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GENERIC TOP LEVEL DOMAIN NAMES: MARKET DEVELOPMENT AND ALLOCATION ISSUES

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FOREWORD

In June 2004 this report was presented to the Working Party on Telecommunications and Information Services Policy (TISP). It was recommended to be made public by the Committee for Information, Computer and Communications Policy (ICCP) in July 2004.

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MAIN POINTS

This paper addresses two areas. First it provides an overview of the structure of the market for domain name registration with a particular focus on generic Top Level Domains (gTLDs). The aim of this work is to provide a review of the reforms introduced by ICANN and their impact. The second focus of the paper is a discussion of the main procedures available to ICANN to allocate resources.

ICANN's management of the Internet's domain name system (DNS) is aimed at benefiting users of the Internet. This goal needs to be borne in mind in considering changes to the DNS, because the networks it supports have become a critical part of economic and social development. Potential efficiency gains, in managing the DNS, need to be weighed against their potential impact on the wider economic endeavours and social activities the Internet supports. ICANN is right to be cautious to preserve the benefits wrought by the Internet and to be conscious of the need to enable the benefits which can accrue from further innovation and competition. The paper concludes that ICANN's reform of the market structure for the registration of generic Top Level Domain names has been very successful. The division between registry and registrar functions has created a competitive market that has lowered prices and encouraged innovation. The initial experience with competition at the registry level, in association with a successful process to introduce new gTLDs, has also shown positive results.

As with any reform, there have been challenges and some further initiatives may be required. One challenge has been for the new gTLDs to win recognition and acceptance by users. The Domain Name System's need to have unique identifiers, and a consequent need for there to be a single registry for each name, means that any registry can exercise a degree of monopoly power over the domain for which it has responsibility. To some extent this can be addressed by competition between registries, but it will also require ongoing contractual oversight by ICANN. The extent to which such a requirement may be lightened depends on the future success of ICANN's reform process, in terms of the acceptance of new gTLDs by the market. However, the large investment many users have in their domain name makes the cost of transfer between registries, and therefore a change of top level name, prohibitive for them.

The existence of defensive registrations, as well as a combination of domain name speculation and traffic aggregation, makes it difficult to assess the real demand for the new gTLDs that have been introduced. Initial experience suggests that user demand for new names may be relatively limited. Much of the user focus is still on **.com** and the other traditional names, with market acceptance of new names being lower than projected. For many existing users, new gTLDs simply represent an additional cost in terms of defensive registrations. On the other hand supporters point to the promise of new services and opportunities for broadening participation that they say will arise with the creation of new names. This potential means that there is support in some sections of the business community for the creation of some new names.

ICANN faces a number of allocative decisions over the coming years, some of which relate to the creation and allocation of new resources. For many of these decisions, the paper does not seek to be prescriptive as they are decisions to be taken by ICANN in consultation with all stakeholders. There is, however, an additional reason. In some instances, the actual resource to be allocated needs to be defined, so that issues such as whether scarcity exists can be determined prior to deciding the most appropriate allocation procedure. Accordingly, the paper discusses the pros and cons of different procedures, such as

auctions and comparative selection, to encourage broader discussion. In contrast, for those resources that are already in existence, and precisely defined, firmer advice can be proffered.

On balance, where scarcity exists the economic arguments favour the use of auctions in some form, in relation to the goals set by ICANN for allocation procedures. They are particularly strong in relation to allocation decisions related to existing names and where a 'tie-breaker' is needed during a comparative selection procedure for a new name. In all cases where auctions are used, the best elements of comparative selection procedures could still be incorporated at a pre-qualification stage using straightforward, transparent, and objective procedures that preserve the stability of the Internet. Pre-qualification procedures, prior to the use of auctions, as a final allocative step for new names, could deal with concerns that a standalone auction might otherwise engender among the Internet community. The choice to be made by ICANN does not have to be purely one process or another but could be a combination of auctions and pre-qualification.

Most concerns that might apply to using auctions as a tool to allocate new gTLDs do not apply to any decision on the future allocation of existing gTLDs. For example, there seem to be few, if any, obstacles to ICANN auctioning the right to be the registry responsible for **.net** as an adjunct to pre-qualification procedures. Indeed, there would be clear and demonstrable benefits in meeting the objectives set by ICANN. An auction would provide a transparent and verifiable mechanism for the market to value **.net** appropriately and avoid the pitfalls associated with comparative selection. Such an auction could also act as a practical demonstration, for auctions, in relation to other allocative choices as and when they arise.

A further issue ICANN could consider is whether the division between registry and registrar needs to apply to relatively small sponsored top level domains. One option would be to create a threshold number of registrations below which registries would have the option to sell second level domains, direct to their community, with appropriate safeguards. An example would be to allow **.museum** to market directly to their community.

TOP LEVEL DOMAIN NAME GROWTH IN OECD COUNTRIES

Introducing Top Level Domain Names

The Domain Name System (DNS) helps users navigate the Internet. Every device connected to the Internet has a unique address called its "IP address" (Internet Protocol address). Because IP addresses (which are strings of numbers) are hard to remember, the DNS allows a string of letters or a combination string of letters and numbers (the "domain name") to be substituted. Whereas numeric IP addresses (*e.g.* 192.11.0.54) generally contain no signification to users, domain names may contain a meaning or signify a relationship with a registrant (*e.g.* oecd.org). It is this feature of domain names that can give them a value, in the domain name market, over and above their functional utility.

Domain names are composed under a hierarchical structure. This hierarchical structure of the DNS is supported by the dot ("."). A sequence of letters which is called the label, divided by the dot, makes up one complete domain name. The highest hierarchical level of the DNS is called the top level domain (TLD) which is the last right label of the domain names (*e.g.* "**.org**" in "oecd.org" or "**.jp**" in "sony.co.jp"). The hierarchy of the DNS descends in the order from right to left. The label to the left of the TLD is called the second level top level domain (*e.g.* "oecd" in "oecd.org" or ".co" in "sony.co.jp").

The TLDs can be generally categorised into two categories. One is the country code top level domain (ccTLD) which is designated to countries or regions and is represented by a two letter label based on the ISO 3166-1 standard (*e.g.* "**.jp**" for Japan, "**.au**" for Australia and "**.at**" for Austria). In March 2004, there were 243 ccTLDs in existence. In contrast, generic top level domains (gTLD) have traditionally not been related to geography but to generic forms of use (*e.g.* **.com** for commercial use or **.int** for international organisations).

There are two types of gTLDs: sponsored TLDs (sTLDs) and unsponsored TLDs (uTLDs). The uTLDs are managed under general gTLDs policies established by the Internet Corporation for Assigned Names and Numbers (ICANN). In contrast, sTLDs are managed by a sponsor organisation which establishes policies and practices for the management of that sTLD. Some sTLDs are reserved for the use of a particular community. This group of stakeholders are sometimes referred to as the Sponsored TLD Community. The domain name **.museum**, for example, is operated by the Museum Domain Management Association (MuseDoma), a not-for-profit trade organisation established by the International Council for Museums (ICOM). This sTLD is exclusively for the museum community and only genuine museums, museums associations and museum professionals can register a second level domain name under **.museum**.

As of March 2004 there were 14 gTLDs and one TLD reserved for Internet infrastructure purposes (**Table 1).** Among the 'original gTLDs', first created in the 1980s, **.com**, **.net** and **.org** are uTLDs while **.edu**, **.gov**, **.int** and **.mil** are sTLDs. Among the 'new gTLDs', approved by ICANN in November 2000, **.biz**, **.info**, **.name** and **.pro** are uTLDs while **.aero**, **.coop** and **.museum** are sTLDs.

Registration under sTLDs is restricted to their respective communities. For the main part this does not relate to location but to other eligibility requirements. The domain **.edu** is for educational institutions that are accredited by an agency on the United States Department of Education's list of Nationally Recognized

Accrediting Agencies. There is no geographical based requirement to register under **.edu.** On the other hand, registries sometimes launch services in one country ahead of others. The registry for **.pro** has established criteria for a launch in the United States ahead of other countries.[1] The **.pro** registry is exceptional in that most uTLDs, as opposed to sTLDs, are open to any registrants, irrespective of their original intended community.

Table 1.   The list of existing gTLDs, March 2004

	The Original gTLDs (1)	
	Type of gTLDs	Purpose of gTLDs
.com	Unsponsored	Unrestricted, but intended for commercial registrants
.net	Unsponsored	Unrestricted, but intended for network provides, etc.
.org	Unsponsored	Unrestricted, but intended for not-for-profit organisations
.edu	Sponsored	For post-secondary institutions that are institutionally accredited by an agency on the United States Department of Education's list of Nationally Recognized Accrediting Agencies
.gov	Sponsored	For the United States governmental organisations
.int	Sponsored	For international inter-governmental treaty based organisations
.mil	Sponsored	For the United States military
	New gTLDs approved in November 2000	
	Type of gTLDs	Purpose of gTLDs
.biz	Unsponsored	Intended for business use
.info	Unsponsored	Unrestricted use
.name	Unsponsored	Aimed at individual registrants
.pro	Unsponsored	For professionals such as accountants, lawyers, physicians (2)
.aero	Sponsored	For the air-transport industry
.coop	Sponsored	For Co-operatives
.museum	Sponsored	For Museums

(1) The TLD **.arpa** (Address and Routing Parameter Area) also exists but this is an infrastructure TLD and is designated to be used exclusively for Internet-infrastructure purposes.

(2) An individual who is currently licensed as *i)* a Certified Public Accountant, *ii)* a physician (including a medical doctor or doctor of osteopathy), or *iii)* an attorney at law, who is currently licensed in one of the 50 United States or the District of Columbia; or, an organisation, that provides accounting, legal or medical professional services, and has an employee who satisfies one of the above criteria and registers on behalf of such entity or organisation that provides accounting, legal or medical professional services, and has an employee who satisfies one of the above criteria and registers on behalf of such entity or organisation. Examples of such organisations include: accounting firms, hospitals, legal publishers, medical supply companies, or even the law department of a large company. Registrants outside the 50 United States (and District of Columbia) are initially eligible only for Defensive Name Registrations. Additional jurisdictions for domain name registrations will be added on a rolling basis.

Source: ICANN[2] and Registries.

TLD market size

At the end of 2003 there were just under 56 million names registered under major gTLDs and the 30 ccTLDs that correspond to OECD member countries (**Table 2**). This number was more than double the same total for July 2000. From the total number of registrations, at the end of 2003, close to 20 million were under ccTLDs, located in OECD countries, and 36 million were under gTLDs.

The number of registrations under both major gTLDs and OECD ccTLDs has shown a fairly constant growth rate from July 2000 to December 2003. Registrations under OECD ccTLDs have had a much sharper increase than major gTLDs and the percentage of the number of OECD ccTLDs registrations in the number of total TLDs registrations, increased from 27% to 34% in the same period.

The differences in the magnitude of registrations under each gTLD and ccTLD are related to a number of factors. For ccTLDs the historical factors involved include the pace of Internet development in any given country. In addition, some ccTLDs are regarded as being more open in the conditions they apply to the registration of domain names. For example, **.de** which is a ccTLD corresponding to Germany has a relatively open policy for its registration. As a result, **.de** had 6.9 million registrations as of December 2003, which is the largest number of registrations among OECD ccTLDs. On a per capita basis the highest number of registrations under ccTLDs are in Denmark, Germany, the United Kingdom and Switzerland (**Figure 1**).

The position of countries is not an indicator of relative performance. Some ccTLDs limit registrations to users with a presence in that country and limit the number of registrations per entity. These practices are designed to limit speculation, cyber-squatting or to give the ccTLD a distinctive national presence rather than trying to maximise the number of registrations. Historically, some ccTLDs had policies that meant users simply preferred gTLDs. Prior to 2002, for example, the **.us** domain did not have a structure as attractive as gTLDs even though **.us** domains were available at a much lower price. On the other hand, some registries charge prices that are uncompetitive in respect to those available for gTLDs. The monopoly which registries have over registrations under each ccTLD, may be one reason for high prices. In most OECD countries industry self-regulation applies but in a small number of cases the communications regulator plays a role.[3]

Some entities responsible for ccTLDs have introduced changes in recent years to promote the use of their ccTLD. In the United States the **.us** domain opened up second-level registration possibilities, in April 2002, enabling users to register names without reference to locality. In France, in May 2004, AFNIC liberalised the requirements for obtaining a **.fr** domain name to encourage broader take-up of that domain.[4] Changes such as these should mean an increased ability for ccTLDs to compete against gTLDs in their 'home markets'.

Table 2.   The number of domain name registrations of major gTLDs and ccTLDs of OECD countries from 2000 to 2003

	Total	major gTLDs	OECD ccTLDs
July 2000	24 183 837	17 476 025	6 707 812
July 2002	45 715 846	30 731 874	14 983 972
December 2003	56 588 888	36 851 022	19 737 866

Note: Major gTLDs are .com, .net, .org, .info, .biz and .name

Source: OECD, based on Registries Monthly Reports.

Figure 1. ccTLD registrations per 100 inhabitants
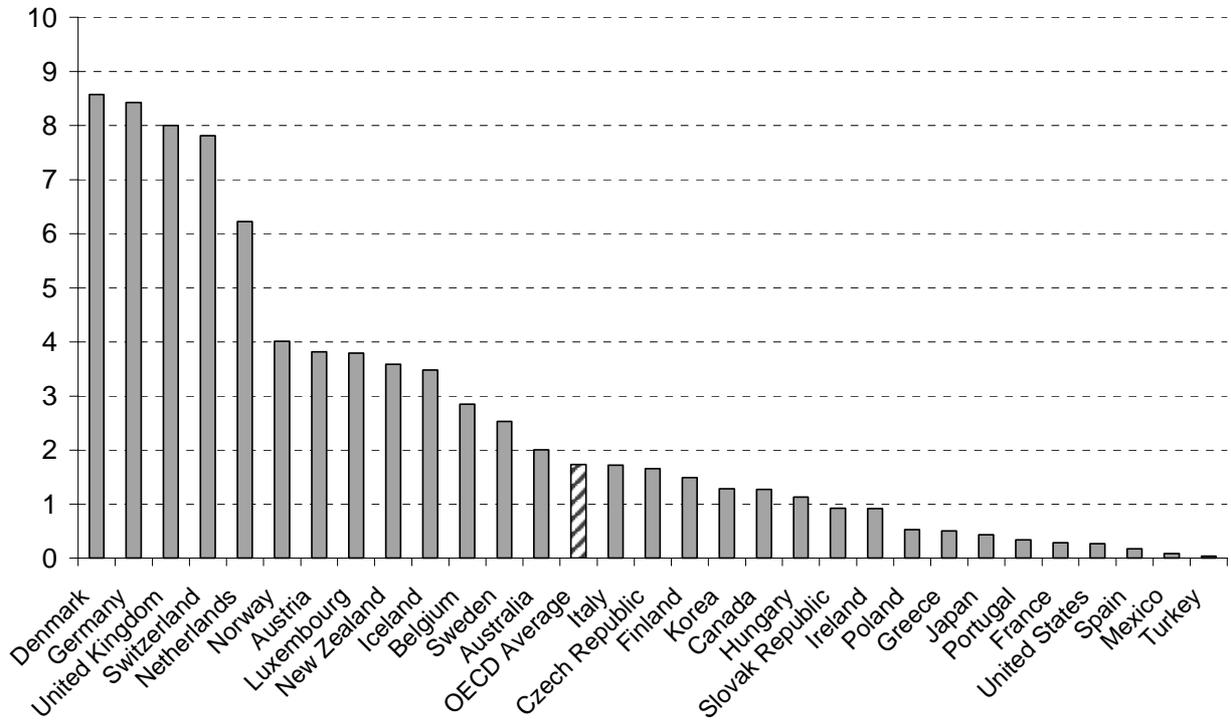
Note: The United States data only show registrations under **.us** and does not include registrations under **.gov, .mil**, and **.edu**.

Source: OECD.

TOP LEVEL DOMAIN MARKET STRUCTURE

ICANN

The Internet Corporation for Assigned Names and Numbers (ICANN) is an internationally organized, non-profit corporation that has responsibility for Internet Protocol (IP) address space allocation, protocol identifier assignment, gTLD and ccTLD name system management, and root server system management functions.[5] These services were originally performed under United States Government contract by the Internet Assigned Numbers Authority (IANA) and other entities. ICANN now performs the IANA functions under Transition Agreements and Implementation Agreements.[6] ICANN was created through a Memorandum of Understanding (MoU) between the United States Department of Commerce and ICANN to transition management of the Domain Name System (DNS) from the United States government to private sector Internet stakeholders. The United States Government effects such privatisation by entering into agreement with and seeking international support for a not-for-profit corporation formed by private sector Internet stakeholders to administer DNS policy.[7]

Following reforms introduced by ICANN, the gTLD market can be broadly characterised along the following lines. Registries perform back-office functions and provide services to Registrars. Registrars, in turn, provide services to users. Many ccTLDs are also structured along these lines while others have direct sales, from the registry to users, without the use of registrars. There are also important distinctions between sponsored and unsponsored TLDs as well as those domains that compete in the same space and those that serve more limited communities. Before looking at the market shares for TLDs it is necessary to briefly summarise the position of various players in the registry and registrar segments of the market.

Registries

The responsibility for operating each TLD (including maintaining a registry of the domain names within the TLD) is delegated by ICANN to a particular organization. These organisations are referred to as "registry operators" or "sponsors". Currently, the gTLDs of **.aero**, **.biz**, **.com**, **.coop**, **.info**, **.museum**, **.name**, **.net**, **.org** and **.pro** are in use, and the corresponding registries are under contract with ICANN (**Table 3**). Separate arrangements apply to **.edu**, **.mil**, **.gov**, under United States Government responsibility, and **.int** which is directly under ICANN's responsibility.[8]

Table 3.   The gTLDs registries

gTLDs	Registries	Location	URL
.aero	SITA	Switzerland	www.sita.aero
.biz	neulevel	United States	www.neulevel.biz
	(Joint venture of NeuStar and Melbourne IT)		
.com	VeriSign	United States	www.verisign.com
.coop	dotCoop	United States	www.coop
	(National Cooperative Business Association)		
.info	Afilias	United States	www.afilias.info
.museum	MuseDoma	Sweden	about.museum
.name	The Global Name Registry (GNR)	United States	www.gnr.name
.net	VeriSign	United States	www.verisign.com
.org	Public Interest Registry (PIR) (Afilias)	United States	www.pir.org
.pro	RegistryPro	United States	www.registrypro.com

Source: OECD based on ICANN.

Unsponsored gTLD registries

Unsponsored registries are organisations which are designated, by ICANN through a registry agreement, with responsibility for a gTLD. This registry agreement provides the authority for registries to act as the sole operator for the applicable gTLD. The agreement also specifies the general obligations of the registry and ICANN as well as administrative issues, such as dispute resolution processes and the fees to be paid to ICANN and those fees charged to registrars.

When ICANN commenced its reform of the gTLD market structure there was only one unsponsored registry. At that stage, VeriSign (following the purchase of Network Solutions) had responsibility for .**com**, **.net** and **.org**. In January 2003, the responsibility for **.org** was shifted by ICANN from VeriSign to the Public Interest Registry (PIR). PIR was selected from 11 other candidates and Afilias performs the back-office registry operations.[9] This transfer followed the expiry of the registry agreement between ICANN and VeriSign, for the responsibility of **.org**.

The current agreement between ICANN and VeriSign, for responsibility of the **.com** registry expires in November 2007, but has a four year renewal option.[10] The agreement between ICANN and VeriSign for responsibility of the **.net** registry expires in June 2005.[11] The **.net** registry agreement obligates ICANN to adopt an open, transparent procedure for designating a successor registry operator by no later than one year prior to the end of the agreement (*i.e.* 30 June 2004). Under the **.net** registry agreement, the incumbent registry (VeriSign), is free to enter into whatever procedure is adopted by ICANN for the selection of the new registry operator. Apart from VeriSign and PIR, the decision to create new gTLDs in 2000 added four new uTLD registries. The four new registries were Afilias, GNR, NeuLevel and RegistryPro.

Sponsored gTLD registries

A sponsored TLD is a specialised domain that has a sponsor representing a specific community that is served by the TLD. The sponsor carries out delegated policy formulation responsibilities over many matters concerning the TLD. The sponsor is designated by ICANN through a registry agreement.

Some sTLD registries say that by restricting registrations to eligible candidates they have the potential to deliver a secure, predictable and trustworthy communications and business medium.[12] The **.aero** sTLD is intended for the air transport community and the sponsor is SITA (*Société Internationale de Télécommunications Aéronautiques*). SITA is a leading provider of global information and telecommunication solutions to the air transport and related industries.

Two other sTLDs were admitted during ICANN's first round of new domain names. The **.coop** domain is an sTLD for co-operatives and DotCoop, which is a wholly owned subsidiary of NCBA (National Cooperative Business Association), operates as the sponsor. NCBA is a United States based association representing the interests of co-operatives and associations of co-operatives in the United States. The domain **.museum** is for the museum community and the Museum Domain Management Association (MuseDoma) is the sponsoring organisation. MuseDoma was established by the International Council for Museums (ICOM) which is an international organisation of museums and museum professionals.

At the time of writing, ICANN is in the process of considering the introduction of new sTLDs. Applications were received between December 2003 and March 2004. There were 10 applications for new sTLDs (**Table 4**). A public comment period was available in early 2004. Following this, an independent evaluation team will evaluate applications based on the selection criteria, (specified in the Request for Proposal, RFP), and make recommendations on which applications should be selected for negotiations on registry agreements, by the end of July 2004.[13]

An evaluation of the proposed sTLDs is beyond the scope of this paper. A couple of points, however, are worth making. At least one of the proposals, if approved, plans to consider the use of auctions for second level domains.[14] In addition, several of the proposals appear to have a more open status in terms of who can register a second level name or number, than the sTLDs approved in ICANN's first round of sTLDs. Finally, several proposals for sTLDs are aimed at supporting new services (*e.g.* **.tel**, **.mail**, **.mobi**) or in serving a 'specific community' with an alternative name (*e.g.* .**xxx**, **.asia**, **.cat**). Although there were several proposals for new gTLDs associated with new services during ICANN's first round of new domains, none of these were chosen at the so-called 'proof of concept' stage.

Table 4.   Proposed sTLDs (March 2004)

Proposed TLD String	Targets of proposed TLD	Proposed sponsor	Sponsor location
.asia	For the Pan-Asia and Asia Pacific community	DotAsia Organisation Limited	Hong Kong, China
.cat	For the Catalan linguistic and cultural community	Fundació puntCAT (which would be formed only in case the TLD is delegated)	N/A
.jobs	For the international human resource management community	The Society for Human Resource Management	Alexandria, Virginia, United States
.mail	For spam-free email exchanges	The Anti-Spam Community Registry	London, United Kingdom
.mobi	For mobile Internet communications	Mobi JV (working name)	Helsinki, Finland
.post	For postal organisations	Universal Postal Union (UPU)	Bern, Switzerland
.tel	For IP Communications Service Providers (IPCSPs) to register telephone numbers as domain names on the Internet and to associate IP-based services with those registered telephone numbers	pulver.com	Melville, New York, United States
.tel	For Internet communications	Telname Limited	London, United Kingdom
.travel	For the global travel community	The Travel Partnership Corporation	New York, New York, United States
.xxx	For the online adult-entertainment community	The International Foundation for Online Responsibility	Toronto, Ontario, Canada

Source: ICANN.[15]

ccTLD registries

ccTLD registries are responsible for the country code TLDs. While ccTLDs are not the subject of this paper it is necessary to take them into account because they do provide services than could be considered substitutable for gTLDs. ccTLDs clearly provide competition to gTLDs, in their home markets, by providing an alternative option for users. Beyond that, a growing number of ccTLDs are being marketed outside their 'home country' to a particular community or to the global market (*e.g.* **.bz**, **.cc**, **.md**, **.ms**, **.nu**, **.pn**, **.tv**, **.vg**, **.ws**). In some of these cases the meaning of the ISO 3166-1 country code top-level domain is played down relative to a concept marketed with the name (*e.g.* **.bz** for business instead of Belize).

Historically, most ccTLDs were operated by academic or governmental organisations. Some academic or governmental organisations still play a role as a registry. However, most ccTLDs registries have shifted from voluntary or *ad hoc* arrangements to having a dedicated institutional basis with private sector involvement. Some are run for profit and others are not-for-profit. Whereas gTLDs registries need to have an agreement with ICANN, it is not necessary for ccTLD registries to have a registry agreement with ICANN. However, some ccTLDs registries have voluntarily entered into such an agreement with ICANN.

Market share of gTLD registries

If the gTLD market is defined as a separate and distinct market (*i.e.* excluding ccTLDs) then Verisign acts as the registry for 85% of all registrations (**Figure 2**). The Public Interest Registry (PIR) is the second largest gTLD registry due to its responsibility for the **.org** domain. Afilias performs the back-end registry responsibilities for the PIR. The PIR-Afilias combination has an 8% market share of all gTLD registrations. Afilias is also the registry responsible for the **.info** domain. The **.info** registry function translates into a 3% market share. NeuLevel is the company responsible for the **.biz** domain. NeuLevel's market share was 2%. All other registries make up less than 1% of the gTLD market.

Figure 2. Market share of gTLDs registries, December 2003
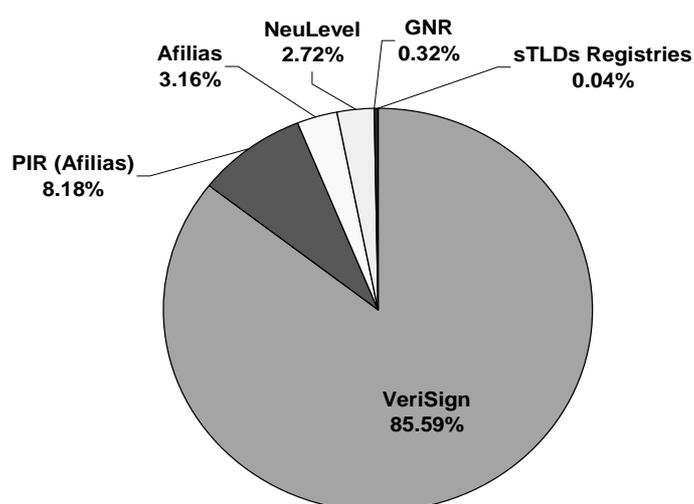
Source: OECD, based on Registry Monthly Reports.

Market share of gTLD registries and OECD ccTLD registries

If the TLD market is not defined as a separate and distinct market (*i.e.* it includes ccTLDs based in OECD countries) then the market shares of the various registries is significantly altered. Under this definition of the market, Verisign is still the largest registry but its total market share is reduced to 55% (**Figure 3**). The ccTLDs corresponding to OECD countries, on the other hand, have a total market share of 34%. The largest ccTLD registries were, in order of size, DE.NIC located in Germany, Nominet located in the United Kingdom and SIDN located in the Netherlands (**Figure 4**).

Figure 3. Market share of gTLDs and OECD ccTLDs registries, December 2003
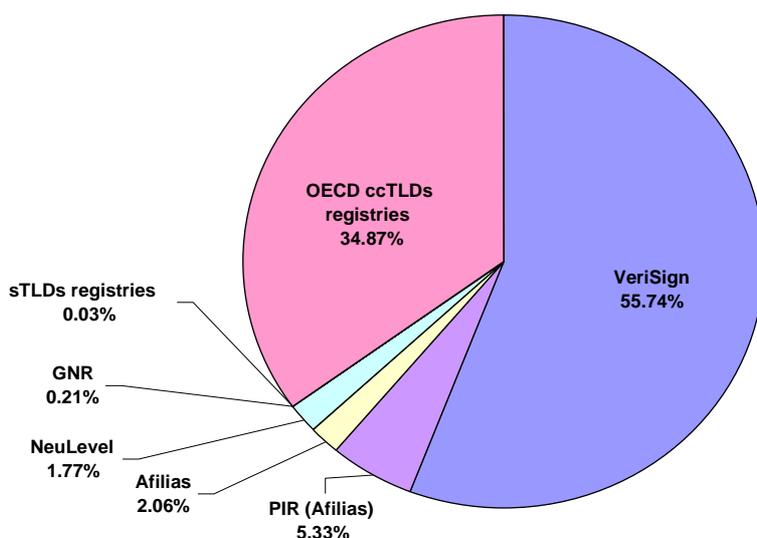
Source: OECD, based on Registry Monthly Reports.

Figure 4. Market share of ccTLDs registries in OECD area, December 2003
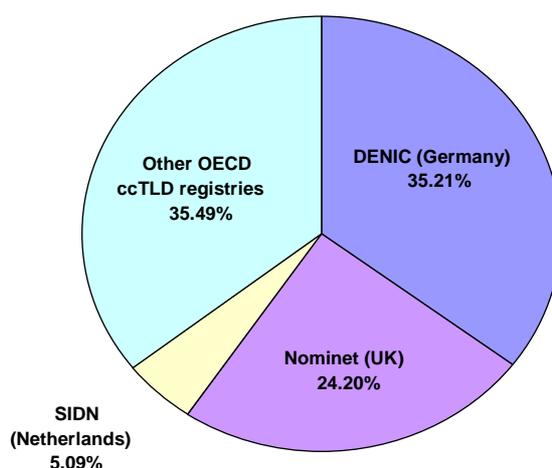
Source: OECD, based on data from ccTLD registries.

TLD registry market share

Under both definitions of the TLD registry market, VeriSign has the largest market share. If the gTLD registry market is treated as a standalone market, VeriSign's market share clearly makes it the principal player with 85% of all registrations. Competition, in the form of new registries, has begun to develop but the open (or unsponsored) gTLDs only make up a relatively small share of the overall registry market. On the other hand, if ccTLDs in the OECD area are included the overall picture significantly changes. This raises the question of how significant is the level of competition, or to be more precise the degree of competitive choice which is available to registrars and users.

Clearly, ccTLDs and gTLDs do represent a choice for users. A user in the Netherlands, for example, has a choice between registering under the various gTLDs, the ccTLD for the Netherlands (**.nl**) or one of the other ccTLDs that has relatively open criteria (*e.g.* **.uk**). While all these domains can perform the same technical function how substitutable they are depends on the application the user has in mind and their perception as to how a registration, under a particular gTLD or ccTLD, may be regarded by others in that respect.

Some ccTLDs may not be commonly associated, by Internet users, with a particular country and therefore be seen as substitutes for gTLDs. The **.nu** domain, for example, the country code for the South Pacific Island of Niue, is widely used in Scandinavia. On the other hand most ccTLDs corresponding to OECD countries are strongly associated with a particular country. Moreover, if ccTLDs beyond the OECD are considered then further adjustment to market share would need to be considered. VeriSign, for example, acts as the registry for **.cc** and **.tv**. To the extent that users register under names such as **.cc** because their first choice is unavailable under a gTLD, or an OECD ccTLD, a greater choice of domains would be welcome. Many ccTLDs have successfully promoted availability and choice by only registering names at the third level across multiple second level alternatives. These ccTLDs clearly offer a competitive alternative for some users. It is far from certain, however, that new gTLDs could compete at the third level on equal terms with existing gTLDs using the second level, given the challenges they already face in winning market acceptance.

For their part, registrars appear to be generally willing to sell all TLDs that are made available by registries if they are likely to reach a significant volume. The most important issue for registrars is that they have equal access to registry services. That being said a greater range of registries should also increase the level of competition between registries. The underlying efficiency of registries should then, in turn, be reflected in the overall service the registrar can offer to users.

One more aspect of registry service needs to be considered. Registries whether they are gTLDs, sTLDs or ccTLDs, have a monopoly over registration in the TLD over which they exercise responsibility. In other words all registries have 100% of the market under the TLD or TLDs for which they have responsibility. Safeguards are therefore essential. One example is where registrars sell services to end users in competition with the registry's own registrar.

A more complex question arises where, although there may be no registrar owned by the registry, issues emerge at the boundary between services performed by the registry and by the registrar. This can occur, for example, in respect to new services, associated with the domain name registration process, which might be commercially performed equally well by either the registry or the registrar. This question, while not related to the discussion of overall market share, may need to take into account the control which can exercised by the registry over the TLD (or TLDs) under their responsibility.

For their part, a second or third level domain name will commonly represent a considerable investment for users which is valued far beyond the direct fee paid for the maintenance of the domain. Indeed, some businesses and professional users are critically dependent on their domain name registration. For these users the cost of transferring their business between registries may be prohibitive irrespective of the amount of choice between registries. They can, of course, not transfer their name between registries. There may, accordingly, be a need for safeguards, irrespective of the amount of market share a registry has in the overall market because they have a monopoly over the registration under a particular TLD. ICANN and the various bodies responsible for ccTLDs in each OECD country have the primary responsibility for applying these safeguards through mechanisms such as contracts or agreed operating rules and procedures.

Registrar market share

If the market for registry services is relatively concentrated, the same can not be said for registrar services. Following the reforms introduced by ICANN new entrants have rapidly gained market shares. In December 2003, according to the registries monthly reports to ICANN, Network Solutions had the largest market share of 21% for gTLDs registrations under **.com**, **.net**, **.org**, **.info**, **.biz and .name** (**Figure 5 and Table 5**). The other leading registrars are Tucows (Domain Direct) with a market share of 10%, Go Daddy Software with a market share of 8.5%, Register.com with a market share of 8%, eNom with a market share of 7% and Melbourne IT with a market share of 5.5%[16].

Figure 5. The registrar market share of domain name registrations under major gTLDs
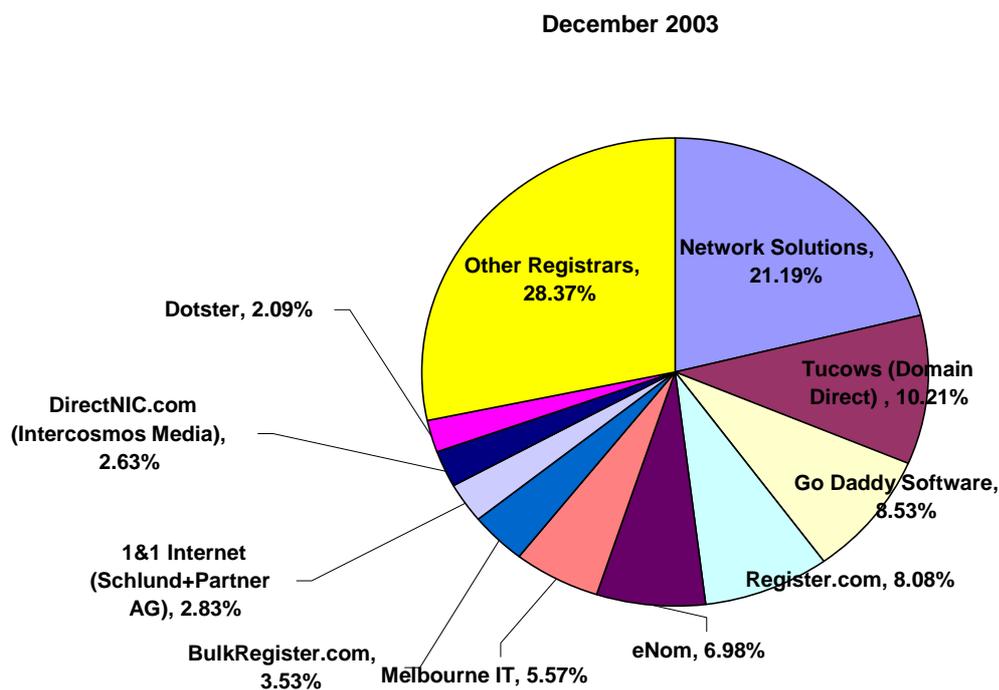
December 2003

Source: OECD, based on Registries Monthly Reports.

Table 5.   The market share and number of registrations by registrars under major gTLDs, December 2003

gTLDs Registrars	Country	Market Share (%)	The number of registered domains under unsponsored gTLDs						
			Total	.com	.net	.org	.info	.biz	.name
Network Solutions	United States	21.19	7 808 502	5 752 174	894 866	833 982	146 104	181 376	0
Tucows (Domain Direct)	Canada	10.21	3 761 460	2 785 066	477 514	307 268	103 628	84 570	3 414
Go Daddy Software	United States	8.53	3 143 015	2 357 458	363 298	238 355	70 518	106 534	6 852
Register.com	United States	8.08	2 976 230	2 190 644	356 819	241 246	79 687	83 469	24 365
eNom, Inc.	United States	6.98	2 572 139	1 948 358	292 565	172 497	84 706	72 724	1 289
Melbourne IT	Australia	5.57	2 051 142	1 519 311	252 570	152 633	52 488	69 250	4 890
BulkRegister.com	United States	3.53	1 300 806	989 558	147 018	100 615	32 896	29 718	1 001
1&1 Internet (Schlund+Partner AG)	Germany	2.83	1 044 101	568 695	184 251	93 934	149 255	47 966	0
DirectNIC.com (Intercosmos Media)	United States	2.63	968 098	742 092	99 051	63 112	39 071	22 607	2 165
Dotster, Inc.	United States	2.09	771 992	574 269	94 360	67 839	19 330	14 885	1 309
Other Registrars		28.37	10 453 537	7 608 244	1 353 238	743 698	386 453	291 019	70 885
Total			36 851 022	27 035 869	4 515 550	3 015 179	1 164 136	1 004 118	116 170

Source: OECD based on Registries Monthly Reports.

The registrar market for the new unsponsored gTLDs of **.info**, **.biz** and **.name**, appears to be even more competitive than for the traditional gTLDs. Network Solutions only holds 14% of the market share (**Table 6**). 1&1 Internet, Tucows, Register.com and Go Daddy Software have more than 8% of the market share. Given that Network Solutions has a significant advantage over other registrars, in terms of having the largest existing client base for the traditional gTLDs, the relatively even spread of registrations is a significant outcome.

Table 6.   The registrar market share in new unsponsored gTLDs

gTLDs Registrars	Country	Market share (%)	The number of registered domains under new gTLDS			
			Total	.info	.biz	.name
Network Solutions	United States	14.34	327 480	146 104	181 376	0
1&1 Internet (Schlund+Partner AG)	Germany	8.63	197 221	149 255	47 966	0
Tucows Inc.	Canada	8.39	191 612	103 628	84 570	3 414
Register.com, Inc.	United States	8.21	187 521	79 687	83 469	24 365
Go Daddy Software, Inc	United States	8.05	183 904	70 518	106 534	6 852
eNom, Inc.	United States	6.95	158 719	84 706	72 724	1 289
Melbourne IT	Australia	5.54	126 628	52 488	69 250	4 890
CORE Internet Council of Registrars	Switzerland	2.90	66 270	42 538	22 858	874
DirectNIC.com (Intercosmos Media)	United States	2.79	63 843	39 071	22 607	2 165
BulkRegister.com	United States	2.78	63 615	32 896	29 718	1 001
Other Registrars		31.41	717 611	363 245	283 046	71 320
Total			2 284 424	1 164 136	1 004 118	116 170

Source: OECD, based on Registries Monthly Reports.

The market share of Network Solutions is worth noting further. Network Solutions was acquired by VeriSign in 2000. At that stage, Network Solutions was the sole provider of registry and registrar functions for gTLDs such as **.com**, **.net** and **.org**. In November 2003, VeriSign announced the sale of Network Solutions, together with its registrar business to Pivotal Private Equity. Phoenix-based Pivotal Private

Equity is a provider of equity for middle market corporate acquisitions. VeriSign retained a 15% equity stake in the company.[17] Had this sale been accomplished, by May 2001, VeriSign would have received an automatic extension as the registry for **.com**, **.net** and **.org** until 2007.[18] In the absence of a sale by that date, however, VeriSign was required to transfer **.org** by the end 2002 and agree to have the **.net** registry open to competitive rebid during 2005. This is a significant development in terms of the subject of this paper. It underlines the point that ICANN needs to make allocative decisions over existing resources as well as any consideration over the creation and allocation of new resources.

Following the reforms introduced by ICANN, to open the registrar market to competition, Network Solutions market share has fallen from 100% to around 21% (**Figure 6**).

Figure 6. **Changes in Network Solutions market share from July 2001 to December 2003**
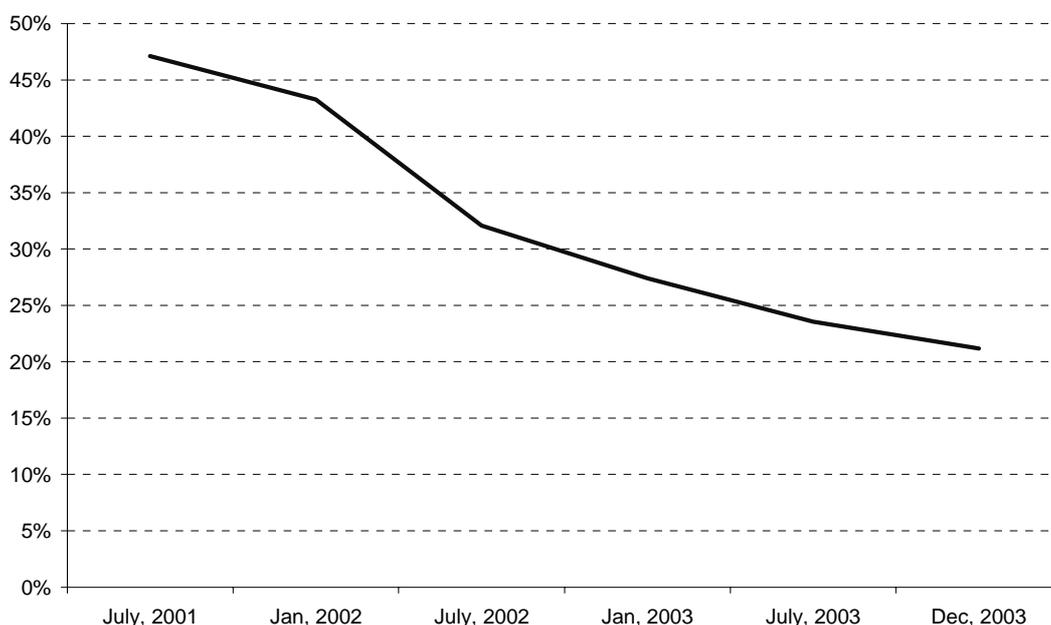
Source: OECD, based on Registry Monthly Reports.

One other aspect of the registrar segment of the registration market structure may need to be considered by ICANN. The introduction of sTLDs has created some registries aimed at relatively small communities. In these cases it may be difficult for small registries to attract the interest of registrars, because of the low potential volume of sales, and the need for authentication in the case of restricted registries. One option ICANN could consider is allowing registries serving relatively small communities to offer services direct to users. One way to accomplish this would be to set a threshold level of registrations below which direct services to users would be permitted. This might take place alongside service from accredited registrars, or in the case of very small registries, be an exclusive right as long as registrations fell below the threshold.

At the time of writing all registrations under sTLDs need to be made via ICANN accredited registrars. ICANN does allow sponsors to register a certain number of names for their own use. In the case of **.museum**, the sponsor can register up to 1 000 names for their own use. The registry can not, however, offer direct services to their community. For the future, if a greater number of sTLDs are introduced, it could be worth considering a threshold below which direct services could be offered. A large number of ccTLD registries offer services direct to users. There may, of course, need to be contractual safeguards if such a measure was introduced to prevent any misuse of such a system. One such safeguard would be to specify the maximum price that could be charged prior to reaching the threshold.

18

EXPERIENCE WITH THE INITIAL NEW GENERIC TLDS AND OTHER MARKET REFORM

Geographical distribution of the take-up of new gTLDs

Data on the geographical distribution of registrations under the new unsponsored gTLDs (**.info**, **.biz** and **.name**) is made publicly available by ICANN. These data are available by country and territory. At the end of 2003, some 91% of these registrations, under new unsponsored TLDs, were made by users in OECD countries (**Table 7**). The largest number of registrations were made by users from the United States, followed by Germany and the United Kingdom.

Table 7.   The geographical distribution of registrations under new unsponsored gTLDs, December 2003

	Total	%	.info	.biz	.name
Australia	54 066	2.37	22 071	27 047	4 948
Austria	30 727	1.35	21 920	8 257	550
Belgium	10 715	0.47	5 831	4 570	314
Canada	58 671	2.57	26 338	27 664	4 669
Czech Republic	6 675	0.29	4 786	1 814	75
Denmark	16 767	0.73	8 439	6 887	1 441
Finland	6 492	0.28	4 346	1 896	250
France	50 677	2.22	26 733	22 768	1 176
Germany	349 571	15.30	256 822	89 832	2 917
Greece	3 431	0.15	2 253	1 102	76
Hungary	1 454	0.06	1 112	322	20
Iceland	249	0.01	119	117	13
Ireland	5 071	0.22	2 625	2 180	266
Italy	45 298	1.98	23 534	19 505	2 259
Japan	33 196	1.45	18 452	11 322	3 422
Korea	42 464	1.86	13 846	25 995	2 623
Luxembourg	1 000	0.04	466	466	68
Mexico	3 997	0.17	1 820	1 914	263
Netherlands	63 358	2.77	44 464	18 223	671
New Zealand	6 412	0.28	2 602	3 580	230
Norway	14 322	0.63	7 424	6 308	590
Poland	5 813	0.25	3 606	2 124	83
Portugal	2 028	0.09	966	981	81
Slovak Republic	1 035	0.05	642	386	7
Spain	36 587	1.60	19 481	14 722	2 384
Sweden	31 171	1.36	17 461	13 092	618
Switzerland	43 787	1.92	25 294	15 399	3 094
Turkey	5 834	0.26	2 862	2 840	132
United Kingdom	142 419	6.23	111 753	19 716	10 950
United States	1 006 570	44.06	433 772	509 958	62 840
OECD Total	2 079 857	91.05	1 111 840	860 987	107 030
Non OECD countries Total	204 567	8.95	52 296	143 131	9 140
Total	2 284 424	100.00	1 164 136	1 004 118	116 170

Source: OECD, based on Registry Monthly Reports

On a per capita basis the new unsponsored gTLDs have proven most popular in Switzerland (**Figure 7**). Next, in order of the greatest number of registrations per 100 inhabitants, were Germany, the Netherlands, Austria followed by the United States and Sweden. On the other hand, relatively little use of new unsponsored gTLDs is being made by users in Greece, Japan, Portugal, the Slovak Republic, Poland, Hungary, Turkey and Mexico.

Figure 7. The number of registrations per 100 inhabitants under new unsponsored gTLDs in OECD, December 2003
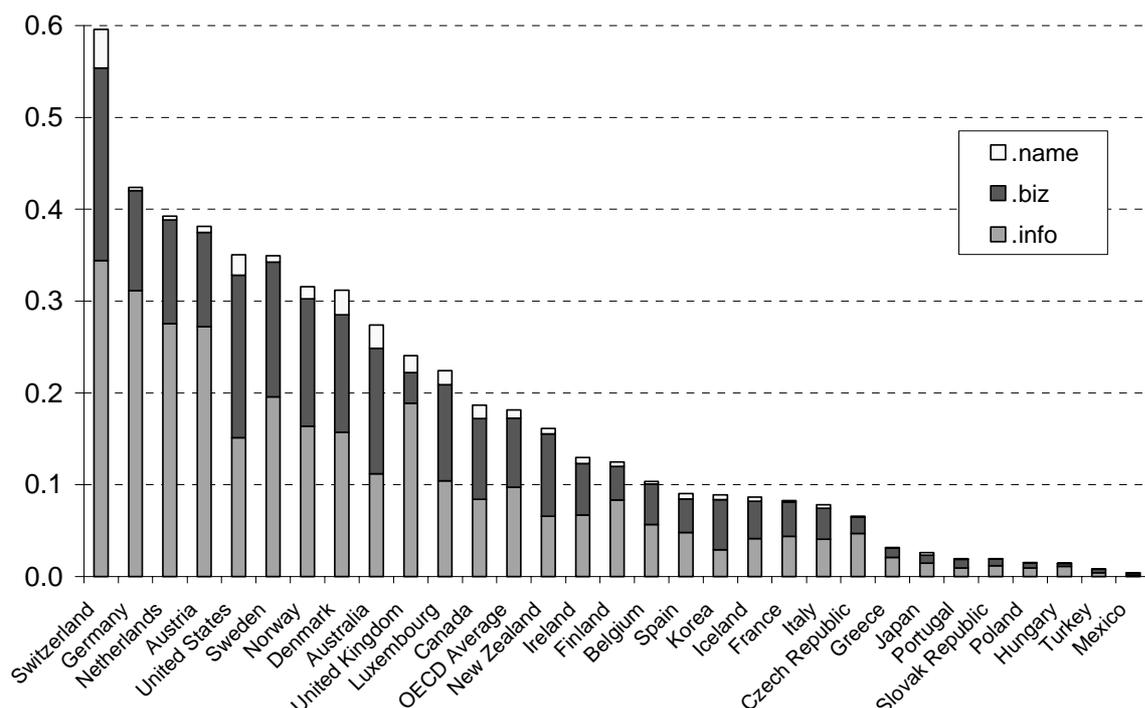
Source: OECD, based on Registry Monthly Reports.

There are, no doubt, many factors involved in why the new gTLDs are used in some countries more than others. Some of these would be related to the overall level of Internet access and use in any country. This is itself dependent on a myriad of economic and social factors. In this respect, the take-up of new gTLDs is not substantially different to the use of ccTLDs with one exception. The exception is the United States where for historical reasons the use of gTLDs, such as **.com**, **.net and .gov**, was much more common than the use of **.us**. By way of contrast, there is a reasonably good correlation between the take-up of ccTLDs and the take-up of new gTLDs if the data for the United States are excluded (**Figure 8**).

Figure 8. Correlation between new gTLDs registration and ccTLDs registration in OECD countries (except the United States), December 2003

new gTLDs registration per 100 inhabitants
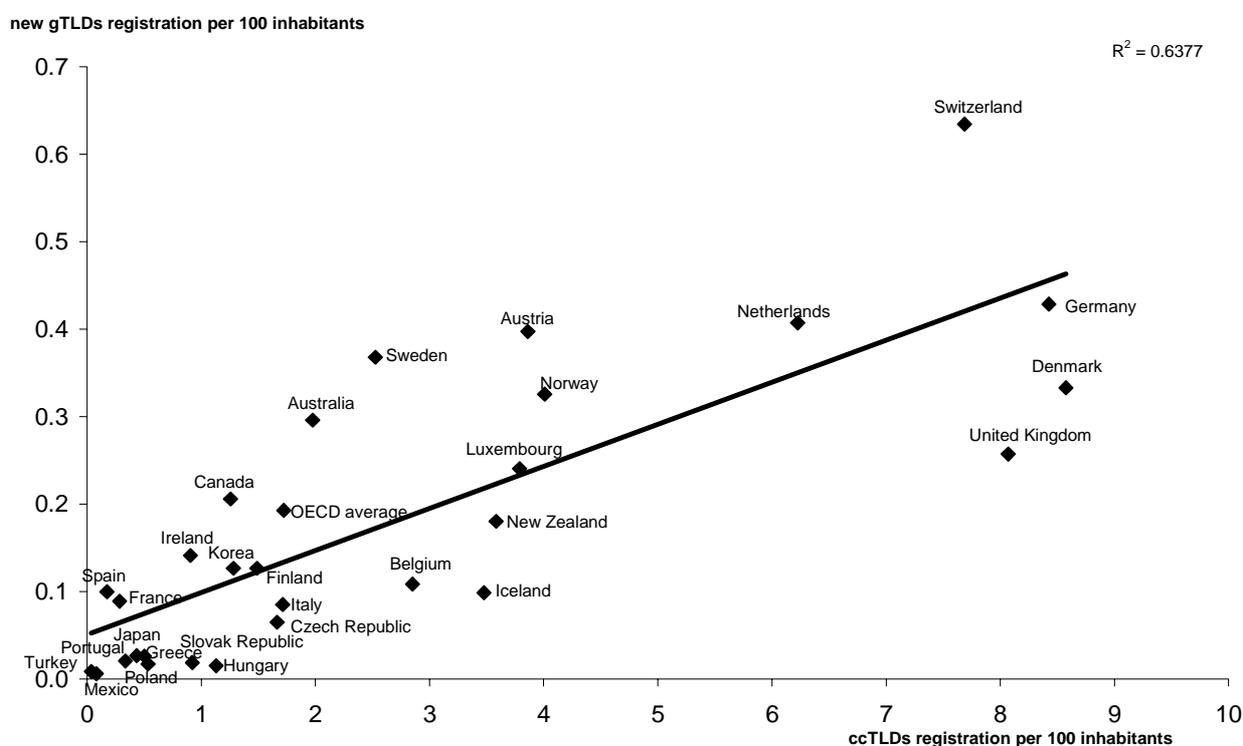
Source: OECD, based on Registries Monthly Reports.

The main question to address here, however, is whether there are factors particular to the new gTLDs that may shed light on why they are more popular in some countries than others. One such factor might be the introduction of IDN (International Domain Name) scripts by Registries. Afilias, for example, announced in September 2003 that it would be the first generic top-level domain (gTLD) registry to implement an ICANN-standards compliant internationalised domain name (IDN) solution with the launch of its first IDN product for **.info**. This included the opportunity to register **.info** names using the German script umlaut characters: "ä," "ö," and "ü". There is perhaps, therefore, a ready reason that Switzerland, Germany, the Netherlands and Austria have the highest take-up of **.info** names on a per capita basis. In these countries German is either one of the official languages or, in the case of the Netherlands, there are people with a high degree of fluency in German in some parts of the country. By early 2004, **.info** contained over 400 000 live Web sites, of which 33% were operated by registrants from Germany.[19] Another factor in the take-up of names across different countries may be related to the geographic location of registrars and their ability to market services to local users. A number of OECD countries do not have registrars, authorised to offer names such as **.biz** and **.info**, located in their country.

Impact of the introduction of new gTLDs

One indicator which can be used to assess the impact of new gTLDs is the trends in registration following their introduction. In total, the number of gTLDs has grown every year following the introduction of the new gTLDs (**Table 8**). On the other hand, there was a significant reduction in the number of registrations under the original gTLDs (**.com**, **.org**, **.net**) at the time of the introduction of the new gTLDs.

There was a decrease of around 3.3 million decrease in the number of registrations for **.com, .net** and **.org** in the first half of 2002 **(Table 9)**. The number of **.com** registrations during this period was especially hard hit, recording a reduction of nearly 2.2 million registrations. Several possible explanations exist. The most optimistic scenario would be that users who could not ascertain their preference under one of the original gTLDs transferred to a new gTLD. A more pessimistic explanation might be that the end of the so-called 'Internet bubble' led to a significant number of domain names being allowed to lapse. The introduction of new gTLDs showed that such a development was possible, a fact that speculators no doubt factored into their activities. Some speculators may have allowed a proportion of their registrations to lapse in response to a perceived lack of demand or decrease in scarcity. Speculators may have also shifted their focus to the new gTLDs prior to demand being tested in that market segment. In any event the primary and secondary market for **.com**, and the other traditional domains, proved to be resilient. Currently **.com** names still command the highest values followed by **.net**, some national domains and **.org**.[20]

The market for the original gTLDs registration had recovered within a year. The number of registrations under **.com** regained an increase in the later half of 2002 and has grown by more than a million per half year since that time.

Registrations under new gTLDs made steady increases, following their introduction, until the final quarter of 2003 **(Table 10)**. The proportion of new gTLDs registration among total gTLDs registration also grew steadily until the final quarter of 2003 **(Figure 9)**. At the end of 2003, new gTLDs accounted for around 6.5% of the total gTLDs registration. On the other hand, the number of registrations under **.info** and **.biz** decreased in December 2003. It is too early to conclude that new gTLDs have reached their peak as unofficial data indicated some growth in the first quarter of 2004. However it does raise the question of why the original gTLDs continued to grow at a time of a reduction in the number of registrations under new gTLDs. One explanation may be that a significant number of registrations, which had been made by speculators in the early period of availability, were allowed to lapse.

Table 8.   The number of gTLDs registrations in bi-annual time series

	Total	.com	.net	.org	.info	.biz	.name
July 2001	32 079 997	24 264 064	4 748 370	3 067 563			
Jan 2002	32 339 459	24 717 455	4 629 289	2 992 715			
July 2002	30 731 874	22 526 354	3 907 160	2 553 817	926 769	735 766	82 008
Jan 2003	32 402 140	23 662 001	4 060 182	2 674 286	1 049 839	858 945	96 887
July 2003	34 635 853	25 260 438	4 226 821	2 867 551	1 173 714	999 009	108 320
Dec 2003	36 851 022	27 035 869	4 515 550	3 015 179	1 164 136	1 004 118	116 170

Source: Registries, Monthly Reports and JPNIC.[21]

Table 9.   Changes in the number of gTLDs registrations in bi-annual time series

	Total	.com	.net	.org	.info	.biz	.name
Q3-Q4, 2001	259 462	453 391	-119 081	-74 848			
Q1-Q2, 2002	-1 607 585	-2 191 101	-722 129	-438 898	926 769	735 766	82 008
Q3-Q4, 2002	1 670 266	1 135 647	153 022	120 469	123 070	123 179	14 879
Q1-Q2, 2003	2 233 713	1 598 437	166 639	193 265	123 875	140 064	11 433
Q3-Q4, 2003	2 215 169	1 775 431	288 729	147 628	-9 578	5 109	7 850

Source: Registries Monthly Reports and JPNIC.

Table 10. Cumulative gTLDs registrations

		Total	.com	.net	.org	.info	.biz	.name
Year 2003	12	36 851 022	27 035 869	4 515 550	3 015 179	1 164 136	1 004 118	116 170
	11	36 521 052	26 651 923	4 452 568	2 991 675	1 213 191	1 096 627	115 068
	10	35 977 903	26 226 110	4 387 134	2 959 744	1 222 181	1 068 802	113 932
	9	35 462 035	25 852 646	4 325 628	2 927 646	1 196 822	1 046 515	112 778
	8	35 033 219	25 545 110	4 269 229	2 890 294	1 195 712	1 021 847	111 027
	7	34 635 853	25 260 438	4 226 821	2 867 551	1 173 714	999 009	108 320
	6	34 266 771	25 005 314	4 203 595	2 825 253	1 152 995	975 778	103 836
	5	34 069 275	24 879 300	4 232 823	2 768 109	1 133 348	953 438	102 257
	4	34 017 424	24 868 250	4 260 418	2 745 927	1 112 058	929 514	101 257
	3	33 737 836	24 683 006	4 229 807	2 728 701	1 091 919	903 716	100 687
	2	33 273 494	24 334 034	4 176 761	2 713 013	1 070 671	880 540	98 475
	1	32 402 140	23 662 001	4 060 182	2 674 286	1 049 839	858 945	96 887
Year 2002	12	31 825 484	23 238 807	3 990 407	2 636 501	1 028 932	835 853	94 984
	11	31 651 929	23 115 164	3 981 471	2 629 250	1 012 535	820 573	92 936
	10	31 330 580	22 875 654	3 966 570	2 609 691	993 417	800 658	84 590
	9	31 037 798	22 677 818	3 937 885	2 587 296	971 695	778 514	84 590
	8	30 777 878	22 500 901	3 917 903	2 567 793	950 159	756 532	84 590
	7	30 731 874	22 526 354	3 907 160	2 553 817	926 769	735 766	82 008
	6	30 567 639	22 463 110	3 903 076	2 542 023	868 162	713 431	77 837
	5	30 866 808	22 727 185	3 968 964	2 563 252	842 094	692 199	73114
	4	31 745 635	23 407 650	4 135 126	2 645 282	813 846	670 617	73 114
	3	32 295 245	24 333 734	4 341 853	2 755 885	795 207		68 566
	2	33 239 212	24 913 507	4 602 160	2 955 322	768 223		
	1	33 076 322	24 717 455	4 629 289	2 992 715	736 863		
Year 2001	12	32 141 940	24 428 417	4 654 443	3 059 080			
	11	32 101 518	24 374 280	4 668 671	3 058 567			
	10	32 444 080	24 559 508	4 764 815	3 119 757			
	9	32 485 742	24 570 758	4 789 586	3 125 398			
	8	32 350 291	24 471 176	4 777 327	3 101 788			
	7	32 079 997	24 264 064	4 748 370	3 067 563			
	6	32 018 302	24 260 267	4 719 498	3 038 537			
	5	31 798 174	24 090 297	4 699 770	3 008 107			

Source: Registries Monthly Reports and JPNIC.

**Figure 9. The proportion of new gTLDs (.info, .biz, .name) registrations among major gTLDs
(.com, .net, .org, .info, .biz, .name)**
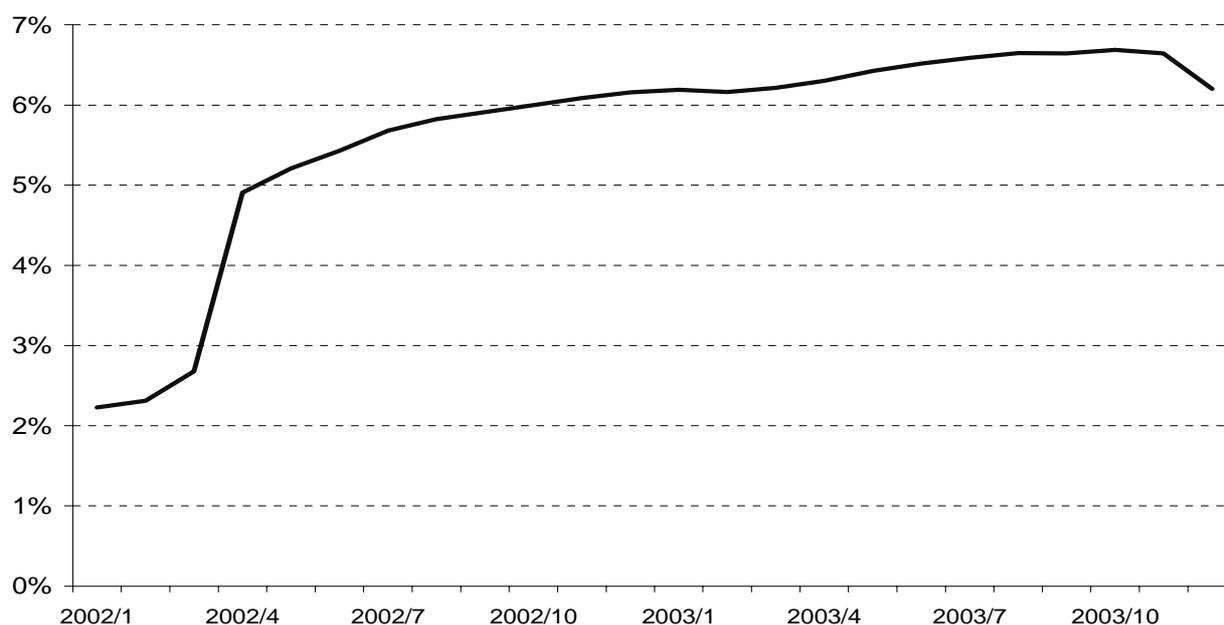
Source: OECD, based on Registries Monthly Reports

If unsponsored gTLD registry service is defined as a distinct market then VeriSign could be said to have had just under an 86% share at the end of 2003 (**Table 11**). This was down from 100% two years earlier. The major factor in reducing VeriSign's market share was the transfer of the **.org** registry to PIR which reduced VeriSign's share by just over 8%. New unsponsored gTLDs collectively hold a 6% market share.

In the short term the major factor that may impact on market share is the responsibility for the **.net** registry. The **.net** registry was responsible for just over 12% of all registrations under uTLDs at the end of 2003. The registry agreement between ICANN and VeriSign expires in June 2005. If VeriSign does not continue to be the **.net** registry its market share would be reduced to the equivalent number of registrations under **.com**. Even if this occurs, however, VeriSign's share of the registry services market will continue to be by far the largest in the market. One of the criteria ICANN has set for consideration in deciding the future of **.net** is the potential impact on competition in the gTLD market. In this context it is important to note that the use of **.net** has gone well beyond its original intended community and provides the alternative with the largest share of registrations next to **.com**.

Table 11. Market share of unsponsored gTLDs registrars (%)

		VeriSign			PIR	Afilias	NeuLevel	GNR
	Total	.com	.net	.org	.org	.info	.biz	.name
Jan, 2001	100.00	76.10	14.60	9.30	-	-	-	-
July, 2001	100.00	75.64	14.80	9.56	-	-	-	-
Jan, 2002	100.00	76.43	14.31	9.25	-	-	-	-
July, 2002	94.32	73.30	12.71	8.31	-	3.02	2.39	0.27
Jan, 2003	85.56	73.03	12.53	-	8.25	3.24	2.65	0.30
July, 2003	85.14	72.93	12.20	-	8.28	3.39	2.88	0.31
Dec, 2003	85.62	73.37	12.25	-	8.18	3.16	2.72	0.32

Source: OECD, based on Registries Monthly Reports

Trends in prices and services in the TLD market

Price trends

In September 1995, the United States National Science Foundation (NSF) authorised Network Solutions to begin charging USD 100 for registrations of second level domain names under **.com**, **.net** and **.org**.[22] The fee included a two year registration period making the annual fee equivalent to USD 50. The same sum, USD 50, was also fixed as the annual maintenance fee for renewal of registrations. NSF further stipulated that 30% of the total revenue collected through domain name registrations should be put into an interest-bearing account for the preservation and enhancement of the 'intellectual infrastructure' of the Internet. In other words the equivalent of a USD 15 annual 'tax' per domain name applied with a further USD 35 being retained by Network Solutions.

In April 1998, NSF and Network Solutions ended the Internet Intellectual Infrastructure Fund portion of domain name registration charges. This reduced the cost of registering a domain name under **.com**, **.net** and **.org** by 30% with the price being reduced from USD 50 to USD 35.[23] The next major change to gTLD pricing occurred following ICANN's reform of the gTLD market. The separation of the registry and registrar functions led to the creation of a registry price (*i.e.* wholesale) and registrar price (*i.e.* retail or in some cases a bundled value added service price). From 15 January 2000 onwards, registrars paid the gTLD registry non-refundable amounts of USD 6 for each annual increment of an initial domain name registration and USD 6 for each annual increment of a domain name re-registration.[24] From then on, registrars were free to set their own retail price.

In the four years following the introduction of competition there have been significant retail price reductions in the gTLD market. ICANN says its reforms have lowered domain name prices by up to 80%.[25] A domain name that would have cost USD 35 at the beginning of 2000 could be registered for less than USD 6 by 2004 (**Table 12**). In March 2004, among the lowest prices was 1&1 Internet's registration service, priced at USD 5.95 per annum, for all gTLDs. This price, below the USD 6 maximum which may be charged by the registry (*e.g.* VeriSign in the case of **.com**), might be viewed as a 'loss leader'. 1&1 Internet's pricing strategy would appear to involve registering domain names at below, or near to, the cost charged by the registry with a view to making a profit on other services (*e.g.* Web hosting or e-mail services associated with that domain).

In 2004 the price of gTLDs could vary depending on a number of factors. Some registrars, for example, offered discounts from their annual fee if customers were prepared to commit to longer term registrations. Network Solutions charged USD 34.99 per annum for a one year gTLD registration. Registrants could get discounted rates, however, if they registered domain names for a longer term with Network Solutions. For example, a 10 year registration was priced at USD 14.99 per annum, which was about 60% lower than annual registration fee with a one year term. Tucows, a registrar located in Canada, offered discounts of 10% to 30% for longer term registration. Register.com also had an incremental reduction according to the length of the registration period and it provided around a 15% discount per annum for a 10 year registration compared to a one year registration. Tucows had three different registration plans with different charges, as discussed in a following section.

Among the larger gTLDs registrars, Go Daddy Software had one of the lowest rates for gTLDs registrations. In March 2004, Go Daddy Software charged USD 8.95 per annum for gTLDs registrations, which was about 75% lower than the standard gTLDs registration fee of Network Solutions. At the time of writing, registrations under **.com**, **.info** and **.biz** were on promotion sales and the **.com** registration cost USD 7.95 per annum. A further discount was available if a **.com** domain name were registered for ten years.

Worthy of note is that Go Daddy is the only registrar, among those with the largest market share, which varies the price of registration depending on which gTLD is being used. A Go Daddy registration under **.info** was priced at USD 6.95 per annum and **.biz** was priced at USD 4.95 per annum. The **.biz** registration fee is 45% lower than the **.net** and **.org** registration fee. One contributing factor may be ICANN setting a lower maximum fee which can be charged by the **.biz** registry (NeuLevel) and the **.info** registry (Afilias). The maximum price paid by a registrar to the registry for **.info**, under the agreement between ICANN and Afilias, is USD 5.75.[26] In addition volume discounts exist under **.biz**. The maximum price a registrar pays to the NeuLevel is USD 5.30 for all domain names registered up to 4.99 million, USD 5 for all domain names registered between 5 million and 9.99 million and USD 4.75 for all domain names registered which exceed 10 million.[27]

Another interesting element in terms of Go Daddy's pricing is the membership discount programme for domain name registration. Go Daddy offers this programme through another ICANN accredited registrar, Blue Razor, with a membership fee of USD 19.95 per year. By subscribing to this programme with the annual fee of USD 19.95, members can register a **.com** domain name for USD 6.85 per year. As well as membership discounts on domain name registration, members can subscribe additional services such as private registrations with discounted rates. For example, private registration is offered with a 50% discounted rate from the regular rate provided by Go Daddy.[28]

ICANN estimates that price reductions brought about by competition have saved consumers and businesses over USD 1 billion annually in domain registration fees.[29] While this seems a reasonable estimate it is hard to be specific without knowing the proportion of customers taking advantage of discounts for registration services with longer duration. At the same time, not all registrars have discounts. In 2004 Melbourne IT, a large non-US registrar located in Australia, charged USD 35 for one year registration of gTLDs and there was no discount for a longer term registration under any of the gTLDs. At the same time if users do not sign up for longer term commitments, at registrars such as Network Solutions and Register.com, they essentially pay the same price they paid prior to ICANN's reforms.

Some registries may be able to charge higher prices in the gTLD market because of the customer relationships they have built in other markets (*e.g.* the **.au** ccTLD in the case of Melbourne IT). In other cases customers may be happy to be able to have longer term registrations with trusted brands with significant discounts over previous prices. In that sense few customers may pay the standard price which is kept only to promote the discounted price. On the other hand, it may be the case that some customers are not sensitive to the price or believe that the transaction cost would be higher than the potential savings if they shifted their registration to a less expensive supplier.

As in any open market it is up to users to look for the service that best suits their needs. For users most concerned with cost, the outcome of ICANN's reforms is that gTLDs can be obtained for very inexpensive prices. At the same time, for users more concerned with other aspects of service, tremendous innovation has been brought about by competition. Where services are bundled together with domain name registration this needs to be taken into account in making price comparisons.

**Table 12. Domain name registration fees under .COM, .NET, .ORG, .INFO, .BIZ
among leading gTLDs registrars, March 2004 (in USD per annum)**

Duration of the registration		1 year	2 year	3 year	5 year	10 year
Network Solutions	All gTLDs	34.99	34.99	24.99	19.99	14.99
DomainsDirect (TuCows)	Domain Parking Account	14.99	12.49	12.00	12.00	12.00
	Personal Identity Account	34.99	30.00	-	24.00	24.00
Go Daddy Software(1)	.com	7.95	7.95	7.95	7.95	6.95
	.net, .org	8.95	8.95	8.95	8.95	8.95
	.info	6.95	6.95	6.95	6.95	6.95
	.biz	4.95	4.95	4.95	4.95	4.95
Register.com	.com, .net, .org	35.00	35.00	35.00	30.00	29.90
	.info, .biz	-	35.00	35.00	30.00	29.90
eNom.com	All gTLDs	29.95	29.95	29.95	29.95	29.95
Melbourne IT	All gTLDs	35.00	35.00	35.00	35.00	35.00
1&1 Internet	All gTLDs	5.95	5.95	5.95	5.95	5.95

Go Daddy's rates are promotional rates.

Source: OECD.

New registrar services

Traditionally, the registration of domain names was a one dimensional service. The opening of the gTLD registrar market has, however, brought tremendous innovation in terms of new services and seamlessly linking value added services to domain name registration. There are several examples of new services brought about by competition. One example is the private registration of domain names.

Network Solutions, Go Daddy Software and eNom all offer a private registration. The service works this way. For an additional fee the Registrar will act as a proxy for the registrant in terms of the 'Whois? database'. Network Solutions offers this service with the lowest annual fee, of USD 5, among major registrars. The same service from Go Daddy was charged at USD 12 per annum (USD 9 per annum as a promotional offer at the time of writing). The advantage advertised to users is that their contact details are not revealed in the 'Whois?' database where they might, for example, be obtained by spammers. Another example of a service which has been pioneered by Registrars, is the 'backordering' of domain names. In this case, Registrars will try to obtain an already registered second level domain name should the existing registration lapse.

The leading registries all commonly offer value added services that seamlessly link a domain name to other Internet services. The most common additional service is Web hosting. The largest registrars all provide Web hosting services aimed at small business users and consumers (**Table 13**). Some registrars also provide Web creation services by providing tools or professional assistance. A Web site creation package provided by Network Solutions including a 5-page Web site, 2 e-mail boxes and Web hosting is priced at USD 11.50 per month. Users can also register domain names and instantly receive e-mail accounts with the use of their own second level domain. Tucows, via resellers such as DomainsDirect for example, enables users to have an e-mail address associated with their registered domain name and to have a domain forwarding service. Services such as Web hosting and e-mail were, of course, available prior to the opening up of the domain name market. They were, however, generally not seamlessly linked to domain name registration in such a way as to enhance competition across a range of services. The ability to easily transfer a domain name between registrars has further contributed to this increase in competition.

Registrars, with their large databases of customers, have also entered other markets with aggressive price cutting. Go Daddy and 1&1 Internet entered the Secure Socket Layer (SSL) certificate market in March 2004. Netcraft, a company that monitors the SSL market noted at the time that both registrars appear poised to have an impact on pricing and market share. Netcraft stated, in April 2004, "Both companies are selling 128-bit certificates for USD 49.95. Go Daddy priced its certificates at USD 89.95 upon the March 8 launch of its SSL service, but has since dropped its price to USD 49.95 – well below comparable products from GeoTrust (USD 149 a year) and VeriSign (USD 199 to USD 349 a year and up)."[30] Companies such as Go Daddy are also making SSL certificate services available to their resellers of domain name services. Accordingly, it can be concluded that ICANN reforms to the domain names services market have assisted the growth of competition in adjacent markets.

Table 13. Some examples of additional services offered by the largest gTLDs registrars

Network Solutions	Domain Forwarding, Web Hosting, Web Page Creation, Private Registration
DomainsDirect (Tucows)	Domain Forwarding, Web Hosting, Web Creation, Bulk Registration
Go Daddy Software	Domain Forwarding, Web Hosting, Web Page Creation, Private Registration, Bulk Registration, Back Order Domains
Register.com	Web Hosting, Web Page Creation
eNom	Web Hosting, Private Registration
Melbourne IT	Domain Forwarding, Web Hosting, Web Page Creation
1&1 Internet	Domain Forwarding, Web Hosting, Web Page Creation, Personal e-mail based on user's domain

Source: OECD.

Table 14. The price of additional services offered by major gTLDs registrars (in USD)

	Domain transfer	Private registration
Network Solutions	19.00	5.00 per annum
Tucows	14.99	Not available
Go Daddy Software	7.95	9.00 per annum(1)
Register.com	39.99	Not available
eNom	29.95	8.00 per annum
Melbourne IT	35.00(2)	Not available

Notes:

(1) This is a promotional price. The regular price is USD 12 per annum.
(2) Includes an additional one year of registration.

Source: OECD.

Demand for new gTLDs

One of the issues raised in association with any discussion of new gTLDs is the likely demand for additional names and whether the potential benefits will outweigh the potential costs. The pros and cons of adding new domain names to the root are summarised below. Before looking at these it is worth reviewing the experience to date with new gTLDs. By the end of 2003 there were just fewer than 2.3 million registrations under **.info**, **.biz** and **.name**. This suggests there is some demand for new gTLDs. It has, however, fallen well short of projections (**Box 1**). Moreover, where businesses engage in so-called

defensive registrations these data considerably overstate the real demand. The available evidence also indicates a considerable proportion of registrations, under the new gTLDs, have been made by traffic aggregators and speculators.

The number of domains registered under **.biz** and **.info** actually declined in the final part of 2003. In December 2003, registrations under **.biz** declined by just over 90 000. Registrations under **.info** declined in both November 2003 and December 2003 by more than 50 000. By way of contrast, registrations under the traditional gTLDs (**.com**, **.net** and **.org**) continued to increase. The combined impact of both these trends was that new gTLDs sharply fell in proportion to total gTLDs. This raises the question of why this occurred and why **.biz** seems to have been hit harder than **.info**.

The most likely reason for the fall off in the number of domains under **.biz** and **.info** is speculators failing to renew names. This suggests that these speculators over estimated the demand for names under the new gTLDs or were not good at predicting what names would be in demand. A counterbalancing trend, in the case of **.info,** may have been the development towards international domain names at the second level which had yet to occur under **.biz**.

While the official data were only available to the end of 2003 at the time of writing, indications from other sources suggest **.info** continued to lose market share in January 2004 before witnessing an increase in February 2004. At the same time **.biz** appears to have stabilised losses in January 2004 and grown in February 2004. This was at a time when registrations under the original gTLDs continued to grow. These data underscore the challenges facing new gTLDs in winning market acceptance.

The role of cyber-squatters, speculators and traffic aggregators needs to be carefully considered in assessing the demand for new domain names. The cyber-squatter phenomenon is well known and has been the subject of extensive work by WIPO. Domain name speculation on generic words, not subject to trademarks, or three and four letter strings of letters is also well recorded. Perhaps less well known is the role that so-called traffic aggregators play in the economics of domain name speculation.

The original 'business model' for cyber-squatting was relatively simple. Cyber-squatters would register names associated with business or social activities of other entities, with no intention to use them other than in reselling the names at a higher price than they paid. In some cases this also involved creating a Website with content designed to 'blackmail' the entity associated with that name into purchasing that name (*i.e.* the entity would not have otherwise cared if the registration had lain dormant).[31] Speculators, on the other hand, register domain names that may or may not be associated with trademarks with the intent of selling them at a higher price. By June 2001, the owners of the site "DomainCollection.com" had registered over 600 000 domain names which were available for resale.[32] From both these areas of domain name registration a further category of registrant emerged in the secondary market for domain names.

Traffic aggregators not only speculate in domain names but provide a source of revenue for speculators and cyber-squatters. The business model works along the following lines. Traffic aggregators enable anyone with a domain name they are not using to 'park' that domain with them. If a user types or mistypes a domain name which has been parked, they are shown or redirected to a Website which is generally presented in the form of a directory. The traffic aggregators, in turn, sell paid links to businesses or space to advertisers. The owner of the domain name, in turn, receives a payment every time a user 'clicks through' to the entity paying for the link. Advertised returns for 'click-throughs' range from USD 0.02 to USD 1.80.[33]

In some cases speculators or traffic aggregators register generic names that they believe may generate traffic to their Websites. In other cases they register names that are identical or closely resemble the names of other sites that are well known or generate significant traffic in their own right. For example, if a user

attempting to reach the OECD's Website (www.oecd.org) typed instead www.oecd.net, which is not registered by the OECD, they would be led to a traffic aggregation Website. A common practice, as in this instance, is for an initial Website to be presented with links or language targeted toward keywords or geography. If the user then moves to another Website, a pop-up window will offer further directory options, the opportunity to set the page as a home page or download other content or software.

One further aspect of the traffic aggregation model is important to understanding trends in domain name registration. Registrants aiming to make money from traffic aggregation closely follow the expiry dates of existing registrations. They target high traffic sites in the hope that the existing registrant will not renew their registration. Accordingly, if, due to an oversight, for example, the existing registrant failed to renew their domain name the speculator registers the name. The intent is to park the domain and earn revenue from traffic aggregation for the time the domain rests in the hands of the new registrant. If the previous registrant is willing to pay to retrieve the name, that presents an additional source of revenue.

As the annual cost of domain names has fallen from USD 35 to below USD 6, the number of 'click-throughs' needed to generate a profit is relatively small particularly where links are targeted towards the previous registrant's area of economic or social activity. Even at a rate, such as USD 0.02 per click-through, the cost of annual registration can be covered with one click-through per day.

A further difficulty in assessing the demand for new gTLDs is the practice of defensive registrations. To prevent the fraudulent or abusive use of names associated with their area of economic or social activity many entities make defensive registrations. Businesses, for example, will commonly register trademarks across all new gTLDs irrespective of whether they intend to use the name simply to prevent abusive or fraudulent registrations. In many cases businesses will either not use such a registration or apply a redirect to their existing Website.

There are few data available to inform the question of what proportion of names under new gTLDs represent defensive registrations. At the time of writing ICANN is undertaking its own study to inform this question. A previous study of registrations under **.biz** carried out in 2002, and therefore relatively early in the evolution of a new domain name, found:

> "Comparison of registrants of **.biz** and **.com** domains has shown that approximately 25% of **.biz** domains are likely registered by the same organization that holds the corresponding **.com** domain. Further inspection of these names shows that the overwhelming majority are not being put to active use. Accordingly, we conclude that these domains are, by and large, "defensive" registrations, for which the registrants pay their respective registrars only to prevent other would-be registrants from using the names."[34]

The foregoing practices of cyber-squatting, domain name speculation, traffic aggregation and defensive registrations make it difficult to assess the demand for new domain names which results from registrants wanting names for new and unique Internet applications (*e.g.* Websites, e-mail). Some data are available from Afilias. Towards the end of 2002, as **.info** reached 1 million registrations, Afilias stated:

> "Of all the new TLDs, **.info** also boasts the highest percentage of active sites – close to 70% – as well as the largest number of live, dedicated Web sites that encompass 27% of its registrations and approaches **.com**'s 35%."[35]

By April 2004, the Afilias Website contained the statement that over two thirds of **.info** Websites were active, including over 400 000 live, unique sites. Active registrations include dedicated Websites, and password protected pages but also redirects to other Websites and 'parked pages'.[36] All that can be determined from these data are that there are a significant number of Websites under **.info**. This would

include unique websites as well as those of speculators and traffic aggregators. There also appears to be a significant proportion of names that are either used for purposes other than the World Wide Web (*e.g.* e-mail), defensive registrations or those that are simply not used.

Cyveillance undertakes surveys by crawling more than 40 million registered domain names to determine the proportion that are in use on the World Wide Web. The survey splits the results into three categories of domain names. Where a registered domain is an accessible site, with unique content, they are counted as live domains. Parked domains consist of a placeholder page usually provided by a registrar while domains that generate an error message are counted under a third category. In March 2003 the traditional domains (**.com**, **.net** and **.org**) recorded the highest proportion of live domains (Table 15). The **.biz** and **.info** domains had significantly more parked pages. The latter two domains also had a higher proportion of redirects to sites under other domain names.

Table 15. Registered domains in use, (March 2003)

	Live (%)	Parked (%)	Error (%)	Proportion of live domains which redirect to other sites (%) (October 2003)
.com	54.1	11.8	34.1	11.4
.org	51.3	8.4	40.3	11.0
.net	46.9	9.1	44.0	13.0
.info	39.8	19.5	40.6	13.6
ccTLDs	39.2	8.4	52.4	..
.biz	36.6	19.7	43.6	14.3
.name	26.5	0.2	73.3	..

Source: Cyveillance (www.cyveillance.com).

One further consideration in respect to the geographical location of registration deserves to be noted. New gTLDs, as has been discussed earlier, are more popular in some countries than others. Where this is the result of a new service associated with that gTLD, such as with international domain names, there is clearly a benefit produced by meeting previously unmet demand. In these cases if business users need to register names under new domains the benefits may well outweigh the costs, in terms of reaching new markets or better serving customers. At the same time additional domains may allow separate businesses with equally valid claims to a particular name to register names. This latter point can be related to geography in that business users in some countries may have joined the Internet well in advance of businesses in another country. Afilias, for example, report that the largest share of registrations under **.info** are made from Europe. As other countries develop greater Internet access, and new international domain name character recognition further develops, increasing demand for new gTLDs might be expected.

Box 1.   The challenges of forecasting demand

As part of the comparative selection procedure ICANN invited all prospective registries to project the likely demand for their proposed gTLD, after four years of operation. This process was undertaken in mid 2000. No registry has, at the time of writing, been in operation for four years. The earliest registry to launch was Afilias, with an initial release of **.info,** in July 2001. Sunrise periods, however, mean that the initial release does not represent the full launch. An alternative indicator for when registries began offering services is the date of their first report to ICANN (**Table 16**). This shows that most registries had been in operation for less than two years by December 2003.

An assessment of the projections for the demand for new gTLDs, against experience to date, would suggest that most are unlikely to meet their forecasts. The registry which has performed best, against their projection of likely demand, is NeuLevel. By December 2003, Neulevel had registered the equivalent of 26% of their projected demand for domain names under **.biz**. No other registry had reached more than 7% of their projected demand. Some caveats need to be mentioned. The progress of Afilias and SITA, registries which initially projected demand for **.web and .air,** is measured against .**info** and **.aero**. That being said, the data indicate that demand, to date, has fallen seriously short of the projections of most prospective registries. In two cases registries have only reached 1% of their targets.

The reasons that demand has fallen well short of projected levels may be numerous. Prospective registries, for example, may have underestimated the challenges involved in winning market acceptance for new gTLDs. On the other hand there may simply be very little demand for certain types of gTLDs. The projections for demand by individuals for personal domain names, by all prospective registries in that space, seem to have mostly widely exceeded real demand. In one case a prospective registry projected they would register 76 million personal names in the first four years of operation. The fact that these projections were made during the 'Internet Bubble' undoubtedly contributed to projections vastly overstating likely demand. Smaller registries may also have over estimated the extent to which registrars would be interested in promoting their name given the low volume or restricted nature of sTLDs.

There is, however, one other possible reading of these projections. The new TLDs were allocated on the basis of a comparative selection procedure. In such a procedure prospective candidates have an incentive to show their proposals in the best possible light. If the criteria for being selected are to serve a widespread need, provide effective competition and so forth there may be an incentive to provide an optimistic projection for demand. By way of contrast, an auction forces participants to reveal their valuation of the size of the market through their bids. An auction would not have guaranteed an accurate forecast of demand, particularly in a 'financial bubble', but it would have forced firms to reveal their expected demand.

For its part, ICANN's assessment team appears to have given greater credence to those firms that forecast financial losses for general purpose gTLDs during the first four years of service, than to their projected registrations. The thinking being that firms projecting financial losses were demonstrating a realistic commitment to competing, over the long term, with the established register for **.com** and **.net**. But even here the onus of expertise is placed on the assessors rather than on the prospective registries where the greatest knowledge should reside in respect to forecast demand and the efficiency of the firm.

Table 16. Projected and actual demand for new gTLDs

	Proposed name	Projected registrations after 4 years	Actual registrations by Dec-2003 and progress to date (percent of projection)		First report to ICANN following launch
Afilias (*)	.web (.info)	16 200 000	1 116 136	7%	January 2002
JVTeam, LLC (NeuLevel)	.biz	3 850 000	1 004 118	26%	April 2002
The Global Name Registry, Limited	.name	14 100 000	116 170	1%	March 2002
RegistryPro	.pro	4 300 000	...	…	Yet to Launch
Sponsored TLDs					
Cooperative League of the USA	.coop	155 300	7 852	5%	April 2002
Société Internationale de Télécommunications Aéronautiques (*)	.air (.aero)	66 000 to 181 000	3840	6%	April-June 2002
Museum Domain Management Association	.museum	30 000	267	1%	April-June 2002
Other Proposed new gTLDs by category that were not accepted					
KDD Internet Solutions Co., Ltd.	.biz	21 100 000			
iDomains, Inc.	.biz	12 000 000			
NeuStar, Inc.	.web	11 100 000			
Image Online Design, Inc.	.web	3 800 000			
Personal Proposed gTLDs					
Sarnoff Corporation	.i	76 000 000			
JVTeam, LLC (NeuLevel)	.per	12 600 000			
CORE Internet Council of Registrars	.nom	5 300 000			
Special Purpose Proposed gTLDs					
International Confederation of Free Trade Unions	.union	46 300			
Restricted Content Proposed gTLDs					
Blueberry Hill Communications, Inc.	.kids	12 660 000			
KIDS Domains, Inc.	.kids	3 900 000			
ICM Registry, Inc.	.xxx	1 200 000			
New Services Proposed gTLDs					
Telnic Limited	.tel	11 700 000			
Group One Registry	.one	10 000 000			
Pulver/Peek/Marschel	.tel	9 600 000			
Number.tel, LLC	.tel	2 600 000			

(*) Afilias and SITA projections were for their first choice strings. They subsequently launched their preferred alternative strings of .info and .aero.
Source: OECD, based on ICANN Data.

The Pros and Cons of new Domain Names

There are a range of views among the Internet community, business users, governments, civil society and the 'domain name industry' on the issue of new sTLDs and unsponsored gTLDs. The advocates of new domain names say they will lead to greater choice for users and open up options for users that have recently joined the Internet community or will do so in the future. Advocates of new domain names also say they will lead to greater competition and allow the market to have a greater say in meeting demand. They also contend that new services can be facilitated by the introduction of new domain names. On the other side of the debate are many of the existing users of domain names. For them the cost of defensive registrations, to protect names associated with their business from uses which might range from abusive to fraudulent, outweighs the benefits which might otherwise be available.

Disadvantages of new generic Top Level Domain names

The strongest argument for not creating new domain names is the cost to business users of defensive registrations. It is difficult to quantify what this might be but some of the major elements can be specified. The cost of a single registration under a gTLD, with prices starting as low as USD 4.95 per annum, is unlikely to be the major consideration for business users. It is true that many businesses register multiple domains and this may be a consideration depending on the number they want to register. More likely, however, the largest cost consideration for business users is the administrative and legal costs of managing an increased portfolio of domain names. In some cases this may be substantial.

Business users recognise that competition among registrars has driven down prices but they are so low that any potential new price reductions may not be a consideration. In fact, some business users may prefer higher fees to discourage speculation. More to the point, expanding the number of gTLDs may create new registries but not impact greatly on end user prices. This is because the prices registries charge to registrars are determined by ICANN. Many registrars are already offering retail prices at or near to the maximum prices set by ICANN which the registries can charge the registrars. More registries, and therefore more competition, may enable ICANN to adopt lighter price controls with, for example, start-up registries. On the other hand it is important to note that each registry essentially has a monopoly for the TLD for which it has responsibility. Here it must be remembered that a domain name under a gTLD, such as **.com,** may be worth many millions of dollars to the company concerned. This means that it largely irrelevant to a business user how many alternative domain names exist, in terms of their ability to shift to a new name. Due to the investment in their existing domain they would be captive to the impact of any price increase, by a registry to a registrar, if ICANN did not set the maximum wholesale price.

Business concerns may be addressed by mechanisms such as 'sunrise periods' where trademark owners can lodge pre-registration requests for their existing domain names under new gTLDs. There might also be other mechanisms that might be favoured by economists but may or may not be welcomed by the business community. One example could be the use of Dutch auctions with initial prices set high enough to discourage speculators but low enough to ensure those most valuing the name can obtain it. But the use of Dutch auctions would only be practical with a relatively limited number of names being created.

The major disadvantage for business users, under all these options, is that costs may increase proportionally, up to a certain point, with the number of new gTLDs created. Beyond that point, however, no costs might be incurred as business would not, in fact, register under any of the new domains. This is either because the cost becomes prohibitive or it ceases to matter if huge numbers of new gTLDs are created. No-one can say with any certainty what that point may be. Nor can they determine whether the domain name market could be large enough to reach that point, even if the possibility to create new gTLDs was left wholly to the market.

One further consideration is worth noting. One of the primary concerns of business users of domain names is to protect their customers from fraudulent use of names associated with their business. In some instances business users may have already reached the point where they will not contest all names containing their trademark as part of a string. Placing a well known brand name, as a key word, into a "Whois?" search engine will commonly result in more than several thousand registrations.[37] In many cases firms will only seek to take action against registrants creating Websites that are misleading or fraudulent or using e-mail in the same manner. This appears to be evident from the number of cases brought before the Uniform Domain Name Dispute Resolution Policy (UDRP) system established by WIPO, which have been decreasing (**Table 17**). Notably this has occurred at a time of expansion in the number of gTLDs. Some attribute this decrease to sunrise periods or other measures adopted by new gTLDs.[38]

It is worth noting that in 2003 the number of challenges involving names under **.biz** and **.info** halved from the previous year. In the first half of 2004 there appears to have been a significant further reduction. Indeed, there were only three UDRP challenges for **.biz** from the beginning of 2004 until 7 June 2004 (Table 18). One notable difference between **info** and **.biz** is that the latter is intended for business and commercial users whereas **.info** is open to all registrants. As a result of this policy there is additional challenge procedure available for registrations under **.biz**. The "Restrictions Dispute Resolution Policy" (RDRP) for .**biz** is exclusive to that gTLD. The RDRP is used to resolve disputes between domain name registrants and third parties asserting that the disputed domain name has been registered in violation of the **.biz** registration restrictions. Registrations under **.biz** must be used or intended to be used primarily for bona fide business or commercial purposes.[39]

Overall the question of whether a tipping point may one day be reached, in terms of firms not engaging in defensive registrations, is an open one. The data do indicate a trend toward less challenges under UDRP processes even at the time of the introduction of new gTLDs. That being said, if users stop challenging infringement of their trademark, a court might see this as being passive in defending that trademark and as a consequence, count that against the company for any particular case in the future. On the other hand, the court would most likely also consider the reasonableness of defending all potential cases if the number of gTLDs is expanded.

Table 17. Number of cases involving gTLDs brought before the UDRP Process

	1999	2000	2001	2002	2003
gTLD UDRP Cases	1	1 841	1 506	1 181	1 053

Source: WIPO.[40]

Table 18. Number of domain names challenged, involving individual gTLD names, before the URDP Process

	.com	.net	.org	.info	.biz	Total
Number of names (2002)	1466	235	123	115	74	2013
Percent of Total	72.83%	11.67%	6.11%	5.71%	3.68%	
Number of Names (2003)	1378	177	84	50	33	1722
Percent of Total	80.02%	10.28%	4.88%	2.90%	1.92%	
Number of Names (January-June 7th 2004)	673	54	33	18	9	788
Percent of Total	85.53%	6.85%	4.91%	2.28%	1.14%	

Note: Some cases involve more than one gTLD in the same case or multiple names under the same gTLD. In other words some cases involve more than one domain name. The data shown here are by the number of names rather than the number of cases as in Table 17.
Source: OECD, based on WIPO.

Advantages of new generic Top Level Domain names

One of the strongest arguments for opening the market to a greater number of new gTLDs is for entities wanting to create new services which they believe can be best facilitated by using new gTLDs or sTLDs. In ICANN's first round of new gTLDs 'service specific' proposals were not among the successful candidates. That being said new services have emerged under some of the new gTLDs. One example of a new service, to date, is the fostering of international domain names under **.info**. Another is the potential use of **.aero** in connection with flight and airport information. A prototype service was piloted from October to November 2003 in Geneva. Users could type in their flight number, expressed as a **.aero** URL and directly access the information pertaining to the flight number entered. Examples included: http://BA723.aero or http://LX1751.aero.

A number of the sTLDs nominated for ICANN's consideration in 2004 propose to offer new services. All these services could seemingly be operated at the second level but the prospective registries clearly believe that they would be best facilitated with a TLD. For the proponents of such names a TLD appears to represent a superior marketing tool rather than being a technological imperative.[41] Importantly, many of the traditional opponents of new TLDs may be among the largest beneficiaries of these services. One example might be business use of the proposed sTLD aimed at facilitating the creation of content sites specific for mobile devices or the proposed service with spam free e-mail. It must also be said that there is opposition in some parts of the Internet community to service or terminal specific gTLDs.[42]

While ccTLDs provide an alternative to the limited number of gTLDs, there is a good argument for saying that equity is not well served by a first come, first served process, if the domain name system is characterised by scarcity. As an increasing number of countries, outside developed countries, increase Internet access and develop greater Internet capabilities equity may be best served by also creating opportunities for users in those countries to register names under new gTLDs.

It might be argued that by opening up a wider variety of gTLDs greater competition will be provided to ccTLDs. The proposed **.asia,** if approved, would provide a new option for users of ccTLDs in that region.[43] The already approved **.eu** will provide an alternative to ccTLDs in Europe. On the other hand, some registries may see names such as **.asia**, as complementary to their businesses rather than competitive. Most of the ccTLD registries in the Asian region welcome the creation of **.asia** and have signed letters of intent to join the DotAsia sponsoring organisation.[44]

Some ccTLDs are clearly aimed at global markets or specific market segments in developed countries such as **.cc** (Coco's Keeling Islands) and **.tv** (Tuvalu). The **.la** domain, for example, is the country code for Laos but is marketed to users in Los Angeles.[45] In addition to these two domains, Network Solutions markets **.ws** (Western Samoa), **bz** (Belize), **.ms** (Monserat), **.gs** (South Georgia & South Sandwich Islands) **.vg** (British Virgin Islands), **.tc** (Turks & Caicos Islands). In the case of **.tv,** second level domain names such as news.tv are offered at prices up to USD 1 million per name.[46] The **.tv** registry also offers single letter names and single numbers which are not available under traditional gTLDs. Second level registrations, such as h.tv and k.tv or 2.tv and 7.tv, are available for registration for USD 10 000.

Apart from the ccTLDs aimed at global markets some appear to be offering services to market segments targeted by sTLDs. One example is **.pw** (Palau) which appears to be aimed at shared communities. The **.pw** registry markets itself as the 'personal Web' domain rather than as a country code for Palau.[47] Other examples are domains that might be associated with particular services such as **.md**. In the case of **.md,** users in Moldova can register a name, for USD 59 per annum, through a state-owned company. An alternative company markets **.md** to the global healthcare industry with prices ranging from USD 200 to USD 300 per annum from some registrars.[48] Given that an increasing number of ccTLDs are targeting specific market segments there may be benefits in providing greater competition from new

gTLDs. The World Health Organisation (WHO), for example, has proposed **.health**.[49] While the WHO's proposal is not primarily about providing competition it could, in fact, have that impact for any TLDs aimed specifically at the healthcare industry.[50] The domain **med.pro** may also provide competition in this area.

While many business users are opposed to the creation of new gTLDs where the cost of defensive registrations would outweigh the potential benefits, there is also support amongst business for some new names where new business opportunities are envisioned. Support can be found among businesses as users and among businesses proposing names. The proposed **.asia** domain has the support, for example, of the Hong Kong Telecommunication Users Group.[51] Entities proposing the **.mobi** domain include the GSM Association, '3', HP, Microsoft, Nokia, Orange, Samsung, Sun, Telecom Italia, T-Mobile, and Vodafone.

ALLOCATION MECHANISMS FOR GENERIC TLDS

The decision on whether new sponsored and unsponsored gTLDs will be introduced is a matter for ICANN. This decision will be taken following an evaluation of the costs and benefits of the introduction of ICANN's first round of additional gTLDs as well as the criteria ICANN has set for making this decision. For its part, ICANN has committed itself to define and implement a predictable strategy for selecting new gTLDs using straightforward, transparent, and objective procedures that preserve the stability of the Internet.

More broadly ICANN's consideration of the introduction of new gTLDs includes the following:

- The potential impact of new gTLDs on the Internet root server system and Internet stability.

- The creation and implementation of selection criteria for new and existing TLD registries, including public explanation of the process, selection criteria, and the rationale for selection decisions.

- Potential consumer benefits/costs associated with establishing a competitive environment for TLD registries.

- Recommendations from expert advisory panels, bodies, agencies, or organisations regarding economic, competition, trademark, and intellectual property issues.

It is important to note that not all the issues before ICANN necessarily bear on the choice of allocation mechanisms for any new domain names. ICANN, for example, looks to the Internet Architecture Board and its own Security and Advisory Committee for advice on issues such as what to do in the event that a registry failures. Here the issue is to ensure continuity of service for a domain name holder in the event of market exit by a registry. At the same time, ICANN looks to WIPO as an authoritative source of advice on intellectual property issues. Issues such as continuity of service and intellectual property, however, need to be considered irrespective of which allocation mechanism is adopted. They may, of course, have implications for procedures (*e.g.* contractual safeguards bearing on these issues) but they are not considerations for the choice of allocation mechanisms.

By way of contrast, how some technical questions are resolved does impact on the choice of allocation procedures. For example, if ICANN hypothetically decided there were few or no technical barriers to introducing a very large number of new gTLDs, then allocation mechanisms, as opposed to any other procedural requirements or safeguards, would be unnecessary to the extent that new gTLDs could be given out on demand to qualified candidates.

The question to be dealt with here is whether the different allocation mechanisms available meet ICANN's requirements for 'straightforward, transparent, and objective procedures'. The key point made by ICANN, which is relevant to a consideration of allocation mechanisms, as opposed to broader issues in an overall assessment of new gTLDs, the need for an evaluation of selection criteria (*i.e.* public explanation of the process, selection criteria, and the rationale for selection decisions). Accordingly, in discussing allocation mechanisms, this paper does not take a view on issues such as the number of new gTLDs which

should be allocated but it does discuss the potential economic implications for differing levels of new gTLDs against the criteria ICANN has drawn up for establishing allocation procedures.

In reviewing the available allocation mechanisms two leaders emerged: auctions and comparative selection procedures[52]. It is possible to envisage other mechanisms, such as lotteries, but these are little used by OECD governments where allocative choice is required. Before considering the pros and cons of auctions and comparative selection procedures several questions need to be addressed. Some of these involve future decisions to be taken by ICANN and can have potential impacts for which allocation mechanisms and procedures are adopted. The first issue is to precisely define what resource is being allocated and the second to make an assessment of the scarcity of that resource.

What resource is being allocated?

The domain name resources being allocated by ICANN are the existing and new gTLDs and the right to act as a registry for a specific top level domain name in either category. In the case of gTLDs which predated ICANN, the resource in question is clear. ICANN inherited a series of gTLDs (*e.g.* **.com**, **.net** and **.org**) and has made a series of allocative decisions to continue with the incumbent registry (*i.e.* **.com** and **.net**) or transfer responsibility to another registry (*i.e.* **.org**). Prior to June 2005, ICANN needs to revisit the allocation of **.net** and make an allocative choice in respect to which entity will continue to operate that gTLD.

In the case of new gTLDs there are a greater range of decisions that need to be taken in defining the resource for existing gTLDs. During ICANN's first round of new gTLDs, the entity wanting to operate a registry for a new gTLD proposed a string or range of strings in order of preference. In this process the ICANN Board also took a decision that it did not want to allocate more than one string to any single applicant at the so-called 'proof of concept' stage. For the future, ICANN must decide whether to continue these practices or to use alternative procedures.

Potential alternative procedures include separating the selection of proposed strings from other considerations (*e.g.* qualifications for operating a registry). In an auction, for example, qualified prospective registries might bid for the right to self select one or more strings. In a comparative selection procedure a candidate meeting all technical, financial and other qualifications might also be able to self select a string or strings at a separate stage. Either of these procedures may give the market a greater role in the selection of strings. On the other hand, some stakeholders may want a procedure that continues to have an element of oversight in the final approval of strings, unless guidelines address their concerns.

In the first round of new gTLDs it is worth noting that a purely market based outcome would have led to different strings. SITA, for example, proposed **.air** as a first choice and were awarded **.aero,** one of their alternative preferences. In this case the ICANN Board felt that '**.air**' was 'too generic' and that a more specific term would be more appropriate.[53] In another case, a successful registry was not awarded their first choice (**.web**) but one of their other preferred names (**.info**).[54] One consideration was the use of **.web** in an alternative root. In other cases proposed strings were excluded because they contravened the advice of one of ICANN's advisory groups. An example, was the exclusion of **.per** due to GAC advice that three letter country codes should be avoided (PER is the three letter country code for Peru).

It is important to remember that ICANN's first round of new gTLDs was essentially a trial. The decisions taken, while no doubt challenging, were probably made easier by being able to apply a stricter set of criteria related to 'proof of concept' criteria. Even for the most favoured strings the question could be posed "does this help inform the 'proof of concept'". For the future ICANN will need to decide how closely to bind the selection of a string with the operation of a registry function. Some entities may wish,

for example, to apply for a gTLD but not operate a registry. In fact, for some entities, the value of a specific string, for their own use or as a platform for a service, may far outweigh whatever revenue might be derived from operating it as a registry. But such outcomes may not meet ICANN's objectives. The main point is that whichever path ICANN chooses some general principles, guiding string selection, will need to be in operation. At the same time how much flexibility ICANN has in implementing these principles will be closely allied to the question of scarcity.

Is the gTLD resource scarce?

In the economic sense scarcity can be said to exist where needs and wants exceed the resources available to meet them. The radio spectrum is often cited as being a scarce resource. One reason for this is that spectrum has physical properties which make its availability finite. In relation to TLDs there are several potential limitations which can lead to a determination of scarcity.

The question of the number of TLDs that can be safely added is a decision for ICANN. Unlike the radio spectrum, in the opinion of a number of experts there may be little or no technological barriers to the introduction of a very large number of TLDs. However, even if a technical assessment concluded that an almost infinite number of TLDs could be safely added, there are other considerations. These might include, for example, assessing the risk of failed registries, if a large number of gTLDs were introduced, prior to ensuring safeguards for continuity of service. Another consideration might be the level of support for the creation of new gTLDs among the Internet community. Consideration also needs to be given to the impact a large number of new gTLDs would have on the management of TLD delegations by the IANA. IANA's management of delegations is a resource intensive process, and generates a cost to ICANN, which needs to be met by the Internet community.

It is possible that the number of applicants to operate a new gTLD may not exceed the number of new TLDs ICANN feels can be added. If this proved true, and an open-ended process for the creation of new gTLDs had the support of the Internet community, there would, in fact, not be any scarcity. In such circumstances the only procedure would involve qualification to operate a registry and new gTLDs could be allocated on demand. On the other hand, if there was opposition among the Internet community to the allocation of gTLDs on demand, ICANN would have to make choices and the resource could be said to be scarce. One group which might oppose an open-ended process might be business users if they felt compelled to register their trademark(s) in every new domain. Some Internet users might also be against new names if the complexity of the DNS increased. Some applicants, on the other hand, promise that their proposed names will simplify navigation over the Internet or with related networks.

The second consideration, on the question of scarcity, is that each TLD needs to be unique and can only be operated by one registry. Accordingly, if multiple entities wish to act as a registry for the same TLD, the resource can be regarded as being scarce and a choice needs to be exercised. Some may, of course, regard alternative new gTLDs as substitutable. In other words if two entities wanted **.example** one may be just as satisfied with **.instance**. This does not, however, remove the need for a decision between candidates if two or more entities have a preference for the same gTLD. In the first round of new gTLDs four entities individually proposed **.kids** and several other names were proposed by multiple applicants.

In the latest round of sTLDs two different entities proposed to operate a registry with the name **.tel**. Foreseeing that some groups may be willing to accept a substitute name ICANN's procedure enabled applicants to nominate a second and third choice. In the case of **.tel**, neither applicant chose to nominate a second or third choice. If during ICANN's comparative selection procedure both applicants proved to be qualified, and do not nominate an alternative name, then a choice must be exercised. In this situation the

resource can be said to be scarce. A similar consideration arises in the case of existing resources. In 2005 ICANN needs to exercise an allocative choice in regard to the registry which has responsibility for **.net**.

Allocation procedures

When OECD countries allocate resources they have certain common objectives irrespective of the method chosen. These can include efficient allocation of a resource and efficient use of that resource, transparency in the award of a resource, non-discrimination, and the creation of appropriate conditions for market competition. There may also be other wider economic and social objectives. Through statements and actions it is clear that ICANN shares the ideals inherent in these objectives. ICANN has responsible for Internet Protocol (IP) address space allocation, protocol identifier assignment, Top-Level Domain name system management, and root server system management functions. As the body primarily responsibility for this technical co-ordination it might be argued that ICANN's remit is a technical and economic one in respect to resource allocation. Some broader factors, such as the aim for geographical diversity, do play a part in forming the criteria for ICANN's decision making.

An allocation process, in the case of for-profit registries, will be efficient if it allocates resources to those firms who value them most. The value of the resource to such a firm is represented by the future returns that this firm expects to get if awarded a gTLD. These returns (profit) depend on several factors such as:

- The firm's own characteristics such as cost, financial situation, ability to innovate and so on.

- The characteristics of competitors as this will be an important determinant of market shares and prices.

- The characteristics of the market such as user demand, and expectations for future service development.

- The performance of financial markets as it will affect registries' financial situation and possibilities as they rely for their investments on such markets.

The firm has certain knowledge only for a few of these factors. This implies that there is uncertainty in terms of the value of the resource for any potential registry. Nevertheless, based on their knowledge of their own cost structure, expected price structures and assessment of market demand, a prospective registry is in a better position to assess the value of a new gTLD than other parties including ICANN. It is a legitimate assumption to believe that the "best" firms will place the highest value on a resource, where best refers to firms with lower costs and a greater ability to innovate and remain competitive.

In an auction the decision on the price paid, for the right to operate a new gTLD, is made by a prospective registry. It is also through these bids that firms determine who will exploit the resource being created or reallocated by ICANN in a transparent way. A comparative selection procedure generally leaves price decisions and allocation decisions to administrative discretion. The price placed on the resource is either decided on a cost recovery basis or a subjective assessment of its value. An allocation under a comparative selection procedure may involve a price mechanism, in the case of the DNS market structure, if the criterion of the maximum price a registry is prepared to charge registrars is considered.

It is important to note that the difference between auctions and comparative selection procedures is not as marked as it may seem at first sight. Auctions may still require participants to satisfy a certain set of technical and service parameters (*i.e.* pre-qualification). Similarly, one of the criteria in a comparative

selection procedure can be a monetary one. This may not necessarily be the price entrants are prepared to pay to the body awarding the resource. In the case of ICANN's first round of new gTLDs those evaluating proposals highlighted the financial projections of prospective registries in terms of their commitment to provide competition with existing registries. The main difference between the two allocation procedures is that in an auction the mechanism for competitive bidding is transparent and objective. In a comparative selection procedure the assessor is guided by information provided by the prospective registry and the transparency and objectivity on the criteria selected. The price a prospective registry is prepared to charge registrars is, for example, verifiable and can be enforced. Other criteria in a comparative selection process may be harder to verify and more subjective.

If there were no asymmetries of information between ICANN and registries, an auction would not be needed at all. ICANN would be able to identify the most capable operators and assign them new gTLDs. In such circumstances ICANN would also have the option of charging registries exactly what they were willing to pay so that all rent could be used to fund ICANN or returned to the Internet community. However, this asymmetric information is unlikely to occur, hence an allocation process has to induce prospective registries to reveal their own private information.

As asymmetric information is relevant in practice, prospective registries must be given the right incentives to disclose the information that they possess. If there is no competitive price bidding, there is no particular reason prospective registries will be forthcoming in the information they reveal. That is why comparative selection procedures, in principle a very flexible way of allocating resources, may not reveal the best available information to allocative decision makers. Indeed, there may be an incentive for prospective registries to offer unrealistic promises, in terms of their business plans, as the evaluators of those plans will not have the best available information at hand with which to judge these promises as being unrealistic.

It is not claimed that unforeseen contingencies could be eliminated by auctions. They would exist in any case. However, by making the bidder financially responsible for what they offer, it gives a more stringent incentive to stick to what the bidder thinks will be realistic. The bidder will obviously make their own discounted calculations about the occurrence of future events. Their bid represents a summary of their evaluation and does not require ICANN to enforce all promises (in the sense that all promises would need to be met to justify awarding one entity a resource over another based on a 'beauty contest'). ICANN would, of course, still need to check that some conditions of receiving a resource are met under any allocation procedure.

In the following sections the pros and cons of auctions and comparative selection procedures are examined.

Auctions: Pros and cons

Advantages

Equity and transparency

Auctions rely on relatively simple and transparent rules that apply to all participants. As such they are fair and transparent. Given that bids are observable and verifiable by a court or any third party, the final allocation is less likely to be legally contested relative to a comparative selection procedure.

Revelation and use of information

Future demand for domain names can not be predicted with any certainty. However, even with such uncertainty, existing and prospective registry operators have superior information about themselves in terms of potential cost functions, price structures, potential returns on investment and innovative ability. Given this information firms also have the capacity to judge the risks they are willing to assume and be able to better estimate the economic value they can create and the profit they can expect.

The market should, therefore, be in a better position than ICANN to judge the demand for new TLDs. In the situation where ICANN needs to make an allocative choice on a gTLD, with prescribed string, such as **.net**, an auction would enable firms to reveal, via their bids, the expected value of this resource. Based on revelation and use of information, Economic theory would suggest that the most efficient operator would outbid the less efficient operators.

In a situation where ICANN did not specify strings, thereby allowing bidders to propose strings, or bid on strings proposed by others, auctions could also reveal the names most likely to succeed in the market. In the case of two or more organisations proposing the same string, such as occurred in the 2004 sponsored domain name procedure, an auction would reveal the firm that believes it could create the most economic value if awarded that resource. If auctions were used only as a tie-breaker, in the case of the same string being proposed, this could provide an incentive for prospective operators to research, consider and offer alternative names. It is worth noting that during the 2004 round more than half the applicants for sTLDs did not offer alternative strings. Neither of the two applicants for **.tel** offered alternatives.

Reliance on expertise

In an auction prospective registry operators determine the price of market entry through their bids. In this scenario ICANN would not need to rely on technical or financial experts to select winners. This may, of course, not obviate the need for expertise to be available to ICANN, such as in the case of pre-qualification, but it could potentially reduce the cost of the allocation process and reduce the 'moral hazard' problem.

A further benefit of auctions can be foreseen in relation to expertise. The current round of sTLDs revealed a range of players with proposals for the creation of new services based on securing a TLD. Among the proposed sTLDs, examples include proposals for 'spam free e-mail', relating telephone numbers to domain names, relating second and third level domains to postal standards, as well as creating gTLDs dedicated to navigational tools or content aimed at mobile communication devices.

It is not clear that sufficient expertise exists, outside the group proposing a new service, to choose which entity should be awarded a TLD. To put this into perspective how would choice have been exercised, prior to their widespread success, in the case of services such as e-mail, the World-Wide-Web, streaming media, instant messaging, Web-logs (blogs), and so forth, if they had first been proposed in association with the introduction of a TLD. ICANN should not be expected to be the arbiter of the merit of new services, particularly where it is not a technical imperative to have a new gTLD but may be a marketing imperative.

Avoiding corruption

A major advantage of an auction is that the mechanism is transparent to all market players, the Internet community and the public. Bids are observable and verifiable meaning that the scope for corruption is minimised since it would not affect the ranking of bids.

Revenue maximisation

Economic theory and experience suggest that auctions are one of the best available mechanisms for realising the true market value of a resource, as the price is decided by those with the best knowledge of the market. In the context of the TLD market the benefits auctions can bring, in this respect, largely depend on the objectives that are set by ICANN.

As a not-for-profit organisation, revenue maximisation may not, in fact, be an objective ICANN sets for itself. The value of any new gTLD may, for example, be impacted by the number of other gTLDs that ICANN chooses to make available. ICANN may decide that the increasing the number of new gTLDs can provide greater competition, choice and innovation and give higher priority to meeting those objectives than to revenue maximisation. This does not, however, negate the benefit an auction can yield in terms of determining the value of a resource or in being a tool for efficient allocation.

As with comparative selection, any decision on revenue raised by allocation procedures is a matter for ICANN. In the case of auctions of licences for using the radio spectrum, one of the advantages forwarded is that it returns a greater share of surplus rent from a scarce resource to the public rather than to shareholders. This is, however, in the context of the sale of licences by governments rather than an entity such as ICANN. There are, of course, obvious differences between the two. It needs to be recognised that a comparative selection procedure, such as in the case of **.net**, would give surplus rent to the shareholders of whichever firm was successful unless some form of price mechanism is used. One alternative under a comparative selection procedure is to give the highest weighting to the maximum price prospective registries are prepared to undertake to charge to registrars. This may lower the cost of registrations if the reductions are passed on to end users by registrars. On the other hand, if registrants are not price sensitive or place greater weight on other criteria this would simply shift rents from the shareholders of registries to those of registrars. By way of contrast, an auction would place a greater share of this rent at the discretion of ICANN. ICANN could, of course, use any such revenue to meet its own funding requirements. At the same time, any surplus might be returned to the Internet community in ways that would benefit users and prospective users. **Box 2** provides one example of how this was managed in Australia.

Box 2.   The experience of domain name auctions in Australia

.au Domain Administration Ltd (auDA) is the policy authority and industry self-regulatory body for the **.au** domain space.[55] auDA carries out the following functions: develop and implement domain name policy; license 2LD registry operators; accredit and license registrars; implement consumer safeguards; facilitate .au Dispute Resolution Policy; and represent .au at ICANN and other international fora. In December 2000, the Australian Government formally endorsed auDA as the appropriate body to administer the **.au** domain space. The Government holds reserve powers in relation to domain names under the Telecommunications Act 1997. In October 2001, ICANN recognised auDA as the suitable operator for **.au** under a Sponsorship Agreement.

In December 2001 auDA released 3 006 domain names previously classified as 'generic' and unavailable to Australian businesses. Domain names like shopping.com.au and sport.com.au became available for the first time. If an applicant was the only eligible applicant for a particular name, they could obtain that name for the reserve fee. If there were several eligible applicants for a name, it was auctioned.

As a result 1 612 generic names were allocated, either to a single eligible applicant or at auction.[56] The highest price paid for a generic name was USD 83 000, for flowers.com.au. The median auction price was USD 1 600. Most names were allocated for the minimum reserve price of USD 60.

The process raised approximately USD 1.4 million in total, of which auDA has allocated approximately USD 423 000 for tax and USD 272 000 for contingencies.

At its meeting in August 2002, the auDA Board gave in principle support to a proposal to use the remainder of the auction revenue to establish the "auDA Foundation". The purpose of the Foundation is to enhance the utility of the Internet for the benefit of the Australian community, through sponsorship of education and community projects.

Disadvantages

Winner's curse

The danger that winners will pay too much in an auction is known as the 'winner's curse'. A widely held belief is that during the, so-called, 'Internet bubble' some firms paid too much for licences to use spectrum enabling them to offer UMTS (3G) services. If that is true then the bursting of the bubble should have provided adequate caution for any repetition of the experience, with auctions for new gTLDs, to be avoided. Any auctions held by ICANN would not take place in an 'Internet bubble'.

A further difference between auctions for UMTS licences and domain names is that '3G' services lay in the future. By way of contrast, the gTLD market is well known and the experience firms have had with new gTLDs, such as **.biz** and **.name**, is available to inform the market. If ICANN chose, for example, to auction the right to operate the **.net** registry the size of the current market is readily available. In December 2003 there were just over 4.5 million registrations for which the registry received up to USD 6 per registration. In other words the revenue received by the registry may approach something in the order of USD 27 million. In an auction prospective registries would weigh the price they were willing to bid against that revenue stream along with there assessment of any potential change in demand and their own cost structure. They would also factor in the value of being able to market additional services to 4.5 million registrants. Given these circumstances it is likely that an auction would most value the **.net** resource at an appropriate level. A similar outcome might be expected if price is given the greatest weight in a comparative selection procedure.

Auctions may necessitate ICANN specifying the actual number of new gTLDs

There are several ways ICANN could use auctions. One way is as an adjunct to other allocation procedures. For example, an auction could be used to choose between multiple entities proposing the same sTLD string or applying to be the registry for an existing gTLD. A second way in which auctions could be used, is in cases where the expected or actual demand exceeds the number of gTLDs ICANN is prepared to add to the root. There is an important distinction between the two. The first case of scarcity does not arise because ICANN has put a limit on the overall number of new gTLDs or sTLDs to be created. It is necessary because each string needs to be a unique identifier. This raises the question of why, in the second case, auctions might be considered a disadvantage relative to comparative selection.

With a comparative selection procedure, or only using auctions as 'tie breakers', ICANN does not need to indicate the specific number of new gTLDs that can or will be created. If ICANN judges the number of proposed gTLDs, or expected proposals, to be within its accepted bounds over a given time period for the introduction of new gTLDs, then the question of absolute scarcity does not arise. Some may argue that this gives ICANN greater flexibility in allocating future new gTLDs. By way of contrast, if ICANN does fix a number, and auctions are utilised, then bidders should be entitled to have an indication of how many new gTLDs ICANN proposes to create in future and over what time period.

ICANN could, of course, not specify a number and reserve the right to create as few or as many as it deems fit. While bidders would factor such uncertainty into their bids it would not enhance transparency or the benefits of auctions that are derived from the use of information by the purchaser.

High prices may discourage or limit participation

It might be suggested that if there was an expectation of high prices, or that auctions in fact led to high prices, this would mean that prospective registries in developed countries would be better placed to win. It

needs to be said that high prices in relation to the introduction of new gTLDs could have this impact under any allocation mechanism, including comparative selection. It is true, however, that in maximising revenue, auctions may be at a disadvantage in relation to comparative selection where specific prices can be set. On the other hand, any registry needs to be adequately resourced or it is unlikely to attract users. At the same time, if ICANN developed criteria that extended beyond the technical co-ordination of the Internet, in relation to widening participation, this might be addressed in other ways such as the design of the auction. One or more places, for the responsibility to operate a registry, might be reserved by region, or eligibility determined through other criteria (*e.g.* firms located in countries with a low GDP per capita). Moreover in maximising revenue auctions could, in fact, provide resources to create a registry or to fund training and skills development in developing countries. Indeed, precisely because of their ability to maximise revenue auctions may provide a tool which has greater potential for inclusiveness than comparative selection. That being said, the question which needs to be asked is whether creating gTLDs reserved for developing countries would be the best use of such resources. What needs to be remembered is that each country has a ccTLD and it might be better to allocate resources to capacity building among those domains. On the other hand, it might be possible for some gTLDs to complement the operations of ccTLDs. If ccTLD registries in a particular region form a partnership, as occurred with the proposed **.asia**, this can potentially provide an additional choice for users and generate revenue for ccTLD operators acting as registrars or as shareholders of a registry.

Unspecified strings may present problems

An auction essentially provides a greater role for the market than a comparative selection process. A purely market-based outcome, in the case of string selection, may be controversial. The highest bidders, in the case of unspecified strings, might be for areas of economic and social activity that would not be ranked highest by a comparative selection process. At the same time strings that might be considered unacceptable or inappropriate by some sections of the Internet community could emerge as the winners. As such, in the case of an auction where the strings were decided by successful bidders, guidelines would need to be specified on what type of strings would be appropriate or unacceptable. This would be necessary to allow bidders to factor this information into their bids. This would, undoubtedly, be a challenging task given social and cultural differences that exist throughout the Internet and wider global community. Some guidelines do exist. The ICANN Government Advisory Committee Principles for the Delegation and Administration of Country Code Top Level Domains, in the creation of new generic TLDs, recommends avoiding well known and famous country, territory or place names; well known and famous country, territory or regional language or people descriptions; or ISO 639 Codes for representation of languages unless in agreement with the relevant governments or public authorities.

As the creation of a proscribed list of names is almost certainly unviable some judgement must be exercised. A pre-qualification procedure, which included the selection of strings acceptable to the Internet community, in combination with an auction to determine the final allocation, could deal with any political, commercial or social concerns equally as well as a wholly comparative selection procedure. Moreover, whichever allocation mechanism is chosen, it still needs to be complemented by contractual oversight by ICANN. The operation of registries can and does change hands and obligations entered into by the contractual parties need to be enforced to ensure public accountability.

Intellectual property concerns should not be a major issue if guidelines were crafted in consultation with WIPO. There would need to be procedures to ensure that any strings proposed, in such an auction, would not clash with intellectual property rights. In some cases, however, this may not be clear cut. Challenges might arise, for example, where multiple firms believed they had some type of right relating to a particular string even if it was a generic word.

In other cases strings may not be controversial but equally they may not add anything, beyond the value of the auction price, to the Internet's development. The latter case might occur if any entity purchased the right to establish a new TLD for reasons of vanity or self-promotion but without a serious intent to operate a registry. For this reason new TLDs should probably only be generic words or concepts. To allow an individual entity to reserve for their own use a gTLD, without the requirement to run an open registry or a registry for a particular community, would create a new category of user. Such a development would be antithetical to the hierarchical nature of the DNS and the benefits that confers in terms of managing the addressing system.

It is unlikely that the vast majority of firms would bid with the intent of transforming their second level domain name to a TLD, should an auction for unspecified strings occur. Nor should they be placed in a situation where they felt compelled to do so. Some firms, of course, might like to have a TLD in the form of their company acronym or name which they could use for themselves and their customers. But in a market economy firms come and go over time whereas users look for stability and continuity in addressing systems. These eventualities, however, could be avoided by the requirement to run a registry, pre-qualification procedures and the requirement that proposed strings be limited to generic words. ICANN has stated that it is "…seeking views from experts and the community on the appropriate balance between corporate/sponsor control of a gTLD and management on behalf of the internet community…".[57]

While in theory allowing a successful bidder to choose the string should lead to a higher price and more efficient outcome, in terms of satisfying demand, this may not be so in practice. Bidders may feel that the ability to choose a string is offset by the potential for rights challenges or other uncertainties in not being able to use their first choice. There may also be a possibility of litigation against ICANN, in relation to string selection, albeit this potentially exists under any allocation mechanism. A further consideration for not allowing individual firms to transform second level names into top level names is that it would further complicate the IANA function and potentially increase the resources needed for this function.

Pre-qualification would still be necessary

In theory the firms that believe they will run the most efficient registries should succeed in auctions. In practice, however, a pure auction based process may attract candidates that do not have the right technical credentials. Accordingly, ICANN's criteria for security and stability dictate the need for auctions to occur only among technically qualified candidates. In the current TLD market a number of registries perform back office functions for other registries, so this may not be a barrier to wide participation by entities that qualify in other respects.

The right to operate registries for gTLDs can be bought and sold in the market. In March 2004, for example, the **.pro** registry changed ownership. This raises the question as to whether speculators would participate in auctions. In most markets, speculators can play a valuable role in helping to realise the true value of a resource. On the other hand, revenue maximisation may not be ICANN's primary objective. If running a registry was a requirement of participating in an auction speculators would factor that risk into their bids if they had no serious intent to run a registry. In addition auctions can be designed to exclude bidders with serious no intent to offer services, such as through non-refundable deposits and performance targets.

Could auctions lead to higher end user prices?

Auctions would not lead to higher prices for domain name users. Prospective operators of new gTLDs would be aware of current pricing levels, and the potential entry of other new operators, and factor that knowledge into their bids.

Auctions could be viewed as unfair given earlier or parallel allocation procedures

It might be suggested that equity is not well served by auctioning the right to operate new gTLDs when previous procedures have not employed this allocation tool. One such objection might be that a firm that paid an entry fee, during a comparative selection procedure, may have an advantage over a firm that paid a higher price using an auction. While it does not necessarily follow that a higher price would be paid, any such outcome would occur with bidders being fully aware of current market conditions. In other words bidders will factor this knowledge into their decision to bid and the price they are willing to pay.

A more substantive objection might be raised in the case of parallel allocation procedures. The case of a 'tie breaker auction' can be placed to one side as this is an adjunct rather than a parallel allocation procedure. If parallel allocation procedures were placed in force, with one process using an auction and the other using comparative selection, the question of equity could be raised. If ICANN wanted to continue to use comparative selection, for a certain type of new gTLD (*e.g.* sTLDs), it would need to address the question of equity if auctions were also employed (*i.e.* for prescribed or unprescribed strings). Any parallel procedures might provide an incentive for operators to misrepresent their business case as being worthy of inclusion under sTLD criteria when it would be more appropriate for an unsponsored gTLD procedure.

Comparative selection: Pros and Cons

Comparative selection procedures, sometimes called 'beauty contests' can be structured in a number of different ways. Usually they involve an up front fee to discourage frivolous applications and to recover the cost of the allocation process. Other aspects commonly include a requirement to indicate the prospective operator's credentials and to specify how they would operate the resource in question. In the case of sponsored strings, applications also involve making a case that the new sTLD would be beneficial to a community. These factors are then assessed against the criteria which ICANN has set for the introduction of new gTLDs and decisions made on the new gTLDs to be introduced and their operators from the field of applicants.

Advantages

Equity

It can be argued that there is equity in a comparative selection procedure in that all participants are judged by the same criteria and face the same information requests. The experts that review the submissions are required to treat them in an objective and non discriminatory manner. Nevertheless, judgements over proposals that are equally meritorious, in all aspects, would still require some type of subjective judgement to be applied. This could be the case, for example, where there were multiple and equally meritorious proposals for the same string. On the other hand, it may not be a drawback if the issue of the string was dealt with separately from the qualifications of a prospective registry. In the latter case, the only limitation would be the number of gTLDs available for qualified candidates rather than the merit of candidates for the same new gTLD.

One additional aspect can be mentioned in relation to equity. This is only relevant in those instances where any objectives ICANN may have for new gTLDs go beyond technical co-ordination. The procedure for sponsored TLDs essentially adopts a comparative selection procedure as a way to deal with specific groups that want a TLD. Although sponsors suggest specific strings, they may be in competition with each other if the number of available new gTLDs is exceeded by the number of worthy and qualified applicants. Other examples can be imagined for new unsponsored gTLDs. Comparative selection, for example, might lend itself more easily to ICANN being able to get a more diverse geographical spread for new registries or

a greater number of not-for-profit registries to participate. On the other hand, auction design might also be used to try to deal with any such objectives.

Fixed fee

Unlike an auction, a comparative selection procedure can determine the final entry price in advance of the resource being allocated and separate from the determination of successful candidates. This might be seen as an advantage if the objective is to set a low or high fee. The mechanism does not, however, set out to find the market value of the resource with other criteria being given greater weight. However, it is also possible to design a comparative selection procedure where one of the criteria, which is given weight in the selection procedure, is the level of the fee a candidate is willing to pay or, in the case of the DNS market, the maximum price the prospective registry is willing to charge registrars. If an auction mechanism is being used it is also possible to require registries to set a maximum price for registrars. This would still be done through contractual negotiation.

At present, ICANN specifies the maximum amount a registry can charge a registrar for any registration. If that fee is USD 6, for example, then prospective registries may be willing to undertake that function with a lower maximum fee per transaction (*e.g.* USD 5 or USD 4 and so forth). If this reduction were to be passed on to end users that could be seen as an advantage, and consequently it could be argued that this criterion should be given a significant weighting in the comparative selection process. A further advantage is that it provides the comparative selection process with a verifiable criterion with its attendant benefit of transparency.

One question that can be raised is whether such a reduction would be passed on by registrars. The answer can most likely be found in the existing market for gTLDs. Some registries charge prices that are very close to the underlying registration fee which they pay registries and they would, in all likelihood, pass on any reduction. Other registrars, on the evidence to date, would probably not pass on the reduction to end users as long as their customers appear to be relatively insensitive to the price of their registration or place a higher value on other aspects of service.

Forecasts may matter less

The type of expertise required to succeed with a comparative selection procedure is different from the one needed for a successful auction. Because less emphasis is placed on price *per se*, forecasts over the future market for domain names, future demand and so forth are not so crucial to market entrants. Instead, financial and technical experts determine a prospective registry's ability to supply the market from their current financial situation and technological base. Some of these elements are observable and verifiable by a third party. On the other hand, firms may not be required to reveal their true valuation of the market in a comparative selection process and ICANN may not admit a new gTLD to the market if a forecast showed low prospective demand. Indeed, there may have been an incentive for candidates to inflate their projections beyond their own true expectations.

Possibility to include broader objectives

One of the reasons that some governments favour comparative selection over auctions in the allocation of licences to use the radio spectrum, is that they believe they have a greater ability to encourage operators to build social objectives into their proposals. However, with both auctions and comparative selection procedures any social objectives can be made a requirement. If such social objectives are not met then the seller has the right to withdraw the right to exploit the gTLD from the buyer. Auctions can have

conditions built into their award and bidders will take these into account in the price they are willing to bid. The main difference, however, is that with auctions it is necessary for the seller to specify such conditions whereas with comparative selection the onus is on prospective registries to specify what they will do. The degree of weight to give this factor essentially depends on whether ICANN has objectives that go beyond its primary role of technical co-ordination. ICANN's contract with the registry is the tool with which to enforce any such obligations irrespective of which allocation procedure is used in their determination.

Disadvantages

Revelation of information

Most of the information needed to evaluate prospective registries is privately known. Some information may be publicly known, be observable and verifiable but this process can be open to manipulation. Auctions have the advantage of forcing firms to reveal information through the price they are willing to pay as, in theory, more efficient firms should be willing to pay higher prices. A comparative selection process which gave the greatest weight to the lowest maximum price, a registry undertook to charge registrars, may counter this point.

Lack of transparency

In most comparative selection procedures the final decision to award a resource is based on evaluations done in private. ICANN is somewhat an exception to the rule. Although the initial evaluations were undertaken in private the final discussion, leading to decisions by the ICANN Board, is a matter of public record.[58] In general one of the drawbacks of the comparative selection decision making process is that it does not have an observable or verifiable action such as bidding. ICANN endeavoured to overcome this shortcoming by publishing an initial assessment of proposals for new gTLDs by its staff and experts, as well as putting its own final decision making discussion on the public record. This is possibly as transparent as a comparative selection procedure can be. On the other hand justifying a decision may be complicated if some of the criteria used are subjective and not clearly stated in advance. The maximum price registries propose to charge to registrars is one verifiable criterion which can be used in a comparative selection procedure.

Reliance on subjective judgement

In ICANN's first round of new gTLDs subjective judgements were applied during the comparative selection procedure. This is readily evident from the public record of the final decision making process. While comparative selection may have had advantages at the, so called, 'proof of concept' stage, there are drawbacks in terms of meeting ICANN's goal of having 'objective procedures' for the routine allocation of resources.

Lower registry prices may bring about unintended consequences

In its report on designating a successor operator for the **.net** registry, ICANN's Generic Names Support Organization recommended that once other criteria from the comparative selection process are satisfied, preference should be given to proposals offering lower pricing for domain name registration.[59] As noted this would provide a mechanism which would be readily verifiable and therefore increase transparency of any comparative selection procedure. It may in theory bring benefits to users in the form of

lower prices although, in practice, this may not be the case. It may also contain a certain risk for the Internet community.

As the primary function of the DNS is addressing it is worth considering whether driving the registry price to the lowest possible level is in the best interest of the Internet community. For their part registries have noted that not all registrars can be expected to pass on any reduction in price.[60] While that is true, for some registrars, others will undoubtedly adopt the reductions as is evident from current pricing models which charge little more than the registry's maximum price. In most markets this development would be considered beneficial in bringing lower prices to users. The broader impact lower prices may have on the DNS and its use, however, needs also to be considered.

At their current level the lowest prices for registration clearly enable a large amount of speculation in domain names and related activities such as those of traffic aggregation. Driving down the baseline cost of registration may considerably enhance the economics of these activities to the point where their negative impacts far outweigh the potential benefits to users of lower prices. In short it would be of little benefit to users if the type of economic models that appear to make large scale spam profitable were transferred to the domain name system. Is this a credible risk? Speculators have already shown a willingness to register virtually all names in English language dictionaries under **.com** at current prices. Lower prices may simply further encourage speculation, across all existing and new domains, to the point where the only option for users is to purchase names from the secondary market. In effect, because secondary market prices are higher than registrar prices, this would lead to a price increase for users. Moreover, given the challenges new names face in winning market acceptance it is not clear that increasing the supply of top level domain names would act as a counter balance to speculation. Rather, speculators would target existing gTLDs that already have acceptance and any new names that gained acceptance.

Risk of corruption

A comparative selection procedure introduces a higher risks for potential corruption compared to an auction.

Summing up: Allocation procedures

ICANN faces a number of allocative decisions over the coming years. Some of these decisions relate to the possible creation and allocation of new resources while others concern the allocation of existing resources. These are decisions to be taken by ICANN in consultation with all stakeholders. In the case of potential new TLDs, the actual resources to be allocated need to be defined, so that issues such as whether scarcity exists can be determined, prior to deciding the most appropriate allocation procedure.

Most concerns that might apply to using auctions as a tool to allocate new gTLDs do not apply to any decision on the future allocation of existing gTLDs. For example, there seem to be few, if any, obstacles to ICANN auctioning the right to be the registry responsible for **.net** as an adjunct to pre-qualification procedures. Indeed, there would be clear and demonstrable benefits in meeting the objectives set by ICANN. An auction would provide a transparent, objective and verifiable mechanism for the market to appropriately value **.net** and avoid the pitfalls associated with comparative selection. Such an auction could also act as a practical demonstration, for auctions, in relation to other allocative choices as and when they arise.

On balance the economic arguments favour the use of auctions in some form, where scarcity exists, in relation to the goals set by ICANN for allocation procedures. They are particularly strong in relation to allocation decisions concerning to existing resources and where a 'tie-breaker' is needed during a

comparative selection procedure for a new resource. In all cases, the best elements of comparative selection procedures could still be incorporated, at a pre-qualification stage for registries, using straightforward, transparent, and objective procedures that preserve the stability of the Internet.

NOTES

1 See: http://www.nic.pro/policies/eligibility.php#defense.

2 See, http://www.icann.org/registries/listing.html

3 In Ireland, for example, the regulation of Ireland's domain name (*i.e.*) is to be transferred to the Commission for Communications Regulation (Comreg).

4 AFNIC, "Liberalization of .fr and .re domain name registrations from 11th May 2004", 7 January 2004 http://www.afnic.fr/actu/nouvelles/nommage/CP20040120

5 http://www.icann.org/general/

6 http://www.icann.org/general/agreements.htm

7 http://www.icann.org/general/amend6-jpamou-17sep03.htm

8 For background on the historical arrangements for .int refer to the materials from a joint ICANN ITU workshop at: http://www.itu.int/ITU-T/worksem/int/index.html

9 Detailed information on .org registry transfer can be found at ICANN Website. http://www.icann.org/tlds/org/

10 http://www.icann.org/tlds/agreements/verisign/com-index.htm

11 http://www.icann.org/tlds/agreements/verisign/registry-agmt-net-25may01.htm

12 Refer for example, http://www.nic.aero/dotaeroinbrief.php

13 See, http://www.icann.org/tlds/new-stld-rfp/new-stld-application-parta-15dec03.htm and http://www.icann.org/presentations/pritz-forum-rome-04mar04.pdf

14 See, http://www.icann.org/tlds/stld-apps-19mar04/mobi.htm

15 See, http://www.icann.org/announcements/announcement-19mar04.htm

16 Registrarstats is one company which follows the market share of Registrars for .com, .net, .org, .biz, .info and the ccTLD .us. In March 2004, their data indicated that Network Solutions was the overall market leader with a 20% market share under these TLDs. The other leading players were Tucows with 10%, GoDaddy with 9.5%, Regisrar.com with 7.69%, eNom with 7.20% and INWW (Melbourne IT) with 5.58%.

Refer to http://www.registrarstats.com

17 See, https://www.verisign.com/corporate/news/2003/pr_20031125.html

18 http://www.icann.org/melbourne/info-verisign-revisions.htm

19   Afilias, "Afilias Announces Launch Date For .INFO German Umlaut Domain Names,"27 January 2004.
        http://www.afilias.info/news/press_releases/pr_articles/2004-01-27-01

20   Refer to Afternic, an online auction site for domain names, at: http://www.afternic.com/rsample.html

21   Registries' monthly report to ICANN is available at http://www.icann.org/tlds/monthly-reports/index.html
        JPNIC provides the summary of the number of gTLDs registration at
        http://www.jpnic.jp/ja/stat/dom/gtld.html

22   OCDE/GD(97)207 Internet Domain Names: Allocation Policies, p46.

23   http://www.nsf.gov/od/lpa/news/press/pr9817.htm

24   http://www.icann.org/nsi/nsi-rla-04nov99.htm#5 The maximum fee of USD 6, which the registry can
        charge registrars, was reaffirmed in April 2001 http://www.icann.org/tlds/agreements/verisign/registry-
        agmt-appg-com-16apr01.htm

25   http://www.icann.org/general/

26   http://www.icann.org/tlds/agreements/info/registry-agmt-appg-20jan04.htm

27   http://www.icann.org/tlds/agreements/biz/registry-agmt-appg-18jun03.htm

28   Details are explained at :
        https://account.bluerazor.com/gdshop/br_landing.asp?authguid=&se=%2b&isc=&prog_id=BlueRazor

29   http://www.icann.org/general/

30   Netcraft Secure Server Survey for March 2004, www.netcraft.com

31   OECD "Cybersquatting: The OECD's experience and the problems it illustrates with registrar practices and
        the Whois system", 2002. http://www.oecd.org/dataoecd/46/53/2074621.pdf

32   For a list of the largest domain name holders see Matthew Zook's research at:
        http://www.zooknic.com/Domains/top_holders.html

33   For example companies see: http://www.sedo.com/services/parking.php3?language=us

34   Jonathan Zittrain and Benjamin Edelman, Berkman Center for Internet & Society, Harvard Law School,
        June 25, 2002. http://cyber.law.harvard.edu/tlds/001/

35   Afilias, ".INFO Reaches 1 Million Registrations", 19 November 2002
        http://www.afilias.info/news/press_releases/pr_articles/2002-11-18-02

36   http://www.afilias.info/news/press_releases/pr_articles/2004-02-12-01

37   This can be done at http://www.whois.net/

38   Refer, for example, to the STOP programme initiated by the **.biz** registry and WIPO's assessment at
        http://arbiter.wipo.int/domains/reports/biz-stop/index.html

39   http://www.icann.org/tlds/agreements/biz/registry-agmt-appl-18apr01.htm

40   http://arbiter.wipo.int/domains/statistics/cumulative/results.html

41   Refer comments of Paul Mockapetris in Kevin Murphy, "ENUM Still Stalled in US", Computer Business Review Online, & March 2004.
http://www.cbronline.com/currentnews/c1ba1096a4c7819180256e6f0032d4bb

42   For example Tim Berner's Lee has expressed this view at: http://www.w3.org/DesignIssues/TLD

43   See, for example, the marketing of the .us domain in Asia."US Domain Has Huge Demand in Asia",
24 April 2002.
http://www.globeinvestor.com/servlet/GIS.Servlets.WireFeedRedirect?cf=GlobeInvestor/config&vg=BigAdVariableGenerator&date=20020424&archive=prnews&slug=2002_04_24_05_0837_713370

44   http://forum.icann.org/lists/stld-rfp-asia/msg00026.html

45   Refer http://www.la/

46   Refer http://www.tv/

47   "PW Registry Corporation Offers Tools to Accelerate The Adoption of the PW", 14 April 2004.
http://www.pwregistry.pw/news.php?content=14-Apr-2004

48   For the price of **.md** refer to http://www.max.md/ and http://www.registrar.us.com/md.htm and http://www.101domain.com/biz/whois-md.php

49   WHO, "Proposal for .health Internet Domain", 8 May 2003
http://www.who.int/gb/EB_WHA/PDF/EB112/eeb11210.pdf

50   Refer WHO comments on the draft criteria for the selection of new sponsored TLDs.
http://forum.icann.org/mtg-cmts/stld-rfp-comments/general/pdf00005.pdf

51   http://www.dotasia.org/letters/LOS-HKTUG.pdf

52   The use of auctions has also been suggested by Professor Milton Mueller and Professor Lee McKnight in "The Post-COM Internet: A Five-Step Process for Top Level Domain Additions". The paper is available at: http://dcc.syr.edu/miscarticles/NewTLDs-MM-LM.pdf Professor McKnight made a presentation on this subject at the meeting of the Working Party on Telecommunication and Information Services Policy in December 2003.

53   For notes of the ICANN Board's deliberations refer:
http://cyber.law.harvard.edu/icann/la2000/archive/scribe-icann-111600.html

54   The first choice of Afilias was **.web** with **.info** being a secondary preference.   Refer http://www.icann.org/tlds/report/report-iiib1a-09nov00.htm

55   http://www.auda.org.au/about/about/

56   http://www.auda.org.au/news-archive/auda-01102002/

57   ICANN Board Resolutions in Carthage, Tunisia 31 October 2003.
http://www.icann.org/announcements/advisory-31oct03.htm

58   http://cyber.law.harvard.edu/icann/la2000/archive/scribe-icann-111600.html#new-tlds

59   http://www.icann.org/tlds/dotnet-reassignment/dotnet-committee-report-23jun04.htm

60   Refer for example to: http://gnso.icann.org/mailing-lists/archives/net-com/msg00011.html