Resource requirements and resource options:

Development of a web site involves more than the cost of development. Additional costs such as bandwidth requirements, disaster recovery resources, and hardware maintenance also must be considered since these charges impact fixed overhead costs. Development of the initial page is a flat rate and must be based on the agreed upon specification, whereas the fixed overhead costs are monthly and annual costs which are reoccurring and ongoing. Consequently this is why consideration and alternatives must be offered since the client will be paying these costs long after the web site is developed. Consequently, this resource analysis will begin with the minimal requirements necessary and will also offer alternatives. To begin we should discuss the bandwidth requirements.

Bandwidth requirements:

Connectivity on the web requires an assigned IP address or a floating IP. Ports must be available for various web functions desired. This is a concern because if you attempt to use various DSL services that are home based and offer dynamic IP address you must use a floating DNS service to change the DNS entries as the IP address is renewed (when the lease for the dynamic IP expired) and you must also be assured ports for operation are available. For example, Verizon offers IP connectivity dynamically to the web for only \$29.95, but they block port 80, which makes it impossible to run a web server using this service. Consequently the following will be minimal requirements to support this web site:

- 1) Connectivity to the web.
- 2) A static IP address (at least 1) or if dynamic then a modification of the configuration to support a floating DNS Service.

3) Ports must be available to support the various services the customer requires, such as http, ftp etc. Consequently the service provider must have either all open ports or at least sufficient ports to support services required.

Bandwidth is normally sold in 64k increments. A t1 line consist of 24 64K increments, where one channel must exist not for data but a control sequence to support the other 23 channels. To determine the amount of bandwidth required requires an analysis of the existing web site usage and some speculation of additional usage that may result from the changes to the site which make it more functional.

Unknown Variables:

We do not know who is hosting the current web page nor do we know the bandwidth currently being purchased to support it. This must remain as an unknown and can be ascertained at a later time. We will begin the requirement by stating the need for some minimal bandwidth (should be at least 64K).

Various options for web hosting:

There are 3 main methods for web hosting:

- 1) Internal hosting
- 2) External hosting on another person's server (ISP, Aol ect).
- 3) Co-location

These are all options and must be decided by the customer. Normally this is done via some cost benefit analysis.

For this proposal we will set the requirements as follows:

- Administrative access to a directory on a server connected to the web. We should have about 10 megs of space available for web pages.
- 2) Administrative access to affect any DNS changes necessary.
- 3) A web engine such as apache..

- 4) CGI for form processing.
- 5) Administrative access to create mailboxes for form forwarding and contact forwarding.

The above requirements assume some in house web hosting. However as previously mentioned there are 3 methods available. This option is the first and assumes some fixed connectivity cost that is on going.

In the event the users of the site complain of access time to web pages or if pages begin to time out due to high utilization then the other options must be considered or the bandwidth or pipe to the web for the initial server must be increased. The increase in bandwidth can add considerable costs to the existing overhead and must be considered carefully. This is where options such as co-location must be considered as an alternative. In co-location your physical server is removed from it present location and delivered to an ISP (Internet Service Provider) who then connects the server to his backbone of connectivity. This can give you greatly improved access to the server since most providers have multiple T1 connections and even T3 connections to the web. It affords you the opportunity to tap their massive bandwidth so long as they are not overselling their service. However the down side is that if you need connectivity to the web for your present location then co-location can only assist with the server and the people accessing your web site. It does not give you connectivity from your location to the web and this will result in additional costs since you must maintain some service at the existing location from where the server was removed. This is why a cost benefit analysis is necessary to determine if it is better to co-locate or increase the bandwidth internally.

Control is also an issue. Having the server at your location gives you complete control over the hardware and software running on the system. It also allows immediate access to the hardware in the event there is a failure. Many ISP's

have unattended location that have equipment and connectivity but no personnel. This can create a problem in the event your hardware should fail or if software such as the operating system requires upgrading.

Another option is to have a service provide host the site on their server. This option eliminates the need for hardware and the concern of hardware failure since the provider will maintain all of the resources and normally has redundant servers in the event the server should fail. As in co-location the problem with connectivity to the web still exists and will require some connectivity in house to allow externally web access and this cost must be factored in. Also, unlike co-location you are relying on the resources the provider has in place. CPU processing speed and disk I/O access can have a dramatic impact on web site access. These are considerations you can fine tune when you co-locate since you own the hardware the web server is running on. However this is not the case when you have an ISP host the site for you. Additionally, ISPs tend to host hundreds of web sites on a single server. Consequently this creates many unknowns since you will not be aware of the bandwidth requirements or web access that is taking place at these other sites which are hosted via the same server. As previously mentioned, disk I/O and processing speed can have a considerable impact on web access and multiple sites hosted on the same server with multiple users accessing the sites hosted results in disk I/O bottlenecks as well high CPU utilization which only serve to compound the problem.

<u>Computer Hardware Requirements:</u>

The computer should have a processor type equivalent to a P2 @ 300 MHZ. Disk I/O Should be redundant. This is where a RAID is recommended. Also SCSI devices are preferred over IDE due to their MTBF (mean time between failure). Disk speed should be in the 7200 – 10000 RPM Range to allow for quick access (10ms or better) and RAM should be 512 Megabytes or better. More memory equates to fewer disk I/O swaps and for the cost of memory this is one of the best investments possible for web hosting. Two network interface cards are required. One for internal use where we will take advantage of natting (network address translation), and one for connectivity to the web. Internal we recommend 100TX and external 100 or 10TX is fine. The operating system is not a concern unless we require perl or desire to use open source software which normally requires some form of standard Unix. This can be SCO, Free BSD, Linux etc. However if this is not the case, then any Microsoft product running IIS will also suffice.

Security Issues and Operating System Platform Considerations:

Two main software platforms exist for web hosting engines. One is made by Microsoft corporation and is supported via IIS. The other is inherent and comes with most version of UNIX. The processor instruction set is a non issue since our requirement is an operating system with web hosting and the code designed is primarily interpretive and does not require us to write for a particular instruction set. Historically Unix was the predominant OS for web hosting. Even Microsoft's original web site resided on a Unix box when they were marketing their IIS services for the internet. Today we have two primary platforms, but it seems that historically security risks are higher with Microsoft products as opposed to traditional Unix based products. Because of this we recommended a traditional Unix platform.