



BECU, 5th largest credit union, achieve success with HP-UX 11i v2 and HP Integrity Servers

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Agenda & Attendee Benefits

Agenda

- Who is BECU?
- Our Business Changes & IT Challenges
- Our Approach & Implementation
- The Results

Attendee Benefits

1. Gain insights on how BECU have overcome both IT and business challenges, especially for financial and SAP environments.
2. Obtain in-depth design and implementation details on how BECU designed, tested, and easily implemented HP-UX 11i v2/HP Integrity into existing HP Alpha environments to work seamlessly together.
3. Understand how HP-UX 11i v2 and HP Integrity can be tuned and integrated seamlessly into existing environment without disruption or failures.

Who is BECU?



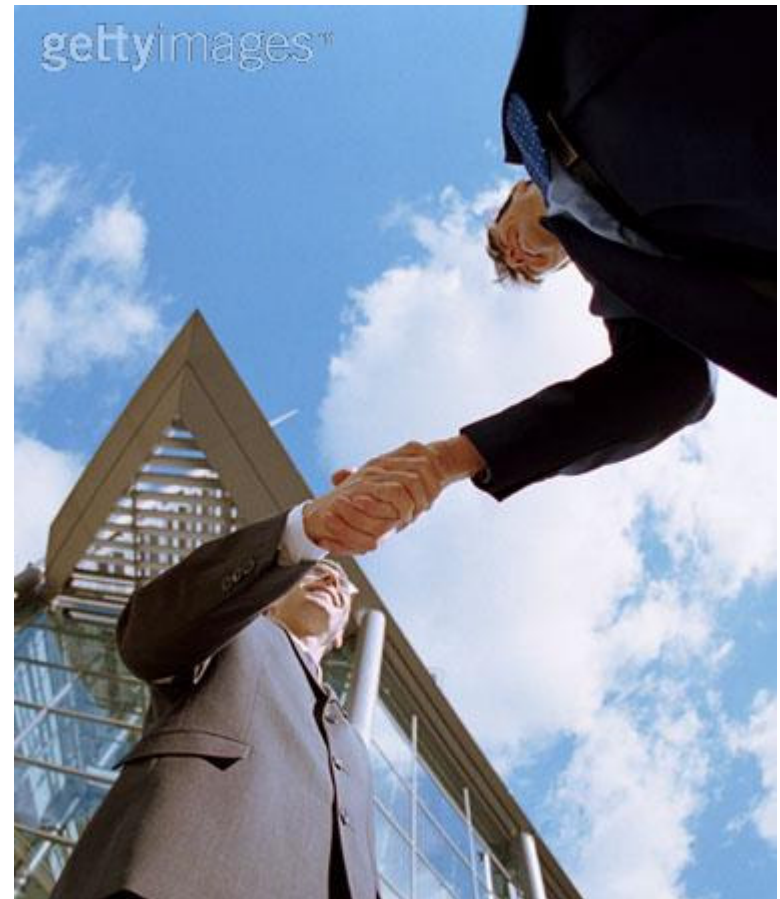
- not Boeing Employees Credit Union
- largest credit union in Washington State
- 5th largest credit union in United States
- serving members since 1935
- 400,000 members; 2 million accounts
- 5 billion in assets
- full-service IT shop

Business Change & IT Challenges

- BECU poised for rapid growth
 - deploying two Express Service Centers per month
 - projections demonstrated database performance limitations within 12 - 18 months.
- Service availability was not meeting our business requirements
 - redundant, stand-alone systems with manual recovery
 - excessive hardware failures and downtime
- Desire to maintain current and well-supported technology.
 - End-of-life announced for RISC and Alpha chipsets
 - Itanium architecture meets our computing needs

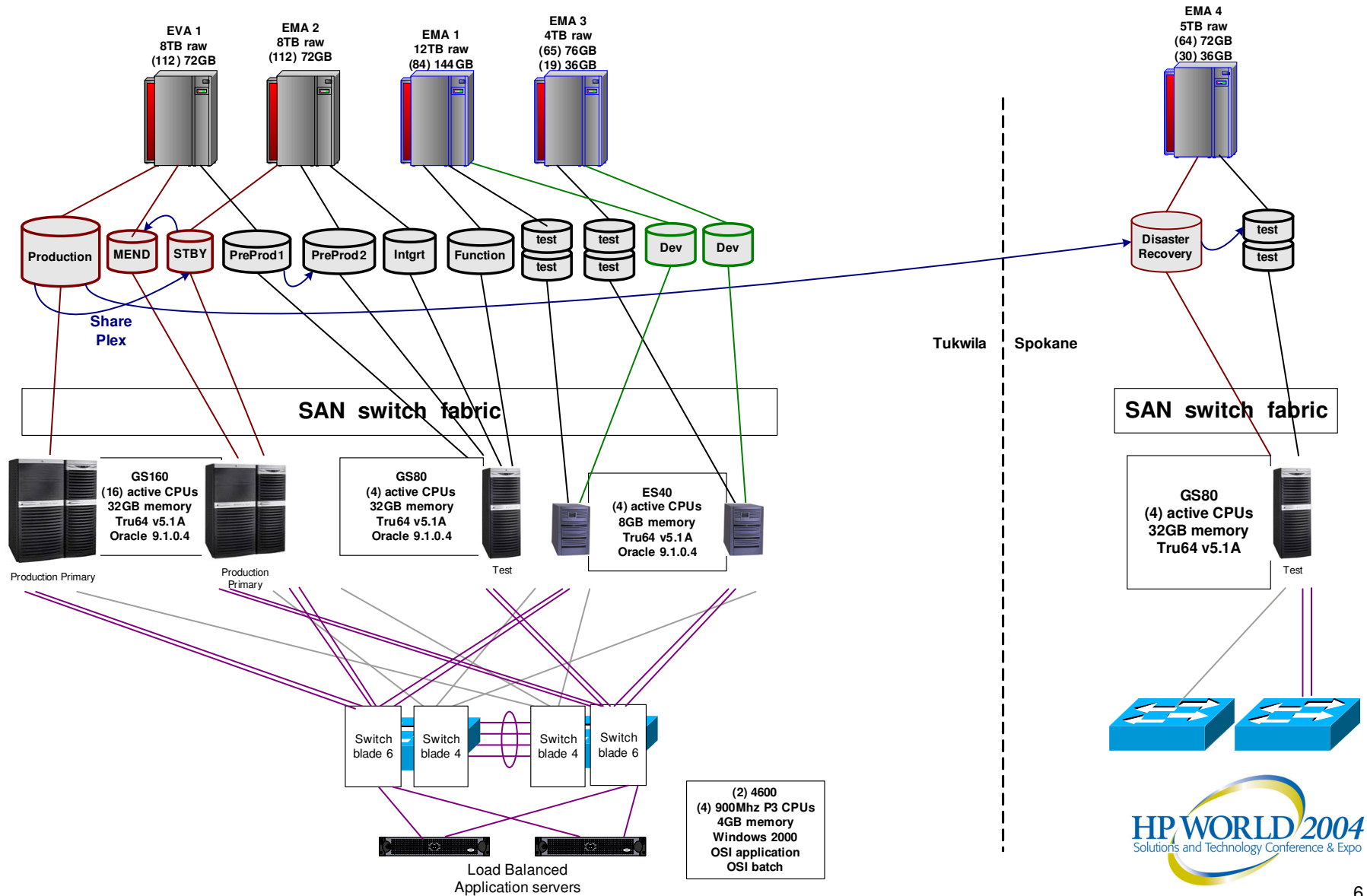
Deciding on the Right Investment

- BECU is a 'buy, don't make' IT shop.
 - Standards based hardware, software and applications
 - Stay current with technology trends
- HP has proven to be a successful strategic partner



Previous environment

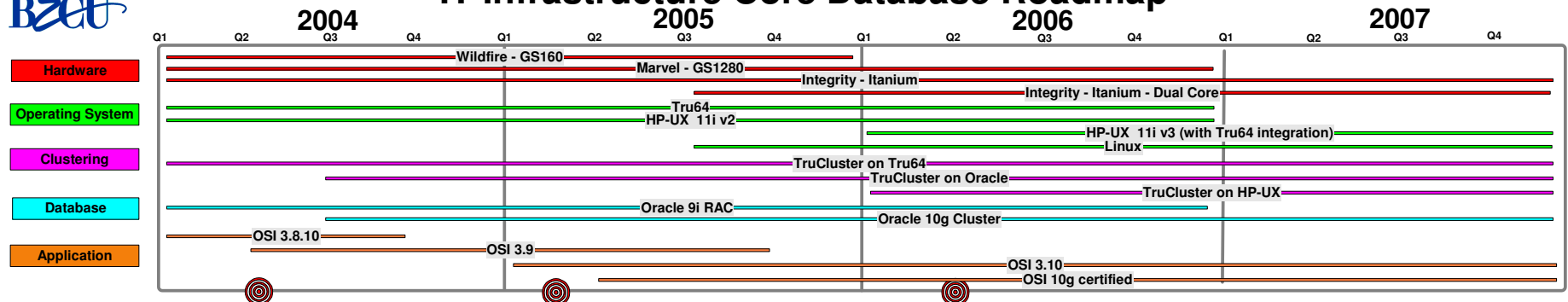
Alpha / Oracle Database Server Infrastructure



HP Enterprise Server Roadmaps



IT Infrastructure Core Database Roadmap

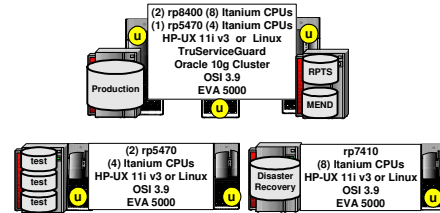
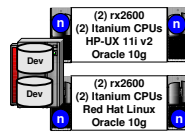
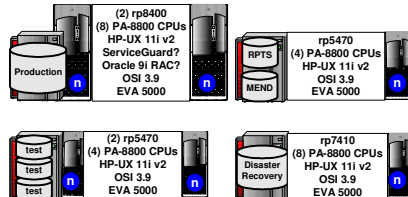
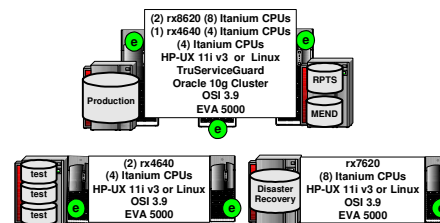
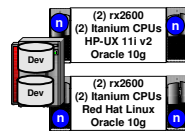
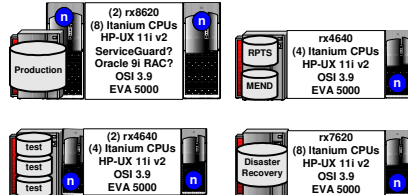
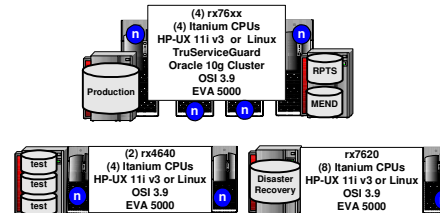
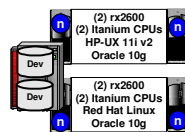
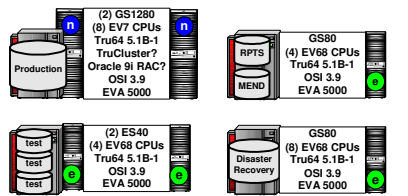


A
Alpha

- = existing server
- = new server
- = server upgrade

B
Itanium

C
PA-RISC



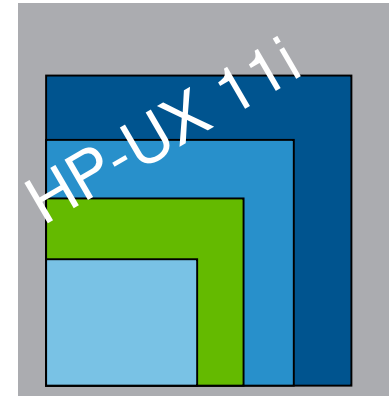
Overcoming Tight Project Timeline

- January - training
- February - configuration
- March - hardware testing
- April - application testing
- May - migration
- May 23 - go live!

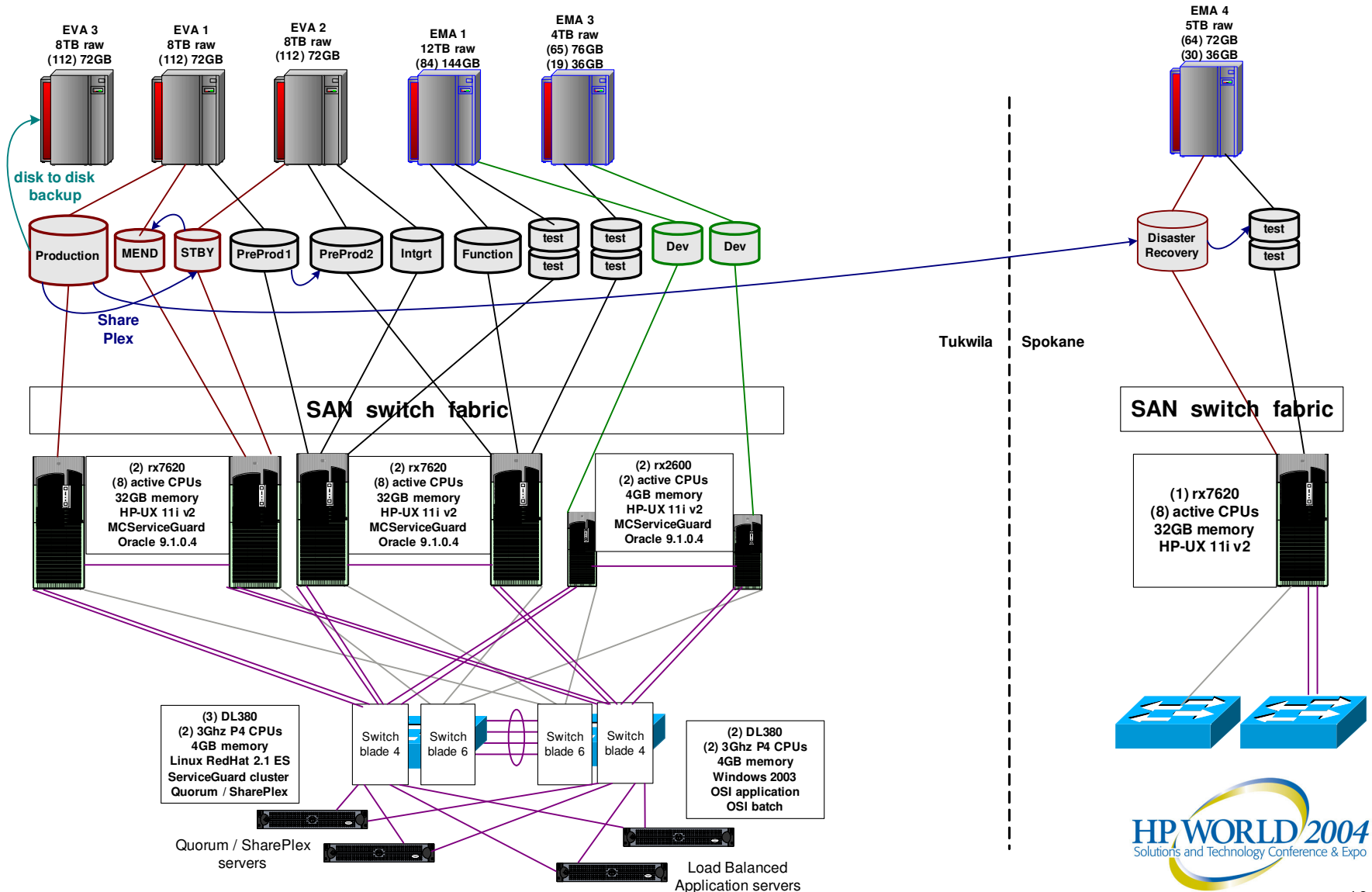


HP-UX 11i v2 Technology Implemented

- HP-UX 11i v2 Mission Critical Operating Environment
- Service Guard with Quorum Servers
- Oracle package failover
- Standby LAN interface
- Auto Port Aggregation
- Mirrordisk/UX
- Ignite Server
- Quest SharePlex transaction replication
- Secure Path
- SAN ISL trunking
- Fabric Manager, Advanced Performance & Health
- Measure Ware

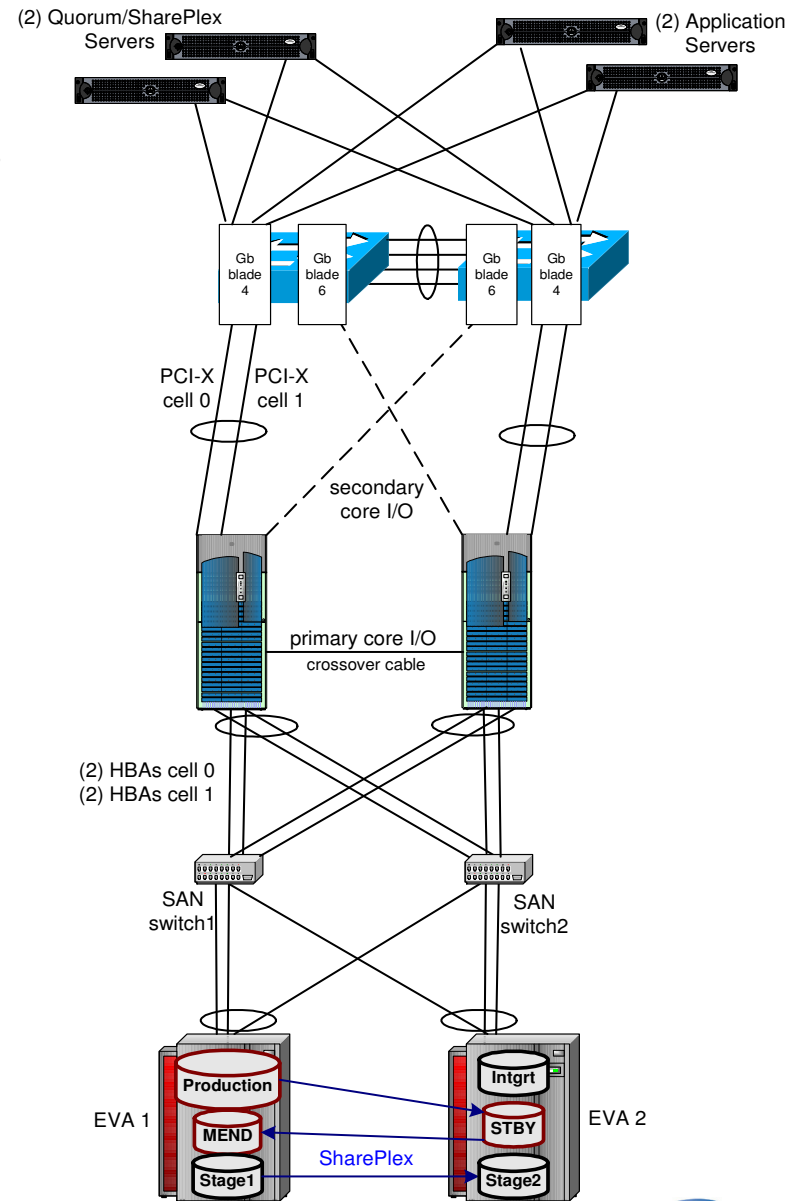


New Architecture for BECU: HP-UX 11i v2 and HP Integrity Servers



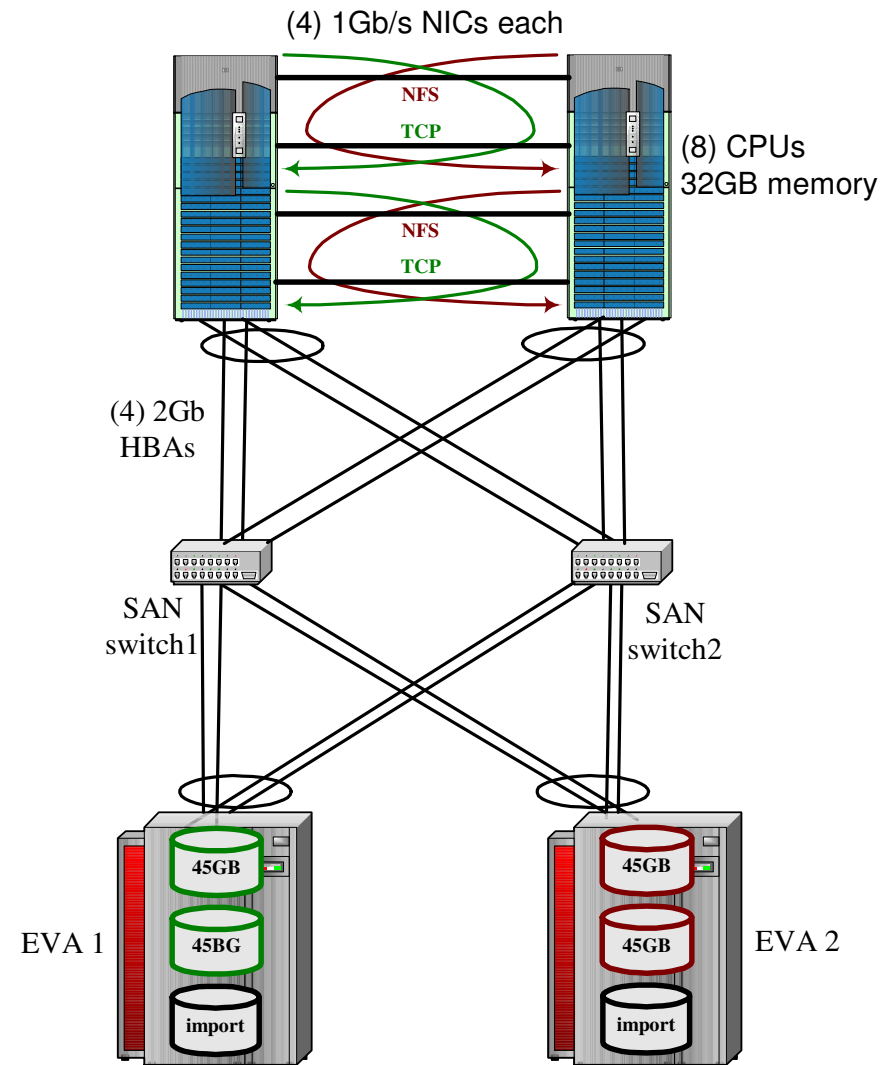
High Availability Tests

- Manual database move
- Oracle service failure
- Database maintenance
- Single network link failure
- Dual network link failure
- Triple network link failure
- Heartbeat link failure
- SAN drive failure
- Local drive failure
- Single SAN link failure



Hardware Testing

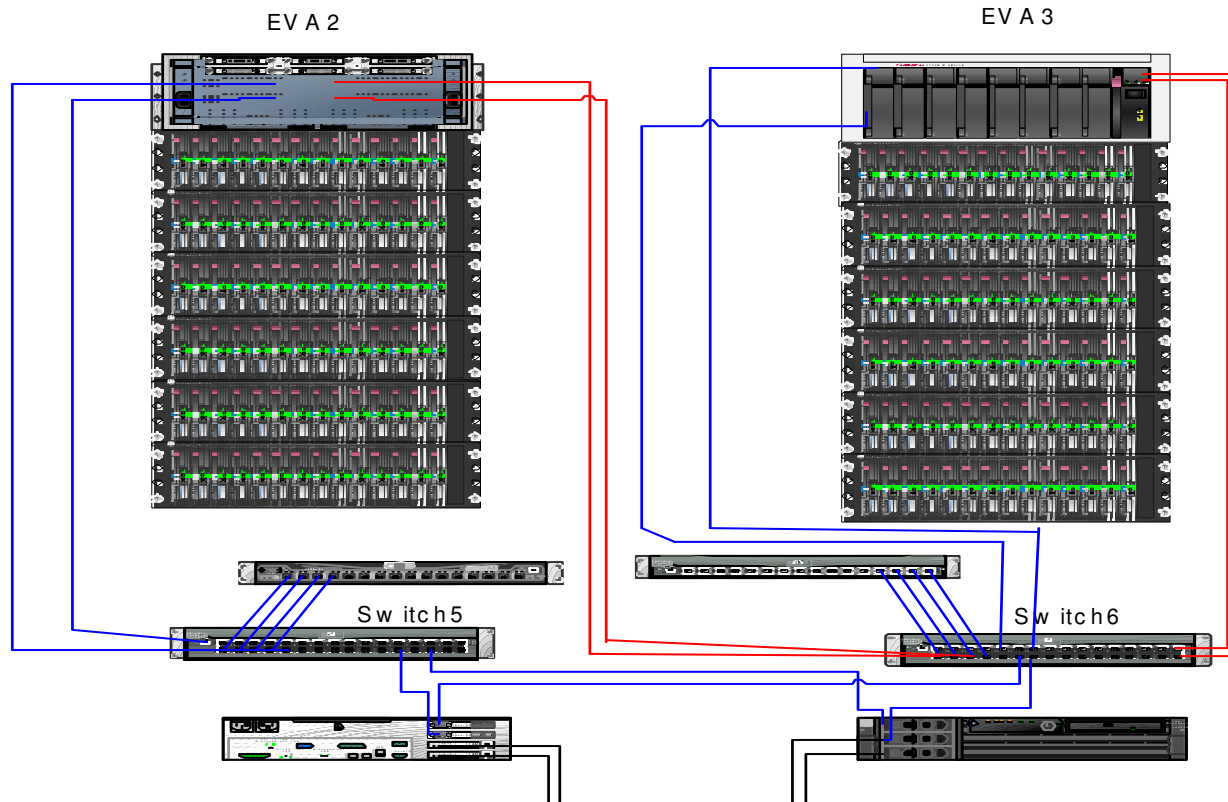
- Four file transfers
 - 45GB each
 - TCP and NFS
 - bi-directional
- EVA Configuration
 - 2C8D configuration
 - mirrored cache
 - 1 diskgroup/112 disks
 - VRAID1 LUNs
- CPU 50%



Application Load Test Results

- SAN Controller
 - 160MB/s sustained throughput limit
 - 200-300MB/s bursts
- CPU
 - average 50%
- Batch Processing
 - average 4x faster
 - realized 2x faster
- Live Transactions
 - little contention
 - many times current volume

Physical SAN configuration



This document is confidential to HP and its intended recipient.

legend

— FiberChannel Connection
— GigabitEthernet LAN

Scale: 1:10

description:

Configuration for Development Cluster (a.k.a. Sugar-Ray Cluster)

page title / customer:

BECU

author:
Lee Chen

date revised:
23 February, 2004
3:50 PM



HP Services
Consulting and
Integration

page: 1 of 3

Database Configuration

Filesystem	Mounted on	Storage	RAID
• /dev/vg04/u01	/u01	Oracle Binary Installation	0+1
• /dev/oradev/u02a	/u02a	Data/Index Volume 1	0+1
• /dev/oradev/u03a	/u03a	Data/Index Volume 2	0+1
• /dev/oradev/u04a	/u04a	Data/Index Volume 3	0+1
• /dev/oradev/u05a	/u05a	Data/Index Volume 4	0+1
• /dev/oradev/u06a	/u06a	Rollback Segments Volume	0+1
• /dev/oradev/u07a	/u07a	Temp. / Log / Trace Volume	0+1
• /dev/oradev/u09a	/u09a	Redo Log File Volume	0+1
• /dev/oradev/u10a	/u10a	Current Archive Log Volume	0+1
• /dev/oradev/u11a	/u11a	Redo Log File Volume	0+1
• /dev/oradevback/backup /u08a		Backup Log / Export Volume	5

Production Metrics

BEFORE

- Alpha GS160
 - (16) 1.2Ghz EV68 CPUs
 - 32GB memory
- average utilization
 - CPU
 - 20% live transactions
 - 50% batch processing
 - memory
 - 20GB daytime
 - 28GB nighttime
 - disk I/O
 - 5MB/s daytime
 - 20MB/s nighttime
- batch runtime
 - 12.5 hours nightly
 - 16 hours month-end

AFTER

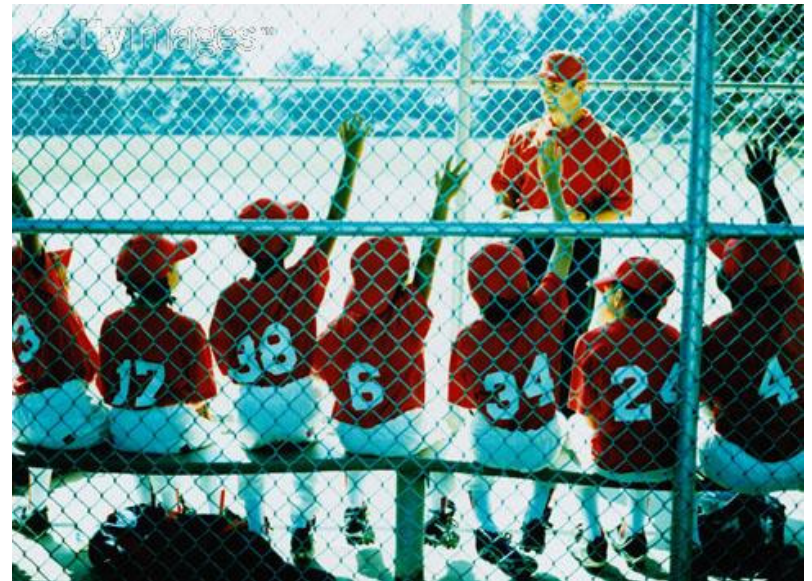
- Integrity rx7620
 - (8) 1.5Ghz Itanium 2 CPUs
 - 32GB memory
- average utilization
 - CPU
 - 15% live transactions
 - 25% batch processing
 - memory
 - 14GB daytime
 - 19GB nighttime
 - disk I/O
 - 10MB/s daytime
 - 35MB/s nighttime
- batch runtime
 - 7.5 hours **(40% less)**
 - 7 hours month-end **(55% less)**

The **WOW** Factors with HP-UX 11i v2 and HP Integrity Servers

- BECU no longer tracks nightly batch run-times during Operations meeting
- Migration was a non-event
- No data migration required
 - batch processing results matched exactly
 - physical database row counts matched exactly
- For the week prior to migration, seven databases were in synch (4 Alpha, 3 Integrity)
- Quality
 - memory management
 - availability and reliability

Secrets to Success

- Get *firm* commitment from ISV to support Itanium platform
- Get the right people on the team
- Plan before you build
- Alpha Retain Trust Program is **FOR REAL and WORKS**
- Oracle on HP-UX 11i v2/HP Integrity is **ready for prime time**
- Involve all business partners early



HP-UX 11i v2 and HP Integrity Benefits to BECU

- Reduced batch processing window:
 - * -5 hours nightly
 - * -9 hours month-end
- Ability to purge historical transactions
- Low contention
- Quick test-database creation
 - import reduced from 16 hours to 8 hours
- More frequent test cycles
 - (Around how much more?)
- Reduced **datacenter footprint by 8x**
- Reduced Oracle licensing
- Alignment with HP roadmap



Questions?

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