

# RNP – Rede Nacional de Ensino e Pesquisa

## PORTUGUÊS

### *Processo de Aquisição*

## **Roteadores para Funções de Core, Peering, Agregação, Acesso, Metro, Datacenter e CPE.**

A RNP (Rede Nacional de Ensino e Pesquisa) é uma organização social privada e sem fins lucrativos vinculada ao Ministério da Ciência, Tecnologia e Inovação (MCTI). É responsável por operar e desenvolver a infraestrutura de rede acadêmica nacional avançada do Brasil, conhecida como Rede Ipê, conectando mais de 800 universidades, institutos de pesquisa e outras organizações educacionais em todo o país. A missão da RNP é promover o uso inovador da tecnologia da informação e comunicação (TIC) para apoiar a educação, a pesquisa e a inovação no Brasil. Ela atua como um facilitador chave para a colaboração científica e a troca de dados, tanto nacional quanto internacionalmente.

A infraestrutura principal da RNP, a Rede Ipê, é uma rede de alto desempenho análoga a uma infovia digital, fornecendo conectividade de Internet segura e confiável e permitindo a transmissão de grandes volumes de dados para fins de pesquisa e educação. É a espinha dorsal para a colaboração acadêmica nacional e internacional.

Reconhecendo as crescentes necessidades de "big science" e da pesquisa intensiva em dados, a RNP está desenvolvendo a Rede de e-Ciência, uma infraestrutura dedicada projetada especificamente para centros de pesquisa com requisitos avançados para processamento, análise, transmissão e armazenamento de conjuntos de dados massivos. Diferentemente da Rede Ipê, que é mais ampla, a Rede e-Ciência oferece políticas e serviços especializados e adaptados aos fluxos de dados científicos, atendendo principalmente Instituições de Ciência e Tecnologia (ICTs) que operam centros de supercomputação, laboratórios multiusuários e outras instalações de pesquisa. Ela oferece velocidades de pelo menos 100 Gb/s e atua como um canal de alta velocidade entre as instituições.

O Programa Conecta, uma iniciativa chave dentro do novo Programa de Aceleração do Crescimento (PAC) do governo brasileiro e liderado pelo MCTI, expande e aprimora significativamente as capacidades da RNP. Os objetivos do programa incluem:

- Expansão e modernização da Rede Ipê: Aumentando sua capacidade, estendendo seu alcance ao interior do país (interiorização), aprimorando sua segurança e garantindo sua escalabilidade. Isso envolve a implementação de 32 enlaces nacionais, 19 infovias estaduais e 79 novas redes metropolitanas, frequentemente por meio de parcerias com empresas de transmissão de energia e provedores de internet.
- Desenvolvimento da Rede e-Ciência: Construindo esta rede especializada segura e de alto desempenho para pesquisa intensiva em dados.
- Estabelecimento de Centros Nacionais de Dados (CNDs): Criando uma rede de data centers seguros e escaláveis por meio de parcerias com provedores privados para hospedar, processar e gerenciar com segurança grandes volumes de dados científicos e tecnológicos. Esses CNDs serão conectados diretamente à Rede Ipê e à Rede e-Ciência.

Deve ser enfatizado que a RNP apoia a experimentação com tráfego e protocolos de rede, mas não é fundamentalmente uma rede experimental. Para apoiar essas diversas capacidades e projetos, a RNP requer uma rede multifuncional com hardware e software (sistema operacional) confiáveis e estáveis.

## Requisitos para participação nesta RFP

**O fornecedor e seu parceiro devem atender aos requisitos abaixo para estarem aptos a participar desta RFP. O não cumprimento de um ou mais itens acarretará a impossibilidade de participação no processo.**

- Os fornecedores de equipamentos (cujos produtos serão avaliados como sistemas integrados de hardware e software) devem participar de testes multivendor, conduzidos por organizações neutras, como a EANTC e seu prestigiado relatório de interoperabilidade entre diferentes fabricantes (Multi-Vendor MPLS SDN Interoperability Test), que na edição de 2024 contou com 14 diferentes fabricantes nas temáticas: MPLS, Segment Routing, SDN e sincronismo de tempo.
- Os fornecedores são obrigados a comprovar sua capacidade de implantar e suportar uma rede crítica de alto desempenho.
- O fornecedor deve apresentar casos de uso de provedores de serviços de Internet Tier 1 e Tier 2, empresas de *hyperscale*, RENS (Redes de Ensino e Pesquisa) de prestígio e outros, demonstrando implantações nas mesmas camadas ou funções de rede propostas para esta RFP.
- O parceiro do fornecedor deve prover evidências de sua capacidade e experiência na implementação da solução proposta.
- O proponente, se não for o próprio vendedor, deve fornecer evidências à RNP de que é qualificado pelo vendedor para este projeto.
- Os fornecedores devem prover evidências de implantação para o equipamento proposto ou uma série/família de produtos comparáveis, com chipset e software idênticos, em um ambiente de rede similar ao da RNP.
- O fornecedor, tanto para hardware quanto para software, deve participar ativamente de organizações de padronização como OIF, IETF e IEEE. O fornecedor deve prover evidências de seu envolvimento e contribuições propostas, incluindo autoria ou co-autoria.
- É desejável (não obrigatório) que o fornecedor esteja listado em algum relatório de análise conduzido por organização neutra, como o Gartner Magic Quadrant.
- É desejável (não obrigatório) que a empresa (apenas o fabricante) seja listada publicamente no mercado de ações (bolsa de valores).
- O proponente, se não for o próprio vendedor, deve fornecer à RNP evidências de sua parceria autorizada com o vendedor no Brasil.
- O proponente, se não for o próprio vendedor, deve provar ser seu representante oficial no Brasil.
- O fornecedor deve ter um laboratório capaz de simular topologias personalizadas para validar e garantir a precisão de todas as informações técnicas fornecidas, incluindo a interoperabilidade de produtos de vários fabricantes. A RNP definirá o caderno de testes e as validações a serem conduzidas.

## Apresentação da proposta comercial e respostas técnicas

O proponente deve cumprir todos os requisitos a seguir. O não cumprimento de qualquer um desses critérios resultará na desqualificação automática do interessado no processo.

Os arquivos modelos XLS ou DOC fornecidos pela RNP não devem ter seus nomes alterados nem sua formatação modificada.

O proponente deve preencher todas as informações solicitadas nos campos disponíveis. Caso o proponente considere que alguma modificação seja necessária para permitir o preenchimento adequado das informações, deve consultar previamente a RNP apresentando a justificativa para a solicitação. Se a RNP considerar a necessidade como relevante, novos modelos serão disponibilizados a todos os proponentes.

- **Todas as respostas técnicas e propostas comerciais devem ser preenchidas e entregues nos modelos de documentos fornecidos pela RNP.**
- **Requisitos marcados como opcionais, mas suportados pelo fornecedor, serão uma vantagem competitiva em favor do proponente.**
- As propostas devem ser submetidas em formato XLS, obedecendo os modelos fornecidos pela RNP.
- No documento XLS da proposta comercial, é adotado o padrão Americano para numeração (vírgula para milhar e ponto para decimal) e data (ano-mês-dia).
- Os arquivos devem ser devolvidos preenchidos pelo proponente sem nenhum tipo de proteção, macros ou scripts.
- Nenhuma formatação ou alteração de células devem ser realizadas nos documentos, tais como cores, fontes, tabelas, alinhamentos e outros.
- O nome do arquivo ("RNP - RFP...") não deve ser modificado.

**Não serão aceitos documentos que apresentem alterações ou que não sigam a formatação do modelo original fornecido pela RNP.**

## Sobre os requisitos e condições desta RFP

Ao participar desta RFP, o proponente aceita integralmente todos os requisitos e condições do processo. Os termos estabelecidos neste documento serão incorporados ao contrato a ser firmado com os vencedores, cabendo ao proponente seu integral cumprimento.

## Roteadores e switches abrangidos nesta RFP

Esta RFP abrange os tipos de equipamentos listados abaixo.

- Por favor, consulte a Topologia de Rede de Referência em anexo, que fornece uma representação detalhada da implantação dos tipos de roteadores e switches solicitados dentro da arquitetura de rede da RNP, conforme descrito nesta RFP.
- Para os casos em que portas 10G/25G são solicitadas: o equipamento deve ter obrigatoriamente portas 10G, mas a porta 25G é opcional.

### Roteadores CORE

- Tipo 1: 12 x 100G e 12 x 400G/800G\* – **54 unidades**
- Tipo 2: 12 x 100G e 6 x 400G/800G\* – **40 unidades**

**\*Apenas para portas de 800G, será aceitável fornecer a capacidade da porta sem suporte de line-rate (considerando a capacidade total licenciada ou suportada pelo chipset) se o roteador suportar algum tipo de recurso de oversubscription inteligente que forneça tratamento adequado de pacotes, como priorização, buffering, etc. A principal razão atual para o requisito de 800G no CORE são as portas QSFP-DD800 com SerDes de 112G que permitirão o uso da última geração de módulos coerentes.**

**Responsabilidade:** Conecta diretamente o backbone da rede. Responsável pelo trânsito de alta velocidade e baixa latência de todo o tráfego entre diferentes partes da rede e, potencialmente, para redes externas. Fornece a infraestrutura de encaminhamento principal.

### Roteadores PEERING

- Tipo 1: 8 x 10G e 12 x 100G – **12 unidades**
- Tipo 2: 8 x 10G e 8 x 100G – **8 unidades**

**Responsabilidade:** Conectar a rede de Ensino e Pesquisa a redes externas (outras redes de ensino e pesquisa, ISPs comerciais, provedores de conteúdo). Responsável por impor políticas de segurança na fronteira da rede e trocar informações de roteamento.

### Roteadores AGGREGATION (Multisserviço)

- Tipo 1: 16 x 100G com 4 x 400G – **56 unidades**
- Tipo 2: 8 x 10G/25G e 6 x 100G – **20 unidades**

**Responsabilidade:** Agregar tráfego de várias redes de acesso e fornecer serviços VPN L2/L3. Atua como uma ponte entre a camada de acesso e o core. Responsável por estabelecer sessões de trânsito BGP com os clientes. Onde ocorre a junção (stitching) de protocolos.

## Roteadores UNIVERSAL (PE/Acesso)

- Tipo 1: 48 x 10G/25G e 6 x 100G – **80 unidades**
- Tipo 2: 24 x 10G/25G e 4 x 100G – **30 unidades**

**Responsabilidade:** Conectar sites de clientes (universidades, laboratórios de pesquisa) à rede. Fornece serviços VPN L2/L3 para esses clientes. O principal ponto de demarcação de serviço.

## Roteadores METRO

- Tipo 1: 8 x 10G/25G, 8 x 100G/400G - **50 unidades**
- Tipo 2: 12 x 10G/25G e 4 x 100G – **200 unidades**
- Tipo 3: 12 x 10G/25G - **200 unidades**
- Tipo 4: 6 x 10G/25G - **250 unidades**

**Responsabilidade:** Interconexão de alta velocidade e de sites de Agregação Metro dentro de uma área metropolitana ou região. Forma uma espinha dorsal regional. Agregação de tráfego e transporte entre a rede regional e a espinha dorsal nacional.

## DATACENTER

### Switch Spine

- Tipo 1: 12 x 100G e 8 x 400G – **6 unidades**
- Tipo 2: 12 x 100G e 2 x 400G – **6 unidades**

**Responsabilidade:** Atuar como o núcleo de uma arquitetura spine-leaf com interconexão de alta velocidade, facilitando o fluxo de tráfego leste-oeste eficiente e suportando uma malha VXLAN/EVPN, fornecendo a conectividade subjacente entre todos os switches leaf.

### Switch Leaf

- Tipo 3: 48 x 10/25G e 4 x 100G – **20 unidades**

**Responsabilidade:** Fornece alta densidade para conectividade de servidores e a borda da rede externa dentro de data centers. Frequentemente parte de uma malha VXLAN/EVPN.

## CPE

- Tipo 1: 8 x 10G (fibra); 8 x 1G (cobre) - **50 unidades**
- Tipo 2: 4 x 10G (fibra); 8 x 1G (cobre) - **200 unidades**

**Responsabilidade:** Conectar a rede interna do cliente à rede do provedor de serviços (através do Roteador de Acesso Universal).

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***A partir deste ponto, todo o texto seguirá em Inglês, repetindo o que está escrito acima em Português e dando sequência ao documento da RFP. Vale ressaltar que todos os questionamentos e respostas no processo deverão ser realizados na língua inglesa devido a ampla participação de empresas internacionais.***

*From now on, all text will be in English, following the information previously given in Portuguese and continuing the RFP document. Due to the extensive participation of international companies, all questions and answers in this process must be in English.*

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## **ENGLISH**

### **RFP – Request for Proposal**

## **Request for Proposal (RFP) – Routers for Core, Peering, Aggregation, Access, Metro, Datacenter and CPE roles.**

RNP (Rede Nacional de Ensino e Pesquisa), the Brazilian National Education and Research Network, is a private and non-profit social organization under the Ministry of Science, Technology, and Innovation (MCTI). It operates and develops Brazil's advanced national academic network infrastructure, known as the Ipê network, connecting over 800 universities, research institutes, and other educational organizations across the country. RNP's mission is to promote innovative use of information and communication technology (ICT) to support education, research, and innovation in Brazil. It acts as a key facilitator for scientific collaboration and data exchange, both nationally and internationally.

RNP's core infrastructure, the Ipê network, is a high-performance network analogous to a digital "highway," providing secure and reliable internet connectivity and enabling the transmission of large volumes of data for research and educational purposes. It is the backbone for national and international academic collaboration.

Recognizing the growing needs of "big science" and data-intensive research, RNP is developing the Rede e-Ciência, a dedicated infrastructure designed specifically for research centers with advanced requirements for processing, analyzing, transmitting, and storing massive datasets. Unlike the broader Ipê network, the Rede de e-Ciência offers specialized policies and services tailored to scientific data flows, primarily serving Science and Technology Institutions (ICTs) that operate supercomputing centers, multi-user laboratories, and other research facilities. It offers speeds of at least 100 Gb/s and acts as a high-speed "tunnel" between institutions.

The Programa Conecta, a key initiative within the Brazilian government's new Growth Acceleration Program (PAC) and spearheaded by MCTI, significantly expands and enhances RNP's capabilities. The program's goals include:

- Expanding and upgrading the Ipê network: Increasing its capacity, extending its reach into the interior of the country (interiorization), enhancing its security, and ensuring its scalability. This involves implementing 19 state-level "infovias" (information highways) and 79 new metropolitan networks, often through partnerships with energy transmission companies and internet providers.
- Developing the Rede e-Ciência: Building out this specialized high-performance network for data-intensive research.
- Establishing National Data Centers (CNDs): Creating a network of secure and scalable data centers through partnerships with private providers to host, process, and securely manage large volumes of scientific and technological data. These CNDs will be directly connected to both the Ipê network and Rede de e-Ciência.

It should be emphasized that while RNP supports experimentation with network traffic and protocols, it is not fundamentally an experimental network. To support these diverse capabilities and projects, RNP requires a multi-purpose network with reliable hardware and software (operating system).

## Requirements to participate in this RFP

**The vendor and its partner must meet the requirements below to be eligible to participate in this RFP. Non-compliance with one or more items will result in the inability to participate in the process.**

- Equipment vendors (whose products will be evaluated as integrated hardware and software systems) must participate in multi-vendor testing conducted by neutral organizations, such as EANTC and its prestigious Multi-Vendor MPLS SDN Interoperability Test report, which in the 2024 edition featured 14 different manufacturers in the areas of: MPLS, Segment Routing, SDN.
- Vendors are required to demonstrate their capability to deploy and support a high-performance critical network.
- The vendor must present use cases from Tier 1 and Tier 2 Internet service providers, hyperscale companies, prestigious RENs (Research and Education Networks), and others, demonstrating deployments in the same network layers or functions proposed for this RFP.
- The vendor's partner must provide evidence of their capability and experience in implementing the proposed solution.
- The proponent, if not the vendor itself, must provide evidence to RNP that they are qualified by the vendor for this project.
- Vendors must provide deployment evidence for the proposed equipment or a comparable product series/family, with identical chipset and software, in a network environment similar to RNP's.
- The vendor, for both hardware and software, must actively participate in standardization organizations such as OIF, IETF, and IEEE. The vendor must provide evidence of their involvement and proposed contributions, including authorship or co-authorship.
- It is desirable (not mandatory) that the vendor be listed in some analysis report conducted by a neutral organization, such as the Gartner Magic Quadrant.
- It is desirable (not mandatory) that the company (manufacturer only) be publicly listed on the stock market.
- The proponent, if not the vendor itself, must provide RNP with evidence of their authorized partnership with the vendor in Brazil.
- The proponent, if not the vendor itself, must prove to be their official representative in Brazil.
- The vendor must have a laboratory capable of simulating custom topologies to validate and ensure the accuracy of all technical information provided, including interoperability of products from various manufacturers. RNP will define the test procedures and validations to be conducted.



## Commercial proposal and technical requirements

Participants must fulfill the following requirements. Non-compliance with any of these criteria will lead to immediate disqualification of the interested party.

The XLS or DOC template files provided by RNP must retain their original names and formatting.

The proponent must fill in all requested information in the available fields. Should the proponent determine that modifications are required for proper information completion, they must obtain prior approval from RNP with appropriate justification. If RNP considers the request valid, revised templates will be distributed to all proponents.

- All technical responses and commercial proposals must be completed and delivered using the document templates provided by RNP.
- Requirements marked as optional but supported by the vendor will be a competitive advantage in favor of the proponent.
- In the commercial proposal XLS document, American standard is adopted for numbering and date.
- Proposals must be submitted in XLS format, following the templates provided by RNP.
- Files must be returned filled out by the proponent without any type of protection, macros, or scripts.
- No formatting or cell modifications must be made to the documents, such as colors, fonts, tables, alignments, and others.
- The file name ("RNP - RFP...") must not be modified.

Modified documents or documents that do not follow the formatting of the original template provided by RNP will not be accepted.

## Requirements and conditions of this RFP

By participating in this RFP, the proponent fully accepts all requirements and conditions of the process. The terms established in this document will be incorporated into the contract to be signed with the selected proponents, with the proponent responsible for their full compliance.

## Routers and switches covered in this RFP

This RFP covers the types of equipment listed below.

- Please refer to the attached Reference Network Topology, which provides a detailed representation of the deployment of the requested router and switch types within RNP's network architecture, as described in this RFP.
- For cases where 10G/25G ports are requested: the equipment must have 10G ports as mandatory, but the 25G port is optional.

### CORE Routers

- Type 1: 12 x 100G e 12 x 400G/800G\* – **54 units**
- Type 2: 12 x 100G e 6 x 400G/800G\* – **40 units**

**\*For 800G ports only, it will be acceptable to provide the port capacity with no line-rate support (considering the total capacity licensed or supported by the chipset) if the router supports some kind of intelligent oversubscription feature that provides adequate treatment of packets such as prioritization, buffering, etc. The current main reason for the 800G requirement in the CORE is the QSFP-DD800 ports with 112G SerDes that will enable the use of the latest generation of coherent transceivers.**

**Role Description:** The backbone of the network. Responsible for high-speed, low-latency transit of all traffic between different parts of the network and, potentially, external networks. Provides the core forwarding infrastructure.

### PEERING Routers

- Type 1: 8 x 10G e 12 x 100G – **12 units**
- Type 2: 8 x 10G e 8 x 100G – **8 units**

**Role Description:** Connect the R&E network to external networks (other R&E networks, commercial ISPs, content providers). Responsible for enforcing security policies at the network boundary and exchanging routing information.

### AGGREGATION Routers (Multi-Service)

- Type 1: 16 x 100G com 4 x 400G – **56 units**
- Type 2: 8 x 10G/25G e 6 x 100G – **20 units**

**Role Description:** Aggregate traffic from multiple access networks and provide L2/L3 VPN services. Acts as a bridge between the access layer and the core. Responsible for establishing BGP transit sessions with customers. Where protocol stitching takes place.

## UNIVERSAL Routers (PE/Access)

- Type 1: 48 x 10G/25G e 6 x 100G – **80 units**
- Type 2: 24 x 10G/25G e 4 x 100G – **30 units**

**Role Description:** Connect customer sites (universities, research labs) to the network. Provide L2/L3 VPN services to customers. The primary point of service demarcation.

## METRO Routers

- Type 1: 8 x 10G/25G, 8 x 100G/400G - **50 units**
- Type 2: 12 x 10G/25G e 4 x 100G – **200 units**
- Type 3: 12 x 10G/25G - **200 units**
- Type 4: 6 x 10G/25G - **250 units**

**Role Description:** High-speed interconnection of Metro Aggregation sites within a metropolitan area or region. Forms a regional backbone. Traffic aggregation and transport between the regional network and the national backbone.

## DATACENTER

### Spine switch

- Type 1: 12 x 100G e 8 x 400G – **6 units**
- Type 2: 12 x 100G e 2 x 400G – **6 units**

**Role Description:** Act as the core of a spine-leaf architecture with high-speed interconnection facilitating efficient east-west traffic flow and supporting a VXLAN/EVPN fabric by providing the underlay connectivity between all leaf switches.

### Leaf switch

- Type 3: 48 x 10/25G e 4 x 100G – **20 units**

**Role Description:** Provide high-density server and border (external) network connectivity within data centers. Often part of a VXLAN/EVPN fabric.

## CPE

- Type 1: 8 x 10G (optical); 8 x 1G (copper) - **50 units**
- Type 2: 4 x 10G (optical); 8 x 1G (copper) - **200 units**

**Role Description:** Connect the customer's internal network to the service provider's network (via the Universal Access Router).

## **SRv6 – SEGMENT ROUTING V6**

The SRv6 protocol, even if not currently supported by the vendor, must be made available to RNP at no additional cost should it become available in future software releases, since equipment has an active support contract. This includes all protocol extensions and functionalities without any restrictions throughout the equipment's operational lifetime.

The hardware must support SRv6 evolution without limitations, that is, for future SRv6 deployment, hardware replacement will not be accepted, and its architecture must allow the implementation of SRv6-related functionalities and extensions listed in this RFP.

Once the vendor indicated that it meets the SRv6 requirement, even though this item is marked as optional in the RFP, the functionality must be made available to the RNP.

## **LICENSE MODEL**

- All features/protocols/characteristics indicated as **mandatory (required)** must be provided at no additional cost.
- Features/protocols/characteristics indicated as **optional**, but supported by the vendor, must also be provided at no additional cost. If the vendor indicates that it provides the feature, even if RNP considers it optional, it's a competitive advantage for the vendor.
- Licenses, if needed for any feature/protocols/characteristics, must be permanent and perpetual after being applied to the device.
- Capacity/port licenses are allowed to be used. The extra cost to enable additional ports/capacity must be provided. The vendor must indicate the lowest capacity/port license available for each model offered in the proposal.
- Scalability licenses are allowed to be used. The extra cost to enable higher scale must be provided, if it exists. If possible, scale licensing should allow RNP to acquire licenses from the base level to the highest level.
- If there are any restrictions or limitations regarding the use of a requested resource or feature, the vendor must inform and detail the operating model of this license as well as whether the resource or feature in question stops working when the license expires. Under no circumstances should the expiration of any license result in the equipment ceasing to function in any routing, switching, or protocol operations related to connectivity, security, or interoperability.

## **WARRANTY**

The equipment must include a factory warranty that remains valid for a minimum of 12 months. During this period, complete replacement of the equipment or parts is included once a manufacturing defect is identified. Additionally, software update files must be made available, and there must be the possibility of opening tickets with the vendor for software support, such as bug fixes.

If a functionality failure or defect is identified, both in hardware and software of the equipment, that cannot be corrected by the equipment supplier/manufacturer, it must be replaced (partially or completely) by equivalent or superior equipment, at no cost to RNP within a period not exceeding 30 days from the evidence of failure or defect.

It is mandatory that the use of third-party transceivers by RNP does not, under any circumstances, result in the cancellation or reduction of the factory warranty or support coverage for the equipment. All warranty and support obligations must be fully maintained, without restrictions or limitations, regardless of whether non-OEM transceivers are utilized. The vendor is required to provide complete technical support and honor all warranty terms irrespective of the origin of the installed transceivers.

It is highly desirable that even after the end of the factory warranty, GA software update files are made available, even if the equipment does not have an active support contract.

### **SUPPORT CONTRACT**

The proponent must provide in the commercial proposal different possibilities for RNP to contract support for the equipment covered in this RFP.

The support start date will be agreed upon later between RNP and the supplier. Therefore, the supplier must not consider that the support start date will be the date on which it was delivered to RNP.

It is mandatory that the use of third-party transceivers by RNP does not, under any circumstances, result in the cancellation or reduction of the factory warranty or support coverage for the equipment. All warranty and support obligations must be fully maintained, without restrictions or limitations, regardless of whether non-OEM transceivers are utilized. The vendor is required to provide complete technical support and honor all warranty terms irrespective of the origin of the installed transceivers.

For Lot 1, which includes equipment to be deployed in international locations, the proponent must ensure that all proposed solutions — including hardware, software, and support services — are fully compatible with the operational, regulatory, and logistical requirements applicable to each deployment site. RNP reserves the right to assess, during the technical evaluation phase, the feasibility of implementation in each location based on the characteristics of the proposed solution and its alignment with local constraints. Proposals that, in RNP's technical assessment, present limitations or incompatibilities with the deployment environment may be considered non-compliant for this lot.

For the equipment lots in which the proponent submits a commercial proposal, values for support contracts of the following types must also be included:

#### **NBD – Next Business Day**

This type of support includes RMA and replacement of defective parts within Next Business Day, opening cases for configuration support and software issues as well as bug fixes and availability of files for software updates. For the RMA process, parts must be in stock within Brazilian territory.

#### **30 Days**

This type of support includes RMA and replacement of defective parts within 30 days, opening cases for configuration support and software issues as well as bug fixes and availability of files for software updates. For the RMA process, parts must be in stock within Brazilian territory.

## Software Only

This type of support does not include RMA or parts replacement. It only covers opening cases for configuration support and software issues as well as bugs fixes and availability of files for software updates. Support for identifying hardware problems must also be included.

The following questions must be considered:

- For any of the support contract types, it must be possible to open tickets through the web system, telephone or email directly to the vendor or its partner.
- While the support contract is in effect, even with a term longer than 1 year, there should be no price adjustments.

For any of the support contract types (NBD, 30 days, software only), the proponent must provide quotations considering periods of 2, 3, and 5 years.

## SERVICES

The proponent must provide proposals for the execution of support services, such as equipment commissioning, configuration, and others. RNP will not necessarily acquire all the services.

### Remote services

#### Remote Logical Configuration and Templates Configuration (per equipment)

Service involving the creation of configuration templates, remote application of configuration in network equipment (routers and switches) according to the technical standards defined by RNP. Includes the application of specific network configurations, security, and management settings. It is important to highlight that the technical team responsible for this service must have deep knowledge of the software and hardware platforms in question

### On-site services

#### Local Logical Configuration (per equipment)

On-site configuration service performed by specialized technicians at the installation location. Includes all the configuration like fine-tuning, connectivity testing, and validation of the applied configurations such as:

- Enable protocols
- Configure monitoring, logging and telemetry
- Hardening
- Integrate to RNP automation and Source of Truth

#### Local Commissioning (per equipment)

Service for functional validation of the equipment in the operational environment, including physical installation, performance testing, integration with the existing infrastructure, and technical compliance verification.

### Local Site Survey (by region)

Technical survey service conducted on-site to assess the physical and logical environment and determine the ideal conditions for equipment installation.

It must also include all logistical costs for two people, such as transportation, accommodation, meals, and any other necessary expenses for proper execution. If we need more than two people, we will use more units of the part number.

### **General Requirements**

All services described above — including configuration, commissioning, and site surveys — must be fully applicable to equipment from any vendor, without restrictions. The supplier must ensure that its technical team is qualified and capable of performing the required activities regardless of the vendor or model of the network equipment provided.

All the configurations need to meet the requirements of the RNP engineering team based on topology and the information provided about the infrastructure. The contracted company is responsible for creating the configuration templates and validating them with the RNP team before applying them.

All the on-site (local) services mentioned above can be performed in any region of Brazil and in Miami (United States). If desired, the proponent may specify prices separately by region.

### **TRAINING**

A training proposal must be provided, as follows:

- Online with hands-on laboratory practice (e-learning including hands-on) or remote instructor-led classes (virtual instructor-led with hands-on), considering training packages for groups of 20 to 30 people.
- In-person, conducted at the vendor's or partner's site, considering training packages for groups of 20 to 30 people.

RNP will not necessarily acquire such training. It will do so if there is a need to train its technical team, which may vary from one lot to another.

Training courses must be delivered by the vendor or an accredited company with certified instructors having a minimum of four (4) years of experience.

RNP reserves the right not to use existing course topics or content from the vendor's portfolio and can request customized content tailored to its needs. In the case of content customization, the rates applied must be the same for basic, intermediate, and advanced type courses in the vendor's track. It also reserves the right to copy the material used exclusively for training its internal technical staff.

The hands-on portion of the training must be conducted, preferably, with the same family/series of equipment provided in the proposal. In the event of unavailability of this type of equipment in a remote laboratory, equipment with similar functionality (or that at least supports all functionalities present in the course content) and with the same configuration and operation syntax will also be accepted.

## **INTEROPERABILITY TESTS**

This is an elimination stage. If the equipment fails to pass the test specifications, the proponent/equipment will be automatically disqualified.

RNP will conduct interoperability and performance tests with selected vendors in each equipment category/lot, taking into consideration the technical requirements defined as mandatory and optional. These tests may include interaction with third-party equipment from vendors in other categories.

- Interoperability validations: between equipment from different vendors.
- Performance validations: will be performed only with equipment from the same vendor, without interaction with third-party equipment.

The test specifications to be executed will be defined by RNP, being applied in the same way to all selected vendors.

It is mandatory that the equipment passes all interoperability and performance tests conducted by RNP, otherwise the proponent and the equipment will be automatically disqualified.

If the proponent offers equipment from the same series for different types and roles and the equipment uses the same software binary and has the same chipset, validation may be performed, at RNP's discretion, on only one of the proposed equipment models in order to verify the features/protocols/characteristics.

Interoperability and performance validation must be conducted using the RNP Network Reference Topology, even if the equipment is logically distributed across different physical locations. Interoperability tests will be executed using existing equipment available at the RNP office (Juniper and Huawei) connecting to the equipment under validation, with the establishment of an IP tunnel-based configuration to be implemented and maintained by the vendor (to connect the vendor lab to the RNP office).

For the performance tests, the vendor must provide the full infrastructure required for traffic generation and traffic analysis, as well as all platforms and protocols necessary to validate interoperability with other manufacturers - regardless of whether it is conducted in an internal or external laboratory of the manufacturer. Performance tests will be carried out in collaboration with RNP's engineering team. All logistical and personnel costs associated with the execution of both test types — including travel, accommodation, technical support, and any other related expenses — must be fully covered by the vendor.

The following questions must be considered:

- The vendor and their partner are responsible for providing the equipment proposed in the RFP to be used in validation tests.
- The vendor and their partner must work actively in the laboratory to ensure the successful execution of the test procedures proposed by RNP.
- The vendor and their partner must act to identify and correct any interoperability issues with other manufacturers (each vendor will be responsible for their own equipment).



## **COMMERCIAL PROPOSAL**

- Please note that the commercial proposal must be presented in two modalities: CIF and FOB for all lots in which the proponent has interest.
- The quantities listed are estimates. RNP may purchase more or fewer items than specified.

The commercial proposal must be presented on both CIF and FOB basis. That is, for each set of devices, the proponent must provide prices for both purchasing modalities. The RNP will decide which purchasing method to use according to the moment of acquisition.

In the commercial proposal, the proponent must provide unit values for the equipment and not the sum of the quantities.

The commercial proposal must take into consideration the grouping of equipment types, services and training and their respective lots, that is, the proponent must provide values for all equipment belonging to the lots in which there is interest. Proposals must be submitted separately by lot.

Lot 1	Lot 2	Lot 3	Lot 4	Lot 5	Lot 6	Lot 7
Core and Aggregation + Support Contract + Training	Universal + Support Contract + Training	Peering + Support Contract + Training	Metro + Support Contract + Training	Datacenter + Support Contract + Training	CPE + Support Contract + Training	Services

Upon completion of the commercial proposal submission stage, RNP will schedule individual meetings with each proponent for proposal presentations, detailed explanations of both commercial and technical aspects, and clarification of any questions.

## **RESPONSIBILITY AND CONFIDENTIALITY**

Proponents must not charge any amount, even as compensation for expenses, for submission, demonstrations, discussions or for any other reason arising from the RFP process. Proponents are responsible for any costs or expenses arising from compliance with this RFP.

Responses are confidential, with their confidentiality preserved, and will not be disclosed by RNP to other proponents and third parties.

Information provided by RNP to proponents is considered confidential and must not be disclosed to third parties without RNP's prior consent.

## **USE OF THIS RFP BY OTHER ORGANIZATIONS**

The proponent must indicate whether they authorize the use of the LPU generated through the RFP to allow the acquisition of equipment by education and research organizations that are partners of RNP.

## Scoring criteria for RFI participants

For the proposers who participated in the RFI phase, RNP will consider the following criteria:

- Presentation/Quality of Discussions
- Quality of Technical Responses
- Quality of Commercial Proposals
- Responses Delivered on Time

Each of the above criteria will receive a score from 0 to 3, where:

Score	Description
0	Does not meet
1	Partially meets
2	Mostly meets
3	Fully meets

The score received in each of the criteria will be summed and subsequently added to the scores of the other criteria of this RFP.

## Proposal evaluation, mandatory and optional technical requirements

### Evaluation and Scoring Criteria

Proposals will be evaluated based on the criteria outlined below. A maximum score of 100% can be achieved.

### Commercial and Mandatory Requirements (88%)

To be considered for evaluation, proposals must comply with all mandatory technical requirements of this RFP. Proposers that meet all mandatory requirements will proceed to commercial evaluation, which accounts for eighty-eight percent (88%) of the total score.

### Optional Requirements (up to 10%)

Proponents may earn up to an additional ten percent (10%) for meeting optional requirements outlined in this RFP. Scoring will be based on the extent and importance of optional requirements fulfilled, as determined by RNP.

Scoring for optional requirements will be limited to 1% per section (a section is identified by a four-digit number in XX.XX format, e.g., VPN section – 17.01). However, the following sections will be worth 2% each: Performance 4.01, Security 6.01, Routing 13.01, VXLAN 15.01, Segment Routing 16.01, VPN 17.01, Management 19.01.

In all cases, the value of each optional requirement within a section will be calculated by dividing the total percentage for that section by the number of optional requirements it contains.

In sections with tiered compliance levels, meeting a higher-level requirement automatically satisfies all lower-level requirements. For example, in Telemetry section 20.01, an export rate of 2 seconds also satisfies the requirements for 5, 10, and 30 seconds, earning full points for this section. However, an export rate of only 30 seconds would earn just 25% of the available points for this section.

When the total points from optional requirements exceed 10%, the excess points will not be counted toward the final score.

### **RFI Participation (up to 2%)**

Proponents who responded to the prior Request for Information (RFI) for this project may receive up to 2% of the total score.

### **Evaluation Methodology**

For the comparative commercial evaluation, an **Evaluated Commercial Value** will be calculated for each compliant proposal. This value will be used solely for ranking the proposals and determining the winning bid for each lot.

The calculation involves applying an **Adjustment Factor** to the proponent's total proposed commercial value. This factor is derived from the scores achieved in Optional Requirements (up to 10%) and RFI Participation (up to 2%).

The calculation will be performed as follows:

1. **Determine the Total Adjustment Percentage (PADJ):** This is the sum of the percentage points awarded for Optional Requirements (SOPT) and RFI Participation (SRFI).

$$PADJ = SOPT + SRFI$$

2. **Determine the Adjustment Factor (Fadj):** The Adjustment Factor is calculated by subtracting the Total Adjustment Percentage from 1.

$$Fadj = 1 - (Padj / 100)$$

3. **Calculate the Evaluated Commercial Value (VEVA):** The proponent's total proposed commercial value (Vprop) is multiplied by the Adjustment Factor.

$$VEVA = Vprop \times Fadj$$

### **Hypothetical Example:**

Consider a proponent with a total proposed commercial value of USD **1,000,000**.

- The proponent is awarded **7%** for meeting several optional requirements (Sopt = 7%).
- The proponent is awarded **1.5%** for having responded to the RFI (Srfi = 1.5%).

The calculation would be:

- $Padj = 7\% + 1.5\% = 8.5\%$

- $F_{adj} = 1 - (9 / 100) = 0.915$
- $V_{eva} = \$1,000,000 \times 0.915 = \$915,000$

In this example, the value of **\$915,000** would be the Evaluated Commercial Value used for comparison against other proposals. The contract for the will be awarded to the proponent with the lowest Evaluated Commercial Value, if it passes in the subsequent homologation phase.