ECATS
Post Kick Off
Technical/Architecture Discussion

North Carolina
Department of Public Instruction
April 7, 2016
10:30 AM
Agenda

• Architecture
  • ECATS Application Architecture
    • State Level Site Control & Administration
  • ECATS Database Architecture
    • TASD (Technical Architecture Specification Document)

• Data Integration

• QA Process

• Application Security

• Hosting, Monitoring, Physical Security
ECATS Application Architecture as Proposed

Multi-Tiered Application

- Authentication and authorization security layer. – NC EdCloud
- Standard and customizable ECATS user interface
- Individual business logic – modules
- Data integration with existing data sources via scheduled or near-real-time system
- Reporting solution
State Level Administration

State Login

Aggregate Portal (ECATS)

State-Wide Reporting
- Aggregate and Granular Data
- Analytics and Monitoring

NC Reference Site
- Standardized Configurations, Data Elements, User Types (Configurations managed across all LEA Sites)

LEA Login

State User Login to LEA Site

LEA Site 1

Data Aggregated and Queried on Demand

LEA 1 Reporting
- Compliance Drilldown
- Individual Student and Caseload Records

Data Aggregated and Queried on Demand

LEA 2 Reporting
- Compliance Drilldown
- Individual Student and Caseload Records

LEA (n) Reporting
- Compliance Drilldown
- Individual Student and Caseload Records

ECATS Advanced Reporting (Statewide)

Nightly Data Feed

www.pcgeducation.com | NCDPI ECATS Presentation
ECATS Database Architecture

The Advanced Reporting (ODS) database is used so that data can be reorganized to support large scale, complex reporting.

This aggregate database contains no LEA specific information, but instead stores information about which LEAs exist in the state and stores references to their databases. It also stores limited information about users that have access to multiple LEAs, allowing simplified management of information about those users.

Another function of the aggregate system is to enable running state-wide reports. The information that is included in such a state-wide report, however, is obtained from the individual LEA databases, then aggregated into the single state-wide report.
Data Integration

Import data each day from PowerSchool for NC students
- Automated data import/export processes
- Nightly data feeds from PowerSchool
- System-generated data integration summary reports

Automatic import of key information
- Student demographics
- School assignment
- Parents
- Users
- Class rosters
- Attendance
- Grades
Data Integration cont’d

- SIS
  - NCEdCloud Identity and Access Management (IAM) Service
  - ECATS Single Data Entry Point

- PBIS
  - External MTSS Data Sources

- MTSS
  - State ODS
  - CEDARS
  - ECATS Data Accessible via BI Tool

- Special Education
  - Aggregate Data Only

- Medicaid
  - • External Medicaid Data sources (Input)
    • Claim Submissions (Output)
  - External EC Data Sources

- LEA Self Assessment
  - LEA Reporting
  - EC SEA Activities

External Data Sources
JIRA used for all defect tracking
Application Security

EdPlan Application Security Model

- Users are tracked using a unique session identifier after authentication
- Independent verification mechanisms are used to validate session records on each request
- Page and Section access are granted based upon the user’s role
- Permissions are granted to perform specific actions based upon the user’s role
- Annual penetration testing is performed on the application and infrastructure
- Internal Information Security Team
- Application Security, Infrastructure (SSL, SFTP, Redundant Firewalls), PCG Security Team
Hosting Architecture

Multi-Tiered, Fault-Tolerant Infrastructure

- All infrastructure uses clustered or fail-over hardware to prevent a single point of failure
- High availability database clusters for improved performance
- Storage Area Network for data storage speed and redundancy
- Hardware and software firewall and security layers
- Backup architecture allowing for easy retrieval of data for disaster recovery
Monitoring

Orion

- Network Elements
- Firewalls
- Routers
- Hardware/Circuits

IDEREA SQL Diagnostic Manager

- SQL Performance
- SQL Queries

Alert Site

- External Performance Monitoring and Availability

Custom Monitoring Scripts

- Transaction Time
- Performance Metrics
Physical Security

**Hosted at secure Tier 4 co-location**
- Highly secure data center with limited controlled access

**24x7x365 security guards**
- Require check in and check out
- Biometric scanning for identification
- Maintain complete access logs
- Video surveillance of the premises, exterior perimeter fencing

**Data transmission**
- Via industry standard encryption (256-bit SSL or higher)
Disaster Recovery

Backups

- Virtual Machine
  - Daily or weekly backups.
- Database
  - Full daily backups
  - Hourly transaction-log backups
- A copy of the backup data exists in each of our two geographically dispersed data centers located in Boston and Austin

Recovery

- Recovery time <= 24 hours
- Recovery point objective <= 1 hour
- Disaster recovery exercise conducted annually