2024 INTERCONNECTION, ACCESS AND INFRASTRUCTURE-SHARING CATALOGUE TRANSPORT

OFFERING FOR DECLARATION RECEIPT HOLDERS

CONTENT

I. INTRODUCTION

I.1. CONTEXT

This catalogue is developed and published by CAMEROON TELECOMMUNICATIONS (CAMTEL) for the operation of the Electronic Communications Transport Network Concession Agreement No. 3 of 4 March 2020. The said Agreement and its appendices, in particular the specifications (articles 1, 9, 22 and 23), the quality of service, the coverage area, the pricing policy and shareholders, highlight the essential requirements and the rules of non-discrimination, the conditions of access to the network, the conditions of commercial operation, and anti-competitive practices.

The operation of an electronic communications transport network in Cameroon is governed by the provisions of a set of instruments:

- Law No. 2015/006 of 20 April 2015 to amend and supplement some provisions of Law No. 2010/013 of 21 December 2010 governing electronic communications in Cameroon;
- Law No. 2010/013 of 21 December 2010 governing electronic communications in Cameroon;
- Decree No. 2023/08473/PM of 23 November 2023 to lay down conditions for interconnection, access to public electronic communications networks, and infrastructure sharing;
- Decree No. 2017/2580/PM of 6 April 2017 to amend Decree No. 2012/1638 of 14 June 2012 to lay down the conditions for the establishment or operation of electronic communications networks and the provision of electronic communications services subject to the authorisation regime, Articles 5, 6 and 7 of which specify requirements relating to the principles of equal treatment of users, transparency and non-discrimination in terms of the pricing of services offered to users throughout the country;
- Decree No. 98/197 of 8 September 1998 to lay down the organisation and functioning of the Telecommunications Regulatory Board;
- Decree No. 2012/203 of 20 April 2012 to lay down the organisation and functioning of the Telecommunications Regulatory Board;
- Decree No. 2020/727 of 3 December 2020 to lay down the reorganisation and functioning of the Telecommunications Regulatory Board;
- Decision No. 54/MINPOSTEL of 18 April 2013 to lay down the conditions for the installation of telecommunications towers and masts in Cameroon;
- Decision No. 191/ART/DG/DAJPC/SDAJ/SREG of 2 October 2014 to lay down the procedures for settling disputes between operators of electronic communications networks in Cameroon;

- Decision No. 64/MINPOSTEL of 21 May 2019 to lay down the conditions for access to and installation of radio equipment on the Mount Mbankolo site;
- Decision No. 44/ART/DG/DLCI/CI of 23 July 2002 to prescribe directives on the conditions for the interconnection of public telecommunications networks.

I.2. DEFINITIONS

The terms hereunder shall, for the purposes of this catalogue, have the following definitions:

AS: Autonomous System. This is a large network or group of networks with a consistent internal routing policy.

Board: Telecommunications Regulatory Board;

BUT: Transport Business Unit

Submarine cable: physical cable infrastructure for electronic communications signals built in the marine environment. It is termed "international" when it connects two or more countries;

CAMTEL: Cameroon Telecommunications

Interconnection catalogue: technical and pricing information published by operators providing infrastructure-sharing services to support electronic communications networks.

Half-Circuit: A circuit whose required resources are provided half by each contracting party;

CEIBA 2: Submarine cable system connecting Kribi in Cameroon to Bata in Equatorial Guinea;

Co-location: service offered by a public electronic communications network operator, consisting of making infrastructure, including premises, available to other operators to install and, where applicable, operate their equipment;

Interconnection catalogue: technical and pricing information for interconnection and access published by public electronic communications network operators;

Cross connect: Submarine cable landing station crossing fee;

Terminal equipment: Device, installation or set of installations meant to be connected to a network termination point, and which transmits, receives or processes electronic communications signals. This does not include equipment that enables access to audiovisual communication services broadcast over the air or distributed by cable, except where such equipment also enables access to other electronic communications services;

Provider: Any person or legal entity that establishes, operates, supervises or provides an electronic communication network;

Full circuit: Full circuit, or a circuit that operates with bidirectional transmission;

Certification: Expert assessment and verification exercise conducted by an approved body to certify that the prototype of electronic communications equipment and systems complies with the regulations and technical specifications in force;

Interconnection: particular method of access that involves physically and logically linking the public electronic communications networks used by the same or different operators to allow users to communicate with each other or to access services provided by another operator;

Alternative infrastructure: installation or set of installations operated by public service concession holders and capable of providing or contributing to the provision of either the transmission or the transmission and routing of communications signals;

Passive infrastructure: infrastructure supporting electronic communications networks, in particular overhead and underground civil engineering structures (ducts, conduits, tunnels, service pipes, facade cable runs, poles and overhead cable runs); premises, cabinets and technical rooms; towers and masts; cables, connection components, and electrical power supply components (generators, power distribution boards, batteries, solar systems, inverters, rectifiers, etc.); air-conditioning components and safety components.

Radio installation, station or equipment: Any electronic communication installation, station or equipment that uses radio frequencies for wave propagation in free space. Radio installations notably include networks that use satellite capacities;

Trunk leased circuits (TLC): Refers to the setting up of circuits linking two centres located in two networks in different localities;

Local leased circuits (LLC): Refers to the setting up of circuits linking two centres located in two different local networks;

Licence: A telecommunications licence is a document authorising an entity to provide telecommunications services or to operate telecommunications facilities. It is issued by a country's authorities.

NCSCS: Nigeria-Cameroon Submarine Cable System. CAMTEL submarine cable system (TRANSPORT) connecting Kribi in Cameroon to Lagos in Nigeria;

Technical offer: Refers to the document in which the supplies and services concerned are set out.

Operator: A telecommunications operator is an entity that provides remote communications services. This generally involves a link to at least one open communications network (e.g. switched network, Internet), but the network can be self-sufficient;

Infrastructure-sharing: Making services, equipment, rights-of-way, buildings, routes, pipes, and high points available to legal entities governed by public law and operators of electronic communications networks for the installation and operation of equipment;

Prepayment: Advance payment;

Tower: A structure, usually metal, that carries telecommunications antennas;

Electronic communications network: Active or passive transmission systems and, where applicable, switching and routing equipment and other resources, which make it possible to transmit signals by wire, by radio, by optical means or by other electromagnetic means: including satellite networks; fixed (circuit-switched or packets, including the Internet) and mobile terrestrial networks; systems using the electrical network, provided they are used for transmitting signals; networks used for radio and television broadcasting; and cable television networks, irrespective of the type of information broadcast;

SAIL: South Atlantic Inter Link (SAIL): A submarine cable system connecting Kribi in Cameroon to Fortaleza in Brazil;

SAT-3/WACS/SAFE: South Africa Transit 3/West Africa Submarine Cable/South Atlantic Far East. Submarine cable system starting at Sesimbra in Portugal and connecting several countries on the West Coast of Africa with a landing point in Douala in Cameroon and ending in Penyang in Malaysia;

SDH: Synchronous Digital Hierarchy. A high-speed digital data transmission protocol. It includes a definition of data rates and physical interface types.

Electronic communications service: Service consisting wholly or mainly in the provision of electronic communications;

Telecommunications service: Service consisting wholly or mainly in the provision of electronic communications;

Internet Service: Solution offered by CAMTEL (TRANSPORT) that enables the establishment of dedicated Internet links, with a dedicated speed of n x 1Mbps, between the customer and CAMTEL's (TRANSPORT) router connected to the Internet backbone. The customer is connected to the router of CAMTEL's (TRANSPORT) Internet Centre via the network of cables;

IP/MPLS Service: Interconnection solution based on the IP/MPLS (Internet Protocol/ Multi Protocol Label Switching) cloud;

IP Transit Service: refers to the bandwidth sold by Internet access providers to other customer networks, which allow their customers to access the entire Internet as part of a contractual and (mostly) paid service.

STMx: Synchronous Transport Module. (X= 1, 4, 16, 64…). STM1=155 Mbps, STM4=622 Mbps, STM16=2,5 Gbps, STM64=10 Gbps.

Global Mobile Personal Communication by Satellite (GMPCS): any existing or planned fixed or mobile, broadband or narrowband, global or regional, geostationary or non-

geostationary satellite system providing electronic communications services directly or indirectly to end users via a constellation of satellites;

Telecommunications: Any transmission, emission or reception of signs and signals, text, images, sounds or intelligence of any kind, by wire, optical, radio means or any other electromagnetic system;

WACS: West African Cable System; Starting point: United Kingdom; Landing point: Yzerfontein-South Africa;

Redundancy: Redundancy is a system design in which a component is duplicated to provide a back-up solution in the event of failure.

Temporary subscription: Subscription to a service for less than the contractual period.

I.3. Purpose and Validity

This catalogue presents the technical offering and tariffs set by CAMTEL (Transport Business Unit) for concession operators, to enable all users of interconnected networks to communicate freely with each other.

It shall enter into effect from the date of signature.

It covers the following services:

- **Connectivity services**: Local leased circuit, trunk leased circuits, international private leased circuits, MPLS;
- **Internet access services**: IP Leased Line (DIA), IP Transit, Public Address;
- **Associated services**: Redundancy, temporary subscription;
- **QoS services**: Tiered SLA, Capacity on Demand, Technical Support.
- **Infrastructure sharing services -** Co-location;

Each interconnection arrangement with CAMTEL shall be subject to an interconnection agreement describing the technical and financial terms and conditions of the services offered.

It is understood that:

- The rates listed in this catalogue are exclusive of tax;
- The transport network complies with international standards relating to existing interfaces, lengths, nodes and loops;
- The access fees for offers or services shall be those in force on the date such offers or services are made available;
- The services covered by this catalogue shall be offered within the limits of the technical conditions and capacities of CAMTEL's infrastructure.

II. CAMTEL'S TRANSPORT NETWORK

CAMTEL's transport network comprises 12,000 km of optical fibre and covers the 10 regions, linking all the regional chief towns with an architecture made up of "national" loops.

The main cities also have urban loops, creating alternative routes for traffic flow.

Some isolated areas are connected via microwave links.

The network's main transmission route is the Kribi-Kousseri axis, which is highly strategic insofar as it acts as a gateway for the Port Sudan - Kribi digital corridor, creating a diagonal across the continent and offering better performance in connectivity between Asia, the Middle East and the Americas.

The transport network is fed internationally by 4 (four) submarine cable outlets with 3 (three) landing stations, including:

- **WACS in Batoke (Limbe)** for the WACS cable linking Cameroon to various countries on the West African coast and the European continent.
- **SAT3, the oldest, with a landing point in Douala** for an alternative exit to Europe and Asia via South Africa.
- **NCSCS in Kribi** linking Cameroon to Nigeria;
- **SAIL, linking Kribi to FORTALEZZA in Brazil,** to interconnect the two great continents of Africa and the Americas;
- **Ceiba 2 in Kribi,** to link up with Equatorial Guinea.

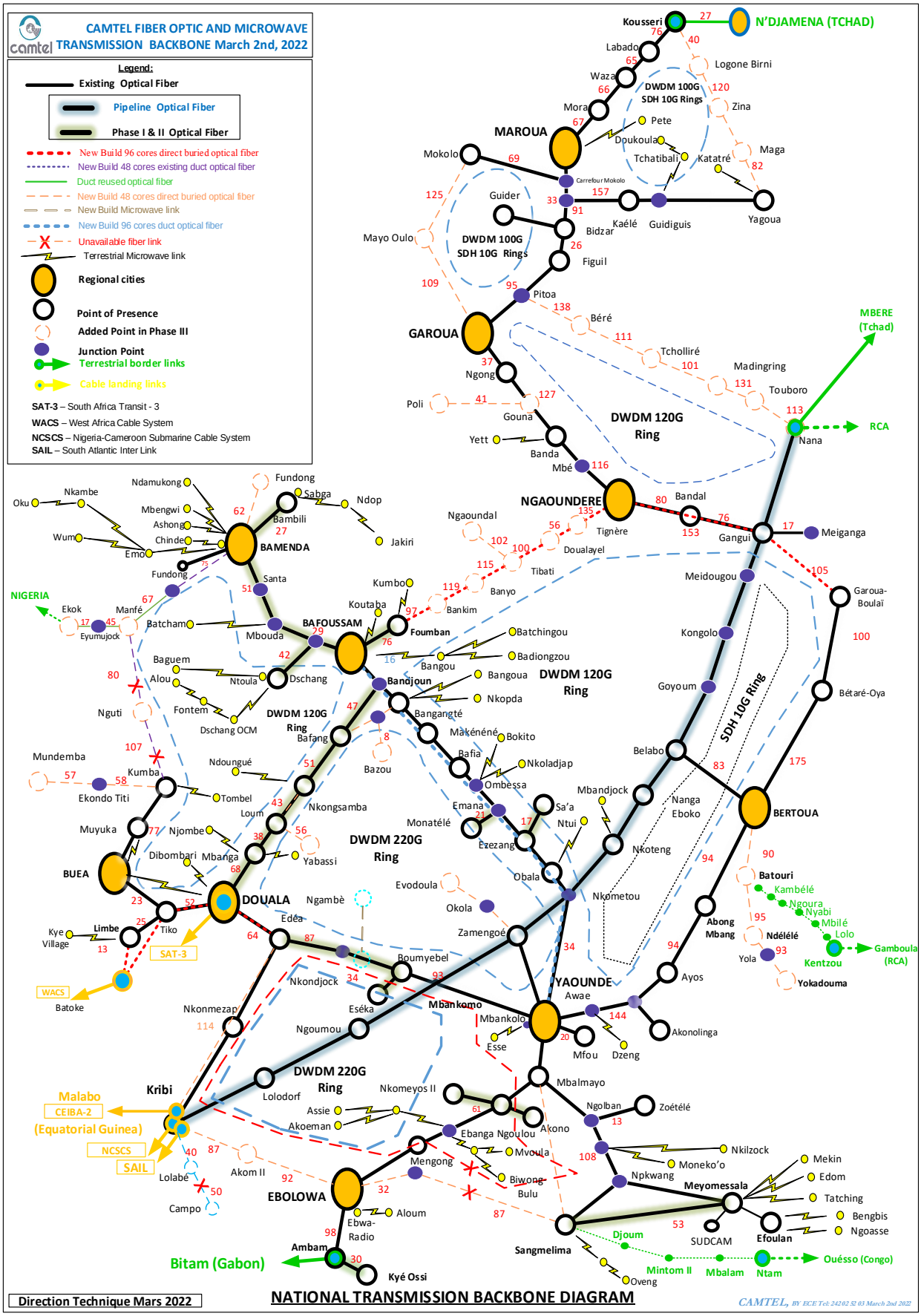


Figure 1: Block diagram of CAMTEL's national transport network

CAMTEL's network also includes international footprints to give its national and international customers (transit traffic) a global reach with POPs in:

- London – Global Switch and Telehouse East;
- South Africa – Yzerfontein;
- Brazil – Fortaleza.

Other digital hubs under consideration include Marseille, Ashburn and New York.

CAMTEL also offers the possibility of international/national interconnection through its VSAT network comprising 3 (three) earth stations: Zamengoue (Yaounde), Bepanda (Douala) and Garoua.

To provide an efficient, quality and high-performance connectivity service, the network comprises the following elements:

- 12,000 km of optical fibre network:
  - IUT –G 652, 18/24/48/96 strands
  - 61 ADM DWDM nodes,
  - 23 OLAs
  - 104 NG-SDH nodes,
  - 57 microwave links
- Self-healing protective loops:
  - 8 NG-DWDM 100/200G protection loops
  - 8 NG-SDH 2.5/10G protection loops;
  - 40/80λ usable
  - Standard interfaces: E1, STM1, STM4, STM16, STM64, Fast Ethernet (FE), Gigabit Ethernet (GbE) Electrical/optical.

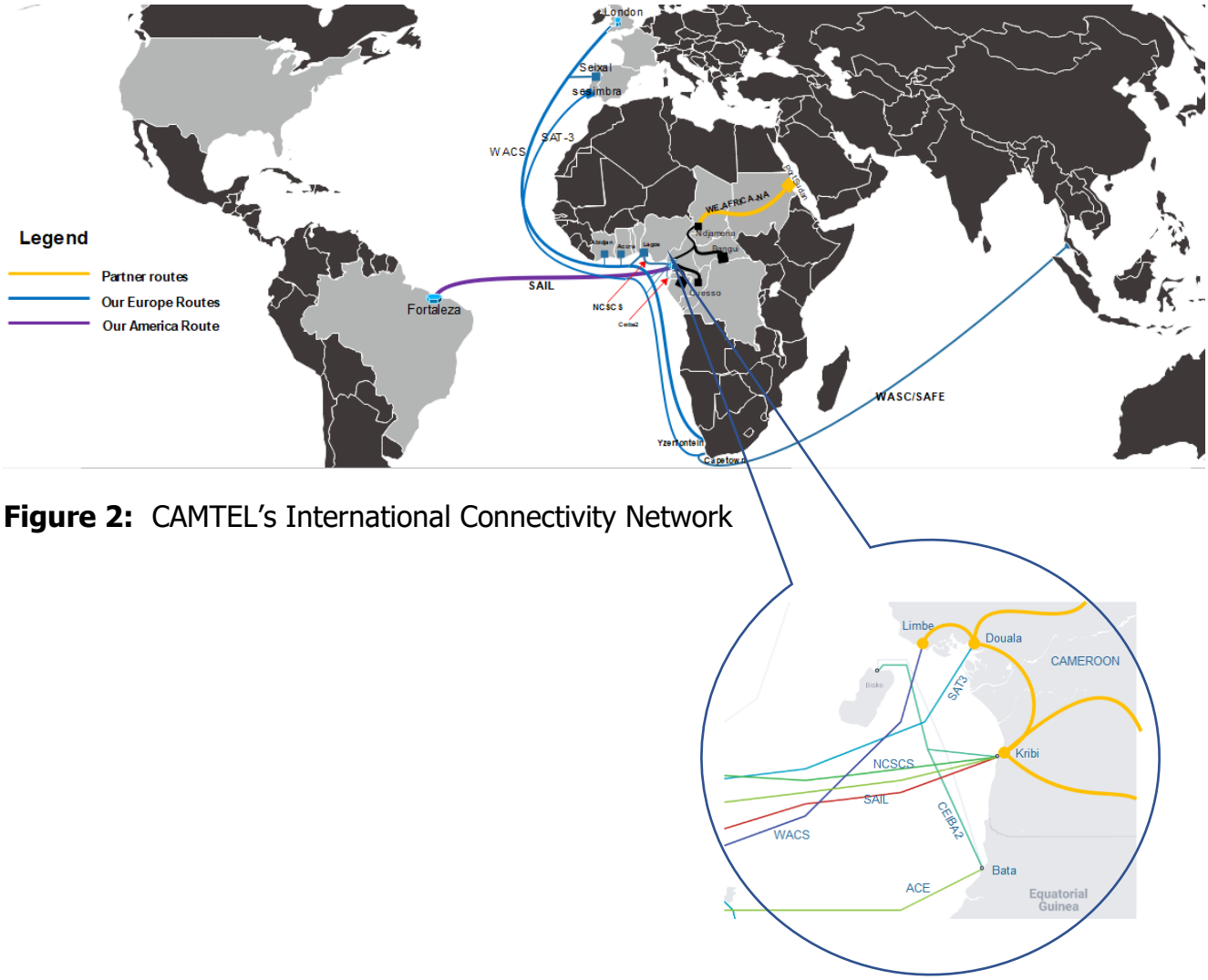


Figure 2: CAMTEL's International Connectivity Network

III. PROSPECTS FOR DEVELOPMENT

For the future development of CAMTEL's transport network, the following actions are envisaged up to 2030:

III.1. OF & MW TRANSMISSION NETWORKS

- Improve resilience;
- Increase penetration/densification;
- Increase transport capacity on major national routes;
- Build interconnection links between the three CLS (Kribi, Limbe, Douala)

III.2. IP/MPLS TRANSPORT NETWORK

- Create 5 major cross-border PoPs to serve neighbouring countries:
  - PoP at EKOK for Nigeria;
  - PoP at Kousseri for Chad and beyond;
  - PoP at Kentzou and Garoua Boulai for the Central African Republic;
  - PoP at Mbalam for the Republic of Congo;
  - PoP at KyeOssi for Gabon and Equatorial Guinea.

- Build a 300Gbps Kribi-Douala IP link;
- Integrate Core Switches in Douala and Yaounde for optimum operator connectivity;
- Protect the Kribi-Yaounde-Douala IP loop;
- Increase international upstream capacity.
- Create cross-border PoPs for easy design of links with all neighbouring countries and implementation of projects and programmes that include the Central African sub-region (GIMAC, CAB Project, etc.);
- Create international PoPs in the countries hosting the various landing points for CAMTEL's submarine cables (NCSCS, SAT-3, WACS, SAIL, CEIBA2).

IV. DESCRIPTION OF SERVICES

IV.1. CONNECTIVITY SERVICES: LEASED LINES

A leased line consists in a public telecommunications network operator providing transmission capacity between specified termination points on a public network, for the benefit of a user, excluding any switching controlled by that user.

This line enables users to exchange all types of data streams between their sites: voice, video and data.

It has the following benefits:

- secure communications to ensure the reliability and confidentiality of data;
- guaranteed symmetrical and dedicated end-to-end transmission speed and performance.

CAMTEL provides 7 (seven) types of Leased Lines.

IV.1.1. LOCAL LEASED CIRCUIT (LLC)

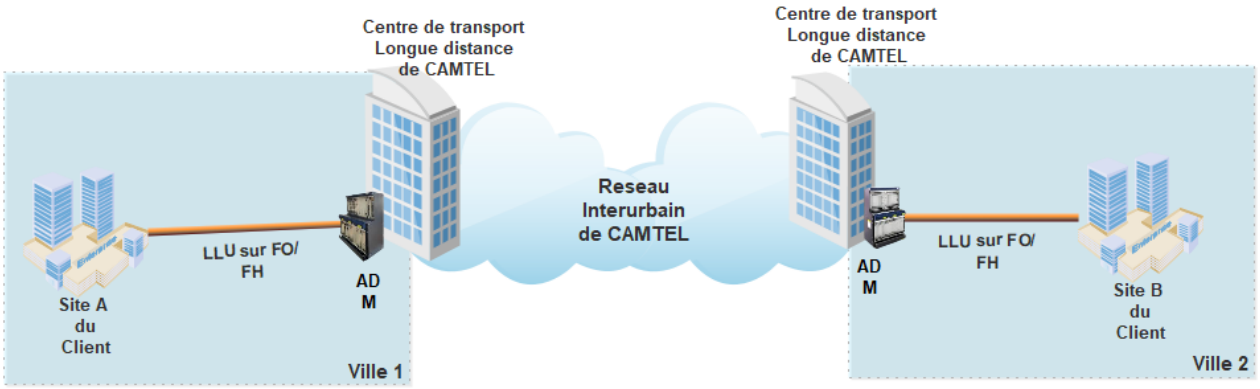
It consists of CAMTEL (the operator) providing dedicated transmission capacity between two customer (user) sites, via optical fibre or microwave links, within the same locality.

IV.1.2. TRUNK LEASED CIRCUIT (TLC)

A TLC involves CAMTEL providing a dedicated capacity between two customer sites located in two different localities.

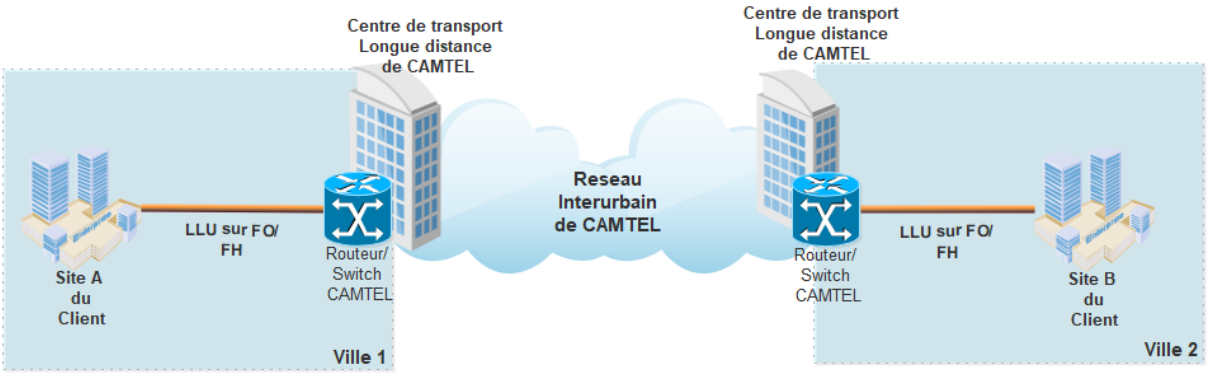
IV.1.2.1. LLI_L2 Clear Channel

An LLI_L2 Clear Channel service is a service where data is transported by CAMTEL ADMs, without any processing whatsoever and in a transparent manner. The basic transport technology used is DWDM. The interfaces may use TDM or Ethernet standards.



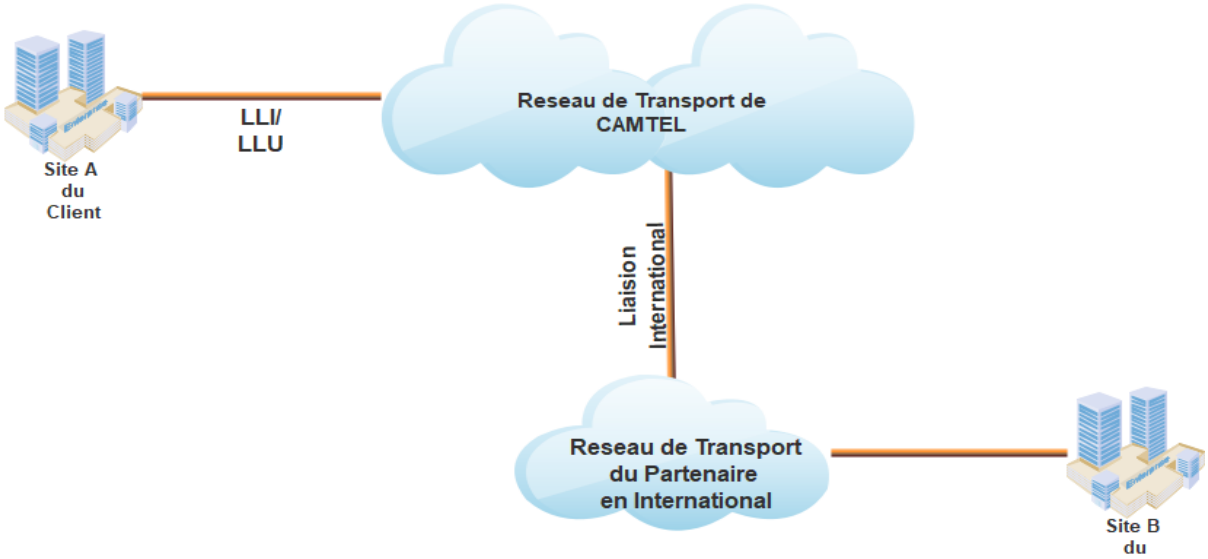
IV.1.2.2. LLI_L2 VPN/MPLS

The LLI_L2 VPN/MPLS service is a transported customer service based on MPLS technology. It enables customers to emulate point-to-multipoint or hybrid architectures according to their needs, interconnecting several sites together using a reduced number of physical links. Transport is provided only on the L2 layer. The service is terminated either on L2 routers or L2 switches with standard interfaces: FE, GbE, 10GbE, etc.



IV.1.3. INTERNATIONAL PRIVATE LEASED CIRCUIT (IPLC)

An International leased line is a link that enables a completely secure, very high-speed private connection to be established between a local site and another located beyond national borders. It is based on bilateral partnership agreements with numerous operators (interconnection agreements) for the international part of the link, and on national service offers for the local end of the link. It is implemented using optical fibre (submarine or terrestrial cable), microwave links, satellite or a combination of these transmission media.



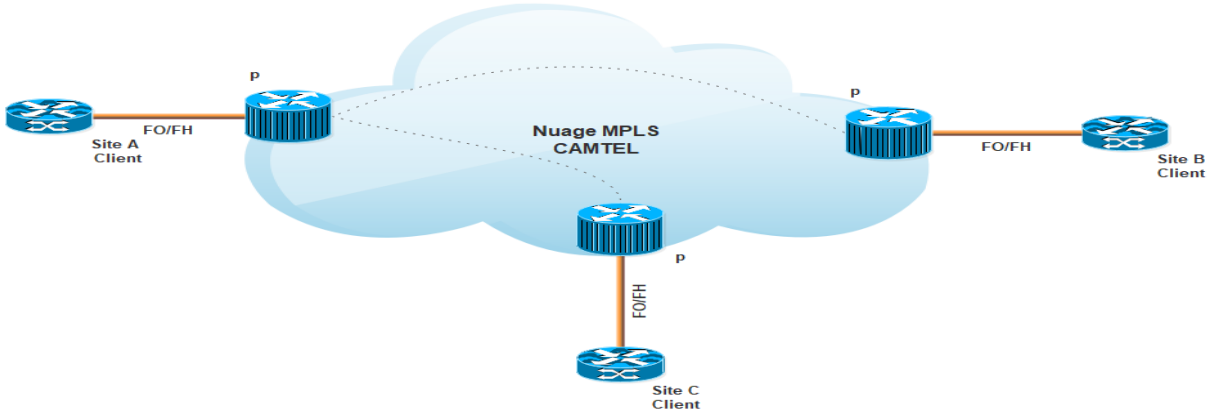
IV.1.4. IP/MPLS LINK

Multiprotocol Label Switching (MPLS) is a protocol designed to optimise, accelerate and secure network traffic for point-to-point, point-to-multipoint or full mesh services for any

user with multiple sites. It also improves quality of service by defining acceptable levels of latency and variations.

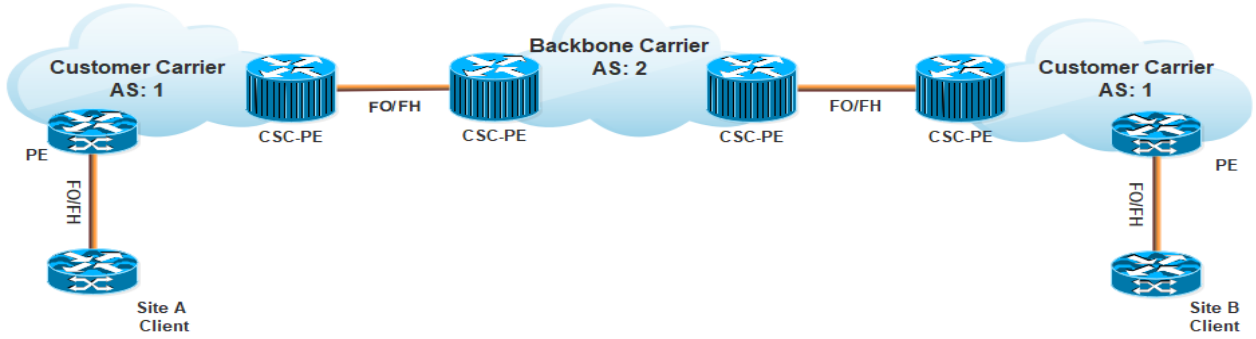
IV.1.5. STANDARD IP/MPLS LINK

The IP/MPLS link is a service that enables several customer sites to be interconnected via the national MPLS cloud.



IV.1.6. CARRIER-SUPPORTING-CARRIER (CSC) LINK (CARRIER MPLS)

The Carrier Supporting Carrier (CSC) link is a solution that enables CAMTEL to provide transport services (L2/L3) to other operators via its IP/MPLS network.

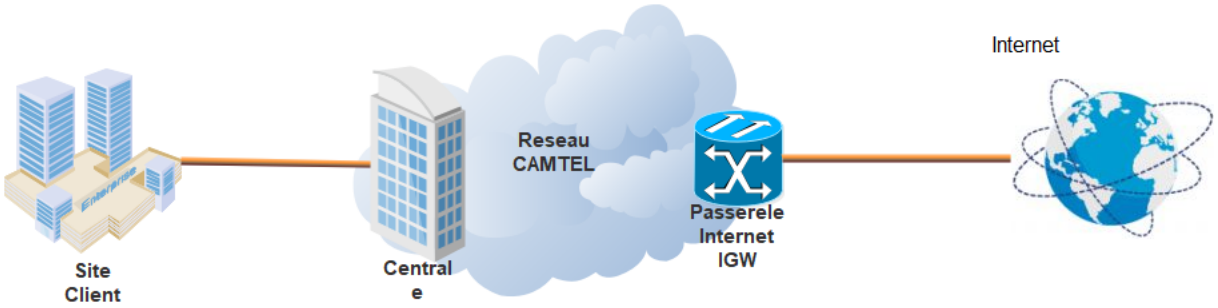


IV.2. INTERNET ACCESS SERVICES

There are two types of Internet access services: LSIP and IP Transit.

IV.2.1. LSIP (DEDICATED INTERNET ACCESS)

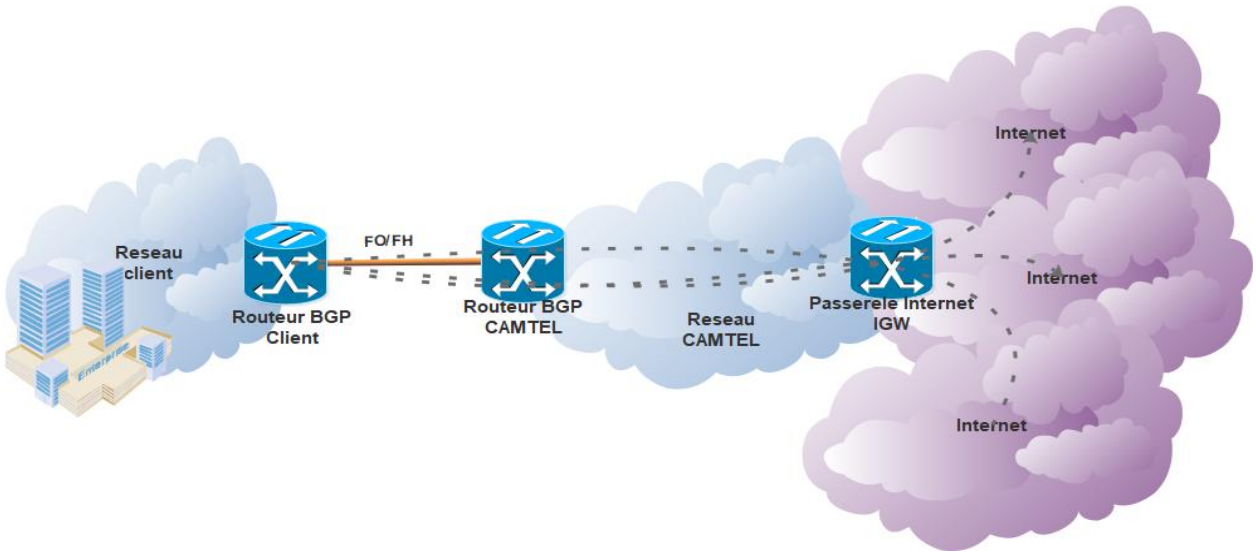
LSIP is an Internet connection via the CAMTEL network. The customer uses one or more of CAMTEL's public IP addresses.



N.B.: The customer is entitled to one public IP address and additions will be billed.

IV.2.2. IP TRANSIT

The IP Transit service allows an Internet service provider with an AS number to transit the CAMTEL network to access the Internet.



IV.3. ASSOCIATED SERVICES

IV.3.1. REDUNDANCY

Redundancy involves putting resources on an alternative path to ensure high availability of the network or service.

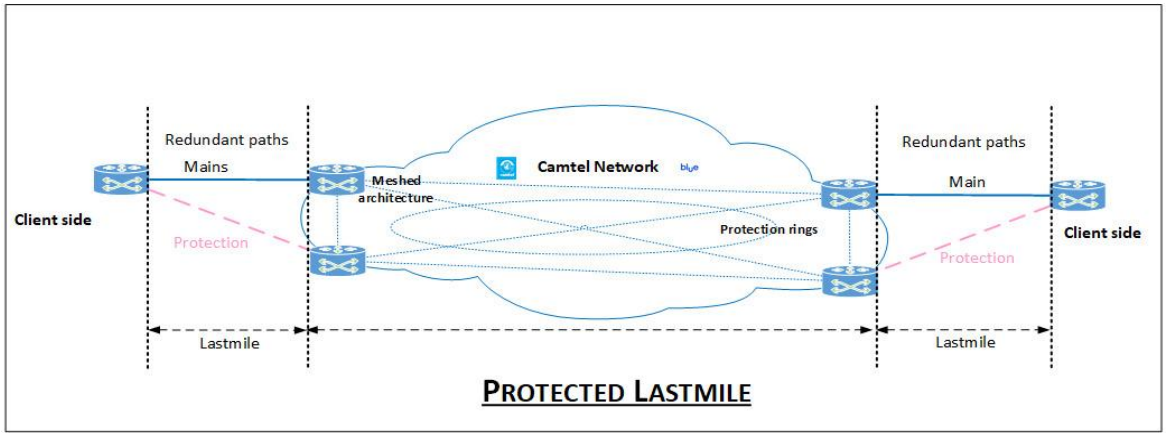
There are two types of redundancy depending on the operating mode:

IV.3.2. 1+1 ACTIVE/STANDBY REDUNDANCY

This is a form of redundancy whereby the customer benefits from a main link plus a back-up link activated on request.

IV.3.3. 1+1 ACTIVE/ACTIVE REDUNDANCY

This is a redundant system in which both circuits are active between the customer's originating and terminating sites. The customer uses the circuits at its disposal to share the load dynamically.



IV.3.4. TEMPORARY SUBSCRIPTION

Temporary subscription is a service CAMTEL offers for a period of less than 1 (one) year for specific needs.

IV.3.5. CROSS CONNECTION SERVICE

The cross-connection service is a service offered as part of the interconnection between the customer's network and CAMTEL's network. Connectors play a fundamental role in routing the service between the two-border equipment of each network without degradation. CAMTEL therefore offers the connection service.

IV.3.6. TECHNICAL SUPPORT (FOR CAMTEL ENGINEERS ONLY)

As Cameroon's incumbent operator, CAMTEL has accumulated a great deal of experience in the operation of telecommunications networks. Through its technical support service, CAMTEL makes its expertise available to electronic and communication network operators to help them provide quality services to end consumers. There are two types of technical support available:

- Technical support over telephone;
- On-site technical support

NB: The terms and conditions for technical support are set out in the agreements signed between the parties.

IV.3.7. INFRASTRUCTURE SHARING SERVICES - CO-LOCATION

Where possible, the terminal equipment used for transmission may be installed in a space reserved for the customer and located in CAMTEL's building or in a space built by the customer on CAMTEL's site. In both cases, the customer shall be responsible for the operation and maintenance of their equipment. The connection of the customer's equipment to CAMTEL's distribution frame shall be implemented by a joint CAMTEL/customer team.

In exceptional cases, terminal equipment used for transmission may be installed in a CAMTEL transmission room. CAMTEL may, under terms to be negotiated, handle the first level operation and maintenance of the equipment hosted in its facilities.

The infrastructure open for sharing are:

- an area of land;
- a machine room;
- a surface area in a technical room (floor space);
- a complete rack (42U) with back-up power supply;
- part of a rack: 1U, 2U, 4U, 6U, 12U, 24U;
- Remote hands & eyes (on-site support).

CAMTEL offers two types of co-location:

IV.3.7.1. Co-location in a submarine cable landing station (CoCLS)

Co-location in a CAMTEL Cable Landing Station (CLS) gives applicants the advantage of international access via the submarine cables that land there at no extra cost. This option also makes it easier to protect international circuits at lower cost. For example, the Kribi CLS makes it possible to reach the American continent and West Africa from the same point.

IV.3.7.2. Co-location at another CAMTEL transport site (CoSiCam)

Co-location in a non-CLS CAMTEL site comes with the benefit of proximity – CAMTEL agents can intervene fairly quickly in the event of an incident on the interconnection of the two networks; the customer also benefits from the opportunity to create multiple interconnection points with CAMTEL as required and at lower cost.

V. COMMERCIAL TERMS AND CONDITIONS

Subscription to any service whatsoever shall be subject to the signing of a contract with CAMTEL BUT.

The signature of the said contract shall be conditional upon the presentation of a technical and administrative file comprising the following:

- be a company incorporated under Cameroonian law;
- have an operating licence (declaration receipt or first category licence) duly signed by the authority in charge of the telecommunications sector;
- have up-to-date tax records (trade register, certificate of tax-exempt status, registration certificate);
- Fill in a service request form;
- hold a certificate of location issued by a competent authority, and renewable in the event of a change of head office;
- Be well-established;
- Provide a location map and full address (PO box, phone, fax, email, town, etc.);
- Have one or more PoPs.

V.1. CONNECTIVITY SERVICES

V.1.1. LOCAL LEASED CIRCUIT (LLC)

V.1.1.1. PRICING

The pricing for local leased circuits shall include:

- Circuit access fee;
- Monthly lease fee;
- Fixed fee of CFAF 50,000.

THROUGHPUT (Mbps)	Access costs	Monthly lease fee in CFAF Distance ≤ 5 KM	Monthly lease fee in CFAF Distance > 5 KM
2	1 900 000	20 603	21 528
6	1 900 000	46 191	53 206
10	1 900 000	57 265	60 851
20	1 900 000	94 318	110 915
34	2 850 000	111 317	142 821
45	2 850 000	119 718	155 840
75	2 850 000	159 973	206 230
100	2 850 000	181 319	234 055
155	3 000 000	212 131	275 141
622	3 800 000	689 426	894 205
1024	3 800 000	1 260 203	1 634 520
STM16	4 750 000	2 585 346	3 353 270
STM64	5 700 000	6 204 831	8 047 850

The commercial offer for throughputs above STM64 (10 Gbps), established following specific request, will be detailed in interconnection agreements.

V.1.1.2. GENERAL TERMS AND CONDITIONS

V.1.1.2.1. Commissioning

All orders for a local leased circuit shall be subject to payment of the access fee prior to commissioning

V.1.1.2.2. Increase or reduction in bandwidth

At the operator's request, CAMTEL may increase or reduce the bandwidth subject to technical availability.

CAMTEL shall bill each of these operations at 30% of the applicable access fee.

V.1.1.2.3. Civil engineering and equipment supply costs

The installation of a local leased circuit may be subject to the payment of civil engineering costs. These costs shall be borne by the customer.

The requesting operator shall be responsible for the provision of transmission equipment at the terminal ends. CAMTEL shall draft the technical specifications for the terminal equipment required to establish the leased circuit.

V.1.1.2.4. Local leased circuit security

At the operator's request, CAMTEL may, subject to technical availability, secure the operator's local leased circuits.

CAMTEL shall bill this service at the rates in force, with a 50% surcharge, and in accordance with the terms and conditions set out in this catalogue.

V.1.1.2.5. Billing of local leased circuits

a) Service access fees

Access fees shall be billed prior to the activation of a new circuit, or prior to any bandwidth increase or decrease on an existing circuit.

b) Monthly charges

Monthly charges (fixed circuit leasing charge and variable circuit maintenance charge) shall be payable based on the date of activation, or of the bandwidth increase or decrease on the circuit covered by the order.

Billing shall take effect in month N where the date of commissioning is before the 15th of the running month, and in month N+1 where the date of commissioning is after the 15th of the running month.

V.1.1.2.6. Service level agreement penalties

Only secured lines shall be subject to penalties under service level agreements.

V.1.1.2.7. Termination

In the event of unilateral termination by the operator before the end of the minimum 12-month commitment period, an additional bill equivalent to the remaining term of the commitment shall be issued and must be paid by the operator

V.1.2. TRUNK LEASED CIRCUITS

V.1.2.1. PRICING

The pricing for trunk leased circuits shall include:

- Circuit access fee;
- Monthly lease fee;
- Fixed fee of CFAF 50,000.

THROUGHPUT (Mbps)	Access costs	Monthly leasing fee per km in CFAF (excl. VAT) Distance ≤ 300 KM	Monthly lease fee in CFAF Distance > 300 KM
2	1 900 000	254	87 281
6	1 900 000	732	248 396
10	1 900 000	813	365 908
20	1 900 000	1 091	816 816
34	2 850 000	1 211	866 176
45	2 850 000	2 181	937 988
75	2 850 000	3 790	1 222 073
100	2 850 000	3 932	1 370 243
155	3 000 000	4 823	1 539 763
622	3 800 000	14 804	4 386 494
1024	3 800 000	27 583	8 805 873
STM16	4 750 000	59 216	18 904 871
STM64	5 700 000	189 492	60 495 590

The commercial offer for throughputs above STM64 (10Gbps), established following specific request, will be detailed in interconnection agreements.

V.1.2.2. GENERAL TERMS AND CONDITIONS

V.1.1.2.1. Commissioning

All orders for a trunk leased circuit shall be subject to payment of the access fee prior to commissioning

V.1.1.2.2. Increase or reduction in bandwidth

At the operator's request, CAMTEL may increase or reduce the bandwidth subject to technical availability.

CAMTEL shall bill each of these operations at 30% of the applicable access fee.

V.1.1.2.3. Civil engineering and equipment supply costs

The installation of a trunk leased circuit may be subject to the payment of civil engineering costs. These costs shall be borne by the customer and shall not be offset against the monthly charges.

The requesting operator shall be responsible for the provision of transmission equipment at the terminal ends. CAMTEL shall draft the technical specifications for the terminal equipment required to establish the leased circuit.

V.1.1.2.4. Trunk leased circuit security

At the operator's request, CAMTEL may, subject to technical availability, secure the operator's local leased circuits.

CAMTEL shall bill this service at the rates in force, with a 50% surcharge, and in accordance with the terms and conditions set out in this catalogue.

V.1.1.2.5. Billing of trunk leased circuits

c) Service access fees

Access fees shall be billed prior to the activation of a new circuit, or prior to any bandwidth increase or decrease on an existing circuit.

d) Monthly charges

Monthly charges (fixed circuit leasing charge and variable circuit maintenance charge) shall be payable based on the date of activation, or of the bandwidth increase or decrease on the circuit covered by the order.

Billing shall take effect in month N where the date of commissioning is before the 15th of the running month, and in month N+1 where the date of commissioning is after the 15th of the running month.

V.1.1.2.6. Scope

The definition of "trunk" shall correspond to the current administrative division.

V.2.2. STANDARD IP/MPLS LINK

The pricing structure includes:

- equipment costs: taking into account the specific needs of each customer, the pricing conditions applicable shall be detailed in interconnection agreements;
- set-up and configuration charges: CFAF 25,000 (T.E.)/site;
- IP/MPLS cloud access fee per site and per month: CFAF 50,000 (T.E.);
- the monthly rate according to the subscribed bandwidth for each site as indicated in the following table:
- The cost of civil engineering works and terminal equipment shall be based on an estimate and shall be borne by the customer.

Throughput (Mbps)	Bandwidth rates (CFAF, T.E.) per Mbps/month/site
5 ≤ C < 10	27 541
10 ≤ C < 34	26 482
34 ≤ C < 45	19 862
45 ≤ C < 75	16 882
75 ≤ C < 122	14 350
122 ≤ C < 255	12 198
255 ≤ C < 622	10 368

V.1.3. INTERNATIONAL PRIVATE LEASED CIRCUIT (IPLC, SUBMARINE CABLE SEGMENT)

V.1.3.1. Access costs

THROUGHPUT	2 Mbps	34 Mbps	45 Mbps	STM1	STM4	STM16	STM64 or more
COST (in CFAF, T.E.)	3 000 000	4 000 000	4 000 000	5 000 000	5 000 000	5 000 000	6 000 000

V.1.3.2. Monthly fee

SAT3/WASC/SAFE starting point: Douala Cable Landing Station.

- **SAT3/WASC/SAFE full-circuit**

Capacities / Destinations	STM64 Circuit
Central Africa	30 310 184
West Africa	51 950 803
Southern Africa	68 151 429
Europe	98 737 083
Asia (SAFE)	134 439 325

WACS:

WACS starting point: Batoke (Limbe) landing station.

- **WACS half-circuit**

Capacities / Destinations	STM1 ½ circuit	STM4 ½ circuit	1G ½ circuit	STM16 ½ circuit	STM64 ½ circuit
Central Africa	1 023 810	2 559 527	3 839 290	10 967 392	15 997 041
West Africa	1 754 791	4 386 957	6 580 435	10 967 392	27 418 479
Southern Africa	2 299 572	5 748 930	8 623 394	14 372 324	35 968 810
Europe	3 315 846	8 289 615	12 434 421	20 724 035	52 111 238

- **WACS full-circuit**

Capacities / Destinations	STM1 Circuit	STM4 Circuit	1G Circuit	STM16 Circuit	STM64 Circuit
Central Africa	1 842 858	4 607 149	6 910 722	19 741 305	28 794 675
West Africa	3 158 623	7 896 522	11 844 784	19 741 305	49 353 262
Southern Africa	4 139 229	10 348 074	15 522 109	25 870 183	64 743 858
Europe	5 968 522	14 921 306	22 381 957	37 303 264	93 800 229

NCSCS

NCSCS starting point: Kribi Cable Landing Station

Capacity	STM1 full circuit	STM4 full circuit	1G full circuit	STM16 full circuit	STM64 full circuit
Nigeria (Lagos) – CMR (Kribi)	2 508 091	6 270 228	9 405 342	15 675 570	40 193 770

SAIL

Capacity	STM1 full circuit	STM4 full circuit	1G full circuit	STM16 full circuit	STM64 full circuit
Bra (Fortaleza) – CMR (KCLS)	1 113 927	2 784 816	4 177 225	6 962 041	17 405 103

SAIL+CEIBA2

Capacity	STM64 full circuit
Bra (Fortaleza) – CMR (KCLS)+ XCO CEIBA 2 + Backhaul 1+1 Active+Active (STM64) DLA + Kribi Co-loc.	44 405 103
Bra (Fortaleza) – CMR (KCLS)+ XCO CEIBA 2 + Backhaul 1+1 Active+Active (STM64) YDE + Kribi Co-loc.	44 405 103

N.B.:

- CAMTEL shall offer full circuits at the customer's request;
- All circuits on SAT-3, NCSCS and SAIL are provided as full circuits;
- Beyond the end-points of the submarine cable, **CAMTEL** may negotiate, on behalf of the requesting customer, an interconnection and the extension of the circuit requested.

V.1.3.3. Circuit Recovery Charges on WACS and NCSCS

Recovery is a security measure to ensure continuity of service in the event of a scheduled or unscheduled interruption. It is provided via constant redundant circuits, the costs of which are borne by **CAMTEL** within the consortium. It is optional.

Taking into account the specific needs of each customer, the pricing conditions applicable to the circuit recovery service shall be provided on the basis of an estimate.

V.1.3.4. Cross-Connect: Submarine Cable Landing Station Crossing Fee

The crossing fee is a monthly charge applied to circuits for which CAMTEL does not provide at least a half circuit.

The rates for the crossing fee shall be 30% of the full-circuit tariff.

V.2. INTERNET ACCESS SERVICES

V.2.1. LSIP (DIA)/IP TRANSIT

V.2.1.1. PRICING

The pricing for dedicated Internet circuits shall include:

- Non-recurring fees;
- Fixed monthly lease fee;

V.2.1.1.1. Non-Recurring Fees

Non-recurring fees, excluding taxes for Internet services, are as follows:

- Civil engineering charges: based on estimate and borne by the customer;
- Terminal equipment charges: taking into account the specific needs of each customer, the pricing conditions applicable shall be detailed in interconnection agreements;
- Access costs: CFAF 204,000 (T.E.).

V.2.1.2. Monthly bandwidth charge

Throughput (Mbps)	Cost of Mbps (CFAF, T.E.)
2 ≤ C ≤ 20	52 180
20 < C ≤ 75	44 353
75 < C ≤ 110	37 024
110 < C ≤ 250	33 914
250 < C ≤ 750	29 484
750 < C ≤ 1 500	24 926
1 500 < C ≤ 3 000	22 322
3 000 < C ≤ 6 200	18 938
6 200 < C ≤ 8 500	17 160
8 500 < C ≤ 12 320	16 070
12 320 < C ≤ 17 320	14 865
17 320 < C ≤ 22 572	13 735
22 572 < C ≤ 27 500	12 224
27 500 < C ≤ 34 000	11 246
34 000 < C ≤ 40 000	10 322
40 000 < C ≤ 45 000	9 109
45 000 < C ≤ 50 000	8 198
50 000 < C ≤ 100 00	8 000
C > 100 000	7 000

V.3. Public IP Address

Description	Unit Price (T.E.)
1 (one) public IP address	25 000

V.4. ASSOCIATED SERVICES

V.4.1. REDUNDANCY

V.4.1.1. 1+1 Active/Standby redundancy

Cost of redundant link = **1.4** × the cost of a non-redundant link.

V.4.1.2. 1+1 Active/Active redundancy

Cost of redundant link = **1.5** × the cost of a non-redundant link.

V.4.2. TEMPORARY SUBSCRIPTION

Prix du service souscrit: 1.14* the cost of the service pro rata temporis to the annual cost.

V.4.3. CROSS-CONNECTION SERVICE

$$\boldsymbol{Connection\ cost\ (Tax\ excl.) = CFAF\ 50,000\ \ per\ pair\ of\ cross-connection\ cables}$$

V.4.4. TECHNICAL SUPPORT

- Technical support over telephone = unit price*number of hours
- On-site technical assistance = CFAF 65,000/man/day

V.4.5. CO-LOCATION

Co-location on a submarine cable landing site

NATURE OF SERVICE	RATE in CFAF, T.E.
Land	CFAF 20,000/m²/yr
Building + Air-conditioning +Emergency power supply (max 1KW)	1,200,000/month/rack (footprint)
Security	400,000/month
Additional back-up power supply	CFAF 99/KWH + fixed premium of CFAF 2,865/KW/month
Maintenance (visual monitoring and first-level intervention)	CFAF 12,000,000/yr
1U rack space	50 000
2U rack space	95 000
4U rack space	180 000
6U rack space	275 000
12U rack space	570 000
24U rack space	1 000 000

Co-location at the Zamengoe Datacentre

NATURE OF SERVICE	RATE in CFAF, T.E.
Access costs	CFAF 200 000
2U rack space + backup power	125 000
4U rack space + backup power	249 000
6U rack space + backup power	373 00
12U rack space + backup power	745 000
24U rack space + backup power	1 490 000
47U rack space (1 rack) + backup power	2 978 4000

N.B.:

- **CIRCUITS ORIGINATING OR TERMINATING AT THE CAMTEL DATA CENTRE IN ZAMENGOE ARE EXEMPT FROM PAYMENT OF ACCESS FEES. ACTIVATION IS SUBJECT TO PAYMENT OF THE MONTHLY CHARGES**.

Co-location at another CAMTEL transport site

NATURE OF SERVICE	RATE in CFAF, T.E.
Land	Based on a cost estimate according to regions, price per m², surface area required (surveys, surveys, miscellaneous research). Undeveloped land: . Yaounde, Douala, Kribi, Limbe: CFAF 7,000/m²/yr . Other towns: CFAF 5,000/m²/yr . Rural areas: CFAF 3,000/m²/yr
Building	. Douala, Yaounde, Kribi, Limbe: CFAF 90,000/m²/yr . Other urban areas: CFAF 60,000/m²/yr . Rural areas: CFAF 40,000/m²/yr
Security	CFAF 100,000/month
Additional back-up power supply	CFAF 100/KWH/Month + fixed premium of CFAF 2,865/KW/month
Maintenance (visual monitoring and first-level intervention)	CFAF 3,000,000/yr
1U rack space	30 000
2U rack space	60 000
4U rack space	120 000
6U rack space	180 000
12U rack space	360 000
24U rack space	720 000
42U rack space (1 rack)	1 000 000

Towers

The parameters that influence pricing can be grouped into the radio characteristics of the antennas to be installed, the mechanical characteristics, and the tower footprint.

Pricing is for the rental of space for a single antenna. The total cost is got by multiplying by the number of antennas.

Pricing Parameters

Radio Characteristics of Antenna

- Frequency or range of frequencies used
- Polarisation of the antenna
- Antenna azimuth and elevation
- Radiation pattern (horizontal and vertical)
- Isotropic gain

Mechanical characteristics of the antenna

- Space requirement (dimensions)
- Weight
- Windward surface (front, side)
- Wind load at a speed of 150 km/h (front, side)
- Permissible wind speed (maximum)

Characteristics of the footprint on the tower

- Height requested for an antenna
- Number of antennas
- Linear occupation of the tower
- Mounting of the antenna (on one of the 3 sides of the tower or on one of the 3 vertical supports)
- Horizontal cable tray and vertical feeders assignment
- Feeder diameter

Analysis of Pricing Parameters

Given:

- Rj, Parameter grouping together the radio characteristics of the antenna, including the use of a single frequency (R1) or a range of frequencies (R2)
  R1=10/5=2
  R2=20/5=4
- Mk, parameter grouping the mechanical characteristics of the antenna, in particular the weight P (kg), the maximum windward surface S (m²), the wind load at 150 km/h, C (N)
  Mk=ak.P
  a1=20 where S<= 0.5 m² or C<=500N
  a2=30 where 0.5<S<1m² or 500<C<1000 N
  a3=40 where S>=1 m² or C>=1000 N
- Parameter grouping the characteristics of the tower footprint, in particular the requested height of the tower h (m), the linear occupation of the tower l (m), the occupancy of the cable tray.
  En=bn.h²
  b1=6 where l <=1m
  b2=8 where 1<l<2m
  b3=9 where l>=2m

Thus, the monthly cost of renting space on the tower for an antenna is gotten via the general formula below:

C =αi (Rj.Mk+En)

αi : Coefficient pertaining to the category of the tower

α1= 5 for category A

α2= 5 for category B

α3= 5 for category C

Classification of Towers

Category A: towers higher than or equal to 120 m;
Category B: towers between 51 m and 119 m tall;
Category C: towers shorter than or equal to 50 m.

Annex: List of towers

No.	Location of site	Height (m)	Type of tower (S= Self-supporting; G= Guyed)	Category of tower
1	**AHALA CHEFFERIE**	40	S	C
2	**AKIRIBA**	40	S	C
3	**AKOEMAN**	40	S	C
4	**AKOM II ancien**	30	S	C
5	**AKOM II nouveau**	50	S	C
6	**AKONO**	33	G	C
7	**AKONOLINGA**	40	G	B
8	**AKUM**	90	G	B
9	**AKWA LAQUINTINIE**	40	S	C
10	**AKWA NORD DLA**	28	S	C
11	**AKWA CENTRE DLA**	84	S	B
12	**ASHONG**	65.11	S	B
13	**ASSIE**	70	S	B
14	**ASU HILL**	125	G	A
15	**AWAE**	50	S	C
16	**BADIONGZOU**	32	S	C
17	**BADZERE**	72	G	B
18	**BAFANG ancien**	12	S	C
19	**BAFANG nouveau**	50	S	C
20	**BAFIA**	60	S	B
21	**BAFOUSSAM MUX**	40	S	C
22	**BAFOUSSAM RADIO**	123	S	A
23	**BAHAM nouveau**	50	S	C
24	**BAMBOUTI**	96	G	B
25	**BAMENDA PTT**	30	S	C
26	**BAMENDJOU**	30	G	C
27	**BANDA**	96	G	B
28	**BANDAL**	29	S	C
29	**BANDJOUN**	36	S	C
30	**BANGANGTE**	33	S	C
31	**BANGOUA montagne**	50	S	C
32	**BANYO**	84	G	B
33	**BARDOUT**	90	G	B
34	**BASSA Logbaba Dla**	42	S	C
35	**BASTOS ANOR Ydé**	35	S	C
36	**BASTOS SIC Ydé**	40	S	C
37	**BATIBO**	38	S	C
38	**BATOURI**	23	G	C
39	**BEMBARA**	108	G	B
40	**BENGBIS**	45	S	C
41	**BEPANDA**	40	S	C
42	**BEPANDA térasse**	25	S	C
43	**BEPANDA Yong Yong**	40	S	C
44	**BERTOUA CENTRAL**	45	G	C
45	**BETARE OYA**	60	S	B

No.	Location of site	Height (m)	Type of tower (S= Self-supporting; G= Guyed)	Category of tower
46	**BIDZAR**	97	G	B
47	**BISSIANG**	50	S	C
48	**BIWONG BULU**	70	G	B
49	**BIYEM ASSI**	55	S	B
50	**BOKITO**	60	G	B
51	**BOMONO**	22	G	C
52	**BONABERI**	34	S	C
53	**BONALOKA**	40	S	C
54	**BONAMOUSADI VILLAGE**	40	S	C
55	**BONANJO**	15	S	C
56	**BOULEMBE**	108	G	B
57	**BOUMNYEBEL**	30	G	C
58	**BUEA**	41	S	C
59	**BUEA UNIVERSITY**	40	S	C
60	**CAMTEL HQ**	15+36	S	B
61	**CARRIERE JEAN VESPA**	40	S	C
62	**CHINDE HILL BAMENDA**	40	S	C
63	**CHUBOH BAMENDA**	10	S	C
64	**COL BANA**	74	G	B
65	**DANG UNIVERSITE**	40	S	C
66	**DIONGO**	60	G	B
67	**DISSO PATERE**	160	G	B
68	**DJOUM**	82	G	B
69	**DOUALA OMNISPORT**	40	S	C
70	**DOUALA PK21**	40	S	C
71	**DSCHANG**	25	S	C
72	**DZENG**	60	S	B
73	**EBANGA NGOULOU**	100	G	B
74	**EBANGA passif**	38	S	C
75	**EBOLOWA comice**	40	S	C
76	**EBOLOWA RADIO**	100	G	B
77	**EDEA PALMERAIE**	162	G	A
78	**EFOULAN**	82	G	B
79	**EKIE**	40	S	C
80	**EKONA**	56	S	B
81	**ELOM**	51	G	B
82	**EMANA**	40	S	C
83	**EMO**	140	G	A
84	**ESEKA passif**	60	G	B
85	**ESEKA PT**	15	S	C
86	**ETOUG-EBE COLLEGE**	40	S	C
87	**EVODOULA**	60	S	B
88	**FIGUIL relais**	90	G	B
89	**FIGUIL Ville**	50	G	C
90	**FOTOKOL**	90	G	B
91	**FOUMBAN**	91	G	B
92	**FOUMBOT**	25	S	C

No.	Location of site	Height (m)	Type of tower (S= Self-supporting; G= Guyed)	Category of tower
93	**GABAN-LARA**	15	S	C
94	**GANGUI**	72	G	B
95	**GAROUA BOULAI**	10	S	C
96	**GAROUA BOULAÏ**			
97	**GAROUA CENTRAL**	25	S	C
98	**GAROUA RADIO**	50	G	C
99	**GOUNA**	96	G	B
100	**GOUNDAÏ**	15	S	C
101	**GUIDER**	31	S	C
102	**GUIDIGUIS 1**	25	S	C
103	**GUIDIGUIS 2**	70	S	B
104	**JAMOT**	55	S	B
105	**KAELE**	36	G	C
106	**KATARE**	120	G	B
107	**KOLOFATA**	18	G	C
108	**KONGA**	108	G	B
109	**KOUM**	50	S	C
110	**KOUSSERI PT**	80	S	B
111	**KOWEIT CITY**	40	S	C
112	**KRIBI PT**	45	S	C
113	**KUMBA**	39	S	C
114	**KUMBA HILL**	22	S	C
115	**KUMBO**	110	G	B
116	**KURUME**	118	G	C
117	**KYE OSSI**	90	G	B
118	**LABADO**	108	G	B
119	**LAF**	96	G	B
120	**LARA**	50	S	C
121	**LEMBE YEZOUM**	54	G	B
122	**LERE**	64	G	B
123	**LIBONG**	150	G	A
124	**LIMBE**	33	G	C
125	**LIMBE KIE VILLAGE**	40	S	C
126	**LOLODORF passif**	60	G	B
127	**LOUM**	168	G	A
128	**LYCEE BILINGUE**	40	S	C
129	**MAGA**	90	G	B
130	**MALANGUE face HG**	40	S	C
131	**MAMFE**	41	S	C
132	**MAMFE**	24	S	C
133	**MANDASSAK**	130	G	A
134	**MANJO**	50	S	C
135	**MAROUA CENTRAL**	42	S	C
136	**MAROUA PITOARE**	40	S	C
137	**MAROUA RADIO**	90	G	B
138	**MATOMB**	125	G	A
139	**MAYO DJINGA**	70	G	B

No.	Location of site	Height (m)	Type of tower (S= Self-supporting; G= Guyed)	Category of tower
140	**MAYO OULO**	25	S	C
141	**MAYO TOLERE**	155	G	A
142	**MBALMAYO**	70	S	B
143	**MBANDJOCK**	90	G	B
144	**MBANGA**	168	G	A
145	**MBANKOLO**	25	S	C
146	**MBANKOLO**	60	G	B
147	**MBANKOLO**	100	G	B
148	**MBE**	60	S	B
149	**MBENGWI**	60	S	B
150	**MBENGWI ptt**	50	S	C
151	**MBOMA**	70	S	B
152	**MBOUDA**	31	G	C
153	**MBOUDA nouveau**	40	S	C
154	**MEBA**	96	G	B
155	**MEIGANGA PT**	40	S	C
156	**MEKIN**	85	G	B
157	**MELONG**	50	S	C
158	**MEMVELE'ELE**	65	G	B
159	**MENDONG SIC**	40	S	C
160	**MENGANGME**	91	G	B
161	**MENGBWA**	100	G	B
162	**MENGBWA**	118	G	B
163	**MENGONG**	72	G	B
164	**MEYOMESSALA**	100	G	B
165	**MEYOMESSALA SUDCAM**	50	S	C
166	**MFOU**	30	G	C
167	**MIMBOMAN VILLAGE**	40	S	C
168	**MOKOLO**	55	S	B
169	**MONEKOO**	60	G	B
170	**MUYUKA**	31	S	C
171	**MVOULA**	70	G	B
172	**NANGA EBOKO**	110	G	B
173	**NDAMUKONG**	40	S	C
174	**NDEM**	98	G	B
175	**NDICK**	60	G	B
176	**NDIKOUM**	75	G	B
177	**NDJI**	96	G	B
178	**NDOGPASSI**	40	S	C
179	**NDOGPASSI 2**	40	S	C
180	**NDOKAYO**	96	G	B
181	**NDOUNGUE**	45	S	C
182	**NEW BELL**	60	G	B
183	**NGAH**	102	G	B
184	**NGAOUNDERE CENTRAL**	40	G	C
185	**NGOA EKELLE PTT**	40	S	C
186	**NGOASSE**	78	G	B

No.	Location of site	Height (m)	Type of tower (S= Self-supporting; G= Guyed)	Category of tower
187	**NGOMEZAP**	60	S	B
188	**NGONG**	96	G	B
189	**NGOUDJEL (Ranch de**	70	G	B
190	**NGUTI TOWN**	37	G	C
191	**NJOMBE**	50	G	C
192	**NKILZOCK**	72	G	B
193	**NKOLADJAP**	60	S	B
194	**NKOLBISSON**	40	S	C
195	**NKOLDOBO**	40	S	C
196	**NKOLFONG**	34	G	C
197	**NKOLNDONGO**	40	S	C
198	**NKOLYOP**	62	G	B
199	**NKOMETOU**	40	S	C
200	**NKONDJOCK**	128	G	A
201	**NKONGMEZAP**	102	G	B
202	**NKONGSAMBA CENTRAL**	24	S	C
203	**NKONGSAMBA RADIO**	115	G	B
204	**NKOTENG ADM**	18	S	C
205	**NKOTENG USINE**	15	S	C
206	**NKOUMBENT**	110	G	B
207	**NSIMALEN**	30	S	C
208	**NTOULA**	18	S	C
209	**NTUI**	115	G	B
210	**NYETE CENTRAL OFFICE**	40	G	C
211	**NYETE V11**	60	S	B
212	**NYETE V13**	50	S	C
213	**OBALA Ancien**	30	S	C
214	**OBALA nouveau**	60	S	B
215	**OBILI IRIC**	40	S	C
216	**ODZA, 11 Arrêt**	40	S	C
217	**OKOLA**	30	S	C
218	**OLAMZE**	30	M	C
219	**OMBESSA**	70	G	B
220	**OVENG**	80	G	B
221	**OYOMABANG NKOLSOO**	40	S	C
222	**PALMIERS, LYCEE**	40	S	C
223	**PANG**	155	G	A
224	**PETTE**	90	G	B
225	**POUMA**	40	S	C
226	**SA'A**	30	G	C
227	**SANGMELIMA PT**	69	S	B
228	**SIGNAL HILL**	40	S	C
229	**SIKWAY**	30	S	C
230	**SIMBOCK VILLAGE**	40	S	C
231	**TCHATIBALI**	50	S	C
232	**TCHOLLIRE**	24	S	C
233	**TIBATI PT**	24	S	C

No.	Location of site	Height (m)	Type of tower (S= Self-supporting; G= Guyed)	Category of tower
234	**TIBATI**			
235	**TIGNERE**	20	S	C
236	**TIKO**	38	S	C
237	**TIKONDI**	67	G	B
238	**TINTO**	60	S	C
239	**TOMBEL**	60	G	B
240	**WAGURI**	96	G	B
241	**WAZA**	108	G	B
242	**WUM**	31	S	C
243	**YABASSI**	50	S	C
244	**YAGOUA**	91	G	B
245	**YAOUNDE CENTRE**	60	S	B
246	**YASSA VILLAGE**	40	S	C
247	**YETT**	45	G	C
248	**ZAMENGOE**	53	S	B