Executive summary

It is widely accepted that there are links between the take-up of modern ICT and economic growth. Inward investment, which has been particularly important for recent economic growth in Ireland, also requires excellent and keenly priced communications.

Up until 2002, the Irish telecommunications market, although fully liberalised, had been slow to invest in the necessary infrastructure to keep pace with the demand for broadband. Incumbent fixed operators have little incentive to price broadband keenly or indeed to roll it out to additional areas in the absence of competition in the access network.

Competition from other forms of access infrastructure, including fibre to the building, wireless and cable is not going to provide sufficient competitive incentives in Ireland in the short to medium term. Accordingly, we argue in this document that infrastructure-based competition based on local loop unbundling (LLU) will be a major factor in making progress towards this goal.

LLU allows operators other than Eircom to rent the economic infrastructure (the ‘bottleneck’) represented by the local access network at a cost-oriented price. Unfortunately, as we will show, LLU in Ireland is currently significantly behind LLU in other EU countries, in both absolute and relative terms. Whilst price is important, other material practical problems exist with LLU in Ireland, for example, relating to the ability to take LLU and use number portability. These practical problems can be fixed.

Our analysis indicates that, if LLU in Ireland succeeds, the broadband penetration could be almost one third larger than it would be otherwise in 2010 i.e 1M vs 750k. Based on current growth rates the market will not hit the Irish government target of 400,000 subscribers by the end of 2006; if LLU were to be a success then it could.

If, however, these problems are not fixed, then the growth of broadband penetration in Ireland will be very slow. If LLU in Ireland fails in the long run, then Irish economic development will suffer from the lack of effective competition. Businesses in Ireland will face higher costs than those in other EU economies and Irish consumers will not have the option of purchasing the advanced services on offer in other countries.
1 Why is fixed broadband important?

It is widely accepted that there are links between the take-up of modern ICT and economic growth. Inward investment, which has been particularly important for recent economic growth in Ireland, also requires excellent and keenly priced communications.

In addition, there is a ‘digital divide’: whilst city centres (such as Dublin) and wealthy suburbs are often well served, there is no access to comparable facilities in rural or less wealthy areas, which denies opportunities to those living or working in the countryside and to the economically disadvantaged.

These links to growth, the urban/rural split and economic opportunities have led to strong interest from governments in the health of competition in the communications sector and in the provision of communications services (including broadband Internet access) in rural areas. Governments across the EU have been grappling with these same issues.

Up until 2002, the Irish telecommunications market, although fully liberalised, had been slow to invest in the necessary infrastructure to keep pace with the demand for broadband. Some of this slowness was related to the behaviour of the incumbent and its apparent unwillingness to launch broadband services; although some of it was more deep-seated and structural.

The following exhibit illustrates how Ireland is lagging behind other European countries with regard to the availability of broadband. The blue arrow represents the ‘trend line’, showing that Ireland’s economic peers all have substantially higher broadband penetration.
Exhibit 1 demonstrates that there are many countries in the EU such as Malta, Portugal and Spain that have a markedly lower GDP per capita than Ireland, but a significantly higher level of residential broadband penetration. Alternatively, we see that countries with a similar GDP per head such as Austria and Denmark have respectively two and three times the broadband penetration of Ireland.

Broadband is important for national competitiveness and for economic growth. Accordingly, it is necessary that this situation should be remedied. In this document we argue that competition based infrastructure is an essential part of this process, and that in an Irish context this will need to be specifically based on local loop unbundling.
2 Why is competition in access necessary to create low prices and high speeds for fixed broadband?

Incumbent (former monopoly) fixed telecoms operators sell many services based on their local access network (the copper wires which connect the telephone system to most of the buildings in a country). Some of these services are more profitable than others (e.g. voice calls and leased lines, which make up a substantial part of an incumbent’s profits).

Broadband Internet access services create additional competition to these highly profitable services in two ways:

- they enable consumers to buy their voice calls from a third party (‘voice over IP’)
- they enable businesses to buy rather less functional, but substantially cheaper, data communication links to replace expensive ‘leased lines’.

Whilst this is optimal for end users, it unfortunately means that incumbent fixed operators have little incentive to price broadband keenly, or indeed, to roll it out in the absence of competition in the access network. Lack of such services, and high prices where they are available, will hold back consumers and other businesses which rely on broadband access for their communications needs.

However, if faced with competition, an incumbent will realise that it has to act, and that it is better to cannibalise its own business than to have it taken away by a competitor. Consequently, it is the threat of competition which is the force keeping the incumbent ‘honest’ when it comes to the pricing and availability of broadband access. Competition in access will also cause additional service innovation (e.g. higher speeds for the same price).

There are two main forms of this competition:

- from different technologies
- from operators using the same technology (in this case, using DSL on LLU).
3 What is LLU?

The local loop

The access network connection between the customer’s premises and a nearby telephone exchange building\(^1\), which is probably in the local town or village, is called the local loop. This is because the connection is a ‘loop’ comprised of two copper wires connected by your telephone. Exhibit 2, below, shows an overview of a typical local loop.

The wires from the local exchange to the customer’s home are typically divided into three sections. The exchange is connected to the primary cross-connect point (PCP) with the exchange side (E-side) cable. The distribution side (D-side) cable runs from the PCP to the final distribution point and then the final drop cable goes from the distribution point to each customer’s premises.

Inside the exchange, the wires in the external cable are terminated on the main distribution frame (MDF) and then are connected to the internal exchange equipment.

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\(^1\) Strictly speaking this is not an exchange, but a ‘main distribution frame site’. However, the phrase ‘telephone exchange’ is commonly used in this way.
Local loop unbundling (LLU)

The process where the incumbent operator makes its local access network (the connection between the customers premises and the local exchange) available to other companies is known as local loop unbundling (LLU). The LLU provider is paid a regulated rate based on the average costs of providing a single loop, (which includes the cost of capital and the costs of the IT systems used to support the loop). Other operators are then able to upgrade individual customer lines using DSL technology to offer services such as always on high-speed Internet access, direct to the customer, by ‘unbundling’ or renting the loop from the incumbent. The new operator is building infrastructure, and providing infrastructure-based competition beyond the economic bottleneck of the local loop.

There are several different types of LLU:

- full
- shared
- sub loop.

In full unbundling, the alternative operator is the only one connected to the loop.

In shared loop unbundling, the alternative operator only uses the ‘high frequency’ part of the line and the incumbent continues to provide telephone service (using the ‘low frequency’ part.

In sub-loop unbundling, the alternative operator only rents a portion of the loop (usually that between the street cabinet and the end user). This option has not yet been widely adopted in any country.

When a line is unbundled, the incumbent operator needs to connect the relevant line to the equipment of the unbundler. However, beyond this, there need to be changes made to the incumbent’s IT systems to note the new status of the line, transfer of the billing to the unbundler, etc. The process of enabling these changes to be made (i.e. introducing local loop unbundling) may involve modifications to existing IT systems or developing new systems.
4 Why is LLU critical in providing competition in access?

In the sections above, we have argued that competition in broadband access is extremely important. The competition can be provided in many ways:

- By using various wireless technologies
- By building a modern wireline network (e.g. fibre to the basement (FTTB))
- By using cable modem on a two-way cable TV network (in urban and dense suburban areas)
- By using the incumbent’s own local loops (LLU).

In the Irish telecommunications market, companies are using all of the technological options open to them (wireless, FTTB, and DSL on LLU). The situation with each of these technology types is considered below:

- Wireless technologies are interesting, especially as regards mobile services, but they have certain disadvantages when compared to wireline technologies. The most significant is that wireless is a finite medium. There is a fixed amount of spectrum available and this is shared between all the users of a given cell site. Whilst it is possible to offer a service comparable to the DSL currently offered by eircom, ultimately broadband wireless offers insufficient capacity per user for advanced fixed network services such as video on demand. Fixed wireless access has not succeeded in building a significant presence in any major telecoms market and has a very small market share worldwide.

- FTTB generally requires extremely large investments. As a consequence, it is developing slowly worldwide, with only a few notable examples (such as FastWeb in Milan). The advent of the Irish MANs may lead to FTTB deployments in a number of areas; nevertheless, it is unlikely to offer competition on such a scale as to significantly change the policy of Eircom as regards broadband speeds and tariffs, at least for the next 10 to 15 years.

- Cable modem can compete in a reasonable way with DSL but will be restricted to areas with modern, two-way cable networks. These are likely to be urban and suburban areas covering a small fraction of the Irish population (and already served with DSL); upgrading the existing Irish cable networks to a standard required to offer cable
modem services will require significant additional expenditure. Accordingly, there are currently not many cable modem customers in Ireland (around 18,000 subscribers, representing approximately 8.5% of the total broadband market). A two-player market such as that shared by an incumbent and a single competitor (the cable operator) will also tend to behave as an oligopoly, given the large barriers to entry. As a result, competition from cable modem, whilst it has been quite successful in increasing the level of competition in countries where cable is near-omnipresent such as the Netherlands, will not create the required competitive behaviour in Ireland.

- LLU, however, is in principle feasible for multiple new entrants in urban and suburban geographies. Accordingly, LLU is extremely important because it offers the prospect of effective facilities-based competition (not an oligopoly) in broadband access, with full functionality – including high speeds. Without it, the services will be less advanced, the speeds will be lower, and the market prices will be higher than they would otherwise have been. We will see later in this document that LLU has had dramatic effects on the market in some other countries.

5 What are the likely differences between countries with well-functioning LLU and those where is it broken?

To illustrate the differences between countries where LLU is working and where it is not, it is best to look at countries where it is working best, such as France and Japan. In both cases, there are aggressive new entrants (such as Free in France and Yahoo!BB in Japan) with very low prices for triple-play services based on unbundled local loops. Speeds offered are at the technological limits of DSL, at up to 24Mbit/s. Advanced services such as TV over DSL and video on demand are offered.

In France, Free’s standard monthly fee is EUR30, which includes: flat-rate ‘all you can eat’ voice over IP to fixed numbers, 100 channels of free-to-air TV, the option to subscribe to premium content from Canal+ and CanalSat, and broadband access speeds of up to 20Mbit/s in unbundled areas. In both cases, consumers have flocked to these new offers, giving the new entrants rapidly growing market share, and the incumbent telcos have been obliged by the forces of competition to bring similar offers to market extremely quickly

Liberty reportedly has plans to spend of order EUR300M
(even if these offers are still slightly more expensive).

As well as France, European countries such as Finland, the Netherlands and Denmark are also seeing considerable success in LLU, possessing some of the highest proportions of unbundled local lines, as shown in Exhibit 3, below.

![Exhibit 3: Broadband per capita versus unbundled lines per capita for several European countries [Source: ECTA]](image)

As can be seen in Exhibit 3, Ireland has a significantly lower proportion of unbundled lines compared with non-accession countries. Importantly, this figure also shows that infrastructure-based competition is correlated with a high broadband penetration:

- a country with strong cable competition (as shown by red diamonds) tends to have a high broadband penetration
- a country with a larger number of unbundled lines per capita (to the right of the chart) also tends to have a higher broadband penetration.

The limited availability and low take-up of cable modem in Ireland only serves to re-emphasise the importance of LLU in Ireland.
Example packages

Exhibit 4, below, provides a selection of broadband packages offered by operators in some of the successful countries mentioned above. The price and peak speed of the packages offered are inferior in Ireland.

<table>
<thead>
<tr>
<th>Selected operator</th>
<th>Ireland</th>
<th>Japan</th>
<th>France</th>
<th>Sweden</th>
<th>Italy</th>
<th>Finland</th>
<th>Netherlands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly Broadband Fee – EUR</td>
<td>40</td>
<td>29</td>
<td>30</td>
<td>44</td>
<td>35</td>
<td>46</td>
<td>40</td>
</tr>
<tr>
<td>Peak Speed (Mbit/s)</td>
<td>1</td>
<td>50</td>
<td>20</td>
<td>24</td>
<td>12</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Overall broadband penetration (per HH)</td>
<td>15%</td>
<td>44%</td>
<td>36%</td>
<td>36%</td>
<td>30%</td>
<td>43%</td>
<td>54%</td>
</tr>
</tbody>
</table>

Exhibit 4: A comparison of similarly-priced broadband packages from several countries with one from Ireland [Source: Analysys Research, operator websites]

Exhibit 5 below demonstrates, that the higher speed DSL service offered by Eircom is also inferior to that offered in countries where LLU is more prevalent.

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3 This price excludes line rental, but includes VAT.
The Importance of Local Loop Unbundling in Ireland

<table>
<thead>
<tr>
<th>Selected operator</th>
<th>Ireland</th>
<th>Italy</th>
<th>Netherlands</th>
<th>France</th>
<th>Sweden</th>
<th>Finland</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard monthly broadband fee^4</td>
<td>EUR</td>
<td>169</td>
<td>35</td>
<td>80</td>
<td>30</td>
<td>46</td>
<td>44</td>
</tr>
<tr>
<td>Peak download speed (Mbit/s)</td>
<td>4</td>
<td>12</td>
<td>20</td>
<td>20</td>
<td>24</td>
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</tr>
</tbody>
</table>

Exhibit 5: Broadband packages with some of the highest download speeds in their country
[Source: Analysys Research, operator websites]

This provides evidence for our earlier statement, namely that in countries where LLU is not a success, the services will be less advanced, the speeds will be lower, and the market prices will be higher than they would otherwise have been.

6 What is the current situation in Ireland, and what might it imply?

At the end of 2005, there were 3 unbundlers with 3634 unbundled local loops in Ireland. Of these, 1448 were shared access lines and 2186 were fully unbundled lines. Smart Telecom is well into a programme to unbundle an initial 64 exchanges for their local loop unbundling project. BT Ireland unbundled its 40th exchange in April 2005. Magnet Networks is also currently engaged in a program to unbundle an initial 45 exchanges.

Two main issues have limited the take-up of LLU in Ireland: process and cost.

- There are a number of issues that mean that the process of converting an existing customer to an LLU customer is currently broken. For example, it is not possible to migrate an existing wholesale customer (using DSL or wholesale line rental) without reverting to Eircom for a period first, adding a delay and potentially denying the customer access to some services in the interim. In addition, it is not possible for the

^4 This price excludes line rental, but includes VAT.
customer to be an LLU customer and to keep their existing telephone number, despite number portability obligations. The overall effect of these restrictions is to make the process so unappealing for customers and competitors as to prevent the development of genuine competition. We note that there is ongoing work in the industry to try to resolve these issues.

- For fully unbundled loops, Ireland’s prices for connection and monthly rental are above the EU average, with the former being amongst the highest in the EU. Regarding shared access, both connection and monthly rental are among the highest in the EU, as is the monthly average total cost per shared access. Ultimately this keeps prices in Ireland high and restricts takeup by end-users.

There are many models which have been used to fix these problems. Annex A, below, shows how some of these issues have been addressed in other countries.

If the current situation of limited LLU take-up continues, competition in broadband access will remain restricted in terms of the number of providers, the geographies in which competition exists, and in the service speeds offered. In the long run, this will have detrimental effects on the welfare of Irish consumers and businesses.

**Possible scenarios**

We have considered the possible change in the broadband penetration level in Ireland in the event that LLU was successful in a similar way to its success in France. The impact of the unbundler, Free, as well as its fellow unbundlers in France, is of course difficult to separate from the natural effects of market evolution. Nevertheless, in the period after the launch of Free’s attractively priced high speed bundles, the rate of growth of the broadband market approximately doubled.

Applying the same initial ‘step change’ to the current rate of growth in the Irish broadband market, the two scenarios (with LLU making a big impact, as against the current scenario) diverge as demonstrated in Exhibit 6, below.

This figure indicates that, if LLU in Ireland succeeds, the broadband penetration could be almost one third larger than it would be otherwise in 2010 i.e 1M vs 750k. Based on
current growth rates the market will not hit the Irish government target of 400,000
subscribers by the end of 2006; if LLU were to be a success then it could.

Exhibit 6: Two plausible scenarios for growth in broadband subscribers in Ireland [Source: Analysys]

7 Conclusions

Up until 2002, the Irish telecommunications market, although fully liberalised, had been
slow to invest in the necessary infrastructure to keep pace with the demand for broadband.
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it out to additional areas in the absence of competition in the access network.

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If, however, these problems are not fixed then the growth of broadband penetration in Ireland will be very slow. If LLU in Ireland fails in the long run, then Irish economic development will suffer from the lack of effective competition. Businesses in Ireland will face higher costs than those in other EU economies and Irish consumers will not have the option of purchasing the advanced services on offer in other countries.
Annex A: What solutions have been tried in other countries?

The UK

In the United Kingdom, Ofcom has established the post of Telecoms Adjudicator (OFFTA) to be independent of the regulator and industry. It exists to facilitate the swift implementation of the processes necessary to enable competitors to gain access to BT’s local loop on an equivalent basis to that enjoyed by BT’s own businesses. It is designed to more efficiently resolve working-level LLU implementation disputes. At present, 17 operators are signed up to the OFFTA scheme.

BT has created an Access Services Division in response to the recent Ofcom Strategic Review of telecommunications. The Access Service Division is a ‘fenced off’ part of the business within BT, with responsibility for ensuring equal access to the services and assets associated with the local loop. The aim of the ASD is to ensure that BT has structural incentives to give its rivals fair and equal access to the parts of the telecommunications network which represent ‘enduring economic bottlenecks’.

BT has also promised to hold the price of its IPStream products constant until at least 1.5 million lines are unbundled (in order to avoid a possible price squeeze of the altnet unbundlers). This in itself has created added urgency to the altnets’ plans.

These significant interventions by Ofcom are particularly of interest in this case given that the UK is almost as far behind the rest of Europe as Ireland in terms of LLU, as previously shown in Exhibit 3.

The USA

In the United States, the Federal Communications Commission attempted to promote the take-up of LLU by restricting Bell operating companies from entering long-distance markets until it was deemed that local competition was open. This was enforced by the 1996 Telecommunications Act. Incumbent local companies were required to interconnect with entrants by offering to lease portions or unbundled ‘elements’ of their networks to
these entrants. However, successful challenges to the 1996 Act have resulted (effective from March 11, 2005) in the FCC having to refine its approach and define unbundling obligations more narrowly.

This remedy was particularly interesting (whilst it was in force) because it used a ‘carrot’ rather than a ‘stick’. This might be of interest to ComReg if there was something to ‘trade’ in this way.