

Foundation for a Successful Web Site

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Abstract

There are many factors that come into play when designing the architecture for a successful web site. The web site must be up and running 99.99% of the time. Redundancy is the key to achieve this.

1. Introduction

There are many ways to design the architecture of a web site. The two options are to either host the site using an outside vendor, or purchase the necessary hardware and software to host and maintain the site yourself. A 4-tier architecture is by far the best method of design for hosting your own site. The goal of a 4-tier architecture is to manage each specific function separately while still working together. The client would be the 1st tier. The application servers would be the 2nd tier. The payment servers would be the 3rd tier, followed by the database as the 4th tier.

2. Hardware

There are a number of key hardware and software that make up the 4-tier architecture. Some of the hardware discussed will include the routers, load balancers, and servers along with a description of the software and providers that operate each of these machines.

2.1 Routers

Routers are used to direct traffic to the appropriate machines. By definition they are computers that determine the best way to direct data packets to their specified destination.[1] The dominant supplier of routers today is Cisco Systems (CSCO). Another vendor is Nortel Networks (NT). Price for routers in the market today range from \$10,000 to \$55,000. Cisco routers range slightly higher than it's competitors but they attract a list of loyal consumers who pay the extra time and time again.[2]

2.2 Firewall

Firewalls are a key component in guarding the traffic flow in and out of your site. Their key purpose is to prevent unauthorized access into the site. In other words they are a defense mechanism between the network inside the firewall and the network outside of the firewall. They

also track the users accessing the site and keep a record of what they do and where they originate from and report any problems to the system administrator.[3] Cisco Systems, Check Point (CHKP), and NetScreen are some providers of firewalls in the market today. Prices for firewalls range from \$11,000 to \$18,000 with Check Point and Cisco dominating the market.

2.3 Load Balancer

Load balancers are either hardware, for large websites, or software that are used to direct traffic to servers that can respond and return the content to the user quickly.[4] By balancing the workload of the servers, the overall performance of the website is improved. Cisco Systems, F5 Networks (FFIV), and Nortel Networks are some major providers of load balancers. The price ranges of load balancers are from \$4,500 to \$30,000 and F5 Networks leads the market with new features.

2.4 Web Server

Web servers are dedicated computers that contain information, clients can access. They contain all the files needed to make up the webpage. The software required to operate the web server is usually free of charge bundled with the purchase of an application server. The most common vendors are Apache, Microsoft (MSFT), and Sun Microsystems (SUNW).[2]

2.5 Application Server

The application server runs on its own hardware and acts as the brains behind the application. It is a machine that services requests of other hardware and software on the network to satisfy a client's request. Some common vendors are BEA Systems (BEA), Borland (BORL), and IBM (IBM) with price ranges from \$8,000 to \$35,000 per CPU.[2]

2.6 Payment Server

The payment server processes all the credit card payment transactions that a user submits. In most cases it is best to outsource payment transactions to outside vendors. An example of a payment processing company is iAuthorizer and Authorize.Net. This company for example provides order forms, shopping carts, CGI scripts,

and transaction processing. They use a protocol called SET (Secure Electronic Transaction), which provides security for credit card payments.[1]

2.7 Database Server

A database server can be used to store text, graphics, sound, personal information about customers, and track inventory as well as various other tasks. Their key purpose is to store structured information, become self-describing, support transactions, and permit rapid information retrieval. Key players in database management are IBM, Microsoft, and Oracle with price ranges from \$11,000 to \$40,000 per CPU. [2][5]

3. Design Layout

The important part of all this is how everything is connected together. As I mentioned before redundancy is the key to the success of the website. In some cases it might be justified to spend the extra money and have backup machines in the case that one fails to operate correctly. If at any time a router, firewall, or server fails to operate correctly, the entire site and business will shut down until that machine is fixed. If there is a backup then business will continue operating while the first machine becomes operational.

Using two Internet connections from different ISP's will also enhance the flow of traffic into the site. Again if one network line goes down, clients can continue to access the site through the second connection.[6]

The combinations of these hardware, software, and layout will produce a foundation for a successful web site. This architecture design combined with a good business plan and the right resources becomes the start of the next successful business.

References

- [1] Gary P. Schneider, James T. Perry. "Electronic Commerce, 2nd annual edition". Course Technology, 2001.
- [2] Business 2.0 Staff. "The Who's Who of E-Business". January 2002 Issue. www.business2.com
- [3] Elias Awad. "Electronic Commerce from Vision to Fulfillment". Prentice Hall 2002.
- [4] 3Com. "Section 3 Firewalls, Webchaches, Load Balancers, and Print Servers". http://www.3com.com/other/pdfs/products/en_US/61000215_sec03.pdf
- [5] G. Winfield Treese. Lawrence C. Stewart. "Designing Systems for Internet Commerce". Addison Wesley 1998.
- [6] 4 Tier Architecture

