Business Models for Web and Application Hosting Services

Introduction

The Internet has revolutionized the way business is conducted throughout the world. Companies are rushing to adopt e-business to remain competitive and reap the benefits of new technologies. However, developing e-business capabilities poses challenges to all companies—from stretched IT resources to fast-changing technologies. For many companies, relying on a service provider for Web hosting services is the first step toward the outsourcing of mission-critical Internet applications. The market momentum is now building toward application hosting services, which promises an Internet model of application delivery and brings unprecedented value to business of all sizes.

Web and application hosting, the foundational services for e-business, have put service providers on center stage in the Internet economy. These services not only power the growth of dotcom companies, business portals, and vertical industry extranets—all businesses now rely on Web and/or application hosting services for critical business transactions.

The total hosting market is projected by Forrester Research to reach US $22.7 billion by 2003. Astute service providers are aggressively entering the market by building the necessary hosting infrastructure and service expertise. This is a substantial market opportunity that all service providers need to capture, as hosting services will furnish the high growth, competitive differentiation, and rich margins sought by all service providers.

What are Web and Application Hosting Services?

While Web hosting has been offered by service providers in the past few years, application hosting is still a newly emerging service. A Web hosting service can be simply defined as the off-premise development, deployment, and management of a Web site by a service provider, where authorized users and the general public access a Web site primarily through the Internet. Management complexity increases as e-commerce applications are added to a Web site.

Leveraging the same infrastructure that enables complex Web hosting, services providers can now deliver application hosting services. Examples of hosted applications are human resources, financial, and customer relationship management applications. These hosted applications are usually accessed through virtual private networks (VPNs), through the Internet with firewall protection, and by dedicated access.

Often a hosting service provider will offer the infrastructure services (bandwidth, networking, and server/operating system platforms) to enable Web and application hosting services in centralized and networked facilities. In this case, the hosting service provider ensures host, content, and application availability, and guarantees security and network performance. A hosting provider may choose to offer a full range of hosting or infrastructure services, or a portion of the services described. In majority cases, a hosting service provider will offer some level of Web hosting service.

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An application service provider (ASP) offers networked-based applications on a rental or per-usage basis. It is responsible for combining related software, hardware, and networking technologies to deliver the application service in lieu of customer ownership and management of these applications. An ASP can choose to outsource rather than own or build the service infrastructure, but in all cases they will deploy, manage, and enhance net-hosted applications.

When an ASP outsources the service infrastructure to service providers, this ASP is seeking an application infrastructure provider (AIP) service. An AIP offers end-to-end network and data center services, and in most cases it also provides the configuration and management of hardware and software platforms for application hosting.

Why are Service Provider Hosting Services Going Mainstream?

Web hosting has been the most popular outsourced Internet service known to date. (Note: for more information on the basics of Web hosting, please visit http://www.cisco.com/warp/public/cc/cisco/mkt/servprod/webhost/whbc_bc.htm for the Web hosting business case.) However, other business services are catching up.

Application hosting services are gaining popularity. According to Forrester Research (1999), 22 percent of enterprise and small to medium-sized business customers outsource their mission-critical applications for sound business reasons. First and foremost, there is a general shortage of Internet IT expertise for hire in the marketplace—this was the reason cited by 67 percent of businesses that have outsourced their applications. Time to market, reduced cost, and reliable network connectivity also drive the decision to outsource.

Hosting services present businesses with a new option in outsourcing. They allow a business customer to choose between owning and managing hardware and software assets versus renting applications as services.

Business Drivers for Hosting Services

Several market conditions are driving businesses to hosting services:

- Businesses and content providers need high-performance e-commerce Web sites as a key competitive differentiator. Since the purchase rate is known to be higher for high-performance sites.
- Most Web sites experience rapid growth and constantly need additional bandwidth. Only service providers can offer bandwidth on demand and guarantee network uptime. Services that require higher bandwidth, such as multicast and video streaming, can also be easily provisioned by service providers that have a scalable network architecture and ample supply of bandwidth.
- Businesses want and need faster deployment of new applications as well as timely upgrades to their current applications to stay competitive. Application service providers offer a viable, and many times better, alternative to in-house deployment.
- Businesses need to focus on their core competencies instead of allowing IT requirements to consume internal resources.
- Businesses desire simplicity in managing IT projects.
- Application hosting offers more affordability; it offers businesses the ability to amortize the cost of business solutions by paying monthly or usage-based fees.
- All major enterprise resource planning (ERP) software vendors recognize the potential of the hosted application business model and are actively utilizing it to reach the relatively untapped small to medium-sized business market.

Technology Drivers for Hosting Services

Technology advances that enable high performance Web and application hosting services closely match the market trends discussed above:

- The Internet provides a reliable, ubiquitous, inexpensive global network, and virtual private networks (VPNs) deliver the requisite security for ecommerce or hosted application transactions.
- Acceptance of the browser as the application GUI made applications user-friendly, and it simplified application deployment and training requirements.
- There is tremendous market momentum in developing applications (e.g., business-to-consumer, business-to-business, e-commerce applications) that can be hosted over the Internet.
- There have been major technology advances in server- and network-based computing, including the thin-client technology that enables net-hosted applications.
- Higher bandwidth is increasingly available in both the access and backbone portions of the network.
- Networks are becoming more content- and application-aware.

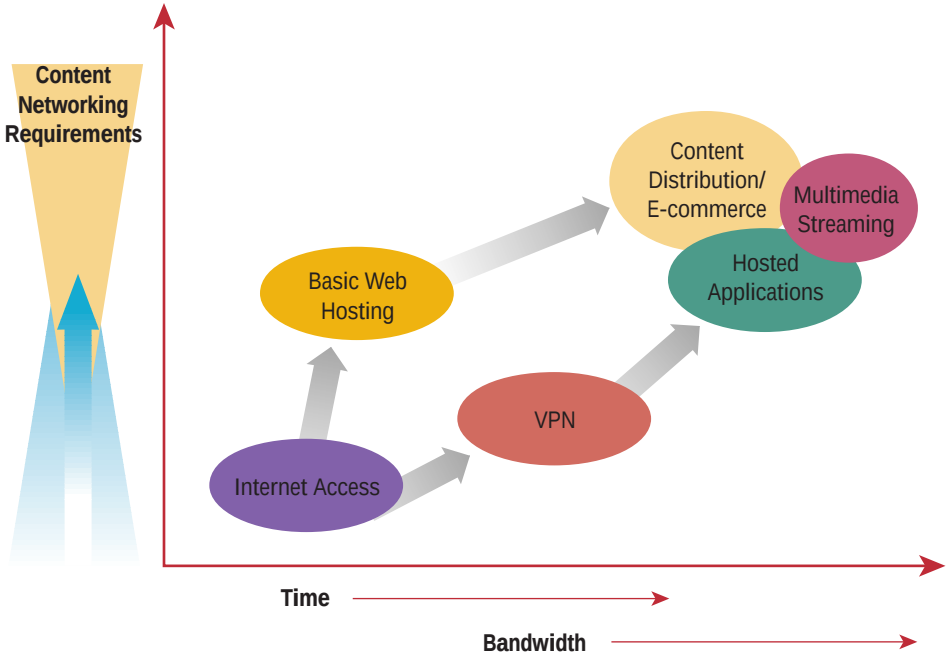
Hosting Services Are Supported by Content Networking Technologies

Hosting services are developing in three key areas that propel the continuous advancement of networking technologies. These three areas are: 1) Web/content hosting, 2) application hosting, and 3) multimedia hosting. Figure 1 illustrates the relationships between these hosting services and the underlying networking requirements.

While all hosting services depend on a scalable and secure data center and backbone infrastructure, each service area entails incremental networking requirements. Web hosting, for instance, requires localized content distribution, dynamic content delivery, and effective local and geographical server load balancing. Going a step further, application hosting requires the network to recognize packets based on application types and user status. Multimedia streaming, in addition to all other requirements, calls for dynamic bandwidth allocation and media on demand.

These advanced networking features are known as “content networking” capabilities. Content networking enables the network to interact with the server farm to deliver content and applications in a scalable and reliable fashion. (For more information on content networking, please visit http://www.cisco.com/go/hosting.)

Figure 1 Evolving Hosting Services Market



What are the Primary Service Opportunities and Projected Market Size for Hosting Services?

Web hosting and application hosting present primary market opportunities for New World services. According to Forrester Research, the total market for both Web and application hosting will reach US $22.7 billion by 2003.

A Web hosting service offers greater differentiation and higher margins than a basic Internet access service, and increasing demand for Web hosting is triggering a build-out of data centers by a number of service providers. Initially, Web hosting services were limited to static content and simple Web sites, but the trend is toward more dynamic content distribution and video streaming. This trend is a response to the continuous growth and expansion of Web and e-commerce sites. As a result of growth in the market, the target customers for Web hosting services today are literally all businesses (large, medium, and small). And dotcom companies drive even higher service levels with their extensive content distribution and e-commerce requirements. According to Forrester Research, the total Web hosting market is projected to be $11.4 billion by year 2003, with a compound annual growth rate of 76 percent.

Application hosting services enable the effective distribution of applications across the Internet or a wide area network (WAN). Existing software applications are becoming net-hosted applications by adaptation or via a thin-client technology. Many independent software vendors (ISVs) are also writing applications exclusively for distribution over the Internet. Primary target customers are small to medium-sized businesses for traditional business applications, although enterprise customers may use an application hosting service for e-commerce and time-sensitive projects. The total application hosting market is projected to be worth $11.3 billion by year 2003, based on estimates by Forrester Research. It will be growing at an annual rate of 91 percent.

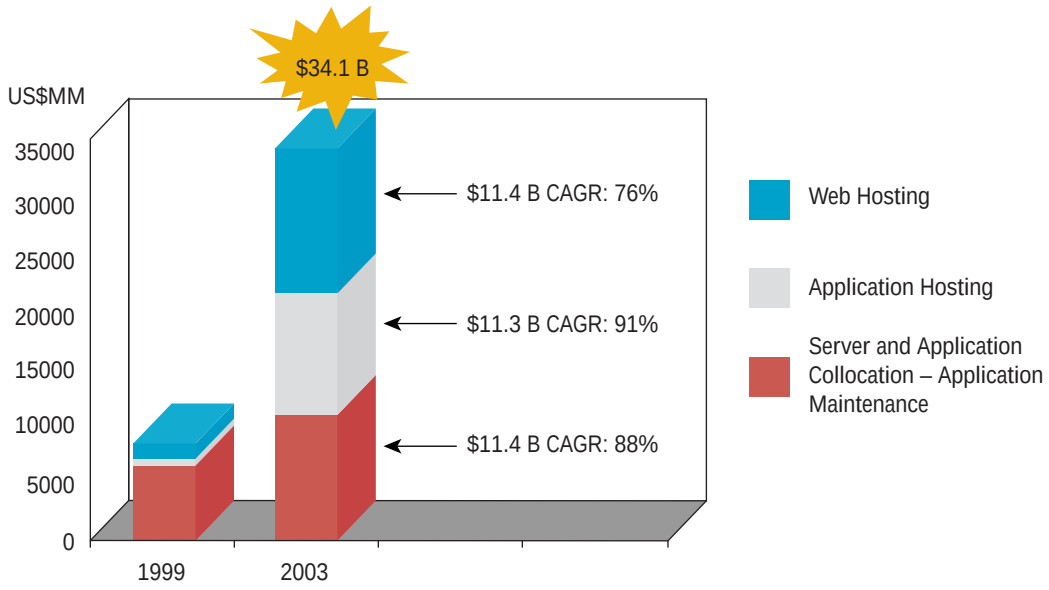
Beyond typical hosting opportunities, service providers may find another market opportunity in application maintenance or server/application collocation. Application maintenance is an outsourced service where the provider manages a customer's proprietary or packaged application at either the customer's or the provider's location. The applications have been purchased, deployed, and implemented by the customer by the time an outsourcer takes over the management and maintenance functions. As service providers continue to grow their hosting services, their data centers will be increasingly equipped to provide application maintenance services. Hosting service providers can expect to gain a healthy share of the application maintenance market. The application maintenance market has been estimated to be worth in excess of $11 billion in year 2003 by International Data Corporation, (IDC) C.E. Untenberg, and Towbin (1999).

Figures 2 and 3 summarize the three market opportunities and their respective market projections.

Figure 2 Primary Hosting Service Market Opportunities

Web and E-Commerce Hosting	Web and e-commerce sites hosted in a service provider data center (content delivery, adding video streaming capabilities) • Data center space + network • Server/OS configurations and management • Major customers: Small to Medium-Sized Businesses, Enterprise and Dotcoms
Application Hosting	Applications "for rent" hosted in a service provider data center (application and content delivery) • Data center space + network – service provider or ASP • Server/OS configurations and management – service provider or ASP • Web-enabled software applications • Major customers: Small to Medium-Sized Businesses, Enterprise, ASPs
Application/Server Collocation (Application Maintenance)	Enterprise allocations/servers collocated in a service provider data center • Data center space + network • Server management and system/application monitoring • Major customers: Enterprise

Figure 3 Total Hosting Service Market Size

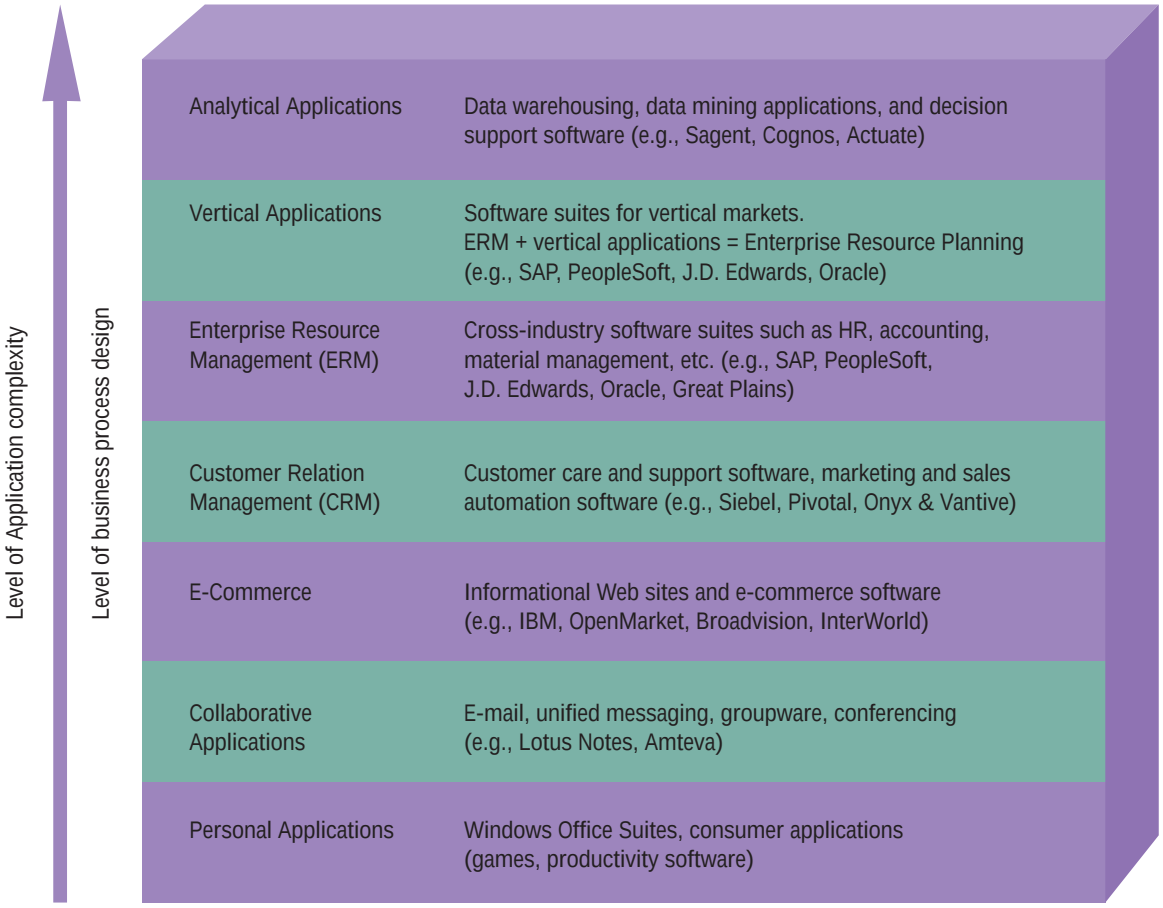


Source: Forrester Research, IDC, C.E. Unterberg, Towbin, 1999

What Customer Segments Require Which Hosted Applications?

Most of the packaged applications used by businesses today can become net-hosted applications. Business and personal applications can be classified into seven categories, as shown in Figure 4. Generally, the higher up the stack, the more complex the applications are. These higher-level applications typically combine specific business processes and frequently require integration with legacy systems.

Figure 4 Categories of Net-Hosted Applications



Source: IDC, 1999

Interest in adopting net-hosted applications varies across different customer segments. It also varies depending on different types of applications. Enterprise customers have largely deployed ERP, customer relationship management (CRM), and communication/ collaborative applications. They do not have an immediate need for an ASP-model offering of these applications. Small to medium-sized businesses, however, represent a significant market opportunity since they do not usually have a wide portfolio of these applications available to them, due to costs associated with purchasing and deploying these applications.

According International Data Corporation (IDC), current ERP solutions generally cost in excess of $1 million and take 18 months to install. Eighty percent of the first-year cost of a packaged software solution is in installation and customization. Hosted applications offer a much more cost-effective model to access these applications. However, enterprise customers do find certain new applications (such as remote learning and e-commerce) appealing as a hosted offering. Figure 5 provides a view of the market opportunities for hosted applications by customer segment and by application.

Figure 5 Market Opportunities for Hosted Applications by Customer Segment and Application

Applications	Small Companies	Mid-Size Companies	Large Companies
Decision Support/ Data Warehousing	H	H	L
ERP	L	H	M*
Payroll/HR	H	H	L
Accounting	M	M	L
Sales Force Automation	M	H	M
Commerce	H	H	H
Messaging	H	M	M**
Remote learning	L	H	H
Video	M	H	H
Desktop applications	M	L	L
IS Services (backup storage, etc.)	H	L	L
Level of Interest: H (High), M (Medium), L (Low) *for subsidiaries and branches **for remote offices, partners			

Source: Summit Strategies, 1999

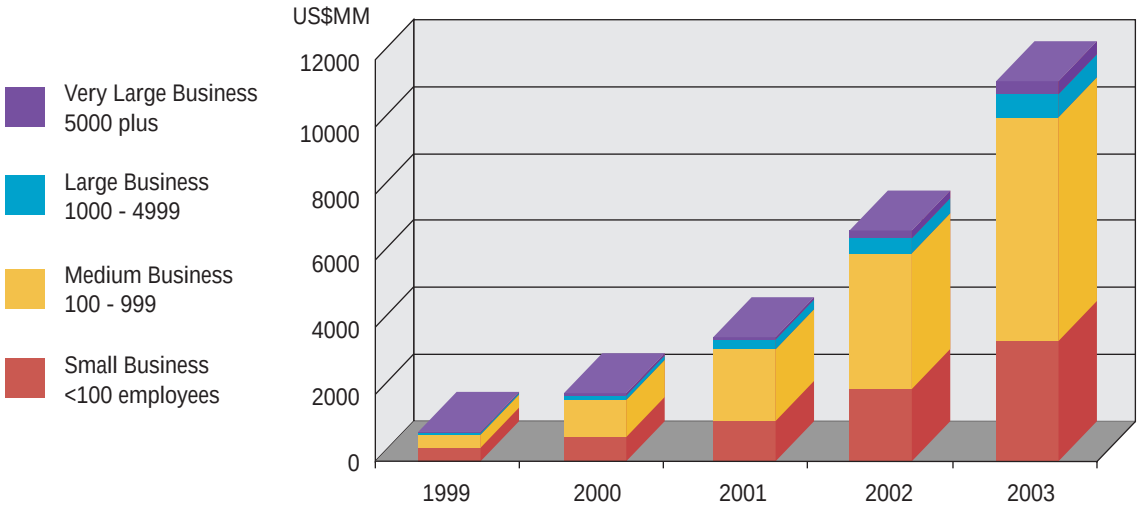
Not surprisingly, net-hosted e-commerce applications are of the highest interest for all to adopt. Apart from e-commerce, there are clearly segment-related preferences. Small to medium-sized businesses (SMBs), particularly mid-sized companies, are the primary market for net-hosted applications. For the mid-sized market, ERP, payroll/HR, sales force automation (SFA), and remote learning are priorities within a 1-2 year time frame. For small companies, payroll, messaging, and backup/storage services are of highest interest within a 1-2 year time frame.

According to the Yankee Group, the SMB market includes 10 million companies, accounts for 98 percent of U.S. businesses, represents 50 percent of the U.S. Gross National Product, and spends $45 billion annually on IT. Based on IDC's estimates, the SMB market is responsible for 25 percent of all personal computer sales in the U.S., and currently only 42 percent of medium-sized businesses use a WAN. Spending will increase if more attractive pricing for Internet and information technology (such as ASP services) can be offered to SMBs. The SMB market has been recognized by all as the prime market for hosted applications.

The target applications for larger companies, on the other hand, are remote learning, SFA, ERP (for subsidiaries, branches) and messaging (for remote offices and partners) applications. Enterprise customers are also interested in using ASPs for quick-turnaround and subsidiary projects, given their stretched IT resources.

Projected ASP revenues by customer segment are presented in Figure 6.

Figure 6 Hosted Application Revenues for Small, Medium, Enterprise, and Fortune 1000 Customers



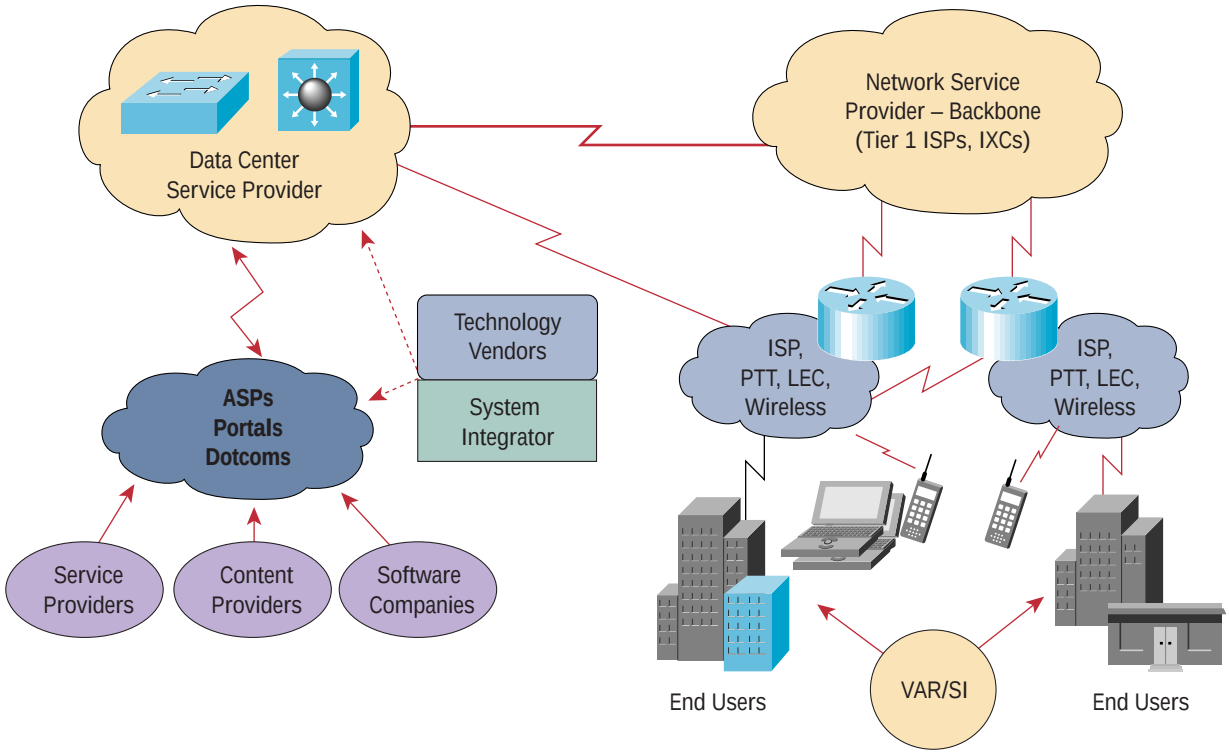
Source: Forrester Research, Dec. 1999

Varying levels of interest in hosted applications by small, medium and enterprise-size businesses provide a broad spectrum of opportunities for service providers in the hosted applications space. Since the revenues in Figure 6 do not include those of desktop, communication, or collaborative applications, revenue potentials for the complete hosted applications market could be even bigger.

The Basic Web and Application Hosting Business Model

Various industry players are involved in the provisioning of Web and application hosting services. Figure 7 presents the hosting service ecosystem—an end-to-end service delivery chain representing a multitude of service providers.

Figure 7 Web and Application Hosting Ecosystem



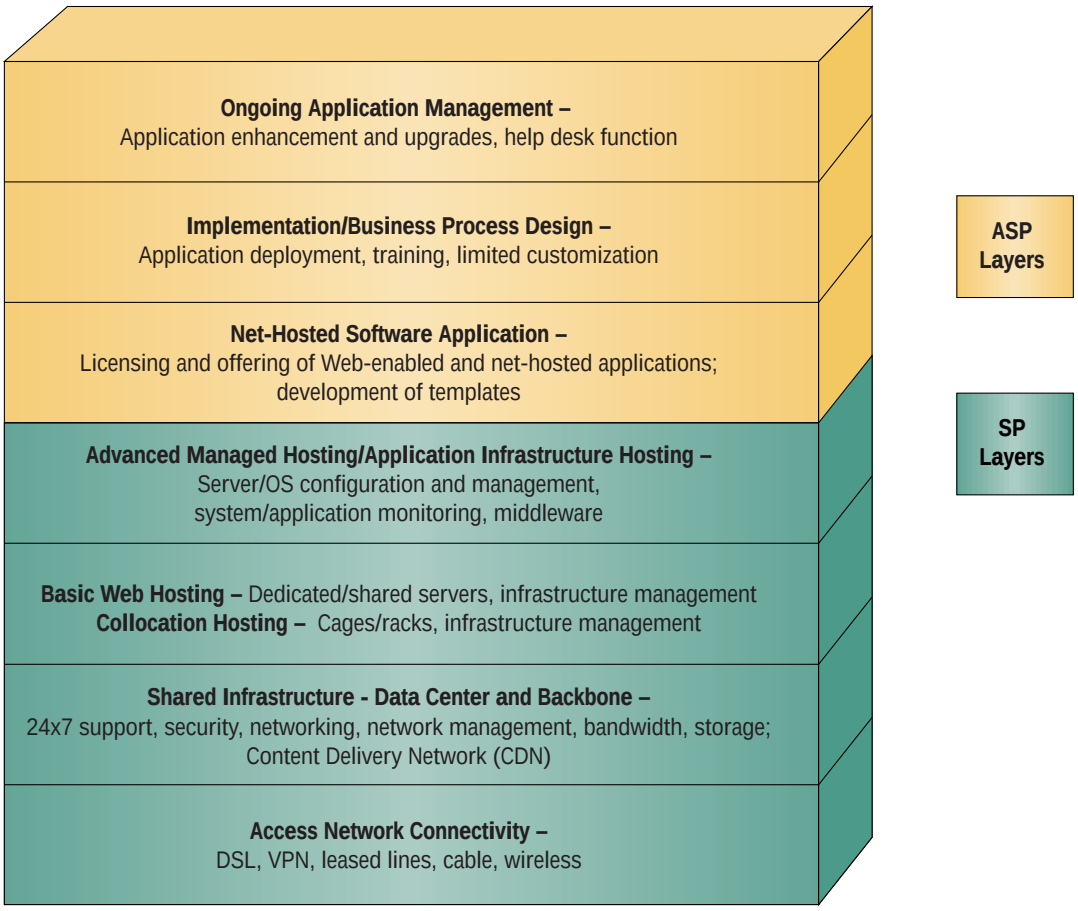
As evidenced by Figure 7, an end user needs Internet access or another type of network connectivity to reach the data center where Web sites or applications are hosted. Internet service providers (ISPs), inter-exchange carriers (IXCs), Incumbent Local Exchange Carriers (ILECs), Competitive Local Exchange Carriers (CLECs), and wireless service providers are all involved in provisioning access or backbone connectivity, which ranges from Internet access to VPN services.

Many network service providers build data centers, and dedicated data center providers (such as Exodus and Intel) exist as well. Inside the data centers is the networking infrastructure and the server farms where applications and Web sites are hosted. Most data center providers offer Web hosting and are considering offering the infrastructure required for application hosting. In addition, ASPs who will offer hosted applications may own or outsource the service infrastructure to service providers.

System integrators (SIs) and value-added resellers (VARs) offer important system integration expertise and are direct channels for an ASP service. In fact, many of them are becoming ASPs.

The end-to-end service delivery chain can be compressed into six service building blocks. These six building blocks comprise the business model for Web and application hosting. As Figure 8 shows, the first four layers (network, data center facility, collocation/Web hosting service, and advanced, fully managed hosting services) are services typically offered by a service provider such as an ISP or a data center provider. The top three layers (application readiness, implementation, and ongoing management), on the other hand, belong primarily in an ASP's service domain.

Figure 8 Major Building Blocks of Web and Application Hosting Service



Source: C.E. Unterberg, Towbin, 1999; Cisco

Access Network

Dial, DSL, wireless, cable, or leased-line configurations are primarily used to access the Web. Visitors to a public Web site will generally go through the Internet, while business users who are accessing an internal company Web site (i.e., an intranet) may use the Internet or alternative data services (Frame Relay, ATM, or DSL) to reach the data center. Increasingly, wireless access will be used in accessing Web sites and e-commerce applications. Businesses that are running large Web sites or e-commerce applications frequently connect directly with their Web site in the service provider's data center using a leased line for access or maintenance.

For application hosting, a VPN becomes a very important access network option since internal business applications are generally restricted to authorized employees. Aside from a leased line or Frame Relay, a VPN is the most secure access option offering high performance—and it is much more cost-effective. Wireless access is also becoming popular as an option to mobile professionals and travelling sales and field personnel.

Web hosting providers do not need to offer access services directly to end users, since end-to-end service provisioning is not always required. For application hosting, however, providers will frequently offer access services (sometimes through resale) or refer the customer to a preferred network access provider.

Demand for high-speed or broadband access will accelerate with the increased adoption of e-commerce, extranet/intranet, and hosted applications as business enablers. Access providers should strive toward offering higher bandwidth and fast provisioning to capture the market growth.

Shared Infrastructure: Data Center and Backbone Bandwidth

A secure physical facility with 24x7 customer support, backup power, hardware and software infrastructure, the data center is the home of hosting services. Sometimes referred to as "Internet data centers," data centers for Web or application hosting services are connected to the Internet, to ISPs, and to other affiliated data centers with a large backbone infrastructure. Backbone bandwidth, either self-provisioned or leased, is necessary to offer customers guaranteed bandwidth, or bandwidth on demand in the distribution of Web content and applications. Efficient management of a backbone infrastructure capable of reliable content delivery is necessary for a hosting service provider.

Inside the data center, a variety of networking requirements must be fulfilled to successfully offer hosting services. These networking requirements are based not only on existing Internet networking technologies, but also on "content networking" technologies. As mentioned in a previous section of this paper, content networking enables the network to interact with the server farm to deliver content and applications in a reliable and scalable fashion.

Security (both authentication and intrusion detection) is a major requirement for successful content networking—so are caching and load-balancing functions. Cache engines store frequently requested content to reduce the traffic load on Web servers, and load-balancing equipment balances the workload across a number of servers to achieve the best performance and response time. Geographic load balancing is performed at the backbone level in order to direct traffic to data centers in different locations. A graphic illustration of these content networking functions can be found at http://www.cisco.com/go/hosting.

Content Delivery Network Service

Content Delivery Network service relies on dynamic caching to replicate server content at the edge of the network. Through Content Delivery Network service, up-to-date content can be served to end users locally rather than remotely. This service can be deployed at multiple data centers, or it can be deployed on multiple ISP networks to improve response time, and reduce traffic and congestion on a service provider's core network.

Basic Web Hosting

A basic service supported by most data center providers is known as basic Web hosting.

Basic Web hosting can support smaller, generally static Web sites on either a shared or dedicated server. Bandwidth and storage capacities similar to those offered under collocation services are available for a range of service fees. Service providers monitor network and server availability and maintain the hardware platform. Many service providers also offer basic Web page creation or e-commerce packages.

Collocation Hosting

Another basic service is a "collocation" service.

Collocation services offer customers data center space with defined levels of bandwidth and storage capacity. Backup services are also included in the service offering. Customers manage servers, LAN switches, and firewalls through on-premise visits or remote administrative tools. Typically collocation customers have sophisticated IT expertise, and customers include major portals, e-commerce merchants, and large enterprises. Service providers offering collocation services tend to have a high-speed backbone (OC-3 and above) as well as multiple data centers that are national, regional, or global.

Advanced/Managed Hosting and Application Infrastructure Provider (AIP) Services

Many data center and Web hosting service providers are creating higher-value hosting services by offering a full set of integration and management services. Typical service elements are:

- server and operating system selection, configuration, and ongoing management
- backend network integration
- complete system and applications monitoring

These service offerings are provided to customers who have sophisticated Web or e-commerce requirements but do not have either the IT expertise or adequate IT resources to cover the management functions.

Recently, a wholesale opportunity opened up for managed hosting service providers. Many ASPs do not want to build a network and hardware infrastructure –either for time-to-market or competency reasons—and would instead choose to use a service provider's data center services, network infrastructure services, and many times its hardware and software platform services as well. A service provider wholesaling these services to an ASP is known as an application infrastructure provider (AIP). To create an enriched set of AIP services to ASPs, some service providers will also offer billing, service provisioning, and customer care software packages, and help manage these functions for an ASP.

The entire set of ASP wholesale services is sometimes referred to as an application infrastructure platform service. Many service providers are planning to offer this service soon.

Hosted Applications

Hosted applications are generally deployed over the Internet or a VPN. An ASP's business plan is built on the principle that the use of centralized infrastructure and IT expertise creates economies of scale, and such efficiency is complemented by a more standardized approach in application deployment. The first task in creating a successful ASP business is to select a net-hosted application or applications. An ASP must be licensed to use the software and should strike a licensing agreement with a software vendor that allows the ASP flexibility in re-using licenses for different customers, or in using annuity payment methods for the licenses. An ASP also needs to work closely with a software vendor to develop application templates suitable for net hosting, preferably addressing the needs of the SMB market. Commitment from an ISV to develop a net-hosted application is important. An ISV's willingness to share revenue can also help an ASP reduce the upfront investment. An ASP should also seek similar revenue or risk-sharing plans from server and operating system vendors who have a stake in the success of this market.

Implementation and Business Process Design

Traditional software vendors sell ERP applications to enterprises. The enterprises in turn hire system integrators and business process consultants to integrate business processes into the applications. Customization, large investment, and an extended deployment period characterize a traditional application implementation process. ASPs, however, operate in a different fashion. ASPs opt for standardized application templates that capture the most prevalent business processes. Minor customization may be required and customization services can be provided in-house or they can be outsourced to a system integrator. An ASP must streamline system integration and business consulting in an application deployment process in order to create economy of scale for its service.

Ongoing Application Management

There are two major tasks central to the ongoing management of net-hosted applications.

An ASP must have expertise pertinent to the applications it is offering. The ASP will need to respond to customer application problems, and the ASP must go back to source ISVs if an application failure requires code modification.

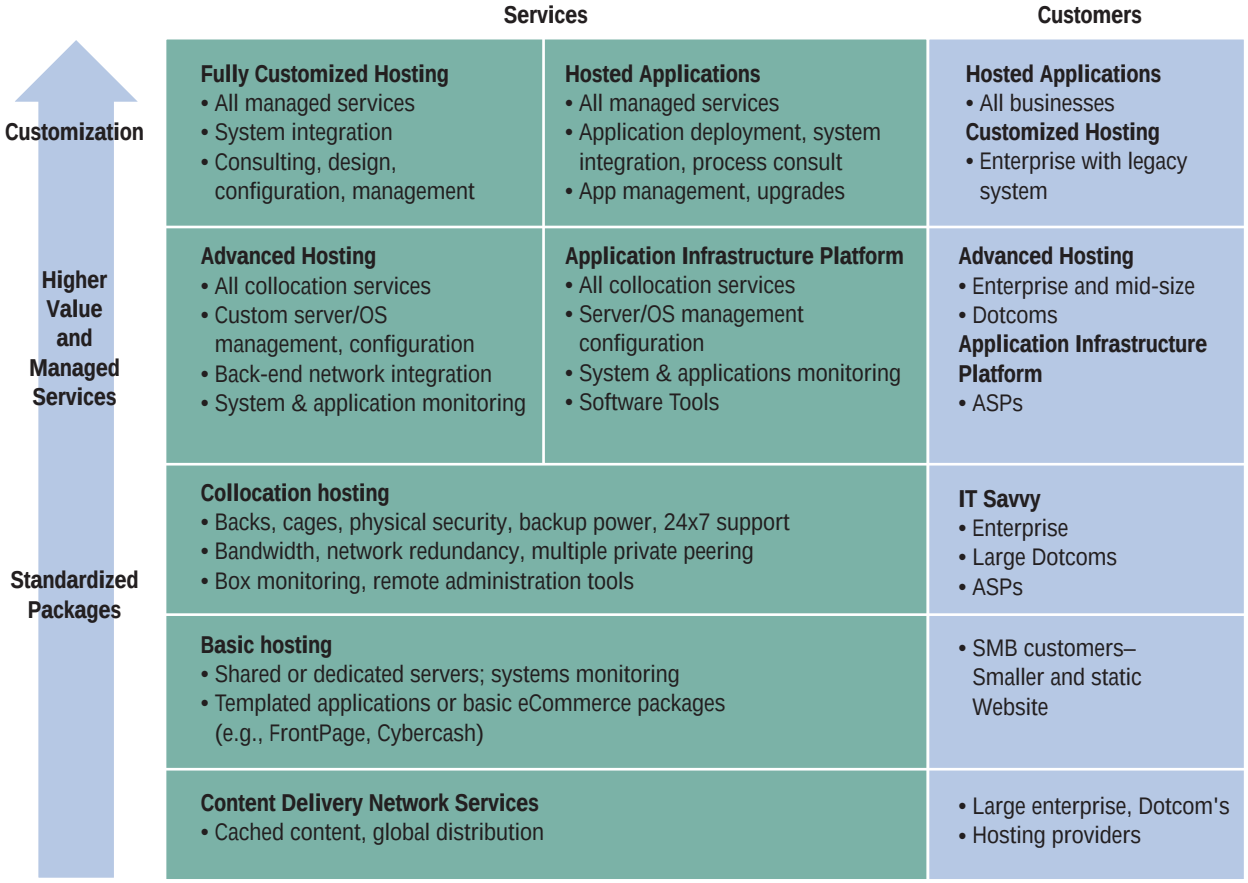
The second service component for application management is more challenging—end-to-end customer care and service guarantee. An ASP is the customer's single point of contact for application performance. The ASP has to be responsible for all failures or problems, including those which emanate from any of the underlying service layers that support hosted applications. The best help-desk or customer-care practice is to issue a single trouble ticket for any problem encountered with a hosted application. An ASP needs to be either in control of the data center and network layers of its service, or have a mechanism established with its service providers to troubleshoot infrastructure-related problems that may have affected the application performance.

The various hosting service offerings and target customers discussed above are summarized in Figure 9.

These services are arranged by their level of customization and management complexity. Advanced Web hosting and application infrastructure platform services are considered equivalent in management complexity. At the top of the services stack are fully customized hosting and hosted applications services. The commonality between the two services is the requirement of system integration and customization. However, ASPs strive toward limited customization while customized hosting services (mostly for Web and e-commerce applications) can involve substantial legacy integration and customization.

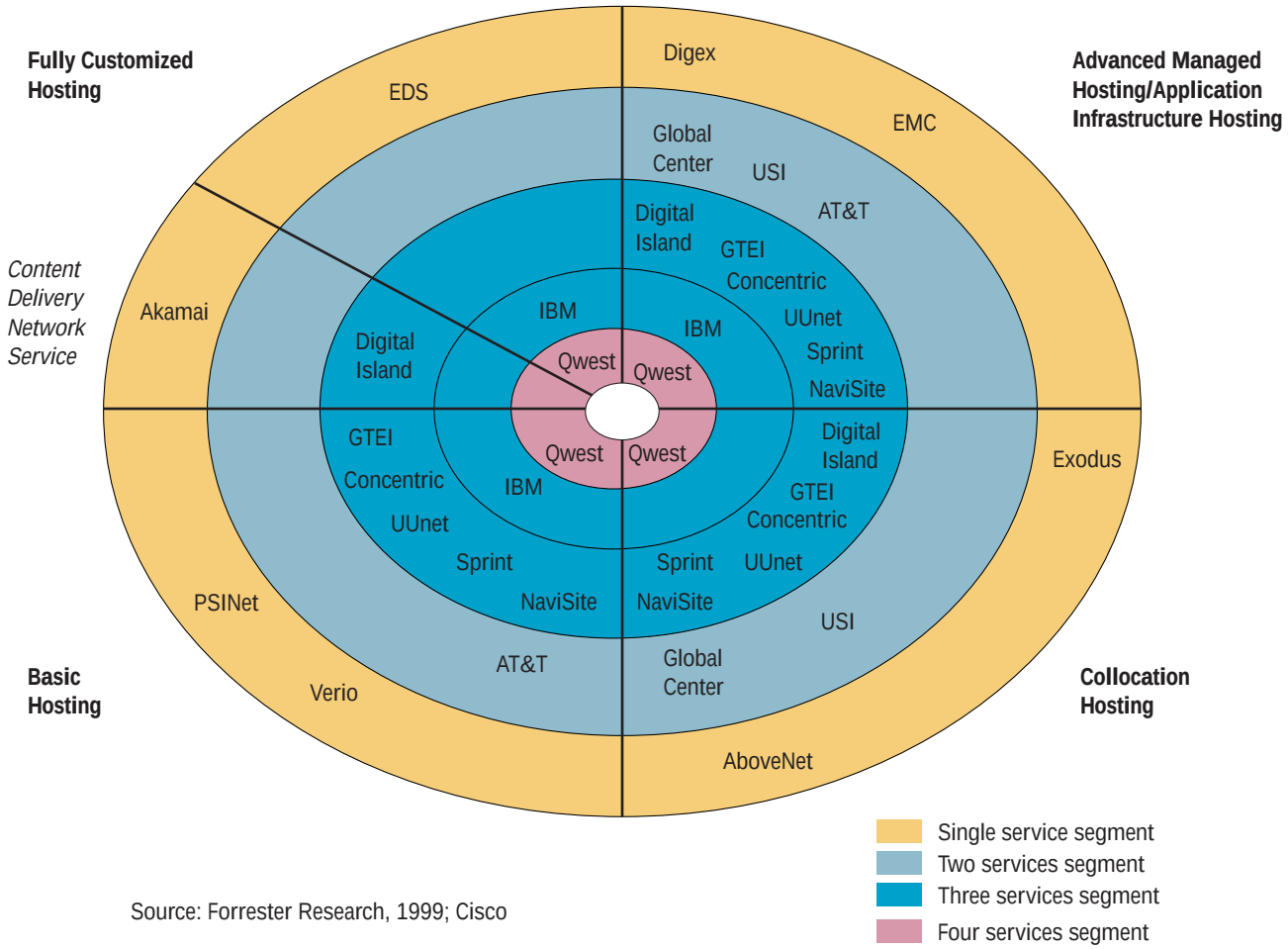
Figure 10 shows how leading U.S. service providers are offering Web hosting services. Figure 11 shows a wide spectrum of ASPs operating in the U.S. market today.

Figure 9 Hosting Business Models, Target Customers, and Primary Services



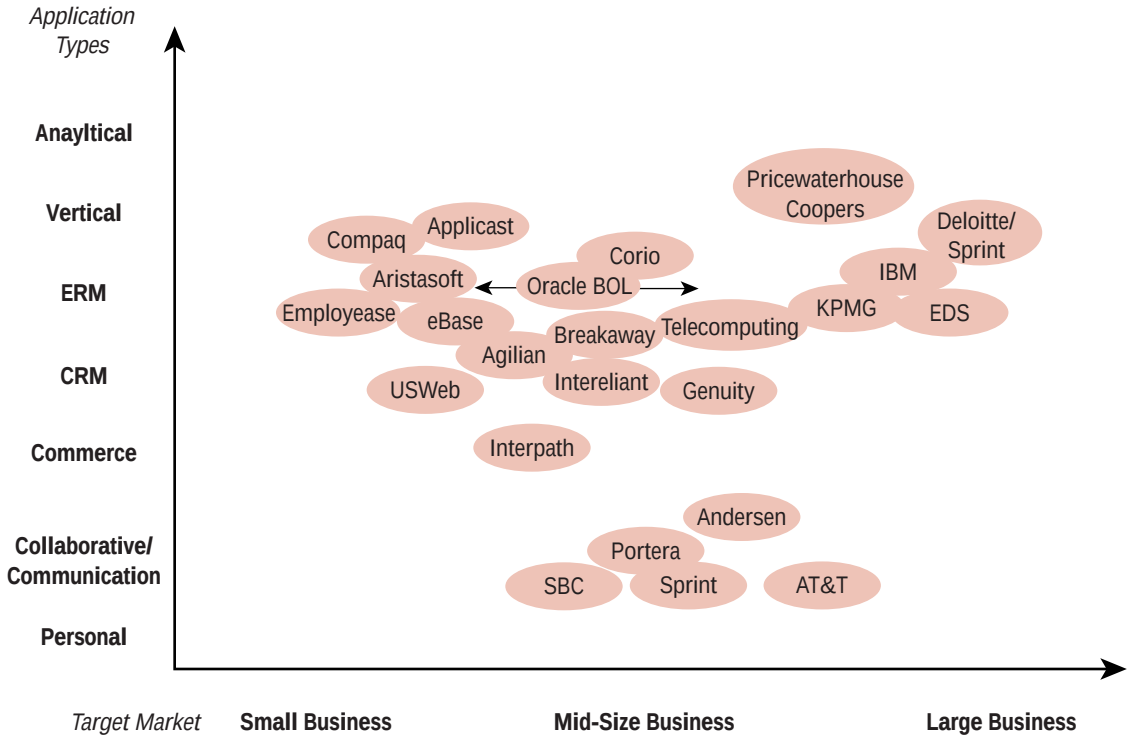
Source: Forrester Research, 1999, Cisco

Figure 10 Service Offerings by Major Hosting Providers



Source: Forrester Research, 1999; Cisco

Figure 11 Major ASPs and Hosted Applications



Source: GIGA Research, 1999

Hosting Services Pricing Model

Hosting service providers generally charge for their services based on the bandwidth and storage space made available to a customer. Basic e-commerce packages are sometimes bundled in the service offering. Collocation service providers typically apply additional charges for rack space leased by customers. Similarly, advanced hosting providers would set higher fees for hardware integration and complete system management. Customized hosting requires integration with legacy systems or highly customized designs and configurations, and consequently such hosting services command the highest premiums.

Figure 12 illustrates the average pricing for different hosting services, expressed as per-server cost on a monthly basis. As evidenced by the data, services that are higher on the value chain are more highly priced.

Figure 12 Hosting Services Pricing Model

Hosting Services	Price per Server per Month		Pricing Elements
	1998	2003 (Estimate)	MB/Mo data transfer *or* peak traffic MB/Mo storage Professional services eCommerce packages Cage/rack space Redundancy Content delivery Integration complexity
Basic Hosting	$80–145	$70–100	
Collocation Hosting	$1,900	$2,300	
Advanced Hosting	$3,100	$3,600	
Customized Hosting	$20,000	$27,000	

Source: Forrester Research, 1999

ASP Pricing Model

ASPs use a variety of pricing models to charge for their application services. Most providers charge for services on a flat per-user, per-month basis, and they frequently price the upfront installation and integration cost separately. However, some ASPs offer a bundled pricing scheme that requires no upfront payment. In a recent survey by Current Analysis (2000), current users have indicated a preference for alternative pricing models such as a flat monthly fee for an entire company, or per-user fees assessed on concurrent users, rather than specified or named users.

While most application services are offered on pre-determined, fixed rates, many ASPs adopt a more flexible pricing model for the start-up dotcom companies which offer e-commerce or other integrated ERP capabilities on their site as part of a total service package. A revenue- and risk-sharing model is used by many ASPs to link the ultimate pricing of their ASP service to the success of these e-commerce sites.

As the ASP industry is still in its nascent stage of development, its pricing structure will undergo changes as the industry evolves.

A summary of major pricing models is presented in Table 1.

Table 1 ASP Pricing Model

Pricing Model	Pricing Elements	Target Customer
Upfront Charges plus Monthly Fee	• Upfront fees for integration, consulting, and/or customization—Option of transferring software and hardware assets to customer after a defined period • Monthly fees based on usage, number of named users, or number of concurrent users	Larger companies with more complex implementation needs
Bundled Monthly Charges	• Upfront cost included in monthly payments	Smaller companies with minor integration and installation needs or companies interested in preserving start-up capital
Flexible/Revenue-Sharing	• Upfront cost but no fixed monthly—Ultimate pricing driven by the total success of the site (including number of users and transaction volume) • Minor or no upfront cost—Total pricing based on the transaction volume and ASP service performance	Dotcoms running e-commerce or business-to-business commerce sites

Source: Current Analysis, 2000

Success Factors for the Hosting Business

Success Factors for Data Center and Bandwidth Provisioning

The following best practices are recommended for a successful data center provider:

- Place data centers in areas with a high concentration of businesses and balance their geographical distribution. This practice is important because most customers prefer physical proximity to the hosting site. Additionally, customers with large e-commerce sites need caching or mirrored servers in multiple locations.
- Connect data centers using dedicated, redundant high-speed links at OC-3 or (preferably) higher speed.
- Peer directly with major ISPs to avoid Internet congestion. Create alliances with major ISPs or backbone providers to reduce peering cost.
- Secure sufficient bandwidth and reduce bandwidth cost. In contrast to the Internet access service model, data center providers usually undersubscribe bandwidth when provisioning "bandwidth on demand." Partnership between data center providers and backbone providers can reduce bandwidth cost for the data center provider.
- Ally with service provider partners to achieve end-to-end SLAs.
- Deploy advanced content networking technologies to enable intelligent and scalable content distribution.
- Build large data centers (50K sq. ft. and above) to achieve more economic efficiency.
- Drive a volume business by way of standardized and high-quality operations.

Success Factors for Advanced/Managed Hosting or AIP Services

Fully managed hosting or AIP services should work toward the following best practices:

- Develop expertise in administering the hardware and software platform needed for fully managed hosting or AIP services. It is important to streamline the operation for quality and scalability.
- Manage a wholesale/retail strategy. Target business customers and dotcoms for Web hosting, and wholesale platform services to ASPs.
- Actively seek out technology enablers and leaders (e.g., hardware vendors and middleware developers) to offer a state-of-the-art infrastructure.
- Enhance customer relationships through management of mission-critical operations.
- Drive a volume business by way of standardized operations.
- Provide service guarantees.

Success Factors for Hosted Applications

In a recent survey by Current Analysis (2000), customers identified and ranked major decision criteria in selecting an ASP, as illustrated in Table 2. These results reflect the challenges ASPs face to successfully grow the market and their customer base.

Table 2 Decision Criteria for ASP Subscription

Rank	Criteria
1	Support capabilities
2	Hosting facilities/expertise
3	Cost/pricing structure
4	Reputation
5	Service level guarantees
6	Track record/reference accounts
7	All-in-one solution

Source: Current Analysis, 2000

These criteria are primary guides to success for an ASP. Many analysts have suggested best practices for the ASP business (C.E. Unterberg, Towbin, 1999; IDC, 1999; Forrester Research, 1999):

- Successfully partner, outsource, and manage all the components of the ASP business, as is required by an ASP's complicated business model.
- Offer some level of service guarantee—ideally an end-to-end SLA covering network, system, and application performance. Such a comprehensive SLA has yet to be developed and requires collaboration among a variety of industry players. It is crucial, however, to guaranteeing performance at a level equivalent to an in-house deployment.
- Demonstrate a single point of accountability to customers. Delivering this level of accountability to customers includes perfecting customer service and help desk operation, having the ability to issue and resolve a single trouble ticket, and having an understanding of changing customer requirements.
- Articulate the ASP value proposition. The proposition should focus on:
  - faster application deployment and competitive differentiation
  - customer access to state-of-the-art application and Internet technology
  - reduced total cost of ownership
- Effectively manage relationships with ISVs. Objectives are to obtain net-hosted versions of applications, to negotiate a flexible revenue sharing model or software license contract (e.g., sublicensing, annuity payments), and to manage potential ISV channel conflicts (e.g., commission structure, preferential referral when ISV sales force is used).
- Balance volume and quality. Economics of the ASP business improve with volume but quality dictates paced deployment and careful execution.
- Develop a multivendor, integrated application portfolio. A large application portfolio allows cross selling of complementary applications to the same customer base. It also allows the ASP to meet the total business application requirements of the customer.
- Co-brand with a known provider or partner with ISVs, systems integrators (SIs), and service providers. Such co-branding will provide an ASP with credibility in a nascent industry.
- Develop innovative sales channels. All segment players in the ASP space, including hardware vendors, ISVs, SIs/VARs, and telcos can be effective sales channels for hosted applications.
- Balance standardization and customization. An ASP needs to develop standardized templates that cover a discrete and integrated set of business functions. For instance, a rule of thumb is that 80 percent of application implementation should be standardized.
- Build basic application implementation expertise. Goals should be the configuration and integration of applications with limited customization, and should follow the following service process:
  1. Analyze a customer's business requirements and processes.
  2. Translate these processes into a given application.
  3. Configure the application to meet the business's requirements.
  4. Technically integrate the application into a given operating system.
  5. Install the application at user's client.
  6. Train customers to use the application.
  7. Provide consulting in selection of hardware and operating systems to support the application.

Business Model Analysis

Competency Gaps

In general, a natural gap exists between data center provider competencies and ASP competencies, (i.e. networking and platform management versus application deployment and management). Some service providers bridge the gap by building a complete service delivery chain while others rely on partnerships. USinternetworking is an example of an ASP that directly owns and manages data

centers and service platforms. Corio, an alternate example, outsources the network and data center infrastructure but hosts and manages applications. Qwest Cyber.Solutions provides another example of partnership. It is a joint venture between Qwest and KPMG. Qwest handles the network and data center infrastructures, and KPMG serves the ASP functions.

Messaging applications, collaborative/productivity applications (including unified messaging, conferencing, and calendering), and Web-based call center applications are exceptions to the competency gap. These applications do not involve the business processes of a customer. They complement service providers' basic telecom services and could become standard offerings for many service providers.

Synergy

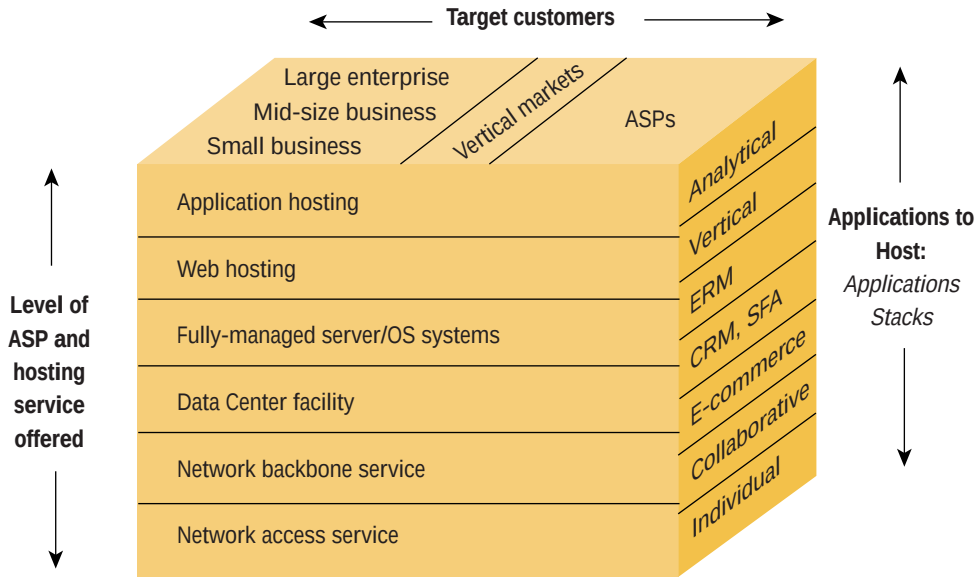
Natural synergy exists between access and backbone transport providers and data center providers. Since backbone bandwidth is a large cost component for a data center provider, integration with a backbone provider brings economic benefits. Data center providers benefit by reduced transport costs as a result of a strong partnership, but backbone providers also benefit by being able to "fill the pipes," or secure IP traffic. There are benefits for the network access provider too, since data center and hosting services will require faster speed and higher bandwidth services at the customer premise. The synergy that exists among providers is an upside to bundling access, transport, and hosting services.

In general, a service provider needs to establish new traffic aggregation and generation points following the growth of IP and Web traffic. Internet data centers have been analogized to central offices in the time-division multiplexing (TDM) network to illustrate their importance in the Internet economy. The increasing demand for hosting services drives a chain reaction demand for transport and network access.

Entry Models

The complexity of the hosting service business model poses challenges to providers who plan to enter this space. Which segment or segments to enter? What service offerings? How far up the service stack to go? What applications to host? Planning to enter the Web and application hosting business is really a three-dimensional exercise, as illustrated in Figure 13.

Figure 13 Entry Decision Dimensions



The following list can serve as a planning guide:

1. **Assess core competence, customer base, and company strategic direction.** Assessment of core competence determines in which service layers a service provider can excel and should enter. It will also make clear which service layers should be left to partnerships if the service provider aims to have a broader set of service offerings. A critical view of the service provider's existing customer base and growth plans will also help identify what hosting services will be desirable to retain customer loyalty and win in the marketplace. Furthermore, companies should determine whether it is entering the hosting business in an opportunistic fashion or for long-term strategic benefits.
2. **Develop a viable business model and determine the level of service.** Based on the analysis performed above, a service provider can develop a Web and/or application hosting model that deliver optimal results.
3. **Make a build versus lease decision for service infrastructure.** After careful market and financial analysis, a service provider can decide whether it's more economical to build or buy certain service components. Time to market is another major consideration. Sometimes it is wise to buy services for quick market entry and build simultaneously for the long term solution.
4. **Select the target market segment.** Choices are small businesses, mid-size businesses, large businesses, dotcoms, vertical markets, and/or the wholesale ASP market. A market-potential and competitive analysis, informed by the service provider's current customer base, will guide the decision to select one or several target customer segments.
5. **Choose applications to host and choose ISV partners.** Target market segments vary in the types of applications they care to adopt. E-commerce is the most well-received hosted application, but unified messaging, Internet call center, and multicast applications are gaining popularity across all market segments with great speed. Therefore these applications can be low-hanging fruits for many service providers seeking to offer a complete telecommunications service portfolio.

One thing worth noting is that the application hosting market is still evolving, and solution requirements can change rapidly. Many analysts (e.g., IDC, Forrester Research, Giga) predict that the trend is moving toward an integrated portfolio of applications and the capability to manage business processes across multiple companies on the net.

If a service provider decides to offer hosted applications, certain other planning tasks need to be completed, such as:

- Structuring the license agreement (revenue sharing and sub-licensing)
- Determining application implementation and customization requirements
- Determining partnership requirements
- Designing customer care operation
- Developing a sales channel plan

Go-to-Market Plans

Many leading hosting providers are developing a rich portfolio of hosting services that range from basic to complex hosting, serving both Web and application hosting needs. However, a focus is frequently desirable at time of market entry—particularly if the service model caters to a niche market segment.

Service providers have participated in the thriving hosting services market in four major ways. First, collocation providers have provided collocation services to dotcoms, large corporations, and now to ASPs. Most representative examples are Exodus and AboveNet. Second, some hosting providers are differentiating themselves by offering complex Web hosting services or AIP services. Examples here are Genuity, Digital Island, Digex, and Concentric.

Third, some service providers have decided to focus on basic Web hosting or basic hosted applications. Verio, for instance, is a service provider dedicated to basic Web hosting for the small to medium-sized businesses. In terms of offering hosted applications, one potential entry strategy is to focus on basic communication and collaborative applications. These applications do not involve business process integration or complication application expertise, and can be more easily deployed by service providers. A good example is iBasis with its deployment of hosted unified messaging applications.

Fourth, service providers aiming to provide a fuller set of hosted applications have partnered with a system integrator or ISV in order to bridge the gap in application expertise. Qwest Cyber-Solutions, an ASP mentioned earlier, is a joint venture between Qwest and KPMG. Spring has a similar partnership with Deloitte Consulting, targeting global enterprise customers. USinternetworking, on the other hand, is a facility-based ASP who manages all components of the ASP value chain. It has accomplished this full range of capabilities by building and acquiring application and system integration expertise. But to facilitate its rapid expansion, it has recently announced a partnership with AT&T to secure infrastructure and joint marketing services.

Entry models for service providers are summarized in Table 3.

Table 3 Potential Entry Models for Service Providers

Models	Infrastructure Services	Target Customers	Web/Application Hosting Services	Channel/ Sales Strategy	Service Providers
Model 1: Bandwidth & Collocation Services	**Resell or leverage own** existing infrastructure • Access network • VPN • Backbone bandwidth **Build** data center facility and/or hosting infrastructure (with content networking and security services)	*IT savvy*— Enterprise Dotcoms ASPs SIs	• Collocation • Basic Web hosting (optional)	Direct sales to current and future customer base (bundle with transport) Joint marketing with ASPs, SIs, VARs, technology vendors	Potential Entrants: Tier 1 and Tier 2 ISPs, PTTs, ILECs, IXCs, national CLECs

Models	Infrastructure Services	Target Customers	Web/Application Hosting Services	Channel/ Sales Strategy	Service Providers
Model 2: Simple to Advanced/AIP Hosting Services	**Resell, lease, or leverage own** existing infrastructure • Access network • VPN • Backbone bandwidth • Data centers **Build** • Server/OS installation, configuration & management • Offer support and back-office software tools for ASP wholesale service	Enterprise SMB Verticals Dotcoms ASPs	• Collocation (Optional) • Basic/ Advanced Web hosting • Application Infrastructure Service • Can choose to offer hosted applications at a later stage	Direct sales to current and future customer base (bundle of transport, web hosting, and comm app services) Joint marketing with ISVs, hardware vendors, SIs	Potential Entrants: IXCs. ISPs, PTTS, ILECs, regional or national CLECs

Models	Infrastructure Services	Target Customers	Web/Application Hosting Services	Channel/ Sales Strategy	Service Providers
Model 3: Basic Web and Application Hosting Services	**Resell, lease, or leverage own** existing infrastructure • Access network • VPN • Backbone bandwidth • Data centers • Server/OS configuration & management	Enterprise SMB Other service providers	• Basic Web hosting • Communication/ collaborative applications (e.g., remote learning, conferencing, multicast, unified messaging)	Direct sales to current & future customer base (bundle transport and hosting) Sell through ISVs and VARs	Potential Entrants: CLECs, ISPs, independent telcos
Model 4: Hosted Applications	**Resell, lease, leverage existing** infrastructure, or **selectively build** • Access network • VPN • Backbone bandwidth • Data centers • Server/OS configuration, management **Build or Partner (including joint venture)** • Application implementation, management expertise	Enterprise SMB Vertical markets	• Web hosting (optional) • Hosted applications—Offer hosted Communication/ Collaborative, CRM, or ERP applications *primarily through partnerships and joint ventures*	Direct sales to current and future customers Joint marketing with ISVs, system integrators, VARs, and hardware vendors	Potential Entrants: All service providers in partnerships/ joint ventures with ISVs, SIs, or ASPs for ERP, CRM, and complex e-commerce applications

Conclusion

Web and application hosting services present the most exciting and lucrative opportunity to service providers in the category of Internet services. The astounding market growth rate promises larger revenue streams and higher margins. However, the need to develop a full portfolio of Internet services to create customer loyalty and the need to remain competitive are equally important to service providers.

Service providers have many roles to choose from when entering the market—from being a niche player to being a full service provider. Since the business model involves various industry players for service delivery, a successful hosting business calls for innovative partnerships to create a win-win business proposition for all. A niche approach may work as well as a full service solution as long as the right partnerships are formed considering market opportunity and target customers.

The hosting services market is still evolving and changing. Early movers will have an advantage in securing market share and establishing market leadership. Service providers need to act quickly to get a solid foothold in the market and realize near- and long-term revenue potential.

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