How Boston University Uses Oracle on Linux to Exploit its IBM System z with Open Systems and Open Standards

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Session 9275

Agenda

- IBM System z
  - Oracle & IBM Partnership
  - System Z Evolution and Oracle
  - Resources
- Boston University
  - Business Challenges
  - Solution
  - The Business Value Gained
  - Future Directions

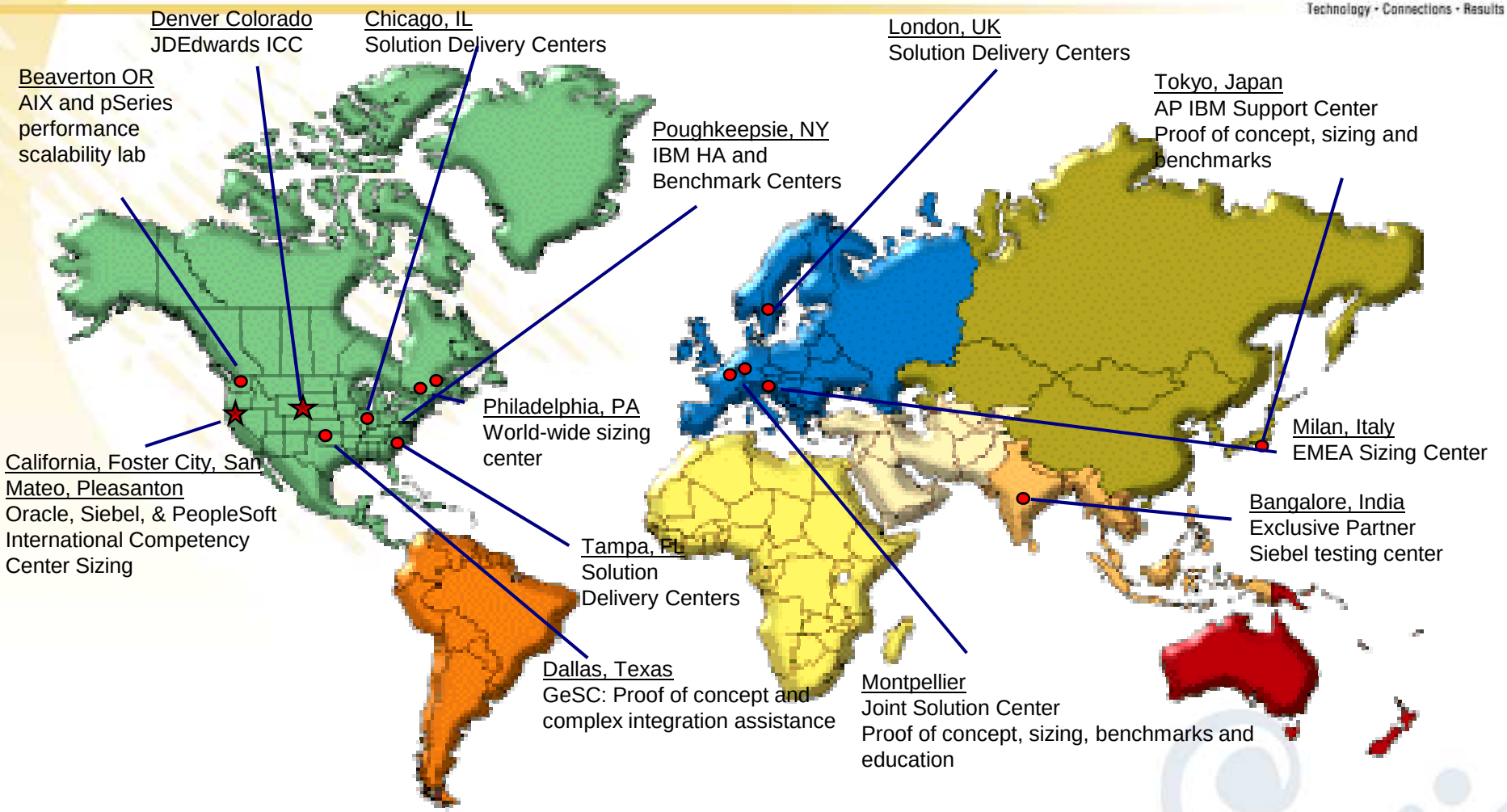
Oracle and IBM Partnership
Working Together for your Success

- **Sustained Partnership for over 21 years**
  - Over 17,000 Worldwide Joint Application Customers

- **Joint Technology Relationship – Covering Systems z, p and x**
  - Joint Solution Center – Staffed by Oracle and IBM IT Specialists and Architects
  - Dedicated Team of Oracle and IBM Architects to Develop Best Practices for High Availability for Oracle Deploying on IBM Platforms
  - Dedicated Resources to Engage Customers in Design, Proof of Concept and Benchmark Activities
  - Dedicated IBM Competency Center (ICC) IBM Level 3 Tech Support located at Oracle HQs

- **Joint Processes in Place to Align Technical Support Teams**
  - To Simplify Problem Resolution

IBM Centers Supporting Oracle



System z Evolution for Oracle

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z *was* a central host mainframe

"System z is a database hosting platform to consolidate single image Oracle database Unix servers…"

z *is* a server on the Oracle Grid

"System z is a high-availability database server platform that provisions virtual Linux servers to the Oracle Grid…"

Linux On System z
Data Serving Excellence for the Oracle Grid

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- Virtualization
  - Near 100% Utilization, near 100% of the time
- Availability
  - Built in across the system
- Security
  - Industry leading security capabilities
- Scalability
  - Virtual servers provisioned in seconds
  - Additional capacity available on demand
- Improved Economics
  - Lower cost per transaction
  - Lower labor costs
  - Lower energy costs

Our Business Challenges

- Economic Factors
  - Initial and ongoing Software Costs
  - Project Costs - Staying within Budget
  - System Maintenance Costs
  - Staff Management Overhead
  - Support Costs - with Reduced Resources

- Technical Factors
  - Agile high-available infrastructure for applications
  - Availability and Service Level Adherence
  - Decentralized Server Management
  - Maintaining Strong Security Models
  - Reduce Project Life Cycle Times & Delivery
  - Complicated Disaster Recovery Procedures

- Environmental Factors
  - Effective Scalable Power Consumption

Our Objective

- Standards-Based Infrastructure
  - Highly Available
  - Integrated
  - Simplified
  - Secure

Always on-line

Solution Strategy: Standardize

- Business Driver: Simplify
  - Linux Virtual Machines as a best practice configuration
  - Oracle Grid Infrastructure - Centralize server management
  - Linux Operating System – Open platform
  - IBM System z – Oracle data server

Solution Strategy: Virtualize

- Business Drivers: Reliability, Availability, Service, Scalability, Security
  - Oracle Maximum Availability Architecture (MAA) with System z
    - Dynamically add and manage disk (Oracle ASM)
    - Centralized backup and recovery of Oracle databases (Oracle RMAN)
    - Protect data from failures, disasters, errors, and corruptions (Oracle Data Guard)
    - Ensure High Available systems (Oracle RAC)
    - Acquire resources once use many (IBM zVM server virtualization)
    - Native high-speed support for internal data flows (IBM z Hipersockets)
    - Point in Time Back-up (IBM Systems z feature)
    - Linux virtual server monitoring and capacity planning (Velocity ESALPS)
    - Remote read/support configuration (Metalink Credential Configuration)
    - Automated systems management (LoZ, Oracle Grid)

Solution Strategy: Consolidate

- Business Driver: Operational Efficiency & Cost Reduction
  - Single guests running multiple Oracle applications
  - Distributed servers to z virtual servers
  - Consolidate database systems to Oracle Database
  - Database administration oracle-help mailing list

BU Applications

BU Applications

- **Business Intelligence BU-DAR** (PROD 10/2007)
  - Data Warehouses built for client data.
  - Oracle Warehouse Builder and database replication with Java – XML utilities.
  - More projects in the active project list.

- **OpenSource Oracle Database Projects**
  - Coeus – MIT Grant contract management system (POC)

- **University Document Imaging** (PROD 10/2008)
  - Scanning, retrieval, workflow
  - Onbase System Selected
  - Target Oracle 10G
  - Enterprise Wide System (5 Intel front ends)
  - Stress showed good performance – Optimizing dynamic queries
  - Platform Integrated with zOS system

BU Applications

- **Java Enterprise Edition Project** (PROD 2005)
  - Student Graphics Scheduler – Student Schedule Matrix - *Very successful*
  - BUCHART – Faculty charting tool
  - Schedule Servlet – Student Course schedule matrix
  - ID-Sync Project – Quartz Scheduler, Hibernate JDBC interface
  - IBM HostOnDemand – Java Servlet Emulation Client

- **DB2 zLinux PhotoID project –** Universal ID (PROD 2004)
  - All Students , Faculty, Staff have a Universal ID

BU Applications

uPortal – uPortal.org (PROD 2005)

- Java Based OSS Portal
- Built by JASIG.org Java Open Source Project
- 1st Sytem z Linux Environment for uPortal planet wide

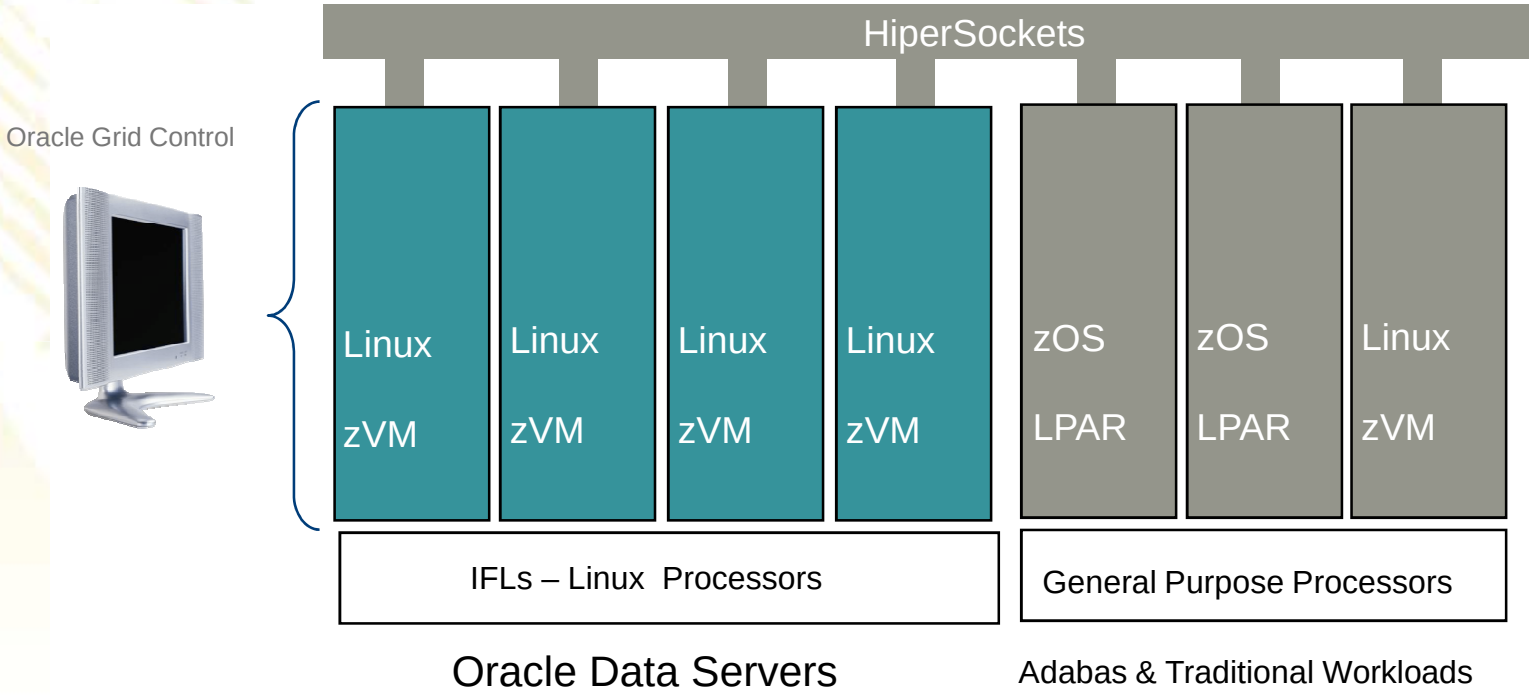
Business Drivers

- Community supported direction – Similar challenges
- Need for high volume transaction processor for Linux – BlueGeneL used for workload simulations
- We Installed Tomcat 5.0 – Open Source Application server
  http://jakarta.apache.org/tomcat/index.html
  Catalina project – Servlet 2.3 and JSP 1.2 specification
- OSS Database Server environment (PostgreSQL)

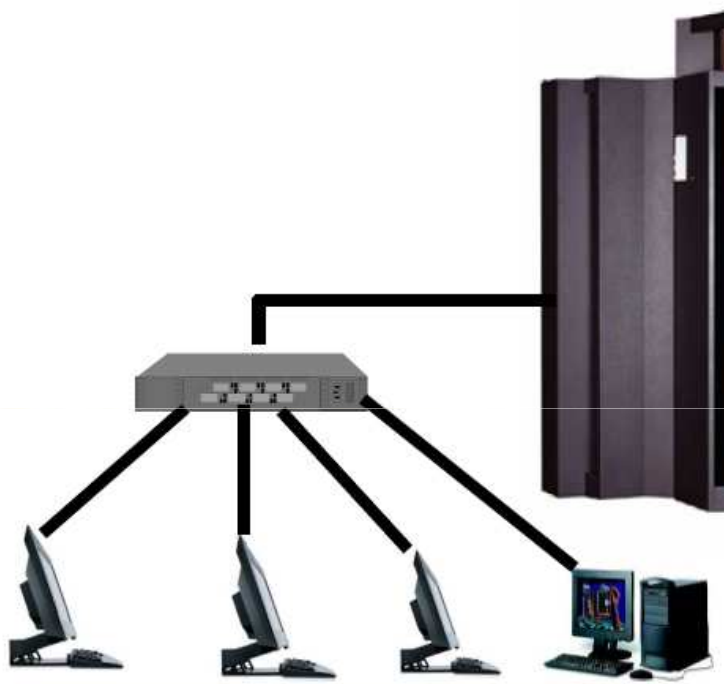
Success Strategies

- Involve all appropriate internal organizations – early and frequently
- Secure appropriate external support organizations – we use Sine Nomine http://sinenomine.net/ 24x7

Oracle Grid Infrastructure for Applications



Hardware Infrastructure

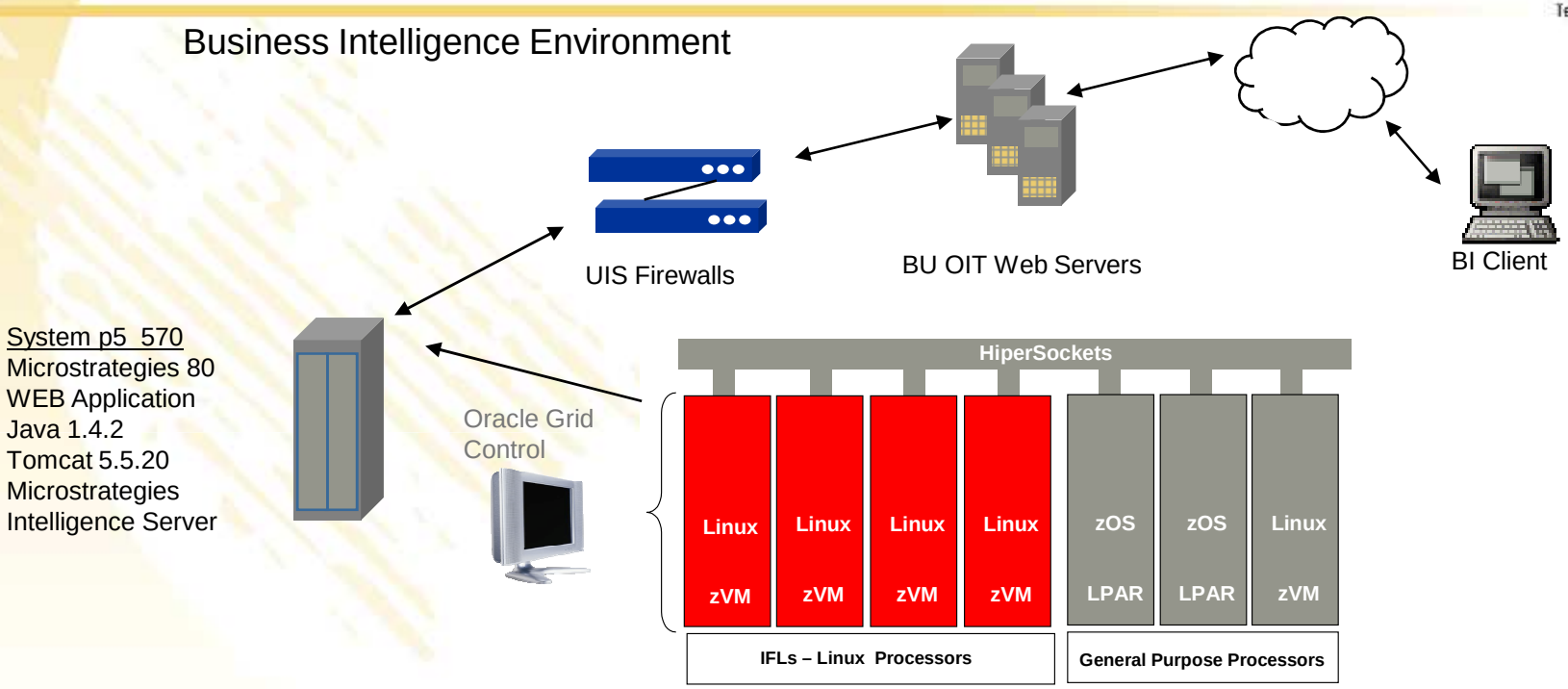


- **z9BC**
  - 5CPs
  - 24GB storage
  - 4 x Gigabit Ethernet OSA Card
  - 4x Ficon Card
  - Oracle 10G , SLES Linux

- **DS 8100**
  - 10TB Storage
  - Point in Time Copy
  - 4 Ficon Channel

Business Intelligence
Enterprise Dashboards

Business Intelligence



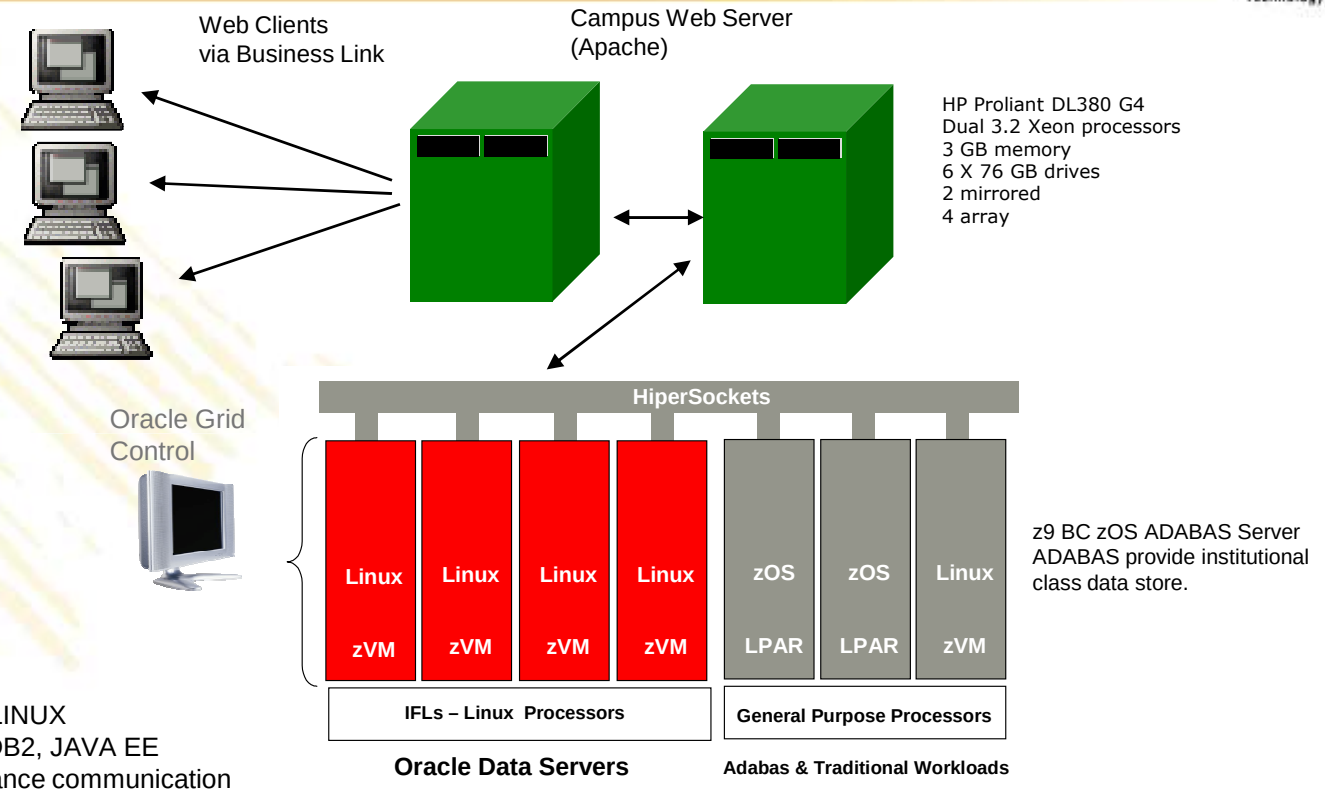
Linux on z9 BC
- Oracle 10g
- Data from zOS ADABAS via ADABAS Replicator

Data Direct Wire Protocol Driver

Feeds data to Oracle via Adabas

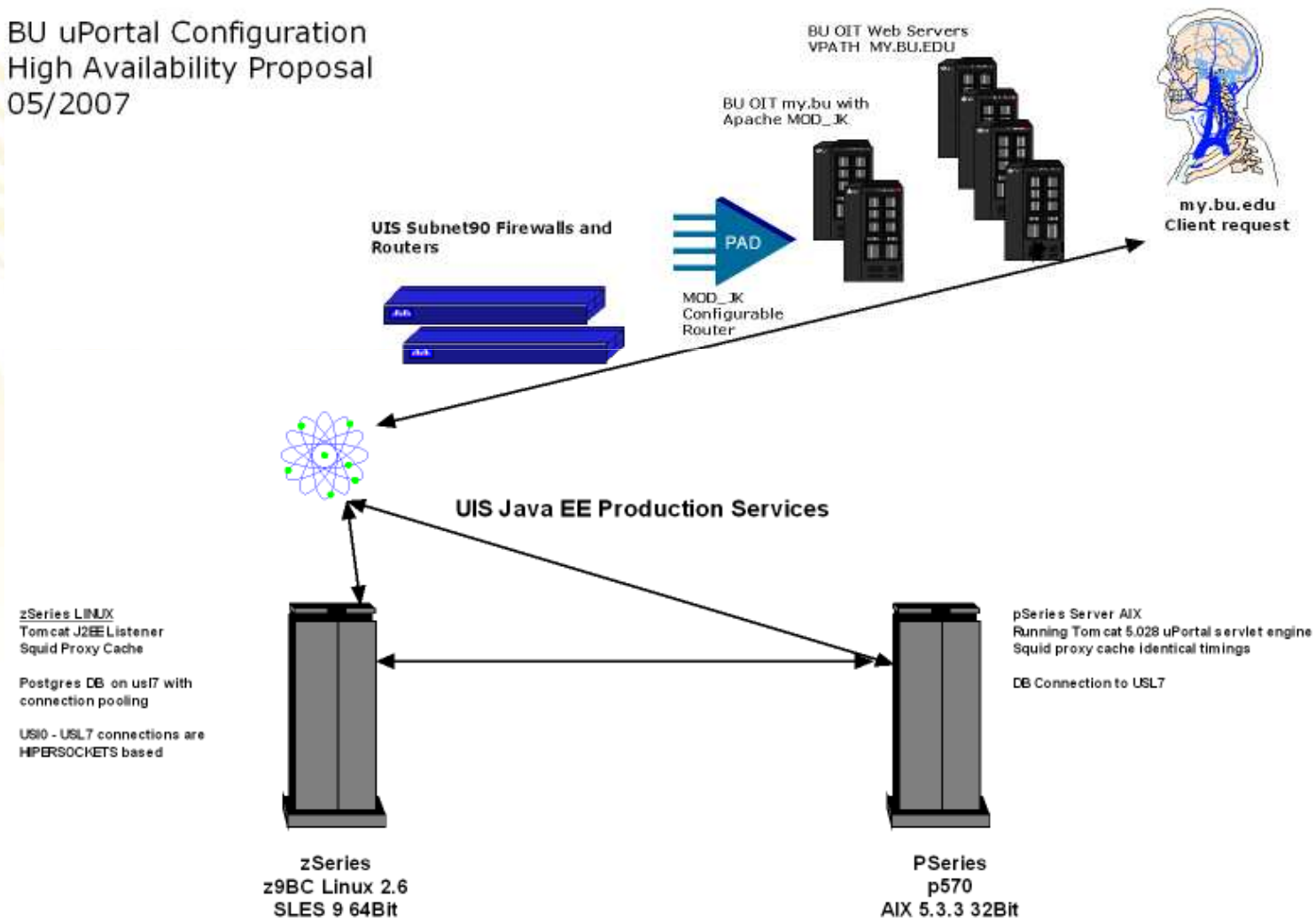
Z9 BC zOS ADABAS Server
- ADABAS provides data to Oracle via Hipersockets Interface

Document Imaging



z9 BC SuSE LINUX
Oracle 10G, DB2, JAVA EE
High performance communication
with zOS via Hipersockets

uPortal Schematic



The Business Value
Oracle Grid and MAA with System z

- Standardized – Reduced Complexity
  - Simplified IT Operations by reducing manual build efforts
  - Simplified Software Systems for Staff, Faculty and Students resulting in streamlined decision support improvements
- Virtualized – Provided Maximum Availability
  - Improved Applications Availability
  - Improved Quality of Service “Uptime” by using MAA
  - Continuous Data Availability
- Consolidated – Reduced Costs
  - Improved Operational Efficiency via n-Tier environment

The Future at BU

- Oracle & IBM Joint Solutions Center
  - Evaluate IBM JSC z Lite Testing and recommendation to peers
- Future Initiatives
  - Continue Complete Exploitation of MAA
  - Enterprise Grid monitoring
  - Develop High Availability Application Offerings (RAC,ASM)
  - Integrate New BU Business Systems with MAA mindset
  - Institutional Research Runtime Environment

Resources

- Solution Design
  - Oracle Sales Development – System z
    - Matt Puccini matthew.puccini@oracle.com
  - Oracle/IBM Joint Solution Center
  - IBM System z Solution Specialists
    - Gaylan Braselton gbrasel@us.ibm.com
- Solution Testing
  - Oracle z Lite – pre-configured Oracle/System z environment

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