



# **FRAMEWORK FOR THE ESTABLISHMENT OF INTERNET EXCHANGE POINTS ("IXPs") IN THE BAHAMAS**

**Statement of Results and Final Decision**

**ECS 11/2020**

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# 1 Introduction

This Statement of Results and Final Decision concludes the Utilities Regulation and Competition Authority's ("URCA") public consultation on a regulatory framework for the buildout of Internet Exchange Points in The Bahamas.

Commonly called an IXP or an IX, an Internet Exchange Point represents a neutral technical facility through which Internet Service Providers ("ISPs"), Governments, educational institutions, Content Delivery Networks ("CDNs") and aggregators, businesses, and other organizations of the Internet community exchange traffic with one another. In essence, IXPs function as centralized clearinghouses for organizations involved in the Internet to peer and exchange data traffic. IXPs are also an important infrastructure for delivering local digital content.

The Communications Act, 2009 (referred to herein as "the Comms Act" or "the Act") endows URCA with power to issue regulatory and other measures in fulfilment of the electronic communications sector policy ("ECS Policy") objectives. Acting in accordance with the draft ECS Policy,<sup>1</sup> on 2 May 2019, URCA released for comments document number ECS 07/2019 "Framework for the Establishment of Internet Exchange Points in The Bahamas".<sup>2</sup> The Consultation Document had the following core objectives:<sup>3</sup>

- to promote public awareness of the contributions IXPs can make to the development of the Internet and digital economy in The Bahamas;
- to alert potential IXP participants of URCA's regulatory framework for the entry of IXPs in the Bahamian market; and
- to ensure the regulatory framework is favorable for IXPs to operate successfully in The Bahamas.

Five (5) companies submitted written responses on the consultation, namely:

- Bahamas Telecommunications Company Limited ("BTC");
- Cable Bahamas Limited ("CBL");
- Last Mile Communications ("LMC");<sup>4</sup>
- Secure Hosting Solutions ("SHS");<sup>5</sup> and
- Cloud Carib.<sup>6</sup>

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<sup>1</sup>See Official Gazette dated 19 March 2020 for the Electronic Communications Sector Policy 2020-2023 available at <https://www.urbahamas.bs/wp-content/uploads/2020/06/ECS-POLICY-2020-2023.pdf>

<sup>2</sup><https://www.urbahamas.bs/consultations/framework-for-establishment-of-internet-exchange-points-ixps-in-the-bahamas-public-consultation-ecs-07-2019/>

<sup>3</sup>The deadline for submission of initial responses was 16 July 2019, with a second round of comments on initial responses concluding on 16 August 2019. Based on the representations made by key stakeholders, URCA extended the response timelines to 22 July and 22 August 2019.

<sup>4</sup> This company provides fixed wireless access-based residential and business retail broadband services in Abaco, Exuma, New Providence, and Cat island.

<sup>5</sup> This company is a cloud and data hosting provider with two data centers on New Providence and Grand Bahama.

<sup>6</sup> This company provides managed cloud and ICT services to businesses and governments in the Caribbean region and Latin America.

URCA thanks the respondents for their feedback and participation in the consultation process. The participation of all five companies was useful and help to guide URCA’s final position in respect of URCA’s IXP enabling measures. Copies of all submissions received on this consultation are located on URCA’s website at [www.urcabahamas.bs](http://www.urcabahamas.bs)

Publication of this Statement of Results and Final Decision represents the first milestone in laying the foundation for the implementation of IXP technology in The Bahamas’ digital space.

### **1.1 Context for the Consultation**

While broadband access and usage in The Bahamas have improved considerably,<sup>7</sup> the use of the Internet to fuel business innovation and service delivery in both the private and public sectors locally remains a challenge. Currently, there are no IXPs in The Bahamas and local ISPs route locally destined IP traffic between their networks through an intermediary switching facility in Miami and back. URCA is cognizant that a previous attempt to introduce IXP technology in The Bahamas was unsuccessful.

As URCA understands it, the Government of The Bahamas now views the presence of IXPs in-country as vital to the development of The Bahamas’ digital space. In total, the Government’s priority is to leverage the full potential of the Internet to drive digital entrepreneurship and transformation in the public and private sectors. Stemming from the draft ECS Policy, URCA issued the Consultation Document setting out its preliminary thinking on the regulatory measures required to stimulate buildout of IXPs in the Bahamian market. Within the Consultation Document, URCA expressed that buildout of Bahamian IXPs would be in harmony with the Act and the Government’s strategic vision for the communications sector. In the context of this, URCA stated that there are compelling reasons to promote an IXP formation in The Bahamas, noting that access to this technology would help to catalyse the measures that enable the Internet and digital economy outlined in the ECS Policy. In particular, a Bahamian IXP would, amongst other things, support:<sup>8</sup>

- Government’s plan to create a Tech Hub in Grand Bahama and digital transformation in the delivery of essential public services; and
- the buildout of data centres which can facilitate and enhance the development of a smart, connected and sustainable Bahamas.

### **1.2 Structure of the remainder of this document**

The rest of the document is structured in the following way:

- Section 2 summarizes the responses received and provides URCA’s comments to the responses
- Section 3 presents URCA’s conclusion and next steps

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<sup>7</sup> See Sections 3.3 and 3.4 of the Consultation Document

<sup>8</sup> Further details of the Government’s agenda for the sector are found in Paragraphs 14 through 19 and Annex 1 of ECS Policy 2020-2023.

## 2 Responses to Consultation Questions

URCA now summarizes and responds to the substantive arguments presented by all the respondents on a question-by-question basis, as outlined below.

In doing so, URCA expressly states that failure on its part to respond in this document to a particular comment should not be interpreted to mean that URCA agrees in whole or in part with the comment, has not considered the comment or considers the comment is without merit.

### 2.1 Context for the Consultation

**Consultation Question 1: Do you agree with URCA’s justification for publishing this consultation on the establishment of local IXPs in The Bahamas?**

#### **BTC’s comments**

It was BTC’s view that the Consultation lacked evidence that demonstrated the IXP-related benefits that would result in The Bahamas. Commenting that URCA’s stated benefits were largely assumed and overestimated in addition to the associated costs being understated. BTC stated that the equipment cost alone is between \$100,000 and \$150,000 and the recurring costs of operation would be substantial.

In the second round, BTC argued that the regulatory measures proposed by URCA would be disproportionate and inconsistent with section 5 of the Comms Act. BTC disagreed with LMC that an IXP would attract additional Content Delivery Networks (“CDNs”) to the Bahamian market, noting there is no evidence to substantiate such a claim.

#### **CBL’s comments**

In common with BTC, CBL reasoned that the assumed set-cost for an IXP is heavily underestimated by URCA. CBL then commented if the IXP is central to the digital infrastructure and enables the huge potential for online services and applications to grow in The Bahamas, it must be set up to the same high standards common in the other data centres and IXPs.

CBL expressed there is a general view that the implementation of IXPs significantly reduces delays or latency in networks and prevents ‘tromboning’, however, in CBL’s view this will depend on local conditions. For example, given The Bahamas’ close proximity to Internet hubs in Miami a local IXP may not be a necessity.

In the second round, CBL commented that, “...CBL and BTC arrive at broadly similar conclusions on URCA’s consultation document...” In CBL’s estimation, the set-up costs of a small carrier grade IXP (which is vital to the digital infrastructure of a country) range from \$200,000 to \$300,000. Additionally, the operational costs for this kind of IXP would be substantial.

CBL concurred with BTC that the consultation did not consider alternatives to the formation of IXPs in The Bahamas. CBL felt that given the geographical location of The Bahamas, US IXPs can be considered ‘local’.

As well, a direct peering arrangement between leading ISPs in The Bahamas is a more efficient and cost-effective way to achieve data privacy and other objectives identified by URCA.

### **SHS' comments**

SHS agreed with URCA on the need to consult with the Internet community on the establishment of local IXPs. SHS said it is aware of individuals that have tried to set up an IXP but were unsuccessful due to the lack of intervention.

### **LMC's comments**

LMC acknowledged URCA's effort to stimulate discussions on the establishment of local IXPs but commented that local traffic volume is insignificant to justify a local IXP buildout. LMC, however, explained that an IXP would deliver other benefits, as follows:

- Combining media content type service demand in one location will allow the IXP the necessary volumes to deploy caching servers from the larger content providers. This is especially beneficial for smaller ISPs and large hotels and resorts.
- Companies that have backup and host services offsite at local facilities could have significant savings because the local loop services are less expensive per Mbps than broadband.
- The Bahamas' E-Government can benefit from an IXP especially from transactions that cross multiple carriers. Adding that when such transactions exit the jurisdiction, they are no longer subject to local Data Protection legislation.

LMC stated that an IXP must have an Autonomous System Number ("ASN") with allocated IP space from ARIN. According to LMC as only 8 ASNs are assigned in The Bahamas, this circumstance will limit the initial participation in an IXP.

### **Cloud Carib's comments**

Cloud Carib considered the implementation of an IXP as crucial to mitigate risk and would aid in The Bahamas' development. This is especially in light of concerns raised about national security, the digitization and modernization of Government, and the ease of doing business by the Grand Bahama Technology Hub Steering Committee.

### **URCA's response to comments received/final decision**

Section 1.1 above underscored the need for URCA to confirm the regulatory framework for IXPs entry to the Bahamian market. BTC and CBL are reminded that the consultation is in fulfilment of a request by the Government of The Bahamas for URCA to establish an enabling regulatory framework for the buildout of IXPs in The Bahamas. That said, URCA is satisfied that the consultation correlates with the Government's agenda and the sector' objectives.

URCA was not surprised by the general approach taken by BTC and CBL in their responses to the Consultation Document. As a general point, considerable evidence exists to support the contention that incumbents, in URCA's region and elsewhere, often opposed the buildout of IXPs due to a perceived IXP threat to their commercial position. URCA is equally cognizant that a previous attempt to introduce IXP

technology in The Bahamas was unsuccessful. Aside from SHS' stated reason above, URCA considers that mistrust, a lack of collaboration, and having a competitive advantage are also potential reasons for the opposition by some networks.

URCA acknowledges that its statement regarding the volume of local IP traffic that travels through Miami IXPs and back was premised on imprecise traffic estimates received.<sup>9</sup> URCA notes the respondents' submissions that local IP traffic volume, as a share of total IP traffic, is insignificant to justify an IXP buildout in The Bahamas. With that stated, URCA understands that traffic volume alone is not always an accurate predictor of an IXP's success. After all, history shows that IXPs may still deliver technical and other benefits regardless of traffic volume. LMC endorsed this view, when it asserted that a Bahamian IXP would generate other benefits even if current traffic volume is low or insignificant.

As for the beneficial impact LMC and Cloud Carib have identified for a local exchange, URCA refers to its reply to responses received on Question 8 below.

URCA notes the extensive comments made by BTC and CBL as it relates to the set-up and operational costs for a local IXP. URCA advises that matters of this nature are beyond the scope of URCA's consultation.<sup>10</sup> URCA should add that the information regarding set-up costs came from independent sources and relates to markets external to its jurisdiction. As URCA understands the data, approximately 90% of IXPs cost between \$4,000 and \$40,000 to establish. Further, the data does not in any way, confirm URCA's final position on the level of capital expenditure required for an IXP buildout in The Bahamas. Rather, it illustrates that in general, IXPs are relatively inexpensive to establish, and especially when compared against the capital costs required to build other communications networks and infrastructure.

Due to a lack of specifics, URCA offers no comment on BTC and CBL's estimates on set-up and operational costs for a Bahamian IXP. That said, like any other networks, an IXP can be simple or more elaborate as the more advanced/complex IXP infrastructure in some advanced economies. The costs and implications of a simple versus a complex IXP model would need to be debated and agreed upon by interested parties before a final decision is taken.<sup>11</sup> Taking into account the need for the IXP to be fit-for-purpose, cost-effective and scalable (i.e., avoid 'gold-plating'). As the key factors relating to an IXP buildout are unknown, at this time, BTC and CBL's claim that a Bahamian IXP is not cost beneficial is premature.

Regarding comments that URCA did not consider alternatives to the creation of local IXPs, URCA disagrees. The Government's articulation of its strategic imperatives for digital economy and transformation is set out in ECS Policy 2020-2023 and envisages the buildout of local IXPs in The Bahamas. URCA shares the Government's urging to stimulate buildout of the country's digital infrastructure for the Internet which, in URCA's view, will also make The Bahamas less dependent on IXP infrastructure or switching facility of another country.

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<sup>9</sup> See Section 4.5 of the Consultation Document

<sup>10</sup> See Section 2.5 below.

<sup>11</sup>In reference to experience elsewhere, ITU cautioned *"A complex model reduces the chances of sustainability and could possibly even severely lower the level of participation from local ISPs and potential members."* See Via Africa Creating local and regional IXPs to save money and bandwidth, Discussion paper prepared for IDRC and ITU for the 2004 Global Symposium for Regulators.

As a final point, URCA understands that The Bahamas can request additional Autonomous System Numbers from ARIN.

## **2.2 Assessment of Market Environment**

**Consultation Question 2: Do you agree with URCA that there is high penetration of broadband access in The Bahamas?**

### **BTC's comments**

BTC said The Bahamas has a high penetration of broadband access and boast one of the highest penetration rates in the CTU member states. BTC explained that there may not be a direct correlation between broadband access and IXPs. Adding that the two CTU countries with the highest fixed broadband access do not have IXPs and the two CTU countries with the lowest fixed broadband access have IXPs.

In the second round, BTC stated that high broadband penetration does not equal cost-benefits for an IXP buildout in The Bahamas.

### **CBL's comments**

CBL said there is a high penetration of broadband access in The Bahamas and shared URCA's goal of ensuring that consumers in The Bahamas are served with high-speed and high-quality Internet connections now and going forward.

### **SHS' comments**

SHS said there is a high penetration of broadband access within The Bahamas and advised that the advent of a second cellular/mobile company operating Long-Term Evolution ("LTE") data services allows more access to the Internet.

### **LMC's comments**

LMC said The Bahamas has a high penetration of broadband access.

### **Cloud Carib's comments**

Cloud Carib said more must be done to improve broadband access and drive service competition in The Bahamas. Emphasizing that The Bahamas' close proximity to Internet hubs in Miami should guarantee that it leads the Caribbean region in broadband access and usage.

Cloud Carib urged URCA, the Government, and market participants to work towards narrowing the broadband penetration gap between The Bahamas and Canada, explaining that this is necessary in order for The Bahamas to compete globally.

Baselines and benchmarks should be established and measured quarterly and annually to ensure the industry is advancing the market aligned to the interests of key stakeholders. Noting "URCA should be the maintainer of these datasets and responsible for reporting progress against targets annually to the Government and the People of The Bahamas ..."

### **URCA's response to comments received/final decision**

The respondents' comments on broadband access in The Bahamas have been noted.

BTC's query on whether broadband access and IXPs are directly correlated in CTU member states, URCA considers this as not being central to the consultation or URCA's regulatory proposals. In any event, URCA never suggested a direct statistical relationship between broadband penetration and IXPs in CTU member states exist. That said, relevant studies are available to support URCA's view that IXPs do help to improve Internet reliability and enhance end-user experience. Additionally, IXPs also help to improve Internet access in unserved and underserved populations or communities in Latin America and elsewhere.<sup>12</sup> Further still, IXPs indirectly help to promote United Nations Sustainable Development Goal 9.c to "Significantly increase access to information communications technology and strive to provide universal and affordable access to the Internet ..."<sup>13</sup> As a final point, evidence exists to show that IXPs in Grenada and Curacao<sup>14</sup> have help to improve Internet reliability and service quality for end-customers.<sup>15</sup>

URCA continues to promote initiatives that would drive take-up of broadband access and level the competitive landscape for smaller ISPs to compete effectively against their more established competitors. These include URCA's assessment of wholesale broadband access which smaller ISPs must have, to compete against major market participants. As well, URCA continues to use its ex-post powers to address claims of anti-competitive conduct by major networks. As per the sector policy,<sup>16</sup> URCA's plan to review the universal services and obligations is targeted at increasing broadband speed and affordability, especially for consumers in vulnerable circumstances. The roll-out of the Government's public Wi-Fi programmes and other broadband-enabling measures will also help to promote fast broadband access on public Wi-Fi networks.

URCA appreciates the need to publish timely and relevant information on market trends and indicators. URCA already publishes market statistics as part of its annual report which is accessible to the Bahamian public. URCA sees a need to publish a wider range of market statistics/indicators covering critical communications services and technologies. Where feasible, URCA will publish comparative datasets for jurisdictions overseas. URCA also notes the Government's stated intention to "collect and measure key statistics regarding the availability and usage of ECS services ..."<sup>17</sup>

**Consultation Question 3: Do you agree with URCA that there is increasing local preferences for web content that has high demand for bandwidth and high sensitivity to latency?**

### **BTC's comments**

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<sup>12</sup>See Section 2.3 of the Consultation Document

<sup>13</sup> Page IGF 2016 Contributing to the success and continued development of Internet exchange points available at [http://www.intgovforum.org/multilingual/index.php?q=filedepot\\_download/3408/442](http://www.intgovforum.org/multilingual/index.php?q=filedepot_download/3408/442)

<sup>14</sup> This is not a CTU member state

<sup>15</sup> See Section 2.4 (Question 8) below

<sup>16</sup> See Paragraphs 17-18 of the sector policy

<sup>17</sup> See paragraph 11 (Annex 1) of the ECS Policy 2020-2023.

While agreeing that Bahamians have a preference for web content that has high demand for bandwidth and high sensitivity to latency, BTC disagreed that such a preference leads to the conclusion that it is appropriate or cost beneficial to establish an IXP in The Bahamas.

In the second round, BTC concurred with the sentiment expressed by CBL and LMC that current volume of local content alone is insignificant to justify an IXP buildout in The Bahamas.

#### **CBL's comments**

In CBL's view, there is no evidence of significant local web content that is highly sensitive to latency and contended local traffic represents a tiny share of total IP traffic in The Bahamas. In CBL's estimation, the additional latency for local traffic is due to its routing abroad, which in general does not cause performance issues. CBL stated the roundtrip time ("RTT") delay to the U.S. Internet hubs that CBL uses are on average less than 18 milliseconds, which CBL deemed an acceptable delay for traffic.

#### **SHS' comments**

SHS agreed with URCA that there is increasing local preference for web content that has high demand for bandwidth and high sensitivity to latency. Noting the need for additional bandwidth and low latency connections as new technology emerges.

#### **LMC's comments**

LMC said local content demand will not be large enough to support an IXP on its own.

#### **Cloud Carib's comments**

Cloud Carib referred to the Government's objective to modernize and digitize Government-to-Government transactions and transactions with citizens and businesses. Cloud Carib then stated the "Most envisioned services will be web or mobile applications where bandwidth consumption and latency affect service quality. This one single initiative directly increases local preference for web content,..."

Keeping local IP traffic local provides best practice for security of data. In support of this view, Cloud Carib commented that developed countries have taken the position that data hosted external to their own jurisdictions is detrimental to national development and stressed the routed path that data travels, pose serious risk as data is the modern state's greatest asset and one that all communication is based upon.

#### **URCA's response to the comments received/final decision**

At Question 1 above, URCA addressed comments that a Bahamian IXP is not cost effective or beneficial, in addition to the fact that local traffic volume is negligible to justify an IXP on its own. URCA will not restate those arguments here.

In its response to Question 8 below, URCA addresses comments relating to privacy risk when local IP traffic is routed externally.

URCA notes that the respondents were unanimous in their views regarding Bahamian preference for web content that has high demand for bandwidth and high sensitivity to latency. However, it was felt that the

current volume of local content is insufficient to support an IXP on its own. URCA, previously, reasoned that traffic volume alone is not always an accurate measure of an IXP's success. That stated, URCA draws attention to its high-level summary (Section 1.1 above) of the Government's justification for building local exchanges in The Bahamas. In particular, the Government's intention is to deliver a wide range of essential services to the Bahamian public via the Internet, therefore, the presence of a local exchange is necessary to produce locally relevant content. The envisioned services and applications include e-government services, e-education, e-health services and so forth. Specific to e-government services, URCA takes note of the fact that the Government's intent is to increase by 70% the number of persons using e-government services by 2025. Added to these initiatives are the Government's plan to create a Tech Hub in Grand Bahama and the buildout of data centres. The foregoing initiatives, in URCA's view, will help to increase the volume of local content that travels over networks in The Bahamas over the long run.

**Question 4: Do you agree that the practice of routing local internet traffic outside The Bahamas adds costs to the operations of local ISPs?**

**BTC's comments**

BTC disagreed that routing local IP traffic via the U.S. adds cost to the operations of local ISPs. BTC said the main ISPs (BTC, CBL) already have access to their own submarine cable systems so the only incremental cost of routing local traffic externally is IP transit cost. BTC referenced a traffic study to show that local traffic between the BTC and CBL is minimal (peaking at 200 Mbps/day for one day) and represents about 3% of total IP traffic.

In the second round, BTC denied SHS' claim that keeping local IP traffic within The Bahamas would reduce transmission costs adding SHS gave no supporting evidence for such a claim and is inconsistent with CBL, LMC and BTC.

**CBL's comments**

CBL maintained that the costs of establishing robust local IXPs are likely to be higher than the incremental cost of routing local traffic abroad.

In the second round, CBL stated that only 1% of its traffic is local, re-emphasizing that the resulting cost savings from keeping local traffic within The Bahamas will be negligible. Again, CBL said the costs of operating a small carrier grade IXP in The Bahamas are very high relative to the cost savings.

**SHS' comments**

SHS agreed with URCA that the practice of routing local IP traffic externally adds cost to the operations of local ISPs. SHS indicated the majority of the costs associated with Internet bandwidth in The Bahamas are add-ons specifically the use of submarine fiber to have bandwidth routed outside of the country. Secure Hosting considered reducing the transmission of local IP traffic outside of the country would reduce overall cost.

**LMC's comments**

LMC did not believe local traffic volume is significant enough to affect broadband transmission cost.

### **Cloud Carib’s comments**

The incremental cost of routing local IP traffic via Miami and back is inconsequential. Again, Cloud Carib stated the routed IP traffic path extending beyond the borders of The Bahamas is the greatest risk to national security.<sup>18</sup>

### **URCA’s response to comments received/final decision**

In Section 4.5 of the Consultation Document, URCA stated “the practice of routing local traffic outside a country adds costs to the operations of ISPs and content aggregators ...” In their submissions, the respondents held the view that this is not the case in The Bahamas. Except for SHS, all the respondents reasoned that the incremental cost of sending Bahamian IP traffic through Miami is negligible or insignificant due to low traffic volume and low transit pricing. Given the majority opinion, URCA no longer holds this view.

Linked to the foregoing was URCA’s view that ISPs would pass through cost savings from routing traffic via a local exchange to end-users in the form of lower retail pricing for broadband access and usage. In light of the majority response above, URCA no longer holds this view.

URCA notes CBL’s insistence that the costs to establish a local IXP are likely to be higher than the cost savings of keeping IP traffic local. It is not apparent to URCA that an IXP would not be cost beneficial when consideration is given to the Government’s sector policy imperatives and objectives. URCA holds to the view that the presence of a local exchange would further the overall goal of stimulating developments in The Bahamas’ digital space. This position appears to be in line with CBL’s support for a local exchange that promotes a tech or development hub in Grand Bahama and development of locally relevant content.

As part of its response to Question 8, URCA addresses Cloud Carib’s concerns relating to privacy risk when local IP traffic is routed outside The Bahamas.

## **2.3 IXP Enabling Measures**

### **Question 5: Do you agree with the supporting measures URCA proposes to adopt to stimulate entry of IXPs in The Bahamas?**

#### **BTC’s comments**

BTC was against implementation of an IXP license or any related fees, noting the imposition of fees will increase the set-up and on-going costs for an IXP and make buildout less cost-beneficial. BTC felt that decisions on traffic routing and exchange should be determined by the operators.

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<sup>18</sup>Explaining that “data in the modern world is the currency of today and the future (the new gold reserve). Whether it is in the form of digital currency or sensitive intellectual property, and personally identifiable information (PII), the value to the modern Nation cannot be understated.”

In the second round, BTC shared that a market driven approach is preferred to the other approaches but did not see a need for URCA to intervene in localizing traffic and how traffic is exchanged. BTC supported LMC and CBL's comments that the Bahamian environment is not conducive to the establishment of an IXP and would require the intervention of URCA. In total URCA's intervention is "disproportionate and inconsistent" with section 5 of the Act.

#### **CBL's comments**

CBL advised URCA to allow all local ISPs to decide how they route their traffic and how they interconnect to exchange local traffic.

#### **SHS' comments**

SHS valued URCA's assistance with imposing measures to stimulate the adoption of a local IXP. In SHS' judgement, without URCA's intervention, this IXP process would not be done at a reasonable pace or as needed for the advancement of ICTs in The Bahamas.

#### **LMC's comments**

Although LMC preferred a market driven approach for the implementation of an IXP in-country given the small number of local providers and past experience in trying to establish peering arrangements, LMC did not see how a market driven approach will work.

#### **Cloud Carib's comments**

In common with BTC and CBL, Cloud Carib claimed licensing and fees would be detrimental to the development and buildout of an IXP, noting that regulation or licensing is not necessary for an IXP success. Cloud Carib stated "the envisioned IXP within The Bahamas is solely for "Peering" and not for "Transit" there should be no licensing or fees required – based on our understanding of the present legal and regulatory structures."

Cloud Carib said:

- Localization of traffic is critical for the protection of The Bahamas and its people.
- URCA, the Government, the Data Protection Commission and businesses in the communications industry must do more to build a more secure Internet for The Bahamas.
- Data holds more value than any other asset base today and The Bahamas possesses the world's trust via Financial Services. Trust is principle barrier to determination of where anyone will store valuable assets.

#### **URCA's response to comments received/final decision**

URCA disagrees that its supporting measures run counter to the statutory guidelines for regulation and Government measures and would stifle an IXP buildout in The Bahamas. URCA affirms that the proposed measures are favorable for IXPs to operate successfully in The Bahamas. Below, URCA puts forward its reasons for this view:

- *Licensing* – The respondents did not put forward any compelling arguments that would cause URCA to resile from its initial position on IXP licensing. URCA notes that its position stems from

relevant Bahamian law, as discussed in Section 5.1 of the consultation. URCA also advises that wholesale-only facilities are not immune from licensing in The Bahamas. URCA continues to believe that a fit-for-purpose or restricted Class Licence is appropriate and proportionate.<sup>19</sup> URCA will determine (after consultation) the full and final scope of the licence once the IXP business model has been determined.<sup>20</sup> As a matter of clarity, and as previously explained in the consultation, it is not URCA's policy or intention to impose onerous licensing requirements and obligations on IXPs.

- *Fees and Payments* - URCA envisages that the IXP licence fee will have minimal financial impact on an IXP buildout in The Bahamas. As for the other fees and payments discussed, URCA's final position is premised on the IXP model ultimately chosen for The Bahamas. URCA, however, reminds the industry of its obligation under relevant Bahamian law to collect communications and regulatory fees on behalf of specified institutions.<sup>21</sup>
- *Peering* – The practice of exchanging traffic via a neutral IXP is called peering. It is not URCA's intention to specify how companies involved in the Internet should peer and exchange traffic at a local IXP. In recognition of the responses to Question 5, URCA, for the avoidance of doubt, clarifies that ISPs and other organizations involved in the Internet should peer and exchange traffic at a neutral IXP in The Bahamas as they choose.
- *Localization of Local IP/data Traffic* - From URCA's viewpoint, the need to localize IP traffic is linked to the Government's strategic vision for the sector. URCA will not impose a timeline for ISPs and other organizations to co-locate and exchange traffic via a local IXP. URCA, however, is concerned that a decision by a major network to continue to route local IP traffic externally could impact an IXP buildout in The Bahamas. Given this concern, URCA reserves the right to direct ISPs to co-locate and exchange traffic at a neutral facility in-country in fulfilment of the ECS Policy objectives. URCA may enforce its decision either by way of amendments to existing licences or by way of a separate regulatory measure (incl. directive, instruction) and without further consultation.

URCA responds to the remaining points raised by the respondents, as follows:

- In reply to Cloud Carib, URCA as part of its response to Question 8 addresses comments relating to privacy/data security when Bahamian IP traffic is routed externally. URCA also welcomes proposals from the Internet community on how to make the Internet in The Bahamas more secure.

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<sup>19</sup>An IXP may need to hold a business licence. This is a matter for the IXP to discuss with the relevant licensing authority.

<sup>20</sup>The IXP licence should be future proof, recognizing an IXP may expand its service offerings to include transit and other services over time.

<sup>21</sup> Public Treasury and Utilities Appeal Tribunal

- In reply to LMC, URCA understands that a small number of ISPs does not lead to the firm conclusion that a local IXP is less likely to succeed or is bound to fail. Indeed, IXPs in external markets that are smaller than The Bahamas are delivering technical benefits, incentivize local content development and alleviate data/privacy risk in their jurisdictions. URCA should add that experience from elsewhere suggests that the number of IXP participants usually increase over time as new technology and services become available.
- URCA previously underscored the need for intervention to support the formation of IXPs within the jurisdiction (Section 1.1). Having regard to the Comms Act and IXP best practice, URCA’s intervention must be, targeted and proportionate and only where necessary to achieve key initiatives outlined in ECS Policy 2020-2023.

**Consultation Question 6: Do you agree with URCA’s assessment of the enabling measures discussed?**

**BTC’s comments**

BTC said it agreed with the principles outlined in Figure 6 (Section 5.5) of the Consultation Document, which speak to enabling measures. Despite its general agreement, BTC argued that the enabling measures proposed by URCA did not meet the general principles for the reasons set out in BTC’s response to Question 5 above. BTC summarized that the proposed enabling measures are inappropriate, disproportionate, and inconsistent.

As part of its the second round response, BTC advised that URCA’s policy should be “transparent and fair”.

**CBL’s comments**

Because CBL answered this question in previous responses it did not see the need to repeat.

**SHS’ comments**

SHS said measures should be put in place to allow the IXP to be transparent and offer fair service.

**LMC’s comments**

LMC did not respond to the question.

**Cloud Carib’s comments**

Cloud Carib expressed support for the high-level principles in Figure 6 of the consultation paper.

**URCA’s response to comments received/final decision**

URCA agrees that its policy should be “transparent and fair.” Additionally, the light-touch approach to IXP regulation discussed above is broadly in line with the high-level policy steps to drive local content production and traffic exchange elsewhere. As such, URCA affirms that the measures are in tandem with the Act (see Table below) and are favorable for IXPs to operate successfully in The Bahamas

<b>IXP Measures</b>	<b>Communications Act</b>
Licensing	see Part IV of the Comms Act
Fees (inc. Comms Fee, URCA/UAT fees)	see Part XVI of the Comms Act

USO Contribution	see section 44 of the Comms Act
Localization of Bahamian Traffic	see section 6 of the Comms Act
Ex-post application of competition law	see Part XI of the Comms Act

It bears repeating that URCA never intended to prescribe how ISPs and other companies should peer and exchange data traffic at an exchange. At Section 5.3 of the Consultation Document, URCA stated it “has no intention to impose peering requirements (at least initially) on IXPs” adding that “most regulators do not prescribe peering/interconnection arrangements between IXP users. The thinking is that users of an exchange need complete freedom to establish these relationships as they see fit.” URCA adds the reference “*at least initially*” in recognition of its ex-post investigative powers under the Comms Act.<sup>22</sup>

As a final point, IXPs that are not sufficiently neutral and impartial will not engender wide participation or industry support. According to the Internet Governance Forum “More than 80% of the success of the IXP will depend on its capability to create an environment of trust and cooperation among its stakeholders.”<sup>23</sup> As such, the IXP Policy Document has as its purpose to promote transparency and impartiality amongst participants. On top of this, the ex-post competition provisions<sup>24</sup> of the Comms Act provide additional protection to all IXP participants.

## 2.4 Expected Benefits for Local IXPs in The Bahamas

### Consultation Question 7: Do you agree with URCA’s objectives for the entry of IXPs in The Bahamas?

#### **BTC’s comments**

BTC questioned URCA’s stated objectives for an IXP entry, as follows:

- Buildout of a local IXP would not help to achieve *efficient and more productive routing of traffic*.
- Buildout of a local IXP would not help *market entry and expansion* to any meaningful degree. In BTC’s view the Consultation Document failed to give evidence demonstrating that the establishment of an IXP would promote or lead to the new entry of ISPs.
- A local IXP would not *attract international business to The Bahamas*. BTC noted that three major international content providers already have nodes in The Bahamas hence BTC did not see the need to establish an IXP.
- A local IXP will not *contribute to the protection of personal privacy* to any meaningful degree.
- BTC did not see how an IXP will *promote affordable access to a wide range of carriage and content services which are of high quality* and did not appreciate how this objective will promote existing and prospective competition in The Bahamas. BTC claimed the consultation failed to give evidence demonstrating how the establishment of an IXP would achieve this objective.

<sup>22</sup> These provisions apply to IXPs and service providers.

<sup>23</sup> [http://www.intgovforum.org/multilingual/index.php?q=filedepot\\_download/3408/442](http://www.intgovforum.org/multilingual/index.php?q=filedepot_download/3408/442)

<sup>24</sup> Anti-competitive agreements and Abuse of a Dominant Position.

In its second round submission, BTC agreed with CBL that URCA did not provide the rationale for URCA to intervene to have an IXP implemented in The Bahamas neither did URCA provide sufficient evidence in the Consultation Document demonstrating why an IXP was needed in The Bahamas.

#### **CBL's comments**

CBL had doubts on the presumed IXP benefits in the consultation. Restating that there are no material issues to be addressed that require an IXP and any issues that do arise can be resolved through other means such as private peering arrangements.

#### **SHS' comments**

SHS said the creation of IXPs will benefit both end-customers and ISPs, generate cost savings for ISPs, and enhance network security for both ISPs and end-customers.

#### **LMC's comments**

LMC did not respond to the Question.

#### **Cloud Carib's comments**

Cloud Carib shared that the entry of an IXP:

- will enhance network efficiency as proven by the establishment of the first IXPs;
- by itself will not create expansion of existing ISPs or market entry by new players. It however, over time, may lead to a more collaborative and competitive industry;
- lays the foundation to develop a strategic marketing program that may leverage routing efficiencies, high security, and proximity to the United States to attract international business to The Bahamas; and
- will directly contribute to the protection of personal privacy.

#### **URCA's response to comments received/final decision**

URCA finds that the views expressed by Cloud Carib, SHS and LMC<sup>25</sup> are not in conflict with URCA's objectives and correlate with section 4 of the Act and the Government's aspirations for digital economy and transformation in The Bahamas. URCA thus finds:

The objective to promote *efficient and more productive routing of traffic* cannot be disputed or downplayed. Relevant cases exist to support the contention that IXPs promote routing efficiency. For further details, URCA refers to its review of responses to Question 8 below.

The objective to *promote market entry and expansion* is not unrealistic and correlates with the Government's agenda to encourage digital-related business opportunities in both the private and public sectors in The Bahamas.

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<sup>25</sup> See LMC's response to Question 1 above

Similarly, URCA also points to the various initiatives by Government that could potentially help to *attract international business to The Bahamas*. URCA is not aware of any prohibition against foreign participation in IXP-related businesses in The Bahamas.

Further still, the objective to *promote affordable access to a wide range of carriage/content services* includes existing and emerging services such as audiovisual media services and ancillary services that enable end-customers to access a content service. This is in recognition of the fact that IXP infrastructure facilitates local content development.

As a final point, the objective to *protect personal privacy* cannot be disputed or downplayed. Buildout of a local IXP would help to reduce or alleviate the privacy risks associated for Government-to-Government transactions and transactions with citizens and businesses. This is a well-known reason to stimulate buildout of local IXPs in Canada and elsewhere.

#### **Consultation Question 8: Do you agree with the benefits URCA has identified for IXPs in The Bahamas?**

##### **BTC's comments**

BTC was adamant that:

- A local IXP would not help to *reduce network operational costs* to any meaningful degree.<sup>26</sup>
- An IXP would not help to *enhance Internet reliability and robustness*, arguing URCA based its assumptions of potential latency gains on external reports dealing with foreign jurisdictions that did not represent local conditions.
- As for promoting *more affordable retail pricing for broadband access/usage*, BTC opined that if the costs of the IXP were to be passed on to customers, the price of broadband access and usage could consequently increase.
- *Enhanced end-user experience*, BTC addressed this point in previous sections of their response and did not see the need to repeat.
- CTU member states with established IXP systems manage very little local traffic, hence IXPs do not contribute to the *development of local content* in CTU member states. Adding, only a small minority appear to have facilitated an ecosystem of sorts and a critical mass of traffic and that this traffic is largely driven by local conditions and other circumstances. BTC stated there is no guarantee that the establishment of an IXP will lead to an expansion of the digital ecosystem in The Bahamas.

As part of BTC's second round response, BTC agreed with CBL and was critical of SHS' support for the IXP-related benefits identified by URCA.

##### **CBL's comments**

In common with BTC, CBL was adamant that:

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<sup>26</sup>See BTC's response to Question 4 above

- There are no expected economic benefits in the short-term because of the low volume of local IP traffic and the local caching of popular web content. For these reasons, the monthly *cost savings of not routing traffic via Miami and back* would be insignificant.
- The addition of an IXP to CBL's existing network and available routings may add *resilience for local Internet traffic*. However, where local traffic must be routed locally the IXP may become a single-point-of-failure and reduce reliability and robustness.
- A local IXP will have limited impact on *data protection and privacy* because residents of The Bahamas use web-based services that stored their personal data overseas.

CBL expressed support for an IXP, if this is part of a tech or development hub in Grand Bahama, adding that an IXP can enable faster *development of local content and local services*.

#### **SHS' comments**

SHS agreed with the IXP-related benefits or improvements outlined by URCA and went on to state that such improvements should benefit end-customers.

#### **LMC's comments**

LMC stated the economic benefits would be direct access to media content caching services and local traffic of hosting services that are locally domiciled and added that all E-Government traffic should remain in The Bahamas.

#### **Cloud Carib's comments**

Cloud Carib shared that:

- The entry of an IX does not directly enhance Internet reliability and robustness. It does increase efficiency in the network and adds security to Bahamian traffic by enabling internal routing between peering partners.
- Buildout of an IXP lays the foundation to develop a National strategy for State security as data is the foundation of all communication and modern finance. Without taking this first step, The Bahamas remains at risk.

#### **URCA's response to comments received/final decision**

URCA welcomes the detailed responses to Question 8 and replies to the comments received on a point-by-point basis.

For context, it bears repeating that the IXP-related benefits identified by URCA are tied to the Government's aspirations for digital economy and transformation in The Bahamas. Chiefly, these include the initiatives that catalyze the Internet and digital economy in the ECS Policy, including establishment of a tech or development hub in Grand Bahama and digital transformation in the delivery of essential public services. These initiatives are expected to generate both direct and indirect benefits over the medium to long-term.

URCA also draws attention to the beneficial impact IXPs are having on the Internet ecosystems in two countries:

*Grenada Internet Exchange (“GREX”)* was created in May 2011 and today, leading ISPs co-locate and exchange traffic at the exchange. GREX is delivering improvements for incumbents and their end-users as evidenced by this statement by a LIME executive, “The Grenada Internet Exchange Point and recently implemented DNS Root server copy are important steps in a collaborative effort between LIME, Columbus and the Grenada NTRC to improve the efficiency and robustness of Internet services in Grenada.” Underscoring that “lower network latency, improved traffic routing and greater incentive to serve local content” are the key benefits of the exchange. Columbus Communications noted that “both Columbus and LIME benefit from the GREX.”<sup>27 28</sup> There are nine (9) IXP members<sup>29</sup>, including leading ISPs.

As well, the buildout of *Caribbean Internet Exchange (“CAR-IX”)* in Curacao (in 2009) similarly improve network resiliency and robustness, amongst other things. URCA understands that leading ISPs now co-locate and exchange traffic via the local IXP despite their strong opposition to its formation. Further, the number of IXP members has increased beyond the founding members to fourteen (14)<sup>30</sup>, including leading ISPs.

Further still, the leading Internet competitors<sup>31</sup> in the French Overseas Territory of Guadeloupe agreed to buildout a local traffic exchange (GIX) to grow the Internet and local traffic volume within their jurisdiction. The benefits envisioned for GIX are equivalent to those identified for IXPs in Grenada, Curacao, The Bahamas and elsewhere.<sup>32</sup>

In light of its review of the responses to Question 4 above, URCA no longer thinks the following IXP-related benefits will materialize, to a significant degree:

- *Reduction of network’s operational costs; and*
- *Promote more affordable retail pricing.*

Additionally, URCA acknowledges comments around an IXP entry causing price increases for end-customers. URCA does not share this view. In fact, URCA does expect an IXP market entry in The Bahamas would trigger price increases for broadband access and usage as this would deter IXP membership.

URCA, however, finds that the following benefits are still relevant and appropriate in the Bahamian context:

- *Enhanced Internet Reliability and Robustness:* URCA appreciates CBL’s concern, relative to a Bahamian IXP becoming a single point-of-failure. URCA, however, understands that there are ways to mitigate this risk.

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<sup>27</sup> <https://www.guardian.co.tt/article-6.2.435507.31aebf8568>

<sup>28</sup> <http://ntrc.gd/wp-content/uploads/2016/09/Grenada-IXP-Launch-Remarks-Brent-McIntosh.pdf>

<sup>29</sup> <https://www.pch.net/ixp/dir>

<sup>30</sup> <https://www.pch.net/ixp/dir>

<sup>31</sup> Daupin Telecom, Orange Caraibe, and SFR.

<sup>32</sup> Network resiliency, traffic routing efficiency, enhanced data security and help to promote development of locally relevant digital content.

Resiliency and robustness are important especially if governments and businesses intend to use the Internet to deliver services. URCA recognizes that the other respondents did not share BTC's view that a local IXP would not help to enhance network resiliency and routing efficiency. CBL concluded that a local IXP will add resiliency for Bahamian IP traffic.<sup>33</sup> This view is also held by BTC's affiliates in Grenada and leading ISPs in the French Overseas Territory of Guadeloupe. As recognized by URCA in the Consultation Document (Sections 2.3 and 6.2), in general, routing efficiency is improved when IP traffic stays local.

URCA acknowledges BTC and CBL's comments around latency gains from keeping IP traffic within The Bahamas. In Section 2.3 of the Consultation Document, URCA referenced studies to prove that IXPs significantly reduced delays in data transmission in external markets (incl. Sub-Saharan Africa). URCA never suggested that the expected latency gains from localizing Bahamian IP traffic would be as significant as elsewhere.

URCA believes that The Bahamas' close proximity to an IXP in Miami or US IXPs generally does not necessarily mean data latency is not a material concern now or going forward. After all, Google, Facebook and Akamai still see a need to cache content in The Bahamas in order to reduce delays (faster downloads) in data transmission and enhance end-user experience.

Furthermore, as new technology and latency sensitive services/applications emerge in The Bahamas the need for very low latency connections assumes greater significance for stakeholders.

The fact that The Bahamas is situated close to Internet hubs in Miami and popular web content by global companies is already hosted in-country (without a local exchange) does not necessarily lead to the conclusion that local IXPs are not necessary. Or, the presence of a local IXP would not incentivize local and other global organizations to cache content locally. Combining media content type service demand in one location will allow the IXP the necessary volumes to deploy caching servers from the larger content providers. This is beneficial for smaller ISPs and other potential participants, such as large hotels and resorts.

- *Data Protection/Privacy:* Data is collected when Internet users interact with search engines, social media, new or retail websites, streaming services, and mobile apps for everything, including payments. URCA accepts that global web content providers already aggregate and store the personal data of many Bahamians outside the country. The Bahamas is not unique in this regard. Cloud Carib described data privacy as critical to national security and key economic sectors in The Bahamas. Further, URCA's own research shows that there is increasing concerns globally (incl. Canada, other OECD countries) that local traffic routed over external networks is not subject to local privacy/data protection legislation. URCA affirms its view that a Bahamian IXP would alleviate data/privacy risk for Government-to-Government transactions and transactions with citizens and businesses.

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<sup>33</sup> Note that other respondents expressed similar views to CBL.

Regarding BTC's comment on the small number of potential IXP members, URCA refers to its response at Question 5 above.

- *Enhanced end-user experience*: Linked to this are the technical improvement benefits discussed (above) and the advent of new time dependent services/applications (as discussed below).
- *Stimulate development of local content sector in The Bahamas*: BTC's assertion on there being no direct relationship between IXPs and local content development in CTU markets have been noted. There is a strong statistical relationship between local content development and infrastructure development.<sup>34</sup> While a discussion on content development across CTU markets or lack thereof would be a useful exercise, this is outside the scope of URCA's consultation. That said, URCA believes the creation of an IXP alone is not sufficient to drive local content production and traffic volume that traverses local networks. Building a community of local content developers is not an overnight thing. It requires sustained efforts by those involved in the Internet and a supportive environment. In essence, "It is all about community building – this takes years not weeks."

URCA welcomes CBL's acknowledgment that a local IXP buildout will enable faster development of local content and local services in The Bahamas. This view is also shared by incumbents in markets external to The Bahamas. Cloud Carib emphasized this benefit as pivotal to modernization and digitization of Government-to-Government transactions and transactions with citizens and businesses. Cloud Carib further noted the envisioned services have high demand for bandwidth and high sensitivity to latency. Arguing a local IXP buildout will directly increase local preference for web content.<sup>35</sup> URCA agrees with LMC that privacy reasons e-government traffic should stay within The Bahamas.

To sum up, an IXP-buildout would have beneficial impact over time in terms of: enhanced network reliability and robustness; improved end-user experience (faster downloads); alleviating privacy risks for Government, end-customers and critical economic sectors; promote local content and local services and vital to the development of a Tech hub in Grand Bahama. In total, although current traffic volume is low, there are still good reasons to stimulate the buildout of IXPs technology in The Bahamas.

## **2.5 IXP Implementation Factors**

In Sections 7 and 8 of the Consultation Document, URCA highlighted key implementation factors for a Bahamian IXP. Upon review of the responses to Questions 9 to 11, URCA felt that the respondents might have misunderstood URCA's role. To be clear, URCA's role in the IXP process is twofold as it aims to put in place fit-for-purpose measures to support their market entry, and foster dialogue/consensus among stakeholders in the Internet community.

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<sup>34</sup>See Joint ISOC/OECD/UNESCO Study available at <https://www.oecd.org/internet/ieconomy/50305352.pdf>

<sup>35</sup>As URCA noted in Section 4.4 of the Consultation Document "...the Government's intent is to increase by 70% the number of people using e-government services by 2025."

**Consultation Question 9: What is URCA’s role, if any, in the formation and/or approval of an IXP Policy document?**

**BTC’s comments**

BTC approved URCA’s role in the formation and approval of an IXP Policy document.

In the second round, BTC stated that it may be appropriate for URCA to prepare the draft IXP Policy document for consultation, and based on the feedback received, approve any such document.

**CBL’s comments**

CBL acknowledged a need for further discussions on the subject of an IXP and supported URCA’s involvement if any, to facilitate the discussion and subsequent cost-benefit analysis.

**SHS’ comments**

SHS said URCA should be responsible for the creation and approval of the IXP Policy and ensure that the policy is made fair and is non-discriminatory to all parties.

**LMC’s comments**

LMC said URCA’s role should be fair and equitable and facilitate low-cost access to the IXP.

**Cloud Carib’s comments**

Cloud Carib said regulators typically remain external to the establishment of an IXP, except in extraordinary circumstances when ISPs (incl. incumbents) are unwilling to participate.

**URCA’s response to comments received/final decision**

A benefit-cost assessment of URCA’s regulatory measures is not warranted. URCA wishes to draw attention to the fact that there is no obligation under relevant Bahamian law for URCA to quantify the costs and benefits of the measures discussed at Section 5 of the Consultation Document. The Comms Act appropriately requires URCA to have “due regard to the costs and implications” of the regulatory measures it proposes to introduce. URCA confirms that it has carefully considered those costs and implications relative to its proposed measures.

In the spirit of collaboration, CBL is free to share its views with interested parties on the benefits/costs of its preferred IXP solution and business model for The Bahamas.

It is not the regulator’s role to approve an IXP Policy Document. Even more, the drafting and finalization of such a document must await further discussions and review by the founding members of the exchange.

While not having direct regulatory oversight of IXPs, URCA notes the competition provisions of the Comms Act and the IXP Policy Document should ensure smaller ISPs have fair and equitable access to the exchange. Note that an IXP Policy document provides common rules and regulations, which all IXP participants must adhere.

URCA restates its primary role is to ensure the regulatory framework is favorable for the entry of IXPs in The Bahamas. Going forward, URCA will continue to play a facilitative role in the IXP process.

**Consultation Question 10: Do you agree with URCA's recommendations regarding IXP location, governance and decision-making, participation, business model and funding?**

**BTC's comments**

BTC responded to Question 10 in the following way:

- If a local IXP is established the location should be in a neutral site.
- The IXP should be open to all interested parties. BTC disagreed with the idea of a mandatory IXP membership because BTC feels it would constitute a restrictive measure, which BTC believe is unnecessary and disproportionate.
- BTC strongly opposed the devotion of financial and other resources to the establishment and/or operation of an IXP.
- BTC favored a free not-for-profit model rather than the fee-based model to any IXP that may be established and considered, the initial set-up costs of the IXP should be paid by the Government or URCA.

As part of the second round, BTC agreed with LMC and CBL that the IXP should be not-for-profit.

**CBL's comments**

CBL supported an IXP that is carrier-neutral, independent, and non-profit membership model that is open to all ISPs within the market.

**SHS' comments**

SHS suggested that there be an independent IXP leasing a space to host the IXP equipment. Further, SHS considered the best way to ensure neutrality with a Bahamian IXP would be through the use of an independent third-party management and operation with the supervision from URCA to ensure fairness.

**LMC's comments**

LMC generally agreed with URCA's recommendations and supports the non-profit type model but is also open to the idea of other business model types.

**Cloud Carib's comments**

Cloud Carib was in agreement with the general points raised by URCA on: Location Neutrality, Governance and Decision-Making Neutrality, Open Membership and Participation, an IXP Business Model that is Not-For-Profit, and an IXP Funding Model led by and supported by the participants of the Industry.

**URCA's response to comments received/final decision**

URCA notes the variance in the respondents' feedback in relation to IXP business model and funding. The suggestion that, the initial set-up costs of the IXP should be paid by the Government or URCA is beyond the scope of this proceeding.

URCA addressed BTC's concern about mandatory membership or participation in response to comments received on Question 5 above. URCA advises that in the spirit of collaboration BTC is free to share with interested parties its views on the benefits/costs of its preferred IXP solution for The Bahamas.

**Consultation Question 11: Do you agree with URCA's preferred IXP model for The Bahamas?**

**BTC's comments**

In BTC's view if an IXP were to be established in The Bahamas, the second option consisting of "Multi-stakeholder owned IXP" would be appropriate. BTC recommended that the Regulator and/or Government finance the IXP set-up and operational costs.

As part of the second round, BTC agreed with CBL that the multi-stakeholder owned IXP would be appropriate. Informing that this could be combined with an outsourcing model where the IXP would be operated by a third-party selected by and subject to the majority approval of the multi-stakeholder owners.

**CBL's comments**

CBL agreed with URCA's preferred IXP model of a market led approach or a multi-stakeholder owned IXP.

**SHS' comments**

SHS reiterated that a third-party independent operator is the best option to have responsibility for the local IXP as it can possibly provide better service to providers and non-discriminatory service to all users. In SHS' view, a multi stakeholder option is not a viable solution especially without intervention from URCA or government. Moreover, SHS recommended the imposition of fees to fund additional services that could be offered to outside entities to further reduce bandwidth usage outside of the country.

**Cloud Carib's comments**

Cloud Carib favored an IXP model that is Industry led, operated, and financially supported. The company was hopeful that the industry participants would embrace the development and build out of an IXP within The Bahamas.

**URCA's response to comments received/final decision**

It bears repeating that a final decision on an IXP business model and related factors is external to this proceeding. URCA proposes to set up a Working Group to promote dialogue and consensus on implementation factors for IXPs in The Bahamas. The appropriate IXP implementation model for The Bahamas should be considered by the Working Group. However, companies involved in the Internet may hold such discussions independent of URCA.

Lastly, the recommendations put forward by BTC and SHS are out of scope and require consideration by the Working Group.

### **3 Conclusion and Next Steps**

In this Statement of Results and Final Decision, URCA clarifies the regulatory framework for market entry of IXPs in The Bahamas. From URCA's viewpoint, the regulatory measures reflect the principle of light-touch regulation and accord with the statutory framework of the Comms Act.

URCA's role in the IXP process is twofold as it aims to put in place fit-for-purpose measures for market entry of IXPs and to foster dialogue/consensus on IXP implementation factors among stakeholders.

In terms of next steps, URCA proposes to set up a Working Group to facilitate further discussions and consensus on IXP governance and operational factors amongst stakeholders. However, companies involved in the Internet may hold such discussions independent of URCA.