



M-PESA - STK PUSH

Developer Guide

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SAFARICOM LTD

PROJECT NAME: M-PESA STK PUSH	
DOCUMENT NAME: DEVELOPER GUIDE	VERSION: 1.1
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Approvals

This document needs below approvals for implementation.

Author(s)	Name	Signature	Date
Financial Systems Planning Engineer	Nahashon Kibet		
Reviewers	Name	Signature	Date

Revision Log

Revision Number	Revision Date	Revision	Revision made by
1.0	29 th July, 2016	Initial Draft	Nahashon Kibet
1.1	15 th September	<ul style="list-style-type: none"> • Updated the response codes • Added sample requests for PayBill, BuyGoods and CashOut 	Nahashon Kibet

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Abbreviations

Term	Definition
API	Application Programming Interface
PGW	Payment Gateway
SP	Service Provider
MSISDN	Mobile Station International Subscriber Directory Number
REST	Representational state transfer

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1 Introduction

Scope

This document specifies the API specifications to access the new M-PESA STK push functionality. The aspects of the Web Service defined here are:

- Message Flow Description
- Data Type Definition
- REST API specification examples
- Sample Requests

Pre-requisites

The following are required to successfully integrate to this service:


- 1) Must be a fully registered M-Pesa Merchant
- 2) API Credentials

The credential required are:

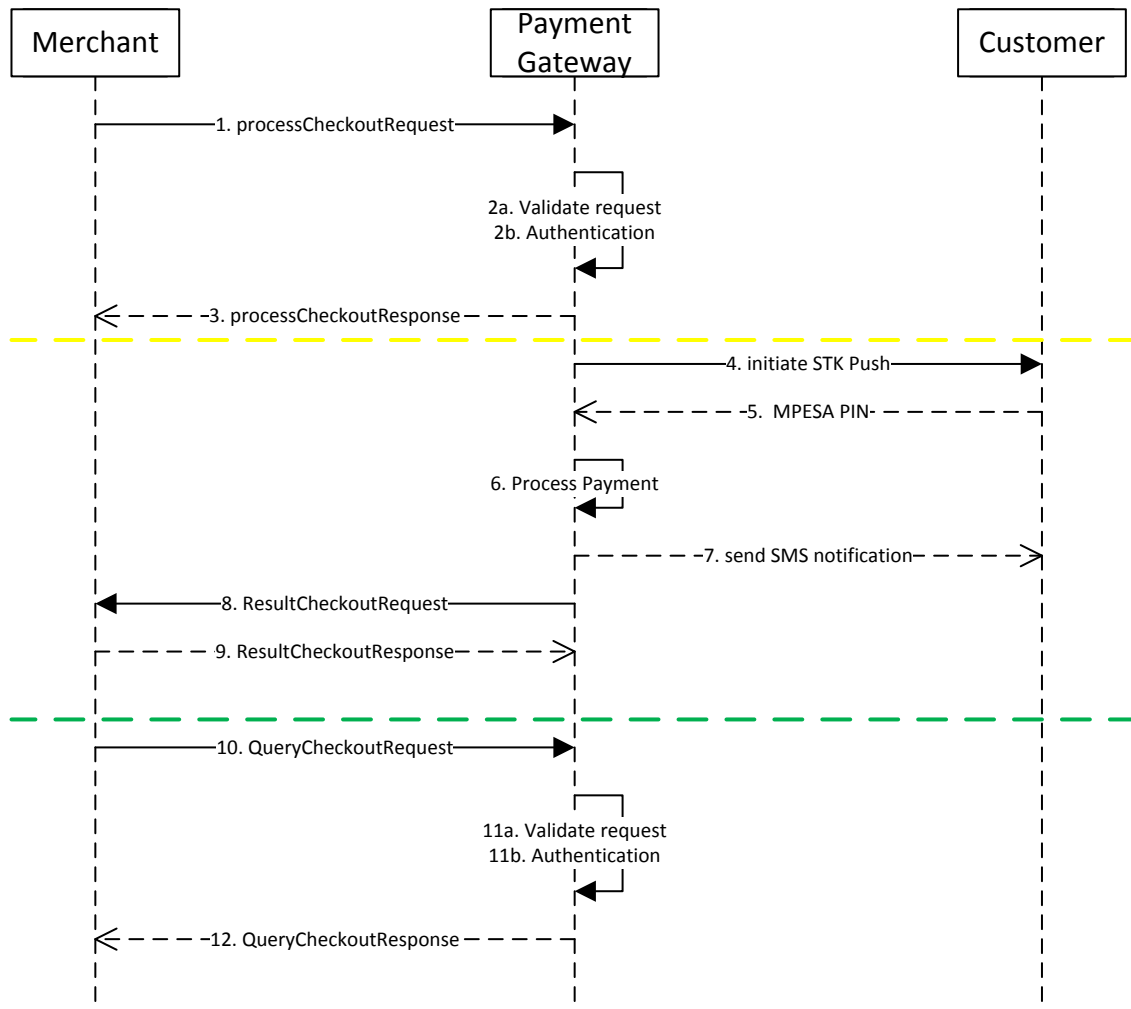
- API Key
- MPESA ShortCode

- 3) Connectivity

The API is accessible via the internet through endpoints to be shared.

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2 Message Flow Description



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3 Data Type Definition

3.1 Process Checkout Request structure

Element name	Element type	Optional	Description
checkoutHeader	checkoutHeader	No	Defines the header information. Refer to section 3.2 below for the structure
checkoutTransaction	checkoutTransaction	No	Defines the transaction details of the request. Refer to section 3.3 below for the structure

3.2 Checkout Header structure

Element name	Element type	Optional	Description
BusinessshortCode	String	No	The M-PESA Shortcode assigned to the Business
Password	String	No	Password used by the PGW to authenticate the merchant. Refer to the section "3.2.1 Password Encryption" for instructions on how encrypt the password
Timestamp	String	No	The transaction timestamp in "yyyyMMdd HHmmssSSS" format

3.2.1 Password Encryption

The password is a Base64 encoding of a concatenated string consisting of:

- Merchant ID
- Pass Key
- Timestamp (The same value as populated in the Timestamp element of the Checkout header).

Steps:

- Concatenate the Merchant ID, Pass key and Timestamp
i.e. *Merchant ID + Pass Key + Timestamp*

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- Encode the resulting string using Base64
Base64.encode(Merchant ID + Pass Key + Timestamp)

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3.3 Checkout Transaction structure

Element name	Element type	Optional	Description
SourceApp	String		The app sending the request: Valid value: - onlinecheckout
TransactionType	String	No	The unique identifier of transaction/business operation. The valid values are: <ul style="list-style-type: none"> • <i>CustomerPayBillOnline</i> • <i>CustomerBuyGoodsOnline</i> • <i>CashOut</i>
MerchantRequestID	String	No	The unique identifier for the request
Amount	String	No	The transaction amount
PartyA	String	Yes	Debit party
PartyB		Yes	Credit party.
PhoneNumber	String	No	The customer's mobile number with "0" or "254"
CallBackURL	String	No	The URL where the Payment gateway will send the result to
Parameter	Parameter	No	Refer to the Parameter structure
TransactionDesc	String	No	A short description of the transaction

3.4 Parameter structure

Element name	Element type	Optional	Description
Referenceltem	Referenceltem	Yes	Refer to the Referenceltem structure

3.5 Referenceltem

Element name	Element type	Optional	Description
Key	String	No	Defines the parameter key name. Notes: Define a Key "AccountReference" TransactionType "Paybill" with:
Value	String	No	The value for the key defined above

3.6 Process Checkout Response structure

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Element name	Element type	Optional	Description
ResponseCode	String	No	A code showing the status of the request
ResponseDesc	String	No	A description of the response
CheckoutRequestID	String	No	A unique ID assigned to the request by the payment gateway
MerchantRequestID	String	No	The merchants unique ID as in the request
CustomerMessage	String	No	A message to be sent / displayed to the customer

3.7 Query Checkout Request structure

Element name	Element type	Optional	Description
checkoutHeader	checkoutHeader	No	Refer to the checkoutHeader structure
queryTransaction	queryTransaction	No	Refer to the queryTransaction structure

3.8 Query Transaction structure

Notes:

Only one of the parameters can be used to retrieve the status of a transaction with preference given to CheckoutRequestID.

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Element name	Element type	Optional	Description
CheckoutRequestID	String	No	The unique ID assigned to the request by the payment gateway
MerchantRequestID	String	No	The merchants unique ID as in the request.

3.9 Query Checkout Response structure

Element name	Element type	Optional	Description
ResponseCode	String	No	
ResponseDesc	String	No	
MerchantRequestID	String	No	The unique identifier of the request message generated by third party. Its value comes from the request message.
CheckoutRequestID	String	No	The unique identifier generated by PGW for a request
Amount	String	Yes	The transaction amount
BusinessShortCode	String	Yes	The M-PESA Shortcode assigned to the Business
MpesaReceiptNumber	String	Yes	The receipt number generated by MM for the completed transaction
PartyB	String	Yes	
PhoneNumber	String	Yes	The customer's mobile phone number
ResultDesc	String	Yes	
TransactionDate	String	Yes	
TransactionDesc	String	Yes	
TransactionStatus	String	Yes	

3.10 Checkout Result Request Structure

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Element name	Element type	Optional	Description
ResponseCode	String	No	
ResponseDesc	String	No	
CheckoutRequestID	String	No	The unique identifier generated by PGW for a request
MerchantRequestID	String	No	The unique identifier of the request message generated by third party. Its value comes from the request message.
CallbackMetadata	CallbackMetadata	Yes	Refer to the CallbackMetadata structure
BusinessShortCode	String	Yes	The M-PESA Shortcode assigned to the Business
MpesaReceiptNumber	String	Yes	The receipt number generated by MM for the completed transaction
PartyA	String	Yes	
PartyB	String	Yes	
PhoneNumber	String	Yes	The customer's mobile phone number
ResultDesc	String	Yes	
TransactionDate	String	Yes	
TransactionDesc	String	Yes	
TransactionStatus	String	Yes	

3.11 CallbackMetadata structure

Element name	Element type	Optional	Description
Item		No	A key and value parameter. Each item has a "Name" key to define the item name and "Value" for the item value
Name	String	No	Specifies the name of the Item: Some of the item names are: <ul style="list-style-type: none"> • MpesaReceiptNumber • Balance • Amount • TransactionDate • PhoneNumber
Value	String	No	The value for the item with the above name e.g. KIF510PGLR

3.12 Checkout Result Response Structure

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Element name	Element type	Optional	Description
ResponseCode	String	No	
ResponseDesc	String	No	

4 API Operations

4.1.1 ProcessCheckout

This operation is invoked by a merchant to make a checkout request.

4.1.1.1 Input Message: ProcessCheckout

Element name	Element type	Optional	Description
checkoutHeader	checkoutHeader	No	An instance of checkout header
checkoutTransaction	checkoutTransaction	No	An instance of checkout transaction

4.1.1.2 Output Message: ProcessCheckoutResponse

Element name	Element type	Optional	Description
Return	processCheckoutResponse	No	An instance of processCheckoutResponse

4.1.2 ResultCheckout

This operation is invoked by the payment gateway to send the payment results to a merchant. The payment gateway sends the result to the callback URL provided in the ProcessCheckout request.

4.1.2.1 Input Message: ResultCheckout

Element name	Element type	Optional	Description
ResultCheckoutRequest	resultCheckout	No	An instance of result checkout

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4.1.2.2 Output Message: ResultCheckoutResponse

Element name	Element type	Optional	Description
Return	resultCheckoutResponse	No	An instance of resultCheckoutResponse

4.1.3 QueryCheckout

This operation allows merchants to check the status of a checkout request.

4.1.3.1 Input Message: QueryCheckout

Element name	Element type	Optional	Description
checkoutHeader	checkoutHeader	No	An instance of checkout header
queryTransaction	queryTransaction	No	An instance of queryTransaction

4.1.3.2 Output Message: QueryCheckoutResponse

Element name	Element type	Optional	Description
Return	queryCheckoutResponse	No	An instance of queryCheckoutResponse

5 Response Codes

The table below outlines the common API responses and their codes. The list will be updated over time as the service is being updated.

Table 1: Response Codes

Response	Response Description	Notes
----------	----------------------	-------

PROJECT NAME: M-PESA STK PUSH	
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0	Success. Request accepted for processing	
1	An exception occurred during processing	
2	Merchant does not exist	
3	Wrong credentials	
4	Merchant not allowed to carry out transaction type	
CBS0001	No ICCID found	
23	Request message structure is invalid	
0	The service request has been accepted successfully.	The MPESA payment was successful
1	The balance is insufficient for the transaction.	
2	Declined due to limit rule: less than the minimum transaction amount	
3	Declined due to limit rule: greater than the maximum transaction amount.	
4	Declined due to limit rule: would exceed the daily transfer limit.	
5	Declined due to limit rule: would be below the minimum balance.	
8	Declined due to limit rule: would exceed the maximum balance.	
11	The DebitParty is in an invalid state.	
17	System internal error.	
26	System busy. The service request is rejected.	
1031	Request cancelled by user	
2001	The initiator information is invalid.	

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Declined due to account rule: The account status does not allow this transaction.

6 Examples

This section presents sample requests for the three API operations via RESTful calls using JSON.

Process Checkout

Buy Goods Sample Request:

```
{
  "ProcessCheckout": {
    "ProcessCheckoutRequest": {
      "checkoutHeader": {
        "BusinessShortCode": "898998",
        "Password": "ODk4OTk4NWU4ODQ4OThkYTI4MDQ3MTUxZDBlNTZmOGRjNjI5Mjc3MzYwM2QwZDZhYWJiZGQ2MmExMWVmNzIxZDE1NDJkODIwMTYwMjE2MTY1NjI3",
        "Timestamp": "20160912092847"
      },
      "checkoutTransaction": {
        "SourceApp": "TestMerchant",
        "TransactionType": "CustomerPayBillOnline",
        "MerchantRequestID": "821804120",
        "Amount": "50",
        "PhoneNumber": "254725716707",
        "CallBackURL": "http://172.29.227.29:8080/mc/callbackURL",
        "Parameter": {
          "ReferenceItem": [
            {
              "Key": "",
              "Value": ""
            }
          ]
        }
      }
    }
  }
}
```

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```

    "TransactionDesc": "Buy Goods transaction"
  }
}
}

```

Samples Response:

```

{
  "ProcessCheckoutResponse": {
    "return": {
      "ResponseCode": "0",
      "ResponseDesc": "Success. Request accepted for processing",
      "CheckoutRequestID": "ws_CO_15092016175503294",
      "MerchantRequestID": "821804121239018",
      "CustomerMessage": "Success. Request accepted for processing"
    }
  }
}

```

PayBill Sample Request

```

{
  "ProcessCheckout": {
    "ProcessCheckoutRequest": {
      "checkoutHeader": {
        "BusinessShortCode": "898998",
        "Password": "ODk4OTk4NWU4ODQ4OThkYTI4MDQ3MTUxZDBlNTZmOGRjNjI5Mjc3MzYwM2QwZDZhYWJiZGQ2MmExMWVmNzIxZDE1NDJkODIwMTYwMjE2MTY1NjI3",
        "Timestamp": "20160912092847"
      },
      "checkoutTransaction": {
        "SourceApp": "TestMerchant",
        "TransactionType": "CustomerPayBillOnline",
        "MerchantRequestID": "821804120",
        "Amount": "50",
        "PhoneNumber": "254725716707",
        "CallBackURL": "http://172.29.227.29:8080/mc/callbackURL",
        "Parameter": {
          "ReferenceItem": [
            {
              "Key": "AccountReference",
              "Value": "123456"
            }
          ]
        }
      },
      "TransactionDesc": "PayBill Test Transaction"
    }
  }
}

```

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```

    }
  }
}

```

The response is similar to the one for Buy goods above

Cash Out Sample Request

```

{
  "ProcessCheckout": {
    "ProcessCheckoutRequest": {
      "checkoutHeader": {
        "BusinessShortCode": "898998",
        "Password": "ODk4OTk4NWU4ODQ4OTkYTI4MDQ3MTUxZDBlNTZmOGRjNjI5Mjc3MzYwM2QwZDZhYWJiZGQ2MmExMWVmNzIxZDE1NDJkODIwMTYwMjE2MTY1NjI3",
        "Timestamp": "20160912092847"
      },
      "checkoutTransaction": {
        "SourceApp": "TestATM",
        "TransactionType": "CashOut",
        "MerchantRequestID": "821804120",
        "Amount": "50",
        "PhoneNumber": "254725716707",
        "CallbackURL": "http://172.18.29.40:8080/mc/callbackURL",
        "Parameter": {
          "ReferenceItem": [
            {
              "Key": "",
              "Value": ""
            }
          ]
        },
        "TransactionDesc": "CashOut Test Transaction"
      }
    }
  }
}

```

ResultCheckout

Sample Callback Request:

```

{
  "stkCallback": {
    "MerchantRequestID": "CCCD68DE-4BB1",
    "ResultCode": "0",
    "ResultDesc": "The service request has been accepted successfully."
  }
}

```

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```

    "CallbackMetadata": [
      {
        "Item": {
          "Name": "Amount",
          "Value": "60"
        }
      },
      {
        "Item": {
          "Name": "MpesaReceiptNumber",
          "Value": "KIF510PGLR"
        }
      },
      {
        "Item": {
          "Name": "Balance",
          "Value": "{Amount={BasicAmount=604.45, MinimumAmount=60t445, CurrencyCode=KES}}"
        }
      },
      {
        "Item": {
          "Name": "TransactionDate",
          "Value": "20160915200515"
        }
      },
      {
        "Item": {
          "Name": "PhoneNumber",
          "Value": "0708835256"
        }
      }
    ]
  }

```

Sample Callback Response

```

{"stkCallbackResponse": {"ResponseCode": "0"}}

```

QueryCheckout

Sample Request

```

{
  "QueryCheckout": {
    "QueryCheckoutRequest": {

```

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```

    "checkoutHeader": {
      "BusinessShortCode": "898945",
      "Password": "ODk4OTk4NWU4ODQ4OThkYTI4MDQ3MTUxZDBlNTZmOGRjNjI5Mjc3MzYwM2QwZDZhYWJiZGQ2MmExMWVmNzIxZDE1NDJkODIwMTYwMjE2MTY1NjI3",
      "Timestamp": "20160912092847"
    },
    "queryTransaction": {
      "CheckoutRequestID": "9763b078-5a62-11e6-8b77-86f30ca893d3"
    }
  }
}


```

Sample Response

```

{
  "QueryCheckout": {
    "QueryCheckoutResponse": {
      "return": {
        "MerchantRequestID": "CCCD68DE-4BB1",
        "ResultCode": "0",
        "ResultDesc": "The service request has been accepted successfully.",
        "CallbackMetadata": [
          {
            "Item": {
              "Name": "Amount",
              "Value": "60"
            }
          },
          {
            "Item": {
              "Name": "MpesaReceiptNumber",
              "Value": "KIF510PGLR"
            }
          },
          {
            "Item": {
              "Name": "Balance",
              "Value": "{Amount={BasicAmount=604.45, MinimumAmount=60t445, C
urrencyCode=KES}}"
            }
          },
          {
            "Item": {
              "Name": "TransactionDate",
              "Value": "20160915200515"
            }
          }
        ]
      }
    }
  }
}

```

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```
}  
}  
}
```