



Annual Report 1998

APNIC

Asia Pacific Network Information Centre

Prepared by the APNIC Secretariat
Paul Wilson, Director General

1. APNIC Overview

1.1. Introduction

APNIC, the Asia Pacific Network Information Centre, is one of three Regional Internet Registries which exist in the world today, providing allocation and registration services to support the operation of the Internet globally. APNIC is a non-profit, membership-based organisation. Its members are Internet Service Providers (ISPs), National Internet Registries and Network Information Centres, and similar organisations.

Purpose and period of this report

This report is presented to the members of APNIC to provide the information necessary to make informed decisions on APNIC's future directions. It describes APNIC's structure, staffing, and services; outlines APNIC's major activities during 1998; analyses APNIC's performance in each of its organisational areas; and describes activities and budgets planned for 1999.

The period of this report is January 1998 to February 1999 inclusive.

1.2. APNIC region

By consensus of the global Internet community, APNIC is the Regional Internet Registry for the Asia Pacific region. The countries, territories, and autonomous regions which comprise this region are set out in table 1 with the appropriate ISO 3166 country codes (entities shown in bold are currently represented in the APNIC membership).

Table 1 Countries in AP Region

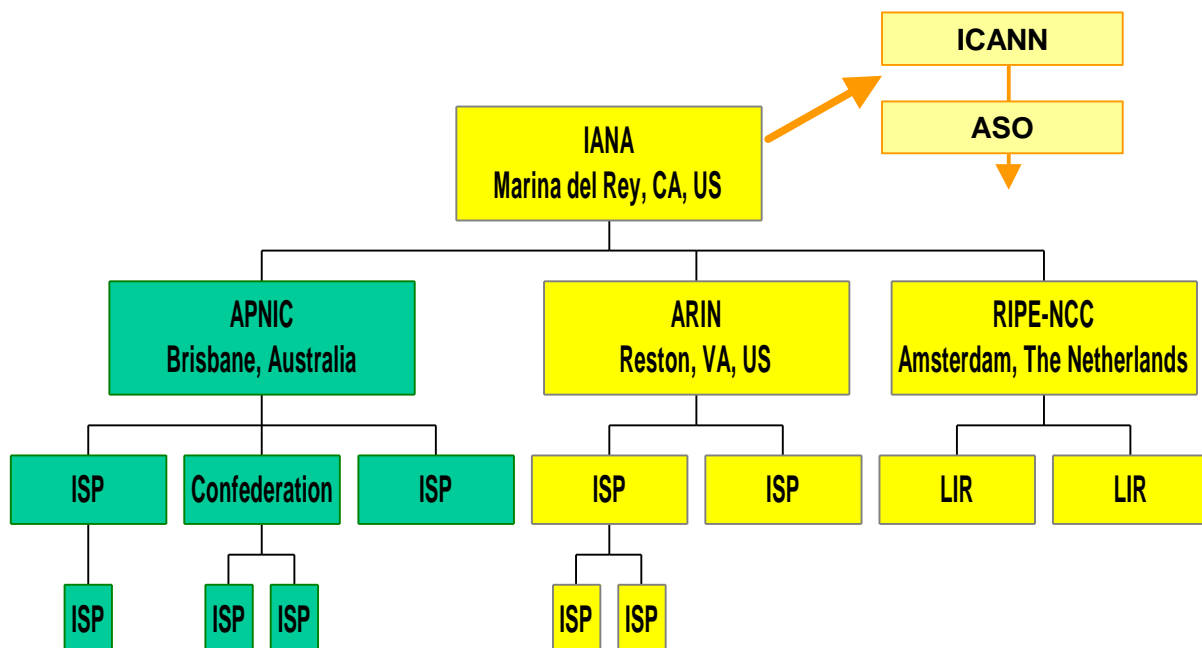
Afghanistan (AF)	Lao People's Democratic Republic (LA)	Seychelles (SC)
American Samoa (AS)	Macau (MO)	Singapore (SG)
Australia (AU)	Madagascar (MG)	Solomon Islands (SB)
Bangladesh (BD)	Malaysia (MY)	Sri Lanka (LK)
Bhutan (BT)	Maldives (MV)	Taiwan, Province Of China (TW)
British Indian Ocean Territory (IO)	Marshall Islands (MH)	Thailand (TH)
Brunei Darussalam (BN)	Mauritius (MU)	Tokelau (TK)
Cambodia (KH)	Mayotte (YT)	Tonga (TO)
China (CN)	Micronesia, Federated States of (FM)	Tuvalu (TV)
Christmas Island (CX)	Mongolia (MN)	Vanuatu (VU)
Cocos (Keeling) Islands (CC)	Myanmar (MM)	Viet Nam (VN)
Comoros (KM)	Nauru (NR)	Wallis and Futuna Islands (WF)
Cook Islands (CK)	Nepal (NP)	
East Timor (TP)	New Caledonia (NC)	
Fiji (FJ)	New Zealand (NZ)	Total Countries: 62
French Polynesia (PF)	Niue (NU)	Total with APNIC Members: 33
French Southern Territories (TF)	Norfolk Island (NF)	
Guam (GU)	Northern Mariana Islands (MP)	
Hong Kong (HK)	Pakistan (PK)	
India (IN)	Palau (PW)	
Indonesia (ID)	Papua New Guinea (PG)	
Japan (JP)	Philippines (PH)	
Kiribati (KI)	Pitcairn (PN)	
Korea, Democratic People's Republic of (KP)	Reunion (RE)	
Korea, Republic of (KR)	Samoa (WS)	

1.3. APNIC services

APNIC's primary activity is the allocation of Internet resources required for the stable and reliable operation of the Internet. APNIC provides the following services:

- **Resource allocation**
 - IP allocations
 - approval of IP assignments
 - AS number assignments
- **Resource registration**
 - APNIC database objects
 - person, inetnum, AS number, domains etc
- **DNS management**
 - in-addr.arpa domains
 - secondary for TLDs
- **Representation**
 - regional representation at Internet meetings
- **Coordination**
 - ARIN, RIPE NCC, IANA
- **Information dissemination**
 - APNIC meetings
 - web and ftp site
 - training courses (from 1999)

1.4. Structure



1.5. The APNIC Executive Council (EC)

The Executive Council (EC) is the governing body of APNIC, comprised of five representatives, each elected directly by the membership for a two-year term. The EC, as the primary policy- and decision-making body of APNIC, has traditionally included persons of high standing and expertise in the Asia Pacific Internet community. Members of the EC represent the membership and the region as a whole in providing guidance and support to the Secretariat. (Full details of the functions and duties of the EC are set out in the APNIC By-laws (<http://www.apnic.net/corpdocs/Bylaws.html>)).

The current Executive Council is comprised of:

- Toru Takahashi, *Chair*, Japan
- Srisakdi Charmonman, *Treasurer*, Thailand
- Che-Hoo Cheng, *Secretary*, Hong Kong
- Xing Li, China
- Geoff Huston, Australia

Srisakdi Charmonman and Xing Li were elected in January 1997 and, therefore, their positions are due for re-election at the 1999 Members' Meeting. Geoff Huston's previous term expired in February 1998, but he was re-elected at that time.

In February 1999, the EC resolved to increase the number of its members from five to seven, with the intention of increasing the EC's ability to draw from a wider geographic range of the APNIC membership. Hence, at the APNIC Members' Meeting in March 1999 an election will be held for four of the EC positions (two replacements for the outgoing representatives and two additional representatives).

1.6. Membership

Table 2 shows the total number of APNIC members and the geographical spread of memberships. APNIC is pleased to note that in the past year, seven countries became represented in the APNIC membership for the first time, namely: Brunei, Bhutan, Laos, Nauru, French Polynesia, Solomon Islands, and Western Samoa.

Table 2 APNIC membership by country

	As of 12/31/96	As of 12/31/97	As of 12/31/98
Total members	108	200	249
Total country:	22	25	28
AP*	4	10	12
AU	6	37	55
BD	2	2	5
CN	11	18	10
FJ	1	0	0
GU	0	1	1
HK	24	39	39
ID	16	19	5
IN	0	7	13
JP	4	6	7
KH	0	1	0
KR	4	4	3
LK	1	2	3
MM	1	0	0
MN	1	2	3
MO	1	1	1
MV	1	1	1
MY	3	6	8
NP	1	1	3
NR	0	0	1
NZ	2	4	7
PF	0	0	1
PG	1	1	1
PH	8	8	19
PK	0	1	4
SB	0	0	1
SG	3	7	10
TH	10	13	14
TW	3	8	20
VN	0	1	1
WS	0	0	1

* The AP category is used to represent members with a head office outside of the Asia Pacific region and multiple offices within the region, or members whose scope of operations within the region justifies an international designation.

APNIC members are self-categorised into five size categories. Table 3 shows the number of members in each size category.

Table 3: Member breakdown by size

Member size	Number	% of total	Number of confederations
Small	197	79.1	1
Medium	31	12.5	2
Large	16	6.4	3
Very Large	5	2.0	5
Total	249		

*In 1998, 5 members changed their size: 1 small to large; 1 medium to large; 1 large to small; 2 medium to small.

Membership numbers and growth

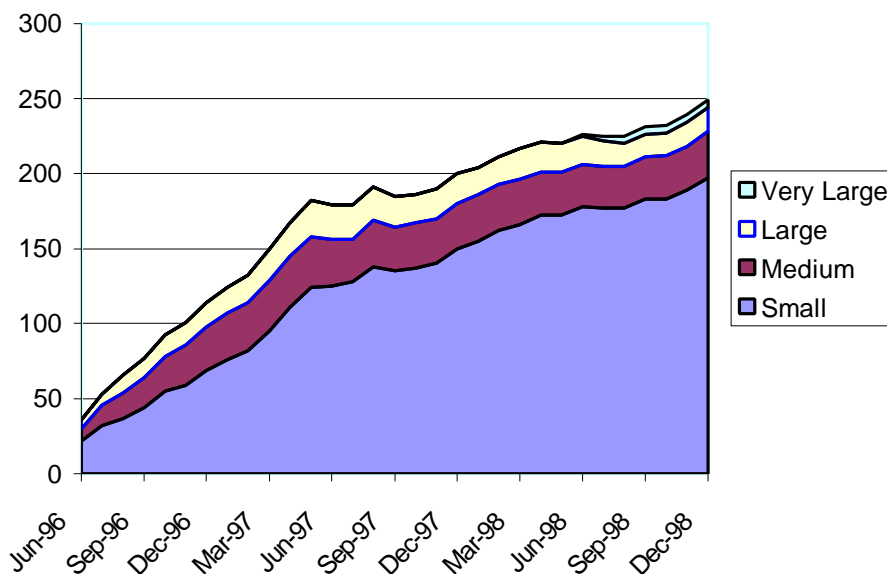
In 1998, APNIC processed 131 membership applications (an average of 11 per month), sending the applicants a package containing APNIC By-laws and Membership Agreement. Not all applications proceeded to completion and several existing members failed to renew, resulting in a net gain of 49 members during 1998. Table 4 details the numbers of membership applications processed since APNIC’s incorporation in April 1996.

Table 4 Membership applications processed since April 1996

Period	Number of new applications processed
1996 (April to December)	145
1997	159
1998	131
Total	371

Figure 2 represents membership growth since incorporation and shows that the ‘small member’ category continues to record the highest growth rate.

Figure 2 Membership growth over time



Non-member services

Since April 1997, APNIC has also provided services to non-members on a fee-for-service basis. Table 5 details the number of non-member transactions since their commencement.

Table 5 Non-member transactions

Period	Number
1997 (April to December)	17
1998	22
Total	39

Policy development by membership

APNIC policies are a product of the needs and interests of the membership as a whole, balanced with Internet community consensus and APNIC's need to fulfill its own responsibilities. The process by which the APNIC membership drives policy development is mediated through mechanisms such as meetings, discussion lists, and official visits coordinated by the Secretariat.

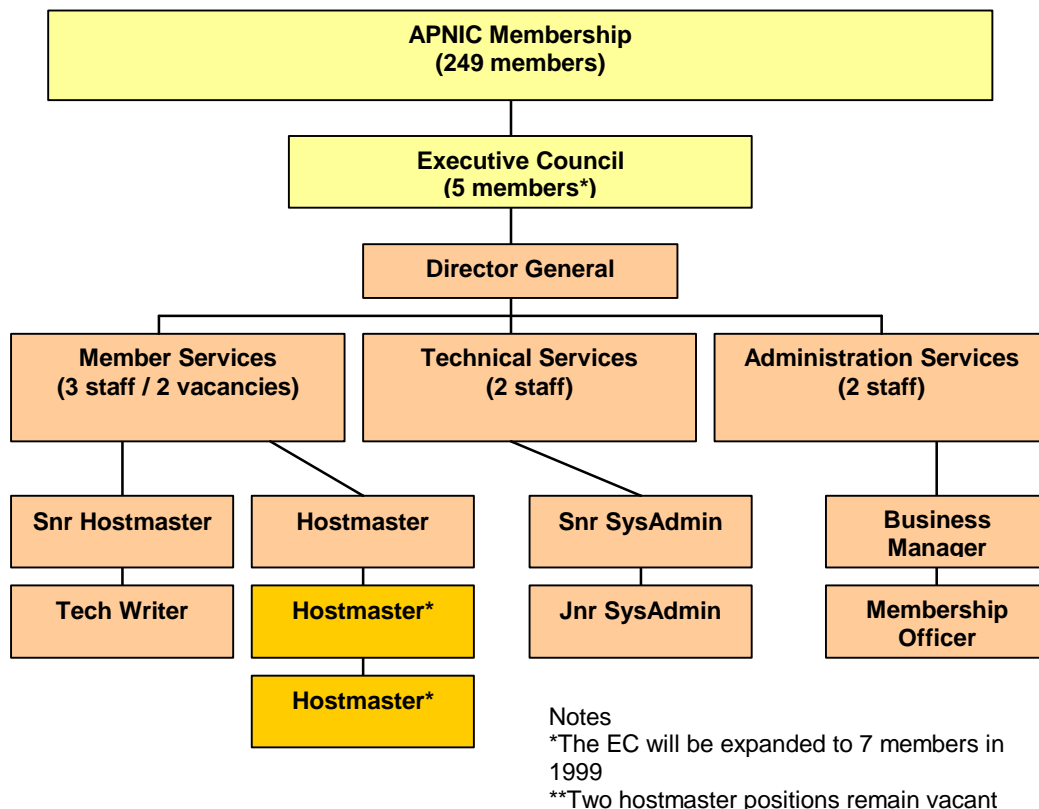
1.7. APNIC Secretariat

The APNIC Secretariat provides the logistical and administrative support for APNIC, operating as the executive arm to implement the decisions of the APNIC membership and Executive Council.

Staff

Figure 3 below represents the staffing structure of the APNIC Secretariat in 1998.

Figure 3 APNIC Secretariat organisational structure



2. Major activities of 1998

2.1. Secretariat relocation

During 1997, following an extensive regional survey of possible locations for the APNIC Secretariat (carried out by KPMG) Brisbane, Australia was chosen as the best available location for the APNIC Secretariat. By the end of that year, suitable premises had been located and a new company (APNIC Pty Ltd) was established in Australia with similar corporate structure to APNIC Ltd (incorporated in the Seychelles).

Relocation to the new premises commenced in February 1998 and was completed in August of that year.

APNIC staff were hired before and during the transition process; however, from the beginning to the end of 1998, almost the entire staff had been

replaced and only one member of the 1997 staff remained. (A summary of staff changes is set out in section 2.3 below.)

Relocation costs:

The major costs of relocating to Brisbane were consultancy fees for the site location and tax analysis, travel and accommodation, and staff moving expenses. Because most of APNIC's equipment in Tokyo was on loan from NTT-Japan and the furniture was second-hand, the actual shipping costs were kept to a minimum. The total costs of relocating were US\$18,194 in 1997 and US\$21,182 in 1998.

2.2. Corporate structure

A new Australian-registered company, APNIC Pty Ltd (Australian Company Number 081 528 010) was formally registered on 5 February 1998, with non-profit status established in its Memorandum and Articles of Association (see <http://www.apnic.net/corpdocs>).

Taxation status

As part of its initial investigations into the cost of operation in Australia, KPMG sought and received an interim ruling from the Australian Taxation Office confirming that APNIC Member contributions would be treated as non-taxable 'mutual' funds. In early 1998, after APNIC had incorporated the new company, this ruling was sought again. On 29 October 1998, the Australian Taxation Office (ATO) formally confirmed that APNIC member contributions would be considered non-taxable mutual funds.

It should be noted that future changes to APNIC's membership and fee structures need to be considered in light of the ATO ruling on member funds to ensure that mutual status is maintained.

Effect on membership

The conditions of current APNIC memberships are still governed by the By-laws and Membership Agreement of APNIC Ltd; however, a transition of all membership agreements to the new company (APNIC Pty Ltd) will be completed within 12 months from March 1999. The Memorandum and Articles of Association for APNIC Pty Ltd are available at <http://www.apnic.net/corpdocs> and <ftp://ftp.apnic.net/apnic/docs/corpdocs>.

2.3. APNIC Staffing

Due to practical restrictions on recruiting by APNIC in Japan, the APNIC Secretariat historically has been understaffed and, consequently, has had difficulty meeting its service obligations to the Asia Pacific region. At the start of 1998, the APNIC staff was as follows:

- David Conrad, *Director General*
- Kyoko Day, *Business Manager*
- Yoshiko Chong, *Senior Hostmaster*
- Yoshiko Tobata, *Administrative Assistant*
- Natsuko Minamisawa, *Assistant*
- Anne Lord, *Senior Hostmaster*

After completion of the relocation to Brisbane, the APNIC staff was:

- Paul Wilson, *Director General* (commenced 1 August 1998)
- Kyoko Day, *Business Manager* (relocated from Japan)
- Anne Lord, *Senior Hostmaster* (commenced January 1998)
- Yoshiko Chong, *Senior Hostmaster* (remained in Japan)
- Fabrina Hossain, *Hostmaster* (commenced 1 June 1998)
- Paul Gampe, *Senior Systems Administrator* (commenced 21 April 1998)
- Connie Chan, *Membership Officer* (commenced 25 May 1998)

Two further appointments were made in late 1998:

- Gerard Ross, *Technical Writer* (commenced 14 December 1998)
- Bruce Campbell, *Systems Administrator* (commenced 16 December 1998)

Recruitment for a Hostmaster position at the same time provided no suitable candidates; however, 2 Hostmaster positions have been advertised at the time of writing.

Yoshiko Chong, the original APNIC Hostmaster, concluded her employment with APNIC on 31 December 1998.

In summary, at the time of writing, the APNIC staff is as follows:

- Paul Wilson, *Director General*
- Kyoko Day, *Business Manager*
- Connie Chan, *Memberships Officer*
- Anne Lord, *Manager - Member Services*
- Fabrina Hossain, *Hostmaster*
- Gerard Ross, *Technical Writer*
- Paul Gampe, *Technical Services Manager*
- Bruce Campbell, *System Administrator*

Current APNIC staff are listed on the APNIC web site at <http://www.apnic.net/staff>.

As mentioned above, two hostmaster positions remain vacant in the Member Services department; they are expected to be filled during April 1999.

Projected staffing level

By the end of 1999, APNIC expects to have a total of 16 staff members, including the Director General. To put this figure in perspective, it should be compared with current staffing levels at other registries: more than 20 at ARIN and more than 60 at RIPE-NCC.

The expected staffing allocations are as follows:

Member Services: 7 staff (currently 3)

- 1 Member Services Manager
- 4 Hostmasters (0.5 allocated to Training)
- 1 Training Officer
- 1 Technical Writer/Webmaster

Technical Services: 5 staff (currently 2)

- 1 Technical Services Manager
- 1 System Administrator
- 1 Database Administrator
- 2 Programmer/Developers

Administration Services: 3 staff (currently 2)

- 1 Business Manager
- 1 Membership Officer
- 1 Accountant/Bookkeeper

2.4. Recruitment of new Director General

David Conrad, APNIC Director General since 1993, resigned from his position during 1998. He agreed to continue serving in the position until the relocation of the Secretariat and the recruitment of his replacement were complete.

During the relocation of the Secretariat, APNIC initiated a recruitment process, engaging KPMG as the primary independent consultant. KPMG advertised the position and conducted first-round interviews to produce a shortlist of candidates, which was then presented to the APNIC Executive Council. The EC then conducted the final interviews and made their selection in June 1998. The successful candidate, Mr Paul Wilson of Brisbane, started work as the new Director General of APNIC on 1 August 1998.

The EC resolved that visits to member organisations should be a high priority for the new Director General. Accordingly, in the first six months of his term, he visited members in Singapore, China, Japan, Korea, Hong Kong, and Taiwan. (Further details of the official visits by the new Director General are included in table 6, below).

The costs of recruiting the new Director General consisted mainly of recruitment consultancy fees and expenses relating to travel and accommodation. The recruitment process cost a total of \$31,040.

2.5. APNIC official visits: Observation and coordination

Official visits to members and attendance at relevant industry conferences are vital parts of APNIC's role in maintaining a strong and relevant presence in the region and in representing the interests of the region to the wider Internet community. Details of these activities from 1998 are set out in table 6.

Table 6, Visits and activities by APNIC staff since January 1998 (excluding travel related to APNIC office relocation)

Date	Details of trip
January 1998	RIPE Meeting and visit
February 1998	APRICOT '98 Manila
March 1998	41 st IETF - Los Angeles USA
July 1998	INET '98 Geneva
August 1998	IFWP Singapore
August 1998	42 nd IETF/IEPG – Chicago USA
September 1998	DG China visit – Beijing
November 1998	Regional Internet Registry meeting – Hawaii USA
November 1998	ICANN open meeting – Boston USA
November 1998	ARIN visit and meetings
December 1998	43 rd IETF/IEPG – Orlando USA
December 1998	DG Japan visit – Japan Internet week, Kyoto
December 1998	DG Korea visit – Seoul
January 1999	DG Hong Kong visit
January 1999	DG Taiwan visit – Taipei

2.6. IFWP: New IANA – ICANN transition

In 1998, the United States Commerce Department published two major discussion papers on the management of Internet names and addresses: the 'Green Paper' in February, and then the 'White Paper' in June.

As a result of the White Paper, the International Forum on the White Paper (IFWP) was established to seek public and industry consensus on the form of the 'New IANA' to replace the existing IANA. Public meetings were held in the name of the IFWP in Geneva, Reston, Singapore, and Buenos Aires, with the intention of gathering input into the form of the New IANA.

After consultations in Geneva in July 1998, the boards of the three Regional Internet Registries issued a position statement on the New IANA. Then, in August 1998, the APNIC Director General and members of the EC attended the Asia-Pacific IFWP meeting in Singapore.

In October 1998, the Internet Council for Assigned Names and Numbers (ICANN) was established. In the following month, APNIC attended an open meeting of ICANN in Boston USA. The Address Supporting Organisation (ASO) of ICANN is expected to be formed in 1999, to carry primary responsibility for global policy recommendations in the area of Internet address space management. The exact form of the ASO is not yet certain, however APNIC intends to play a strong role in the organisation, in the interests of its members and in collaboration with the other RIRs.

Depending on the progress of ongoing deliberations by the RIRs, APNIC expects to incur obligations to provide funding for the ASO and/or ICANN, and has budgeted US\$50,000 for this purpose in 1999 (in addition to an amount of US\$50,000 allocated in 1998 but not spent).

2.7. Sponsorships

APNIC is grateful for the generous support it has received in the form of sponsorship from a number of organisations. Table 7, sets out the sponsorship APNIC received in 1998.

Table 7 1998 Sponsorship 1998

SPONSOR	Project
Ascend	Remote access servers
Cisco	7000 series routers and switchers
Compaq	Server cluster
SCO	UnixWare software 7 licenses
Telstra	Internet connectivity

2.8. APRICOT Conference

In previous years, APNIC has committed considerable labour and resources in support of the APRICOT conference and has underwritten the conference financially. However, in 1998 the APNIC EC resolved that APNIC could no longer maintain that level of support, but should instead contribute to APRICOT in future years through normal sponsorship channels.

Hence, in 1999, APNIC has become a Platinum Sponsor of APRICOT, contributing US\$19,000.

Membership survey

An independent survey of the APNIC membership will be conducted during the first half of 1999, to gather information on members' needs and priorities, which will in turn influence APNIC's business and strategic planning processes. A membership survey form was circulated in February 1999 and direct consultations with members will take place during the APRICOT week in March in Singapore. The results and recommendations of this survey process will be provided to the APNIC EC and Secretariat by the end of March 1999.

3. Member Services

3.1. Resource status

3.1.1. Internet addresses

APNIC is the custodian of Internet address space that it has received from IANA in five separate allocations since 1994. Table 8 sets out the ranges of address space that APNIC has been allocated.

Table 8 Address space allocated to APNIC

Date of allocation	Address space allocated
10 January 1994	202.0.0.0/7
6 June 1995	169.208.0.0/12*
16 September 1996	210.0.0.0/7
25 April 1997	61.0.0.0/8
7 December 1998	24.192.0.0/14

* To date, APNIC has been using this address space allocation for special short term purposes, such as conferences, exhibitions (with the exception of one allocation that was made prior to APNIC receiving the address space).

Status

The following table (table 9) shows the proportions of APNIC's total pool of address space allocated and unallocated since January 1996. (Please note that APNIC no longer reserves address space within the unallocated ranges.)

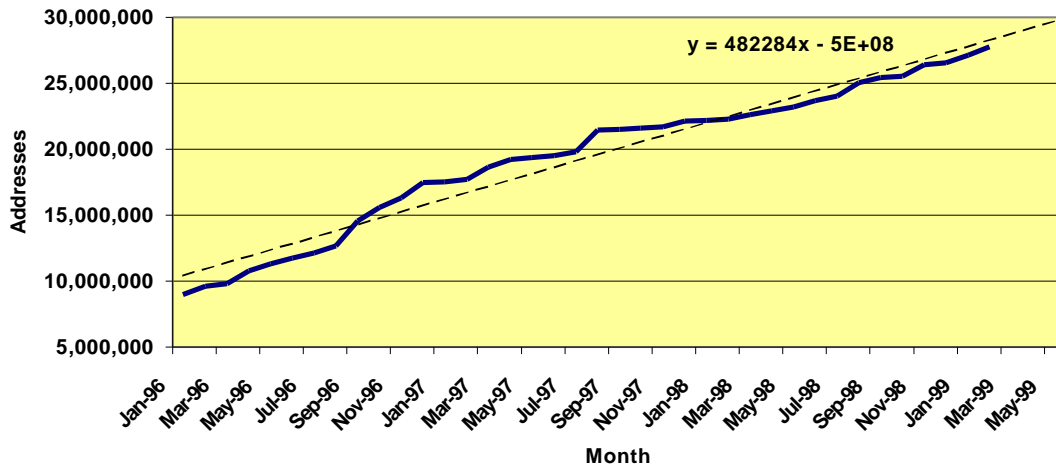
Table 9 Address space allocated and free since January 1996

Address block	Addresses	%Allocated	%Free	Date delegated by the IANA
202.0.0.0/7	33,554,432	50.18	49.82	10 January 1994
169.208.0.0/12	1,048,576	0.00	100.00	6 June 1995
210.0.0.0/7	33,554,432	64.21	35.79	16 September 1996
61.0.0.0/8	16,777,216	0.05	99.95	25 April 1997
24.192.0.0/14	2,62,144	6.25	93.75	7 December 1998
Total	85,196,800	33.23	66.77	

Growth in demand for address space

The rate of address space allocations has continued to remain consistent over the last year, following a roughly linear trend, as shown in figure 4.

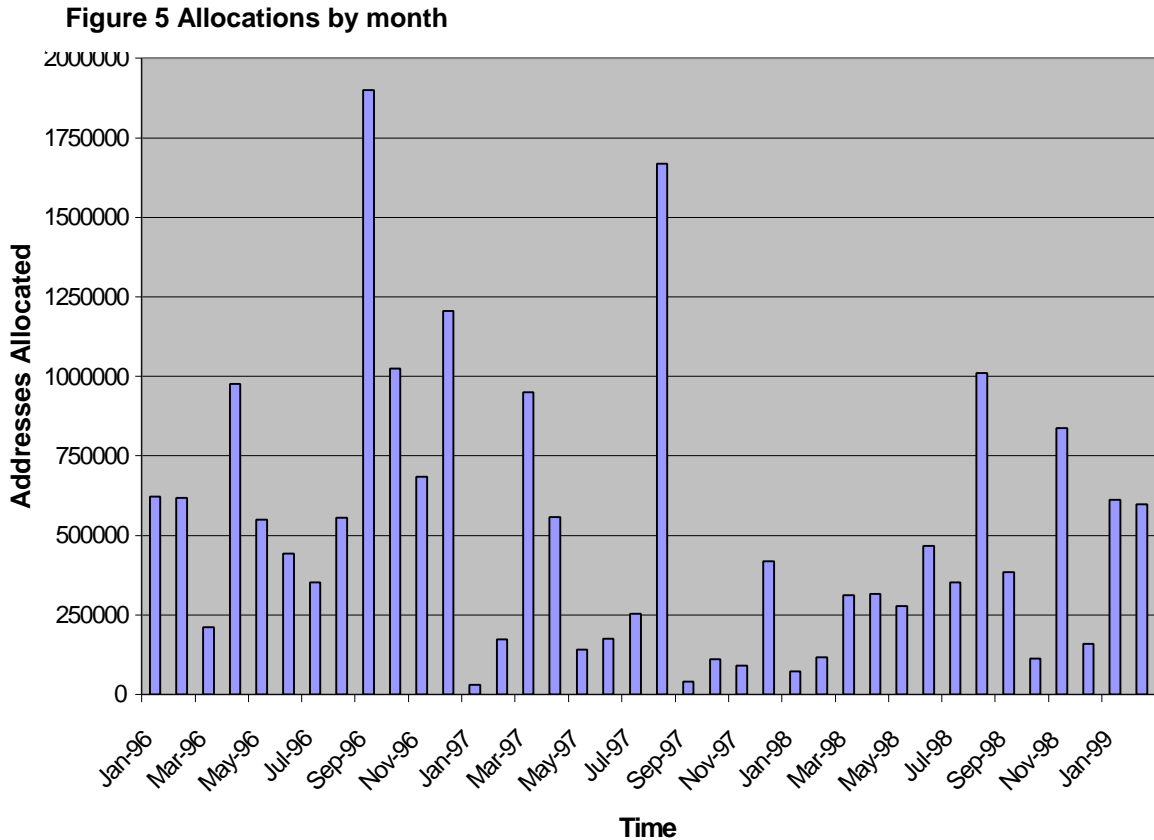
Figure 4 APNIC allocated address space over time



Projections made in 1997 suggested that APNIC would consume approximately 7,000,000 addresses during 1998. In fact, APNIC allocated considerably fewer addresses during that period: in the order of 5,000,000, an amount that lies between a /10 and a /9 in prefix terms. The difference between predicted and actual amounts can be linked to a smaller increase in membership numbers than was projected in 1997. It may also relate to the increase in the number of organisations using private address space.

Allocations by month

Figure 5 shows APNIC allocations by month from January 1996 until January 1999. (Please note, the significant peaks represent allocations to confederations.)



The average amount of address space allocated per month for the past three calendar years is as follows:

- 1996 — 761,151 per month
- 1997 — 384,128 per month
- 1998 — 368,085 (between a /13 and a /14) per month

These monthly averages show a noticeable decline in allocation patterns since 1996, when the requirement for address space conservation was less rigorously applied and corresponding technical solutions (such as variable length subnetting techniques) were less advanced. Again, as noted above, the increase in use of private address space may also be a contributing factor.

Geographical distribution of address space

Figure 6 shows the total amount of address space allocated according to member domains.

Figure 6 APNIC allocated address space over time

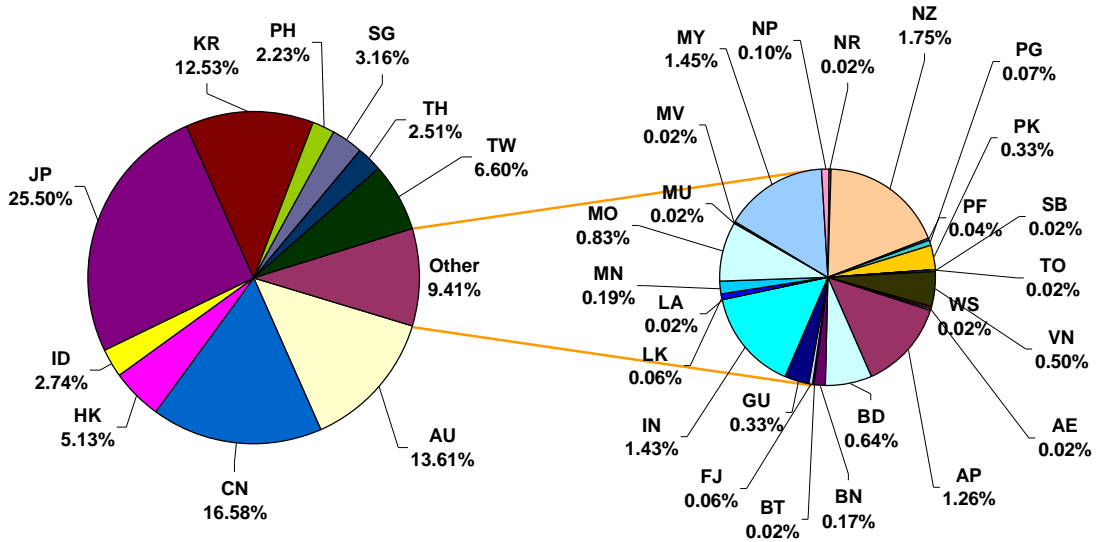


Table 10 compares the geographical distribution for 1997 and 1998. The data show very little change overall.

Table 10 Geographical distribution of address space, 1997 and 1998

Country	% 1997	% 1998
AU	15	14
KR	12	13
HK	5	5
TW	5	7
JP	23	26
CN	17	17
other	22	17

Non-member distributions of address space

No non-member assignments were made during 1998. This may be attributable to the impact of the fee structure on non-members.

3.1.2. Autonomous System (AS) numbers

Status

Table 11 sets out the Autonomous System (AS) number ranges that APNIC has been allocated by the IANA, organised according to date of allocation.

Table 11 AS numbers allocated to APNIC

Date of allocation	AS range allocated
10 January 1994	4608-4863
6 June 1995	7467-7722
16 September 1996	9261-10239

Table 12 shows the proportions of APNIC's total pool of AS numbers allocated and unallocated.

Table 12 AS numbers allocated and free since January 1996

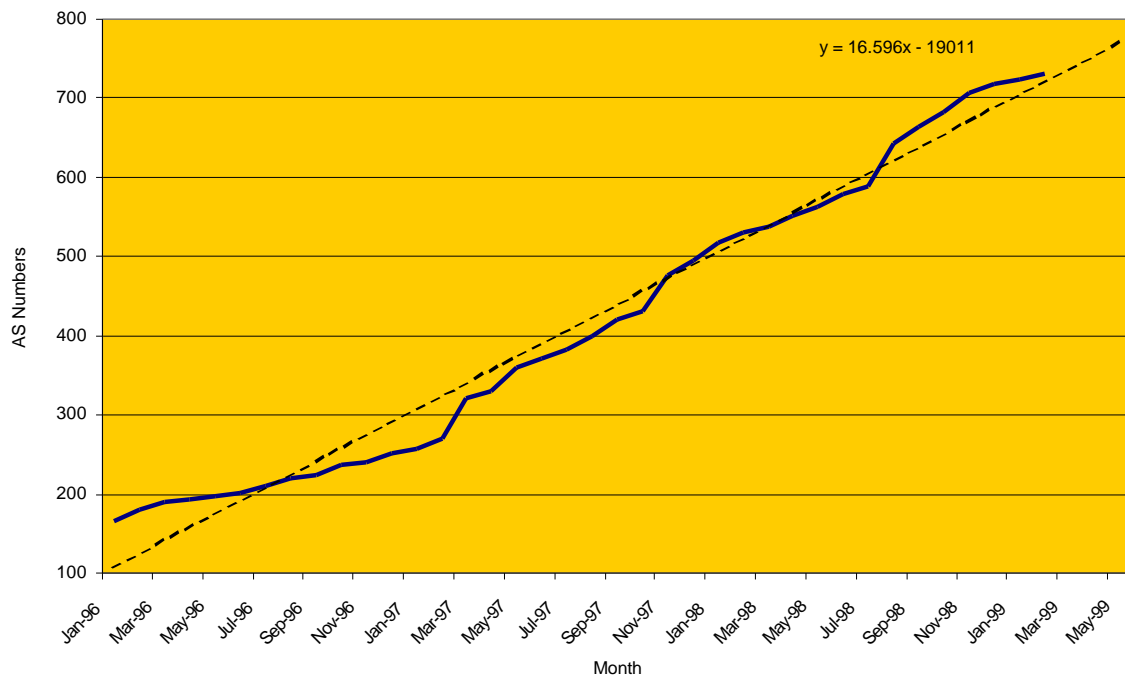
AS Block	Quantity	%Allocated	%Free	Date delegated by the IANA
4608-4863	256	98.83	1.17	10 January 1994
7467-7722	256	100.00	0.00	6 June 1995
9261-10239	979	22.98	77.02	16 September 1996
Total	1491	49.23	50.77	

Of the total 4,457 AS numbers in the global routing table, 424 (approximately 10%) are from within APNIC allocated ranges (seen via a BGP multihop peering between APNIC router in Japan at NSPIXP-II and Brisbane).

Growth in demand for AS numbers

Figure 7 reflects the constant growth rate of AS number assignments (cumulative depiction).

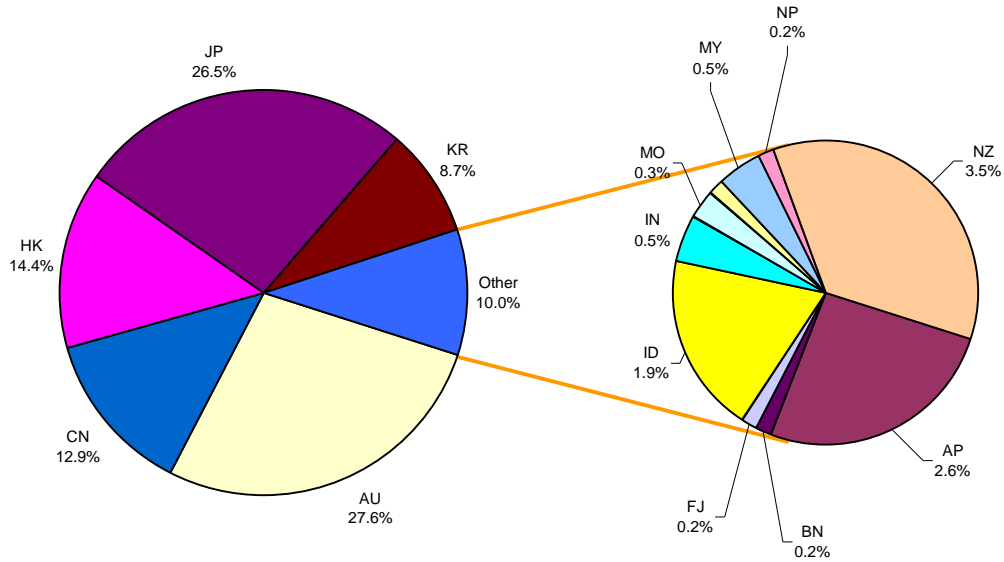
Figure 7 AS Assignments over time



Geographical distribution of AS numbers

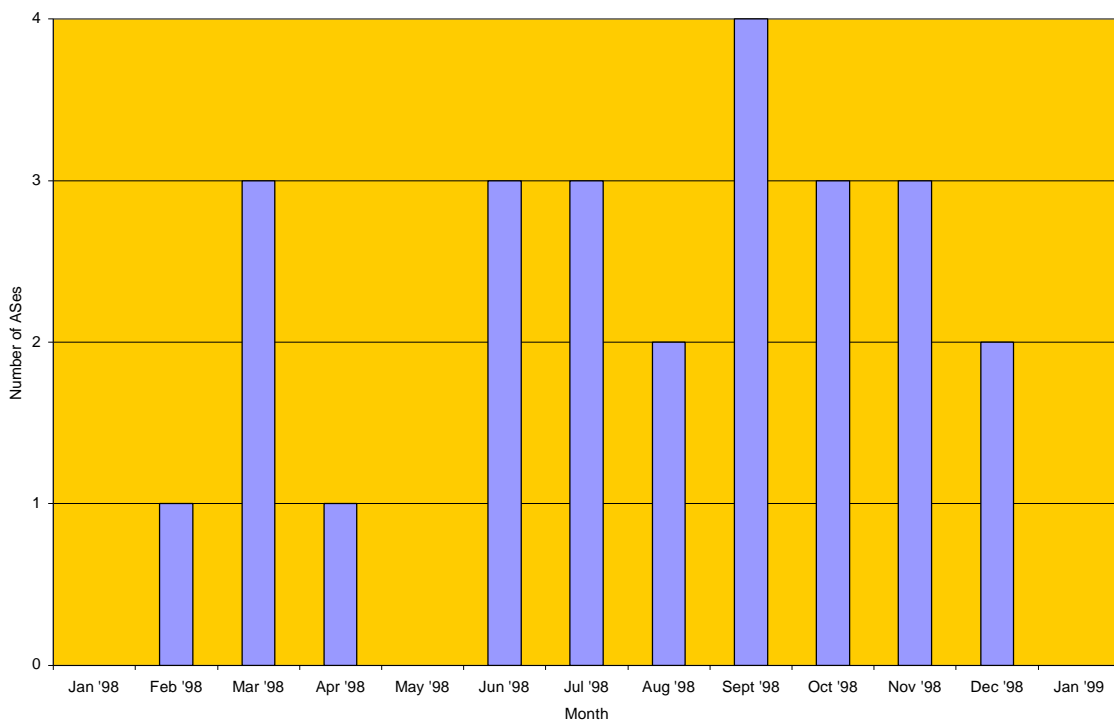
Figure 8 shows the geographical distribution of AS number allocations. The most significant change since 1997 is a 9% increase in distribution to the .au domain. All other countries show modest growth.

Figure 8 Percentage of AS distributions by member domains



AS assignments to non-members

Figure 9 Number of AS assignments made to non-members in 1998



3.2. Activities

Introduction

During the first quarter of 1998, fifty percent of core Member Services resources were diverted into tasks associated with the relocation of APNIC to Brisbane. The tasks included hiring personnel; arranging the office fit out; and assisting with business, financial, and legal matters. Because the relevant staff resided locally, involvement in these activities was more cost effective than arranging such matters from Japan.

Migration of Member Services

APNIC Member Services were provided full-time from Tokyo, Japan until the second quarter of 1998. To ensure seamless transfer of responsibility and operations to Brisbane, Australia, much staff time was spent in training related to hostmaster workflow processes, policies, and procedures. APNIC completed the migration of Member Services data in early June 1998.

The migration of existing APNIC tools, however, raised a number of concerns, and further development of these tools has been temporarily suspended. Basic requirements for automation and integration have been specified, but full deployment is dependent on a further allocation of resources. This matter is being investigated in consultation with the Technical Services department.

Request tracking system

Member Services evaluated a prototype request tracking system in the early months of 1998; however, this system displayed insufficient functionality for the hostmaster workflow requirements. Subsequently, an alternative was installed after evaluation identified it as being suitable for current needs and capable of future development and integration.

The request tracking system assigns a ticket number to all new requests and enables accurate logging of a request lifecycle. APNIC commenced gathering data from this system on 1 July 1998; relevant statistics are presented in the following sections. (Further details of the request tracking system are provided in the Technical Services section of this report.)

Allocation and registration services data

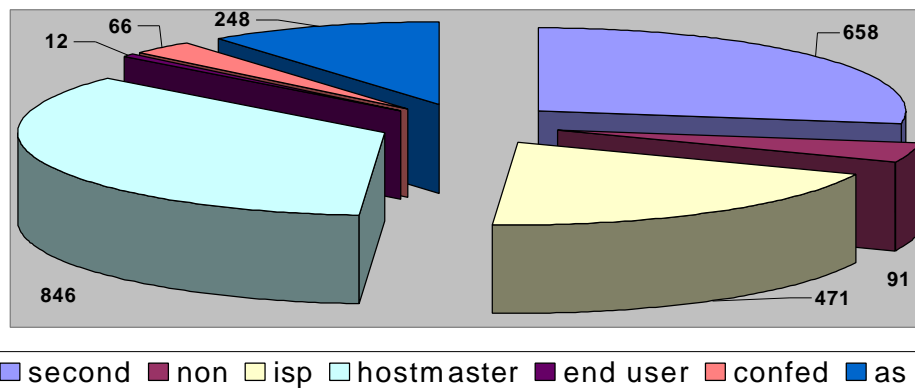
Requests entering the request tracking system are automatically assigned an 'area' and manually assigned an 'owner'. The area types within the Member Services department fall into the following classifications:

- *ISP* (ISP requests)
- *Confederation* (confederation requests)
- *Second-opinion* (second opinion requests)
- *AS* (AS number requests)
- *End-user* (end-user requests)
- *Non* (non-member requests)
- *Hostmaster* (any email which does not fit into one of the classifications above)

Total number of tickets for Member Services

During the seven-month period from 1 July 1998 to 1 February 1999, Member Services received a total of 2,392 new tickets, an average of seventeen new requests per working day. Figure 10 shows the total number of ticketed requests during that period, separated by classification.

**Figure 10 New tickets opened by type for Member Services
1st July 1998 - 1st February 1999**

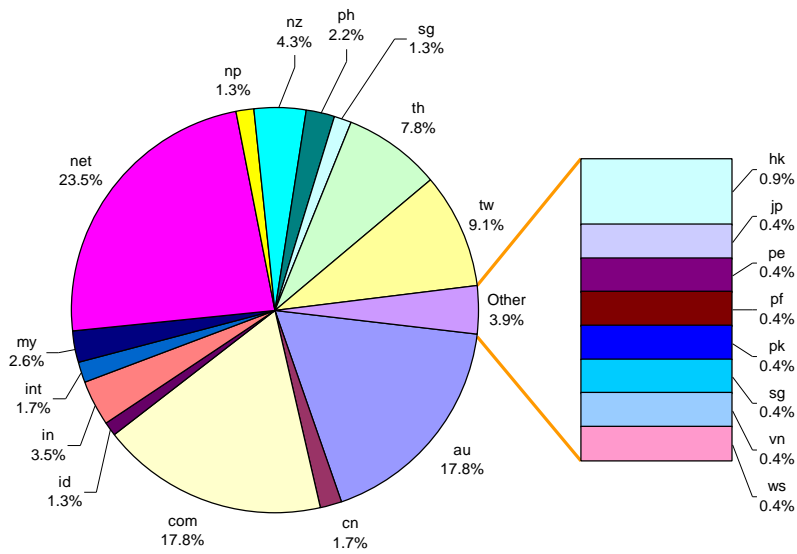


Analysis of the ticketing data reveals that second opinion requests are the most common type of request submitted to the APNIC mailbox, followed by ISP requests. The number of general enquiries received by the hostmaster mailbox confirms APNIC's position as an important source of information for IP address related matters.

Request types by domain

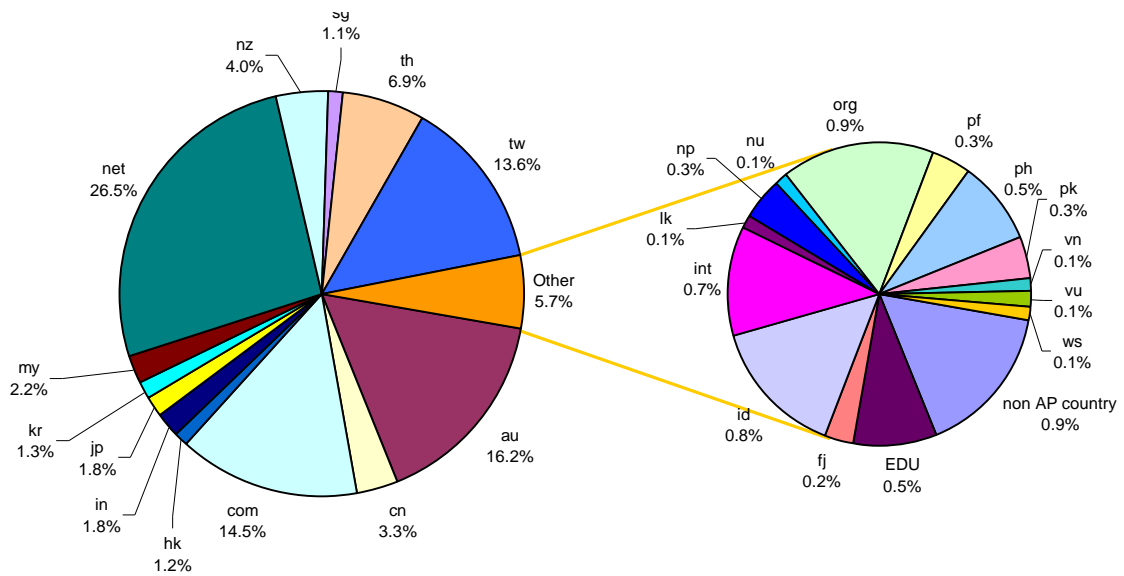
Figures 11 – 14 show the percentage of requests received from different domains for the request types 'ISP', 'hostmaster', 'second opinion', and 'AS', respectively. (Please note, there are small percentages throughout these pie charts showing requests from the .int domain. In fact, all such requests came from one organisation in Taiwan.)

Figure 11 Percentage of ISP requests per domain



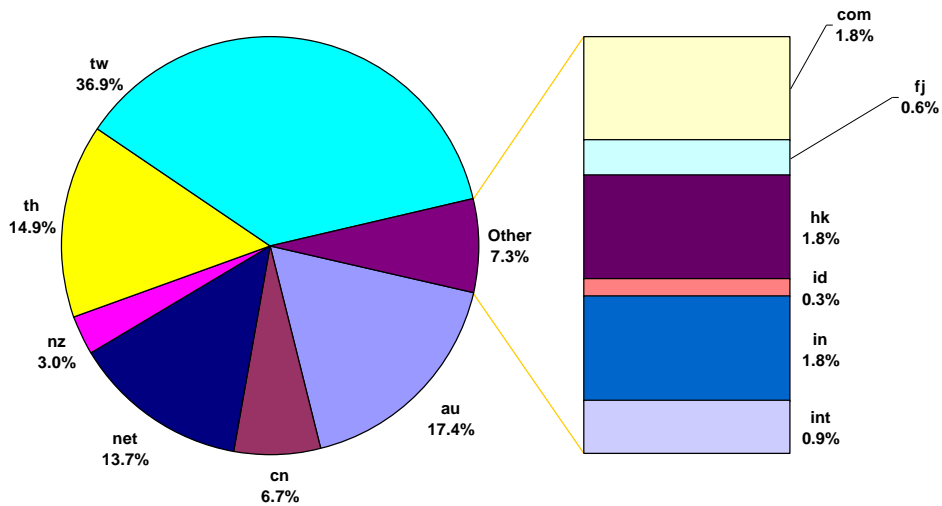
The majority of requests received are from the .net domain, with the .com and .au domains also submitting a high percentage of the total. It is worth noting that countries served by a National Internet Registry record low request rates.

Figure 12 Percentage of total requests received by hostmaster per member domain



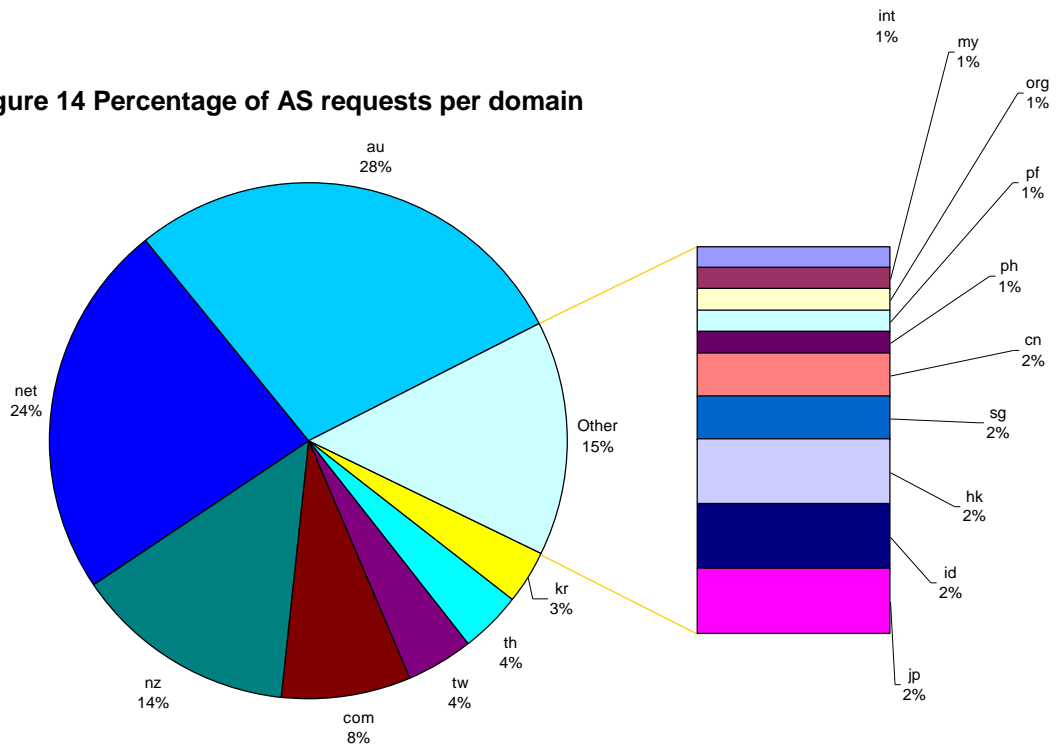
According to APNIC's assignment window policy, Internet Registries wishing to make an assignment that exceeds a predetermined size, must send APNIC a 'second-opinion' request. APNIC evaluates these requests as a way of ensuring consistent assignment practice throughout the region. Figure 13 shows the percentage of second opinion requests received per domain.

Figure 13 Percentage of second opinion requests per domain



In 1998, Taiwan recorded the largest number of second-opinion requests, with 36% of the total. Most of these requests, in fact, came from a single organisation. Second opinion requests from the .net domain also constitute a high percentage of the total.

Figure 14 Percentage of AS requests per domain



These data clearly indicate that .net and .com are the most popular choices of domain names across the APNIC membership and that Australia submits the highest number of AS requests.

'No Questions Asked' prefix return policy

APNIC's 'no questions asked' policy represents a trade-off of a gain in aggregation for a potential loss in conservation. The policy applies to space previously received on a 'provider independent' basis and allows organisations holding address space from three or more discontinuous prefixes to exchange addresses on a one-to-one basis from a single contiguous prefix. (It should be noted, however, that APNIC does not guarantee under any circumstances that such prefixes will be routable.)

In 1998, only two requests were made pursuant to the 'no questions asked' policy and only one of those requests was approved. The evidence suggests that despite the existence of the policy, organisations prefer to retain all their previously assigned address space. In light of this, a review of the role of the policy may be appropriate.

Service levels

APNIC aims to maintain a consistent turnaround time on all requests. This ensures that members are able to predict response times with a high degree of confidence and plan the submission of their requests accordingly. Currently, the response time for requests is two working days.

Documentation

In late 1998, following the employment of a technical writer, work commenced on a review of Member Services documentation. The first major component of this review was the development of a document describing APNIC's policies for address space management. This document will be presented to the APNIC Members' Meeting in March 1999 for further consideration.

Other ongoing projects commenced as part of this review include development of support material for those making requests to Member Services, integration of legal and other documentation with the policy documents, improved integration of web- and text-based request forms, and development of improved document revision and archiving processes.

Related to these activities, in 1999 APNIC will commence work on a project to translate the core APNIC documents into the most widely spoken languages of the region. APNIC plans to work closely with the membership to ensure the quality and accuracy of the translated documents. During 1999, the technical writer will seek the assistance of willing APNIC members to cooperate in this project.

Training

In the Annual Report for 1997, APNIC identified a need for a greater level of training of registry staff within the Asia Pacific region. Due to the demand on staff resources by the relocation of APNIC, significant progress on this issue was not possible for much of 1998. However, by the end of that year, Member Services had coordinated with Technical Services to commence development of an intensive training course covering APNIC policies and procedures for the management of address space. The course will be delivered for the first time during the APRICOT '99 conference in March 1999.

During 1999, APNIC will recruit a full-time trainer and commit significant resources to the training needs of the region. The frequency of courses will be determined by demand from the membership and training courses will be subject to a nominal fee. APNIC will also make training material available on the APNIC web site.

Initially, APNIC will focus on delivering a single course, but expects that demand will emerge for different levels of training. APNIC expects that advanced courses will incorporate aspects of RPSL and routing policy.

IPv6

Following a request from the IANA in 1998, the Regional Internet Registries (APNIC, ARIN, and RIPE NCC) agreed to commence IPv6 allocations in the first quarter of 1999.

In mid-1998, senior registry representatives attended a Regional Registry retreat, with Steve Deering, co-chair of the IPng working group, attending in a consultative role. The result of the retreat was an initial draft for the allocation and assignment of IPv6 addresses. Subsequent email discussions refined the draft, which was then published for membership feedback during February of 1999.

At the time of writing, the draft IPv6 policy document has been the subject of substantial public comment and the Registries may defer the launch of the IPv6 service in order to resolve any outstanding policy issues.

Demand for IPv6 address allocations has, to date, been limited. APNIC has received one application for a sub-TLA allocation and a total of 4 general enquiries.

Staffing

In January 1998, APNIC had one Senior Hostmaster, and one Junior Hostmaster. In June 1998, Fabrina Hossain, a Junior Hostmaster was appointed, bringing the total Member Services staff to three. However, Yoshiko Okazaki Chong Fong left APNIC in July on maternity leave and in December joined JPNIC.

In December 1998, APNIC employed Gerard Ross as Technical Writer, to meet the need for a greater and more consistent level of documentation within Member Services.

APNIC plans to increase the Member Services staffing level to a total of seven during 1999. New staff will include one full-time trainer and three new hostmasters, one of whom is expected to be at senior level.

The planned increases in staffing will allow APNIC to introduce a greater degree of specialisation within Member Services. One of the hostmasters will be assigned specifically to deal with the existing Confederations, (particularly those operating at a national level) with a key responsibility to provide support to those structures. An additional hostmaster will be responsible for providing specialised support to new members.

Additionally, APNIC intends that hostmasters, as they gain experience, will be involved in the presentation of training courses with the full-time trainer.

Staff loans and liaison

Liaison with other Regional Internet Registries, as well as with NIRs continues to be regarded as an important activity of the Member Services department and this importance is reflected in the staffing plan.

During the relocation of hostmaster activity from Tokyo to Brisbane, staffing emerged as a critical issue. To assist, RIPE NCC approved the secondment of Nick Reid to APNIC for a period of 6 weeks from 10 August until 18 September 1998. In March 1999, to ensure continued operations of APNIC hostmaster services during the lead up to the APNIC Members' Meeting and during APRICOT, RIPE NCC approved a further secondment, that of Sabrina Waschke.

Staff exchanges have proved to be an invaluable opportunity to share experience regarding policies and procedures. APNIC hopes that future opportunities will arise for it to arrange mutual staff exchanges with both ARIN and RIPE NCC.

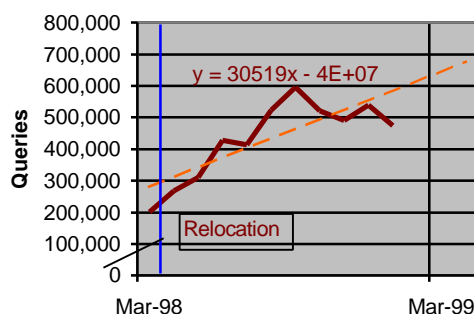
4. Technical Services

4.1. Status

APNIC web site

In July 1998, APNIC migrated its web site from servers in Tokyo to its new Brisbane network. Since then, the site has been receiving an average of 500,000 hits per month (figure 15).

Figure 15 HTTP hit log (<http://www.apnic.net/stats/http/>)



Significant improvements made to the web site in 1998 include the addition of a search engine for both the HTTP and FTP repositories, HTTP access to the FTP repository to accommodate increasing demand, and a web interface to the mailing list archives. In December 1998, management of web site content was transferred from Technical Services to Member Services, to be supervised by APNIC's newly-appointed technical writer.

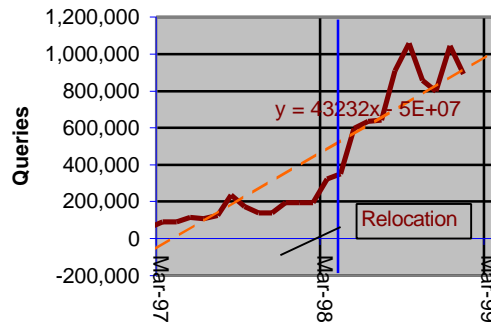
Whois server

The whois server was the first core service migrated from Tokyo to Brisbane. The migration presented a valuable opportunity to restructure the whois process.

With the Brisbane network split by a firewall into internal and production networks, APNIC decided to deploy the master whois database on an internal server, to be backed up daily and tuned for the database update process. Further, APNIC deployed a mirror server (whois.apnic.net) on the production network, tuned for high volume queries. Splitting the update process from the query process has improved both performance and security. The mirroring process takes an average of 10 minutes to synchronise and most members have now demonstrated familiarity with this change in operations.

The number of queries is increasing at an average of more than 8,000 additional queries per month and the current server (P233/128Mb) is rapidly approaching its resource limits. A two-way cluster has been designed to replace the current server (see 'Future Activities' below for configuration details of the cluster).

Figure 16 Queries to APNIC Whois server



in-addr.arpa domain server

APNIC took over management of the in-addr.arpa domain delegation from Telstra in November 1998. The automated processing of delegation requests gave rise to some security concerns, so in January 1999 APNIC commenced manual processing of all delegation requests. This places a considerable strain on Technical Services staff resources and plans are underway to implement a secure automated process by the second quarter of 1999.

System infrastructure

The current production and internal networks comprise Intel Pentium workstations running SCO UnixWare 7.

A detailed 'Vendor and Platform Evaluation Report', was conducted in August 1998, during which APNIC approached and sought sponsorship from several hardware and Unix vendors, including Sun Microsystems, Hewlett-Packard, Compaq, and SCO. APNIC concluded that the best value-for-money, long-term solution for APNIC to pursue was an Intel/Unix architecture.

Accordingly, discussions are underway with SCO and Compaq to provide software and hardware respectively for APNIC's production network. Unfortunately, delays in finalising the sponsorship agreements have meant that APNIC has operated on servers not sufficiently resourced to accommodate the increasing load; however, APNIC expects to commence deployment of these resources by the second quarter of 1999.

In November 1998, APNIC decommissioned all of its remaining Tokyo-based servers. Concurrently, APNIC deployed a Compaq 1850R 450Mhz/128Mb RAID-1 in Tokyo's NSPIXP-II as APNIC's secondary domain name server.

Cisco's sponsorship of APNIC's backbone network requirements and Ascend Communications's sponsorship of APNIC's WAN requirements have meant that both these areas of Technical Services operations have been well resourced. Feasibility and cost analysis for a redundant Internet connection have been underway since December 1998, with the intention of obtaining a minimum 512Kbps second connection by the third quarter of 1999.

Internal services

The request ticketing system under evaluation in early 1998 failed to meet the requirements of Member Services and was abandoned in June. However, Technical Services evaluated several public domain ticketing systems during this period, finally choosing the REQNG ticketing system, which was deployed in July 1998. Technical Services undertook further internal development to add functionality to the base system and, while the system now meets Member and Technical Services tracking requirements, further work is ongoing to integrate other components of APNIC's operations.

Member Services internal tool set lacks some functionality and requires considerable integration with other departments to optimise the flow of the resource allocation process. Technical Services has designed a schema for integrating Member and Billing Services, as well as other tool set specifications. A full-time internal developer will be appointed in the second quarter of 1999 to progress this development.

4.2. Future activities

Whois server

Work on a revised APNIC database administration system was undertaken under contract in 1997 and early 1998 and a prototype database has been produced. This prototype provides internal management functions for some of APNIC's membership and allocation processes, as well as Web-based entry of allocations and assignments made by APNIC members. Currently, the prototype is limited in terms of membership management functions, security, scalability, and extensibility.

Technical Services will conduct a thorough evaluation of this prototype by June 1999 and, subject to the results of that evaluation and feedback from members, will continue through to either deployment of that prototype or development of an alternative during the second half of 1999.

Work is also underway to evaluate the re-implementation of RIPE's Whois server and ISI's Whois server, to investigate the possibility of deploying one of these databases as a joint development effort.

To serve the administration needs of the APNIC Database, and of the Routing Registry (see the Routing Registry section below), APNIC plans to employ a database administrator in the Technical Services department in 1999.

Certification authority (CA)

APNIC has identified a need to provide facilities that ensure security of member interactions with APNIC and its online systems. Such a system would issue certificates to members to be used for security purposes. APNIC intends that the certificates will be valid for the term of each membership (to expire and be reissued on membership renewal) and will be used for secure encryption of email communications with APNIC, and secure access to the APNIC web site and database.

As a future extension of this scheme, APNIC may develop a system to issue certificates to confirm that an allocation of a specific Internet resource (such as a range of IP address space or an AS number) has been made to a particular member and to confirm the term of that allocation.

Technical Services will follow discussions and developments of the various certificate protocols and evaluate those that best suit the requirements of APNIC's membership.

Technical Services intends to make a prototype certification facility available to APNIC members by mid-1999. By the end of 1999, it is hoped that member certificates will be in active operational use.

APNIC estimates that a full-time developer (possibly under short-term contract) will be required during 1999 to implement the CA and associated facilities.

Routing Registry

The Asia Pacific Internet community does not yet have a dedicated Internet Routing Registry of the type currently available in America and Europe. As the authority responsible for ASN and IP address allocations for this region, APNIC proposes to establish an Internet Routing Database to meet this requirement. The APNIC Internet Routing Registry will allow its members to register and query routing policy and related objects.

Routing Policy Specification Language (RPSL) is the IETF proposed standard language for specifying Internet routing policy. Consistent with other RIRs, APNIC will deploy an RPSL-capable Routing Registry to facilitate the transition from RIPE-181 to RPSL. Technical Services will deploy the database as a prototype in the second quarter of 1999.

To serve the administration needs of the APNIC database, including the Routing Registry, APNIC plans to employ a database administrator in the Technical Services department. Development of the registry is expected to occupy a full-time developer (possibly under short-term contract) for three months in 1999.

in-addr.arpa Domain server

The introduction of the 'mnt-lower' and other attributes to the RIPE database raises the possibility of using the domain object as a master record for generating in-addr.arpa zone files. Given that all APNIC members should already be familiar with managing objects within the APNIC database, APNIC is considering using the database to manage in-addr.arpa delegation requests. Technical Services has been developing software since January 1999, with a view to automating the zone file management by late April 1999.

System infrastructure

Negotiations are underway with Compaq/SCO to provide sponsorship of hardware and software for APNIC's production network. For the primary Whois and in-addr.arpa server, Technical Services will deploy a two-way Single System Image cluster of Compaq 1850R 450Mhz 256Mb 20Gb RAID-5 running Non-Stop Clusters for UnixWare in April 1999. In addition to this, several other systems including the internal file server, firewall, and monitoring station will also be upgraded in the second quarter of 1999, using a standard Compaq 1850R configuration. Standardising to the Compaq/SCO platform raises the possibility of APNIC migrating resources into the cluster if server demand increases beyond forecasted levels. This configuration is expected to meet APNIC's server requirements for the next twelve months.

Internal services

Historically, APNIC's internal departments have developed independently, using different systems. APNIC has identified the provision of a centralised repository of Internet resource and membership information as a key component in streamlining its operations. Technical Services has completed a Database and Object schema encompassing access to these core resources. A full-time internal developer will be employed in the second quarter of 1999 to complete implementation of the core APIs by the third quarter of 1999. The internal developer will then focus on enhancing Member Services' tool set using these core resource access methods.

Year 2000 Compliance

APNIC has released a Year 2000 Compliance Statement (for full details refer to <http://www.apnic.net/statement.html>). The workplan for ensuring Y2K compliance is as follows:

- Phase 1 (Completed) Identify all areas within APNIC that should be included in the Year 2000 Project. Form project team and prepare workplan.
- Phase 2 (Completed) Identify critical functions within APNIC so that project team activities may be prioritised to rectify problems that would threaten continued operation.
- Phase 3 (Completed) Identify all resources that are required for APNIC to perform the critical functions.
- Phase 4 (Underway) Determine risks associated with these resources that may impact APNIC's ability to reach Year 2000 compliance.
- Phase 5 (Underway) Assess each of the resources to provide an indication of the nature, size, and cost of Year 2000 problems.
- Phase 6 (15th March 1999) Prepare a plan for a Year 2000 Compliance Project to address the Year 2000 problems identified and develop contingency plans.
- Phase 7 (1st April - 30th June 1999) Implement the approved Year 2000 Compliance Project Plan.

FINANCIAL STATUS

The 1998 books have been audited by PricewaterhouseCoopers; the figures below are a combination of two sets of accounts kept in different currencies. In order to calculate the figures into US\$, APNIC used the monthly average exchange rates published by the Australia Taxation Office.

CONSOLIDATED BALANCE SHEET

As at 31 December 1998

	Consolidated 1998 in US\$	APNIC Ltd 1997 \$US	% change
CURRENT ASSETS			
Cash	774,412	418,856	85%
Receivables	128,565	104,396	23%
Other	47	6,068	-99%
Total current assets	<u>903,024</u>	<u>529,320</u>	71%
NON-CURRENT ASSETS			
Property, plant and equipment	129,242	33,917	281%
Intangibles	2,040	2,040	0%
Total non-current assets	<u>131,282</u>	<u>35,957</u>	265%
TOTAL ASSETS	<u><u>1,034,306</u></u>	<u><u>565,277</u></u>	83%
CURRENT LIABILITIES			
Accrued expenses	45,074	42,463	6%
Provisions	19,263		100%
Unearned income	494,193	0	100%
TOTAL LIABILITIES	<u>558,530</u>	<u>42,463</u>	1215%
EQUITY			
Share capital	1.63	1	63%
Retained earnings	475,775	522,813	-9%
TOTAL EQUITY	<u>475,777</u>	<u>522,814</u>	-9%
TOTAL LIABILITIES & EQUITY	<u><u>1,034,306</u></u>	<u><u>565,277</u></u>	83%

Notes

- Change in accounting policy: APNIC has applied accrual accounting in recognising membership fee revenue to comply with the Australian Accounting Standards. The financial effect of the change was an increase in liability and a reduction on operating profit by \$494,193.

- After APNIC relocated to Australia, it purchased equipment resulting in an increase of 281% in equipment value.

- Share capital balance of \$1.63 represents a US\$1.00 share of APNIC Seychelles' company and another AU\$1.00 share of the Australian company.

- Cash holding has steadily increased by 85%. A total cash holding of fifty percent of APNIC's total budget was mandated by the Executive Council Members in January 1997 in Hong Kong. APNIC was able to meet the 50% requirement during the 1998.

CONSOLIDATED INCOME STATEMENT

For the year ended 1998

	Consolidated 1998 in US\$	APNIC Ltd 1997 \$US	% change
REVENUES			
Membership fees	536,393	721,561	-26%
Non-members fees	12,062	16,192	-26%
Start-up fees	144,844	105,000	38%
Sundry income	15,955	698	2186%
Interest received	16,286	7,433	119%
Foreign currency exchange gain/(loss)	(23,158)	-	-100%
TOTAL INCOME	702,382	850,884	-17%
EXPENSES			
Auditor's remuneration	12,162	7,000	74%
Bad and doubtful debts	3,248	3,290	-1%
Bank charges	8,144	6,580	24%
Books and periodicals	98	362	-73%
Cleaning	226		100%
Communication expenses	9,084	1,082	740%
Consultancy fees	39,018	66,258	-41%
Computer expenses	1,820	20,377	-91%
Depreciation	39,684	8,268	380%
Donation and gifts	500		100%
Electricity	824		100%
Employee entitlements	17,841		100%
Entertainment expenses	74	567	-87%
Foreign currency exchange loss	684		100%
Insurance	1,092		100%
Interest paid	1		100%
Internet connection fee	3,791		100%
Legal costs	27,279	20,546	33%
Licencing fees	-	163	-100%
Loss on disposal of fixed assets	7,548		100%
Office expenses	4,818	9,111	-47%
Parking expenses	1,214		100%
Payroll tax	17,180	13,176	30%

Postage	5,880	5,239	12%	
Printing and stationery	3,814	1,793	113%	
Professional fees	29,852	38,701	-23%	
Rates and taxes	4		100%	
Registration fees	4,434	302	1368%	
Rent	19,003		100%	
Repairs and maintenance	809	157	415%	
Relocation expenses	21,182	18,914	12%	
Service charges	-	50,000	-100%	
Staff training and welfare	680		100%	
Superannuation contributions	8,903		100%	
Sundry expenses	1,068		100%	
Telephone	28,430	18,878	51%	
Training levy	44,300	4,436	899%	
Travelling expenses	46,697	110,413	-58%	
Underwriting fee - APRICOT	-	86,296	-100%	
Wages	338,101	229,669	47%	
Workcare	919		100%	
	TOTAL EXPENSES	750,406	721,578	4%
	OPERATING PROFIT/(LOSS)	(48,024)	129,306	-137%
Without change in accounting policies:		494,193		
(in revenue recognition)				
Without APRICOT98 loss:			86,296	
NET PROFIT		\$ 446,169	\$ 215,602	107%

Notes

- Registration fee – invoices from InterNIC domain name registration fee for XXNIC.NET were paid for two years in 1998 for 1997 and 1998.

APRICOT'98 & '97 FINANCIAL REPORT

APRICOT	1998	1997
Revenues:		
Sponsors	154,830.37	119,896.74
Registration	79,582.80	96,770.51
From Previous APRICOT	1497.05	15,067.41
Fellowship Fund	(2,500.00)	0.00
Total Revenues	233,410.22	231,734.66
Expenses;		
Hotels	(94,488.05)	(114,884.27)
Speakers	(48,670.51)	(106,015.48)

Liaison	(28,497.64)	(31,731.56)
Exhibition	(22,344.02)	(22,846.88)
Others	(30,041.33)	(42,552.50)
Total Expenses	<u>(224,041.55)</u>	<u>(318,030.69)</u>
Profit/(Loss)	9,368.67	(86,296.03)

Notes

- During 1998, APNIC was an underwriter for APRICOT activities.
- One of the objects of APNIC is to provide educational opportunities to further Members' technical and policy understanding of the industry – as stated in the By-laws of APNIC.
- APNIC underwrote a substantial loss from APRICOT '97; however, APRICOT '98 resulted in profit. Reasons: a) many speakers who volunteered to participate only asked for the minimum expenses or no expenses at all; b) Organisation was subcontracted to a person outside of APNIC who could hold the costs to the minimum; c) more last minute sponsors were solicited by APNIC volunteers.