# 2008 IEEE International Conference on Web Services

## ICWS 2008

## Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message from General Chairs</td>
<td>xvii</td>
</tr>
<tr>
<td>Message from Program Chairs</td>
<td>xviii</td>
</tr>
<tr>
<td>Message from the Application Services and Industry Track Chairs</td>
<td>xix</td>
</tr>
<tr>
<td>Organizing Committee</td>
<td>xx</td>
</tr>
<tr>
<td>Program Committee</td>
<td>xxii</td>
</tr>
<tr>
<td>External Reviewers</td>
<td>xxv</td>
</tr>
<tr>
<td>IEEE Computer Society Technical Committee on Services</td>
<td>xxvi</td>
</tr>
</tbody>
</table>

## Keynotes

- **Web Services: Software-as-a-Service (SaaS), Communication**
  - *Wu Chou*
  - Page 1
- **Net-Enabled Applications for Commercial Aviation**
  - *Susan X. Ying*
  - Page 2
- **Mobile Services Business and Technology Trends**
  - *Cesar Gonzales*
  - Page 3
- **Services Computing: A New Thinking Style of Education and Engineering**
  - *Liang-Jie Zhang*
  - Page 4

## Panels

- **Cloud Computing and IT as a Service: Opportunities and Challenges**
  - *Geng Lin, Glenn Dasmalchi, and Jinzy Zhu*
  - Page 5
- **Smarter SOA**
  - *Tony Shan, Ephraim Feig, Thomas Bui, and Jia Zhang*
  - Page 6
- **How Can Web Services Help Civil Aviation?**
  - *Casey Fung*
  - Page 8
Tutorials

Common Business Components and Services toward More Agile and Flexible Industry Solutions and Assets ..........................................................................................................................9
Min Luo

Practical SOA: Service Modeling, Enterprise Service Bus and Governance .....................................................11
Min Luo and Liang-Jie Zhang

Make the Consumable Services via REST ............................................................................................................12
Ning Yan

Web Service-Based Business Process Development, Threat Modeling and Security Assessment Tool ...........................................................................................................................................................................13
Jianxin Li, Teodor Sommestad, Patrick C. K. Hung, and Xiang Li

Regular Research Papers

Research Session 1 - Web Services Orchestration

Orchestrating caGrid Services in Taverna .............................................................................................................14
Wei Tan, Ravi Madduri, Kiran Keshav, Baris E. Suzek, Scott Oster, and Ian Foster

A Dependable Infrastructure for Cooperative Web Services Coordination ........................................................21
Eduardo Adilio Pelinson Alchieri, Alysson Neves Bessani, and Joni da Silva Fraga

Towards Scalable Web Service Composition with Partial Matches ................................................................29
Adina Sirbu and Jörg Hoffmann

Research Session 2 - Web Services Mining

A Temporal Data-Mining Approach for Discovering End-to-End Transaction Flows ..........................................................................................................................................................................................................................37
Ting Wang, Chang-shing Perng, Tao Tao, Chungqiang Tang, Edward So, Chun Zhang, Rong Chang, and Ling Liu

Discovering Reference Process Models by Mining Process Variants ................................................................45
Chen Li, Manfred Reichert, and Andreas Wombacher

Modeling and Discovery of Data Providing Services ..........................................................................................54
Roman Vaculin, Huajun Chen, Roman Neruda, and Katia Sycara

Research Session 3 - QoS-Aware Web Services Composition

A Hybrid Approach to QoS-Aware Service Composition ..................................................................................62
Xinfeng Ye and Rami Mounla

An Adaptive Service Selection Approach to Service Composition ................................................................70
Lijun Mei, W.K. Chan, and T.H. Tse

Using User Interface Design to Enhance Service Identification ................................................................78
Senthil Mani, Vibha S. Sinha, Noi Sukaviriya, and Thejaswini Ramachandra
Research Session 4 - Ubiquitous Web Services
A Context-Driven Content Adaptation Planner for Improving Mobile Internet Accessibility ................................................................. Stephen J.H. Yang, Jia Zhang, Angus F.M. Huang, Jeffrey J.P. Tsai, and Philip S. Yu
Realizing an Open Ubiquitous Environment in a RESTful Way ................................................................. Yong Liu and Kay Connelly
A QoS-Oriented Reconfigurable Middleware for Self-Healing Web Services ..................................................... Riadh Ben Halima, Khalil Drira, and Mohamed Jmaiel

Research Session 5 - Semantics in Web Services
Exploiting Semantics for Analyzing and Verifying Business Rules in Web Services Composition and Contracting ........................ Hai Liu, Qing Li, Naijie Gu, and An Liu
On Extending Semantic Matchmaking to Include Preconditions and Effects ........................................ Umesh Bellur and Harin Vadodaria
A Semantic QoS-Aware Discovery Framework for Web Services ........................................................................................................ Qian Ma, Hao Wang, Ying Li, Guotong Xie, and Feng Liu

Research Session 6 - Quality of Service
An Overview and Evaluation of Web Services Security Performance Optimization ................................................................. Robert A. van Engelen and Wei Zhang
A Rule-Based Approach for Availability of Web Service ........................................................................................................ Qianhui Althea Liang, Herman Lam, Lalita Narupiyakul, and Patrick C.K. Hung

Research Session 7 - Web Services Assessment
Automatically Determining Compatibility of Evolving Services ............................................................................... Karin Becker, Andre Lopes, Dejan S. Milojicic, Jim Pruyne, and Sharad Singhal
Adaptive Quality Recommendation Mechanism for Software Service Provisioning ................................................................. SiMing Li, Chen Ding, Chi-Hung Chi, and Jianming Deng
A Faceted Classification Based Approach to Search and Rank Web APIs ........................................................................ Afit Ranabahu, Meenakshi Nagarajan, Amit P. Sheth, and Kunal Verma
Research Session 8 - Workflow and Scheduling

Communications Semantics for WSBPEL Processes ................................................................. 185
  Walid Fdhila, Mohsen Rouached, and Claude Godart
A Formal Model of Human Workflow ....................................................................................... 195
  Xiangpeng Zhao, Zongyan Qiu, Chao Cai, and Hongli Yang
Service Level Agreement Based Grid Scheduling ................................................................. 203
  P. Balakrishnan, S. Thamarai Selvi, and G. Rajesh Britto

Research Session 9 - Semantics-Equipped Web Services Composition

Semantic and Syntactic Data Flow in Web Service Composition ........................................... 211
  Freddy Lécue, Samir Salibi, Philippe Bron, and Aurélien Moreau
Generalized Semantics-Based Service Composition ............................................................ 219
  Srividya Kona, Ajay Bansal, M. Brian Blake, and Gopal Gupta
A Framework for the Semantic Composition of Web Services Handling User Constraints .................. 228
  Y. Gamha, N. Bennacer, G.V. Naquet, B. Ayeb, and L.B. Romdhane

Research Session 10 - Services Composition

Towards Heuristic Web Services Composition Using Immune Algorithm ............................. 238
  Jiuyun Xu and Stephan Reiff-Marganiec
Automatic Service Composition Based on Enhanced Service Dependency .......................... 246
  Zhifeng Gu, Juanzi Li, and Bin Xu
Towards Verifying Contract Regulated Service Composition ............................................. 254
  Alessio Lomuscio, Hongyang Qu, and Monika Solanki

Research Session 11 - Services Provisioning

Multimedia Content Provisioning Using Service Oriented Architectures ................................ 262
  Ingo Brunkhorst, Sascha Tönnies, and Wolf-Tilo Balke
A Trust Vector Approach to Service-Oriented Applications .............................................. 270
  Lei Li and Yan Wang
Measurement, Modeling, and Analysis of Internet Video Sharing Site Workload: A Case Study ................................................................. 278
  Xiaozhu Kang, Hui Zhang, Guofei Jiang, Haifeng Chen, Xiaoqiao Meng,
  and Kenji Yoshihira
Research Session 12 - XML Services

High-Performance XML Parsing and Validation with Permutation Phrase Grammar Parsers .......................................................... 286
Wei Zhang and Robert A. van Engelen
Lazy XML Parsing/Serialization Based on Literal and DOM Hybrid Representation ......................................................... 295
Toshiro Takase and Keishi Tajima
Emergency Response Framework for Aviation XML Services on MANET .......................................................... 304
Yu Xiaofeng, Teodor Sommestad, Casey Fung, and Patrick C.K. Hung

Research Session 13 - Web Services Standards and Implementation

Extending WS-Notification with an Expressive Event Notification Broker .......................................................... 312
Sven De Labey and Eric Steegmans
A Theory of Role Composition .......................................................... 320
Jeffrey Fischer and Rupak Majumdar
On Synchronizing with Web Service Evolution .......................................................... 329
Zhi Le Zou, Ru Fang, Liang Liu, Qing Bo Wang, and Hao Wang

Research Session 14 - Tools and Applications

Mashup Advisor: A Recommendation Tool for Mashup Development .......................................................... 337
Hazem Elmeleegy, Anca Ivan, Rama Akkiraju, and Richard Goodwin
A Hybrid Integrated Architecture for Language Service Composition .......................................................... 345
Arif Bramantoro, Masahiro Tanaka, Yohei Murakami, Ulrich Schäfer, and Toru Ishida
Approaches to Improving Reliability in e-Engineering Framework .......................................................... 353
Seung Hak Kuk, Hyeon Soo Kim, Jai-Kyung Lee, and Seong-Whan Park

Application and Industry Track

Application and Industry Session 1 - Web Services Composition

Redundant-Free Web Services Composition Based on a Two-Phase Algorithm .......................................................... 361
Joonho Kwon, Hyeonji Kim, Daewook Lee, and Sukho Lee
A Faceted Requirements-Driven Approach to Service Design and Composition .......................................................... 369
Eric Bouillet, Mark Feblowitz, Zhen Liu, Anand Ranganathan, and Anton Riabov
Composing Adaptive Web Services on COTS Middleware .......................................................... 377
Yan Liu, Simon Truong, Shiping Chen, and Liming Zhu

Application and Industry Session 2 - Quality of Service

Performance Comparison of Web Service Engines in PHP, Java and C .......................................................... 385
Toyotaro Suzumura, Scott Trent, Michiaki Tatsubori, Akihiko Tozawa, and Tamiya Onodera
A Meta-model for Non-functional Property Descriptions of Web Services .......................................................... 393
Flavio De Paoli, Matteo Palmonari, Marco Comerio, and Andrea Maurino
Evaluation of WSML Service Retrieval with WSMO-MX  ................................................................. 401
Matthias Klusch, Patrick Kapahnke, and Frank Kaufer

Application and Industry Session 3 - SOA in Applications

Communication over IP Based on Web Services ................................................................. 409
Wu Chou and Li Li

Design and Development of a University-Oriented Personalizable Web 2.0
Mashup Portal .................................................................................................................. 417
Jia Zhang, Momtazul Karim, Karthik Akula, and Raghu Kumar Reddy Ariga

CAFISE-S: An Approach to Deploying SOA in Scientific Information
Integration ....................................................................................................................... 425
Zhuofeng Zhao, Jun Fang, and Jing Cheng

Application and Industry Session 4 - Web Services Specifications

Classification of SOA Contract Specification Languages .................................................. 433
Joseph C. Okika and Anders P. Ravn

SoftAlloc: A Work Allocation Language with Soft Constraints ....................................... 441
Christian Stefansen, Sriram Rajamani, and Parameswaran Seshan

Publishing Dynamic State Changes of Resources through State Aware WSDL ................ 449
Michael Brock and Andrzej Goscinski

Application and Industry Session 5 - Web Services Verification and Testing

A Framework for Verifying SLA Compliance in Composed Services ............................... 457
Hua Xiao, Brian Chan, Ying Zou, Jay W Benayon, Bill O’Farrell, Elena Litani, and Jen Hawkins

Ontology-Based Test Modeling and Partition Testing of Web Services ............................. 465
Xiaoying Bai, Shufang Lee, Wei-Tek Tsai, and Yinong Chen

Control Flow Analysis and Coverage Driven Testing for Web Services ........................... 473
Li Li, Wu Chou, and Weiping Guo

Application and Industry Session 6 - Business Services

Algorithm for Extrapolating Blogger’s Interests through Library Classification
Systems .......................................................................................................................... 481
Young Sik Kim, Kibeom Lee, and Jung-hee Ryu

Building Profit-Aware Service-Oriented Business Applications .................................... 489
An Liu, Qing Li, Liusheng Huang, and Hai Liu

A Model-Driven Framework for Enabling Self-Service Configuration
of Business Services .................................................................................................... 497
Xin Zhang, Pei Sun, Ying Huang, and Wei Sun
Application and Industry Session 7 - XML Services

Hybrid Parallelism for XML SAX Parsing ........................................................................................................... 505
  Yinfei Pan, Ying Zhang, and Kenneth Chiu

InfoParser: Infoset Driven XML Processing for Web Services ........................................................................... 513
  Li Li and Wu Chou

Facilitating Dynamic Collaborations with eContract Services .................................................................................. 521
  Shiping Chen, Surya Nepal, Chen Wang, and John Zic

Application and Industry Session 8 - Service Oriented Architecture

A Distributed-SOA Model for Unified Communication Services ............................................................................ 529
  Shrikant Kanaparti

A Unified Design Method of Asynchronous Service-Oriented Architecture
Based on the Models and Patterns of Asynchronous Message Exchanges ................................................................. 537
  Mikio Aoyama and Akira Mori

Enhancing Security Modeling for Web Services Using Delegation and Pass-On .................................................... 545
  Wei She, I-Ling Yen, and Bhavani Thuraisingham

Application and Industry Session 9 - Model-Driven Services Engineering

Coding-Free Model-Driven Enablement Framework and Engineering Practices of a Context-Aware SOA Modeling Environment ........................................................................................................... 553
  Nianjun Zhou, Yi-Min Chee, and Liang-Jie Zhang

Toward a Model-Based Approach to Dynamic Adaptation of Composite Services .................................................... 561
  Wei Song, Xiaoxing Ma, Wanchun Dou, and Jian Lü

Toward the Development of Contextually Aware Business Applications via Model-Driven Transformations ........................................................................................................................................ 569
  Rama Akkiraju, Tilak Mitra, Pankaj Dhoolia, Wei Zhao, Shiwa Fu, Manisha Bhandar, Nilay Ghosh, and Dipankar Saha

Application and Industry Session 10 - Web Services Monitoring and Handling

Flexible Pattern Monitoring for WS-BPEL through Stateful Aspect Extension ....................................................... 577
  Guoquan Wu, Jun Wei, and Tao Huang

Dynamic Thread Count Adaptation for Multiple Services in SMP Environments ........................................................................................................... 585
  Takeshi Ogasawara

Dynamic Exception Handling Based on Web Services and OPC XML-DA ............................................................. 593
  Francisco Javier Diez and Inaki Maurtua
Application and Industry Session 11 - Case Studies

Development of Service Control Server for Web-Telecom Coordination
Service .......................................................................................................................................................................600
Yoji Yamato, Hiroyuki Ohnishi, and Hiroshi Sunaga

Creating Bioinformatics Semantic Web Services from Existing Web Services:
A Real-World Application of SAWSDL .............................................................................................................608
Paul M.K. Gordon and Christoph W. Sensen

Information as a Service in a Data Analytics Scenario - A Case Study ..........................................................615
Vishal Dwivedi and Naveen Kulkarni

Application and Industry Session 12 - Web Services Management

Transparent Reputation Management for Composite Web Services .................................................................621
Domenico Bianculli, Walter Binder, Luigi Drago, and Carlo Ghezzi

Hidehiro Kanemitsu and Yoshiyori Urano

Declarative Constraint Framework for SOA Deployment and Configuration .....................................................637
Jing Luo, Ying Li, Jie Qiu, and Ying Chen

Application and Industry Session 13 - Quality of Web Services

Dynamic Availability Estimation for Service Selection Based on Status
Identification .............................................................................................................................................................645
Lingshuang Shao, Lu Zhang, Tao Xie, Junfeng Zhao, Bing Xie, and Hong Mei

QoS-Driven Selection of Web Services for Transactional Composition ...............................................................653
Joyce El Haddad, Maude Manouvrier, Guillermo Ramirez, and Marta Rukoz

Autonomic Ranking and Selection of Web Services by Using Single Value Decomposition Technique ...............661
Hoi Chan, Tieu Chieu, and Thomas Kwok

Application and Industry Session 14 - Services Integration

Integration and Data Sharing between WS-Based Workflows .............................................................................667
C. Walker and D.W. Walker

SCWIM an Integrity Model for SOA Networks .................................................................................................675
Majid Al-kofahi, Su Chang, and Thomas E. Daniels

A Consistency-Preserving Mechanism for Web Services Response Caching .................................................683
Wubin Li, Zhuofeng Zhao, Kaiyuan Qi, Jun Fang, and Weilong Ding
Application and Industry Session 15 - Web Services Composition

An Efficient Syntactic Web Service Composition Algorithm Based on the Planning Graph Model ................................................................. 691

Xianrong Zheng and Yuhong Yan

An Approach to Check Choreography with Channel Passing in WS-CDL .................................................................................. 700

Cai Chao and Qiu Zongyan

A Policy-Driven Distributed Framework for Monitoring Quality of Web Services ........................................................................... 708

Li Fei, Yang Fangchun, Shuang Kai, and Su Sen

Tool Support for Safety Analysis of Service Composition and Deployment Models ........................................................................ 716

Howard Foster

Application and Industry Session 16 - Web Services Discovery and Integration

Interoperability among Service Registry Implementations: Is UDDI Standard Enough? ........................................................................ 724

Alexander Mintchev

Anchor Semantics Enabled Ranking Method for Service Discovery and Integration ........................................................................ 732

Jing Luo and Ying Li

Web Services Discovery Based on Latent Semantic Approach ......................................................................................................... 740

Jiangang Ma, Yanchun Zhang, and Jing He

Work-in-Progress Track

Work-in-Progress Session 1 - Model-Driven Services Engineering

Model-Driven Quality of Service for Web Services: An Aspect-Oriented Approach ........................................................................... 748

Guadalupe Ortiz and Behzad Bordbar

Data-Enriched Modeling and Verification of WS-CDL Based on UML Models ............................................................................. 752

Pengcheng Zhang, Bixin Li, Henry Muccini, Yu Zhou, and Mingjie Sun

A Modeling Approach for Service-Oriented Application Based on Extensive Reuse ............................................................................... 754

Budan Wu, Zhi Jin, and Bin Zhao

Exploiting Independence in Design of Web Service Composition .................................................................................................. 758

Fangfang Liu, Yan Chi, and Xiangfeng Luo

Support Web Services Composition with Optimal Cost Using PPA .............................................................................................. 760

Fangxiong Xiao, Zhiqiu Huang, Jun Hu, Min Yuan, and Junhua Zhang

Automated Web Service Composition Using Extended Representation of Planning Domain .............................................................................. 762

Mohamad El Falou, Maroua Bouzid, Abdel-Illah Mouaddib, and Thierry Vidal
Work-in-Progress Session 2 - Services Composition

Transforming Abstract QoS Requirements, Preferences, and Logic Constraints for Automatic Web Service Composition ................................................................. 764
   Incheon Paik, Haruhiko Takada, and Michael N. Huhns

Specify and Compose Web Services by TLA ..................................................................................... 766
   Hongbing Wang, Hui Liu, and Xiaohui Guo

A Tree-Based Method of Web Service Composition ......................................................................... 768
   Haiming Tang, Farong Zhong, and Chang Yang

A Fast Method to Find Solution for Service Composition ................................................................. 771
   Yan Huang, Xiaoling Wang, and Aoying Zhou

A User-Oriented Approach to Automated Service Composition .................................................... 773
   Xuanzhe Liu, Gang Huang, and Hong Mei

Work-in-Progress Session 3 - Context-Aware Services

Change Sequence Mining for Context Aware Service Process Customization .................................. 777
   Yi Wang, Jian Cao, and Minglu Li

An Architecture for Context-Aware Semantic Web Services ................................................................ 779
   Iman Keivanloo and Hassan Abolhassani

WS-CCDL: A Framework for Web Service Collaborative Context Definition Language for Dynamic Collaborations ........................................................................... 781
   Surya Nepal, John Zic, and Shiping Chen

Composition Context for Web Services Selection .............................................................................. 785
   Hong Qing Yu, Stephan Reiff-Marganiec, and Marcel Tilly

A DDL-Based Model for Web Service Composition in Context-Aware Environment .................................. 787
   Wenjia Niu, Zhongzhi Shi, Changlin Wan, Liang Chang, and Hui Peng

Optimised Mobile Reasoning for Pervasive Service Discovery ............................................................. 789
   Luke Steller and Shonali Krishnaswamy

Work-in-Progress Session 4 - Application Services

A Distributed e-Education System Based on the Service Oriented Architecture .................................. 791
   Parichat Pasatcha and Komrhon Sunat

Service Design for 3D Virtual World Learning Applications ............................................................... 795
   Hong Cai

Middleware for Communication and Deployment of Time Independent Mobile Web Services .................. 797
   Fahad Aijaz, Seyed Mohammad Adeli, and Bernhard Walke

Integrating Information-Providing Web Services into the Data Integration System .................................. 801
   Wenfeng Zhao, Xiangwu Meng, Junliang Chen, and Chuanchang Liu
Services Characterization with Statistical Study on Existing Web Services .................................................. 803
   Yan Liu, Mingguang Zhuang, Biao Yu, Guannan Zhang, and Xiaojing Meng
Explaining Reputation for Informed Web Services Selection ........................................................................ 805
   Wanita Sherchan, Shonali Krishnaswamy, and Seng W. Loke

**Work-in-Progress Session 5 - Quality of Services**

Identifying Security Aspects in Web-Based Federations .................................................................................. 807
   Andreas Heil, Martin Gaedke, and Johannes Meinecke
Mining the Web of Trust for Web Services Selection .................................................................................. 809
   Sibo Cai, Yanzhen Zou, Bing Xie, and Weizhong Shao
New Broadcasting System Combined with Radio Broadcasting and WWW .................................................. 811
   Yoshitoshi Murata, Daisei Sato, Yuki Ito, Tsuyoshi Takayama, Nobuyoshi Sato,
   and Shoichi Horiguchi
Reliability Analysis of Component-Based Software Based on Relationships of Components .......................... 814
   Wang Dong, Huang Ning, and Ye Ming
An Acknowledgement-Based Approach to Synthesizing Reliable Service Mediators ........................................ 816
   Baoping Lin, Qing Li, and Naijie Gu
Trust Management for Web Services ............................................................................................................. 818
   Weiliang Zhao and Vijay Varadharajan
A Comprehensive Six-Dimensional Quality of Web Services Assessment Model ........................................... 822
   Nan Guo, Tianhan Gao, and Bin Zhang

**Work-in-Progress Session 6 - Business Process Management and Semantic Services**

Choreography = Orchestration with Scripts + Conversations ........................................................................... 824
   A.K. Bhattacharjee and R.K. Shyamasundar
Developing Process Mediator for Web Service Interactions ........................................................................ 828
   Zhangbing Zhou, Sami Bhiri, Walid Gaaloul, Lei Shu, Laurentiu Vasiliu,
   and Manfred Hauswirth
Service Differentiation for Business Process by Value Based Service Scheduling ........................................... 830
   Chen Wang, Qiming Tian, Xiaoyan Chen, and Chun Ying
Towards a Reversible BPEL Debugger ......................................................................................................... 832
   Liang Bao, Sheng Chen, Xiyang Liu, Shengming Hu, and Ping Chen
Control Flow Intervention for Semantic Failure Handling during Composite Service Execution ........................ 834
   Thorsten Möller and Heiko Schuld
SWFilter: Semantic Web Services Filtering System ...................................................................................... 836
   Joonho Kwon and Sukho Lee
A Clustering-Based Approach for Assisting Semantic Web Service Retrieval

Dong Shou and Chi-Hung Chi

Author Index