

Mission Critical Storage and Data Protection in the Financial Services Industry

FIS/CERTEGY

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- ❑ FIS/CERTEGY Overview
- ❑ Industry Drivers
- ❑ IT Infrastructure
- ❑ Operational Observations
- ❑ Current and Future Challenges

- ❑ Certegy is a leading provider of card and check risk management, fraud management, cash access and payment services for:
 - ❑ Retailers (POS integrated and Web-based)
 - ❑ E-tailers
 - ❑ Gaming Establishments
 - ❑ Integrated Bill Payment – Web-based
 - ❑ Check Cashing – (Kiosk and over-the-counter)
 - ❑ Financial Institutions

Overview: Premier Services

Signature Services

- ✓ Check Authorization + Risk Management
- ✓ Digital Payment Processing
- ✓ Collection + Recovery Services
- ✓ E-Commerce (payment processing; fraud management; order review)
- ✓ Check Cashing (payroll; government; tax refund)
- ✓ Bill pay
- ✓ Credit Card Processing (Elavon Information Systems)
- ✓ Gaming

Premier Products

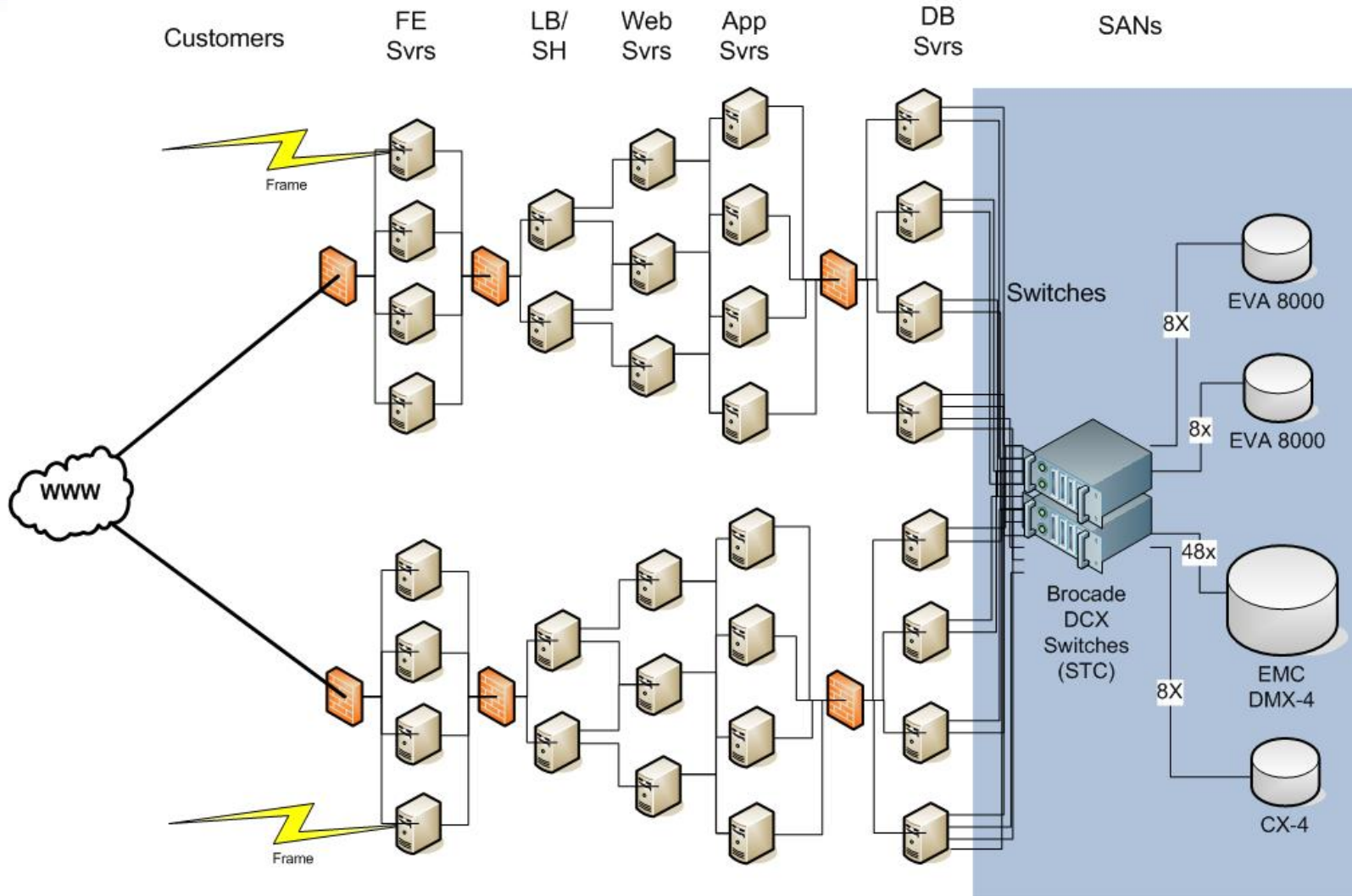
- ✓ Enhanced Warranty™
- ✓ ElecCheck®
- ✓ PayBack™
- ✓ PayNet®
- ✓ PayReady™
- ✓ Certegy® Payment Recovery Services
- ✓ ClearCommerce®
 - CommercePointe®
 - PaymentDirector
 - Fraud Shield
 - RapidReviewer
- ✓ PayCheck Accept®
- ✓ BillPointe®
- ✓ ECAGE®

Overview: CERTEGY Key Statistics

- ❑ \$19.3 Billion Annual Check Warranty Volume
- ❑ \$257.7 Billion Authorized
- ❑ 4 Billion transactions in 2008
 - ❑ 490M OLTP POS authorizations
- ❑ Proprietary DB – 100+ Million Check Writers.
- ❑ 18,300 Client Relationships (includes 18 of top 25 retailers in North America)

- ❑ Economic Challenges → Fraud Goes Up
- ❑ Sophisticated Fraudsters Force New, More Data Intensive Models
- ❑ Predictive Analytics – Model Sophistication
- ❑ Integration Between Card, Check, & Electronic Purchase Data
- ❑ Customer Shared-risk For Loss Control – Customer Can Enter Fraud Prevention Rules
- ❑ Non-public Information Data Storage Requirements

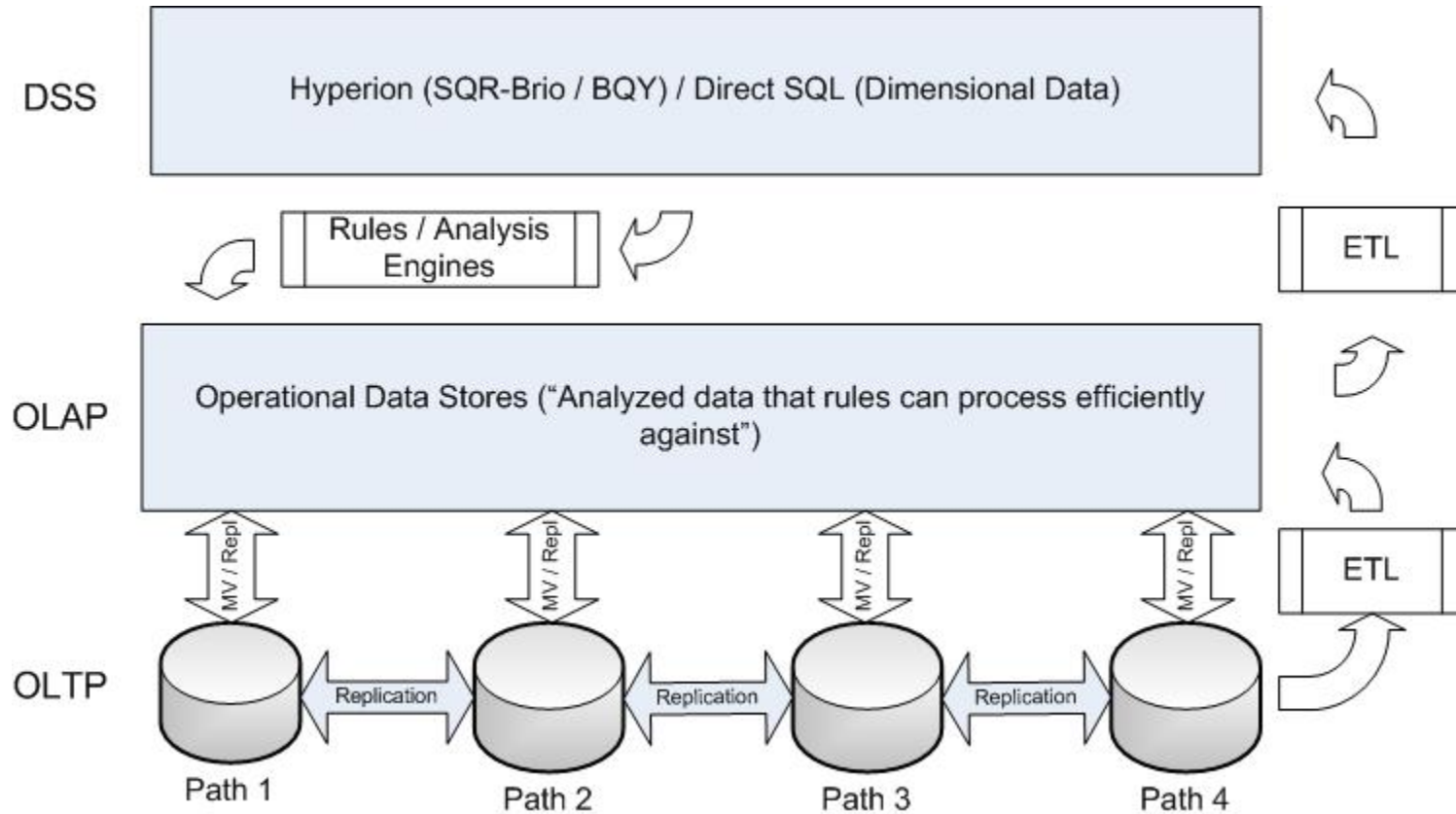
IT Infrastructure – STC Logical



- ❑ 4 Parallel Processing Environments – 2 per DC
- ❑ 150+ TPS – any single path
- ❑ 4 Second Response Time SLAs
- ❑ 750 Servers (120 per path, 20 per DC, dev/test)
 - ❑ Virtualized (IBM P5 & P6 series)
 - ❑ X86, P5 & P6 series blades (28/center)
 - ❑ PC/IVR servers

- ❑ 35 TB active data/path, 20 TB OLAP data/DC
- ❑ Dual/Quad IO paths and dual fabrics per server with VIO for Web and App Servers
- ❑ 300 FC ports per center
- ❑ 10 Virtualized test paths w/cloning ability

Logical Processing View



- ❑ Follow the hotspot
 - ❑ Hot disks/blocks move every minute
 - ❑ Sequential write streams for transaction logs
 - ❑ Random Access for fraud parameter updates
 - ❑ EVA 8000's re-level daily
 - ❑ Fraud & Risk OLAP queries of real-time transaction data “follow-the-fraud”

- ❑ 8-12 TB moves between paths daily
 - ❑ 4-way active master replication interrupts sequential write streams
 - ❑ Oracle ASM attempts to load balance between presented LUNs
 - ❑ ODS to OLTP Replication (MV/RSync)

- ❑ Fraud/Risk Model Generators:
 - ❑ 32K IOPS w/4 HBAs
 - ❑ Sustained at 20K IOPS for 5-6 hours each day
- ❑ OLTP DB systems:
 - ❑ 11k IOPS w/2 HBAs
 - ❑ Average 2-3k IOPS over 24 hours

Peak Loads

- ❑ Peak load 90-130K IOPs per path
- ❑ DB servers average 8% IO wait time
- ❑ Oracle Cache hit rates from 42%-85%
- ❑ Backups hit 8k IOPs per server
- ❑ SAN heavy from 10PM-4AM (backups)

- ❑ Data Encryption
- ❑ Disk-to-VTL backups take 36 hrs (4 hour window)
 - ❑ 90 TB per DC/night
 - ❑ Disk-to-disk backups in progress – no data yet
 - ❑ Snapshot backups with dedup in the SAN
- ❑ More Intelligent hot-spot handling
- ❑ 90% of our data is rarely accessed, can't predict the 10% - it's intermixed.

- ❑ Moving From A Massive Distributed Architecture To A Centralized-virtualized Architecture
 - ❑ Price Of Virtualization
 - ❑ Only As Fast As The Bus
 - ❑ Frame Failures Have A Larger Impact – Must Have HA
 - ❑ Bladecenter IO & Network Shared Switching
 - ❑ Interface Bus To Switch Line-card To Improve Speed
- ❑ Data Retention, Archive, and Log/Transaction consolidation

The Next 5 Years

- ❑ N+1 Redundancy Vs 2N Redundancy
- ❑ Storage Volumes Will Triple
- ❑ Transaction Volume Will Increase From 2M/Day To 5M/Day
- ❑ Transaction Complexity Will Double – Especially With The Need To Capture More Images At POS

□ Questions...



□ Have you never seen a Logfile?

□ Please fill out the survey 😊