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**Tribal Lands Playbook**

***<*** ***RFI Fixed Wireless Access Solutions>***

**<** **Tribal Land’s Name>**

**

*<Release Date>*

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***NOTE TO USERS OF THIS RFI TEMPLATE***

***Throughout this template, notes and instructions to the Author are provided in red, using the format of this paragraph. Please, review the notes and instructions to the Author and delete all notes and instructions before the RFI is posted. It is recommended that these notes are not deleted until the RFI is finalized, in the case that changes are made during drafting.***

***[Blue brackets indicate text fields that must be filled out with your own data]***

***This request for information (RFI) template addresses the case when a Tribal Land hasn’t secured the budget to implement the fixed wireless network and is looking for vendors and budgetary estimates regarding the following products and services:***

* ***Network Equipment (CPEs, RAN, Backhaul, Core, IT hardware)***
* ***Network Systems (Billing, Ticketing, Network Management Systems)***
* ***Site Surveys***
* ***Low-Level Network Design***
* ***Network Deployment (Installation & Commissioning)***

***Vendors may address one or more of the points above. In addition, vendors may provide information regarding capabilities for civil works and site construction, in the case that the deployment of a new (greenfield) site is required. In this way, the Tribal Land can understand the vendor ecosystem and shortlist vendors that best suit their requirements and constraints.***

***Depending on the state of the initiative the Tribal Land should provide the following inputs or a subset of them:***

* ***Coverage Targets***
* ***Service Plans***
* ***Spectrum Requirements***
* ***Existing Network Infrastructure Data***
* ***Network Architecture – Optional***
* ***High-Level Network Design – Optional***

***DELETE THIS PAGE PRIOR TO POSTING***

# Information for Vendors

## Introduction

***[Author: Provide a summary of your Tribal Land. Add any relevant information to the following generic statement]***

***[Tribal Land]*** is a federally recognized Tribal Nation located in the state of ***[state’s name]***. The***[Tribal Land]***Reservation comprises approximately***[Tribal Land area in sq km]*** square kilometers. Approximately ***[# of tribe members*],** tribal members live and work on or near the Reservation.

***[Author: edit the paragraph below to match your own scope. In particular, confirm if you require public Wi-Fi]***

***[Tribal Land]*** is undertaking an effort to deploy a fixed wireless network to provide broadband service in unserved or underserved areas of the Reservation to residential, commercial, business and institutional users, *including Wi-Fi access in public services*.

The target area for coverage is distributed in ***[# of target polygons]*** polygons that together represent an area of ***[total area of target polygons]*** square km covering an estimate of ***[total housing units in target polygons]*** homes.

The purpose of this request for information (RFI) is to solicit responses from system integrators, original equipment manufacturers (OEMs) and value-added resellers (“the Vendor”) in order to understand their capabilities and pricing structures to provide network equipment, management systems and implementation services for a fixed wireless network (the “Network”) in ***[Tribal Land]***. This document provides interested parties with the required information to prepare and submit a response.

Responses will be analyzed by ***[Tribal Land]***’s committee and will serve to finalize the business plan and secure funds to deploy the Network. In addition, based on the responses, a shortlist of vendors will be created so that these vendors are considered for the next steps toward deployment of the Network.

## Point of Contact

Upon release of this RFI all Vendor communications concerning the overall RFI should be directed to the point of contact listed below. Any oral communication will be considered unofficial. Vendors should rely only on written statements issued by the point of contact.

***[Author: Include other means of contact as you see fit]***

Name: ***[Tribal Land’s RFI Contact]***, RFI Administrator

Address: ***[Tribal Land’s RFI Contact address]***,

E-mail: ***[Tribal Land’s RFI e-mail Contact]***

# Network requirements

The fixed wireless network to be deployed in/by ***[Tribal Land]*** must meet the requirements listed in the following subsections.

## Coverage targets

The Network must provide coverage to the area(s) shown in Figure 1. The total target area is ***[sum of the target areas in sq km]*** sq km and covers an estimate of ***[sum of estimated covered homes]*** homes. Detailed information for each polygon shown in Figure 1 is provided in Annex B.

In addition, the Network must provide coverage to the set of priority targets listed in Annex B.

***[Author: Replace the figure with your target polygons]***

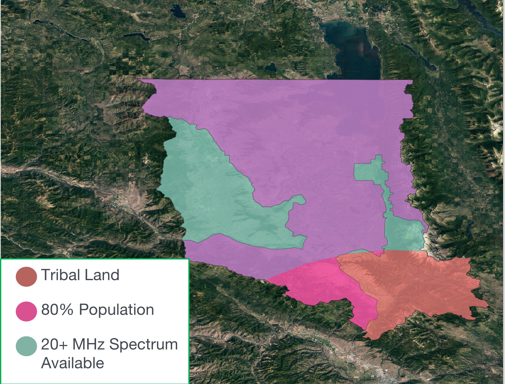


Figure 1 – Target Coverage Area

## Service plans

The network will provide ***[Number of services]*** services with varying throughputs as indicated in Table 1. Thus, the network must be dimensioned to support the expected traffic based on the adoption rates shown in Table 1 for each service.

***[Author: Fill the table with the characteristics of your services defined in Module 1 of the Playbook]***

|  |  |
| --- | --- |
| Throughput | Service adoption rate |
| **[X Mbps DL/ Y Mbps UL]** | ***[Y%]*** |
| **[X Mbps DL/ Y Mbps UL]** | ***[Z%]*** |

Table 1 – Service plans & adoption rate forecast

## Spectrum

***[EBS License Applicants/Holders]***

***[Author: If your Tribal Land has applied for an EBS license use the paragraphs below, otherwise, look for the “Non EBS Applicants” tag and use those paragraphs instead]***

***[Tribal Land]*** has ***[applied for / been granted]*** an EBS license in the area shown in Figure 2.

***[Author: Insert a map showing your EBS license area].***

Figure 2 – EBS License area.

Thus, the fixed wireless network must use the available EBS spectrum in the license area for the RAN solution. Available frequencies are ***[list the frequencies or channels that are available in your EBS license area]***.

***[Author: if your coverage targets are outside of the EBS license area, include the paragraph below, else, delete it]***

For areas of the coverage targets that are outside the EBS license, or if additional capacity is required at one of the sites, the network may use CBRS spectrum (3.65 GHz) or unlicensed spectrum in 5.8 GHz. Selection of frequency band to be used must consider the technical and economical tradeoffs of each frequency band.

***[Non EBS Applicants]***

***[Author: If your Tribal Land has not applied for an EBS license use the paragraph below, instead of the paragraphs above]***

The RAN solution of the fixed wireless network must use CBRS spectrum (3.65 GHz) or unlicensed spectrum in 5.8 GHz. Selection of frequency band to be used must consider the technical and economical tradeoffs of each frequency band.

## Use of existing infrastructure

The fixed wireless network must leverage existing buildings, towers, and other IT or telecom infrastructure available in ***[Tribal Land]***. Thus, the sites shall be deployed on existing infrastructure, minimizing, and avoiding to the extent possible the construction of new (greenfield) sites.

***[Author: If your Tribal Land has undergone the network planning data collection process, include the paragraph below, else, delete it]***

*Assets that can be potentially used for the network deployment have been identified by* ***[Tribal Land]****. A detailed list of these assets is provided in Annex C.*

For the responses to RFI, Vendor can assume that existing infrastructure is suitable and sufficient to deploy the network without the need to build new (greenfield) sites.

## Network Architecture

***[Author: If your Tribal Land has not established the network architecture, delete this section]***

Fixes Wireless Access (FWA) Network must be implemented using ***[LTE/TDMA]*** technology; backhaul must allow for *microwave (licensed and unlicensed), fiber, and VSAT solutions*.

***[Author: In the paragraph above, remove backhaul options that are not part of the Tribal Land architecture]***

*The mobile core must be implemented under a* ***[distributed/centralized]*** *architecture.*

***[Author: Remove the previous statement if using TDMA technology]***

The high-level E2E network architecture of the Network is shown in Figure 3.

***[Author: Insert the image of your network architecture from the Reference Architecture document obtained through the Network Architecture Wizard]***

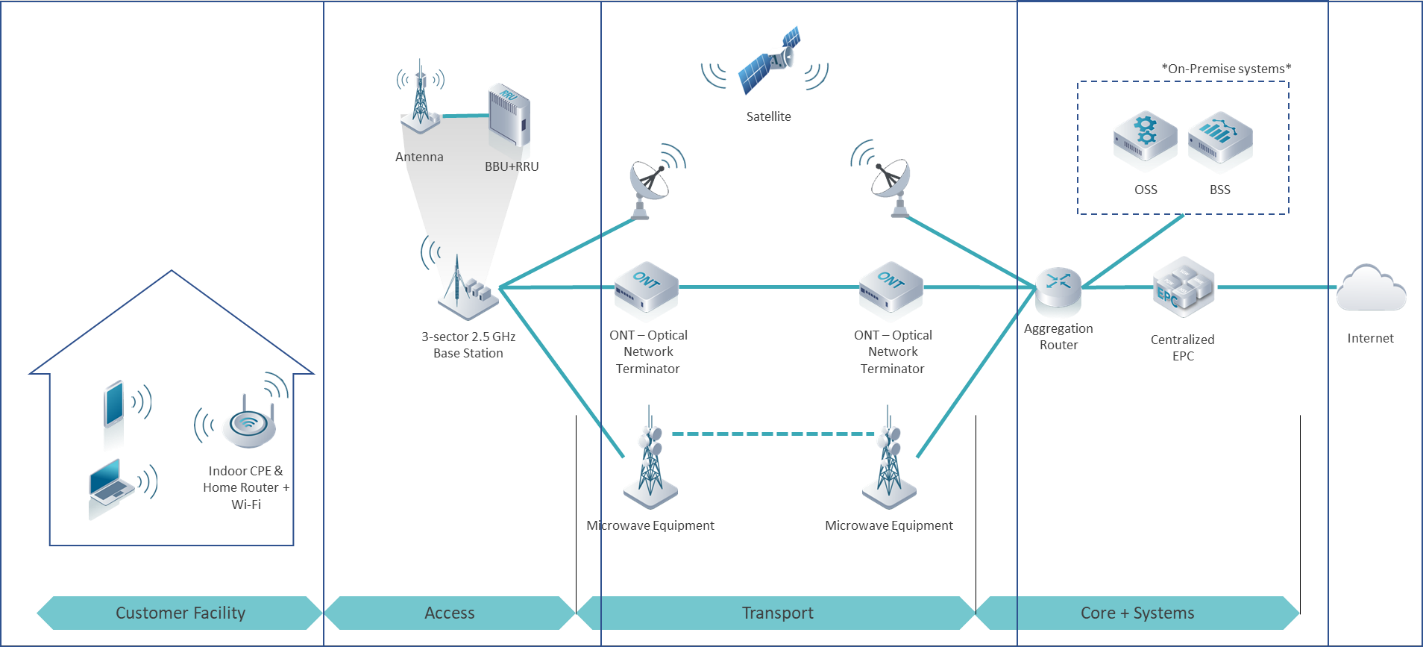


Figure 3. [Tribal Land] Network Architecture.

# Required information

Interested parties are requested to respond to this RFI following the format and instructions detailed in this section .

1. Cover page (See Annex A)
2. Table of contents including page numbers.
3. Content of the response
   1. Vendor background as indicated in section 3.1
   2. Summary of Products & Services as indicated in section 3.2
   3. Project References as indicated in section 3.3
   4. Network Equipment & Systems Offering as indicated in section 3.4
   5. Design & Implementation Services Offering as indicated in section 3.5
4. Appendices, including technical specifications and any other additional information or deliverable samples that can improve the understanding of the product and/or services that your company provides

The response must be compiled in a *single PDF document* and must be sent *via email* with the subject line “RFI Fixed Wireless Access Solutions: <Vendor Name> Response”

***[Author: Edit the submission details such as the delivery method in the paragraph above]***

## Vendor Background, Capabilities and Experience

Provide relevant and concise information of the Vendor, including at minimum, name, address, website, main area of expertise, and market differentiators.

## Summary of Products and Services

From the table below please indicate the equipment and services that your company is able to provide and that will be considered as part of the response to this RFI

***[Author: Edit the table including just the products and services required by your Tribal Land]***

|  |  |
| --- | --- |
| **Product / Service** | **Able to provide it ?** |
| **Products** | |
| LTE Base Stations operating at ***[2.5 ,3.5, 5GHz] [Author: Add a line for each frequency that is being considered. Delete if TDMA architecture has been established]*** | Yes | No |
| LTE CPEs operating at ***[2.5 ,3.5 or 5GHz] [Author: Add a line for each frequency that is being considered. Delete if TDMA architecture has been established]*** | Yes | No |
| TDMA Base Stations operating at ***[2.5 ,3.5, 5GHz] [Author: Add a line for each frequency that is being considered. Delete if LTE architecture has been established]*** | Yes | No |
| TDMA CPEs operating at ***[2.5 ,3.5 or 5GHz] [Author: Add a line for each frequency that is being considered. Delete if LTE architecture has been established]*** | Yes | No |
| Point-to-point microwave equipment and antennas | Yes | No |
| Routing & Switching Equipment | Yes | No |
| VSAT ***[Author: Delete if VSAT is not part of the architecture]*** | Yes | No |
| Distributed Evolved Packet Core (EPC) equipment ***[Author: Delete if centralized or cloud EPC has been established]*** | Yes | No |
| Centralized Evolved Packet Core (EPC) equipment ***[Author: Delete if distributed or cloud EPC has been established]*** | Yes | No |
| Cloud Evolved Packet Core (EPC) ***[Author: Delete if distributed or on-premises core has been established]*** | Yes | No |
| Billing Systems | Yes | No |
| Ticketing Systems |  |
| Network Management Systems |  |
| **Services** | |
| Site Survey | Yes | No |
| Network High-Level Design | Yes | No |
| Network Low-Level Design | Yes | No |
| New Site Build & Site Adaptation | Yes | No |
| Network Implementation | Yes | No |
| Network Systems Implementation | Yes | No |

Table 2 – Summary of Products & Services.

## Project References

Provide a brief description of at least one and maximum three projects that your company has participated in with a similar scope to that of the Network subject to this RFI. Include project objectives, size of the network, type of entity, challenges during project execution, and results and benefits that the client obtained through the products and services offered by your Company.

## Network Equipment & Systems Offering

Provide an overview of the solution (in terms of network equipment and systems) that your company would offer to fulfill the Network requirements in Section 2 *and the preliminary design that has been attached in the RFI release email*. ***[Author: If your Tribal Land is not providing a preliminary network design, delete the reference above]*** For each equipment or system that is part of the solution include the following:

* Description, main functions, and special features
* Technical specifications requested in Annex D according to the type of equipment.
* Estimated quantities based on initial dimensioning (Does not apply for systems)
* Budgetary pricing and pricing conditions
* Lead times and delivery conditions (in particular, indicate if the equipment can be delivered at the Reservation)

## Design & Implementation Services Offering

For those services listed below that are part of Vendor’s offering, describe the methodology, process and tools that your company applies to execute the service, considering requirements in section 2. It is also important to mention whether the service is provided in collaboration with other partners.

In addition, for each service explain the pricing structure and a budgetary estimate based on the requirements in section 2, clearly stating if pricing is based on fixed-fee deliverables or on time and material resources.

* **Site Survey** – Inspection of sites and infrastructure to register key characteristics relevant to network design. Deliverable consists of a report including photographs, site identification and location, structure and backhaul characteristics.
* **Network High-Level Design –** Complete design of the network including dimensioning and high-level configuration of the radio access network, backhaul solution for each site, design of the core/aggregation site, and an architecture for network systems
* **Network Low-Level Design –** Development of the low-level design of the network based on the selected network equipment and systems. The low-level design must document all the required details to install, configure, integrate, and put the network in service.
* **New Site Build & Site Adaptation** – Structural design and Civil work related to the deployment of new sites or structural adaptations to existing sites. Vendor should explain their capabilities and approach to address these tasks, including third-party companies that can act as partners in this regard.
* **Network Implementation –** Set of services that include last-mile transportation of network equipment, site installation and commissioning, acceptance testing and project management to ensure a timely and quality implementation of the network.
* **Network Systems Implementation –** Set of services to install, configure and launch operation of network systems, including all the necessary hardware and software installation.

# RFI Schedule

Table 3 sets forth the schedule that applies to this RFI. Based on ***[Tribal Land] ´s*** needs or unforeseen circumstances, schedule may change. Changes will be communicated by e-mail to all invited Vendors.

***[Author: Edit dates according to your schedule. Elapsed time is suggested for each milestone]***

| RFI Milestone | Responsible | Date |
| --- | --- | --- |
| Issuance of invitation email and copy of Non-Disclosure Agreement. | ***[Tribal Land]*** | ***[RFI Start Date]*** |
| Vendor confirmation of intent to participate and return of signed NDA. | Consultant | ***[+ 1-2 weeks]*** |
| RFI document released to participants | ***[Tribal Land]*** | ***[+ 1-2 days]*** |
| Clarification questions accepted from Vendors deadline | ***[Tribal Land]*** /Consultant | ***[+ 1 weeks]*** |
| Answers to clarification questions supplied to Vendors | ***[Tribal Land]*** | ***[+ 1 weeks]*** |
| Deadline for Vendor RFI responses | Consultant | ***[+ 2-3 weeks]*** |

Table 3 – RFI timeline

# Questions Related to this RFI

Questions regarding this RFI shall be submitted in writing by email to the point of contact identified in Section 1.2. Verbal questions will NOT be accepted. Questions will be answered by email and sent to all participants; accordingly, questions shall NOT contain proprietary or classified information.

**[Tribal Land]** does not guarantee that questions received after the deadline in Table 3 will be answered.

# Terms and conditions

***[Author: Do not share these terms and conditions without legal advice]***

1. Issuance of this RFI in no way constitutes a commitment by ***[Tribal Land]*** to make a contract or to enter into an Agreement.
2. ***[Tribal Land]*** shall not be liable for any expenses incurred by any Vendor as result of the process associated with this RFI
3. Vendor agrees to treat all the information contained in this document as Confidential Information to ***[Tribal Land].*** The information is to be used by the Vendor only for the purpose of preparing a response and will not be disclosed to third parties. *Please refer to the executed Non-Disclosure Agreement (NDA) between* ***[Tribal Land]*** *and Participant for additional details regarding the treatment of Confidential Information (as defined in the NDA).* ***[Author: check applicability of the NDA statement]***
4. In the event it becomes necessary to revise any portion of the RFI for any reason, ***[Tribal Land]*** shall distribute addenda, supplements, and/or amendments to all potential Vendors known to have received the RFI.

# Annex A: Cover Page

***RFI Fixed Wireless Access Solutions***

***<Company Name>***

|  |  |
| --- | --- |
| **Name of Person, Business or Organization:** |  |
| **Type of Entity:** |  |
| **Federal Tax ID Number:** |  |
| **Contact Name** |  |
| **Contact Address** |  |
| **Contact Phone Number(s)** |  |
| **Contact Email address(es)** |  |

By signing this Cover Sheet I hereby attest: that I have read and understood all the terms listed in the RFI, and have read and understood all terms listed in this response.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*<Name & Position>*

# Annex B: Coverage Targets

Details regarding coverage polygons is provided in Table 4.

***[Author: Take the data from the Geodemographic tool and paste it in the table below]***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Polygon | Area [sq km] | Spectrum availability | Population Estimate | Housing Units Estimate |
|  |  |  |  |  |
|  |  |  |  |  |

Table 4 – Coverage Polygons data

Priority targets to be covered by the fixed wireless network are listed in Table 5.

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Location Type | Latitude | Longitude |
|  |  |  |  |
|  |  |  |  |

Table 5 – Priority Targets Data

***[Author: Attach the KML and/or CSV file with the coverage polygons and priority targets]***

# Annex C: Existing Infrastructure & Network Assets

***[Author: If the Tribal Land has not undergone the Network planning data collection process detailed in module 2 of the playbook, this annex should be deleted]***

Preliminary data on existing sites that can be considered for the network design is provided in Table 6.

***[Author: Fill the table with the data obtained through the Network Planning data collection process]***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Site ID | Latitude | Longitude | Height Estimate | Existing Backhaul |
|  |  |  |  |  |
|  |  |  |  |  |

Table 6 – Existing Sites & Infrastructure.

***[Author: If there is any other relevant infrastructure such as fiber runs or telco rooms, etc. Please, provide it below]***

Annex D: Technical Specifications

## Base Station

|  |  |  |
| --- | --- | --- |
| **Base Station Technical Specs – <Model No.>** | | |
| **Category** | **Attribute** | **Value** |
| ARCHITECTURE | Radio Access Technology | LTE/TDMA |
| Split Architecture? | BBU+RRU / All-In-One |
| Number of TX/RX Ports | #TX / # RX |
| Integrated Antenna? | Yes | No |
| Antenna Gain (dBi) | #dBi |
| Network-in-a-box? | Yes | No |
| EPC Functionality | Yes | No |
| RF | Output Power (dBm) | #dBm |
| Number Of Carriers | #Carriers |
| Frequency Band | LTE 40, 41 ETC. / TDMA not apply |
| Frequency Range (MHz) | 2300 – 2400 MHz, 2496 – 2690 MHz, 3400 – 3600 MHz, 3600 – 3800 MHz, others. |
| Channel BW | 5,10,15,20, other MHz |
| Active Users | # Active Users (With an active bearer) |
| Connected Users | # Connected Users (Idle state) |
| Max Throughput | Mbps |
| Antenna Connector |  |
| QOS & SERVICES | Scheduling Mechanisms |  |
| Support for IoT | Yes | No |
| Support for Voice | VoLTE / Voice over IP , others |
| SOFTWARE | Release\_Number\_3GPP | Release # |
| OAM Mechanisms | SNMP,WEB-GUI,HTTP, others |
| SYNC | GPS Antenna Required? | YES / NO |
| GPS Antenna Connector | SMA , other |
| ELECTRICAL & MECHANICAL | Power Input | #VAC / #VDC |
| Power Connector | PoE /AC adaptor |
| Power Consumption | # Watts |
| Dimensions | [L\*W\*D in mm] |
| Weight | # kg |

## CPE

|  |  |  |
| --- | --- | --- |
| **Customer Premise Equipment – <Model No.>** | | |
| **Category** | **Attribute** | **Value** |
| ARCHITECTURE | *Device Type* | CPE | Home Router | Both |
| *Radio Access Technology* | LTE | TDMA | NA |
| *Type of Environment* | Indoor | Outdoor |
| *Number of TX/RX Ports* | e.g. 2T2R | 4T4R |
| *Integrated Antenna?* | Yes | No |
| *Antenna Gain* | # dBi |
| *Operation Mode* | Router | AP | WDS |
| *Base station dependency* | No | Baseband model |
| RAN (CPE) | *Output Power* | # dBm |
| *Frequency Band* | # MHz |
| *Frequency Range* |  |
| *Channel BW (MHz)* | # MHz |
| *RX Sensitivity (CPE) -dBm* | # dBm |
| *Max Throughput* | Mbps |
| *Antenna Connector* |  |
| WLAN (Wi-Fi) | *Supported Bands* | Single-Band | Dual-Band | Tri-Band |
| *802.11 Protocols Supported* | 802.11 g/n/ac/ax |
| *Output Power (dBm)* | # dBm |
| *Number of SSIDs* | # |
| *Max Users/Devices Supported* | # |
| *Wi-Fi Throughput* |  |
| HARDWARE INTERFACES | *WAN Interfaces* | e.g. DSL, Ethernet |
| *LAN Interfaces* | 4 x 100 | 1 x 1G | 5 x 1G |
| FEATURES | *Community WiFi Support* | Yes | No |
| *IP Address Support(v4/v6)* | IPv4 | IPv6 |
| *DNS* | Server | Client | Relay |
| *DHCP* | Not Supported | Server | Client | Relay |
| *MAC/IP Filter* | Yes | No |
| *WAN Setup Mode* | Static IP | Dynamic IP | PPPoE | PPTP |
| *DMZ* | Yes | No |
| *RADIUS Authentication* | Yes | No |
| *VLAN Assignment per SSID* | Yes | No | VLAN Supported (Not Specified per SSID) |
| QOS & SERVICES | *QoS Mechanisms* | List of Mechanisms |
| *DSCP Marking* | Yes | No |
| *CoS Marking (Priority Code Point: 802.1p)* | Yes | No |
| SOFTWARE | *Release\_Number\_3GPP* | RX |
| *OAM Supported Protocols* | e.g. TR-069 | SNMP |
| *Supported Open Source Firmware* | Yes | No |
| *Open Source Firmware* | e.g. DD-WRT | OpenWRT | Tomato |

## Backhaul Equipment

|  |  |  |
| --- | --- | --- |
| **Backhaul Equipment – <Model No.>** | | |
| **Category** | **Attribute** | **Value** |
| ARCHITECTURE | *Transport Technology* | P2P | P2MP MW |
| *Supported Frequency Bands* | - GHz |
| *Full Outdoor?* | Yes | No |
| PHY | *Integrated Antenna?* | Yes | No |
| *Max. Supported channel size* | # MHz |
| *Max Link throughput/capacity per channel* | # Gbit/s |
| *Max TX power (dBm)* | # dBm |
| *Highest supported Modulation* |  |
| *MIMO* | *(e.g., 2X2, 4X4)* |
| R&S | *Integrated Switching* | Yes | No |
| *Port Number & Capacity* | 10/100/1000-BASE-T |
| *Max supported frame size(bytes)* |  |
| *IP Address Support(v4/v6)* |  |
| QOS & OAM | *Latency round trip (ms)* | # ms |
| *QoS Mechanisms* |  |
| DEPLOYMENT | *OAM Mechanisms* |  |
| *Deployment Complexity* |  |
| *Power Input* | # VDC | VAC |
| Electrical & Mechanical | *Power Connector* | PoE | Power adaptor |
| *Power Consumption* | # W |
| *Dimensions [L\*W\*D in mm]* | *[L\*W\*D in mm]* |
| *Weigth (kg)* | *(kg)* |

## EPC and Core/Aggregation Routers

|  |  |  |
| --- | --- | --- |
| **Core Equipment – <Model No.>** | | |
| **Category** | **Attribute** | **Value** |
| Architecture | *Type of equipment* | Core / Aggregation |
| *Technologies supported* | 2G| 3G| LTE|5G |
| *Type of architecture* | Disaggregated | CNFs |
| *Is scalable?* | Yes | No |
| PHY | *Topology* | Distributed | Centralized |
| *Port Number & Capacity* | #x E/FE/GE |
| NAT & QoS Mechanisms | *Supported NAT* | Yes | No |
| *QoS Protocols* | Default QCI | Override | DSCP profiles | others |
| DHCP  Capacity | *DHCP Integrated* | Yes | No |
| *Number of Subscribers* | # *Subscribers* |
| R&S | *Number of Active sessions* | *# Active sessions* |
| *Number of eNB/AP Supported* | # |
| EPC | *3GPP Release* | Release # |
| *EPC Entities* | MME | SGW | PGW |
| QOS & OAM  Voice | *Non3GPP and 3GPP interoperability* | Yes | No |
| *Supported Voice Technologies* | VoLTE | CS Voice |
| DEPLOYMENT  IoT  Cost | *Number of active calls* | # |
| *IoT Version Supported* | Yes | No |
| Electrical  Mechanical | *Power Input* | VAC |
| *Power Connector* |  |
| *Power Consumption* | # Watts |
| *Dimensions [L\*W\*D in mm]* |  |