

Investing in the Net Generation

IBM Comes to the Table

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Since 1984, Andrews Consulting Group (formerly D.H. Andrews Group) has been helping organizations make more effective use of computer technology. Much of the consulting practice focuses on replacing older applications with newer and more effective ones based on a mix of technologies including PCs, AS/400 systems, Unix computers, and mainframes. Andrews Consulting Group has pioneered the development of management techniques to speed up the implementation of improved applications.

Andrews Consulting Group helps organizations plan their use of information technology and then assists in the implementation of new systems. We are also widely recognized for our clearly written computer industry reports on current technologies including IBM's server families, client/server, LANs, networks, and Internet computing.

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Introduction

Celebrities such as Michael Jordan, Julia Roberts, and Donald Trump need no introduction—we all know who they are. Likewise there are businesses such as Coca-Cola, Microsoft, and Disney that nearly everyone knows. IBM would appear near the top of any list of well-known companies, and yet there are situations when even IBM still needs an introduction. There are so many products and services that IBM offers, and they change so rapidly that many customers are unaware that IBM might have something of value to offer to them. This appears to be the case in a new and rapidly growing segment of the market for computer technology—*net generation companies*.

Pick a term: net generation, dotcom, new economy, Internet startup. It doesn't matter; they all refer to the new category of high-technology companies that have emerged in recent years in reaction to the rise of the Internet. The companies that belong to this unique new group include Internet service providers (ISPs), application service providers (ASPs), Web-hosting providers, Web portals, and e-marketplaces (business to business [B2B] and business to consumer [B2C]). For the purposes of this report, *net generation* or *dotcom* will be used.

A handful of net generation companies are well known. AOL, AT&T, and Digex are among the most recognized ISPs. Yahoo is perhaps the best known portal, and Amazon.com, e-Bay, and e-Trade are widely recognized consumer Web businesses. These well-known companies represent a small fraction of the dotcom community. It is made up of many smaller businesses that have not established brand names.

Many net generation companies started as ISPs and quickly added other services. They may offer Web site hosting, Internet access, and e-mail. Increasingly, they

offer services such as Web site design, Web integration with other applications, and even data center management. In addition to e-mail, the newest trend is to offer a growing set of applications for rent and business services to communities. Most of these net generation companies are small, independent businesses that employ fewer than 100 people, are less than five-years old, and generate under \$5 million per year in revenue.

Collectively, net generation companies spent nearly \$40 billion worldwide in 1999 on IT services. By 2003 that amount could triple. IT vendors worldwide, however, realize these net generation firms will have, in addition to their direct spending, extraordinary influence on trends and directions in the future. IBM has discovered this new community and has started showing it with attention.

The people that make technology-buying decisions for net generation companies are all aware of IBM. Many, however, do not realize the extent to which IBM has refocused important parts of its products, services, and marketing energies to meet their unique needs. IBM is a complex corporation. Navigating the enormous breadth of the IBM offerings is not easy.

This report is designed for the net generation companies who know little or nothing about IBM. Written in a modular form, it will combine a view of the critical success factors for a net generation business with a kind of roadmap to understand that IBM has offerings for virtually every dimension of those success criteria. The real trick is to find it all and put it in understandable terms. Along the way, we will provide some historical perspectives to frame IBM's serious investments in this new exciting market. ♦

Executive Summary

Net generation companies have become a major force in the world economy. Those that have gone public have helped drive the stock market to all time highs. While the market for technology stocks has plunged recently, that has not changed the ability of others in attracting much of the record amount of venture capital being invested. Future directions of IT technology, combined with the way business will be done on the Internet, will be dramatically influenced by these new businesses. It is therefore not surprising that IBM has selected net generation firms for special attention.

The appetite of net generation businesses for information technology seems insatiable. They are exceedingly knowledgeable buyers who are highly value conscious and willing to try innovative new products. Research shows that they prefer to do business with technology providers who understand their unique needs, have demonstrated technology leadership over time, and have established enough market share to remain viable in the long term.

The technology-astute people that make buying decisions for these companies prefer products that they already know—often the ones they were first exposed to at a university. Recent media reports have focused on new net generation companies that are being created in dorm rooms! Students are often not exposed to IBM products until after graduation. This is a problem for IBM.

Some net generation companies start small, and they are initially strapped for cash. They are staffed with energetic people who learn the hard way the complexities of larger-scale software development—after their business volumes start to explode. They make technology decisions early and quickly in the life cycle without the luxury of a careful analysis of long-term implications. They do not have time. The natural ten-

dency is to buy whatever the technical staff already knows best or what costs the least in the short term.

To complicate matters, this is not a single-dimension market. Internet service providers, Internet startups, application service providers, and portals all exhibit different buying characteristics. Some early leaders are morphing into e-marketplaces, which will drive another set of wants and needs.

Since when does IBM pay attention to businesses that average around \$5 million in annual sales? In the past, the answer was never. All that has changed. The rapid rise of net generation companies is forcing IBM to take notice. A special group of people has been assembled to focus exclusively on the unique requirements of net generation buyers. Just as importantly, the IBM approach to developing solutions, servers and software, creating special offerings, and selling is being adjusted to the needs of the net generation companies. No other opportunity is currently getting more attention from IBM's senior management.

The challenge IBM faces is to get an opportunity to tell its story to net generation companies before other products are selected. The key to doing this will be to identify and pay more attention to these companies early in their life cycle and to communicate in understandable terms what IBM has to offer. IBM has a stunning array of technologies but at times has trouble sorting out the story.

When something new comes along, the IBM approach has always been to create carefully designed and well-engineered products backed up by excellent support. The result is that IBM products often arrive later and cost a little more but are regularly leaders in quality and reliability. Therefore, IBM usually features value and cost of ownership versus initial price. This has

proven to be a winning formula over many decades, but is one that needs to be sold to a whole new industry that is being courted with many freebies up front as well as deferred-payment financial arrangements.

The emergence of a new class of businesses that exploits opportunities created by the Internet has hardly come as a surprise to IBM. Lou Gerstner, the Chairman of IBM, was one of the first high-profile executives to openly embrace the Internet and to grasp its full significance. Early in 1996, IBM established an Internet division and began to shift its product and research development spending in this new direction.

IBM coined the term *e-business*. The company took it upon itself to educate the general public about the implications of the information technology revolution. Hundreds of millions of dollars have been spent on television advertising alone. The ads feature slice-of-life stories, usually humorous, shown with large blue borders above and below the black and white video. The widespread use of the term *e-business* can be directly attributed to this campaign. The ad campaign has been successful enough that most people now associate IBM with e-business. It is ironic that the company that invented the term now finds itself in a sort of e-business catch-up mode, trying to appeal to the fastest growing and most exciting segment of the market—net generation companies. Few understand the degree to which IBM has restructured its product lines and services to meet their needs.

It is troubling to IBM that many net generation businesses do not view the concept of e-business as applicable to them. Some view the term as specific to transitioning existing businesses from old-world models to e-commerce models, rather than being relevant to companies that are starting from scratch. Not so. The explosive growth profile of the typical net generation company will quickly immerse it in all the same scalability, reliability, and complex transaction problems of a more mature entity. Amusingly, dotcom firms will also face legacy problems of their own over time. If anything typifies the concept of e-business, it is massive integration.

As a result of the Gerstner e-business vision, IBM boasts the largest portfolio of real customer success stories—about 20,000 at last count—across every industry imaginable. Pick a sub-segment in any industry, and one will most likely find IBM has hands-on experience transitioning companies to true e-business.

To date, an estimated 70% to 80% of typical ISP or ASP customers are consumers. The largest opportunity for growth and profit in the future lies in business to business (B2B). IBM has well-earned legendary credentials for helping the major corporations of the world manage the alignment of their IT capabilities and their businesses. This should be an important attraction for the typical net generation company.

This report will highlight interesting and sometimes surprising bits of information to help the net generation reader understand what IBM brings to the table.

Read on to learn about:

- An initiative called IBM Service Providers for e-business that is an integrated portfolio of offerings and programs designed to help ISPs, ASPs, ISVs (independent software vendors), and system integrators.
- The ASP Prime program that helps ISVs who want to become ASPs with every detail from education to implementation and marketing.
- Servers that virtually never fail and lead the planet in scalability and reliability.
- The way in which IBM has become the “dot in .com.”
- The Application Framework for e-business that is a roadmap for designing successful e-business applications.
- Eight different scaling techniques across five different Internet workload profiles.
- The role of the Linux operating system in IBM’s server strategy.
- IBM’s support of open standards.

Net generation firms should carefully weigh what IBM has to offer. ♦

Success Factors for the Net Generation

It isn't hard to find consultants who are ready to provide endless opinions on everything that relates to dotcoms—from a broad definition of e-business to a method for becoming an ASP. In this section of the report, Andrews Consulting Group is going to distill these down to those essential elements that should resonate as critical for all net generation readers. Few of these are unique to a segment of the market, and all are important criteria for success.

- *Keeping up with changes in technology.* This is a combination of monitoring advances in technology that are relevant, making sense out of them, and implementing them at the correct rate and pace. State-of-the-art, reliable technology is the key mechanism by which the smaller net generation company competes with the titans.
- *Having scalable, non-disruptive growth.* Explosive growth in business volumes is the norm, and the infrastructure has to be scalable on demand. This cannot lead to instability in the delivery of products and services.
- *Demanding 24x7 availability.* Downtime is unacceptable and very expensive.
- *Managing in an increasingly complex environment.* A burgeoning customer base, seamless integration with existing infrastructure, and the ability to add product enhancements all become a mind-numbing challenge.
- *Acquiring and retaining skills.* This is pandemic in the industry today because the smaller net generation firms can be at a disadvantage. From competitive compensation on the one hand to time for adequate training on the other, this is a quandary that most firms face today.
- *Attaining and maintaining market leadership.* Targeted leadership in the market is essential to large-scale success. Being a first mover is more important than having the most brilliant solution. Brand recognition is cemented early.
- *Closing business deals quickly.* Alliances, partnerships, and customer contracts take place at Web speed. The dotcom companies must select partners who can move at the same rate—or be left behind.
- *Selecting experienced partners and vendors.* As the shift from consumer to business focus occurs, vertical industry experience that matches the direction of the net generation firm's plans will be invaluable.
- *Choosing vendors with quality products.* As the stakes go up, overall quality of the products procured by net generation companies must be industry leading. Companies should be careful of low-cost providers as the downstream consequences of cost of ownership and reliability can be devastating.
- *Choosing vendor products that support open and emerging standards.* The term proprietary is a bit outmoded—NT fits the description as well as any operating system. What is important is that all platforms solidly support open standards.
- *Funding growth.* Adequate financing is a major element in sustaining a business.

As the net generation reader of this report considers IT vendors, matching those vendor capabilities with the critical success factors would be good advice. In the section on IBM products and services, this report will point to linkages between the value propositions of IBM's offerings and these critical success factors. ♦

What IBM Is Up To

The battle for the hearts and minds of net-generation technology buyers is about to heat up as IBM makes its play to become a major supplier to this community. The IBM strategy for doing so is not an obvious one and is going to make for great theater for those watching from the sidelines.

If your company is part of the net generation, IBM wants to be your “big blue buddy.” IBM will not fail for lack of effort, funding, or senior management attention. The strategy that has been put in place includes the following elements:

- *Creating the Global Net Generation organization.* It is dedicated to helping to generate business with this new hotbed in the industry by offering IBM support, products, and services. To date, IBM boasts about 1,000 net generation customers worldwide.
- *Establishing the net generation City Manager organization.* In 35 major cities worldwide, the net generation city manager is someone who can be contacted by dotcoms so that they can engage with IBM. Over 500 people have been dedicated to net generation sales and are being trained to communicate effectively with this new community of buyers.
- *Providing aggressive new programs.* Both a financial program, called Quick Launch, and an educational program, called Going Global, were announced in June 2000.
- *Creating the ASP Prime program.* This program pays special attention to software developers who want to ASP-enable their applications. Specifically, IBM will provide education, assessment, and enablement assistance programs as well as discounted hardware, software, and special financing.
- *Leveraging IBM Global Services (IGS).* IGS is the world leader in overall size, geographic coverage, and experience in e-business. Net generation companies are being encouraged to come to IBM for the advice and assistance most will need. IGS will help not only on IBM but also Sun Microsystems and other competitive platforms.
- *Offering unparalleled servers.* Many dotcom companies have already installed non-IBM servers, but there are hundreds of new companies making server decisions every month, giving IBM an opportunity to strut its stuff. Not everyone is happy with the servers now in use, and since IBM boasts every popular platform, this leaves the door open for IBM to increase share.
- *Catching the Linux wave.* IBM provides leadership in Linux and can help net generation companies discover a more open, flexible, and cost-effective operating system option. IBM is the first large vendor to completely embrace Linux. All IBM servers either support Linux now or will soon.
- *Having global industry experience.* If growth is what fuels a net generation company, then all will be impressed with IBM’s depth of e-business experience. No one on the planet can point to as many true-life customer experiences. The value here is that IBM can provide global solutions and insight into the complexity of multinational businesses. With deployment of offerings and programs worldwide, net generation firms can benefit from connections with IBM teams and business partners in approximately 170 countries. IBM has been there and done that.

What IBM Is Up To

- *Providing a wide breadth of offerings.* No other vendor has the sheer number of relevant products and services to offer net generation companies. If IBM does not sell the server, it can still provide middleware, storage, and services.
- *Becoming the best partner.* IBM invented the concept of a business partner and pioneered the manner in which it assisted software and service providers to go to market together. IBM will leverage its considerable expertise in this arena to facilitate success for the netgen companies.
- *Leveraging an impressive portfolio of technologies.* IBM boasts more patents than any other technology company. Its software and hardware products deliver end-to-end functionality for its customers. IBM is committed to technology and the technology community.
- *Speeding up decision-making.* IBM can react at Internet speed to whatever customers need. This has not been an IBM strength in the past, but today IBM is adapting to the speed of the Internet.

The most successful net generation companies outsource functions that they do not consider core. IBM hopes to become the most popular partner for netgen companies to turn to for a wide variety of functions. As an example, IBM has an initiative called Edge of Network (EoN) that drives the design, builds, and supports special-purpose PCs and Internet appliances.

One of the EoN appliances has been selected by Fidelity Investments for a new program it is offering to its investors. The device will be a simple computer that will provide a browser interface to the Internet through a Web portal site controlled by Fidelity. Partners in the deal include IBM, AT&T, Lycos, and Fidelity.

This project is a proof-point of IBM's EoN initiative. It leverages the size and capability IBM has to offer to the industry as it enters the next phase of Internet computing. IBM designed and built the appliances as

well as supplied key middleware components, and it is helping to support these devices once they are in the hands of investors. It is hard to think of another IT vendor that can handle all of the different functions IBM is providing for this project.

Linux as a Critical Element in IBM's Strategy

It is not obvious why IBM would bet on an operating system that no one owns. Linux is developed by a loose federation of independent programmers, most of whom do not get paid for their efforts and who rarely see each other in person. Linux source code is available for free, and users are encouraged to modify it in any way that suits them. It is a true grassroots movement.

IBM makes a great deal of money selling proprietary software whose inner workings are as closely guarded as the formula for Coke. It is therefore surprising to find IBM working feverishly to help the Linux movement succeed. IBM's aggressive support for Linux begins to make sense after a closer look at the dynamics of the market.

Linux is a return to the original values that drove the Unix market. It holds out hope for a united set of standards for the open systems community. A growing number of people entering the job market come with knowledge of Linux since it is often what is running on their university or home systems. Many are already part of the growing Linux development community, which developed the Apache Web server software that is so popular within dotcom companies. The ability to modify Linux source code has a great deal of appeal to the technical people who frequently make the buying decisions at net generation companies.

IBM's strategy has two components. It is important to understand both. These include:

- Having a dual operating system strategy. All servers will run Linux in addition to the regular operating system.

- Becoming the provider of hardware, middleware, and services around Linux.

Another more subtle component of IBM's strategy is that Linux will allow a move to the next frontier—to standardizing system services. This is the area that open standards of the past have never been able to touch. All the proprietary operating systems of the world (like NT, OS/390, OS/400, and the Unix variants) have had to maintain their custom-designed inner workings. Linux finally offers an answer. This is not lost on IBM. It will not miss the front end of this revolution.

Recently, IBM made it known that it is formally adopting a dual-operating system strategy. Every server brand, from the mainframe down to the Netfinity PC server line either does now—or will soon—run Linux. Implementations will vary by brand. Some will run in native mode, while others will run in a compatibility mode. All the sizzling new Web-based applications that come along in Linux will automatically be available on all the IBM servers. Paramount here is that a company's existing applications will not have to change, and benefits can be realized instantly.

While Linux is free, the hardware on which it runs is not. Companies that desire to use the Linux operating system will still need to pay for services to install and deploy both applications and middleware. IBM's goal is to become the leading supplier of the hardware, middleware, development tools, and services that will surround Linux operating systems. IBM believes that the cost of ownership of Linux servers can be much lower than that of servers running NT or any of the popular Unix variants.

Right now, Linux is an immature operating system. It takes many years for an operating system to move to a robustness capable of enterprise computing. For now, Linux is positioned at the lower end of the market where its use in lighter applications and server appliances is about all it can handle.

The companies that have the most to lose if Linux is successful are Sun and Microsoft. To compete, Sun hopes to establish Solaris as a de facto standard for Web applications. Microsoft, of course, wants Windows NT/2000 to be the dominant server operating system as well as its own proprietary development environment to be the first choice of ISVs. Initially, Sun will be satisfied if Linux can slow NT's ability to impact Sun at the low end. If Linux, with IBM's help, becomes the leading server operating system and the leading environment targeted by developers, then the market momentum of both Sun and Microsoft will be impacted considerably.

The inevitable increase in popularity of Linux is sure to put strong pressure on the incumbent server operating system vendors to lower costs and improve their value proposition. IBM is the first large vendor to jump into the pond and is steadfastly resisting the temptation to take over. What is surprising is that IBM has publicly promised it will follow wherever Linux leads. The company will make extraordinary contributions along the way. Net generation companies cannot help but be among the winners as this battle of the titans plays out.

To learn more, go to IBM's Linux home page at www.ibm.com/software/is/mp/linux.

Should You Do Business with IBM?

As you think about IBM, don't just consider it a provider of hardware for commercial applications. Gerstner's Internet-oriented IBM is a far different company than the one he inherited. IBM has become a leader in inventing the technology that is driving the Internet revolution. Managed the right way, a partnership with IBM can be of valuable assistance to net generation companies.

In addition to accomplishing the tasks required to be successful, dotcom companies have the added challenge of having a short life cycle. From concept to full

What IBM Is Up To

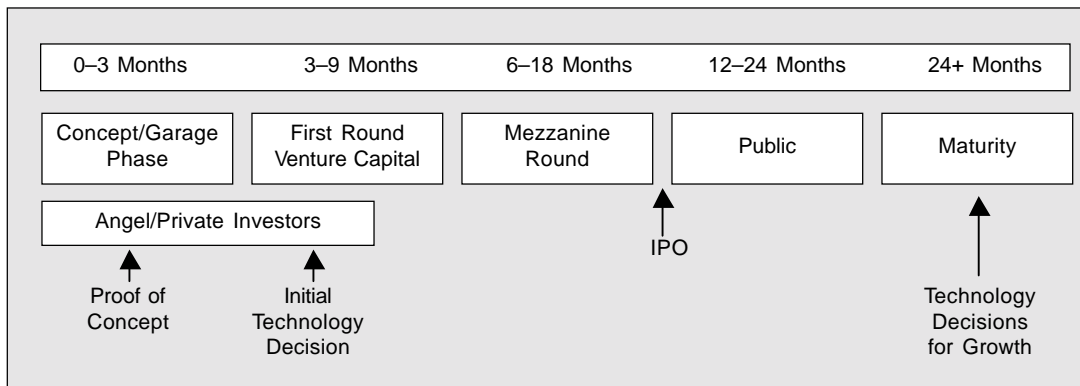
maturity, twenty-four months is a typical pattern. IBM, therefore, needs to be engaged at the outset, as technology decisions are normally made at the end of the concept phase, which lasts approximately three months. The graphic in Figure 1 illustrates this life cycle.

It is not possible to say whether a particular net generation business should buy anything from IBM. What has become obvious is that IBM products and services should be considered. Net generation compa-

nies are sophisticated enough to recognize which products and services fit their needs; so there is little danger in considering what IBM has to offer. In many cases, these companies will be pleasantly surprised by what is discovered.

The remainder of the report will provide a summary of the relevant IBM products and services, highlighting key and unique value points. It is provided as a broad guide and a starting point. ♦

Figure 1: The life cycle of a net generation company



IBM Products and Services

Think about IBM as a combination of tens or even hundreds of smaller companies. Ask any selection of customers or business partners and one is likely to get very different opinions on what it is like doing business with IBM. In reality, IBM is not the monolith that the logo implies, and managing this titan is a lesson in matrix management. It is not within the scope of this paper to cover the subject of managing an IBM relationship.

What will be helpful to interested net generation companies is a roadmap to guide them through all the important products and services within IBM. The table on the next page is designed to provide a quick matrix of relevant offerings from IBM. The balance of this section expands most of the points with an eye toward linkage to the critical success factors outlined previously. The reader will be referred to Web sites where more specific information can be found.

IBM offers the broadest line of products and services of any IT vendor. It includes servers, PCs, storage systems, system software, middleware, consulting, industry marketing experience, and a growing array of services too numerous to mention.

IBM's pure research efforts regularly result in winning the patent battles among companies of all types. In 1999, IBM earned approximately 2,800 patents that led the next closest company (NEC) by roughly 1,000. Interestingly enough, only Toshiba and Canon are close to NEC. None of IBM's traditional IT competitors even come close. To IBM's credit, its research is not "brilliant irrelevance," but is focused on bringing usable technology to the market.

IBM Service and Support Programs

One of the clearest indications that IBM is serious about increasing sales to net generation companies has been the creation of the IBM Global Net Generation Business headed by senior executive, Jim Corgel. With access directly to Lou Gerstner, Corgel is spearheading an impressive initiative designed to deliver value-added programs to net generation companies and to get them to consider IBM products and services.

A flurry of new programs has been announced in recent months. The goal of these programs is to make it easier to learn about, finance, buy, and use IBM products and services. An equally important objective is to provide easy access to local contacts. Global Net

Key Value Propositions: IBM Service and Support Programs

- *Global Net Generation Business.* A dedicated organization headed by a senior IBM executive is in place to create services, products, and overall focus on this market. The full weight of IBM's resources is now targeted at the hot dotcom market.
- *Business partner programs.* IBM offers comprehensive programs to establish partnerships with companies of all sizes. These programs provide technical support and information to net generation companies. IBM pioneered most of the fundamentals of partnering that are utilized across the IT industry today.
- *ASP- and ISP-specific programs.* These have been tailored to help software developers and ISPs who are considering the ASP model. In addition, assistance on service-center hosting problems, including finding a partner, is available.
- *Financing.* IBM provides creative ways to aid with the acquisition of IBM hardware, software, and services.

IBM Products and Services

Table 1: Roadmap of important IBM products and services

Success Factors	IBM Support & Services	IBM Hardware	IBM Software
Keeping up with technology	<ul style="list-style-type: none"> Global Net Generation Business organization PartnerWorld and SPe Going Global educational series ASP Prime developerWorks Web site 	<ul style="list-style-type: none"> Servers Edge of Network appliances (EoN) Java on all brands Linux on all brands Storage area network (SAN) 	<ul style="list-style-type: none"> Application Framework for e-business Linux organization Commercial e-business transaction processing Linux tech centers
Scalable, non-disruptive growth and 24x7 operations	<ul style="list-style-type: none"> IBM Global Services (IGS) consulting IGS Co-location Hosting program 	<ul style="list-style-type: none"> Design Center for e-transaction processing Netfinity OnForever RS/6000 HACMP AS/400 high availability S/390 Parallel Sysplex 8 different scaling techniques Enterprise Storage Server (Shark) 	<ul style="list-style-type: none"> DB2 WebSphere CICS MQ Series Storage management software
Management of complexity	<ul style="list-style-type: none"> PartnerWorld for Developers IGS Co-location Hosting program 	<ul style="list-style-type: none"> Design Center for e-transaction processing Interoperability Netfinity A Series of appliance servers SAN integration centers 	<ul style="list-style-type: none"> Notes Domino DB2 WebSphere Tivoli Systems management software Lotus ASP Solution Pack Universal Manageability
Skills acquisition and retention	<ul style="list-style-type: none"> ASP Prime Incubator Series Going Global educational series 	<ul style="list-style-type: none"> Design Center for e-transaction processing 	
Speed of deals	<ul style="list-style-type: none"> Global Net Generation Business organization IGS specific service points of contact Quick Launch financing PartnerWorld for Developers Net Generation Fund Hosting Advantage ASP Prime City Manager 	<ul style="list-style-type: none"> Packaged solutions across all servers and storage Netfinity A Series of appliance servers 	<ul style="list-style-type: none"> Lotus ASP Solution Pack Net.Commerce Hosting Server for ISPs
Vendor industry experience	<ul style="list-style-type: none"> Global Industries Global mid-market IGS 	<ul style="list-style-type: none"> Servers and storage installed in every industry segment 	<ul style="list-style-type: none"> Software e-business experience in every industry
Vendor product quality		<ul style="list-style-type: none"> Excellent IBM reputation 	<ul style="list-style-type: none"> Excellent IBM reputation
Vendor support of open and emerging standards		<ul style="list-style-type: none"> Servers and storage support for all major standards Linux on all brands Java and XML on all brands 	<ul style="list-style-type: none"> Software support for all major standards VisualAge for Java Application Framework for e-business
Funding growth	<ul style="list-style-type: none"> Net Generation Fund Quick Launch financing IBM financing Venture capital programs 		
Market leadership and branding	<ul style="list-style-type: none"> Use of IBM e-business logo 		

Generation Business now has city managers in 35 cities worldwide who can be contacted to learn how to engage with IBM.

First-of-a-kind IBM programs are in place thanks to the efforts of Corgel's new net generation team. Highlights of this new initiative are:

- The *City Manager* program, which provides for the customer's ease of contacting IBM.
- *Service Providers for e-business (SPe)*, which is a special initiative that provides insights, education, marketing, and sales enablement for service providers who want to broaden their portfolio of e-business services.
- The *Going Global* educational series, which provides a framework for realistic and sustainable international business.
- *Quick Launch for e-business Ventures*, a series of offerings which package hardware, software, support, and education with very attractive financing options that are targeted to startup dotcom companies.
- *ASP Prime*, which is designed to help traditional and startup ISVs move to the ASP model.
- *Hosting Advantage*, which is an offering that enables service providers to assess the reliability of their hosting infrastructure. It also links ISVs who do not want to run data centers to companies with hosting capabilities.
- The *IBM Incubator Series*, which has the goal of working with incubators to help startup dotcoms get up and running. Approximately thirty are currently in process.
- *Venture capital programs*, which match the startup candidate with a compatible venture capitalist.
- The *Net Generation Fund* of \$500 million, which was established in 1999.
- *IBM Global Financing*, which is tightly linked to IBM Global Net Generation Business to provide quick turnaround and creative deals.
- *IBM Global Services (IGS)*, which develops services for net generation firms. The IGS section of this report includes details about the Co-location Hosting program, the Dot.Com Dozen offerings, a dotcom national practice, and more.

The announcements made in late June 2000 are essential reading for startups as well as more mature dotcoms. These include some of the more aggressive financial offerings that Andrews Consulting Group has seen from IBM. At the same time, IBM has distilled much of its global experiences into an educational offering aimed at startup dotcom companies.

Going Global is an educational series designed specifically to teach a company the realities of operating on the Internet in a truly global manner. Starting in September 2000, classes will be available in Europe, North America, Asia/Pacific, and Latin America. Three major topics will be covered: success factors for going global, technology issues for internationalization, and international branding and marketing.

Perhaps the clearest sign of IBM's interest in the net generation community is the appearance of new financing programs. Quick Launch for e-business Ventures is the label for packaged hardware, software, support, and educational programs that are offered with attractive financing. Rebates are offered on selected server and storage products. Thirty-six month leases with the first payment deferred for six months are available on the purchase of up to \$400,000 of hardware and software. At the end of the six-month deferral period, 25% of the financed amount must be paid to IBM, with the balance spread over the remaining thirty months.

In addition, IBM has set aside a \$500 million Net Generation Fund to be used to finance the purchase of hardware, software, and services by companies that qualify. This program is being offered through a growing network of venture capital firms. Under its auspices, IBM will finance the purchase of up to \$5 million (but no more than 25% of what the venture capitalist is financing) on favorable lease terms to companies that would otherwise not qualify. Approvals can be obtained under this program in less than two days.

PartnerWorld for Developers is the banner under which IBM delivers an overwhelming array of

 IBM Products and Services

marketing and support programs. The PartnerWorld program covers all types of partner relationships with IBM across many different IBM business units: hardware and software products, services, financing, and technology.

Any business that develops or sells software products can join IBM's PartnerWorld program for free. Membership is the first step in obtaining the benefits of the various programs. PartnerWorld members get access to information and advice from IBM, are provided with free or discounted education, and can qualify for discounts on IBM products and services.

The more interesting features of PartnerWorld are:

- Use of the IBM Business Partner logo and the e-business mark helps with e-business branding. There should be increased confidence in e-commerce transactions under the e-business mark as IBM helps assure security, reliability, and scalability via the partnership.
- Business Partner Connections is a program which provides links to 20,000 resellers and distributors around the world.
- developerWorks is the largest Web site in the world for technology information. With 28 million hits per day, this site provides up-to-the-minute, in-depth information on Java, XML, Linux, and more.
- Global Solutions Directory is a catalog of 33,000 ISV applications available from IBM's business partners. The directory is searchable by industry, application type, vendor name, product name, geography, and other slices that assist the visitor in finding a matching solution. Call centers are in place, and online ordering is available.
- Business development funds are available through joint campaigns with IBM. Over \$50 million was allocated in 1999.

Another organization worthy of mention is Solution Developer Marketing (SDM), which has the mission to provide a single point of contact to IBM for software and solutions developers.

The umbrella term that IBM uses for the initiative that encompasses numerous elements highlighted in this report is IBM Service Providers for e-business. The abbreviated moniker SPe is used in much of the company's marketing material to represent the effort. In typical fashion, IBM creates some confusion in its use of a multitude of terms: initiatives, offerings, programs, focus areas, etc. SPe is really an amalgamation of products and service offerings that result from the Global Net Generation organization's effort to drive IBM business units to serve the net generation market. Designed to deliver new business benefits to all service providers, it has custom features especially for ISPs, ASPs, ISVs, and systems integrators. A list of offerings in this initiative includes:

- IBM and Lotus business partner programs.
- ASP Prime program.
- Hosting Advantage.
- Lotus ASP Solution Pack.
- Packaged service offerings.
- Netfinity Web server.
- RS/6000 Model B50 server.
- IBM Global Financing.
- Web Connections for Service Providers.
- Net.Commerce Hosting Server Package for ISPs.

All of these will be covered in various sections of this report. For the remainder of this section, however, we will focus on ASP Prime and Hosting Advantage.

ASP Prime is a program to help ISVs convert their applications to run in an ASP environment. By the end of 2000, IBM will have established ASP Prime Centers in Oregon, Minnesota, Massachusetts, California, England, France, Germany, Australia, and Japan. These centers will offer at no charge a great deal of help to software developers that qualify.

ASP Prime provides a five-step program from basic education all the way to launching and marketing a full-blown ASP service. The elements of this program include:

- *Educate*. An ISV who contemplates ASP-enabling its applications can learn about the key factors involved.
- *Assess*. IBM provides an in-depth assessment of not only the suitability of the application for an ASP environment, but a review of the entire business plan.
- *Enable*. The ASP Prime Centers provide help in benchmarking and stress testing ISV applications for the ASP model. Assistance is also possible for specific enhancements.
- *Host*. IBM, through IGS, can either host an application for an ISV or help an ISV find a suitable hosting partner. IBM can also help an ISV become an ASP.
- *Launch*. IBM will help with demand generation and go-to-market activities for selected ISVs.

ASP Prime Centers are staffed with technical experts, and each includes a fully equipped data center for benchmarking and testing. IBM does charge for some of the services provided at ASP Prime Centers, but a great deal of useful information and assistance is available for free. It therefore makes sense for ISVs wanting to ASP-enable their applications to look into this program.

Hosting Advantage offers service providers (ISPs and ASPs) an efficient way to assess the reliability of their hosting environments. ISV firms that are moving to the ASP model, but do not want to host their own applications, can obtain leads from IBM about possible hosting partners. The combination of the applications and the hosting environment are reviewed for:

- Capacity and scalability.
- Performance.
- Architecture.
- Data center operations.
- Availability.
- Security and integrity.
- Backup and recovery.

This approach drives value to the hosting provider, to the ISV by connecting it to a qualified hosting partner, and to IBM's customers as a larger number of

qualified Web-hosted applications become available in the market. To IBM's credit, it will provide consulting services across an entire spectrum of platforms—whether IBM or OEM—in ASP and ISP shops.

For more information about these services, visit the following Web sites and follow the links:

- www.ibm.com/solutions/netgeneration.
- www.ibm.com/developer.
- www.ibm.com/partnerworld.
- www.developer.ibm.com.
- www.developer.ibm.com/asprime.

IBM Servers

IBM is the largest hardware provider with five major server product lines. Offering a diverse line of servers is very profitable for IBM, but it does lead to confusion. For example, the AS/400 line that many people view as serving a niche market actually earns nearly as much profit as all of Sun Microsystems does. It would make no sense for IBM to drop any of its servers since each has a significant customer following. Keeping them all, however, forces IBM to continually explain its differences.

There is not just one market for servers since they are used for so many different things: Web page serving, firewall, proxy and domain name serving, software development, data warehousing, database and application serving, etc. At the moment, different vendors control different segments of the market. In the net generation community, NT and Unix are the most popular operating systems with Linux showing the fastest growth.

IBM's primary competition for servers comes from Sun, Compaq, Dell, and HP. Each has one or more market segments where it is strong. There is actually another hidden competitor because some organizations that buy Intel servers actually assemble the hardware themselves. As these white-box buyers become more mature companies, however, they usually realize that

IBM's Products and Services

Key Value Propositions: IBM Servers

- IBM offers all the popular hardware platforms including Intel-based PC, RS/6000, AS/400, and S/390 mainframes. Recently IBM acquired Sequent and the NUMA-Q line.
- The Design Center for e-transaction processing, located in Poughkeepsie, NY, provides services to IBM and non-IBM customers who have complex e-business transaction problems. All five IBM server platforms and some non-IBM servers are supported. IBM works with the customers to test their solutions before going live.
- IBM provides interoperability with any operating system, client or server platform, legacy applications, and database applications.
- All IBM servers deliver 99.9+% availability and bullet-proof security.
- IBM servers scale from the lowest entry point upward to handle the largest compute problems anywhere.
- IBM is a proponent of open standards. Its creative integration of Java and XML is done across all platforms. Linux is—or will be—supported on all server brands.

the time of their technical people is far too valuable to spend putting boards into boxes, and they begin to turn to the established major vendors.

Having five major server brands is both a blessing and a curse for IBM. While it helps to have viable offerings in all of the different market segments, the overlap in capability, price, and capacity makes it difficult for IBM to explain in simple terms which of its server lines is best in a given situation. One major advantage is that IBM has had to solve all server interoperability problems because the company offers all server platforms.

IBM's goal is to become the infrastructure provider for this net generation economy. IBM created Global Net Generation Business specifically to work with the

dotcom companies. The blending of RS/6000 with Sequent's NUMA-Q products and the variations of Unix (AIX and Monterey) is now called the Web Server organization.

Segmentation of the server market has led IBM to conclude that in this networked world, servers fall into three logical classes: data and transaction servers, Web application servers, and appliance servers. The heavy lifting will be done on the back end by data and transaction servers. Web application servers fall in the middle of functional demands. The lightest loads will be carried by appliance servers. Linux will work fine at the appliance end of the spectrum. OS/390, AIX, and OS/400 need to manage the back end. A sophisticated analysis of five very different workload patterns across the three tiers, has been completed. From this work, IBM has identified eight different scaling techniques. This should be of interest to any net generation firm. (For more information, contact Dr. Douglas Grose, IBM Vice President of Server Development, Somers, NY.)

The Design Center for e-transaction processing was established in 1999 in Poughkeepsie, NY, and is a unique differentiator for IBM. The objective is to help both IBM and non-IBM customers solve complex e-commerce transaction problems across multiple server platforms. All five IBM platforms, along with Sun Solaris, are installed in this powerhouse center. Anyone with a first-of-a-kind e-business application that involves unpredictable and volatile transaction rates can petition IBM for help. Varying levels of support are available, but most important is IBM's hands-on commitment of elite resources to assist the business in question with prototyping, testing, and solving complex infrastructure problems. The company using the center also makes a substantial commitment of time and people to assure success. A key objective is the transfer of skills to the visiting company.

Visit www.ibm.com/servers/design_center for more information.

IBM's clustering technologies across the server brands are arguably the most sophisticated in the IT universe. Parallel Sysplex, running on S/390s, is a shared-everything architecture, which yields an industry record 99.9987% availability mark that translates into less than five minutes per year of unscheduled downtime. Through the X-architecture initiative, Netfinity has borrowed heavily from S/390 and AS/400 and now sports 99.9% availability. AS/400 is close behind S/390, and RS/6000's High Availability Cluster Multiprocessing (HACMP) technology leads the Unix world. For 24x7 availability and bulletproof security, IBM is the industry leader.

More information on IBM servers can be found at www.ibm.com/servers.

Netfinity

PC servers, by definition, use Intel-compatible processors and run Windows NT and NetWare operating systems. This leaves hardware vendors a limited number of ways in which to innovate. X-architecture is a standard by which the Netfinity team leverages technology from other IBM server platforms. Netfinity is making the most of the ways in which differentiation is possible.

Good evidence of this transference of knowledge is the recent announcement of the OnForever high-

availability option. It enables IBM the ability to provide the customer with 99.9% availability. PC servers have traditionally suffered in availability comparisons to midrange servers, with 92% to 94% availability being the norm. The mathematical calculation of unscheduled downtime per year runs in the hundreds of hours (at 92% this can amount to 700 hours or more). This is very expensive for PC servers compared to midrange servers.

The X-architecture approach is a blueprint for bringing the best technical strengths from IBM's midrange and mainframe servers to the Intel-based Netfinity servers. This results in giving Netfinity servers an advantage in the market over other vendors' Intel-based servers in the following ways:

- Extending high-availability capabilities for Hot-Plug/Hot-Add PCI to processors and memory. Much was emulated from the top-of-the-line S/390 including hot-swap components, light-path diagnostics capability (online, real-time), and multibit error-correcting memory technologies. At the same time, the hot-swap implementation includes disks, fans, and power supplies.
- Adopting the AS/400's service processor, which is a coprocessor that detects and deals with failures and can, in some cases, prevent problems before they occur. This feature increases the reliability of Netfinity versus other Intel servers.
- Protecting select Netfinity servers from any single memory chip that fails. This technology called Chipkill was initially developed for NASA's Mars Pathfinder mission and is part of the OnForever initiative.
- Utilizing Summit clustering techniques modeled after those used in RS/6000 servers.
- Leveraging the experience of other IBM engineers in creating the physical layout for Netfinity server components. The result is a design that many

Key Value Propositions: Netfinity

- X-architecture is the blueprint for moving the best of the midrange and mainframe capabilities to the world of Windows NT—without making them proprietary.
- The OnForever high-availability implementation ensures 99.9% availability using technologies such as hot swap.
- Universal Manageability (UM) is comprised of tools and technologies that allow customers to manage PC desktops, laptops, and servers.

 IBM Products and Services

independent observers feel is the best in the industry. Its advantages include greatly reduced size of the components, ease of setup, and user convenience when making cable changes. For many ISP and ASP companies, the physical size of rack-mounted Intel servers is a critical issue. Netfinity servers are the current market leader in efficient rack-space usage.

- Providing Netfinity storage subsystems that are space efficient, cost effective, and highly reliable. Some of the gain in reliability comes from use of software that resides on the service processor and can predict disk failures before they occur.

Another important differentiator for Netfinity is the Universal Manageability initiative. While differentiation in a fundamentally commodity-based market is not easy, IBM is picking up the pace in marketing the fact that it has a special end-to-end systems management solution that spans its Intel-based PC server, desktop, and laptop lines.

Universal Manageability is a suite of powerful tools and technologies designed to deliver greater life-cycle management capabilities for networked servers and clients. The UM initiative supports industry standards. It can help customers integrate with a wide set of system management tools from other vendors including Tivoli TME 10, HP OpenView, Computer Associates Unicenter, Microsoft Management Console, and Intel LANDesk Management Suite.

IBM has taken three UM tools and has packaged them into the System Installation Tool Kit (SIT). The products that comprise the toolkit are:

- *LANClient Control Manager (LCCM)*, which automatically downloads the operating system and BIOS to standards-compliant PCs and Netfinity servers.
- *System Migration Assistant (SMA)*, which migrates users' personal settings and data automatically from one PC to another.

- *Software Delivery Assistant (SDA)*, which automatically downloads and installs only the applications required by a department or even a specific user profile. This eliminates the need to develop and maintain multiple software images for different departments within a company. A single image of all the applications that a company uses can be created. Just that one image has to be maintained.

Every Netfinity server comes with a free five-seat Lotus Domino license. If purchased for another server, this license would cost \$1,800. Domino is one of IBM's most popular software products. IBM is thus imitating Microsoft's highly effective practice of bundling successful products together to create a combination that is highly attractive.

There are several operating systems and many applications that run on Netfinity servers today. They include over 40 ServerProven Linux applications, Linux for Domino, and Unix, which is planned for year end.

Many businesses that use Intel servers and have not evaluated Netfinity ought to do so because IBM has become serious about this product line. Most companies that do the research are pleasantly surprised. What they like most is the quality of the engineering, the reliability and availability, and the deep level of software integration.

Go to www.pc.ibm.com/netfinity for more information about Netfinity servers.

RS/6000

When Deep Blue (an RS/6000) defeated world chess champion Gerry Kasparov, it looked like nothing could stop the momentum of IBM's Unix computers. A short time later, IBM delivered to the U.S. Department of Energy an RS/6000 SP super computer that was twice as fast as any other computer of its class. It was obvious IBM was finally making a serious investment in its Unix product family, showing off world-

Key Value Propositions: RS/6000

- The AIX 64-bit operating system has been rated the number one overall Unix system for the sixth year in a row, according to D.H. Brown Associates.
- The Monterey project is a major Unix initiative designed to run on IBM PowerPC, Intel 32- and 64-bit architectures.
- The leading Unix technology is available on RS/6000. The introduction of copper-based processors in May 2000 has provided a leap in performance.
- The HACMP high availability solution leads other Unix competitors.
- The IBM RS/6000 family of servers provides industry-leading scalability.
- There will be support for Linux in 2000.

class technology. The commitment to technology and its application to the business world has not slowed.

For most analysts, the most significant evidence of improvements in IBM's Unix line is the win at Network Solutions Inc. (NSI) in Herndon, VA. NSI is the central registry of all Internet domain sites. Growth rates in registrations have been breathtaking in the past 12 months and continue to accelerate at a torrid pace. NSI faced serious scalability and performance issues. It recently installed an RS/6000 S80 as the central domain server, the heart of the overall system. Previously this had been exclusively Sun turf. It is interesting that IBM can probably lay claim to now being the "dot in .com."

D.H. Brown Associates, an independent industry analysis firm that follows the Unix market closely, rates the RS/6000 AIX operating system as having leading systems-management capabilities as well as outstanding Internet and intranet functionality. The 64-bit operating system integrates with a Java-based systems management tool that also gets very high marks. Leading TCP/IP technologies push it to the

top of the Internet functional stack. The systems management rating is not new news; AIX has been the leader for almost as long as the competitive evaluations have been conducted.

High availability is critical for 24x7 operations. The HACMP option can cluster together up to 32 RS/6000s or SP nodes to yield a highly available configuration. With the enhanced scalability feature, nearly nonstop computing is possible.

Performance has always been a critical-buying criterion in the Unix market. IBM has reestablished a position of strength with its latest generation of hardware, copper-based Power3 processors. According to D.H. Brown Associates, the RS/6000 S80 SMP now holds the best top-end commercial performance of any popular Unix server. Benchmarks tend to be a game of leapfrog, but the S80 has made quite a splash with leads in SPECweb96, SPEC sfs97.v2, SPEC sfs97.v3, VolanoMark, BaanERP, SAP R/3, and OLTP in TPC-C.

The May 2000 announcement of the X80 series made the copper-based processor technology available to the new midrange models (F80, H80, and M80). The top-notch performance has allowed IBM to vault into a leading position in a price band where it has been vulnerable for some time.

Offering the processor with the best current specifications is nice, but the features that are becoming increasingly important to Unix buyers are reliability, scalability, systems management, ease of use, and investment protection. IBM has always had a great reputation for providing these features.

Success among net generation buyers has not been at the same level for RS/6000 as for other segments of the Unix market because the technical people most likely to be hired by net generation companies tend to be unfamiliar with AIX. IBM's biggest challenge therefore centers around increasing awareness of the capabilities of RS/6000.

IBM's Products and Services

Go to www.rs6000.ibm.com for more information about RS/6000.

AS/400

IBM's AS/400 is to servers what the Apple Macintosh is to PCs—a unique, pioneering product with an extremely loyal band of followers. Just as the Internet gave new life to the Macintosh, it has also breathed new life into AS/400. Those who have AS/400 computers rarely need to be sold on its virtues—they tend to use it wherever practical. Many of the large number of IT decision-makers who are not familiar with this unusual computer become pleasantly surprised as they learn more about it.

**Key Value Propositions:
AS/400**

- AS/400 is the first product in the industry to utilize IBM's newest processor technology, Silicon on Insulator (SOI).
- AS/400's unique design, known as Technology Independent Machine Interface (TIMI), allows all applications to take advantage of 64-bit addressing without being changed.
- TIMI separates the application, operating system, and hardware layers. As a result, applications never need to be rewritten or modified when changes are made to the underlying processor.
- The logical partitioning (LPAR) technology was borrowed from S/390, allowing users to run multiple instances of OS/400, Unix, and Linux (planned) on a single AS/400 server.
- AS/400 is an ideal platform for ISV applications moving to the ASP model.
- AS/400 boasts a record of having never had a security breach.
- Running under the covers, a sophisticated Java Virtual Machine (JVM) provides excellent Java serving abilities on AS/400.

In the last few years, IBM has not aggressively marketed AS/400 outside its highly loyal customer base. As a result, many organizations that are good candidates have not discovered it. Those that have may be using Lotus Domino. Special AS/400 models can be the most cost-effective option for Domino serving in companies with up to 1,000 users. Net generation companies considering Domino should also consider using these special AS/400 models as Domino servers. In addition, AS/400 is also frequently the best choice for net generation companies when it comes to running their business-critical applications.

In May 2000, IBM announced some surprisingly aggressive technical enhancements to AS/400. Silicon On Insulator (SOI), IBM's newest processor technology, became available on AS/400 first. SOI reduces harmful electrical effects within processor chips, resulting in an additional 20% to 30% improvement in performance over IBM's copper-based processors. To the analyst community, SOI is an indication that IBM continues to be serious about investments in this platform. Another enhancement to AS/400 is the 24-way server processor that boasts 20 terabytes of storage.

AS/400 can also be a highly effective choice for database and application serving. A large number of the most popular commercial application packages are offered on AS/400 including SAP R3, J.D. Edwards OneWorld, Lawson, BAAN, etc. AS/400 therefore becomes an option for those wishing to offer any of the applications on an ASP basis. The unusual and highly innovative architecture around which AS/400 was created makes it attractive as a host for shared applications. This brand boasts bulletproof security with reports of zero incidents of breaches due to hackers.

High availability is an area in which AS/400 has an interesting pedigree. This server family achieved a reputation in the days before clustering as a system that never went down. As a standalone system it touted a 99.9% availability level. Clustering on AS/400 raises the bar to 99.99% availability. Its clustering business partners and ISVs running their applications on AS/400

can look forward to these impressive percentages not only for hardware but for their entire solution.

Recently, AS/400 implemented the legendary mainframe capability for logical partitioning (LPAR). This allows the customer to run multiple instances of OS/400 simultaneously. It also allows customers the option of running other operating systems under the covers. The recently announced Portable Applications Solution Environment (PASE) that will support Unix on AS/400 is one example. In the near future, PASE will also enable Linux to run on AS/400. AS/400 has long been able to run the various Windows operating systems under its covers. Currently, it can also run Windows NT/2000. All this adds up to some very interesting and flexible possibilities for ASPs to host applications.

See www.as400.ibm.com for more information.

S/390

All dotcom readers who want to crack the Fortune 500, raise your hands. Good! Now for those who actually achieve that goal, there is S/390 in your future. Like it or not, there are some things in massive, complex, commercial-transaction, e-business environments that only a mainframe can handle. If continuous uptime—regardless of workloads—as well as excellent response time—regardless of demand—are required, then S/390 is the server of choice. The vast majority of net generation decision-makers have probably never seen an S/390, much less used one.

Many people still think of IBM mainframes as overly expensive, proprietary systems that can only run outmoded applications that were created decades ago. While this point of view made some sense in the 1980s and early 1990s, nothing could be further from the truth today. To IBM's credit, it did not abandon the mainframe. Instead, the computer giant embarked on a campaign to entirely redesign the system for the 21st century. The result is S/390—a dramatically different, high-capacity computing platform.

Key Value Propositions: S/390

- Completely transitioned from the mainframe of old, S/390 is a reinvented modern server platform.
- Parallel Sysplex is the leading clustering technology in the IT industry. Virtually nonstop, 24x7 computing is possible through this shared-everything architecture.
- Dynamic workload balancing reacts in real-time to changing workload demands.
- A fault-tolerant technology keeps S/390 running and helps it make repairs while online.
- S/390 supports open standards including Unix, Java, and Linux.

While S/390 morphed into a slick, modern server, it still offers the traditional strengths that distinguished previous mainframe generations. These include:

- *Industry-leading scalability and compute capacity.* The S/390 Parallel Enterprise Server can expand a single-processor model to one that supports over 20 million transactions per day, 15 terabytes (TB) of disk storage, and more than 100,000 users—all within a single system. In addition, customers can cluster together up to 32 Parallel Enterprise Servers (for a total of 384 processors) to work together as a single system. This clustering technology, known as Parallel Sysplex, gives S/390 virtually unlimited computing capacity. Moreover, the S/390's Capacity on Demand feature allows customers to install additional processors in S/390 and bring them online without disrupting normal operations.
- *Reliability and availability.* IBM designed S/390 with self-monitoring and self-correcting features. The system tolerates faults, keeps running, and does online repair while performing. While the technical staff is performing hardware or software maintenance, the redundant backup components protect S/390 from unplanned outages. In addition,

IBM's Products and Services

Parallel Sysplex clusters allow one system in the cluster to take over instantly if another system fails. As a result, the average Parallel Sysplex configuration achieves a system availability of 99.9987%—or less than five minutes of downtime per year. Equally important, the S/390's operating system, OS/390, provides the most sophisticated and stable environment to manage and control mainframe-class servers. IBM's DB2 software provides comprehensive data management capabilities that give users uninterrupted access to information, even when running database reorganizations or backups.

- *Sophisticated workload management and balancing.* The S/390 can simultaneously run a variety of workloads including Web serving, online transaction processing, database queries, and batch jobs. In addition, the S/390's Dynamic Workload Manager facility lets it utilize up to 95% of the computing capacity within each processor. For further flexibility, customers can run different applications or parts of the enterprise in separate logical partitions (LPARs) within a single S/390.
- *Airtight security.* Almost every week, industry newspapers carry reports about new viruses or security holes that can compromise servers. S/390 never receives such unfavorable press because it combines a highly integrated security system that IBM has enhanced over decades with security solutions such as SSL, digital certificates, FIPS 140-1 level 4 cryptographic capabilities, and 128-bit encryption. This blending of security technologies makes S/390 extremely tough to compromise.

Here are the key features that set it apart from previous mainframe generations:

- *Lower total cost of computing.* Today's S/390 reflects IBM's commitment to make its mainframes cost competitive with other servers. IBM's track record demonstrates that it is improving

mainframe price/performance by 35% to 40% annually. Moving to CMOS technology has allowed IBM to reduce the S/390's physical size. This lets customers enjoy savings of roughly 90% in power and cooling expenses over older water-cooled mainframes, not to mention dramatic reductions in maintenance costs and office space. IBM has also reduced costs for software, support, and services to dramatically improve the overall cost of ownership for S/390.

- *Openness and standards compliance.* Linux runs "on the metal" of the S/390. Students at Marist College in New York recently led the open source push on the mainframe. See www.marist.edu/linuxvm for complete compiled libraries. Also, S/390 supports a broad array of industry-standard networking technologies. All the Unix commands, utilities, and file systems specified in the Unix 95 standard and critical features of the Unix 98 standard are supported. As a result, S/390 now runs many Unix applications natively.
- *Support for packaged applications.* Because S/390 supports open-industry standards, over 1,200 software vendors have been convinced to port their products to the mainframe.
- *Internet enablement.* S/390 supports many packaged applications. Customers can quickly Web-enable these solutions or their own applications by using products such as IBM's WebSphere Application Server. S/390 offers robust support for all the industry-standard protocols needed to run secure Web sites. It has all the facilities that e-business applications require including HTTP servers, firewalls, search engines, and a Java Virtual Machine. This makes S/390 a highly scalable platform for Web serving.

Go to www.s390.ibm.com for a more complete look at S/390.

IBM Moves to the Edge of Network (EoN)

One of the side benefits of having a \$6 billion per year research and development budget is that a great deal of useful information about the likely future direction of the industry gets created along the way. This has allowed IBM to create a vision of what the future holds. An important part of the IBM vision centers around pervasive computing.

In IBM's view, PCs will soon cease to be the most common end-point for communications across the Internet. They will not go away, but they will be supplemented by many millions of special-purpose intelligent devices. As time passes, an increasing number of these devices will use wireless technology to connect to the Internet.

Pervasive computing has already started to arrive in the form of intelligent telephones, personal data access devices (PDA) like the Palm Pilot, and onboard computers in vehicles. The number and variety of such devices will see explosive growth in the next few years as wireless technology continues to improve, micro-processors become smaller and more powerful, and the standards needed to pull everything together become accepted by the industry.

IBM hopes that its research will propel this movement forward. As it does so, IBM will be there offering a wide variety of hardware devices, middleware, and the advice and assistance that will be needed to take advantage of the endless number of opportunities that will arise. IBM refers to all this activity as occurring at the Edge of Network (EoN).

Key Value Propositions: Edge of Network (EoN)

- IBM has just released a line of desktop Internet appliances that utilize advanced technology.
- The Netfinity A-Series is the new line of ultrathin, rack-mounted servers.

One of the early practical outcomes of this work is the recently announced Netfinity A-Series. Here IBM has unveiled a family of appliance servers with advanced software and hardware in a condensed design that provides a single function. An example is the Web Hosting A100 appliance server, which is built on the world's thinnest commercially available Intel-processor-based server. These servers are ultrathin, rack-mounted, and designed specifically for high-density Web-serving environments. They are easy to set up and quick to install. These servers are also preloaded with Windows 2000 for Appliances and are intended for use by ISPs, ASPs, and enterprises.

Dotcom businesses will be the ones that build and deploy the actual EoN applications and services. IBM will therefore begin to step up efforts to educate this community about the growing number of ways in which EoN concepts can be included in the plans of almost any technology-oriented business.

It makes sense for ISP and ASP firms that want to provide customers with specialized browser appliances to talk to IBM.

See www.pc.ibm.com/ww/eon for more information about pervasive computing and EoN.

IBM Storage

Data is the most precious piece of intellectual property of any corporation. Inability to store, manage, access, or protect the data renders the business incapable of moving forward.

The Internet and e-commerce have radically altered the complexity and dramatically increased the growth rate of corporate and consumer data. An example of the mind-numbing metrics of this growth is provided by IBM's merchandising campaign that asks, "How many Libraries of Congress have you processed today?"

IBM's Products and Services

Key Value Propositions: IBM Storage

- IBM delivers open storage systems.
- The storage area network (SAN) initiative includes solutions, business partner-owned centers, and testing facilities.
- IBM provides industry-leading tape, disk, and software storage technology.

For a number of decades, no other company could match IBM as a provider of magnetic storage devices. In recent years, IBM has not been in the headlines as a storage device provider, but has still remained the largest producer of devices and the most important source of basic research and development for the industry. In the IBM portfolio today one will find:

- Disk storage.
- Tape storage.
- Optical storage.
- Hard disk drives.
- Magnetic read heads.
- Storage software.
- Storage area network solutions.

It is the concept of the storage area network (SAN) that has the industry excited. The simple definition of a SAN is a high-speed, dedicated, centrally managed, secure network that provides complete management of information. These are amalgamations of hardware, software, and networking componetry that provide any-to-any connectivity between servers and storage. The key architectural secret is the separation of information management from information processing. SANs promise to connect people, handle the vast oceans of data, and respond rapidly.

To be successful in networked storage, several characteristics are mandatory:

- It no longer matters where the data resides, but all who need it, need it now.
- Standards must be open and flexible. Heterogeneous environments are the norm.

- The quality of products must be at higher levels than ever before. Most firms no longer have time to test; everything must work when plugged in.
- True operating efficiencies must be rendered.
- Transparency to business applications is required.

IBM unveiled its SAN strategy initiative earlier this year and appears to be executing it well. In the past, one might have expected the storage organization in IBM to be focused on product feeds and speeds. However, today everything from discussions with IBM executives to a quick inspection of the storage Web site reveals a whole-product solution strategy. This includes:

- *Hardware.* Storage subsystems are optimized for SANs.
- *Connectivity.* Customer investments are protected through seamless interconnectivity.
- *Management of infrastructure.* This includes a centralized and robust approach to managing existing and evolving systems.
- *Exploitation.* All IT business functions that use SAN technologies should provide and add value.
- *Support.* IBM offers support and services through IBM Global Services and business partners.

The announcement of the SAN strategy initiative included:

- Establishing more than 50 SAN solution centers with IBM business partners.
- Opening new SAN testing facilities in France and Japan. Centers already exist in Maryland (U.S.) and Germany where customers can evaluate and prototype solutions for performance and security.
- Creating a SAN and storage service practice within IGS.
- Offering new models of the Shark Enterprise Storage Server (ESS) with up to 100% performance improvement.
- Providing new fibre channel-based SAN solutions including support for Netfinity servers.

A key objective of this paper is to identify those IBM initiatives that will offer immediate help to net

generation companies. One of the more important is the newly announced series of IBM Business Partner SAN Solution Centers. Utilization of the services at the 50 (and growing daily) centers will provide a quick and thorough understanding of the benefits and best practices of SANs. The features and services in these solution centers include:

- Centralized storage solutions in a SAN environment.
- Tape device sharing.
- LAN-free backup and recovery.
- High availability server clusters.
- Data sharing across platforms and server-free backup and recovery.
- Training (lecture and hands-on).
- Technical demonstrations.
- Customer testing.
- Benchmarking.

Last year, IBM shipped a new Enterprise Storage Server (ESS) called Shark. More than a thousand Shark systems were sold during the first 100 days of availability, making it an immediate success in the market. For those needing massive amounts of storage, Shark can be highly attractive. Its capacity ranges from 420 gigabytes to 11 terabytes. The capacity and entry price are high; so it is far from a starter system. But, for users who think in terms of terabytes when buying storage, Shark has become an option that should not be ignored.

The announcement of the SAN strategy and Shark has made it clear that IBM has re-emerged as a major force in the market for storage devices. Given IBM's size, manufacturing capacity, and industry-leading research and development capability, success seems highly likely. An increasing percentage of information storage is moving into hosting centers, making the companies that manage them the key to that success.

Go to www.ibm.com/storage for more information about IBM's SAN strategy, Shark, and other IBM storage products.

IBM Software

If a survey asked people to name the top ten software companies in the world, few would name IBM. Because IBM is so large, it is not easy to realize that the company is second only to Microsoft in software revenue and profits. Much of IBM's software revenue comes from S/390 and AS/400 system software. Even without them, IBM would be one of the largest and most profitable software producers.

IBM's DB2 family of relational database management systems is one of the company's most successful product lines. CICS and MQ Series are among the most popular transaction management and message management systems on the market. WebSphere is the umbrella name IBM uses for a family of software products that facilitate the creation of Web-based applications. One of the most widely used of these products is WebSphere's Net.Commerce, IBM's framework for building e-commerce Web sites.

Key Value Propositions: IBM Software

- Application Framework for e-business is a roadmap for solution developers to assure success in e-commerce.
- WebSphere is an integrated tool suite for the development of serious e-commerce applications.
- Net.Commerce Hosting Server helps ASPs and ISPs build e-commerce Web sites.
- Lotus ASP Solution Pack is a comprehensive application hosting platform that offers ready-to-rent applications.
- The Institute for High Performance Computing provides information on e-business research.
- IBM offers industrial-strength transaction processing software.
- Lotus Notes is the industry leader in collaborative/workgroup software.

 IBM's Products and Services

For over thirty years, IBM has been the world's leading provider of software development products. At the moment, its flagship development tools all use the VisualAge brand name. For example, VisualAge for Java is one of the most popular and effective integrated development environment (IDE) packages for the Java community.

Tivoli is an IBM subsidiary that creates some of the best systems management software available. Tivoli products are especially good at managing highly diverse networks of PCs, their servers, and the host systems to which they attach.

The family of IBM software products that appeal to the greatest number of net generation companies is that created by Lotus Development Corporation. Lotus has a history of innovative offerings that began with Lotus 1-2-3 and continues with Lotus Notes, Domino, and the recent knowledge management and distance learning efforts.

Lotus leads the worldwide market for integrated messaging and collaborative infrastructure with over 56 million users. A pioneering spirit has helped drive a large business built around Notes and Domino. Over 20,000 Lotus business partners make up a powerful channel that has created a wide range of horizontal and vertical solutions. To extend these solutions into the ASP marketplace, Lotus and IBM have announced the Lotus ASP Solution Pack.

The Lotus ASP Solution Pack, which glues together solutions from Lotus, IBM, and its business partners, was designed specifically for the ASP marketplace and delivers benefits for end customers, ISVs, and ASPs. It is an application-hosting platform with a core set of ready-to-rent applications that is targeted at the dotcom customer.

Through an ASP, a customer can receive specific applications or these same applications wrapped in an integrated environment. Out-of-the-box ASPs can provide messaging, online awareness, and instant col-

laboration with a single log-on for a specific customer community. ASPs can decrease their costs by using a middleware layer which tracks licenses for Lotus and non-Lotus products, provides billing services, and allows multiple independent copies of the same application to reside securely on the same server for multiple companies. ISVs receive the benefits of a standard framework for creating Web-based applications that enable them to write an application once and deliver it to any service provider.

More information about IBM software can be found at www.ibm.com/software. For Lotus information, visit www.lotus.com. For more information on ASP Solution Pack and Domino, www.lotus.com/products will be helpful.

IBM Global Services (IGS)

Lou Gerstner, the Chairman of IBM, started his career as a consultant for McKinsey and Company. Services are therefore in his blood. Gerstner is also good at math. Soon after taking control of IBM, he saw that the largest and fastest growing segment of the IT market was services. The result has been the transformation of IBM from a hardware-centric business to one that focuses strongly on services.

IBM now has over 150,000 people providing services with another 10,000 to 15,000 being added each year. The ability to assemble project teams from this huge base of talent often gives IBM a competitive advantage.

Key Value Propositions: IBM Global Services (IGS)

- IBM offers the largest experience base of e-business customer installations, approximately 20,000.
- Services targeted specifically for net generation companies include a Co-location Hosting offering and tuned offerings called Dot.Com Dozen.

In recent years, IBM has concentrated on building expertise in a number of specific industries. This can make IBM an effective partner for others because it offers products and services to specific industries.

No other consulting company can match IBM's level of global coverage. If a company aspires to do business throughout the world, IBM can provide support nearly anywhere.

IGS can also leverage IBM's \$6 billion per year research and development organization. No other company comes close to IBM in making contributions to the technological advances that are behind the information revolution. Having access to people in laboratories that are pushing the leading edge outward makes it possible for Global Services to offer help and advice that smaller service providers cannot match.

It is important to note that while IGS is an integral part of IBM, it is not obligated to only recommend or work with IBM products. If a business uses Sun and Compaq servers with EMC disks and mostly Microsoft software, IBM Global Services still wants to be its preferred source of advice and help.

The Co-location Hosting program announced in March 2000 is one of the more interesting of recent IGS announcements aimed at the net generation market. IBM is partnering with Qwest to build and operate 28 centers to provide Co-location Hosting capabilities. The first four are in process in the U.S. A presence in Europe with six more centers was announced in partnership with KPNQwest.

Under the Co-location Hosting banner, customers bring their servers and software to the IBM centers.

The centers provide:

- Facilities.
- Geographically convenient locations.
- Power.
- Bandwidth.
- Communications.
- Security.

The customers are responsible for managing their own data center operation; however, they have access to experienced help.

In April 2000, IGS announced a group of offerings specifically tuned for net generation companies. You may hear them referred to as the Dot.Com Dozen. Here dotcoms will find a progression of valuable aids to their businesses from concept to implementation.

Included in these offerings is help with:

- Infrastructure assessments.
- Performance management.
- Capacity planning/testing.
- Security, privacy, business continuity, and recovery.
- Cisco Gold Service.
- Storage area network, networking, and remotely delivered services.
- Linux support.
- Asset services.
- Sun Solaris.

As further evidence of IBM's focus on this market, national and regional practices have been started in the U.S. It is likely this will be emulated in other geographies. The important message here is that IGS will have a contact point whose responsibility will be to develop relationships with and drive more new offerings to net generation firms.

IGS can be a good choice for a partner when a company has a grand ambition. For example, IBM is currently working with a very large labor union that wants to offer its nearly 20 million members a simple-to-use Internet appliance. This special device is being designed, built, and serviced by IBM.

Many net generation companies have great ideas and have created products or Web-based offerings that are unique. The challenge often lies in finding a way to be heard above the din in the marketplace. Having IBM as a partner can be a significant asset given the size and reach of the Global Services organization.

 IBM's Products and Services

More information about IBM Global Services and its offerings can be found at www.ibm.com/services and www.ibm.com/services/e-business.

Global Industries

Targeting major customers worldwide for the marketing of IBM solutions has been an IBM focus for many years. With the advent of e-commerce and IBM's leadership in the concept of e-business, its global marketing teams have riveted their attention on making their customers successful via the Internet.

Although IBM's vertical-industry focus changes at times, the company most consistently aligns itself as follows:

- Manufacturing. Both process and discrete manufacturers.
- Petroleum. Currently combined with manufacturing under an umbrella industrial sector structure.
- Financial. Banking, finance, and trading.
- Insurance. All forms of insurance business except health. At present, IBM is merging insurance with finance as deregulation of these two industries makes a natural combination.
- Healthcare.
- Telecommunications.
- Public sector. Federal, state, and local governments.
- Distribution. Retailers and wholesalers.
- Travel and transportation.
- Utilities.

Key Value Propositions: Global Industries

IBM Global Industries provides worldwide customer experiences in e-business in virtually every market segment. It has more customer references than any other IT vendor.

Real-world e-commerce examples can be found by selecting an industry Web site at www.ibm.com/solutions.

Summary

The old IBM that focused only on the largest corporations of the world is long gone. The trouble is, not many understand that.

Enormous resources and energy are consolidating within this giant to focus on the new breed of business many call the *net generation*. IBM realizes that the influence of this new adolescent will overwhelm the industry, and it is not about to be left out.

This report has attempted to marry those factors critical to the success of these new entrepreneurial companies with the value IBM now brings to the table. An equally important focus has been to guide the reader through the maze of IBM information and point to places where more details on the topics are available. IBM should be included on the short list of vendors being considered for hardware, software, or services in the net generation arena. ♦



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