The Opportunity for Linux in a New Economy

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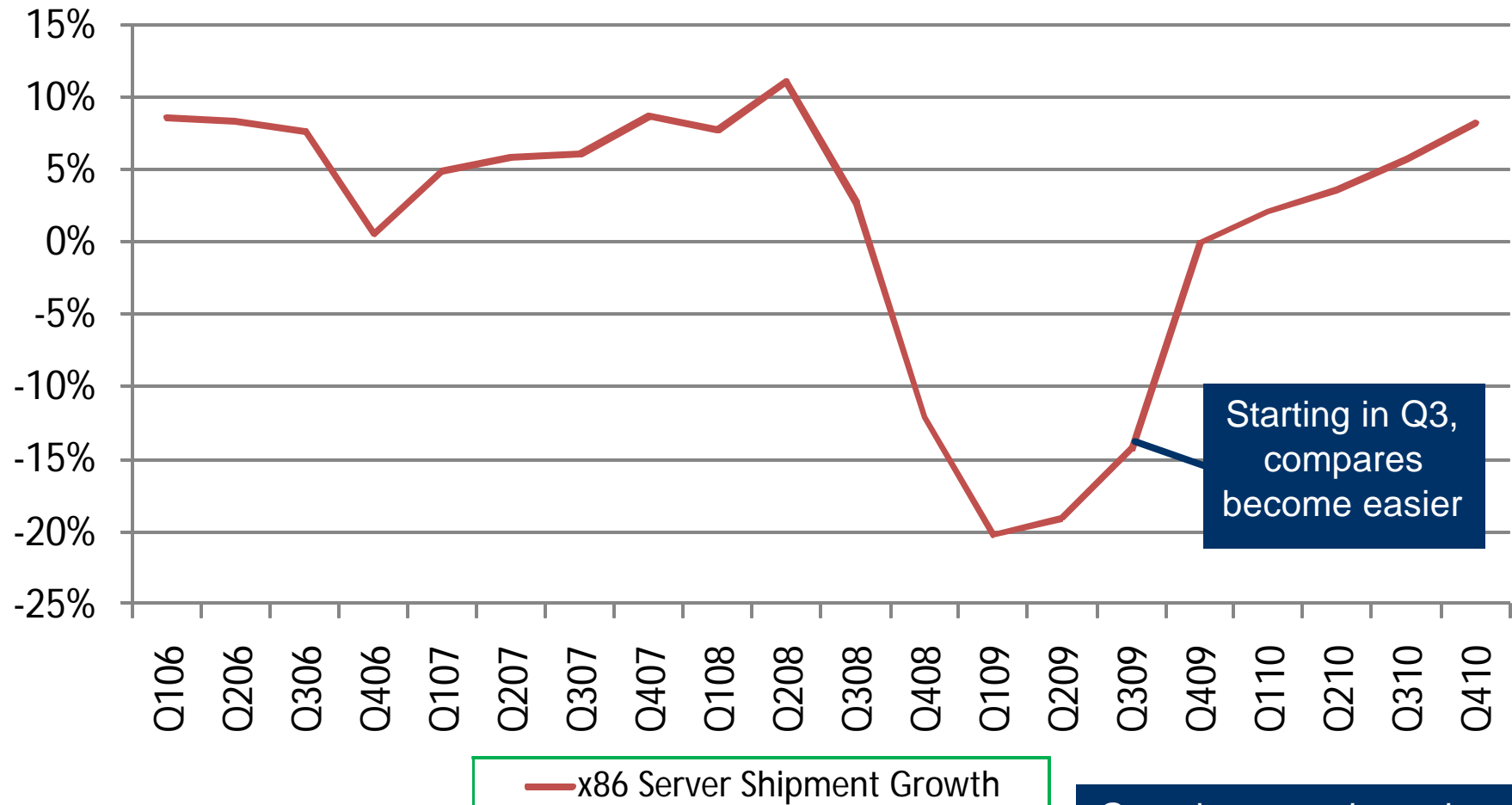
April 8, 2009

Agenda

- **Economic impact**

- Trends from past recessions – and how that applies today

- The role of virtualization software

- Outlook for the Linux ecosystem

- Essential Guidance

Economic Impact

- ## Slowdown in IT spend

  - Capex reduction mandatory for many customers

  - Worst in NA, second in WE, less so in AP – at least for now

  - Nonpaid solutions are likely to be hot: Linux, open source DBMS, middleware, tools

  - Watch for uptake on non-paid virtualization solutions

- ## ROI window compressed dramatically

  - Paybacks not realized this fiscal year are nonstarters

  - Difficult to justify new initiatives today

- ## New migration initiatives unlikely

  - If a migration was not already underway, is unlikely to start now

  - Existing skills will determine what is and is not done

- ## Everybody wants to declare victory in a down market

The Realities of Today's Market
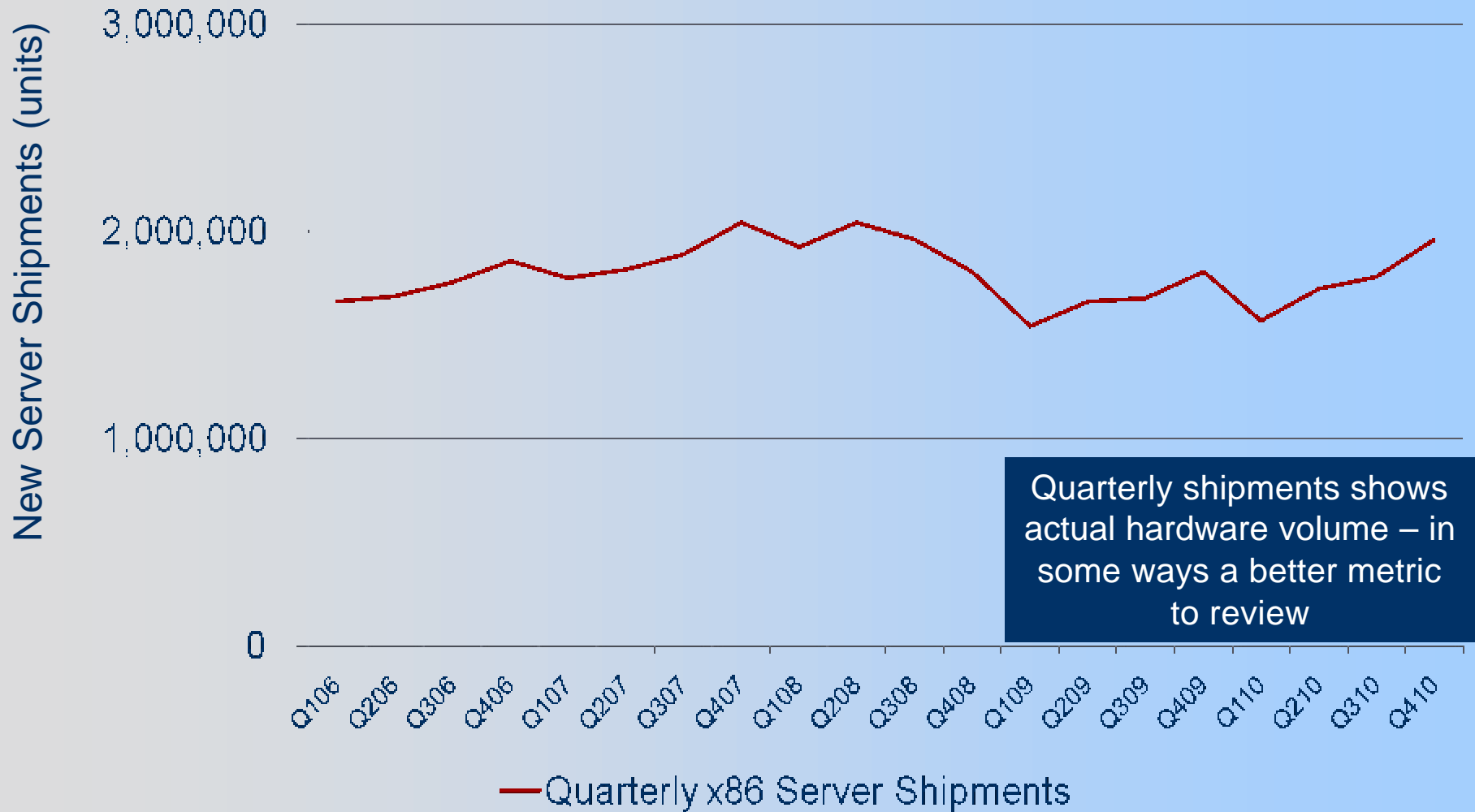## *Worldwide x86 Server Shipment Growth*

Quarterly x86 Server Shipments

Quarterly shipments shows actual hardware volume – in some ways a better metric to review
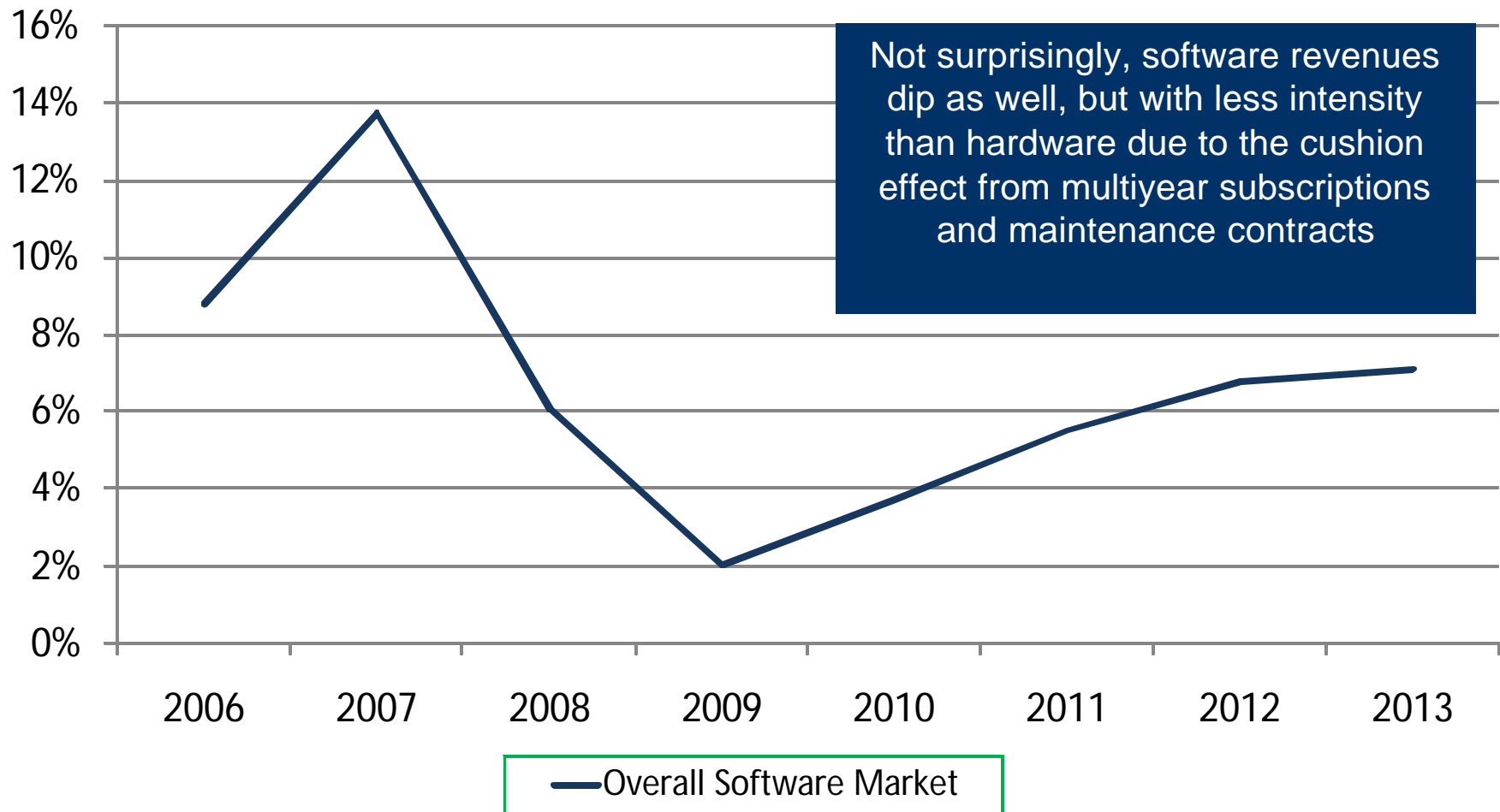
—— Quarterly x86 Server Shipments
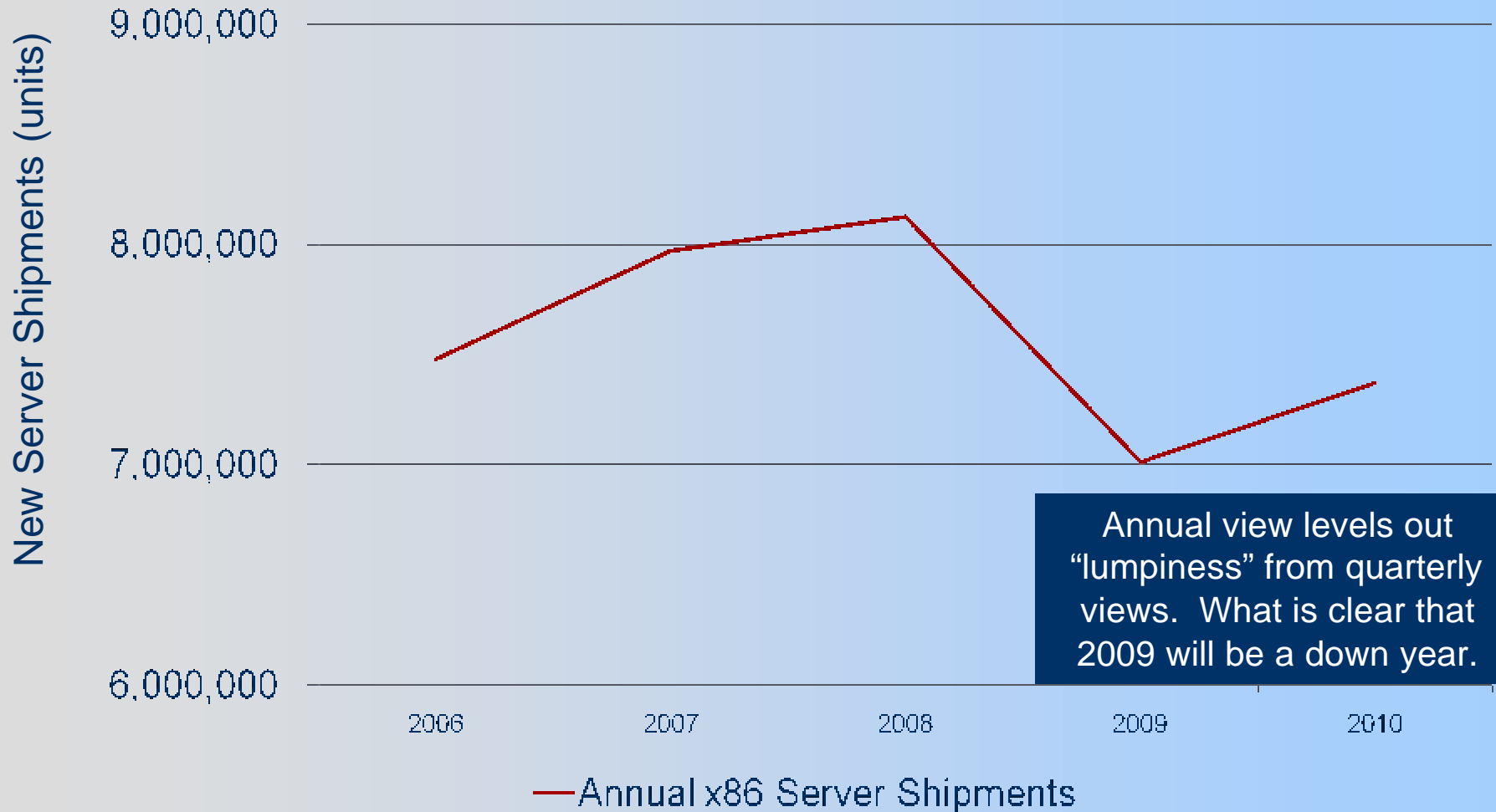
The Realities of Today's Market
Worldwide Y-Y Software Revenue Growth by Platform

Overall Software Market

Not surprisingly, software revenues dip as well, but with less intensity than hardware due to the cushion effect from multiyear subscriptions and maintenance contracts

Legend: Overall Software Market

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Legacy of the 2001-2002 Recession

- Linux adoption accelerates – with Unix experiencing collateral damage

- Enterprise distributions emerge; Linux business model shifts dramatically

- Linux becomes available on RISC and Itanium servers, System z

- Revenues begin to be measured in hundreds of millions of dollars

- Standardization on x86, Linux, Java, becomes a popular trend

- Linux credibility, scale, reliability, availability begins to accelerate

  – Application vendors sit up and take notice of Linux

  – No longer is Linux just a "PC operating system"

  – Enterprise attributes become a selling point of Linux

  – Linux becomes a viable competitor for winning Unix replacements

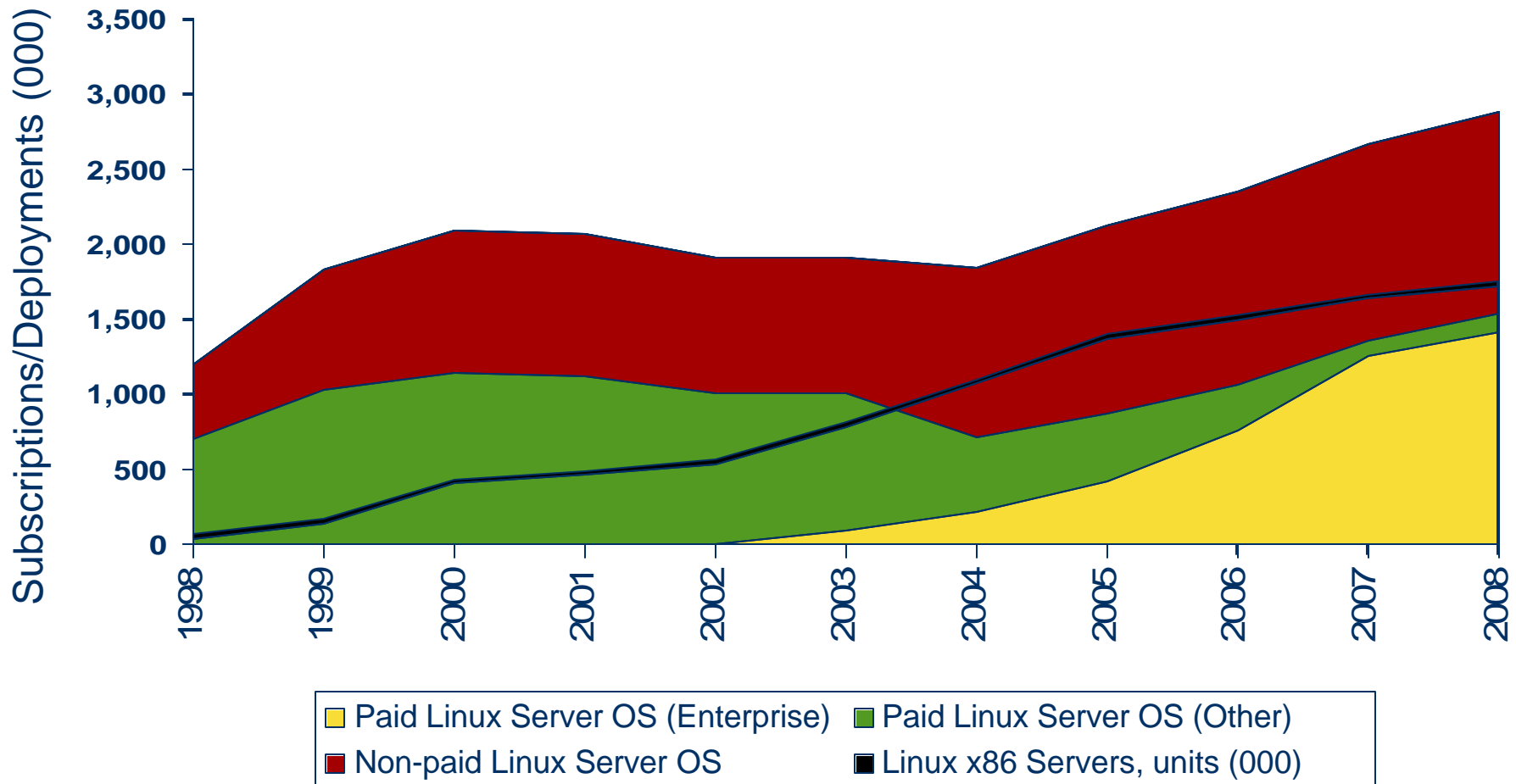 – Unix customers become the most lucrative prospects for Linux vendors

Linux Server OS vs. Server Data
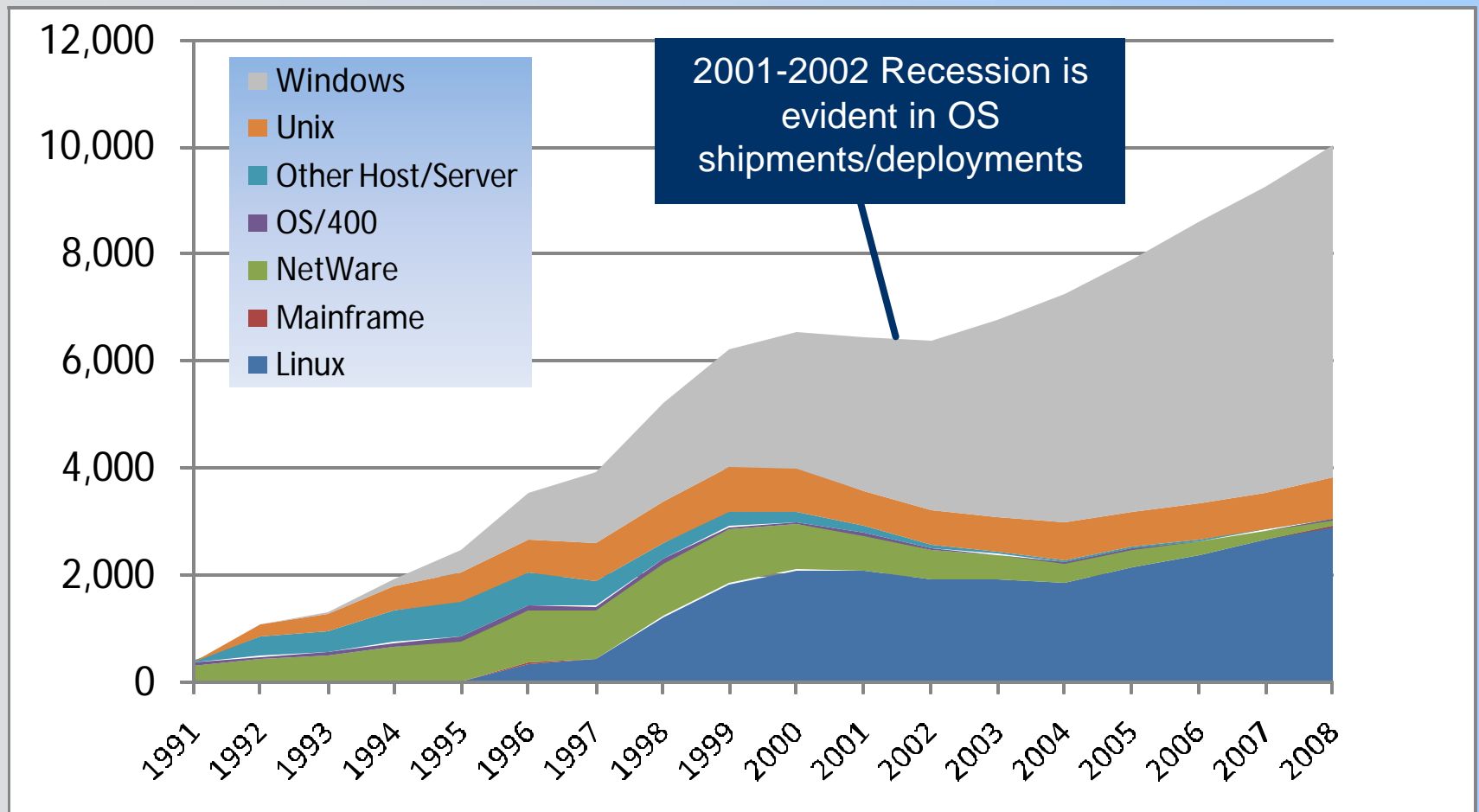## *Worldwide x86 Shipments/Subscriptions/Deployments*

Observations:
- Nonpaid Linux is not affected negatively by economic conditions
- Enterprise distros account for the vast majority of commercial Linux today

Legend:
- Paid Linux Server OS (Enterprise)
- Paid Linux Server OS (Other)
- Non-paid Linux Server OS
- Linux x86 Servers, units (000)

Source: IDC, 2009

Worldwide Shipments and Subscriptions
Looking at the industry holistically

IDC
Analyze the Future

Combined Shipments and Subscriptions and Nonpaid Deployments (000)

Legend:
- Windows
- Unix
- Other Host/Server
- OS/400
- NetWare
- Mainframe
- Linux

2001-2002 Recession is evident in OS shipments/deployments

What Happens *This Time*?

- Another wave of nonpaid software deployment

- "Free" servers become widely available thanks to virtualization software

- Irregularity in geographic recovery likely

- Unix increasingly under siege from Linux … and Windows

- Cloud may get a boost, but revenue from cloud Linux might not

- Windows, of course, does not go away

  – Nor does Microsoft cease to be a fierce competitor

- Transitions eventually mandate rationalization and assimilation

  – Managing nonpaid OSes

  – Managing hypervisors and guest OSes installed

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Virtualization as a Solution

- Lifecycles for OSes and apps will be extended

- Solutions that foster cost avoidance will be favored

- Customers will look carefully at virtualization rights

- Solutions that cost $0 will be tested and adopted

- These initiatives will result in permanent changes to how IT does business
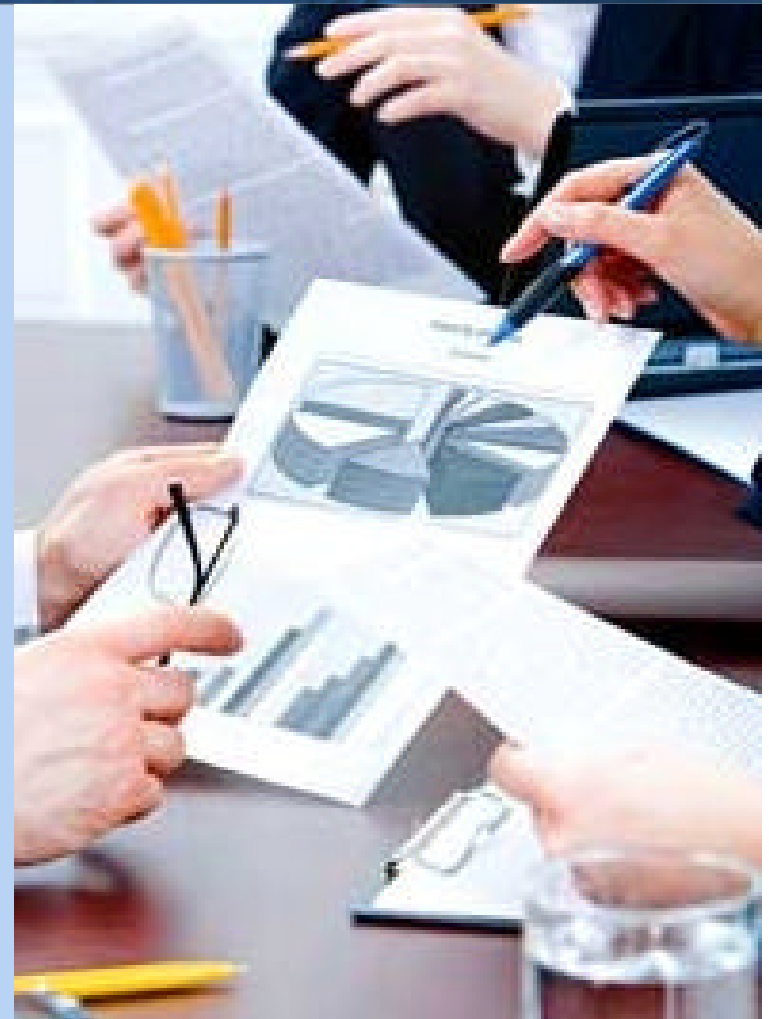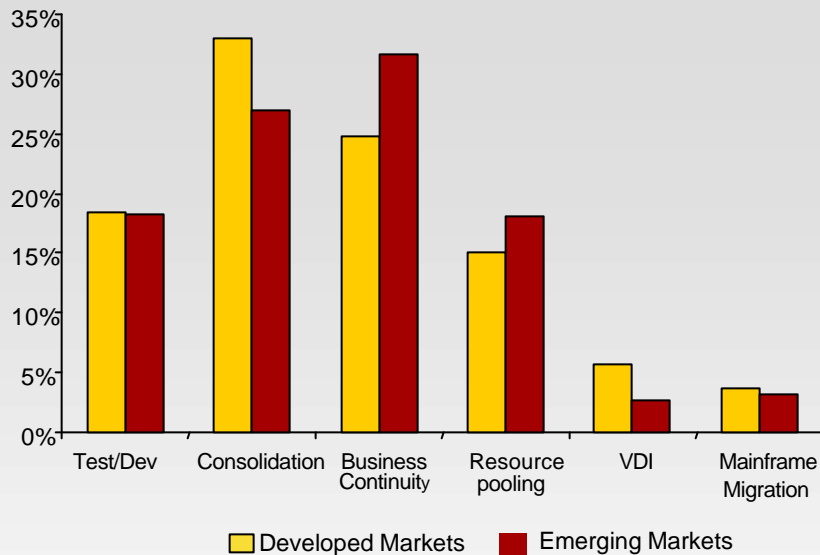
The Virtualization Effect

- We see a decoupling of hardware and software, via virtualization

- Virtualization takes two basic forms

  - Independent guests ("stand alone" OS)

    - Associated with nonpaid copies, less c

    - Affinity with less critical workloads

  - Replica guests ("child" copies)

    - Associated with enterprise distros, more critical workloads

    - Virtualization rates higher with enterprise subscriptions

- Rapid adoption of virtualization is changing the game

  - Within18 months, x86 VMs will outnumber physical machines

The Changing Nature of Virtualization

Percent of Respondents Ranking Capability Very Important

Companies under 1000 employees are as likely to employ virtualization for Business Continuity as Consolidation
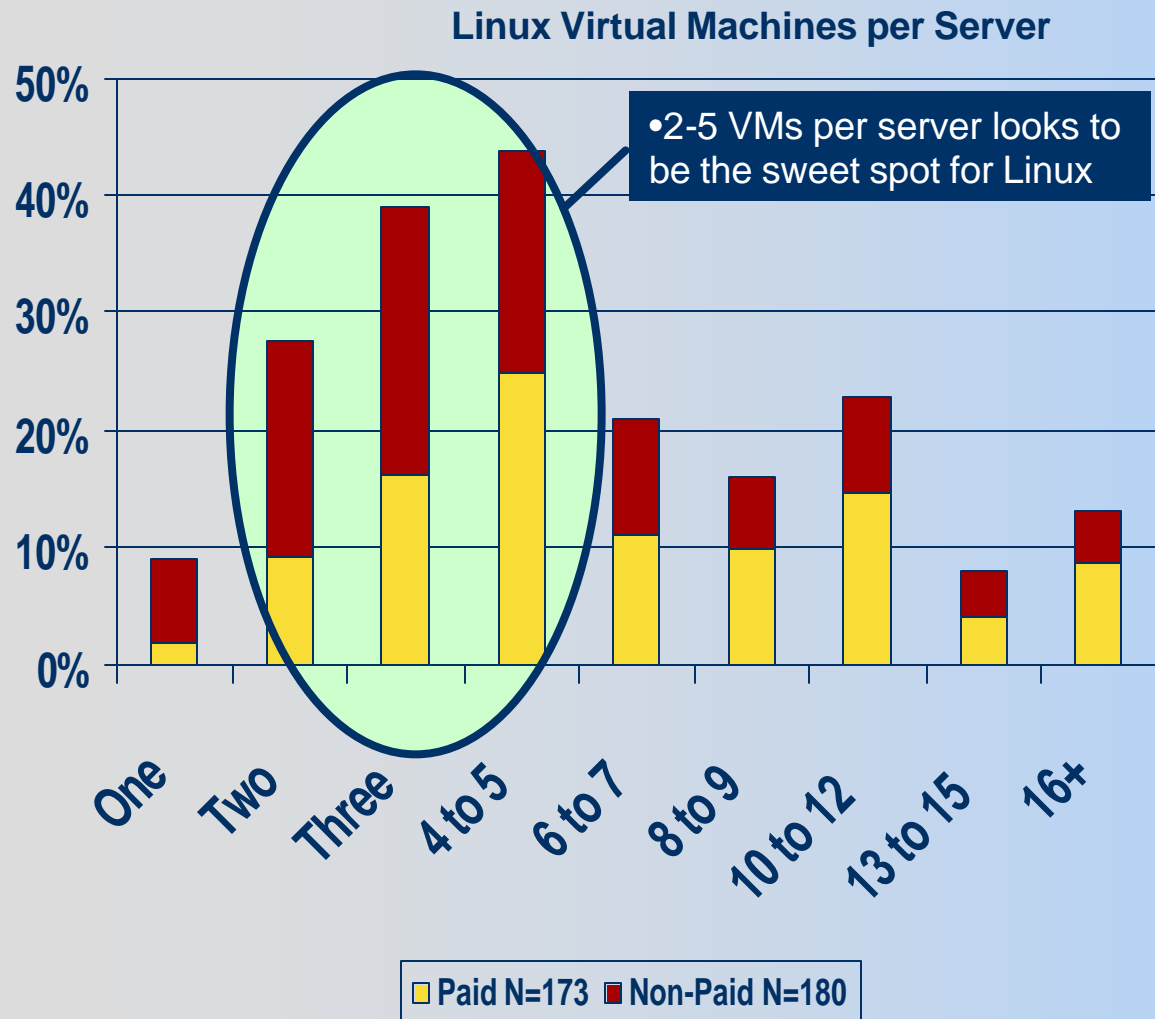
Organizations in emerging markets are more likely to employ virtualization for Business Continuity then Consolidation

Source: IDC Virtualization Tracker Survey, 2007 and 2008
Apr-09
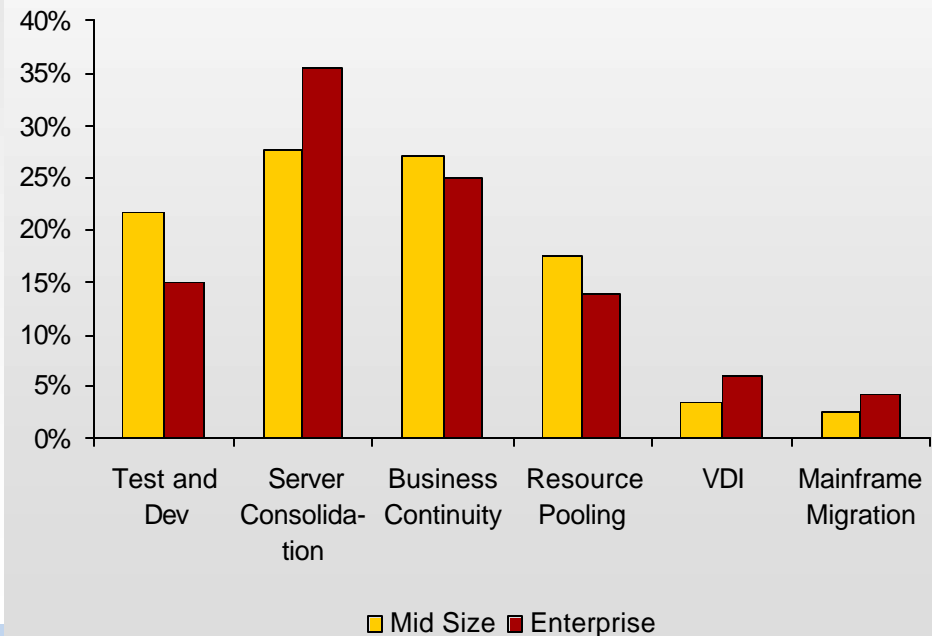
Linux Virtual Machine Density

B11. What is the average number of virtual machines PER physical server, aboard the servers that are running virtualization software?

Linux Virtual Machines per Server

•2-5 VMs per server looks to be the sweet spot for Linux

Chart x-axis: One, Two, Three, 4 to 5, 6 to 7, 8 to 9, 10 to 12, 13 to 15, 16+

y-axis: 0% to 50%

■ Paid N=173 ■ Non-Paid N=180

•Use of paid OS Linux peaks right in the virtualization sweet spot

• At low end of the virtualization use, non-paid Linux more favored.

• Theory: single VMs are for personal use, or for test/dev on a server, hence need to be free

• High end has low free Linux use

• Theory: high VM use indicates multiple programmers or high production use

• High VM use working on the same server system indicates production or heavy dev use, support is beneficial

Where does Virtualization Go Next?

- Pricing has been driven to $0

- Value-add moves to management

- Integration with hardware, OS

- Uniguest installations

- Heterogeneous hypervisor mgmt

- Managing offline images critical

Linux and Cloud Computing

- **Infrastructure clouds**
  - Services such as CPU, networking, and storage
  - Often presented as a virtual machine over the Web
  - User installs and manages their own OS and applications
  - Pay by the megabyte, gigabit/s, MIPS, etc.
  - Examples: Amazon EC2

- **Platform clouds**
  - An operating system and possibly infrastructure software,
  - Hosted in a Web-accessible location
  - May provide application development and runtime environment
 - Examples: Any Web hosting provider

- **Application clouds**
  - Virtualize an entire application (a.k.a. SaaS)
  - Consumed as a solution or individual services through APIs
  - Examples: Salesforce.com, Google
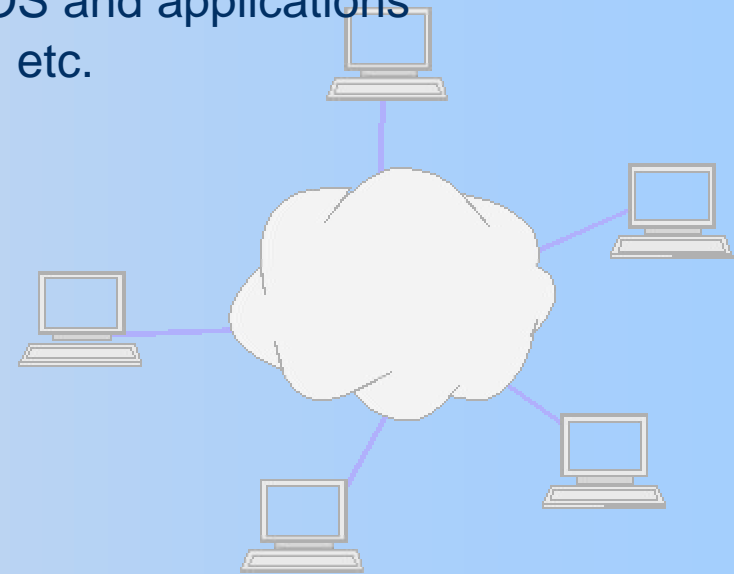
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Bellweather Company Results
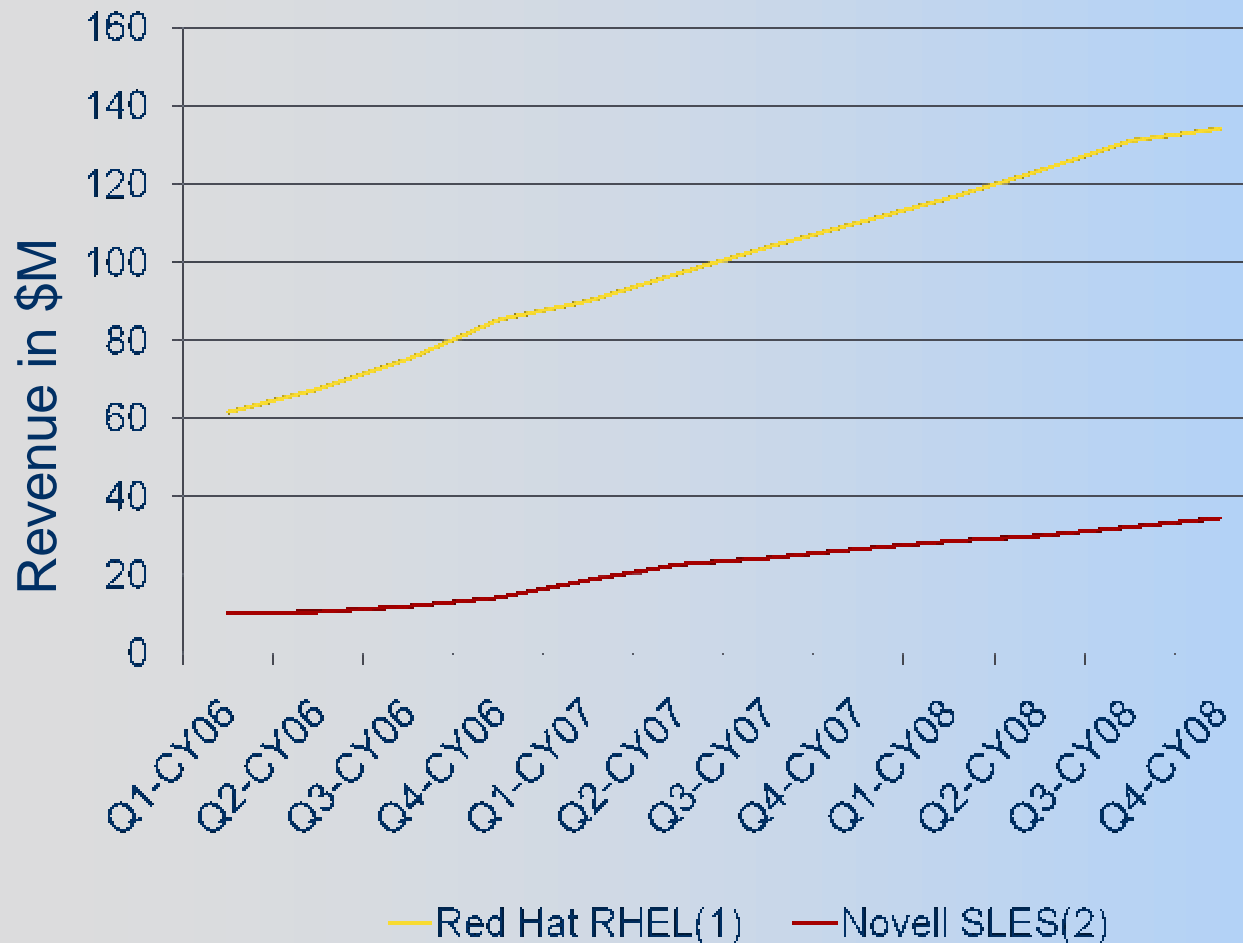
- No immediate impact from server hardware declines – because Linux software is only partially dependent on hardware

- Subscription revenues span multiple quarters over multiple years

- Subscriptions provide insulation from dramatic quarterly variations

- New billings are a more immediate metric

- New billings become less critical to any given quarter as install base grows

- Qualitative comments from both companies indicate a continued focus on opportunities around nonpaid conversions

Notes:
(1) Red Hat revenue includes subscription revenue only, calendar quarter corrected
(2) Novell revenue includes SLES revenue only, calendar quarter corrected

The Linux & Open Source Ecosystem

Worldwide revenues for hardware, packaged software and services aboard Linux

15.7% CAGR

Revenue ($M): 45,000 / 40,000 / 35,000 / 30,000 / 25,000 / 20,000 / 15,000 / 10,000 / 5,000 / 0

2007 2008 2009 2010 2011 2012

Legend:
- **Linux and Open Source Services***
- **Linux Server Hardware**
- **Application Software**
- **App Development & Deployment Software**
- **Linux Operating System**
- **System Infrastructure Software (excl. OS)**
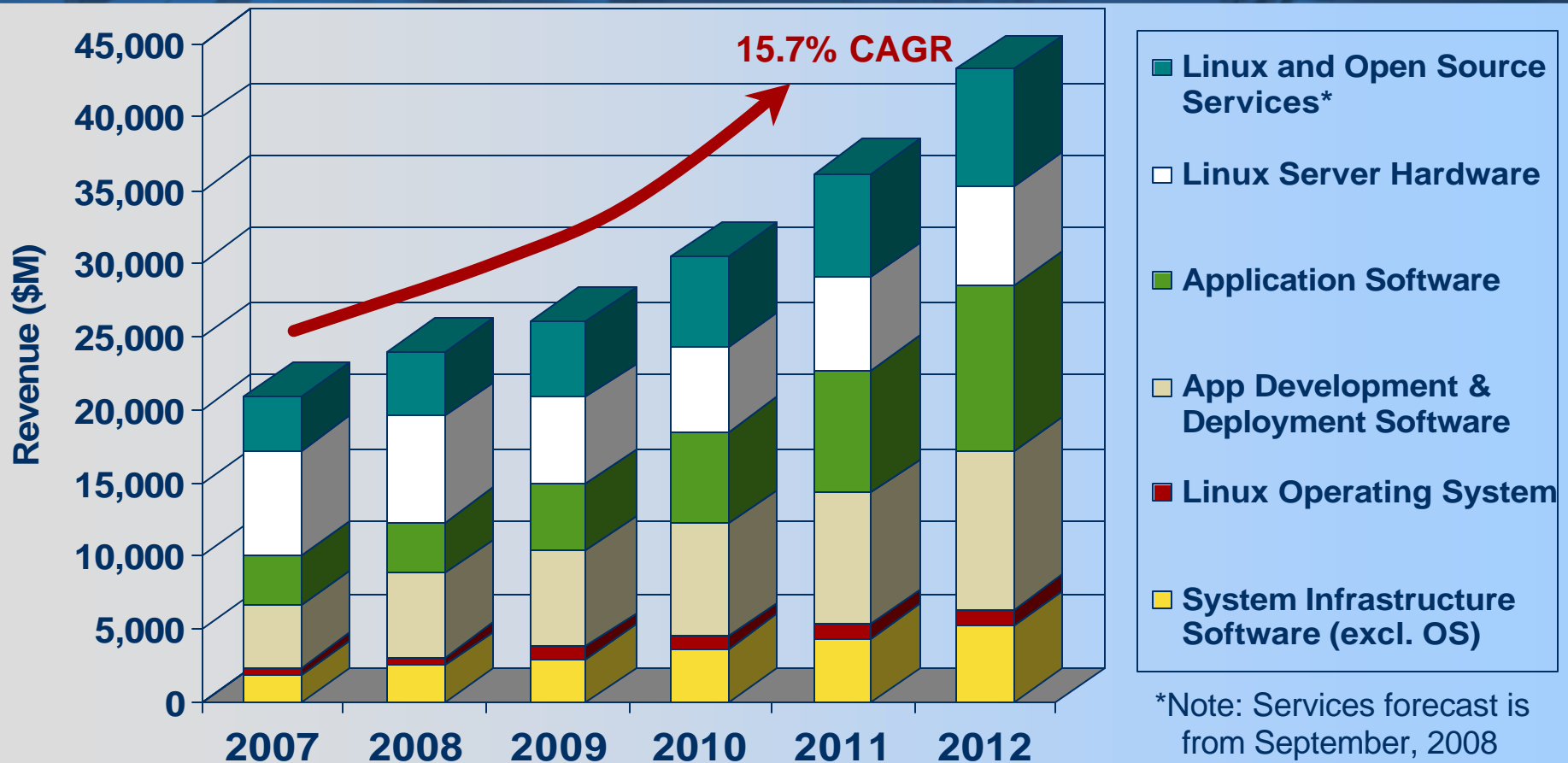
*Note: Services forecast is from September, 2008

What's missing from this picture?

Open source software used on Unix & Windows

(Such as JBoss on Windows, MySQL on Solaris, etc.)

PC hardware-related revenue

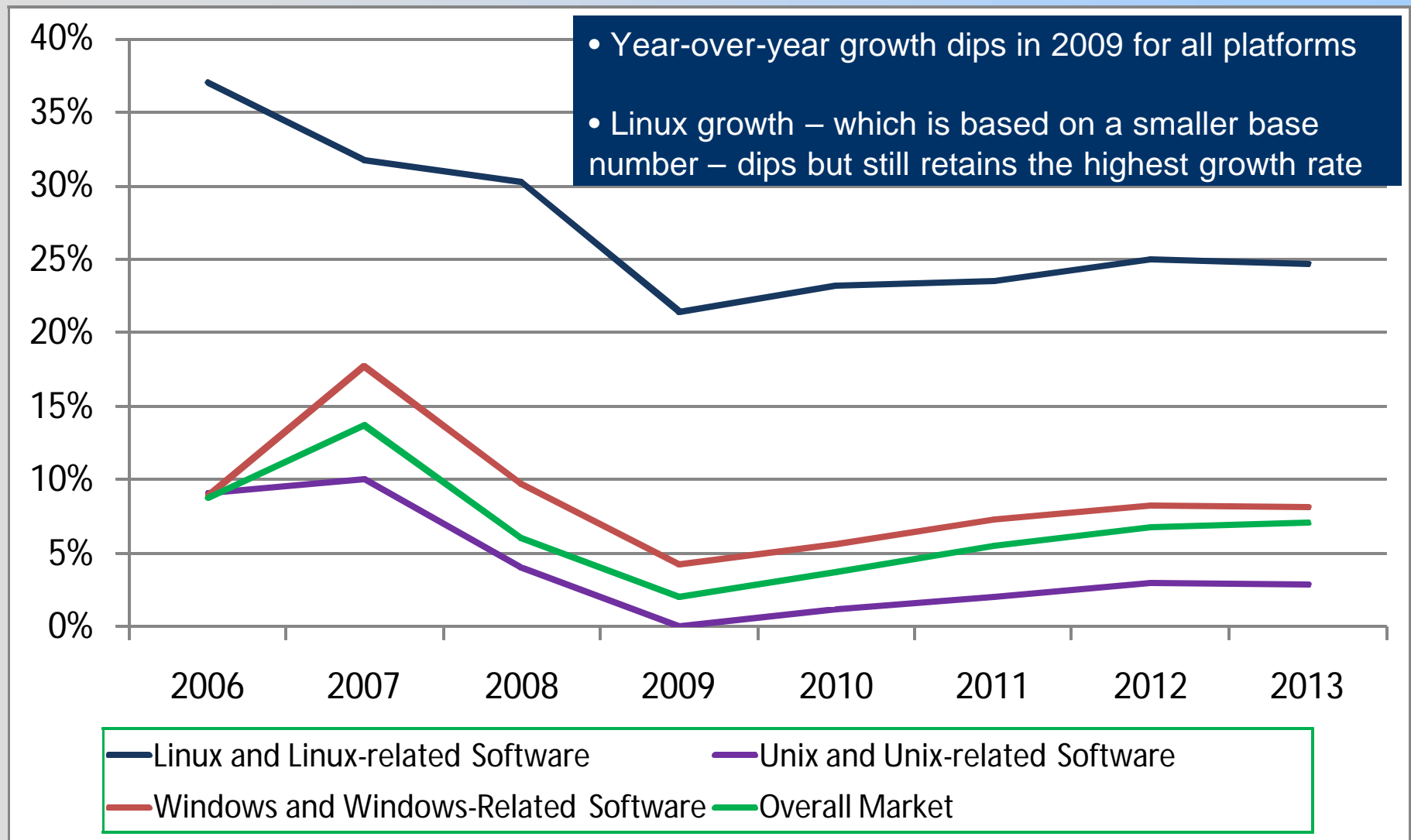**2007-2012 CAGRs:**

Software: 23.2%

Hardware: 0.6%

Services: 17%

Source: IDC, April 2009

- Solid revenue growth with Linux ecosystem

- Worldwide 2008-2013 Software CAGRs led by:
  - Application software: 33.8%
    - Includes ERP, CRM, supply chain management, manufacturing applications, and engineering application software
  - Application development & deployment software: 17.7%
    - Includes database, middleware, dev tools, dev life-cycle products, app deployment software/application serving/transaction/middleware and data analysis software
  - System infrastructure software: 19.3%
    - Includes Systems mgmt, virtualization software, storage, security

- Linux and open source-related services 2007-2012 CAGR: 17%
    - Systems integration, software deployment and support, outsourcing, education and training and consulting

- Linux x86 server hardware 2008-2013 CAGR: 1.6%

The Realities of Today's Market
Worldwide Y-Y Software Revenue Growth by Platform

- Year-over-year growth dips in 2009 for all platforms
- Linux growth – which is based on a smaller base number – dips but still retains the highest growth rate

Legend:
- Linux and Linux-related Software
- Unix and Unix-related Software
- Windows and Windows-Related Software
- Overall Market

Where Does Linux Grow from Here?

Worldwide software revenues for Linux and competitive environments
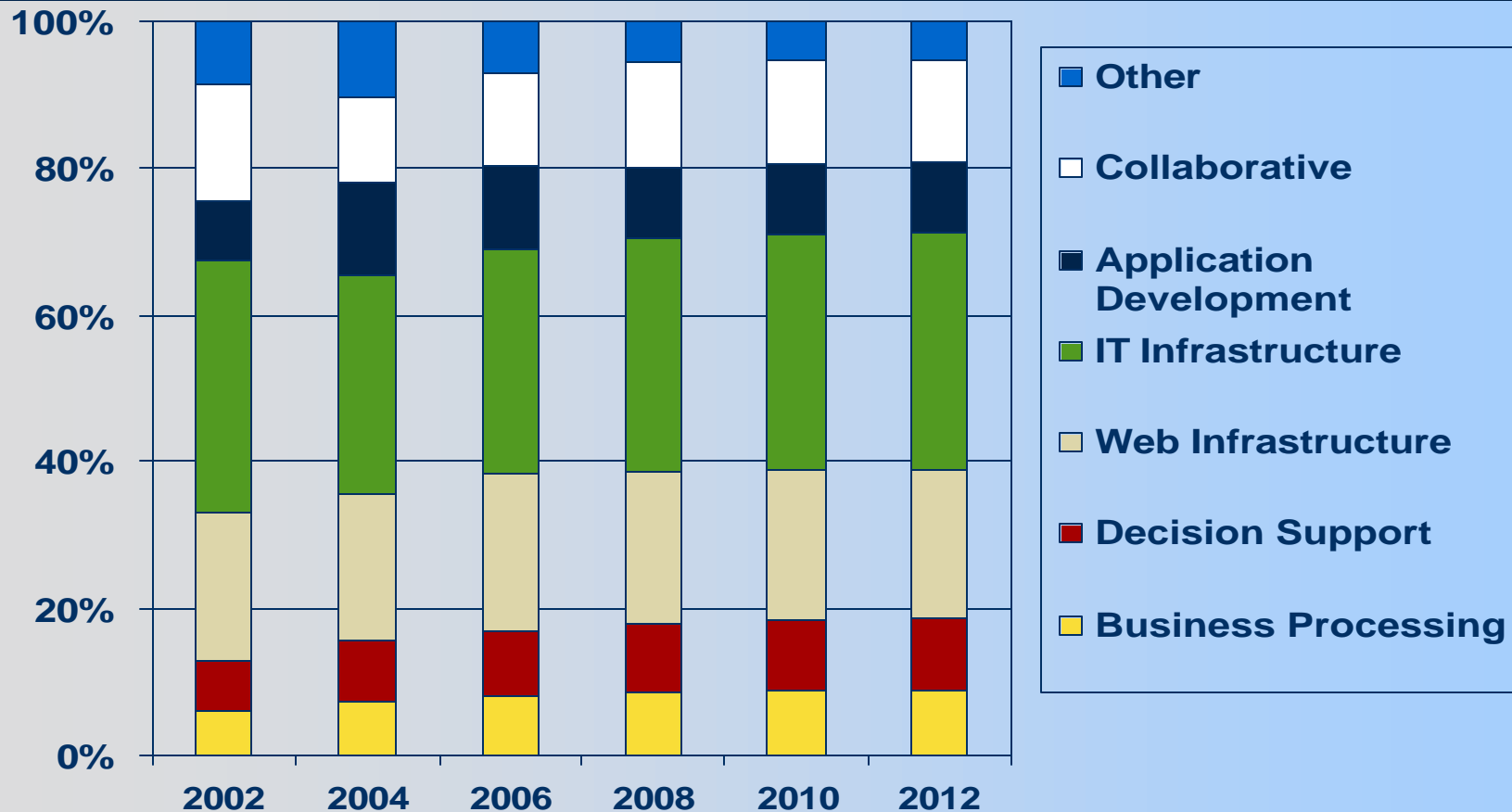
- Linux has highest growth
- By 2013, Linux-related software revenue is half that of Unix

- Growth for Linux ecosystem continues to be heavily driven by database and applications
- Windows growth includes client OS revenue

Legend:
- Applications
- Application Development & Deployment
- System Infrastructure Software

Source: IDC Software Market Forecaster, April 2009
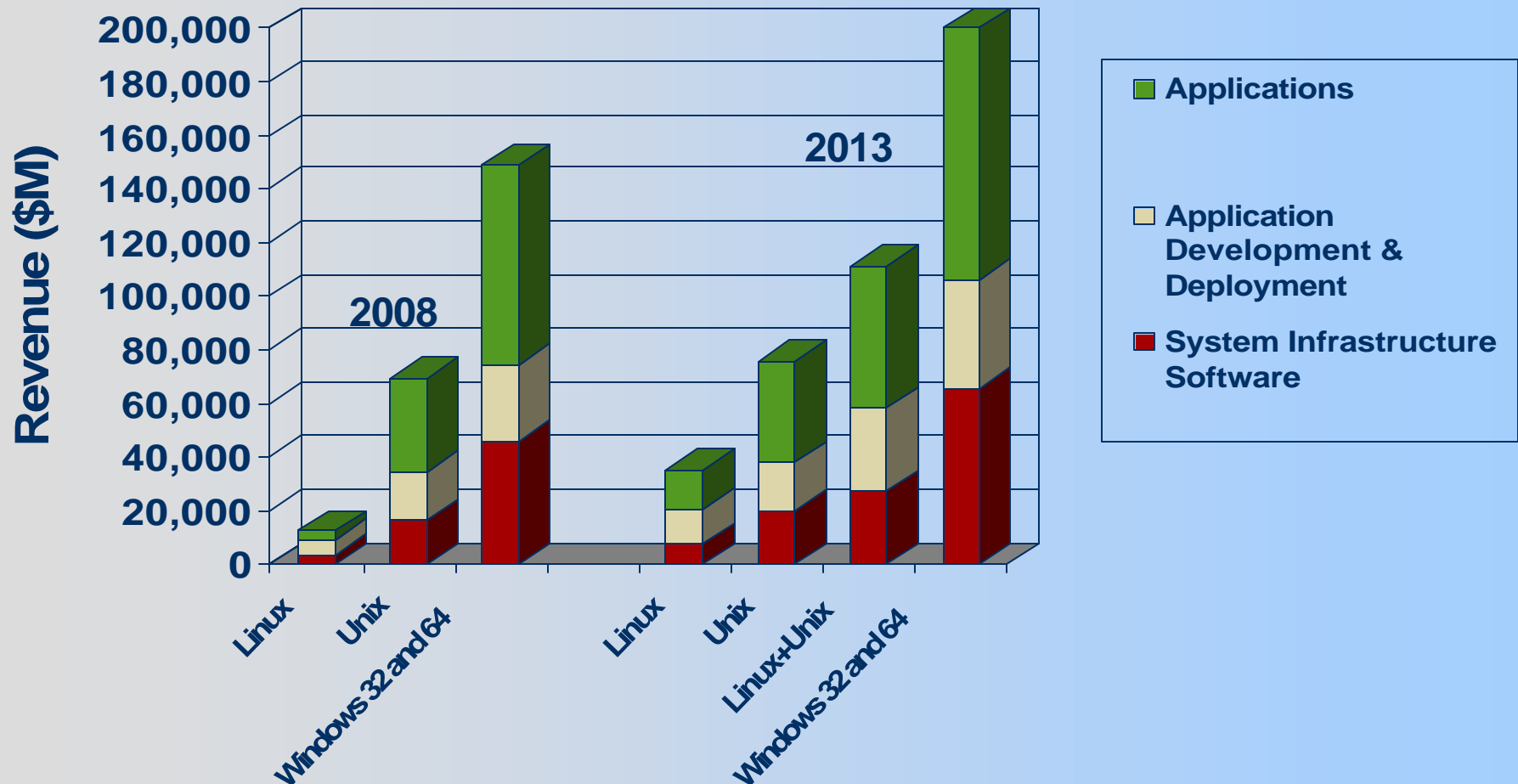
Evolution of Linux Servers by Workload

Worldwide Linux Server Shipments, 2002-2012 (% of shipment total)

IDC — *Analyze the Future*

- **Business Processing: 6% to 9% of total**
- **Decision Support: 7.1% to 9.6% of total**
- **IT infrastructure down by 2%**
- **Nonpaid likely impacts some segments**

Legend:
- **Other**
- **Collaborative**
- **Application Development**
- **IT Infrastructure**
- **Web Infrastructure**
- **Decision Support**
- **Business Processing**

Years: 2002, 2004, 2006, 2008, 2010, 2012

Source: IDC Server Workloads Study, 2008

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Drivers and Challenges for Linux

Drivers for Linux

- Capex concerns

- Virtualization
  - Guest acquisition costs
  - Ease of deployment

- Non-paid Linux
  - Larger ecosystem is good
  - Open source layered SW

- Increasing integration

- Software appliances
  - New form factors
  - New GTM scenarios

Challenges for Linux

- Capturing new customers
  - Particularly in a down economy
  - Freeing up resources
  - Staff training

- Non-paid Linux and OSS
  - Generates no revenue
  - Dries up survival funding

- Microsoft
  - Windows solutions
  - Applications

- Generating revenue from cloud

Essential Guidance

- Look at the current economic downturn as opportunity

- Use vitualization as an integration point for commercial and nonpaid Linux

- Remember that revenue is not the only metric that matters

- However, revenue is important to ensure a sustainable ecosystem that can penetrate less-sophisticated shops

- Linux can and will excel in next-gen deployment scenarios, including cloud computing and software appliances

Questions?

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