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Coherence as a solution for eCommerce Capacity Absorption

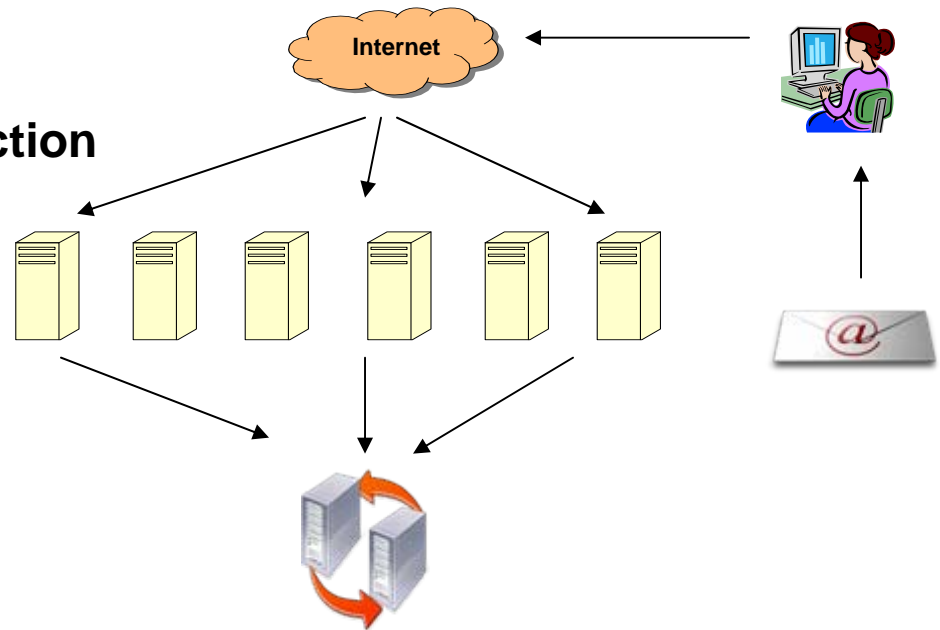
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A typical Scenario

- Commerce website growing at 25-30% annually
 - Capacity growth is typically addressed horizontally w/ more hardware
- Email file growing at 25-30% annually
 - Aggressive email strategy push by marketing (email frequency)
 - Business (Nirvana) get all emails out before 9AM.
 - Spreading out over the day is not popular w/ the business team
 - The pages the emails target are typically the same (PA, PD, LandPg, HP)
- Email Blasts w/ Sale Messages are “website killers” because
 - Response rate is much higher
 - A lot of browsing is generate as customer browse aggressively
 - The frenzy is concentrated to specific short window time periods
 - The same content is being browsed in duplicate across your application farm

Impact on Application Layer

- Page Views on a Typical Sale Day (of total page views)
 - 6% Homepage
 - 6% Sale Landing Page
 - 40% Regular Product Array
 - 16% Sale Product Array
 - 26% Product Detail
 - 2% Checkout
 - 4% Misc Other Site Section



Impact on the Application Layer

- **Problem**

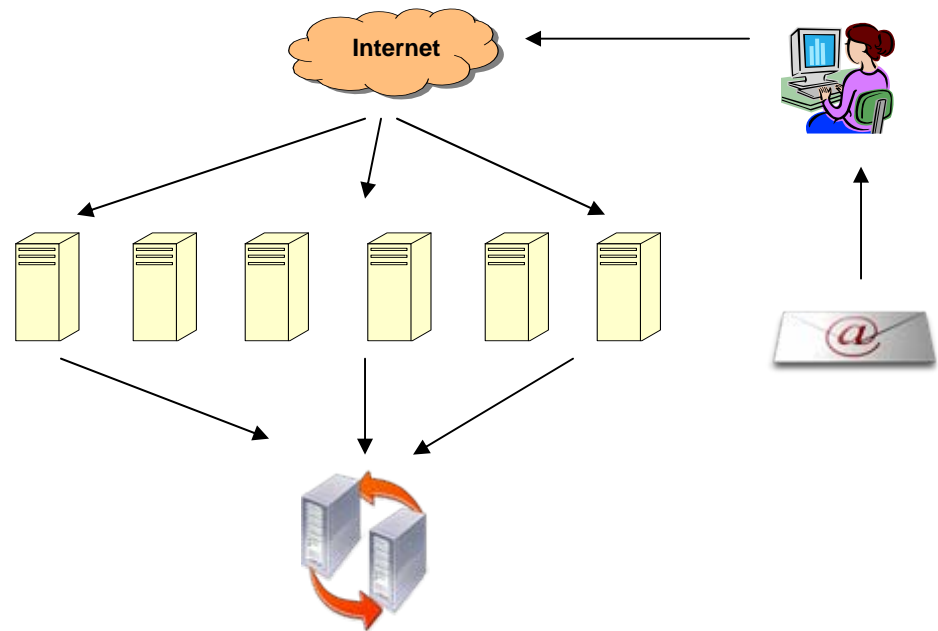
- Each Server is redundantly caching the same content in cache memory
- For a 6 app server farm w/ 2-4 gigs of ram you have duplicate information
- The Memory is constantly being trashed as you content is viewed
- The server CPU usage & resources start to max out
- Your only solution is to add additional instances (aka servers)

- **Solution**

- Focus on Product Array ~56% of page views
- How can the same content be shared across the application layer
- Coherence provides a unique opportunity to address this particular problem
- The solution is agnostic to your application solution (Java is Java)

Solution

- Use Coherence Application Caching to only cache a single PA or PD once
- Use Coherence to Cluster the applications to share/view the same cache
- The Memory usage drops dramatically (nearly 50%)
- The same farm of servers affectively can now absorb 2 times the load
- No additional hardware is required



Lessons learned

- Attacking Capacity issues needs to be a three pronged approach
 - Hardware
 - Efficient Code
 - Application Optimization using tools like (Coherence) for cache distribution
- The Win
 - Cost is the primary driver
 - Long term adding hardware (only) is a losing cause
 - Other pages that can use the caching technology can be targeted

Oracle Coherence in:

- Retail
- Capital Markets
- Telecommunications
- Logistics
- Travel and Entertainment



Large Clothing Company

Profile

- Started as catalog business
- 186 stores, 57 outlets
- \$1.25 Billion in revenue

Scenario

- On-line catalog application
- Retail front for on-line store

Problem

- Slow performance for their on-line store during peak business hours and holiday season.
- Slow user experience causing poor customer service and loss in revenues.
- Tried fixing it with more hardware and databases; under utilized in off-peak times.

Solution

- Coherence data grid solution helped by loading the critical catalog data in memory for faster access and less load on databases
- Predictably and dynamically scale out their environment between off-peak periods and peak periods to maintain consistent high performance
- Reduced cost of operation and improved customer satisfaction
- Higher revenues and control on costs.

Clothing retailer

Profile

- One of the largest clothing retailer
- 3100 Stores
- FY2006 revenue \$16 Billion

Scenario

- Online retail store
- High availability of the web site , shopping cart

Problem

- Many times on-line store shopping cart would lose connections to back-end servers, causing users to re-select the items and add to shopping cart, causing loss of sales and low customer satisfaction
- Slow on-line store performance

Solution

- Coherence data grid and Coherence Web solution provides better caching for the data and no loss connections to the back-end systems
- Q1 2008, customers can shop between different brands without having to check out between sites.

Oracle Coherence in: Capital Markets



Discount Insurance company

Profile

- 4th largest private auto insurance company
- 3rd largest P&C insurer in US
- \$22 Billion in assets

Scenario

- One of the largest online insurance providers in the US with self-service website for customers
- Scaled out application tier built to handle high volume and high growth customer traffic

Problem

- Large Database was heavily loaded by persistence of enormous user profiles (>1MB each) for thousands of concurrent users
- Challenge expanding environment for spikes in usage or additional services offered
- Maintaining desired service levels was becoming a serious problem

Solution

- Oracle Coherence allows all customer data to be managed in-memory for consistent high performance; meeting SLAs
- Updates to profiles are actively held in the Data Grid and only persisted to the database once, less load on DB / Mainframe

Over 10X increase in application tier capacity while reducing load on back office resources by over 50%

High-profile bank

Profile

- 41st on Fortune 500 list
- About 6000 locations
- \$540 Billion in assets

Scenario

- Enterprise Service Bus for in-branch client relationship management application had slow performance

Problem

- The performance of their in-branch applications is critical since most of the time a customer is either waiting across the desk of the financial consultant or on the phone.
- The data access latency is the main variable in the performance of this system and is largely dictated by the availability of various legacy data sources which are hosted in a couple of datacenters.

Solution

- Harmonize the access to their data sources thru the deployment of web services in an SOA
- Offload their backend system by processing the majority of their operations in the Coherence data grid
- Consistently meet SLAs resulting in improved employee and customer satisfaction and reduced customer and employee turnover

Fast growing Investment bank

Profile

- 46th on Fortune 500 list
- About 3400 locations
- \$754 Billion in assets

Scenario

- Investment Bank introducing “Service Oriented Infrastructure (SOI)”
- Requires absolute data availability for complex Grid Computations

Problem

- Existing Compute Grid infrastructure suffering from data latency and throughput problems
- Complex calculations so lengthy as to be outdated

Solution

- Data Grid overlay on Compute Grid
- Enable risk calculations to fully utilized the grid hardware by having real time access to in-memory data as well as parallelization .
- Reduced critical risk computation from **several days** to under **1 hour**

Large European Bank

Profile

- Leading global investment bank
- About \$45 Billion in revenues

Scenario

- Financial trading systems

Problem

- Trading systems cannot handle the volume of transactions in spite of using expensive SMP servers and competitive grid product.
- Slow trading platform causing delay in transactions and loss of revenues.

Solution

- Coherence data grid solution enabled 500 orders per second (twice the volume from previous solution)
- System could handle in excess of 1000 TPS; giving them confidence for future growth on the same platform to several times that simply by expanding the grid with more commodity servers
- Reduced cost of operation by moving to low cost commodity hardware - \$500K
- Grow the top line business (\$1 trillion a day) by simply adding more low cost hardware and Coherence Grid.

Oracle Coherence in: Telecommunications



Global ISP

Profile

- Leading global ISP
- 114 million unique visitors per month
- 52 billion pages viewed per qtr.
- 1.5 billion instant messages per day

Scenario

- ISP moving their email Portal from a subscription to advertising-based model.
- Need to focus more on value-add data and services through this portal
- Legacy Portal already supporting 90M Accounts

Problem

- No effective way to scale their apps without writing it themselves.
- Desire to standardize in J2EE and move away from home grown C/C++ apps.

Solution

- Coherence Grid Edition + Real time client
- Most effective and reliable way to scale their new Java Apps
- Easy answer to reduce time to market
- Cost effective vs. developing their own caching in house.
- Coherence reliability, performance, and scalability are a perfect fit for their high-end Production Environment demands

Oracle Coherence in: Logistics



Logistics Global Leader

Profile

- One of the top logistics company
- About \$36 Billion per year revenues
- 270,000 employees worldwide

Scenario

- On-line package tracking system

Problem

- Huge volumes of tracking activities as business grew
- Slow system performance; customer satisfaction down 24%
- Seasonal peaks required more hardware deployment
- Cost of operations going up

Solution

- Coherence data grid solution provided instant reply on tracking queries
- Reduction in phone based staff; lowering the cost of operations.
- Page refresh time reduced by 68%
- Predictably scale out their environment between off-peak periods and peak periods
- Reduced cost of operations; higher gross margins.

Oracle Coherence in: Travel and Entertainment



Profile

- Third largest US airline company
- About \$19 Billion per year revenues
- 55,000 employees worldwide

Scenario

- On-line reservation system

Problem

- Huge volumes of on-line bookings
- Slow system performance; customer satisfaction down
- Need to offer better service to their on-line bookers
- Cost of operations going up

Solution

- Coherence data grid solution provided instant result on booking queries
- Reduction in phone based staff; lowering the cost of operations.
- Richer on-line booking experience
- Reduced cost of operations; higher gross margins.

Online Travel Services

Profile

- One of the large online travel services provider
- Parent company is IAC Interactive

Scenario

- Online travel reservation system

Problem

- Existing infrastructure performance is slow
- Customers move to competitor sites for travel needs
- Cost of operations are high since each query to the partner sites cost money.

Solution

- Coherence data grid solution provides better caching solutions, letting Hotwire.com keep more data in cache and preventing from individual queries to the partner sites. Significantly reduces cost.
- Faster site performance means happy customers and higher profitability.