Linux on iSeries

Linux Can Do It! - Infrastructure solutions for Linux for iSeries

Hosted by Mike Martin and Robin Clark

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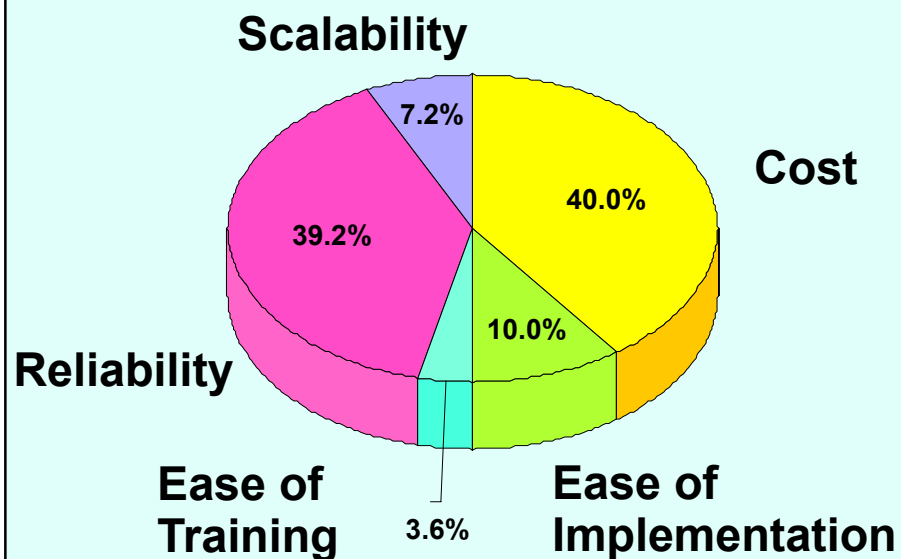
Agenda

Linux in the marketplace

Why Linux on iSeries

Key Solutions on Linux

- Red hat
  - Kerry Kim, Product Manager

- eOne Group
  - Dan Watson,   President

Why Move to Linux

Most Influential Factors in Moving to Linux

Scalability 7.2%

Cost 40.0%

Reliability 39.2%

Ease of Training 3.6%

Ease of Implementation 10.0%

Source: TechRepublic survey, 2001

"Linux Has Gone Mainstream: Are You Up to It?"

Linux server revenues
- ► $1.5 billion in 2000
- ► $2.5 billion in 2002
- ► Grow to a $15 billion by 2007

Today
- ► 20 million+ Linux users
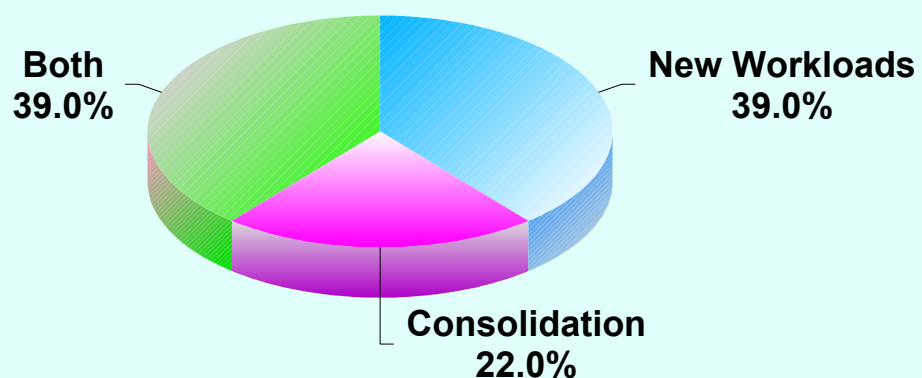- ► 30% of the Web server market

Forces Driving Linux Acceptance
- ► Flexibility
- ► Open standards
- ► Distributed development / collaboration
- ► Price/performance
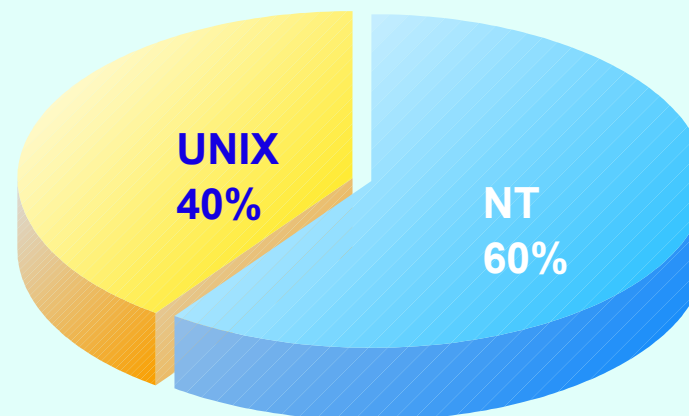- ► Lack of license fees
- ► Lack of vendor lock-in

Source: Giga Information Group June 2002

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Linux Server Usage

Linux Server Usage

Both 39.0%

New Workloads 39.0%

Consolidation 22.0%

Linux Consolidation by OS

UNIX 40%

NT 60%

- **Multiple workloads on a single server**
- **Workload migration**
- **Virtualization capabilities**

Source: IBM IT Trends Survey

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Linux Marketplace

## Linux shipments projected to show the highest growth rate of any operating system in the next three years*

▶ Driving Cross Industry Support: Hardware, Software, Services

* International Data Corporation (IDC) "Server Operating Environments Market Forecasts & Analysis" January 2001

Linux Usage Intentions

	Today	In 12 Months
HTML Server	45%	68%
E-Mail Server	50%	66%
Web Application Server	43%	65%
Intranet Server	49%	64%
Firewall	48%	63%
File and Print	50%	62%
Software Development	43%	58%
Database Server	38%	50%
Non-Internet, non-Web	33%	49%

Zona Research Market Survey of IT and ISP customers with buying authority: 10/2000
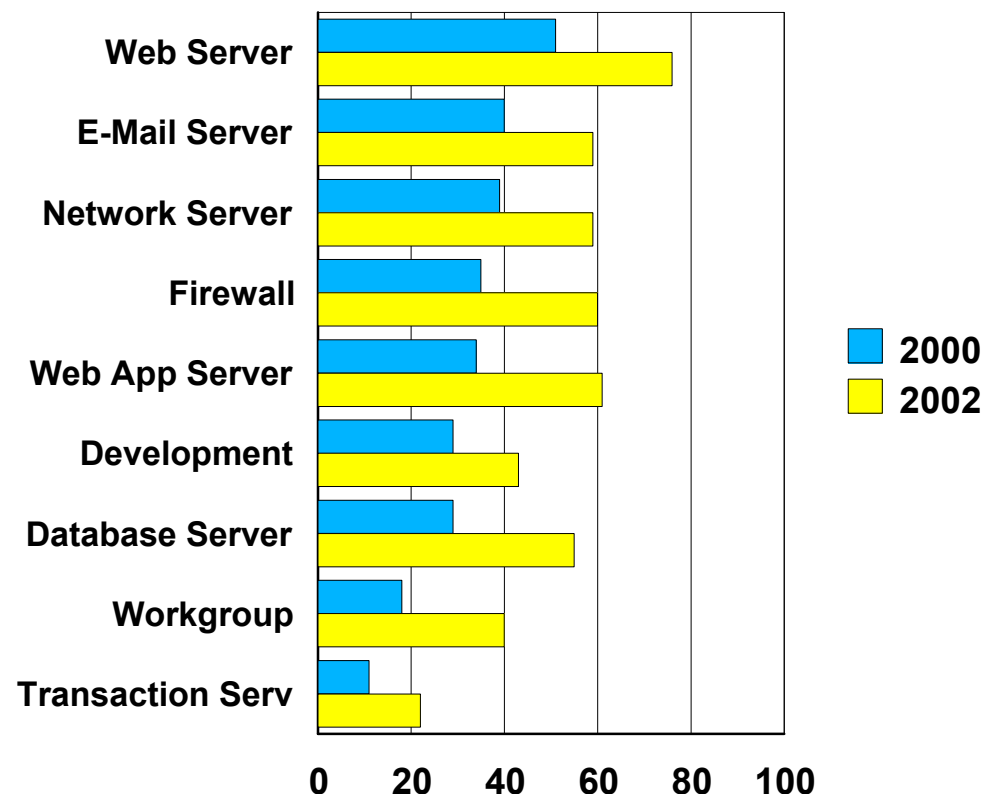
Functions for Which Linux is being used (2000 vs 2002) - IBM Worldwide Linux Study 3/01 - 1704 Responses

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Linux and iSeries

What does Linux Bring to iSeries

- ► Applications
  - ● ebusiness infrastructure
  - ● New generation of web-based applications
  - ● Provides flexibility and choice of environment
  - ● Ease delivery of open source components
- ► Resources and Skills
  - ● Leverage virtual world-wide development team
  - ● Broad skill base to deliver iSeries solutions
  - ● Leverage other IBM investments in Linux

What does iSeries Bring to Linux

- ► Ability to consolidate multiple Linux servers
- ► A reliable, scalable server to run Linux
- ► Resource sharing and management
- ► Integration with OS/400
- ► Low Cost of Ownership

IBM eServer iSeries Wins "Best of Show"
LinuxWorld
San Francisco, CA August 28-30

Linux on iSeries

LPAR1
OS/400
V5R1

LPAR2
OS/400
V5R2

LPAR3
Linux

LPAR4
Linux

Primary Partition
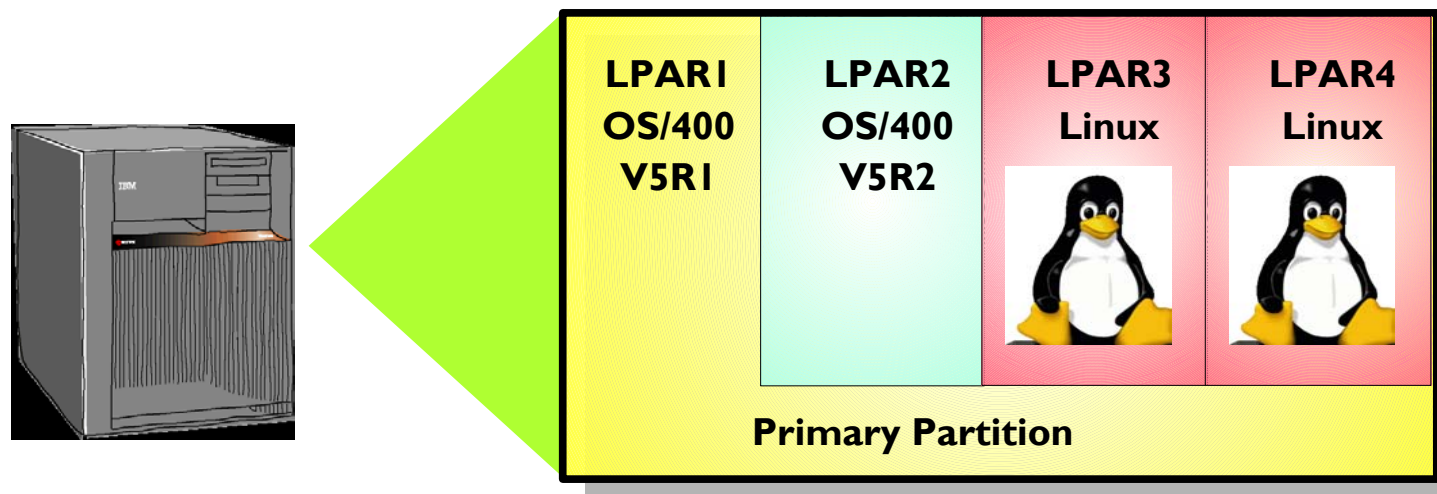
Consolidate up to 31 Linux servers on one iSeries server

- ▸ Linux runs in iSeries logical partition
- ▸ Move processor, memory, and I/O resources between partitions
- ▸ Supported with V5R1 or V5R2 on iSeries Model 270, 820, 830, 840, 890

I/O Flexibility

- ▸ Virtual - Linux shares OS/400 managed disk, tape, CD-ROM, and LAN resources
- ▸ Direct - Linux owns I/O resources

Standard Linux from Leading Distributors: SuSE, Turbolinux, and Red Hat

- ▸ Based on a 2.4, 64 and 32-bit PowerPC kernel

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www.ibm.com/eserver/iseries/linux

Linux and LPAR V5R1

Shared Processor Support*

- ► Linux shares processors with other OS/400 and Linux partitions
- ► Up to 4 partitions per processor
- ► Minimum 0.10 processor in a partition
- ► Minimum processor movement: 0.01

Resource Movement

- ► Processor, Memory and I/O resource movement requires the Linux partition to be stopped and restarted

    Minimum memory movement: 1 MB
- ► Processor, Memory, and I/O can be moved independently

Linux runs in a secondary partition

- ► OS/400 V5R1 Primary Partition

**Maximum Number of
Linux Partitions**

# of Processors in Server	Maximum # of Linux Partitions*
1	3
2	7
4	15
8	31
12	31
24	31
32	31

* Shared processor is supported on iSeries servers with SStar processors. Servers with IStar processors require a dedicated processor for Linux

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Linux LPAR Enhancements with V5R2

Dynamic Resource Movement

 ► Virtual Processor Units moved to/from Linux or OS/400 V5R2 partitions dynamically
   Immediate, scheduled, or under program control

Increase number of Linux partitions on 1, 2, and 4 processor servers

 ► Requires OS/400 V5R2 Primary Partition
 ► Requires iSeries with SStar or Power4 processors

# of Processors in Server	Total Maximum # of Partitions	Maximum # of OS/400 Partitions	V5R1 Maximum # of Linux Partitions	V5R2 Maximum # of Linux Partitions
1	10	4	3	9
2	20	8	7	19
4	32	16	15	31
8 and >	32	32	31	31

Enables Consolidation of more workloads on iSeries servers

Linux Partition Management

V5R2 iSeries Navigator

- Create Partition Wizard
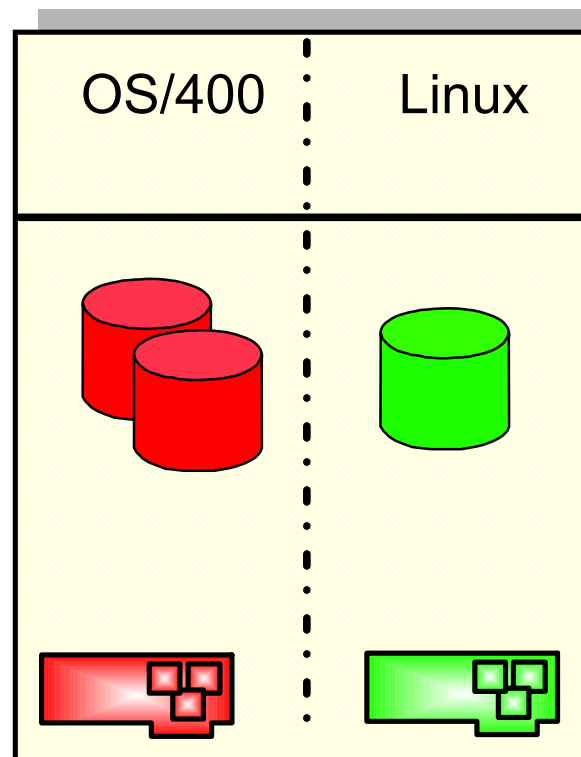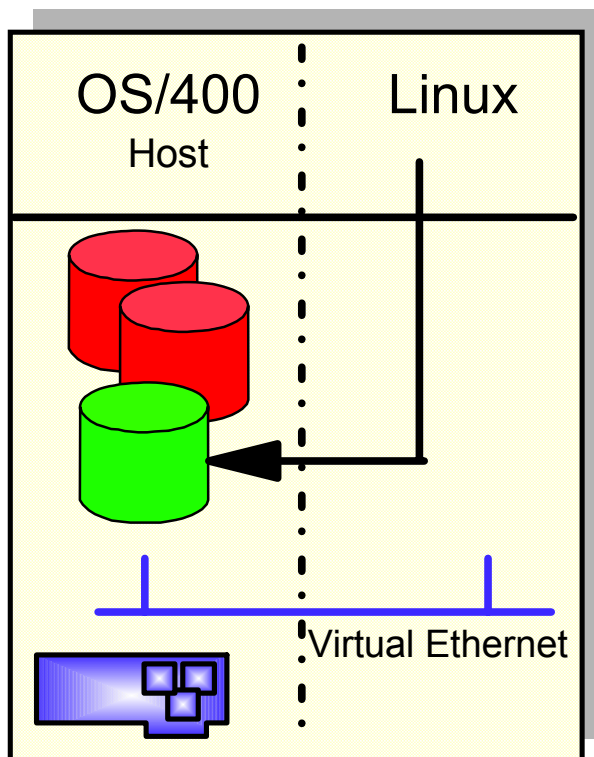- Create, Delete Partitions

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Linux I/O Flexibility

Virtual I/O

Direct I/O

► SCSI Disk
► Fibre ESS
► Tape
► LAN
► CD, DVD

► Dynamic
  Storage
  Adding
  ► OS/400 V5R2

► Shared,
  read only
  virtual disk
  ► OS/400 V5R2

OS/400 Host | Linux

Virtual Ethernet

OS/400 | Linux

► SCSI Disk
► Fibre ESS
► Tape
► LAN
► WAN
► CD, DVD

► Leverage iSeries resources
► OS/400 management

► Dedicated resources
► Linux management

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Linux Storage Virtualization Enhancements with V5R2

Dynamically add virtual disk storage spaces to Linux partition

- ► Requires OS/400 V5R2 Primary Partition
- ► Details
  - Storage Spaces are 1MB to 64 GB each
  - Up to 20 Storage spaces per Linux partition

iSeries Disk
Virtual Drives

Disk #1

Disk #2

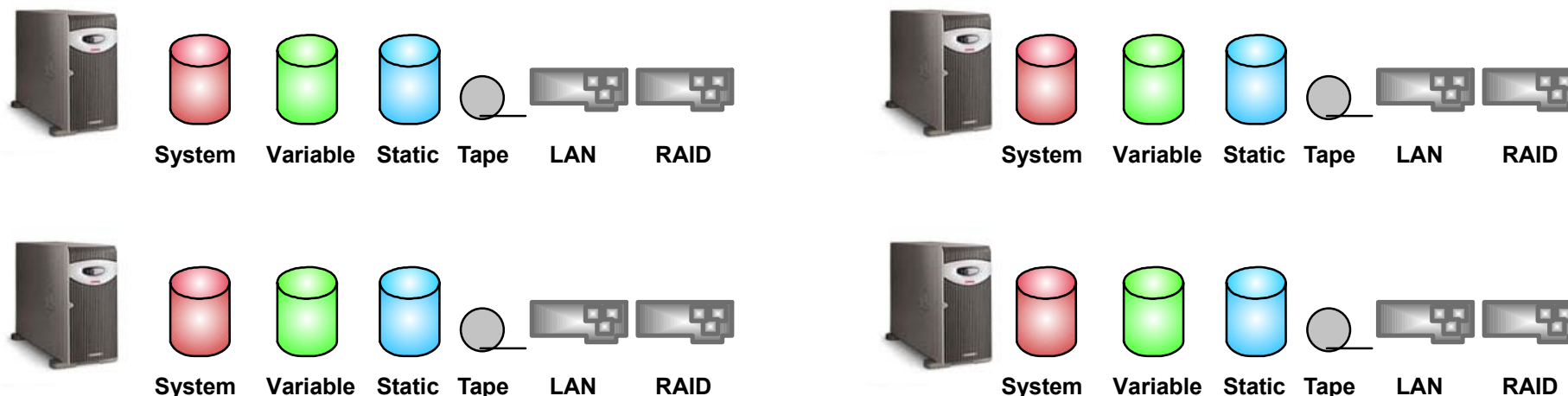Disk #3
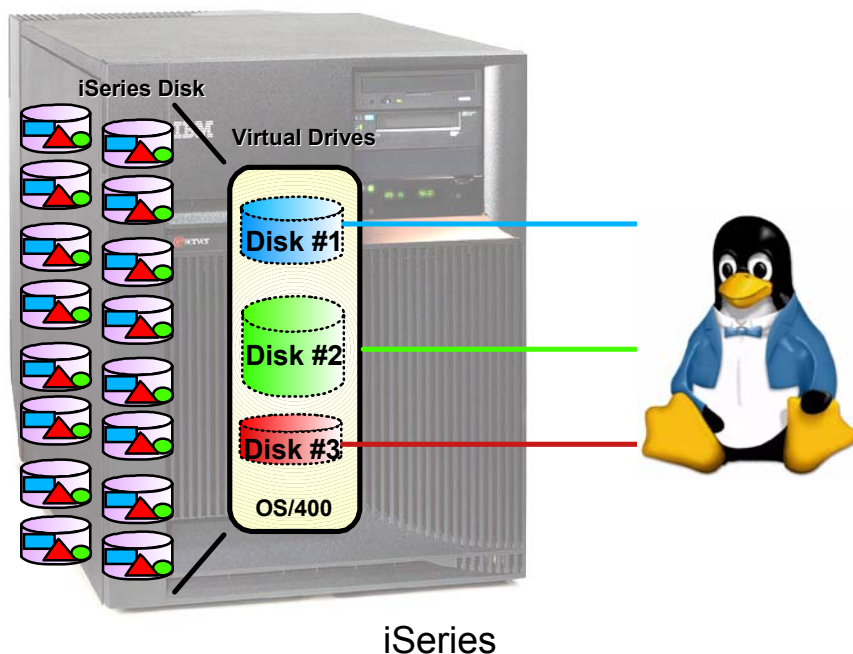
OS/400

iSeries

Linux can Benefit From:
- ► iSeries Storage Management
- ► Improve performance with more disk arms
- ► Consolidated Backup of OS/400 and Linux
- ► Flexible Storage Management
- ► Easy setup of multiple Linux environments

Storage virtualization enables Linux to leverage the advanced iSeries storage architecture
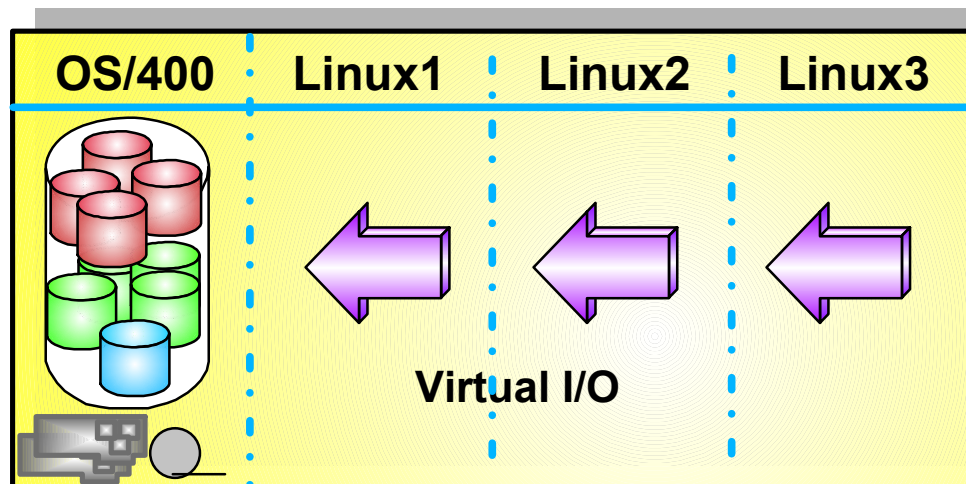
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Virtual I/O and Shared Storage Spaces

Before: Server Farm

System   Variable   Static   Tape   LAN   RAID

System   Variable   Static   Tape   LAN   RAID

System   Variable   Static   Tape   LAN   RAID

System   Variable   Static   Tape   LAN   RAID

After: iSeries

OS/400	Linux1	Linux2	Linux3

Virtual I/O

With a Single Pool of Resources

- ► Fewer disk drives, tape drives and LAN adapters can be used
- ► Resources can be shared
- ► Resources can easily be moved to where they are needed

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Linux for iSeries

Available from distributors

▸ **SuSE Linux Enterprise Server 7**
- 64-bit kernel
- Available January, 2002
- http://www.suse.com/us/products/suse_business/sles/sles_iSeries_pSeries/index.html

▸ **Turbolinux Server 7 for iSeries**
- 64-bit kernel
- Available, April 2002
- http://www.turbolinux.com/products/iseries/index.html

▸ **Red Hat 7.1 for iSeries**
- 32-bit kernel
- Available February 2002
- http://www.redhat.com/software/linux/ibmseries/

Linux on iSeries: Key Solutions

Included with Distributions

- ▸ Samba - file server
- ▸ Apache - web server
- ▸ Squid - proxy server
- ▸ DNS/DHCP
- ▸ MySQL - database
- ▸ ...

Open Source

- ▸ Tomcat - web application server
- ▸ OpenOffice - office suite
- ▸ ...

ISVs

- ▸ Symantec - Enterprise Firewall
- ▸ eOne - Commerce
- ▸ Sage - business applications
- ▸ Bynari - mail server
- ▸ MAPICS - ERP
- ▸ Dimensional Insight - BI
- ▸ Vision Solutions - HA
- ▸ Cybozu - workgroup

IBM Software SODs

- ▸ DB2 UDB
- ▸ WebSphere Application Server

More http://www-1.ibm.com/servers/eserver/iseries/linux/apps.html

Red Hat Linux for iSeries

Red Hat, Inc.

17 October 2002

Kerry Kim

Product Manager

Red Hat Linux for IBM's eServer Platforms

Agenda

- **Current products**
  - Red Hat Linux 7.1 for iSeries (32 bit)

- **Upcoming products**
  - Red Hat Linux 7.1 for iSeries (64 bit)
  - Red Hat Linux Advanced Server for iSeries (64 bit)

- **Why Red Hat?**

- **Red Hat and IBM Global Alliance**

- **For more information**

Red Hat Linux for iSeries

- **Open Source Linux Operating System – kernel, development libraries, and tools and utilities for installing and maintaining Linux systems**

- **Reliable, scalable and cost effective alternative to proprietary Unix and Windows operating systems**

- **Utilizes the same 7.1 code base as Red Hat's other Linux OS products (IA-32, Itanium, Alpha, etc.)**

- **Optimized for IBM's eServer iSeries hardware**

Current Offerings (32 bit)

	Good	**Better**	**Best**
Operating System and Software Maintenance	**Red Hat Linux 7.1 for iSeries (32 bit kernel)** • Operating system – source and binary packages • Documentation – installation guide, reference guide, customization guide, and getting started guide • 30 days of web based installation support • One year of software maintenance • Price is $495 per server per year		
Support Services	**System Response Services – Std.** • One year of remote telephone and web based technical support (installation, basic configuration) • Support available during standard business hours (9 x 5) • Starting at $4750 for five server minimum purchase	**System Response Services – 24 x 7** • One year of remote telephone and web based technical support (installation, basic configuration) • Support available 24 hours a day, 7 days a week (24 x 7) • Starting at $6415 for five server minimum purchase	**Premium System Response Services** • One year of remote telephone and web based technical support (installation, basic and advanced configuration) • Support available 24 hours a day, 7 days a week (24 x 7) • Starting at $10,000 for five server minimum purchase
Professional Services	**Consulting and Engineering Services** • Custom consulting services – assessment, design, deployment, integration, and proof of concept services • Custom engineering services – OS customization, performance tuning, application porting services • Prices determined on a case by case basis		

Supported Hardware (32 bit)

Server Type	270	820	830	840
Supported Feature Models	2431, 2432, 2434, 2452DSD, 2454DSD	0150, 0151, 0152, 2435, 2436, 2437, 2438, 2456DSD, 2457DSD, 2458DSD, 2397, 2398, 2426DSD, 2427DSD	2400, 2402, 2403	2461, 2352, 2353, 2354, 2418, 2420, 2416, 2417, 2419

- **Supported Hardware**
  - For more detailed information about supported hardware, go to www-1.ibm.com/servers/eserver/iseries/linux/hardware.html

- **Minimum Requirements**
  - Memory
    - ✓ *256 MB RAM minimum for the primary partition that runs OS/400*
    - ✓ *64 MB RAM minimum for each Linux partition (128 MB recommended)*
  - Disk
    - ✓ *4 drives to support RAID array if using Hosted Linux (One or more Linux partitions have access to certain hardware of a "hosted" OS/400 partition)*
    - ✓ *3 drives to support RAID array if using Non-hosted Linux (I/O and devices are provided through native hardware attach)*
    - ✓ *16 GB for OS/400 partition*
    - ✓ *2 GB minimum for each Linux partition*
  - LAN Adapters
    - ✓ *1 recommended for the OS/400 partition*
    - ✓ *1 recommended for each Linux partition*
  - Software
    - ✓ *OS/400 V5R1 with appropriate PTFs (see www-1.ibm.com/servers/eserver/iseries/linux/ptfs.html for the PTFs required)*

- **Operating Mode**
  - Natively within in an LPAR (logical partition) – requires OS/400 to be running in the main partition
  - Depending on the feature model, up to 31 Linux partitions are supported

Value Proposition (32 bit)

- **Cost effectively run your independent core business applications, and centrally manage your e-Business IT workloads with Red Hat's open source Linux operating system and IBM's eServer iSeries computer hardware**

- **Linux advantages**
  - Low cost – Affordable open source platform for your e-Business applications
  - Flexibility – OS can be customized for your specific purpose
  - Portability – Applications developed on one platform can be easily ported to another platform
- **IBM eServer iSeries advantages**
  - Reliability – Industry leading single server availability
  - Manageability – Sharing of hardware resources possible between partitions
  - Extendibility – iSeries Storage Area Network facilities available for Linux partitions
- **Key Features**
  - 2.4.3 kernel, gcc 2.96, glibc 2.2.4
- **Key Benefits**
  - Lower operating costs through server consolidation and improved manageability
  - Easier, faster application porting through a common source base (Red Hat Linux 7.1)
  - Better extension and enhancement of existing OS/400 applications with Linux applications running on up to 31 separate Linux servers, all on the same iSeries hardware

Upcoming Products

- **Red Hat Linux 7.1 for iSeries (64 bit kernel)**
  - 64 bit kernel, 32 bit applications
  - ext3 and Red Hat Network
  - More supported hardware – 270, 820, 830, 840, 890
  - Availability – 4Q2002

- **Red Hat Linux Advanced Server for iSeries (64 bit)**
  - Enterprise family of operating systems
  - 64 bit development environment
  - Enterprise kernel enhancements
  - Availability – Summer 2003

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Why Red Hat?

Red Hat is the world's premier open source and Linux provider

Expertise. 7 of the top 10 Linux kernel developers, 6 of the top 10 software tools engineers

Global capabilities. Broad range of enterprise software and services, backed by an expert 24/7 global support organization

Financial stability. $287 million in the bank and zero long term debt

Industry support. Red Hat Linux has 52% market share and has gained the broadest ISV and IHV support

Red Hat Value Add: Engineering
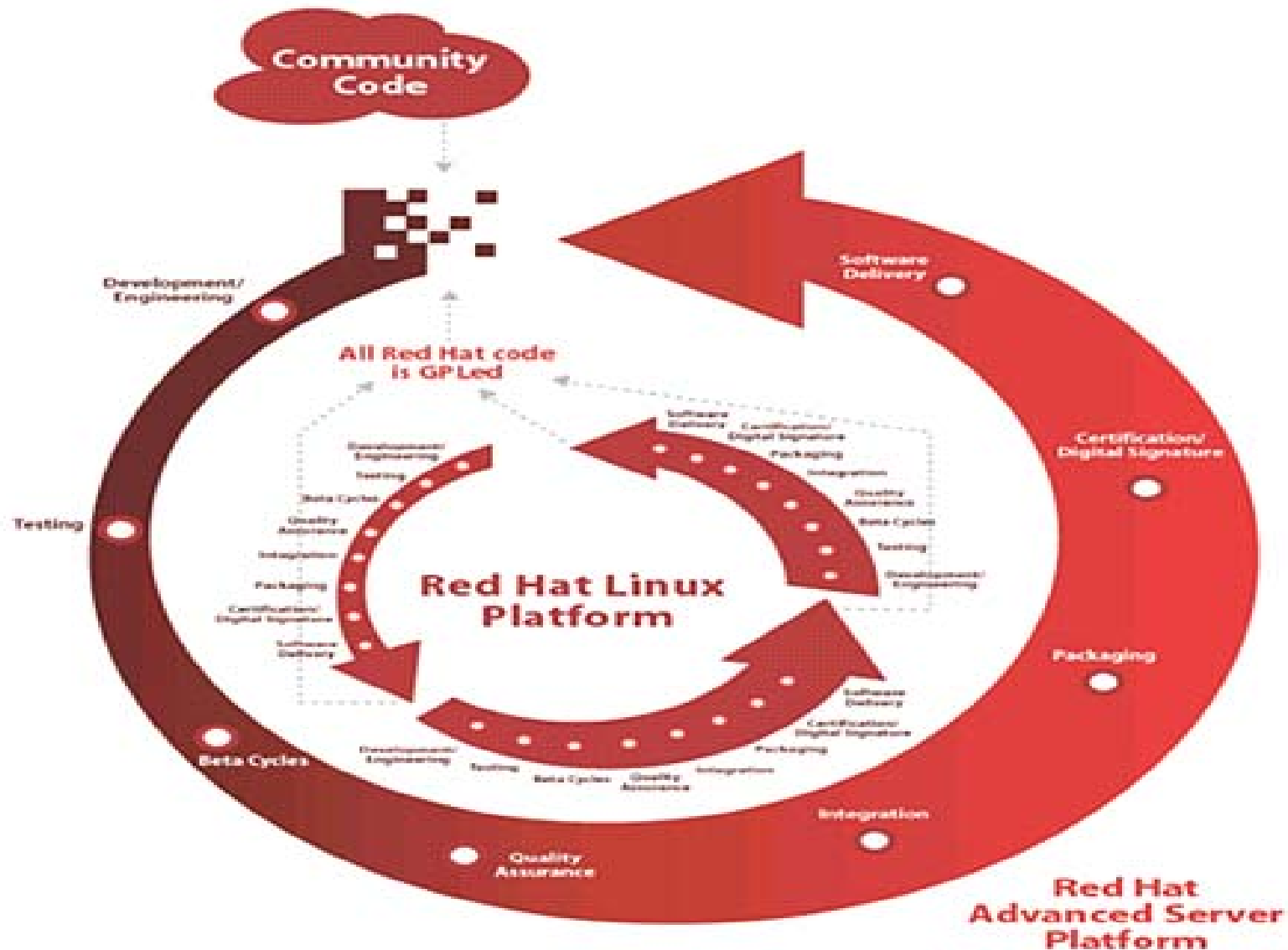
Global Organization

- Founded: 1995
- HQ: Raleigh, NC
- 22 locations worldwide
- 600+ employees
- 500+ enterprise customers
- IPO: August 1999 (NASDAQ: RHAT)
- $90M in annual revenues and $300M in cash
- Profitable and cash flow positive from recurring operations
- 17th most highly regarded high-tech brand (Harris Study)
- Named in Red Herring's Top 50 Public Companies

Financial Position

	May 31, 2002	February 28, 2002
Assets:		
Cash and investments in debt securities	$286,557	$286,977
Accounts receivable, net	15,306	13,019
Costs and estimated earnings in excess of billings	6,055	5,727
Inventory	1,201	885
Prepaid expenses and other assets	8,0__	7,49_
Property and equipment	20,___	_,___
Goodwill and intangibles, net	36,___	3___
Total assets	$373,645	$369,965
Liabilities		
Accounts payable and accruals	$___	17,302
_____ value	_,35_	8__4
Deferred lease credits	4,223	3,778
Other liabilities	17,500	12,612
Total liabilities	47,772	42,316
Stockholders equity:		
Noncontrolling interest in subsidiary	82	74
Common stock	17	17
Additional paid-in capital	627,650	626,633
Deferred compensation	(5,506)	(5,984)
Accumulated deficit	(288,098)	(283,805)
Treasury stock, at cost	(6,672)	(6,672)
Accumulated other comprehensive income (loss)	(1,600)	(2,714)
Total stockholders equity	325,873	327,549
Total liabilities and stockholders equity	$373,645	$369,865

$287 Million in the Bank. Zero Long Term Debt.

ISV support for Red Hat Advanced Server

Red Hat and IBM Global Alliance (Summary)

- **Expands upon our existing partnership of 4+ years**

- **Global, multiyear alliance to accelerate the commercial enterprise mainstream adoption of open source solutions worldwide, including emerging markets**

- **Alliance covers collaboration with IBM's services (IGS), hardware (eServer), and software (SWG) groups**

  - IBM will resell Red Hat Linux Advanced Server and Red Hat Network managed software services, and complement them with jointly delivered service and support offerings. Both companies will resell a subset of each others products and services to give customers maximum flexibility and choice, while providing customers end-to-end support with a single point of accountability, or a single face to the end customer

  - Red Hat and IBM will collaborate to drive high end features and functionality into Red Hat Linux Advanced Server and optimize performance across all eServer platforms

  - IBM will port, test and certify all of its major middleware, like DB2, WebSphere, Tivoli, and Lotus on Red Hat Linux Advanced Server, again across all its eServer platforms

Red Hat and IBM Global Alliance (Benefits)

Best of breed Linux technology (Red Hat) combined with one of the world's largest, most trusted services providers (IBM) to offer customers end to end Linux solutions

- **Price**
  - High value, low cost enterprise level Linux technology, services and support

- **Quality**
  - Reliable, enterprise hardened operating platforms
  - Rapid innovation in relevant enterprise technologies

- **Convenience**
  - What customers want, how they want it
  - Maximize flexibility and eliminate vendor "lock in"

For more information:

- **Please visit www.redhat.com**
- **Or call:**
  - Americas   866-2REDHAT (Toll Free)
    919-754-3700 (From outside the US)
  - EMEA   44-1483-300-169
  - Asia Pacific   61-7-3872-4811
  - Japan   81-3-3257-0411

e·ONEGROUP

Dan Watson

President

1-800-FAST-ROI

www.fastroi.net

www.eonegroup.com

eOneGroup mission

- eOneGroup provides software products and services to organizations wanting to:
  - Streamline Business Processes
  - Cut Costs
  - Increase Sales
  - Deploy integrated portals for customer, employees and partners
  - Reduce technical expertise required to create and maintain the website
- In Aberdeen Group's words, eOneGroup provides:
  - "Robust application simplicity, greater reach at a lower cost: The Second Wave of Sell-side commerce" (Kent Allen, Aberdeen Group)

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eOneGroup offers…

- Suite of Application Software that enables
  - B2C Commerce
  - B2B Commerce
  - Supply Chain
  - Customer Self Service
  - Complex Commerce
  - Complex Sales Channel Enablement
  - Web Portals
- Proven methodology and track-record
- End-2-end expertise for *all* aspects of an integrated web portal

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eOneGroup product suite

Value proposition

- Fast ROI
- Quick to Install
- Built to Easily Integrate
- Easy to Administer
- Advanced Features
- Scalable and Robust
- Pick your Platform
- Take ownership

Competitive advantage

- Connectivity and Integration

- Platform Independent

- Speed to Market and Implementation

- Lower Cost of Ownership

- Customer references

- IBM partnership

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Omaha Steaks

- Achieved 60% per order cost savings for internet orders
  - Savings in call center time
  - Use members, promotions, pricing, inventory from back-end systems
- Needed huge scalability—sometimes
  - Busy seasons (20,000 orders per day on website)
  - Wanted cost-effective solution that didn't "waste money" during slow seasons
- Very "promotion-driven"
  - Needed a website that marketing staff could manage & change themselves

Omaha Steaks ROI

In 2 years, website sales quadrupled and
cost went down 60%

Legend:
- Profit
- Cost

tommyB2B.com
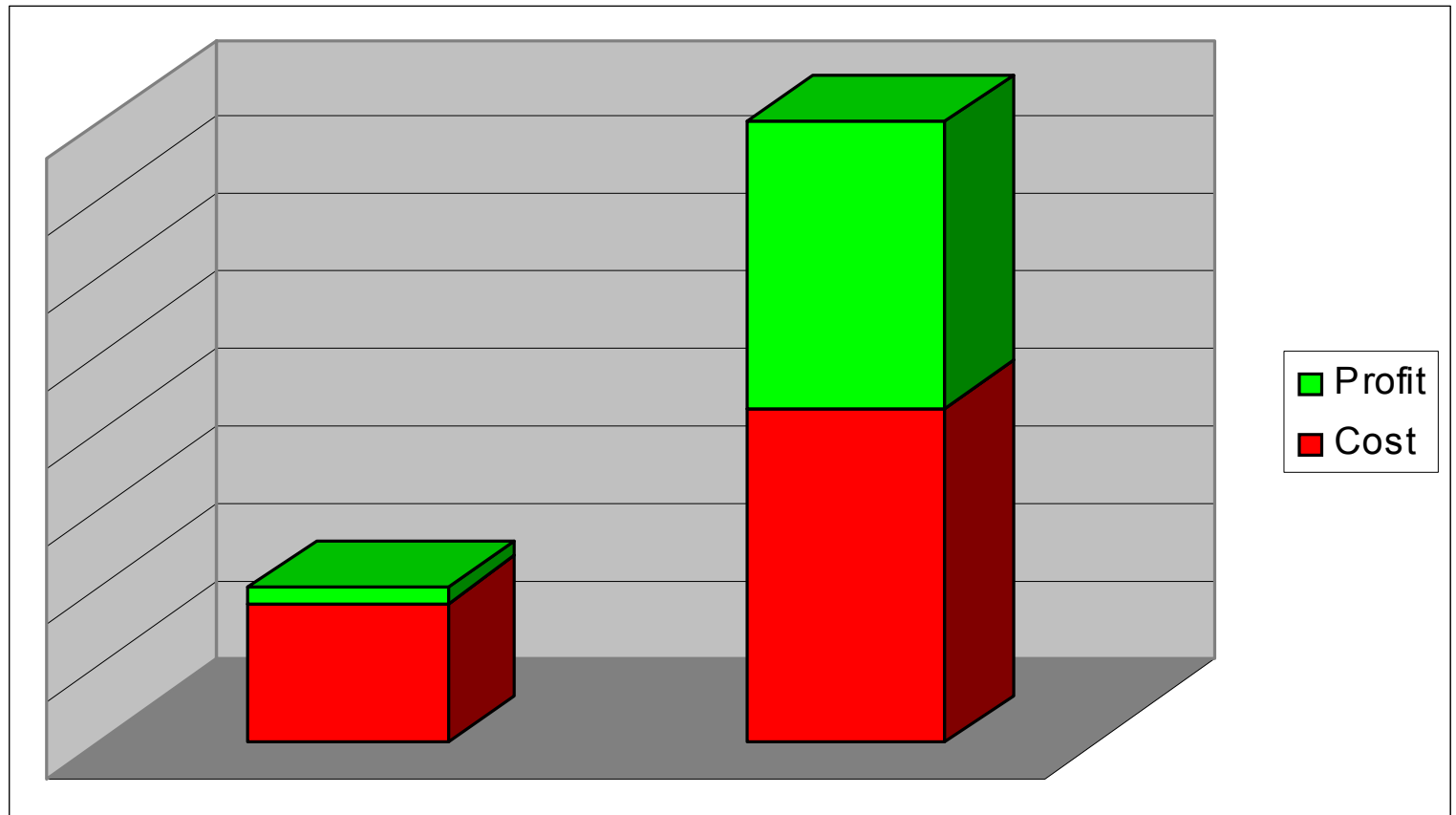
Tommy Hilfiger

- Losing business in small store channel
  - Couldn't address the small clothing shop using its existing (EDI-based) systems
  - Using Customer Service Reps and manual (phone/fax) order methods would not be profitable

- Had previously failed in disconnected commerce website attempt

- Wanted to get live quickly with outside resources, and then transition to internal maintenance of the site

- Needed to connect to multiple, disparate back-end systems

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tommyB2B.com

Tommy Hilfiger ROI

- Acquired > 3,000 new customers

- Replaced employee stores with website
  - No personnel required
  - No store inventory needed
  - No floor space needed
  - Eliminated all costs for employee store

- Manufacturing spec documents online
  - 24 X 7 access for Pacific Rim manufacturers
  - Eliminated physical paper distribution costs

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YKK (USA)

- Customers were demanding 24 X 7 real-time information to back-end data that resided in multiple (user-surly) systems

- Needed a portal that would enable customers to check inventory, place orders securely, track and review order status and history, and access a variety of links, including an online product catalog.

- Wanted a tightly integrated, highly customized, but turnkey solution they could eventually take ownership of

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YKK (USA) ROI

- Leveraged existing IT procedures, hardware, skillsets
  - Backup / Recovery
  - Operators
  - System management
- Customer self-service during initial pilot rollout saves > 10 hours of FTE time per day

Wolferman's Bakery

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Wolferman's Bakery

- First production xSeries "Blue Ice" commerce site
  - IBM Integrated eServer for eBusiness
  - xSeries 330, PIII 1.4GHz/133MHz
  - 1GB PC133 SDRAM ECC RDIMM
  - 36.4GB 10K Ultra160 SCSI HS HDD
  - Websphere App Server / DB2
  - eOneGroup's eOneCommerce
  - SuSe 7 Enterprise

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Past Problems – Future ROI

- Lost > 1000 orders last Christmas when website response time was > 2 minutes per page

- Lost repeat business because website not connected to inventory system

- Website changes were difficult to make

Why Linux?

- Traditional, brick-and-mortar companies care about total cost and ROI.
  - Choice of hardware platforms
  - Easy to manage
  - More stable, less buggy
  - Fast, lightweight, low system requirements
  - Low cost of entry

Why eOneCommerce?

- Excellent hooks to back-end
- Completely flexible and scalable
- Only HTML skills are required to maintain the system
- Compatible with ANY web server, application server, database or ERP system
- eOneGroup's customer focus
- Very competitive pricing

Product Suite Overview

Advanced shopping features

- One click buy

- Express item entry

- Up-sell / cross-sell / related links

- Mini-cart display

- Flexible browsing navigation and check out flow

- Unlimited item text, images

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Membership functionality

- Account Information
  - Can be a hybrid mix of eoneCommerce data and real-time back-end data
- Multiple ship-to addresses
- Role-based authority
- Email reminders / Calendar events
- Stand-alone or integrated order status and order history
- Member personalization
- Wishlist, send-a-link

eOneConfigurator

- Customer Configured
  - Manufacturing orders
  - Variable kit components

- Database-driven, dynamic HTML forms
  - edit boxes
  - combo boxes
  - text areas
  - radio buttons
  - check boxes

- Validates options and values, including "nested" dependent choices

- Sophisticated configuration pricing capability

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eOneClickstream

- Data Warehouse

  – All visitors

  – All pages browsed

- Marketing Analysis

  – Revenue vs. lost revenue

  – Products / promotions used

  – "Last page viewed" analysis

  – Click-path analysis

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eOneCampaigns

- Create and manage email campaigns based on
  – Who bought what
  – Demographics
  – Imported Lists
  – Opt-in newsletters
  – Product Announcements
- Features include
  – HTML / plain text email
  – Special promotional landing pages & pricing
  – …

eOneAdministrator

- GUI tool to manage all site content
  - Catalog data
  - Promotions
  - Events
  - Configurations
- Role-based "dashboard" panels
- Mass Import / Mass Updates
- Data publishing and promotion (Test to QA to Production)
- Data replication
- Real-time view of eoneClickstream data

Customer-proven success

- eOneCommerce provides all of the benefits of an application **with** all of the personalization of custom-written code

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eOneCommerce Portals