



# Red Hat Enterprise Linux 3

The Next Generation Of Enterprise Class Linux

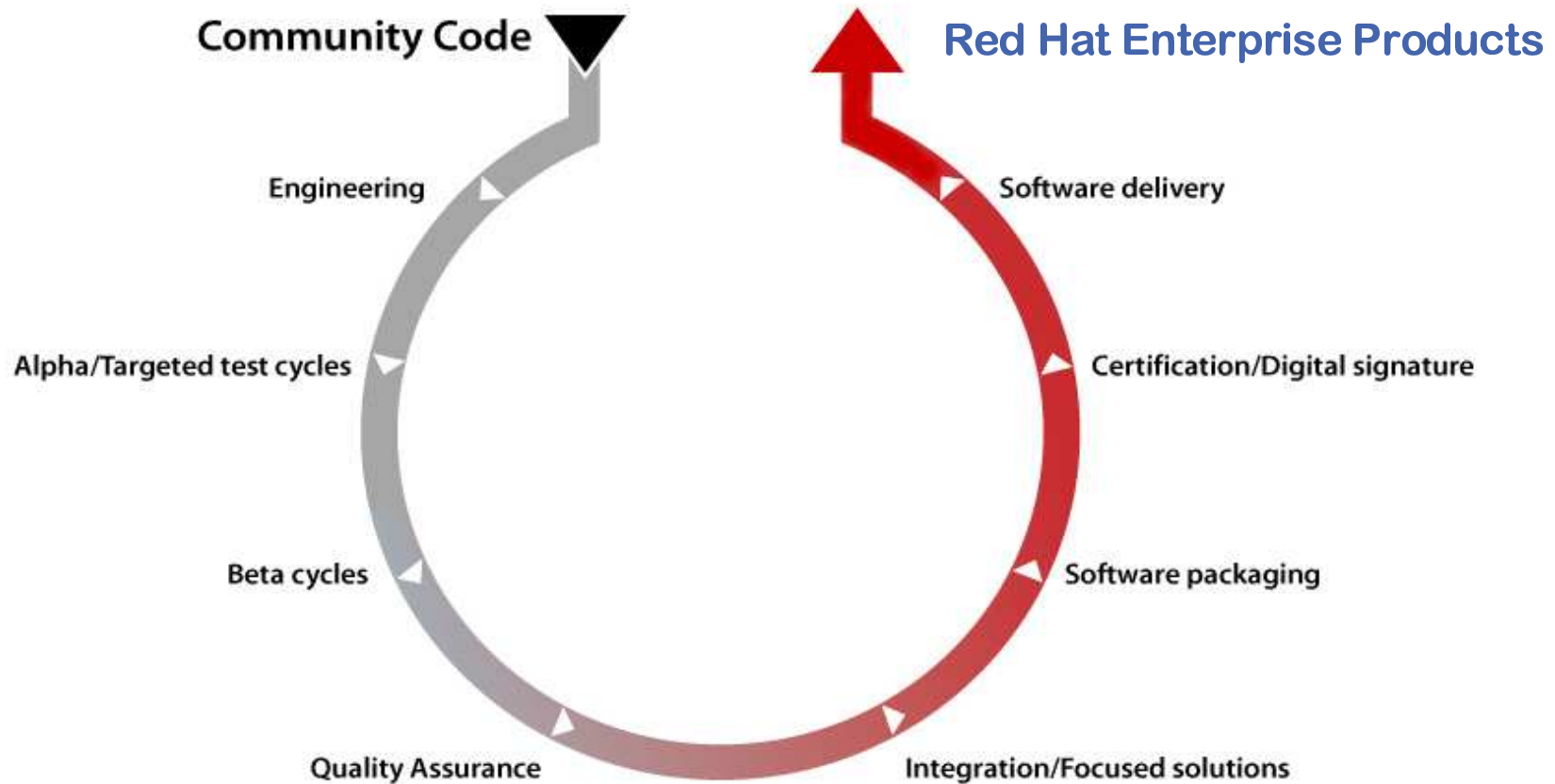
Ken Crandall  
Engineer, Red Hat

# Red Hat at a Glance

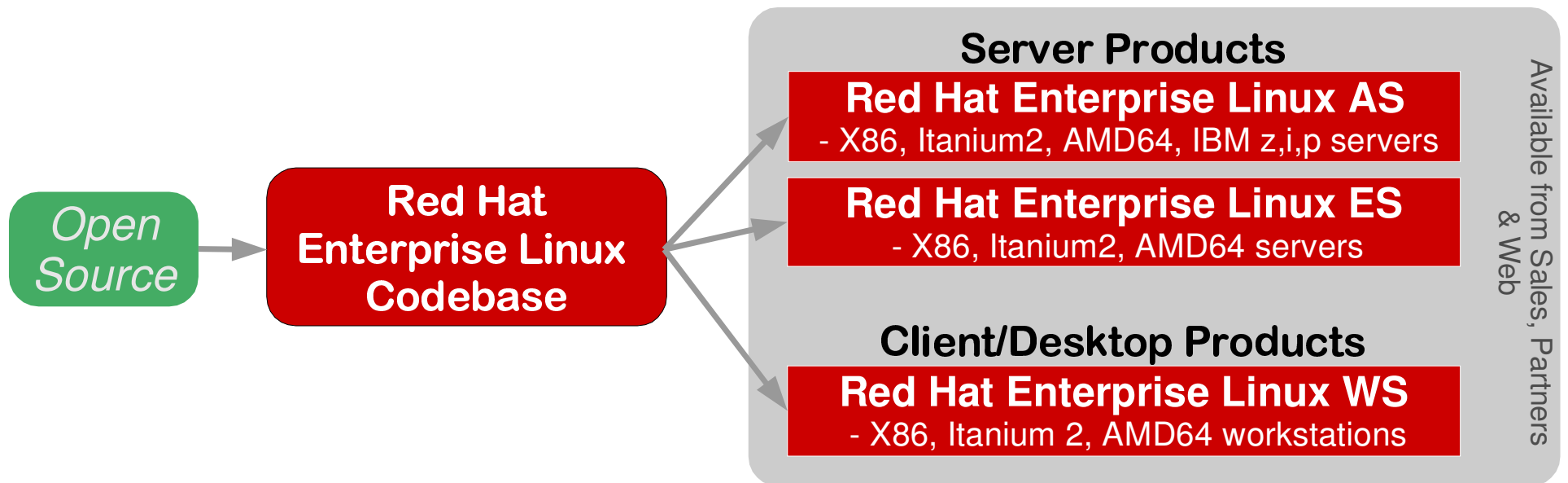


- 8 Year Old Company
- Global Scope: 22 locations worldwide
- 650 Employees with 300+ Engineers
- Full service business model
- Public: Full financial visibility
- \$120M in annual revenues and \$300M in cash
- 75% of the North America Linux server market

# From Open Source to Enterprise Products



# Enterprise Linux 3 Product Family



# Red Hat Enterprise Linux AS



- High-end server environment
  - Broadest system support – 7 architectures
  - Most extensive services – up to 24x7 @ 1hr
- Includes server applications
  - E.G. Apache, Sendmail, DNS, DHCP, PXE...
  - Also includes full desktop environment

- Target applications:
  - Commercial databases and their applications
  - Medium-large web & application server environments
  - Custom corporate applications

# Red Hat Enterprise Linux ES

- Variant of Enterprise Linux priced for smaller systems
- Mid-range/medium server environment
  - Common package set with Enterprise Linux AS
- Targeted for servers with 1-2 CPUs and up to 8GB
  - Small/medium departmental databases & applications
  - Edge-of-network devices (firewalls, name servers...)
  - Web/mail servers
  - File/print servers
  - Infrastructure servers



# 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



# 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)





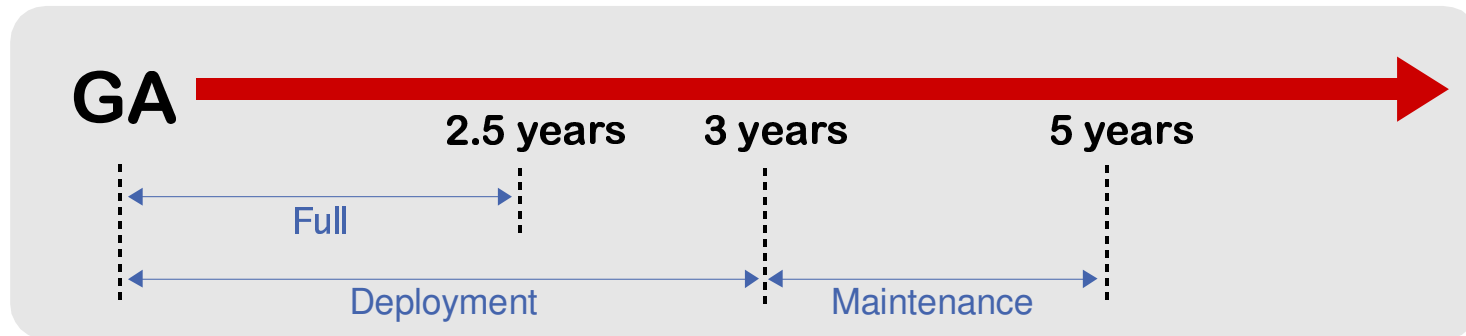
# Enterprise Linux 3 Architecture Support

	Red Hat Enterprise Linux AS	Red Hat Enterprise Linux ES	Red Hat Enterprise Linux WS
<b>Intel x86 compatible</b>	Y	Y	Y
<b>Intel Itanium</b>	Y	Y	Y
<b>AMD AMD64</b>	Y	Y	Y
<b>IBM pSeries</b>	Y	N	N
<b>IBM iSeries</b>	Y	N	N
<b>IBM zSeries</b>	Y	N	N
<b>IBM S/390</b>	Y	N	N

# Enterprise Linux Differentiators

- Extended development of new releases
  - 12-18 month release cycle
  - Customers, partners and OEM's involved in 6-month Alpha/Beta test cycle
  - 5-year support life cycle
- Regular, consolidated updates provided during product lifetime:
  - Bug fixes
  - Minor enhancements
  - Support for new hardware

# 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

# Red Hat Enterprise Linux 3

- 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

# Major New Features

- 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

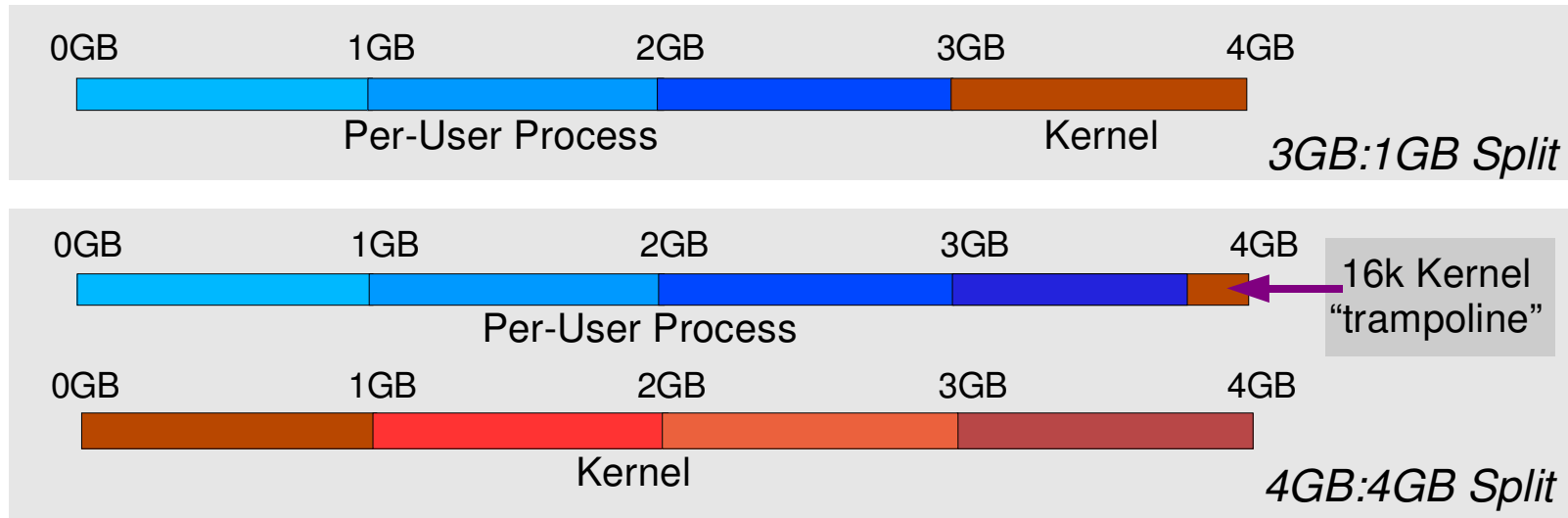


# Enhanced Linux Kernel

- 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

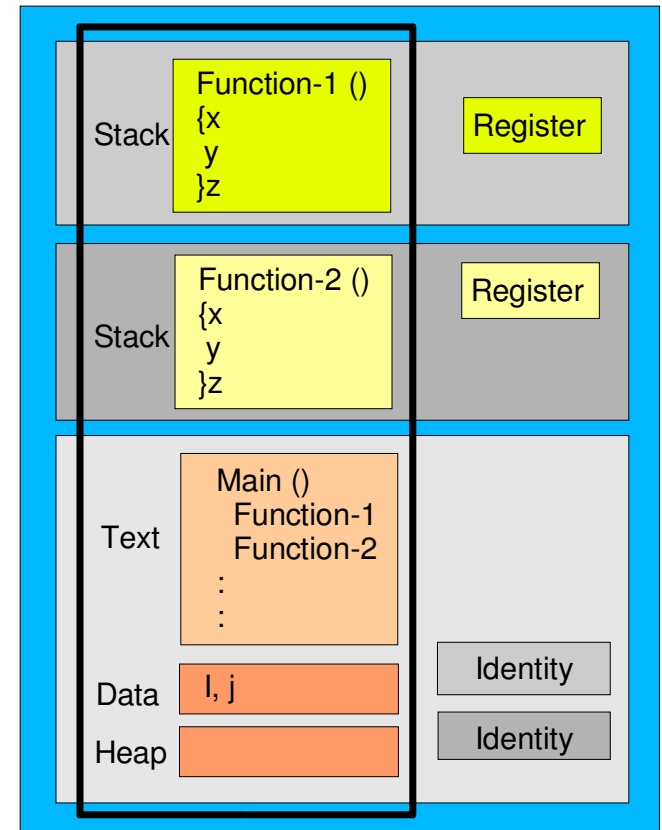
# Full 4GB Addressing for 32-bit x86 Systems

- 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



## Improved Threading Compatability and Performance

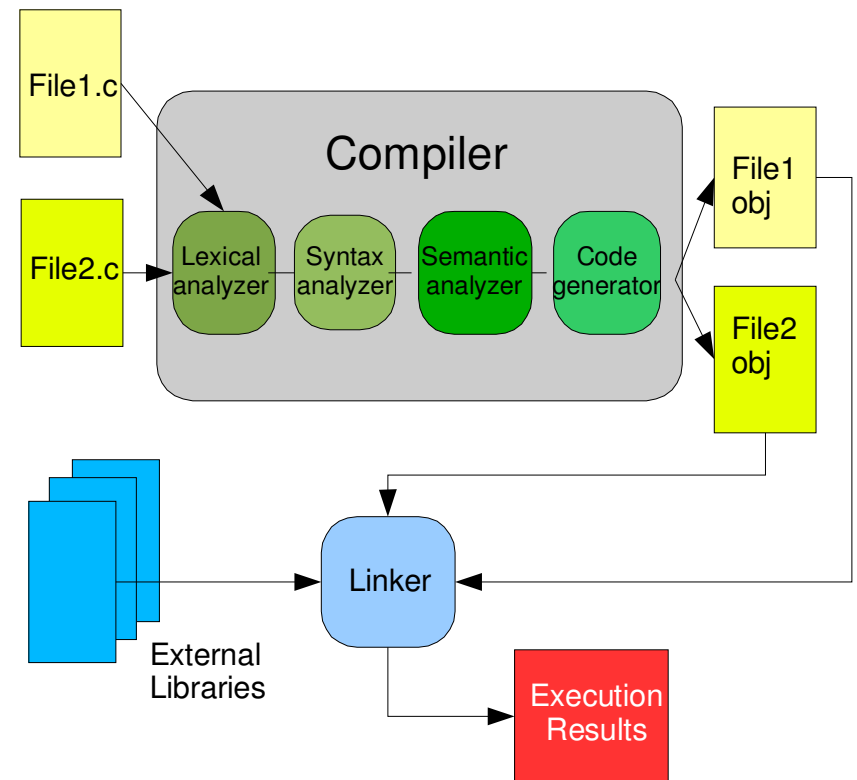
- Native Posix Thread Library (NPTL)
  - Full implementation of POSIX threads
- Highly scalable, native implementation
  - Creation/deletion performance independent of the number of threads running
  - Supported by all utilities and applications
- Major benefits to massively multi-threaded applications
  - Databases
  - Application Servers





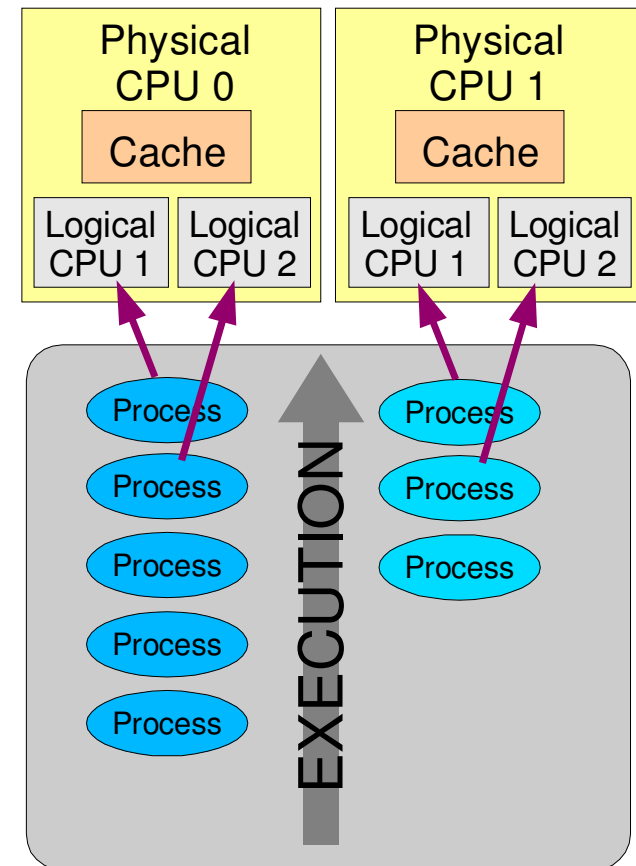
# Updated Tools and Java Support

- 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



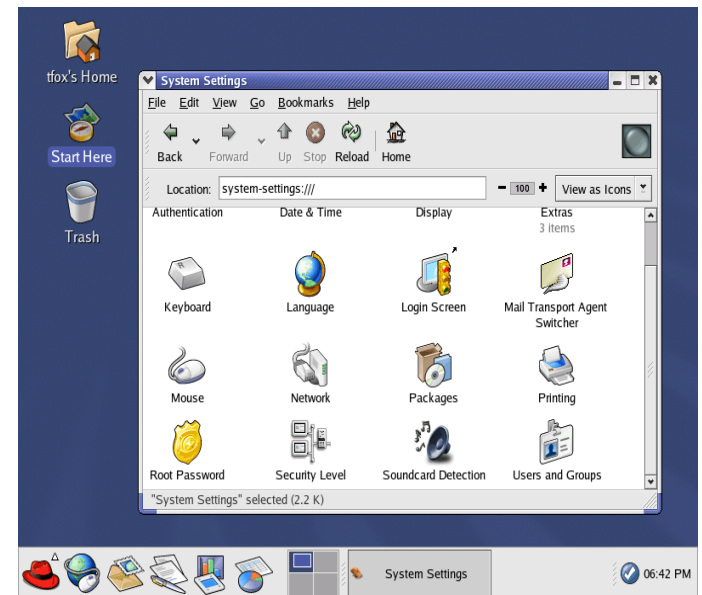
# Enhanced Architecture Support

- 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



# Enhanced Desktop with Bluecurve™

- 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



# Storage Enhancements

- Subsystem Improvements
  - Improved large-memory I/O support
  - Up to 256 SCSI devices
  - Serial ATA support
- Access Control Lists (ACL's)
  - Read/Write/Exec separate 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



# 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

# 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
- Common Operating Environment (COE)
  - DISA standard for DoD deployments

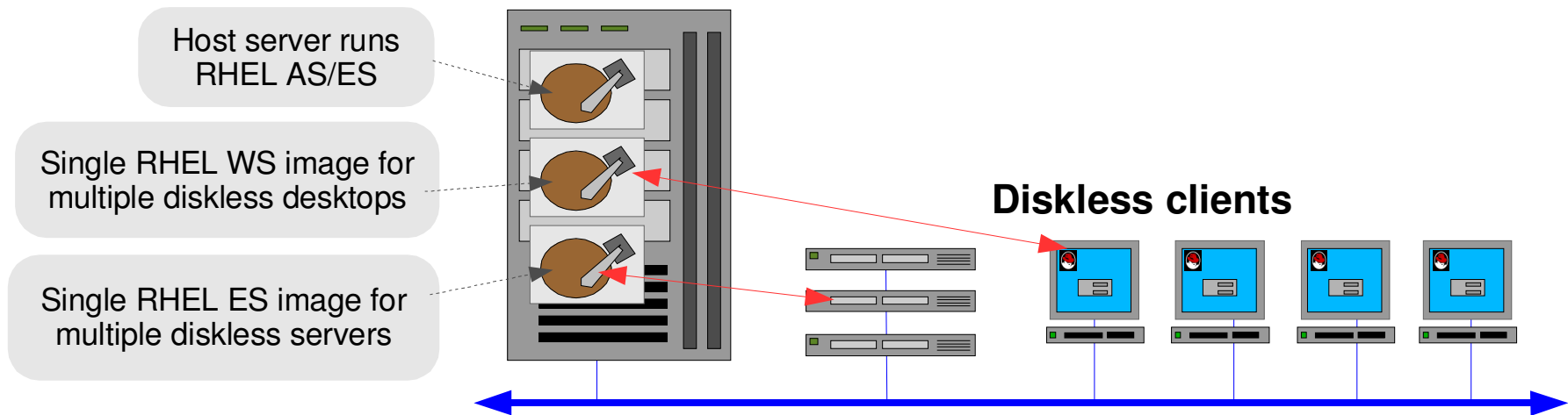


# Security Enhancements

- 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

# 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







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## Q & A

