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UNIVERSITY OF CAMBRIDGE

**Computer Laboratory
Xenoservers publications**

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Xenoservers

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"The Xenoserver project aims to build a public infrastructure for wide-area distributed computing."

Publications

The academic publications related to the XenoServer project are divided in 7 main categories:

1. Overview and architecture
2. Xen and virtual machine technology
3. Global-scale deployment
4. Resource discovery and management
5. Distributed storage
6. Trust and reputation management
7. Pervasive debugging

1. Overview and architecture

- **Global Public Computing**
  Evangelos Kotsovinos
  PhD dissertation, available as Computer Laboratory Technical Report UCAM-CL-TR-615, ISSN 1476-2986
  This dissertation provides a detailed description of the design and implementation of the XenoServer platform, including a novel role-based resource management framework for federated systems and mechanisms for efficient global-scale service deployment.
  [PDF]

- **The XenoServer Open Platform: Deploying global-scale services for fun and profit**
  Evangelos Kotsovinos and David Spence.
  Poster, To appear in ACM SIGCOMM '03, August 2003
  The XenoServer Platform tackles many difficult problems at the same time, allowing users to discover XenoServers and deploy global-scale services easily and with a very low cost of entry. This poster presents a high-level view of the platform, outlining the research challenges faced and the features offered by the platform.
  [PDF]

- **Controlling the XenoServer Open Platform**
  Steven Hand, Tim Harris, Evangelos Kotsovinos, Ian Pratt

to appear in the Proceedings of the Sixth IEEE Conference on Open Architectures and Network Programming (OPENARCH 2003), April 2003.
This paper presents the XenoServer open platform, showing its flexibility in supporting multiple payment models, server owners, code execution formats and resource discovery mechanisms.
[PDF]

- **The Xenoserver Computing Infrastructure**
  Keir A Fraser, Steven M Hand, Timothy L Harris, Ian M Leslie and Ian A Pratt
  Technical Report UCAM-CL-TR-552, January 2003.
  The report gives an overview of the XenoServer project including motivation, research context and work programme.
  [PDF]

- **Xenoservers: Accounted execution of untrusted code**
  Dickon Reed, Ian Pratt, Paul Menage, Stephen Early, Neil Stratford
  IEEE Hot Topics in Operating Systems (HotOS) VII, March 1999
  This paper identifies the need for Xenoservers, discusses related approaches and examines some of the issues necessary to implement them.
  [ps.gz]

2. Xen and virtual machine technology

- **Are Virtual Machine Monitors Microkernels Done Right?**
  Steven Hand, Andrew Warfield, Keir Fraser, Evangelos Kotsovinos, and Dan Magenheimer
  In Proceedings of the Tenth Workshop on Hot Topics in Operating Systems (HotOS X), June 2005, Santa Fe, New Mexico
  [PDF]

- **Live Migration of Virtual Machines**
  Christopher Clark, Keir Fraser, Steven Hand, Jakob Gorm Hansen, Eric Jul, Christian Limpach, Ian Pratt and Andrew Warfield
  In Proceedings of the 2nd Symposium on Networked Systems Design and Implementation (NSDI '05), May 2005, Boston, MA

- **Facilitating the Development of Soft Devices**
  Andrew Warfield, Keir Fraser, Steven Hand and Tim Deegan
  In Proceedings of the USENIX Annual Technical Conference, April 2005, Anaheim, CA

- **Safe Hardware Access with the Xen Virtual Machine Monitor**
  Keir Fraser, Steve Hand, Rolf Neugebauer, Ian Pratt, Andrew Warfield and Mark Williamson
  In Proceedings of the 1st Workshop on Operating System and Architectural Support for the on demand IT InfraStructure (OASIS), October 2004, Boston, MA

- **Reconstructing I/O**
  Keir Fraser, Steve Hand, Rolf Neugebauer, Ian Pratt, Andrew Warfield and Mark Williamson
  Technical Report UCAM-CL-TR-596, August 2004
  [PDF]

- **Xen and the Art of Virtualization**
  Paul Barham, Boris Dragovic, Keir Fraser, Steven Hand, Tim Harris, Alex Ho, Rolf Neugebauer, Ian Pratt and Andrew Warfield

In the Proceedings of the ACM Symposium on Operating Systems Principles (SOSP), October 2003
[PDF]

- **Isolation of Shared Network Resources in Xenoservers**
  Andrew Warfield, Steven Hand, Timothy Harris and Ian Pratt
  PlanetLab Design Note PDN-02-006, November 2002
  [PDF]

- **Xen 2002**
  Paul R Barham, Boris Dragovic, Keir A Fraser, Steven M Hand, Timothy L Harris, Alex C Ho, Evangelos Kotsovinos, Anil V S Madhavapeddy, Rolf Neugebauer, Ian A Pratt and Andrew K Warfield
  Technical Report UCAM-CL-TR-553, January 2003.
  *This report presents the design of **Xen**, a machine hypervisor that enables multiple guest operating systems (Linux 2.4, NetBSD, WinXP coming soon) to be run simultaneously on the same hardware platform in a secure and QoS assured manner. The report reflects the state of play at the end of 2002.*
  [PDF]

3. Global-scale deployment

- **Global-scale service deployment in the XenoServer platform**
  Evangelos Kotsovinos, Tim Moreton, Ian Pratt, Russ Ross, Keir Fraser, Steven Hand, Tim Harris
  In Proceedings of the First Workshop on Real, Large Distributed Systems (WORLDS '04), December 2004, San Francisco
  [PDF]

4. Resource discovery and management

- **Location Based Placement of Whole Distributed Systems**
  David Spence, Jon Crowcroft, Steve Hand and Tim Harris
  To appear in the Proceedings of the Co-NEXT 2005, October 2005

- **Role-Based Resource Management**
  Evangelos Kotsovinos and Tim Harris
  In Proceedings of the 8th CaberNet Radicals Workshop, October 2003, France.
  [PDF]

- **XenoSearch: Distributed Resource Discovery in the XenoServer Open Platform**
  David Spence and Tim Harris
  In Proceedings of the Twelfth IEEE International Symposium on High Performance Distributed Computing (HPDC-12), June 2003
  [PDF]

- **Distributed resource discovery and management in the XenoServers Platform**
  Evangelos Kotsovinos and Timothy L Harris
  In Proceedings of the 7th CaberNet Radicals Workshop, Bertinoro, Italy , October 2002.
  This paper outlines the high-level design of the XenoServers platform, and emphasizes on mechanisms for locating and administering distributed resources.
  [pdf]

- **An Economic Approach to Adaptive Resource Management**
  Neil Stratford and Richard Mortier
  IEEE Hot Topics in Operating Systems (HotOS) VII, March 1999
  [ps.gz]

5. Distributed storage

- **Parallax: Managing Storage for a Million Machines**
  Andrew Warfield, Russ Ross, Keir Fraser, Christian Limpach and Steven Hand
  In Proceedings of the Tenth Workshop on Hot Topics in Operating Systems (HotOS X), June 2005, Santa Fe, New Mexico
  [PDF]

- **Palimpsest: Soft-Capacity Storage for Planetary-Scale Services**
  Timothy Roscoe and Steven Hand
  In Proceedings of the Ninth Workshop on Hot Topics in Operating Systems (HotOS-IX), May 2003
  [PDF]

- **Storage, Mutability and Naming in Pasta**
  Tim D Moreton, Ian A Pratt, Timothy L Harris
  Networking 2002 International Workshop on Peer-to-Peer Computing, May 2002
  This paper describes the design and operation of Pasta, a peer-to-peer storage system that provides traditional file system semantics while offering the wide-spread caching and distribution required for publishing networks.
  [ps.gz]

6. Trust and reputation management

- **BambooTrust: Practical scalable trust management for global public computing**
  Evangelos Kotsovinos and Aled Williams
  In Proceedings of the 21st Annual ACM Symposium on Applied Computing (ACM SAC), Dijon, France, April 2006.
  This paper presents a scalable distributed reputation management system based on the Bamboo DHT, facilitating asynchronous notification of subscribers
  [PDF]

- **Pinocchio: Incentives for honest participation in distributed trust management**
  Alberto Fernandes, Evangelos Kotsovinos, Sven Ostring and Boris Dragovic
  In Proceedings of the 2nd International Conference on Trust Management (iTrust 2004), March 2004, Oxford. Also published in Springer-Verlag Lecture Notes in Computer Science (LNCS)
  This paper presents an incentive model for improving participation in reputation systems. It features a probabilistic honesty metric to detect dishonest or arbitrary feedback.
  [PDF]

- **XenoTrust: Event-based distributed trust management**
  Boris Dragovic, Evangelos Kotsovinos, Steven Hand and Peter Pietzuch.
  To appear in Proceedings of the Second IEEE International Workshop on Trust and Privacy in Digital Business (DEXA-TrustBus'03), September 2003
  This paper presents a more detailed design of the XenoTrust architecture, and introduces the

incorporation of explicit event notification in a global-scale trust management system.
[PDF]

- **Managing trust and reputation in the XenoServer Open Platform**
  Boris Dragovic, Steven Hand, Tim Harris, Evangelos Kotsovinos and Andrew Twigg.
  to appear in the Proceedings of the 1st International Conference on Trust Management, May 2003, Heraklion, Crete.
  This paper discusses the trust management issues that arise in the context of the XenoServer Open Platform, examines the necessity of trust and presents our trust management architecture.
  [PDF]

7. Pervasive debugging

- **On the Design of a Pervasive Debugger**
  Alex Ho and Steven Hand
  In Proceedings of the 6th International Symposium on Automated and Analysis-Driven Debugging (AADEBUG2005), September 2005, Monterey, CA [to appear]

- **PDB: Pervasive Debugging With Xen**
  Alex Ho, Steve Hand, and Tim Harris
  In Proceedings of the 5th IEEE/ACM International Workshop on Grid Computing (Grid 2004), November 2004, Pittsburgh, PA

- **Dependable Software Needs Pervasive Debugging**
  Timothy L Harris
  2002 ACM SIGOPS European Workshop, to appear, June 2002
  This paper describes techniques for the seamless debugging of distributed and concurrent applications.
  [ps.gz]