

Rural NGA broadband development in Penrith & the Border - a parish guide

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In 2009 the government of the day published its report *Digital Britain* which, amongst other things, made clear the need for the universal availability of broadband services to the population of the UK. It set a minimum standard of 2Mbps¹, embodied in a universal service commitment (USC) to be achieved by 2012, later revised by the current government to 2015. The *Digital Britain* report also acknowledges that up to one-third of the population (the *Final Third*), comprising mainly rural communities, will not be supplied with broadband of a satisfactory standard by established commercial suppliers using conventional means in the foreseeable future. Indeed, Eden District has been designated a 'red area' in that 72% of its population fall within the 5% of the national population that will not receive Next Generation Access broadband by 2017.

With the current government's announcement on implementing the Big Society (19 July 2010), the designation of the Eden Valley as a Big Society vanguard community, and the initiative taken by Rory Stewart MP to seek to achieve Next Generation Access broadband in his constituency of Penrith & the Border, the opportunity exists to undertake some serious planning of rural NGA broadband development in the communities concerned. This paper sets out some thoughts on how that should be approached.

Next Generation Access

Next Generation Access to the internet (NGA) is defined in terms of the level of service experienced by the user rather than the method of delivery². It needs to be capable of delivering all the services that customers require now and in the future. To do that it must be: high speed, symmetrical (as fast uploading as it is downloading), and with low latency (minimal delay in data transmission) so that it is able to handle next generation applications such as high definition TV, 3-D HDTV, interactive video for gaming, tele-medicine and social interaction. Moreover, as most homes and businesses often have more than one person in them simultaneously using the connection for

different applications, more than one data stream is likely to be in play. Accordingly, the requirement is for symmetrical, low contention capacity, running at not less than 50Mbps at the point of use.

Most of the current delivery technologies (e.g. fibre to the cabinet (FttC), data over cable service interface specification (DOCSIS), terrestrial wireless, satellite or data over high-voltage power) cannot deliver NGA so defined. The only technology that has the required range and bandwidth and minimises contention is fibre all the way to the premises (FttP), also known as fibre to the home (FttH). This is currently available at bandwidths of 10Mbps, 100Mbps, 1Gbps or 10Gbps. All but the first meet NGA requirements. So the basic requirement for NGA is FttP running at 100Mbps or more back to the serving point of presence (PoP).

While NGA is not to be defined in terms of method of delivery, it is essential that in planning its delivery an important principle is observed: money, especially public money, can only be invested once. It must therefore be invested for the long term in technology that is 'future-proof'. A significant investment in short term sub-NGA quick fixes is a misplaced investment. The Government will believe it has solved the problem for the rural areas and will not want to listen to people telling it that "hundreds of millions of pounds have been spent but by the way we need to do it all again as it is no longer fit for purpose". A second, related principle to be observed is that Final Third communities should not be content to follow the other two-thirds with their sub-NGA, largely copper-based solutions but should leap-frog them and aim for future-proof solutions that are practical and affordable.

The first priority in delivering NGA broadband to an identified rural community is therefore to bring a 100Mbps (minimum) fibre-optic internet connection (the 'backhaul') to a PoP that is appropriately located to serve that community – metaphorically referred to as the Digital Village Pump – and is affordable. The key to achieving an affordable backhaul is open access to networks, in particular public service networks whose capital (and possibly revenue) funding comes out of public money. An example of this is the Cumbria & Lancashire Education Online (CLEO) network which is currently the subject of discussion in respect of open access.

The second priority is to identify and implement ways of distributing that connection to individual premises. To secure "true" NGA delivery, this should also be done by means of fibre

(FttP). However local circumstances may require that community delivery is implemented in stages such that initially an affordable sub-NGA *local* distribution solution (e.g. a 5.8GHz wireless network) is deployed in order to achieve early connection(s), to be replaced by FttP as resources allow. A FiWi approach may be the practical option – deploy FttP where there is the greatest concentration of households and ease of reach, and use wireless to reach more distant locations where the use of fibre is problematic or too expensive; or deploy fibre to a number of wireless nodes and connect individual subscribers wirelessly.

There is a balance to be struck between capital and operating costs in developing a network. Generally, the higher the former the lower the latter, resulting in the deployment of a longer-lasting, future-proof solution, i.e. FttP. However, high capital costs can be difficult to meet for small community projects. A community's financial operating mode should allow the build up of reserves to enable future investment in extending and upgrading the network; to ensure that surpluses are not treated as profits, the **community interest company** (CIC) is an attractive vehicle for owning and managing the network.

Different communities will require different solutions to suit their unique circumstances – varying combinations of FttP and wireless may need to be deployed – and it will be important to engage communities in determining what those circumstances and their priorities are. They may well need to find ways in which they can facilitate the development by making a financial contribution to the capital cost or by donating wayleaves and volunteer labour digging ducts and undertaking fibre installation.

Relevant communities

In planning rural broadband service developments it is necessary to define the area to which each development will relate. The following criteria are suggested:

- The target population is large enough to form a critical mass such that the service is coherent, is financially viable, and can benefit from economies of scale. Experience suggests that at least 100 households are required.
- The target population is sufficiently concentrated as to be able to connect to a single point of presence.
- The target population is linked in other ways, e.g. it is part of the same administrative entity, it already shares some

¹ Mbps: megabits per second, the speed or bandwidth of an internet connection

² This section draws on the views of Barry Forde, NGA advisor & Guy Jarvis, NextGenUs UK CIC

common services, and/or other relevant (potential umbrella) organisations exist.

Given the remote and disparate nature of rural communities, probably the largest administrative entity within which a rural broadband service development is realistic and manageable is the **civil parish**. These only exist in England - historically only in rural areas, although since 1997 civil parishes and councils can be created by petition anywhere. Not every civil parish has a parish council: smaller ones — typically with an electorate under 200 — have parish meetings instead.

Parish councils have the power to precept (tax) their residents to support their operations and to carry out local projects. Although there is no limit to the amount that can be precepted, the money can only be raised for a limited number of purposes, defined in the 1894 Local Government Act and subsequent legislation. Not surprisingly *broadband services* is not one of those purposes but the list does include various local facilities and social amenities. Funds can also be raised through the **Public Works Loan Board**.

For wider broadband planning purposes it is proposed that the civil parish (and its associated council) should be adopted as the **community area of focus** within which an integrated broadband development plan should be formulated. Reasons include:

- It has a legal administrative status and democratically represents the local interests of a defined population.
- It covers a relatively small number of separate communities and a geographical area small enough to make projects manageable.
- To varying degrees it is a recognised authority and is therefore well-placed to facilitate or intervene in local developments.
- It has formal links to higher administrative entities such as district and county councils in relation to planning and development matters.
- It has the power to raise a precept.
- Parish councils are destined to assume an important role within the Big Society approach and rural broadband is a key issue that the majority of the population will have a keen interest in.

A rural broadband planning model

To ensure that rural broadband development in Penrith & the Border is not undertaken in a piecemeal and idiosyncratic

fashion, and that it is able to draw on all the available resources, experience and expertise, it is proposed that a **planning model** is adopted which encompasses the following.

- The overall approach is initiated and sponsored by a recognised 'local champion' – e.g. Rory Stewart MP.
 - A small constituency-wide steering group is established, comprising people with appropriate knowledge, expertise and influence, to oversee and inform the approach.
 - Each specific plan covers a civil parish, or an identified area within the parish.
 - Parish councils are invited to endorse the approach, participate in it and possibly lead it.
 - A **parish broadband champion** is nominated and encouraged to form a local implementation group of interested and motivated local people.
 - The parish/area is **mapped** in respect of:
 - Geography & topology
 - Population
 - Socio-economic characteristics
 - Existing broadband provision and gaps therein
 - Need/demand for USC/NGA standard broadband services
 - Existing public service networks
 - Nearest PoP or potential PoP (digital village pump)
 - Land-ownership if and where fibre-laying is envisaged.
 - A **parish/area plan** is formulated that sets out:
 - The stakeholders
 - How stakeholders, including potential users of the service, are advised or educated as to the benefits of NGA broadband and the internet in general
 - Location and range of discrete network(s), and premises to be included
 - Method of backhaul delivery and location of PoP ('middle mile')
 - Method of local distribution ('last mile' – or 'first mile' depending on your perspective)
 - Routes and locations of fibre, wireless nodes and access points
 - Suppliers of key services and equipment
- Projected performance at the premises (end-user experience)
 - Use of (shared) facilities such as ducts, poles, masts and other structures, including permissions, wayleaves, etc. (This is a thorny area of asset ownership and access in which BT plc is a key player.)
 - Wayleaves, licences and permits to bury cable required from landowners, local authorities, etc.
 - Costs: capital and operating
 - Funding options
 - Organisation(s) responsible for delivery (ref the CIC model) and whether they have an exclusively local or wider remit
 - Financial/business model for service delivery.
- An **enabling plan** is formulated to overcome obstacles encountered in the parish plan that may require the cooperation of or intervention by local government, national government, Ofcom, telecommunication companies, wider area broadband projects, funding bodies, etc.

Summary

The opportunity now exists to deliver next generation access broadband in remote rural communities in Penrith and the Border, notwithstanding the inability of 'the market' do so in a commercially viable fashion. By taking a co-operative and focussed approach and engaging the help of specialist companies and technical experts as well as drawing on the experience of those who have been there before, local community groups can achieve a great deal. This paper provides an outline plan for setting about the task and advocates a systematic and co-ordinated planning approach based on the civil parish as the appropriate community area of focus. It sets out a brief account of the NGA technology options and proposes a planning framework. In order to capitalise on available local experience and expertise it is proposed that an appropriate planning and implementation structure is put in place, led by a recognised 'local champion'.

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