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The Battle for an ISP: The Case of a Polytechnic Institution in New Zealand

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ABSTRACT

To find an appropriate Internet Service Provider (ISP) for instant Internet services (e.g., web browsing, e-mail, etc.) to meet the current and future needs of a tertiary institution is indeed a challenging task. The fundamental issues such as cost, bandwidth, technology, ongoing support and future upgrade are to be considered when selecting an ISP. This paper reports on a case study of New Zealand Polytechnic institution – selecting the best ISP for instant Internet and email services for the institution. It provides an in-depth evaluation of three short-listed New Zealand ISPs and recommends the best solution for the institution. We found that the 64 kbps ISDN service is one of the cheaper options for the Polytechnic institution for low Internet usage (5 hours or less per day). For high or unlimited Internet usage the 64 kbps DDS service is the best solution for the institution. The conclusions drawn are based on the actual quotation provided by three contending ISPs.

INTRODUCTION

Internet Service Provision involves a relationship between a service provider and a client, usually through a service level agreement (SLA) between the two parties. The selection of an ISP to meet the current and future needs of tertiary institutions is not an easy task. Issues such as pricing, bandwidth, technology, ongoing support, future upgrade and other value added services represent some of the implications when confronted with a decision to select an appropriate ISP for instant Internet and email services. For example, anonymous (2004a) suggested that issues like bandwidth, price, ISP that offers SLAs, ISP with a proven track record in customer service that gives us the most technical, operational and billing support with minimal churn rate (customer turnover) and providing different value-added services, such as various security products, online tools and portals that allow customers access to usage statistics, account information, and network performance were some of the important determinants of selecting an appropriate ISP. Above all, providing sufficient and reliable bandwidth is essential for the effective and continuous operation of educational institutions. This is especially important nowadays as most educational institutions offer large proportions of their courses or their contents online.

In this paper we report on a case study of a small Polytechnic institution in New Zealand, requiring an ISP for instant Internet and email services for both tutors and students. In this paper we provide an in-depth analysis and evaluation of three short-listed ISPs, and recommend the best solution for the Polytechnic institution under study. To maintain the commercial confidentiality and to protect the anonymity of the three contending ISPs, we refer them as ISP1, ISP2, and ISP3. For comparison purposes, we consider only three common technologies for the Internet connection: Integrated Services Digital Network (ISDN 64 kbps), Digital Data Service (DDS 64 kbps) and Frame relay (64-and 128 kbps).

The remainder of this paper is organized as follows. First we describe the case background. We then briefly discuss the three common technologies for Internet connectivity. The three short-listed ISPs are evaluated and interpreted followed by a brief discussion and conclusion.

CASE BACKGROUND: INITIATION, MOTIVATION AND PROCESS

One of the Polytechnic institutions in New Zealand desired to offer Internet courses for their senior students, and consequently both tutors and senior students were required to access instant Internet and email services. The IS manager of the institution under study initiated the acquisition process of getting Instant internet and email services for the institution right after the project approval by the chief executive officer (CEO). The IS manager conducted the following activities to complete the formal acquisition process:

- Acquisition plan
- Writing a request for proposal and send it to relevant ISPs
- Evaluation of ISP responses
- Selection of the best ISP

The acquisition plan is a one page document which summarizes project objective, scope, requirements, timeframe, resources required and budgeting requirements. This document is targeted for management team to make informed decision about project approval. The following requirements were identified and included in the acquisition plan.

- Tutors and senior students are able to use instant Internet and email services seven days a week.
- Offer several Internet courses both on and off campuses.
- 50 active users are able to access the Internet and email services concurrently in the first year. The projected number of users would be doubled in the subsequent year and this trend will continue for the next five years.
- International traffic: 800 MB/month for the first year and may increase over the years.
- Accounting facilities are required for charging purposes.
- Budget: NZ$10,000 for the first year.

The request for proposal (RFP) is a document (about 15 pages) which contains information about institutional background, contact address, timeframe, service requirements (including business and technical requirements), contractual issues and other related information. The formal process of selecting an ISP for the institution was initiated by inviting a number of potential New Zealand ISPs who can provide both instant Internet and email services. A copy of an RFP was sent to a number of selected ISPs so that each ISP can prepare a quality proposal/ response for final evaluation by the evaluation team. Upon receiving the responses from ISPs, the evaluation team further short-listed the bidding ISPs down to three based on some mandatory criterion e.g. price, service requirements, and ongoing support. The final ISP selection process involves a detail evaluation of three short-listed ISPs, which is discussed in section 4.

INTERNET CONNECTIVITY TECHNOLOGY: ISDN, DDS AND FRAME RELAY

There are various technologies available for Internet connectivity in New Zealand. The most common technologies are ISDN, DDS, and

Frame Relay. Integrated Services Digital Network (ISDN) is a high-speed (64 kbps building block) digital stitched service available for Internet connection through various ISPs (*Telecom NZ Links*, 2004). One ISDN line can manage a business' phone, fax, Internet and data transmission requirements. There are two types of ISDN line access: (1) Basic rate access (BRA); and (2) Primary rate access (PRA). A detailed discussion of ISDN services and applications can be found in (Anonymous, 2004b; Comer, 2001; Dodd, 2002; Gallo & Hancock, 2002; Palmer & Sinclair, 2003). The ISDN service cost is based on amount of time the line is being used for data transmission (*ICONZ Links*, 2004).

Digital Data Service (DDS) (64 kbps or 128 kbps) is a permanent leased line digital service available for Internet connection with a guaranteed bandwidth (*Telecom NZ Links*, 2004). It is a flexible, secure, easy to use, and customised solution to match individual business needs. The monthly cost for DDS services is a flat rate i.e., 24/7 service (*Telecom NZ Links*, 2004). The ICONZ suggested that if an ISDN line were connected for more than 8 hours per day, it would generally be more economical to have a DDS leased line (*ICONZ Links*, 2004).

The Frame Relay service is also a dedicated leased line available both at 64- and 128 kbps and can be used for high-speed Internet connection (ICONZ Links, 2004). A more detailed discussion of Frame Relay services and potential application areas can be found in the networking literature (Dodd, 2002; Forouzan, 2004; Gallo & Hancock, 2002; Morgan, 2000; Wexler, 1999).

It should be noted that digital subscriber line (DSL), asynchronous digital subscriber line (ADSL) and wireless technologies are not included in the ISP services evaluation because these technologies are not available throughout New Zealand and the most ISPs are not ready yet to offer these services.

In the following section we evaluated the three contending ISPs.

EVALUATION AND INTERPRETATION

Table 1 compares ISDN and DDS services offered by ISP1. ISDN service charge includes the amount of time the line is being used for data communication and is considered as very expensive option for applications requiring high online usage. For example, if an ISDN line is used for 6 hours per day, then the monthly cost for the ISDN service will be exceeded the 64 kbps DDS service cost ($1,600 per month) (table 1). However, the ISP1 mentioned that the 64 kbps DDS service cost for the first month is $700 just for promotional purposes.

It should be noted that the cost associated with email server (both software and hardware) is not included in the analysis. The email server is required to be purchased separately from a software vendor. The ISP1 recommends an email package named TFS gateway which can be purchased for NZ$3,250 with unlimited user license. More detail about TFS gateway can be found in (*TFS Email Gateway.*, 2004).

Table 2 compares ISDN and DDS services offered by ISP2. Unlike ISP1, the cost associated with 64 kbps DDS service offered by ISP2 is based on international traffic ($1.5/MB), which is going to be very expensive especially for unlimited Internet access.

Table 1. ISP1- Summary of Cost and Services (prices in NZ$)

Charges for:	ISDN (64 kbps)		DDS (64 kbps)	
	Once only ($)	Monthly ($)	Once only ($)	Monthly ($)
Setup	50	-	1,000	1,600
Connection	-	$8/hour	-	-
Instant Internet box	2,300	-	5,300	-
POP3 setup	100	50	-	-
SMTP setup	-	-	-	-
Telecom ISDN	175	150	-	-
Total	2,625	200 + $8/hour	6,300	1,600 (Unlimited traffic)

Table 2. ISP2- Summary of Cost and Services (prices in NZ$) (The following charges are based on monthly allowances – Time: 100 hours, International traffic: 100 MB.)

Charges for:	ISDN (64 kbps)		DDS (64 kbps)	
	Once only ($)	Monthly ($)	Once only ($)	Monthly ($)
Setup	400	-	950	750
Connection	-	195	-	-
Cisco router	2,689	-	2,689	-
Router security	980	-	980	-
Telecom line installation	400	135	-	350
Transmission fee	-	240 (for 100 hour)	-	-
Bandwidth	-	150 (for 100 MB)	-	150 (for 100 MB)
Total	4,469	720	4,619	1,250

Table 3. ISP3 - Summary of Cost and Services (prices in NZ$) (The following charges are based on monthly allowance – International traffic: 100 MB.)

Charges for:	Frame relay (64 kbps)		Frame relay (128 kbps)	
	Once only cost ($)	Monthly cost ($)	Once only cost ($)	Monthly cost ($)
Setup	1,000 (waived)	959 + 750 (router) + 100 (traffic)	1,000 (waived)	1471 + 750 (router) + 100 (traffic)
Internet access	375	-	375	-
Cisco router 2501 (including firewall and installation charges)	1,200	-	1,200	-
Total	1,575	1,809	1,575	2,321

Table 3 compares Frame Relay services (64 and 128 kbps) offered by ISP3. Notice that the setup and installation charges of $1,000 can be waived provided the Polytechnic institution agreed to sign up a contract with ISP3 within a specified time (for example, before Xmas). The Cisco router with in-built firewall can be purchased from the ISP3 either with upfront $7,000 or it can be rented out for $750 per month.

Table 4 lists ISP3's international traffic (measured in megabyte, MB) charges for Frame Relay services both at 64- and 128 kbps.

Table 5 compares three technology services namely, ISDN, DDS and Frame Relay offered by three contending ISPs. As can be seen in Table 5, ISDN services offered by ISP2 are more expensive compared to services offered by ISP1. For 64 kbps DDS service with international traffic of 100 MB/month, the ISP2 is slightly cheaper than the ISP1. Since the current international traffic requirement for the Polytechnic institution is 800 MB/month, the services offered by both ISP2 (64 kbps DDS) and ISP3 (64 kbps Frame Relay) are more expensive than the ISP1 (64 kbps DDS). This is because both ISP2 and ISP3 are charged for international traffic on the basis of time and bandwidth usage.

DDS (64 kbps) service with "Instant Internet Box 400" offered by ISP1 would be the better solution to meet the current and future needs of the Polytechnic institution. The "Instant Internet Box 400" with in-built firewall offered by ISP1 has more functionalities than the Cisco Router proposed by both ISP2 and ISP3. The "Instant Internet Box 400" can be purchased either upfront $6,300 (including installation charge) or "rent to buy" option for $185 per month over three-year period. The TFS gateway email package can be used with Instant Internet Box 400 for email services.

DISCUSSION AND CONCLUSION

We have evaluated three short-listed New Zealand ISPs for instant Internet and email services for both tutors and students of a NZ

Table 4. ISP3's Frame Relay International Traffic Charges (both 64 and 128 kbps)

Traffic (MB)	Cost (NZ $)	Traffic (MB)	Cost (NZ $)
100	100	700	680
200	198	800	775
300	295	1500	800
400	393	2249	1000
500	490	6000	2500
600	585	9000	3500

Table 5. Cost and Services Comparison of Three Contending ISPs (prices in NZ$)

Vendor and Services	ISDN (64 kbps)		DDS (64 kbps)		Frame relay (64 kbps)		Frame relay (128 kbps)	
	Once only ($)	Monthly cost ($)	Once only ($)	Monthly ($)	Once only ($)	Monthly ($)	Once only ($)	Monthly ($)
ISP1: Instant Internet Box 400 (firewall), ongoing support, maintenance, IP address and domain name.	2,625	1,450	6,300	1,600 (un-limited usage)	-	-	-	-
ISP2: Cisco router	4,469	720	4,619	1,250 (based on 100 hour and 100 MB)	-	-	-	-
ISP3: Internet connection, frame relay X.21 interface, Cisco router 2501 firewall, ongoing support and service, domain name	-	-	-	-	1,575	1,809	1,575	2,321

Polytechnic institution. The evaluation and the final selection of an ISP are based on the actual quotation provided by three contending ISPs. We considered cost, technology, and ongoing support and services as mandatory criterion for the evaluation of contending ISPs.

We found that the 64 kbps ISDN service offered by either ISP1 or ISP2 is one of the cheaper options for the Polytechnic institution for low Internet usage (up to 5 hours per day). However, ISDN is not recommended for the institution because it is very expensive for high volume of international traffic and unlimited Internet access. The 64 kbps DDS service with an option 'rent-to-buy' for instant Internet Box 400 offered by the ISP1 is recommended for the Polytechnic institution since this service fulfils both budgeting and service requirements.

Our analysis and findings reported in this paper serve two main purposes. Firstly, we believe that our findings, as reported in this paper, can be a useful resource, aiding CEO to make informed decisions about selection of an ISP for instant Internet and email services for their educational institutions. Secondly, both teachers and students can be benefited from this study in carrying out further research in the areas of ISP evaluation. In addition, this case study can be used in the classroom as a real-world example when teaching technologies for Internet connectivity and ISP evaluation.

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