Industry Briefing

Fibre TV / RF Light Path: Consultation Paper and Expression of Interest

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# Contents

1. **Introduction**  
   - 1.1. Document Purpose  
   - 1.2. Background  

2. **Opportunity**  
   - 2.1. Service Provider role  
   - 2.2. Fibre TV Solution Overview  
   - 2.3. Fibre TV Operating Models  
     - 2.3.1. Transactional Model  
     - 2.3.2. Deployment and Ownership Model  
     - 2.3.3. Commercial transactions  
   - Availability of content and relationship to broadband  

3. **Product Construct and Consultation**  
   - 3.1. Product elements for RF Light Path product  
     - Pricing  
     - Ongoing Maintenance Model  
     - Activations / assurance  
     - Service levels  
     - Testing / verification of the product before release  
   - 3.2. Product construct consultation  

4. **Becoming a Fibre TV Service Provider**  

5. **Frequently Asked Questions (FAQs)**
1. Introduction

1.1. Document Purpose

This document has four purposes:

- To introduce a proposed new nbn™ solution known as “nbn™ Fibre TV”;
- To introduce a complementary specialised product concept for carriage and content service providers (Service Providers) within the Fibre TV construct known as “RF Light Path”;
- To seek feedback from nbn’s customers and industry on nbn’s proposed product construct for nbn™ Fibre TV and RF Light Path; and
- To seek expressions of interest from customers and industry to participate as Service Providers for Fibre TV.

1.2. Background

During the course of 2015, nbn has been developing a solution known as Fibre TV, which enables television signals to be provided to premises in large new developments using the same nbn™ fibre-to-the-premises (FTTP) broadband infrastructure used to carry nbn’s™ broadband services. The solution is designed to allow developers to avoid the need for television rooftop antenna infrastructure or MATV cabling.

The Fibre TV solution requires a Service Provider to inject a television signal into nbn’s fibre, and carry the television signal into the premises using the 1550nm wavelength channel. nbn has developed a product known as RF Light Path for this purpose, which provides the infrastructure and carriage necessary for a Service Provider to carry the television signal into the end user premises.

nbn’s product development to date has included market research and discussions with a number of likely market participants in respect of the RF Light Path product. nbn now believes the product construct is mature enough to brief the broader industry on its plans, and to seek additional input and interest from potential Service Providers.

We expect that new development infrastructure providers will be interested in becoming Service Providers for RF Light Path.

While RF Light Path is a new type of product for nbn, nbn has retained the character of other nbn™ products by:

- maintaining a traditional supplier-customer product construct; and
- retaining an “open-access” element to the service, to ensure that a broad range of television content suppliers are able to use Fibre TV to provide content to residents of new estates.
2. Opportunity

Incorporating nbn™ broadband infrastructure into their development projects helps developers to:

- Bring broadband coverage within reach of all new premises within new development estates;
- Plan new developments to help ensure residents have access to fast broadband;
- Maximise efficiency and lower costs by installing telecommunications infrastructure like a utility service; and
- Promote new developments as 'nbn ready', so residents can enjoy the benefits of access to fast broadband.

The Fibre TV solution is not a traditional carriage service but rather an access arrangement to specific spectrum in nbn’s network. As such:

- the television signal is “always-on” once activated;
- nbn will install and activate the UNI-RF at no charge to the end-user; and
- the entire development is enabled at once for Fibre TV.

The nbn™ Fibre TV solution consists of two offerings: a physical build offering to developers, which augments the nbn™ physical network infrastructure with the components needed to carry TV signals, and a service offering to service providers to carry TV signals from their head-end equipment to developers’ end-user premises that have been enabled by the build offering.

In order to take advantage of the Fibre TV product offering, a developer will need to contract with nbn for the augmentation of the network, and with their choice of Service Provider for the provision of the particular television content that suits their needs. In addition, the Service Provider will need to contract with nbn for provision of the RF Light Path which will carry their content through nbn’s network to the end user’s premises.

nbn intends to make the Fibre TV network build available in new developments with greater than 250 lots for MDU premises, and 500 lots for SDU premises.

Participating in the process set out in this paper provides potential Service Providers and market participants with the opportunity to:

- provide input and feedback on the RF Light Path product construct; and
- be involved in the development/negotiation of an RF Light Path Agreement.

2.1. Service Provider role

To promote maximum choice of television content for Fibre TV customers, nbn will offer the RF Light Path product to eligible providers of television carriage services. These Service Providers will be responsible for the sourcing and nbn™-compliant encoding of television signals to be injected into the nbn™ fibre network, and the maintenance of television signal infrastructure in the end-user premises.

nbn will offer Service Providers an RF Light Path product, which is a point-to-multipoint signal path from a demarcation point in the network, to a demarcation point in the end-user’s home.
Service Providers will need to enter into their own commercial arrangements with developers in respect of the
provision of TV services and maintenance of all required infrastructure.

nbn will rely on Service Providers to provide content to residents (in the same way that nbn relies on its
broadband customers to provide broadband). In this way Fibre TV allows nbn to offer developers a solution
to provide access to both television content and broadband to its residents using a single set of infrastructure.

If you are interested in becoming a Service Provider for Fibre TV, please contact nbn as set out in section 4 of
this paper ("Becoming a Fibre TV Service Provider").

2.2. Fibre TV Solution Overview

nbn™ Fibre TV relies on a standard feature of FTTP technology known as RF Overlay. As described in ITU-T
G.984.5, RF Overlay uses a specific wavelength of light to carry the TV signal, which is injected into the same
optical fibre that carries the broadband traffic.

The main components of the nbn™ Fibre TV solution is illustrated on Figure 1.

![Figure 1. Fibre TV Architecture Overview](image)

The solution consists of three new network components, two new network interfaces, and two new components
provided by the Service Provider, as described below.
The Fibre TV solution introduces three new network components:

- An Optical Combiner at the FAN or FDH;
- A combined Optical Splitter and RF Converter in the end-user premises; and
- A power supply unit to power the active RF components in the combined Optical Splitter and RF Converter.

The Fibre TV solution introduces two new network interfaces, which demarcate the complementary RF Light Path product:

- A NNI-RF at the optical combiner in the FAN or FDH to accept the optically encoded TV signal (each NNI-RF can serve up to 128 premises subject to nbn’s GPON architecture and design rules; and
- A UNI-RF in the end-user premises to connect to the in-home coaxial TV distribution network.
The Fibre TV solution introduces two Service Provider Components:

- An RF head-end to receive and transcode satellite and/or terrestrial TV content for presentation to the NNI-RF; and

- Installation of in-home coaxial television cabling.
Figure 5. Content Injection Options

The Fibre TV solution offers two injection options, as illustrated in Figure 5:

- In the "FAN-located" option, the Service Provider installs the RF head-end near to the nbn™ FAN site, for example within a co-location space that the Service Provider acquires from the facilities provider within the exchange that houses an nbn™ FAN, or in a telecommunications hut outside of a building that houses an nbn™ FAN. In this option, nbn provides a connectorised interconnection point either in the co-location space within an exchange, or in a pit outside of the FAN site. In cases where the RF head-end is located in the co-location space within the exchange that houses an nbn™ FAN, it will be the Service Provider’s responsibility to arrange this access with the owner of the exchange.

- In the "FDH-located" option, the Service Provider installs the RF head-end near to the nbn™ FDH, for example in a telecommunications hut on the broadacre estate to be served, on a nature strip adjacent to that estate, or in the communications room of an MDU. In this option, nbn provides a connectorised interconnection point at a location on the estate or in the MDU mutually agreed by nbn and the Service Provider.
2.3. **Fibre TV Operating Models**

The Fibre TV solution requires close collaboration between **nbn**, developers and Service Providers. **nbn’s** operating model is intended to deliver desirable business outcomes for both developers and Service Providers.

### 2.3.1. Transactional Model

The Fibre TV solution will require contractual arrangements to be entered into by **nbn**, the developer and the Service Provider. The transactions can be summarised as follows:

- **nbn** works with a developer to identify a Fibre TV requirement and confirm eligibility;
- **nbn** introduces the developer to all **nbn™** Fibre TV Service Providers (ie those with whom it has a “RF Light Path Agreement”);
- the developer selects a single Service Provider for the distribution of television content in respect of each development, who may or may not be included in the list of **nbn™** Fibre TV Service Providers; and
- **nbn** works with the selected Service Provider and the developer to design and deploy an appropriate network solution in each development.

### 2.3.2. Deployment and Ownership Model

**Optical Combiner & Interconnection point**

Once the developer has selected their preferred Service Provider for a development, **nbn** will work with that Service Provider to define the location of Optical Combiners and the interconnection location for that development. **nbn** will incorporate the Optical Combiners as part of New Development fibre design and deployment practices. **nbn** will also prepare the agreed interconnection point to allow for the Service Provider to inject video signals into the fibre.

**nbn** proposes to own and maintain the Optical Combiners and all network components between the network interfaces. **nbn** plans to provide an interface specification for Service Providers to adhere to.

**Optical Splitter & RF Converter**

At the End User’s premises the combined data and TV signals need to be processed as follows:

1. A passive splitter is used to optically de-multiplex the combined data and TV signal. The data signal is then fed to the NTD; and

2. An RF converter is used to convert the optical TV signal to an electrical TV signal. The RF converter needs a power supply to perform the optical to electrical conversion, and will require a second power outlet in the end-user’s premises.

As shown in **Figure 2**, an integrated optical splitter and RF converter can be used to perform the above tasks. Integrating the splitter and converter has the following benefits:

- **Space saving**: An integrated unit requires less space and is easier to integrate into an already space restricted installation.

- **Ease of deployment**: **nbn** can include installation of the integrated splitter and converter as part of New Development pre-installation process. Therefore in addition to “**nbn ready**”, eligible new developments will also be “Fibre TV ready”. **nbn** can help to facilitate this activity with one visit instead of requiring a separate site visit by a Service Provider for the installation of the RF converter.
• **End User experience**: Once the necessary infrastructure is in place, as End Users move into their premises they know that they have television capability already installed.

*nbn* proposes that *nbn* will both own and maintain the integrated optical splitter and RF converter.

### 2.3.3. Commercial transactions

There are three transactions contemplated in the delivery of the service:

- **Transaction 1: The Service Provider contracts with nbn for an RF Light Path.** This enables Service Providers to qualify as an *nbn* customer for the supply of the RF Light Path product and enables *nbn* to pass on their interest in supplying content to developers.

- **Transaction 2: *nbn* contracts with the developer.** Developer orders a broadband network installation from *nbn* and requests the additional Fibre TV network build option.

- **Transaction 3: The developer contracts with a Service Provider.** The Developer chooses a Service Provider to supply TV signals to the developer's estate utilising the *nbn™* fibre with Fibre TV network option. This transaction enables *nbn* to accept orders from the Service Provider for an RF Light Path product at a particular estate and then operationalise the service.

A summary of each transaction is set out below.

**Transaction 1: Service Provider contracts with *nbn* for RF Light Path**

*nbn* proposes to include the following arrangements in the standard RF Light Path Agreement:

*nbn* will provide a carriage service to the Service Provider in relation to an eligible estate, which will include access to a channel of 1550nm wavelength capacity for Service Providers to transmit television content from the headend to end users over the *nbn™* network, using their own active equipment.

- The Service Provider will be responsible for:
  - sourcing content;
  - all head-end equipment (either at the development, within an *nbn™* FAN, or adjacent to an *nbn™* FAN) up to the NNI-RF; and
  - assurance and maintenance of the head-end.

- The Service Provider will not damage any *nbn™* equipment or inhibit the performance of any *nbn™* service;

- RF Light Path is only intended and suitable for the provision of broadcast content and cannot be used for internet services;

- RF Light Path provides for one-way content transmission only from the head end to end user premises;

- The Service Provider must provide access to its service in response to any reasonable request from a content supplier, subject to technical and capacity limitations;
The Service Provider must provide end user access to free-to-air television services without making that provision subject to the end user entering into a contractual arrangement with any other party, or the purchase of any service (including broadband, telephony or another television content service); and

any signal fed onto the network must comply with nbn's technical specifications for the product (such as wavelengths and power levels).

**Transaction 2: nbn contracts with developer**

nbn provides an additional orderable feature in the standard Developer In-Estate Fibre Agreement, enabling the provision of physical network elements which are required for Fibre TV services.

When the Fibre TV option is selected, nbn will install the Fibre TV network build (optical combiner and in-home splitter/RF Converter) in addition to standard broadband infrastructure to serve a new development.

nbn will also provide the developer with details of all currently participating Fibre TV Service Providers that have RF Light Path agreements with nbn. Service Providers may be able to provide summary information to nbn for it to provide to developers on a non-discriminatory basis to assist them in deciding on a solution partner.

**Transaction 3: Developer contracts with Service Provider**

Before the network build commences, the developer should nominate a Service Provider for the development, and enter into a contractual relationship for the provision of content services. To assist the developer in identifying a Service Provider, nbn will provide the developer with details of all current Service Providers that have signed a RF Light Path Agreement. Developers will be free to choose any Service Provider, including from the Service Providers participating at that time or another Service Provider (who would then need to enter into a RF Light Path Agreement with nbn, subject to eligibility, in accordance with Transaction 1 above). Service Providers may be able to provide summary information to nbn for it to provide to developers to assist them in deciding on a solution provider.

The arrangements between the developer and the Service Provider are expected to include arrangements under which the Service Provider takes responsibility for the provision of television signals to end user premises, and the purchase, siting, installation and maintenance of the head end. This may involve the upfront fixed cost of the head end equipment to be borne by either or both of the Service Provider and the developer.

In addition to the transactions listed above, the Service Provider will need to make arrangements for the physical hosting of head-end equipment at a location of their choosing. nbn does not currently offer hosting services at FAN sites, but will provide information about the location of FAN sites so that Service Providers may enter into their own agreements with site owners.

**Availability of content and relationship to broadband**

nbn proposes to include provisions in the RF Light Path Agreement which require the Service Provider to supply free-to-air TV to end users in line with the below:

**Availability of the 1550nm channel for television content**

The Fibre TV solution will result in an end user at a premises in the development being able to access free-to-air TV channels at the UNI-RF.
The ability to access free-to-air TV will be provided on an "always-on" basis, and cannot be compulsorily bundled with another product: e.g., it will not be permitted for Service Providers to supply a free-to-air television service only if the end user first acquires a broadband or any other service from that or any other Service Provider.

In addition, nbn proposes to include provisions in the RF Light Path Agreement that require the Service Provider to inject at the head-end television content from any content supplier that wishes to provide content to the estate. This could potentially involve multiple subscription television service providers.

The obligation would be subject to the Service Provider reaching reasonable terms with the content suppliers and any technical limitations/constraints.

**In-premises equipment**

nbn’s Fibre TV premises equipment will provide an RF feed to the premises. nbn will install the equipment and activate the UNI-RF at no charge to the end user.

The Service Provider will also be responsible for agreeing with the developer how any in-premises cabling that may be required to connect to the RF jack provided by nbn is installed and managed. This may be within scope of the new development specifications, or alternatively the end user may commission this work separately from a licensed installer.

At some premises, nbn’s premises equipment will not be installed when the end user first moves into that premises. Where this is the case and the end user does not wish to subscribe to a broadband/telephony service, they will need to contact the Service Provider for the estate, who will arrange for the installation of the nbn premises equipment.

**Relationship to broadband**

Given the nature of the Fibre TV construct, nbn does not expect that its broadband customers will wish to become Service Providers for Fibre TV. However, we are happy to engage at any time with any customer who wishes to become a Service Provider, or who wishes to provide suggestions for product improvement.

The RF Light Path Agreement will stand separately from the WBA as it does not relate to a WBA service, even though it is being provided over the same infrastructure.
3. Product Construct and Consultation

3.1. Product elements for RF Light Path product

- **Pricing**

  nbn anticipates a zero price for Service Providers for the RF Light Path product, subject to any assurance charges as set out below.

- **Ongoing Maintenance Model**

  nbn proposes that Service Providers manage all End Users’ interactions, including enquiries and resolutions with respect to Fibre TV.

- **Activations / assurance**

  nbn proposes that the Service Provider is responsible for service assurance of the Head End, while nbn is responsible for maintenance of the combined RF converter-WDM unit, given its proximity to nbn fibre.

  The product does not carry any activation or billing characteristics: the Service Provider is responsible for the activation of the service for the whole development, with nbn merely providing carriage and specified infrastructure elements required to enable the carriage of the signal. Given a zero charge, there is no billing element to the service; however nbn may charge the Service Provider for maintenance and assurance of network elements if:

  - the Service Provider’s initial diagnosis of the fault was incorrect, for instance where a Head End fault was not diagnosed, causing nbn to investigate an in-premises fault; or
  
  - if nbn is required to assure a TV-only fault.

  nbn will arrange for assurance and maintenance of the service where the relevant fault is in the nbn network rather than the Head End provided by the Service Provider.

- **Service levels**

  nbn proposes not to provide service levels for this product, given its characteristics: i.e., the infrastructure is provided during construction of the development; the television service is passive and always-on; and there are no charges for the supply of RF Light Path.

- **Testing / verification of the product before release**

  The Service Provider will be required to pass capability testing defined by nbn as a prerequisite to the supply of RF Light Path.

- **Credit Policy**

  In order to ensure the longevity and sustainability of the Fibre TV service, the Service Provider will need to adhere to a Credit Policy established by nbn for the Fibre TV service, both in order to be accepted as a customer, and during the term of the agreement.
3.2. **Product construct consultation**

**nbn** is interested to receive feedback from potential Service Providers in relation to the product construct and attributes of Fibre TV set out in this paper, including the elements set out in this section, as part of its ongoing development of the product and supply terms.
4. Becoming a Fibre TV Service Provider

nbn is seeking expressions of interest from companies interested in participating as Fibre TV Service Providers.

nbn intends to follow the product construct set out in this paper, subject to any feedback it receives on the consultation request in this paper on the Fibre TV solution.

nbn has not yet selected developments to participate in the program.

nbn is developing commercial terms for an RF Light Path Agreement, to be published as an Standard Form of Access Agreement (SFAA). As a new product, nbn is continuing to develop the product and its terms by testing these in the marketplace. Therefore Service Providers can expect some development of these terms over time as the product matures.

Upon receiving your interest, nbn will work with you to finalise the commercial terms of an RF Light Path Agreement, and will define an onboarding and verification process for Service Providers to follow.

After arrangements are confirmed, nbn will add your name to a list of Service Providers who have signed RF Light Path Agreements that will be provided to selected developers. Developers will choose a Service Provider, including from the participating Service Providers or another Service Provider (who would then need to enter into a RF Light Path Agreement with nbn, subject to eligibility, in accordance with Transaction 1). Service Providers will separately need to enter into agreements with the developers under which the Service Providers will supply services for the benefit of end users.

If you would like to discuss the RF Light Path product, would like to participate as a Service Provider, or if you have comments or suggestions on the Fibre TV product construct, please provide feedback to industryengagement@nbnco.com.au by 10 November 2015. Alternatively, please contact Andrew Mikkelsen at andrewmikkelsen@nbnco.com.au to arrange a time for a discussion.
5. Frequently Asked Questions (FAQs)

Why is nbn offering this service?
This is an opportunity to utilise nbn’s infrastructure to provide a solution for both Service Providers and developers in serving new development estates served by nbn’s FTTP technology.

What is the difference between Fibre TV and RF Light Path?
Fibre TV refers to the overall solution, including the product offered to developers as an optional addition to nbn™ broadband. RF Light Path is a specialised product within the Fibre TV product construct which is offered to Service Providers, and covers the carriage of the content signal from the FAN or FDH to the end users’ premises.

Who is a Service Provider?
nbn will supply to carriage and content service providers, as those terms are defined under Telecommunications Act 1997. This includes organisations intending to offer a content service to the public using nbn’s infrastructure via Fibre TV.

Do these arrangements have any relationship with the WBA?
No, the RF Light Path Agreement will be separate to the WBA, and the provision of Fibre TV via a Service Provider will be managed separately from the provision of nbn™ broadband access to an nbn™ retail service provider.

However, the underlying infrastructure used for Fibre TV and RF Light Path is the same fibre infrastructure used to supply broadband and related products under the WBA. These services will continue to be supplied consistent with the terms of the WBA.

Will nbn be a party to the agreement between the Service Provider and the developer?
No, the developer and the Service Provider are free to come to their own arrangements provided that they each continue to comply with their separate arrangements with nbn in respect of Fibre TV.

What is the price of RF Light Path?
nbn anticipates that nbn’s price for the RF Light Path will be zero.

Can the solution be bundled with Pay TV, or over the top services?
Yes, we are open to applications which bundle other services with FTA TV broadcasts over Fibre TV, provided end users are able to access FTA TV broadcasts without acquiring any other service. It is up to each Service Provider to decide on a commercial application that meets their business needs, as long as the technical requirements regarding the transmission of a 1550nm wavelength signal are met.

Which areas/developments qualify for Fibre TV?
The nature of the Fibre TV solution means that it is only suitable for FTTP technology. Future Fibre TV installations will therefore be focused on:

- A single technology (FTTP);
- New developments only: additional infrastructure installation and required scale economics mean the product is most suitable for greenfield sites;
• Both broadacre and multi-dwelling-unit formats: technical design allows for multiple development formats;
• Developments of sufficient scale: nbn intends to make Fibre TV available in new developments only, where the development has more than 250 lots for MDU premises, and 500 lots for SDU premises.

What restrictions apply to developers’ use of the service?

Developers who choose to install a Fibre-TV-capable nbn network will need to select a Service Provider to feed a signal onto the network which either has already entered into a RF Light Path Agreement with nbn, or will do so.

What restrictions apply to Service Providers’ use of the service?

Service Providers will be subject to certain restrictions including those set out in this paper:
• they must only carry one-way content;
• the signal must conform to the agreed wavelength and power levels;
• they must ensure that if free-to-air television is available in a new development served it is made available to all premises in that development on a stand-alone basis; and
• if requested they must provide carriage for any television content supplier on reasonable terms, subject to technical limitations and capacity constraints.