



The Intelligence Behind The Technology

November, 2012

Case Studies & Client Information

By:

Michael Petrov
CEO

Patricia Marro
Director of Marketing

Case Study: Fund Administration

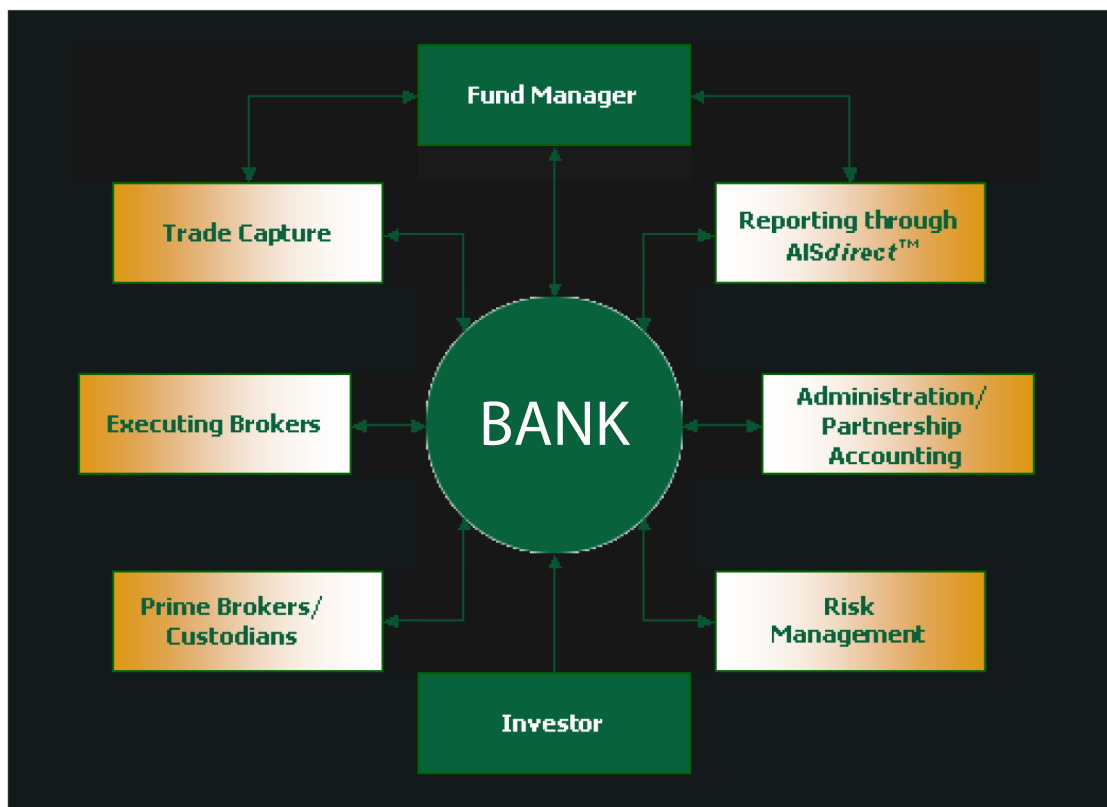
Executive Summary

Digital Edge designed and implemented an information technology infrastructure for a financial services company. The design and implementation addressed multiple business challenges and provided this company with both a reliable and scalable comprehensive information technology system, as well as services fulfilling business demand which provided a foundation for future growth. Digital Edge designed and implemented the described solution. Digital Edge assisted this company with documentation and training, facilitated the hiring and training of an appropriate system engineer to take the knowledge of the system in-house, and transferred user support responsibility in-house keeping server and back office support responsibilities.

Company -provides an outsourced solution for the fund administration of hedge funds. A service-based business, they target their daily operational and reporting needs.

Problem - To design and implement technology architecture that would allow uninterrupted, reliable services to their clients.

The business flow of could be described by following diagram:



Design Parameters

Architectural Concerns

1. Security

- a. Reliable secured remote access from 3 offices
- b. Manage multiple outgoing and incoming protocols
- c. Physical security
- d. Intrusion detection

2. Stability

- a. 24/7 support team availability for all underlined technology
- b. Locked down user environment.
- c. Administration measures to restrict users from potentially dangerous operations.
- d. Terminal server administration.

3. Processing capacity and reliability

- a. Sustain targeted amount of Oracle transactions
- b. Scale Oracle processing and data capacity
- c. Sustain targeted amount of terminal server users and VB clients
- d. Sustain targeted level of incoming information from multiple data sources
- e. Sustain targeted level of outgoing information to multiple clients and data consumers

4. Recoverability

- a. Full recoverability within single environment in the case of any technology failures within 30 min.
- b. 30 minutes data lose target.
- c. Full recoverability in the case of global regional disaster
- d. Up to 30 minutes data loss in the case of global regional disaster
- e. Single component recoverability

5. Regulatory compliance

- a. Security
- b. Electronic communications
- c. Incoming and outgoing data
- d. Internal data
- e. Change management

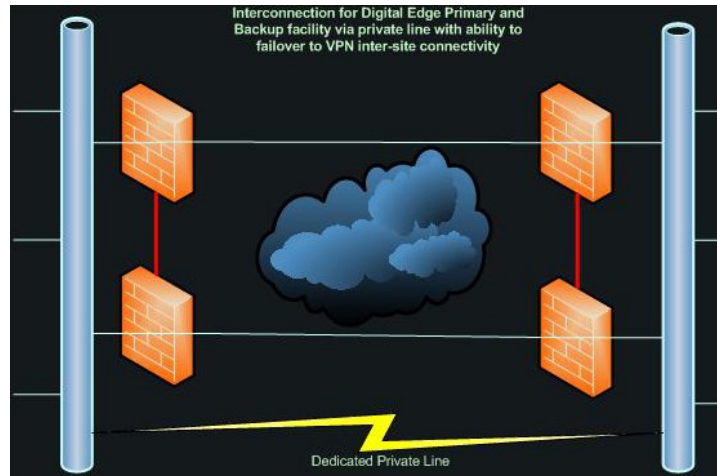
Legacy technology:

1. Oracle
2. Shadow Financial
3. SendMail
4. Proprietary Visual Basic modules managed by in-house development team
5. CVS source control.

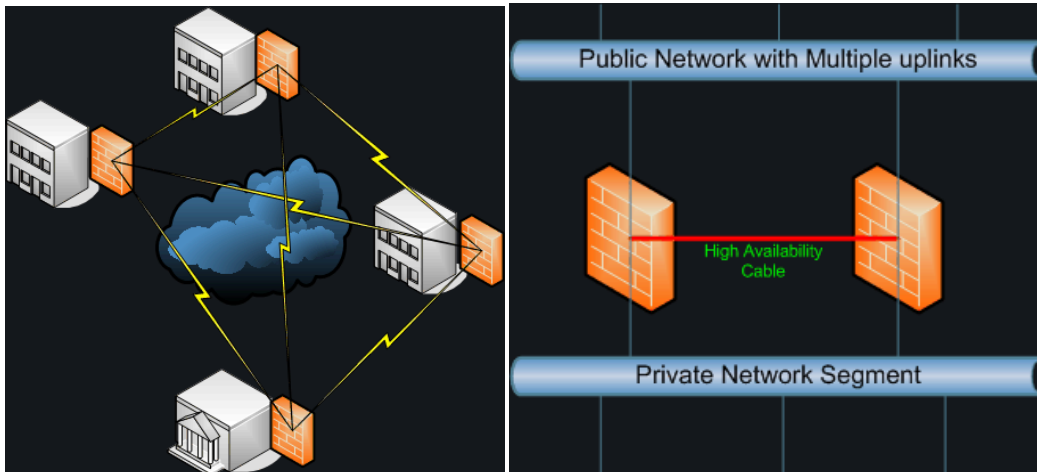
Architectural Design

1. Network Concepts

- a. Backend servers reside at Digital Edge Primary and Backup interconnected facility. Secured tunnel between DE Primary and DE Backup data center is established and available for all clients needs.

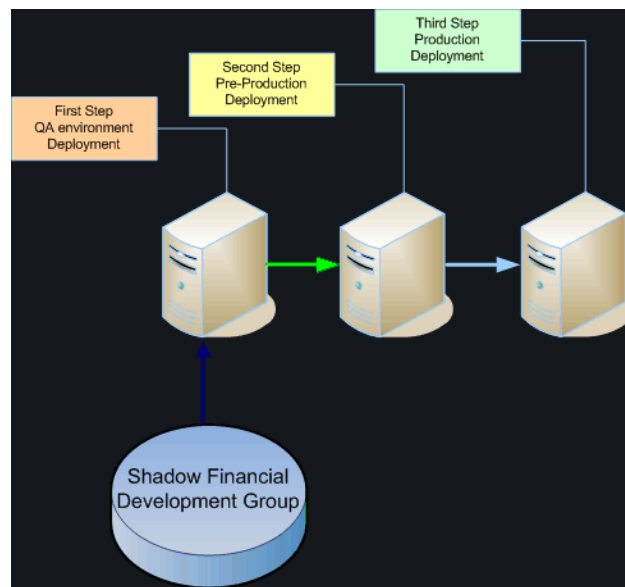


- b. Point-to-point connectivity between primary company office and Digital Edge primary facility. Ability to failover to the internet secure tunnel in the case of point-to-point link failure.
- c. Meshed VPN architecture between satellite offices and DE Primary and DE Backup data center to insure higher availability and avoid single point of failure.
- d. Network High Availability concepts



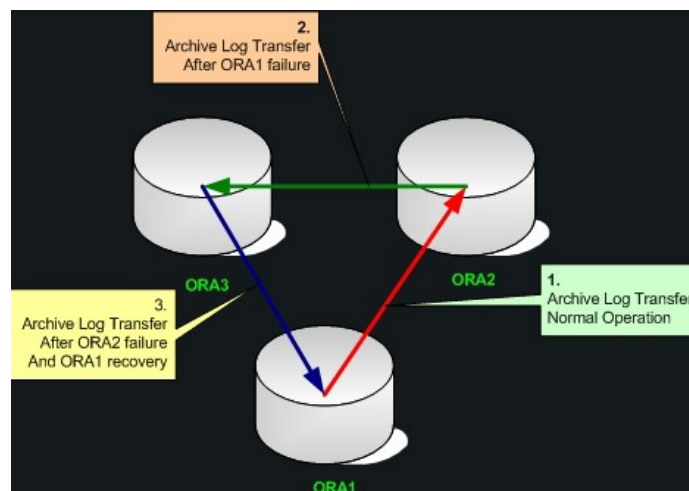
2. Terminal Servers configuration

- Multiple terminal servers with elements of virtualization
- Domain managed login rights
- Centralized data storage from all Terminal Servers to NAS
- Change management enforcement with 3 environments allowing graduate change propagation



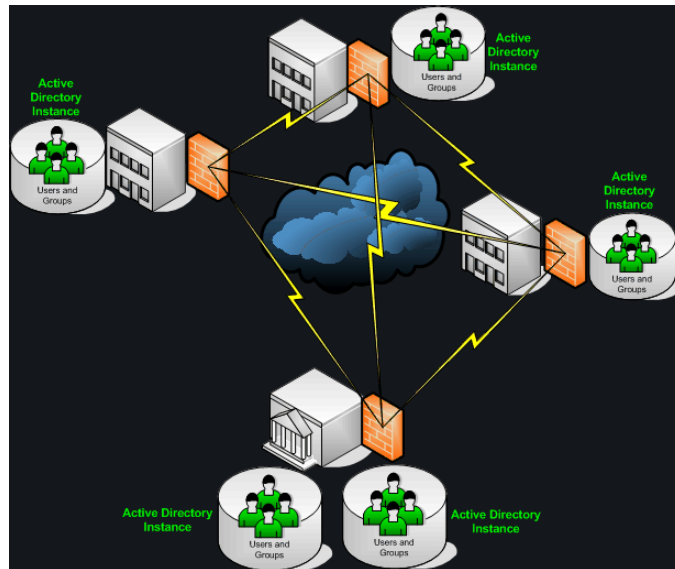
3. Database Configuration:

- Linux/Oracle deployment
- Oracle DataGuard for local database recoverability
- 3 Oracle database servers working as 3 levels of recoverability. ORA1 pushes changes to ORA2. In the case of ORA1 failure, ORA2 comes up as a primary database pushing changes to ORA3. ORA3 is configured to push data to ORA1 in the case of ORA2 failure. Such architecture forms loop of change propagation providing maximum recoverability within targeted parameters. Also, such architecture minimizes hardware cost as targeted parameters allow not using hardware clusters or grid computing.
- Besides DataGuard, nightly backups of production data on NAS environment
- 3 database environments to address change management processor
- Nightly backup of non-production databases to NAS



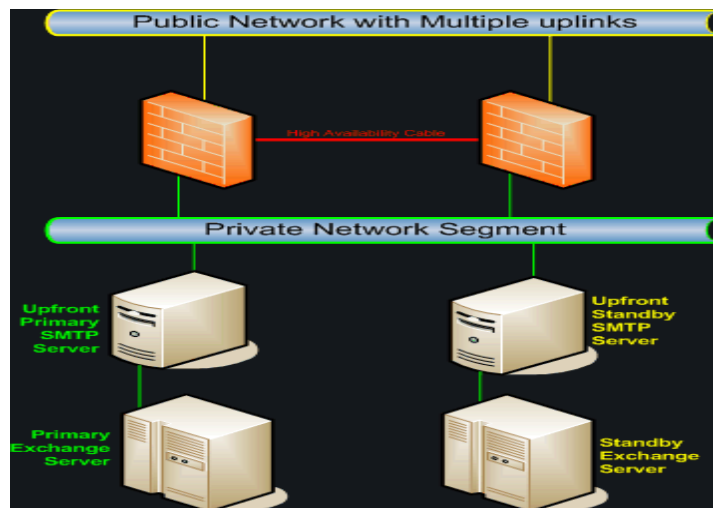
4. Domain architecture

- Microsoft Active Directory for user authentication in terminal servers environment
- Active directory in the main office and satellite offices providing higher availability and single login authentication for all company employees
- Database servers are not part of domain authentication and users have no access to Oracle. There is only one way of accessing Oracle databases from terminal servers is by using standard Oracle protocol and authentication



5. Email Communication Architecture

- MS Exchange / MS Outlook implementation allowing company employees better intercommunication and using sales workflow system
- Up-front Linux based SMTP server
- Archiving solution for SOX compliance
- Daily backups to NAS
- Standby Exchange server



6. Incoming and outgoing data flow

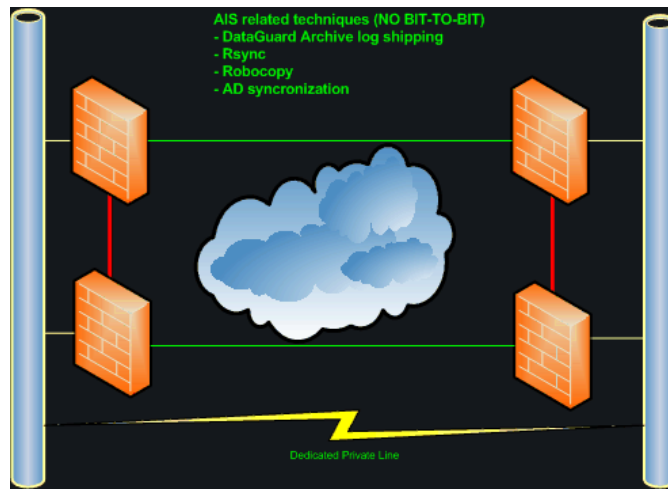
- FTP/PGP combination for outgoing and incoming data
- Custom scripts for PGP data encryption, push and pull
- Custom Report delivery mechanisms

7. Change management

- Microsoft VSS for source control
- 3 environments for change propagation
- System of commands and scripts for change propagation
- Shadow Financial deployment processes
- Single change management officer

8. DE Primary and Backup datacenter data replication

- Mirrored environment
- NAS data mirroring
- Oracle archive log shipping and application
- Domain security replication



9. Other operational needs

- DE Oracle DBA services
- DE Network Administration services
- DE System Administration services
- DE Monitoring cluster
- DE Vendor coordination services
- DE Hardware maintenance service

10. Future implementations and improvements.

- Switching from NAS to SAN to consolidate data services and provide hardware bases for Clustering or Grid Computing
- HDD cached tape backups to provide faster backup recovery
- Easy conversion to Oracle Grid to provide on demand scaling and recoverability

Responsibility Model

Type of Service	Responsible party
Desktops	Company IT
Employee Email	Company IT
Domain Security	Company IT / Digital Edge
Shadow Client Deployments	Company IT
Shadow Change Management	Company IT
Custom Script Management	Company IT
Defining specs for future implementation	Company Business
Oracle DBA	Digital Edge
Terminal Servers maintenance	Digital Edge
Network Administration	Digital Edge
Firewall/WAN/Network security and high availability	Digital Edge
Site replications and synchronization	Digital Edge
Backup and Recovery	Digital Edge
Change management configuration	Digital Edge
Documentation	Company IT / Digital Edge

SLA terms:

1. **20 min** on site response time for any problems.
2. Oracle RAC – recoverability to any local failures within **1 hour**
3. SQL Server cluster recoverability to any local failures within **1 hour**
4. Recovery of any single server within **3 hours**
5. Recovery of business application functionality within **3 hours**
6. Failover to DR site for Oracle with up to **15 min** data lose
7. Failover to DR site for SQL databases with **1 hour** data lose
8. Failover to DR site file server with no data lose
9. Failover to DR site of all financial apps within **3 hours** in the case of global primary site failure or disaster.
10. Recovery of deleted or overwritten files to up to **3 month** in past.\
11. Responsibility as per Responsibility Model table

Infrastructure:

- 200 servers
- Primary and DR location
- Oracle RAC
- SQL Server cluster
- EMC SAN storage
- VMWare vSphere 4 Cluster
- MS Exchange cluster
- Production EMC to DR EMC bit-to-bit replication

Price

Total Monthly price: \$

Migration:

The client was migrated from 111 8th Ave, NY data center to Telehouse.

Full migration process took 6 month. First application started working in 1 week. First application went to production in 2 weeks.