

REQUEST-TO-PAY SERVICE

TECHNICAL SPECIFICATIONS

(API DESCRIPTION DOCUMENT)

Client	Banks, S&Ls, EMIs, PSPs
Version	1.3

Document Versions

Version	Author(s)	Date	Modifications
1.0	TSD GhIPSS	09/2019	Initial version
1.1	TSD GhIPSS	01/2020	Addition of new JSON fields & Operations: 3.13,3.14,3.16, 3.17, 4.5, 5.5, 6.3, 6.4, 6.5
1.2	TSD GhIPSS	08/2020	Update to Payer Service – List Operation
1.3	TSD GhIPSS	12/2021	Updates to Process Flow, Biller Service and removal of Payer Service operations

Distribution List

Name	Institution	Name	Institution
Project team	GhIPSS	Project / Tech. team	Banks, S&Ls, EMI's, PSPs

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1. Introduction

This document contains the technical specifications for the implementation of the REQUEST-TO-PAY SERVICE by Financial Institutions. It provides the definitions, communication protocols, and tools (API) for implementing the service.

This API is exposed as REST services, TLS ciphered and secured through digital signatures;

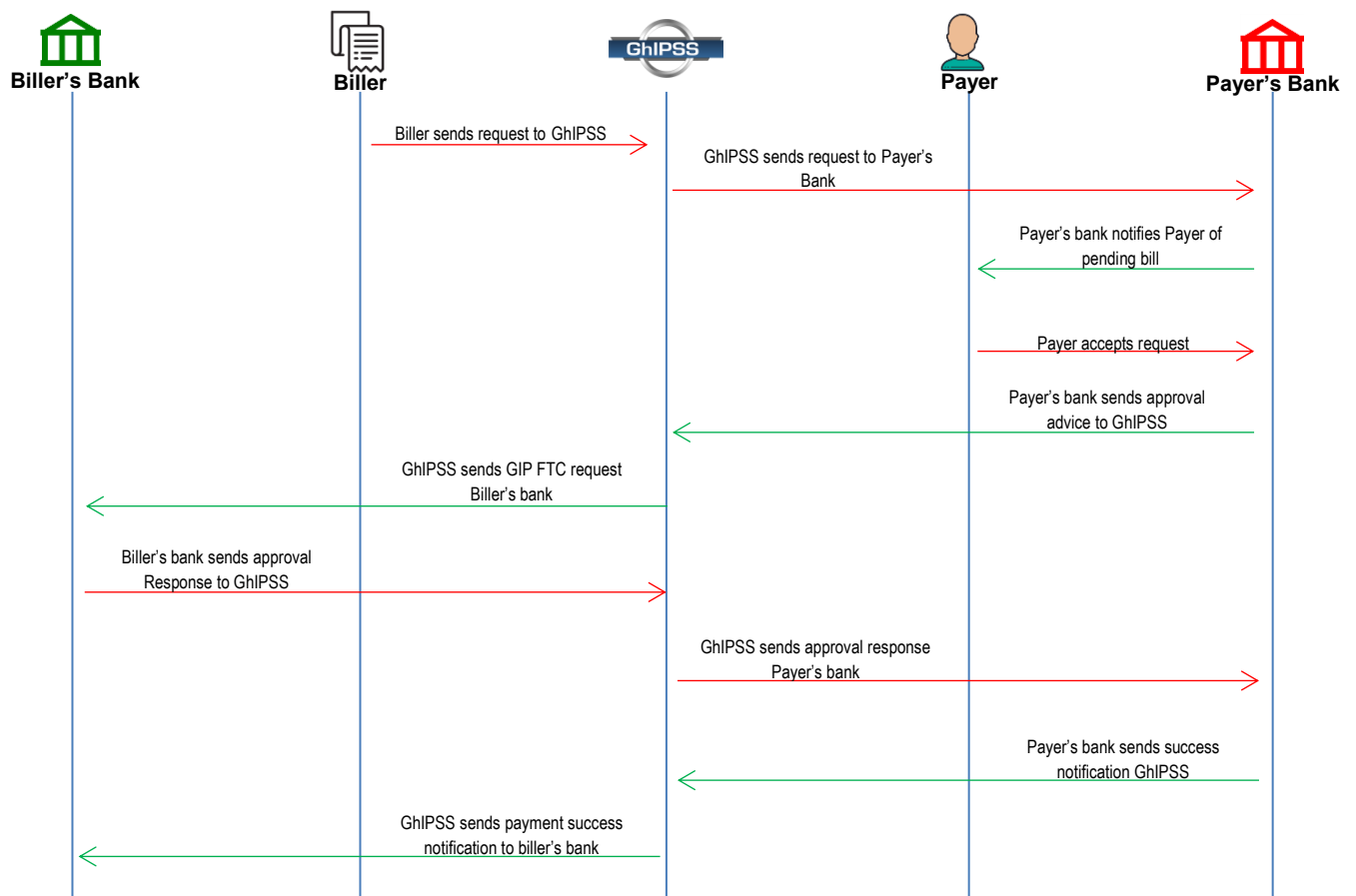
REQUEST-TO-PAY

Request to Pay is a secure digital messaging and payment service. It is a simple and fast payment process that allows a beneficiary (Merchant, Biller etc) to initiate an electronic request for payment to a payer's (Customer's) account / wallet. The payer is notified immediately via their mobile device and can accept the request. If accepted, the requested amount is transferred instantly from the payer's account to the beneficiary's account and the beneficiary notified accordingly.

For each request, the payer has the choice to accept or decline to pay.

Request-To-Pay is an overlay service on top of GhIPSS Instant Pay (GIP)

PROCESS FLOW



2. HTTP

- Base URL
 - API : <https://ghipss.com/ghipssapi/>
- Headers
 - Content-type: “application/json”
- Methods :
 - GET
 - POST
- HTTP Status Code :
 - 200 : Success
 - 420 : Application error
 - 500 : System error
- Data
 - All data is exchanged in JSON format.

3. JSON Fields

This section describes all the fields that the API uses in the different services it provides.

3.1. **institutionId**

- Type : Character String
- Length : 6 characters
- Description : Code assigned by GhIPSS to its member institutions (Banks, MMO ...)

3.2. **name**

- Type : Character String
- Length : Variable with a maximum of 128 characters
- Description: A name by which the individual/institution would be known.

3.3. **accountNumber**

- Type : Character String
- Length : Variable with a maximum of 32 characters
- Description: The account number which shall be used later on as the destination of payment on a GIP FTC.

3.4. **branchCode**

- Type : Character String
- Length : Variable with a maximum of 16 characters
- Description: A code identifying, if applicable, the branch of the institution to which the individual belongs. An "X" shall be used in case this information is not available/applicable.

3.5. **billerId**

- Type : Character String
- Length : Variable with a maximum of 64 characters
- Description: An ID chosen by a biller institution to be used as target for payments from the payer.

3.6. **payerId**

- Type : Character String
- Length : Variable with a maximum of 64 characters
- Description: An ID which ties a payer to a biller to be used as the single source of payment. This ID is assigned by the biller and made available to payers and used as target for payment requests.

3.7. billId

- Type : Character String
- Length : Variable with a maximum of 64 characters
- Description: ID of the bill that the Biller is requesting a payment for from the payer.

3.8. billDate

- Type : Character String
- Length : Variable with a maximum of 64 characters
- Description: Date of the bill for which the payment is being requested. The format of date in this field ISO8601 Datetime.

3.9. billAmount

- Type : Character String
- Length : Variable with a maximum of 12 characters
- Description: Amount in Ghana Cedis of the bill for which a payment is being requested.

3.10. billDescription

- Type : Character String
- Length : Variable with a maximum of 128 characters
- Description: Extra details about the bill for which a payment is being requested that is sent by a biller to the payer to provide more information / context / justification for the request being made.

3.11. requestSource

- Type : Character String
- Length : Variable with a maximum of 64 characters
- Description: A code indicating the source / channel of the request of the enrollment. The possible values are the following :
 - IB : Internet Banking/Web Site of the institution
 - MB : Mobile application of the institution
 - USSD : USSD application of the institution
 - IVR : Interactive Voice Response
 - BRANCH
 - OTHER

3.12. requestTimestamp

- Type : Character String
- Length : Variable with a maximum of 32 characters
- Description: Date and time of the request expressed in ISO8601 Datetime format.

3.13. fromRequestTimestamp

- Type : Character String
- Length : Variable with a maximum of 32 characters
- Description : Date and time starting from which the list of RTP request will be done. It is expressed in ISO8601 Datetime format.

3.14. toRequestTimestamp

- Type : Character String
- Length : Variable with a maximum of 32 characters
- Description : Date and time to which the list of RTP request will be done. It is expressed in ISO8601 Datetime format.

3.15. requestSignature

- Type : Character String
- Length : Variable with a maximum of 512 characters
- Description: A base64 encoded digital signature generated by the sender and signed by their private key, which public key is certified by GhIPSS. The data to be signed is the concatenation of data of all the fields sent in a message, except the signature, in the order of their appearance.

3.16. Status

- Type : Character String
- Length : 1 character
- Description : A code the status of the processing of an RTP request by the Payer Institution. The possible values are the following :
 - N : Not Processed yet.
 - A : Payer Institution Approved transaction. By sending this status the Payer institution confirms that the payer's account was duly debited, and the a successful FTC was sent to the Biller's institution
 - D : Transaction declined. By sending this status the Payer institution confirms that the transaction was not successful.

3.17. notificationTimestamp

- Type : Character String
- Length : Variable with a maximum of 32 characters
- Description : Date and time of the notification expressed in ISO8601 Datetime format.

3.18. errorCode

- Type : Character String
- Length : Variable with a maximum of 16 characters
- Description: A code generated by the system to indicated the error that happened. The possible values are the following :
 - "200" : Operation was successful
 - "420.000" : Mandatory parameters were missing. Mainly the "state" parameter where applicable.
 - "420.001" : Mandatory JSON data fields were missing
 - "420.002" : The public key of the sending institution was not found in the system
 - "420.003" : The requested service is not authorized for the sending institution
 - "420.004" : The received signature is incorrect. It verification by the system failed.
 - "420.005" : The requested operation failed. Field "errorDescription" shall have more details on the failure.
 - "420.007" : The biller id, for which an enrollment is being request, exists already in the system
 - "420.008" : The payer id, for which an enrollment is being request, exists already in the system
 - "420.009" : The bill, for which a payment is being request, exists already in the system
 - "420.010" : The destination id was not found. Field "errorDescription" shall have more details on the failure.

3.19. errorDescription

- Type : Character String
- Length : Variable with a maximum of 128 characters
- Description : A text in English giving a detailed description of the error that system detected

4. Request To Pay – Biller Service

The following operations are related to the biller service under RTP and initiated through a financial institution.

4.1. Enrollment

This operation enrolls or adds a new biller onto the RTP platform. This operation is initiated through the financial institution of the biller.

- **URL:** <https://rtp-test.fin.ghipss.com:7543/ghipssapi/rtp/biller?state=add>
- **Request Body:**

```
{
  "institutionId": "300311",
  "billerId": "0618536308ss",
  "name": "John DOE",
  "accountNumber": "0123456789012",
  "branchCode": "55002",
  "requestSource": "IB",
  "callbackUrl": "https://callbackUrl.com",
  "requestTimestamp": "2019-06-15T20:49:55.450+01:00",
  "requestSignature": "o9ve3a5YR5I99c0iSd3zaJowAsDzGuTN12yfDS95XhT64Jrh
JV5vzy1xhy7x5Y10rycbpmLp1wgdRw8ugzd1RvP6H13CPzWmmtaL93utuFx/J46xXSN6MW2
OrZgC2r6w7uooYmR9yt2HpQTh0chORQo87jBQZMlnInu07cBqses="
}
```

- **Mandatory Fields:**
 - institutionId
 - billerId
 - name
 - accountNumber
 - branchCode
 - requestSource
 - callbackUrl
 - requestTimestamp
 - requestSignature

- **Response Body**

```
{
  "errorCode": "200",
  "errorDescription": "success"
}
```

- **Mandatory Fields:**
 - **errorCode**
 - **errorDescription**

4.2. Update

This operation updates the record of an existing biller. The billerId and the institutionId must be the same as the one previously used in the creation or enrolling of the biller. This operation will be initiated through the financial institution.

- **URL:** <https://rtp-test.fin.ghipss.com:7543/ghipssapi/rtp/biller?state=update>
- **Request Body:**

```
{
  "institutionId": "300311",
  "billerId": "0618536308ss",
  "name": "John DOE",
  "accountNumber": "0123456789012",
  "branchCode": "55002",
  "requestSource": "IB",
  "callbackUrl": "https://callbackUrl.com",
  "requestTimestamp": "2019-06-15T20:49:55.450+01:00",
  "requestSignature": "o9ve3a5YR5I99c0iSd3zaJowAsDzGuTNl2yfDS95XhT64Jrh
JV5vzy1xhy7x5Y10rycbpmLp1wgdRw8ugzd1RvP6H13CPzWmntaL93utuFx/J46xXSN6MW2
OrZgC2r6w7uooYmR9yt2HpQTh0chORQo87jBQZMlnInu07cBqses="
}
```

- **Mandatory Fields:**
 - **institutionId**
 - **billerId**
 - **name**
 - **accountNumber**
 - **branchCode**
 - **requestSource**
 - **callbackUrl**
 - **requestTimestamp**

- requestSignature

- **Response Body**

```
{
  "errorCode": "200",
  "errorDescription": "success"
}
```

- **Mandatory Fields:**

- errorCode
- errorDescription

4.3. Delete

This operation is initiated through the financial institution to delete or remove a biller from the RTP platform.

- **URL:** <https://rtp-test.fin.ghipss.com:7543/ghipssapi/rtp/biller?state=delete>
- **Request Body:**

```
{
  "institutionId": "300311",
  "billerId": "0618536308",
  "requestSource": "IB",
  "requestTimestamp": "2019-06-17T23:37:41.445+01:00",
  "requestSignature": "0Xmd/bAwws1l3drFaSlNhbfw0qisQmpMuBy9a32s5X1jIIIR
kenyRGZhdunrcaleBGiRggFv+aAw077FnSnj1PF/DHPyqMGq+CV0YQH37Nzu4om46X3DgP
nmomsbIF7H7zqBzXBh1Sv5bVi0F5Vk/RSqro1nIRxa/3TRSyrt2M="
}
```

- **Mandatory Fields:**

- institutionId
- billerId
- requestSource
- requestTimestamp
- requestSignature

- **Response Body**

```
{
  "errorCode": "200",
  "errorDescription": "success"
}
```

- **Mandatory Fields:**

- errorCode
- errorDescription

4.4. Query

This operation searches and retrieves the details of a biller enrolled onto the RTP platform. The institutionId and the billerId uniquely identify the biller.

- **URL:** <https://rtp-test.fin.ghipss.com:7543/ghipssapi/rtp/biller?state=query>
- **Request Body:**

```
{
  "institutionId": "300311",
  "billerId": "6Y262Y26111",
  "requestSource": "IB",
  "requestTimestamp": "2019-06-15T15:26:07.194+01:00",
  "requestSignature": "2nkn0Fdm0k74Akhg2dL1at0p/tv28Eyr1hQ0RnvLY3VQ/hqTbL6LRGBAbuvTa1PAjqw/Pg2UWhBr9c0MLVervdaq0xpD88JX3IjVd6XSA1P41D2rUGOZApX8IXIXewQUu+ZsUCMXLK2Vztkh6BZgYQf7fUuyQ7pvwSbpmh1pDdU="
}
```

- **Mandatory Fields:**

- institutionId
- billerId
- requestSource
- requestTimestamp
- requestSignature

- **Response Body**

```
{
  "institutionId": "300311",
  "billerId": "6Y262Y26111",
  "name": "KNUST",
  "accountNumber": "0123456789012",
  "branchCode": "55002",
  "callbackUrl": "https://callbackUrl.com",
  "errorCode": "200",
  "errorDescription": "success"
}
```

- **Mandatory Fields:**
 - institutionId
 - billerId
 - name
 - accountNumber
 - branchCode
 - callbackUrl
 - errorCode
 - errorDescription

4.5. List

This operation returns the record of all billers enrolled under a particular financial institution.

- **URL:** <https://rtp-test.fin.ghipss.com:7543/ghipssapi/rtp/biller?state=list>
- **Request Body:**

```
{
  "institutionId": "300311",
  "requestSource": "IB",
  "requestTimestamp": "2019-06-15T15:26:07.194+01:00"
}
```

- **Mandatory Fields:**
 - institutionId
 - requestSource
 - requestTimestamp

• Response Body

```
{
  "billers":[
    {
      "institutionId":"300311",
      "billerId":"0618536308",
      "name":"John DOE",
      "accountNumber":"0123456789012",
      "branchCode":"55002"
      "callbackUrl":"https://callbackUrl1.com"
    },
    {
      "institutionId":"300311",
      "billerId":"0618666666",
      "name":"LANAGEM",
      "accountNumber":"0123456789012",
      "branchCode":"55002"
      "callbackUrl":"https://callbackUrl2.com"
    },
    {
      "institutionId":"300311",
      "billerId":"6Y262Y26111",
      "name":"KNUST",
      "accountNumber":"0123456789012",
      "branchCode":"55002"
      "callbackUrl":"https://callbackUrl3.com"
    },
    {
      "institutionId":"300311",
      "billerId":"88888888888888",
      "name":"SHOPRITE",
      "accountNumber":"0123456789012",
      "branchCode":"55002"
      "callbackUrl":"https://callbackUrl4.com"
    }
  ],
  "errorCode":"200",
  "errorDescription":"success"
}
```


- **Mandatory Fields:**
 - **Billers**
 - **institutionId**
 - **billerId**
 - **name**
 - **accountNumber**
 - **branchCode**
 - **callbackUrl**
 - **errorCode**
 - **errorDescription**

5. Request To Pay – Requests

The operations below together facilitate delivery of payment requests from biller to payer through his /her financial institution.

5.1. Request from Biller to GhIPSS

This is the request initiated from the biller to GhIPSS to be forwarded to the payer's institution for payment of a bill. The payer's institution must have had their end point URL already setup on the RTP platform.

- **URL:** <https://ghipss.com/ghipssapi/rtp/request>
- **Request Body:**

```
{
  "billerId": "6Y262Y26111",
  "billId": "GH782882",
  "billDate": "2019-05-31",
  "billAmount": "123.45",
  "payerInstitutionId": "300311",
  "payerAccountNumber": "0123456789012",
  "payerName": "John DOE",
  "billDescription": "Some bill that needs payment",
  "requestTimestamp": "2019-06-17T17:20:24.726+01:00",
  "requestSignature": "uI6jyGLte+RaUL9+qJjNqjjy70RQ4tJYY6/HlazmuMpaJJZaf
+m6ngXNZjA+WjK1atZY03JBjexqnqVtYI1QuiXuV8f11txpH+Ag40dhnve9MrXo8B+R0r6n
OobFQ/4NLN5prmb1wapDm9UYJ8QYgSY9fKxEnWBP7AWwuZFf6IwU="
}
```

- **Mandatory Fields:**
 - **billerId**
 - **billId**
 - **billDate**
 - **billAmount**
 - **payerInstitutionId**
 - **payerAccountNumber**
 - **billDescription**
 - **requestTimestamp**
 - **requestSignature**

- **Response Body**

```
{
  "errorCode": "200",
  "errorDescription": "success"
}
```

- **Mandatory Fields:**

- errorCode
- errorDescription

5.2. Request from GhIPSS to Payer's Institution

This is a request initiated from GhIPSS to the end point of the Payer's Institution. This request is to be forwarded to the payer by his/her financial institution as a notice and also a request to pay a bill.

- **URL:** <https://> [URL to be provided by the Payer's Institution]
- **Request Body:**

```
{
  "billerId": "6Y262Y26111",
  "billId": "GH782882",
  "billDate": "2019-05-31",
  "billAmount": 123.45,
  "billDescription": "Some bill that needs payment",
  "billerName": "KNUST",
  "billerInstitutionId": "300311",
  "billerAccountNumber": "0123456789012",
  "payerName": "John DOE",
  "payerInstitutionId": "300311",
  "payerAccountNumber": "0123456789012",
  "requestTimestamp": "2019-06-17T17:20:24.726+01:00",
  "requestSignature": "NNkX0tePGViveWFX79n/+043yz5lKQakk+eLKPmi7ANd+JKp  
kFIKR5iV03CyFo/1qAioXLy9MIP+snGURA31kaa2t0y1AsUG0YQx3ltkxDrybmzPswZRYHI  
9hfwW0e4HNoApS9D1IYEZNGWcuMgNHys+Nb4bCZAwNShuY523W0="
}
```

- **Mandatory Fields:**

- **billerId**
- **billId**
- **billDate**
- **billAmount**
- **billDescription**
- **billerName**
- **billerInstitutionId**
- **billerAccountNumber**
- **payerName**
- **payerInstitutionId**
- **payerAccountNumber**
- **requestTimestamp**
- **requestSignature**

- **Response Body**

```
{
  "errorCode": "200",
  "errorDescription": "success"
}
```

- **Mandatory Fields:**

- **errorCode**
- **errorDescription**

- Check on Payer's Institution's Response:

1. **HTTP RESPONSE STATUS IS 200 :**

In this case we check the payload above to verify if **errorCode** field equals '200', once this check is done the process continues, the request is saved and marked then awaits for the payer's institution confirmation (accept/decline).

2. **HTTP RESPONSE STATUS IS DIFFERENT THEN 200 :**

If the payer's institution response was with an http response status different then 200(timeout, communication error...), the transaction is failed at this point, and the request is saved and marked as unreachable and can be viewed at the admin portal on **RTP UNREACHABLE PAYER BANKS report**.

5.3. Request from GhIPSS to Biller's Institution

GIP FTC will be sent to the Biller's institution with channel code 915

- **Failing Scenarios of FTC request**

Once the FTC request is initiated, a check on the “ActCode” tag in the response will be done, if the response code indicates a successful operation the FTC request will be marked as a successful one, if the response code is in the code 9** series (eg 902,908,909,911,912,992,993,994,995 etc) , a job will retry to send FTC request over and over again and check for the response code each time, as long as the response is not successful, the job will continue retrying to send the request.

The job will stop retrying when it either reaches the maximum number of retries specified by the admin or when reaching cutoff time, once one of these factors is reached the FTC request will marked as expired and will be added to Failed FTC requests report in the admin portal.

If the “ActCode” is different from the values above, it's marked as failed and will not be re-tried.

5.4. Notification from GhIPSS to Biller

- **URL:** <https://> [URL provided is sent in the request]
- **Response Body:**

```
{
  "billerId": "6Y262Y26111",
  "billId": "GH782882",
  "billDate": "2019-05-31",
  "billAmount": 123.45,
  "billDescription": "Some bill that needs payment",
  "payerName": "John DOE",
  "payerInstitutionId": "300311",
  "payerAccountNumber": "0123456789012",
  "status": "OK",
  "requestTimestamp": "2019-06-17T17:20:24.726+01:00",
  "requestSignature": "NNkX0tePGViveWFX79n/+043yz5lKQakk+eLKPmi7ANd+JKp
kFIKR5iV03CyFo/1qAioXLy9MIP+snGURA31kaa2tOy1AsUG0YQx3ltkxDrybmzPswZRYHI
9hfwW0e4HNoApS9D1IYEZNGWcuMgNHyDs+Nb4bCZAwNShuY523W0="
}
```

Once the payer institution responds to payment request with an approval (accept to pay the bill) or declines the payment, a notification will be sent to the biller using the callback url provided during its enrollment.

The “**status**” in biller notification can take the value “OK” in case the payer accepted to pay the bill, or “NOK” in case the payer refused to pay the bill.

NB: Once the payer institution responds to the payment request, the above notification will be sent to the biller (there is also a retrying mechanism until reaching number of retries specified in the admin).

The notification of the biller is considered successful when receiving a response code in the header

5.5. Notification from Payer’s Institution to GhIPSS

- **URL:** <https://ghipss.com/ghipssapi/rtp/notification>
- **Request Body:**

```
{
  "billerId": "JS785S4",
  "billId": "7445672",
  "payerAccountNumber": "0123456789012",
  "payerName": "Jhon Doe",
  "payerBankId": "300311",
  "sessionId": "050721214865",
  "status": "A",
  "requestTimestamp": "2021-05-15T18:06:56.312+01:00",
  "notificationTimestamp": "2021-06-15T18:06:56.312+01:00",
  "requestSignature": "NNkX0tePGViveWFX79n/+043yz5lKQakk+eLKPmi7ANd+JKpkFI
KR5iV03CyFo/1qAioXLy9MIP+snGURA31kaa2t0y1AsUG0YQx3ltxDrybmzPswZRYHI9hf
wW0e4HNoApS9D1IYEZNGWcuMgNHys+Nb4bCZAwNShuY523W0="
}
```

- **Mandatory Fields:**
 - **billerId**
 - **billId**
 - **payerAccountNumber**
 - **payerName**
 - **payerBankId**

- status (“A” to accept the bill payment, “D” to refuse the payment)
 - sessionId (will be used in the FTC request), this field is mandatory in case the status = ‘A’ otherwise it’s optional.
 - requestTimestamp (request of the biller)
 - notificationTimestamp
 - requestSignature
- **Response Body**

```
{  
  "errorCode": "200",  
  "errorDescription": "success"  
}
```