



## IBM Informix® Dynamic Server:

*The Low-Cost Solution for Extreme  
Availability and Scalability*

*Andreas Weininger*

*[Andreas.Weininger@de.ibm.com](mailto:Andreas.Weininger@de.ibm.com)*



## Important Disclaimer

THE INFORMATION CONTAINED IN THIS PRESENTATION IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY.

WHILE EFFORTS WERE MADE TO VERIFY THE COMPLETENESS AND ACCURACY OF THE INFORMATION CONTAINED IN THIS PRESENTATION, IT IS PROVIDED “AS IS”, WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED.

IN ADDITION, THIS INFORMATION IS BASED ON IBM’S CURRENT PRODUCT PLANS AND STRATEGY, WHICH ARE SUBJECT TO CHANGE BY IBM WITHOUT NOTICE.

IBM SHALL NOT BE RESPONSIBLE FOR ANY DAMAGES ARISING OUT OF THE USE OF, OR OTHERWISE RELATED TO, THIS PRESENTATION OR ANY OTHER DOCUMENTATION.

NOTHING CONTAINED IN THIS PRESENTATION IS INTENDED TO, OR SHALL HAVE THE EFFECT OF:

- CREATING ANY WARRANTY OR REPRESENTATION FROM IBM (OR ITS AFFILIATES OR ITS OR THEIR SUPPLIERS AND/OR LICENSORS); OR
- ALTERING THE TERMS AND CONDITIONS OF THE APPLICABLE LICENSE AGREEMENT GOVERNING THE USE OF IBM SOFTWARE.

The information on the new product is intended to outline our general product direction and it should not be relied on in making a purchasing decision. The information on the new product is for informational purposes only and may not be incorporated into any contract. The information on the new product is not a commitment, promise, or legal obligation to deliver any material, code or functionality. The development, release, and timing of any features or functionality described for our products remains at our sole discretion.

# Agenda

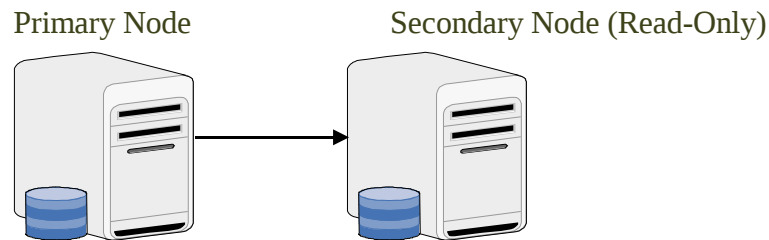
- **Pre-11.5 Scenario**
- **11.5 Technology**
- **Business Value & Benefits**
- **Implementations**
- **Panther details**
- **Summary**

## Pre-11.5 Scenario

### ■ HDR

- Replication to a single secondary node
- Secondary is read-only
- Secondary promoted to Primary in case of a failure in the primary

#### Replication to Single Secondary Node



# Agenda

- **Pre-11.5 Scenario**
- **11.5 Technology**
- **Business Value & Benefits**
- **Implementations**
- **Panther details**
- **Summary**

## 11.5 Continuous Availability and Scalability: Some Usage Scenarios

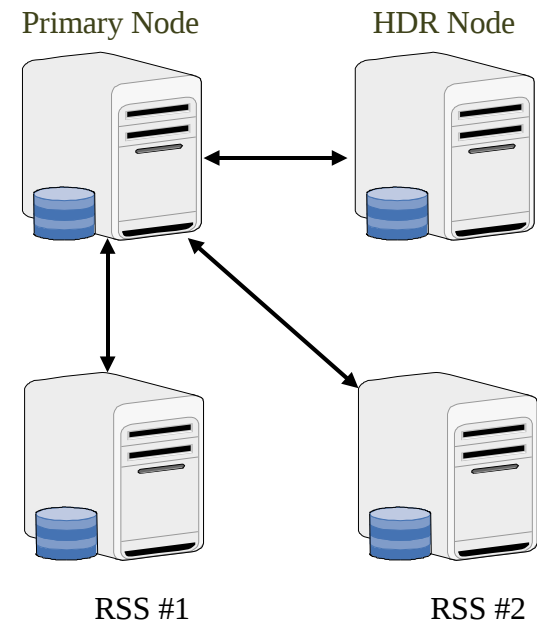


- Need additional nodes for reports
- Scale out for workload distribution without geographic limits
- Add Nodes without duplicating data
- Need guaranteed availability in event of an unforeseen disaster
- Automatic Failover without delay
- Data available on secondary nodes with lowest possible latency via Shared Disk
- Add or remove capacity as demand changes
- Protect against accidental data corruption
- Isolate critical workload on its own node

## Remote Standalone Secondary (RSS)

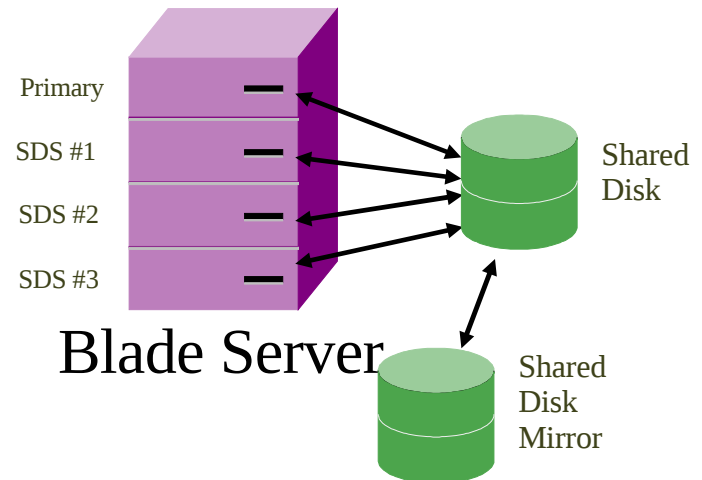
- **Can have 0 to N RSS nodes (Multiple Secondary Servers)**
- **Works with HDR, ER, SDS**
- **Uses:**
  - Application Balancing (local or distributed)
  - Additional backup in case primary and secondary fail
  - Availability
  - Scale Out
- **Similarities with HDR node:**
  - Receive logs from Primary
  - Has its own set of disks to manage
  - RSS has minimal impact on primary performance
- **Can be dynamically promoted to HDR node**
- **Supports long distances better than HDR**
  - Kansas to Poland

### Replication to Multiple Remote Secondary Nodes



# Shared Disk Secondary (SDS)

- **SDS nodes share disks with primary**
  - Can have 0 to N SDS nodes
- **Works with HDR, ER, SDS**
- **Uses:**
  - Adjust capacity (scale) dynamically
- **Features**
  - Specialized hardware NOT REQUIRED
  - Does not require a global lock manager
  - Simple to setup
- **Similarities with HDR secondary node:**
  - The primary role can failover to any SDS node



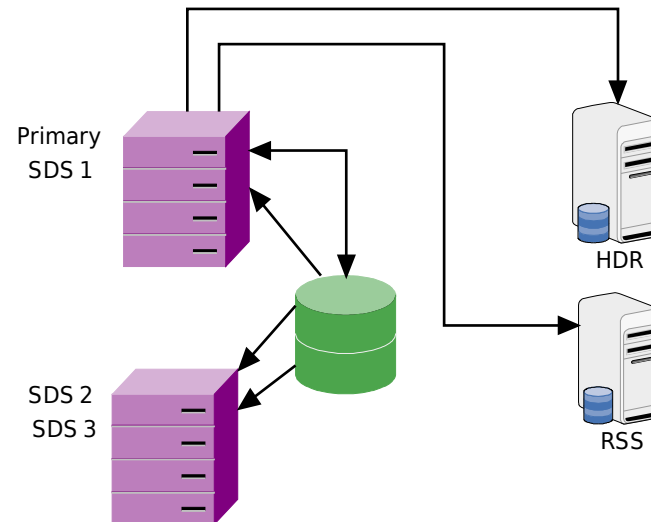


# Cluster Connection Choices for Workload Balancing and High Availability

## Automatic Load Balancing and Fail Over

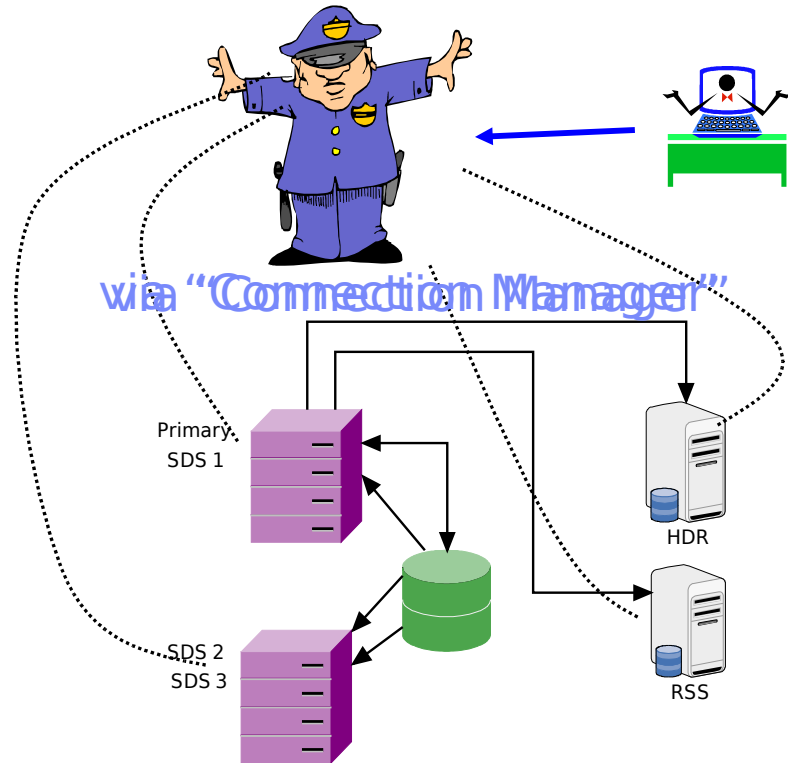
How do applications determine which node to connect to in order to perform an operation?

How is fail over managed?



# Connection Manager Provides Transparency to End Users

- Maintains knowledge of all nodes within the cluster
- Records adding/removal of nodes
- Monitors type of node (Primary, Secondary, RSS)
- Monitors workload of nodes
- Dynamic workload balancing
  - Transparently routes the client application to target node based on Service Level Agreement
  - Dynamically change target nodes within a Service Level Agreement
- Can have multiple connection managers as a logical group to avoid a single point of failure
- Automatically connects to another target node in event of failure

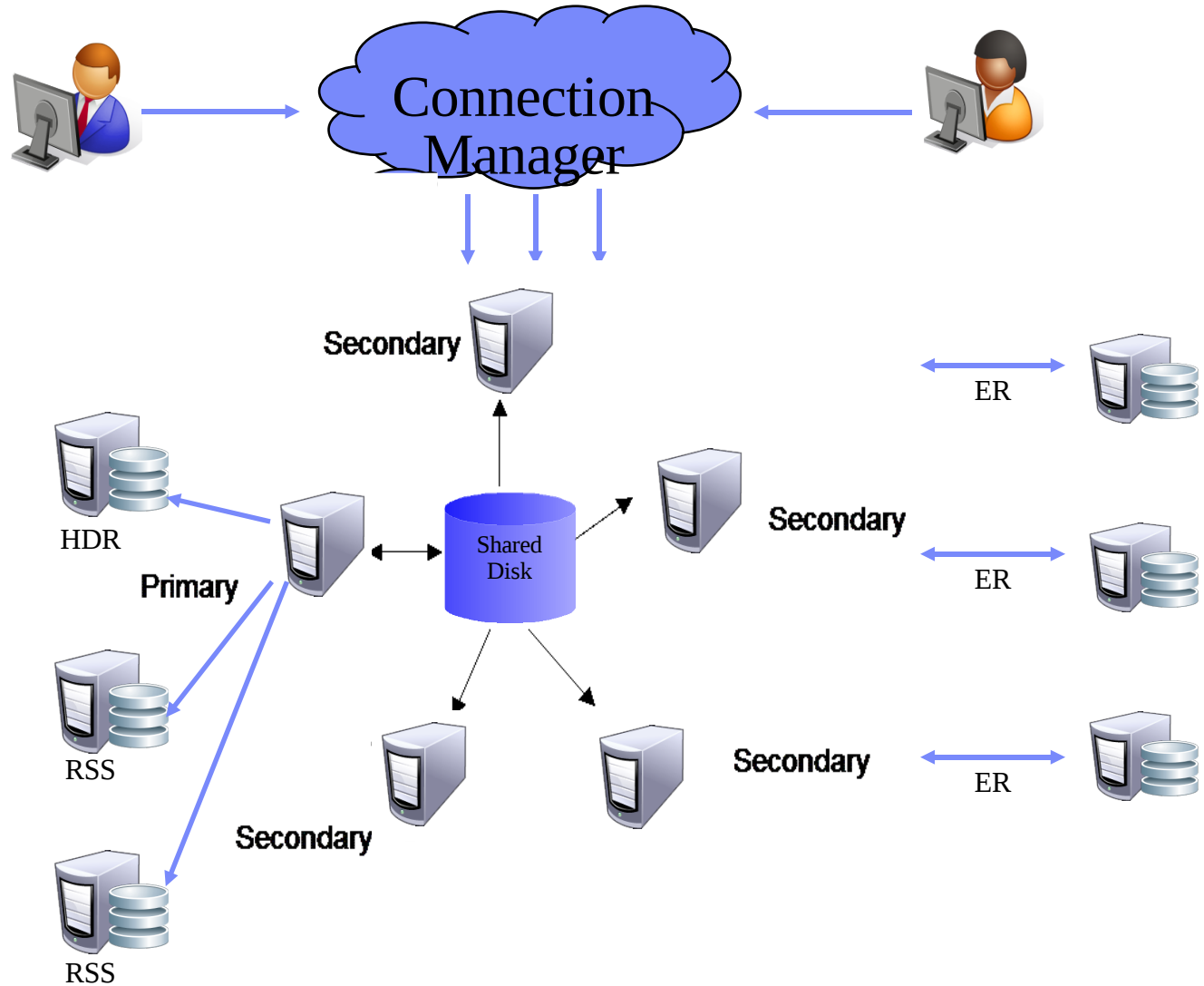


# Active Data Clusters



## Clustering Strengths

- Critical data always available
- Easy to implement – no application changes
- Scale Up or Scale Out across commodity hardware
- Add capacity on demand
- Change dynamically
- All Nodes can be Active-Active



# Agenda

- **Pre-11.5 Scenario**
- **11.5 Technology**
- **Business Value & Benefits**
- **Implementations**
- **Panther details**
- **Summary**

# IBM Informix Dynamic Server (IDS)

## Extreme Availability And Scalability

Always On

- 24x7 Availability
- Flexible Business Continuity
- Global Deployment

Seamless Scalability

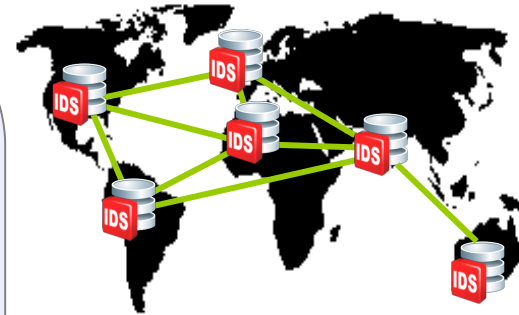
- Robust Scaling
- Active-Active
- Application Transparency

Cost Effective

- Low Cost Commodity Hardware
- Small Footprint
- Near Hands Free

Mixed Workload

- Transactions and Analytics
- Choice of Platforms
- Workload Distribution



# Optimize your Availability

“Always On” Availability with Informix

*How do I minimize planned/unplanned outages?*

- Business Continuity Demands:
  - 24 x 7 availability  
Downtime = Lost Revenue
  - Customizable disaster recovery plan  
Multiple global backup locations
  - Worldwide application availability  
Global marketplace

How much does 1 hour of downtime cost your business?		
Time Is Money	Application Segment	Average Cost of Downtime/Hour
	Shipping - Distribution	\$28,000 per hour
	Tele-Ticket Sales	\$69,000 per hour
	Airline Reservations	\$89,000 per hour
	Home Shopping	\$113,000 per hour
	Pay Per View - Television	\$150,000 per hour
	Credit Card Sales	\$2,650,000 per hour
	Financial Market	\$6,450,000 per hour

Source: Giga Group

\$6,450,000/hour is  
\$107,500/minute!

# Optimize your Availability

*“Always On” Availability with Informix*

## Extreme availability with IDS: *Manage Planned Outages*

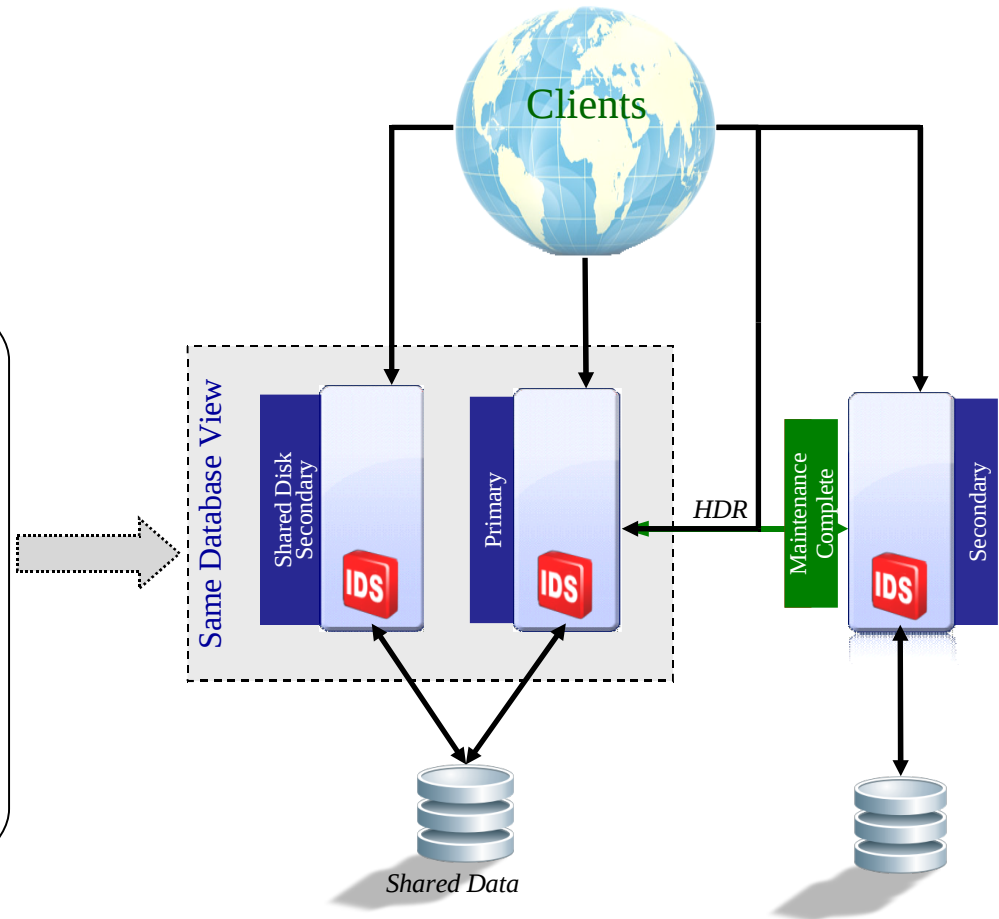
- Rolling Upgrade
- Transparent Maintenance
- Online reconfiguration

### Stealth Maintenance and Upgrades

#### Running System

- Secondary needs upgrade
- Optionally add an Shared Disk Secondary Server (SDS) to ensure consistent over all system capacity

*Applications always available*



# Optimize your Availability

“Always On” Availability with Informix

## Extreme availability with IDS: *Anticipate Unplanned Outage*

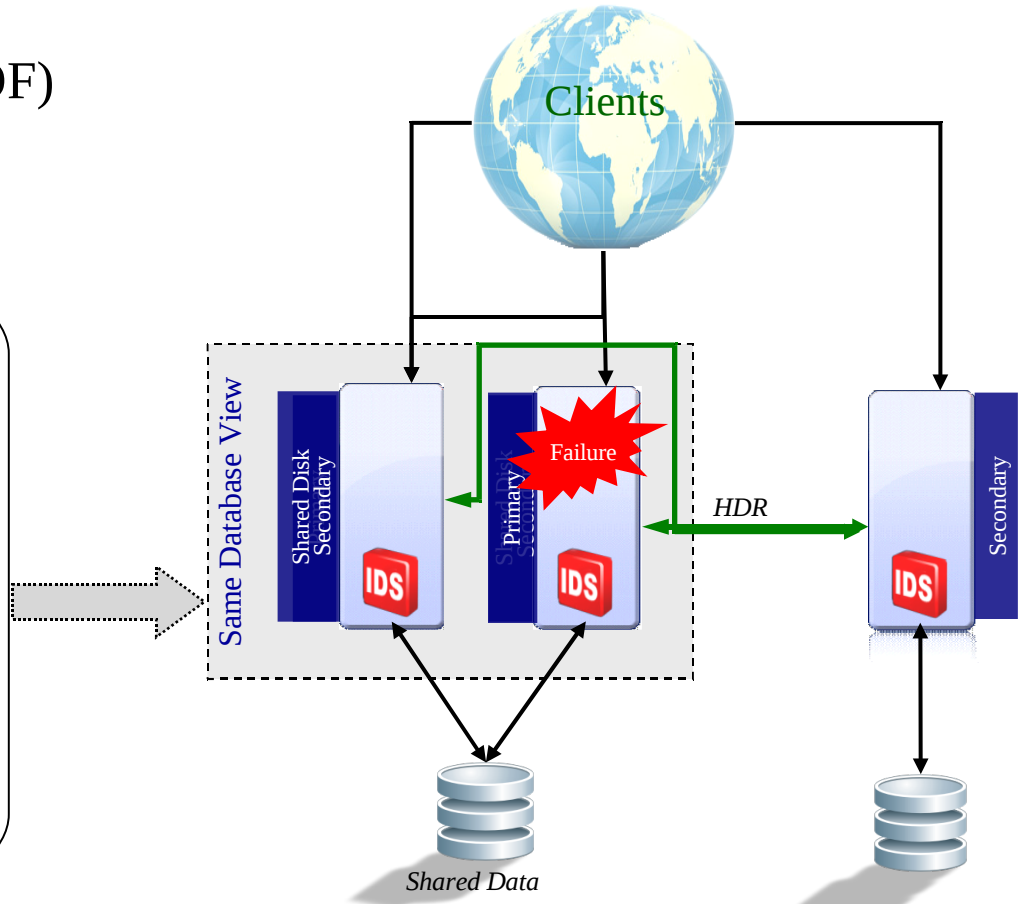
- Industry proven reliability
- No Single Point Of Failure (SPOF)
- Near Instantaneous Recovery

Fast Recovery

*System Repaired*

- Repaired system becomes Shared Disk Secondary
- Clients automatically re-routed for load balancing (Optionally)
- System back to original performance state before failure

**Applications Always Available**



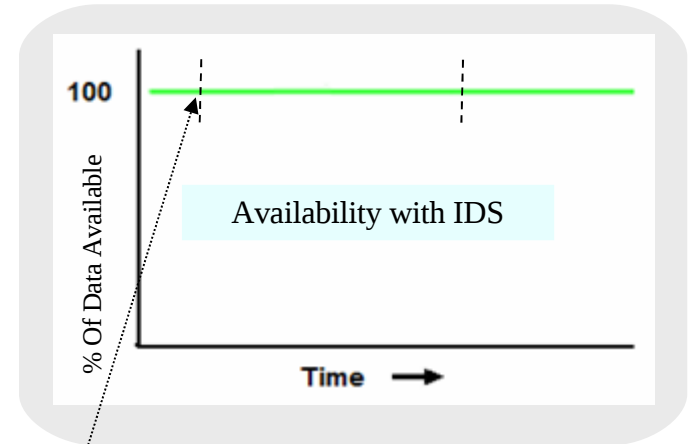


# Optimize your Availability

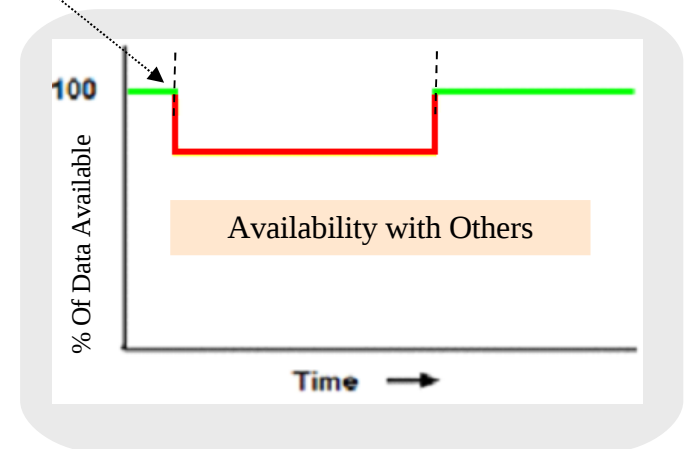
*“Always On” Availability with Informix*

## *IDS Availability Second To None*

- Software Only Solution
  - No special hardware required
- High Availability Built Into IDS
  - No external software components
- Maximum Availability with minimum investment
- Resilient to multi-node failures



Instance Failure



# IBM Informix Dynamic Server (IDS)

## Extreme Availability And Scalability

Always On

- 24x7 Availability
- Flexible Business Continuity
- Global Deployment

Seamless Scalability

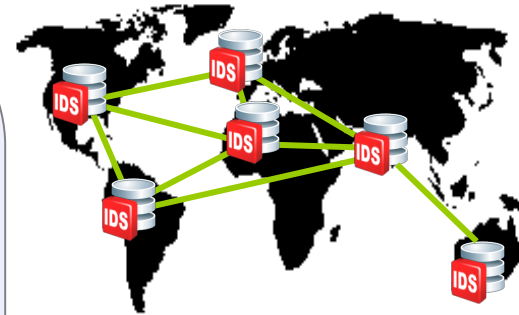
- Robust Scaling
- Active-Active
- Application Transparency

Cost Effective

- Low Cost Commodity Hardware
- Small Footprint
- Near Hands Free

Mixed Workload

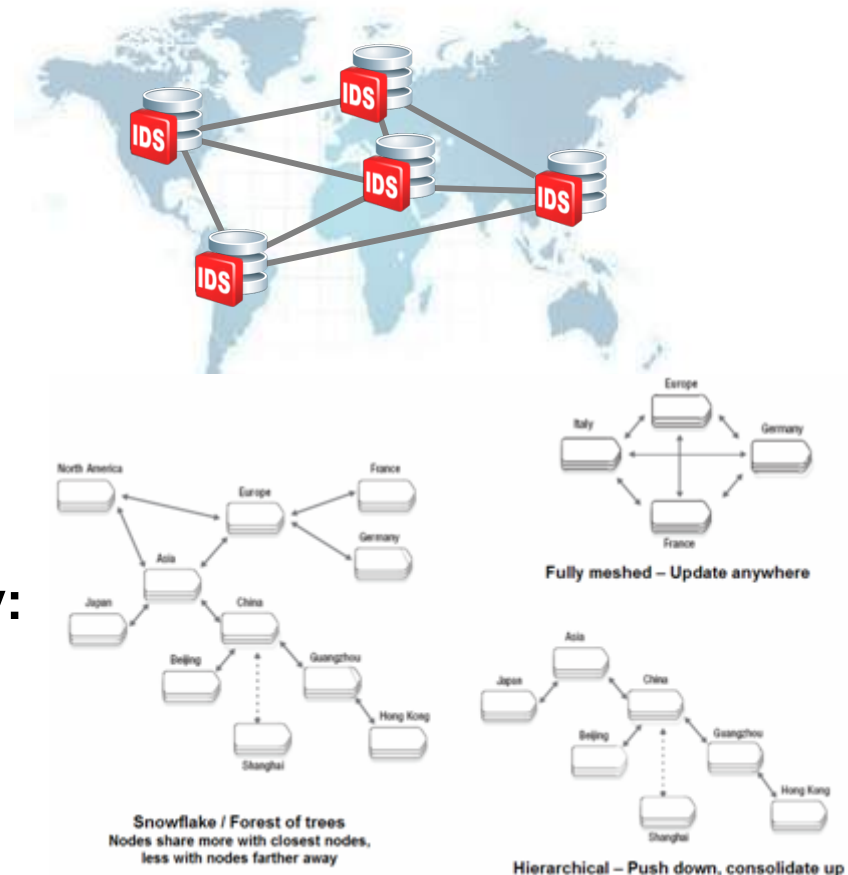
- Transactions and Analytics
- Choice of Platforms
- Workload Distribution



# Seamless Scalability

## *How do I Add Processing Power on Demand?*

- **To scale out locally for:**
  - Business growth
  - Seasonal business peaks
  - End of month or year processing
  
- **To scale out globally for:**
  - Distributed business units
  - Moving the data and processing closer to the users
  - A global business view
  
- **To build a low cost design for today:**
  - Flexible for future requirements
  - Scale out or scale up in any combination



# Seamless Scalability

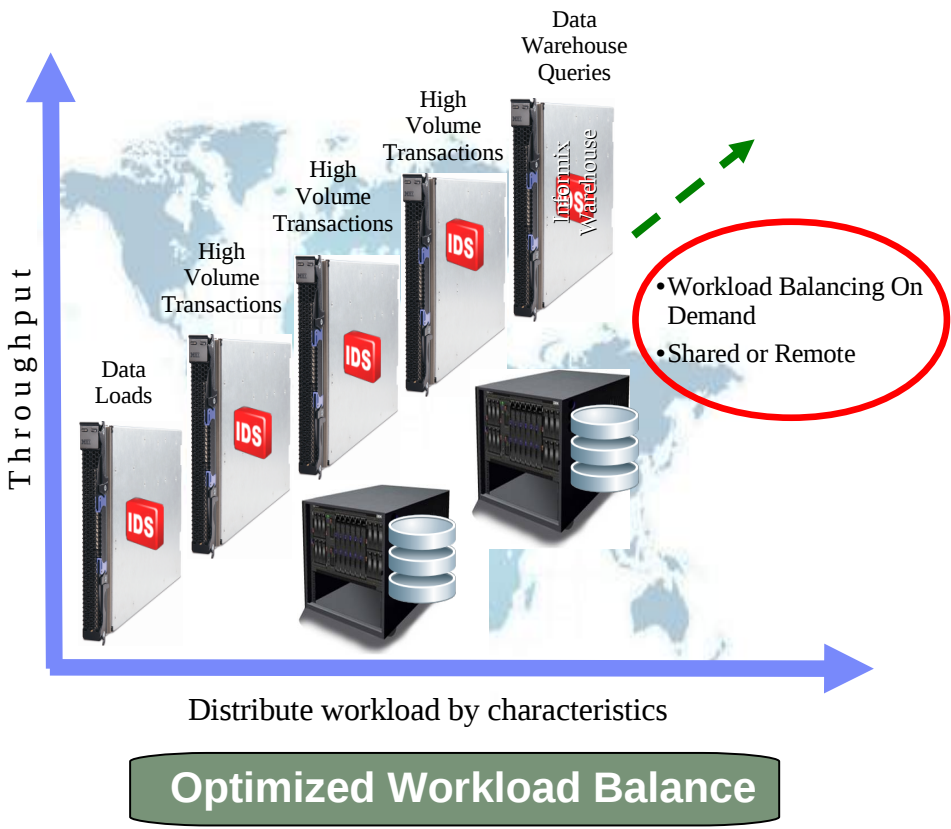
## *The Informix Approach:*

- **Active-Active shared disk cluster**
- **Policy-based workload management**
  - Connection routed to best-fit node
  - Dynamic management
- **Scale out by adding nodes**
  - Transparent to applications
  - No interruption of service
  - Bring new nodes online in seconds
- **Built-in peer-to-peer replication**
  - Update anywhere
  - Complete or partial replication
    - At table and row level
- **Scales to 1000's of sites**



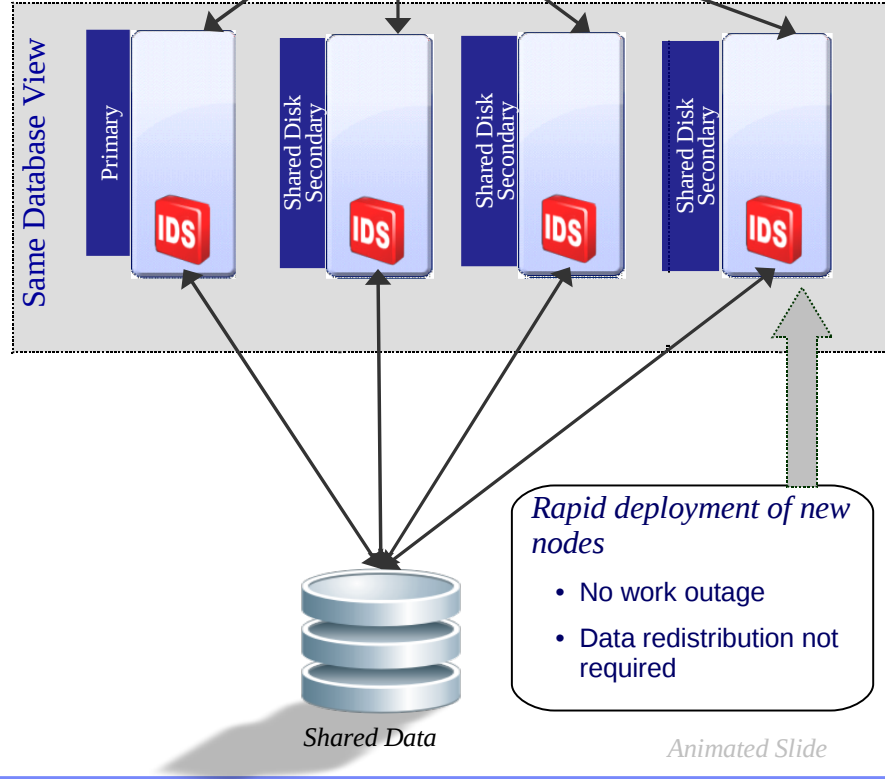
# Seamless Scalability

*Fast and Simple with IDS*



*Scaling*

- Good linear scaling with out any application change
- Same database view for all instances
- Transparent and flexible workload routing through connection manager



*Animated Slide*

## Informix Scalability

*No Hassles!*

- **No specialized hardware**
- **No down time to add nodes**
- **No processing interruption**
- **No complex load re-balancing**
- **No special administration required**



# IBM Informix Dynamic Server (IDS)

## Extreme Availability And Scalability

Always On

- 24x7 Availability
- Flexible Business Continuity
- Global Deployment

Seamless Scalability

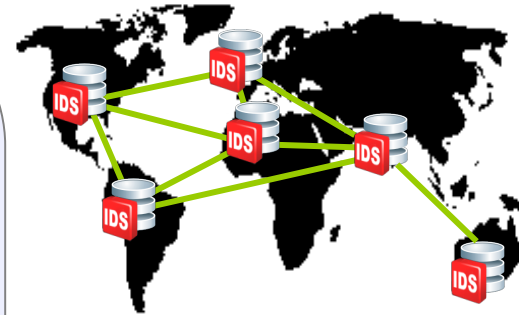
- Robust Scaling
- Active-Active
- Application Transparency

Cost Effective

- Low Cost Commodity Hardware
- Small Footprint
- Near Hands Free

Mixed Workload

- Transactions and Analytics
- Choice of Platforms
- Workload Distribution



# Informix: The Cost Effective Database

*Achieving Cost Effective High Availability and Scalability*

- **How can I avoid a complex environment?**
- **What are the Costs of:**
  - Equipment
  - Installation
  - Optimizing
  - Monitoring
- **How many resources will be spent managing the environment?**
- **Will I lose focus on my business?**





# Informix Cost Effectiveness

*Focus on Your Business, Not Your Systems*

- **No specialized hardware**
  - Low Cost Commodity Hardware
- **Installing a cluster node: As easy as 1-2-3!**
  1. One step IDS installation/configuration
  2. Associate with the primary node = 1 simple command
  3. Start IDS on the new node
- **Worry free transparent maintenance**
  - Seamless Upgrade
  - Online reconfiguration
- **Workload automatically routed**
- **Near hands free administration**
- **Minimal monitoring required**



*German Bank – Chose IDS Continuous Availability because of ease of use while maintaining cluster and low implementation costs. They didn't need any additional third party software and experienced no unplanned downtime during migration. Failed twice to move to Oracle RAC.*

# IBM Informix Dynamic Server (IDS)

## Extreme Availability And Scalability

Always On

- 24x7 Availability
- Flexible Business Continuity
- Global Deployment

Seamless Scalability

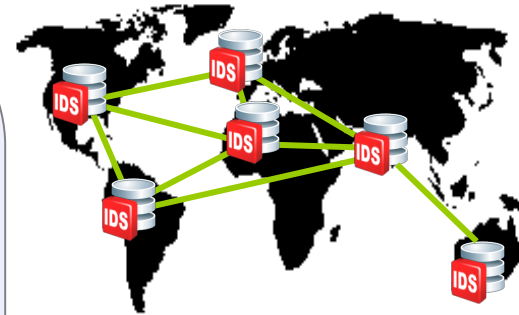
- Robust Scaling
- Active-Active
- Application Transparency

Cost Effective

- Low Cost Commodity Hardware
- Small Footprint
- Near Hands Free

Mixed Workload

- Transactions and Analytics
- Choice of Platforms
- Workload Distribution

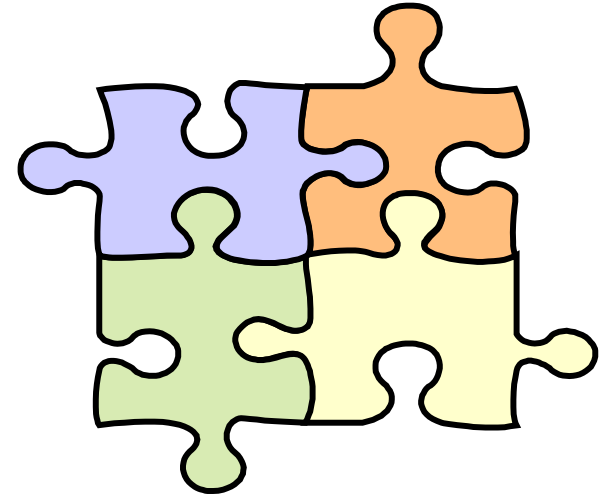


# Informix: Mixed Workloads

*How do I Run in a Mixed Workload Environment?*

## ■ Data processing examples:

- OLTP systems
- Web applications
- Reporting
- Business data analysis
- Data loading
- And more. . .



## ■ Problem:

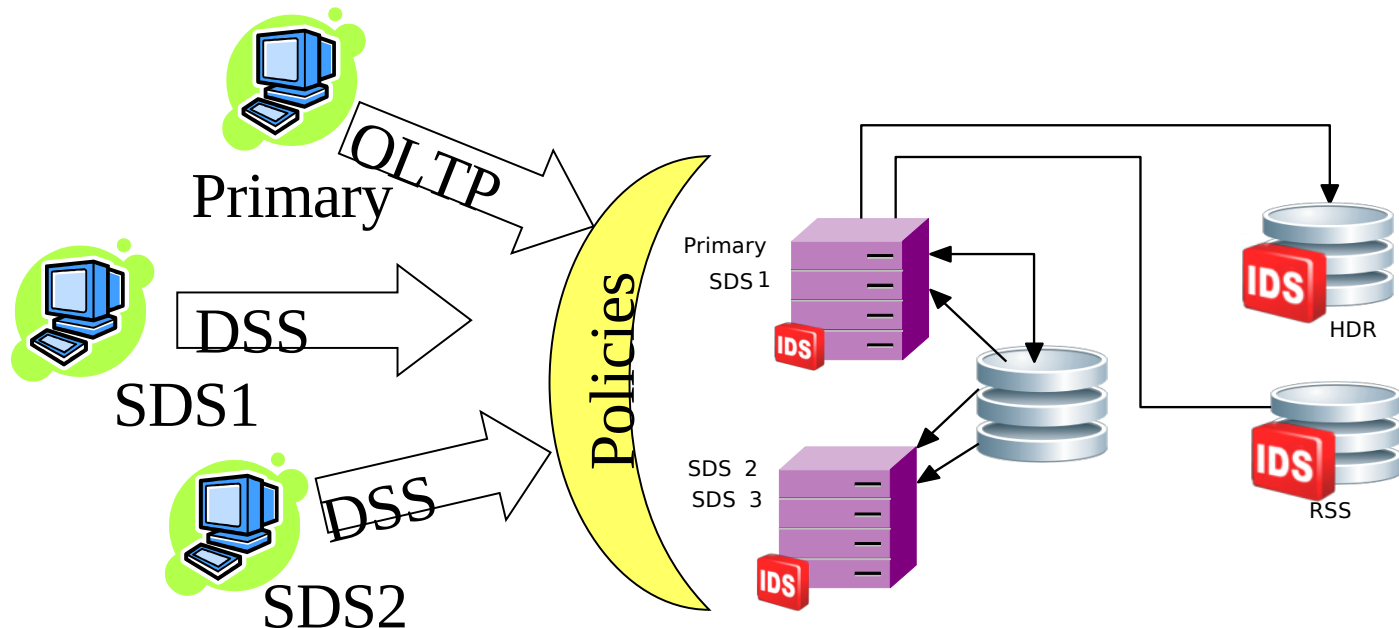
*My business processes bottleneck when they compete for the same resources*

- Results in increased disk access and memory contention

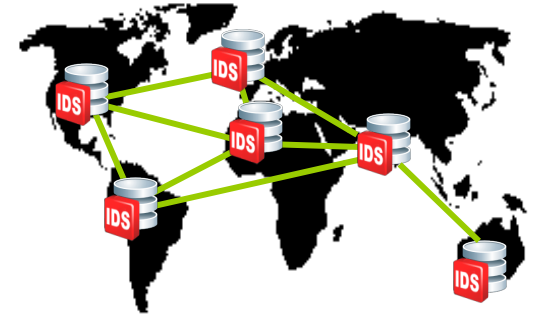
# Informix: Mixed Workloads

## Mixed Workload Solution

- **Policy-based connection manager**
  - Service Level Agreements (SLAs), processing types
  - Optimizes nodes memory utilization
- **Partition workload across groups of nodes**
- **Multiple nodes per policy**
- **Connection routed to best-fit node**
- **Policies definitions can be dynamically modified**



# IBM Informix Dynamic Server (IDS)



## *Extreme Availability And Scalability*

Always On

Seamless Scalability

Cost Effective

Mixed Workload



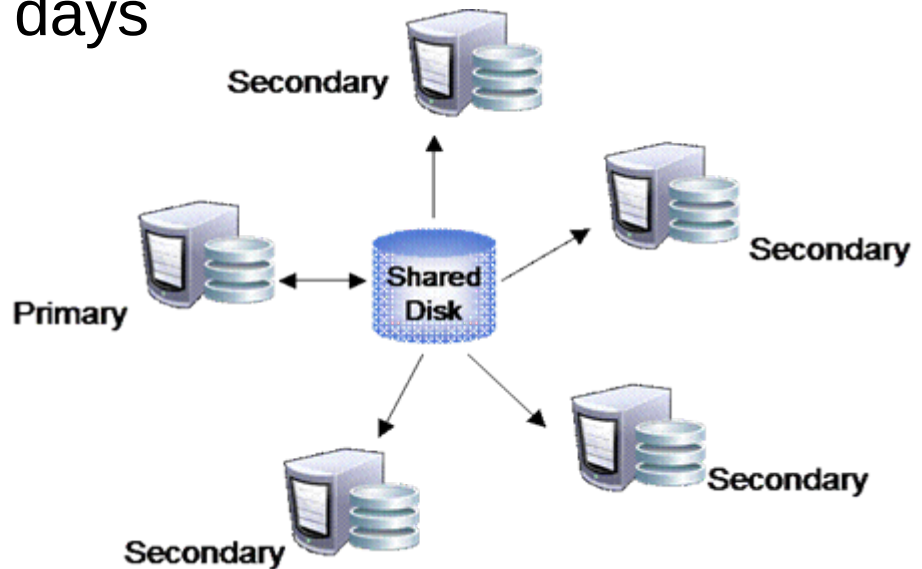
# Agenda

- **Pre-11.5 Scenario**
- **11.5 Technology**
- **Business Value & Benefits**
- **Implementations**
- **Panther details**
- **Summary**

# Informix Clustering Delivers 4 Times the Scalability

*For a Large Latin America Financial Services Company*

- Data loads previously took 4 days now completed in 1 day
- Using Informix active-active shared disk clustering
- Adding compression improved load time by an additional 25%



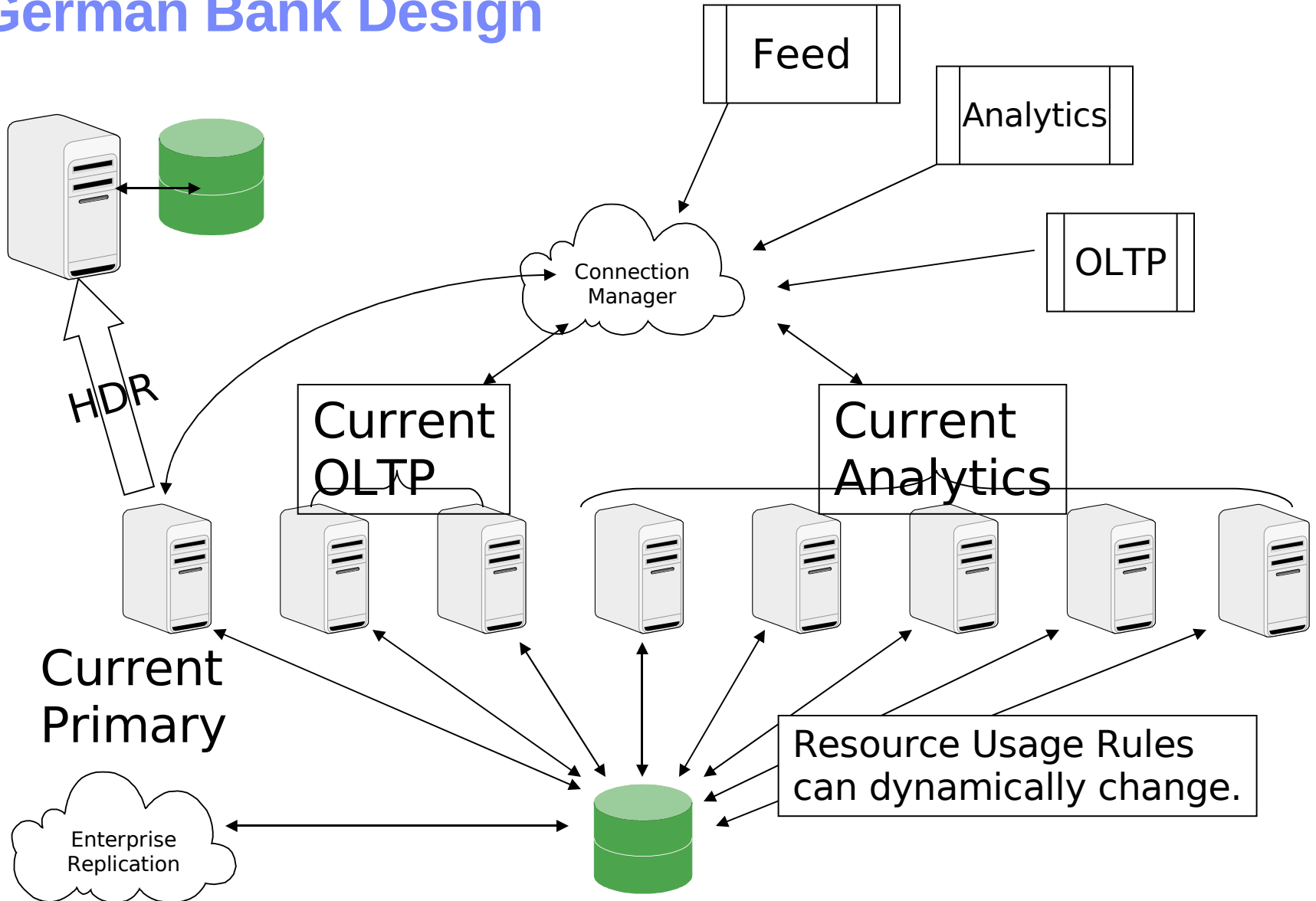
*“Its dynamic performance, low cost and outstanding availability”  
- F.R. Campagnoni, CEO MediaSpan*

## German Bank Details

- **Had a need to combine high speed loading, normal OLTP application and ad-hoc analysis on the same set of data**
- **Needed to be able to dynamically change the resource usage as business requirements changed**
- **Had tried to implement Oracle RAC twice, but failed**
  - Setup complexity
  - Complexity in trying to segregate OLTP/ad-hoc/BI applications
- **Successfully implemented MACH11 cluster**



# German Bank Design



# Technische Universität Berlin

## Informix clustering manages peak workloads



The Technische Universität Berlin, founded in 1770, has more than 27000 students and more than 7000 staff in research and education.

### ■ Challenges:

- Provide a highly available, scalable and secure student management and course registration system which handles high peak loads at each semester begin with ease...
- ...while providing secure application and database access (e.g. for student self services) through a firewall (DMZ) into a protected campus network.

### ■ Solution:

- IDS 11.5 with the Continuous Availability Feature (CAF)...
- No application changes required



# Financial Banking – Metavante Technologies



## Challenge

- Sustain superior service levels for a growing customer base
- Increase transaction processing performance and boost the resilience of its IT infrastructure.
- Create a more flexible and responsive platform for delivering IT services.

## Solution

- IBM System p5 570s, clustered using IBM High Availability Cluster Multi-Processing (HACMP) to run its central IBM Informix database
- Upgraded to IBM Informix Dynamic Server 10 and WebSphere Application Server 6.1

## Business Benefits

- Implementing new IBM hardware and software delivered a five-fold increase in transactional performance
- Implementing a scalable architecture helps support business growth
- Implementing IBM PowerVM technology enabled the new servers to adapt dynamically to changing business conditions

*“IBM has been our infrastructure partner for a long time now. . . In our experience, the reliability of IBM hardware and software products can provide an ideal foundation for businesses that require 24x7 availability from their IT environment.”*

*— Clive Taylor, Head of Operations at Metavante Technologies, Ltd.*

# IT Computer Services – Monitor Computer Systems

MONITOR COMPUTER SYSTEMS



## Challenge

- Enhance database server replication capabilities to support the that the Sentinel Plus Security monitoring solution, especially in remote locations
- Prevent downtime that can lead to security breaches
- Ensure 24/7 availability of the Sentinel Plus Security monitoring solution to protect clients and support business objectives
- Promote rapid disaster recovery to safeguard clients against downtime and data loss

## Solution

- Worked with Bell Micro, an IBM Business Partner to implement IBM Informix Dynamic Server (IDS) 11 and the Remote Standalone (RS) secondary server replication feature

## Business Benefits

- Provided full disaster recovery for Sentinel Plus environments and helped ensure that security monitoring systems can remain online at all times
- Successfully deployed ‘bunker backup’ servers for its clients at almost any distance from the main client site.
- Implemented the asynchronous remote standalone (RS) server to replace complex daily backups with a simple and reliable solution that performs well, even where little bandwidth is available.

*"We want Sentinel Plus to be the leading alarm monitoring system on the market, and Informix has a major role to play in its development. IDS 11 gives us the performance, reliability and simple administration that we have come to expect from Informix, combined with a robust and flexible disaster recovery capability."*

*— Michael Askew, Managing Director of MCS*

# Secretary of Finance, Jalisco, Mexico

Utilizing Informix Clustering to achieve 99.999% availability

- **Reduced cost of tax collection**
- **Better service to 3 million+ citizens**
  - Single point of access (pay taxes, access tourist information, pay traffic fines, etc.)
  - Additional tax payment locations and options (Retail kiosks, Computer, Handheld and mobile devices)
- **99.999% availability with Informix clustering**
- **Reliable SOA Infrastructure**
- **Integration with 21 state departments, organizations and private offices**
- **Met Green initiatives: reducing paper consumption and decreasing agencies' environmental impact**



Transforming Citizen Services with Smarter Government

# Agenda

- **Pre-11.5 Scenario**
- **11.5 Technology**
- **Business Value & Benefits**
- **Implementations**
- **Panther details**
- **Summary**

# Panther Highlights

## Proposed Product

- Grow the Informix business by extending IDS core strengths to help customers and business partners reduce their costs of doing business and shorten time to value.

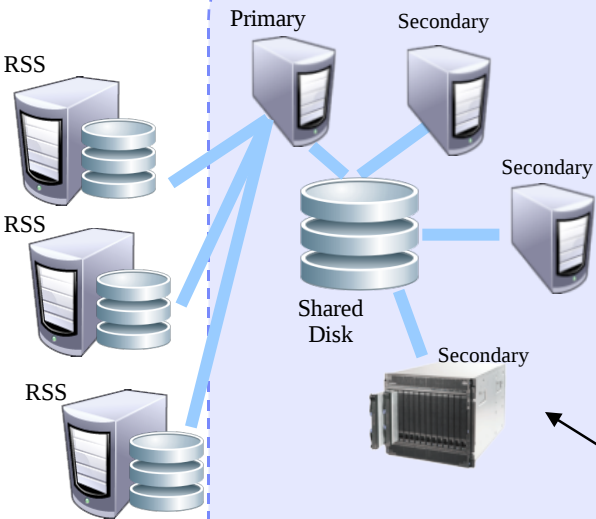
## For existing and new deployments, Panther will offer:

- **Ease of Embed** - Smarter administration with enhanced manageability, availability, performance. Increased reliability and reduced costs with automated administrative tasks
- **Dynamic Global Grid** - Linear scale-out with dynamic global grid for greater resource utilization
- **Enhanced Programmability** - End to end programmability for solutions customization and deployment
- **Enhanced Warehouse Solution** - Enhanced warehouse infrastructure
- **Enhanced Security Management** - Easy security management and compliance

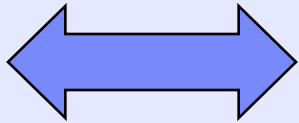
# Dynamic Global Grid: Linear scale-out to multiple clusters



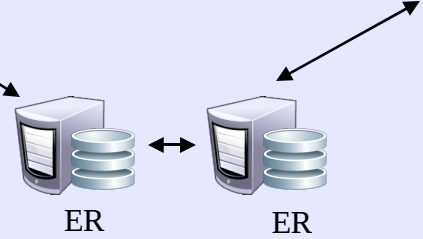
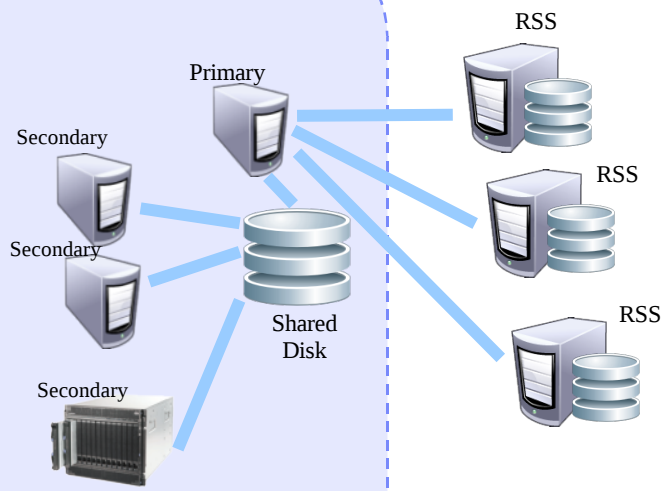
Cluster #1  
San Francisco



Nodes with Shared  
"Grid" Objects



Cluster #2  
New York





## IDS Panther Theme – Dynamic Global Grid

### ■ Value Statement

- Linear scale-out beyond a single cluster, spread workload across systems worldwide
- Reduce operating costs and gain higher utilization of existing global hardware infrastructure, able to utilize a mix of hardware in the grid
- Faster time to value with single push button grid creation

# Panther Early Validation Program

## Join Panther Early Validation Program

### Program Objectives

- The objectives of the early program are:
  - Validate that enhanced features meet customer needs.
  - Provide direct customer input to development, marketing, and sales.

### Program Benefits

- Early exposure to new capabilities
- Assist the IBM Information Management team in defining the roadmap.
- By having access to IBM resources through lab advocates, ensure successful deployment of new IDS features.
- By having early access to the upcoming release, you will be able to prototype solutions in your environment for faster deployment.

### Program schedule

- Nomination accepted until : Feb 2010
- Customer Selection : Mar 2010
- Validation Start : Mar 2010
- Validation End : September 2010

### How do I participate?

- If you have any questions, please send email to [ahujam@us.ibm.com](mailto:ahujam@us.ibm.com) or [gayathri@us.ibm.com](mailto:gayathri@us.ibm.com)

# Agenda

- **Pre-11.5 Scenario**
- **11.5 Technology**
- **Business Value & Benefits**
- **Implementations**
- **Panther details**
- **Summary**

## Summary

- Currently Lab is engaged with several customers
- This continues to strengthen our Usage Scenarios knowledge /experience
- Most deployments we have are using CAF/SDS to take advantage of
  - Scalability
  - Availability
  - Protection from machine or blade failure
  - Protection from site failure
  - Distributed processing

*German Bank – Chose IDS CAF because of ease of use while maintaining cluster and low implementation costs. They didn't need any additional third party software and experienced no unplanned downtime during migration. Failed twice to move to Oracle RAC.*

# Don't Wait!! Take Action Now!!

- **Don't Wait - Lets Meet now**
- **Let's set up one-on-one Meetings**
  - Meet the Informix Team
  - Meet Technical Services Team to kick start your technology
- **Leave us your card and contact information**
- **Take our contact info**
- **Save Operational Costs by Upgrading to IDS 11.5**
  - Utilize the Open Admin Tool
  - Consider Continuous Availability with SDS and RSS
  - Save Money with Informix Compression “Storage Optimization”
- **Participate in Panther EVP**
- **Contact IBM with Questions / Feedback**
  - ISV Support
  - Training Needs
  - Requirements
  - Feedback on Technology, Quality, Anything that is important to you!

