Broadbanding Australia

Multicast Sandpit Alpha Release

Invitation for Expressions of Interest

NBNCo Limited

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Disclaimer

This Information Paper sets out NBN Co's proposals in respect of certain aspects of the National Broadband Network. The contents of this Information Paper are intended for public consultation and represent NBN Co's preliminary position on the subject matter of this Information Paper. The contents of this Information Paper should not be relied upon by our stakeholders (or any other person) as representing NBN Co's final position on the subject matter of this Information Paper.

Environment

NBN Co asks that you consider the environment before printing this Information Paper.

Table of Contents

Section 1 – Document purpose

The NBN Co Multicast feature is scheduled for initial release in quarter 3, 2012. NBN Co would like to invite service provider customers to register their interest in testing the Multicast feature in one of five capital city 'sandpit' testing environments.

The sandpit testing provides service providers who intend to utilise Multicast an environment in which to become familiar with the feature and understand the requirements and interaction with their own products and infrastructure.

Multicast Sandpit Alpha Release testing will commence from December 2011, and service providers are invited to nominate the location and duration of their desired testing programme.

Section 2 – Introduction

As part of the nationwide rollout, NBN Co currently proposes releasing a Multicast capability for its fibre product that is designed to enable service providers to deliver high-quality video over the fibre footprint.

Television is going through a period of significant change in Australia and the rest of the world. No longer simply a box connected to an aerial, the television screen is now a gateway to a large range of content and ways to receive that content. With the NBN rollout providing the bandwidth that high-quality video demands, IPTV (Internet Protocol Television) is set to grow significantly in Australia. Content providers will soon be able to offer premium content services in full high definition, complete with innovative audience interactivity and device connectivity options.

The Multicast feature however is not only applicable to Internet Protocol Television. Anytime a single piece of identical data needs to be delivered to thousands of End-Users at one time, the technology could be used. eg. in the future, when thousands of electricity smart-meters are connected to the NBN and a firmware update is required.

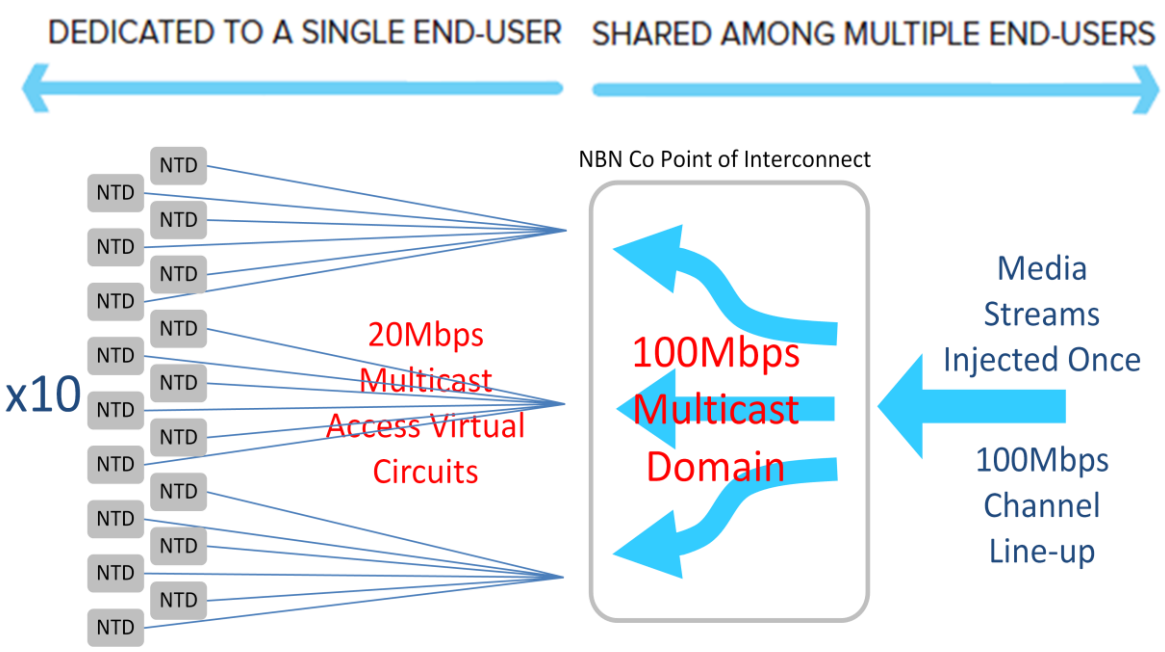
Multicast is presently intended be delivered in quarter 3, 2012 and is intended to be available for service providers to offer in areas where the NBN fibre rollout has occurred.

Section 3 – Overview of the NBN Co Multicast feature

Multicasting is a feature which enables content to be transmitted simultaneously to multiple parties, but is carried as a single stream as far into the network as possible before being replicated and forwarded to End-Users. Multicast technology is uni-directional: traffic flows one way to the End-User.

The Multicast feature can achieve significant bandwidth savings for the delivery of one-to-many services, allowing more efficient use of service provider backhaul. This enables more cost effective delivery of services such as Internet Protocol Television and other video content.

To illustrate this, Figure 1 shows 180 End-Users, each receiving a 20 Megabits per second (Mbps) media stream. Multicast enables the service provider to inject the media streams only once at the Point-of-Interconnect. Without Multicast, the service provider would need to inject each individual End-User's media stream 180 times, consuming 3600 Megabits per second of bandwidth, compared to the 100 Megabits per second required when using the Multicast feature.



The Multicast product drives significant network and cost efficiencies for providers who have a large number of End-Users. For smaller providers, a Unicast delivery methodology (ie. where each End-User's video channel is delivered to them, end-to-end, from the source) is more economical. As each service provider's Internet Protocol television business grows, there will be a crossover point where Multicast becomes more economically attractive than Unicast.

Overview of the Multicast feature product construct

The NBN Co Multicast feature is similar to the standard NBN Co Fibre Access Service, in that it consists of the same four product components (ie. User Network Interface Data, Access Virtual Circuit, Connectivity Virtual Circuit and Network to Network Interface) working in conjunction with each other to deliver a service to an End-User. The major difference is that Service Providers will need to purchase a Multicast variant of the Access Virtual Circuit (called a 'Multicast Access Virtual Circuit'), as well as a Multicast variant of the Connectivity Virtual Circuit (called a 'Multicast Domain') in addition to the standard Access Virtual Circuit and Connectivity Virtual Circuit products purchased with the standard Ethernet bitstream service.

Further details on the NBNCo Multicast product construct can be found in the document 'Multicast - feature, technology and pricing overview for Multicast over fibre' published on the 11th of August 2011 and available on the NBNCo website at this link

http://www.nbnco.com.au/assets/documents/multicast-product-prcing-overview-aug-11.pdf

Section 4 – Overview of the Multicast Sandpit Alpha Release

Service providers are invited to run a technical trial of the feature during a 'Multicast Sandpit Alpha Release' from December 2011. Full details of this technical trial are described in this document, including how to register interest to take part.

Service providers who wish to take part in the Multicast Sandpit Alpha Release must have signed the NBN Co 'First Release Sites Trial Agreement' which is available at the following link or the NBN Co Wholesale Broadband Agreement.

http://www.nbnco.com.au/our-network/industry-consultation/first-release-sites-trial-agreement-fibre.html

Multicast Sandpit Alpha Release Scope

The NBN Co Multicast feature will be available on a Multicast Sandpit Alpha Release from December 2011. The Multicast Sandpit Alpha Release is a technical trial; a proposed list of use cases that a service provider will be able to test during the sandpit is in Schedule A of this document.

The scope of the Multicast Sandpit Alpha Release is for fibre connected premises only; wireless and satellite are not covered by this Alpha release.

At this time the scope of the Multicast Sandpit Alpha Release will not include the supporting aspects of the feature, eg. ordering and assurance.

Location and duration of Multicast Sandpit Alpha Release

The Multicast Sandpit Alpha Release is expected to be available to service providers in major capital cities according to the following table. It should be noted that these are target dates and may change. If unavoidable changes to availability dates are made they will be communicated to service providers who have registered their interest.

The Multicast Sandpit Alpha Release is expected to be available until the end of April 2012, further details on the exact end date will be supplied to service providers upon registration of interest.

Multicast Sandpit Alpha Release location	Date Scheduled to commence
Melbourne	**8th December 2011**
Adelaide	**12th December 2011**
Perth	**14th December 2011**
Sydney	**19th December 2011**
Brisbane	**20th December 2011**

Multicast Sandpit Alpha Release allocation

Any service provider may nominate which geographical location they wish to use and the duration they wish to use it for up until the end time of the Multicast Sandpit Alpha Release.

Priority for the Multicast Sandpit Alpha Release will be given to current or prospective service providers which are currently running or planning to run a commercial Internet Protocol Television service in Australia.

A service provider may allocate an Internet Protocol address of their choosing to each media stream within the sandpit; however these IP addresses will pass into the Multicast Sandpit Alpha Release on a first come, first served basis within each geographical sandpit location. If an Internet Protocol address is already taken by a service provider, the next service provider will need to designate a different Internet Protocol address.

Capacity of the Multicast Sandpit Alpha Release

A maximum of five media streams will be initially provisioned and integrated within the Multicast Sandpit Alpha Release for each service provider. These media streams will be identified by a unique Internet Protocol address, allocated on a first-come, first- served basis in each sandpit.

If a service provider wishes to test more than five media streams concurrently in one sandpit, additional streams will be added on a 'best efforts' support basis according to the 'First Release Sites Trial Agreement' document. Backhaul of all media streams to the Multicast Sandpit Alpha Release is the responsibility of the service provider.

Certification exemption for Multicast General release

Service providers who participate in the Multicast Sandpit Alpha release may gain exemption to some of the Multicast General Release pre-certification test use cases at NBN Co's discretion. Confirmation of this exemption would be provided to a participating service provider in June 2012.

Multicast Sandpit Alpha Release pricing

Service providers wishing to take advantage of the Multicast Sandpit Alpha Release can do so free of any charges levied by NBN Co. However, service providers are responsible for any backhaul costs related to getting their media streams to the chosen capital city sandpit.

Support

The Multicast Sandpit Alpha Release will be supported on a 'best efforts' basis as detailed in the NBNCo document 'First Release Trial Agreement'. A service provider will be able to refer all issues and support requests to an email drop box and support requests and issues will be executed within the hours listed below and on a best efforts basis.

Dates of Multicast Sandpit Alpha Release support

Dates	Support
8th December 2011 to 21st December 2011	24 to 48 hours turnaround of requests
22nd December 2011 to 4th January 2012	No support actioned. Christmas period.
5th January 2012 to end of Alpha Release	24 to 48 hours turnaround of requests

Trial Feedback

During and after completing the Multicast Sandpit Alpha Release review meetings will be scheduled with each participating service provider to share lessons learned from the Multicast trial environment.

Technical and support details for Multicast Sandpit Alpha Release

After expressions of interest have been received and Sandpit locations have been allocated to service providers, NBN Co will issue an addendum to the 'First Release Sites Trial Agreement' document to service providers registered for the trial. This addendum will include relevant technical information and support information for the duration of the alpha release.

Section 5 – Registering interest for the Multicast Sandpit Alpha Release

If your organisation is interested in participating in NBN Co's Multicast Sandpit Alpha Release, please let us know by lodging an expression of interest, following the procedure set out below.

Process of registering interest

1. Service providers that are interested in taking part should make contact with NBN Co with the subject line "Multicast Sandpit Alpha Release" via feedback@nbnco.com.au by 5pm on **January 31st 2012**. This email should include your requested sandpit location and the proposed start date.

2. If not done so already, service providers will also need to have signed the 'First Release Sites Trial Agreement' available from this link http://www.nbnco.com.au/our-network/industry-consultation/first-release-sites-trial-agreement-fibre.html or the NBN Co Wholesale Broadband Agreement.

3. NBN Co's account team will make contact with respondents to discuss their interest, explain our requirements, and assist them to get ready to connect.

4. Sandpit location and dates will be confirmed by email for each respondent. An addendum to the 'First Release Sites Trial Agreement' will be issued detailing the Multicast Sandpit Alpha Release procedures and processes.

5. During and after completing the trial NBN Co will be in touch with respondents to conduct a post review meeting.

The process is summarised in the table below :

Action	Expected Date
Service provider executes trial agreement	From November 21st 2011
Confirmation of service provider sandpit location and dates from NBN Co	From November 23rd 2011
Multicast Sandpit Alpha Release commences	From December 8th 2011
Last day for service providers to register Interest by	January 31st 2012 (Date extended)
Service provider review meetings scheduled	From February 2012

Schedule A: Multicast Sandpit Alpha Release test cases

It is expected that within the Multicast Sandpit Alpha Release service providers will be able to perform the following technical tests:

1	Assess the impact of adding or removing the Multicast feature
2	Assess the impact of adding and deleting media streams on a Multicast feature
3	View Standard Definition, High Definition, 3D and Audio channels without any interference through the network
4	Change media streams at a speed commensurate with the existing satellite or cable viewer experiences
5	Verify channel surfing (fast leave) behaviour for single and multiple set top box scenarios
6	Send back audience interactivity (other than channel changes) over the return path
7	Test audio exactly synched with vision correctly without straying and lipsync is 100% matched
8	Operate an electronic programme guide successfully and at commensurate speed
9	Record a media stream with no interference and as per service provider set top box specifications
10	Record a media stream while watching another with no interference as per service provider set top box specifications
11	Use broadband in conjunction with the Multicast feature on the same user network interface data port without any interference
12	Verify simultaneous operation of Internet Protocol over Ethernet (iPoE) Multicast and point to point protocol over Ethernet (PPoE) Unicast on the same User Network Interface Data port
13	Assess the impact of exceeding Multicast domain, media stream and access virtual circuit bandwidth limits
14	Assess the impact on End-Users of changing peak bandwidth on a media stream
15	Test conditional access and digital rights management is unaffected by NBN Multicast feature delivery
16	Test joining channels into aggregated media streams is possible.
17	Test impact of forcing a bad packet(s) to analyse impact across multiple channels on same media stream
18	Verify in-house handling of upstream Internet group management protocol (IGMP) messages received from the Multicast feature
19	Verify a sparse mode of operation over service provider backhaul

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