

WEBSITE HOSTING FOR PNG ORGANISATIONS



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WHITE PAPER 2

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A White Paper by Cybermasta & Lexacorp

The Internet is evolving in PNG with more companies, organizations and government offices wanting to have a presence on the World Wide Web. One of the many decisions which must be made is where the organisation's website will be physically located (hosted). We have produced this White Paper to assist managers in determining the most appropriate solution to hosting their corporate website.

Hosted Internally or Externally

Websites can be hosted within an organisation or externally by a Hosting Company. There are two major considerations when considering whether to host a website within an organisation, Security and Bandwidth.

Security

Websites are controlled by "Web Servers" which are computer programs which run on computer "Servers". They receive requests from users and returns information to users using a standard communication protocol. The Web Server normally runs a number of components including the Server application (e.g. IIS or Apache) itself and additional facilities such as database servers (e.g. MySQL, MS SQL Server, PostGress) and script interpreters (e.g. PHP, ASP etc) which enhance the capabilities of the basic server. By its very nature as a receiver of requests from eternal users, this entire Web Server infrastructure is exposed to the whole world.

The essential point is that wherever the website is hosted, anything on it has to be considered to be "in the public domain" and it should not contain confidential information.

As you are no doubt aware, there are a large number of people around the world who are constantly searching for and finding security "holes" in these applications which they can exploit. Once a such a "black hat" finds a security vulnerability they use software tools to automatically search for web servers which are vulnerable and use this vulnerability to access at least the "web services" of the server. With more serious vulnerabilities, they can not only gain access to the "web services" but can also gain access to the underlying network infrastructure.

There is a constant battle between there "black hats" and the software developers with the developers quickly releasing updates and patches every time a new security hole is discovered.

To maintain any effective level of security, it is essential that all components are kept completely up to date with all relevant upgrades and security patches installed as soon as they become available. This requires dedicated, knowledgeable staff who need to spend considerable time - constantly monitoring developments and downloading and installing upgrades and patches when necessary.

As pointed out earlier. Some of the more serious vulnerabilities can give access not only to the compromised web services but also to the underlying network infrastructure. For this reason, it is essential that an externally exposed web server be isolated from the rest of an organisations infrastructure. This can be done in two ways:

1. Set up a separate server in a “DMZ” which is kept isolated by additional firewalls and routers within the organisations network.
2. Host the website on an external web server hosted by a Service Provider.

Unless an organisation has well trained, dedicated IT staff to maintain the infrastructure, the first option is not recommended.

Bandwidth

Most organisations in PNG now have wireless connections through one of the ISPs or Telikom ADSL. These are frequently in the range of 128-256 Kb per second connections. Note that Kb with a small “b” means Kilobits per second. KB with a capital “B” means KiloBytes per second.

When ISPs talk about bandwidth, they are referring to “download” speeds i.e. the speed at which you can retrieve data from the internet. Typically “upload” speeds (for sending information from your organisation to the internet) are ½ or ¼ of the download speed - so effective upload speeds will be 64KB or 128Kb per second. This bandwidth is shared between all users and applications using your wireless connection including email servers and any staff members using a web browser for internet research.

Even with a 128Kb per second upload speed, allowing for protocol overheads this give you an effective upload speed of about 12 KB (kilobytes) per second or 720 KiloBytes per minute.

Assuming that you have no incoming or outgoing email being processed and that no staff members are using a web browser - if you have 10 users concurrently connected to your website, you can only supply each of them with a maximum of 72KB per minute. That is the approximate size of a single web page with a few small graphic images. In other words, it will take up to a full minute for each new page to be presented to a viewer. If each of those users were to request a smallish PDF file of say 300KB, it would take each of them about 5 minutes to download the file.

If you currently have incoming and/or outgoing email and staff using a web browser, there will be far less bandwidth available and the user experience would be considerably worse.

To provide a reasonable level of service to even a small number of concurrent website users, you need a separate dedicated internet connection of at least 1Mb per second in upload speed. To set this up you will need a separate wireless modem and antenna or ADSL line, a separate router and - as a minimum - a second network interface card on your Corporate Server which is also running the Internet Service, and preferably a completely separate Server.

Based on the above considerations, we recommend that you do NOT host your website internally.

Choice of External Host

There are two alternatives for external hosting.

Either hosted by a PNG based ISP or hosted by a dedicated overseas hosting company. The following table lists a number of comparison points between these alternatives:

	PNG Hosted	Dedicated Overseas Host
Access	There is currently a great deal of dispute between PNG ISPs and Telikom over Telikom providing retail internet services in competition to the ISP that they wholesale to. As a result at least one ISP is currently blocking access to it's hosted email and websites from anyone using any of the Telikom's internet connections, thereby preventing a large number of PNG internet users from viewing these sites.	All PNG Internet subscribers full have access to any overseas hosted website.
Reliability	Service availability is subject to outages cause by PNG Power outages, Telikom backbone outages, and limited or no redundancy in the event of ISPs in-house infrastructure failures . Such outage have been experienced on may occasions over the last few years, resulting in outages of up to several days for some services.	Highly reliable power and infrastructure redundancy in Australia or USA with close to zero downtimes.
Level of Support	<p>PNG ISPs provide website hosting as a small component of their business models and have limited levels of service and in house expertise.</p> <p>Website hosting is regarded as unimportant by ISPs as apart from the hosting fee the ISP make very little revenue from this business. They are more interested in signing up customers to surf the Internet and download emails because that attracts a per MB charge, often amounting to thousands of Kina per month.</p> <p>They do not provide tools to allow customers to readily maintain various aspects of their</p>	<p>Dedicated web hosting companies overseas treat this service as their core business and are staffed with high levels of competent and experienced staff. They also provide web based interfaces which allow customers to immediately make any desired changes to the configuration of their email and web hosting services.</p> <p>24/7 staff available for assistance.</p>

	<p>accounts. Any changes involve requests to the ISP followed by possibly days of waiting for a response.</p> <p>No support is provided outside of normal business hours</p>	
Backup	<p>It is difficult to determine the level of backup provided, but in one situation that we are aware of where a PNG based website was compromised, the last available backup from one PNG ISP was 9 months old.</p>	<p>At least daily complete backup of websites</p>
<p>Updates /Security</p> <p>(Note comments above concerning need to regularly update software and install patches for security)</p>	<p>While we are not aware of the current version of all components for all of the PNG ISPs, we have been able to ascertain the following:</p> <p>ISP 1:</p> <p>Apache 2.0.46</p> <p>PHP version 4.3.2</p> <p>Built Apr 16 2005</p> <p>ISP 2:</p> <p>Apache 1.3.27</p> <p>PHP version 4.3.9</p> <p>Built Mar 28 2006</p> <p>ISP3:</p> <p>Apache 1.3.26</p>	<p>Constant updates by dedicated staff to ensure that the latest version of all software and relevant patches are installed. Our preferred host currently (as at July 2009) has the following versions:</p> <p>FreeBSD,</p> <p>Apache 2.2.11</p> <p>PHP version 5.2.6</p> <p>Built Mar 29 2009</p>
Cost	<p>PNG hosting costs range from K240 to K350 per year for minimal services (hosting of a static website) with additional charges if you wish to utilise PHP scripting, on-line databases etc</p>	<p>Full services including PHP, databases and user maintained email accounts etc for AUD 95 per year.</p>

SUMMARY

Based on the above, it is our strong recommendation that an overseas based, dedicated website hosting service is used.

For further information, please contact either of the following:

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