

# **RNP – Rede Nacional de Ensino e Pesquisa**

*RFP – Request for Proposal*

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

## **Respostas aos questionamentos**

Este documento apresenta as respostas consolidadas a todos os questionamentos dos interessados nesta RFP. As perguntas e respostas foram mantidas em seus idiomas originais para preservar a precisão das informações.

## **Responses to the inquiries**

This document presents the consolidated responses to all inquiries from interested parties regarding this RFP. Questions and answers have been maintained in their original languages to preserve the accuracy of the information.

Referente ao item SERVICES – Local Commissioning do documento “RNP - RFP RS - TERMO DE REFERÊNCIA - Routers and Switches - Rede Ipê - Conecta.pdf. Entendemos que a CONTRATANTE será responsável por disponibilizar toda a infraestrutura necessária para a correta instalação dos equipamentos ofertados, tais como energia elétrica, climatização, espaço físico adequado (racks), cabeamento, entre outros. Por sua vez, a CONTRATADA será responsável apenas pela instalação física e lógica dos equipamentos nos locais previamente definidos pela CONTRATANTE. Está correto o nosso entendimento?

Sim, está correto em relação as responsabilidades da parte da CONTRATADA. Caberá também a CONTRATADA realizar o troubleshooting conjunto para resolução de possível problema de interoperabilidade.

Referente ao item INTEROPERABILITY TESTS do documento RFP “Roteadores e Switches – Rede Ipê – Conecta”. Entendemos que os testes serão divididos em duas etapas distintas:

**Etapas de Interoperabilidade:** Tem como objetivo validar que os equipamentos ofertados são capazes de operar de forma integrada com equipamentos de outros fabricantes. Esta etapa poderá ser realizada remotamente, por meio da configuração de túneis IP entre a CONTRATANTE e o laboratório do fabricante/proponente.

**Etapas de Testes de Desempenho (Performance):** Visa certificar que os equipamentos atendem aos requisitos mínimos de performance especificados no Termo de Referência. Está correto o nosso entendimento?

A validação do suporte técnico das funcionalidades, performance e escalabilidade deverão ser realizadas em laboratório do fabricante representado pela proponente.

As funcionalidades deverão ser validadas tanto entre equipamentos do próprio fabricante, linha de produto objeto do processo, quanto em ambiente de interoperabilidade com algum outro grande fabricante de porte mundial (Arista, Ciena, Cisco, Huawei, Juniper ou Nokia) a ser escolhido pela proponente e fabricante que ela representa.

Caso a RNP não fique satisfeita com o cenário de teste, ela poderá, a seu critério, disponibilizar acesso remoto via túnel IP/GRE a equipamentos que possua em estoque (ex: Cisco NCS540, Juniper MX204, Huawei Cloud Engine S57XX ou S67XX ou Huawei NE8000 M1C) de forma a repetir os testes com esses outros equipamentos.

Para os testes de performance e escalabilidade, o laboratório deverá contar com equipamentos profissionais geradores de tráfego que simulem as condições necessárias para a homologação.

Se viável em termos de agenda da equipe da RNP, a preferência será pela realização dos testes de forma presencial.

Referente ao item INTEROPERABILITY TESTS do documento RFP “Roteadores e Switches – Rede Ipê – Conecta”. Entendemos que a Etapa de Testes de Desempenho (Performance) será realizada

nas dependências do laboratório do fabricante, sendo de responsabilidade da CONTRATADA/FABRICANTE o custeio de todos os encargos logísticos relacionados à participação da equipe da CONTRATANTE, incluindo, Custos de traslado (aéreo/terrestre), Hospedagem e alimentação, Suporte técnico e infraestrutura local necessária para a realização dos testes. Está correto o nosso entendimento? Caso o entendimento esteja correto, solicitamos a gentileza de informar quantas pessoas da equipe técnica da CONTRATANTE estão previstas para acompanhar presencialmente os referidos testes de desempenho.

Considerar 2 colaboradores da RNP por fabricante a ser homologado.

Referente ao arquivo “RNP - RFP RS - ComercialProposal.xlsx”, utilizado para apresentação da proposta comercial. Entendemos que a PROPONENTE deverá apresentar, obrigatoriamente, os valores para todos os níveis de suporte técnico previstos na planilha (Software Only, 30 dias e NBD – Next Business Day), cabendo à CONTRATANTE, no momento oportuno, selecionar o(s) nível(is) de SLA desejado(s) para contratação. Além disso, entendemos que, independentemente do SLA selecionado, o valor apresentado deverá contemplar o período mínimo de 12 (doze) meses de cobertura, conforme exigência do Termo de Referência. Está correto o nosso entendimento?

A garantia contra defeitos de fabricação deve ser de 12 meses. A RNP realizará a soma de todas as modalidades de suporte solicitadas (NBD, 30 days, Software Only) e de todos os prazos contratuais solicitados (2, 3 e 5 anos), dividindo o resultado por 10 (anos) para posterior soma com os valores propostos de hardware e licenças de software.

É possível um único lote ser dividido entre 2 fabricantes diferentes, ou seja, 2 fabricantes diferentes ganharem cada uma parte de um único lote?

Não é possível realizar a divisão de um lote entre 2 fornecedores. Cada lote será adjudicado para um único fornecedor.

Existe pontuação que beneficia a avaliação do parceiro que oferecer tempo de entrega mais curto, ou flexibilizar a forma de pagamento, ou prestar algum serviço sem custo como por exemplo treinamentos, voucher de certificação?

Neste processo não haverá benefício (pontuação extra) para as questões colocadas, mas entendemos que o prazo máximo ofertado deverá ser de até 90 dias.

**Garantia de hardware**  
O termo de referência menciona que os equipamentos devem ter garantia de fábrica mínima de 12 meses. Poderiam confirmar se essa é, de fato, a exigência esperada, ou se haveria interesse em uma extensão desse período?

Não há interesse na extensão da garantia de fábrica para além de 12 meses. Se houver necessidade, a critério da RNP, a extensão deste prazo será tratado através do contrato de suporte – conforme item específico do Termo de Referência.

**Contrato de suporte (Software Only / 30 dias / NBD)**  
Sabemos que o proponente deve oferecer valores para diferentes tipos de suporte, porém o período de cobertura não é definido no documento. Assim, gostaríamos de entender qual

horizonte de tempo é mais adequado à expectativa da RNP: 12 meses (acompanhando a garantia de hardware), 24 meses, 36 meses. Ou ainda se desejam receber todas essas opções como alternativa na proposta.

As informações relacionadas aos períodos de vigência para cotação do serviço de suporte foram atualizadas no Termo de Referência.

**Suporte tipo NBD**  
Especificamente para o modelo de suporte NBD, há interesse que acompanhe apenas o período de garantia (12 meses), ou seria mais adequado também considerar 24 ou 36 meses? Caso já tenham as modalidades de NBD esperadas (ex: atendimento remoto, troca avançada, visita técnica local), ficaremos gratos se puderem compartilhar para que possamos estruturar a proposta de forma aderente.

As informações relacionadas aos períodos de suporte que devem ser cotados estão disponíveis no Termo de Referência da RFP.

**Capacidade de interfaces para o roteador de peering – Tipo 1**  
Gostaríamos de confirmar se seria aceitável oferecer um roteador com até 10 interfaces 100G, considerando que o requisito do termo de referência para esse perfil indica 12 portas 100G. Essa confirmação nos ajudará a validar o modelo mais alinhado tecnicamente, evitando sobredimensionamento.

Devido a necessidade técnica e evolutiva da rede da RNP, os requisitos relacionados ao número de portas e capacidades dos equipamentos devem atender, no mínimo, ao especificado na RFP, não sendo possível aceitar o roteador com as características propostas.

**Roteador Metro – Tipo 1 (8 x 10G/25G e 8 x 100G/400G)**  
Para este perfil, estamos avaliando a possibilidade de utilizar um modelo com 4 portas 400G e 22 portas 100G uplinks, 4 x 10G/25G. Para atender à demanda total de interfaces 10G/25G, consideraríamos o uso de cabos breakout a partir das portas 100G. Poderiam confirmar se essa abordagem seria aceitável? Em sendo viável, gostaríamos também de entender qual seria a distância ideal ou aceitável para os módulos ópticos breakout, conforme a topologia e as diretrizes de conectividade da rede.

Os requisitos relacionados ao número de portas físicas e capacidades dos equipamentos devem atender, no mínimo, ao especificado na RFP, não sendo possível aceitar o roteador com as características propostas. Em relação aos módulos ópticos, estes não fazem parte do escopo deste processo.

**Ciclo de vida do hardware (Hardware Lifecycle)**  
Sobre os requisitos de ciclo de vida do hardware (itens 10.01.01 a 10.01.03), poderiam esclarecer se o objetivo é considerar: o tempo de suporte oficial do fabricante (EOL/EOS), o tempo operacional estimado dos equipamentos na rede, ou o ciclo de aquisição previsto em projetos futuros?

Deve ser levado em conta o EOL (End of Life) e EOS (End of Support) definidos pelo fabricante, considerando como marco inicial a data de assinatura do contrato com a RNP. Dessa forma, o

fabricante deve assegurar que o ciclo de vida completo do produto seja mantido a partir desta data contratual.

**Segment Routing (SR) – Planejamento e protocolo de transporte**  
A RFP menciona suporte a LDP, RSVP, SR-MPLS e SRv6 (opcional). Poderiam confirmar qual protocolo de transporte está previsto para os papéis de núcleo (core) e agregação? Segment Routing já está implantado na rede ou está previsto para futura migração?

Segment Routing ainda não está implementado. A evolução da rede RNP está pautada, entre outros aspectos, na implementação do SR-MPLS em suas camadas de transporte.

**Arquitetura atual da rede**  
Seria possível compartilhar uma visão geral de alto nível da arquitetura atual da rede? Especialmente se já existe alguma transição em curso ou planejada de LDP/RSVP para SR-MPLS.

A topologia de referência apresentada neste processo ilustra a perspectiva evolutiva da rede RNP e a integração dos equipamentos nas diferentes camadas. A evolução da rede RNP tem como direcionamento a implementação do SR-MPLS.

**Protocolos de roteamento underlay (IS-IS e OSPF)**  
Ambos os protocolos estão listados como requisitos para o plano underlay. A expectativa é que os dois sejam implantados simultaneamente, ou a intenção é apenas garantir flexibilidade conforme o cenário?

A RNP definiu o uso do protocolo IS-IS na evolução da sua rede. A disponibilidade do protocolo OSPF é necessário para eventuais integrações com outras redes. Ressaltamos que os dois protocolos são requisitos mandatórios para determinados tipos de equipamentos, conforme requisitos técnicos do processo.

**VXLAN nos roteadores de agregação e universais**  
Poderiam esclarecer o caso de uso previsto para VXLAN nesses roteadores, considerando que SR-MPLS também é exigido para os mesmos papéis? Isso nos ajudará a entender o objetivo funcional e os requisitos de encapsulamento e plano de controle envolvidos.

Os requisitos técnicos relacionados a VXLAN foram atualizados para os roteadores do tipo Agregação, Universal e Metro, passando para opcionais

**Solução de Gerenciamento/Controller/Orquestração obrigatório ou desejável?**  
Para que possamos melhor calibrar nossa proposta, gostaríamos de entender se a solução de Gerenciamento/Controller/Orquestração é obrigatória ou desejável para os produtos de: 1. Telecom 2. Datacenter.

A solução de orquestração e gerenciamento de serviços centralizados será objeto de outro termo de referência, não estando no escopo deste processo. Caso o fornecedor realize a oferta de tal solução, ela será desconsiderada para fins desta RFP.

**A execução e entrega do Projeto Lógico (HLD/LLD) será obrigatória? Em caso afirmativo, o projeto deve ser elaborado pelo próprio fabricante?**

Sim, HLD e LLD são obrigatórios. A elaboração destes documentos é responsabilidade do proponente, seja através de sua equipe própria ou terceiros. Deverá ser assinado por profissional qualificado, com certificações técnicas e experiência profissional que comprovem essa condição.

**O treinamento exigido deverá conter certificação oficial emitida pelo fabricante?**

Não é necessário emissão de certificado oficial do fabricante para os participantes do treinamento. Porém, o treinamento deve ser ministrado por profissional qualificado, com certificações técnicas e experiência que comprovem essa condição.

**Poderiam, por gentileza, esclarecer como deverá ser realizada a cotação dos itens de serviço, considerando que a quantidade indicada no edital é "03"?**

Não foi possível compreender a questão com as informações providas. Ao longo dos questionamentos respondemos algumas dúvidas sobre serviços. Esperamos que as respostas elucidem as dúvidas dessa questão.

**Não identificamos a informação sobre o prazo de entrega. Poderiam confirmar esse ponto?**

Prazo padrão considerado será de 60 dias, com tolerância para 90 dias.

**Considerando que a capacidade total requisitada para os elementos TIPO 1 é de 1080 Gbps (FD), seria possível ofertar um equipamento com maior capacidade, porém com altura de 2RU, para atender essa demanda? Entendemos que essa troca seja justificada para a RNP em termos financeiros, sem perda de funcionalidade.**

Sim, a RNP aceitará equipamentos tipo 1 com até 2RU de altura, conforme especificado no item 1.01.02.

**O fornecedor precisa fornecer documentos comprobatórios para cada item solicitado no documento "RNP - RFP RS - Technical Specifications and Requirements" ou apenas se comprometer de que os possui?**

Deverá indicar a comprovação de cada item atendido. Para aqueles considerados complexos, que não existam em nenhuma documentação técnica do fabricante, uma carta assinada pelo fabricante com os itens atendidos sem documentação poderá ser aceita.

De toda forma, quando o fabricante (ou seu parceiro que o representa no processo) indica que atende a um requisito técnico, seja ele mandatório ou opcional, para determinado tipo de equipamento, ele se obriga a entregá-lo dentro das especificações solicitadas pela RNP. Todos os requisitos técnicos serão validados em ambiente de homologação. Caso o fabricante indique que atende a um requisito, mas este não for comprovado em ambiente de homologação, o proponente estará desclassificado do lote em questão.

**Na especificação, foi mencionado fontes AC e DC para CPE e Data Center. Isso significa que um único equipamento precisa suportar tanto AC quanto DC? Ou o equipamento deve suportar AC ou DC conforme o local?**

O entendimento não está correto. A especificação dos requisitos técnicos para alimentação é referente a redundância de alimentação e não ao tipo de alimentação (AC ou DC). Portanto, os tipos de equipamentos onde há indicação de mandatório devem atender ao nível de redundância exigido (N+1), tanto para AC ou DC. Estas informações foram atualizadas na planilha de requisitos técnicos.

**É mencionado que "O fornecedor deve possuir 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 diversos fabricantes." O fornecedor deve realizar os testes de integração em seus próprios laboratórios, mesmo que não haja produtos de diversos fabricantes disponíveis no local?**

Conforme estabelecido no requisito, o fornecedor deve possuir um laboratório capaz de simular topologias personalizadas para validar e garantir a precisão das informações técnicas fornecidas, incluindo a interoperabilidade entre produtos de diferentes fabricantes. Portanto, em todos os casos, é obrigatório que o fornecedor disponha de equipamentos de pelo menos mais um fabricante (entre Arista, Ciena, Cisco, Huawei, Juniper ou Nokia), embora a condição ideal seja outros 2 ou mais fabricantes em seu laboratório para a realização dos testes de integração e interoperabilidade. Essa exigência assegura que os cenários reais de implementação sejam contemplados e que a solução proposta funcione adequadamente em ambientes heterogêneos.

**Este projeto será uma construção nova ou uma expansão de infraestrutura existente?**

As informações sobre este projeto, denominado Programa Conecta, estão disponíveis no Termo de Referência deste processo, e incluem expansão de infraestruturas existentes, atualização tecnológica e a criação de novas redes.

**Por favor, esclareçam o conteúdo de "CIF/DDP (incl. impostos) – R\$" na tabela RNP - RFP RS - Proposta Comercial. O que está incluído no preço CIF? E no preço DDP? Esses dois preços são a mesma coisa, certo? Entendemos que CIF e DDP seria o valor com todos os impostos.**

Sim, está correto o entendimento de que seria o custo final para a RNP com todos os impostos inclusos.

**Com relação à divisão de cada lote, é possível que os equipamentos dentro do mesmo lote sejam entregues por fornecedores diferentes? Por exemplo: No lote "Roteadores Universal" (lote 2), é possível participarmos apenas para a entrega do equipamento tipo 2?**

Não é possível que equipamentos de um mesmo lote sejam entregues por fornecedores distintos. Por isso, estão agrupados em lotes.

**Empresas estrangeiras podem apresentar proposta com preços FOB, ou a RNP realiza compras apenas de empresas nacionais mesmo quando a comprar for considerando proposta FOB?**

Empresas estrangeiras podem apresentar propostas com preços FOB. Essa deverá ser a oferta preferencial visto que a RNP consegue solicitar a isenção de impostos de importação. No entanto, é imprescindível que a empresa possua representatividade no Brasil, seja por meio de filial, escritório ou representante legal. Isso se deve ao fato de que esta RFP não contempla apenas o fornecimento de equipamentos, mas também envolve atividades como suporte técnico, comissionamento e outros serviços que exigem presença e atuação no território nacional.

**Qual é o orçamento total para este projeto?**

A RNP se reserva ao direito de não prover este tipo de informação.

**A RNP escolherá dispositivos de múltiplos fornecedores para Roteadores e Switches?**

A escolha dos fornecedores e equipamentos se dará de acordo com a análise técnica e preço, podendo haver a escolha de múltiplos fornecedores de acordo com a distribuição dos lotes especificados no processo.

**(ENTREGA GERAL & LOGÍSTICA REGIONAL)** A RNP exige que os técnicos possuam certificações específicas (ex: certificações do fabricante, autorização de segurança, liberação EHS) para a realização de serviços no local?

Sim, todas as certificações necessárias e exigidas legalmente para a execução dos serviços contratados deverão ser apresentadas para a RNP.

**(ENTREGA GERAL & LOGÍSTICA REGIONAL)** Dois técnicos são sempre suficientes para as visitas locais de levantamento de requisitos (site surveys), ou devemos nos preparar para exceções?

Para o site survey, a princípio, um técnico experiente seria suficiente. Para implantação ou comissionamento on-site, recomenda-se dois técnicos.

**(ESCOPO E EXECUÇÃO DOS SERVIÇOS)** A RNP fornecerá templates padronizados de configuração, ou o fornecedor será totalmente responsável por sua criação desde o início?

A criação dos templates será de responsabilidade da contratada, sob orientação do time de engenharia da RNP. A contratada deverá gerar todos os artefatos de configuração dos templates.

**(ESCOPO E EXECUÇÃO DOS SERVIÇOS)** Os serviços de configuração remota devem incluir procedimentos de backup/rollback ou integração com os sistemas de automação da RNP (Source of Truth)?

O escopo de configuração remota deve contemplar o comissionamento, migração e instalação da infraestrutura e, eventualmente, a interação com equipamentos legados. A integração com o sistema de Source of Truth se dará no aspecto de cadastros dos equipamentos e suas características para fins de inventário. O sucesso da atividade se dará quando o equipamento estiver operacional na nova infraestrutura e com os serviços operacionais.

**(ESCOPO E EXECUÇÃO DOS SERVIÇOS)** A RNP espera ajuste fino das configurações de telemetria, logging, monitoramento e hardening tanto nos serviços de configuração local quanto remota, ou apenas local?

Sim, estes itens devem ser contemplados nos serviços de configuração, tanto para os casos locais como remotos.

**(ESCOPO E EXECUÇÃO DOS SERVIÇOS)** Os serviços de comissionamento devem incluir testes de estresse completos ou apenas validação funcional e de conformidade?

Os testes de carga e estresse serão realizados em laboratório, no momento da validação dos equipamentos. Em tempos de comissionamento e configuração, haverá testes de conformidade das configurações aplicadas conforme requisitos exigidos pela RNP, podendo também existir testes de simulação de falhas para convergência e re-roteamento.



**(ESCOPO E EXECUÇÃO DOS SERVIÇOS)** A RNP fornecerá acesso a documentação pré-instalação (ex: elevação de racks, layout de cabos, planos de IP) antes da execução no local?

Estas informações serão obtidas através do site survey a ser realizado pela contratada, quando solicitado pela RNP. Nos demais casos, a RNP proverá as informações.

**(TESTES DE INTEROPERABILIDADE E DESEMPENHO)** Os testes de interoperabilidade serão executados na topologia de referência da RNP, de modo que a RNP disponibilizará uma amostra ou ambiente de teste com os equipamentos legados, bem como, terá o acompanhamento de um representante técnico indicado pela RNP para qualquer apoio se necessário referente a estes equipamentos. Está correto o entendimento?

Todos os testes serão realizados no laboratório do fabricante, incluindo o teste de interoperabilidade. A exceção seria para o caso da RNP solicitar testes adicionais ou a repetição de algum teste com equipamento existente da RNP. Neste caso, a solução proposta é de tunelamento IP/GRE com o laboratório do escritório da RNP para acesso a equipamentos específicos. A RNP definirá o caderno de testes a ser realizado, baseado nos requisitos técnicos deste processo e na topologia de referência. Haverá envolvimento do time da RNP neste processo.

**(TESTES DE INTEROPERABILIDADE E DESEMPENHO)** A RNP fornecerá um plano de testes e design do teste, ou o fornecedor deverá propor um plano para validação?

A RNP definirá o caderno de testes a ser realizado, baseado nos requisitos técnicos deste processo e na topologia de referência.

**(TESTES DE INTEROPERABILIDADE E DESEMPENHO)** A RNP fornecerá os parâmetros de túnel e credenciais para conectar o laboratório do fornecedor ao laboratório da RNP para testes de interoperabilidade?

Isso será necessário apenas se a RNP decidir pela realização de testes adicionais com equipamentos existentes no laboratório da RNP. O padrão é que existam equipamentos de outros fabricantes para realização dos testes de interoperabilidade no laboratório do fabricante selecionado para esta etapa.

**(TESTES DE INTEROPERABILIDADE E DESEMPENHO)** A infraestrutura de testes (ex: geradores de tráfego, analisadores) pode ser compartilhada entre múltiplos lotes durante o mesmo ciclo de avaliação?

Não. Cabe ao proponente/fornecedor providenciar os equipamentos geradores de tráfego e analisadores pois as validações serão realizadas no laboratório do fabricante.

**(TESTES DE INTEROPERABILIDADE E DESEMPENHO)** Para fornecedores que propõem equipamentos da mesma família (mesmo software binário e chipset), uma única unidade pode ser validada para todos os subtipos dentro de um lote, ou é necessária confirmação explícita por caso?

Não, pois cada lote de equipamento possui requisitos técnicos distintos, tanto de software como de hardware.

**(TESTES DE INTEROPERABILIDADE E DESEMPENHO)** Os testes devem incluir emulação de protocolo com dois fabricantes ao mesmo tempo (ex: BGP com Huawei e Juniper simultaneamente), ou apenas um por vez?

Os testes de interoperabilidade serão realizados entre diferentes fabricantes. Ademais, o questionamento não trouxe informações suficientes do contexto dentro do processo para que possamos respondê-lo com mais detalhes.

**(TESTES DE INTEROPERABILIDADE E DESEMPENHO)** Todos os testes serão executados na topologia de referência da RNP exatamente como desenhada, ou essa topologia será apenas simulada virtualmente?

A topologia de referência fornecida pela RNP serve para entendimento do cenário multidomínio e multiprotocolo. A topologia não será simulada virtualmente, todos os equipamentos utilizados no ambiente de validação e homologação devem ser físicos.

**(ESCLARECIMENTOS SOBRE TREINAMENTO)** O idioma inglês é obrigatório para todas as sessões de treinamento e materiais?

Não, os materiais dos treinamentos podem ser fornecidos em português.

**(ESCLARECIMENTOS SOBRE TREINAMENTO)** A RNP exige que os instrutores de treinamento sejam certificados pelo fabricante, ou experiência técnica equivalente é aceitável?

De acordo com o Termos de Referência do processo, é obrigatório que o instrutor seja certificado e credenciado pelo fabricante.

**(ESCLARECIMENTOS SOBRE TREINAMENTO)** A RNP aceita treinamentos com simuladores (ex: GNS3, laboratórios virtuais) se o equipamento físico não estiver disponível, desde que as funcionalidades e CLI sejam equivalentes?

Sim, para o ambiente de treinamento são aceitos laboratórios virtuais.

**(ESCLARECIMENTOS SOBRE TREINAMENTO)** Caso a RNP exija conteúdo de treinamento personalizado, ela fornecerá um currículo-alvo ou objetivos de aprendizagem de alto nível com antecedência?

Sim.

**(ESCLARECIMENTOS SOBRE TREINAMENTO)** O mesmo pacote de treinamento pode ser aplicado a múltiplos lotes, ou cada lote deve ter preços e módulos de treinamento dedicados?

O treinamento pode abranger uma família de equipamentos desde que contemple a ementa solicitada pela RNP.

**(ESCLARECIMENTOS SOBRE TREINAMENTO)** O treinamento deve ser precificado por grupo (20–30 pessoas), por pessoa, ou como pacote fixo independentemente do número de participantes?

A precificação deve ser feita por grupo de pessoas.

**(LICENÇAS, GARANTIA E MODELOS DE SUPORTE)** Funcionalidades opcionais (ex: SRv6, Segment Routing, EVPN) suportadas pelo fornecedor devem ser declaradas explicitamente, mesmo sem custo?

Todos os requisitos mandatórios e opcionais devem ser indicados se são atendidos ou não pelo fabricante, conforme documento de requisitos técnicos deste processo. Ao indicar o atendimento a um requisito, seja ele mandatório ou opcional, o fabricante deve entregá-lo sem custos adicionais para a RNP, e eventuais licenças devem estar contempladas na proposta comercial.

**(LICENÇAS, GARANTIA E MODELOS DE SUPORTE)** A RNP espera que atualizações de software GA pós-garantia (ex: correções de bugs, patches de estabilidade) sejam incluídas mesmo sem contratos ativos de suporte?

Conforme descrito no Termo de Referência, é desejável que, mesmo após fim do contrato de suporte do equipamento, haja o fornecimento de atualizações de software, em especial para correção de bugs e patches.

**(LICENÇAS, GARANTIA E MODELOS DE SUPORTE)** As opções de suporte devem ser cotadas por lote e por tipo de equipamento, ou é possível agrupar múltiplos lotes sob um único modelo de suporte?

A cotação do suporte deve ser por equipamento.

**(LICENÇAS, GARANTIA E MODELOS DE SUPORTE)** A RNP pode confirmar que as licenças perpétuas devem cobrir todas as funcionalidades obrigatórias e opcionais desde o início, sem necessidade de renovações futuras?

Sim, todas as funcionalidades mandatórias ou opcionais indicadas como atendidas pelo fabricante devem ser disponibilizadas a RNP, sem necessidade de renovações futuros de licenciamento.

**(LICENÇAS, GARANTIA E MODELOS DE SUPORTE)** A RNP aceita contratos de suporte compartilhado entre múltiplos CNPJs/entidades no caso de joint ventures ou múltiplos importadores?

Não. O contrato firmado é único entre a RNP e o fornecedor do produto ou serviço.

**(LICENÇAS, GARANTIA E MODELOS DE SUPORTE)** Os tipos de suporte (NBD, 30 dias, Apenas Software) devem ser cotados apenas para equipamentos ou também para serviços (ex: SLA de configuração remota)? Em outras palavras, devemos ir ao local para coletar o equipamento ou a RNP enviará o equipamento para substituição?

Fica sob responsabilidade da RNP a substituição do equipamento.

**(LICENÇAS, GARANTIA E MODELOS DE SUPORTE)** Entendemos que para este projeto, é necessário o atendimento de suporte técnico remoto na modalidade 24x7, em língua portuguesa, com telefone para acionamentos em casos críticos, abertura de chamado através de portal com registros de data e hora da abertura, com login e senha de pessoas previamente cadastradas e autorizadas pela RNP para abertura de chamados. Está correto o nosso entendimento?

Sim, está correto o entendimento.

**(LICENÇAS, GARANTIA E MODELOS DE SUPORTE)** Entendemos que o portal para abertura de chamado deve permitir consultar chamados anteriores, visualizar data e hora das interações bem como permitir indicar na abertura do chamado qual canal de atendimento deseja retorno: pelo próprio portal, pelo whatsapp ou por telefone. Está correto nosso entendimento?

Não está correto o entendimento. Os canais de atendimento obrigatórios para o fluxo operacional de chamados de suporte estão descritos no Termos de Referência.

**(LICENÇAS, GARANTIA E MODELOS DE SUPORTE)** Entendemos que, em casos que exijam a substituição física de equipamentos, a RNP contará com uma equipe própria para realizar essa atividade localmente contando com apoio da equipe técnica remota da contratada. Está correto o entendimento?

Sim, está correto o entendimento.

**(CONDIÇÕES CONTRATUAIS E FINANCEIRAS)** Os preços de suporte, serviço ou treinamento podem ser apresentados em USD, ou todos esses itens devem ser cotados apenas em BRL?

Preços de suporte poderão ser em dólar, com impostos inclusos, para conversão em reais com PTAX do dia anterior ao pagamento caso seja realizado pelo próprio fabricante. Serviços de site survey, instalação comissionamento, sejam remotos ou on-site, assim como treinamento, devem ser precificados em reais com todos os impostos inclusos.

**(CONDIÇÕES CONTRATUAIS E FINANCEIRAS)** Para os lotes entregues sob condição FOB, a proposta comercial deve incluir uma estimativa completa de CIF (frete, seguro, custos de importação) apenas como referência, ou apenas o preço FOB bruto?

Para a oferta de equipamentos e suas licenças de software é esperado apenas o recebimento de proposta FOB. Não deve ser apresentado nenhum valor de referência CIF.

**(CONDIÇÕES CONTRATUAIS E FINANCEIRAS)** As propostas devem incluir preços opcionais para garantias estendidas (além de 12 meses) ou cobertura de suporte além do período base de 24 meses do contrato?

Esta informação foi atualizada no Termo de Referência para indicar os períodos de suporte desejados.

**(CONDIÇÕES CONTRATUAIS E FINANCEIRAS)** A RNP exige que os Acordos de Nível de Serviço (SLA) sejam anexados como apêndices para cada serviço cotado, ou uma descrição detalhada em XLS é suficiente?

Devem ser anexados com apêndices para cada serviço cotado. Adicionalmente, no XLS, deverá existir o apontamento para essa documentação.

**(SRv6)** O Termo de Referência exige que o protocolo SRv6, mesmo que não seja atualmente suportado pelo fornecedor, deve ser disponibilizado à RNP sem custo adicional caso seja disponibilizado em versões futuras do software. Entendemos que não é mandatório que o equipamento suporte o protocolo SRv6 atualmente, mas é obrigatório que o fabricante garanta que o protocolo estará disponível nas próximas versões (roadmap) até a entrega do equipamento sem custo para a RNP. Está correto nosso entendimento?

O entendimento está parcialmente correto. Embora a funcionalidade SRv6 possa não estar disponível no equipamento no momento da entrega à RNP, ela deverá ser fornecida sem custos adicionais, caso essa funcionalidade seja disponibilizada posteriormente pelo fabricante durante o período em que o equipamento estiver com um contrato de suporte vigente.

**(Gerenciamento)** A falta de plataforma de gerenciamento causará impacto no gerenciamento da rede, visto que o provisionamento manual de recursos causa grande onerosidade da equipe técnica, podendo causar erros, e consequentemente impactando na disponibilidade e qualidade do serviço oferecido. A RNP não considerará a aquisição de uma solução de gerenciamento?

A solução de orquestração e gerenciamento de serviços centralizados será objeto de outro termo de referência, não estando no escopo deste processo.

**(Capacity)** Com relação ao suporte para a quantidade de rotas na Tabela de Roteamento (RIB), quais são os critérios para a aceitação da capacidade máxima de rotas suportadas? Questiona-se este ponto, visto que, em algumas situações, os fabricantes baseiam-se apenas na quantidade de memória presente no sistema, resultando em uma capacidade de rotas que é meramente um número teórico máximo, sem validação em testes reais.

Os requisitos relacionados a RIB e demais funcionalidades técnicas solicitadas neste processo serão confirmados na etapa de laboratório com validações práticas e de interoperabilidade. Portanto, o requisito de rotas na RIB não se trata de um número teórico máximo e sim deve ser garantido na prática. De toda forma, os valores de RIB foram ajustados para os tipos Aggregation e Peering (itens 4.01.08 e 4.01.09).

**(Sobre a RFP)** Quais os requisitos de certificação de equipamentos, normalização e certificados internacionais?

Os requisitos de certificação bem como os equipamentos para os quais estes devem ser apresentados estão especificados no documento XLS de Requisitos e Especificações Técnicas.

**(Sobre a RFP)** O Termo de Referência traz informações sobre a avaliação das propostas, porém não detalha os critérios de SCORE que serão utilizados. É possível informar e detalhar os critérios de avaliação e seleção das melhores propostas?

Estas informações foram atualizadas e adicionadas no Termo de Referência.

**(Sobre a RFP)** O Termo de Referência menciona que os requisitos marcados como opcionais, mas suportados pelo fornecedor, serão uma vantagem competitiva em favor do proponente. Quais os critérios de pontuação para os itens opcionais, ou qual o peso percentual em relação aos itens opcionais versus itens mandatários?

Foi adicionada uma nova seção no Termo de Referência “Proposal evaluation, mandatory and optional technical requirements”, na página 19, que descreve em detalhes essa questão.

**(Treinamento e serviços)** O treinamento deve ser realizado por um centro de treinamento autorizado pelo fabricante? Se sim, o treinamento utilizado deverá utilizar material oficial do fabricante?

Os treinamentos devem ser ministrados pelo fornecedor ou por uma empresa credenciada com instrutores certificados e com experiência comprovada, porém, não necessariamente, o material a ser utilizado deve ser o oficial do fabricante. Independente se o material a ser utilizado é o oficial ou não do fabricante, a ementa do curso deve contemplar os tópicos relacionados a protocolos e funcionalidades desta RFP.

**(Treinamento e serviços)** Quais os principais fabricantes que a RNP possui em sua rede, e que demandará serviços de instalação, configuração lógica, comissionamento e survey?

Atualmente na infraestrutura da RNP contamos com equipamentos Cisco, Huawei e Juniper. Porém, os serviços de instalação, configurações lógicas e demais não devem ser limitados a estes fabricantes, pois também devem contemplar os fabricantes e equipamentos vencedores deste processo de aquisição que está em andamento.

**(FlexE)** O item 3.01.18 exige o suporte ao protocolo FLEX-E v2.1 ou superior para os roteadores CORE, PEERING e UNIVERSAL. O protocolo FLEX-E possui elevada dependência de hardware, não é padronizado e pode causar diversos problemas de interoperabilidade em ambientes com múltiplos fornecedores, como é o caso da RNP. Entendemos que o suporte a FLEX-E será opcional para todos os equipamentos desde que suportem os protocolos de conectividade padrão Ethernet padrão de mercado. Está correto nosso entendimento?

Correto. Este item é um requisito opcional para todos os tipos de equipamentos citados. O documento de requisitos técnicos foi atualizado alterando a versão do Flex-E para 2.0 e dividindo o critério em duas aplicações (3.01.18 e 3.01.19).

**(VXLAN)** O item 15.01 das especificações técnicas traz a exigência de suporte a VXLAN para os roteadores AGGREGATION e UNIVERSAL. O termo de referência menciona o uso de VXLAN apenas para os switches spine e leaf de DATACENTER. O protocolo VXLAN é utilizado exclusivamente para redes locais ou datacenters, não sendo utilizado em redes de transporte e consequentemente em roteadores. Entendemos que o suporte a VXLAN é opcional para todos para os tipos de roteadores, desde que suportem os demais protocolos exigidos e relacionados às suas funções SR (MPLS ou V6, EVPN e outros. Está correto nosso entendimento?

Os requisitos técnicos relacionados a VXLAN foram atualizados para os roteadores do tipo Agregação, Universal e Metro, passando para opcionais.

**(Homologação)** O Termo de Referência menciona a necessidade de laboratórios para validação das informações técnicas. Entendemos que serão aceitos laboratórios remotos do próprio fabricante para realização dos testes de especificações pela RNP. Está correto nosso entendimento?

O entendimento está parcialmente correto. O laboratório de validação será realizado nas dependências do fabricante, juntamente com a equipe da RNP, preferencialmente de forma presencial – caso exista disponibilidade da equipe da RNP.

**Requirements marked as optional, but supported by the supplier, will be a competitive advantage in favor of the bidder. Is there a clear scoring criterion to be taken into consideration during proposal evaluation? Will the competitive advantages of supported optional features be evaluated positively by how much, exactly?**

Yes. There is a clear criterion for the proposal evaluation. The information related to this criterion has been updated in the RFP descriptive document.

**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.**

We understand that bidders may consider at the time of commercial/technical proposal the non-use of the SRv6 protocol by RNP during the contractual term to be signed in case of award. In this case, the proponent would bear the responsibility of providing the integration later and in case of request by RNP for the availability of SRv6 . Nevertheless, they may offer solutions not compatible with SRv6 at the time of this RFP and still not be required to prove compatibility with the protocol for homologation purposes. Therefore, it is concluded that smaller equipment and consequently lower cost, provided compatible with the other requirements listed, may be accepted by RNP, even not supporting any integration to SRv6 in the present time and without real guarantee of future support to the same. There is also a significant change in the technical direction previously disclosed by RNP through the RFI corresponding to the current process, which attested as mandatory several features and functionalities of the SRv6 protocol in the Core, Aggregation, Universal and Metro layers and that become simply optional in this RFP. Is our understanding correct?

It was already answered in the next questions that are similar (or repetitive) with different words.

**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.**

**We understand that all devices must currently support SRv6 and, the ones that cannot currently support it, must provide proof that their chipsets will be able to support SRv6 without the need to change any hardware. Is this understanding, correct?**

Yes, it's correct. A statement about this point was added to the technical specification in the RFP document.

**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. Equipment that do not support SRv6 must provide clear roadmap. Based on this understanding, what is the maximum time that this roadmap can reach (how many months or years)?**

RNP does not intend to deploy an SR-MPLS network in the next months and then change everything to SRv6 shortly thereafter. Therefore, the timeline for this roadmap transition will be no less than 2 years from now. Vendors do not publish committed roadmap statements for 2+ year timeframes. These long-term plans are more about strategic intentions than firm commitments.

**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. What will be the penalty if the proponent cannot support SRv6 in the proposed hardware before the roadmap deadline?**

There will be no roadmap for SRv6. Once the proponent has indicated that a particular equipment meets the SRv6 requirement, the feature must be made available immediately.

**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. If the equipment cannot meet SRv6 requirement would this be a disqualifying item during the homologation?**

All functionalities, whether mandatory or optional, where the proponent indicates that the equipment meets the requirement, will be validated in the laboratory. Failure to meet one or more requirements indicated as compliant will result in the disqualification of the bidder and the equipment.

**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. From our understanding, the competition for this item can be considered unfair since ASIC-based equipment are usually way cheaper than other high-capable ones, and, if at some point, those devices start to support SRv6 protocol, it will have very limited functionalities. Is it possible that the support to SRv6 be considered mandatory once again as stated in RFI or that the requirement of the supplying SRv6 is not placed without any cost? Both understandings would bring a strong commercial and technical balance between the offers.**

There are well known hardware products in the market that support SRv6. The evaluation will consider that. All functionalities indicated in this RFP must be met regardless of the hardware architecture. It is important to emphasize that the requirements outlined in an RFI are not immutable. On the contrary, they are subject to change as part of a broad and exploratory market analysis. The RFI process is designed to inform and refine future procurement strategies, and RNP



reserves the right to adjust its requirements based on the insights gathered. The SRv6 functionality will remain optional.

**"Requirements marked as optional but supported by the vendor will be a competitive advantage in favor of the proponent." Could you clarify or quantify the benefits?**

The information related to this criterion has been updated in the RFP descriptive document.

**"Requirements marked as optional but supported by the vendor will be a competitive advantage in favor of the proponent." Could you explain what the weight of the technical evaluation would be versus the commercial evaluation?**

The commercial evaluation is 88% percent, technical evaluation 10 and RFI the other 2%. A new section was added in the RFP document explaining the evaluation criteria.

**In the chapter "Routers and switches covered in this RFP" in the item "LICENSE MODEL" and in the requirement " 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 is a competitive advantage for the vendor." Could you clarify or quantify the benefits?**

The information related to this criterion has been updated in the RFP descriptive document.

**In the chapter "Routers and switches covered in this RFP" in the item "LICENSE MODEL" and in the requirement " 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." Does this item also comprise feature licenses per port or capacity only?**

All ports should support the same feature list and scales

**"Routers and switches covered in this RFP", which includes equipment to be deployed in international locations, the proposal must ensure that all proposed solutions". Will RNP buy this equipment in FOB and then be responsible for the internalization and payment of taxes in other countries?**

In the case of other countries, where RNP has presence and international connectivity, the acquisition of equipment will be carried out by RNP partner organizations.

**In the chapter "Routers and switches covered in this RFP" in the item "SUPPORT CONTRACT" and in the requirement "For Lot 1, which includes equipment to be deployed in international locations, the proposal must ensure that all proposed solutions". If we are considering US, how do we measure the tariffs to be applied?**

Equipment delivered in the US with taxes included. RNP can only request for tax exemption to import equipment to Brazil.

**In the chapter "Routers and switches covered in this RFP" in the item "SUPPORT CONTRACT" and in the application "All the on-site (local) services mentioned above can be performed in any region of Brazil and also in Miami (United States). If desired, the proponent may specify prices**

separately by region. Is it possible to keep the routers all in Brazil and take only the transmission to Miami?

No. RNP needs routers in every important point of connection from its own network design, plan and strategy. Additionally, RNP plans to expand its international connectivity to other international locations.

In the chapter "Routers and switches covered in this RFP" in the section "INTEROPERABILITY TESTS" and in the application "Interoperability and performance validation must be conducted using the RNP Network Reference Topology, even if the equipment is logically distributed across different physical locations.". The reference topology consists of 21 routers, 14 Switches (metro + DC), and 6 CPEs. Should the POC environment follow these quantities, or is it possible to optimize/reduce this topology? This could reduce costs and homologation duration.

The reference topology provided serves to understand RNP's infrastructure and how the different domains interact. For the homologation environment, a specific topology will be defined with fewer equipment.

We understand that the bidders will be awarded by each lot. In this context, the homologation must be made for all lots or will RNP determine which specific lots should be tested by each supplier/winner?

All equipment covered in this RFP will be validated in the laboratory.

Should we assemble specific test notebooks for all batches? Especially considering if different vendors win different lots, this can be relevant information.

The laboratory testing and validation manual will be defined by RNP, covering all winning manufacturers of this process.

In the chapter "Routers and switches covered in this RFP" in the item "INTEROPERABILITY TESTS" and in the requirement " 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 this case, our understanding is that IP-based tunnels can influence the test results. Is it possible to break the test book into two: POC and INTEROP? Thus, it is possible to perform all functionality and performance tests in the supplier's environment and INTEROP tests locally in RNP's office with a reduced topology that meets RNP's requirements (in this case a minimum INTEROP topology should be defined)?

#### **Understanding of IP Tunnels:**

We recognize that IP tunnels between the vendor's lab and the RNP office can **influence test results**, particularly performance metrics (throughput, latency, jitter, loss), due to encapsulation overhead, effective MTU, Internet path variability, and fragmentation behavior. To preserve measurement fidelity, only interop tests will be done using tunnels if needed. **All the scalability and performance tests must run in the vendor laboratory.**

**Criteria for Using Juniper/Huawei Equipment at the RNP Office (when requested by the vendor):**

Use of the office equipment is **exceptional** and conditioned on the vendor's submission of **objective proof of commercial impediment** (e.g., a letter from a distributor/manufacturer or a formal declaration) that temporarily or definitively prevents access to third-party devices in the vendor's lab. If approved, RNP will provide the local setup for the **specific INTEROP tests**, while all performance testing remains in the vendor's lab.

In the chapter "Routers and switches covered in this RFP" in the item "PROPOSAL EVALUATION" and in the requirement "Vendor or their partner who responded to the RFI within RNP's terms will receive additional scoring in this RFP stage." How can we measure the benefit of having participated in the RFI? Since no official RFI result has been published, what will be the criteria for additional scoring? Will everyone who participated in the RFI receive the same score or will there be differences based on RFI compliance?

There is a defined scoring criterion for RFI participants. This information is contained in the updated version of the process.

**13.01.01.12- BGP Optimal Route Reflection (BGP-ORR) mandatory for CORE, AGG , PEERING.** From our understanding, there are several other methods that can select as better paths from the ingress router to the egress router, such as ADD-PATH, inline RRs or network planning. Moreover, Segment Routing determines the hop-by-hop path also allowing optimal and controllable routing. The IGP cost is only the 8th decision making check in BGP Best Path Algorithm and its more recommended to properly manipulate route selection using more controllable BGP features (communities, Local\_Pref, Weight, MED). Is it possible to convert this item into optional?

The BGP Optimal Route Reflection (BGP-ORR) functionality has been changed from mandatory to optional.

**16.01.02.02.02-RFC 8666 - OSPFv3 Extensions for Segment Routing SR-MPLS doesn't need IPv6 IGP and it's recommended to keep using OSPFv2.** For this scenario, changing IGPs will be too painful and OSPFv2 can completely handle SR-MPLS scenarios. Whether the network evolves to IPV6, our conclusion is that it's better to use SRV6 combined with ISIS. So, is it possible to delete this item?

RNP plans to migrate its IGP to IS-IS with SR-MPLS, as we believe this combination offers greater scalability and operational simplicity for the current scenario. Requirement 16.01.02.02.02 has been changed from mandatory to optional.

**16.01.02.05.02- RFC 8403 - A Scalable and Topology-Aware MPLS Data-Plane Monitoring System.** Is it possible to perform a similar function using BFD in the LSP tunnel entrance? Can this be accepted instead of RFC 8403?

RFC 8403 - A Scalable and Topology-Aware MPLS Data-Plane Monitoring System has been changed from mandatory to optional.

**1.01.02 Maximum height: 2 RU (3.5 inches)**

For a Peering router, would a slightly higher height be acceptable than specified? Current requirement is 2RU. A height of 3RU would be acceptable? The device selected by Huawei to this depth is only 22cm, so it's possible to install 2 routers back-back and occupy only 3RU in a standard 600c, with 19 inches cabinet, with no relevant impact to RNP.

For peering routers, equipment depth less than 300mm is not a relevant consideration. However, lower height equipment (2RU) is preferred for this type of device. Additionally, some commercial datacenters do not permit back-to-back configurations.

**4.01.24 Payload filtering (Layer 7 ACLs) with minimal performance impact**  
 In carriers' application scenarios, Layer 4 filtering is often used. Is it possible to change this item to Layer 4?

No, it's not possible. But item "4.01.24 Payload filtering (Layer 7 ACLs) with minimal performance impact" is optional, not mandatory.

**3.01.17 Network Slicing support with TDM-style bandwidth and jitter guarantees**

**3.01.18 Support for Flex-E version 2.1 or higher**

In order to provide E2E slicing for the services, all layers must support these solutions, or it will not be possible to ensure service SLA in a TDM style in the entire backbone domain. Is it possible to make this item mandatory for peering, metro and CPEs as well?

No. The items mentioned have been changed from mandatory to optional.

From our understanding, each lot will be awarded to only one vendor. Is our understanding correct?

Yes, it is correct.

**8.01.01 Support PTP, including G.8275.1 profile**  
 PTP is much more precise than NTP and normally mandatory in future MVNO or private 5G scenarios that need to carry clock for the eNODEBs. Since RNP is planning 5G initiatives, this protocol will become very important. Can PTP become mandatory in all layers?

According to the technical specifications, PTP is only mandatory in CORE and UNIVERSAL routers. This characteristic will remain unchanged due to RNP's requirements.

SRv6 protocol has better programmability and standardization in IETF is focused on this protocol instead of SR-MPLS. SRv6 is being widely homologated and deployed in Brazil market by the key players (such as VIVO/CLARO/TIM/ALLOha/Petrobras and others) normally in multivendor scenarios. All main vendors have equipment that can support the technology as our experience in carriers biddings all of them consider this item mandatory. Can SRv6 become mandatory as it was in the RFI?

No. Following extensive internal discussions on this subject and consultations with our most advanced peers among high-performance NREs, we have reached a conclusion across all scenarios to postpone SRv6 deployment and adopt SR-MPLS for immediate implementation. The RFI process is designed to inform and refine future procurement strategies, and RNP reserves the

right to adjust its requirements based on the insights gathered. The SRv6 functionality will remain optional.

**NP Processor can provide flexible programmability allowing the evolution to any new protocols that may come without the need to change the hardware in future. Is there any technical advantage to providing more robust Architecture (NP) vs ASIC?**

Each vendor that develops its own in-house chip does so using a certain architecture. All of them claim that theirs is the best. Therefore, it is very complicated to evaluate them objectively. So, this factor will not be considered.

**For smaller Core Routers(type2) is it possible to provide:  
Option 1: 5\*400G + 12\*100G or Option 2: 6\*400G+8\*100G?**

Due to the need for connections between the different network layers of RNP, the CORE type 1 and type 2 equipment must have the minimum characteristics already specified. Therefore, it is not possible to change them.

**Metro Type 1 Routers with 8\*400G would be almost the size of CORE Type 2 and probably will not require so many 400G. Is it possible to accept the following configuration instead? CORE type 2. 8 x 10G/25G, 6 x 100G/400G + 2\* 100G?**

The specifications for different types of devices are not only about the number or capacity of ports; they are also related to hardware and software characteristics and functionalities. METRO devices and CORE devices have totally different characteristics. Therefore, the specifications and equipment types will remain unchanged.

**For cases where 10G/25G ports are requested: the equipment must have 10G ports as mandatory, but the 25G port is optional. Could RNP inform what is the expected technical advantage of having 25G versus 10G?**

If hardware supports 25G ports, it will receive a small extra score.

**As established in the RFP, it is required that the equipment include a factory warranty with a minimum validity of 12 months, in addition to the presentation, in the commercial proposal, of different options for contracting support for the covered equipment. In this context, does RNP expect the proposals to include which support/warranty period options — for example, 1 year, 2 years, 3 years, 5 years, among others? Also, what will be the effective start date for the support contract related to the factory warranty?**

The Request for Proposal (RFP) document has been updated to include this information. Please refer to the Support Contract section for more details.

**As stated in the RFP, Lot 1 (CORE and AGGREGATION) includes equipment to be installed in international locations. The requirement for replacement (partial or full) with equivalent or superior equipment within a maximum of 30 days from the identification of a failure or defect may represent a restrictive factor for the participation of proponents in this RFP, especially those operating with centralized logistics structures outside the United States. In this context, we suggest splitting Lot 1 into two distinct and independent lots: one for the acquisition of**

equipment and services for national use and another for international use. This approach would enhance competitiveness by allowing the participation of qualified vendors who may not have logistical, commercial, and/or regulatory infrastructure in the United States, while also increasing the feasibility of meeting the established deadlines and requirements and mitigating contractual and operational risks.

RNP operates a highly complex, mission-critical backbone that already integrates equipment from multiple vendors. This multivendor environment requires strict architectural and operational consistency to ensure interoperability, stability, and predictable performance across all layers of the network.

The decision to maintain Lot 1 (CORE and AGGREGATION) as a single lot is based on the following technical and operational considerations:

1. **End-to-End Stability and Interoperability**  
The CORE and AGGREGATION layers form the backbone of the RNP network, where uniformity in design, configuration, and support processes is essential. Splitting the lot could introduce heterogeneous operational models, increasing the risk of incompatibilities, performance degradation, and extended troubleshooting times.
2. **Operational Complexity and Risk Mitigation**  
Managing different vendors for national and international segments would significantly increase operational complexity, requiring additional integration, testing, and certification efforts. This could lead to delays in deployment and higher risk of service disruption, which is unacceptable for a backbone that supports critical academic and research services.
3. **Service-Level Commitments**  
The 30-day replacement requirement is aligned with the need to maintain high availability and reliability. While we acknowledge the logistical challenges for vendors without U.S.-based infrastructure, this requirement ensures that international sites—often in strategic research locations—receive the same level of resilience as domestic sites.
4. **Strategic Consistency**  
RNP's long-term strategy prioritizes architectural coherence and simplified lifecycle management. Introducing separate lots would fragment procurement and support processes, undermining these objectives.

For these reasons, Lot 1 will remain consolidated.

As established in the RFP, the use of third-party transceivers by RNP must under no circumstances result in the cancellation or reduction of the factory warranty or support coverage for the equipment. In this regard, we understand that the vendor of one or more lots will not be required to provide technical support or specific warranty for third-party or OEM transceivers that may be installed in the equipment, being responsible only for maintaining the warranty and support of the equipment offered for the respective lot. Considering the interoperability and performance tests specified in the RFP, we suggest that RNP inform, in advance and in a timely manner, the transceiver models that will be used during testing, by lot and equipment type, in order to allow compatibility validation with the proposed devices. Alternatively, we recommend that proponents be allowed to offer third-party

**transceivers, provided that interoperability between these transceivers and the supplied equipment is ensured, in accordance with the requirements set forth in the RFP.**

Your understanding is correct. As established in the RFP, the use of third-party transceivers by RNP must under no circumstances result in the cancellation or reduction of the factory warranty or support coverage for the equipment. Furthermore, the vendor of one or more lots will not be required to provide technical support or specific warranty for third-party or OEM transceivers that may be installed in the equipment, being responsible only for maintaining the warranty and support of the equipment offered for the respective lot. It is also required that full support for the equipment be provided even when a third-party transceiver is installed.

**The RFP requires proponents to submit proposals for support services such as commissioning and configuration, with contracting these services being optional at RNP's discretion. On-site services may take place in any region of Brazil and in Miami (USA), within the scope of Lot 1 (CORE and AGGREGATION), with the option for region-based pricing. However, the requirement for technical support and equipment replacement abroad, combined with the complexity of Lot 1, may limit the participation of vendors without logistical infrastructure in the U.S., impacting deadlines and increasing risks. Therefore, we suggest dividing Lot 1 into two independent lots: one for national use and another for international use.**

RNP operates a highly complex, mission-critical backbone that already integrates equipment from multiple vendors. This multivendor environment requires strict architectural and operational consistency to ensure interoperability, stability, and predictable performance across all layers of the network.

The decision to maintain Lot 1 (CORE and AGGREGATION) as a single lot is based on the following technical and operational considerations:

5. **End-to-End Stability and Interoperability**  
The CORE and AGGREGATION layers form the backbone of the RNP network, where uniformity in design, configuration, and support processes is essential. Splitting the lot could introduce heterogeneous operational models, increasing the risk of incompatibilities, performance degradation, and extended troubleshooting times.
6. **Operational Complexity and Risk Mitigation**  
Managing different vendors for national and international segments would significantly increase operational complexity, requiring additional integration, testing, and certification efforts. This could lead to delays in deployment and higher risk of service disruption, which is unacceptable for a backbone that supports critical academic and research services.
7. **Service-Level Commitments**  
The 30-day replacement requirement is aligned with the need to maintain high availability and reliability. While we acknowledge the logistical challenges for vendors without U.S.-based infrastructure, this requirement ensures that international sites—often in strategic research locations—receive the same level of resilience as domestic sites.
8. **Strategic Consistency**  
RNP's long-term strategy prioritizes architectural coherence and simplified lifecycle management. Introducing separate lots would fragment procurement and support processes, undermining these objectives.



For these reasons, Lot 1 will remain consolidated. However, RNP encourages proponents to explore partnerships or local stocking strategies to meet SLA requirements, as these measures have proven effective in previous projects within our multivendor environment.

**For the purpose of preparing the commercial proposal in a more accurate manner and with the aim of mitigating potential risks that could compromise the viability of the project at a later stage, we kindly request that RNP inform which locations within Brazilian territory should be considered for each of the following items: remote services, on-site services, local commissioning (per equipment), and local site survey (per region). We also request clarification on whether a minimum quantity of equipment per location or region is foreseen, and what is the estimated average number of equipment units to be acquired per location.**

The following items — remote services, on-site services, local commissioning (per equipment), and local site survey (per region) — should include the state capitals of Brazil and their respective metropolitan areas.

Regarding the minimum quantity of equipment per location or region, we inform that there is no predefined minimum quantity. The distribution will be based on project needs and may vary among locations – according to the device quantities specified in this RFP.

**Those services refer exclusively to the provision of services and are segregated from the other lots that involve the supply of equipment. Based on the current wording, it is understood that all implementation and technical support services may be executed by the vendor awarded Lot 7, who would be responsible for implementing the equipment supplied by any other vendor awarded Lots 1 to 6. Considering the operational, technical compatibility, and coordination risks among different manufacturers and service providers that this approach may pose to RNP, we recommend that the pricing and responsibility for services by the proponent be interpreted by lot, equipment type, and independently, in accordance with the defined scope. This would help ensure greater accuracy in cost estimation, as well as the proper technical capacity and specialization of services for each respective equipment.**

Lot 7, designated for service provision, will remain responsible for supporting all equipment supply of lots (Lots 1 to 6). The proposed fragmentation of service execution by equipment type will not be implemented, as such an approach would compromise the assurance of interoperability among the different manufacturers awarded in the bidding process. Centralizing implementation and technical support activities under a single provider is essential to ensure full solution integration, operational compatibility across components, and the mitigation of risks related to technical coordination. This strategy aims to guarantee standardized procedures, consistent installation practices, and efficient incident management, thereby preserving the quality and reliability of RNP's operational environment.

**According to the current wording of the RFP, we understand that bidders may submit proposals with equipment that, at the time of submission, is not compatible with the SRv6 protocol, provided that all other technical requirements are met. Furthermore, such equipment would not be required to demonstrate SRv6 compatibility for homologation purposes, even if it does not currently support the protocol or offer a future support guarantee. This interpretation allows for the acceptance of lower-cost, smaller-scale solutions. We also highlight a change in technical**



**direction compared to the previous RFI, which defined SRv6 support as mandatory for the Core, Aggregation, Universal, and Metro layers — a requirement that is now treated as optional in this RFP. In this context, we request confirmation that any eventual need for SRv6 integration, if required by RNP during the contract period, will be the responsibility of the supplier, and whether equipment that does not currently support SRv6 may still be considered technically qualified in the test evaluation.**

The SRv6 functionality is related to software evolution and not hardware evolution. Therefore, hardware replacements will not be accepted to incorporate SRv6 functionality into the same equipment in the future. Regarding this observation, it was added a mandatory requirement “16.01.01.25 - Proven hardware support for SRv6 (all features listed in this SRv6 section)”.

We appreciate your observation and would like to clarify that the change regarding SRv6 support reflects precisely the purpose of an RFI — that is, to allow RNP to assess different technical approaches available in the market without prematurely narrowing the solution to a specific technology.

This decision was not based solely on discussions with equipment manufacturers but also involved consultations with several other companies operating in the same segment. These broader engagements provided RNP with a comprehensive view of current market practices, technological maturity, and strategic directions.

It is important to emphasize that the requirements outlined in an RFI are not immutable. On the contrary, they are subject to change as part of a broad and exploratory market analysis. The RFI process is designed to inform and refine future procurement strategies, and RNP reserves the right to adjust its requirements based on the insights gathered.

Ultimately, it is RNP’s responsibility to determine what is technically and strategically aligned with its long-term goals. Should SRv6 integration be required during the contract period, this need will be addressed according to the contractual terms established, and may involve adaptations or upgrades by the supplier, as agreed.

**Could you please confirm whether the topology presented in the file referring to the network layers reflects the current infrastructure scenario of RNP, or if it represents the architecture planned after the implementation of the new solution? Additionally, we kindly request, if possible, the sharing of complementary information that clarifies any differences between the current and future topology, particularly regarding changes in interconnections, points of presence, and types of equipment involved in the implementation phases. This information is essential for the proper estimation of service costs during the proposal preparation phase.**

The reference topology represents RNP's vision and planning for its future network. RNP reserves the right not to share other information requested.

**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. Considering the possibility of different vendors being selected for the various lots, we request clarification regarding the specified “management” requirements, such as NETCONF, RESTCONF, ZTP (Zero Touch Provision), among others. Are these functionalities intended for integration with an existing centralized management solution already adopted by RNP (if so, which solution), or is the provision of a new management solution included in the scope of this procurement, comprising all necessary components for its operation, such as hardware, software, and licensing?**

The specifications related to the mentioned protocols are defined in the technical requirements of the process. These protocols will be used for integration with RNP's monitoring and automation systems. The acquisition of a centralized service orchestration and management solution will be the subject of another process document and is not within the scope of this process.

**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. Could you inform how many new devices are expected to be added to the network and how many legacy devices are planned to be replaced? Additionally, would it be possible to provide a breakdown of the number of ports per device that will be replaced?**

Estimated quantities to be acquired are informed in the RFP document (both English and Portuguese). RNP reserves the right not to share other information requested.

**Could you please confirm whether the Spine-Leaf architecture is already implemented in RNP's network? If so, which manufacturer's equipment is currently in use? In the event of a change in manufacturer, are migration services planned? Will these services be carried out in a single phase or progressively, in multiple stages?**

RNP has a specific case of spine-leaf deployment. RNP reserves the right not to share other information requested.

**In the event of a new network deployment, will the planning and execution of the migration be the responsibility of the bidder? Could you provide the estimated number of devices that should be considered for this service?**

The planning and execution of the migration will be the responsibility of the contracted party, as outlined in the scope of the agreement. The quantities to be considered are presented in the RFP and should be used as a reference for sizing. Please note that these quantities do not represent a purchase guarantee but serve as an estimate that can be used as a guideline for your proposal.

**Will the replacement of equipment be carried out by directly removing the existing devices, or by installing the new equipment in parallel with a gradual migration of services and ports? Will the current configuration be maintained, or is the implementation of new protocols and services planned? If so, could you please specify which ones?**

The equipment replacement will be carried out in a gradual and well-planned manner, in collaboration with the contracted company, following the reference topology previously defined. During this process, the new equipment will be installed in parallel, allowing for a progressive migration of equipment's, services and ports.

Additionally, the implementation of new protocols and services is planned, aligned with best practices and the current infrastructure requirements. This approach aims to ensure greater efficiency, security, and scalability of the network.

**What are the permitted days of the week and time windows for carrying out equipment migration activities? Additionally, what is the maximum number of devices that can be migrated within a single maintenance window?**

Activities may be carried out from Monday to Saturday, provided that:

- They are previously planned and duly authorized by RNP.
- Downtime windows must occur outside business hours and at a time that meets the local Point of Presence (PoP) requirements, considering that certain periods may involve high-impact events.

Conditions for Migration Execution:

- Migration, whether partial or total, may take place as long as all risks are mapped.
- The entire process must be planned with the approval of the RNP engineering team.

Maximum Number of Devices per Maintenance Window:

There is no fixed number defined, as this will depend on approved planning and risk assessment. The priority is to ensure service continuity and minimize impacts.

**Will SR-MPLS and SRv6 be implemented during the network migrations and expansions planned under this procurement, or only at a later stage?**

RNP plans to implement SR-MPLS at the time of commissioning the new devices.

**Are the hardening policies already defined by RNP for application to the new equipment, or will it be necessary to plan and define these policies during the project phase?**

RNP has established hardening policies in place.

**Which automation solutions and protocols are currently in use at RNP, including those related to network configuration, provisioning, and monitoring?**

RNP reserves the right not to answer this question as it contains internal information. The protocols for management, monitoring, and automation related to RNP's network evolution are listed as technical requirements of this RFP.

**Which protocols are currently in use for integration with the Source of Truth tool adopted by RNP? We kindly request a detailed explanation of the plan for integrating device configurations**

and commissioning processes with RNP's existing automation systems and Source of Truth database, particularly considering the potential diversity of equipment vendors and models to be supplied.

RNP has its own Source of Truth system and integration guidelines for integrating equipment to this system will be provided by RNP. This integration involves registering the equipment, its characteristics, and services in the SoT platform.

**Could you clarify which activities are included in the scope of the commissioning phase? Does this phase also include the migration of the existing cabling, if necessary?**

The connection of optical cables or cords to the equipment is part of the scope and responsibility of the CONTRACTED PARTY.

**How does RNP's technical team — particularly the engineering team responsible for defining the network topology and infrastructure requirements — plan to collaborate with and provide support to the CONTRACTED PARTY during the remote and on-site configuration phases, commissioning, and inspections? Given that these activities require in-depth knowledge of RNP's environment, will this collaboration be formalized and included in the service planning?**

Yes, it will be formalized and all the information needed to enable the execution of these activities will be supplied by RNP to the contracted party through an NDA. The collaboration will be formally documented as part of the service planning, establishing clear communication channels, escalation procedures, and technical support protocols. All necessary technical documentation, network specifications, and operational procedures will be shared with the contracted party under appropriate confidentiality agreements to ensure successful project execution while maintaining information security standards.

**How will RNP define the scope and need for training of its technical team, considering that such requirements may vary depending on the equipment provided in each lot? Additionally, how will these training needs be communicated to the CONTRACTED PARTY of Lot 7, given that it must submit training proposals, but RNP is not obligated to acquire them?**

The commercial proposal template has been updated to include pricing for training lots and equipment roles. Training will be carried out on demand by RNP, according to its needs, through LPU to be generated.

**Considering that the acquisition of training by RNP is not mandatory, and that customized training content may be requested, with the right to use the provided materials internally, could you clarify how the request and contracting process for such training will be conducted? Will there be defined criteria to evaluate the quality of the proposed content, materials, and instructors, in order to ensure that the training meets RNP's technical needs and represents an effective investment in staff development?**

The requirement for certified instructors with a minimum of four years of experience, combined with the option to conduct training at the vendor's or partner's site, provides a baseline for evaluating the quality of the training. These criteria ensure that the instructors are not only qualified but also familiar with the operational and technical standards expected by RNP.

**Given the requirement that the practical portion of the training preferably be conducted using the same equipment offered in the proposal, or devices with similar functionality and syntax, will RNP require the supplier to provide dedicated lab environments for each equipment lot acquired, especially considering the diversity of switch and router models involved? Additionally, how will RNP verify or audit compliance with this requirement?**

RNP requires that the training must be conducted, preferably, with the same family/series of equipment provided in the RFP, and not necessarily the exact same equipment models. The laboratory to be provided for the training must include a physical and logical topology that meets the requirements of the curriculum to be defined by RNP, but not necessarily a dedicated laboratory for each type of equipment. RNP will verify compliance with this requirement through evaluation of the proposed curriculum alignment with the specified technical requirements, as well as accessing the lab environment.

**How should the bidder approach the creation of configuration templates that ensure compatibility across different hardware and software platforms, while maintaining the standardization required by RNP and ensuring efficiency in the deployment and maintenance of these templates in a heterogeneous environment?**

RNP will provide information related to policies, definitions, and configuration standardizations. It is the contracted party's responsibility to translate and apply these guidelines according to the type and model of equipment and its configuration syntax.

The contracted party must ensure that the configuration templates maintain functional equivalence across all platforms, even when the underlying syntax differs between vendors. This approach will enable RNP to maintain unified network policies and operational procedures regardless of the heterogeneous nature of the equipment deployed throughout the infrastructure.

**Given the nature of the services in Batch 7, which encompass remote logic configuration and configuration templates, local logic configuration (on-site), local commissioning (on-site) and local technical survey (site survey), and the requirement that the CONTRACTOR's technical staff for this batch have in-depth knowledge of the software and hardware in question for the services to be fully applicable to equipment from any manufacturer, this requirement should not be met with restrictions. Although RNP will conduct interoperability tests that may include interaction with third-party equipment from other manufacturers (such as Juniper and Huawei), it would not be more efficient and less prone to compatibility and expertise risks if the responsibility for performing these implementation and support services were assigned to the technical partners of the winning manufacturers of each of the equipment supply lots (Lots 1 to 6). Since these partners must already prove to be qualified by their respective vendors in Brazil and have experience and in-depth technical knowledge in the implementation of the specific solutions they will provide?**

It was already answered in the previous questions.

**How does the Company ensure a consistent and high-quality standard in the provision of services (configuration, commissioning) for all equipment, regardless of the manufacturer or the complexity of the platform?**

RNP is interested in contracting configuration and commissioning services that are vendor-agnostic, so that it can meet the requirements regardless of the vendor and platform - since RNP's network is, by nature, multi-vendor. For this purpose, the contracted company must have knowledge, whether through its own staff or third parties, across different platforms.

To ensure consistent and high-quality service delivery across all equipment manufacturers and platform complexities, the contracted company must demonstrate comprehensive expertise spanning multiple vendor ecosystems. This includes maintaining certified technical personnel with hands-on experience in various network platforms, establishing standardized operational procedures that can be adapted to different vendor syntaxes while maintaining functional consistency, and implementing quality assurance processes that verify compliance with RNP's technical requirements regardless of the underlying hardware or software platform.

The company should also maintain partnerships or subcontracting arrangements with specialized technical resources when needed to ensure complete coverage of all platforms present in RNP's multi-vendor environment, guaranteeing that service quality remains uniform across the entire network infrastructure.

**How will the CONTRACTED PARTY approach the creation of universally compatible configuration templates that can be applied in various hardware/software platforms, maintaining standardization and efficiency, according to RNP standards?**

It was already answered in the previous questions.

**Detail the plan to integrate the configurations and commissioning processes with RNP's existing automation and 'Source of Truth' systems, considering the diversity of equipment?**

RNP has its own Source of Truth system and integration guidelines for integrating equipment to this system will be provided by RNP. This integration involves registering the equipment, its characteristics, and services in the SoT platform.

**As the internal team of RNP (especially the engineering team, which defines the topology and infrastructure requirements) Do you plan to collaborate with and support Lot 7 CONTRACTED during the remote and local configuration, commissioning and survey phases? This is crucial for remote and local logic configurations and commissioning, which require deep knowledge of RNP's environment and must integrate with its automation and "Source of Truth".**

All the information needed to enable the execution of these activities will be supplied by RNP to the contracted party through an NDA. However, it is the contracted party's responsibility to execute the configuration, commissioning, and survey activities, reporting progress to RNP, and ensuring compliance with the requirements.

RNP's internal team, particularly the engineering team that defines topology and infrastructure requirements, will provide the necessary technical specifications, documentation, and guidance to support the contracted party's work.

While RNP will make available all required technical knowledge and maintain open communication channels for clarifications and support, the contracted party remains fully accountable for the successful execution of all configurations, commissioning, and survey phases. The contracted party must demonstrate the capability to interpret RNP's requirements, implement configurations according to specifications, integrate with existing automation and Source of Truth systems, and provide regular progress reports to ensure project milestones are met and technical requirements are fulfilled.

**How will RNP define the need for training its technical team, which may vary between lots, and how will the communication be to the Lot 7 CONTRACTED PARTY, since it must offer training proposals, but RNP "will not necessarily acquire such training"?**

There is no specific communication plan for Lot 7 in this regard. The CONTRACTED PARTY may submit training proposals, but RNP will evaluate them on demand, considering criteria such as technical relevance, cost-effectiveness, and alignment with project goals. This means that offering training does not imply automatic acquisition by RNP.

**Since RNP "will not necessarily acquire" the trainings and may request customized content, reserving the right to copy the material for internal use, how will the process of requesting and hiring these customized trainings be, and how will RNP evaluate the suitability and quality of the content and instructors for their specific needs, ensuring that the investment is effective for the training of their technical staff?**

As with other items in the RFP, an LPU will be generated for the services lot, and RNP will contract the training according to its needs, considering criteria such as technical relevance, cost-effectiveness, and alignment with project goals. This means that offering training does not imply automatic acquisition by RNP.

**Regarding the requirement that the practical part of the training is preferably with the same equipment as the proposal or with similar functionalities and syntax, will RNP require the supplier to guarantee the availability of specific laboratory environments for each batch of equipment purchased, given the diversity of types of routers and switches? How will it be audited?**

RNP requires that the training must be conducted, preferably, with the same family/series of equipment provided in the RFP, and not necessarily the exact same equipment models. The laboratory to be provided for the training must include a physical and logical topology that meets the requirements of the curriculum to be defined by RNP, but not necessarily a dedicated laboratory for each type of equipment.

RNP will verify compliance with this requirement through evaluation of the proposed curriculum alignment with the specified technical requirements, as well as accessing the lab environment.



**According to the document RNP - RFP RS - TERMS OF REFERENCE - Routers and Switches - Rede Ipê – Conecta, under the Site Survey section – We understand that if there are multiple sites/equipment in the same location/city, we will be able to optimize the inspection and thus reduce costs in order to present our best commercial offer. Please confirm our understanding.**

Yes, it's correct.

**According to the document RNP - RFP RS - TERMS OF REFERENCE - Routers and Switches - Rede Ipê – Conecta, under Supplies/Materials – We understand that for the surveyed sites, both the racks for accommodating the equipment and the power PDUs will already be installed in these racks, and it will be the client's responsibility only to connect the PDU to the equipment that will be provided later. Please confirm our understanding.**

Yes, it's correct, but the PROPONENT must provide power cable with Brazilian ABNT NBR 14136 plug.

**According to the document RNP - RFP RS - TERMS OF REFERENCE - Routers and Switches - Rede Ipê – Conecta, under Supplies/Materials – Once the site survey is completed, who will be responsible for providing the supplies/materials required for the proper installation and activation of the equipment?**

Major changes to RNP facilities are the responsibility of RNP. Miscellaneous items (screws, velcro, organizers, etc) are the responsibility of the contracted party.



**According to the document RNP - RFP RS - TERMS OF REFERENCE - Routers and Switches - Rede Ipê – Conecta, under Services – Will both the installation and configuration activities of the equipment take place during business hours, Monday to Friday, from 08:00 to 18:00? Please confirm our understanding.**

Installation must be done during business hours. Configuration could be done at any time before the equipment is connected to the RNP network. Activation should be performed in maintenance windows to be scheduled at non-business hours.

**According to the document RNP - RFP RS - TERMS OF REFERENCE - Routers and Switches - Rede Ipê – Conecta, under the section Requirements to participate in this RFP, it states: “The proponent, if not the vendor itself, must provide evidence to RNP that they are qualified by the vendor for this project.”. Our understanding is that providing a manufacturer’s letter confirming this partnership fulfills the requirement for proof. Is our understanding correct?**

The vendor's letter should establish both the partnership relationship and confirm the technical qualification to represent the vendor for this RNP project.

**According to the document RNP - RFP RS - TERMS OF REFERENCE - Routers and Switches - Rede Ipê – Conecta, under the section Requirements to participate in this RFP, it states: “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.”. What type of confirmation/evidence does RNP expect to receive in this case? Could you please clarify?**

Public release notes, public articles, letters from real customers are some examples of documentation to be provided.

**According to the document RNP - RFP RS - TERMS OF REFERENCE - Routers and Switches - Rede Ipê – Conecta, under the section Requirements to participate in this RFP, it states: “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.” With regard to interoperability, could you please clarify what specific deliverables are expected in this context, considering that the list of vendors and products from other manufacturers can be extremely broad? Our understanding is that we can only commit to the equipment and products for which we are selected under each lot. In cases where a given lot is awarded to another bidder, any related interoperability testing should fall under the responsibility of that respective bidder. Could you please confirm if this understanding is correct?

**Understanding of IP Tunnels:**  
We recognize that IP tunnels between the vendor’s lab and the RNP office can **influence test results**, particularly performance metrics (throughput, latency, jitter, loss), due to encapsulation overhead, effective MTU, Internet path variability, and fragmentation behavior. To preserve measurement fidelity, only interop tests will be done using tunnels if needed.

**All the scalability and performance tests must run in the vendor laboratory.**

**Criteria for Using Juniper/Huawei Equipment at the RNP Office (when requested by the vendor:**  
Use of the office equipment is **exceptional** and conditioned on the vendor’s submission of **objective proof of commercial impediment** (e.g., a letter from a distributor/manufacturer or a formal declaration) that temporarily or definitively prevents access to third-party devices in the vendor’s lab. If approved, RNP will provide the local setup for the **specific INTEROP tests**, while all performance testing remains in the vendor’s lab.

Each vendor will be responsible for the interoperability of their equipment with other vendors in the laboratory.

**According to the document RNP - RFP RS - TERMS OF REFERENCE - Routers and Switches - Rede Ipê – Conecta, under Item 4.01.05 – Support for more than 50,000 simultaneous stateless filters (including BGP FlowSpec)**

**Technical Justification:**

- The intensive use of filters (stateless ACLs) at this scale is more common in security edge layers or in data center infrastructures with complex segmentation, and is not typically required in metro aggregation or transport layers.
- In well-distributed and optimized architectures, the application of filters tends to be more efficient and centralized, resulting in significantly lower volumes of active filter terms per device.

- Additionally, BGP FlowSpec, although relevant, is primarily used in specific DDoS mitigation scenarios, with short-duration policies focused on centralized mitigation devices.

**Technical Recommendation:**

We suggest adjusting the requirement to a minimum support of 10,000 simultaneous stateless filters, a value more consistent with market practices for high-performance aggregation equipment, thus ensuring greater competitiveness in the bidding process. Is our understanding correct?

No, understanding is not correct. The aggregation layer in the context of RNP's reference topology is a PE (provider edge) router for the RNP's ASN.

According to the document RNP - RFP RS - TERMS OF REFERENCE - Routers and Switches - Rede Ipê – Conecta, under Item 4.01.08 – Support for at least 40 million routes in the RIB,

**Technical Justification:**

- The requirement for 40M routes in the RIB (Routing Information Base) is more aligned with backbone or international peering routers and is not a common practice for the aggregation layer.
- In service provider networks and large enterprise environments, the number of RIB routes in aggregation equipment typically ranges between 2 million and 16 million, even in scenarios with multiple services, VPNs, and overlays.
- The current requirement may limit the participation of technically adequate solutions without delivering real scalability benefits for the aggregation layer.

**Technical Recommendation:**

We propose adjusting the requirement to support at least 16 million routes in the RIB, which ensures full operation even in networks with high service volumes, multiple tenants, and redundancy. This adjustment would also promote greater competitiveness in the process. Is our understanding correct?

No, understanding is not correct. The aggregation layer in the context of RNP's reference topology is a PE (provider edge) router for the RNP's ASN. But, RNP reviewed this requirement, lowering the mandatory scalability to 20M routes. The items 4.01.08 and 4.01.09 were updated.

**According to the document RNP - RFP RS - TERMS OF REFERENCE - Routers and Switches - Rede Ipê – Conecta, under Item 4.01.13 – Support for at least 5 million routes in the FIB,**

**Technical Justification:**

- **The FIB (Forwarding Information Base) contains the routes programmed in hardware for packet forwarding, and in aggregation networks, this volume rarely exceeds 2M to 3M routes, even in dense environments with multiple services and customers.**
- **A threshold of 5M FIB routes is more consistent with IP core equipment or global interconnection environments.**
- **Maintaining excessively high values may restrict solutions that are widely tested and used by major operators, without any practical impact on the expected performance.**

**Technical Recommendation:**

**We suggest reducing the requirement to a minimum of 3 to 4 million routes in the FIB, a value aligned with real-world usage scenarios while still ensuring sufficient headroom for network and service growth. This adjustment would also promote greater competitiveness in the process. Is our understanding correct?**

No, understanding is not correct. The aggregation layer in the context of RNP's reference topology is a PE (provider edge) router for the RNP's ASN. Additionally, RNP seeks to ensure the longevity and long-term viability of the solution being acquired.

**According to the document RNP - RFP RS - TERMS OF REFERENCE - Routers and Switches - Rede Ipê – Conecta, under Item 4.01.21 – Support for at least 256,000 MAC addresses**

**Technical Justification:**

- The MAC address learning capacity is directly related to the number of hosts and Layer 2 services within the broadcast domain. In modern architectures based on VXLAN-EVPN, the use of Layer 2 segments is often limited or distributed to avoid large MAC domains.
- Current datacenter solutions employ techniques such as:
  - Separation of broadcast domains (BDs);
  - ARP suppression and ND proxy;
  - MAC mobility control via BGP.
- Furthermore, values around 160,000 MAC entries are generally considered sufficient to:
  - Support multi-tenant environments with hundreds of VLANs;
  - Accommodate distributed Layer 2 workloads with redundancy;
  - Operate with switches acting as hardware VTEPs in overlay infrastructures.

**Additional Note:**

- In VXLAN-EVPN solutions using BGP as the control plane, host MAC addresses are not only learned in the data plane through traditional flooding, but rather advertised and synchronized between devices in a scalable manner via BGP, as defined in RFCs 7432 and 8365.
- This model reduces the heavy reliance on dynamic MAC tables within switches, since control becomes distributed and based on controlled MAC/IP route advertisements, optimizing memory usage and improving operational predictability.

**Technical Recommendation:**

We suggest adjusting the requirement to a minimum support of 160,000 MAC addresses, in line with modern EVPN-BGP and VXLAN architecture practices, without compromising the network's operational capability, thereby ensuring greater competitiveness in the bidding process. Is our understanding correct?

The RNP agrees with the suggestion. The number of MACs requested in item 4.01.21 has been updated in the technical specification to 128.000.

According to the document RNP - RFP RS - TERMS OF REFERENCE - Routers and Switches - Rede Ipê – Conecta, under Item 14.01.01 – LDP

**Technical Justification:**

- The use of LDP (Label Distribution Protocol) has been losing relevance in datacenter architectures, being replaced by technologies such as:
  - EVPN/MPLS for segmented transport with MAC control;
  - VXLAN-EVPN for overlay networks with L2/L3 segmentation;
  - Segment Routing as the natural evolution of MPLS signaling.
- In datacenter environments, the use of LDP is rare or nonexistent, being more common in service provider backbones, pure MPLS networks, or legacy scenarios.
- Requiring LDP support for all types of datacenter layer switches could restrict the adoption of platforms designed for modern environments based on IP overlays and distributed control planes.

**Technical Recommendation:**

We propose changing the requirement from “mandatory support” to “optional or desirable support” for MPLS LDP, allowing greater flexibility in selecting switches aligned with current datacenter and SDN architectures, thereby ensuring greater competitiveness in the bidding process. Is our understanding correct?

RNP agrees with the suggestion. LDP for datacenter has been changed from mandatory to optional.

According to the document RNP - RFP RS - TERMS OF REFERENCE - Routers and Switches - Rede Ipê – Conecta, under *Warranty*: Additionally, software update files must be provided, and it must be possible to open support tickets with the vendor for software-related issues, such as bug fixes. Support will be provided as long as RNP maintains an active support contract.

RNP appreciates the information.

According to the document RNP - RFP RS - TERMS OF REFERENCE - Routers and Switches - Rede Ipê – Conecta, under *Warranty*: If a functionality failure or defect is identified in either the

hardware or software of the equipment that cannot be corrected by the supplier/manufacturer, the equipment must be replaced (partially or completely) with equivalent or superior equipment at no cost to RNP, within a period not exceeding 30 days from the confirmation of the failure or defect. After the standard 12-month warranty period, RNP must maintain an active support contract to ensure the continuity of these services.

RNP appreciates the information.

According to the document RNP - RFP RS - TERMS OF REFERENCE - Routers and Switches - Rede Ipê – Conecta, under Warranty: It is highly desirable that, even after the end of the factory warranty, GA software update files remain available, even if the equipment does not have an active support contract. After the warranty period, RNP must maintain an active support contract to continue receiving software support.

It is highly desirable, but it is not mandatory.

According to the document RNP - RFP RS - TERMS OF REFERENCE - Routers and Switches - Rede Ipê – Conecta, under *Support Contract*: The support start date will be agreed upon later between RNP and the supplier. Therefore, the supplier must not assume that the support start date will coincide with the delivery date to RNP.

Regarding this matter, after the purchase order is placed with the manufacturer, the vendor has a maximum period of up to **180 days** to initiate the equipment support contract. For example, if the equipment takes **100 days** to be delivered after purchase, RNP will still have **80 days** remaining to start the support for the equipment in question. This start date may be agreed upon to occur earlier; however, under no circumstances shall this period exceed **180 days**.

Ps.: Once the contract has been activated, it will not be possible to make any changes to the dates.

The proponent (the vendor or its partner) should provide RNP with a delay option to start the support contract of at least 90 days after delivering the equipment to RNP.



According to the document RNP - RFP RS - TERMS OF REFERENCE - Routers and Switches - Rede Ipê – Conecta, under *Support Contract*: 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 compliant with the operational, regulatory, and logistical requirements applicable to each deployment site. Regarding this point, we understand that the locations is MIAMI? For these location, provided there is an active support contract or the equipment is within the warranty period active, support will be provided directly by the respective manufacturer.

Miami (USA) is the confirmed international location where RNP will require equipment installation. There are additional potential locations in the USA and Western Europe currently under internal analysis, but there are no committed deployment plans for these sites.

According to the document RNP - RFP RS - TERMS OF REFERENCE - Routers and Switches - Rede Ipê – Conecta, under *Support Contract*: While the support contract is in effect, even if its term exceeds one year, there should be no price adjustments. Regarding the initial period, our recommendation is that it should be at least 36 months to take advantage of additional discounts for longer contract terms and to ensure better contract management. Is our understanding correct?

The information regarding support periods has been updated in the RFP descriptive document.

According to the document RNP - RFP RS - TERMS OF REFERENCE - Routers and Switches - Rede Ipê – Conecta, under *General Requirements*: All the on-site services mentioned above can be performed in any region of Brazil as well as in Miami, United States. If desired, the proponent may provide prices broken down by region.

Would it be possible for you to provide us with an estimated quantity of supply per LOT and per region? This information is necessary for us to have a more realistic perspective aligned with RNP's expectations and to help us streamline the commercial proposal.

Regarding the estimated quantity of equipment per location or region, we inform that there is no predefined quantity. The distribution will be based on project needs and may vary among locations – according to the device quantities specified in this RFP.

According to the document RNP - RFP RS - TERMS OF REFERENCE - Routers and Switches - Rede Ipê – Conecta, under *Interoperability Tests*: 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. At this stage, which is scheduled to take place between October 13 and October 31, 2025, will RNP perform tests with more than one vendor from the same lot, or only with the single vendor selected for that lot? RNP will call upon the top 3 vendors with the best commercial positions from each lot, considering only those that are technically approved and meet the mandatory requirements.

Additionally, we understand that between September 22 and September 26, 2025, individual meetings will be held with the bidders to review the technical and commercial proposal details and address any questions. However, it is not clear when RNP will announce which vendor has been shortlisted to proceed to the testing phase. Could you please clarify?

RNP will send an email to the vendors with the best evaluated proposal considering the commercial proposal with all the mandatory requirements, optional requirements and RFI participation using the criteria defined in the section “Proposal evaluation, mandatory and optional technical requirements”. It will happen as soon as RNP finishes the proposals analysis.

According to the document RNP - RFP RS - TERMS OF REFERENCE - Routers and Switches - Rede Ipê – Conecta, under *Interoperability Tests*: 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 these tests are 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 types of tests — including travel, accommodation, technical support, and any other related expenses — must be fully covered by the vendor. Regarding this matter, what criteria will RNP use to determine where each test will be conducted? For example, if Vendor A is awarded Lot 1 and Vendor B is awarded Lot 2 or Lot 3, how will the interoperability tests be coordinated and how will the related logistical aspects specified in the RFP be addressed? Additionally, for budgeting purposes, how many members of the RNP engineering team will be involved in this phase?

We propose dividing the test book into two complementary modules:

1. **POC – Functionality and Performance (vendor's laboratory):**  
Full execution of functionality tests and **all performance tests** in the vendor's controlled lab environment, with no IP tunnels carrying measurement traffic. Reference methodologies may include established standards (e.g., RFC 2544/RFC 2889/RFC 6349, ITU-T Y.1564), with traffic generators/analyzers **directly connected** to the device under test (DUT).
2. **INTEROP – Interoperability (vendor's laboratory, if a possible connection to RNP' office if needed):**  
Vendor must have available equipment from other vendors at its laboratory (at least one vendor from the global, well known, player in the market). Execution of **specific interoperability cases only** with the Juniper and Huawei equipment available at the RNP office, using a minimum topology that satisfies the RFP's interoperability requirements. **This local INTEROP block will be triggered only if the vendor provides formal and documented evidence of a commercial impediment** preventing the availability/use of third-party equipment in the vendor's lab. In the absence of such evidence, interoperability must be performed entirely in the vendor's lab, **without** reliance on IP tunnels.

**Criteria for Using Juniper/Huawei Equipment at the RNP Office (when requested by the vendor):**  
Use of the office equipment is **exceptional** and conditioned on the vendor's submission of **objective proof of commercial impediment** (e.g., a letter from a distributor/manufacturer or a formal declaration) that temporarily or definitively prevents access to third-party devices in the vendor's lab. If approved, RNP will provide the local setup for the **specific INTEROP tests**, while all performance testing remains in the vendor's lab.

Up to 2 members of the RNP engineering team will be involved in the homologation activities.

Conforme o documento Contrato Padrão de Fornecimento e Manutenção de Preço Equipamentos\_2021, foi realizada análise pelo nosso Jurídico, baseando-se em outros contratos firmados com esta instituição, e foi notado que o mesmo se encontra em desconformidade com

as cláusulas padrões ajustados pelas partes em parcerias anteriores. Sendo assim, antecipamos a solicitação, e recomendamos a inclusão/alteração dos seguintes termos:

**1) Incluir cláusula de limitação de responsabilidade: "Em hipótese alguma as PARTES, seus prepostos e empregados serão responsáveis perante qualquer pessoa, incluindo a outra PARTE, por danos indiretos, punitivos, especiais, exemplares, incidentais ou emergentes, ou por perda de receita, de dados, de uso de dados, lucros cessantes, uso ou outra vantagem econômica decorrente do contrato ou de qualquer forma a ele relacionada. A responsabilidade das Partes resta limitada aos danos materiais e diretos, efetivamente causados, demonstrados em juízo e limitados, ainda que cumulados, podendo ser de até 100% do valor do Pedido de Compra objeto do dano";**

Esta questão contratual foi encaminhada para o setor competente dentro da RNP e está sob análise.

**2) Alterar a cláusula 10.1 para o seguinte: "Fica estabelecida a multa diária equivalente 0,33% do valor do produto e/ou serviço objeto do inadimplemento, limitado a 10% (dez por cento) deste valor, caso a CONTRATADA não complete devidamente os serviços contratados."**

Esta questão contratual foi encaminhada para o setor competente dentro da RNP e está sob análise.

**3) Excluir a cláusula 10.3 que prevê retenção de pagamento;**

Esta questão contratual foi encaminhada para o setor competente dentro da RNP e está sob análise.