



**ORACLE®**

**Extreme Performance with In-Memory Database  
Technology – Real Life Stories**

Presented at Oracle Open World

Joseph E. Conway  
Chief Technology Officer  
FedCentric Technologies, LLC

# FedCentric Technologies LLC Overview

- Veteran Owned Small Business
- Founded in 2005
- SGI and Oracle TimesTen Partner
  - 20 years experience working with SGI
  - 18 years experience working with Oracle
- Memory-Centric Database (MCDB): TimesTen + FedCentric IP for applications requiring large memory caches
- Core Competencies
  - Data Center Solutions
  - Memory Centric Computing
  - MCDB Consultancy, Design and Implementation



# at a Glance

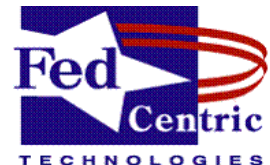
## 2009 Revenue Profile

- 1<sup>st</sup> Class Mail \$35.9 Billion
- Advertising Mail \$17.4 Billion
- Periodicals \$ 2 Billion

# Total: \$ 55.3 Billion

## USPS Postal Facts:

- 21<sup>st</sup>: Fortune 500 ranking if USPS were a private business
- 212 billion: number of mail pieces delivered each year
- 700 million: Mail Pieces that enter or exit USPS each day
- 500,000: number of carriers who deliver mail 6 days per week
- \$2 billion: amount paid in salary and every two weeks
- \$8 million: increase in fuel costs for each penny increase in price
- \$0: amount received from the US Government





# Total Revenue Protection (TRP) Program

# Total Revenue Protection (TRP)

- Front End Data Capture
  - OCR Scan
  - Sender
  - Destination
  - Mail Piece Dimensions
  - Postage Type
  - Postage Amount
  - Bar Code Applied
- Very Large (10+ TB) Oracle 10g Data Warehouse
  - 4 Billion Mail Piece Scans per 15 hour processing day
  - 2000 Mail Piece Scans per second (nominal)
  - 74,000 Mail Piece Scans per second (peak)
- Back End Business Intelligence Applications

# Why Real Time Fraud Detection?

## Save time... print your postage online.

Print exact postage for letters and packages using just your PC and printer.



### Print Postage Stamps

- Print any denomination
- Use for letters or packages
- Never run out of stamps again

[DETAILS](#)

### Stamps.com... Your own personal Post Office open 24 hours a day.

Developed in conjunction with the United States Postal Service,™ Stamps.com is a revolutionary software-based service that allows you to calculate and print official USPS postage right from your PC.

NO ADDITIONAL HARDWARE REQUIRED. Stamps.com even keeps track of all your postal spending using your client codes, and can even recommend optimal delivery methods, formats and more. Plus, Stamps.com gives you postage discounts you can't even get at the Post Office or with a postage meter.

# Total Revenue Protection Program

- Processing Requirements
  - Rate
    - 4 billion mail scans per day peak (74,000 per second)
  - Geographic Scope
    - Incoming mail from 275 Processing and Distribution Centers
    - Outgoing mail to 33,000 postal operated facilities
  - Objective
    - To find, track and reject mail pieces due to:
      - Duplicate postage
      - Short Pay
      - Ineligible Discounts



# Total Revenue Protection Program

- Processing Requirements

- Rate

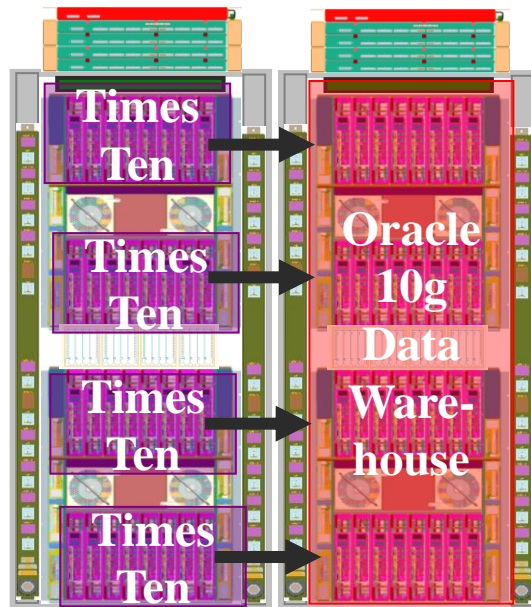
- 4 billion

- Geographical

- Object

**Sorting and  
Capture Time  
Exceeded  
Processing  
Window**

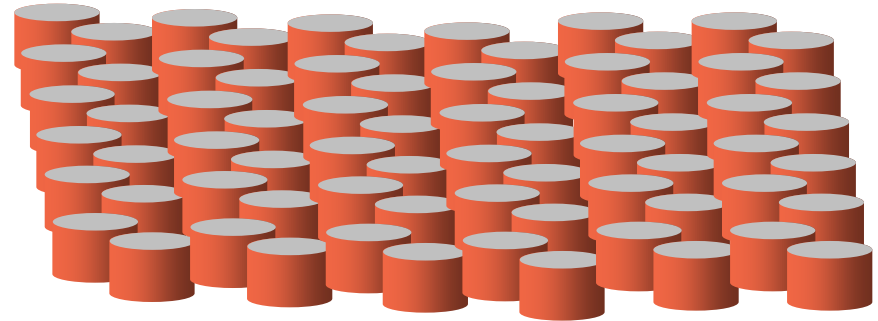
# Total Revenue Protection High Level Architecture



- SGI Altix 4700
- 2.25 TB RAM
- 72 Itanium2 cores
- 17 TB disk
- 1.6 TB TimesTen cache



USPS Mail Processing Equipment (MPE)  
Scanner & Sorter



- Data stream from Mailpiece scans ingested directly into TimesTen cache
- Realtime TRP algorithms executed against TimeTen
- Results retained in TimesTen and pushed back into Oracle warehouse via Cache Connect for long term storage and analysis

# TRP Results using MCDB & TimesTen

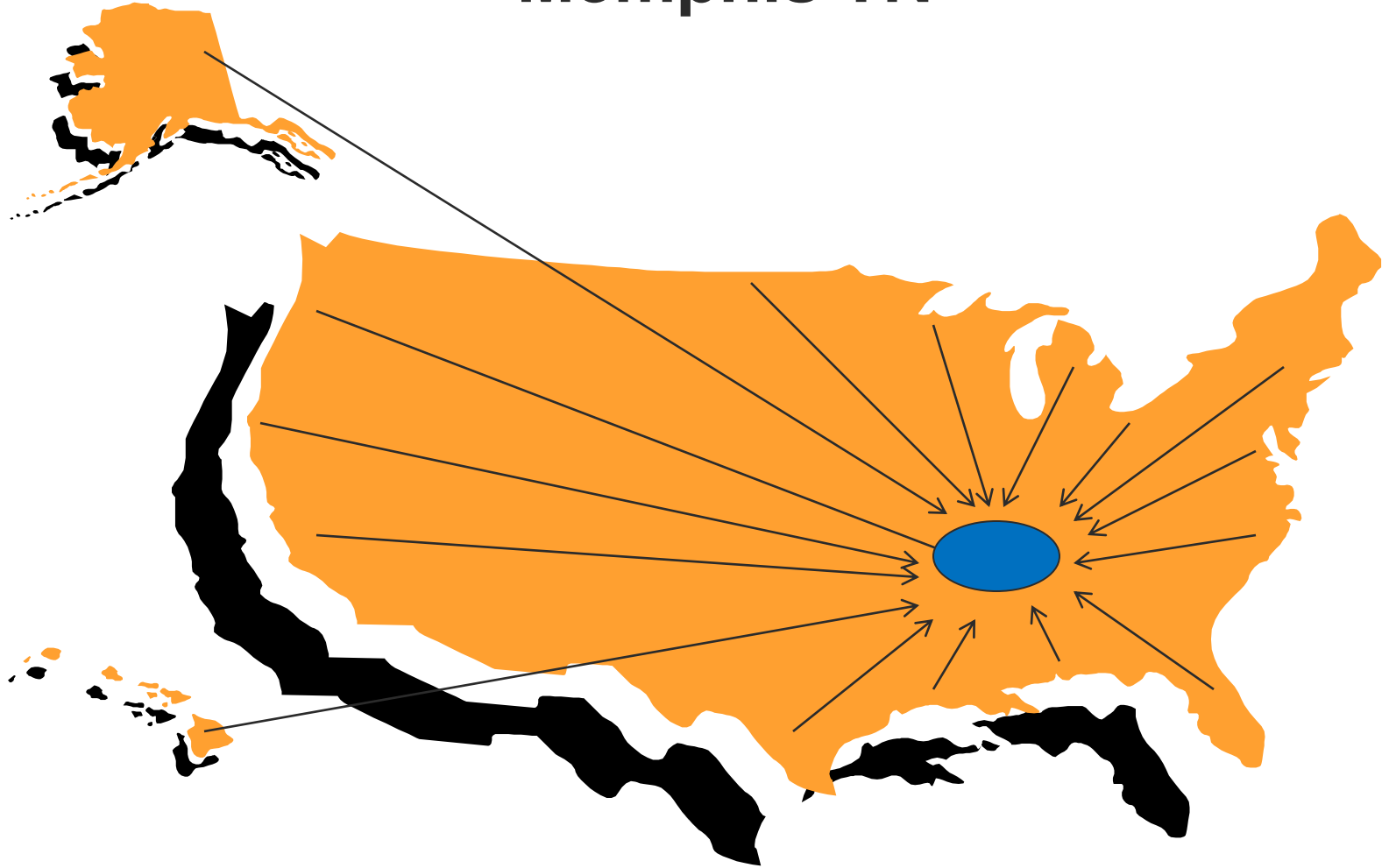
## Pre-MCDB

1. 509 row inserts per second (RIPS)
2. Direct path load option a partial solution (2000 RIPS)
3. 275 Million Transactions per 15 hour processing window created backlog during peak processing windows
4. Revenue Protection performed as a batch data warehouse process, run 3 – 12 hours after Mailpiece scan

## With MCDB Deployed

1. 190,222 RIPS (3 Threads)
2. 1,091,018 RIPS (18 Threads)
3. Processed 4 B Transactions in less than 6 hours
4. Revenue Protection is performed in real-time upon first scan

# USPS Installed TRP System in Memphis TN



# USPS Installed TFC System in Me

**Sorting and  
Capture  
Now Easily  
Fits Within the  
Processing  
Window**

