

RFP No. FSID/IOSMCN/05-03 Dated: 03rd June 2024

Foundation for Science Innovation and Development (FSID)



REQUEST FOR QUOTATIONS (RFQ) DOCUMENT

FOR

**Supply of PTP Grandmaster switch for 5G Radio
Access Network Product**

**India Open Source for Mobile Communication
Network (IOS MCN) Project**

**Foundation for Science, Innovation and
Development IISc, Bengaluru**

Notice Inviting RFQ



TENDER

NOTICE NO. FSID/IOSMCN/05-03

Dated: 03rd June 2024

BID SCHEDULE			
Sl.No.	Bid Activity	Date	Time
1	Notification	03/06/24	10:00 AM
2	Bid Query	10/06/24	5:00 PM
3	Answers to Bid Queries	12/06/24	10:00 AM
4	Submission of Bid	22/06/24	5:00 PM
5	Opening of Technical Bid	22/06/24	10:00 AM
6	Completion of Technical interaction and Demonstration of bidder's Technical Solution to the Technical Evaluation Committee	06/07/24	5:00 PM
7	Completion of Technical Evaluation	07/07/24	5:00 PM
8	Opening of financial Bid	09/07/24	10:00 AM

Pre-bid queries should be addressed to email: smohammed@fsid-iisc.in and Cc: Vinay Kulkarni vinay@fsid-iisc.in

Mode of Bid Submission: Please refer to Para 5 for instructions.

Technical Bid: Can be submitted by email. In addition, a hard copy has to be sent to the address.

Financial Bid: Quotes for the product must be enclosed in a password-protected PDF file emailed to Puja Srivastava at puja.srivastava@datakaveri.org, cc: Chethan at chethan@fsid-iisc.in or sent a hard copy in a sealed envelope @ Address: 5G Lab, Dept. of Electrical Communication Engineering, Indian Institute of Science, Bangalore – 560 012.

Date:

Chandra R. Murthy
Chief Project Investigator

Address: 5G Lab, Dept. of Electrical Communication Engineering

Chandra R. Murthy, Ph.D.
Professor, ECE Department
Indian Institute of Science
Bangalore 560 012, India

Indian Institute of Science, Bangalore – 560 012
Tel. 080-2293-2464



REQUEST FOR QUOTATIONS.

1. INTRODUCTION

As part of the MeitY funded India Open source for Mobile Communication Networks project the procurement is being done for setting up the lab infrastructure. We seek quotations from qualified vendors for the procurement of PTP Grandmaster Switch to support the development and testing of 5G Core infrastructure. The selected devices will be utilised for generating and sending accurate timing signals to other devices in the network, ensuring that all devices are synchronised to a common time reference.

2. SCOPE OF WORK:

Provide the PTP Grandmaster switch configured to meet the specifications outlined below, including all necessary hardware, software, and peripherals required.

Deliver PTP Grandmaster switch, that offers scalability, reliability, and performance to accommodate future expansion and evolving project requirements. Include warranty, technical support, and maintenance services to ensure the continued operation and reliability of the device.

3. TECHNICAL REQUIREMENTS

Mentioned below are the specifications that are must for the quote to be sent.

Please refer to the table below ANNEXURE-1 **Specifications**

Please refer to the table below ANNEXURE-2 **PoC (Proof of Compliance)**

Please refer to the table below ANNEXURE-5 **BoQ (Bill of Quantity)**



4. QUANTITY OF REQUIREMENTS

The hardware specified in the mentioned specifications, along with all contingency requirements, is required in the quantity of **1 (One)** unit. Vendors are requested to provide quotations that include the following:

Per Unit Price: Please specify the price per unit of the hardware, inclusive of all specified components and features, as well as any additional contingency provisions.

Total Quantity Price: Calculate the total price for the specified quantity of units, incorporating all contingency requirements.

5. SUBMISSION REQUIREMENTS

The quotation should be submitted in the form of 2 separate documents as specified below:

1. TECHNICAL EVALUATION DOCUMENT:

This should contain the following:

- a) A checklist indicating compliance with or deviation from the above technical requirements.
- b) A technical datasheet of the PTP Grandmaster Switch which includes all or subset of the requirements specified in the technical requirements.
- c) Certifications and compliance documentation if any should be included with the quotation

2. COMMERCIAL BID DOCUMENT:

- a. Quotations should include detailed pricing, including unit prices, taxes, shipping costs, and any additional fees.
- b. Provide information on warranty terms, technical support services, and maintenance agreements.
- c. Include company profile, relevant experience, and references from past projects.
- d. Quotes for the product must be enclosed in a password-protected PDF file emailed to **Puja Srivastava** at puja.srivastava@datakaveri.org, cc: **Chethan** at chethan@fsid-iisc.in or sent a hard copy in a sealed envelope @ **Address: 5G Lab, Dept. of Electrical Communication Engineering, Indian Institute of Science, Bangalore – 560 012.**

Tel. 080-2293-2464



e. Quotations must be addressed to

Director,

Foundation for Science Innovation and Development

Innovation Centre, IISc Campus Near Maramma Circle gate

Bengaluru 560012 GSTIN: 29AAECF1802E1Z1

IMPORTANT: Vendors must submit their quotations no later than the specified deadline.

6. EVALUATION CRITERIA

The evaluation criteria include for considering the quote and awarding with the purchase order include,

- Compliance with RFQ requirements and specifications.
- Price competitiveness.
- Vendor experience, and track record.
- Warranty and support offerings.
- Technical capabilities and compatibility with existing infrastructure.

7. IMPORTANT NOTES

- The lowest-priced quotation may not necessarily be selected, quality, reliability, and vendor reputation will also be considered.
- IOS MCN reserves the right to reject any or all quotations and to award the purchase order on its own evaluation criteria.
- Any clarifications or questions regarding this RFQ should be directed to the contact person listed above.



ANNEXURE-1

PTP Grandmaster Switch Specifications for Bidder Compliance

Component	Specification
Ethernet	<ul style="list-style-type: none"> 4 x 100/1000/2500BaseX (SFP) 2 x 10/100/1000BaseT (RJ45) 2 x 1/2.5/10G (SFP+) <p>All ports should support PTP, sync and NTP</p>
Sync	<ul style="list-style-type: none"> ToD/1PPS (RJ45) 2 x 1PPS/10MHz (SMA) BITS (RJ48) GNSS antenna in (SMA, active, 5VDC)
USB Console	
IEEE1588/PTP	
Functions: Grandmaster (PRTC), Boundary Clock (Class C/D), Ordinary Clock (M/S), Transparent Clock (Class C/D)	
Modes supported: 1 and 2 step, L2 Multicast, L3/UDP Unicast/Multicast, Mixed transport modes, E2E and P2P delay, VLAN tagging	
Profiles supported: Telecom Frequency (G.8265.1), Telecom Phase (G.8275.1, G.8275.2), Default (1588)	
Slave capacity: Up to 128 Unicast @ full packet-rate (optional)	
Other Timing Services/Features	
Synchronous Ethernet (SyncE): G.8261, G.8262, ESMC (G.8264)	
GNSS: 32 channels, Multi-constellation (GPS, GLONASS, Galileo, Beidou)	
NTP: Server (Future upgradable to HW based), Client	
Physical interfaces: 2 x SMA connectors, User configurable for 1PPS/10MHz input/output, ToD/1PPS (NMEA) input and output	

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Architecture & forwarding
Hardware architecture Hybrid (ASIC-FPGA)
RAM/Flash memory: 256MB/256MB
RAM/Flash memory: 256MB/256MB
Flow-based forwarding
Performance: Wire-speed, on all ports, all frame sizes
Switching fabric: 34 Gbps, non-blocking
MTU: 10K bytes
MAC table: 16K addresses
VLANs: 4K concurrent
Provider bridging: 802.1ad (Q-in-Q)
Private VLANs
L1-L4 ACLs
Multicast: IGMPv3 snooping, MLD snooping, up to 8K MC groups
Layer 3: Static routes, IPv4/IPv6, DHCP (client, server, relay)
Quality of Service
Classification: Based on L1-L4 information
Ingress policing per flow: MEF BW profiles
Hierarchical queuing/scheduling, Hierarchical shaping

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Priority based flow control: 802.1Qbb
Scheduling: Strict and DWRR (WFQ equivalent)
Compliant with 3GPP QoS requirements for LTE backhaul
Protection
Link: Static or LACP link aggregation, Link protection
Linear protection (G.8031), Ring protection (G.8032v2), Loop protection
Spanning tree: STP, RSTP, MSTP
OAM & Diagnostics
Link OAM, CFM, Performance Monitoring, Traffic generator & analyser, L2 loopbacks, Throughput metering, SFP diagnostics, Traffic mirroring & Remote mirroring, sFlow
Management
CLI Interfaces: Console (RS232), Telnet, SSH1/2 SNMP: v1/v2c/v3, extensive MIBs, trap profiles, Web: HTTP/HTTPS, Management VLAN, IPv6 management
Link discovery: LLDP, CDP snooping
Operations: Remote System Update, Configuration upload/download, Text based config files
Alarms: SNMP traps, Syslog (internal and remote server), CLI events, Remote temperature reading & alarm
Statistics: Per port, EVC and CoS detailed statistics, RMON; NTPv4
NMS integration: Integrated into the NetACE NMS
Physical
Dimensions <= 50x250x150mm



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Mounting: Desktop, Rack, Wall

Accessories: Power cable, RS232 cable (console), Rack mounting kit (optional), GPS antenna.

Regulatory & Compliance

Safety, CE, RoHS, EMC and MEF

**ANNEXURE-2****Proof of Compliance.**

Seq. No.	Specification	COMPLIANCE/ Observation/Remarks
1	Ethernet 4 x 100/1000/2500BaseX (SFP) 2 x 10/100/1000BaseT (RJ45) 2 x 1/2.5/10G (SFP+) All ports should support PTP, sync, and NTP	
2	Sync ToD/1PPS (RJ45) 2 x 1PPS/10MHz (SMA) BITS (RJ48) GNSS antenna in (SMA, active, 5VDC)	
3	IEEE1588/PTP	
	Functions: Grandmaster (PRTC), Boundary Clock (Class C/D), Ordinary Clock (M/S), Transparent Clock (Class C/D)	
	Modes supported: 1 and 2 step, L2 Multicast, L3/UDP Unicast/Multicast, Mixed transport modes, E2E and P2P delay, VLAN tagging	
	Profiles supported: Telecom Frequency (G.8265.1), Telecom Phase (G.8275.1, G.8275.2), Default (1588)	
	Slave capacity: Up to 128 Unicast @ full packet-rate (optional)	
4	Other Timing Services/Features	
	Synchronous Ethernet (SyncE): G.8261, G.8262, ESMC (G.8264)	
	GNSS: 32 channels, Multi-constellation (GPS, GLONASS, Galileo, Beidou)	
	NTP: Server (Future upgradable to HW based), Client	


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	Physical interfaces: 2 x SMA connectors, User configurable for 1PPS/10MHz input/output, ToD/1PPS (NMEA) input and output	
5	Architecture & forwarding	
	Hardware architecture Hybrid (ASIC-FPGA)	
	RAM/Flash memory: 256MB/256MB	
	RAM/Flash memory: 256MB/256MB	
	Flow-based forwarding	
	Performance: Wire-speed, on all ports, all frame sizes	
	Switching fabric: 34 Gbps, non-blocking	
	MTU: 10K bytes	
	MAC table: 16K addresses	
	VLANs: 4K concurrent	
	Provider bridging: 802.1ad (Q-in-Q)	
	Private VLANS	
	L1-L4 ACLs	
	Multicast: IGMPv3 snooping, MLD snooping, up to 8K MC groups	


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	Layer 3: Static routes, IPv4/IPv6, DHCP (client, server, relay)	
6	Quality of Service	
	Classification: Based on L1-L4 information	
	Ingress policing per flow: MEF BW profiles	
	Hierarchical queuing/scheduling, Hierarchical shaping	
	Priority based flow control: 802.1Qbb	
	Scheduling: Strict and DWRR (WFQ equivalent)	
	Compliant with 3GPP QoS requirements for LTE backhaul	
7	Protection	
	Link: Static or LACP link aggregation, Link protection	
	Linear protection (G.8031), Ring protection (G.8032v2), Loop protection	
	Spanning tree: STP, RSTP, MSTP	
8	OAM & Diagnostics	
	Link OAM, CFM, Performance Monitoring, Traffic generator & analyser, L2 loopbacks, Throughput metering, SFP diagnostics, Traffic mirroring & Remote mirroring, sFlow	


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9	Management	
	CLI Interfaces: Console (RS232), Telnet, SSH1/2 SNMP: v1/v2c/v3, extensive MIBs, trap profiles, Web: HTTP/HTTPS, Management VLAN, IPv6 management	
	Link discovery: LLDP, CDP snooping	
	Operations: Remote System Update, Configuration upload/download, Text based config files	
	Alarms: SNMP traps, Syslog (internal and remote server), CLI events, Remote temperature reading & alarm	
	Statistics: Per port, EVC and CoS detailed statistics, RMON; NTPv4	
	NMS integration: Integrated into the NetACE NMS	
10	Physical	
	Dimensions <= 50x250x150mm	
	Mounting: Desktop, Rack, Wall	
	Accessories: Power cable, RS232 cable (console), Rack mounting kit (optional), GPS antenna.	
	Regulatory & Compliance	
	Safety, CE, RoHS, EMC and MEF	



ANNEXURE-3

Self-declaration is to be given by the bidder.

RFQ Reference No.

Date:

Bidder's Name & Address:

Person to be contacted:

Designation:

Telephone No:

Fax No:

Email:

To,

Director,

FSID, IISc Bangalore-560012

We, the undersigned Bidder, having carefully read and examined in detail the Terms and Conditions, specifications, and all bidding documents regarding the supply of the Core server at FSID accept the same.

We also hereby declare that.

1. We have not been blacklisted/debarred by any Government/Undertaking.
2. The rates quoted are not higher than the rates quoted for the same item for any Government/Undertaking.
3. The bid submitted by us is properly sealed and prepared to prevent any subsequent alteration and replacement.

For and on behalf of the firm

(Firms Name & Address)

(Signature of Authorized
Signatory)

Name:

Date: -----

Designation:

Place: -----

Seal

Phone No:



ANNEXURE – 4

Bidder Organisation Details Format for RFQ No. FSID/IOSMCN/05-03 Dated 03/06/24		
To, Director, FSID, IISc Bangalore-560012		
1	Bidder Name	
2	Website Address	
3	Email Address	
4	Address for Communication	
5	Telephone Number	
6	Fax/Telefax Number	
7	Authorised Person Name	
8	Designation:	
9	Mobile No.	
10	Email ID	
11	Alternate Person Name	
12	Designation:	
13	Mobile No.	
14	Email ID	
15	PAN Number	
16	GST Regn. No. with Address	
17	Beneficiary's complete Bank Details.	
18	Bank Account No.	
19	IFSC / NEFT Code	
20	Name of the Bank	
21	Turnover of the Bidder in last 3 years	
22	2023	
23	2022	
24	2021	
25	Are you a MSME Unit. If yes, please furnish. Registration Details, Name of the DIC/State.	
26	If you are MSME, is it owned by SC/ST Entrepreneurs or Women Entrepreneurs? If Yes, please specify the Name of the Owner who is SC or ST or Women Entrepreneur (as applicable)	
27	Following Documents are to be submitted	
28	Certificate of Incorporation	
29	PAN No	
30	GST Registration No.	
31	DECLARATION 1) We have read and understood the terms & conditions of the above-mentioned tender and comply to all Terms & Conditions of the Tender.	Signature of Authorised Signatory with Seal (Name)



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	(In case of any deviation, the Bidder must attach a separate sheet clearly mentioning the Clause No. of the Tender and Deviation thereto) 2) We certify that the information mentioned above are true and correct to best of our knowledge.	
32	Place	



ANNEXURE-5

BoQ

RFQ No: FSID/IOSMCN/05-03 Dt 03/06/24 for Supply of PTP Grandmaster switch				
Sl. No	Equipment/Devices	HSN Code	Qty	Compliance (Yes/No)
1.	PTP Grandmaster Switch		1	



ANNEXURE-6

Format: Letter of undertaking

(Company letterhead)

To,

Director,
FSID, IISc Bangalore-560012

Sir,

Sub: Undertaking on non-disclosure of contract documents

I/We do hereby undertake that we shall not disclose the contract or any provision, specification, plan, design, pattern, sample, or information to any third party for a period of three years from the termination of the contract.

I/We do hereby undertake that except with the written consent of the Buyer/Seller, the other party shall not disclose the contract or any provision, specification, plan, design, pattern, sample or information to any third party.

I/We do hereby undertake not to copy the AS-IS documentation captured in this tender document in any form Xerox, electronic, or via DMS or any other physical/electronic means for any purpose but for the bidding process.

For and on behalf of the
Bidder

(Signature)

(Name of the Authorized Signatory)

Date:



ANNEXURE-7

Financial Bid Format

RFQ No: FSID/IOSMCN/05-03 Dt 03/06/24 for Supply of PTP Grandmaster switch					
Sl. No	Equipment/Devices	Qty	Unit Rate in INR	GST in INR	Total with GST in INR

- **Delivery charges**
- **Installation charges**
- **AMC charges for 3 years**

END THE DOCUMENT