



**Linux + Certification White Paper  
December, 2000**

The IT industry has embraced Linux, the open source variant of Unix. From a handful of users in the mid-90s, Linux has grown an installed base of hundreds of thousands of users today. Linux now claims a substantial share of the Internet server market.

This white paper is an outgrowth of the Marketing Research Report and discussion for Linux+ that was disseminated to the industry players in the cornerstone committee meetings that were held in August and October of 2000.

**The background information for the Linux + certification program**

Today, Linux runs on an estimated 7 to 8 million computers, and thousands of programmers work on both the kernel and the Linux applications. The Linux kernel is now well into version 2.1, and compatible with an enormous amount of hardware, including the Alpha, Amiga, Atari, IBM, Intel, PowerPC/Macintosh, SGI, and Sun Sparc platforms.

LPI and Sair are two associations for the Linux community. LPI, Linux Professional Institute is a not-for-profit association. Sair is currently owned by Wave Technology International. They both have Linux certification tracks and target experienced Linux technical professionals. They have agreed to help CompTIA develop an entry-level certification. Linux+ can also be the stepping stone toward their higher level certification track. Caldera, Compaq, ElementK, HP, Compaq, Linuxcare, LinuxMall.com, LPI (Linux Professional Institute), Prosofttrainig.com, Sair, and Turbolinux are currently members of the Linux + cornerstone committee.

**Related information for the Linux+ certification program**

On October 10<sup>th</sup>, the second Linux + committee meeting was held in Atlanta, GA hosted by IBM. The committee members defined some basic information and outline for the program. We are considering using this information as the first draft. More program details will be defined after the Job Tasks Analysis.

### What is Linux+?

The Linux+ certification measures vendor-neutral Linux knowledge and skills for an individual with at least 6 months practical experience.

### Linux+ Target Audience

The target market for the Linux+ certification is any individual interested in demonstrating fundamental Linux knowledge and skills.

### Linux+ Potential Job Roles

- Entry Level Helpdesk
- Technical Sales / Marketing
- Entry Level Service Technician
- Technical Writers
- Resellers
- Application Developers
- Application Customer Service Reps

### Linux+ Exam Objectives Outline

- User administration
- Connecting to the network
- Package Management
- Security Concept
- Shell Scripting
- Networking
- Apache web server application
- Drivers (installation, updating, removing)
- Kernel (what it does, why rebuild)
- Basic printing
- Basic troubleshooting

Because Linux and GNU, by their very nature, are vendor-independent, there is a strong need in the industry for someone to drive the technical skills marketplace with comprehensive certification requirements. With the concepts of a PC appliance explained, for example, it becomes clear that A+ technicians will need to be able to support Linux. Network+ professionals will need to address it as it emerges as a network operating system and server platform. iNet+ and Internet providers need to understand Linux and GPL as it emerges as a very solid platform for the Apache web server.

These skills and competencies might be addressed by augmenting existing coverage of A+, Network+ and iNet+ certifications or they could be addressed through a Linux+ program.

## The Linux Market

Below is information about the distributors of Linux software show in the tremendous growth in the adoption of the Linux. As corporations increasingly embrace the use of Linux software, it is reasonable to assume that there will be an increase in the demand for Linux training. The following information is taken from the January 1999 Zona Research report “The Linux Market.”

### Estimated Revenue

<b>ESTIMATED REVENUES (\$ MILLIONS)</b>			
Distributor	1996	1997	1998
Red Hat	3.2	6.4	12.8
TurboLinux	NA	3.5	7.0
Caldera	NA	2.5	3.0
SuSE	NA	10.0	10.0
Total	3.2	22.4	32.8

The same report also estimates the number of Linux CD-ROM units sold in the U.S. through the same period:

<b>YEAR</b>	<b>US Linux CD-ROM Units Sold</b>
1996	450,000
1997	750,000
1998	1,500,000

IDC also attempted to estimate the size of the Linux market in its 1998 reports “Client Operating Environments” and “Server Operating Environments.” The table below shows the results of these reports for client and server shipments.

<b>LINUX NEW SERVER LICENSE SHIPMENTS, 1997-1998 (000)</b>					
	1997		1998		1997-1998 Growth(%)
	Shipments(000)	Share(%)	Shipments(000)	Share(%)	
Red Hat	130.0	54.1	418.8	55.9	222.1
SuSE	21.8	9.1	81.0	10.8	270.9
Caldera	16.0	6.7	56.7	7.6	254.6
TurboLinux	7.8	3.2	27.0	16.3	22.2
Other	64.8	27.0	166.3	22.2	156.6
Total	240.4	100.0	749.8	100.0	211.8

## **Industry participation**

According to Prometric's 2000 Training and Certification Study, conducted with Gartner Group in late 1999, the most important reasons to obtaining certification are to increase productivity (19%), increase credibility (16%), and assess ability (14%). Eighty-five percent of the 250 surveyed IT managers agree that there are advantages to having certified employees. Higher service levels (72%), access to vendor information (70%), and increased productivity (65%), were the top benefits recognized by managers. More than half of the managers could not identify to any disadvantages to certification. 85% of employers fund certification training and 93% fund employee training. The main reason employees don't pursue certification is because their employer does not require it (59%), although these employees claimed certification to be their motivation for training. Seventy seven percent of the surveyed certified employees said they are planning further certifications. Seventy five percent said that the certification vendor had not been in contact with them.

According to CompTIA's 1999 Workforce Study conducted with Ogilvy Public Relations and ICR Survey Research, 67% of CIOs in companies with more than \$20M in annual revenues say their most challenging issue is keeping up with technology, 58% keeping IT staff up-to-date, 57% for both finding qualified staff and end-user training. The companies that experience IT staffing difficulties site end user complaints as the number one problem (66%), lost productivity (59%), and IT staff dissatisfaction (57%). Instead of lowering employment standards, 87% of companies have taken action to fill open IT service and support positions; 75% train their own staff. Fifty six percent of the companies believe that "most job applicants for IT service and support positions do not have the training to do the job properly".

Forty-one percent of the companies say that independent certification is important (26% indicated neutral). Forty-eight percent are willing to pay higher salaries to certified employees that completed an industry- supported program. Companies with \$1B or more in revenues participate in programs that train students for IT careers (33%), while only 20% of companies with less than \$1B in revenues participate.

The demand for computer support specialists, database administrators, computer scientists, and systems analysts will more than double by 2006, according to the U.S. Bureau of Labor Statistics. Job vacancies in the IT sector were estimated to be 269,000 in 1999. Replacement costs of an IT worker are estimated to be 65% to 120% of base salary, according to the Meta Group. AUS Consultants, ICR's parent company, figured a total cost of \$124,28 for every vacant position. That figure translates to \$33.4B as the total cost for filling the open technical support specialist positions for every industry. IT shortages significantly affect the whole economy in ways of reduced final demand, lower household income, and less jobs in every industry. (CompTIA's Workforce Study, 1999).

The Hammes and Associates survey, 'The Mandates for the A+ Certificate for Manufacturers Only', in July 2000, shows that 77% of the companies benefit from A+ certification, such as reduced training needs, improved service capability, qualifies a technician's knowledge, etc.

The business rationale for industry participation shows the following benefits:

- 1.) Reduced training costs. Reduced training costs result in reduced production cost as well as cost to the end customer, which in turn leads to a quicker and greater adoption of a given technology, benefiting the industry as a whole.
- 2.) Increased quality control. The technology industry is well known for the radical change that occurs yearly. Concomitant with this furious rate of change is the fact that users arrive and progress in their technical abilities with a widely divergent body of knowledge. With standardized tests, vendors have an increased handle on staff competencies, resulting in more appropriate employee deployment, and better coordination in-house or at customer sites amongst employees with different skill sets. An employee lacking certain skills – as denoted by test results – will not be deployed in an area in which they are not capable, or else will be deployed with a more knowledgeable co-worker to the task, thus assuring greater customer satisfaction, while at the same time allowing co-workers to know with a reasonable degree of assurance what they can expect or not expect from a co-worker.
- 3.) Increased employee retention. Critical to this industry is that a large percentage of employees feel they are being put into situations inappropriate to their skill level. Clearly workers must adapt on the fly to novel situations and technologies they haven't seen. But they should also clearly feel confident when addressing a problem – whether it is novel or not – that they have a corpus of knowledge to allow them to address it intelligently and systematically. A worker constantly challenged beyond expertise level is very often one who may leave a company. Equally risky to a company, an employee who feels underused and not able to progress in knowledge or challenge is also at risk of being lost by a company. When an employee becomes certified it doesn't mean they're more likely to leave their current employer in search of the next higher-paying company. IDC's 1999 report, "Evaluating the Benefits and Market Perceptions of Novell Certification" also found that 61% of the 135 companies with Novell certified employees "believe that it is no more difficult to retain certified employees than it is to retain non-certified employees, and 40% of the 65 non-certified organizations agreed with this statement." Gartner's 1999 Dataquest report, "The Value of IT Certification" finds that once employees become certified they are more loyal to their employer. Twenty-three percent of the IT managers agree that certified employees stay more, only 9% said they're likely to leave more. Certification should be used as a marketing tool to retain employees. Also according to the same report, 19% of the IT managers said their top reason (along with increased productivity, 19%) for investing in certification is for service marketing advantage.
- 4.) Certification helps these situations: it creates a goal for those that feel underused to stretch for, while at the same time preventing frustration from in more junior employees who are deployed in situations for which they are not ready.

- A company can reduce attrition rates and the concomitant costs that go into every lost employee (e.g., replacement costs, placement costs, etc.) through an appropriate understanding of employee skills sets via certification such as Linux+, or the other CompTIA certifications. Employees in the technology industry are some of the brightest in any industry, and they know that the success of a company – and hence their own jobs – depends upon the savvy of their company. In this industry, “savvy” translates into not only knowledge, but knowledge delivered at the right time, to the right people, and at the right level. There is no way to accomplish this without testing to understand what levels people have achieved. To fail at this transfer of knowledge level may well send a subtle message to the employee that the company is no longer on the cutting edge. Employees will often “jump ship” at the first sign a company will not be able to compete in the future, as their own financial well being depends upon this ability.
- 5.) Appropriate training. Vendors invest greatly in their employees, with training as a major component in this investment. An employee engaged in training that is above or below the appropriate skill level may be dissatisfied, and furthermore the vendor may be left with an inappropriate expense and an employee who is non-billable for a period of time. Linux+ certification will assist in ascertaining what training is appropriate.
  - 6.) Reduced time to market. If a vendor can measure the abilities, as corroborated by a psychometrically valid test such as Linux+, of workers brought into their operations, less time need be spent on confirming skills levels or retraining workers. Instead, new workers are ready to learn the proprietary elements of a given company immediately, and the vendor can move them into more advanced and/or proprietary work faster. This translates into a more competitive company relative to competition that does not enjoy this benefit.
  - 7.) The industry as a whole benefits. As has been observed, a rising tide lifts all ships. While it may not be intuitively apparent, competition is ultimately a boon for any company that is itself driven by competence and quality. In other words, an industry that has reliably tested and trained workers is good for the success of the industry as a whole, while shoddy competition can lower the success of even good companies. In any event, certification such as Linux+ can ensure that companies that do participate in certification will have a staff able to create greater customer satisfaction, for the reasons noted above. Those that do not participate will have a much lesser ability to even gauge, let alone provide, customer satisfaction.
  - 8.) Worldwide standardization. With an increasingly mobile work force, as well as a globally distributed product, it is vital that vendors know their products can be serviced and supported reliably. To do otherwise may well risk vendor reputation and thus market share. Employee knowledge, which must necessarily be measured by certification as the metric, is cost-effective, if even a small percent of market share is protected or gained.
  - 9.) Recouping of investment. The investment as a cornerstone partner, which will range for CompTIA members from several thousand dollars up to \$25,000 USD, will be paid back dollar for dollar in coupons, providing a 25 percent discount on certification (choice of international or domestic). Additionally, CompTIA exams are discounted by \$50 or more for members under the non-member price. Please

see section following entitled Cornerstone Benefits for complete benefits on being a cornerstone with the Linux+ certification.

### **Cornerstone Benefits**

CompTIA develops certifications with industry players

The benefits that accrue to cornerstone members are many. Noted below are the most significant.

- ?? A number of 25% off coupons (choice of International or Domestic) for the Linux+ certification dependent on investment amount and CompTIA membership status.
- ?? Voting privileges on the Advisory Committee meeting. This Committee is the driving force behind the advancement of the certification and serves as the decision-making body. There are four advisory committee meetings a year, once a quarter, one of which may be held at an international location.
- ?? Listing as a Cornerstone Sponsor in all CompTIA's promotional materials (brochures, ads, etc.) regarding the Certification.
- ?? Authorization to use the certification program logo designating your company as a Cornerstone Sponser.

### **Chair & Cornerstone Responsibilities**

Cornerstone members should be present at all quarterly advisory committee meetings, to contribute ideas, content, and sit in committee. Additionally, only cornerstone members may function in the chair or vice-chair capacity.

The responsibilities of the chair are:

1. Setting the time, place and agenda for activities, calls and meetings in consultation with the CompTIA staff liaison.
2. Coordination of each member's assigned duties on initiatives or action items.
3. Presiding over each meeting and bringing decisions to a vote.
4. Formulating the group priorities.
5. Setting of group objectives.
6. Reviewing the draft minutes created by the staff liaison.

The responsibilities of the vice-chair are:

1. The Vice-Chair will serve in the Chair's position should the Chair be unable to attend a meeting. Should the Chair resign from this position, the Vice-Chair will serve as Chair for the balance of the un-expired term of office.
2. The Vice-Chair may succeed the Chair at the end of the Chair's term of office. However, this succession is at the recommendation of the Linux+ Advisory Committee and at the confirmation of CompTIA's Board of Directors.

### **Next Steps**

The next steps for parties interested in advancing the Linux + certification in the marketplace is to join the Linux + cornerstone committee. For further information, contact the Certification Program Manager, Eva Chen at 630-268-1818 x337, email [echen@CompTIA.org](mailto:echen@CompTIA.org).