Red Hat Enterprise Linux 6

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Red Hat - an Established Global Leader

- Global development and support
- Listed on S&P 500
- 67 offices in 29 countries
- Extensive partnerships with leading enterprise hardware and software vendors
- Pioneered the open source subscription-based business model
- Comprehensive product portfolio for enterprise environments
A Complete, Open Stack
Products, Services, and Support for Enterprise-Class Applications

Red Hat Enterprise Linux
- Virtualization
- High Availability
- Clustered storage
- Volume management,
  - Multi-path I/O
  - LAMP stack

Platform
- JBoss Enterprise Application Platform
- JBoss Enterprise SOA Platform
- JBoss Communications Platform
- JBoss Enterprise Portal Platform
- JBoss Enterprise BRMS
- JBoss Enterprise Data Services
- JBoss Enterprise Frameworks
- JBoss Enterprise Developer Studio
- MRG Messaging

Middleware
- Cloud & Management
  - Red Hat Network Satellite
  - JBoss Operations Network
  - Red Hat Directory Server
  - Red Hat Certification System
- Red Hat Enterprise Virtualization
  - Hypervisor
  - Manger for Server
  - Manager for Desktop

Integration Solutions

Services
- Red Hat Consulting
- Red Hat Support
- Red Hat Training & Certification

Red Hat Support

Red Hat Consulting

Red Hat Training & Certification
Only Two Server Operating Systems Will Remain

Combined Shipments and Subscriptions and Nonpaid Deployments (000)

Source: IDC, 2009
Red Hat Momentum in a Challenging Market

- Red Hat revenue increased 15% (bookings even more)
- Linux is deployed on ~25% of new servers**
- The UNIX Installed base continues to decline*
- ~4x more Linux than Unix being deployed**

Red Hat is the industry leader

Why You Should Care

• **Huge Opportunity** – realizing dramatic cost savings.

• **Convergence of Factors:**
  • Huge performance, RAS, and scalability increases with the introduction of Nehalem-EX.
  • Addition of new mission-critical features in RHEL5 and RHEL6.
  • Oracle acquisition of Sun is motivating to migrate.

• **Linux is the Future** – In Q2 of this year, demand for Linux skills surpassed demand for Unix skills for the first time ever!
Red Hat Enterprise Linux: Enabling the New Now

Move Faster
A better starting point for every project because your platform is robust, secure and ready

Run Leaner
Data Center efficiency, performance and scalability

Be More Flexible
Making IT nimble across physical, virtual and cloud
Move Faster

The platform for today and your long-term growth

- Scalability & Performance: More cores, more memory, more data
- Freedom of choice: Optimized for the major hardware architectures and hypervisors
- Stability: Stable 10 year (plus) life cycle,
- Extensible: A portfolio of included software and enterprise Add-Ons

Reliable across applications and workloads

- Working across the industry
- Scale Up, Scale Out, Scale Consolidation
- Modular, flexible and robust operating system architecture that enables the latest in hardware reliability features
### Move Faster

#### PERFORMANCE

PERFORMANCE ENHANCEMENTS IN EVERY COMPONENT

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>FEATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU/Kernel</td>
<td>NUMA – Ticketed spinlocks; Completely fair scheduler; Extensive use of Read Copy Update (RCU)</td>
</tr>
</tbody>
</table>
| Memory          | Caching and NUMA enhancements  
                  | Large memory optimizations: Transparent HugePages                        |
| Virtualization  | Large SMP virtual machines: guests up to 64 CPUs  
                  | Block: Async-I/O; Network: Kernel support                                  |
| Disk/Network    | Per LUN flush daemons  
                  | Multi-queue Network drivers                                               |
Move Faster
Optimized for current and future systems

RHEL6 NUMA Application Performance
2 socket AMD MC, 4/8 socket Intel EX x86_64

NoNUMA – Memory interleaved
NUMA (default)
%NUMA Gain

Move Faster
Optimized for current and future systems
Move Faster
Scale performance with enhanced memory management
Move Faster
Support tens of thousands of files

Fileserver Peak Throughput (jobs/min)

- RHEL 5.5
- RHEL 6
- RHEL 6 Tuned
Run Leaner
Data Center Efficiency, Performance & Stability

Make the most of your new new hardware & deployment paradigms

- **Less Power**: Advanced resource management designed to minimize and manage your data center power requirements

- **Improve virtualization**: Optimize applications on both physical and virtual platforms with hardware independent diagnostic and management tools

- **Operational excellence**: Lower provisioning and management costs while increasing utilization with enhanced management, deployment & security features
Run Leaner
Lower Power Consumption

**GREEN I.T.**

Reduces power consumption at multiple layers in the software stack

<table>
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<tr>
<th>COMPONENT</th>
<th>FEATURE</th>
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</thead>
<tbody>
<tr>
<td>Utilities</td>
<td>Power audit to reduce power consumption, E.G. convert utilities to event based algorithms</td>
</tr>
</tbody>
</table>
| File System | Intelligent drive spin-down  
File metadata I/O reduction: realtime mount option |
| Kernel      | Tickless kernel enables extended low power states for idle systems       |
| CPU         | Core/CPU idling in lightly loaded SMP systems; applies for virtual guests |
| I/O         | Dynamic power adjustments to PCIe and SATA links via ASPM and ALPM       |
Run Leaner
Lower Power Consumption

Idle power consumption (W), measured on Nehalem-EP
Run Leaner
Get More with Virtualization

Oracle scales up and out very well on Red Hat Enterprise Virtualization

Be More Flexible
Across physical, virtual & cloud

Consistent operating environment
- Hardware and hypervisor independence
- Same execution environment (ABI/API) & support everywhere
- A portable, tunable, secure wrapper for all your apps

Improve IT operations with a common foundation
- Leverage skills, processes and operation technology
- Unified and comprehensive app & system security
- Manage to SLAs with unprecedented resource control (on x86)

Use integrated virtualization (KVM) to maximize options
- All RHEL features benefit the virtual environment
- Run RHEL or Windows guests confidently
- As physical or guest deployment
Physical to Virtual to Cloud
Be More Flexible
Red Hat Enterprise Linux with Virtualization

- **High Performance**
  Leading performance for virtualized enterprise applications

- **Secure**
  Comprehensive security stack with many built-in and integrated features

- **Advanced Features**
  Memory page sharing, NIC bonding, multipath I/O, power management, etc.

- **Scalability**
  Operating system unmatched efficiency with high levels of performance

- **Live Migration**
  Easily and transparently move running workloads in virtual machines from one physical host to another

- **SMALL FOOTPRINT**: <100 MB

- **SCALABLE**: Host (96 cores, 1 TB RAM), guest (16vCPU, 64 GB RAM)
The Red Hat Enterprise Linux Product Portfolio

Servers (x86)

One solution – three editions

Servers (other architectures and use cases)

Four additional offerings

Add-ons (optional software)

Seven add-ons

High Availability
$399/socket-pair/year

Load Balancer
$199/socket-pair/year

Resilient Storage (includes high-availability)
$799/socket-pair/year

Scalable File System
$199/socket-pair/year

Smart Management *
$192/year – up to 1 guest
$289/year – up to 4 guests
$576/year – unlimited guests

Extended Update Support
$249/socket-pair/year

High Performance Network
$199/socket-pair/year

* Note: Only Smart Management can be added to a RHEL, Self-support subscription

Desktops

Two offerings

RHEL Desktop
Premium
Standard
N/A
Self-support
$499/desktop/year

RHEL Workstation
Premium
Standard
N/A
Self-support
$259/workstation/year

Red Hat Enterprise Linux 6
The Red Hat Enterprise Linux Product Portfolio

Servers
(x86)

One solution – three editions
The Red Hat Enterprise Linux Product Portfolio

Servers
(Other architectures and use cases)

Four additional offerings

<table>
<thead>
<tr>
<th>Red Hat Enterprise Linux for IBM System z</th>
<th>Red Hat Enterprise Linux for IBM POWER*</th>
<th>Red Hat Enterprise Linux for High-Performance Computing</th>
<th>Red Hat Enterprise Linux for SAP Applications*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Premium</strong></td>
<td><strong>Premium</strong></td>
<td><strong>Premium for entire cluster</strong></td>
<td><strong>Premium</strong></td>
</tr>
<tr>
<td>$18,000/IFL/year</td>
<td>$4,300/socket-pair/year</td>
<td>$79/socket-pair/year per compute node -- plus -- $2,598 per socket-pair per head node</td>
<td>$3,249/socket-pair/year</td>
</tr>
<tr>
<td><strong>Standard</strong></td>
<td><strong>Standard</strong></td>
<td><strong>Standard for entire cluster</strong></td>
<td><strong>Standard</strong></td>
</tr>
<tr>
<td>$15,000/IFL/year</td>
<td>$2,700/socket-pair/year</td>
<td>$79/socket-pair/year per compute node -- plus -- $1,598 per socket-pair per head node</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Self-support</strong></td>
<td><strong>Self-support</strong></td>
<td><strong>Self-support for compute nodes</strong></td>
<td><strong>Self-support</strong></td>
</tr>
<tr>
<td>N/A</td>
<td>N/A</td>
<td>$79/socket-pair/year per compute node</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*POWER
(allows up to 15 guests per socket-pair)

* allows unlimited guests
Add-ons
(optional software)

Seven add-ons

High Availability
$399/socket-pair/year

Load Balancer
$199/socket-pair/year

Resilient Storage
(includes high-availability)
$799/socket-pair/year

Scalable File System
$199/socket-pair/year

Smart Management *
$192/year – up to 1 guest
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Extended Update Support
$249/socket-pair/year

High Performance Network
$199/socket-pair/year

* Note: Only Smart Management can be added to a RHEL, Self-support subscription
The Red Hat Enterprise Linux Product Portfolio

**Desktops**

**Two offerings**

**RHEL Desktop**
- **Premium**: N/A
- **Standard**: N/A
- **Self-support**: $49/desktop/year

**RHEL Workstation**
- **Premium**: N/A
- **Standard**: $299/workstation/year
- **Self-support**: $179/workstation/year
## Red Hat Enterprise Linux Add-On's

<table>
<thead>
<tr>
<th>Red Hat Enterprise Linux Add-On's</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Availability</td>
<td>May be configured for most applications that use customizable agents, as well as for virtual guests. Provides redundancy for web serving, databases, networking, and storage. Enables a shared storage or clustered file system to access the same storage device over a network. Provides support for file systems that are more than 16 terabytes in size. Includes management, monitoring, and provisioning support modules for Red Hat Network and Red Hat Network Satellite. Delivers remote directory memory access over converged Ethernet (RoCE) for those times when low network latency and high capacity are important. Extends the support period of an update for 18 months and delivers overlapping release support to give enterprise customers more flexibility.</td>
</tr>
<tr>
<td>Load Balancer</td>
<td></td>
</tr>
<tr>
<td>Resilient Storage</td>
<td></td>
</tr>
<tr>
<td>Scalable File System</td>
<td></td>
</tr>
<tr>
<td>Smart Management</td>
<td></td>
</tr>
<tr>
<td>High Performance Network</td>
<td></td>
</tr>
<tr>
<td>Extended Update Support</td>
<td></td>
</tr>
</tbody>
</table>
# Red Hat Enterprise Linux Server Support Options

<table>
<thead>
<tr>
<th>Hours of coverage:</th>
<th>Self-support*</th>
<th>Standard</th>
<th>Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>None</td>
<td>Business Hours</td>
<td>24x7 for Severity 1 and 2</td>
</tr>
<tr>
<td>Support channel:</td>
<td>None</td>
<td>Phone and Web</td>
<td>Phone and Web</td>
</tr>
<tr>
<td>Number of cases:</td>
<td>None</td>
<td>Unlimited</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Initial and ongoing response times:</td>
<td>None</td>
<td>1 Business Hour</td>
<td>Initial – 1 Hour Ongoing – 1 Hour**</td>
</tr>
<tr>
<td>- Severity 1:</td>
<td>None</td>
<td>1 Business Hour</td>
<td>Initial – 2 Hours Ongoing – 4 Hours**</td>
</tr>
<tr>
<td>- Severity 2:</td>
<td>None</td>
<td>4 Business Hours</td>
<td>Initial – 4 Business Hours Ongoing – 8 Business Hours**</td>
</tr>
<tr>
<td>- Severity 3:</td>
<td>None</td>
<td>1 Business Day</td>
<td>Initial – 8 Business Hours Ongoing – 2 Business Days**</td>
</tr>
<tr>
<td>- Severity 4:</td>
<td>None</td>
<td>2 Business Days</td>
<td></td>
</tr>
</tbody>
</table>

**Customer portal access:**
- **Included**
- **Yes**

Software Maintenance:
- **Included**
- **Included**

Software upgrades:
- **Included**
- **Included**

*Self-support replaces Basic support.
**or as agreed.
Red Hat Enterprise Linux
A Comprehensive Platform

<table>
<thead>
<tr>
<th>Features</th>
<th>Red Hat</th>
<th>Costly Vendor Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating system</td>
<td>Red Hat Enterprise Linux</td>
<td>Windows, AIX, HP-UX, Solaris</td>
</tr>
<tr>
<td>Multi-path I/O</td>
<td></td>
<td>EMC PowerPath</td>
</tr>
<tr>
<td>High availability</td>
<td>Red Hat Enterprise Linux</td>
<td>Veritas Cluster Suite</td>
</tr>
<tr>
<td>Systems management</td>
<td></td>
<td>HP OpenView/Opsware, IBM Tivoli</td>
</tr>
<tr>
<td>Volume/storage Management</td>
<td></td>
<td>Symantec Storage Foundation Suite</td>
</tr>
<tr>
<td>High Performance Networking</td>
<td></td>
<td>Infiniband</td>
</tr>
<tr>
<td>Server virtualization</td>
<td></td>
<td>Vmware, Citrix</td>
</tr>
</tbody>
</table>
Life-cycle – expanded stream model

- Service Packs with hardware enablement during Production I phase of four years.
- Total of seven years for the regular life-cycle
- 3 years Extended Life-cycle Support (ELS) option
- 8 EUS streams with 18 month overlap each
MORE OPEN THAN ORACLE
MORE RELIABLE THAN MICROSOFT
MORE COMPREHENSIVE THAN VMWARE