# **nbn** Special Access Undertaking Variation: Response to ACCC Draft Decision

# Network-Network Interface (NNI)

**May 2023**

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# 1  Introduction

**nbn** welcomes the ACCC's Draft Decision and its views on NNI pricing concerns that have been raised by some RSPs. We have considered ACCC and RSP feedback from the Draft Decision, the ACCC consultation on **nbn**'s November 2022 SAU Variation, **nbn**'s NNI Enhancements consultation of October 2022, and earlier consultations, most notably through the SAU variation process.

This submission provides a brief introduction to NNI and how RSPs connect to the **nbn** network, followed by an explanation of the current NNI pricing structure and levels, including addressing its relationship to costs and efficient use of the **nbn** infrastructure. The paper covers the concerns raised by some RSPs and covered by the ACCC in its Draft Decision and evaluates an alternative pricing structure proposed by Launtel as a result of its analysis, as included in Launtel's public submission to the ACCC's SAU Variation consultation in February 2023. The price changes that **nbn** committed to as part of the NNI Enhancements consultation, in response to industry feedback, are restated for completeness, as **nbn**'s proposed further changes build on these.

These proposed further changes to NNI pricing focus on 10G NNI, and include reducing the activation charge by 40% and reducing the recurring charge by 50% for those RSPs with a single 10G NNI at a POI, whether used in single or diverse paths. This allows growth RSPs to upgrade 1G ports to 10G, and to establish new 10G NNIs to support higher speed services at unit (per Gbps) charges that are lower than 100G NNIs.

**nbn** expects that the cumulative changes to NNI pricing will work to flatten the price curve and promote RSP expansion within existing and to new POIs while retaining incentives for efficient use of NNI. This should further promote competition between RSPs and encourage efficient use of **nbn**'s network.

# 2 Network-Network Interface and other equipment at a POI

A Network-Network Interface (**NNI**) is the interface at an **nbn** Point of Interconnection (**POI**) where RSP traffic is handed over to the **nbn**® network. The NNI provides RSPs an aggregation point for their services supplied on any of the various access technologies that **nbn** has deployed in the network. NNIs are available in three interface rates – 1Gbps, 10Gbps, and 100Gbps. Each NNI can be configured as a single chassis NNI or diverse chassis NNI to provide redundancy and is available in two physical interface types to cater for different optical fibre reach.

Apart from purchasing NNI, an RSP must also connect other physical assets including backhaul and a network gateway to interface with the RSP's systems. All of these assets must be matched in capacity, so that, for example, a 10G NNI must be matched to 10G of backhaul and a 10G gateway. As well as directly connecting to a POI through NNI, backhaul, etc, an RSP has the option to use an NNI Link / V-NNI (Virtual NNI) which enables RSPs to acquire CVCs, AVCs and Enterprise Ethernet directly from **nbn** without a physical presence by connecting to a virtual NNI via a wholesaling RSP.

As a physical asset, the supply of NNIs by **nbn** to RSPs has certain constraints such as the number of ports (NNI card slots) that are available in each chassis, the configuration of those ports to support 1G, 10G, or 100G, and the physical housing of the equipment and associated running costs. Balancing these constraints with commercial considerations of demand for various configurations, growth in traffic over time, and differing levels of utilisation leads to the provisioning by RSPs of a certain configuration of NNI. The cost of this configuration and the expected 10-year asset life-cycle requires wholesale price settings that result in returns sufficient to pay for a platform refresh at the end of the asset life.

# 3  NNI pricing

## 3.1  Current NNI pricing

**nbn**'s NNI pricing structure and levels were established at the time the 121 POIs were commissioned, and the nominal prices have remained flat since, resulting in real price reductions. **nbn** is currently undertaking a multi-year program of POI upgrades which includes replacement of NNI assets to provide greater capacity and support future network traffic volumes.

The current pricing of NNI reflects the costs for **nbn** in supplying the assets and the scaling of those costs. The physical components of NNI are scaled in multiples of ten, however **nbn**'s current pricing flattens this scaling by applying a four-times price multiple from 1G to 10G and a six-times multiple from 10G to 100G for recurring charges.

Tables 1 and 2, below, set out the current monthly recurring and one-off activation charges in respect of NNI.

**Table 1  NNI Monthly Recurring Charges**

| NNI Product Feature | Monthly Recurring Charge | | |
|---|---|---|---|
| | **FY24** | **FY25** | **FY26** |
| 1000BaseLX - per NNI Bearer | $100 | $100 | $100 |
| 10GBaseLR - per NNI Bearer | $400 | $400 | $400 |
| 100GBaseLR4 - per NNI Bearer | $2,400 | $2,400 | $2,400 |
| 1000BaseEX - per NNI Bearer | $125 | $125 | $125 |
| 10GBaseER - per NNI Bearer | $500 | $500 | $500 |
| 100GBaseER4 - per NNI Bearer | $3,000 | $3,000 | $3,000 |
| V-NNI - per V-NNI^ | $65 | $65 | $65 |
| NNI Link Recurring - per NNI Link | $0 | $0 | $0 |

^ *V-NNI and NNI Link are not available in respect of the NBN Co Satellite Network.*

**Table 2  NNI Activation Charges**

| Activity | Charge per activity |
|---|---|
| | **FY24-26** |
| NNI 1000BaseLX Set-up & Activation | $1,000 |
| NNI 10GBaseLR Set-up & Activation | $5,000 |
| NNI 100GBaseLR4 Set-up & Activation | $30,000 |
| NNI 1000BaseEX Set-up & Activation | $2,000 |
| NNI 10GBaseER Set-up & Activation | $6,000 |
| NNI 100GBaseER4 Set-up & Activation | $36,000 |
| NNI Link Activation | $0 |
| V-NNI Activation | $250 |

The structure of the current pricing provides incentives for RSPs to upgrade at given capacities which leads to efficient use of the limited port capacity. Both the activation charges and the monthly recurring charges follow a gradual progression, allowing RSPs to manage their incremental costs. This upgrade pathway, as shown table 3 below, is also complemented by V-NNI which provides a lower cost starting point for smaller RSPs. At the same time, having activation charges limits 'over-optimisation', that is, continual upgrading and downgrading of capacity, which directly drives incremental operational cost for **nbn** in truck rolls, technicians and stranded assets, and would also need to be covered by the pricing.

**Table 3   NNI upgrade pathway**

| From | To | Net Activation | Total Monthly |
|------|------|----------------|---------------|
| -    | 1G   | $1k            | $100          |
| 1G   | 2G   | $1k            | $200          |
| 2G   | 3G   | $1k            | $300          |
|      |      |                |               |
| -    | 10G  | $5k            | $400          |
| 1G   | 10G  | $4k*           | $400          |
| 2G   | 10G  | $3k*           | $400          |

*These costs factor in the activation cost rebates that resulted from the NNI Enhancements consultation.[1]*

# 3.2  Concerns raised with NNI Pricing

Some growth RSPs have asked **nbn** to investigate options for reducing activation and recurring charges of NNI infrastructure, particularly across multiple POIs.

In the initial ACCC industry roundtable on **nbn** regulation on 18 June 2021, one RSP made a presentation that focused on the costs an RSP faces to directly connect 10G NNIs at all 121 POIs. In its February 2023 submission to the ACCC consultation on **nbn**'s November 2022 SAU Variation, Launtel provided an analysis of the recurring charges at a per service level faced by an RSP with sub-scale take up compared with an RSP at scale take up and concluded that a scale RSP has a significant per service cost advantage over a sub-scale competitor. Launtel's proposed solution was that **nbn** abolish NNI activation charges and instead adopt a flat price per service charging model for NNI recurring charges.

In the Draft Decision, the ACCC notes the following with respect to NNI pricing:[2]

> *"We are concerned that this issue (economies of scale embedded in the NNI price structure) has ongoing potential to impede competition by raising barriers to entry and expansion by smaller operators that could otherwise assist in keeping retail prices and demand at more efficient levels as wholesale charges increase."*

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[1] **nbn** industry consultation, NNI Enhancements RMID 1118, February 2023. See section 4.1  for further discussion of this change.

[2] ACCC Draft Decision, p. 43

In addition, some RSPs have expressed concerns that 1G NNIs cannot adequately support services such as Home Ultrafast, which can operate at wholesale speeds from 500Mbps to close to 1Gbps, in conjunction with other services on the same NNI. Any RSP that holds those concerns and has a desire to sell Home Ultrafast services may choose to purchase 10G NNIs, which substantially increases their initial set-up costs and means it takes longer for the RSP to reach average levels of capacity utilisation while incurring a higher monthly recurring cost, as set out in table 1 in the previous section.

# 3.3 Alternative pricing construct – RSP proposal

Launtel's proposed solution to the disparity between sub-scale and scale RSPs' per-service costs was for **nbn** to charge for NNI on a per-service basis. This would flatten the price curve and remove the scaling effect from differences in NNI capacity utilisation.

Launtel's analysis concludes that a scale RSP pays $0.24 per service compared to $4.00 per service for a sub-scale RSP,[3] with the calculations summarised in table 4, below.

**Table 4  Re-creation of scale issue calculations[3]**

|  | Sub-scale | Scale |
|---|---|---|
| **Services at a POI** | 200 | 20,000 |
| **NNI bearer provisioned (dual chassis)** | 2 x 10G | 2 x 100G |
| **NNI recurring charges (per month)** | $800 | $4,800 |
| **Cost per service** | $4 | $0.24 |

This analysis assumes that:

- 1G NNIs have limited capacity to support higher speed services and any substantial number of such services should be connected to 10G NNIs or larger.
- Sub-scale RSPs would purchase 2 x 10G NNI bearers in a diverse chassis configuration for a limited number of services, effectively allocating 50Mbps of capacity for each service.
- That there is an equal distribution of services across all 121 POIs.

At the industry level, **nbn** observes that:

- Rather than there being a widespread and equal deployment of 100G NNI bearers across the network, only 3 RSPs currently acquire such bearers, with only 208 100G NNI bearers in total deployed across the 121 POIs.
- On average, RSPs currently allocate 2.5Mbps of NNI capacity per service.
- NNI utilisation is about 30% on average, with larger RSPs at about 35% weighted by total NNI capacity and small RSPs averaging about 14% on the same weighted basis. The analysis above implies 50% utilisation for scale RSPs and 5% utilisation for sub-scale RSPs by comparison.
- There is significant variance between RSPs, and even between POIs for the same RSP, with regards to NNI configuration and utilisation.

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[3] Launtel submission to ACCC consultation, 19 February 2023, p.3

- There are currently 21 RSPs connected to all 121 POIs, of which half use a mix of direct connection and V-NNIs.
- The number of addressable premises at a POI varies significantly across the 121 POIs.

Given that NNI pricing is set at a cost recovery level and structured to provide price signals to drive efficient allocation of the physical assets, implementing a new pricing structure would need to be revenue neutral for **nbn**. This also reflects that **nbn** is currently under-recovering costs in respect of Core Regulated Services and any additional shortfall would widen that gap.

Applying a per-service price to NNI on a revenue-neutral basis would create a situation whereby RSPs would be worse-off at POIs where they have high levels of utilisation efficiency and they would benefit at POIs where utilisation is below industry average. These instances are not clearly delineated by the size of an RSP's customer base either in total or at a POI level.

Further, per-service NNI pricing would be a fundamentally different construct for RSPs to implement and adapt to, likely requiring changes to existing systems and processes. In addition to RSPs' costs, moving to this type of pricing construct has the potential to drive significant one-off costs for **nbn** where RSPs choose to make significant changes to their current NNIs. It also removes the current price signals which more closely reflect the costs of providing NNI, and may result in RSPs over-provisioning NNI, driving up opex costs, most notably those associated with rack space and power.

Alternatively, if **nbn** were to take full responsibility of NNI provisioning this would likely remove or substantially curtail RSPs' ability to choose their network configuration and their control of when, or whether to, upgrade their NNI and associated equipment at the POI, which must be matched in capacity.

# 4 nbn response to the concerns

## 4.1 Changes proposed to date

To date, **nbn** has sought to address feedback in respect of NNI pricing via **nbn**'s existing product and pricing development processes. In particular, in October 2022 **nbn** commenced the NNI Enhancements consultation, seeking feedback on proposed first steps to address the concerns that had been raised on NNI pricing. Together with the consultation closure paper released in February 2023, **nbn** announced two key pricing changes:

- Reducing the monthly recurring charges (**MRCs**) for 1G NNI (1000BaseLX and 1000BaseEX) and V-NNI by 50%, effective 1 November 2022, implemented as price changes and reflected in updated Prices in the November SAU Variation; and,
- Introducing 100% rebates of activation charges for 'returned' NNI ports where these rebates offset the activation charges for upgraded NNI ports, effective March 2024.

In relation to the analysis provided by Launtel, the reduced monthly recurring charges would halve the final per-service cost where an RSP chooses to use 1G NNI. Where an RSP has a presence in a POI using one or more 1G NNIs and intends to upgrade to 10G, the rebate of already incurred Activation charges provides a material reduction to the RSP's cost. In combination, these changes work to flatten the price curve for sub-scale RSPs, who have the largest proportion of 1G NNIs and V-NNIs, and reduce barriers to expanding within, or to new, POIs.

## 4.2 Further changes proposed by nbn

**nbn** has listened to further RSP and ACCC feedback with respect to NNI pricing, and is proposing to commit, as part of a revised SAU variation, to the following further pricing changes, effective no later than 1 July 2024:

- Reduce the activation charges on 10G NNI to $3,000 (from $5,000)
- Reduce the activation charges on 100G NNI to $20,000 (from $30,000)
- Reduce the 10G NNI bearer recurring charges by 50% to $200 per month where an RSP has a single 10G NNI group at a POI used either in single or diverse chassis configuration. This price reduction will cease to apply when the RSP adds additional 10G NNIs (bearers or Groups) or 100G NNIs at the same POI.

Proposing this price commitment now enables **nbn** to include these changes in the revised SAU variation **nbn** intends to lodge in June 2023 and provide RSPs with greater certainty in their network planning and growth planning. While RSPs may prefer for these price changes to take effect immediately, **nbn** is upgrading NNI equipment and capacity across the network to address potential constraints and expand the availability of 10G and 100G NNI ports to meet the additional demand for these services that is expected as a result of these changes.

The proposed price changes reduce the activation charges by 40% and, in conjunction with the announced NNI Upsize rebates, to as little as $0 where 3 x 1G NNI bearers are upgraded to a 10G NNI, supporting expansion into new POIs and upgrades of existing capacity within POIs. With the changes to the monthly recurring charges, a single 10G NNI bearer will cost an RSP the same as 2 x 1G NNI bearers for five-times the capacity. In combination, these changes provide greater planning freedom for an RSP to move to 10G NNIs sooner and then grow their business with less concern for capacity constraints. These changes, in conjunction with the move to utilisation-based billing, AVC-only plans, and NNI overbooking as proposed in the November SAU Variation, will work to simplify RSP operations and help to support the global trend towards higher speed services.

# 5 Conclusion

**nbn** considers that the combination of price changes from the NNI Enhancements consultation and those proposed in this submission directly and substantially address the concerns raised by RSPs and outlined by the ACCC in its Draft Decision.

As stated previously, **nbn** is in the midst of a multi-year upgrade program for POIs which will expand the available NNI capacity in line with demand. While **nbn** expects that the proposed price changes will drive positive outcomes for the industry, **nbn** will continue to review the pricing of network elements as the market and technology evolves.