

Revision history

date	amendment	description of amendment

SERVICE DESCRIPTION 2-12: BITSTREAM SERVICE

1. THE SERVICE

The Bitstream product (as further detailed in Annex 6) (Service) is an access product which enables the Access Seeker to provide high speed products and services to its End Users via Connections over a digital pathway across the Access Provider's network. The digital pathway consists of one or more Connections, involving one or more Access Links between End User premises and one or more Aggregation Links.

Available To: Holders of an appropriate Individual Telecommunications or Class License.

Traffic: Traffic permitted by the licenses held by Access Seekers.

Reciprocal Service: Not required.

Further to the "Determination of Significant Market Power and Determination of Dominant Position in the Markets for Provision of Broadband Internet Access Services from a Fixed Location" dated 27 March 2014, Bitstream Service packages for mass market are no longer regulated however Bitstream Service packages for business continue to be regulated.

2. DEFINITIONS

Capitalised terms not defined in this Service Description are defined in the Dictionary. Terms defined in this Service Description are specific to it.

Access Seeker means a Licensed Operator.

ADSL means asymmetrical digital subscriber line.

Access Link means the digital point-to-point communications between an End User Premises and the MSAN or OLT nearest to that End User Premises.

Aggregation Link means the logical or physical link between an Aggregation Point and an Access Seeker's Point Of Presence. For the avoidance of doubt, an Access Seeker must have SE establish at least one Aggregation Link before the implementation of the first Service Request.

Aggregation Point means the point on SE's network where the Aggregation Link is connected.

SE Exchange (BE) means an exchange which has MSANs or OLTs installed at the time of the Service Request. The exchanges at which the Bitstream Services is available are listed in Annex 5.

Bitstream Service Request means the request by the Access Seeker for a Bitstream Service.

Cancellation Request means a Service Request for discontinuing a Bitstream Service.

Connection means the digital pathway that provides one end-to-end connection between one specific End User premises and the Access Seekers POP.

DSL means digital subscriber line technology, having physical and electrical characteristics defined by relevant international telecommunications and engineering standards.

DSLAM means a DSL access multiplexer, the network device that receives signals from multiple customer ADSL connections and aggregates the signals on a high-speed backhaul line using multiplexing techniques.

End User means an existing customer paying a direct exchange line rental to SE in connection with a Useable Pair.

End User Consent means the written consent of an End User to receive a service by means of a Bitstream Service supplied to the Access Seeker in accordance with a Bitstream Request, which consent is provided to SE by or on behalf of the End User.

End User Management means all aspects of interface with the customer product support and billing of the End User by the Access Seeker in relation to each End User contracting with the Access Seeker for using the Bitstream Service and first line support by the Access Seeker in relation to maintenance issues related to the End User.

End User Premises Equipment means a splitter and modem, or other equivalent technology, necessary to support the End User ability to use a Bitstream Service.

Gaining Operator means an Access Seeker who presents SE a valid End User Consent and Bitstream Request.

GPON means gigabit passive optical networks, an access technology used by SE to provide a fiber based asymmetric connection at a fixed location.

Implementation Date means the date set out in a Bitstream Request, which shall be determined in accordance with the timescales set out in clause 11.11 of the Supply Terms.

Incompatibility (and the cognate term **Incompatible**) means a circumstance in which a Bitstream Service cannot reasonably be provided over the SE network, whether by reason of a technology block or a product or for any other technical or product-related reason. Incompatibilities may include but are not limited to: PABX, hunting lines, ISDN, key telephone systems, fixed wireless systems and distance limitations.

Invalid Transfer means a Service Request:

- (a) where the End User (or its/her/his agent) did not request the services that the Access Seeker intended to supply via a Bitstream Service;
- (b) where a valid written End User Consent cannot be produced by the Access Seeker to support the Service Request; or
- (c) which resulted from a processing error.

IP means Internet protocol.

IP Addresses means the Internet addressing information, in compliance with the relevant standard which describes the address of all devices physically located within the global Internet.

Losing Operator means an Access Seeker whose End User is subject to a Bitstream Request given to SE by a Gaining Operator.

MPLS means multi-protocol label switching.

MSAN means multi service access node, network equipment in SE Exchange used in the provision of Bitstream Connections when the Access Link is based on ADSL technology(copper-based access).

Network Boundary means, for a copper based Access Link, the SE distribution point at the End User Premises, and for a fiber based Access Link, the ONT at the End User Premises..

New Connection Request means a Service Request for establishing a new Bitstream Connection for the provision of services to an End User at the premises of such End User.

Non-SE Equipment means any End User Premises Equipment which is not supplied and supported and maintained by SE and all equipment used by the Access Seeker.

OLT means optical line terminal, network equipment in SE Exchange used in the provision of a Bitstream Connection when the Access Link is based on GPON technology(fiber based access).

ONT means optical network terminal, network equipment in the End User Premises used in the provision of a Bitstream Connection when the Access Link is based on GPON technology(fiber based access). The ONT is supplied, supported and maintained by SE.

Point of Presence (POP) means an aggregation or network connection point in the Access Seeker's Network located at premises owned or shown to be leased by the Access Seeker or at a SE collocation facility, but for the avoidance of doubt cannot be at an End User Premises, cable station, earth station, manhole, power room, lead-in pipe, duct, outdoor cabinet, MDF, riser room or anywhere not on the main island of Bahrain unless connected by a permanent physical connection above sea level and accessible the Access Provider.

Reconfiguration Request means a Service Request for reconfiguring the technical parameters of an existing Connection.

Reversal Request means a Service Request for returning a Bitstream Service to its setup or configuration prior to the most recent Service Request. For the avoidance of doubt this type of Service Request can either be made by the OLO (on behalf of the End User) to SE or by the End User directly to SE.

Service Qualification means the analysis carried out by SE via the Internet or manually to confirm whether an ADSL service can be provided on the SE network by checking:

- (a) line loss;
- (b) infrastructure availability;
- (c) interference; and
- (d) incompatibility.

Service Request means a formal request for a service of the Bitstream product. Service Request for the Bitstream product include New Connection Request, Change Request, Reversal Request, Transfer Request, and Cancellation Request.

Transfer Request means a Service Request for transferring an existing connection from one operator to another operator. For the avoidance of doubt, the existing connection may be provided as retail broadband service by SE and transferred as Bitstream Connection to an OLO.

Upgrade/Downgrade Request means a Service Request to upgrade/downgrade the speed of an existing Connection, where a Connection is already provided by an OLO for the provision of services to an End User at the same location.

Useable Line means the copper access line or fiber access line to the End User over which the End User is acquiring a standard suite of telephone services provided by SE.

3. SERVICE TERMS

3.1 SE will implement Bitstream Requests from the Access Seeker and requests for configuration and provision of connections from other Licensed Operators and from itself with respect to any SE Exchange in batches of 32, representing the number of ports on a DSLAM or MSAN equipment card in the SE Exchange.

3.2 If SE terminates this service in whole, then each Bitstream Service will terminate.

- 3.3 For the avoidance of doubt, there is no minimum service period for the Bitstream Product.
- 3.4 If a regulatory obligation to support or supply any specific Bitstream Service no longer applies, SE may cease to supply the Bitstream Service to an Access Seeker on 12 months prior written notice. Following the giving of a notice under this clause, the Access Seeker will not request the Bitstream Service for any further End Users. The Access Seeker will also inform each existing End User that the Bitstream Service will terminate at the end of the 12 month period. The Access Seeker shall be the only party responsible for informing End Users if their existing service will be migrated to another network at the end of the notice period.
- 3.5 Where SE has reasonable objective grounds to consider that the Access Seeker is in breach of an obligation under paragraph 3.4, SE may:
- (a) suspend implementation by the Access Seeker of the Bitstream Service and/or
 - (b) take any other step contemplated by the Supply Terms to protect SE's network or other interests.

4. END USER ACCESS

Useable Pairs

- 4.1 The Access Seeker acknowledges that SE only supplies a Bitstream Service where SE supplies operational standard telephone services to the same End User over the same Useable Pair as may be used with the Bitstream Service by the Access Seeker to provide services to the End User and accordingly:
- (a) SE will only provide the Bitstream Service to the Access Seeker for so long as the End User continues to acquire that standard telephone service from SE using that Useable Pair;
 - (b) where the End User ceases to have a standard telephone service from SE using that Useable Pair, SE will terminate the provision of the Bitstream Service over that Useable Pair at the same time.

Installation or Transfer of End User Access

- 4.2 For each Bitstream Request the Access Seeker warrants that it has informed the End User that:
- (a) the installation and operation of the Bitstream Service may require changes to the placement of existing telecommunications devices or changes of equipment; and
 - (b) the installation and operation of a Bitstream Service may mean that other Incompatible services cannot be supplied to the End User using the Useable Pair.
- 4.3 In respect of each Bitstream Service, the Access Seeker releases SE from all liability to the End User or the Access Seeker, and indemnifies SE, subject to SE using all reasonable endeavours to mitigate against the effect of the occurrence of the indemnified event, against all costs, expenses, liability, loss or damage incurred or suffered by SE in conjunction with any claims, actions or proceedings against SE (including third party claims or claims by an End User) arising out of the following (to the extent that the liability is caused by the testing, qualification, enquiry regarding, provision, transfer or cancellation of a Bitstream Service):
- (a) disruption in PSTN services;
 - (b) suspension or cancellation of the Bitstream Service;

- (c) suspension of the provision with the Bitstream Service of particular IP Addresses;
 - (d) cancellation of, or inability to provide, other Incompatible services;
 - (e) termination in accordance with paragraph 3.3 of this Service Description; and
 - (f) in relation to any matter set out in paragraph 4.1 of this Service Description.
- 4.4 The Access Seeker acknowledges that the Bitstream Service will allow it to provide services to End Users but the quality of service will be subject to the variable conditions of the Useable Pair.
- 4.5 Data transport using the Bitstream Service between either DSLAM equipment or MSAN equipment, and a SE Aggregation Point are available for the range of products identified in Annex 2.

Maintenance

- 4.6 SE will provide network maintenance and support services to ensure that all of the network elements used to provide the Bitstream Service are provided to the Access Seeker at the same level of quality of service and availability as SE provides to itself for the same or equivalent network elements.

5. EQUIPMENT

- 5.1 The provision of a Bitstream Service or the implementation or transfer of the Bitstream Service does not include the provision of any cabling or any customer premises equipment.
- 5.2 The Access Seeker must ensure that Non-SE Equipment connected to the Bitstream Service:
- (a) meets the specifications and requirements defined by relevant international telecommunications and engineering standards; and
 - (b) is approved equipment.

6. CONNECTION

- 6.1 SE will use its reasonable endeavours to connect the Bitstream Service by the relevant Implementation Date. SE will notify the Access Seeker when the connection has been effected in accordance with the Bitstream Request procedures set out in Annexure 1 to this Service Description. Except for any service credit specified in this Service Description, SE will not be liable for any inconvenience, loss or damage suffered by Access Seeker or an End User if SE does not connect the Bitstream Service by the Implementation Date.
- 6.2 The Access Seeker releases SE from all liability to the End User or the Access Seeker, and indemnifies SE, subject to SE using all reasonable endeavours to mitigate against the effect of the occurrence of the indemnified event, against all costs, expenses, liability, loss or damage incurred or suffered by SE in connection with any claims, actions or proceedings against SE (including third party claims) arising out of the allocation of IP Addresses or allocation and management of domain names.

7. PRIORITY POLICY

- 7.1 SE will develop, disclose to the Access Seeker and subsequently apply a policy (the "Priority Policy") for Bitstream Requests within twenty-one (21) days of the effective date of the first Bitstream Request made by the Access Seeker or any other Licensed Operator or SE.
- 7.2 The Priority Policy must be consistent with the following principles:

- (a) SE's Priority Policy must be non-discriminatory between Access Seekers;
- (b) the Priority Policy must apply on a non-discriminating basis to the provisioning of accepted Bitstream Requests and SE's own internal confirmed orders, requirements and plans for the relevant ADSL Links for each affected End User and the relevant Aggregate Links capacity; and
- (c) subject to sub-paragraph (a) above, SE must seek to maximise the efficiency of its Priority Policy.

8. BITSTREAM TRANSFER

Bitstream Transfer Process

- 8.1 SE and the Access Seeker must comply with this clause 8 and Annex 1 of this Service Description when carrying out any Bitstream Request.
- 8.2 The Access Seeker must establish robust procedures to ensure an appropriate End User Consent is received and properly recorded before any Bitstream Service Request is notified to SE.
- 8.3 The Access Seeker must provide SE with a copy of the End User Consent.

Charges

- 8.4 The Access Seeker must pay to SE the relevant Charges set out in Annex 3.

Responsibilities

- 8.5 From the time of the completion of the Bitstream Transfer Process, the relevant End User will no longer be a customer of SE for those services supplied by the Access Seeker using the Bitstream Service, but instead the customer of the Access Seeker for those services.
- 8.6 From the time of completion of the Bitstream Transfer Process, the Access Seeker must provide End User Management to support the Bitstream Services. However, if requested by an End User or the Access Seeker, SE will provide technical support in relation to problems End Users may report with services supplied to End Users using the Bitstream Service, including fault management, and support and maintenance for which the Access Seeker must pay the charges set out in Annex 3.
- 8.7 The Access Seeker will contact SE for all maintenance replacement or repair of the Bitstream Service and the network on the Access Provider's side of the Network Boundary and will pay SE the Charges at the rate specified (or if not specified, on a time and materials basis) for all such work.
- 8.8 The Access Seeker is responsible for billing the customer for the services supplied to End Users using the Bitstream Services provided since the date of the completion of the Bitstream Request.
- 8.9 In relation to any SE service:
 - (a) SE will continue to bill the End User for any outstanding SE charges and other SE services; and
 - (b) the End User remains liable to pay any outstanding charges to SE and remains subject to standard SE debt enforcement policies,

notwithstanding that the End User an Access Seeker Customer also.

- 8.10 In respect of each Bitstream Request submitted by the Access Seeker to SE, Access Seeker must ensure that:
- (a) the Access Seeker has a valid End User Consent authorising the transfer or implementation (which consent is not more than 30 days old from the date the Bitstream Request was submitted to SE);
 - (b) the Access Seeker retains records of the End User Consent and the retention is in accordance with the reasonable requirements notified to the Access Seeker by SE from time to time;
 - (c) the Access Seeker has used its reasonable endeavours to ensure that the information in the Bitstream Request is complete and correct;
 - (d) the processing of each Bitstream Request, at the time it is lodged, does not breach any party's contractual or other rights (but, for the avoidance of doubt, a valid End User Consent shall be deemed to be a valid notice to SE to terminate the relevant SE services);
 - (e) the Access Seeker has used its reasonable endeavours to provide the End User with sufficient information to make an informed choice about transferring the End User's internet service provider, including informing the End User that:
 - (i) the End User remains liable for the amount of any pre-existing charges and possible termination expenses; and
 - (ii) the Access Seeker has complied with any relevant legislation or other industry code of practice.

- 8.11 SE may investigate whether the Access Seeker has acted in compliance with the warranties given under this Service Description. On reasonable request, the Access Seeker must provide SE with evidence that the Access Seeker has acted in compliance with this Service Description.

Indemnity

- 8.12 The Access Seeker indemnifies SE, subject to SE using all reasonable endeavours to mitigate against the effect of the occurrence of the indemnified event, in respect of any loss, liability or cost incurred by SE (including third party claims or claims by any End User) in connection with a breach by the Access Seeker of the warranties given under this Service Description.

9. Billing Period

- 9.1 The Billing Period in respect of the Service shall be 30 days. The Billing Period shall commence on the date of the first billing date of the SE billing cycle after installation and may include billing on a pro rata time basis for the period between the Bitstream Request to the next billing cycle to ensure compatibility with the SE billing cycle.

ANNEX 1 –BITSTREAM REQUEST PROCESS

1. Bitstream Service Request for existing or new Bitstream Services

- 1.1 The Access Seeker must make a Bitstream Service Request for the provision of a Bitstream Service to allow the Access Seeker to supply a new or existing service to an End User.
- 1.2 SE shall send the Access Seeker an acknowledgement of the Service Request within 15 minutes of receipt of the Service Request. If the Service Request is done outside working hours, SE will acknowledge the service request within 15 minutes following the start of the first working hour after receipt of the Service Request.
- 1.3 A Bitstream Service Request must be in the format notified by SE from time to time and be submitted by the means and to the address notified by SE from time to time.
- 1.4 SE will, within 1 Working Day of receipt of any Bitstream Service Request, notify the Access Seeker whether the Bitstream Service Request is:
 - (a) accepted; or
 - (b) rejected.
- 1.5 SE may reject a Bitstream Service Request if it:
 - (a) is incomplete or incorrect or illegible or cannot reasonably be understood;
 - (b) does not properly identify the End User, or provide information which does not enable SE to identify the Useable Pair;
 - (c) is not submitted in accordance with paragraph 3 of this Annex 1;
 - (d) requests the Transfer of a Bitstream Service which has different transmission characteristics from any existing Bitstream Service being provided (if any), without also requesting a Service Qualification with regard to the Useable Pair over which the new Bitstream Service is to be provided; or
 - (e) requests the Bitstream Service for provision of services to a customer or potential customer of the Access Seeker who is not an End User at the date of submission of the Bitstream Service Request; or
 - (f) has any other defect notified by SE to the Access Seeker at the time of rejection.
- 1.6 SE may in its sole discretion elect to accept any Bitstream Service Request notwithstanding that there is any defect in that Bitstream Service Request if SE considers that such defect does not have a material effect on SE's ability to process the Bitstream Service Request and provide the Bitstream Service.
- 1.7 SE will within 2 Working Days from the acceptance of the Service Request provide the Access Seeker with notice of the expected RFT and RFS Dates.

2. Bitstream Change Request

- 2.1 The Access Seeker must, to initiate a Bitstream Change to an existing Bitstream Service used by the Access Seeker to supply a service to an End User, provide SE with a properly completed Bitstream Change Request, in the format notified by SE from time to time, submitted by the means and to the address notified by SE from time to time.
- 2.2 SE will, within 1 Working Days of receipt of any Bitstream Change Request, notify the Access Seeker whether the Bitstream Change Request is:
 - (a) accepted; or

- (b) rejected.
- 2.3 SE may reject a Bitstream Change Request if it:
- (a) is incomplete or incorrect or illegible or cannot reasonably be understood;
 - (b) does not properly identify the End User, or provide information which does not enable SE to identify the Useable Pair;
 - (c) is not submitted in accordance with paragraph 3 of this Annex 1;
 - (d) requests a Bitstream Change which cannot reasonably be provided for practical or operational reasons; or
 - (e) has any other defect notified by SE to Access Seeker at the time of rejection.
- 2.4 SE may in its sole discretion elect to accept any Bitstream Change Request notwithstanding that there is any defect in that Bitstream Change Request, if SE considers that such defect does not have a material effect on SE's ability to process the Bitstream Change and provide the Bitstream Service.

3. Batches

- 3.1 The Access Seeker must submit Bitstream Requests to SE in batches. Batches must be:
- (a) submitted to the address notified by SE from time to time;
 - (b) submitted by authorised personnel of the Access Seeker;
 - (c) made up of only Bitstream Requests that comply with the requirements of this Service Description and the Supply Agreement;
 - (e) identified by a unique batch number generated by the Access Seeker.
- 3.2 SE will only accept batches of Bitstream Requests that:
- (a) are delivered to SE during business hours;
 - (b) comply with the requirements set out in paragraphs 1 and 2;
 - (c) do not exceed the maximum number of two (2) batches per day.
- 3.3 If any batch of Bitstream Requests contains one or more Requests that contains one or more defects, SE will:
- (a) reject the defective Bitstream Requests by returning them to Access Seeker; and
 - (b) continue to process the valid Bitstream Requests within the same batch.

4. Completion of Request

- 4.1 If SE notifies the Access Seeker that the Bitstream Request is accepted, then SE must use its reasonable efforts to complete the Bitstream Request on or before the Implementation Date.
- 4.2 SE shall not be obliged to further process a Bitstream Request where:
- (a) the relevant Bitstream Service cannot meet Service Qualification;
 - (b) there exists any Incompatibility;

- (c) SE is not able to process the number of Bitstream Requests made due to resourcing constraints without having to deploy more staff or other resources; or
- (d) an authorised person from the End User or the Access Seeker is not available to provide further information when requested.

5. Notification of Completion of Request

5.1 SE must, within 2 Working Days of completion of a Bitstream Service Request or a Bitstream Change Request, notify the Access Seeker of completion.

5.2 SE is entitled to rely on a Request as evidence that the relevant End User:

- (a) in the case of a Bitstream Service Request:
 - i) has given a valid End User Consent in relation to the requested Bitstream Request; and
 - ii) understands and is aware of the End User's continuing liability to pay any charges to SE when due; and
- (b) in the case of a Bitstream Change Request understands and has requested the Bitstream Change.

6. Reversal of a Bitstream Request

6.1 At any time following the successful completion of a Bitstream Request, either:

- (a) the relevant End User; or
- (b) the Access Seeker;

may make a request to SE to reverse the Bitstream Request.

6.2 SE will, within 2 Working Days of completion of a Reversal Request notify the Access Seeker that the Reversal Request has been processed.

6.3 The Access Seeker must render a final bill to the End User within 10 Working Days of receipt of a notice from SE under paragraph 6.2 of this Annex.

7. Service Levels for Bitstream product and services used for businesses

Service Levels	Service Level Terms	Service Level Penalties
◆ Service request process		
◆ Service Request Acknowledgment	<p><u>Maximum Time for Service Request Acknowledgment:</u></p> <p>During working hours: 15 minutes following receipt of the Service Request</p> <p>◆ Outside working hours: 15 minutes after the start of the first working hour following receipt of the Service Request</p>	◆
◆ Service Request Confirmation	<p>◆ <u>Maximum Time for Service Request Confirmation:</u> 1 WD</p>	<p><u>Penalties for Service Request Confirmation:</u></p> <p>◆ 5 Service Credits ('SC') for each WD after the Maximum Time for Service Request Confirmation until such time as the OLO receives the confirmation.</p>
◆ Service delivery process		
◆ Notification of Expected RFT and RFS Dates	<p><u>Maximum Time for Notification of Expected RFT and RFS Dates:</u> 2 WD</p> <p>For a Cancellation Request, SE shall only provide the Maximum RFS Date, which shall be the expected date of cancellation, taking into account the required notice period for cancellation.</p>	<p>◆ Penalties for Notification of Expected RFT and RFS Dates: 5 Service Credits ('SC') for each WD after the Maximum Time for Notification of Expected RFT and RFS Dates until such time as the OLO receives the notice.</p>
◆ Service Level for RFS Date	<p>◆ <u>Maximum Delivery Time:</u> 7 WD</p> <p>◆</p> <p>◆ In cases of Transfer Requests, SE shall coordinate the deactivation and activation of the Connection on the same day to ensure minimum service disruption.</p> <p>◆ <u>Maximum Validation Time:</u> 2 WD</p>	<p>◆ Penalties for RFS Date: 20 SC for failure to meet the Maximum RFS Date and 10 SC for each additional working day thereafter until the OLO receives the RFS Certificate.</p>
◆ Acceptance Criteria	◆ To be defined by SE	◆
◆ Service quality management		
◆ QoS Parameters	◆ To be defined by SE	◆
◆ Fault management process		
◆ Fault Acknowledgment Time	◆ <u>Maximum Fault Acknowledgment Time:</u> 1 hour	◆

Service Levels	Service Level Terms	Service Level Penalties
◆ Response Time	◆ <u>Maximum Response Time: 5 working hours during working hours and 12 hours outside working hours</u>	◆
◆ Restoration Time	◆ <u>Maximum Restoration Time: 24 hours</u>	◆ Penalties for Restoration Time: 10 SC for failure to meet the Maximum Restoration Time + 5 SC for every 4 hours exceeding the Maximum Restoration Time
		◆ Maximum Monthly Penalty Cap: 300 SC per Connection and per month

ANNEX 2 BITSTREAM PRODUCT LIST

Bitstream products are defined for both residential End users and business End Users, and are defined with packet access contention ratios as shown in the table below.

Bitstream Access Speed
Residential (Contention Ratio 15:1)
256kbit/s downstream / 64kbit/s upstream
512kbit/s downstream / 128kbit/s upstream
640kbit/s downstream / 128kbit/s upstream
1.024Mbit/s downstream / 512kbit/s upstream
2.048Mbit/s downstream / 1.024Mbit/s upstream
3.072Mbit/s downstream / 1.024Mbit/s upstream
4.096Mbit/s downstream / 1.024Mbit/s upstream
6.144Mbit/s downstream / 1.024Mbit/s upstream
8.192Mbit/s downstream / 2.048Mbit/s upstream
10.240Mbit/s downstream / 2.048Mbit/s upstream
16.384Mbit/s downstream / 2.048Mbit/s upstream
Business (Contention Ratio 8:1)
256kbit/s downstream / 64kbit/s upstream *
512kbit/s downstream / 256kbit/s upstream
640kbit/s downstream / 256kbit/s upstream
1.024Mbit/s downstream / 512kbit/s upstream
2.048Mbit/s downstream / 1.024Mbit/s upstream

4.096Mbit/s downstream / 1.024Mbit/s upstream
6.144Mbit/s downstream / 1.024Mbit/s upstream
8Mbit/s downstream / 2Mbit/s upstream
10.240Mbit/s downstream / 2.048Mbit/s upstream
16.384Mbit/s downstream / 2.048Mbit/s upstream

* contention ratio of 15:1

Data Type Handling

The data type handling capability provided over the Bitstream Service is a Layer 2 MPLS service. End User services provided by the Access Seeker will be limited only by the capability of the Access Seekers themselves within the boundaries of the Access Providers network.

ANNEX 3 BITSTREAM CHARGES

The Access Seeker shall pay the relevant Charges for the Bitstream Service as specified in Schedule 3 of this Reference Offer.

ANNEX 4 AGGREGATION LINK

SE shall establish at least one Aggregation Link.

The SE Aggregation Points and their expected implementation dates are as follows:

- (a) Seef: For Seef site is October 2006
- (b) Manama: For Manama site is December 2006

Set-up

The price of establishing each Aggregation Link is subject to time and materials.

ANNEX 5 SE Exchange Roll Out Plan

DSLAM CUTOVER			
No	Site Name	Planned Cutover Date	Location
1	AAL	By June 2007	AALI
2	AB1	By June 2007	Air - Base 1
3	AB2	By June 2007	Air - Base 2
4	ABM	By June 2007	Abu Maher
5	APT	By June 2007	Airport
6	AWA	By June 2007	Awali
7	BIC	By June 2007	Bahrain International Circuit
8	BRI	By June 2007	Border Island
9	BUD	By June 2007	Budaiya
10	DPT	06/09/2006	Diplomatic
11	DUM	By June 2007	Dumistan
12	HIA	By June 2007	Hidd Industrial
13	HID	By June 2007	Hidd
14	HML	By June 2007	Hamala
15	HOR	By June 2007	Hoora
16	ITN	08/08/2006	Isa Town
17	JAW	By June 2007	Jawa
18	JUF	By June 2007	Juffair
19	JZR	By June 2007	Aljazair
20	KMS	By June 2007	Khamis
21	LZI	By June 2007	Lawzi
22	MAN	13/09/2006	Manama
23	MHQ	By June 2007	Muharraq
24	MHZ	By June 2007	Mahooz
25	MMR	By June 2007	Mameer
26	MSH	By June 2007	Magsha
27	NIT	24/08/2006	North Isa Town
28	NZA	By June 2007	Nuzha
29	QUD	By June 2007	Qudaibiya
30	RIF	By June 2007	Riffa
31	RJR	By June 2007	Ras Abu Jarjoor
32	RMN	15/08/2006	Ras Ruman
33	ROW	17/07/2006	Rowdha
34	SAD	By June 2007	Sadad
35	SAR	By June 2007	Sar
36	SBS	By June 2007	Sanabis
37	SEF	30/08/2006	Seef
38	SIT	By June 2007	Sitra
39	SKR	By June 2007	Sakhir
40	SMJ	By June 2007	Samaheej
41	SND	26/06/2006	Sanad
42	TPH	01/08/2006	Telephone House Salmaniya
43	USN	By June 2007	USA Navy Base
44	WDI	By June 2007	WADI
45	WRF	By June 2007	West Riffa

ANNEX 6

