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white paper

Trends in the Internet Operations
Management Industry:
A Brief Historical Overview

REAL WORLD EXPERIENCE

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Introduction

Computer operations is hardly a new topic — in fact, some would say that most present-day operations issues were adequately addressed more than a quarter century ago. But while it's true that most of the challenges of that day — which do bear some similarity to those faced by present-day operations professionals — were appropriately resolved, some new wrinkles have appeared, thanks mainly to the advent of the Internet. As a result — and despite the IT industry's unfortunate reputation for “reinventing the wheel” — operations professionals today are tackling many of their biggest challenges for the first time.

What follows is an exploration of some of the historical landmarks that shaped the theory and practice of computer operations from the late 1980s to the present day. From there, we'll venture forward and, based on that history, extrapolate the shape of things to come.

The Late 1980s: Desktop Computing Takes Hold

With the advent of the Apple II and the subsequent arrival of the Macintosh and the IBM PC, corporate end users suddenly found themselves in the operations business. The initial reasons were purely practical: It was generally faster and easier to tinker and troubleshoot on your own than to call the central help desk with your problem and wait for a call back. As hardware and software prices dropped, it became feasible and even common for individual departments to specify and purchase their own equipment, adding to the “do it yourself” momentum. This growing sense of autonomy sometimes bordered on hubris, and users frequently got themselves into trouble — which would require a visit to the desktop by MIS staff, as networks were not yet ubiquitous and there were no tools to enable remote administration. In some cases, entire environments were built “organically” within a company. Once the principals lost interest or moved on, the central MIS department inherited these often slapdash arrangements.

This freewheeling state of affairs resulted in much finger pointing. Users took the position that they needed control of their desktops in order to work effectively (or to work at all). MIS departments, on the other hand, watching their own control over the computing environment erode, foresaw that the almost complete lack of centralized control and standards would result in an operationally intractable situation.

As networks began to appear in corporate environments, the need for network services — which typically meant centralized file and printer sharing — arose with them. These services were provided using general-purpose computers, or servers, that were similar to those on the desktop, but with more memory and disk space. The number of these servers grew rapidly, especially compared with what was used to implement similar services in the mainframe days and (to a lesser extent) in UNIX environments.

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From a cultural standpoint, many MIS departments didn't take desktop computing seriously. New groups — consisting largely of inexperienced staff — were created to deal with these new devices. In addition to the comparatively low cost, one of the main drivers behind desktop computing was the ability to “get the job done quickly” — in other words, faster than a centralized MIS department.

Consequently, a new culture began to appear around desktop computing — a “just make it work” culture that was, in significant respects, contrary to the prevailing MIS methodology. Indeed, the conventional view of the development cycle, supported by academic papers, saw such issues as needing to be addressed over a matter of years. With the new culture came new operations professionals, people who for the most part had little or no IT experience outside the realm of desktop computing. As a result, in the never-ending scramble to “just make it work,” the operations practices in place up to that point were largely left by the wayside. For instance, it became an accepted practice for both end users and operations staffers to reboot desktop and server machines — something completely unheard of in the mainframe days. For the first time, it was common to hear the words “my server is down” in company hallways.

In short, an operations staff with little or no exposure to the tried-and-true processes and procedures of mainframe operations was left managing these servers. Since most of the systems in question weren't performing mission-critical tasks (such as running payroll or a factory line), their relative instability was considered a tolerable tradeoff for quick turnaround on new features, higher speed, and of course localized control. Little attention was paid to topics like change control, repeatability, stability, monitoring, and proactive maintenance. All the while, more and more servers were being added to corporate data centers.

The Mid-1990s: Companies Connect to the Internet

As the Internet took hold, most of the new services being offered were delivered on general-purpose computers — not mainframes. The operations professionals running these systems were the same as those running the growing number of desktop machines and the servers supporting them. They brought the “just make it work” culture with them, and so the operational practices already becoming widespread within corporate environments became pervasive in Internet operations as well. Of course, there were exceptions, most notably the military Internet presence. Nonetheless, these exceptions were far outweighed by the “just make it work” community in the private sector.

With the advent of the World Wide Web, companies initially posted static Web pages, primarily for information and marketing purposes. The traffic these sites generated was generally quite

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low, since they were comprised primarily of plain text and images without multimedia and weren't especially compelling. As the Internet user population grew, the content of Web sites grew accordingly, both in volume and in complexity.

As a Web site's size, complexity, and number of visitors increases, the corresponding Internet traffic generally grows to represent the majority share of all Internet-bound traffic (the remainder being made up of employees accessing the Internet). Once this threshold has been crossed, a compelling argument can be made for co-locating the Web servers with an ISP, thereby defraying the cost of installing and maintaining a high-bandwidth connection to the corporate data center.

With nearly 10 years' accumulation of servers in corporate data centers, space was getting tighter all the time. MIS managers were looking for ways to reduce the number of servers and/or move some of the servers off-site, as data center construction is prohibitively expensive. The obvious choice was the Web servers, since this solved a tactical problem while simultaneously saving money.

ISPs meanwhile were watching their margins erode, as data bandwidth gradually became a commodity. The tier-1 carriers, as well as many others, realized that with corporate data centers bursting at the seams and the Internet continuing its explosive growth, co-location facilities would be needed. Although most of the carriers didn't have much interest in becoming co-location providers, they realized that doing so might give them a leg up on the competition — and that if they didn't, they would very likely lose out on all but long-haul, point-to-point traffic. Millions of square feet of data center space were built and populated. Most clients preferred to be physically close to their equipment — partly for emotional reasons, partly because ISPs were not providing operations support beyond power-cycling and facilities maintenance. As a result, data centers were built in major metropolitan areas, close to their clients.

The Present Day: Companies Seek Fully Managed Services

Since the mid-1990s, many changes have come to the Internet operations arena. Among them:

Competition for co-location business among ISPs has increased, despite overall growth in this segment.

With increased IT deployment across most industries has come a severe shortage of qualified operations professionals — a shortage so severe that Internet operations

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staffing has effectively become a zero-sum game, with each operations professional hired perceived as a reduction in the pool of talent available to other companies. As a result, there has been a high-stakes “land grab” for technical talent, since the more them to be providers of commodity services, with the differentiating factor being the level and quality of fully managed services available within their facilities.

Companies are starting to separate mission-critical activities (such as keeping their site up) from strategic activities; many have outsourced or are thinking of outsourcing the mission-critical operations activities, since attracting and retaining trained operations professionals is difficult in absolute terms, and particularly difficult for companies whose core business is not IT (a description that includes most dot-coms).

Software vendors have increased the rate at which new versions of applications, operating systems, databases, and related technologies are released, yielding an ever-growing n-dimensional compatibility matrix — which, like the “just make it work” culture, is at odds with stable operations.

Many of the operations professionals are young, hail from the “just make it work” arena, and aren’t accustomed to designing and implementing scalable environments.

ISP/co-location providers take various approaches to these issues. Some, adopting a purist stance, continue to have nothing to do with Internet operations beyond keeping the facilities and the network running. Some have invited operations companies to lease space and bandwidth at bulk rates; they, in turn, resell these offerings and supplement them with operations services. Some have elected to provide end-to-end service, and have acquired operations and/or consulting companies to help them do so. Others have chosen to partner with operations companies, but still own the relationship with the end-client. The relationship between ISP/co-location companies and operations companies is a marriage of necessity, driven by the demand for fully managed services. An uneasy partnership by definition, it touches on client ownership and brings to the surface the cultural differences between pure ISP/co-location companies and pure consulting/operations companies.

The consulting and operations companies also take various approaches. Some provide OS and networking support only. Others provide consulting and operations support. Still others have fixed architectures into which they expect prospective clients to place their content. Some insist that the environment be “cleaned” before taking over operations responsibility. Some have security offerings, and some don’t. Some lease hardware and/or software, and some don’t. Some resell hardware and/or software, and some are vendor-agnostic. Some have partnered with one or two ISP/co-location companies while others are prepared to provide service in any

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facility. Some have fixed monthly fees, others charge by the hour. With some, it's possible to purchase a block of hours per month at a reduced rate; with others, this is not an option. Some do consulting and/or modification work on an hourly basis, while others have a fixed-rate offering.

The many choices available in Internet operations services today stem from the immaturity of the industry (which is after all only a few years old), coupled with the high rate of technological change and a wide spectrum of requirements from potential consumers of these services.

The Future: Standardization

As the Internet operations industry matures, there will obviously be further changes in technology and in the corresponding best practices accepted in the operations arena.

Up to now, each site has been to a great extent a unique creation. Although there have clearly been good reasons for this, it's also clear that this is not the most efficient way to construct a site. Indeed, when we examine mature industries, we find there are accepted good engineering and operations practices. While the Internet and the industry that has grown up around it have evolved with unparalleled speed, there is still something to be learned from these other industries, all of which have eventually gravitated to a set of generally accepted standards and practices.

Companies are now demanding all-inclusive service offerings, and it is likely that in the future, they'll get what they're demanding. We expect to see ISP/co-location providers who either "do it all" themselves or establish healthy partnerships with companies that can help them provide the services they lack. More likely than not, spending on the operations component will far outweigh co-location and bandwidth costs. ISP/co-location providers will primarily be differentiated by their ability to provide Internet operations services, not merely by the stability of their physical infrastructures and networks.

As a result, Internet operations are likely to be the next big wave in the Internet technical-service industry. If the Internet operations industry is successful in convincing companies that using standardized service offerings is in the long run cheaper and more reliable, there will be more and more sites engineered with a view to handing operations over to a specific operations company or group of companies. Operations would then no longer be an afterthought, but rather the starting point for engineering activities. Before design work begins, engineers might ask, "How should this be built so that operations can be outsourced with minimal fuss?" There will likely be standards (possibly de facto product/configuration standards) to which engineering

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solutions must adhere; otherwise the operations costs will be prohibitive. We can expect to see plenty of “standards are good” marketing.

Given a continued shortage of trained operations professionals, it is virtually certain that future solutions will be constructed to minimize the amount of ongoing human intervention, and perhaps even the amount of up-front development and engineering time. In this vein, the META Group has been referring to “sledge-hammer engineering” for several years already.

Operations professionals have already begun to congregate within companies where “IT is the business,” much as large consulting firms attract many of the best and the brightest in the arenas where they participate. It could very well be that, if some semblance of standards does not emerge before non-IT companies hit the Internet operations recruiting wall, Big Five-style Internet operations companies will emerge to run the majority of Internet sites. It would then be virtually impossible for a non-IT company to find the talent required to run its own site. If these large Internet operations companies were to partner with the large consulting firms, the market would become virtually impenetrable to smaller players, much like the hold large consulting firms currently enjoy in their own markets. As in other industries, a phase of standardization and consolidation will likely follow the wave of innovation sweeping in the Internet space today.

Since the effects of operational quality are felt most acutely in the Internet arena, we expect to see these trends appear there first. Then later on they may start to appear in corporate MIS practices, where TCO is still king.

About Certainty Solutions, Inc.

Certainty Solutions is the leading integrated managed services provider (IMSP) for companies with sophisticated Internet businesses. The company provides customers with both pre-packaged and customized site architecture solutions, standard and a-la-carte managed services offerings, implementation services and hosting/bandwidth solutions.

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