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TITLE: THE INTERCONNECTION ENVIRONMENT IN ZAMBIA

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1. INTRODUCTION

Interconnection is the mechanism for the seamless connecting of multiple telecommunication systems, including local exchange services, long distance telephone service including international, cellular, pay telephone etc.

As we get more operators setting up operations in the telecommunications sector, the interconnection of networks becomes of absolute need. In the absence of interconnection, operators and service providers can only offer isolated networks. Though networks have been interconnection regimes unique is that the operators and service providers obtain interconnect at wholesale price and not retail.

The Zambia Telecommunication Company Limited's initial request for interconnection was in 1996 following the government's policy to liberalise the telecommunication sector in 1994 and open up a number of services to competition.

2. TELECOMMUNICATIONS SECTOR

2.1 LIBERALISATION OF THE TELECOMMS SECTOR

The telecommunication sector was liberalised in 1994 with a view of encouraging development of the sector.

This was in the appreciation of the importance placed on telecommunication as an enabling technology, which makes it possible for a wide of industries to reach high levels of productivity especially critical to global competition.

The then Zambia Posts and telecommunication company through an Act of Parliament in 1994 was split into two separate entities, namely the Zambia Telecomm company limited (Zamtel) and the Zambia Postal Services Corporation (Zampost).

Through the same Act, operations of telecommunications services in Zambia were liberalised.

Currently, Zamtel still holds monopoly on fixed network and exclusively on International Gateway.

2.2 REGULATORY FRAMEWORK AND GOVERNMENT POLICY

Through the same Act of 1994, Government created the communication Authority to oversee the liberation of the telecommunication industry in Zambia.

2.2.1 OBJECTIVE OF THE COMMUNICATIONS AUTHORITY

The Act confers upon the Communications Authority the mandate to supervise and regulate the provisions of the telecommunications services and products, to promote

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competition and to ensure that the benefits of this sector accrue to the Citizens of Zambia and its economy.

2.2.2 FUNCTIONS OF THE AUTHORITY

The Authority supervises and promotes the provision of Telecommunications services throughout Zambia and to:

- a) Take reasonable steps to extend the provision, throughout all urban and Rural areas of Zambia of such Telecommunications services to satisfy all reasonable demands for them including, in particular emergency services, public call boxes, directory information services and machine services.
- b) Promote the interests of consumers, purchasers and other users of Telecommunications services (including in particular those who are disabled or of Pensionable age) in respect to the prices charged for, the quality and variety of such services.
- c) Promote and maintain competition among persons engaged therein.
- d) Exercise general control and supervision of Radio communications and Radio communications services.
- e) Promote research into telecommunication and the development and use of new techniques in telecommunications.
- f) Encourage major investors in and users of telecommunications and the development and use of new techniques in telecommunications and Radio communications services.
- g) Promote the provision of international transit services, that is services conveying sound, visual images or signals (that have been conveyed to, places outside Zambia) by persons providing Telecommunications Services to Zambia.
- h) Enable persons providing Telecommunications services in Zambia to compete effectively in the provision of such services outside Zambia; and,
- i) Enable persons producing Telecommunications apparatus in Zambia to compete both inside and outside Zambia.

2.2.3 GOVERNMENT POLICY ON TELECOMMUNICATIONS

Recognising that telecommunications is a public utility necessary for the development of all sectors of the economy and society, the government policy should be to ensure provision of affordable and efficient telecommunications service to all parts of the country through liberalisation and commercialisation of the sector.

2.2.4 THE ROLE OF GOVERNMENT

At the macro level Government will perform the following principal functions: -

- a) Create enabling environment for the provision of affordable services through the liberalisation and commercialisation of the telecommunications sector.
- b) Create a level playing field to facilitate entry and growth of nascent operators.

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- c) Restructure and consolidate the sector by assigning responsibilities to the Players dealing with policy (Ministry of Communications and Transport), Regulation, (Communication Authority of Zambia) and operators to ensure the community as a whole, and all its parts are provided with adequate choice of services at reasonable prices.
- d) Offer incentives to telecommunication operators in rural areas of the country. Incentives will be through transparent tax rebates to help pay for service to serve the high cost rural areas.

3. CURRENT SCENARIO

Currently all operators are subjected to competition in provision of a number of services.

3.1 LIBERALISED SERVICES

The following are among the service opened up for competition.

- a) Mobile Cellular Telephone Service
- b) Radio Paging
- c) Voice Mail Service
- d) Public Telephone Service (Public Call office)
- e) Global Mobile Personal Communication by Satellite (GMPCS)
- f) Data Communication, including Internet, EDI and E-Mail
- g) Customer Premises Equipment (CPE), Importation, manufacture, distributing, installation and maintenance.

Following liberalisation of the above services competition set in influenced by various factors such as:

- a) The liberalised policy of telecommunication.
- b) The market and profit potential that exist in the telecommunication business.
- c) The advancement in technological development such as wireless, VSAT, Fibre etc, it is now fairly easy to rollout a network in a very short period.
- d) The desire by Government to accelerate development of the telecommunication infrastructure.

3.2 OPERATORS

Currently various operators have been licensed to operate a number of services. These have mostly been in the following areas.

- a) Mobile Cellular (Zamtel, Celtel and Telecel)
- b) Internet (Zamnet, Zamtel Online, CopperNet, Microlink and UUNet Zambia)
- c) Pay Telephone (Zamtel, Tele Two Africa and Zynex Telekom)

4. INTERCONNECTION

The licensing of other operators brought in the requirement for interconnection, as it is generally a requirement that any customer should be able to communicate with any other customers, regardless of the provider. Interconnection issues can be divided into two major areas.

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a) **The technical issues:**

While this may seem to imply only the “engineering” type issues, it also entails the operational type issues. The engineering issues are perhaps the easiest to solve.

Generally there do exist international or national standards that are in wide use, which may be followed unless there is such an overriding mutual concern that they cannot be used. Otherwise, there is no reason to reinvent the wheel. The operational issues are just as much technical issues as the engineering issues. However these issues cover all of the activities necessary to properly provide the customer the requested service, and traditionally covers such items as network information, service order processing, billing information access to customer records, etc.

b) **Pricing issues:**

These can be the most contentious considering that the buyer wants to buy low and the seller wants to sell high. The most common interconnection pricing mechanism is called access charges. That is the prices charged by local telecommunications carriers for originating and/or terminating toll calls for the toll provider, either international or domestic.

4.1 WHAT IS INTERCONNECT

Interconnect is the link, via wire, radio, satellite, or other means, of two or more existing telecommunications carriers or operators or with one other so that the customer of different carriers can reach each other. Interconnection points are the physical parts of the network where traffic/information is exchanged.

4.2 WHY IT IS IMPORTANT

- a) Imagine for a moment a telecommunications system without interconnection. The customers of each carrier in the market would only be able to call other cellular phones, but not call into the fixed network. Similarly, calls from the fixed network could not be terminated in the cellular network. This would also completely preclude international calling.
- b) Secondly interconnect is important in that it promotes infrastructure sharing. If second and third operators were required to build their own infrastructure in order to compete, then there would be duplication of expensive and disruptive construction projects. Interconnect allows for telecommunications to be viewed as other than a natural monopoly, because competitors may use the same facilities to provide service in whichever segment of the market they choose.

4.3 INTERCONNECT AND INDUSTRIAL STRUCTURE

In weighing the benefits of competition against the benefits of exclusivity, a number of factors come into consideration against the impact of each alternative relative to a number of possible sector objectives. The following are among the factors for consideration.

c) **Increased Line Penetration:**

Competition can either suppresses or stimulates line penetration. On one side of this argument is the notion that the higher prices, which may be charged in a non-competitive environment, provide greater investment capital for the monopoly operator. Assuming that the capital available is reinvested in the network, the exclusivity allows

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for faster infrastructure development. Proponents of competition, however, argue that competitors will find it economic to invest in line plant so they can serve new customers.

d) Improved Supply Efficiency:

In general, it would be expected that a single operator, who would be able to coordinate all the planning for a national network, would enhance supply efficiency. In actuality, however, monopolists have little incentive for efficiency. Assuming that effective interconnect is available to reduce the expenditure of resources on redundant infrastructure competition allows for the market to make decisions regarding supply configuration, resulting in greater efficiency for the market overall.

c) Improved Product and Service Innovation:

In the area of development and introduction of new products or service quality improvement, there is no substitute for competition. The benefits to be gained by being first to market with a new service or of being able to promise a substantial quality advantage far outweigh any benefit a monopoly structure may offer (e.g., economies of scale in research and development).

d) Beneficial Privatization Results:

Exclusivity period tends to be highly attractive to investors, particularly overseas investors who may be facing new competition in their home markets. With all other factors being equal, including an exclusivity period in a concession or license may help attract interest from foreign investors and likely to result in a higher transaction price.

4.4 INTERCONNECT LEGISLATION

The draft interconnect for operators in Zambia, the legislation requires that:

- a) Operators providing services to the public interconnect other operators where requested;
- b) The dominant operator provides interconnect to other players on the same basis that it would interconnect its own downstream operations;
- c) Interconnect services be provided on an unbundled basis;
- d) Co-location of facilities be provided if requested;
- e) The legislation further stipulates that interconnect prices should be based on the cost of efficient service provision (call termination charges); and
- f) Not be in any way anti-competitive; and avoid discrimination between users

4.5 INTERCONNECT PRACTICES

Best practices in developing an Interconnect Framework have emerged from experience of various countries in introducing competition into the Telecom sector. Certain features of the relationship between interconnecting operators has led to development of these best practices and should be kept in mind in establishing the framework for interconnect. These features include.

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a) Commercial

Interconnect is a commercial arrangement between two operators. Assuming that each operator understands its costs and requirements and are equally leveraged and motivated, optimal arrangements will be reached through negotiation between those operators, rather than imposition by a third party. For example, the operators through negotiation can do reaching an optimal pricing point for interconnection. A regulator may not have sufficient access to market and strategy information to find that optimal point.

b) Leveraged:

Operators do not approach interconnect negotiations from the same position. Incumbents will generally view interconnecting other operators as a threat to their market. Delays in negotiating or implementing interconnect appear to serve the needs of the incumbent but, at a great cost, potentially its very existence, to new operators. In such cases there is always intervention from a regulator to get the incumbent to the table for good faith negotiations.

c) Asymmetric:

It is frequently the case that the incumbent may frequently the case that the incumbent may need to interconnect with the incumbent. Thus the incumbent will likely have more technical compatibility issues, as well as more experience in negotiating interconnect than interconnecting operators.

d) Segmented:

Different segments of the telecommunications market have different needs and different impacts on the incumbent. For example, global experience has shown that introduction of a cellular operator tends to increase the total volume of calls in a market, including calls in the incumbent's network. Thus cellular service primarily complements, rather than competes with, fixed network operators.

4.6 LEGISLATIVE APPROACHES

The success of interconnection arrangements will depend to a large extent upon the effectiveness of the regulatory framework for interconnection established by Regulator, and the degree of support by industry.

In implementing the legislative framework for Interconnect, the regulator must ensure that the regime is:

- a) Firmly established
- b) Relevant to the market conditions and interconnection needs of the country
- c) Technically sound
- d) Understood by the industry participants
- e) Enforceable under law

4.7 FACILITIES ACCESS

From our experience, access by carriers to the services of the other carriers is necessary in order that interconnecting carriers may in turn provide end-to-end services to customers. It

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will also be necessary that carriers be able to gain access to the facilities (or infrastructure) of other carriers. The need for such facilities access arises for two main reasons:

- a) Interconnecting carriers will need to establish physical points of interconnect between networks, often involving co-location of facilities; and
- b) It will often be considered beneficial that carriers be encouraged to share infrastructure such as mobile telecommunications towers to minimize the need for duplication. This may be desired particularly from an environmental viewpoint, since duplication of infrastructure is often regarded within the community as unsightly, and a waste of resources.

The facilities to which such access requirements apply will usually include:

- a) Tower;
- b) Underground ducting
- c) Cables (or lines)
- d) Building; and
- e) Land on which facilities are located.

Not surprisingly, carriers are often reluctant to permit other carriers to access their facilities. It will therefore be important that carriers understand from the outset why reciprocal access to infrastructure is important to the smooth operation of telecommunications interconnect arrangements, and that they appreciate the benefits to themselves in having such arrangements in place.

4.8 FACILITIES ACCESS THROUGH INTERCONNECTION AGREEMENT

The detail of arrangements for provision by carriers of access to facilities arising out of interconnection arrangements should be specified in the interconnection agreements between those carriers. Inclusion of facilities access provisions in the interconnection agreement ensures that the parties acknowledge that facilities access is an integral part of the interconnection arrangements arising from provision by one carrier of interconnection services to another.

Facilities access issues to be addressed in the interconnection agreement between carrier will relate primarily to arrangements for access to physically space for the installation and operation of equipment necessary to establish and maintain a POI between carriers. These issues will include:

- a) Procedures and guidelines for physical access to POI space, including security procedures.
- b) Notification periods to be provided by one carrier to another prior to gaining access to building or entering onto the land;
- c) Arrangements for reimbursement of carrier costs arising from provision of facilities access to another carrier; and
- d) Specification requirements for inquiries seeking access (i.e., information that one carrier must provide to another in order that a facilities access request may be assessed, and acted upon).

It may be necessary that the regulator indicates to carriers its expectation that interconnect agreements include facilities access provisions, since it is to be expected that there may be some resistance (particularly from the incumbent) to inclusion of such provisions in the

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interconnect agreement. The regulator will also need to develop clear guidelines (or principles) that it will apply if required to arbitrate on the facilities access aspects of interconnect agreements.

4.9 NETWORK INFORMATION SHARING

In addition to requiring access to the facilities of other carriers, interconnecting carriers will require access to key network information on the carriers with which they plan to interconnect. In this regard, it is normally helpful to establish a technical work group, which meets on a regular basis.

This information will be necessary to enable the interconnecting carrier to design its network in a way that ensures compatibility between its network, and those of others.

It will also be necessary that an interconnecting carrier receives periodical updates on performance of the networks with which it interconnects, and any changes to those networks (so that possible interconnect implications can be assessed).

The type of network data that an interconnecting carrier reasonable expect to receive from other carriers will include:

- a) The volume of traffic transferred between networks over a given period
- b) Network performance against benchmark standards
- c) Anticipated action by either carrier that may affect the quality of the interconnect service, e.g., any change in standards or protocols affecting network operations.
- d) Routing information necessary for the interconnecting carriers to determine when/where calls have failed; and
- e) Identification of equipment in each carrier's network that is responsible for, or has contributed towards, unsuccessful routing of calls.

In considering what benchmarks should be used for deciding whether or not it is necessary that particular interconnect difficulties be reported by one interconnecting carrier to another, it will usually be best that reference be made to internationally understood (and adopted) guidelines. Perhaps the best benchmarks to use in this way are the quality of service recommendations and standard set by the Telecommunications Standards Bureau of the International Telecommunication Union (ITU).

Terms and conditions for access to network information are best negotiated between the parts, and should as a minimum provides for reimbursement of each carriers costs in providing network information to other carriers.

As with other aspects of interconnect, the regulator should expect to play an active role in facilitating arrangements for access to network information, and in arbitrating in the event of disputes.

One of the most common disputes that regulators can anticipate regarding access to network information relates to the timeliness of information. Even if carriers accept that there is a legitimate need that they provide network information to interconnecting carriers, they may still dispute the frequency with which such information should be provided. The incumbent will usually wish provision of network information to be as infrequent as possible (usually citing costs of provision as a barrier, while new entrants will want information exchange to occur more regularly.

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In arbitrating on disputes relating to exchange of network information, the regulator will need to take account of:

- a) What information it is possible for carriers to provide to one another (given the unique characteristics of their networks).
- b) The costs involved in extracting his information, and
- c) Time taken to extract information and the frequency of each carrier's usual extraction of information.

As with facilities access, it is necessary that the interconnection agreement between carriers specify the arrangements for exchange of network information. This should include reference to the type of information to be exchanged, the frequency of exchange, and the terms and conditions under which exchange will occur.

5. INTERCONNECTION RATES

5.1 PAYMENTS OR SETTLEMENT MECHANISM

Payment of interconnect fees may assume different forms and structures. In the case of the operators in Zambia is typically accomplished through a revenue sharing arrangement. Initial, the revenue sharing arrangement was based on a negotiated percentage of call revenue by the parties, which was then allocated to each operator.

Typically, the revenue received by each company that was owed to the other would be netted against each other and a single payment would be issued

Increasingly, this type of mechanism is being phased out and replaced by an access charge-style mechanism. Access charges usually some combination of traffic sensitive and non-traffic sensitive components, reflecting the costs of providing access. An access charge structure involves carriers paying each other to originate or terminate traffic. As a general rule, the operator who collects revenue from the customer is the one to pay for access.

6. INTERCONNECTION DISPUTES

6.1 ENFORCEMENT

Interconnect agreements, as any commercial agreements, must have enforceability built into the agreement, through both proscribed remedies and through the courts system. Therefore, the agreement itself should include.

a) **Procedures for dispute resolution:**

Clearly, the parties themselves best resolve disputes. If this is not possible at the executive level, then disputes pertaining to regulatory issues must be referred to the regulator. The decision of the regulator should be binding unless disputed through any legally established right to appeal regulatory decisions. Disputes not related to matters of regulation may be resolved through the civil court system or through arbitration in accordance with specifications in the interconnect agreement.

b) **Specific performance requirement:**

Disputes may also be best resolved either through courts or arbitration when the performance requirements are set out in detail. Thus the agreement should set out in detail procedures for initiating some action and timelines for response.

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c) **Financial provisions:**

The timing and amount of financial settlements may also come under dispute. The agreement should set out with what frequency and in what time frame (e.g., within 30 days of the end of the month or end of quarter) settlement will be made. The agreement should also specify how adjustments for uncollectibles will be made and what documentation will be provided between the operators to document the settlement amounts.

7. **BENEFITS**

7.1 **Traffic Growth**

As a result of the new services introduced, additional number of operators and restructuring and development of Zamtel over the years resulting from the advent of competition following liberalisation, the network has experienced some growth in the traffic.

7.2 **Tariffs**

- a) Resulting from technological advancement and the competitive environment prevailing.
- b) Pricing is considered as one of the sources of a competitive advantages
- c) The issues of price differential and service values are of prime consideration. There is need to recognize that customer has a choice. The question of alternatives comes into play.
- d) The need for customer care and Billing Systems that support wide variety of tariff options. etc.

7.3 **Network Development**

Network development including that of the incumbent operator is enhanced resulting from pressure for demand of certain services such as roaming from the mobile operators.

9. **CONCLUSIONS**

All types of interconnection are critical issues for consideration in formulating a new telecommunications regime.

As countries introduce, or consider introducing competition through private sector participation, they will need to consider at the same time the type of interconnect rules to be put into place.

Policy, legislation, and regulation within the sector must all echo the same message to allow for competition to be implemented.

It is important to bear in mind that implementation of an effective interconnect regime may be hindered by:

- a) Reluctance of incumbent operators to provide access to competitors;
- b) Attempts by the incumbent to provide discriminatory or high-cost interconnect;
- c) Inexperience or under-capitalization of new entrants, inhibiting them from fighting the first interconnect battle;
- d) Poorly defined legal obligations to interconnect
- e) Poorly enforced regulatory interconnect regime; and

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- f) Poorly defined regulatory regime with respect to related issues, such as carrier selection, number portability, or costing guidelines.

While countries undertaking sector reform may not be able to start out with a perfect regime, the reform process is aided by endeavour to establish an interconnect regime. This entails long-term sector planning, possible legislative change, regulatory action, and commercial response, all of which are critical steps that need to be taken to ensure an efficient interconnect regime that stimulates and enhances competition within the telecommunications sector.

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