6.4 Impact of Convergence

This Chapter addresses the international response of policy-makers and regulators to convergence and its effects on their legal and regulatory frameworks. First, it analyses the different regulatory approaches most commonly used to address convergence (*i.e.*, legislative, regulatory and self-regulation approaches) and describes the advantages and disadvantages of each approach. Second, it outlines the impact that convergence is having on different regulatory processes, namely licensing, spectrum, interconnection, universal service, and numbering. Finally, it analyses and describes the type of legislation and regulatory processes that should be implemented by countries to facilitate a converged environment.

Practice Notes

- Copyright in the US and Europe
- Different Approaches to Facilitate In-Band Migration [4.3.2]
- EU Copyright Directive [4.4.3]
- Examples of Data Retention Rules in Different Countries [4.4.4]
- FCC Rules Regarding Emergency Calls for VoIP Service Providers (E911) [4.3.1]
- In-Band Migration [4.3.2]
- Licensing broadband wireless access in Switzerland and France
- Licensing of Wireless Technology in Different Countries [4.3.2]
- Regulating WiFi and WLAN
- Regulatory Treatment of WiFi and WLAN [4.3.2]
- Table 4-2: Pros and Cons of Legislative Approach in Telecommunications/ICT Regulation [4.2.1]
- Table 4-8: Licensing in Malaysia [4.5.3]
- UK Office of Communications [4.4.1]
- US Copyright Directive [4.4.3]

Reference Documents

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- Australia - Policy and Regulatory Considerations for New and Emerging Services
- Australia Privacy Act report
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- EU Commission Communication on Voice Over Internet Protocol 2000
- EU Commission Recommendation - Provision of Public Radio Local Area Networks
- EU Directive Concerning the Processing of Personal Data and teh Protection of Privacy in the Telecommunications Sector
- EU Directive on Privacy and Electronic Communications
- EU Directive on the Retention of Data
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- EU Framework Directive
- EU Green Paper on Convergence
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- EU Recommendation on Relevant Product and Service Markets Susceptible to ex ante Regulation
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6.4.1 WHAT IS CONVERGENCE?

There is no universal definition of convergence, although generally it is understood to mean the ability of different networks to carry similar kinds of services (*e.g.*, voice over Internet Protocol (IP) or over circuit switched networks, video over cable television or Asynchronous Digital Subscriber Line (ADSL) or, alternatively, the ability to provide a range of services over a single network, such as the so-called "triple play." Box 4-1 summarizes some of the issues that regulators should consider with regard to convergence.

◂ **Box 1Checklist of Issues for Regulators to Consider with Regard to Convergence**

- Does the regulatory framework facilitate the provision of different services over different platforms (*e.g.*, technology neutrality)?
- Does the regulatory framework support full competition?
- Does the regulatory framework allow service providers to offer multiple services?
- What are the regulatory policies for these new technologies and services with regard to numbering, spectrum, universal service, and interconnection?
- Does the country's legal framework contain the necessary legislation to support an ICT environment (*e.g.*, intellectual property laws, computer crime, electronic transactions, data privacy and security)?
- How much turn-around time and process is required for the country's legal framework to respond to future changes in the sector?

Convergence is accelerating as existing networks are modified to offer new services (*e.g.*, upgrade of telephone networks to offer ADSL, alteration of electric power networks to offer broadband services, and the modification of cable networks to offer interactive services). Convergence is also possible with wireless broadband technologies. As a result, different network infrastructures can today provide a plethora of services (Table 4-1). Cable television providers can offer consumers voice, Internet access, and broadcast services over the same network as one bundled package of services, and for one monthly price. Likewise, a mobile service provider may be able to offer a subscriber data and video services, as well as voice services, and digital television (DTV) providers are offering interactive services.

◂ **Table 4-1: Developing viable business models with convergence**

Source: Telecommunications Management Group, Inc.

Multiple service provision under different network infrastructures

Infrastructure	Voice	Data	Video
Fiber Optic	VoIP	FTTx	IPTV, Standard and High Definition TV, VOD
Cable	VoIP	Cable modem	Standard and High Definition TV, VOD
Mobile	2G, 3G and 4G	2.5 G, 3G and 4G	DVB and other terrestrial mobile TV
Copper line	PSTN	DSL	IPTV, VOD
Fixed Wireless	Some (VoIP)	3G, WiMAX	DVB and other terrestrial mobile TV

DSL=Digital Subscriber Line, FTTx=Fiber to the "x", which may be home, curb or building, VoIP=Voice over Internet Protocol, VOD=Video on Demand, IPTV=Internet Protocol TV, DVB=Digital Video Broadcasting, 2G = Second generation mobile service, 3G=Third generation mobile service, 4G= Fourth generationa mobile service, BPL=Broadband over Power Line.

The combination of services over the same platform is challenging common perceptions about the best means to license and regulate providers in the information and communications technology (ICT) sector. Traditionally, regulatory frameworks were designed for an era when clear functional differences existed between services and infrastructure, but these regulations are increasingly inadequate for dealing with today's world.

Policy-makers and regulators are responding to the challenges presented by the ICT sector in a variety of ways. First, there has been a shift towards an equal or technology-neutral regulatory treatment of different information and communications infrastructure. For example, the European Union (EU), India, and Kenya[1] have introduced, or are in the process of introducing, legal frameworks and regulations to regulate aspects of convergence through a flexible and a technology neutrality approach.

Second, governments such as Malaysia, Singapore, and the United Kingdom, are modifying the structure of regulatory authorities by providing them with the authority to regulate the telecommunications, broadcasting, and information technology sectors. Finally, governments are drafting and implementing new laws and regulations to create the necessary legal enabling framework to support an ICT sector. These laws and regulations deal with such issues as intellectual property, content, data protection, security, and computer crime.

Another approach to convergence is to accommodate it within the existing legal and regulatory framework. This is possible in countries where there are no barriers to market entry or restrictions on the type of service offering. Although operators can, and do, offer multiple services over multiple platforms in fully competitive markets, it is often a cumbersome process requiring multiple licences and regulatory oversight by different institutions.

6.4.2 DIFFERENT APPROACHES IN IMPLEMENTING ICT REGULATION

There are three approaches taken by countries to address convergence: (i) a legislative approach; (ii) a regulatory approach; and (iii) a self-regulation approach. Although the first two are most commonly used among policy-makers, the self-regulation approach is gaining increasing popularity. Each of the approaches presents advantages and disadvantages as discussed below, but no one approach results in an optimal solution. In general, countries see more effective results when several approaches, especially the legislative and the regulatory ones, are used together. Moreover, the first two approaches are generally more effective when they also incorporate a consultative process (see Box 4-2), such as a public

hearing. Additionally, incorporating a self-regulation approach with industry participation allows policy-makers to better understand the consequences of convergence and its trends, as well as to balance the different interests involved in convergence regulation.

◂ **Box 1The public consultative process within the European Union New Regulatory Framework**

The liberalization of telecommunications in the European Union (EU), completed in 1998, is generally considered a marked success. Opening up formerly monopolistic markets led to dramatically lower prices and improved services for consumers and businesses, boosting Europe's communications industry and creating economic growth.

Ongoing technological innovation, however, overtook the telecommunications regulatory regime. Digitalization now allows many kinds of content to be delivered over different networks. The Internet has become a global infrastructure for a range of electronic communications services. Information and communications technologies are converging, opening up myriad possibilities for new industries and services.

To tackle the emerging policy and regulatory issues associated with this new technological environment, the European Commission (EC) published a Green Paper on the convergence of telecommunications (Convergence Green Paper) in December 1997.1 This was followed by a five-month public consultation period, including a public hearing, to allow the EC to receive feedback from industry, member state regulators, and other interested parties. The EC subsequently published the results of the public consultations in March 1999.2

Later that year, the EC launched a review of its telecommunications framework in a consultation document known as "the 1999 Communications Review",3 which was published in November 1999. The aims of the review were fivefold: (i) to promote more effective competition; (ii) to react to technological and market developments; (iii) to remove unnecessary regulation and simplify associated administrative procedures; (iv) to strengthen the internal market; and (v) to protect consumers.

The review drew on the key messages of a series of consultations, reports and independent studies, in particular, the Communication on the Convergence of the Telecommunications, Media and Information Technology Sectors, the Communication on the Consultation on the Radio Spectrum Green Paper,4 the Report on the Development of the Market for Digital Television in the European Union,5 and the Fifth Report on the Implementation of the Telecom Regulatory Package.6

A public hearing was held in January 2000 in which interested parties were invited to submit their comments on the 1999 Communications Review. The public consultation period ended in February 2000 and the results of these consultations were published in April 2000.7 After reviewing the responses of all interested parties, including member states' regulators and industry representatives, the EC issued several "orientations" (*i.e.*, policy documents) in April 2000 and subsequently proposed in July 2000 a package of measures for a new regulatory framework for electronic communications networks and services.8

The result of these lengthy consultations is the EU new regulatory framework (NRF), comprised of six specific directives and one decision,9 which tackles convergence by generally extending and adapting liberalization to electronic communications.10

The 2009 Telecom Reforms, which updated the 2002 NRF. In the 2009 Reforms process, the European Commission acknowledged that there have been major developments in the area of convergence since the 2002 framework—in particular, the growth of VoIP and the uptake of television services through broadband lines (i.e., IPTV).11 Rather than impose any new rules to promote converged services, the 2009 Reforms address convergence in terms of potential net neutrality principles in which users should be free to use any type of application or service over their broadband Internet connections.12

6.4.2.1 LEGISLATIVE APPROACH

The legislative approach consists of developing legislation that responds to convergence, either in the immediate term or in anticipation of convergence trends. Legislative solutions define new laws or create new regulatory frameworks to respond to convergence and guide future policy direction. This can be done by developing and implementing a reform of the entire legal framework for telecommunications or by amendments to existing laws.

An advantage of the legislative approach is that it allows the introduction of a new framework to deal with convergence, without constraints imposed by other regulations or by the existing telecommunications law that may contain categories in

which converged services do not fit. A new law or an amendment of an existing law aimed at addressing convergence through a technology-neutral approach with a simplified service category can eliminate contradictions and inconsistencies in regulatory classifications. This ultimately makes the regulator more efficient and effective.

Korea (Rep.) overhauled its telecommunications legislation in 2008 in order to accommodate convergence between telecommunications and television. Under the previous legislative framework, the Korean Broadcasting Commission held jurisdiction over television broadcasting while the Ministry of Information and Communication (MIC) held jurisdiction over the ICT sector.1 Since these regulatory authorities could not come to agreement on the provision of real-time IPTV by telecommunications operators, the converged technology was effectively banned in the country. To remedy this issue, the Korean Government passed a new law creating a converged regulator, called the Korea Communications Commission (KCC), which has jurisdiction over both television and telecommunications-related matters. In addition, the Korean Government enacted a new law, entitled "Internet Multimedia Broadcasting Business Act" that specifically addressed the licensing requirements and service obligations of IPTV.2 With extensive build-out of broadband infrastructure, the new law facilitated fast growth of IPTV services in Korea. By the end of 2010, Korea's IPTV market was the fourth largest in the world with about 3.65 million IPTV subscribers and was also the fastest growing IPTV market with an increase of 54% between 2009 and 2010.3 By July 2012, the number of IPTV subscribers in Korea had reached 4.42 million.4

When designing new legislative frameworks to address convergence, flexibility and foresight are critical elements. Given that the market of new services and technologies is extremely dynamic, legislators must be mindful not to develop legislation that may rapidly become outdated. Legislation should allow the regulator sufficient flexibility for interpretation so that solutions can be implemented as needed despite the evolving nature of convergence, and can do so without constricting future applications and technologies that could benefit the economy and consumer welfare.

In addition, the evolution of convergence, combined with the uncertainty about which technologies and services will succeed in the marketplace, requires a continuous review of the applicable legislation. Some jurisdictions, such as the EU and Malaysia, have established a permanent legislative review process to address convergence.5

Legislative approach through amendment of existing laws

Although a legislative approach commonly involves a modification of the entire legal framework, it may also be carried out through a process of amendments. Through an amendment process, policy-makers can obtain the feedback of industry, consumers and other affected parties for each amendment and address external input before carrying out the legal reform. The amendment process can be quite effective to address urgent convergence challenges without the time-consuming process required for an entire legal framework reform, and is useful to prepare industry and consumers for further regulatory changes. For example, in Hong Kong (SAR), the Government introduced numerous reforms by amending existing legislation, such as the Telecommunications Ordinance, as well as introducing new legislation including the Electronic Transactions Ordinance.6

◂ Table 4-2 summarizes the advantages and disadvantages of the legislative approach.

Practice Notes

- **Table 4-2: Pros and Cons of Legislative Approach in Telecommunications/ICT Regulation [4.2.1]**

6.4.2.2 REGULATORY APPROACH

Under the regulatory approach, countries do not develop new legislation to address convergence. Instead, they modify existing regulations or institute new regulations to address new technologies. For example, in the United States, the Federal Communications Commission (FCC) introduced regulatory modifications to allow new technologies, such as power line communications (PLC), also referred to as broadband over power lines (BPL).1 (See Box 4-3.)

◂ Box 4-3: FCC's Rules Regarding Broadband Power Lines

In October 2004, the U.S. Federal Communications Commission (FCC) modified regulations to support the development of Access Broadband over Power Lines ("Access BPL"), and provide the necessary safeguards against harmful interference to existing services (*e.g.*, licensed radio services). Access BPL technology provides high speed services using the communications capabilities of the electrical power grid.

The FCC's new rules:

- Impose technical requirements on BPL devices (*e.g.*, the capability to avoid the use of any specific frequency and the ability to adjust or shut down a unit remotely);
- Establish frequency bands within which BPL may not operate ("excluded frequency bands") in order to safeguard aeronautical communications;
- Create an Access BPL notice database to identify and resolve harmful interference in an organized manner;
- Require equipment certification for Access BPL systems (replacing the former verification requirement); and
- Establish an improved measurement procedure for all equipment that uses radiation and electromagnetic field safety (RF) energy to communicate over power lines in order to ensure that other licensed uses are protected from harmful interference.

The regulatory approach can be a practical way of addressing convergence provided that existing regulations can be modified or new ones introduced relatively quickly. However, the regulatory approach must be carefully managed to minimize inconsistencies between new and existing rules.

In jurisdictions where the regulator's actions are constrained by the legal framework, a regulatory approach may be extremely limited to the point of being ineffective or unavailable as an option. In addition, since convergence may result in different services and technologies being provided by a single operator, more than one branch of the government, or more than one regulatory agency, may need to be involved. To eliminate inconsistencies, a common policy articulated by the highest level of the government may be required. The involvement of different branches of the government and regulatory agencies slows the process and eliminates one of the main advantages of the regulatory approach, its fast pace.

Most often, the regulatory approach is used by policy-makers in conjunction with the legislative approach. This complementary mix allows governments to establish new legal frameworks to address convergence while dealing with its specific effects through regulation. For this combined approach to work most effectively, the legislation must be sufficiently flexible to allow periodic regulatory adjustments.

For example, this mixed approach was used in Spain. The Government of Spain had already implemented the EU's 2002 NRF and modified its interconnection regulation to allow broader interconnection than traditional switching (*e.g.*, operators were able to interconnect to parts of the infrastructure or have access to wholesale services for subsequent resale (*i.e.*, broadband wholesale service). However, because operators' needs were changing due to increased provision of IP-based systems and services, the regulator implemented a subsequent resolution introducing a capacity-based interconnection system that would serve as an alternative to the traditional time-based system and the access to parts of infrastructure and wholesale services. Table 4-3 summarizes the advantages and disadvantages of the regulatory approach.

PROS	CONS
It allows a faster approach (than legislation) to address convergence and its effects, introducing regulatory measures according to the pace of the technology.	It may cause inconsistencies among existing and new rules.
It allows regulators to make precise rules addressing the effects of convergence.	It may raise asymmetries among existing operators and those that operate technologies that arise from convergence.
When used in conjunction with the legislative approach, it allows for the quick updating or elimination of outdated rules. It also allows flexibility in interpreting existing rules.	In jurisdictions where different branches of the government deal with convergence, it may entail the intervention of a higher level of government to harmonize a common approach.

◂ **Table 4-3: Pros and Cons of the Regulatory Approach in Telecommunications/ICT Regulation**

6.4.2.3 SELF-REGULATION PROCESS

The self-regulation process consists of developing and designing convergence policy through an ad hoc or existing consultative body. This body is normally composed of several government agencies, industry representatives, and other interested parties.

The role and functions of these consultative bodies varies, but they generally issue recommendations to the government addressing the need for changes in convergence legislation and/or regulation. To the extent that industry representatives are involved, self-regulation and industry guidelines may be an outcome of this approach. These consultative bodies may address specific issues of convergence (*i.e.*, VoIP or Next Generation Networks (NGN)) or may undertake a more comprehensive analysis assessing the consequences of the legislative and regulatory environments. A consultative body is a valuable tool that provides a way to constantly review and monitor the effects of convergence and provide first-hand contact with industry and other parties that deal with convergence directly.

Australia has several consultative forums for the communications sector, with the most important being the Communications Alliance (formed in 2006 from the merger of the Australian Communications Industry Forum (ACIF) and the Service Providers Association Inc (SPAN)).1 The Communications Alliance implements and manages industry self-regulation in the interests of both industry and consumers. For example, as part of its activities, the Communications Alliance has developed a number of VoIP-related industry guidelines including: 1) IP network quality of service for Carriage Service Providers, such as ISPs and 2) VoIP quality of service measurements.2

However, the self-regulation process has certain potential problems. For example, the intervention of industry representatives may pose a risk in those jurisdictions where competition has not developed or where significant asymmetries exist among operators, since the consultative body may be dominated by these operators and its conclusions could reflect narrow interests. In these cases, self-regulation guidelines developed by these consultative bodies may result in rules that benefit existing operators to the detriment of new competitors that operate new technologies providing converged services. Policy-makers must carefully manage these risks in order not to regulate convergence according to the special interests of a few companies and against consumers and the public welfare.

PROS	CONS
It provides first-hand knowledge of the effects of convergence and can provide insight on the effects of proposed regulation.	The establishment of a consultative body, and the development of procedures to ensure its neutrality, may be difficult.
It can be a useful tool to introduce the measures to address convergence with the pace and flexibility requested by the industry.	In those jurisdictions where competition has not developed or where significant asymmetries exist among operators, recommendations may not be neutral and may tend to foreclose effective entry by new convergence technology-based operators.
	It may not result in quick solutions if recommendations to modify existing regulations must be implemented through a subsequent legislative approach.

◂ Table 4-4 summarizes the advantages and disadvantages of the self-regulation approach.

Table 4-4: Pros and Cons of the Self-Regulation Approach in Telecommunications/ICT Regulation

6.4.3 MODIFICATIONS TO TELECOMMUNICATIONS LEGISLATION TO ADDRESS CONVERGENCE

Policy-makers are implementing reforms to their legal frameworks in order to address the issues raised by convergence. Most of these reforms are focused on telecommunications legislation and regulation. However, due to convergence, legal reforms of telecommunications legislation are increasingly coordinated with and, in some cases even integrated into legislation affecting broadcasting and information technology. These reforms are resulting in the opening to competition of increasingly more advanced and converged services (see Figure 4-A). Countries where such an approach is not carried out have less effective regulatory tools to handle convergence and therefore may miss the full benefits of its development and the introduction of advanced and converged services for the market and consumers. For instance, reforms may be developed in the telecommunications regulatory framework, but if regulation in other ICT sectors is not also modified to address the challenges of new technologies (

i.e.

, privacy and security issues, e-signature, e-commerce, etc.), the market will not fully develop because consumers will be reluctant or unable to use all ICT capabilities until these challenges are fully addressed.

Reforms due to convergence are following common trends affecting various aspects of telecommunications regulation, particularly in the areas of licensing, spectrum, interconnection, universal service, and numbering. With regard to licensing, modifications to regulations have focused mainly on reducing market-entry requirements for new technologies by introducing a simpler and technology-neutral licensing regime. In the area of spectrum management, the concept of technology and service neutrality is being proposed, as well as spectrum trading and in-band migration, to allow the more flexible introduction of new services and obtain a more efficient use of the spectrum. Interconnection ideas are also shifting and new concepts are being implemented such as “access” and “capacity based interconnection.” For purposes of universal service and numbering, technology-neutrality and inter-modality portability is being introduced.

6.4.3.1 LICENSING

Licensing frameworks traditionally consisted of a large number of different service categories, and applicants applied for separate licences in order to provide each service. In addition, licences were often granted based on the type of technology that was being offered by the applicant (

e.g.,

VSAT licence).

Convergence has had an impact on this categorization and made it complicated for regulators to continue to grant licences

in this manner. For example, a cable television operator intending to provide "triple play" services generally would require three different licences, one for each of the bundled services (*i.e.*, broadcasting, voice and data), instead of one single licence. Countries have been modifying their licensing frameworks to address this new situation by simplifying their licensing regimes. This has been primarily implemented by: (i) introducing technology-neutral licences with broader service categories; (ii) establishing a unified and technology-neutral licence that allowsoperators to provide multiple services under one licence using any kind of technology; (iii) "de-licensing" whereby the operator merely needs to submit a notification or registration with the regulator, although specific rights of use may be required when scarce resources such as spectrum or numbering are involved in the provision of a service;or (iv) not requiring any registration or notification on the basis that the services provided fall outside of the regulator's authority or because the regulator has decided to forbear from regulating a particular service.

However, these modifications may not be sufficient to fully address convergence if they are not accompanied by related measures in the regulatory framework to introduce competition and non-discrimination. For example, in many jurisdictions, cable television operators, which were initially licensed to provide broadcasting services, can provide voice and data services without any specific restriction. On the other hand, traditional telecommunications operators may not be allowed to compete with cable operators if broadcasting service licences are restricted. In this case, the lack of reform in broadcasting legislation becomes a bottleneck that restricts competition and discriminates against telecommunication operators.

The modification of the licensing regime may not be an easy task for policy-makers and regulators because of the existing legal framework and market structures already in place. However, necessary reforms may be introduced through a transition process in which market and legal structures are smoothly adapted. A regulator willing to follow this transition into a technology-neutral licensing regulation likely will address the following decisions (Box 4-4):

◂ Box 1Decisions to Undertake in the Transition to a Technological-neutral Licensing Regime1

- Deciding which model of licensing will be adopted.
- Deciding whether the existing licensing framework will be overhauled in one step or through a gradual, phased in fashion.
- Deciding which entity or entities will be responsible for licensing, authorizations, and notifications.
- Mapping various services licensed under a service or technology-specific regime to a less burdensome licensing regime. This includes deciding which services may still be subject to licensing, which may require only an authorization or notification process and which may become unlicensed as well as eliminating any geographical licensing restrictions and redesigning the application process.
- Ensuring a level playing field under the new licensing regime so that neither existing service providers nor new market players will be at a competitive disadvantage, *i.e.*, whether existing licensees will require any compensation for moving to the new licensing regime or whether the transition can be accomplished in the absence of compensation; how to address issues such as large licence fees paid during a period of limited competition while reduced licence fees apply in the new regime, changes to bank guarantee policies, etc.
- Revising existing universal access/service regulations, including modifications to network rollout, coverage or investment requirements as well any contributions to universal access funds and reviewing which services consumers should be provided under the nation's universal access/service definition.
- Reviewing and updating other regulations such as quality of service, interconnection, spectrum and numbering, both to transfer any such regulations currently included in licence terms and conditions to stand-alone regulation as well as updating such regulations to accommodate convergence.
- Developing a regulatory framework that incorporates recent technological developments, such as WiFi, VoIP and WiMax and anticipating a continuous technical and market evolution.
- Developing regulatory capacity to regulate disputes, enforcement and sanctions.

(a) General Licence Categories and Technology Neutrality

The first trend in licensing reform is to introduce technology-neutral licences that combine converged services or broaden the types of services that fall within one licence.

For example, in Malaysia, the prior licensing framework consisted of 31 service-based licences, whereas its new framework consists of four general and technology-neutral licences: Network Facilities Provider (NFP); Network Services Provider (NSP); Application Services Provider (ASP); and Content Application Services (CSP)(a special subset of application services that includes television and radio broadcast services and Internet content services).**2**

The Eastern Caribbean Telecommunications Authority (ECTEL), has developed a technology-neutral licensing approach

with four categories of licences: Individual Licences (generally for services that are infrastructure-oriented); Class Licences (ISPs or resale, among others); Frequency Authorization Licences (that is an ancillary licence that would be required in addition to an Individual or Class Licence); and Special Licences (that are foreseen for special cases in emergency circumstances). 3 ECTEL classifies licences based on the service that will be provided without regard to the type of technology being used. For instance, whereas previously an operator might obtain a VSAT licence, it now obtains a licence for the service (*i.e.*, a private or a public network service) it will be offering using that VSAT.

(b) Unified Licensing

A second trend is the introduction of a unified licensing regime, in which licences evolve into a single licence covering a wide range of services. This approach has been or is being adopted by various countries, including Kenya and India.

Kenya's licensing regime, announced in September 2004, adopted a unified and technology-neutral licensing framework that permits any form of communications infrastructure to be used to provide any type of communications service.4 This licensing regime differs significantly from the previous service-specific licensing regime consisting of 46 types of licences grouped into nine categories. Kenya's current Unified Licensing Framework (ULF) consists of three main technology-neutral licences: (i) Network Facilities Provider (ii) Application Service Provider (iii) Content Service Provider.5 In addition, investors seeking to land a submarine cable in Kenya require a Submarine Cable Land licence while those interested in building system for the provision of international voice/data services are required to get a licence for international Systems and Services. An operator may be issued multiple commercial licenses, provided that it maintains separate accounts for each licence.

In India, the Department of Telecommunications adopted a more unified licensing framework in which Unified Access Service (UAS) licensees may provide, within their licensed geographic area, any voice and/or non-voice (i.e., data) services over either fixed line or wireless networks via circuit-switched or IP-switched equipment.6 These licensees may also provide specific value-added services of voicemail, video conferencing, audiotex, videotex, email and closed user group services to subscribers. However, all other types of services require a separate licence. As of March 2008, there were 240 UAS licensees in India.

(c) De-licensing

A third trend is the movement in certain countries towards lighter licensing regimes or de-licensing. Traditionally, many countries used three general approaches to authorize telecommunications networks and services -- individual licences, class licences, and open entry. In the initial phase of liberalization in particular, countries leaned towards a higher degree of regulatory control over market entry, thus requiring individual licences in most cases, where: (i) there was a need for access to public property and/or locations of public use and/or third party's properties to roll out the networks (*i.e.*, deploy a base station or a fiber network); (ii) there was a need for scarce resources (*e.g.*, frequencies and/or numbers), and (iii) the government of a particular country determined that the service needed to be provided in a certain way.

Convergence has called this premise into question, with countries realizing that burdensome administrative procedures relating to market entry limit the offer of a greater variety of applications or services. As a result, many countries (including all 27 EU member states) are moving towards a general authorization regime.

De-licensing involves a general authorization or class licence system in which operators are free to provide services subject to regulatory obligations. Typically, the operator must submit to the regulator a notification containing minimal information before, or within a short time after, initiating service. However, operators do not have to wait for approval before commencing service.

A registration regime typically requires minimal information, but involves stricter formalities in that prior acceptance of the registration by the regulator is required for the operator to commence its activities. In addition, unlike a notification, a registration may be rejected by the regulator.

In April 2004, Japan implemented a review of its Telecommunications Business Law and established a registration and notification regime. Operators in Japan that install networks of a certain size and scale must obtain a registration from the Ministry for Internal Affairs and Communications. However, all other operators are only required to submit a notification to the Ministry.7

The EU has moved towards a simple authorization regime using minimal regulatory intervention and requiring individual licences only where strictly necessary (*e.g.*, for the use of resources such as radio frequencies and numbering). The regime covers authorization of all electronic communications networks and services regardless of whether they are provided to the public. The objective of the new framework is to ensure the freedom to provide electronic communications networks and services, subject only to the conditions relating in particular to welfare, public security, and public health. However, one interesting aspect of the new regime is that the definition of "electronic communications networks and services" is so

broad that in certain EU jurisdictions various services that were previously unregulated now require a notification and operators are now subject to a variety of related obligations (*e.g.*, fees and taxes) to which they were not previously subject.

(d) Eliminating Licence Requirements on New Converged Services

A fourth trend to address convergence is to eliminate filing requirements with the regulator on the basis that the services fall outside of the regulator's authority or because the regulator has decided to forbear from regulating a particular service.

This approach has been followed in the United States for ISPs and the services they provide (*e.g.*, e-mail, Internet access, and VoIP). To date, services provided by ISPs have been treated as unregulated "information services" in order to promote the continued development of the Internet.8

(e) Adherence to Regulatory Requirements and Obligations

As many regulatory functions were based on a license regime at inception, the move to forbear from licensing is viewed by some, as eroding the regulator's authority in relation to the new entrant, leading to a license being issued even when regulatory oversight is no longer required. Although a regulator may decide that certain categories of service or network providers will not be subject to licensing requirements, this does not exclude the possibility of the regulator imposing certain regulatory obligations on such providers, such as contributions towards universal service funds or compliance with emergency service requirements. For example, although the FCC has not implemented licensing, notification or registration requirements for ISPs, it has determined that certain VoIP providers must comply with emergency number (**E911**) requirements. This determination is part of a rule-making proceeding that was initiated by the FCC to determine whether VoIP services should be regulated and whether providers of such services should be subject to certain regulatory requirements.9

Practice Notes

- **FCC Rules Regarding Emergency Calls for VoIP Service Providers (E911) [4.3.1]**

6.4.3.2 SPECTRUM

Most countries allocate spectrum on a national basis in accordance with the ITU frequency allocation table, and then assign specific frequencies for use by particular radio services. Traditionally, spectrum licences have been subject to stricter government controls than other types of licences because they involve the use of a scarce resource and can be hampered by interference.

However, to promote competition, convergence and efficient use of spectrum resources, policy makers and regulators have begun introducing changes to spectrum regulations. First, regulators are starting to grant the right to use spectrum without regard to the type of technology being used (*i.e.*, technology-neutral approach). For example, in India, the government has reformed the licensing and spectrum authorization regime from a service-specific to a technology-neutral unified access service licence (UASL) framework.1 Under the previous spectrum authorization framework, the government issued Cellular Mobile Telephone Service (CMTS), which only permitted licensees to provide mobile voice and data services. However, under the UASL, licensees are permitted to offer both mobile and fixed telecommunications services. Additionally, CMTS licensees are able to migrate to the new licensing framework. In May 2010, the Telecom Regulatory Authority of India (TRAI) released to the government its Recommendations on the Spectrum Management and Licensing Framework, which includes a recommendation to create a specific fund for spectrum refarming.2

The United States has similar rules to Australia and generally takes a technology-neutral approach. Congress authorized the FCC to allocate spectrum for flexible use when it: (i) will be in the public interest; (ii) will not deter investment in communication services, systems and technology developments; (iii) will not result in harmful interference; and (iv) is consistent with international agreements.3

Second, regulators are allowing spectrum trading or in-band migration. In Australia, spectrum licences are tradable and technology neutral.4 Spectrum licences authorize the use of spectrum and licensees are free to use any device and technology within their spectrum, provided that such devices comply with the conditions of the licences and the advisory guidelines established for the corresponding bands. To avoid interference, the Australian Communications Authority (ACA) creates a document called "interference management framework" for each auction in which it sets forth the rules for spectrum use.5 In addition, in Guatemala, the 1996 Telecommunications Law**5** introduced private spectrum rights that are granted in frequency usage portions (Títulos de Uso de Frecuencias – TUC), which have technical limitations to protect against interference (*e.g.*, maximum power transmission and emission). These private rights are limited for a period of time (15 years plus an additional 15 year extension if requested), but they can be traded without limitation other than the technical condition related to each TUC to protect against interference.

(a) Introduction of Technology Neutrality in Spectrum Regulation

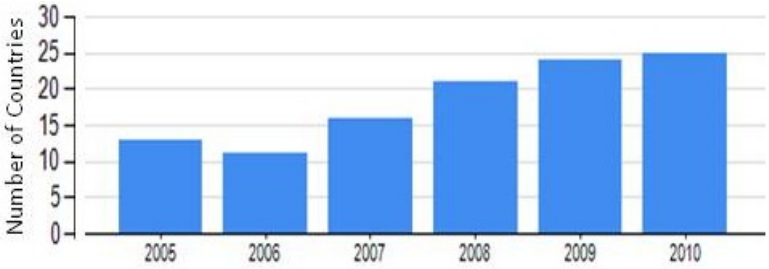
The introduction of technology neutrality in spectrum regulation brings with it certain limitations. The premise of a technology-neutral approach is that any service should be provided through any kind of technology in any frequency band, and the use of spectrum can be altered at any time. However, in practical terms, this is not feasible for various reasons:7

1.

- **Interference**. Traditionally, regulators have addressed interference problems by mapping the services and allocating them in a national table of frequencies. Only those services allowed in a frequency band could be licensed therein. However, now that countries have introduced a technology-neutral approach in spectrum regulation, interference issues may be dealt with in a different manner. One option followed by certain regulators is to issue specific technical rules associated with the specific spectrum granted. These technical rules introduce some limitations to the spectrum use, and thus in the strictest sense full technology neutrality is not possible, but it does resolve the problem of interference. Another option, and one that has been used in the past, is to establish "guard bands" or small blocks of 1 or 2 MHz between different types of allocations.
- **Economies of scale**. The implementation of new technologies is more effective and economically viable when efficient economies of scale (*e.g.*, decreases in the cost of equipment and technology development) are achieved by industry coordinating in the development of a standard and the identification of specific spectrum bands. In certain instances, countries and regions with industrial interests tend to develop their own standards (*e.g.*, GSM in Europe). A technology-neutral approach in spectrum regulation challenges this coordination as different technologies and standards could be deployed in the same spectrum bands. However, although the costs related to deploying different technologies and standards are potentially higher in the short term because the economies of scale of each standard are lower than if a unified standard is adopted, a standard competition policy could have its benefits in the medium term because standards are enhanced and improved in a competition environment, providing consumers with better options and reducing technology costs.
- **International coordination**. The ITU Radio Regulations, which are binding on the signatories of the ITU Constitution and Convention, are the international regulations used by the member nations to allocate and manage spectrum within their jurisdictions. The Radio Regulations affect the extent to which technology neutrality can be implemented; however, the ITU Radio Regulations are broad enough to allow development of different radiocommunications services within the designated spectrum bands, so countries still have a wide degree of discretion to introduce technology neutrality.

(b) Spectrum Trading

A second response to convergence has been the introduction of spectrum trading and in-band migration. Spectrum trading refers to the ability of licensees to sell or trade their spectrum rights. Countries may decide to limit spectrum trading for specific uses or technologies or to allow unlimited trading except for requiring adherence to rules regarding interference. As of 2010, only 25 of 156 countries responding to the ITU's survey question on secondary spectrum trading indicated that secondary trading is permissible while only six of these countries stated that there may be a change in spectrum use permitted on transfer. However, as Table 4-5 shows, the number of countries allowing spectrum licensees to trade spectrum on the secondary market has been steadily rising since 2005, showing that this is an area with great potential for further flexibility and liberalization.



◂ Table 4-5: Number of Countries Permitting Secondary Spectrum Trading, 2005-2010

Source: ITU World Telecommunication Regulatory Database (2010).

Within the EU, the NRF allows spectrum trading.8 In 2004, certain member states and the European Commission commissioned an independent study regarding the conditions and options of introducing spectrum trading. The report recommended the implementation of spectrum trading and further liberalization of spectrum use.9 The United Kingdom has already allowed spectrum trading for certain types of licensed transmissions, and is expected to expand to more types of licences.10 Furthermore, the United Kingdom has introduced measures to liberalize spectrum by, among other things, reducing obligations of current licences and allowing them to modify their spectrum use provided they do not cause

interference.11 The 2009 Telecom Reforms continue to permit spectrum authorization holders to trade spectrum in the secondary market.

(c) In-band Migration

Various countries are introducing **in-band migration** which refers to the policy of allowing operators to use existing licensed spectrum to provide new services. Jurisdictions in the Americas and Asia have used this policy with the introduction of IMT-2000 systems,12 allowing existing mobile operators to provide third generation (3G) networks in their assigned frequencies. This policy has permitted operators to decide when to deploy 3G networks and has been effective in reducing implementation costs because it has allowed operators to use their existing spectrum without incurring the cost of new licences. As a result, 3G mobile networks have proliferated throughout these two regions. In 2009, the EU amended the GSM Directive of 1987, which reserved part of the 900 MHz band for GSM access technologies only.13 The updated Directive allows licensees in the 900 MHz to also offer 3G (UMTS) technologies. Although the 2009 reforms are not entirely technology-neutral, the EU has stated that it will review other mobile technologies, particularly upcoming 4G systems, to ensure compatibility with GSM and UMTS systems.

(d) Unlicensed or Licence-Exempt Use

Regulators are also facing the introduction of Wireless Local Area Networks (WLAN and WiFi), technologies that operate in the Industrial, Scientific and Medical (ISM) bands. The ISM bands are generally unlicensed because they operate on a non-interference basis. Regulators have generally allowed WiFi networks to operate unlicensed, provided thattheir transmitting characteristics fall into those designed for that band. In practice, this has resulted in the implementation of a technology-neutrality approach for the ISM band. For example, of the 67 countries that responded to the ITU's annual regulatory survey,„**12** only two prohibit WLANs in the 2.4 GHz band and four in the 5 GHz band. Thirty-nine countries allow WLANs without any prior notification or registration in the 2.4 GHz band, and 25 in the 5 GHz band. Finally, 27 countries allow WLANs with a simple registration or notification in the 2.4 GHz band and 28 in the 5 GHz band. In line with the "hands-off" policy approach, the European Commission has issued a recommendation **13** calling on EU member states to facilitate WLANs without imposing any specific regulatory conditions. In Singapore, the band in which WLAN operates was already being used. To facilitate the introduction of WLANs, the regulator migrated existing systems out of the band to allow WLANs to operate.

(d) Unlicensed or Licence-Exempt Use

Regulators have also begun introducing unlicensed (also called licence-exempt) use of spectrum, particularly with the rise of Wi-Fi and other Wireless Local Area Networks (WLANs technologies that operate in the Industrial, Scientific and Medical (ISM) bands. Many regulators have allowed Wi-Fi networks to operate in existing unlicensed spectrum bands, provided that their transmitting characteristics fall into those designed for that band. In practice, this has resulted in the implementation of a technology-neutral approach for the ISM band. For example, of the 67 countries that responded to the ITU's annual regulatory survey,14 only two prohibit WLANs in the 2.4 GHz band and four in the 5 GHz band. Thirty-nine countries allow WLANs without any prior notification or registration in the 2.4 GHz band, and 25 in the 5 GHz band. Finally, 27 countries allow WLANs with a simple registration or notification in the 2.4 GHz band and 28 in the 5 GHz band. In Singapore, the band in which WLAN operates was already being used. To facilitate the introduction of WLANs, the regulator migrated existing systems out of the band to allow WLANs to operate.

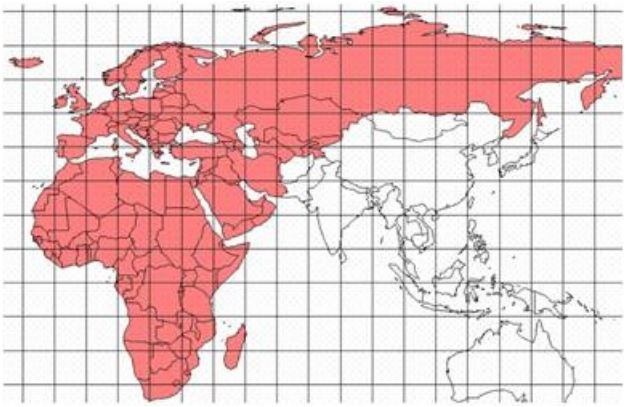
(e) Digital Terrestrial Television and the Digital Dividend

In order to better to provide higher quality terrestrial broadcast television programming, as well as allow for refarming of spectrum in the television broadcast bands, digital terrestrial television (DTT) has increasingly garnered the attention of regulators and policy makers around the world over the last several years. DTT is more spectrally efficient than analogue terrestrial television, and therefore requires less spectrum per channel. As a result, it potentially makes available a considerable amount of spectrum in bands that new and existing technologies are demanding. However, in order to receive DTT, consumers must acquire a new television set or a set-top box (STB), introducing a disruptive effect for consumers that must be carefully managed.

Regulators and policy makers are facing the challenges arising from these two factors by establishing policies to: (i) recapturing spectrum from analogue broadcasters that is no longer required in order to operate in an all-digital format; (ii) assign the newly available spectrum to new uses; and (iii) pursue a smooth transition for consumers that minimizes the disruptive effect of requiring a new television or STB.

Countries are increasingly implementing policies establishing long parallel emissions periods allowing broadcasters and consumers to smoothly transition, which includes designating a specific date whereby broadcasters must switchover from analogue television to DTT, often referred to as the analogue switch-off or switchover (ASO). Many countries have already completed the ASO, including Austria, Denmark, Finland, Germany, the Netherlands, Norway, Spain, Sweden, Switzerland

and the United States. Other countries are planning to complete the ASO by 2012, including Canada, Australia, Japan, Korea (Rep.) and New Zealand, as well as most of the remaining EU Member States in order to meet the proposed deadline set out by the European Commission.15 Additionally, the signatories of the ITU's Geneva 2006 (GE06) Agreement, all Region 1 countries, as shown in Figure 4-A below, have agreed to complete the DTT transition by June 17, 2015.16 Although not all African countries have set out an ASO date, Kenya, Nigeria and South Africa have each established hard deadlines for the ASO of July 1, 2012; June 17, 2012; and December 2013, respectively.



◂ **Figure 4- A: Region 1 Countries**
Source: ITU GE06

In addition to higher quality television broadcasting services, the DTT transition allows governments to reclaim broadcast spectrum and assign the spectrum for new uses. This reclaimed spectrum, often referred to as the digital dividend, is ideal for commercial wireless services, such as mobile broadband, due to its excellent propagation characteristics. Digital dividend spectrum allows for wide coverage in rural areas, as well as good in-building and non-line-of-sight coverage, while requiring installation of fewer base stations than in higher frequency bands.17 As such, the digital dividend enables a more cost-effective network roll-out.

The digital dividend spectrum, located n the 698-862 MHz band, was identified by WRC-07 for use by IMT systems. (Note that WRC-07 identified the 862-960 MHz band for IMT as well, but this is not generally considered "digital dividend" since it has not been part of television broadcast spectrum.) As shown in Figure 4-B, the digital dividend for Region 1 (R1) countries (i.e., in Europe, Africa, Russia and parts of the Middle East) is generally the 790-862 MHz band and is referred to as the "800 MHz band". However, the digital dividend covers the 698-806 MHz band (called the "700 MHz band") for Region 2 (R2) countries in North and South America and Region 3 (R3) countries in Asia-Pacific and parts of the Middle East.18 Within these harmonized bands, countries may then select their own specific band plans for mobile services.

Since harmonization and the resulting economies of scale are considered beneficial, most countries are expected to try to adopt the same or similar band plans as other countries in their respective regions. So far, APT and the EU have been at the forefront of regional harmonization, but ATU, CITEL and other intergovernmental organizations are expected to play a key role in regional harmonization as well.

- **European Union**: The European Commission (EC) has issued multiple consultations, recommendations and decisions on the harmonization and release of digital dividend spectrum, which resulted in a May 2010 decision on the harmonized technical conditions in the 790-862 MHz band.19 This decision provides that "Member States may decide individually whether and at what point in time they designate or make available the 800 MHz band for networks other than high-power broadcasting networks, and this Decision is without prejudice to the use of the 800 MHz band for public order and public security purposes and defence in some Member States." In addition, the EC will not set a deadline for allowing mobile services in the 800 MHz, but this may be decided by the Parliament and Council at some future date, upon a proposal from the Commission. The general conditions of the 800 MHz Decision are as follows:

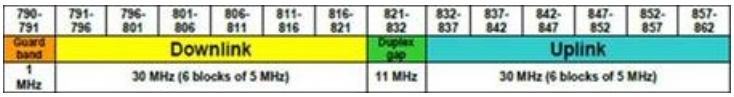
o Where the 800 MHz band is made available for networks other than high-power broadcasting, it must be on a non-exclusive basis for terrestrial systems capable of providing electronic communications services.

o There must be appropriate protections provided to systems in adjacent bands.

o Member States must facilitate cross-border coordination, particularly where neighboring countries are releasing digital dividend spectrum at different times or are third countries (i.e., non-EU Member States) using these bands for different services. As such, Member States are not bound by the 800 MHz Decision in geographic areas where spectrum coordination with third countries requires a deviation.

o As shown in Figure 4-C, within the 790-862 MHz band, the frequency arrangement will include 5 MHz blocks and FDD duplex spacing of 41 MHz with base station transmission (downlink) located in the lower part of the band (791-821 MHz)

and terminal station transmission (uplink) located in the upper part of the band (832-862 MHz).

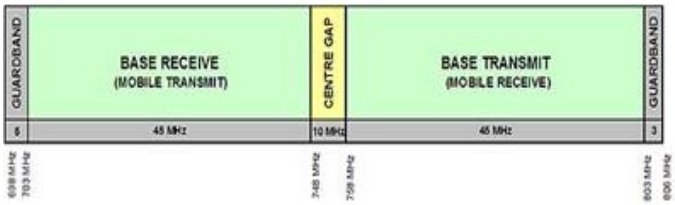


◂ Figure 4-C: EC Proposed Frequency Arrangements for Digital Dividend

- · Asia-Pacific Telecommunity **(APT)**: One of the APT's key work programs is the APT Wireless Group (AWG), formerly known as the APT Wireless Forum (AWF). The AWG addresses various aspects of emerging wireless systems, including IMT/IMT-Advanced. At the ninth meeting of the APT Wireless Forum in September 2010, an agreement was reached on two harmonized frequency arrangements for IMT in the 698-806 MHz frequency band in the Asia-Pacific region. The AWF-9 agreed that a harmonized frequency arrangement for the band 698-806 MHz is appropriate to assist Region 3 countries wishing to use the entire band for IMT as well as those administrations considering use of a portion of this band.20 Recognizing the need to provide sufficient protection for the services in adjacent bands and based on studies of the various interference mechanisms that may impact services in adjacent bands, it was decided that digital television spectrum would be allocated below 694 MHz. Spectrum for mobile services is to be allocated in one of the following ways:

o **For FDD frequency arrangements**: 703-748 MHz uplink paired with 758-803 MHz downlink, including a lower guardband of 5 MHz at 698-703 MHz and an upper guardband of 3 MHz at 803-806 MHz for a total of 90 MHz of FDD spectrum (2x45 MHz). (See Figure 4-D)

o **For TDD frequency arrangements**: A single 108 MHz band from 698-806 MHz.



◂ Figure 4-D: APT Digital Dividend Band Plan for FDD Frequency Arrangement

Despite efforts at regional harmonization, final decisions on the allocation and assignment of digital dividend spectrum will be made on a country-by-country basis. Given the various stages of the DTT transition around the world, the release of this spectrum is likely to be on-going for the next decade with some general trends emerging, including:

- **DTT transition timelines vary, but ASO will likely be completed worldwide by 2020** . Many developed and developing countries have adopted ASO dates, or have at least set a goal for completing the transition by a certain year. While the United States and many European countries have already completed the ASO or will complete it in the next two years, other countries appear to be focusing on 2015-2020 to complete their transitions.
- **International and regional harmonization is well underway**. At the international and regional level, there have been efforts to harmonize the digital dividend spectrum and develop common band plans. The 2007 World Radiocommunication Conference (WRC-07) identified spectrum in the 698-960 MHz band for International Mobile Telecommunications (IMT).
- **Consideration of the award of digital dividend on a national basis is still developing** . There has generally been less progress made towards developing rules and timeframes for the award of digital dividend spectrum. While there are several digital dividend proceedings to be completed and issued over the next two years, including Chile, Ireland and the United Kingdom, most countries around the world have yet to establish technical and service rules or award processes for the digital dividend spectrum, particularly in developing countries.
- **Countries are waiting to assign digital dividend spectrum until after the ASO**. It appears that generally countries are waiting to award the digital dividend spectrum until after the ASO is completed and the spectrum is unencumbered by broadcasting services. For example, Finland's ASO in the 800 MHz band was completed in 2007, but digital dividend licenses still have not been awarded.

Practice Notes

- Different Approaches to Facilitate In-Band Migration [4.3.2]
- In-Band Migration [4.3.2]
- Licensing of Wireless Technology in Different Countries [4.3.2]

- Regulatory Treatment of WiFi and WLAN [4.3.2]

6.4.3.3 INTERCONNECTION

The technological innovations that have resulted in the convergence of telecommunications, information and broadcasting have raised numerous regulatory issues regarding interconnection. Until recently, interconnection policies were mainly used to facilitate competition by requiring incumbent telecommunications operators (or dominant suppliers) to provide interconnection to competing operators. Today, effective interconnection arrangements are considered an essential element to foster the development of integrated ICT markets. Convergence has forced a reassessment of this policy in order to take into account the interconnection of different types of networks and service providers (*e.g.*, cable television/content providers and IP networks/ISPs).

Traditional interconnection regulation was established for telecommunications operators with interconnection rates generally based on time (*i.e.*, per minute). Services based on IP protocol, however, do not fit within the traditional schemes of switched voice interconnection and requires different kinds of access (*e.g.*, interconnection at an IP level or the higher frequencies of the local loop necessary to provide ADSL data services over the existing copper wiring) and different kinds of charges. This is necessary to permit, in a converged environment, the fundamental principle that any network operator is able to interconnect with any other operator regardless of the network (*i.e.*, "any-to-any" interconnection). Countries are addressing these needs by introducing: (i) a symmetrical interconnection regime, (ii) new kinds of "access" through interconnection regulation and (iii) a technology-neutral interconnection charging system based on capacity, instead of time and distance.

(a) Introduction of a Symmetrical Interconnection Regime

Traditionally, only public switched network operators (fixed or mobile) were subject to interconnection obligations. However, there has been some ambiguity regarding other operators, such as cable networks or ISPs. As convergence blurs the traditional difference between networks, regulators are introducing a symmetrical interconnection regime in which any operator, regardless of the type of network it has, is obliged to interconnect with any other operator. For instance, in Denmark, communications network providers offering service to the general public (including traditional telephone network operators as well as broadcasters and Internet service providers) have the obligation of, and the right to, interconnection. In Argentina, new legislation implemented a symmetrical interconnection regime where all operators are obliged to interconnect upon request.1

However, some jurisdictions have maintained asymmetrical interconnection. For instance, the EU NRF requires regulators throughout the EU to carry out a market analysis to determine which operators have significant market power. Interconnection has been separated into three different markets (*i.e.*, call origination, call termination and transit). Regulators will decide after this analysis which markets are deemed to have significant market power. In each such market, an operator is obliged to provide interconnection. By way of example, the EC has determined that all mobile operators are dominant in the provision of termination on their networks as there is no realistic possibility of substitution.2

(b) "Access" Interconnection

To address the different needs of IP network and service operators for interconnection, the EU NRF introduced the concept of "access",3 principally for origination, which allows ad hoc interconnection to network infrastructure via direct access or resale (such as local shared access4 or bitstreamaccess).5 Within the EU, member states have implemented "access" interconnection and granted this right to operators other than traditional voice providers. Member states, such as Denmark, Finland, and Greece, have determined that all operators have a right to bitstream access, and Austria has allowed ISPs to request unbundled infrastructure.The United Kingdom has proposed implementing an "equivalence of inputs" (EoI) for NGN6 that obliges the incumbent telecommunications operator to make available the same products7 and services to other operators as it makes available to itself, at a wholesale price (which is the same 'transfer' price that a network division may provide to a retail division), and using the same system and processes. EoI implements a further step within the "access" concept, as it allows operators to request directly, on a wholesale basis, services which have a retail counterpart instead of regulating a physical connection. In September 2005, the operator agreed to support the proposals in the consultation, including commitments to provide unbundled network access on an EoI basis, and not to make design decisions that would foreclose specific product options without adequate consultation.8 See Table 4-6 for a comparative summary of the EU concept of access and the U.K. concept of EoI.

◂ Table 4-6: The EU Concept of Access and the U.K. Concept of Equivalence of Inputs

Access [9]	OFCOM Proposal of Equivalence of Input [10]
Making facilities and services available to another operator for the purpose of providing electronic communications services under defined conditions. It includes, among other things ▪ physical interconnection, ▪ access to network elements and associated facilities (*i.e.*, local loop), ▪ access to physical infrastructure, including buildings, ducts, and masts, ▪ access to software systems, including operational support systems, ▪ access to numbering translation, ▪ access to fixed and mobile networks, ▪ access to conditional access systems, and, ▪ access to virtual network systems.	Making available to competitors the same products and services that an operator with significant market power makes available to itself, which includes: ▪ a wholesale price, and ▪ the same systems and processes. No retail service may be launched by an operator with significant market power without a corresponding wholesale product offered to other operators as EoI.

(c) Capacity-based Interconnection

A relatively new measure being implemented to address convergence needs for interconnection is a flat charge representing the cost of the capacity, rather than a per-minute rate. Some jurisdictions, such as Spain and Colombia, have implemented a capacity-based interconnection (CBI) modality that allows operators to request a specific capacity for interconnection and pay a flat rate charge that reflects the fixed cost nature of the interconnection capacity. As interconnection capacity is dimensioned to peak-hour traffic, CBI rates reflect true economic costs and do not require artificially spreading such fixed costs over projected traffic minutes to arrive at a per-minute charge.

In Spain, CBI was introduced in the incumbent's Reference Interconnection Offer (RIO),11 and allows operators to request interconnection through three different models: (i) on a capacity basis; (ii) a time-based model; or (iii) or a mix of both. Capacity-based interconnection may be requested in two capacity units (64kbps and 320kbps) and the RIO allows for the reselling of excess capacity. Similarly, in Colombia, the regulator issued a resolution12 allowing operators the option of choosing time-based interconnection or capacity interconnection on a per-city basis. However, there is only a single 2 Mbps capacity unit and reselling is not allowed. The table below compares the capacity interconnection models of Spain and Colombia.

◂ Table 4-7: Comparison of Capacity Interconnection Models of Spain and Colombia

Issue	Spain	Colombia
Is use of both models (time and capacity) by an operator permitted?	Yes, but the operator must select at each interconnection point (POI) the model it is going to be used.	Yes, but only for national operators that interconnect in more than one city. Capacity-based interconnection cannot be used simultaneously with time-based interconnection in the same city.
What is the minimum Capacity Unit (MCU)	There are two MCUs: 1. ▪ For those POIs that have interconnection links equal or less than four 2 Mbps (120 channels of 64 kbps) the MCU is 64 kbps. ▪ For those POIs having interconnection links more than four 2 Mbps (120 channels of 64 kbps); the MCU is 5x64kbps.	Capacity interconnection charges are established according to a 2 Mbps (E1) link, but the regulation expressly states that a different unit may be agreed upon by the parties.Currently, there has not been any interconnection agreement signed by any operator with an MCU lower than 2 Mbps.
What types of traffic are allowed?	There are two types: 1. ▪ Internet traffic only ▪ Voice + Internet traffic	Not expressly defined. Any type of traffic is allowed.
Is resale possible?	Yes	No
Is overflow possible?	Yes. Operators may opt for capacity links without or with an overflow possibility	Yes. Overflow routes must be established by both parties in order to guarantee the minimum quality parameters established in the regulation.

(d) *Wholesale Open Access Models*

Some countries, including Singapore and Australia, are rolling out fiber network infrastructure based entirely on a wholesale open access model. In Singapore, the government has established a three-layer industry structure for the country's Next Generation National Broadband Network ("Next Gen NBN") with different responsibilities and roles to ensure that there is no conflict of interests among the various layers.13 Each of the layers is to be provided by a single company or group of companies, but these companies are prohibited from providing any other layer. The layers are comprised of:

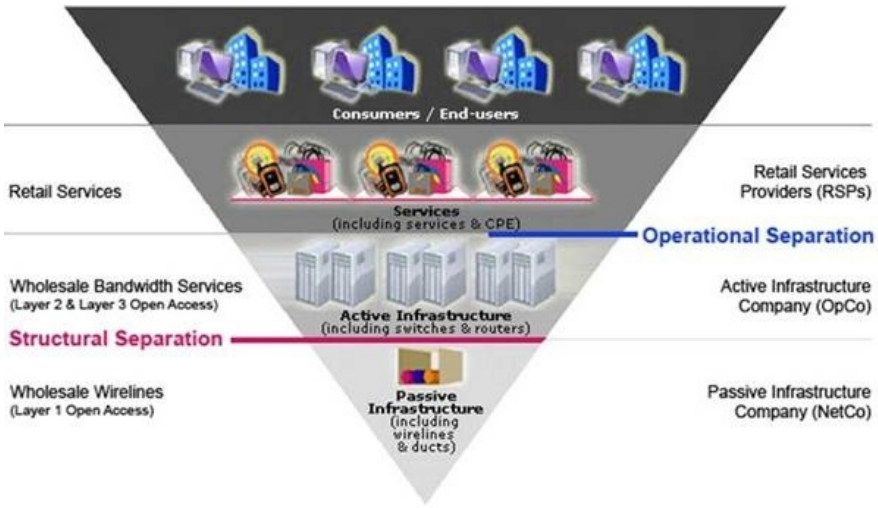
1. The Network Company (NetCo), which operates at the first layer, is responsible for the design, build-out and operation of the passive infrastructure, which includes the dark-fiber network and ducts. OpenNet was appointed as the Next Gen NBN's NetCo.

2. The Operating Company (OpCo), which operates at the second layer, provides wholesale network services over the active infrastructure, comprising switches and transmission equipment. Nucleus Connect was selected as the OpCo for the Next Gen NBN.

3. The Retail Service Providers (RSPs), which form the third layer, offer services over the Next Gen NBN to end-users, including businesses and consumers. RSPs are able to purchase bandwidth connectivity at non-discriminatory and non-exclusive prices, and compete on a level playing field to provide competitive and innovative services to end-users.

The following figure illustrates the various layers and the responsibilities of each company or set of companies:

◂ E: Industry Structure for NBN Open Access in Singapore



Similarly, Australia is establishing the National Broadband Network (NBN) with the objective of providing 93 percent of Australian homes, schools and businesses with a fiber-to-the-premises connection capable of providing broadband speeds of up to 100 Mbit/s, with capability to provide speeds of up to one gigabit per second. For the remaining premises, the NBN will be a combination of next-generation wireless and satellite technologies will provide peak speeds of at least 12 Mbit/s. In order to build out the largest single infrastructure project in Australian history, the government established the National Broadband Network Company ("NBN Co.") to both construct the NBN infrastructure, as well as resell capacity on a wholesale basis.14 The NBN Co is required to provide access to the network infrastructure on a wholesale, transparent and non-discriminatory basis to retail service providers.

(e) Networks that Require Interconnection

The types of networks and services to be considered in interconnection policies vary with the development of new technologies. Examples of services that have required a reshaping of such policies are mobile data, cable television, and Internet.

When first introduced, Short Messaging Service ("SMS") provided mobile users the ability to transmit text between mobile terminal devices. Today, SMS may be transmitted from call centers and websites, and may even be received by fixed line users. This has pushed the boundaries of voice-focused interconnection policies and has forced regulators to consider whether traditional interconnection policies should be applicable to SMS traffic between mobile operators, content providers and fixed line operators. In Bahrain, Venezuela, and Mexico, regulators ordered interconnection for SMS providers.15

Another challenge regarding interconnection with mobile networks is the emergence of multimedia applications, prompting questions as to whether mobile network operators can operate as ISPs and whether there should be any limitations on the ability of users to access mobile portals. Whether a mobile network operator can operate as an ISP is generally based on the scope of the mobile provider's licence or whether a special licence is required to provide Internet access. Where the provision of Internet access does not require a licence, mobile operators generally do not encounter problems in deploying mobile Internet services. Consumers should be allowed to use alternative access and content providers, but this is not possible when mobile operators lock users in their portals. Mobile operators should be required to open their networks to other Internet service providers, content providers and other portals.

Regulators have also taken different decisions regarding Internet access via cable television modem networks. Some countries such as the United States, have ruled that Internet access is unregulated and, therefore, cable operators have no obligation to open their networks to alternative ISPs.16 Other countries, such as Canada, have ruled that cable television

companies are obliged to make their Internet access network available for resale to other operators.17

6.4.3.4 NUMBERING AND INTERNET PROTOCOL ADDRESSING

ITU-T Recommendation E.164 defines the international public telecommunications numbering plan while countries implement their own national numbering policies and regulations based on the E.164 recommendation. Countries have typically implemented numbering plans that establish different numbering ranges for fixed line and mobile voice telephony, often divided into geographic areas. This differentiation had a twofold function of informing end users of the charges of the calls and maintaining the interconnection cost structure based on services (*i.e.*, mobile voice service vis-à-vis fixed voice service) and distance. Since this allowed subscribers to be reached by a unique combination of digits, numbering became an essential resource for telecommunications networks operators. However, with the advent of convergence, regulators are finding that modifications to such policies and regulations are necessary. Just as telephone numbers are required to identify the calling and called parties, an addressing system—known as the Domain Name System (DNS)—is necessary in order to identify and allow communications among Internet-enabled devices, websites and other Internet applications and services. The worldwide growth of the Internet has required substantial reforms to the management of IP addresses, as outlined below.

(a) Assignment of Numbering Resources to New Technologies Service Operators

One of the significant impacts on numbering regulation relates to the proliferation of VoIP services. This has raised questions among regulators as to whether numbering resources should be assigned for VoIP and whether traditional telephone service operator obligations should be imposed on VoIP providers. Regulators have adopted a variety of solutions. For example, in some jurisdictions, providers are allowed to use geographic numbers provided they offer service under the traditional voice service regime, which imposes various obligations (*e.g.*, quality of service, access to emergency services, and lawful interception). In addition, countries such as Singapore, Japan, South Korea and some EU Member states (*e.g.*, Ireland, France, Germany, and Austria), have created a specific numbering range for VoIP services, due to the special characteristics of the service, most notably its nomadic use.

Some countries, such as Japan, Spain, and the United Kingdom, have combined both measures, and grant geographic numbers to VoIP providers if they operate under the voice service regime (*i.e.*, voice quality of service, lawful interception obligations, access to emergency services), and specific number ranges if VoIP providers operate under the "information service" regime. The implementation of this differentiation has the additional intention of highlighting to consumers that these services are not equal and that VoIP specific range service providers do not necessarily provide the same set of features commonly associated with public voice service.

(b) Inter-modal Portability

A second modification on numbering regulation has been the introduction of inter-modality number portability. Number portability is the ability of a consumer to maintain the same telephone number when changing service providers. Number portability may be inter-modal (*e.g.*, porting a number from a fixed line to a mobile network or vice versa) or restricted to one type of network (*e.g.*, mobile number portability). The United States has included a geographically restricted inter-modal portability, meaning that a consumer may port among different types of networks within a limited geographical area. In Argentina, although the regulator issued a decree in 2000 (Article 30 of Decree 764/2000) recognizing a consumer right to inter-modal number portability, implementation has been slow due to challenges from incumbents. Final adoption of rules is expected by the end of 2011.1 Hong Kong (SAR) has also introduced inter-modality number portability to address fixed to mobile convergence in conformance with the Unified Carrier Licensing Regime.2 However, there are signs that number portability could potentially be expanded to other services, such as VoIP. In Denmark, the regulator has implemented a non-geographic numbering plan (*i.e.*, a consumer may be reached at a telephone number that does not correspond to its geographical location) where numbers are not attached to a specific service, and consequently, there are no portability restrictions among services.3

However, the implementation of inter-modal portability is currently limited to few jurisdictions. Geographical restrictions on inter-modal portability often respond to the potential effects on traditional numbering plans that are based on distance, services, and interconnection cost structures and for this reason, inter-modality portability may require a numbering policy restructure to be implemented.

(c) ENUM

E.164 NUmber Mapping (ENUM) is a protocol that is the result of work of ITU-T's Internet Engineering Task Force's (IETF's) Telephone Number Mapping Working Group.4 The charter of this working group was to define a DNS-based architecture and protocols for mapping a telephone number to a Uniform Resource Identifier (URI) that can be used to contact a resource associated with that number. The ENUM protocol enables resolution of E.164 telephone numbers into

other resources or services on the internet.

The ENUM protocol has allowed the introduction of a fully neutral approach to numbering, simplifying numbering regulations and addressing complexities resulting from convergence. Essentially, by translating a PSTN number to an IP address, ENUM makes it easier to contact people through electronic means (*e.g.*, linking users' email, telephone number, fax and instant messenger address allowing them to be reached by any of these means through a single number). ENUM developments are helping to define the future direction of numbering policies. In addition, ENUM can help to address some of the transparency concerns with VoIP, due to the mapping of PSTN numbers to "uniform resource locators" (URLs). The Internet Architecture Board (IAB) and ITU-T Study Group 2 are discussing collaboration on the operational, administration and delegation issues related to deployment of ENUM protocol-based services. This requires extensive consultation with administrators of resources derived from the international E.164 numbering plan, including national and integrated numbering plan administrators. ENUM trials are being conducted in several countries including Austria, China, Finland, France, Japan, the Netherlands, Republic of Korea, Sweden, the United Kingdom and the United States.5

(d) Domain Names

The DNS translates domain names, which are meaningful to humans (e.g., **www.itu.int**) into unique IP addresses (i.e., the numerical identifiers associated with networking equipment for the purpose of locating and addressing these devices worldwide). The DNS can be thought of as the "telephone directory" for the Internet by translating user-friendly device and application identifiers into IP addresses. The Internet Corporation for Assigned Names and Numbers (ICANN) is the administrator of IP addresses and helps to coordinate how IP addresses are supplied to avoid repetition or clashes.6 In addition, ICANN is the central repository for IP addresses, from which ranges are supplied to regional registries who in turn distribute them to network providers. ICANN and the Internet Assigned Numbers Authority (IANA) work together to manage top level domain (TLD) names, such as ".com", ".org", ".net", as well as country code TLDs (ccTLDs), such as ".uk" for the United Kingdom and ".bh" for the Kingdom of Bahrain.

As numbering policies continue to be influenced by the development of IP networks, the management of ccTLDs on a national level has become another regulatory issue. Several countries have given their telecommunications regulators the responsibility to manage ccTLDs,7 yet some regulators may not have the necessary resources to take on this task. Although regulators maintain the control and legal responsibilities, they may rely on others for the domain names management including other government agencies, private companies, academic institutions and non-profit organizations.8 Furthermore, some governments have even commercialized the ccTLDs that correspond to their jurisdictions in order to obtain an additional source of revenues.9

On an international level, one of the biggest issues facing the Internet relates to guaranteeing that ample IP addresses continue to be available. The current IP address system, IPv4, provides for approximately 4.3 billion addresses. Due to the growing number of Internet-enabled devices, IPv4 is to be completely exhausted by the end of 2011.10 In order to ensure that the billions of existing and new devices expected to go online in the near future can be accommodated, ICANN has introduced IPv6, which allows for many trillions of IP addresses—enough to last for the foreseeable future. Despite the need for more addresses, many governments, as well as the private sector, have been slow to migrate to IPv6 due to the costs of upgrading equipment that are not IPv6-capable. Some countries are implementing regulations to ensure that network operators and device manufacturers are IPv6 compliant. For example, India has required all telecom operators and ISPs to be IPv6 compliant by the end of 2011 and to offer IPv6 services beginning March 2012, which is also the date when all public sector agencies and companies must also switch to IPv6.11 Other countries are taking an industry-led approach. In New Zealand, for example, following a 2008 workshop held by the Ministry of Economic Development, New Zealand's major ICT industry and stakeholder organizations formed the IPv6 Task Force to develop a transition plan from IPv4 to IPv6.12 In March 2011, the IPv6 Task Force launched an online service directory containing a list of New Zealand-based vendors, trainers, consultants, service providers and IT integrators who have expertise in IPv6 in order to promote a smoother migration.13

Practice Notes

- **ENUM**
- **ICANN**
- **VoIP Numbering schemes**

Reference Documents

- **India -- Telecommunications Mobile Number Portability Regulations, 2009**
- **Looking Forward: Mobile Number Portability in South Africa (Tracy Cohen)**

- Nigeria: Numbering Regulations 2007
- OECD: ENUM: CONVERGING TELEPHONE NUMBERS AND ADDRESSES IN NEXT GENERATION NETWORKS
- Pakistan: MNP Code of Practices v. 9
- South Africa: Making MNP Work

6.4.3.5 UNIVERSAL SERVICE

Convergence is challenging traditional universal service policies and the means by which universal service objectives are currently met. Universal service was initially an obligation imposed on the monopoly operator that concentrated on the provision of voice telephony, requiring operators to expand coverage to provide services in remote and underserved areas. Incumbent operators typically cross-subsidized the cost of their universal service obligations with revenues derived from other services. With the introduction of competition and new technologies, regulators substituted this implicit cross-subsidization with a requirement that all or some operators contribute a percentage of their revenues to a universal service fund.

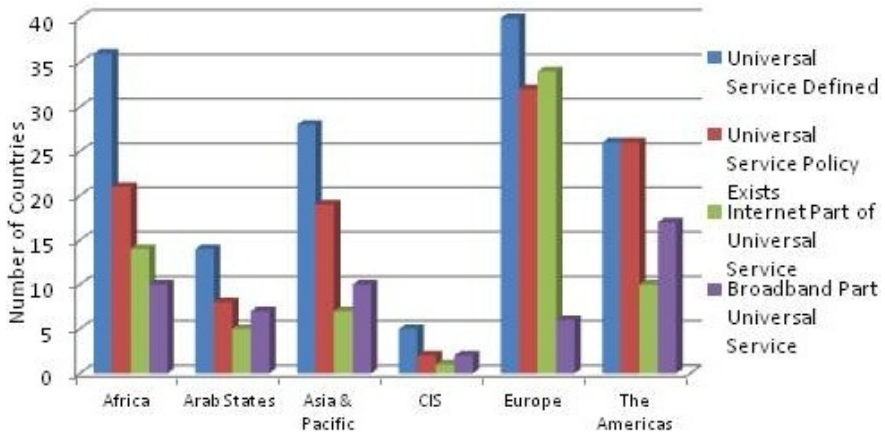
The primary question confronting regulators in jurisdictions where a universal service contribution system exists, is whether operators offering VoIP services should have universal service obligations, and whether they should contribute on the same basis as traditionally established operators. Many countries have not imposed universal service obligations on service operators using new technologies due to concerns that such obligations would inhibit their development and the development of new technologies and new market players. However, this trend seems to be shifting as more traffic shifts from public switched telephone networks to IP-protocol networks. In Canada, for example, universal service requirements have been imposed on all service providers, including VoIP providers that enable one-way or two-way interconnection with the PSTN (therefore, excluding PC-to-PC VoIP). Canada's approach is consistent with its technology-neutral policy to VoIP, equating such providers to traditional voice operators, provided the service is offered through access to the public switched telephone network.1

In addition, as IP technologies are gaining importance, regulators are modifying the Universal Service Obligations (USOs) to include narrowband and broadband Internet access. For example, of the 125 countries that responded to the ITU's annual regulatory survey in 2011, 73 included narrowband Internet service in the universal service definition and 52 included broadband access. In 2000, no countries had established a mandate to make broadband a part of a universal service policy; by 2010, at least 25 countries had expanded their universal service policies to include broadband access.2 In September 2006 (effective January 2008), Switzerland was among the first countries to expand USOs beyond voice telephony to include broadband.3 Under the new regime, universal service includes the obligation to provide a broadband connection with a transmission speed of at least 600 kbit/s download and 100 kbit/s upload speeds, with a price ceiling of CHF 69 excluding VAT.4 In October 2009, the Finnish government announced that, as of July 1, 2010, a 1 Mbit/s Internet connection is defined as a universal service, which means that all telecom operators defined as universal service providers are required to provide every permanent residence and business office with access to a reasonably priced and high-quality connection with a downstream rate of at least 1 Mbit/s.5 With this decision, the Finnish Ministry found that access to affordable broadband services is a basic right for every consumer and business in Finland.6

Other countries are also considering the expansion of USOs to broadband, particularly as traditional fixed line voice telephony wanes and new IP-based technologies are playing a more important role in the economy. For example, Brazil's Bill 1481/07 proposes to use resources from the countries Fund for Universal Telecommunications (FUST) for the expansion of broadband and would require all primary schools and higher education institutions to have Internet access, particularly in rural areas.7

Regulators are also looking beyond USOs in seeking to ensure that those living in rural and unserved areas have universal service and access to broadband services. Instead of mandates on universal access, regulators can implement more flexible licensing regimes to take advantage of technological development and convergence. For example, reasonable rural coverage obligations can be included in licenses or regulators may set specific rural UAS targets for operators in exchange for relief from universal service fund contributions. The Hungarian government has implemented a variation of this policy by reducing the taxes on telecommunications operators by 50%, provided they have invested at least HUF 100 million (USD 500,000) in broadband infrastructure in unserved areas and expect to have profits exceeding HUF 50 million (USD 275,000).

◂ F: Universal Service Worldwide



6.4.4 MODIFICATION TO BROADCASTING AND ICT LEGISLATION TO ADDRESS CONVERGENCE

In order to facilitate the development of new technologies, which brings telecommunications, broadcasting, and the Internet closer together, the regulatory frameworks governing these industries are being coordinated, and correspondingly modified, so that they are all focused on the same objectives.1 Today, the ICT sector requires governments to undertake a broader perspective of law and regulation and assess the impact and interaction of telecommunications legislation with ICT related legislation, such as media/broadcasting legislation, content laws, intellectual property laws, and privacy laws. As shown in Table 4-8, several countries (

e.g.,

Hong Kong SAR and India) have adopted or are in the process of adopting ICT-related legislation.

◂ Table 4-8: Snapshot of ICT Legislation in Hong Kong SAR and India2

Hong Kong SAR	India
The Telecommunications Ordinance, (Chapter 106), 2000	The Indian Telegraph Act, 1885
The Broadcasting Ordinance (Chapter 562)	The Indian Wireless Telegraphy Act, 1933
The Personal Data (Privacy) Ordinance (Chapter 486), 1995	Telegraph Wire Unlawful Possession Act, 1950
The Electronic Transactions Ordinance (Chapter 553), 2000	The Cable Television Networks (Regulation) Act, 1995
The Telecommunications Regulations, 2000	The Telecom Regulatory Authority of India Act, 1997
The Copyright Ordinance, 1997	The Information Technology Act, 2000
The Patents Ordinance, 1997	The Information Technology (Certifying Authority) Rules, 2000
The Trade Marks Ordinance (not yet in operation)	The Cyber Regulations Appellate Tribunal (procedure) Rules, 2000
The Intellectual Property Ordinance, 1998	The Information Communications and Entertainment Bill, 2000
The Control of Obscene and Indecent Articles Ordinance, 1998	The Convergence Bill, 2002

However, to achieve the benefits of the information society requires the adaptation of legal frameworks and in-depth coordination with the relevant sectors to develop integrated solutions to the regulatory challenges arising from

convergence and the introduction of new technologies.

6.4.4.1 MEDIA AND BROADCASTING LEGISLATION

While the driving force behind telecommunications regulation has been primarily the liberalization of the sector and promotion of competition, the regulation of broadcasting and media has been mostly influenced by the social and cultural impact of the industry.1 Broadcasting is defined by the ITU as a radiocommunication service in which the transmissions are intended for direct reception by the general public. This service may include sound, television, or other types of transmission.2 Broadcasting often has substantial content regulation because it is perceived as playing a special role in the cultural life of a country and in developing a national identity. For example, in order to promote social objectives, the majority of OECD countries have regulations regarding broadcasting content and media ownership.3

Telecommunications and broadcasting services traditionally have been regulated separately, whether by the same regulatory entity or a different regulatory entity.4 In a majority of countries, broadcasting is regulated by a separate entity or responsibility over broadcasting is shared by the telecommunications regulator with other government entities responsible for broadcasting. In other countries, such as Australia, Bulgaria, Canada, Croatia, Ghana, India, Italy, Japan, Malaysia, Norway, South Africa, Switzerland, Tanzania, the United Kingdom and the United States, the telecommunications regulator also fully responsible for broadcasting.5

Convergence has resulted in new technologies and services that often are not encompassed in existing service definitions and regulation. This has challenged the adequacy of the current industry-based regulatory framework. For instance, should audiovisual content offered through the Internet or a mobile telephone be defined as telecommunications or broadcasting?6 As broadcast content and telecommunications network carriage become more integrated, a need exists to review telecommunications and broadcast media regulation to accommodate the regulation of new services and ensure consistency in policy and regulation. Convergence from a broadcasting perspective is primarily manifested in the joint offerings of video and high-speed Internet service (and often voice service), mostly via cable television networks.7

In order to address the challenges of convergence, some jurisdictions such as Australia, Malaysia, Hong Kong (SAR), and the United Kingdom have established a common regulator with responsibilities over the telecommunications and broadcasting sector. Regulators such as the Office of Communications (**OFCOM**) in the United Kingdom and the Malaysian Communications and Multimedia Commission (MCMC) have undertaken regulatory reforms to enact new converged regulatory frameworks that apply to all electronic communications networks and services. In Hong Kong SAR, the Office of the Telecommunications Authority (OFTA) is currently reviewing its broadcasting regulatory regime, and considering the benefits of establishing a unified regulator, merging the Broadcasting Authority (BA) and OFTA into one regulator to oversee the electronic communications sector. In Korea (Rep.), a new converged regulator with authority over telecommunications and television broadcasting—the Korea Communications Commission (KCC)—was largely created in 2008 from the merger of the Korean Broadcasting and the Ministry of Information and Communication (MIC)in order to facilitate a regulatory framework for IPTV services.8

Practice Notes

- **UK Office of Communications [4.4.1]**

6.4.4.2 CONTENT

Historically, content has been delivered by different service providers using distinct networks (

e.g.

, television from terrestrial and satellite broadcasting, and telephone through telephone networks).1 With digitalization, content formerly dedicated to specific networks now can be conveyed on different infrastructures and delivery platforms. This poses a potential conflict in regulation as different standards of content regulation are applied to telephony, sound and television broadcasting, print media and the Internet. With convergence, policies may need to be changed to achieve the common social objectives of promoting and protecting cultural traditions, public service, and protecting citizens from harmful material across all types of networks and delivery platforms.

While convergence poses challenges to the regulatory framework, it is recognized that differences in the expectations, context and intrusiveness of different services exist, and could justify the differentiation in regulatory approaches.2 Therefore, while Internet content remains mostly unregulated, regulation requiring a minimum level of domestic content on television is still a feature of broadcasting regulation and licensing in many countries. For instance, the 2002 National Trade Estimate Report on Foreign Trade Barriers by the U.S. Trade Representative states that approximately 30 trade partners have local content restrictions in the audio-visual sector.3

Additionally, an ITU survey regarding broadcasting and Internet content demonstrates that broadcasting content is more highly regulated than Internet content in the majority of countries. Of the approximately 125 countries surveyed by the ITU, almost all of the countries had some form of regulatory entity responsible for broadcasting content, except for Bahrain, Nicaragua, Paraguay, Peru, St. Vincent and the Grenadines, and Spain. On the other hand, the majority of the countries surveyed had no regulatory entity responsible for Internet content. Of the regions surveyed, Internet content seems to be more heavily regulated in the Asia Pacific region and Europe and least regulated in the Americas and Africa.[4]

Some of the issues regulators face regarding content regulation are:[5]

- Applicability of public service provisions;
- Cross media ownership, cross sector ownership and restriction on the size of individual broadcasters;
- Cultural diversity, local content quotas and local production of content;
- Programming standards associated with accuracy and impartiality in the reporting of new and current affairs;
- Intellectual property rights;
- Role and means of supporting public broadcasting; and
- Programming standards associated with decency, censorship and freedom of speech.

(a) Broadcasting Content

Due to the role of broadcast media in defining the cultural identity of a country, one of the main issues in regulating broadcasting is the quota on national content. Two EU directives, the Framework Directive[6] and the Television Without Frontiers Directive[7] have redefined broadcasting in the region. In particular, the Directives separate regulation of content from the regulation of transmission, place specific limits on the regulation of transmission and permit EU member countries to regulate content in order to achieve social objectives.[8] The Television Without Frontiers Directive stipulates that where practicable and by appropriate means, broadcasters should reserve a majority of their transmission time for European content (excluding time appointed to news, sports, games, advertising and teletext services).[9] In addition, broadcasters should reserve at least 10% of their transmission time or program budget for European works created by producers who are independent broadcasters.[10]

In Australia, the Australian Content Standard requires all commercial free-to-air television licensees to broadcast an annual minimum transmission quota of 55 per cent Australian programming between 6 a.m. and midnight. There are also specific minimum annual sub-quotas for Australian adult drama, documentaries and children's programs.[11]

(b) Internet Content

In many countries, ISPs and Internet data centers are not required to review, monitor or classify the content that they host, and are therefore not held liable for the transmission of prohibited content unless they have specific knowledge of the illegal content or fail to report and take corrective action. This policy results from the rationale that, like traditional telecommunications carriers, ISPs are merely a conduit that passively transmit data and therefore are not responsible for the nature, or character of that data. Thus, it would be unjust, unreasonable and impractical to expect an ISP to monitor content in order to safeguard against illegal use or criminal activity.

The EU Directive on Electronic Commerce follows this approach. ISPs have no liability when the service provided is a mere transmission or access to a communication network, to the extent that the ISP cannot select or modify the content of the transmission, or select the receiver of the transmission. There is no liability on the ISP when the service is an automatic, intermediate or temporary storage of data (caching) so long as the provider does not modify the information, complies with conditions on access, and acts promptly to remove or disable access to the information when required. Furthermore, the ISP is not liable when the service offered consists merely of the storage of information, provided that the ISP does not have knowledge of illegal activities or information, or upon being aware, acts promptly to remove or disable access to the information.[12]

Japan's ISP Liability Law[13] follows an approach similar to the EU, but imposes a stricter standard on ISPs. In Japan, ISPs are not generally liable for damages caused by infringement of laws as a result of the transmission of information via the Internet. They may be held liable, however, if they were either aware of the infringement or were aware of the information and should have known of the infringement, and could technically prevent the transmission of the information. Any person whose right is allegedly infringed by transmission of the information via the Internet can request that the ISP disclose the person who transmitted the information, and the ISP may disclose such information if the right of the requesting person has been obviously infringed and the requesting person has legitimate reason to be entitled to such disclosure.

Because an ISP provides access to the Internet, some argue that it is in the best position to take action against illegal

activity conducted over the Internet. As a result, in some countries ISPs have been given a degree of responsibility over content regulation under certain circumstances. Although a country may not have specific legislation regarding Internet content, this does not mean that ISPs are immune from liability for content handled under their networks under other laws. For example, in Mexico, ISPs may be held responsible under the Federal Criminal Code which provides that any person who publishes, by any means, exposes or distributes obscene books, writings, images or objects commits a crime against public morality and good custom, and can be sanctioned with imprisonment and/or fines. ISPs are not deemed responsible for the distribution of the prohibited material under the Federal Criminal Code based on the provision of Internet access or for providing shared, dedicated, or co-located hosting because they are not obliged to know the content of the web sites that they host. However, ISPs may be responsible for distribution of prohibited content when providing hosting services, where they collaborate in the production and development of the content with the author of the website and consciously host the website with specific knowledge of its contents. **14**

6.4.4.3 INTELLECTUAL PROPERTY LAWS

Part of content legislation is the issue of protection of intellectual property rights associated with the growth of ICT use. In an era of electronic commerce, the sale and exchange of copyrighted material in digital format must be protected in order to ensure the continued investment and development of the ICT sector. Digitalization of information results in new risks for holders of copyright and related rights in their works, but also makes it potentially easier to administer and control acts of exploitation by means of access control, identification and anti-copying devices.**1** The EU has adopted a **Copyright Directive** and jurisdictions such as the **United States** and Hong Kong (SAR) have also passed legislation enforcing intellectual property laws in the ICT sector. In May 2011, the European Commission expanded on the Copyright Directive in the release a new Intellectual Property Rights (IPR) Strategy aimed at reforming the legal framework of IPRs in order to strike the right balance between promoting creation and innovation and promoting the widest possible access to goods and services protected by IPR.2 The EC's IPR Strategy sets out a series of key policy actions in copyright licensing and violations (e.g., piracy), as well as other IPR areas such as patents and trademarks.

The need for copyright reforms are due to technological developments that enable works of literature, film, music and art, as well as computer programs, to be created or transferred into digital format that allows for easy and inexpensive copying. With high-speed broadband access that allows users to download a feature length movie in a matter of minutes, the unauthorized transmission of copyrighted materials has become a major concern of those seeking to protect copyrights. One of the most basic rights granted under copyright is the right to control reproduction under the Berne Convention, which covers reproduction in "any manner or form."3 This right is critical to determining reproduction rights in e-commerce, as the transmission of a work presupposes the uploading of that work into the memory of a computer or digital device, and when the work is transmitted over networks, multiple copies are made in the memories of the network computers.

Some of the most significant issues arising from the extension of copyright protection in the digital environment are: (i) scope of copyright protection in the digital environment; (ii) responsibility of online providers; (iii) rights of performers in the digital environment; (iv) rights of digital broadcasters, such as webcasting and digital film and television online; (v) linking of copyright information online, including deep-linking and framing; (vi) protection of databases; and (vii) peer-to-peer (P2P) file sharing systems and video or audio streaming of copyrighted materials.4 Measures to address illegal P2P file sharing and online streaming of copyrighted video (e.g., movies) and audio (e.g., music) have been at the forefront of countries' amendments to IPR regulatory frameworks.

In many cases, countries have opted to involve ISPs in protecting copyrights online. For example, France passed a "three-strike" law in 2009, which requires ISPs to help the government identify copyright violators (i.e., online users who illegally download copyrighted material). Under the law, users receive two warnings of violations and ISPs are required to terminate the service of users who are found to engage in copyright infringement a third time within 12 months of the first violation.5 Like France, countries around the world are requiring Internet intermediaries, such as ISPs, to play a more active role in preventing and enforcing copyright laws.6 For example, the New Zealand government passed the *Copyright (New Technologies) Amendment Act* in 2008, which includes an obligation for ISPs to have, and reasonably implement, a policy for termination of accounts of repeat copyright infringers through a "notice-and-takedown" regime.7 In Korea, the government amended the country's Copyright Act in 2009 to involve ISPs in the "notice-and-takedown" regime.8 Under Article 133bis of the amended Copyright Act, once the government has sent notice to an ISP that a user has engaged in copyright infringement, it is the ISP's responsibility to warn the user of infringement. After the third such notice, the ISP may be required by the Ministry of Culture, Sports and Tourism to suspend the infringing user's account for up to six months as part of the country's "three-strike" regime.9 Although such "three-strike" laws are supported by the music and film industries and several national governments, others criticize such measures as leading to violations of users' rights to access and share information. In particular, the United Nations expressed in May 2011 its concern that "three-strike" and other "graduated response" measures that terminate or suspend users' Internet connection for copyright infringement can violate users' basic human rights, including access to Internet infrastructure.10

In the trademark field, commercial branding, advertising and marketing, including the use of domain names to identify one's presence on the Internet are heightened by the online environment and can result in unfair competition. The general international consensus is that trademark protection under international and national laws should extend to the Internet, and the protection should be neither more nor less extensive than that granted in the physical world.11 Some of the issues regarding the protection of trademarks in the digital environment are:

- use of trademarks as meta tags - which are HTML codes inserted into the header of a webpage that allows search engines to identify the contents of the page and index it;
- sale of trademarks as keywords;
- pop-up advertisements;
- mousetrapping – an aggressive marketing technique that forces users to remain on a specific website, by disabling a user's browser functions; and
- linking and framing.

In general, patents protect inventions. In the patent field, with the growth of e-commerce, the scope of patentable subject matter has increased, resulting in issues with respect to:12

- Scope of patentable subject matter, including online business method patents and software protection;
- Prior art effect – as applied to prior art in electronic form "cyber art," and
- Enforcement of patent rights.

Practice Notes

- **EU Copyright Directive [4.4.3]**
- **US Copyright Directive [4.4.3]**

6.4.4.4 DATA PROTECTION/PRIVACY LAWS

As a result of the growing international concern for cybercrimes, such as computer-related fraud, child pornography and hacking, 47 EU and non-EU Member States have signed the Convention on Cybercrime, the first international treaty seeking to address computer and Internet crimes through harmonization of national laws that improve investigative techniques and increase cooperation among nations.1 The convention is designed to: (1) harmonize domestic criminal law in the area of cyber-crime; (2) provide for domestic criminal procedural law powers necessary for the investigation and prosecution of such offenses as well as other offenses committed by means of a computer system or evidence in relation to which is in electronic form; and (3) establish a fast and effective regime of international cooperation. In addition to streamlining definitions and civil and criminal penalties for cybercrimes, the Convention also gives signatory countries common powers to search and intercept the Internet communications of suspected terrorists.

◂ Box 1Need for Regulation of Cyber-crimes

Source: Council of Europe, Convention on Cyber-crime, Explanatory Report.

"The fast developments in the field of information technology have a direct bearing on all sections of modern society. The integration of telecommunication and information systems, enabling storage and transmission, regardless of distance, of all kinds of communication opens a whole range of new possibilities. These developments were boosted by the emergence of information super-highways and networks, including the Internet, through which virtually anybody will be able to have access to any electronic information service irrespective of where in the world he is located. By connecting to communication and information services users create a kind of common space, called "cyber-space," which is used for legitimate purposes but may also be the subject of misuse. These "cyber-space offenses" are either committed against the integrity, availability, and confidentiality of computer systems and telecommunication networks or they consist of the use of such networks or their services to commit traditional offense. The transborder character of such offenses, *e.g.*, when committed through the Internet, is in conflict with the territoriality of national law enforcement authorities."

Due to convergence and the rapid development and deployment of ICTs around the world, ICT regulators are increasingly taking on a new role of assisting law enforcement and national security agencies in protecting users' data and privacy online. One of the main challenges in addressing cybercrime is keeping pace with the fast-paced adaptation of cybercriminals, which requires a flexible and forward-looking regulatory framework that also clearly defines cybercrime offenses and remedies.2

An analysis of country practices in various countries suggests that the ICT regulator's mandate can potentially be usefully extended or strengthened in the following areas:3

- Implementing cybercrime rules as part of the regulator's consumer protection responsibilities, such as related to fighting spam, malware or spyware. In the Netherlands, the Independent Post and Telecommunication Authority (OPTA) enforces prohibitions on spam, malware and spyware by imposing fines on wrongdoers.
- Expanding the ICT regulator's responsibility for information security or network security, which may include establishing a department within the regulator focused on consumer outreach and education efforts on network security practices and enables cooperation with law enforcement agencies. For example, the Malaysian Communications and Multimedia Commission (MCMC) has an Information and Network Security (INS) department to ensure information security and network reliability within the communications and multimedia industry.
- Establishing a new regulator with the operational mandate for Internet safety. In Korea, for example, among the responsibilities of the new, converged regulator—the Korea Communications Commission— is the protection of Internet users from harmful or illegal content.

Practice Notes

- **Examples of Data Retention Rules in Different Countries [4.4.4]**
- **Privacy and data retention policies in selected countries**

6.4.5 CASE STUDIES OF CONVERGED LEGISLATION

This section contains case studies on converged legislation in the EU, Hong Kong, and Malaysia.

6.4.5.1 EUROPEAN UNION NEW REGULATORY FRAMEWORK (NRF)

The EU's 2002 NRF represented the paradigm legislation aimed at addressing convergence and its challenges. Although the 2009 EU Telecom Reforms included new provisions to promote competition, innovation and adoption of ICT services,1 the 2002 NRF remains the backbone of the EU's electronic communications regulatory framework. It is composed of six Directives2 that address the convergence of telecommunications, media, and information technology. The 2002 NRF did not address content.3

The 2002 NRF established a unified, technology-neutral system of authorization that covers all comparable services, with the objective of addressing convergence between different electronic communications and services, and stimulating their further development. The authorization system has only a procedural notification requirement.

The general authorizations issued by national regulatory authorities (NRAs) must, at a minimum, provide the following rights:

1. The right to provide electronic communications networks or services or both.

2. The right to request interconnection or access to facilities of other providers. However, only providers of public services and networks have the right to be supported by the regulator in case negotiations with a significant market power operator fails.

3. The right to apply for rights of way.

4. The right to be considered for designation as a universal service provider (only for providers of public services and networks).

NRAs may not attach conditions to an authorization other than the ones set forth in the 2002. **4** Member states may impose different requirements on services and networks to grant numbering, but NRAs may not discriminate among providers of comparable services. Member states may establish the requirement to obtain a separate licence for spectrum rights, although the 2002 NRF introduces the possibility of spectrum trading.

The 2002 NRF requires NRAs to conduct a market analysis on certain markets susceptible to *ex ante* regulation. The NRAs may propose draft measures if they find that effective competition does not exist in the relevant market. The 2002 NRF notes that newly emerging markets, such as VoIP, should not be subjected to inappropriate obligations, and while it cautions against the imposition of premature obligations, it also notes the need to prevent full control of the market by the dominant player.

The 2002 NRF also created several Committees to assist the Commission in the implementation of the NRF. One of these

is the European Regulatory Group (ERG), an advisory body to encourage cooperation and coordination among the NRAs of member states. Although the ERG was replaced with BEREC with the passage of the 2009 Telecoms Reform, the ERG was actively involved in the implementation and harmonization of the 2002 NRF, including playing an influential role in the EU VoIP debate where the ERG helped to issue a common position that has been followed by various member states.5

How has the 2002 NRF dealt with VoIP?

As a result of the growing significance of VoIP, the European Commission opened a public consultation proceeding to develop a VoIP harmonized regulation (the "EC Consultation Document").6 This process occurred at the same time the 2002 NRF was being implemented.

The EC Consultation Document opened a comment process on the challenges brought by VoIP, proposing preliminary guidelines for VoIP regulations. Under such recommended preliminary guidelines, service providers have the commercial freedom to offer services that qualify the provider as an electronic communications service (ECS) provider or as a publicly available telephone service (PATS) provider.

Each category of service provider has different rights and obligations:

§ Only PATS providers have PATS number portability; ECS providers do not.

§ Only PATS subscribers have a right to request carrier selection and pre-selection.

§ Only PATS subscribers have the right to be listed in the public telephone directory.

§ Only PATS providers have the obligation to provide access to emergency services.

§ Quality of service standards only applies to PATS providers.

From a customer perspective, a VoIP service provided as ECS and PATS have a similar look and feel. Therefore, the EC Consultation Document suggested that to avoid consumer disinformation, member states could require ECS providers to give precise information to customers on how they differ from PATS and the impact that their services have on power line terminals, access to emergency services, and caller location.

So as not to hinder the development of VoIP services, the EC Consultation Document encouraged VoIP providers to rapidly devise and implement technical requirements and solutions such as how to handle emergency services, lawful call interception, and caller ID.

With respect to numbering, the EC Consultation Document provided the following possibilities for Member states under the 2002 NRF:

1. Allocation of geographic numbers to ECS providers, allowing mobility in limited area (*e.g.*, a city or a telephone district)

2. Allocation of geographic numbers to ECS providers, allowing countrywide mobility

3. Allocation of geographic numbers to ECS providers, without mobility

4. Establishment of a new range of numbers specific for ECS VoIP services

Within the 2002 NRF and taking into account this Consultation Document and the ERG common statement, EU Member States have been adopting and implementing decisions on VoIP services.7

Some jurisdictions, such as Spain and the United Kingdom, allow the service provider to freely decide which rights and obligation regime (the ECS or PATS) will be applicable when offering the service. Others, such as Austria and Finland, established specific parameters for the service, limiting the freedom of the providers to choose the applicable regime.

There have also been different approaches on numbering. Some jurisdictions such as Spain and the United Kingdom, have established a specific range for ECS VoIP providers, while allowing non-geographic numbering for VoIP PATS providers. Spain permits nomadic use within a particular telephone district while the United Kingdom does not have any nomadic restriction. Other jurisdictions, such as Germany, France or Austria, have recently established a specific range of numbers for ECS VoIP service.

Portability within a particular numbering range (*i.e.*, geographic to geographic or special ECS VoIP range to special ECS VoIP) has been allowed in some jurisdictions, such as Spain and Ireland, while others, such as United Kingdom, only allow portability for PATS service providers.

How has the NRF dealt with WLANs?

The EC adopted a Recommendation in March 2003 urging EU Member states to facilitate the use of public WLANs (e.g., Wi-Fi "hotspots").8 The EC recognized the importance of WLANs as an alternative platform for broadband access to information society services and suggested that the desirability of promoting a harmonized approach for the provision of public WLAN access throughout the EC. To that end, the EC Recommendation advised that the provision of WLAN access on a commercial basis should be allowed under the least onerous system, *i.e.*, to the extent possible without any specific conditions. The 2002 NRF principle of technologically-neutral regulation helped to ensure that there is no discrimination between the various WLANs and other technologies. As an example of how the Recommendation has been applied, France does not require any licence for the implementation of WLANs. The use or provision of a private WLAN by an already licensed public operator is allowed without any regulatory notification. Furthermore, a simple declaration will suffice for those providing public WLAN access who do not have a public network licence.9

The EU legislation approach to address convergence

The purpose of the 2002 NRF is to address convergence by a comprehensive transformation of the applicable legal framework by means of a technology-neutral and flexible approach.

The 2002 NRF was the result of several consultative processes involving interested parties (*e.g.*, member states, consumers and industry representatives), which gave the EC a broader perspective of convergence regulation, its effects, and its challenges. In addition, from a convergence standpoint, the practical implementation of the 2002 NRF was supported by consultation proceedings, harmonization processes, and ultimately, member states regulations. An example of this approach is the VoIP EC Consultation Document cited above. NRAs have a choice of: (i) establishing their own consultative processes at a national level; (ii) waiting for the results of the EC consultative proceeding; or (iii) adopting regulations on the subject directly.

The EU's legislative approach to convergence involves an additional element of regional harmonization, which is achieved through EC guidelines (as in the case of VoIP) and the common position of the ERG. ICT-related regulation in the EU is addressed separately from the NRF, but takes into account the existing links between them.

6.4.5.2 HONG KONG (SAR)

Hong Kong (SAR) has adopted various regulatory measures to address convergence, focusing on fixed/mobile convergence. In 2008, the unified carrier license (UCL) regime was introduced as a single licensing vehicle for both fixed and mobile telecommunications services.1 The UCL replaced two previous types of carrier licenses, namely the fixed carrier license (FCL) and mobile carrier license (MCL), which are no longer issued by the Office of the Telecommunications Authority (OFTA). However, any existing FCLs and MCLs are effective until their expiry dates.

VoIP

Prior to the issuance of a statement by OFTA in June 2005, VoIP was not expressly regulated in Hong Kong (SAR).2 Instead, VoIP was treated as a technology that could be operated under any service or network license, and the license under which VoIP was provided determined the operators' rights and obligations.

In June 2005, the Government issued a statement that set forth two specific class licenses to operate VoIP services that differentiate between VoIP services that are marketed with characteristics equal to voice services (Class 1) and those that are not (Class 2).

Class 1 licenses provide numbering rights equal to voice services and their users will have portability; however, Class 1 licensees must provide emergency access service and comply with a minimum set of quality of service standards.

Class 2 licenses do not have numbering rights, and to the extent that numbers are not assigned, operators are not required to provide access to emergency services.

To protect consumers, operators will be required to clearly declare in their marketing materials the type of licence under which they operate (Class 1 or Class 2).

WLANs

Since January 2003, OFTA has required a class license for commercial use of WLANs (i.e., offering WLAN to the public through Wi-Fi "hotspots" or Internet cafes). The license, which does not require approval, is automatically granted upon registration of the name, contact details, location of the service, and identification of the frequency band being used.3

ICT-Related Regulation

Currently, broadcasting and telecommunications are regulated by separate entities and are subject to different regulations. OFTA is the regulatory authority responsible for regulating the telecommunications industry and ensuring

compliance with the Telecommunications Ordinance. Broadcasting in Hong Kong (SAR) is regulated by the Broadcasting Authority (BA) pursuant to the Broadcasting Ordinance, which divides broadcasting into four categories of television program services: (a) domestic free television program service; (b) domestic pay television program service; (c) non-domestic television program service; and (d) other licensable television program services. In addition, Hong Kong (SAR) has separate regulatory frameworks for the provision of media content or television program services and for the transmission of these services. Transmission networks are licensed and regulated by OFTA pursuant to the Telecommunications Ordinance, whereas television programming and content (regardless of the transmission mode) is regulated by the BA under the Broadcasting Ordinance.

In response to convergence, the Hong Kong (SAR) Government reviewed the broadcasting regulatory regime, covering convergence strategy, media ownership and the merits of establishing a unified regulator (merging the BA and OFTA into one regulator) to oversee the electronic communications sector. A public consultation document on the Government's proposal for a unified regulator named Communications Authority was published in March 2006.4 As stated by the Secretary for Commerce, Industry & Technology John Tsang, "convergence at the infrastructure level means that cable and satellite broadcasters are facing increasing competition not only from their peers, but also from telecommunications providers and new media firms that are branching out into the broadcasting business. The increase in broadband penetration also means the increase of converged services on broadband networks (such as PCCW's launch of broadband television service via ADSL in addition to video services on the Internet portal and Hong Kong SAR Broadband Network's telephony, broadband Internet access and video triple-play service via its communications network). These developments have required the Government to review its definition of broadcasting and the relevance of considerations such as spectrum scarcity, as well as current regulatory measures that many no longer be justified on public interest grounds in view of the convergence trend."5 The Communications Authority was established under the Communications Authority Ordinance (Cap. 616) in April 2012 as a converged regulator combining OFTA and the BA was still planned and under consideration by the Hong Kong legislature.6

6 Hong Kong Legislative Council, Bills Committee on Communications Authority Bill at . Also see Legislative Council Brief, Communications Authority Bill at .

Reference Documents

- **Broadcasting in Hong Kong**

6.4.5.3 MALAYSIA

The Communications and Multimedia Act 1998 (CMA)**1** came into effect on 1 April 1999, providing a regulatory framework to accommodate the convergence of the telecommunications, broadcasting, and computing industries.

The basic principles underlying the CMA are transparency, technology neutrality, flexibility, and transparency. Regulation is reduced by the establishment of generic provisions, and self-regulation is promoted.

In addition, the Malaysian Communications and Multimedia Commission (MCMC) was established on 1 November 1998, as the sole regulatory authority of the new framework, thereby restructuring the different branches of the government that previously had jurisdiction over the telecommunications, broadcasting, and computing industries.

The CMA encourages industry self-regulation and establishes an industry forum as a dynamic tool for the industry to formulate and implement voluntary codes of rules. These industry codes of self-regulation may be prepared at the industry's own initiative or by request of the MCMC.

Finally, the CMA establishes a permanent review process, which must be conducted every three years by the MCMC, to examine rules and regulations under the CMA and adapt them to the dynamics and evolution of convergence. Pursuant to this review process, the MCMC must provide written recommendations to the Minister to modify or to repeal any rules or regulation under the CMA.

Licensing

The Malaysian licensing framework separates the network from the service, and places emphasis on the activity rather than on the technology. The following are licensable activities:

§ *Network Facilities Providers* ("NFP") are considered "the fundamental building block of the convergence model upon which network, applications and content services are provided."**2** NFPs own facilities and equipment (*i.e.*, satellite earth stations, broadband fiber optic cables, telecommunications lines and exchanges, radio communications transmission equipment, mobile communications base stations, and broadcasting transmission towers);

§ *Network Services Providers* provide basic connectivity and bandwidth that supports a variety of applications, and enables transport between different networks;

§ *Applications Service Providers* provide specific services to end-users (*e.g.*, voice services, data services, content-based services, electronic commerce, and other transmission services); and

§ *Content Applications Service Providers* provide traditional broadcast services, online publishing and information services.3

The above services fall under one of the two categories of licenses created by the MCMC: individual and class. Individual licenses are for situations where a high degree of regulatory control is deemed necessary. This is the case of infrastructure (*i.e.*, NFP) when there may be reasons to limit the number of licenses because of technical constraints (*e.g.*, scarce radio spectrum), to avoid duplication, to protect major investments or for national security considerations. See **Table 4-8** for a summary and comparison of the licensing framework in Malaysia under the old and new regimes.

VoIP

The MCMC set forth VoIP policy principle, which recognizes two ways to provide VoIP service:4

1. PC-to-PC based VoIP, which the MCMC also refers to as Internet telephony; and

2. Phone-to-phone through the Public Switched Telephone Network (PSTN), which involves multistage access dialing known as VoIP.

The Ministry of Energy Communications and Multimedia had issued a policy position that the provision of PC-to-PC based Internet telephony is not subject to licensing. However, the provision of phone-to-phone VoIP requires an Applications Service Provider (ASP) individual licence as stipulated in the Communications and Multimedia (Licensing) Regulations 2000.

WLANs

Given the technology-neutral approach of the CMA, the provision of WLAN activities do not require registration or application to the MCMC provided that the business (or the service provided) does not involve any of the following categories as defined by the Law:5

(a) Network Facilities Provider (NFP) activities (b) Network Services Provider (NSP) activities (c) Applications Services Provide (ASP) activities

Prospective providers of wireless hotspot Internet services which contract with a licensed Internet Access Service Provider (IASP) for access to the Internet do not require licensing under the CMA 1998. However, as this is not an Internet ASP (IASP) service, consumers would not be protected by any quality of service determinations as these providers would have to compete to provide the best service possible.

Practice Notes

- **Table 4-8: Licensing in Malaysia [4.5.3]**

Next: 6.5 Elements for an Effective Regulator ➔