Mission Critical Storage and Data Protection in the Financial Services Industry

FIS/CERTEGY

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Agenda

- 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®
  oCommercePointe®
  oPaymentDirector
  oFraud Shield
  oRapidReviewer
✓ 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)
Industry Drivers

- 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

Customers

FE Svrs

LB/SH

Web Svrs

App Svrs

DB Svrs

SANs

WWW

Frame

Switches

Brocade DCX Switches (STC)

EMC DMX-4

CX-4

EVA 8000

EVA 8000

48x

8X

8x

8X
System Demographics

- 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
System Demographics

- 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

DSS

Hyperion (SQR-Brio / BQY) / Direct SQL (Dimensional Data)

Rules / Analysis Engines

OLAP

Operational Data Stores (“Analyzed data that rules can process efficiently against”)

OLTP

Path 1

Path 2

Path 3

Path 4

Replication

Replication

Replication

Replication

ETL

ETL
Operational Observations

- 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”
Operational Observations

- 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)
IO Loads

- **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)
Current Challenges

- 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.
Current Challenges

- 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 ☺