

EXPRESSION OF INTEREST (EOI) FOR  
EMPANELMENT OF GPON ONT  
(with Wi-Fi) SINGLE BAND AND DUAL  
BAND PROVIDERS FOR ANDHRA  
PRADESH FIBERNET LIMITED

EOI NO. APSFL / EOI/GPON ONT/2023, Dt: 23.02.2023

Andhra Pradesh State Fiber Net Limited (APSFL, a fully-owned entity of the Government of Andhra Pradesh) invites Expression of Interest (Eoi) for Empanelment of Suitable OEM/Distributor for GPON ONT.

1	EOI Number & Date	APSFL / EOI/GPON ONT/2023, Dt: 23.02.2023
2	EOI Document Availability	EOI document can be downloaded from website <a href="http://www.apsfl.in">www.apsfl.in</a> from date: 23-02-2023 onwards till last date of submission of the EOI.
3	Last date and time of submission of response to EOI	3:00 PM Dt 09.03.2023
4	Last date and time for submission of sample GPON ONT.	3:00 PM Dt 09.03.2023
5	Address for Communication and submission of proposal	3rd Floor, NTR Administrative Block, APSFL corporate office, Vijayawada - 520010
6	Contact Person	V G Shashank Reddy AGM ( OCC, IPTV & OTT ), APSFL. Ph: 8790107108 Email: <a href="mailto:agm@apsfl.co.in">agm@apsfl.co.in</a>
7.	Any proposal received by Andhra Pradesh State Fibernet Limited after the deadline for submission of Eoi will not be accepted.	
8.	Andhra Pradesh State Fibernet Limited reserve the right to reject or accept or withdraw the EOI without assigning the reasons thereof.	
9.	The sealed envelope containing the Proposal documents / the sealed box containing GPON ONT's must be submitted at Andhra Pradesh State Fibernet Limited 3rd Floor, NTR Administrative Block, Pandit Nehru Bus Station, NH 65, Vijayawada-520001, Andhra Pradesh, India before closure of submission dated & time. The proposal may also be sent through post / speed post/Courier. A copy of the proposal shall also be emailed to <a href="mailto:agm@apsfl.co.in">agm@apsfl.co.in</a> . APSFL will not be responsible for any postal delay.	

## **Objective of the EOI:**

Andhra Pradesh State FiberNet Limited intends to provide the services through the AP Fiber Network to the households and the government offices (Departments/schools/hospitals etc.). APSFL has finalized the standards & specifications for the Customer Premise Equipment (CPE) to enable the intended services.

APSFL through this EOI intends to empanel OEMs/Distributors of GPON ONT which are capable of providing High Speed Internet with FTTH.

## **Scope of Work:**

The Empaneled vendor shall be able to supply GPON ONT with Wi-fi Single band/ Dual band for enhancing the APSFL broadband connections.

The scope of work covers as follows:

### **1. Sample Testing & Acceptance**

The Empaneled Vendor/OEM have to submit the Prototypes of GPON Single Band/ Dual Band CPE box for testing and the CPE has to comply for all the standards & specifications given in this EOI and any other compliance that are deemed necessary for delivery of quality services to the end users adhering to the SLA.

Empaneled Vendor/OEM shall submit and offer **5 nos.** of Prototypes of the entire kit (including but not limited to CPE box and other required accessories like interconnection cables) to APSFL, for testing, which will be tested in a lab as well as on the field as per requirements by APSFL. Bidder should submit Prototypes of CPE as proposed with their feature test reports along with the Proposal. In case bidder fails to submit the Prototypes on the request of APSFL (or) fails to submit successful test reports within the stipulated time, such Proposals will be rejected.

The Empaneled Vendor/OEM shall ensure to meet the following during Sample testing / Acceptance Phase:

- The make/model of the CPE box is fully interoperable (full functionality) with existing APSFL Network, including and not limited to BSS, ZTP etc.
- The make/model of the CPE box is fully interoperable with M/s Altice Labs OLT, M/s Dasan OLT and M/s ZTE OLT

APSFL will provide the required details and approve the input devices. Bidders to note that the test lab is already ready and available for testing and certification of new CPE products. New OEMs to get their product certified at the available test facility by APSFL in their own interest at any time prior to submission of Proposal or within time as stipulated above post submission of Proposals.

## Eligibility Criteria:

- Bidder/OEM should possess an experience of having delivered 100,000 GPON ONTs or having a manufacturing capacity of 100,000 GPON ONTs per annum. Self-declaration of the same shall be provided by the bidder along with the proposal.
- Non-fulfilment of the above said criteria shall result in rejection.
- In case, if the bidder has TEC certification, the same shall be submitted along with the proposal

## Submission of Technical Proposal:

S. No	Description	Accessories
1	GPON ONT	<ul style="list-style-type: none"> <li>- RJ 45 Ethernet (Internet)- 2/4 Ports</li> <li>- RJ 11(Telephone)- 1 Ports</li> <li>- Feature for Wi-Fi Functionality</li> <li>- USB – 1 Port</li> </ul>

### 1. Common Specifications

S.No	Parameter	Requirement/Standards
1	Basic Features	ONT with WIFI (Single Band 802.11 a/b/g/n/ac)
2		ONT with min 4 LAN ports
3		ONT with min 1 Voice Port
4		ONT with min 1 USB Port
5		TR069 and zero touch
6	Physical Parameters	ONT CPU must be at least dual core 1GHz
7		ONT shall support at least 2x2 for 2.4 Ghz
8		Specify WIFI chipset for 2.4 / 5.8
9		ONT RAM/Flash must be at least 64MB/64MB
10		With Indian standard Power Supply (output at least 12V 1.0A)
11		Data Port should support 10/100/1000 Base-T interface with RJ-45
12		Voice Port should support RJ11 FXS Interface
13		ONT should support 1490nm wavelength downstream, 1310nm wavelength upstream
14		ONT ideal power consumption should be <15W
15		ONT should support small form-factor type laser, SC/APC connector
16		ONT should support different LEDs for Power, PON, LOS, Internet, Lan(1-4), Phone(1), Wi-Fi, WPS, USB

17		ONT should support Safety and electronic magnetic interface (EMI) i.e., protection of over voltage/current
18		The device Serial No., manufacturing month & year & MAC Id (alphanumeric as well as barcode representation) shall be available on the back side of ONT
19		One RESET button should be present placed in a suitable recess forming ONT settings to factory default. The switch shall perform its intended operation when it is kept pressed for 6-10 seconds.
20		ONT should have Wi-Fi button and WPS button.
21		ONT should have at least 1*USB 2.0 port / 3.0 port
22		ONT should have external 5dBi antennas.
23		GPON Specifications
24	TU-T G.984.3-compliant Advanced Encryption Standard (AES) in downstream	
25	ITU-T G.984.3-compliant forward error correction (FEC)	
26	ITU-T G.984.3-compliant dynamic bandwidth reporting (DBR)	
27	GPON Encapsulation Method (GEM) mode support for IP/Ethernet service traffic support	
28	2.488Gb/s line rate downstream, 1.244Gb/s line rate upstream	
29	Dying gasp support on ONT	
30	ONT should support SC/APC for PON interface	
31	The transmit optical power ranges from 0.5 dBm to 5 dBm.	
	The receive optical power ranges from -27 dBm (receiver sensitivity) to -8 dBm (overload optical power).	
	The optical power budget ranges from 13 dB to 28 db.	
32	WAN UP LINK INTERFACE	G.984 GPON B+
33		ONT should support configuration of Single VLAN on a particular Data Port
34		ONT should support configuration of multiple VLAN on a particular Data Port
35		ONT should support Double Tag QinQ VLAN on a particular Port
36		Virtual switch based on IEEE 802.1p virtual LAN (VLAN)
37		VLAN tagging/de-tagging per Ethernet port and marking/remarking of IEEE 802.1p
38		IP type of service/differentiated services code point (ToS/DSCP) to IEEE802.1p mapping for untagged frames
39		Class of Service (CoS) based on VLAN-ID, IEEE 802.1p bit
40		Vendor to specify the maximum number of Vlan support on a particular port of ONT

41	Software function	Vendor to specify the maximum number of MAC supported on a particular port of ONT
42		ONT should support Wire-Speed rate
43		ONT should detected duplicate MAC on a particular Data port
44		QOS interface of Strict priority should be supported for 4 or 8 queues
45		QOS interface of Weight fair Queue should be supported for 4 or 8 queues
46		Ethernet ports comply with IEEE 802.3u ,8023ab, 802.3i
47		Supports the configurations of rates and duplex modes for Ethernetports. Auto-negotiation on rates and duplex modes is supported by default.
48		Ethernet ports support automatic MDI/MDI-x.
49		Supports a maximum of 2000-byte Ethernet frames.
50		ONT should support PPPoE, DHCP and Static IP configuration for WAN Interface
51		ONT should support NAT functionality
52		ONT should support Dual Stack for IPv6:IPv4 configuration on WANInterface, ONT should be able to operate with some LAN ports in routed and some in bridge mode with IPv4/IPv6 dual stack support.
53		ONT should support SNTP slave mode
54		ONT should support Firewall Functionality in routed mode
55		ONT should support Port forwarding in routed mode
56		ONT should support Demilitarized Zone (DMZ) in routed mode
57		ONT should support dynamic domain name system (DNS) in routed mode
58		TR-69, TR098, support on ONT for ACS accessibility, configuration andperformance management (Data, Voice, Video)
59		Shall support provisioning, diagnosis & performance monitoring fortriple play services through TR069
60		Shall support customization of DM tree as per ACS solution deployed in operator network
61		ONT should support IP, MAC filtering in routed mode
62		ONT should be able to deliver High Speed Internet Service
63		ONT should be able to deliver Voice service
64		ONT should be able to deliver IPTV service (IGMPv2)
65		ONT should be able to deliver Triple play service concurrently
66		ONT should support Wi-Fi Standard of 802.11 b/g/n (256 QAM support)
67		ONT should support Wi-Fi standard of 802.11 ac (256 QAM support)
68		ONT should support Wi-Fi band steering function

69	All ports should be switched ports i.e., traffic from one port should not be received at second port.
70	QoS support on wireless interface
71	Bandwidth management capabilities
72	Security :-> 64-bit/128-bit/256-bit WEP
73	Dynamic WEP key
74	Support for MAC filter
75	Support for hiding Broadcast SSID
76	Output power EIRP at antenna port, 26 dBm for 2.4 Ghz
77	Support WPA, WPA2
78	Option for feeding 4 different manual/random keys for each 64/128 bit available.
79	Hardware priority queues on the downstream direction in support of CoS
80	Priority and rate-controlled scheduling
81	Channel bandwidth should be configurable for 20MHz/40MHz/80 Mhz
82	Certificate of Wi-Fi alliance
83	Implicit/Explicit Beamforming for 2.4Ghz
84	Maximum DL speed over WIFI in Vendor HQ
85	Maximum UL speed over WIFI in Vendor HQ
86	Maximum number of clients supported - Single a/b/g/n/ac
87	Maximum number of clients supported - Mix a/b/g/n/ac
88	Maximum Range in meters for 2.4Ghz
89	WIFI for 2.4 GHz
90	Shall support proportionate fair scheduling of the traffic for the Wi-Ficient in a mix of 802.11b/g/n/ac devices connected concurrently to the device
91	Auto mode for Client re-connection (when an already latched client comes within WIFI range again)
92	External RADIUS Authentication
93	AES and TKIP Encryption
94	Wi-Fi multimedia support: WMM and WMM-PS
95	WPS (Pushbutton and PIN entry)
96	ONT should support GPON OMCI protocol for remote management.
97	ONT should be visible on Vendor EMS(OMCI)
98	ONT should be configurable for Port configuration via Vendor EMS
99	ONT alarm should be available on Vendor EMS such as dying gasp, PON Loss

100		ONT should be automatically detected via EMS once plugged on the fiber network
101		Creation & Deletion of ONT should be possible via EMS
102		Measurement of ONT optical power should be available via EMS
103		ONT should support TR-069 in case of RGW ONT
104		Support of remote software upgrade via EMS on ONT
105		ONT performance monitoring support via EMS
106	General Engineering & operational requirements	The ONT should be able to interoperate with at least one of current network's OLT existing in APSFL Network
108		The gold plating thickness on RJ11 & RJ45 jacks will be 1.27 microns. Vendor to submit the certificate of compliance from third party.
109		The CPE should have Wi-Fi Certification
110		The PCB used shall be FR4 only.
111		The CPE shall have adequate cooling arrangements. The holes used for this purpose should not be available on the Cabinet Top cover.
112		In the event of a bug found (IAD going to factory default, Loss of wi fi configuration, frequent PPP down, multicast performance issue etc.) in the software, the manufacturer shall provide patches and firmware replacement if involved, free of cost. Compatibility of the existing hardware shall be maintained with future software/firmware.
113		It will be the responsibility of supplier to supply IAD's with amended firmware with effect from the date of reporting firmware bug. It shall be applicable for all supplies in warehouse/ in transit & in production. Vendor to submit an undertaking. <ul style="list-style-type: none"> <li>• It has to support IPOE</li> <li>• It has to support multicast mdt</li> </ul>
114		The MTBF (Mean Time Between Failure) should be higher than 500,000 hours and the MTTR (Mean Time to Restore) should be less than 30 minutes.
115		The CPE should work satisfactorily for continuous operation of tripleplay services (Voice+ video+ Data) for min. 120 hours.
116		The CPE & Adaptor shall have protection mechanism for Over voltage, Over Current & reverse current on the following interfaces as per ITU T K.21.
117		Electrostatic discharge - EN 61000-4-2
118		Fast transients' common mode - EN 61000-4-4
119		RF Immunity - EN 61000-4-3
120		Surge lines to earth coupling & line to line coupling - EN 61000-4-5
121		Electrostatic discharge - EN 61000-4-2
122		Call control: SIPv1/v2.
123		T.38 Fax relay

124	<b>VoIP specifications</b>	Fax/Data bypass
125		Echo canceller (G.168)
126		Echo canceller length(32ms)
127		Jitter buffer
128		Caller ID, Call Waiting, Call Forwarding, Call Transfer, Three Way Calling/Conferencing, Distinctive Ringing, Call hold
129		G.711 PCMU, G.711 PCMA, G.723.1, G.726, G.729
130		G.729; VAD and CNG; Caller ID and call waiting
131		ONT should support FXS Port for VOIP service
132		ONT should support SIP protocol to deliver voice service (SIP client allocation & Registration)
133		RTP/RTCP packet encapsulation
134		RFC 2833 Support
135		In-band signaling detection and generation (DTMF, call progress tones)
136		Automatic Tone generation (dial, busy, ring back, stutter, distinctive ring)
137		3-Way Conferencing
138	<b>Power Saving</b>	IEEE Energy Efficient Ethernet mode (EEE)
139	<b>Management Support</b>	Web-based with GUI
140		Remote management over the OMCI, PLOAM OMCC versions: 0xA0 to 0xA3
141		OAM and TR-069, TR-104, TR-111, TR-142. Support Zero Touch.
142		Must expose all its interfaces via HTTP, REST API only when connected directly via USB or RJ45, and over Wi-Fi with password access, which is visible in a menu in the CPE. All messages (both send and receive) must be in JSON-LD format
143		CPE should provide an interface to publish VOIP status messages (Ex:VOIP Calls Status, CLIP, Ringing, etc.,)
144	<b>Power Requirement</b>	Comply with CoC V3 or latest version
145	<b>Power Supply</b>	150V to 250V AC 50Hz, Indian Socket Plug, BIS standards
146	<b>Environment</b>	-0°C to +50°C,

### Pricing proposal Template

S.No	Item (Box type)	Model ID	Proposed MRP (INR) excluding taxes
1			
2			
3			
4			
5			

At any time prior to the last date for receipt of offer, APSFL may for any reason, whether at its own initiatives or in response to a clarification requested by a prospective bidder, modify the EOI document and all formats including annexure by issuing clarification(s) and or amendment(s). In order to provide prospective bidders reasonable time to take the amendment into account in preparing their offers, APSFL may, at its sole discretion, extend the last date for receipt of offers and/or make other changes in the requirements set out in the invitation for EOI.

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