Red Hat Enterprise Linux 3
The Next Generation Of Enterprise Class Linux

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Agenda

- Why Red Hat Enterprise Linux

- Workstations

- High Performance Computing

- Summary

- Q & A

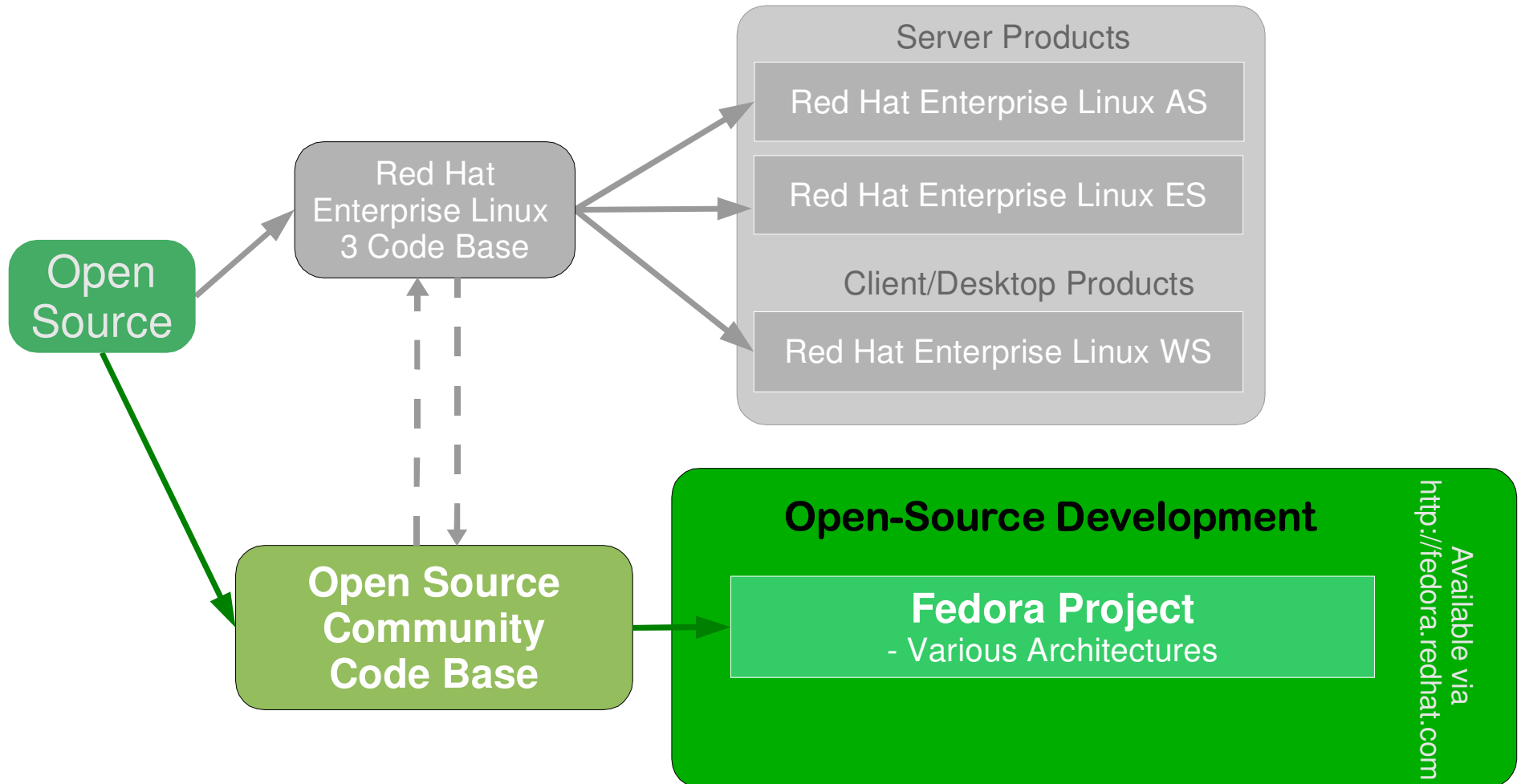# Why Red Hat Enterprise Linux?

Key Changes to Red Hat Linux

- Red Hat Linux products are going end-of-life (EOL)

  - *EOL = no bug fix errata and nosecurity errata*

- *Red Hat will no longer maintain these products on the following schedule:*

  - RHL 6.x, 7.0 – Already EOL

  - RHL 7.1, 7.2, 7.3, 8.0 – EOL Dec. 31, 2003

  - RHL 9 – EOL April 31, 2004

- When RHL 9 box sets aredepleted, RHL will no longer be available in stores, or through an RHN download

- OEMs will no longer be able to pre-load RHL *(All are moving to Red Hat Enterprise Linux)*

The Fedora Project

- Launched in September 2003 at http://fedora.redhat.com

- Community-driven and community-supported project to replace Red Hat Linux consumer product line

- Proving-ground for new technology that may eventually end up in Red Hat Enterprise Linux

- Not a Red Hat *product* – an open-source *project*

  - No support available from Red Hat

  - Driven by steering-committee, not Red Hat revenue constraints

The Fedora Project provides for open-source developement and allows Red Hat to share technical leadership

The Fedora Project

Open Source

Red Hat Enterprise Linux 3 Code Base

Server Products

Red Hat Enterprise Linux AS

Red Hat Enterprise Linux ES

Client/Desktop Products

Red Hat Enterprise Linux WS

Open Source Community Code Base

Open-Source Development

Fedora Project
- Various Architectures
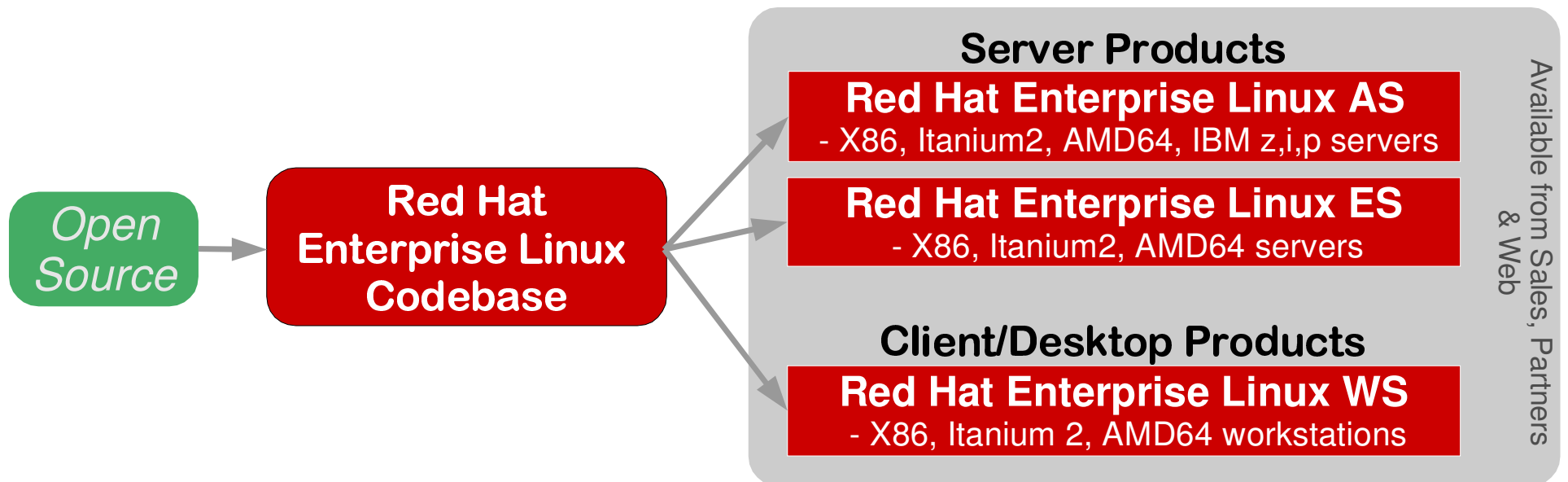
Available via
http://fedora.redhat.com

The Fedora Project

- Open source project sponsored by Red Hat

    - Promote collaborative development with other open source projects

    - Used as a base for Red Hat supported products

    - Provides rapidly evolving technology driven Linux distribution

    - Open, highly scalable development and distribution model

- Designed to be an incubator and proving ground for new technologies

    - No set schedule for releases

    - No explicit Security Errata/Support

    - Fixes published for 2-3 months after release

    - Individual package developers QA and support

    - No focus on compatibility

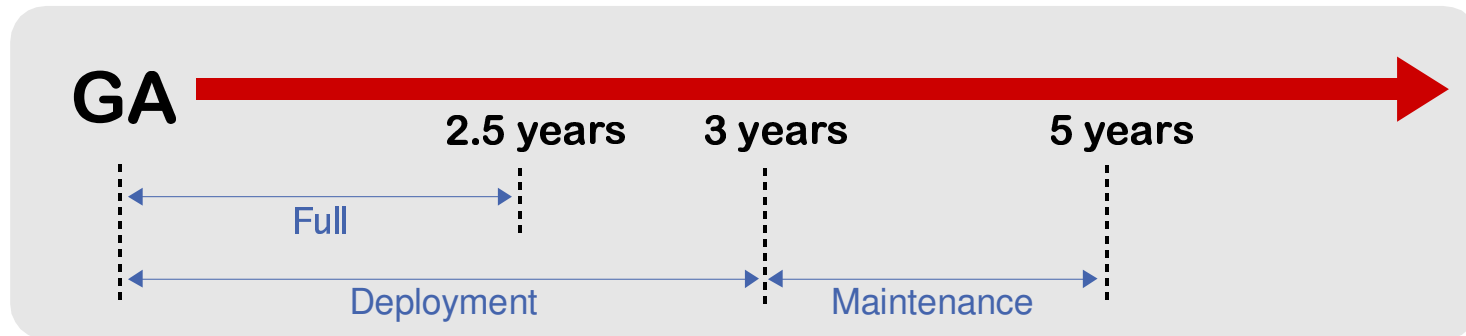   - No Alpha/Beta Programs

    - No Integration Testing

Red Hat Enterprise Linux

- Delivered via a subscription model where one price covers everything
  - Product – Binaries, sources, and documentation
  - Upgrades – New releases at no extra charge
  - Maintenance – Updates and errata (security & bug fixes)
  - Support – Up to 7x24x365 SLAs available with unlimited calls
- Predictable – fixed costs means no surprises
  - Scalable – Multiple price points for different SLAs
  - Volume discounts available
  - Multi-Year Agreements
- Available directly from Red Hat, or through select OEMs

Enterprise Linux 3 Product Family

Open Source → **Red Hat Enterprise Linux Codebase**

Server Products

Red Hat Enterprise Linux AS
- X86, Itanium2, AMD64, IBM z,i,p servers

Red Hat Enterprise Linux ES
- X86, Itanium2, AMD64 servers

Client/Desktop Products

Red Hat Enterprise Linux WS
- X86, Itanium 2, AMD64 workstations

Available from Sales, Partners & Web

Enterprise Linux Lifecycle

- Three Phases of Support

  - *Full Support:* Update Releases, bug fixes, security fixes

  - *Deployment:* bug fixes, security fixes

  - *Maintenance:* critical bug fixes, security fixes

- Update Releases

  - Released every 3-6 months for during *Full Support*

  - Update releases include

    - Updated hardware support, including a new installer

    - All cumulatively published errata

Enterprise Linux Differentiators

- Extended development of new releases

  - 12-18 month release cycle

  - 5-year support life cycle

  - Targeted 6-month Alpha/Beta test cycle with extensive customer, partner and OEM involvement

- Regular, consolidated updates provided during product lifetime:

  - Bug fixes

  - Minor enhancements

  - Support for new hardware

Clear Choice for Development and Deployment

Open-Source Development

Fedora Project
- Various Architectures

Server Products

Red Hat Enterprise Linux AS
- X86, Itanium2, AMD64, IBM z,i,p servers

Red Hat Enterprise Linux ES
- X86, Itanium2, AMD64 servers

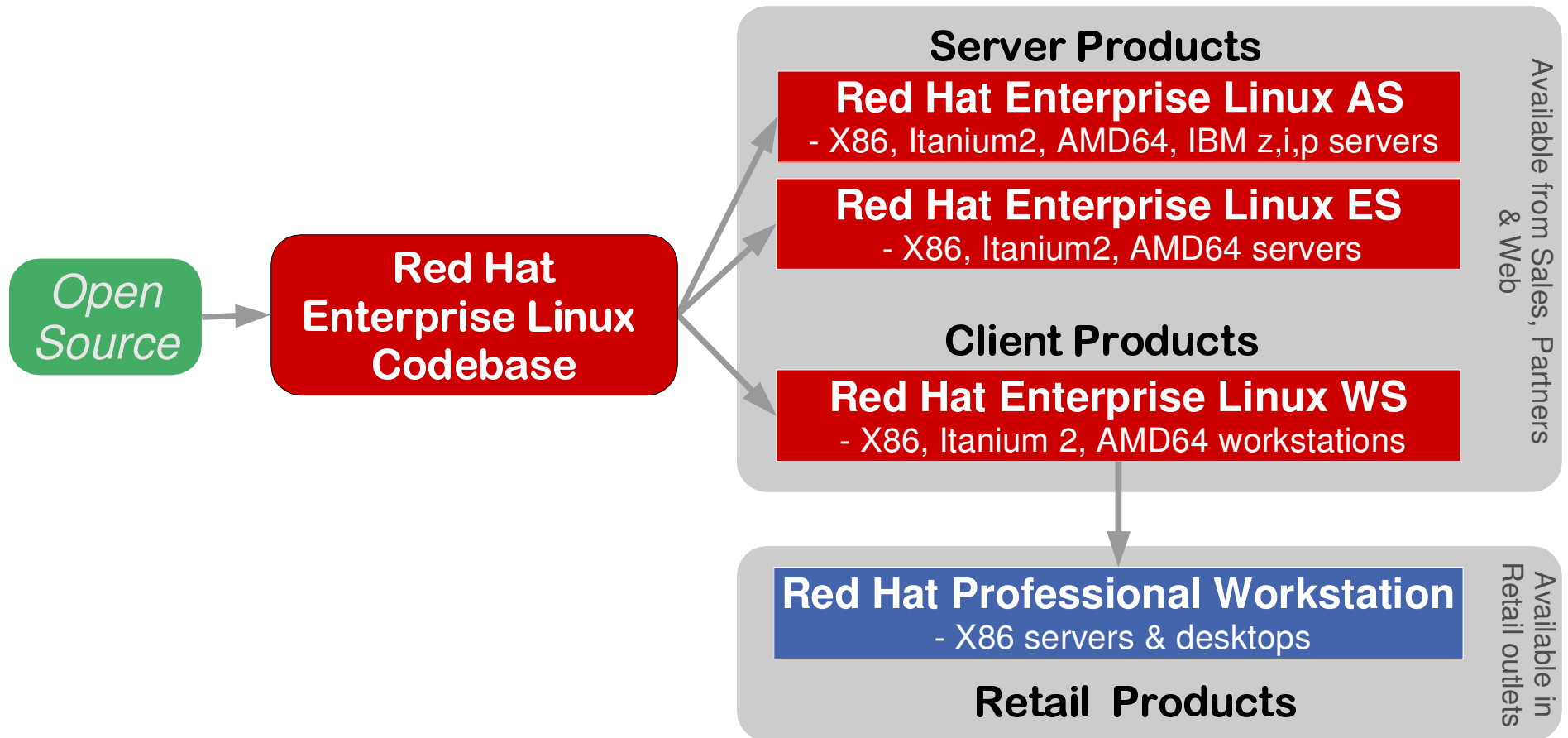**Client/Desktop Products**

Red Hat Enterprise Linux WS
- X86, Itanium 2, AMD64 workstations

Available from Sales, Partners & Web

High Risk:
Unsupported
Unmanageable
Uncertified

Low Risk:
Stable
Supportable
Manageable
Certified

What about Retail?

Open Source → **Red Hat Enterprise Linux Codebase**

Server Products

Red Hat Enterprise Linux AS
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Red Hat Enterprise Linux ES
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Client Products

Red Hat Enterprise Linux WS
- X86, Itanium 2, AMD64 workstations

Available from Sales, Partners & Web

Red Hat Professional Workstation
- X86 servers & desktops

Retail Products

Available in Retail outlets

Red Hat Professional Workstation

- Retail version of Enterprise Linux WS: *Available December 2003*

  - No SLA options (WS is the suppored enterprise workstation project)

  - No version upgrades (Enterprise Linux 3 ➜ Enterprise Linux 4)

  - No volume discounts or bundles

- Available through **retail** and **corporate resellers**

  - Includes 1 year of RHN channel access

  - Includes 30 Days of installation/configuration support

- Can I use it?

  - Technically ➜ YES!

  - Does it make business sense ➜ NO!

  - RHPW is for home use, and is a stepping-stone to RHEL WS for businesses

Which Linux Should I Use?

- *Which Red Hat is right for me?*
  - *Corporate workstations and compute farms:*
    - Red Hat Enterprise Linux WS
  - *Home/personal computer:*
    - Red Hat Professional Workstation
  - *Open-Source development of bleeding-edge technology:*
    - The Fedora Project
- Questions? See the web site!

    http://www.redhat.com/solutions/migration/rhl/

Red Hat Enterprise Linux

Corporate Network

DMZ

DNS
Web
FTP

Firewall
VPN

Red Hat Enterprise Linux WS

Engineering Workstation

Compute Farm

Intranet

Red Hat Enterprise Linux ES

Red Hat Enterprise Linux AS

DNS, Web, FTP, NFS, NIS

Database CRM ERP

Internet
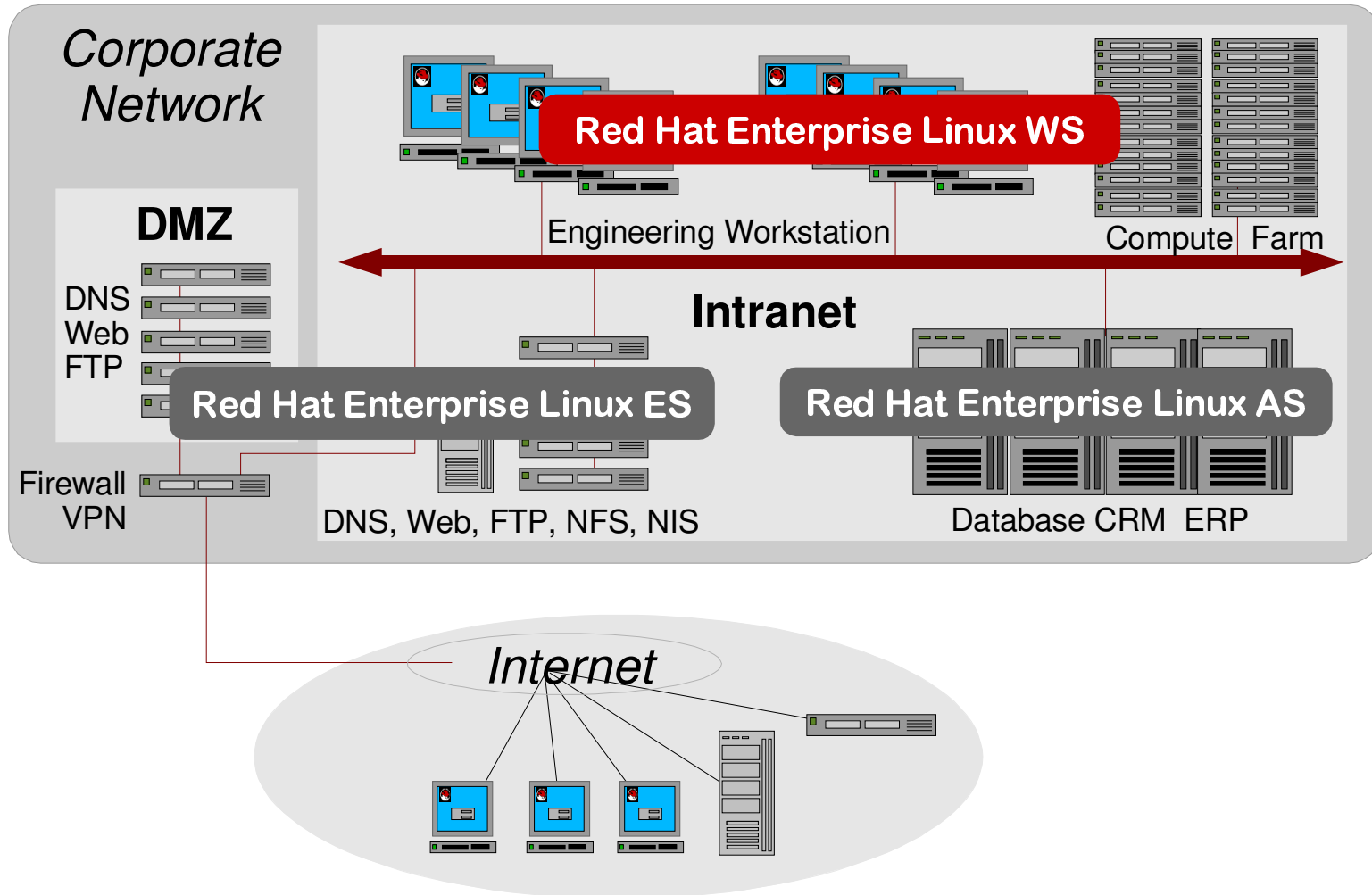
Workstations
Red Hat Enterprise Linux 3 WS

Red Hat Enterprise Linux WS

- Client variant of Enterprise Linux

    - Shared core technology with Enterprise Linux AS & ES

    - Supports x86, Itanium and AMD64 architectures

- Suitable for desktop systems

    - Includes full suite of productivity applications – Email
      Word Processor, SpreadSheet, Presentation, Web Browser

- Target applications:

    - Personal productivity

    - Technical workstations (S/W development, engineering)

    - Commercial desktops (financial, back-office, manufacturing, etc)

    - EDA & graphics imaging

Extensive Hardware Support

- Red Hat Enterprise Linux is supported by many leading hardware manufacturers

  - Extensive hardware certification – servers and storage

  - http://www.redhat.com/hardware

  - Open hardware certification program

  - http://hardware.redhat.com/hcl/?pagename=redhatready

- Systems with preloaded Red Hat Enterprise Linux Subscriptions available from multiple vendors

 - Support provided for complete hardware + Red Hat Enterprise Linux solution

AMD   **intel**   **IBM**

FEATURE: Enhanced Architecture Support

- Architecture Optimizations

  - Pentium IV s/w pipelining, etc

  - IA64 instruction scheduler

  - Support for MMX & SSE

- Hyperthreading-Aware Scheduler

  - Recognizes differences between logical and physical processors

 - Takes advantage of shared on-chip caches
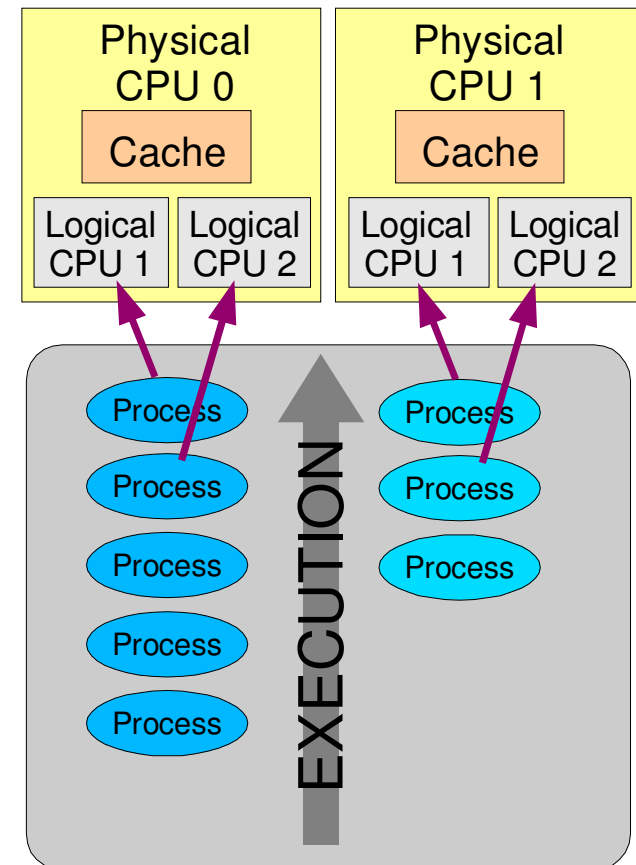
Strong Software Ecosystem
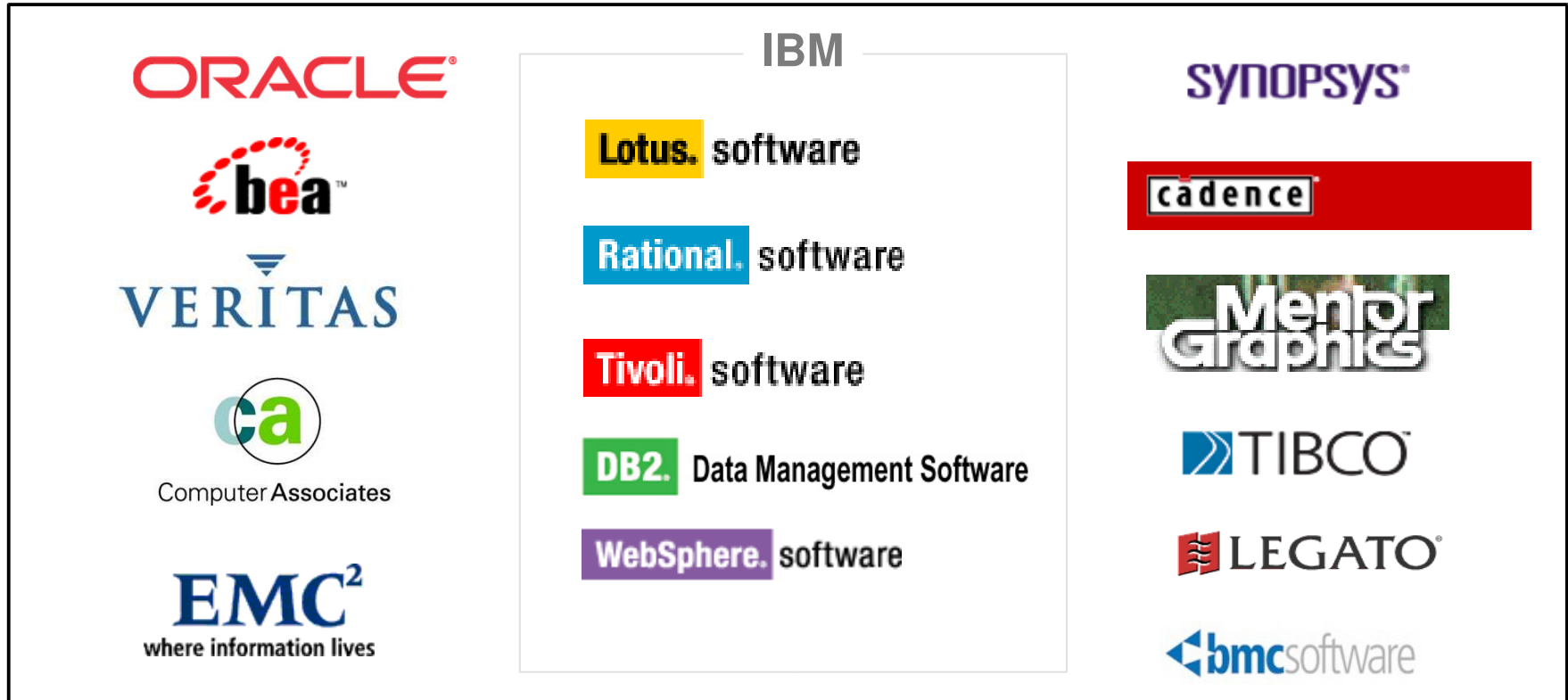
Red Hat's EDA Efforts

- *Hardware alignment:* Support for IBM Intellistation, Dell Precision, HP Workstation teams to pre-load RHEL 3 on workstations.

- *ISV alignment:* Red Hat has ongoing relationships with Mentor, Synopsys, and Cadence to assist in porting applications to RHEL.

- *Customer Engagement:* Red Hat is deeply engaged with a growing number of EDA customers including...

  - Intel, AMD, LSI Logic, Xilinx, STMicro, Qualcomm, Motorola, Nvidia, Hitachi Semi., Marvell Semi., NEC, Broadcom, Texas Instruments

Major EDA companies are buying into RHEL for their infrastructure, and are looking forward to moving EDA workstations to RHEL, as well.

FEATURE: Enhanced Desktop with Bluecurve^{TM}

- **Modern easy-to-use user interface**
  - Unified look-and-feel for applications

- **Support for newer graphics hardware**
  - Enables RHEL Certifications for OEM workstations

- **Productivity Applications**
  - OpenOffice Productivity Suite
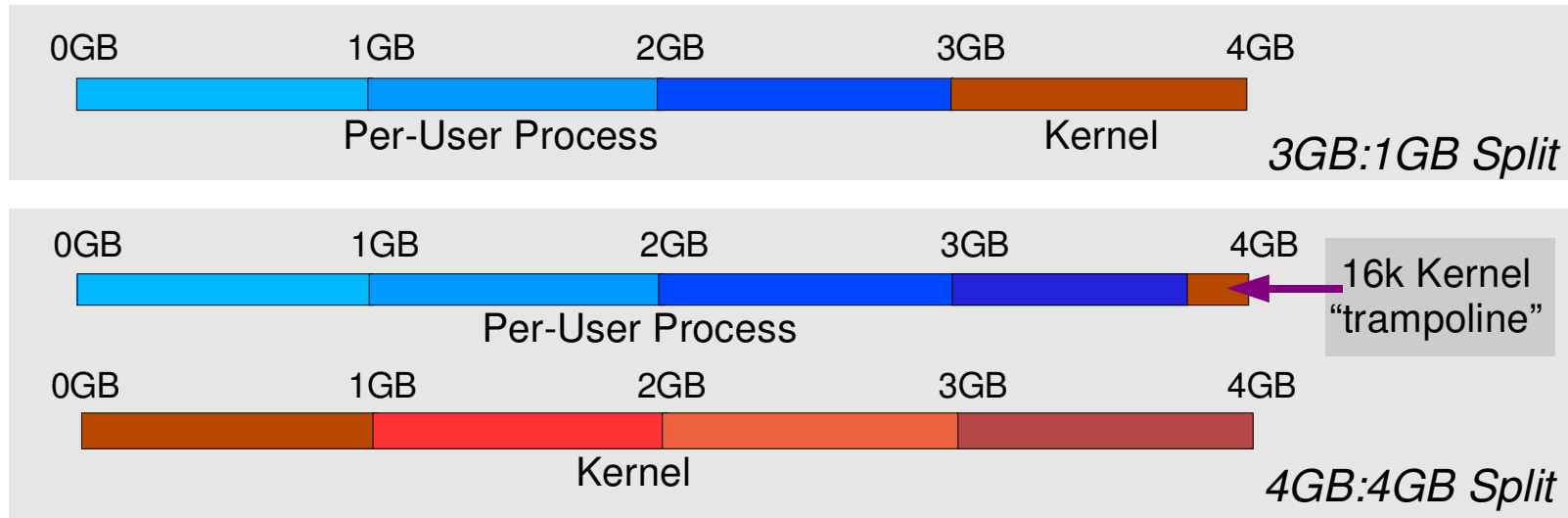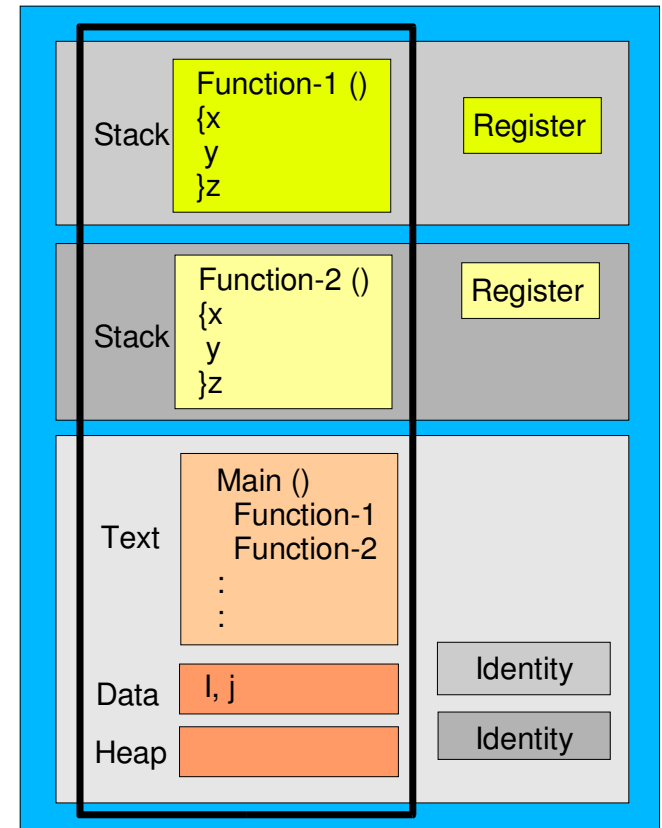 - Ximian Evolution Email
  - Mozilla Web Browser
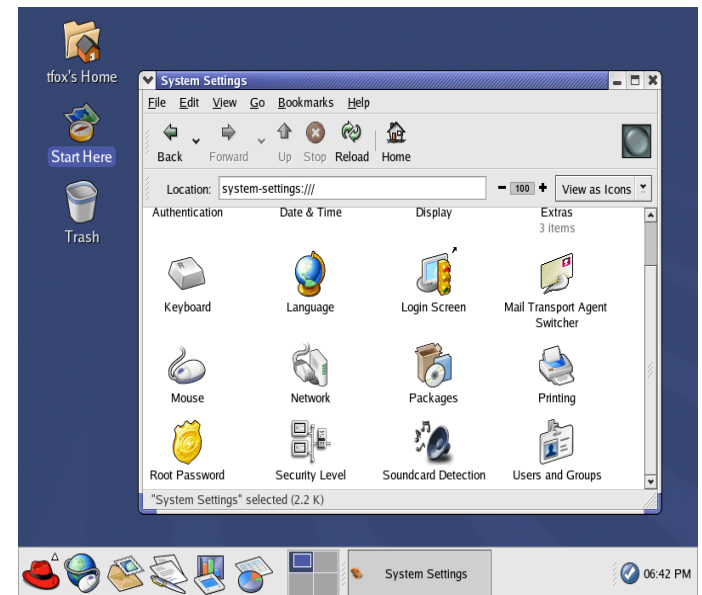
FEATURE: Full 4GB Addressing for 32-bit x86 Systems

- On Linux, a classic 32-bit 4GB virtual address space is split 3GB for user processes and 1GB for the kernel

- The new Red Hat kernel permits 4GB of virtual address space for the kernel and almost 4GB for each user process

FEATURE: Improved Threading Performance

- Native Posix Thread Library (NPTL)
  - Full implementation of POSIX threads

- Highly scalable, native implementation
  - Creation/deletion performance independent of the number of threads running
  - Supported by all utilities and applications

- Major benefits to massively multi-threaded applications
  - Databases
  - Application Servers

Stack | Function-1 ()
{x
 y
}z | Register

Stack | Function-2 ()
{x
 y
}z | Register

Text | Main ()
Function-1
Function-2
:
:

Data | I, j | Identity

Heap | | Identity

High Performance Computing
Red Hat Enterprise Linux 3 WS

High Performance Computing

- Enterprise Linux WS is also for HPC
  - Basic HPC platform functionality included (pvm, lam...)

- Why WS for HPC?
  - Considered a "Headless workstation"
  - Fits price-point and package lists for HPC nodes

- Suitable for Semiconductor Design and Simulation
  - Compute farms
  - EDA and imaging farms
  - Available with maintenance only (no SLA)

FEATURE: Enhanced Linux Kernel

- Kernel based on 2.4.21

  - Better support for large SMP up to 16 physical CPU's (x86)

  - Better support for large memory up to 64GB (x86)

- Back-ported features from 2.5/2.6

  - NPTL

  - RMAP VM

  - ATAPI Block Subsystem
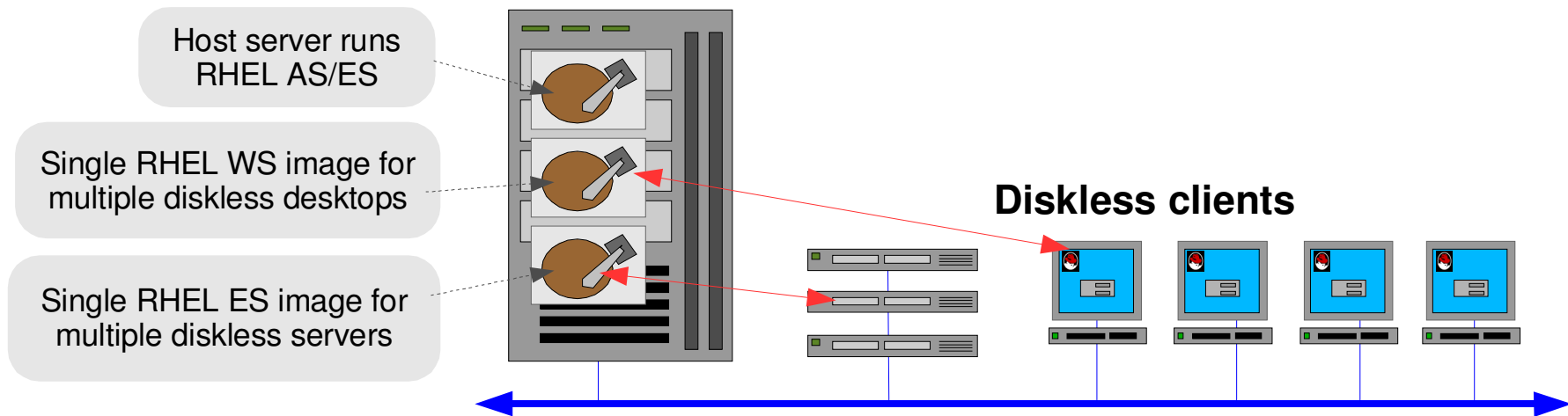
  - KAME IPSec/IPv6

  - CryptoAPI

FEATURE: Storage Enhancements

- Subsystem Improvements

  - Improved large-memory I/O support

  - Up to 256 SCSI devices

  - Serial ATA support

- Access Conrol Lists (ACL's)

  - Read/Write/Exec sepparate from UNIX permissions

  - ACL's honored over NFS with RHEL 3 client and RHEL 3 server

- Logical Volume Manager (LVM)

  - Support for separate physical and logical devices

  - Support for "warm" resize of partitions and select filesystems

  - Compatible with existing software RAID

FEATURE: Diskless System Support

- Suitable for HPC and thin-client configurations
- Allows a Red Hat Enterprise Linux server to host other Red Hat Enterprise Linux images with net-boot clients
- Minimal per-client overhead
- Clients can use local disks for swapping and general storage

Host server runs RHEL AS/ES

Single RHEL WS image for multiple diskless desktops

Single RHEL ES image for multiple diskless servers

Diskless clients

Summary

Enterprise Linux 3 New Feature Summary

- Linux 2.4.21 kernel enhanced with 2.5/2.6 features

- Full 4GB addressing on x86

- Improved threading performance

- Updated tools and Java

- Enhanced architecture support

- Enhanced Bluecurve™ desktop environment

- Storage and networking enhancements

- Continued commitment to standards

- Enhanced security features

- Diskless system support

The Choice is Clear...

- Over 300 new features, including 100 "Priority 1" features from OEM's, partners, and customers

- 64-bit clean implementation

- RHEL 2.1 system upgrade path (for stock installations only)

- Single source code base is used for 7 architectures: x86, AMD64, IA64, IBM zSeries, IBM S/390, IBM pSeries, IBM iSeries

- Available in 10 languages: English, German, French, Italian, Spanish, Korean, Japanese, Chinese – Simplified, Chinese – Traditional, Portugese

Red Hat Enterprise Linux offers an unbeatable combination of quality, applications and services
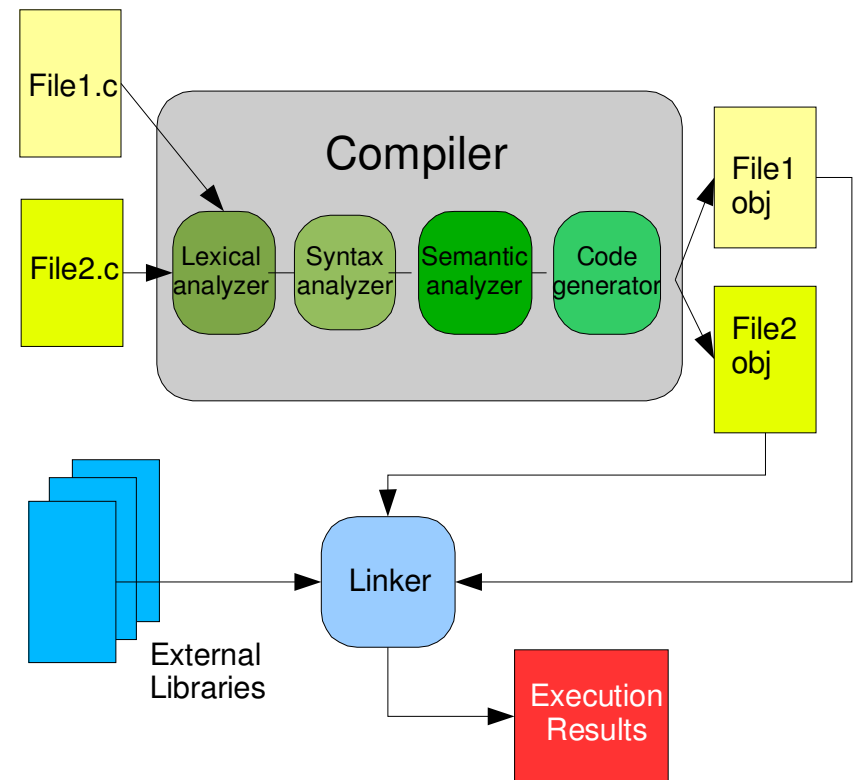
Q & A

Extra Slides

FEATURE: Continued Commitment to Standards

- LSB 1.3 compliance (Linux Standard Base)

  - Builds on RHEL 2.1 LSB 1.2 compliance

  - All RHEL releases will be LSB compliant

  - Standard available at http://www.linuxbase.org

- National Information Assurance Partnership (NIAP) Common Criteria Certification

  - Expected to be complete by the end of 2003

  - Certification to EAL 2 (Evaluation Assurance Level)

  - Internationally accepted standard

  - Specified by US Department of Defense

- CommonOperating Environment (COE)

  - DISA standard for DoD deployments

FEATURE: Updated Tools and Java Support

- ## GCC 3.2 toolchain

  - ### Full ANSI C++ support

  - ### ISO C99 Standard support

  - ### Memory debugging support

- ## Same API across architectures

  - ### Use GCC to build on all platforms from a single source base

- ## Java 1.4.x

  - ### BEA, IBM and Sun implementations available with NPTL support (architecture specific)

  - ### GCJ/LibGCJ – Open-Source Java GCC compiler front-end

File1.c

Compiler

File2.c

Lexical analyzer

Syntax analyzer

Semantic analyzer

Code generator

File1 obj

File2 obj

External Libraries

Linker

Execution Results

FEATURE: Networking Enhancements

- KAME Kernel IPSec/IPv6 Stack

  - Offers enhanced, standard IPSec

  - Packets are encrypted, authenticated & anti-replay protected

  - Support for tunnels between subnets

  - Support for transport mode for secure communication directly between two machines

  - Tested to be able to communicate with IPSec appliances and other OS IPSec implementations

- Improved, more complete IPv6 support than in 2.1

FEATURE: Security Enhancements

- Kernel-level cryptography (CryptoAPI)

- Pluggable cryptographic algorithms

  - e.g. DES, AES, MD5

- Allows encryption to be done within the Kernel, transparent to applications

- Support for crypto-accelerator hardware