as clusters, Grids, and high performance computing.

About the moderator:

Dr. Dejan Milojicic is a senior researcher and a senior manager at HP Labs, where he leads a number of projects and programs. Currently he works on serviceability architecture of HP products and also technically leads the Open Cirrus Cloud Computing testbed, a collaboration between HP, Intel, Yahoo, UIUC, KIT, and IDA. He has worked in the area of operating systems, distributed systems, and service management for more than 20 years. He has been the program chair of the IEEE Agent Systems and Applications Symposium (ASA/MA’99) and of the first USENIX Workshop on Industrial Experiences with System Software (WISES’2000). Dr. Milojicic published in many journals and at various events. He is currently on the editorial board of IEEE Internet Computing and he is an inaugural editor of IEEE Computing Now, a front end to all IEEE magazines. He has been engaged in various standardization bodies, such as OMG and Global Grid Forum. He is a member of the ACM, IEEE, and USENIX and an ACM distinguished engineer. He received his BSc and MSc from University of Belgrade and his PhD from University of Kaiserslautern. Prior to HP Labs, Dejan worked at Institute "Mihajlo Pupin", Belgrade and at OSF Research Institute, Cambridge, MA.
Panel 4

Business and Enterprise Cloud

Moderator: Calton Pu (Georgia Institute of Technology)

Abstract:

Cloud computing has evolved from data centers and grid computing to fill the entire spectrum ranging from raw physical infrastructure to end-user software as a service. For example, one class of applications that run well on clouds is the parallel processing of large data sets such as MapReduce on BigTable or Hadoop for web search and time series analysis. These applications fall into the “embarrassingly parallel” category, achieving scalable resource scheduling with ease. Similarly, the non-mission-critical nature of these applications requires modest recovery facilities.

In contrast, business and enterprise applications (e.g., N-tier e-commerce applications involving web servers, application servers, and database servers) are characterized by interdependencies among the system components, non-stationary workloads, and extra-functional requirements such as service level agreements on performance and business continuity on availability. Many research and practical challenges arise due to these enterprise application requirements. For example, the interdependencies and asymmetry among the various servers of N-tier applications make their performance prediction much more difficult than achievable by typical assumptions made in queuing theory models. This is a serious challenge when strict response time requirements are imposed by service level agreements. Similarly, typical enterprises require business continuity availability, which cannot be easily achieved by virtual machine movement facilities alone.

This panel will discuss the research and practical challenges in the development of cloud computing environments to support business and enterprise applications in service computing. Topics of discussion start at the base level with the complexity due to business application requirements beyond the embarrassingly parallel, scalability and evolution of business applications on clouds, and accountability due to legal and mission-critical constraints. At the second level, the automation of business application resource management through growth and evolution add to the base level complexity. At the third level, the guarantees offered by a cloud for executing automated and complex business applications require significant progress in static and dynamic validation of service-based system properties. At the fourth level, the integration of interoperation of automated, complex, and guaranteed business applications in a cloud environment present both challenges and opportunities for services computing.

About the moderator:

Dr. Calton Pu was born in Taiwan and grew up in Brazil. He received his PhD from University of Washington in 1986 and served on the faculty of Columbia University and Oregon Graduate Institute. Currently, he is holding the position of Professor and John P. Imlay, Jr. Chair in Software at the College of Computing, Georgia Institute of Technology. He has worked on several projects in systems and database research. His contributions to systems research include program specialization and software feedback in the Synthesis, Synthetix, and Infosphere projects. His contributions to database research include extended transaction models and their implementation such as Epsilon Serializability and Reflective Transaction Framework. His recent research has focused on event processing (Continual Queries over the Internet), automated system management (Elba project) and services computing (dependable systems software). His collaborations include applications of these techniques in scientific research on macromolecular structure data, weather data, environmental data, and health care. He has published more than 50 journal papers and book chapters, 150 conference and refereed workshop papers, and served on more than 100 program committees, including the co-PC chairs of SRDS’95, ICDE’99, COOPIIS’02, SRDS’03, DOA’07, DEBS’09, and co-general chair of ICDE’97, CIKM’01, ICDE’06, DEPSA’07, CEAS’07, SCC’08, CollaborateCom’08.
Panel 5

Modernizing Civil Aviation Services with Services Computing

Moderator: Casey Fung, Boeing Phantom Works, USA
Panelists:
  - Timothy M. Mitchell, Boeings, USA
  - Patrick C. K. Hung, University of Ontario Institute of Technology, Canada
  - Chi Hung Chi, Tsinghua University, Beijing, China
  - Mansour Rezaei Mazinani, SITA, France

Abstract:

The civil aviation system is a global enterprise that includes airframe, engine and component manufacturers, airlines, maintenance organizations, regulatory agencies, airports, air traffic control authorities and millions of service providers that must work together effectively to ensure cargo and passengers get to their destinations as scheduled, while traveling safely and efficiently. The system includes a bewildering array of commercial and custom developed systems for monitoring and controlling the operations of the participant.

The news has been filled with examples of operations not working as smoothly as we all hope. Passengers have been stranded on taxi-ways, flights cancelled for weather and maintenance inspections and crowds of passengers complaining of lost baggage have become common as civil aviation grows. The growth has been rapid and shows no signs of abating. To cater the new decade of this competitive Web 2.0 world, we need to find ways to:

- Improve communications between manufacturers, airlines and regulatory agencies to defend the civil aviation industry’s unmatched safety records in the face of increasing traffic.
- Orchestrate and streamline workflow among the hundreds of collaborating organizations that keep civil aviation functioning.
- Improve the services the civil aviation industry provides a diverse flying public to increase their enjoyment of the travel experience.

Services Computing is believed to provide a means of enhancing communications between heterogeneous systems that make up the civil aviation transportation systems. A Web service is a software component that supports interoperable component-to-component interaction over a network. Each service makes its functionality available through well-defined or standardized XML interfaces. Web services do not work together by coincidence. Smoothly interacting systems in a network of the scale described here will require initial investment in building an enabling platform. Crafting a services computing architecture is the first step towards this infrastructure. Openness and standardization are key ways to accumulate resources and spread the risk of capitalization. This panel will focus on finding a vision and roadmap for initiating an interoperable and scalable civil aviation with services computing that is sustainable and self-actuating in the long run.

About the moderator:

Casey K. Fung is Associate Technical Fellow in Boeing Research and Technology. He is principal investigator for projects such as Wireless Ground Services at Airport, Open Aviation Services Platform, Mobile Maintenance Assistant and other Web services related research projects. Casey is the lead inventor of a methodology for the development of mobile wireless services that are resilient to attacks, failures, or accident. He was Affiliate Professor at University of Washington, Seattle. He obtained B.S. in Electrical Engineering from Ohio University, Ph.D. in Computer and Information Science from Ohio State University, Columbus.