



EOS Network  
Foundation



# **REQUEST FOR PROPOSAL**

**RFP# 0009**

**TITLE: RAM Limitation Fixes (Discovery/Research)**

**DATE: 28 NOV 2022**

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RFP# 0009****ISSUE DATE:** 28 NOV 2022**TITLE:** RAM Limitation Fixes**RFP PROPOSAL DUE DATE/TIME:**

Action Item	Date
Issue RFP	28 NOV 2022
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Questions about the RFP by Respondents submitted back to Antelope Coalition	12 DEC 2022
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Finalists to meet with Coalition	04 JAN 2023
Award	10 JAN 2023

**INTENT TO BID:** Responses shall be directed to:[operations@eosnetwork.com](mailto:operations@eosnetwork.com)\*With email title: **"Intent to Bid | RFP#0009"****QUESTIONS/INQUIRIES:** All inquiries for information shall be directed to:[operations@eosnetwork.com](mailto:operations@eosnetwork.com)\*Please title email with **"Question | RFP#0009"****SUBMISSION:** Submit bid responses to:[operations@eosnetwork.com](mailto:operations@eosnetwork.com)\*With email title: **"Bid Submission | RFP#0009"**

In compliance with this Request for Proposal and to all conditions imposed therein, the undersigned offers and agrees to furnish the goods/services described at the prices indicated in Exhibit C – Financial Proposal.



## Table of Contents

<b>1. RFP GENERAL INFORMATION</b>	<b>3</b>
1.1 Background	3
Coalition Background	3
Purpose	3
1.2 Guidelines	3
1.3 PROJECT MANAGEMENT	4
1.4 PROPOSAL PREPARATION AND SUBMISSION	5
1.5 FORMAT REQUIRED FOR RFP RESPONSES	6
1.6 EVALUATION AND AWARD CRITERIA	6
1.7 RFP ANTICIPATED SCHEDULE (Subject to change):	7
1.8 EXHIBITS	7
1.9 REQUEST FOR PROPOSAL QUESTIONS	7
<b>2.0 PROJECT INFORMATION</b>	<b>8</b>
2.1 GLOSSARY	8
2.2 PROJECT SCOPE	8
2.2.1 BUSINESS REQUIREMENTS	8
2.2.2 TECHNICAL REQUIREMENTS	9
<b>EXHIBIT A - CERTIFICATE OF AUTHORITY</b>	<b>10</b>
<b>EXHIBIT B - QUESTIONS</b>	<b>11</b>
RESPONDENT COMPANY OVERVIEW	11
KEY PERSONNEL AND SUBCONTRACTORS	11
TECHNICAL QUALIFICATIONS	11
APPROACH AND METHODOLOGY	12
REFERENCES	12
SOLUTION COST AND SCHEDULE	12
<b>EXHIBIT C - Financial Proposal</b>	<b>13</b>
<b>Exhibit D - Sample Documents</b>	<b>14</b>

# 1. RFP GENERAL INFORMATION

## 1.1 Background

### Coalition Background

The Antelope Coalition represents multiple blockchains with a common core base that collaborate and improve those core technologies with a mission to do the following:

- Convey unity amongst participating stakeholders;
- Emote technical excellence and promise of a better future; and
- Express the cohesive vision of improving the world and lives of every individual through new efficient and equitable ways for individuals to empower themselves through fair dealings with other individuals.

### Purpose

Presently, the physical RAM required on some Antelope-based networks has become a constraint. Hardware to successfully operate nodes on these networks has become cost prohibitive and is at risk of future growth, pushing to an even higher tier of hardware requirements. Some measures have been taken to constrain the growth of the RAM system resource in order to virtually limit the consumption of physical RAM by nodes in the network, but these same constraints limit the scalability of applications running on a given network.

As a starting point to address these issues, research is required to assess some of the best opportunities to slow down the growth of physical RAM consumption per transaction and optimize or refactor existing solutions to better manage this resource. The outputs of this research will be used to author one or more additional Requests for Proposal to deliver these solutions along with possibility of some opportunities being managed by the ENF internal development team.

## 1.2 Guidelines

By responding this this RFP you are confirming and agreeing to the following:

1. This RFP specifies requirements from Antelope Coalition and invites proposals from Respondents for the provision of services defined within it.
2. This RFP is not an offer to contract. Even if the Respondent provides a solution that meets all requirements, Antelope Coalition is not obligated to enter an agreement.

Antelope Coalition reserves the right to make no selection or may choose any Respondent at its sole discretion. Antelope Coalition is not obligated to explain its decision making process to any external parties, including the Respondents.

3. No Reimbursement for Costs. Respondents will incur all costs associated with creating a response to this RFP, no matter the expense. This includes any costs incurred due to delays by Antelope Coalition in responding or in making a decision.
4. Antelope Coalition reserves the right to modify the requirements of this RFP as well as the process utilized by this RFP at any time.
5. By submitting a response for your company, you attest that you have full power to enter into the submission of this RFP response on behalf of your company.
6. Antelope Coalition reserves the right to request additional information from any or all Respondents to evaluate any or all proposals
7. Before awarding a contract, Antelope Coalition may request evidence of qualifications, insurance or other information deemed necessary.
8. Antelope Coalition may choose to modify the requirements within this RFP when negotiating a contract with the selected Respondent(s).
9. Antelope Coalition Reserves the right to amend the schedule published within this RFP.

## 1.3 PROJECT MANAGEMENT

The Antelope Coalition assigns a Project Manager to each contract awarded. The Project Manager shall be the initial point of contact for the Contractor (throughout the project lifecycle). Project Managers are charged with ensuring the terms and conditions of the contract are followed, payments are made in accordance to the contractual pricing schedule, and reporting noncompliance issues. Any proposed changes and/or modifications to the contract can be escalated by the Project Manager to the appropriate Coalition stakeholder for formal review and approval as required. The Contractor will agree to work with the assigned Project Manager to help maintain full project visibility by delivering the following artifacts (examples in Exhibit:

1. A stakeholder register
2. A project plan with sufficient detail to support estimated milestone dates
3. A weekly status report using the Antelope Coalition template

Contractor will also agree to a weekly review meeting to review the status, risks, and other escalated issues to ensure continual communication between the project team and the Coalition.

## 1.4 PROPOSAL PREPARATION AND SUBMISSION

### General Instructions:

1. **RFP Responses:** In order to be considered for selection, the Offeror shall submit to EOS Network Foundation a complete response to this RFP. Proposals shall be the electronic documents as detailed below, each containing full identical content including all exhibits.
2. **Contact:** To ensure timely and adequate consideration of your proposal, Offerors are to limit all contact, whether verbal or written, pertaining to this RFP to the Contracts Manager. The email for contact is indicated on the face of this document and is in place for the duration of this proposal process. Failure to do so may jeopardize further consideration of Offeror's proposal.
3. **Proposal Presentation:** Proposals shall be signed by an authorized representative of the Offeror. All information requested must be submitted. Failure to submit all information requested may result in EOS Network Foundation requiring prompt submission of missing information and/or giving a lowered evaluation of the proposal. Proposals which are substantially incomplete or lack key information may be rejected.
4. **Concise & Clear:** Proposals should be prepared simply and economically, providing a straightforward, concise description of capabilities to satisfy the requirements of the RFP. Emphasis should be placed on completeness and clarity of content.
5. **Organization:** Proposals should be organized in the order in which the requirements are presented in the RFP. All pages of the proposal should be numbered. Each paragraph in the proposal should reference the paragraph number of the corresponding section of the RFP.

6. **Presentations:** Offerors who submit a proposal in response to this RFP may be invited to give a presentation of their proposal to EOS Network Foundation. This provides an opportunity for the Offeror to clarify or elaborate on the proposal. This is a fact finding and explanation session only and does not include negotiations. EOS Network Foundation will schedule the time and location of these presentations. Presentations are an option for the University and may or may not be conducted.

## 1.5 FORMAT REQUIRED FOR RFP RESPONSES

**Specific Proposal Requirements:** Proposals should be as thorough as possible so that EOS Network Foundation may properly evaluate your capabilities to provide the required services. Offerors are required to submit the following items as a complete proposal:

- Any information provided above what has been specifically requested may be submitted as a separate document only if it adds value specifically to deliberations about this RFP.
- For each question in Exhibit B, a simple affirmation that the requirement is met will not be considered complete. Each question requires a short, concise explanation as to how the requirement will be met.
- Occasionally, the Respondent may offer an explanation that explains how more than one requirement will be met. Is it acceptable to copy / paste the same answer for multiple requirements. However, questions should not be grouped together.
- Pricing not included in this response will not be considered valid cost elements if the Respondent is selected.
- The Exhibits should be submitted in a Microsoft Word document, Google Doc, or PDF. The pricing spreadsheet may be submitted in a Microsoft Excel document, Google Sheets document, or PDF.

## 1.6 EVALUATION AND AWARD CRITERIA

**Evaluation Criteria:** Proposals will be evaluated for full compliance with the RFP requirements and the mandatory terms and conditions set forth within the RFP document. The objective of the EOS Network Foundation will be to select the contractor that is most responsive to the described needs and represents the best value.



## 1.7 RFP ANTICIPATED SCHEDULE (Subject to change):

The schedule below provides the anticipated dates for several progress points within the RFP process, all subject to change.

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## 1.8 EXHIBITS

Exhibit A - Certificate of Authority

Exhibit B - RFP Questionnaire

Exhibit C - Financial Proposal

Exhibit D - Sample Documents

## 1.9 REQUEST FOR PROPOSAL QUESTIONS

After reading this RFP, it is expected that Respondents will need clarification on a variety of points. Respondents must submit questions by the scheduled deadline listed below. Antelope Coalition will consolidate questions from all Respondents into a single document but remove and reference to which Respondent asked a particular question. The consolidated answers will be distributed to all Respondents per the schedule below.

Submit any question regarding this RFP to:

**[operations@eosnetwork.com](mailto:operations@eosnetwork.com)**





## 2.0 PROJECT INFORMATION

### 2.1 GLOSSARY

Term	Definition
Physical RAM	A form of short-term memory used for faster data storage and retrieval for a processor's needs in support of a computer's operating system and applications.
RAM system resource	A virtual resource tracked on Antelope blockchains which limits the total size in bytes of persistently stored data associated to each account. The persistently stored data associated to an account includes: permissions/keys of the account; any contract code deployed on the account; and, any persisted storage data (e.g. via multi-index tables) that have been stored and not yet freed by the contract(s) deployed on the account.

### 2.2 PROJECT SCOPE

#### 2.2.1 BUSINESS REQUIREMENTS

ID	Requirement
General	
BR01	The solution will be research findings that identify known limitations in the Antelope framework, which prevent users from more efficiently utilizing the current RAM system resource capacity.
BR02	The solution will be research findings that identify opportunities for changes to Antelope software to better utilize commonly available hardware in a way that increases the storage capacity available for contracts.
BR03	The solution will acknowledge and discuss trade-offs for each recommended opportunity.
BR04	The document must present defined proposals that will address the needs defined in these requirements.
BR05	The document will present any ideas researched and rejected, including the rationale for rejecting the ideas.



## 2.2.2 TECHNICAL REQUIREMENTS

ID	Requirement
<b>General</b>	
TR01	The solution will be delivered as a PDF document.
TR02	The solution will include methodology documentation for the research performed.
TR03	The solution will inspect and discuss the efficiency of chainbase data structures.
TR04	The solution will inspect and discuss the efficiency of existing account structures and the processes by which they are managed.
TR05	The solution will inspect and discuss methods to utilize solid-state drives for storage of parts of state to relieve demands on physical RAM.
TR06	The solution will inspect and discuss methods that shard state across multiple nodes to reduce physical RAM requirements on each node.
TR07	The solution will inspect and discuss methods where some nodes can fully validate the blockchain without persistently storing all state locally.
TR08	The solution will acknowledge trade-offs within recommended solutions including but not limited to increases in architectural complexity for the application developer and end-user, changes in transaction latency and throughput, changes in time duration to restart a node, and opportunity cost for existing systems to accommodate these updates.
TR09	The solution will acknowledge the limitations of each recommended solution, including scope of benefactors or trade-offs across user groups.
TR10	The proposals in BR04 must be extensions or refactoring of the Antelope protocol.
TR11	The proposals will not include the creation of a new token.
TR12	The proposals must include clear upgrade paths for all Coalition chains.



## EXHIBIT A - CERTIFICATE OF AUTHORITY

The undersigned certifies that he/she has the complete authority to contractually bind the proposing company and to submit a response to this RFP on the company's behalf. The undersigned has read all components of this proposal, including any exhibits and attachments. By submitting this signed proposal, the undersigned acknowledges an intent to accept a contract if this proposal is selected by Antelope Coalition.

<b>Signed Name (printed)</b>	
<b>Title</b>	
<b>Legal Name of Respondent Submitting</b>	
<b>Address One</b>	
<b>Address Two</b>	
<b>City / State / Postal Code</b>	
<b>Email Address</b>	
<b>Phone</b>	
<b>Telegram Handle (if applicable)</b>	
<b>Company URL</b>	
<b>Authorized Signature</b>	
<b>Date Proposal Submitted</b>	

## **EXHIBIT B - QUESTIONS**

Respond to all questions within a copy of this document and return your response as either a Google Doc or a Microsoft Word document.

### **RESPONDENT COMPANY OVERVIEW**

1. State the full name, address, and other contact information of your company. Indicate what legal entity type your company operates as (e.g. individual, partnership, corporation, etc) and in which country and state / province / territory is it registered.
2. Indicate if you will be using subcontractors. If so, provide the information in item #1 for each subcontractor and indicate which areas of this project the subcontractors will complete.
3. Provide a brief summary of your company including history, operating model, and growth trajectory of the previous five years. Include sufficient information to demonstrate your capability to manage a project of this size and scope.
4. Provide evidence of your financial strength / stability.
5. Has your company ever been party to any litigation concerning the government entities you listed as your registration in item #1. Is there any pending litigation against your company?

### **KEY PERSONNEL AND SUBCONTRACTORS**

6. For key positions on the project, such as technical architect, project manager, delivery manager, etc, describe the individual's role on the project, their position within your organization, where they will physically work during the project, and decision making authority they will have on the project. Specify the individual's professional background only as it applies to their ability to deliver this project.
7. If the project will use subcontractors, include a full list of subcontractors and a description of those individuals' roles on the project along with an overview of their professional background as it applies to their role on the project. Respondents will be responsible for the performance of any subcontractors included within the project team.

### **TECHNICAL QUALIFICATIONS**

8. Include a description of how each requirement (in Section 3) will be met.

9. If your company's solution will not meet every requirement defined in Section 3, please identify which requirements will not be met.
10. Provide examples of similar projects that your company has successfully delivered.

## **APPROACH AND METHODOLOGY**

11. Detail your project management methodology and collaboration methodology.
12. Describe your approach to changes to the project scope.
13. Describe your approach to post-implementation support and transferring approach knowledge to the Antelope Coalition staff.
14. Would you project and service level guarantees in our agreement?

## **REFERENCES**

15. Supply three references of customers to whom you provided similar solutions.

## **SOLUTION COST AND SCHEDULE**

16. Provide a spreadsheet identifying the total costs of the solution outlined in Section 3. Identify as applicable: labor, software licensing, maintenance / support fees, hardware, and other expenses.
17. Detail the payment schedule and include any milestones that may trigger a payment
18. Provide a rough estimate of the project schedule.

## EXHIBIT C - Financial Proposal

The Consultant is asked to prepare the Price Schedule as a separate document. All prices/rates quoted must be in USD. The format shown below should be used in preparing the price schedule.

[Financial Proposal Form](#)

## Exhibit D - Sample Documents

[Sample Contract](#)

[Sample Project Stakeholder Form](#)

[Sample Weekly Project Status Report](#)

[Sample Project Plan](#)