BBBritain proposed design of a Universal Service Commitment for Broadband

BBBritain represents a group of avid Broadband users who campaign to get better Internet services while providing resources on the nature and composition of Broadband services. More detail is available here; http://www.bbbritain.co.uk

Scope: We wish to respond to the request for proposals on the nature of the proposed universal Broadband service, who contributes, its governance, scale and scope and accountability structures. This is a response to the invitation in section 4 titled Universal Connectivity of the Interim Digital Report – Jan 2009.

This proposal does not seek to justify the USO for Broadband but provides a means to define it and operate such as a scheme. It does not take account of what might or might not emerge from the European commission.

Status: This is a working draft, designed to be added to, pulled apart or re-written. The numbers provided are indicative, there are to be improved by those who have individual expertise. This is a straw man design.

Summary of assumptions and framework

- The USO for Broadband is a significant development in the evolution of the UK Digital Commons. Moving from a free market to one where all people need to be connected is a big policy change.
- The call for a USO for Broadband is a separate topic to that of next generation access. To be specific any case for rural FFTH or FTTC must be treated as a separate case and a separate subject matter given the associated change in costs and services consumed.
- It is assumed in this paper that a central fund – a Universal Service Industry Fund will be needed to assist those in remote rural areas or not spots and those on welfare benefits to get the connectivity they need to apply for work, gain access to education, or gain access to future health care services.
- The USO proposal must have a coverage dimension involving the building of network. A variety of approaches are possible from satellite, to mobile and extending ADSL coverage.
- The USO for Broadband will outline the key services to be supported within the USO. Each key service has a bandwidth and a quality associated with it.
- It is assumed that a common set of principals of running the Internet is adopted by ISPs, Ofcom and user groups in order for the USO Broadband to develop in a uniform way.
- The USO for Broadband needs to be flexible. As bandwidth improves and services develop the USO must remain relevant. It is important to avoid legislation which causes outdated services to exist in perpetuity, be it payphones or text translation service for deaf people which should evolve but get frozen by the regulations.
- The USO should be an industry scheme where all ISPs, their customers, and government contribute a share of the cost.
- It is recommended that the USO for Broadband is administered through a specific portal to allow potential recipients to apply for assistance, get approval and continue their purchase of the best offers in the market place.
- It is proposed that the USO Industry Fund is designed to support a maximum number of

connections, be it households or individuals. For the purposes of this proposal the USO Fund is designed to support 1.5 m additional connections in the UK. The USO Industry Fund (UIF) is finite, not open ended.

- The UIF would be run by industry and administered by at least two ISPs or their agents.
- The UIF would be chaired by an individual with a proven record in helping people out of poverty. The person would be supported by an independent audit team.
- In addition specific projects needs to be supported. The replacement of a text relay service with a Video relay service is one such project. Projects could be pursued as the UIF Funds and governance permit.
- Consideration should be given to transferring any excess budget from the Digital Switchover to the UIF.
- Consideration should be given to the notion that a proportion of spectrum auction fees and ongoing spectrum costs be made available to the USIF.
- Consideration should be given to whether the replacement of 24,000 lightly used phone boxes with Broadband Wimax access would contribute to universal coverage.
- It is envisaged no new product is created but existing services are labeled to illustrate the set of key services they support.
- As a separate issue, the decision to permit geographic de-averaged pricing should be re-examined and in particular the indicative quality of service pricing being proposed by BT 21CN. The latter is will be very punitive for rural users.

Defining the Universal Service Obligation for Broadband.

The existing USO legislation covering the telephone service, payphones and a text relay service for deaf users was based on a tight product and performance definition of service. The legislation provided little room or motivation to change or upgrade services. The services were engineered to a high specification and became part of the nations critical service infrastructure in times of emergency. Telecare offered by the NHS utilises the PSTN for in house alarms and sensors as the this single service network is engineered to work in a consistent predictable way.

Broadband services have different properties. Broadband is a multi-service network. It is possible to use the same connectivity to support two way video communications, while downloading files, or watching live streams of TV. Broadband services are best effort meaning there is none of the certainty of performance which is a feature of existing USO legislated services. Yet we have all become more dependent on our high speed connectivity for home working, education, communications and entertainment. The utility and potential to do even more is vast. However, critical to the USO is the little appreciated fact that the underlying data transport is stable and good.[1] This makes it possible to begin defining what a USO looks like, how it might evolve so all of society can benefit from what is a life and society transforming service.

In setting a USO for Broadband there are at least five considerations, the coverage issue particularly in rural areas, the speed and the quality associated with that speed, and the services supported. These will be taken in reverse order, as services supported dictate the speed and quality needed. The fifth consideration is cost and a section is written on a proposed UIF.

1 Stable Data Transport – predictable user experiences are possible at various load levels up to 90% of the capacity of the link, making possible to plan critical services over broadband. Planning rules need to be followed to achieve this outcome.

In outlining a set of services there is an assumption that there is common approach and philosophy to how the our high speed services should work. While it is not appropriate to legislate for net neutrality there is a need for some founding principles for the operation of the UK Internet and services. To this paper I have appended a copy of the principles used by the Norwegian NTP, ISPs and Consumer groups. I would recommend that this document or a version of it is adopted by the UK Digital Britain Team, as a founders document. Similar founders documents on privacy should be produce prior to any attempt at writing legislation on this matter.

USO Broadband services and the USO Broadband Portal

What would a customer see?

Declaring a USO for Broadband is suggesting special measures will be made to help those currently living in 'not spots' and those on state benefits unable to get or accord to be connected.

I am recommending a USO broadband portal is created as an overlay to existing broadband portal sites similar to the broadband finder services which compile the various offers. It's initial objective would permit the user to see what assistance is available to them, either as an individual or community group in a rural area, an individual on state benefit, or someone with a special health need. Having determined this, which may require a returned application, they would continue their transaction in the same way as broadband is purchased today.

What services would be accessible?

The competitive market in the UK has created some very compelling offers. It would seem wise to ensure prospective USO customers use the power of the market and existing support rather than introducing special product builds. However because it will be a USO service, additional transparency of service parameters is needed.

The Digital Britain report included a table on individual applications. The table at this link[2]

expands the table in the Digital Britain report by adding the quality needed to provide customers predictable user experiences. It is not a definitive list, but provides a start point for defining a set of key services and the performance they need.

We would ask all ISPs to add tables in their product help pages identifying what key services they packages support and not support at peak periods, in such a way that the USO portal can pick this information up and use it. Some understanding is also needed of the bandwidth allocation per user in busy hour periods. This creates a template from which to compare existing services. Some of the ISP packages may only support some key services, others more, but variation is allowed because those needing help to access USO Broadband will have different needs. For instance health care applications are sensitive to delay and variation, but one not demanding on bandwidth.

This portal approach provides a place to start. All ISPs can partake, and services can be updated in a dynamic way. As connectivity improves operators can increase the number of key services they support and update the services on their USO help pages.

For example, today Mobile Broadband services would not be able to tick delay sensitive applications such as video and voip, but can tick the other services. As mobile broadband services improve more of the key services can be ticked.

The establishment of the USO demands more transparency of service parameters. Specifically the USO will demand ISPs outline how these services are likely to behave at busy periods. It may be

2 http://bbbritain.co.uk/ubs.aspx - table of key services.

that ISP may not be able to assure any busy hour working, but some will be offering QOS for delay sensitive applications. Both cases need can be accommodated.

One advantage of this approach is that the USO is not dictating to users or ISPs what to do, but a framework is being created so the USO can evolve as our usage evolves and connectivity improves.

Is there too much wiggle room? Affordability of service is important, so I would argue not! If customers need USO grade services for health care, then a service is selected for that purpose.

A good iPlayer experience is important to some but not others, as long as the service is clearly marked , customers can make an informed decision.

I am recommending that the USO for Broadband starts with a defined set of services, the creation of a USO for Broadband portal, front ended with the geographic and welfare entitlement online customer journey. Beneath the entitlement journey, comes the standard journey of making a broadband purchase. It would provide access to CPE offers which could be included in the USO for Broadband bundles. Operators will need to mark up their existing packages and availability against the USO set of services and required performance. This form of USO labelling of existing services provides a framework for implementing a USO across a wide variety of access methods of varying quality. It also possible to start this process now. The USO for Broadband is underwritten by a Universal Industry Fund which is described later.

Speed, quality and the USO

It is telling that the Obama broadband stimulus package withdrew the speed requirements before the approval of the package. The FCC definition of Broadband is 750Kbps. This number is not that important. What is important is the services you can access and the ease and predictability of doing so. A well built 256/512 Kbps adsl connection will support more key services than a 7Mb Mobile Broadband service today[3]. The importance of speed, once the underlying quality is understood is the volume of things you can do any one time.

It perhaps good to pick an indicative speed like 2Mb, as a reference point but it is probably equally powerful to communicate that by 2012 – Digital Britain, or the UK Digital Commons will act as a primary medium for health care delivery and everyone will need connecting as connectivity will be a part of education, health care delivery and gaining employment.

Speed without defining the underlying quality has little meaning in end to end service delivery.

In the proposed USO support page the 2Mb threshold could feature and operators can mark their services accordingly. But, by not marking it, you are not preventing people taking the service, just letting then know that it's below the threshold.

There is nothing to prevent the USO for Broadband portal being tested with operators now to find a formula that works.

3 ADSL can typically achieve a consist response of 60ms – while Mobile services exerience high levels of variability from 100 to 300ms but frequently much longer reducing their utility for home working or other time sensitive applications.

Coverage and the USO for Broadband.

The objective is to deliver a 2Mbps[4] Broadband service to 98.5% of the UK.

Achieving 100% (98.5%) coverage is one factor, achieving 100% (98.5%) coverage at a standard retail price is another factor.

There are a number of avenues to achieve the 100% or 98.5% coverage required.

Extending ADSL with loop amplifiers and improved chip sets

The addition of amplifiers to local loops is being used in the USA and China to sometimes double the reach and bandwidth of ADSL connections in rural areas. The one off capital cost of $40per line seems to be a means of increasing coverage and bandwidth efficiently in rural areas. This and the possibility of improved chips to make better use of the ADSL frequencies suggests that there is much to be gained by gleaning more from existing access.

Perhaps it is time to re-examine the nature of the Metal Path Facility(MPF) defined in BT SIN 349- the standard copper pair, and include signal to noise ratios that support the delivery of Broadband at the desired speed. At present the product definition exists so a telephone service is supported. As the price of the MPF rise then perhaps the utility of the line for Broadband should also increase. The re-examination of the USO responsibilities should include this factor.

Satellite Internet access from Freesat/SKy

Freesat – the joint venture between BBC/ITV to deliver their programmes via satellite did announce in the summer of 2008 that Internet access would be available as an option over satellite. Other providers have indicated a 2Mb service at £45 pm. It shows that this approach is possible but the cost gap between a standard and offer of circa £25pm including telephony and a satellite delivered solution needs to be discussed. One assumes costs are volume related and an effort to increase volume would reduce costs.

It is also worth noting that the Digital Switchover activity could apply itself to encourage the Freesat entity to offer full Internet access as a return path as one variant of its service.

Mobile 3G Coverage

It is envisaged that with 3G Mobile Broadband reusing the 2G frequencies to increase reach, a commitment to coverage can be gleaned from the Mobile operators in exchange for concessions on auction and AID spectrum fees.

The notion of all operators sharing common facilities in remote areas seems sensible, and thus dividing up geographies where each operator pays for shared facilities in exchange for reduced spectrum costs seems very pragmatic.

This is a function of what negotiations can be concluded.

There is a question as to the nature of the bandwidth that mobiles can support, but if the approach

4 The proposed 2Mbps service needs to have minimum quality associated with it. Guideline are available here -http: //bbbritain.co.uk/guarantee.aspx

on defining services is adopted, then there is no reason why even todays services could not be included with a commitment to improve support of USO services over time.

Wifi -community coverage.

It is possible to support Wifi initiatives to support discrete remote connectivity projects, but the lack of standard offers points to it being applied in local connectivity projects on remote islands or valleys.

For the purposes of this paper, any submission would need to be a community application to the UIF and the case judged on its merits in the absence of standard offers in the market.

Community Fibre Networks

This is another much discussed option and I believe the Digital Britain is suggesting these are encouraged but the level of support is unclear.

For the purposes of this paper, any submission would need to be a community application to the USIF and the case judged on its merits in the adsence of standard offers available in the market.

Public Wimax access points

The possible use of public wimax access should be accessed as an option for public access in urban/city areas. The re-use of redundant payphone lines to create a fabric of cheap wimax access should be evaluated.

Special Services

There will be a long list of services and equipment needed to support individual groups. One specific example is the possible replacement of the text relay service with a Broadband based video relay service for deaf users.

Costings and budgets for such a service will need to be a separate exercise.

Affordability and the USO for Broadband.

Affordability is a key attribute in achieving Universal Broadband Service. In the context of the USO – affordability has a different meaning depending on who you are and where you live. Rural customers have a need to get physical connections in remote places at standard costs, while those on welfare benefits[5] would benefit from getting a reduced ongoing subscription.

Some consensus of what is affordable is needed to discuss what level of subsidy is required, what the total cost might be and who pays it. The numbers outlined are place to start.

5 By welfare benefit I am referring to those entitled – income support, income based jobseekers allowance or guaranteed pension credit.

Geographic averaged versus de-averaged pricing .

The price for MPF (metallic path facility) is more in rural areas, denoted as market 3 exchanges than in urban exchanges. Left to itself this gap will widen as the indicative Broadband quality of service prices put forward by BT 21CN will cause that gap to broaden further for applications like video telephony and conferencing[6]. From a Digital Divide and a regional development perspective this looks a significant backward step.

If reducing the geographical digital divide is a government policy then geographic averaged pricing will be need to be expressed as a specific policy goal and Ofcom orthodoxy will need adjusting to reflect this change. Whether a change to average pricing would create the means of funding a Universal Service Obligation would need to be discussed.

Rural subsidy for non-standard delivery.

If high take up is needed so customers can access key services, then access to a market average price is needed. In todays terms that could be a £15 a month mobile broadband service with support for a limited set of key services, or a combined £25[7] a month phone and Broadband service where most of the key services[8] could be supported.

If near universal access is the goal, including high take up in current 'not' spots, where the only option is a non standard Broadband service or one requiring additional investment then some provision is needed to make up the difference in cost.

If in the simple case of satellite, a 2mb download service is approximately £45pm and a £100 connection charge, then a £20pm incentive would be needed to support the take up rates needed.

Achieving the connectivity rates desired demands that the incremental cost is covered somehow. It is proposed here that the creation of a USO Industry Fund (UIF) is considered, the workings of which will be outlined overleaf.

Subsidy for those on welfare[3].

The current USO covering BT's legacy phone service, permits those on state benefits to apply for BT Basic a subsidised phone line and call package princed at £13.20 a quarter. It includes a calls allowance. This is approximately one third of the standard charge. The USO also subsidises the cost of telephone boxes in remote areas and a text relay service for deaf users.

A proposal to create a subsidised package for those on state benefits needs to include devices, be they laptops, netbooks or future Internet connected set top boxes.

Setting an entitlement level is always subjective but for this draft proposal purposes some starting point is needed to work through the consequences. Some voucher system contributing £10 a month to a package of the subscribers choice should be tested. Where entitlement to CPE may arise, then some additional allowance is needed.

6 Source – 21CN briefing on Wholesale Broadband Connect QOS option pricing – May and June 2008.
7 Talk talk offer of £16.99 a month – shows this number could be lower.
8 As per table here http://bbbritain.co.uk/ubs.aspx
3

For the purposes of seeing what the costs might look and to open the discussion on how it to be paid for I am suggesting 5 possible entitlement packs.

Welfare connectivity voucher I [9]– (access to public wifi + CPE) £5pm - £60pa

Welfare connectivity voucher II – (for fixed or mobile access) - £10pm - £120 pa

Welfare connectivity voucher II I(for access and CPE) - £15pm - £180 pa

Special needs connectivity voucher (for access and specialist CPE) - £20pm - £240pa

Rural not spot special service subsidy - £20pm - £240pa

It is envisaged that the vouchers or allowances would be applied for and redeemable through the online USO Broadband portal. The vouchers or allowances are credits to the Universal Service Industry Fund.

The avarege claim would need to be modelled, and allowances would need to be made for other projects such as a Video Relay service, and support for specific charities and caring organisations.

For the purposes of this draft I am assuming 1.5m individuals making claims of £150 a year, plus a the need to fund special projects. At these levels then a fund of £250m pa plus donations in kind would be needed.

Universal Service Industry Fund (UIF)

This proposal is for an industry run fund rather than a legislated government fund. I am making this recommendation for many reasons. They include; the notion that technology is changing continually and no legislation can keep pace, the USO Industry Fund cannot be an open ended commitment, but one which needs to be finite. Priorities and needs will change and the Industry Fund will need to change with it. It can be topped up by central resources for specific projects but the burden on industry and it customers is of a fixed proportion. Industry are better equipped to more quickly deal with abuse should it arise. Specific services could be more easily stopped if not delivering the desired outcome.

It is suggested that the Universal Service Industry Fund is there to assist 1.5 million additional connections.

It is proposed the Universal Service Industry Fund (USIF)consists of a 50p a month levy on all Internet users , residential, business and mobile. It is collected by each operator and deposited with the vat into the USIF account. The USIF could be topped up by other contributions in kind, including the costs of running an industry portal. One suggestion is that the administration of the fund could be made the principle objective of ISPs Corporate Responsibility programmes.

The government would match the funding from customers as the fund is geared towards meeting the public goals of reducing the digital divide. Additional funding would be provided to initiatives like Home access (free laptops), NHS health transformation (telecare alarms and sensors) and programmes to reduce re-offending by the Probation service.

For the purposes of this draft, the Universal Service Industry Fund (UIF) would generate approximately £10m a month from paying broadband customers, £10m a month direct from

9 Nature and scope public wifi spots needs to accessed . Included for discussion purposes.

Government, services in kind from operators to run the portal, and contributions from individual corporate responsibility programmes. The USO Industry Fund would be a £250m a year fund tackling the digital divide.

Finally

This document is straw man as to how a USO could work. I happy to place the document on a Wiki if folk wish to comment or improve it.

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Appendix 1
Norwegian NPT – published guidelines On Internet Service Principles

Proposed Internet Service Principles to support consistent approach to supporting a Universal Service obligation.

Guidelines for Internet neutrality

Version 1.0
24 February 2009

These network neutrality guidelines have been drawn up by the Norwegian Post and Telecommunications Authority (NPT) in collaboration with various industry players, such as Internet service providers (ISPs), industry organisations, content providers and consumer protection agencies. The guidelines are intended to ensure that the Internet remains an open and non-discriminatory platform for all types of communication and content distribution.
NPT has sought to establish principles for network neutrality that as many parties as possible can endorse and comply with. These principles will not have any formal legal status, nor will NPT be able to issue sanctions on the basis thereof.
Three basic principles of network neutrality have been identified. To explore these principles in depth and give them substance, each one is explained in a dedicated section. In a number of cases, the explanations will support one another across principles. That is why when evaluating these principles it is necessary to look at the big picture and not only individual principles.
The guidelines may be updated as needed.

The main objective of network neutrality is to ensure that the Internet remains an open and nondiscriminatory platform for all types of communication and content distribution.

Principles of network neutrality:

1. Internet users are entitled to an Internet connection with a predefined capacity and quality.[1]
2. Internet users are entitled to an Internet connection that enables them to
- send and receive content of their choice
- use services and run applications of their choice
- connect hardware and use software of their choice that do not harm the network.[2]
3. Internet users are entitled to an Internet connection that is free of discrimination with regard to type of application, service or content or based on sender or receiver address.

Principle 1 states that the characteristics of the Internet connection are to be contracted in advance, also with a view to cases where Internet access is provided together with other services on the same physical connection.
Principle 2 states qualitatively that the Internet connection must be able to be used as the user wants. And
Principle 3 states that traffic over the Internet connection is to be transferred in a non-discriminatory manner.
These principles are expanded on in detail in the following sections.

1. Basic Internet connection
Principle 1
Internet users are entitled to an Internet connection with a predefined capacity and quality.
This means that
- The capacity and quality of the Internet connection is to be clearly specified.
- If the physical connection is shared with other services, it must be stated clearly how the capacity is shared between Internet traffic and the other services.

A.
The capacity and quality of the Internet connection is to be clearly specified.
This principle states that Internet users are to be given sufficient information about the characteristics of the Internet connection, so that they know what resource is being provided for communication with the Internet in the form this has traditionally had. This is normally referred to as "best effort" Internet. It is how this resource is managed that is described in Principles 2 and 3.

B.
If the connection is shared with other services, it must be stated clearly how the capacity is shared between Internet traffic and the other services.
The connection service that a customer subscribes to from a provider shall have as its primary function – or one of its primary functions – to provide the end user with access to the Internet. If other services are provided to the user in addition to the Internet connection, the subscription terms must state how the use of the other services will affect the Internet access capacity.

2. Internet user's right to freely use the connection
Principle 2
Internet users are entitled to an Internet connection that enables them to
- send and receive content of their choice
- use services and run applications of their choice
– connect hardware and use software of their choice that do not harm the network.
–
However, this does not mean that the principle can be used to legitimise unlawful or harmful actions.
This principle states that the user shall have free use of the basic Internet connection. An important characteristic of Internet technology is that it can be used for all forms of communication, which is why it is important that this characteristic is not degraded by the provider.
A.
This principle may not be used to legitimise unlawful or harmful actions.
The principle of network neutrality shall not be interpreted in a manner at variance with current law. For example, the unlawful distribution of copyrighted content with the aid of P2P file sharing would still be an illegal act by the user. Furthermore, the current practice of ISPs to block child pornography will not infringe this principle. The same may be said regarding spam filters and measures to counteract denial-of-service attacks and infected PCs. It will be in the interest of all users for the ISP to protect the network through which its users communicate. The ISPs are to publish as well as inform all users of all measures of this type.

3. Non-discrimination of Internet traffic
Principle 3
Internet users are entitled to an Internet connection that is free of discrimination with regard to type of application, service or content or based on sender or receiver address.

- This means that there shall be no discrimination among individual data streams that use the basic Internet service.
- But it does not mean that the principle precludes traffic management efforts on an operator's own network to block activities that harm the network, comply with orders from the authorities, ensure the quality of service for specific applications that require this, deal with special situations of temporary network overload or prioritise traffic on an individual user's connection according to the user's wishes.

Principle 3 expands on the more qualitative approach we find in Principle 2 by specifying how this is to be understood quantitatively.

There shall be no discrimination among individual data streams that use the basic Internet service.
This principle states that the sharing of capacity among users shall be done in the fairest and most efficient manner that ensures a functional Internet. This is a matter that is difficult to define precisely. Since different users (on both ends of the various communication sessions) can be connected to the network at different bandwidths, it is reasonable that they will experience different capacity for end-to-end communication.
As the competition for bandwidth will typically occur on particular places on the network, either network internal connections, external peering/transit connections and the actual access connection, the principle should apply to all types of communication lines within the framework that the connection contracts (subscription contracts, peering/transit contracts, SLAs, etc.) set. An absolutely fair sharing of bandwidth for all Internet users applied to all communication lines would be difficult to achieve in practice. Inherent in the principle, however, is that there must be no unreasonable manipulation or degradation of traffic for individual data streams.

However, this principle does not preclude traffic management efforts on an operator's own network to block activities that harm the network, comply with orders from the authorities, ensure the quality of service for specific applications that require this, deal with special situations of temporary network overload or prioritise traffic on an individual user's connection according to the user's wishes.
If it becomes necessary to manage traffic streams on the network for these reasons, the operator must be able to account for how this management complies with the principle. Examples of legitimate blocking of harmful activities are measures to combat denial-of-service attacks and spam (cf. Principle 2). An example of orders from the authorities is the requirements of the Electronic Communications Act to give priority to functions critical to society in crisis or emergency situations. Examples of application types whose quality of service may require special handling are telephony and video.
In special situations of temporary network overload it is also deemed to be a reasonable measure to ensure that network resources are used as efficiently as possible. However, such measures must always be carried out in a non-discriminatory manner that does not give priority to selected users or content/service providers.

5 Guidelines for network neutrality

There must be a distinction between giving priority to traffic without the user's consent and prioritising that is done on the user's own Internet connection according to the user's wishes. Some users may need help from the provider to prioritise the traffic on their own connection when the amount of traffic exceeds total capacity. In principle it is not at variance with network neutrality when this is done for an individual user in isolation. This requires, however, that the users have a real opportunity to choose an Internet connection without prioritising.

The methods for measures of this type shall be published and disclosed to users.