Systems Z - Linux at it's best!

Mark Shackelford
Baldor Electric Company

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3:00 P.M.

Baldor's Mission Statement

BALDOR is to be the best (as determined by our customers) marketers, designers and manufacturers of industrial electric motors, mechanical power transmission products, drives, and generators.

- To think of value to our customers as,

$$V_p = \frac{Q_p \ x \ S_p}{C \ x \ T}$$

Agenda

- Challenges

- Inhibitors to Success

- How we did it

- Summary and Questions

The Company

Ft Smith, Arkansas

- 1.6B in Revenue in 2009
- 90 Year Old Company
- Global Headquarters in Fort Smith, AR
- 26 U.S. Mfg. Plants, Bristol UK, Mexico and China
- 50 North American Sales Office's
- Over 20 International Sales Offices
- Sales in over 70 countries
- Global SAP Implementation in Fort Smith, AR

Consolidation Summary

- 3 System Z Systems down to 1
- 12 Large P-Series
- Over 50 Windows Systems
- 6 Very Large Sun Servers
- 4 HP 3000 servers
- 10 I-Series

- All consolidated to 1 System Z10

Key Challenges facing CIO's today (1 of 3)

- Business Growth – Do more with the same

- Outside Pressures
  Cloud Computing
  Software as a Service (SaaS)
  Eliminate the Mainframe (I read about this in .....)

- Regulations
  Sarbanes-Oxley
  HIPAA
  Security

- Service Levels (Availability and Reliability)

- Aging Applications

SHARE in Boston

- Cost Reductions
  People - Productivity
  Hardware Maintenance
  Software Maintenance
  Electrical Power Consumption
  Cooling
  Floor Space

- Alignment of I.T. Department with the Business

- Innovation

- Flexible

- Global Business

- Complexities
  100's or 1000's of applications
  100's or 1000's of servers
  Network Infrastructure
  Mergers and Acquistions
  Disaster Recovery
  Server Backup's
  Capacity on Demand
  Under Utilization of Servers
  Provisioning of Servers

- Greening of the datacenter

Inhibitors to Success

- Internal Politics

- Your own employee's

- Non Z Suppliers

- Lack of Knowledge

- A Vision of the future

- Spot Solutions

- Complex Solutions

- Status Quo

- Lack of Capital

Challenges and Inhibitors   (Politics)

- Silo's

- Departmental Ownership

- Multiple Divisions

- Respect

- Baldor Solution: Executive Support

Challenges and Inhibitors (Employees)

- Groups of Experts
  System Z Group
  Network Group
  Open Systems Group
  Wintel Group

  ....

- Baldor Solution: Cross train and build one team

Challenges and Inhibitors (Non Z Suppliers)

- Intel

- Sun

- HP

- Lack of ISV Support for System Z Linux

- Even IBM

- Baldor Solution: Pick a solution that can run mixed workloads with a high service level. System Z

Challenges and Inhibitors (Lack of Knowledge)

- Executives
  Your job to educate
  Do they really care what hardware you are running on?

- Technology Staff
  Education
  Re-train

- Baldor Solution: Executives care about results
                    Techies like education

Challenges and Inhibitors (Vision of the Future)

- 5-7 Year Planning Horizon

- 3-6 month sub-projects that will be successful

- Projection of savings

- Case studies showing success stories

- Baldor Solution: 5 Year Plan for SAP
                        Production Linux in less than 6 months

Challenges and Inhibitors (Spot Solutions)

- 37 Different Applications

- 5 different types of hardware platforms

- 100's of servers

- Baldor Solution: Consolidate to one Z Server with Linux

Complex Solutions

- Supporting many different kinds of software and development languages

- Network Infrastructure and Speed problematic

- Interfaces, bridges, batch schedule, downtime

- Baldor Solution: One Application (SAP)
  One Hardware Platform (System Z)
  One Database (DB2 on Z)

Challenges and Inhibitors (Status Quo)

- Risk of Business Disruption

- Too complex to change

- Too expensive to change

- Too expensive to retrain people

- Too disruptive to the business

- Baldor Solution: System Z Consolidation

Lack of Capital / Cash

- Overcoming large expenditure for System Z

- Other platforms are small expenditures that get hidden

- Work with finance folks so that System Z becomes hardware as a service internally.

- Flexible Leasing – Step Leases

- Elimination of other HW/SW

- Baldor Solution: Flexible Leasing

Technology Vision…..

- <u>One</u> hardware platform, <u>One</u> database, and <u>One</u> business system

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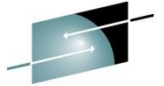
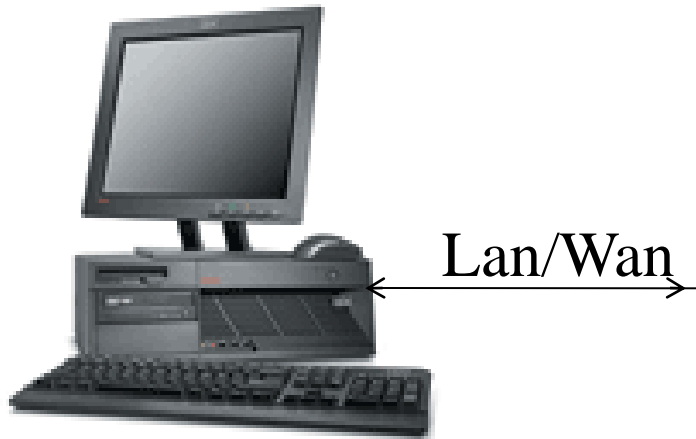DB2. Information Management Software

SAP

THE BEST RUN BUSINESSES RUN SAP

- Hardware Platform   - z-Series, z/OS, z/VM, z-Linux (SUSE)
- Database   - z-DB2 for z-Series
- Business System   - SAP Business Suite

SAP 3 Tier Client Server Architecture

Same Machine – Single z-10

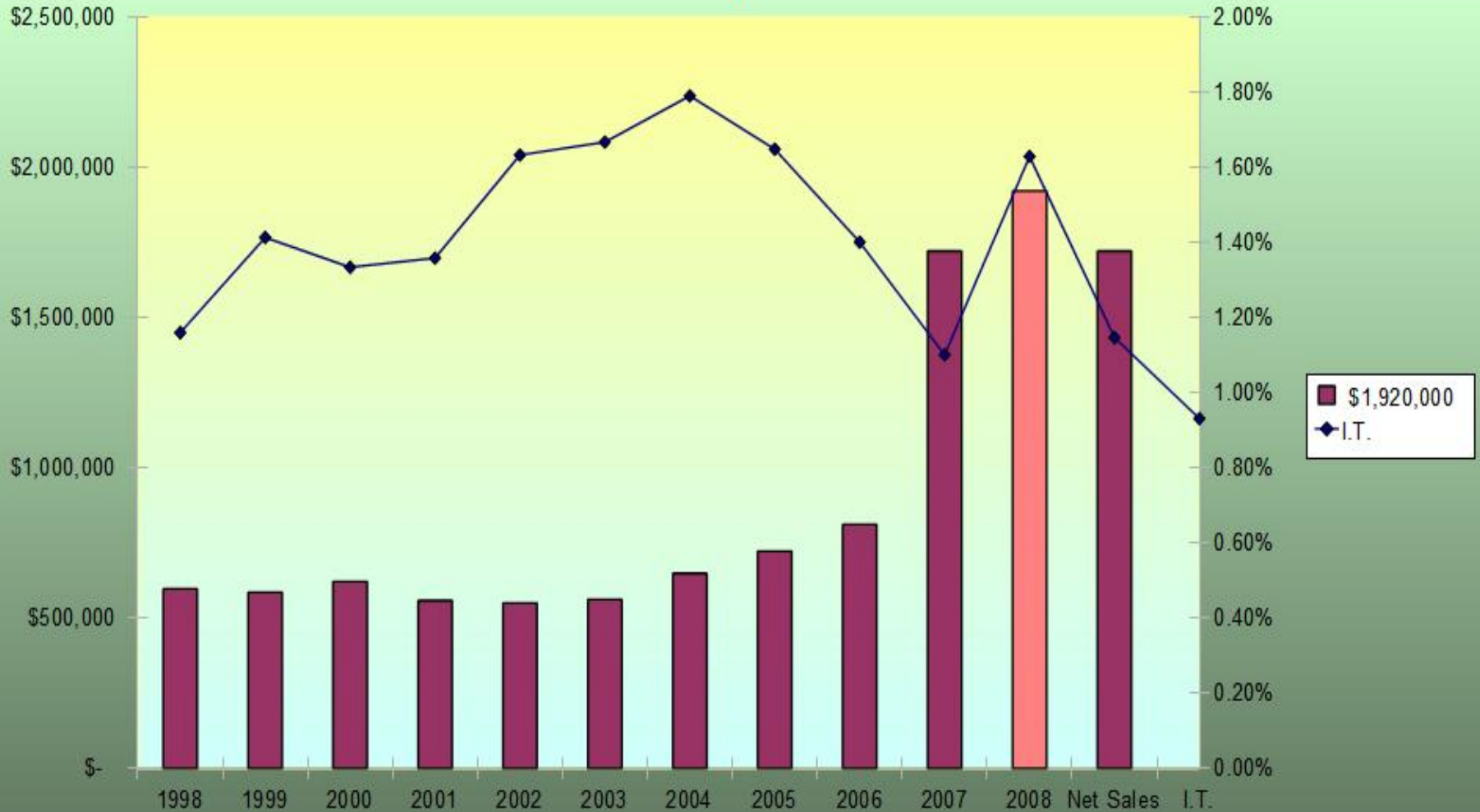Hipersockets

Lan/Wan

Presentation Layer
(XP,2000,Mac,Linux)

Application Server
z-Linux

z/OS – z/DB2
Database

Net Sales vs. I.T. Percentage of Sales

Environment

- Z10-EC 2097-706 Model E40

  06 GP's

  16 IFL's

  03 zIIP's

  02 ICF's

  320 Gig of Memory

- z/OS 1.11 (Dev/Test, 2 PROD Datasharing members)

- z/VM 6.1   (Dev/Test, PROD)

- DB2 Version 9   (38 DB2 Subsystems)

- Novell SUSE Linux (SLES 10)

- (2) Disk DS8300 (30 Terabytes)

- Standard RMF for z/OS monitoring

- Performance Toolkit for z/VM and zlinux

Sizing

- 4300 Users
- Average of 1 million Transactions a Day
- Average of 1,350 Scheduled Batch Jobs a Day (SAP & z/OS)
- End User Average Response Time of Less than 1 Second
- SAP Database Size is 1.9 Terabyte
- 30 Terabytes of DS8000 Storage
- Two z/DB2 Data Sharing images
- 72 z/Linux images

Baldor 2097-E40 (6 GP, 3 Ziip, 16 IFL, 2 ICF, 320 Gig)

Partition labels (top row):
MVS1, BUS01014, BALICF2, BUS01003, BUS01067, BUS01078, BUS01081, BUS01101, BUS01112, BUS01123, BUS01135, BUS01146, BUS01109, BUS01220, BUS01221, BUS01220, BUS01230, BUS01315, BUS01336, BUS01340, BUS01411, BUS01450, BUS01157, BALMON1, BALWEB20, BALWEB21 ... MVS3, BALSMB01, BUSNFS, MVS4, BALICF1, MVS7

z/VM 6.1 VMPRD — 122880K Main Storage
z/VM 6.1 VM TEST — 49152K Main Storage

PID	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
PROC	6	2	6	1	0	16	0	16	6	2	6	1	1		
MEM	20480	3072	6144	13312	0	122880K Main Storage	0	49152K Main Storage	20480	3072	10024	10024	0	13312	24480

(4) OSA(FE – Gig)   HIperSockets   OSC

SHARE in Boston

Large System Support

- System Z is managed by working manager

- His backup is the Operations Manager

- 2 DBA's

- 2 z/VM & z/Linux

Business Growth

- Baldor has not added any additional staff for the infrastructure group since 1997

- Business is now 4x as large

- I believe we can go to $10B without additional people

Outside Pressures

- Ten's of Thousand of Solutions are out there

- You have to choose what you can support and is economical

- Your executives love to be sold

- You have to be the internal salesman

- No cloud, No SaaS, use your System Z

Regulations

- System Z is the most secure, has the most tools for security, and it is all built in

Service Levels

- Z in System Z stands for Zero downtime

- I take IBM for their word

- Consolidated to 1 System Z in 2005

- Response time less than ¾'s of a second

Aging Applications

- Old Packages

- Old home grown (Cobol, RPG, Assembler, Powerbuilder, 5 different query tools, ...)

- All Replaced

- Linux provides a standard environment with all the latest tools (C++, Java, Apache, ...)

Cost Reductions

- Jobs re-assigned   Eliminated Operations Staff

- Elimination of 4 hardware platforms

- Elimination of underutilized servers

- Elimination of many software packages (Maintenance!!!)

- 60%+ reduction in electrical consumption (Green)

- 50%+ reduction in cooling (Green)

- 6000 SqFt down to less than 3000 SqFt

- 80% Reduction in Network Costs

- Group Capacity Software Reductions (z/OS)

- All applications run on IFL's for reduced software/hardware pricing   You only pay for specialty engines once

- zIIP's fully utilized

Alignment of I.T. Dept with the Business

- 90% Maintenance to 90% new business functions/dev

- Relationship and trust developed with C-Level exec's

- Executive Review meeting dictates what we work on, NOT I.T.

- Ability to meet business demands is at an all time high

Innovation / Flexible / Global Business

- Linux is open

- Allows for innovative ideas

- Allows for flexibility in applications

- Mergers and Acquisitions

- Languages and Currencies

- College grad's are trained in Linux

Complexities Eliminated

- One Server   System Z

- One Integrated Application

- Operations completely automated

- Network simplified/fast with Hipersockets

- Disaster Recovery Simplified and actually works

- One consolidated backup system with robotic tape library

- Capacity on Demand built in

- Redundancy built in

- Provisioning of new Linux server in less than 15 minutes

- No underutilized servers

- All File Serving using SAMBA on Linux on System Z

World Class Data Center
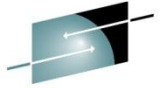
World Class Data Center - Baldor

Summary

- System Z is the platform of choice for Baldor
- Almost unlimited scalability
- Lowest Risk
- Most Flexible
- Best Total Cost of Ownership
- Best security. Best availability. Best reliability. Best performance
- Linux at it's best!
- Best for Baldor   Best for me!
- To be the best……

Questions?