Decision Framework, DF-19-1750
G. Weiss

Research Note
27 January 2003

The Linux Hype Cycle, 1Q03

Determining when to adopt an emerging technology is a critical decision. Gartner's Hype Cycle model can help the IS organization to manage the expectations and realities of Linux.

Core Topic
Hardware Platforms: Server Platforms

Key Issue
How will centralized and distributed servers evolve during the next five years?

Strategic Planning Assumption
It will take seven to 10 years for Linux to evolve from its established roots as infrastructure servers to achieve the high confidence levels required by IS management for deployment in large, critical corporate applications (0.8 probability).

Gartner introduced the Hype Cycle in 1995 as a model for judging if and when emerging technologies can be deployed within the enterprise with confident expectations of providing repeatable returns on investment. The Hype Cycle highlights patterns that tend to repeat themselves during most new technology cycles: overly optimistic anticipation and expectation, followed by a period of disillusionment when expectations are not met, eventual maturity and growth of the technology (if it succeeds, because not all technologies reach the Plateau of Productivity), followed by the productivity and benefits that accrue from its implementation. Gartner has characterized the process as passing through five phases:

- Technology Trigger: A breakthrough, invention, discovery, public demonstration, product launch or other event that generates significant press and industry interest.
- Peak of Inflated Expectations: A phase of overenthusiasm and unrealistic projections, producing a flurry of well-publicized activity by technology leaders that results in some successes, but more failures, as the technology is pushed to its limits. The enterprises that make money during this phase are generally conference organizers, magazine publishers and consultants.
- Trough of Disillusionment: The technology does not live up to its inflated expectations and rapidly becomes unfashionable; the press abandons the topic or touts its failure to meet expectations.
- Slope of Enlightenment: Focused experimentation and solid hard work by an increasingly diverse range of organizations lead to a true understanding of the technology's applicability, risks and benefits. Commercial off-the-shelf methodologies

© 2003 Gartner, Inc. and/or its Affiliates. All Rights Reserved. Reproduction of this publication in any form without prior written permission is forbidden. The information contained herein has been obtained from sources believed to be reliable. Gartner disclaims all warranties as to the accuracy, completeness or adequacy of such information. Gartner shall have no liability for errors, omissions or inadequacies in the information contained herein or for interpretations thereof. The reader assumes sole responsibility for the selection of these materials to achieve its intended results. The opinions expressed herein are subject to change without notice.

and tools become available to ease the development process and application integration.

- Plateau of Productivity: The real-world benefits of the technology are demonstrated and accepted. Tools and methodologies are increasingly stable as they enter their second and third generations. The final height of the plateau varies according to whether the technology is broadly applicable or benefits only niche markets.

A major fallacy with Linux is the tendency to view it as a single, homogeneous technology when, in effect, it should be analyzed by its application to markets and architectures. The most obvious example is the degree of divergence between Linux as a client operating system (OS) and Linux as a server OS. A desktop OS has a different set of design parameters, applications, management, compatibility and market dynamics from those for the server. However, even in the server market, there is a broad spectrum of deployment choices and dependencies.

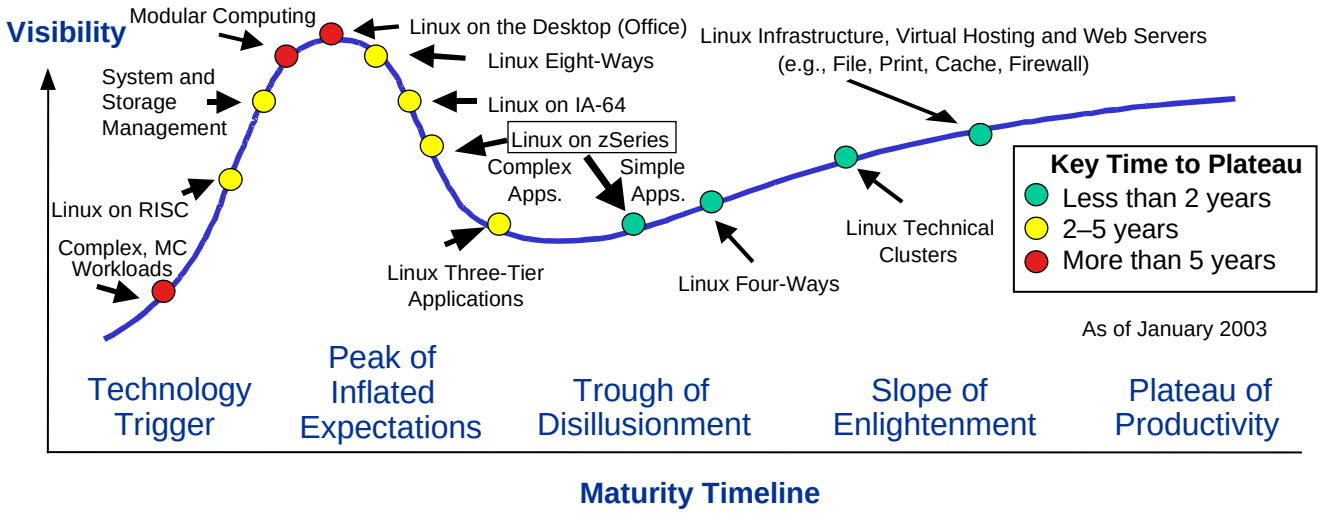
Consequently, the Linux Hype Cycle is fundamentally about market opportunities related to a battery of technologies. Linux started virtually from scratch in the early 1990s, destined by its author, Linus Torvalds, for desktop OS duty. The application of the OS to a multitude of server roles has been a gradual but relentless climb. Its emergence and growth were primarily due to a community of developers who were freely allowed access to the code to implement additions and changes to the kernel and submit them to a review process. The community interest in Linux was sparked by the challenge of hands-on tinkering and a democratic process, giving any individual equal opportunity to contribute and be recognized based on the merits of the submissions. And then there was the image of a competitive foe in Microsoft, whose market dominance and ability to dictate software evolution and pricing provided an additional impetus.

By 2000 to 2001, the press and Linux aficionados were anticipating no bounds to its role. However, the capability of an OS to satisfy a wide variety of roles is a multidimensional problem. Thus, the Hype Cycle breaks Linux into market- and technology-related components and where, on a timeline, they exist in maturity and acceptance (see Figure 1).

© 2003 Gartner, Inc. and/or its Affiliates. All Rights Reserved.

Figure 1

Linux Hype Cycle, 1Q03: Multiple Phases



MC = mission critical
RISC = reduced instruction set computer

Source: Gartner Research

Slope of Enlightenment to Plateau of Productivity: Linux began with its use in simple and narrowly defined roles in the network infrastructure, such as firewalls, gateways, Domain Naming System (DNS) and Dynamic Host Configuration Protocol (DHCP), File Transfer Protocol (FTP), Web, file-and-print servers, and caching. Its ability to run these services reliably on a network was already demonstrated in the late 1990s during the dot-com boom. Technical compute clusters have also emerged in applications that are specialized and can usually be parceled among servers (or workstations) that operate on one facet of the problem or can be used to crunch through an algorithm in batch mode as the parameters are changed, as in financial investment decision analysis.

Ascending the Slope to the Plateau of Productivity: Linux has been tested and deployed on servers with relatively simpler server configurations. Four-way symmetric multiprocessing (SMP) systems are now appearing, but usually with dedicated applications and small storage (50GB to 100GB). The adoption of these systems is still slowed by storage, volume management, backup and recovery, and other issues. Nevertheless, less expensive Intel-compatible servers for 32-bit front-end applications (for example, SAP) are becoming more common. IBM has made a successful strategy of taking simpler applications demanding deployment of many small servers and consolidating these loads in partitions on a mainframe, but these workloads still remain relatively simple (such as file, print, Web pages, e-mail, news and intranets).

© 2003 Gartner, Inc. and/or its Affiliates. All Rights Reserved.

Descending the Slope to the Trough of Disillusionment: The next stages in scalability will encompass Linux on 64-bit hardware and eight-way SMP systems. However, independent software vendors must write or port their applications for 64-bit hardware, and eight-way systems must be fully tested to ensure that the Linux OS can support heavier workloads and scale in a linear fashion. Larger database sizes and support of storage area networks with strong storage management will also be required features. High availability must also be a noteworthy part of the OS support. As these capabilities emerge (for example, Oracle's 9i Real Application Clusters, SteelEye Technology's LifeKeeper, Veritas Cluster Server and Red Hat's HA/Cluster), three-tier architectures, particularly for Unix, will over time adopt mixed Unix-Linux or all-Linux environments, especially where Java 2 Platform, Enterprise Edition (J2EE) is an underlying development foundation.

Ascending the Slope to the Peak of Inflated Expectations: Several Linux-related technologies will need more maturation for the OS to become pervasive in the enterprise. Among these are a large basket of system and storage management, provisioning, disaster recovery, performance analysis and reliability, availability and serviceability (RAS) support. Although it is easy to make simple extrapolations that these tools will migrate from Unix or Windows to Linux, much of the work is in system integration and testing with the Linux kernel. For example, some tools may operate well as layered products and others might demand changes/additions to application programming interfaces. In addition, success will be predicated on continuing life cycle improvements in maintenance and support as kernel updates occur. Rigorously proving and testing such environments for mission-critical RAS at cost economies more beneficial than those for current OS environments of Unix, Windows, mainframes and other proprietary environments will take time. It is with this recognition that we postulate our Strategic Planning Assumption:

It will take seven to 10 years for Linux to evolve from its established roots as infrastructure servers to achieve the high confidence levels required by IS management for deployment in large, critical corporate applications (0.8 probability).

Bottom Line: Linux should be considered a set of technologies with varying degrees of maturity and various applications, as opposed to a single, pervasive technology. The use of Linux for one application may not be an indicator that it is ready for other uses, and enterprise readiness snapshots in time can vary as much as five or more years. If an enterprise launches its efforts too soon, it will suffer unnecessarily through the painful and expensive lessons associated with deploying an immature

Acronym Key

DHCP	Dynamic Host Configuration Protocol
DNS	Domain Naming System
FTP	File Transfer Protocol
J2EE	Java 2 Platform, Enterprise Edition
OS	Operating system
RAS	Reliability, availability and serviceability
SMP	Symmetric multiprocessing

© 2003 Gartner, Inc. and/or its Affiliates. All Rights Reserved.

technology. If it delays action for too long, it runs the even-greater risk of being left behind by competitors that have succeeded in making the technology work to their advantage, or it runs the risk of leaving the enterprise open to vulnerabilities the new technology addresses. The decision can be made easier by understanding the Hype Cycle model of emerging technologies.

© 2003 Gartner, Inc. and/or its Affiliates. All Rights Reserved.