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

Enterprise Supercomputing

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
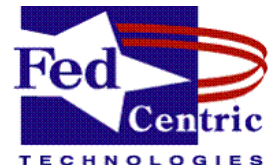
  - MCDB Consultancy, Design and Implementation

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UNITED STATES POSTAL SERVICE® **at a Glance**

2009 Revenue Profile

- 1st Class Mail $35.9   Billion
- Advertising Mail $17.4   Billion
- Periodicals $ 2   Billion

Total:$ 55.3 Billion

USPS Postal Facts:

- 21st: 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

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Total Revenue Protection (TRP) Program

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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

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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.

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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
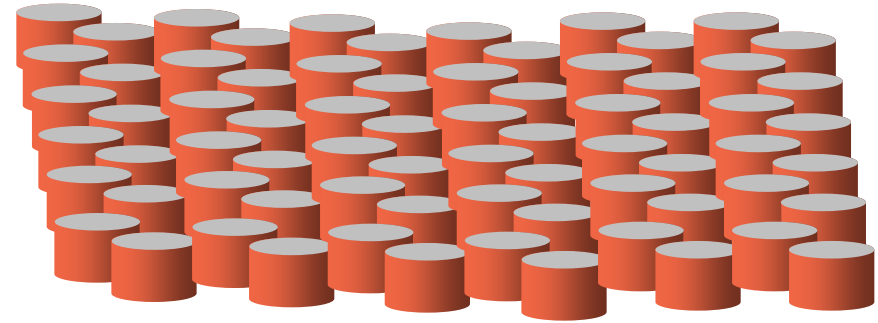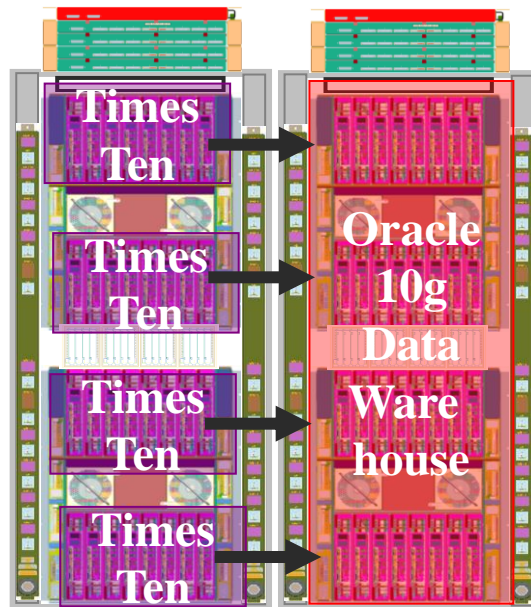
- Processing Requirement
  - Rate
    - 4 billion
  - Geographi
    - nters
  - Object

Sorting and Capture Time Exceeded Processing Window

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Total Revenue Protection High Level Architecture

Times Ten

Times Ten

Times Ten

Times Ten

Oracle 10g Data Ware house

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

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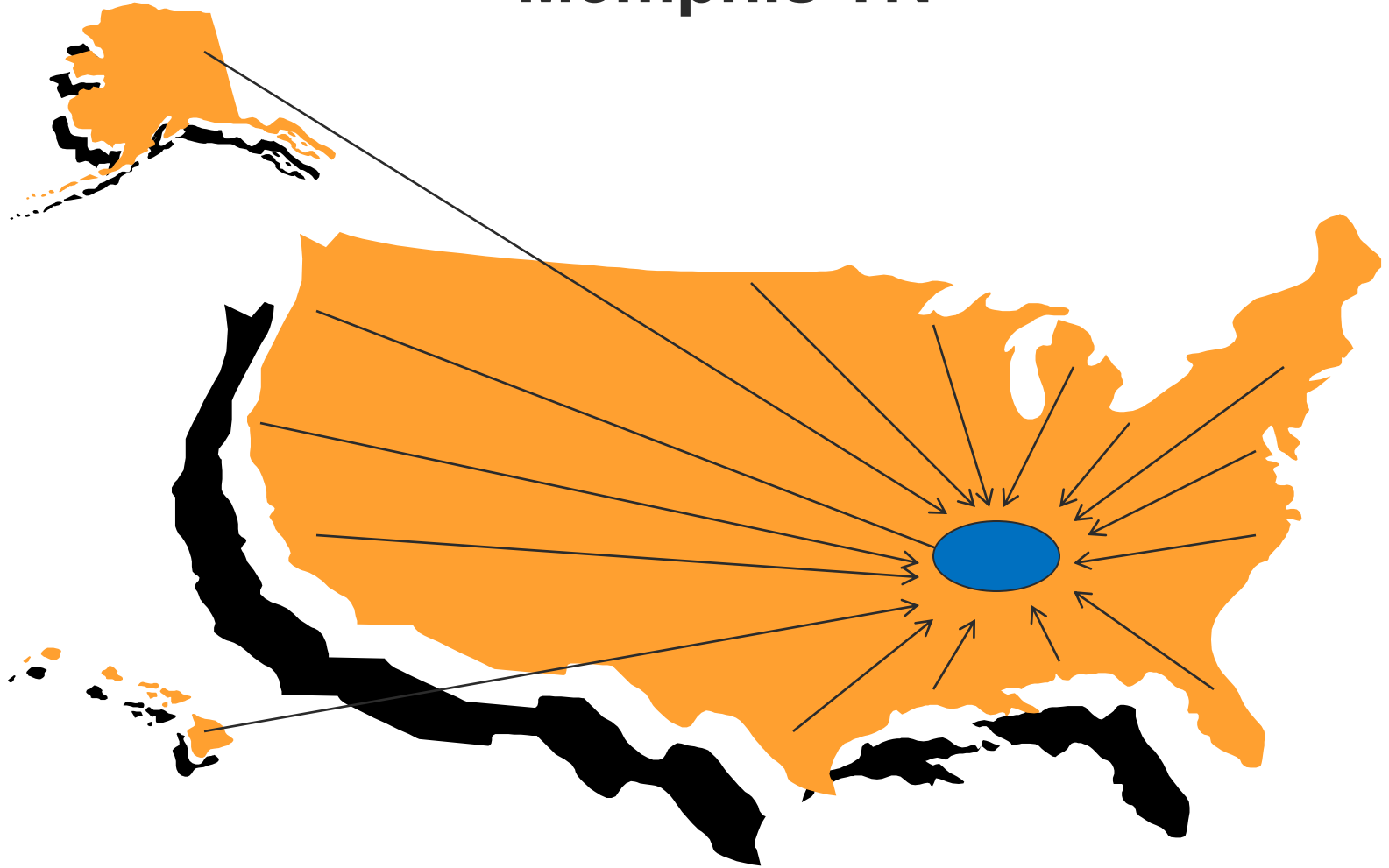
TRP Results using MCDB &TimesTen

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

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USPS Installed TRP System in Memphis TN

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USPS Installed TR System in Memphis

Sorting and Capture Now Easily Fits Within the Processing Window

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