

**18/01/2021**

# **EFD RECEIPT API**

RECEIPT POSTING APPLICATION  
PROGRAMMING INTERFACE.  
(APIv3.1)



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**TANZANIA REVENUE AUTHORITY**

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## DOCUMENT DESCRIPTION

<b>Document Name</b>	Receipt Posting Application Programming Interface (Api)
<b>Owner</b>	Tanzania Revenue Authority
<b>Document Type</b>	EFDMS – Tax Payer Integration

## DOCUMENT VERSION CONTROL

<b>Version</b>	<b>Date</b>	<b>Change Description</b>
1.0	08-11-2018	Baseline initial version created.
1.1	30-11-2018	<ul style="list-style-type: none"><li>• Added CUSTIDTYPE, CUSTID, MOBILENUM &amp; RCTVNUM Field to efdmsRctInfo</li><li>• Removed CUSTTIN FIELD</li></ul>
1.2	06-12-2018	<ul style="list-style-type: none"><li>• Added ACKMSG to efdmsRctInfoAck</li></ul>
2.0	07-01-2019	<ul style="list-style-type: none"><li>• Added Token Based Authentication</li></ul>
2.1	10-04-2019	<ul style="list-style-type: none"><li>• Omitted MARKUP Field from efdmsRctInfo</li></ul>
2.2	05-05-2019	<ul style="list-style-type: none"><li>• Registration Information Request</li></ul>
	12-06-2019	<ul style="list-style-type: none"><li>• Renamed Fields SubTotal to TOTALTAXEXCL &amp; GrandTotal to TOTALTAXINCL in efdmsRctInfo</li></ul>
	28-06-2019	<ul style="list-style-type: none"><li>• Added TIN &amp; VRN node to efdmsRegAckInfo</li></ul>
	04-08-2019	<ul style="list-style-type: none"><li>• Added CITY, MOBILE, UIN &amp; STREET to efdmsRegAckInfo</li></ul>
3.0	16-12-2020	<ul style="list-style-type: none"><li>• Added Z-Report Posting Info</li></ul>
3.1	18-01-2021	<ul style="list-style-type: none"><li>• Added VFD Command Function</li></ul>

## **1. REGISTRATION INFORMATION REQUEST FLOW**

- a) Tax Payer billing system compose registration information request as per efdmsRegInfoxml format and submit request to TRA.
- b) TRA receive the request, immediately send back the acknowledgement as per efdmsRegInfoAckxml format to the billing system

## **2. RECEIPT POSTING FLOW**

- a) Tax Payer billing system compose receipt submission request as per efdmsRctInfoxml format and submit single receipt to TRA.
- b) TRA receive the receipt, immediately send back the acknowledgement as per efdmsRctInfoAckxml format to the billing system and post the receipt to its incoming receipt queue for processing.

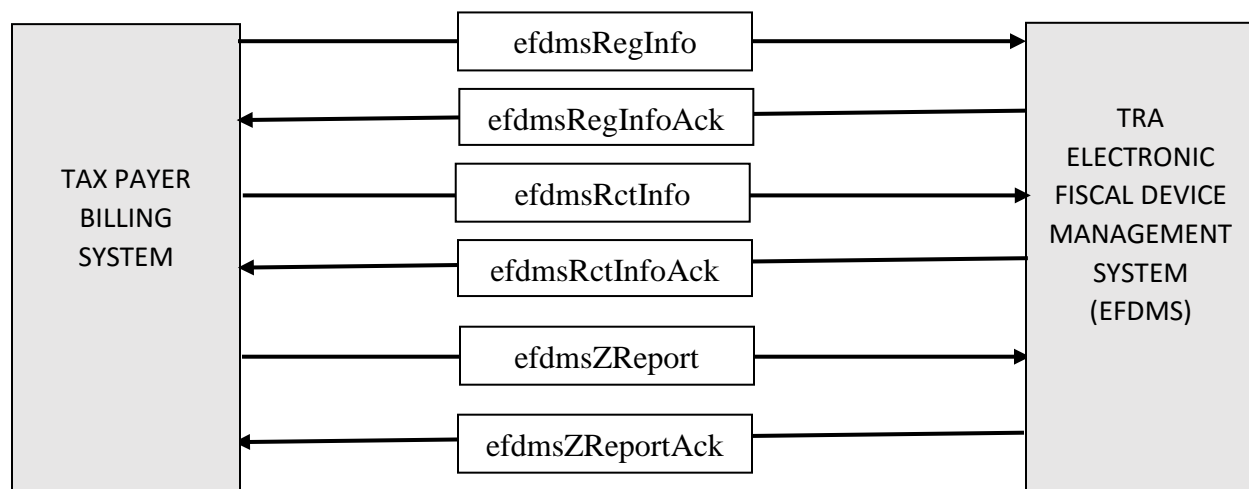
## **3. Z REPORT POSTING FLOW**

- a) Tax Payer billing system compose z-report submission request as per efdmsZReportxml format and submit single z-report to TRA.
- b) TRA receive the z-report, immediately send back the acknowledgement as per efdmsZReportAckxml format to the billing system and post the z-report to its incoming zreport queue for processing.

Receipt/Z Report (URL):

- i. <https://virtual.tra.go.tz/efdmsRctApi/api/efdmsRctInfo> (Posting of Receipts/Invoices)
- ii. <https://virtual.tra.go.tz/efdmsRctApi/api/vfdRegReq> (Posting registration request)
- iii. <https://virtual.tra.go.tz/efdmsRctApi/vfdtoken> (Posting token request)
- iv. <https://virtual.tra.go.tz/efdmsRctApi/api/efdmszreport> (Posting Z report)

## EFD REGISTRATION, RECEIPT & Z-REPORT POSTING FLOW



### 4. EFD REGISTRATION INFORMATION REQUEST HEADER

Parameter	Value/Description
Content-Type	Application/xml
Cert-Serial	Serial of the Key certificate provided. Should be base64 encoded
Client	Will be given during integration

### 5. EFD Registration Information Request – efdmsRegInfo

<REGDATA>

<TIN>109029092</TIN>

<CERTKEY>01TZ000001</CERTKEY>

</REGDATA>

Field	Data Type		Description
REGDATA			Registration Acknowledgement Envelop
TIN	Number(9)	Mandatory	Tax Identification Number of Vendor
CERTKEY	String(14)	Mandatory	Vendor System Serial Number

## 6. EFD Registration Information Acknowledgement– efdmsRegAckInfo

<EFDMSRESP>

<ACKCODE>0</ACKCODE>

<ACKMSG>Registration Successful</ACKMSG>

<REGID>TZ01005517</REGID>

<SERIAL>10TZ100101</SERIAL>

<UIN>09VFDWEBAPI-10131758710786855010TZ100280</UIN>

<TIN>109029092</TIN>

<VRN>40902909R</VRN>

<MOBILE>+255 713 655 545</MOBILE>

<STREET>OBAMA ST</STREET>

<CITY>DAR ES SALAAM</CITY>

<ADDRESS>P. O. BOX 5 DAR ES SALAAM</ADDRESS>

<COUNTRY>TANZANIA</COUNTRY>

<NAME>TANZANIA ELECTRIC SUPPLY COMPANY LTD</NAME>

<RECEIPTCODE>T61C7J</RECEIPTCODE>

<REGION>Large Taxpayer</REGION>

<ROUTINGKEY>vfdrc</ROUTINGKEY>

<GC>1</GC>

<TAXOFFICE>Tax Office Large Taxpayer</TAXOFFICE>

<USERNAME>babaaaib8490pawv</USERNAME>

<PASSWORD>SGyG!v8qndUk26h!</PASSWORD>

<TOKENPATH>vfdtoken</TOKENPATH>

<TAXCODES>

<CODEA>18</CODEA>

<CODEB>10</CODEB>

<CODEC>0</CODEC>

<CODED>0</CODED>

</TAXCODES>

</EFDMSRESP>

Field	Data Type		Description
EFDMSRESP			Registration Information Envelop
ACKCODE	Int(1)	Mandatory	0 means success. Else it would be an error code
ACKMSG	String(50)	Mandatory	Describes the ACKCODE above
REGID	String(50)	Mandatory	Vendor System Registration Id
SERIAL	String(14)	Mandatory	Vendor System Serial Number
UIN	String	Mandatory	User identification number issued by TRA once Taxpayer has been registered in EFDMS
TIN	Number	Mandatory	Tax Identification Number
VRN	String	Mandatory	Vat Registration Number
MOBILE	String	Mandatory	Mobile/Telephone number
STREET	String	Mandatory	Street
CITY	String	Mandatory	City
ADDRESS	String	Mandatory	Tax Payer's Address
COUNTRY	String	Mandatory	Country
NAME	String(100)	Mandatory	Tax Payer Trading Name
RECEIPTCODE	String	Mandatory	Also known as RCTVCODE which represent a unique code issued during registration
REGION	String	Mandatory	Tax Region
GC	Number	Mandatory	Integer to tell the total counter of the system, i.e. how many total receipts signed till date
TAXOFFICE	String	Mandatory	Tax Payer's Tax Office
USERNAME	String	Mandatory	Username to be used for Token Request
PASSWORD	String	Mandatory	Secret Key to be used for Token Request
TOKENPATH	String	Mandatory	URL Path for Token Request
TAXCODE	Char	Mandatory	Applicable tax on the item 1=Standard (CODEA) 2=Special rate(CODEB) 3=Zero Rated (CODEC) 4=Special Relief(CODED)

## 7. EFD RECEIPT INFORMATION REQUEST HEADER

Parameter	Value/Description
Content-Type	Application/xml
Routing-Key	Will be given during integration
Cert-Serial	Serial of the Key certificate provided. Should be base64 encoded
Authorization	Bearer token

## 8. EFD Receipt Information Posting – efdmsRctInfo

```
<RCT>

  <DATE>2018-11-07</DATE>

  <TIME>16:10:30</TIME>

  <TIN>109029092</TIN>

  <REGID>TZ001999000001</REGID>

  <EFDSERIAL>01TZ000001</EFDSERIAL>

  <CUSTIDTYPE>1</CUSTIDTYPE>

  <CUSTID>111222333</CUSTID>

  <CUSTNAME>Richard Kazimoto</CUSTNAME>

  <MOBILENUM>0713655545</MOBILENUM>

  <RCTNUM>1</RCTNUM>

  <DC>9</DC>

  <GC>1098</GC>

  <ZNUM>100</ZNUM>

  <RCTVNUM>AAAA119</RCTVNUM>

  <ITEMS>

    <ITEM>

      <ID>1</ID>

      <DESC>Sponsorship deal to TRA FC</DESC>

      <QTY>1</QTY>

      <TAXCODE>1</TAXCODE>

      <AMT>20000.01</AMT>

    </ITEM>

    <ITEM>

      <ID>2</ID>

      <DESC/>

      <QTY>2</QTY>

      <TAXCODE>2</TAXCODE>

      <AMT>10000.00</AMT>

    </ITEM>

  </ITEMS>

  <TOTALS>
```



<TOTALTAXEXCL>18000.00</TOTALTAXEXCL>  
 <TOTALTAXINCL>38000.0</TOTALTAXINCL>  
 <DISCOUNT>0.00</DISCOUNT>  
 </TOTALS>  
 <PAYMENTS>  
     <PMTTYPE>CASH</PMTTYPE>  
     <PMTAMOUNT>50000.00</PMTAMOUNT>  
     <PMTTYPE>CHEQUE</PMTTYPE>  
     <PMTAMOUNT>100000.00</PMTAMOUNT>  
     <PMTTYPE>CCARD</PMTTYPE>  
     <PMTAMOUNT>68000.00</PMTAMOUNT>  
     <PMTTYPE> EMONEY </PMTTYPE>  
     <PMTAMOUNT>68000.00</PMTAMOUNT>  
     <PMTTYPE> INVOICE </PMTTYPE>  
     <PMTAMOUNT>68000.00</PMTAMOUNT>  
 </PAYMENTS>  
 <VATTOTALS>  
     <VATRATE>A</VATRATE>  
         <NETTAMOUNT>100000.00</NETTAMOUNT>  
         <TAXAMOUNT>16500.00</TAXAMOUNT>  
     <VATRATE>B</VATRATE>  
         <NETTAMOUNT>100000.00</NETTAMOUNT>  
         <TAXAMOUNT>0.00</TAXAMOUNT>  
     <VATRATE>C</VATRATE>  
         <NETTAMOUNT>100000.00</NETTAMOUNT>  
         <TAXAMOUNT>0.00</TAXAMOUNT>  
 </VATTOTALS>  
 </RCT>

Field	Data Type		Description
RCT			Receipt Information Envelop
DATE	DateAndTime	Mandatory	Transaction Date YYYY-MM-DD
TIME	DateAndTime	Mandatory	Transaction Time HH24:MI:SS
TIN	Number(9)	Mandatory	Tax Identification Number of Vendor
REGID	String(50)	Mandatory	Vendor System Registration Id

EFD SERIAL	String(14)	Mandatory	Vendor System Serial Number
CUSTIDTYPE	String	Mandatory	Buyer Used ID type. This can be 1- TIN, 2Driving License, 3-Voters Number, 4. Passport, 5. NID, 6. NIL, 7.Meter No. for
CUSTID	String	Mandatory if custidtype is not 6	Identification Number corresponding to the CUSTIDTYPE choosen
CUSTNAME	String(100)	Optional	Customer Name
RCTNUM	String	Mandatory	RCT Receipt Number
MOBILENUM	Integer	Optional	Buyer's Mobile Number
DC	Number	Mandatory	Integer to tell the daily counter of the system
GC	Number	Mandatory	Integer to tell the total counter of the system, i.e. how many total receipts signed till date
ZNUM	Number	Mandatory	The znum to which this RCT will belong
RCTVNUM	String	Mandatory	This is a receipt verification number composed of RCTV CODE which represent a unique code issued during registration or by command to existing machine. It's concatenated with Global Counter (GC) Format description RCTV CODE: AAAA11, GC:9 RCTVNUM: AAAA119
ITEMS			Envelop for Receipt Items
ITEM			Receipt Item Information
ID	String	Mandatory	Item Code
DESC	String	Optional	Item Description
QTY	Decimal	Mandatory	Quantity
TAXCODE	Char	Mandatory	Applicable tax on the item 1=Standard (A-18) 2=Special rate(B-10) 3=Zero Rated (C-0) 4=Special Relief(D-SR) 5=Exempted(E-EX)
AMT	Decimal	Mandatory	Amount Inclusive of taxes
TOTALS			Envelop for Receipt Totals
TOTALTAXEXCL	Decimal	Mandatory	Total Amount of all Items Excluding Tax
TOTALTAXINCL	Decimal	Mandatory	Total Amount of all Items Including Tax
DISCOUNT	Decimal	Mandatory	Discount Amount exclusive of Tax
PAYMENTS			Envelop for Receipt Payments
PMTTYPE	String	Mandatory	Receipt can have more than one modes of payment. Only 4 types allowed. They must be specified as CASH, CHEQUE, CCARD, EMONEY, INVOICE. Any other will not be accepted
PMTAMOUNT	Decimal	Mandatory	Payment Amount
VATTOTALS			Envelop for Receipt Vat Totals
VATRATE	String(100)	Mandatory	Identification of the Vat Rate (A,B,C...)
NETAMOUNT	Decimal	Mandatory	Net Amount

TAXAMOUNT	Decimal	Mandatory	Tax Amount
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## 9. EFD Receipt Information Posting Acknowledgement – efdmsRctInfoAck

<RCTACK>

<RCTNUM>1</RCTNUM>

<DATE>2018-11-07</DATE>

<TIME>19:30:24</TIME>

<ACKCODE>0</ACKCODE>

< ACKMSG>Success</ ACKMSG>

</RCTACK>

Field	Data Type		Description
RCTACK			Receipt Acknowledgement Envelop
RCTNUM	Int	Mandatory	Receipt Number for the posted receipt
DATE	DateAndTime	Mandatory	Transaction Date YYYY-MM-DD
TIME	DateAndTime	Mandatory	Transaction Time HH24:MI:SS
ACKCODE	Int(1)	Mandatory	0 means success. Else it would be an error code
ACKMSG	String(50)	Mandatory	Describes the ACKCODE above

## 10. EFD Z-REPORT REQUEST HEADER

Parameter	Value/Description
Content-Type	Application/xml
Routing-Key	Will be given during integration
Cert-Serial	Serial of the Key certificate provided. Should be base64 encoded
Authorization	Bearer token

## 11. EFD Z-Report Posting – efdmsZReport

<ZREPORT>

<DATE>2020-06-03</DATE>

<TIME>05:53:04</TIME>

<HEADER>

<LINE>TEST TAXPAYER</LINE>

<LINE>PLOT:125/126/127,MAGOMENI STREET</LINE>

<LINE>TEL NO:+255 999999</LINE>

<LINE>DAR ES SALAAM,TANZANIA</LINE>

<!--Header details for taxpayer as per registration acknowledgment-->

</HEADER>

<VRN>12345678A</VRN>

<TIN>22222222</TIN>

<TAXOFFICE>TEST REGION</TAXOFFICE>

<REGID>TZ0100082639</REGID>

<ZNUMBER>20201005</ZNUMBER>

<EFDSERIAL>10TZ107372</EFDSERIAL>

<REGISTRATIONDATE>2019-08-15</REGISTRATIONDATE>

<USER>09VFDWEBAPI-111111112222222210TZ107372</USER>

<SIMIMSI>WEBAPI</SIMIMSI>

<!--Fix simimsi to webapi-->

<TOTALS>

<DAILYTOTALAMOUNT>2143250.00</DAILYTOTALAMOUNT>

<!--Sum of all sales for the day-->

<GROSS>513880841.00</GROSS>

<!--Cumulative sales from day one to present-->

<CORRECTIONS>0.00</CORRECTIONS>

<!--Fix corrections to zero-->

<DISCOUNTS>0.00</DISCOUNTS>

<!--Total discounts issued -->

<SURCHARGES>0.00</SURCHARGES>

<TICKETSVOID>0</TICKETSVOID>

<!--Total number of tickets voided/cancelled in the system & therefore not sent to tra. -->

<TICKETSVOIDTOTAL>0.00</TICKETSVOIDTOTAL>

<!--Total amount of tickets voided/cancelled in the system & therefore not sent to tra. -->

<TICKETSFISCAL>36</TICKETSFISCAL>

<!--Total fiscal receipt issued-->

<TICKETSNONFISCAL>6</TICKETSNONFISCAL>

<!-- Total number of receipts not sent to tra as a result of void/cancel -->

</TOTALS>

<VATTOTALS>

<VATRATE>A-18.00</VATRATE>

<NETTAMOUNT>1816313.55</NETTAMOUNT>

<!--Total exclusive of tax for vat items-->

<TAXAMOUNT>326936.45</TAXAMOUNT>

<!--Total vat for the day-->

<VATRATE>B-0.00</VATRATE>

<NETTAMOUNT>0.00</NETTAMOUNT>

<TAXAMOUNT>0.00</TAXAMOUNT>

<VATRATE>C-0.00</VATRATE>

<NETTAMOUNT>0.00</NETTAMOUNT>

<!--Total sales for zero rated items for the day-->

<TAXAMOUNT>0.00</TAXAMOUNT>

<!--Tax will always be zero-->

<VATRATE>D-0.00</VATRATE>

<NETTAMOUNT>0.00</NETTAMOUNT>

<!--Tax will always be zero-->

<TAXAMOUNT>0.00</TAXAMOUNT>

<VATRATE>E-0.00</VATRATE>

<!--Total sales for zero rated items for the day-->

```

<NETTAMOUNT>0.00</NETTAMOUNT>

<!--Tax will always be zero-->

<TAXAMOUNT>0.00</TAXAMOUNT>

</VATTOTALS>

<PAYMENTS>

  <PMTTYPE>CASH</PMTTYPE>

  <PMTAMOUNT>2143250.00</PMTAMOUNT>

  <!--TOTAL sales of all receipts paid by CASH-->

  <PMTTYPE>CHEQUE</PMTTYPE>

  <PMTAMOUNT>0.00</PMTAMOUNT>

  <!--TOTAL sales of all receipts paid by CHEQUE-->

  <PMTTYPE>CCARD</PMTTYPE>

  <PMTAMOUNT>0.00</PMTAMOUNT>

  <!--TOTAL sales of all receipts paid by CREDIT CARD-->

  <PMTTYPE>EMONEY</PMTTYPE>

  <PMTAMOUNT>0.00</PMTAMOUNT>

  <!--TOTAL sales of all receipts paid by EMONEY-->

  <PMTTYPE>INVOICE</PMTTYPE>

  <PMTAMOUNT>0.00</PMTAMOUNT>

  <!--SUM of for all invoices. This is for INVOICES alone-->

</PAYMENTS>

<CHANGES>

  <VATCHANGENUM>0</VATCHANGENUM>

  <!--Fix VATCHANGENUM to 0-->

  <HEADCHANGENUM>0</HEADCHANGENUM>

  <!--Fix HEADCHANGENUM to 0-->

</CHANGES>

```

<ERRORS></ERRORS>

<!--For VFD leave ERROR node empty like shown above-->

<FWVERSION>3.0</FWVERSION>

<!--Fix firmware version to 3.0-->

<FWCHECKSUM>WEBAPI</FWCHECKSUM>

<!--Fix checksum to WEBAPI-->

</ZREPORT>

Field	Data Type	Description	Remarks
DATE	Date	Date of the Z report	
TIME	Time	Time of the issue	
HEADER	Recordset	Contains Header lines	
LINE	String	Inside Header, define Name, Address, TIN, VRN, Telephone etc. as programmed in EFD and printed on each receipt	Can be multiple, minimum 4 header lines and maximum 8 header lines
VRN	String	VAT registration number	If taxpayer is registered on VAT should show its VRN, if not registered should be left blank
TIN	String	TAX identification number	TIN of the seller
TAXOFFICE	String	Name of the Tax office where a taxpayer submits his/her returns	
REGID	String	This is a unique ID issued to a fiscal device upon a successful registration. The REGID must not be programmed by user or technician and must only be received from server.	REGID will be in format TZmmmmnnnnxxxxxxxxx Where mmm=manufacturer code nnn=supplier code xxxxxxxxx=unique ID issued for the device
ZNUMBER	Integer	ZNUM for VFDs will be a number in format of (YYYYMMDD) and this will change on Daily Basis	Example: ZNUM for Today: 20191018, ZNUM for yesterday: 20191017, ZNUM for tomorrow: 20191019. ZNUM is date of transaction written in number format.

EFD SERIAL	String	This is the serial number of the fiscal device. This number is composed of two digits which represent the manufacturer code followed by two letters representing the Tanzania country code and followed by the serial number of the production.	Each fiscal device should have a unique serial number to avoid matching with another fiscal device(s)  The format of the serial number should be like this: Example: 01TZ100311
REGISTRATION DATE	Date	Date when the fiscal device has been registered/Fiscalized	
USER	String	Identification number of the taxpayer	Leave this node empty with both tags
SIMIMSI	String	International Mobile Subscriber Identity (IMSI) for sim card used in the EFD Machine	Fix value to <b>WEBAPI</b>
TOTALS	RecordSet	Record that contains totals and each kind of counter since the last Z Report	
VATTOTALS	RecordSet	Nett and Tax Amounts Totals	
PAYMENTS	RecordSet	RecordSet that contains payments	
CHANGES	Recordset	This includes VAT rates, header changes	Will further contain VATChanges, HeaderChanges
ERRORS	RecordSet	Any Errors Contained	Leave this node empty with both nodes
FWVERSION	String	Firmware Version	Fix value to 3.0
FWCHECKSUM	String	Firmware Checksum	Fix value to WEBAPI

#### Z Report TotalsRecordSet

Field	Type	Description	Remark
DAILYTOTALAMOUNT	Double	Total Sales Amount	Sum of all Sales For The Day
GROSS	Double	Accumulative Total	Cumulative Sales From Day One To Present
CORRECTIONS	Double	Any Corrections made	Fix Value For TotalCorrection To Zero
DISCOUNTS	Double	Discounts for the Day	TOTAL DISCOUNTS ISSUED
SURCHARGES	Double	Extra Charges added	Fix Value For Totalsurcharge To Zero
TICKETSVOID	Integer	Number of voided tickets	Total number of tickets voided/cancelled in the system and therefore not sent to TRA



TICKETSVOIDTOTAL	Double	Amount of all voided receipts	Total amount of tickets voided/cancelled in the system and therefore not sent to TRA
TICKETSFISCAL	Integer	Number of fiscal receipts	Total fiscal receipt/invoices issued
TICKETSNONFISCAL	Integer	Number of non-fiscal receipts issued by the machine	Total number of tickets voided/cancelled in the system and therefore not sent to TRA

#### VATTotalsRecordSet

Field	Type	Description	Remark
VATRATE	Char	Identifier of the vatrate (A,B,C...)	
NETTAMOUNT	Double	Nett Sales	
TAXAMOUNT	Double	Tax Amount for the Rate	

#### PaymentsRecordSet

Field	Type	Description	Remark
PMTTYPE	String	Payment type can be CASH CHEQUE CCARD EMONEY INVOICE	
PMTAMOUNT	Double	Payment amount based on payment type used	

#### ChangesRecordSet

Field	Type	Description	Remark
VATCHANGENUM	Integer	Number of changes on VAT rates	If tax code value changes after sending registration request update vatchangenum count
HEADCHANGENUM	Integer	Number of changes on Header	If header lines change after sending registration request update headchange count
FMCHANGENUM	Integer	Number of changes on firmware	Fix value to zero

### VATChangesRecordSet

Field	Type	Description	Remark
VATRATE	Char	Identifier of the vatrate (A,B,C...)	
FROMVALUE	Double	Previous value of the vat rate	
TOVALUE	Double	Current value of the vat rate	

### HeaderChangesRecordSet

Field	Type	Description	Remark
HEADERLINE	Integer	Number of header line starting from 1	
FROMVALUE	String	Previous text	
TOVALUE	String	Current text on the header line	

## 12.EFD Z-Report Posting Acknowledgement – efdmsZReportAck

<ZACK>

<ZNUMBER>1</ ZNUMBER >

<DATE>2018-11-07</DATE>

<TIME>19:30:24</TIME>

<ACKCODE>0</ACKCODE>

< ACKMSG>Success</ ACKMSG>

</ZACK>

Field	Data Type		Description
ZACK			Z-Report Acknowledgement Envelop
ZNUMBER	Int	Mandatory	Z-Report Number for the posted receipt
DATE	DateAndTime	Mandatory	Report Date YYYY-MM-DD
TIME	DateAndTime	Mandatory	Report Time HH24:MI:SS
ACKCODE	Int(1)	Mandatory	0 means success. Else it would be an error code
ACKMSG	String(50)	Mandatory	Describes the ACKCODE above

## 13. Digital Signature Security

### 1.0 Overview

Digital signature will be used for message exchange between EFDMS and Tax Payer Billing System. The EFDMS and Tax Payer Billing System API will be required to apply the digital signature. All messages must be signed by the Participant's private key and verified using participants Public Key. In case of failure to verify the signature messages will be rejected with the reason "Invalid Signature".

### 2.0 Digital Signature

The security architecture used 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.

### 3.0 Format of Digital Signature

The 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. The message should be digitally signed and obey the following rules:

The message contains the actual message (Request and Response) and the digital signature of that message in the form of:-

<Envelope>

<message></message>

<digital\_signature></digital\_signature>

</Envelope>

The Digital Signature Algorithm used must be SHA1withRSA.

Therefore, after applying the digital Signature the complete message exchanged between the systems will be as follows: -

<EFDMS>

Actual Message	<pre>&lt;RCT&gt;   &lt;DATE&gt;2018-11-07&lt;/DATE&gt;   &lt;TIME&gt;16:10:30&lt;/TIME&gt;   &lt;TIN&gt;109029092&lt;/TIN&gt;   &lt;REGID&gt;TZ001999000001&lt;/REGID&gt;   &lt;EFD SERIAL&gt;01TZ000001&lt;/EFD SERIAL&gt;   &lt;CUSTIDTYPE&gt;1&lt;/CUSTIDTYPE&gt;   &lt;CUSTID&gt;111222333&lt;/CUSTID&gt;   &lt;CUSTNAME&gt;Richard Kazimoto&lt;/CUSTNAME&gt;   &lt;MOBILENUM&gt;0713655545&lt;/MOBILENUM&gt;   &lt;RCTNUM&gt;1&lt;/RCTNUM&gt;   &lt;DC&gt;9&lt;/DC&gt;   &lt;GC&gt;1098&lt;/GC&gt;   &lt;ZNUM&gt;100&lt;/ZNUM&gt;   &lt;RCTVNUM&gt;AAAA119&lt;/RCTVNUM&gt;   &lt;ITEMS&gt;     &lt;ITEM&gt;       &lt;ID&gt;1&lt;/ID&gt;       &lt;DESC&gt;Sponsorship deal to TRA FC&lt;/DESC&gt;       &lt;QTY&gt;1&lt;/QTY&gt;       &lt;TAXCODE&gt;1&lt;/TAXCODE&gt;       &lt;AMT&gt;20000.01&lt;/AMT&gt;     &lt;/ITEM&gt;     &lt;ITEM&gt;       &lt;ID&gt;2&lt;/ID&gt;       &lt;DESC/&gt;       &lt;QTY&gt;2&lt;/QTY&gt;       &lt;TAXCODE&gt;2&lt;/TAXCODE&gt;       &lt;AMT&gt;10000.00&lt;/AMT&gt;     &lt;/ITEM&gt;   &lt;/ITEMS&gt;   &lt;TOTALS&gt;     &lt;TOTALTAXEXCL&gt;18000.00&lt;/TOTALTAXEXCL&gt;     &lt;TOTALTAXINCL&gt;38000.0&lt;/TOTALTAXINCL&gt;     &lt;DISCOUNT&gt;0.00&lt;/DISCOUNT&gt;   &lt;/TOTALS&gt;   &lt;PAYMENTS&gt;     &lt;PMTTYPE&gt;CASH&lt;/PMTTYPE&gt;     &lt;PMTAMOUNT&gt;50000.00&lt;/PMTAMOUNT&gt;     &lt;PMTTYPE&gt;CHEQUE&lt;/PMTTYPE&gt;     &lt;PMTAMOUNT&gt;100000.00&lt;/PMTAMOUNT&gt;     &lt;PMTTYPE&gt;CCARD&lt;/PMTTYPE&gt;     &lt;PMTAMOUNT&gt;68000.00&lt;/PMTAMOUNT&gt;     &lt;PMTTYPE&gt;EMONEY&lt;/PMTTYPE&gt;     &lt;PMTAMOUNT&gt;0.00&lt;/PMTAMOUNT&gt;   &lt;/PAYMENTS&gt;   &lt;VATTOTALS&gt;     &lt;VATRATE&gt;A&lt;/VATRATE&gt;     &lt;NETTAMOUNT&gt;100000.00&lt;/NETTAMOUNT&gt;     &lt;TAXAMOUNT&gt;16500.00&lt;/TAXAMOUNT&gt;     &lt;VATRATE&gt;B&lt;/VATRATE&gt;     &lt;NETTAMOUNT&gt;100000.00&lt;/NETTAMOUNT&gt;     &lt;TAXAMOUNT&gt;0.00&lt;/TAXAMOUNT&gt;     &lt;VATRATE&gt;C&lt;/VATRATE&gt;     &lt;NETTAMOUNT&gt;100000.00&lt;/NETTAMOUNT&gt;     &lt;TAXAMOUNT&gt;0.00&lt;/TAXAMOUNT&gt;   &lt;/VATTOTALS&gt; &lt;/RCT&gt;</pre>

Signature	<EFDMSIGNATURE>WBbXH0ZZtNfOPzpVQz0UCsTMhk6OALZYeEXaJKShtkyp4afb1Ttx3cKj L4JfiHKq9+JJBo19qQORgoJC1+ihh2HIJ0DJLkmtW3Ltt1CFmc2Rd20Z5FgkXBZX+r+dkVEzwFN y7qi6yTheH6FwyL96Tqc1N3O+2Fhr63QufpYPD8Yo3Ee7rqqSY8hiJTatwt4S+oLAoVQOPyVE z+21Xm26LDEObsvMmA1e5qdtOGWeewYQHmamRhSYPIY70Jnh8PtTCFbE4pLaLuYyeiy4S2 fqRoy+h8mpu8ZUokgLnMz5Z2i2PaNDQ8UEn2pKAww1bzIKWFPTeZ+BaCXwx9gdvE9NKA= = </EFDMSIGNATURE>
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</EFDMS>

## **14. Token Based Authentication**

### **1.0 Overview**

Tokens will be used for message exchange between EFDMS and Tax Payer Billing System. All requests must be passed with the valid token in the message header to the server, which will be validated by the server and if the token is valid, then the client will be able to access and post the receipt.

### **2.0 Token**

A token is a piece of data that has no meaning or use on its own, but combined with the correct tokenization system, becomes a vital player in securing the Web API. Token based authentication works by ensuring that each request to a server is accompanied by a signed token which the server verifies for authenticity and only then responds to the request.

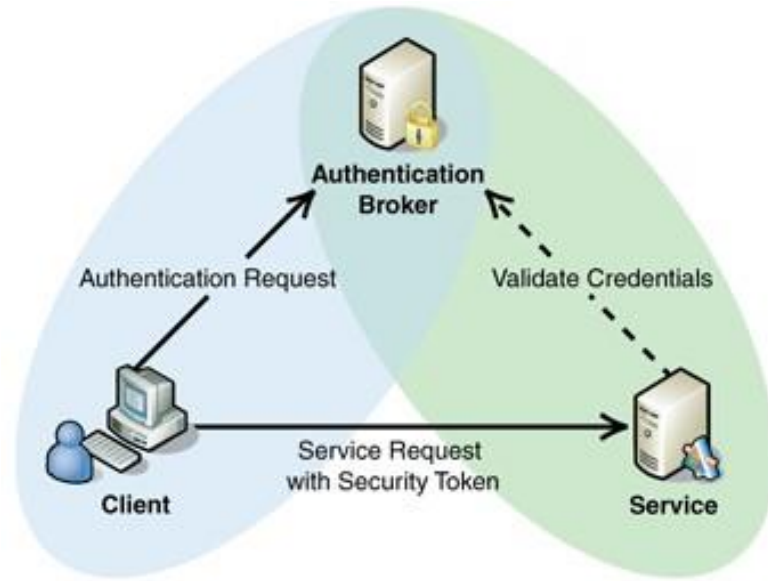
### **3.0 Token Authentication Architecture**

- a) Tax Payer billing system (Client) sends an authentication request of Content-Type (application/x-www-form-urlencoded) by passing its credentials [user name and password], which go to the TRA authentication server.
- b) TRA authentication server verifies Client credentials and if it is a valid user, then it will return a signed token to the client system, which has an expiration time.
- c) The client can store this token locally using any mechanism like local storage, session storage etc. and if the client makes any other call to the server for data, then it does not need to pass its credentials every time. The client can directly pass the token to the server, which will be validated by the server and if the token is valid, then the Client will be able to access post the receipt.

Token Request URL:

<https://virtual.tra.go.tz/efdmsrctapi/vfdtoken>

## Token Authentication Architecture Diagram



### 15.VFD Commands

Commands are a set of instruction that are issued by TRA to perform specific Functions on given Virtual devices. Such commands will include BLOCK, UNBLOCK, RCTVCODE, ENABLEVAT & DISABLEVAT which will be transmitted through message headers on response to the Token request.

Whenever a token request is made to TRA servers, a response will be generated with headers as shown below.

#### VFD TOKEN RESPONSE HEADER

Parameter	Value/Description
CONTENT-TYPE	Application/json;charset=UTF-8
ACKCODE	A number that represents the status or command issued by TRA
ACKMSG	Description of the given command (ACKCODE)

#### LIST OF VFD COMMANDS

ACKCODE	ACKMESSAGE	DESCRIPTION
7	ACTIVATED	The device is activated and ready for use and hence the token is granted
8	Custom Message from TRA	The device is BLOCKED with reason or message as provided in the ACKMESSAGE
18	Vfd Vrn/Rctvcode Changed, Re-Registration Required	RCTVCODE/ENABLEVAT/DISABLEVAT commands have been issued by TRA hence a Registration Information Request is required to acquire the given changes and update accordingly