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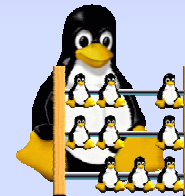
Linux Evangelist



What We Will Look At Today



LINUX-SRT



Oracle9i Application Server - The
Application Platform for Linux

*An Oracle White Paper
August 2002*



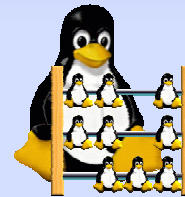


What We Will Look At Today

- 1. General Linux Market Trends**
- 2. Platform Players (How Two Majors use Linux)**
- 3. Emerging Market: Embedded Linux**
- 4. Two Linux Education Options (LPIC & RHCE)**



General Linux Market Trends



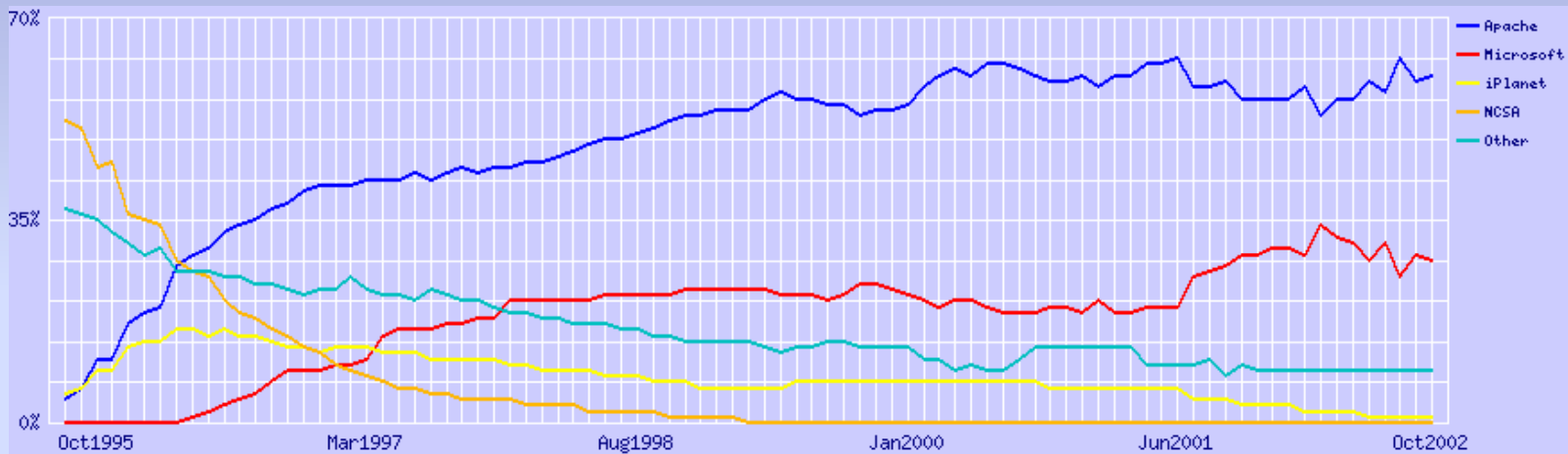


Factoids

- Linux shipments (licenses) are growing faster than for any other operating system at more than 25% per year.
 - The source of this growth is market share erosion of the traditional *nix vendors, not incursion into the Microsoft market space
- Desktop Linux is receiving little interest from the market - servers are really where the action is when it comes to Linux
- Red Hat commands a significant share of the Linux market. In fact, its market share is nearly double its nearest competitor (Mandrake).
- When it comes to Linux developers and development platforms, Red Hat Linux is the most popular choice of developers by a factor of 3.

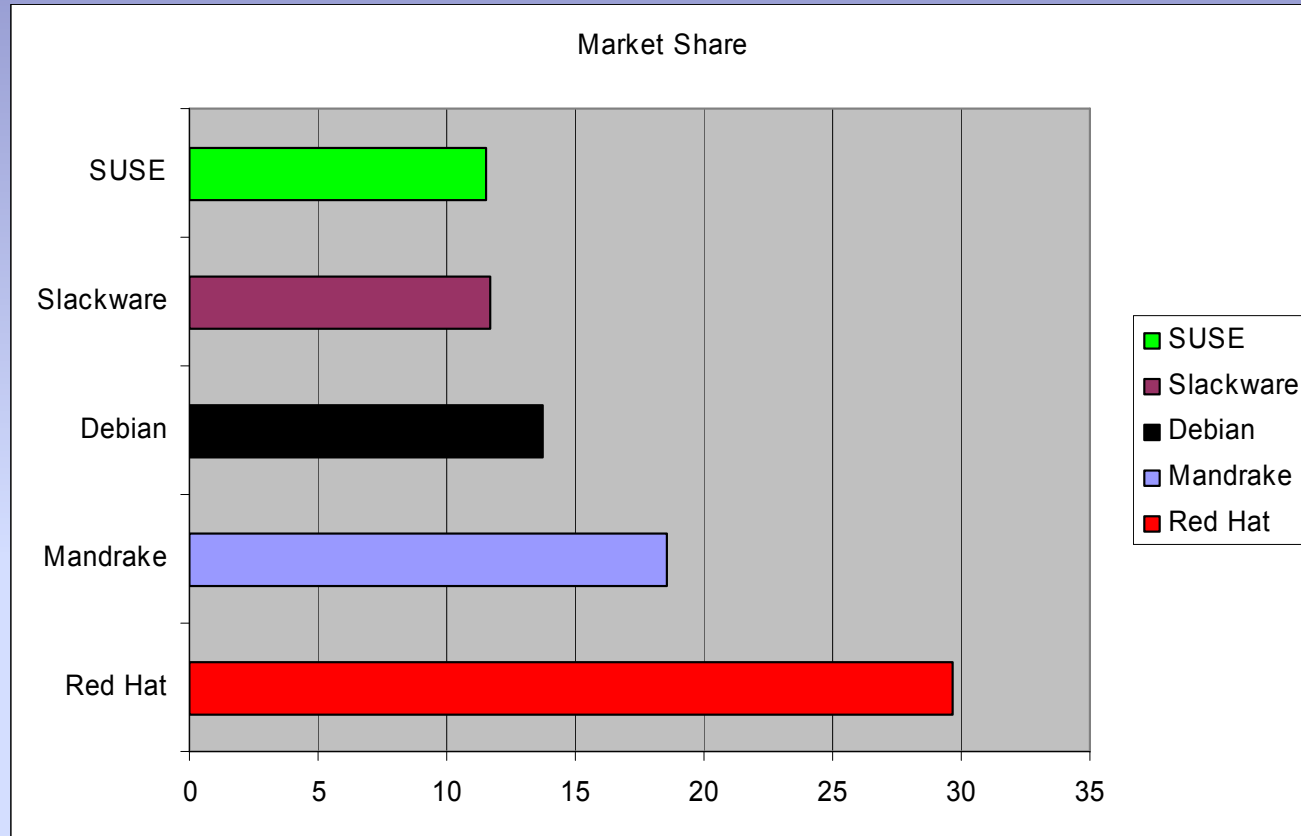


Netcraft Web Server Survey



Source: Netcraft (www.netcraft.com), November 23rd, 2002

Apache (usually on Linux) Dominates The Web Server Space

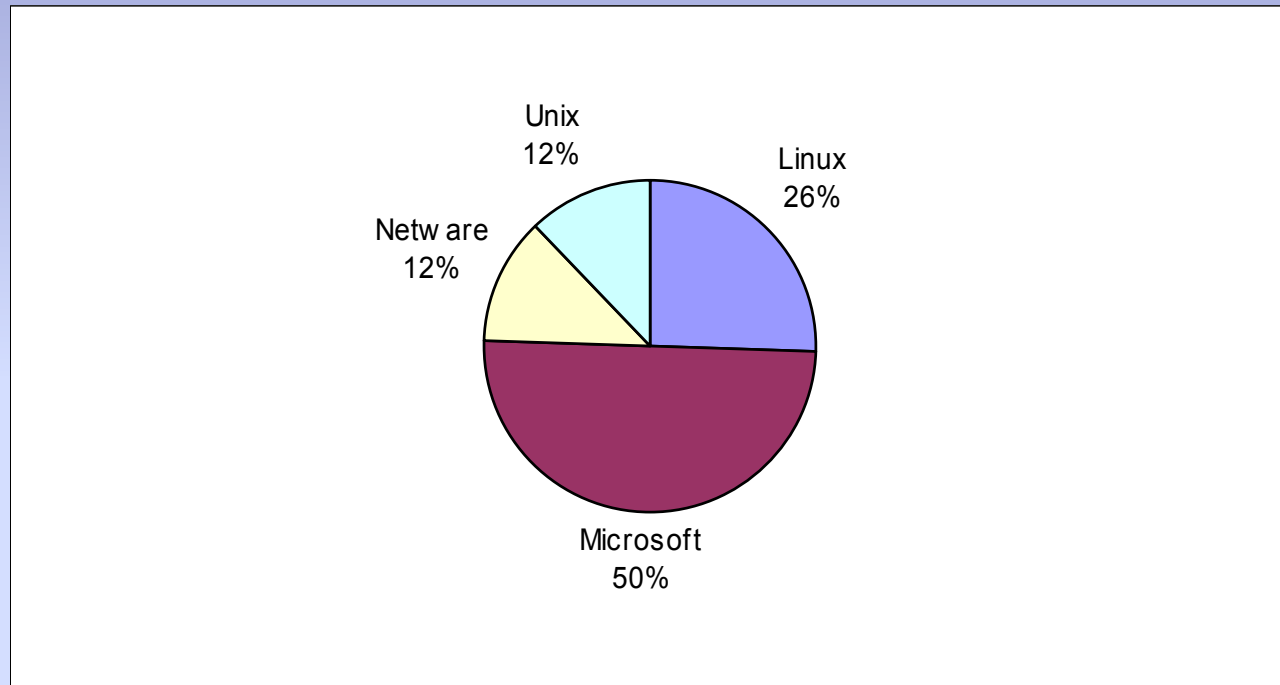


Source: counter.li.org, November 23rd, 2002

Red Hat Dominates the Linux Distribution Race



Reality Check, Part I

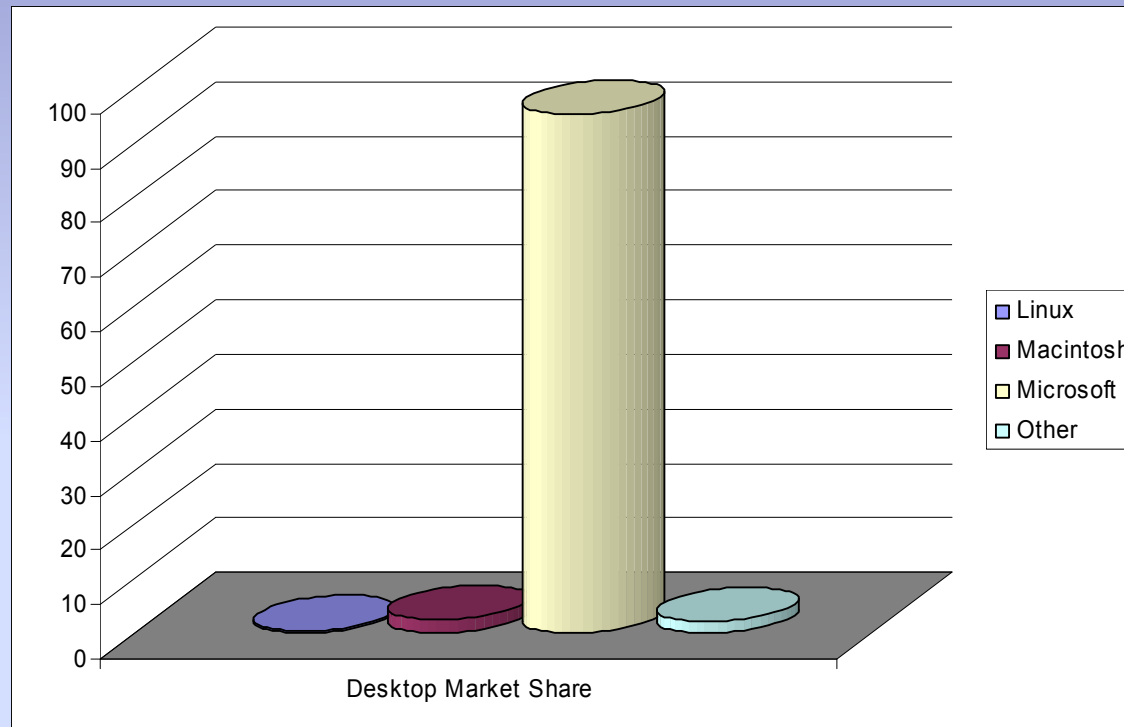


C|NET News (<http://news.com.com/2100-1001-959049.html>), Sept 23rd, 2002 – approximation/rounding error < 2%

Red Hat Commands Only 13% of Total Server Market



Reality Check, Part II



Source: News Factor Network (<http://www.newsfactor.com/perl/story/19535.html>), Sept 30th, 2002

Red Hat Commands Only 0.25% of Total Desktop Market



Even More Sobering Reality

Microsoft



Price: \$58.22, EPS: \$1.68, P/E: 34.43

A **Profitable** Company

Red Hat



Price: \$6.00, EPS: **-\$0.28**, P/E: **N/A**

An **Unprofitable** Company

The Good News is that Red Hat is "Moving Towards Profitability"



Platform Players

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Application Platform for Linux

*An Oracle White Paper
August 2002*

Oracle Corporation



IBM Corporation



Oracle and Linux



IBM and Linux



Emerging: Embedded Linux



The WatchGuard Firebox



LINUX-SRT



Types of **Linux** Real-Time Systems

Non Real Time (NRT)

Soft Real Time (SRT)

Hard Real Time (HRT)

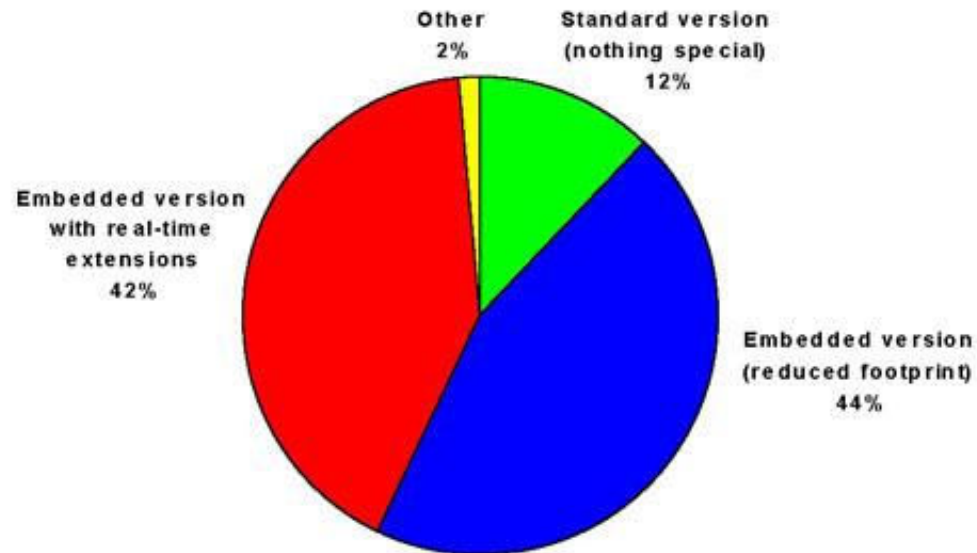


Linux Non Real Time Systems

- This is the status of the default Linux Kernel
 - Linux Kernel lacks the following functions:
 - Prioritization
 - Preemption functions
 - Offers services on a “best effort” basis
- Just like working with the Linux you know, but
 - Unnecessary drivers removed
 - NO or only a Single shell available
 - Often developed on one platform & deployed to another



What type of Linux OS will you need?



NRT Embedded Linux Satisfies 56% of Market Need NOW!



Linux Soft Real-Time Systems

- Designed to provide SRT (for multimedia application)
 - The problem with Linux-SRT was that it required modifications to the kernel
 - Keeping the kernel up-to-date became a time-consuming and ultimately futile exercise for the author, thus:

News

Linux-SRT is no longer being actively maintained, sorry!

The project was very successful but is too complex to keep up to date, due to the time involved tracking the modified kernel, X-server and window manager.

- This may not be the disaster it seems, the code is still available and the kernel version relatively recent



Linux Hard Real-Time Systems

- There are many Linux HRT systems
 - POSIX has defined RT services in PSE54
 - POSIX 1003.13[10]
 - A product called RTLinux is available (**commercial**)
 - A Linux kernel is run as a task under a proprietary RTOS, providing a “virtual machine” to operate in.
 - A product called RTAI is available (**open source**)
 - A patch is applied to the kernel to provide a Hardware Abstraction Layer (HAL), plus associates services.



In Summary:

Regardless Of The Embedded System Need

There Is A Linux For It!

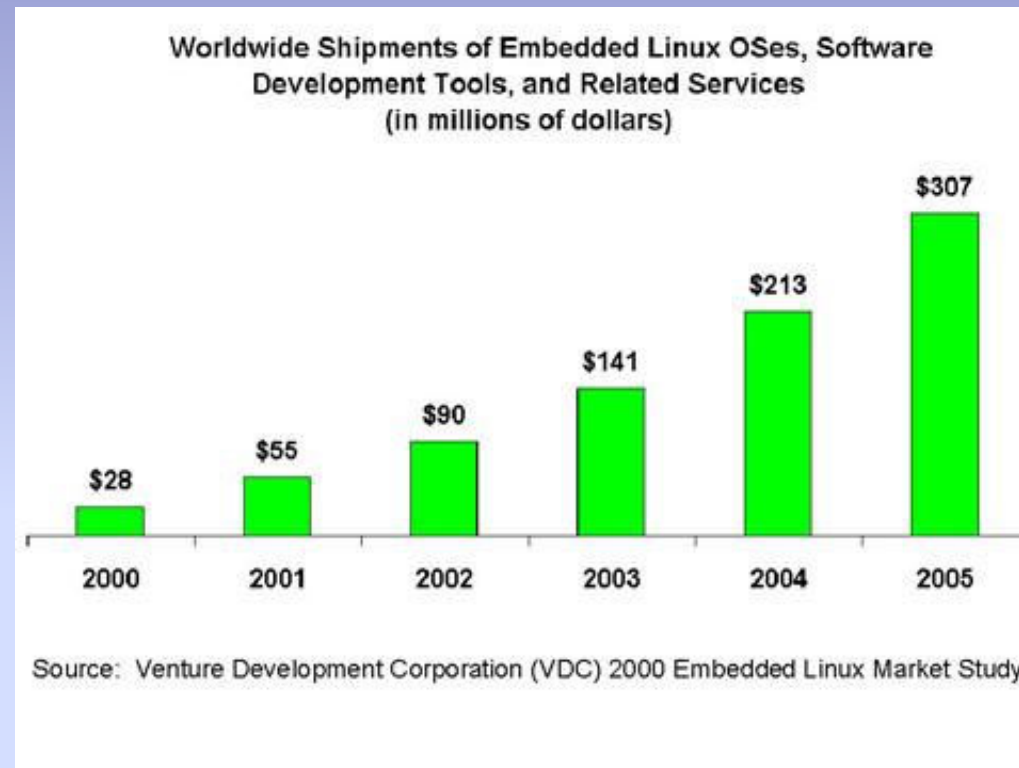


The Embedded Linux Marketplace

Just How Big Is The Embedded Linux Market?

Where Is The Embedded Linux Market Size Headed?

What Is Being Built With Embedded Linux?

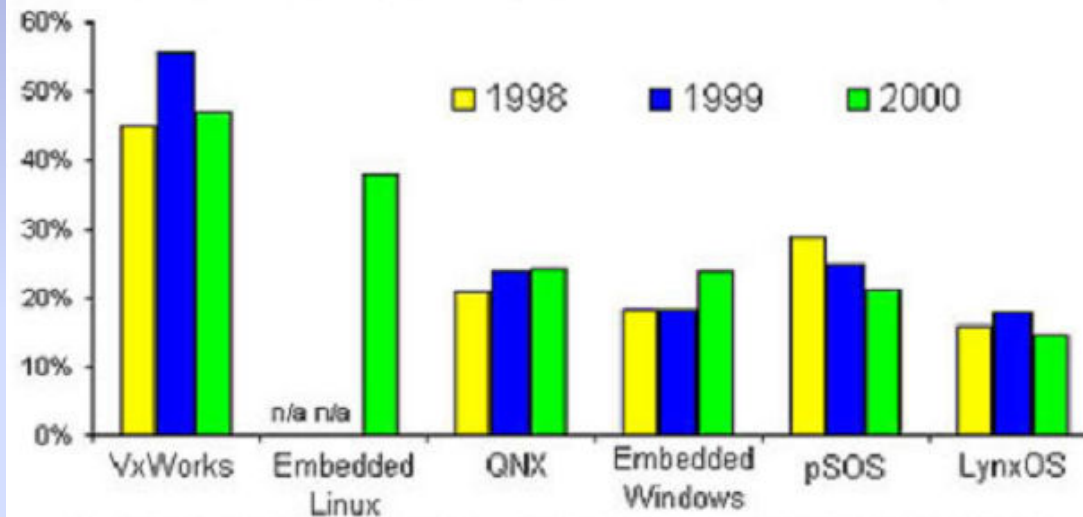


Embedded Linux Market – \$90M Now, \$307M by 2005



Which 16 or 32-bit vendors would you consider when purchasing RTOSes or kernels for your embedded projects?

(multiple selections permitted; top 6 selections in 2000 shown)

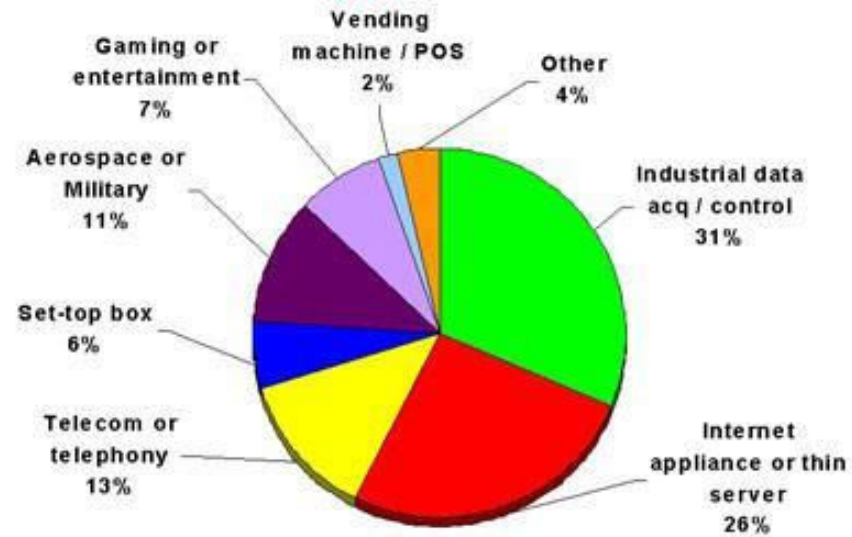


(Source: Embedded Systems Programming Magazine 2000 Subscriber Study)

Embedded Linux - 0% Market Choice in 1999 to 40% in 2000



Embedded Linux Application



Embedded Linux – Control Systems, Internet, Telco Top List



Certifications: LPIC & RHCE



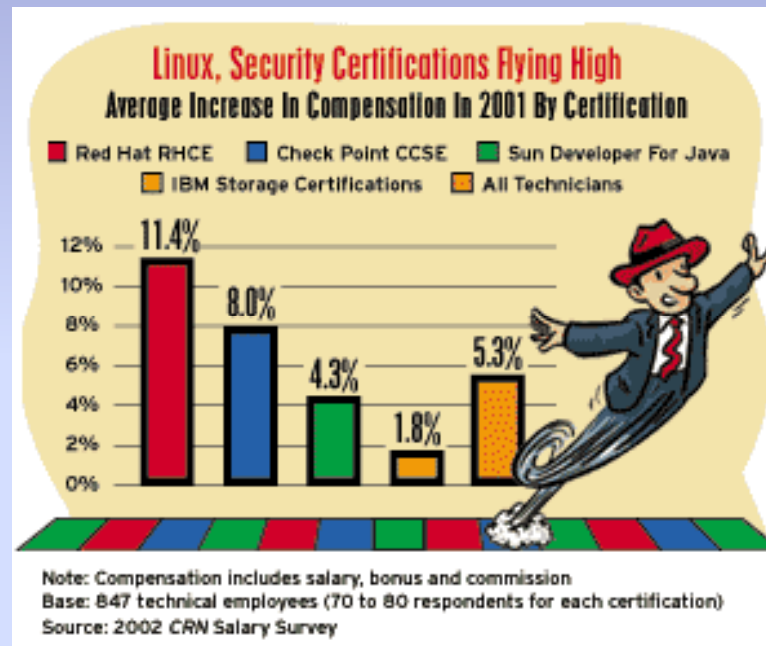


LPIC Is Not BETTER Than RHCE
--
RHCE Is Not BETTER Than LPIC

These Programs are both trying to create a pool
of EXPERTS businesses can count on
to solve problems



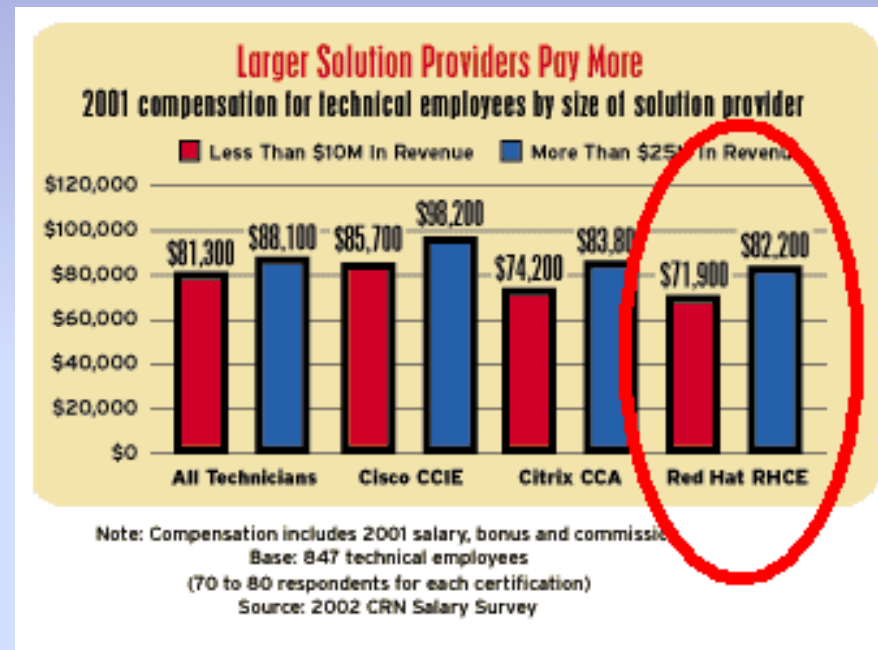
Certification – Why Bother?



A RHCE Designation Means an 11.4% Difference in Pay



Certification – Why Bother?



A Linux Certification Means \$7K to \$8K More Pay, Forever







Certification As An Investment

- Example (short term)
 - Certification Cost: \$HK10,000
 - Increased pay: \$HK5,000 per year
 - Term: 5 years
 - Cost of Money: 5% (inflation)
- Result (Net Present Value) = **\$11647.38**

<http://www.datadynamica.com/irr.asp>



RHCE vs. LPIC

| Vendor | Level | Cost | Exams |
|---|--------|----------|-----------|
|  | RHCT | \$USD349 | RH202 |
|  | RHCE | \$USD749 | RH302 |
|  | LPIC 1 | \$USD200 | 101 & 102 |
|  | LPIC 2 | \$USD200 | 201 & 202 |

RHCE More Mature, Better Recognized
LPIC Less Expensive



Linux Professional Institute



what...when...where...why...how...how much?



LPI Mission Statement

The Linux Professional Institute believes in the need for a standardized, multi-national, and respected program to certify levels of individual expertise in Linux.

This program must be able to satisfy the requirements of Linux professionals, as well as organizations which would employ or contract them.



The Certifications

LPIC Level 1

LPIC Level 2

LPIC Level 3



LPIC Level 1

- Beyond the power user & help desk level
- Heavier than the SAGE "Novice" level
- More advanced than CompTIA's Linux+
- Parallel to the Red Hat training program
- **MUST COMPLETE 101 & 102 EXAMS**



LPIC Level 1 (exam 101)

- Hardware & Architecture
- Linux Installation
- Package Management
- GNU & Unix commands
- Devices
- Linux File Systems
- Filesystem Hierarchy Standard
- X-Windows Configuration



LPIC Level 1 (exam 102)

- Kernel
- Boot, Initialization, Shutdown
- Run Levels
- Printing
- Documentation
- Shell Scripting
- Programming, and Compiling
- Administrative Tasks
- Networking Fundamentals
- Networking Services
- Security



LPIC Level 2

- LAN server (samba)
- Internet Gateway (firewall, proxy, mail, news)
- Internet Server (web server, FTP server)
- Advises management on automation and purchases
- **MUST COMPLETE 201 & 202 EXAMS**



LPIC Level 2 (exam 201)

- Linux Kernel
- System Startup
- Filesystem
- Hardware
- File and Service Sharing
- System Maintenance
- System Customization
- System Automation
- Troubleshooting



LPIC Level 2 (exam 202)

- Networking
- Mail
- News
- DNS
- Web Services
- Network Client Management
- System Security
- Network Troubleshooting



LPIC Level 3

- Designs and implements solutions to complex problems
 - Multi-site enterprises
 - Heavy-duty Internet sites
 - Custom solutions.
- Initiates projects and manages budget(s) to support them.
- Supervises assistants.
- Acts as a consultant to higher management.



LPIC Level 3 (assorted exams)

During 2002, we will be doing research to determine exactly which exams will be part of LPI Level 3.

The following titles are examples only:

- **321:** Windows Integration (working with MS server & clients)
- **322:** Internet Servers (FTP, HTTP; DNS, ISP, NFS, etc...)
- **323:** Database Server
- **324:** Security, Firewalls, Encryption
- **325:** Kernel Internals & Device drivers



Taking The LPIC Exams

- Where
 - Any VUE or Thompson Prometric Testing Center
- How
 - The exam is administered in a controlled environment
 - There is no “troubleshooting” laboratory as with the RHCE
- How Much
 - Exams cost \$USD100.00 each
 - Each Certification Level (1,2,3) costs \$USD200.00 in exams



LPIC Sample Questions

Which of these commands shows one page of output at a time?

1. more
2. less
3. sed
4. pause
5. grep

Which commands give you information about how much disk space a file uses?

- ls -l
- ls -la
- du .
- ls -a
- ls



IBM LPIC Tutorials

The *developerWorks* tutorial series for LPIC 101 and 102 exams:

- LPI certification 101 exam prep, Part 1: Linux fundamentals
- LPI certification 101 exam prep, Part 2: Basic administration
- LPI certification 101 exam prep, Part 3: Intermediate administration
- LPI certification 101 exam prep, Part 4: Advanced administration
- LPI certification 102 exam prep, Part 1: Compiling sources and managing packages
- LPI certification 102 exam prep, Part 2: Configuring and compiling the kernel
- LPI certification 102 exam prep, Part 3: Networking
- LPI certification 102 exam prep, Part 4: Secure shell and file sharing

<http://www-106.ibm.com/developerworks/training/>



LPIC Study Resources

- LPIC Certification Website
 - www.lpic.org
- The website I devoted to promoting the LPIC:
 - www.lpiwinnerscircle.com
 - The material there is constantly being updated
 - There are FREE questions available (about 30)
 - Go to the EXAM ENGINE section
 - User: HKLPG
 - Password: LPIC



Questions?