

STATEMENT OF REQUIREMENTS

WIFI HOTSPOTS AT FOUR BORDER POSTS

1. Objectives

UCC through the RCDF programme seeks to conduct a pilot WIFI Hotspot project implementation in four chosen border posts. The chosen service provider will install and equip the four sites with a Bandwidth capacity of 5Mbps per location in each of the areas that have been selected in that particular district whose cost UCC will meet for the initial three years to enable the public to access free internet connectivity in the Wi-Fi's coverage footprint of each of the locations installed. Maintenance of the infrastructure will be the responsibility of the Service provider and shall ensure 99.9 service availability 24/7.

The Wi-Fi solution should be designed in such a way that the customer can login using options of Facebook, Twitter, Email, phone number, LinkedIn, as well as the possibility for open access and this information should be captured and may be used by UCC/RCDF to inform future projects or to improve the installed services. It should also be possible to allocate a specific duration of access to a user and to limit the services accessible, say video streaming may be blocked.

Analytics on Wi-Fi solution should be possible where UCC can determine the use of the Wi-Fi network in the selected locations and the users in terms of age groups, gender etc., ability to run UCC adverts and sensitisation campaigns on the platform say information from Ministry of Health should also be possible

A monitoring tool for the Wi-Fi network should be provided by the vendor to give UCC visibility of the network for availability, topology, packet drops, usage, availability, etc.

Below are four locations : -

	WIFI Location	District
1.	Busia	Busia district
2.	Mpondwe	Kasese district
3.	Lwakhakha	Manafwa
4.	Katuna	Kabale district

2. Background

The RCDF Guidelines III prioritises Broadband connectivity and access as one of the programs for funding and implementation of projects. This is also further emphasised by the National Broadband Policy that seeks to have broadband coverage across the country by all mobile operators. The National Broadband policy defines broadband for Uganda as robust connectivity that is affordable, always on and delivers a minimum of 5Mbps to the user for applications, content and services. RCDF through this initiative seeks to drive the adoption of broadband services in these four areas.

3. Technical Requirements

Below are an optimal set of features that a custom-designed Wi-Fi hotspot solution should have in order to efficiently implement and easily manage and maintain a Wi-Fi hotspot network. These set of requirements will cover most of the use cases for public Wi-Fi access.

3.1 Requirements for WIFI Access Point (AP)

Item No.	Technical Specification required including applicable standards	Compliance of specification offered	Technical literature on specification offered in column c
<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
High performance and superior coverage	Gives up to 4x the speed of 802.11n networks; Maximises coverage for optimal deployment, Auto-channel selection, band-steering, and meshing Built-in AAA module for Wi-Fi hotspot networks		
Comprehensive security	Supports wireless security features (WPA, WPA2) MAC-based Access Control List to protect against intruders		
Easy to Configure	Cloud, controller or stand-alone modes for configuration		

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	Plug and play device with auto-configuration sync		
Interoperate with both new and legacy clients	Support latest 802.11ac wireless clients to achieve maximum speed Backward compatible to allow legacy devices to connect at their fastest speed		
AP characteristics			
AP Throughput and Max users	1200 Mbps ; 100+ users (AP Mode)		
Radios (built-in)	2.4GHz:802.11b/g/n; 5GHz: 802.11a/n/ac		
Radio operation modes	Wi-Fi Access Point, Gateway, Local Meshing		
AP operation modes	Cloud and controller managed, Autonomous		
Wi-Fi Alliance Certification	a/b/g/n/ac Wi-Fi certified		
Antenna	External MIMO antenna, Two 8dBi 2.4GHz and Two 12dBi 5GHz		
Ethernet Interface	1 * 10/100 /1000Mbps RJ45 WAN Port; 1 * 10/100 Mbps RJ45 LAN Port		
Reset Button	1 * Reset button, press 15 seconds to revert to factory setting		
Power and POE specification	DC IN:12V/1.5A, PoE IN:48V/0.5A; IEEE 802.3af/802.3at PoE compliant for Gigabit Ethernet		
Size	230mm X 280mm		
Weight	4Kgs		
Environment			
Operating temperature	32°F to 122°F (0°C to 50°C)		
Operating relative humidity	5% to 95%, noncondensing		
Non-operating/Storage temperature	Minus 40°F to 158°F (-40°C to 70°C)		
Non-operating/Storage relative humidity	5% to 95%, noncondensing		

3.2 Requirements for a suitable Wi-Fi Controller

Item No.	Technical Specification required including applicable standards	Compliance of specification offered	Technical literature on specification offered in column c
a	b	c	d
High Availability	the wireless controller shall support Redundant power supply		
RF Management	Shall support an ability to dynamically adjust channel and power settings based on the RF environment.		
RF Management	Radio coverage algorithm shall allow adjacent Access Points to operate on different channels, in order to maximise available bandwidth and avoid interference		
RF Management	Shall support RF Management with 20/40/80 MHz channels with 802.11a/b/g/n/ac		
Performance:	Controller performance shall remain the same if encryption is on or off for wireless SSIDs.		
Security:	Shall adhere to the strictest level of security standards, including 802.11i Wi-Fi Protected Access 2 (WPA2), WPA, 802.1X with multiple Extensible Authentication Protocol (EAP) types, including Protected EAP (PEAP), EAP with Transport Layer Security (EAP-TLS), EAP with Tunnelled TLS (EAP-TTLS		
Security:	Shall support Management frame protection for the authentication of 802.11 management frames by the wireless network infrastructure.		
Functionality	Shall be able to set a maximum per-user bandwidth limit on a per-SSID basis.		
Functionality	Shall support user load balancing across Access Points.		

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Functionality	The controller shall provide Mesh capability for Mesh supported AP.		
Operational:	Shall provide an Air Quality rating on a per- radio basis to help gauge the impact of interference on the network		
Operational:	Shall support encrypted mechanism to securely upload/download software images to and from wireless controllers		

3.3 Requirements for a suitable Centralised WIFI Management System

Item No.	Technical Specification required including applicable standards	Compliance of specification offered	Technical literature on specification offered in column c
<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
General	The system shall comply with the DoT guidelines regarding the provision of Wi-Fi internet service under the de-licensed frequency band		
General	The Solution Shall Support Captive portal having customisable GUI. This portal shall be available to any client coming into the Wi-Fi zone.		
General	Captive portal shall allow local branding and content as per the location.		
General	The solution shall be able to restrict the bandwidth as per the policies. The solution shall have configurable GUI for Policy management to differentiate location-wise Bandwidth policies		
General	The solution shall support Usage-based as well as Time duration-based accounting. It shall support real-time disconnection on completion of allotted resources, i.e. Time or Data		
General	The solution shall support the		

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	centralised server for User authentication		
Administration	GUI based management console for system administration, policy/package creation, backup and restore accounting data, SMS gateway configuration etc.,		
Administration	Creation of batches in advance and activation upon the first usage		
Administration	Generation of a report of usage and accounting, real-time usage of USER as per the location.		
Administration	Management of different Packages.		
Administration	The centralised system shall available in Failover mode		
Administration	Policy-based access control for administrative activities		
Administration	Login and session details, browsing history and audit trails		
Subscriber Management	Creation of subscribers as per the required packages. Activation of subscribers as per the usage		
Subscriber Management	Renewal/Registration of the subscriber.		
Subscriber Management	Portal providing Self-registration.		
Accounting and Billing features	Creation of various packages		
Accounting and Billing features	Real-time accounting of the usage		
Accounting and Billing features	Location wise usage and billing detail		
Subscriber Management System & database	It shall offer complete subscriber management features in Subscriber Management options, which mainly focuses on creating, editing, updating,		

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	renewing, deleting, and managing of accounts for all subscribers.		
Subscriber Management System & database	It shall support multiple Login Controls		
Subscriber Management System & database	It shall support Guest Management.		
Subscriber Management System & database	It shall support bulk username and password creation		
Subscriber Management System & database	It shall support centralised Profile creation & Subscriber Provisioning		
Subscriber Management System & database	It shall support different customer acquisition process for Public Wi-Fi users		
Subscriber Management System & database	It shall support time-bound username & password generation for Wi-Fi users		
Subscriber Management System & database	It shall be able to bind the MAC of Wi-Fi users		
Subscriber Management System & database	It shall have a centralised database which enables administrator easily manage the database from a single point in distributed Architecture		
Subscriber Management System & database	It shall allow the administrator to define whether the subscriber has to be added to the existing customer database or added as a fresh customer. Multiple subscribers shall be added under the same customer. The administrator can define the username & password by which the subscriber		

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	can login.		
Subscriber Management System & database	It shall allow the administrator to lists down the complete subscriber list in the system and allows updating or modifying subscriber information as required. The administrator can select the customer name from the list and update details.		
Subscriber Management System & database	The database for the system is to be provided by the vendor along with the required hardware, software, etc. to maintain logs as per TRAI guidelines issued from time to time.		
Self Service Portal	This shall work as an interface between NMC and City Wi-Fi user. Any prospective user coming into NMC public hotspot shall be presented a webpage portal giving details of Wi-Fi services, tariffs and procedure to subscribe to the services. A citizen shall be able to make payment through this portal		
Self Service Portal	The subscriber shall be able to check his Wi-Fi account details		
Self Service Portal	The subscriber shall be able to change their password		
Self Service Portal	Shall be able to create new Wi-Fi accounts through Captive/Web portal		
Self Service Portal	Shall be able to display the complete information that includes IP address using which the subscriber logged in as well as the MAC address of the subscriber (if MAC binding option is selected).		
Self Service Portal	For security reasons, it shall suggest subscribers change or update their password regularly.		
Self Service Portal	It shall allow subscribers to update personal details and contact information		

3.4 Requirements for a suitable 24 Power back up system

Item No.	Technical Specification required including applicable standards	Compliance of specification offered	Technical literature on specification offered in column c
<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
Invertor	Invertor dimensioned to WIFI Access point Load, with charge controller (Over 98% efficiency), a monitoring device that displays battery charge status, Remote temp sensor for battery temperature sensing and charging, user-friendly LCD panel to display system data and Surge Protector for protection from surges in the power network.		
Battery	Deep Cycle GEL based solar battery with 24-hour backup dimensioned to the WIFI Access point Load		
Solar Panels (Optional)	Dimensioned as per load requirement. Easy to install modules, long-term warranty, with Low-temperature deposition, and guaranteed product quality.		
LED Luminaries	High Quality, long-lasting energy-efficient LED Lighting		

3.5 Requirements for suitable Steel Poles

Item No.	Technical Specification required including applicable standards	Compliance of specification offered	Technical literature on specification offered in column c
<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
Steel Poles	8mm Steel Street Pole on which t mount the antenna system, at the optimal height required with all mounting accessories.		