Texas Skyward User Group Conference

Tech Intro to Qmlativ

Qmlativ: What's Under the Hood?

We will discuss the IT-related aspects of Qmlativ. We will cover topics like the Qmlativ server roles, SQL database, system requirements, hosting options, and much more.

- N-Tier Server Design Benefits
- Microsoft SQL Server
- Layered Application Design
- Qmlativ Accessibility
- Hosting Options
- Sample Server Configurations
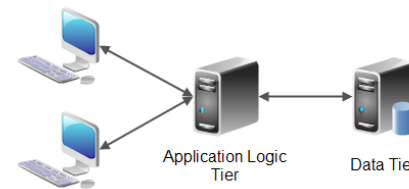
N-Tier Server Design Benefits

Benefits
- Flexibility
- Security
- Scalability

Server Roles
- Database Server Role
- Web Server Role
- Workflow Server Role

Presentation / GUI Tier — Application Logic Tier — Data Tier

N-Tier Server Design Benefits

Database Server Scalability

- Windows 2008 R2 / 2012 R2 / 2016
- SQL 2014 Standard / Enterprise
- 100% 64 Bit Architecture
- DB Server RAM / CPU Scaled for District Size
- DB Server RAM used for Database Buffers
- Database Buffers Reduce Disk I/O strain

Web Server Scalability

- Windows 2008 R2 / 2012 R2 / 2016
- Web Server IIS / .NET Framework
- SSL Encryption
- Multiple Load Balanced Web Servers

Workflow Server Scalability

- Windows 2008 R2 / 2012 R2 / 2016
- Workflow Service / .NET Framework
- Multiple Load Balanced Workflow Servers

N-Tier Server Design Benefits

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Firewall Friendly

- Optional DMZ Web Server (Outside Access)
- Single SSL Port (Reduces attack surface)

Server Friendly

- Secure Service Account for Skyward Services
- Compatible with all Endpoint Protection
- Windows Firewall Compatible
- Windows Critical Updates Encouraged

Security Experts Review

- Annual 3rd party Security Audit
- Audit includes:
  - Skyward Corporate Networks
  - Skyward Server Configurations
  - Skyward Applications

Microsoft SQL 2014 R2 64 Bit Standard / BI Edition

- Compute Capacity limited to lesser of 4 Sockets or 16 cores
- 64 GB Maximum Memory (per instance of SQL Server Database Engine**)**

Microsoft SQL 2014 R2 64 Bit Enterprise Edition

- Compute Capacity and Memory limited to Operating System maximums

SQL Advanced Features

- High Availability Options
    - Availability Groups
    - Failover Clustering
    - Log Shipping
- Transparent Database Encryption
- Resource Governor
- SQL Server Audit

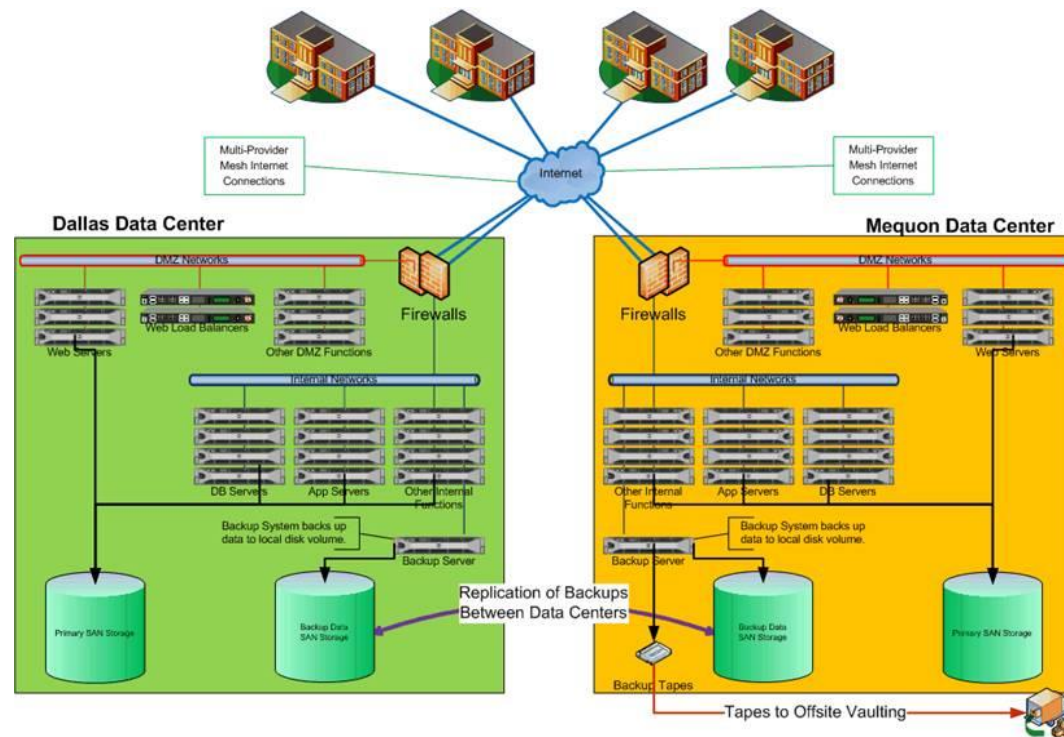SQL feature availability varies by SQL Edition

Qmlativ Layered Application Design

User Interface Layer

ASP.NET MVC 4.0

Skyward View Engine

REST API

Business Layer

Business logic and Validation

Workflow definitions

Skyward ORM (Object Relational Mapping)

Logical representation of the Qmlativ database

Query construction and security logic

Data Layer

Translation from Skyward ORM to native T-SQL

Open avenues for accessibility

- Native SQL Client Access
- ODBC (open database connectivity)
- TSQL (structured query language)
- REST API
- Direct access to Skyward .NET assemblies

Third Party Tools

- SQL Management Studio
- Microsoft Reporting Services
- Cognos (IBM)
- Crystal Reports (SAP)
- Squirrel SQL Client (Open Source)
- Too many others to list…

Qmlativ Hosting Options

Secure Cloud Hosted

- ISCorp
  - Exclusive Hosting Partner
  - Platinum, Gold, Silver Hosting options
  - Built in Disaster Recovery: Multiple Data Centers
  - N + 1 for Maximum Uptime
  - Includes all Application Updates, DBA, and System Administration
  - 24x7 System Support

Secure Cloud Hosted Overview

Skyward, Inc.
5233 Coye Dr.
Stevens Point, WI 54481

Skyward TEA Datacenter Architecture and DR Replication Diagram

Description: Diagram outlining the Architecture Data Replication Process between the Dallas and Mequon Datacenter

Date	Project	DWG NO	REV
11/18/2011	SKY	SKY-111811-1.1.0	A
Author	SRodenhuis		SHEET 1 OF 1

Qmlativ Hosting Options

Managed Services On-Premise Hosting

Platinum, Gold, Silver:
- HPE Server
- Microsoft Windows / SQL Licensing
- SSL Certificate
- Symantec Endpoint Protection
- Business Hours support via toll free, web, chat, VPN, WebEx
- After Hours Support

Platinum, Gold:
- 24 x 7 Monitoring

Platinum:
- Disaster Recovery Service
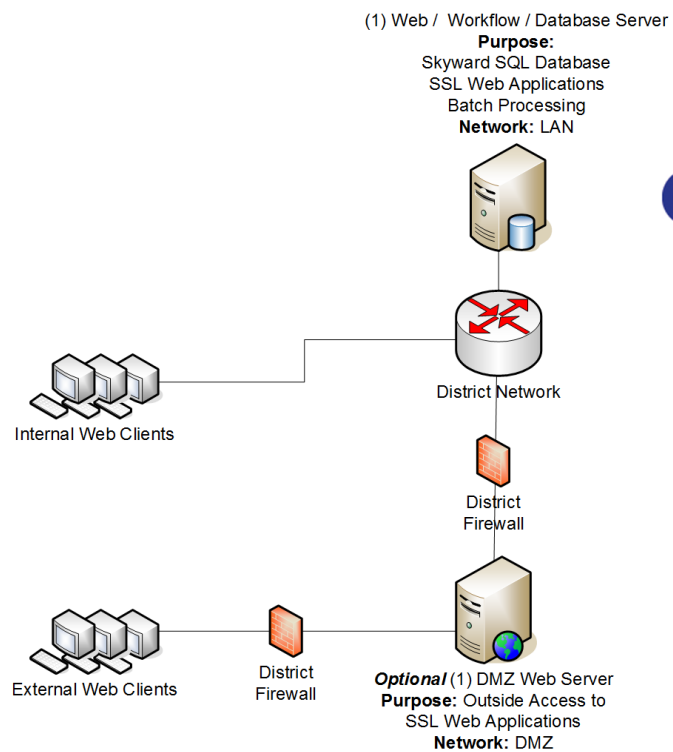
Qmlativ Hosting Options

Managed Services On-Premise Hosting

- Skyward Provides the Experts
- Product Updates
- Database Refreshes
- Conversion Assistance
- VMWare, Microsoft, OpenEdge, HPE, Cisco Certified Employees
- Experienced DBAs
- Experienced System Administration

IT Services Average Employee Tenure: 15+ years!

System Configuration

Sample System Configuration – up to 10,000 Students

(1) Web / Workflow / Database Server
Purpose:
Skyward SQL Database
SSL Web Applications
Batch Processing
Network: LAN

Internal Web Clients

District Network

District Firewall

External Web Clients

District Firewall

Optional (1) DMZ Web Server
Purpose: Outside Access to
SSL Web Applications
Network: DMZ

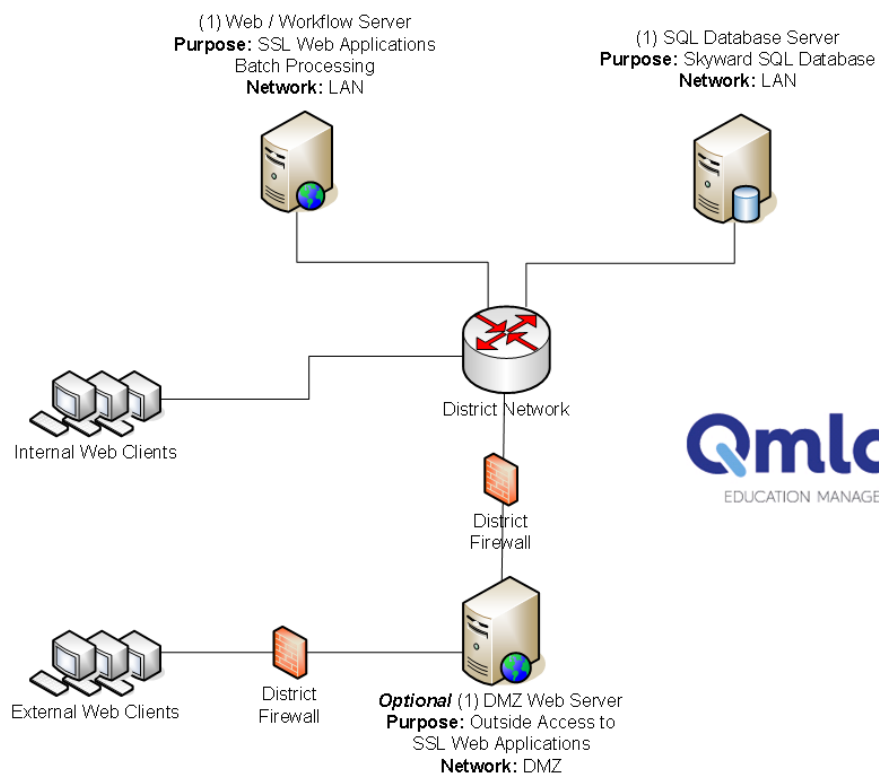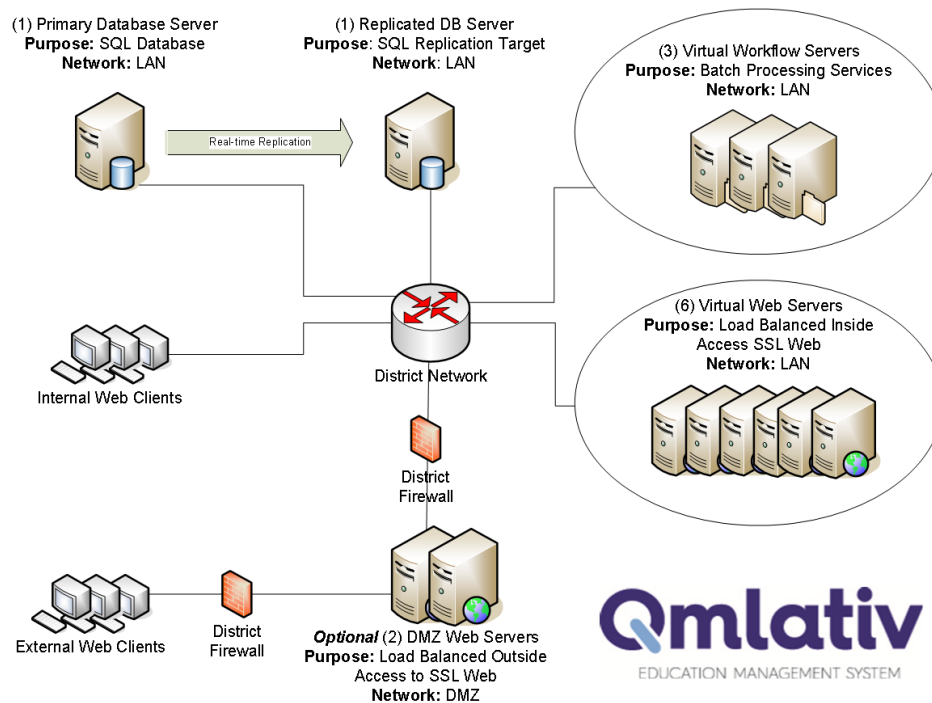# System Configuration

Sample System Configuration – 20,000 Students

System Configuration

Sample System Configuration – 40,000 Students

Sample System Configuration – 80,000 Students

(1) Primary Database Server
Purpose: SQL Database
Network: LAN

(1) Replicated DB Server
Purpose: SQL Replication Target
Network: LAN

(3) Virtual Workflow Servers
Purpose: Batch Processing Services
Network: LAN

Real-time Replication

Internal Web Clients

District Network

(6) Virtual Web Servers
Purpose: Load Balanced Inside
Access SSL Web
Network: LAN

District
Firewall

External Web Clients

District
Firewall

Optional (2) DMZ Web Servers
Purpose: Load Balanced Outside
Access to SSL Web
Network: DMZ

Qmlativ
EDUCATION MANAGEMENT SYSTEM

End of presentation –

Extra space for other notes

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Texas Skyward User Group Conference

THANK YOU FOR ATTENDING!

SKYWARD®
www.skyward.com