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ETS ACHIEVES HIGHEST MARKS WITH RED HAT

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Overview

- ETS mainstreamed Red Hat Enterprise Linux and JBoss on Intel platform (Red Hat Enterprise Linux, JBoss Enterprise Application Platform, JBoss Enterprise Web Platform)
  - Cost savings
  - Improved efficiency
  - Technology management and standardization
  - Leverage of development resources
  - Positioned for adoption of cloud computing and virtualization technologies

Agenda

- About ETS
- Our findings
- What we did with Red Hat Products
  - Hardware platform
  - OS
  - J2EE application server technology
  - J2EE IDE
- What we learned
- Sample J2EE component architecture

About ETS

- Founded in 1947
- Our mission
  - To advance quality and equity in education by providing fair and valid assessments, research and related services. Our products and services measure knowledge and skills, promote learning and educational performance, and support education and professional development for all people worldwide
- Deliver and score more than 50 million assessments per year
- $925 million nonprofit company with several subsidiaries
- 17% of revenue is spent on IT. IT is the “Factory” for ETS.
- Large percentage of application portfolio is custom-developed
- 150 complex Line of Business applications

Our Heterogeneous Environment

- Server platforms:
  - Linux, Mainframe, Solaris, Windows
- Desktop:
  - Primarily Windows, some Macintosh
- Heterogeneous application platform:
  - Cobol, C/C++, Fortran, Java, .NET, etc.
- Large percentage of Enterprise applications are built on J2EE platform
  - Multiple application server technology, IDE and J2EE framework
- Database platform:
  - DB2, CA-IDMS, MS SQL Server and Oracle

ETS – Strategic Changes

- Formed Enterprise Architecture Office to manage and align technology to industry trends and best practices
  - Introduced processes to manage technology lifecycle
- Created technology road map (Standards):
  - Hardware and OS Platform for application and database servers
  - J2EE application server technology
  - J2EE IDE
- Moving into the adoption of cloud computing and virtualization technologies

HW and OS Platform for application and database servers – Findings and Changes

- Observations
  - Vertically scalable machine support is expensive to ETS
  - ETS server farm was 50% Sun/Solaris and 7% Linux/Intel
- Changes
  - Three years ago ETS began aggressively moving away from vertically scalable platform to horizontally scalable platform
    - E.g. Sun SPARC(4 CPU , 1.2 GHz) to Intel (2 CPU Dual Core, 3.2 GHz)
  - ETS server farm is approximately 30% Linux/Intel and 29% Sun/Solaris

HW and OS Platform (cont.)

- Results
  - Average 40% cost savings per server
  - Average 40% performance improvement per server (application and database)

Note: Results based on the support service cost at ETS

Application Server Technology

- Observations
  - Deployment and O&M activities on vertically scalable machines (Sun SPARC with Solaris) are expensive to ETS
  - Difficult to manage configurations and deployment procedures for each version of application server container
    - Multiple versions of IBM WebSphere, JRUN, JBoss, Tomcat and IIS
  - Opportunity for cost savings, cloud computing and virtualization

Application Server Technology – Changes and Results

- Changes
  - Migrate J2EE applications to a minimum set of standard supported versions of the application server
    - JBoss EAP and JBoss EWP (JBoss and Tomcat)
- Results
  - Easy to manage application configuration, deployment and technology lifecycle
  - Minimize skill-set and resources to support applications
  - Better leverage of existing development resources
  - Better positioned for adoption of cloud computing and virtualization technologies

J2EE IDE – Findings and Changes

- Observations
  - Current IDEs enable too many versions of frameworks
  - Difficult to apply patches appropriately
  - Difficult to fix issues
- Changes
  - Standardize J2EE application development IDE to a supported version
    - JBoss Developer Studio
    - Standardize the frameworks for use at ETS
      - JBoss Seam (Evaluation)
      - Spring

J2EE IDE – Results

- Results
  - Improved skill-set and resource management
  - Improved application portability
  - Improved application configuration and deployment management
  - Improved security monitoring and patch update
  - Improved technical support through Red Hat support and consulting

J2EE Application Architecture – Changing

- Align ETS's J2EE application technology strategy with Red Hat J2EE technology strategy
  - Technology stack, standard frameworks, standard development environment
  - Standardize application server configuration
    - Deployment, data access, security and performance
- Use Red Hat Package Manager (RPM) for version upgrades and patch upgrades
- Choose appropriate J2EE container for application deployment at design time
  - JBoss vs. Tomcat

Examples: ETS J2EE application component architecture

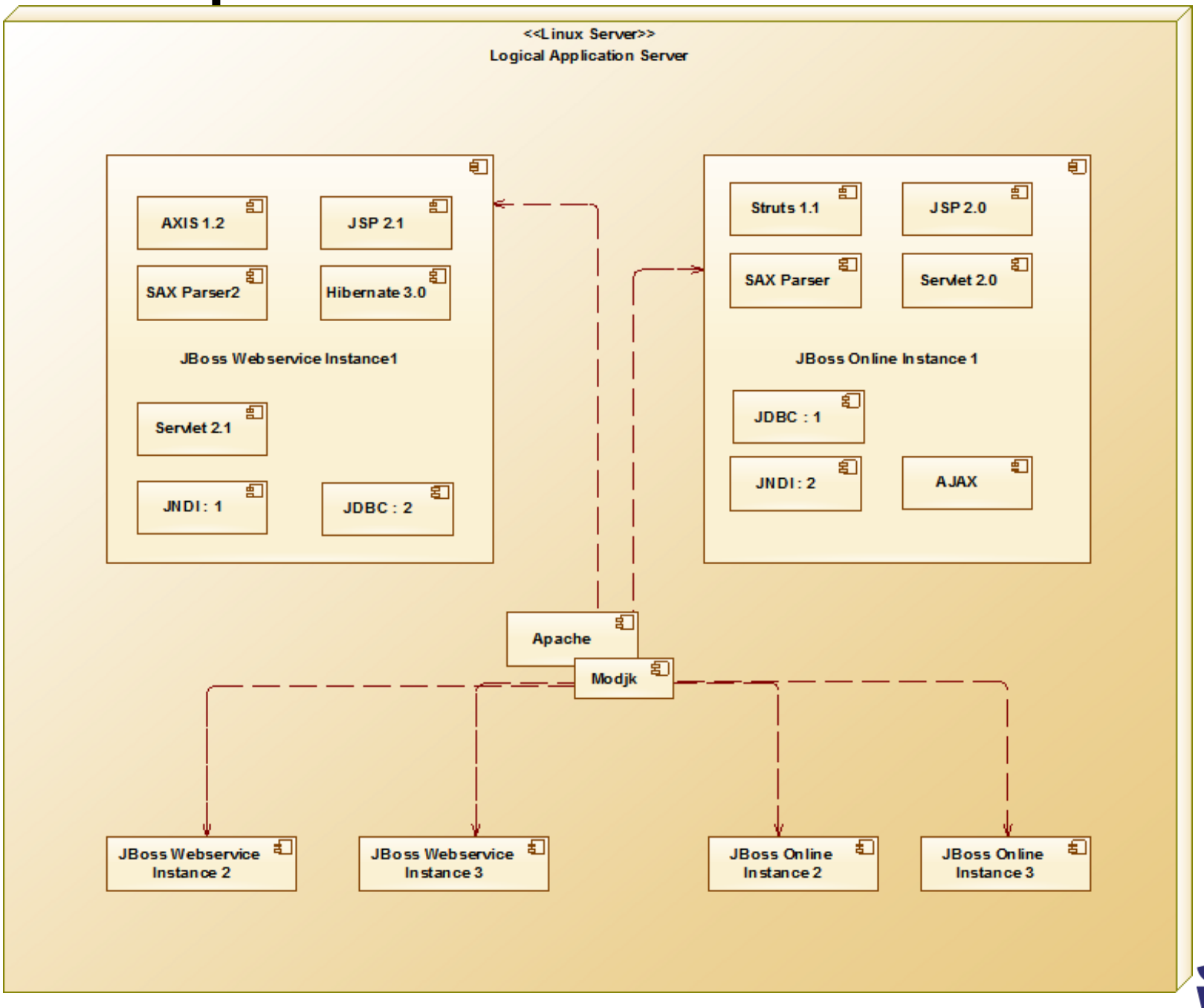
Scoring Application

A web-based global constructed-response scoring system. This system was originally built on Web-Sphere and later migrated to JBoss.

Non-functional Requirements:

- High availability: Yes
- Volume – Online: 2000 concurrent users
- Volume – Web Service: 100,000 transactions per day

J2EE Component Architecture



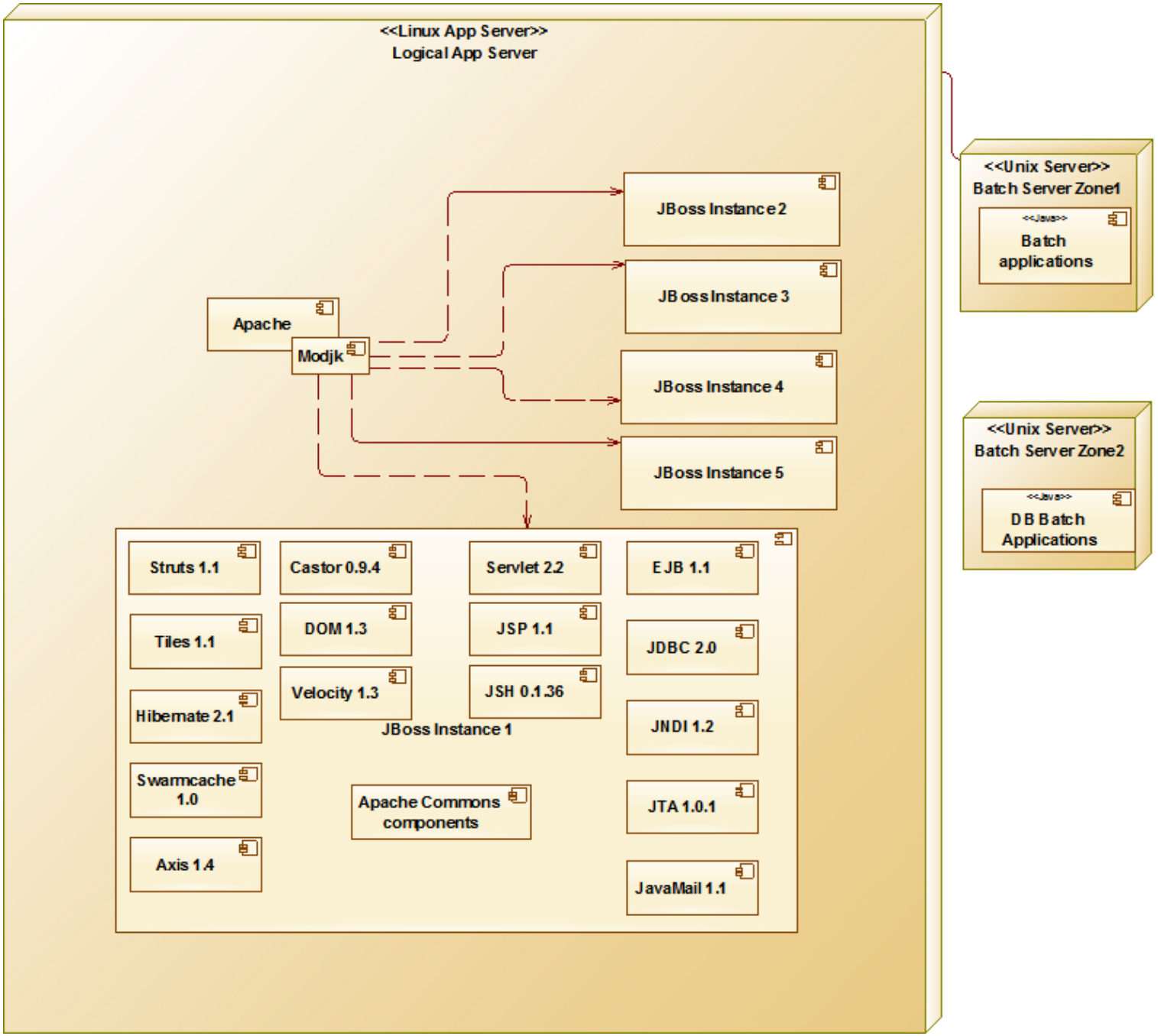
Integrated Testing and Reporting Application

A web-based K – 12 Assessment order management system built to support K – 12 public schools, as well as private schools. This system was originally built on Web-Sphere and later migrated to JBoss.

Non-functional Requirements:

- High availability: Yes
- Volume: 1400 concurrent web users

J2EE Component Architecture



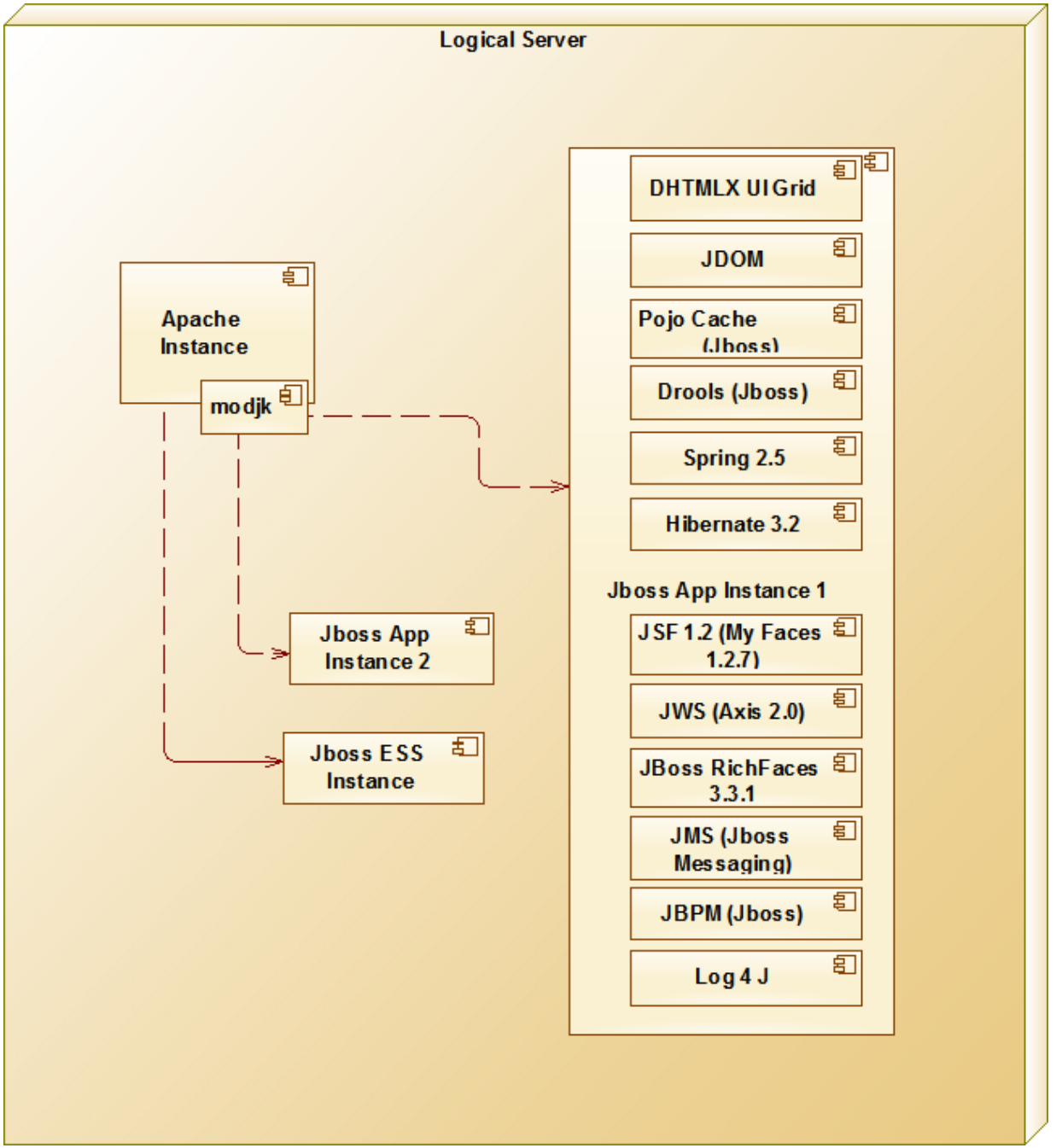
Assessment Test and Question Management System

A web-based global, centralized items/questions and test management system.

Non-functional Requirements:

- High availability: Yes
- Volume: 200 concurrent users

J2EE Component Architecture



Conclusion

- ETS mainstreamed Red Hat Enterprise Linux and JBoss on Intel platform
  - Cost savings approximately 40%
  - Improved efficiency approximately 30%
  - Improved technology management and standardization
  - Improved leverage of development resources
  - Better positioned for adoption of cloud computing and virtualization technologies

QUESTIONS?

TELL US WHAT YOU THINK:
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