SUBMISSION BY THE AUSTRALIAN COMMUNICATIONS AUTHORITY TO THE PRODUCTIVITY COMMISSION INQUIRY INTO INTERNATIONAL TELECOMMUNICATIONS MARKET REGULATION

Introduction

The Australian Communications Authority (ACA) is a body responsible for regulating telecommunications and radiocommunications. The ACA's specific roles include:

- telecommunications carrier licensing;
- facilitating access to, and use of, the radiofrequency spectrum;
- making technical standards for customer equipment and cabling;
- oversighting the licensing of cablers;
- protecting integrity of networks;
- managing electromagnetic interference;
- managing the National Numbering Plan;
- monitoring health and safety issues, and making standards for exposure to electromagnetic radiation;
- encouraging industry self-regulation through development of industry codes and standards;
- registering and monitoring compliance with industry codes, or determining and enforcing mandatory standards where necessary;
- administration of legislative provisions relating to powers and immunities of carriers in constructing communications facilities;
- protecting consumers and monitoring service quality; and
- representing Australia's communications interests internationally.

2. We are therefore in a position to submit on many of the questions posed by the issues paper, particularly those relating to customer issues and technology. Our submission brings into focus the factors which shape the international telecommunications market, and those we believe should underpin future arrangements.

Defining the Market

3. Like all aspects of the telecommunications industry, the international telecommunications market has undergone a major transformation in the last few years. Where the market could have been fully described as dial-up telephony services and point-to-point data links just a few years ago, it is now characterised by a vast range of service offerings, driven by the following;

- *Technology* - advancements in network technology have provided a quantum leap in telecommunications capacity, capability, and a fall in cost, facilitating;

- *Competition* - the opening up of previous Government-monopoly enterprises to competition and the provision of and stimulation of market offerings;
- *Pent-up Consumer demand* - now taking full advantage of the increase in services and their decreased price.

4. The customer offerings now include services such as

- Internet (e-mail, web browsing, streaming video)
- broadband services such as videoconferencing
- cellular telephony including international roaming
- satellite mobile
- direct satellite broadcasting (broadcast, broadband)
- value-added direct dialled telephony

5. At the same time, the technology advances which have brought increased capacity and reduced costs are now converging to provide a universal platform carrying all services, reducing costs and allowing for further widening the diversity of services.

International network and services

Market definition

6. The ACA does not have a view on how the market should be defined. However, in the light of our knowledge of the underlying technology of international access, we feel that the option of defining and regulating by technology is not sustainable. As a general position, our regulatory arrangements are technology neutral, both to avoid "picking winners", and ensure that the arrangements do not have a "use-by date" determined by technology change.

Recent major developments

7. There are several key developments, mostly technological, which have fundamentally influenced the provision of international telecommunications.

8. Until relatively recently, the traffic capacity of international links was controlled and regulated by national carriers, mostly Government-owned, leading to conservative planning. This has changed under the influence of the following drivers.

Increased Investment

9. Private investment in undersea cables and satellite trunk facilities has increased substantially. In order to utilise this capacity, there has been an increase in market stimulation, and a consequential increase in demand for services.

Technology

10. Current optical-fibre cable technology (the industry preferred trunk transmission technology) has allowed capacity to be increased by several orders of magnitude over earlier cables. New network and switching technology has allowed that capacity to be controlled and shared. In the satellite area, where capacity is more constrained, new compression and coding techniques have also provided significantly increased capacity. All have come at dramatically reduced cost per unit of output.

Convergence

11. Another trend which will fundamentally affect the industry is the convergence of technologies and service delivery. With the capability of data-casting (a feature of high-definition television broadcasting planning), companies in the media business will now be able to combine their existing offerings with those which traditionally have been the province of telecommunications carriers. Likewise, companies with broadband telecommunications access to consumers can offer services which have traditionally been the domain of broadcasters. The mediums involved are both radio and cable-derived.

Australian providers

Regulation reform

12. The reforms, which were introduced in July 1997, have fundamentally affected the industry.

New carriers

13. The new regime places no restrictions on the number of carriers that can be licensed in Australia. Basic requirements such as a current Industry Development Plan (approved by the Minister for Communications, Information Technology and the Arts), and obligations in relation to matters such as interception capability and access, must be satisfied as licence conditions. As of early-May 1999 there were 28 carriers in Australia and many offer international services. A licence does not discriminate on technology or mode of delivery grounds.

14. These carriers have pursued different strategies depending on their market perception, and this has resulted in an expanded market for services such as dialled telephony, and an increase in offerings in other areas such as Internet and broadband services.

Prices dropping significantly

15. The competition among carriers and carriage service providers (some of whom have been specifically established to provide international calls) has resulted in a general lowering of call prices as well as the establishment of niche market opportunities (such as special rates to specific countries). In addition, various consumer groups (such as clubs, associations etc.) have negotiated deals for their members with further discounted access to overseas destinations.

Pre-selection/Override

16. As a condition of their licences, carriers and carriage service providers are required to provide a pre-selection and over-ride service in accordance with any ACA determinations.

Pre-selection

17. This provides for customers to nominate (before a call is made) a carrier of their choice to carry a defined range of services. International direct trunk dialling using 0011 is one of these services, and applies even if the nominated carrier is not the one to which the customer is directly connected.

18. As an example, most customers in Australia are connected directly to the Telstra network. In the absence of any pre-selection arrangements, all international 0011 calls would be carried by (and billed by) Telstra. However, if the customer puts in place arrangements for (say) Optus to be pre-selected, all 0011 dialled calls would then be carried by (and billed by) Optus.

Over-ride

19. This also directs calls to a chosen carrier or carriage service provider independent of the carrier or carriage service provider to whom the customer is directly connected, but in this case it is activated on an individual call basis. As an example, a Telstra-connected consumer who dials 1414 before dialling the 0011 international number, has his or her call carried (and billed by) AAPT (the AAPT over-ride code is 1414), irrespective of any existing pre-selection arrangements.

20. Both these services allow for greater freedom of customer access to service providers.

Performance Monitoring

21. The ACA monitors the performance of Australian carriers and reports quarterly in its publication *Telecommunications Performance Monitoring Bulletin*. Included in these statistics are those covering the international call network, including the following:

- International call network loss
- Operator assisted calls
- Customer satisfaction index

Further changes

22. We would expect the already well-established trends to continue. The number of carriers is expected to rise, and the technology employed is expected to become more diverse.

23. Now that the basic restrictions on the provision of telecommunication infrastructure have been lifted, we are seeing new carriers emerge on the back of established infrastructure providers (such as power utilities, railways and Government instrumentalities) with them and carriage service providers also using legislated access rights. We are also seeing new (and possibly more localised) new carriers emerge as a result of technological capability (such as the new cellular mobile carriers established with spectrum recently acquired at ACA auctions). Both these trends are expected to continue.

24. We also see an increasing trend for these local established carriers to become affiliated with international carriers, both in a continuation of existing arrangements such as mobile roaming, and in more significant arrangements such as shareholdings.

25. The convergence of media and telecommunications companies will increasingly occur in Australia, with the expansion of the cable networks and the introduction of data-casting.

Remaining impediments

26. There are a number of the new telecommunications technologies which are radio-based, and as a consequence, a significant regulatory impediment to entry can be access to radiofrequency spectrum, which is a limited resource insofar as the bands for these applications are concerned.

27. Many of the new developments in international telecommunications are satellite-based. By employing a series of low earth-orbit satellites, services using mobile hand-held terminals or wide-bandwidth earth stations can operate anywhere on the earth's surface (provided there is a clear line-of-sight to the satellite). Because the satellites orbit over every country on earth, each administration (in Australia, this is

the ACA) has a role in coordination and interference control amongst satellite systems, and with existing and planned terrestrial systems.

28. Further satellite developments are planned and each requires the allocation of spectrum. This is coordinated on an international basis through the ITU, but still requires Australia to plan for spectrum use which it might otherwise have used for other telecommunications purposes eg. fixed point-to-point or multi-point systems for terrestrial broadcasting.

29. In addition, newer developments in cellular mobile technology require further spectrum. This is a more local use but is coordinated on an international basis to allow for international standardisation and therefore lower prices and other benefits to consumers, along with neighbouring concerns for interference of radio frequencies. Australia has been successful in allocating such spectrum by a series of auctions, but once gone, this cannot be re-allocated for an extended period (successful bidders gain a licence for a period of up to 15 years). The spectrum licences so allocated also have tradeable rights in the market place.

Australian consumers

30. The following changes have occurred.

Increased capacity

31. Increased bandwidth capacity, and the acceptance in the marketplace of new technology to exploit this capacity, has led to many new service offerings. A striking example is the Internet, which combines technology (ubiquitous PC's and browser software) with the availability of wide bandwidth international services to provide a fundamentally different service offering.

Equipment Provision

32. Customer equipment prices are being driven down by technology advances and standardisation, and with the opening up of the market place for overseas suppliers (particularly with mutual recognition arrangements being put in place), the cost of bringing those products to market has also fallen.

International Standardisation

33. The activities of international standardisation organisations has ensured that standards for customer equipment have been extended beyond country borders. This has had the effect of reducing testing costs (which are ultimately passed on to consumers) and providing a much greater diversity of available equipment suppliers, along with the obvious attraction of economies of scale which standardisation brings.

Customer Awareness

34. Until quite recently, international calls were perceived by customers as expensive and/or difficult to access. Businesses limited their use because of cost, and (for a similar reason) domestic consumers limited their calls to significant family occasions such as Christmas or Mother's Day. With the increased international capacity, the emergence of many new service providers, competitive pricing strategies in the market place, and intense marketing, international dialled services are now trending towards equal standing with national dialling, becoming a routine spur-of-the-moment activity.

Emergent technologies

35. We would expect that the drivers detailed above would continue to influence the international telecommunications industry (and Australia as a part of that industry) over the next five years. However, two technology drivers will stand out.

Satellite

36. Within the last few months, a satellite mobile system called Iridium has been brought into operation. Iridium is the first system allowing access to a "cellular" mobile phone network spanning the whole of the world's surface. Calls made via the service are carried directly to an overseas switching centre without having to make a landfall in Australia. This is because, as yet, there are no Iridium gateways in Australia. All calls are (theoretically) international calls. Even calls to an Australian destination from a mobile handset in Australia are switched from the overseas gateway back into Australia using the traditional incoming international services infrastructure.

37. There is a number of competitors moving into this market, both providing services from low-bandwidth hand-held units to high-bandwidth fixed location services, some bypassing local carriers and others integrated with them. These are expected to provide significant diversity for customers in international service provision.

Internet telephony

38. The Internet has not only stimulated much increased demand for international services, but its underlying technology is about to be adopted as a much more economic method of actually carrying traditional telephone calls.

39. Some smaller service providers use Internet technology to carry their calls to overseas destinations, but as yet they only use this as their internal carriage technique, converting calls to traditional circuit switched means to access the local networks in Australia and in the country of destination. This reduces transmission

costs significantly, but does provide somewhat inferior speech quality to that of the traditional carriers using circuit switched services. However this deficiency will be quickly overcome, and this method currently represents a significant driver to reduce carriage costs, for both new and established providers. As quality increases, the divergence of costs and prices might be expected to close up significantly.

40. Telephony can also be provided directly via the world wide-web and there are a significant number of people using this method to access overseas destinations. These calls are not carried by carriers or service providers and do not appear on any statistics of international calls or traffic.

41. At the present stage this method is limited to the realm of knowledgeable hobbyists, as it requires some technical expertise and competence on the part of the originator and the receiver. However once established, it offers a reasonable quality voice path between Australia and a point overseas and is very cheap, being merely the cost of Internet Service Provider (ISP) time at each end. Calls are therefore only about 10% of the price of equivalent service provider dialled calls.

42. However, while there is no customer assistance, and no general dialling access, this method is seen as potentially providing significant bypass of traditional carrier services in the future.

International payment arrangements/Distortions & Mispricing

Telephony

43. Current settlement rate arrangements for international telephony, which were originally set up under previous monopolistic public telecommunications structures run by Administrations, are generally based on principles contained in International Telecommunications Union-Telecommunications Sector (ITU-T) Recommendations D.150 and D.155. In general terms, these arrangements compensate the carrier in the destination country of an international call. Basically, every time an international call is made, the originating carrier pays a fee, referred to as the settlement rate, to the receiving carrier to complete the call. This rate is generally set in bilateral negotiations between the two carriers, under the accounting revenue division procedure (see D.150). However, in practice there usually exists more traffic in one direction than the other, resulting in a net traffic flow in one direction only, to which the agreed accounting rate is applied. This results in the originating country paying the settlement rate to the destination country.

44. In terms of cost/price for these international services, ITU-T Rec D.140 states that the accounting rate principles utilised for international telephony should be cost based, but collection charges (the price to the customer) are generally considered to be a national matter fixed by the service provider subject to any national constraints. One line of opinion suggests that the gap between the cost of providing

the telephone service (approximated by the accounting rate) and the price charged to customers (the collection charge) is widening over time. However, efforts in ITU-T Study Group 3 (SG3) through its Recommendation D.140 foresee a progressive reduction in accounting rate towards cost over five years. Either way, there exists increasing pressure to revise the accounting rate system to be more inline with WTO trade agreements and trends.

45. Inequities in the current system of settlement rates has led to development of alternative calling procedures including calling cards, country direct services, international resale and callback. These procedures depart from the traditional concept of international telecommunications as a jointly provided service. The most well known of these procedures is callback, which has done much to bring reductions in international call charges to individual users by bringing the tariff structures closer to the real cost of providing the service. Several variations of callback exist, and the ITU has been under pressure from some countries to ban the service. However, the ITU Council has determined that it is the sovereign right of each country to regulate its telecommunications including callback.

46. The ACA has participated in and supported the preparation of submissions to the ITU-T SG3 which is responsible for the reform and development of charging, accounting and settlement principles for international telephone services.

47. These submissions from the Department of Communications, Information Technology and the Arts, which has convenorship for Study Group 3 matters in Australia, propose a position in support of competition which entails

- more understanding of current weaknesses such as incentive for rate reduction, discriminatory charging and lack of transparency
- a move to cost-based charging
- unbundling of international circuit links from the termination charge so that carriers have choice
- more equitable sharing of Internet transport costs
- application of competitive safeguards to minimise abuse of position by carriers in non-competitive markets.

48. Additionally, the emergence of global alliances between major telecommunications providers may see the emergence of commercial ‘ownership’ of all aspects of the international network, including international telecommunications lines, which might well alter the traditional approach to settlement rate strategies, based upon commercial realities.

Internet

49. The widespread application and utilisation of the Internet has grown from a US Government sponsored entity in terms of its networking capabilities, to a world

wide ubiquitous system, which in reality does not have an established set of international charging arrangements and for which no international settlement scheme exists. The Internet has grown from an assumption that high capacity bandwidth is available at low costs (generally true in a local or metropolitan area from which the concept emerged), and has generally evolved separately from the traditional telecommunications world. Historically, Internet Service Providers (ISPs) were small or medium concerns that agreed to exchange traffic on a 'rough justice' basis (no settlement arrangements), and made their income through flat recurring charges to customers – peer arrangements, referred to as the 'sender-keep-all' model (SKA).

50. With the proliferation of Internet now encompassing international borders, a disparity has arisen between small/medium ISPs and the larger ISPs who tend to provide the bulk of the network infrastructure and associated costs. This has led to changes to the peering philosophy, where smaller ISPs now must pay circuit costs of provisioning lines to the larger ISP network access points into the Internet, leading to private peering arrangements now only being in force between larger ISPs, thus creating a hierarchy of ISPs. As well, the larger ISPs tend to be major telecommunications operators, who are building new capacity in terms of national and worldwide Internet transport backbones. Whilst the original concept of a ubiquitous Internet service is still applicable, even in a global context, it is becoming more prevalent for small/medium ISPs to require contractual agreements with the larger ISPs to utilise the global networks (and put their share in to its expansion).

51. The ACA is a member of the APEC Telecommunications Working Group, participating in the preparation of Australia's input which is led through the Department of Communications, Information Technology and the Arts. The APEC TEL WG is investigating International Charging Arrangements for Internet Services, in relation to the development of the Asia Pacific Information Infrastructure, and has commissioned a study on this matter, which is currently being undertaken. Of interest is the concern that much Internet traffic now has to pass through the US even though both originator and recipient might be in the Asia Pacific region.

Benefits from reform

52. Benefits are being seen by customers in decreased international call-prices, but to now these have been largely derived from arrangements (such as call-back) which circumvent the formal settlement methods. With competition and technology driving down the costs, there exists significant potential for improvements, and these should be reflected in the settlement methodology. The Department of Communications, Information Technology and the Arts, with assistance from other national SG3 inputs, is working these issues in the international ITU forum and this has the full support of ACA.

53. The process of reform of international accounting rates for telecommunications services must be centrally coordinated to ensure a fair and

equitable solution for both developed and developing countries and ensure the global acceptability of the utilisation of scarce resources (e.g. spectrum),. The ACA endorses the use of such international cooperation for reform with outcomes based upon international agreements.