

THE UNITED REPUBLIC OF TANZANIA

BILL AND PAYMENT POSTING APPLICATION PROGRAMING INTERFACE (APIv2.0)

Contents

1.	BILL POSTING FLOW	4
2.	Request Header	5
3.	GePG Bill Submission Request – gepgBillSubReq	5
4.	GePG Bill Submission Request Acknowledgement – gepgBillSubReqAck	7
5.	GePG Bill Submission Response – gepgBillSubResp.	7
6.	GePG Bill Submission Response Acknowledgement – gepgBillSubResAck	8
7.	GePG Bill Cancellation Request – gepgBillCanclReq	8
8.	GePG Bill Cancellation response - gepgBillCanclResp	8
9.	PAYMENT POSTING FLOW	10
10.	GePG Payment Information posting - gepgPmtSpInfo	10
11.	GePG Payment Information posting Acknowledgement – gepgPmtSpInfoAck	11
12.	GePG Reconciliation Request –gepgReconcReq	12
13.	GePG Reconciliation Request Acknowledgement – gepgSpReconcReqAck	12
14.	GePG Reconciliation Response – gepgReconcResp	12
15.	GePG Reconciliation Response Acknowledgement – gepgPmtSpInfoAck	14
16.	Digital Signature Security	15
16.1	. Overview	15
16.2	. Digital Signature	15
16 3	Format of Digital Signature	15

Document Description

Document Name	Bill and Payment Posting Application Programming Interface (API)
Owner	Government of Tanzania
Document Type	GePG – Public institution Integration

Document version Control

Version	Date	Change Description
1.0	24-02-2017	Baseline initial version created.
1.1	24-02-2017	Added Token Request Procedure
1.2	25-02-2017	I. Ack XML simplified
		II. Added payment posting section
1.3	16-05-2017	Added Bill cancellation feature
1.4	19-07-2017	Update bill information
1.4.1	12-10-2017	Added Exact bill definition
		Added CtrAccNum tag in payment notification
2.0	28-10-2017	Added digital signature
		Added reconciliation message
		Added data type definitions
2.0.1	31-10-2017	Document formatting
		Added reserved fields on recon message
2.0.2	18-01-2018	Added Signed Bill Cancellation Request
		Format

1. BILL POSTING FLOW

- a. Public institution billing system compose bill submission request as per gepgBillSubReqxml format and submit (single bill or multiple bill at once) to GePG
- b. GePG receive the bill, immediately send back the acknowledgement as per gepgBillSubReqAckxml format to the billing system and post the bill to its incoming bill queue for processing.
- c. GePG process the bill, publish the bill response to outgoing bill queue, compose the bill response as per gepgBillSubReq xml format and send the result to a billing system.
- d. The billing system respond to a gepgBillSubReq withgepgBillSubReqAck , GePG receive the ACK and remove the bill from the queue.

NOTE: Incase the GePG does not receive the Ack in step d, it will keep onretrying to send the bill result until the message in the queue expires.

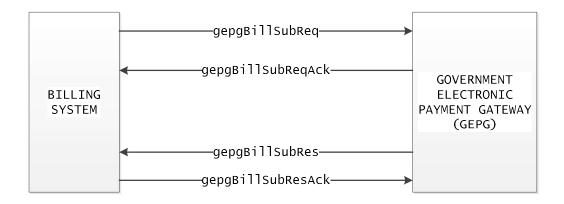
BilluRLs:

- I. http://<gepgIP>:<port>/api/bill/qrequest
- II. http://<qepqIP>:<port>/api/bill/cancel-request
- III. http://<gepgIP>:<port>/api/reconciliations/sp_qrequest

Billurus (For signed messages):

- I. http://<gepgIP>:<port>/api/bill/sigqrequest
- II. http://<gepgIP>:<port>/api/bill/sigcancel request
- III. http://<qepqIP>:<port>/api/reconciliations/siq_sp_grequest

GEPG BILL POSTING FLOW



2. Request Header

The following parameters should be included in HTTP header when sending request to GePG

Parameter	Values/Description		
Content-Type Application/xml			
Gepg-Com default.sp.in			
Gepg-Code	Will be given during the integration		

3. GePG Bill Submission Request -gepgBillSubReq

```
<gepgBillSubReq>
       <BillHdr>
             <SpCode>S023</SpCode>
             <RtrRespFlq>true
      </BillHdr>
      <BillTrxInf>
             <BillId>7885</BillId>
             <SubSpCode>2001</subSpCode>
<SpSysId>tjv47</spSysId>
<BillAmt>7885</BillAmt>
             <MiscAmt>0</MiscAmt>
             <BillexprDt>2017-05-30T10:00:01</billexprDt>
<PyrId>Palapala
             <PyrName>Charles Palapala</PyrName>
             <BillDesc>Bill Number 7885</billDesc>
             <BillGenDt>2017-02-22T10:00:10</BillGenDt>
             <BillGenBy>100</BillGenBy>
<BillApprBy>Hashim</BillApprBy>
             <PyrCellNum>0699210053</pyrCellNum>
             <PyrEmail>charlestp@yahoo.com</PyrEmail>
             <Ccy>TZS</Ccy>
<BillEqvAmt>7885</BillEqvAmt>
             <RemFlag>true
             <BillPayOpt>1</BillPayOpt>
             <BillItems>
                    <BillItem>
                           <BillItemRef>788578851</BillItemRef>
                           <UseItemRefOnPay>N</UseItemRefOnPay>
<BillItemAmt>7885</BillItemAmt>
                           <BillItemEqvAmt>7885</BillItemEqvAmt>
                           <BillItemMiscAmt>0</BillItemMiscAmt>
                           <GfsCode>140206</GfsCode>
                    </BillItem>
                    <BillItem>
                           <BillItemRef>788578852</BillItemRef>
                           <UseItemRefOnPay>N</UseItemRefOnPay>
                           <BillItemAmt>7885</BillItemAmt>
                           <BillItemEqvAmt>7885</BillItemEqvAmt>
                           <BillItemMiscAmt>0</BillItemMiscAmt>
                           <GfsCode>140206</GfsCode>
                    </BillItem>
             </Billitems>
       </BillTrxInf>
</gepgBillSubReq>
```

gepgBillSubReq	Data Type		GePG Bill Submission Request - Used to Submit Bill to the GePG
BillHdr			Bill Header Information
SpCode	String(5)	Mandatory	Service Provider Code
RtrRespFlg	Boolean	Mandatory	Return Response Flag - Boolean if True then response for the submit request is required.
BillTrxInf			Bill Transaction Information - Can be many if submitting multiple bill
BillId	String(100)	Mandatory	Bill Identification - Unique identification of the Bill in Service Provider Billing System
SubSpCode	Number(30)	Mandatory	Service Provider Sub Code
SpSysId	String(30)	Mandatory	Service Provider System Identification Code
BillRef	String(50)	Mandatory	Billing Reference – similar to Item that is billed
BillAmt	Double	Mandatory	Billing Amount
MiscAmt	Double	Mandatory	Miscellaneous Amount
BillExprDt	DateAndTime	Mandatory	Bill Expiry Date - Beyond this date the bill is deemed invalid
PyrId	String(30)	Mandatory	Payer Identification
PyrName	String(200)	Mandatory	Payer Name
BillDesc	String(400)	Optional	Bill Description
BillGenDt	DateAndTime	Mandatory	Bill Generation Date
BillGenBy	String(30)	Mandatory	Bill Generated By
BillApprBy	String(30)	Mandatory	Bill Approved By
PyrCellNum	String(30)	Optional	Payer Mobile/Cell Number
PyrEmail	String(30)	Optional	Payer Email Address
Ссу	String(3)	Mandatory	Currency
BillEqvAmt	Double	Mandatory	Bill Equivalent Amount
RemFlag	Boolean	Mandatory	Reminder Flag - True if reminder must be sent
BillPayOpt	String(10)	Mandatory	Bill Pay Option - 1 if must be paid in full only , 2 if partial payment is allowed and 3 - for exact bill (same as full but does not allow over or under payment)
BillItems			Envelop for Bill items

BillItem			Bill item information
BillItemRef	String(30)	Optional	Item reference eg meter number for lukuetc
UseItemRefOnPay	Char(1)	Mandatory	Flag indicating whether the item reference is preferred to be used as a payment control number — only apply when bill has single bill item
BillItemAmt	Double	Mandatory	Bill item amount
BillItemEq∨Amt	Double	Mandatory	Bill item equivalent amount - applicable for non TZS bill
BillItemMiscAmt	Double	Mandatory	Bill item miscellaneous Amount
GfsCode	String(10)	Mandatory	GFS code of the specific bill item

4. GePG Bill Submission Request Acknowledgement – gepgBillSubReqAck

TrxStsCode

• 7101: SuccessfulReceived

5. GePG Bill Submission Response–gepgBillSubResp

TrxSts:

- GF GePG Failure
- GS GePG Success

gepgBillSubResp	Data Type	GePG Bill Submission Response - Message returned upon successful Bill Submission
BillTrxInf		Bill Transaction information - Can be many if multiple are submitted
BillId	String(100)	Bill Identification
TrxSts	String(2)	Transaction Status Code

PayCntrNum	Number(12)	Payment Control Number
TxnStsCode	Number(4)	Error code indicating reason of failure in case the bill fail to be posted in GePG database, if several will be separated by;

6. GePG Bill Submission Response Acknowledgement – gepgBillSubResAck

7. GePG Bill Cancellation Request – gepgBillCanclReq

Unsigned Request

Signed Request

gepgBillCanclReq	Data Type		GePG Bill cancellation request - Used to cancel bill in the GePG
SpCode	String(5)	Mandatory	Service Provider Code
BillId	String(100)	Mandatory	Bill Identification
SpSysId	String(30)	Mandatory	Service Provider System Identification Code

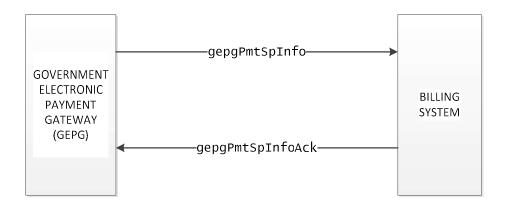
8. GePG Bill Cancellation response - gepgBillCanclResp

re		GePG Bill cancellation Response - Message returned upon successful Bill cancellation request
BillCanclTrxDt		Bill Cancel Transaction details
BillId	String(100)	Bill Identification
TrxSts	String(2)	Transaction Status Code
TxnStsCode	Number(4)	Error code indicating reason of failure in case the bill fail to be cancelled in GePG database, if several will be separated by;

9. PAYMENT POSTING FLOW

- a. Once payment receive and successful settle the bill, GePG notify a respective institution by sending gepgPmtSpInfo to institution billing system indicated in **SpSysId** field when bill was posted.
- b. The billing system respond to a **gepgPmtSpInfo** with **gepgPmtSpInfoAck** , GePG receive the ACK and remove the payment notification from the queue.

GEPG PAYMENT POSTING FLOW



10. GePG Payment Information posting -gepgPmtSpInfo

```
<gepgPmtSpInfo>
    <PymtTrxInf>
           <TrxId></TrxId>
           <SpCode></SpCode>
           <PayRefId></payRefId>
<BillId></BillId>
           <PayCtrNum></PayCtrNum></BillAmt></
           <PaidAmt></PaidAmt>
           <BillPayOpt></BillPayOpt>
           <CCy></CCy>
           <TrxDtTm></TrxDtTm>
           <USdPayChnl></usdPayChnl>
<PyrCellNum></pyrCellNum>
<PyrName>
<PyrName>
<PyrEmail>

           <PspReceiptNumber></PspReceiptNumber>
           <PspName></PspName>
           <CtrAccNum></CtrAccNum>
    </PymtTrxInf>
</gepgPmtSpInfo>
```

gepgPmtSpInfo	Data Type	GePG payment posting to public institution - Used to Submit payment info received from payment service provider
PymtTrxInf		Payment Information Envelop
	(100)	·
TrxId	String(100)	Transaction id
SpCode	String(5)	Service Provider Code
PayRefId	String(100)	Payment receipt issued by the GePG
BillId	String(100)	Bill Identification - Unique identification of the Bill in Service Provider Billing System
PayCtrNum	Number(12)	Payment Control Number in payment by payer
BillAmt	Double	Bill Amount
PaidAmt	Double	Paid Amount
BillPayOpt	String(10)	Bill Pay Option - FULL or PARTIAL
Ccy	String(3)	Currency
TrxDtTm	DateAndTime	Transaction Date and Time YYYY-MM-DDTHH24:MI:SS (2017-03-25T14:30:12)
UsdPayChn	String(2)	Payment provider payment channel used to pay the bill Online bank, Mobile bank, POS etc
PyrCellNum	String(30)	Payer Mobile/Cell Number as received from payment provider
PyrName	String (200)	Payer Name as received from payment provider
PyrEmail	String(100)	Payer Email Address as received from payment provider
PspReceiptNum ber	String(100)	Payment Receipt issued by payment service provider
PspName	String(100)	Payment service provider Name eg. NMB, Vodacom etc
CtrAccNum	String(30)	Credited Account Number

11. GePG Payment Information posting Acknowledgement – gepgPmtSpInfoAck

TrxStsCode

• 7101: SuccessfulReceived

12. GePG Reconciliation Request –gepgReconcReq

gepgReconcReq	Data Type		GePG Reconciliation Request- Send to GePG by PSP for reconciliation
gepgSpReconcReq			Batch Reconciliation details
SpReconcReqId	String(50)	Mandatory	Transaction Identification
SpCode	String(5)	Mandatory	Service Provider Code
SpSysId	String(10)	Mandatory	Service Provider System Identification Code
TnxDt	Date	Mandatory	Reconciliation transactions date YYYY-MM-DD (2017-03-25)
ReconcOpt	Int(1)	Mandatory	Recorn Option - 1 for GePG successful transactions and 2 - for exception report after reconciliation between GePG and bank

13. GePG Reconciliation Request Acknowledgement – gepgSpReconcReqAck

TrxStsCode

• 7101: SuccessfulReceived

14. GePG Reconciliation Response – gepgReconcResp

Reconciliation response will be returned to the recorn call back url provided during setup

```
<ReconcTrxInf>
                       <SpBillId>FH4671150752/SpBillId>
                       <BillCtrNum>991080222529/BillCtrNum>
<pspTrxId>E991080222529</pspTrxId>
<PaidAmt>37500/PaidAmt>
                       <CCy>TZS</CCy>
<PayRefId>9910222529</PayRefId>
<TrxDtTm>2017-10-09T07:35:56</TrxDtTm>
<CtrAccNum>0150211612834</ctrAccNum>
                       <usdPayChnl>FAHARI HUDUMA</usdPayChnl>
                       <PspName>NMB</PspName>
<PspCode>PSP006</PspCode>
                        <DptCellNum/>
                       <DptName/>
<DptEmailAddr/>
                        <Remarks>Failed at PSP</Remarks>
                       <ReconcRvs1></ReconcRvs1>
                       <ReconcRsv2></ReconcRsv2>
                       <ReconcRvs3></ReconcRvs3>
               </ReconcTrxInf>
               <ReconcTrxInf>
                       <SpBillId>FH4671150754/SpBillId>
                       <BillCtrNum>991080222520</BillCtrNum>
<pspTrxId>E991080222528</pspTrxId>
                        <PaidAmt>37500</PaidAmt>
                       <CCy>TZS</CCy>
<PayRefId>9910222529</PayRefId>
                       <TrxDtTm>2017-10-09T07:35:56</TrxDtTm>
                        <CtrAccNum>0150211612834</CtrAccNum>
                        <usdPayChnl>FAHARI HUDUMA</usdPayChnl>
                       <PspName>NMB</PspName>
<PspCode>PSP006</PspCode>
                       <DptCellNum/>
                        <DptName/>
                        <DptEmailAddr/>
                        <Remarks>Failed at PSP</Remarks>
                       <ReconcRsv1></ReconcRsv1>
                       <ReconcRsv2></ReconcRsv2>
                        <ReconcRsv3></ReconcRsv3>
               </ReconcTrxInf>
       </ReconcTrans>
</gepgSpReconcResp>
```

gepgReconcResp	Data Type	GePG Reconciliation Response- Send to PSP by GePG for reconciliation
ReconcBatchInfo		Batch Reconciliation details
SpReconcReqId	Number(50)	Unique Request Identification
SpCode	String (5)	Service Provider Code
SpName	String(30)	Payment service provider Name eg. NMB, Vodacom etc
ReconcStsCode	Number (5)	Status code
ReconcTrans		Reconciliation Detail
ReconcTrxInf		Envelope for reconciliation transaction data
SpBillId	String(50)	Transaction Identification
PayRefId	String(15)	GePG receipt

BillCtrNum	Number(12)	Bill Control Number
PaidAmt	Double	Paid Amount, negative(-) amount indicate reversed transaction on bank side
ССУ	String(3)	Currency
TrxDtTm	DateAndTime	Transaction Date and Time YYYY-MM-DDTHH24:MI:SS (2017-03-25T14:30:12)
CtrAccNum	String(15)	Credited Account Number
UsdPayChnl	String(2)	Used Payment Channel
DptCellNum	String(30)	Depositor Cell/Mobile/MSDN Number 0766723821 or 255022234567
DptName	String (100)	Depositor Name
DptNameEmai lAddr	String(100)	Depositor Email Address
Remarks	String(200)	Reconciliation remarks
ReconcRvs01	String(50)	Reserved field (For future use)
ReconcRvs02	String(50)	Reserved field (For future use)
ReconcRvs03	String(50)	Reserved field (For future use)

15. GePG Reconciliation Response Acknowledgement – gepgPmtSpInfoAck

ReconcStsCode

• 7101: SuccessfulReceived

16. Digital Signature Security

16.1. Overview

Digital signature will be used for messages exchange between the gateway and Service Provider and Payment Service Provider. The SP and PSP will be required to apply the digital signature.

Digital signatures will also be used for files and messages sent via the upload facility of the Web station. Files which have to be uploaded must be previously signed by the Participant's private key and verified using participants Public Key.

In case of failure of to verify the signature messages will be rejected with the reason "Digital Signature Failed".

16.2. Digital Signature

The security architecture used by the Gateway is based on Public Key Infrastructure (PKI) technology in which two keys (Public and Private) are used. The keys are generated using digital certificates downloaded by the Central CA Server. PKI digital certificates are used for access control and digital signature.

16.3. Format of Digital Signature

The files and message will be digitally signed using the PKCS12 standard. This provides authentication, message integrity and non-repudiation of origin. The standard describes a general syntax for data that may have cryptography applied to it, such as digital signatures and digital envelopes.

If the signing is to be done directly by the PSP and SP, the Gateway expects files or message to be digitally signed and obey the following rules:

The file/message contains the actual message (BillPOsting, Payments and acknowledgement) and the digital signature of that message in the form of

<Envelop>
<message></message>
<digital_signature></digital_signature>
</Envelop>

<Digital_signature> is the electronic signature in PKCS#12 format

The digital signature must be BASE64 encoded.

```
The Digital signature Algorithm used must be SHAlwithRSA
<message></message> is the appropriate API message format E.g.
               <gepgBillSubReq>
<BillHdr>
                <SpCode>S023</SpCode>
                <RtrRespFlq>true
               </BillHdr>
<BillTrxInf>
                <BillId>7885</BillId>
                <SubSpCode>2001</SubSpCode>
               <SpSysId>tjv47</spSysId>
<BillAmt>7885</BillAmt>
                <MiscAmt>0</MiscAmt>
                <BillExprDt>2017-05-30T10:00:01</BillExprDt>
                <PyrId>Samizi</PyrId>
               <PyrName>Samizi Abdallah</pyrName>
<BillDesc>Bill Number 7885</BillDesc>
<BillGenDt>2017-02-22T10:00:10</BillGenDt>
<BillGenBy>100</BillGenBy>
                <BillApprBy>Hashim</BillApprBy>
               <PyrCellNum>0699210053</pyrCellNum>
<PyrEmail>Samizi@gmail.com
               <Ccy>TZS</Ccy>
<BillEqvAmt>7885</BillEqvAmt>
                <RemFlag>true
                <BillPayOpt>1</BillPayOpt>
                <BillItems>
                <BillItem>
                <BillItemRef>788578851</BillItemRef>
               <UseItemRefOnPay>N</UseItemRefOnPay>
<BillItemAmt>7885</BillItemAmt>
               <BillItemEqvAmt>7885</BillItemEqvAmt>
<BillItemMiscAmt>0</BillItemMiscAmt>
               <GfsCode>140206</GfsCode>
</Billitem>
                </Billitems>
                </BillTrxInf>
                </gepgBillSubReq>
```

Therefore, after applying the digital Signature the complete message exchanged between participants and the system will be: -

<Gepg>

```
<gepgBillSubReq>
       <BillHdr>
              <SpCode>S023</SpCode>
              <RtrRespFlg>true</RtrRespFlg>
       </BillHdr>
       <BillTrxInf>
              <BillId>7885</BillId>
              <SubSpCode>2001</SubSpCode>
              <SpSysId>tjv47</SpSysId>
              <Billamt>7885</Billamt>
              <MiscAmt>0</MiscAmt>
              <BillexprDt>2017-05-30T10:00:01</BillexprDt>
              <PyrId>Samizi</PyrId>
              <PyrName>Samizi Abdallah</pyrName>
<BillDesc>Bill Number 7885</BillDesc>
<BillGenDt>2017-02-22T10:00:10</BillGenDt>
              <BillGenBy>100</BillGenBy>
              <BillApprBy>Hashim</BillApprBy>
              <PyrCe11Num>0699210053</pyrCe11Num>
<PyrEmail>Samizi@gmail.com</pyrEmail>
              <Ccy>TZS</Ccy>
<BillEqvAmt>7885</BillEqvAmt>
              <RemFlag>true
              <BillPayOpt>1</BillPayOpt>
              <BillItems>
                     <BillItem>
                            <BillItemRef>788578851/BillItemRef>
                            <UseItemRefOnPay>N</UseItemRefOnPay>
                            <BillItemAmt>7885</BillItemAmt>
                            <BillItemEqvAmt>7885</BillItemEqvAmt>
                            <BillItemMiscAmt>0</BillItemMiscAmt>
                            <GfsCode>140206</GfsCode>
                     </BillItem>
              </Billitems>
       </BillTrxInf>
</gepgBillSubReq>
```

<gepgSignature>

U6VJ6jZYnrQQST5e/wBifETG9aiPoJwmPufgdOomrtA8Hdcpaqz2iUP6Baqqaxs7zvLVlVoNp+HV s1cmW6+Rk17rqaMqMf7NabI+m+0JpLZArf5itoNOv1]/NXHJtasISx2UGg23kBCVn0aNxLQzfcvM Cbbs3n2izs+5zFVFnsOtcbjPNJY3uwNqotXY8MspXjwRhvxg484ab72difhkoioiXxp5JwuCVA/I QVwWJVIaV4xRy8QSQ7NMkwBFlOn07m2UNMFPqIfybr/Bsi5evFHxf9Mlz9puIh9je7kLbEbKdSLL HQ24o1TGdHspcLcbj9kMbbipMkUzbZTwhC3w80aEnlGzjNAT4kTWWRJ8sE4XO2qSkz9vDR+tzJiN wgHc42H4SgSUnni1flZ6w/ONy/N+IPR6lBgq1k8pVUF39Lf0GfPrlYr74RHu1Ub7L/8JTuyFUb5f M69G5PbRRRUamRE+q5/zXPiksn7QslwuV2lb1g+6Zq2Il3ztzUyFsIP4Dipo9ikEQ9yYKkq6DOWe DHsxkx80HAEOTFihZJCgf3ZrSs1aOCFok8TTrp4EACR37GBrr3OwaebiU+OJtzwBNOWM3/mqprn+t+mf7+s7Dkk8lxK+hwKPYFBUUDryylQV9Rs71uZE4khLqA4tlRqMgC49GuUd5TFm8VOyutmR3dk=

</Gepg>