Cross-border (FX) Design

The Mojaloop currency conversion functional implementation includes support for Payer DFSP currency conversion. In this scenario, it is the Payer DFSP that comes to an agreement with the foreign exchange provider, to provide another currency liquidity in order to fund the transfer. There are two variation of the implementation.

- Sending funds from a local currency
- Making a payment in a foreign currency

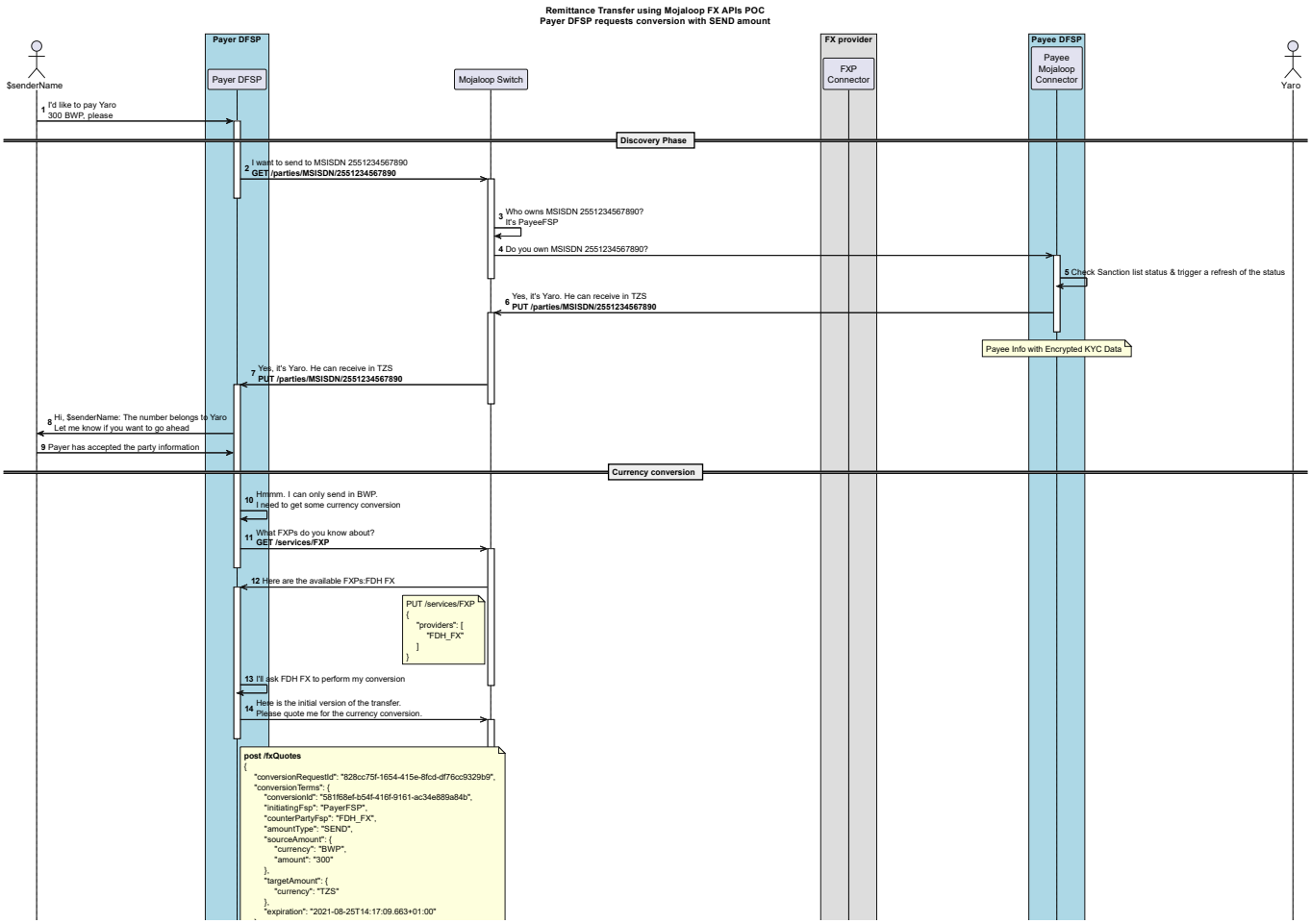
The difference between these use case concerns the amount Type that is specified when making the transfer.

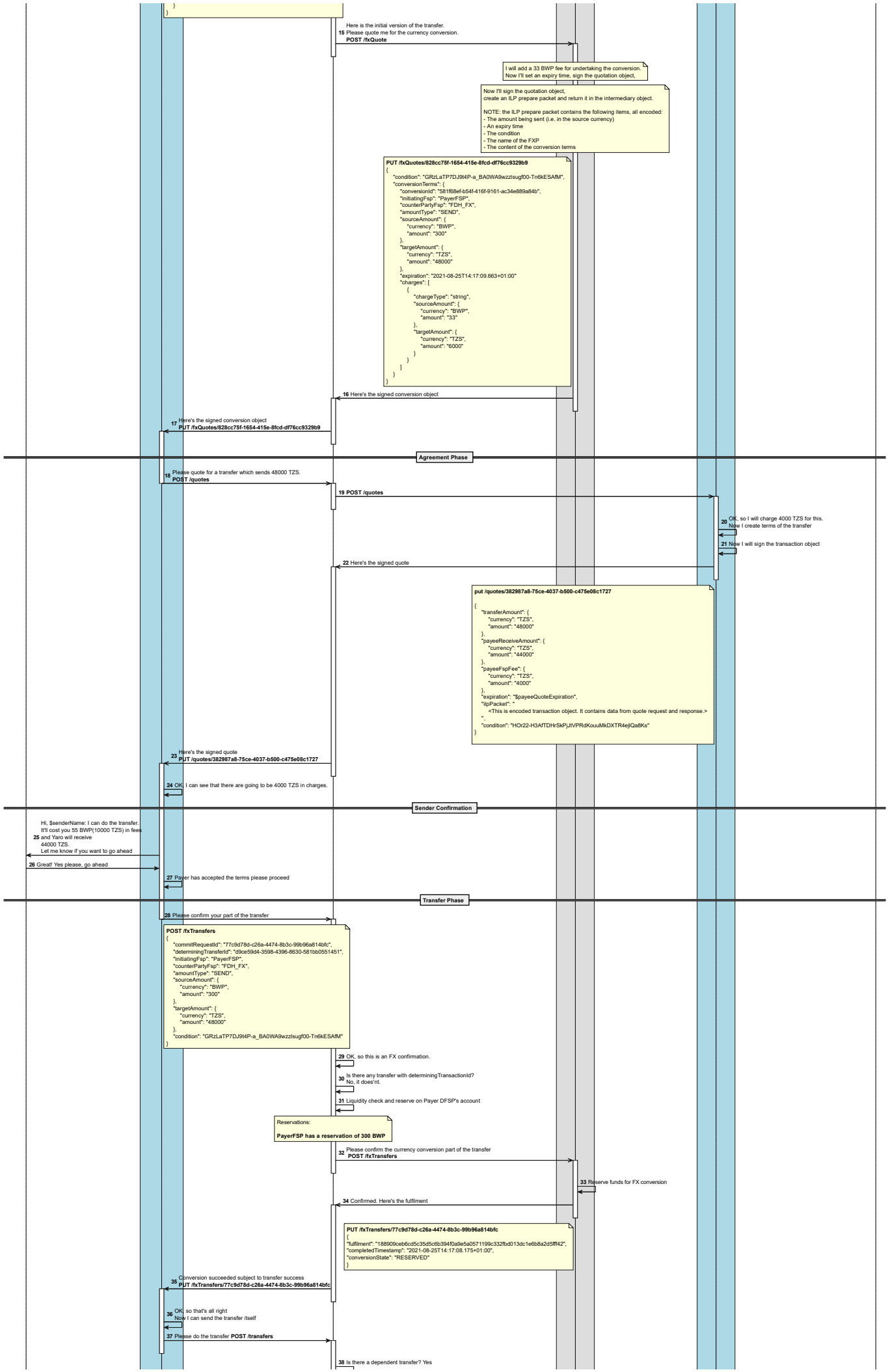
Sending funds to an account in another currency

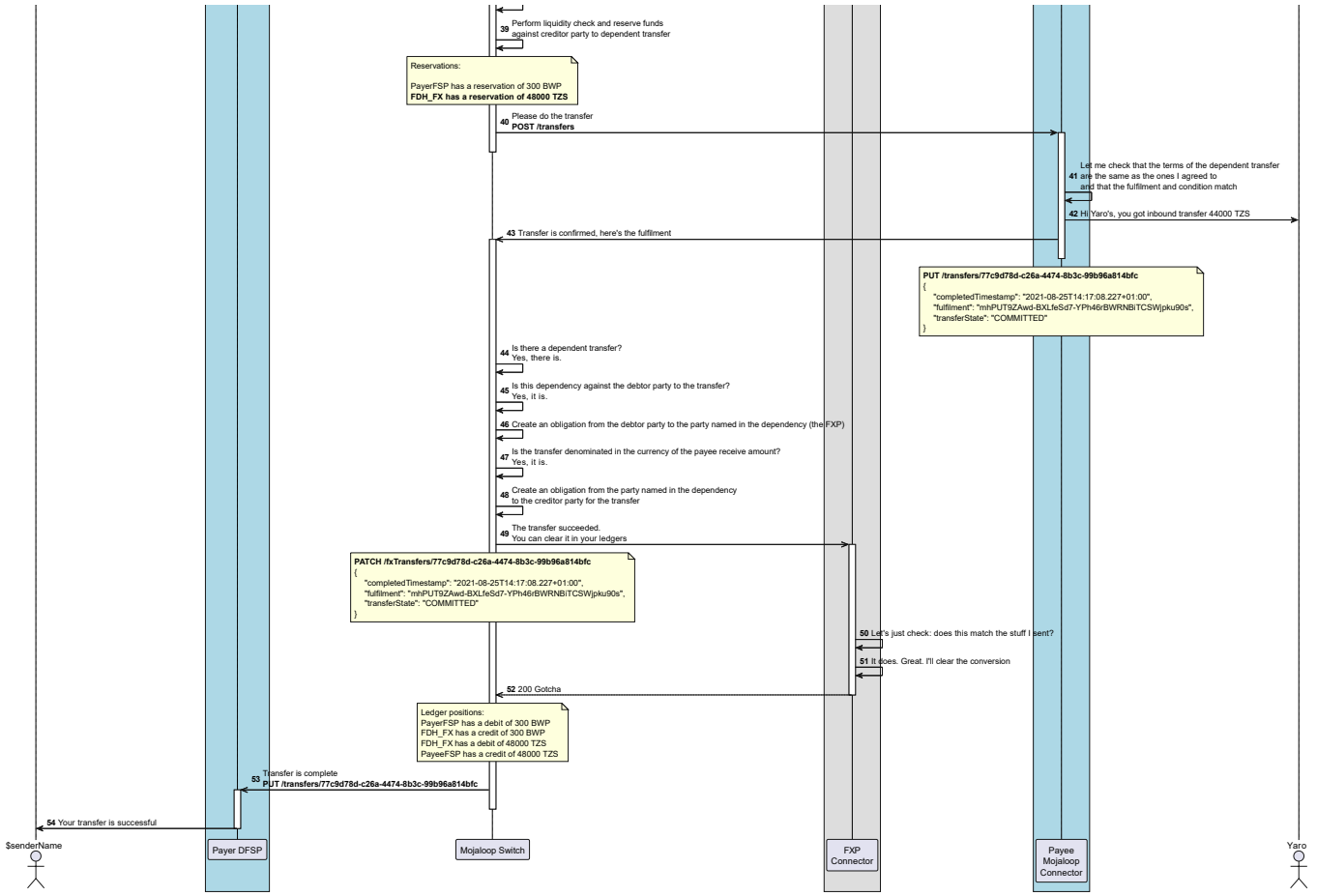
For this use case, the Payer DFSP will specify the transfer with amount type **SEND** and define the transfer amount in the **Payer's local currency** (the source currency). An secondary use case example for this is a P2P remittance transfer.

Simplified Send Money Diagram

Below is a simplified sequence diagram showing the flows between the Participant organizations, the foreign exchange providers and the Mojaloop switch.

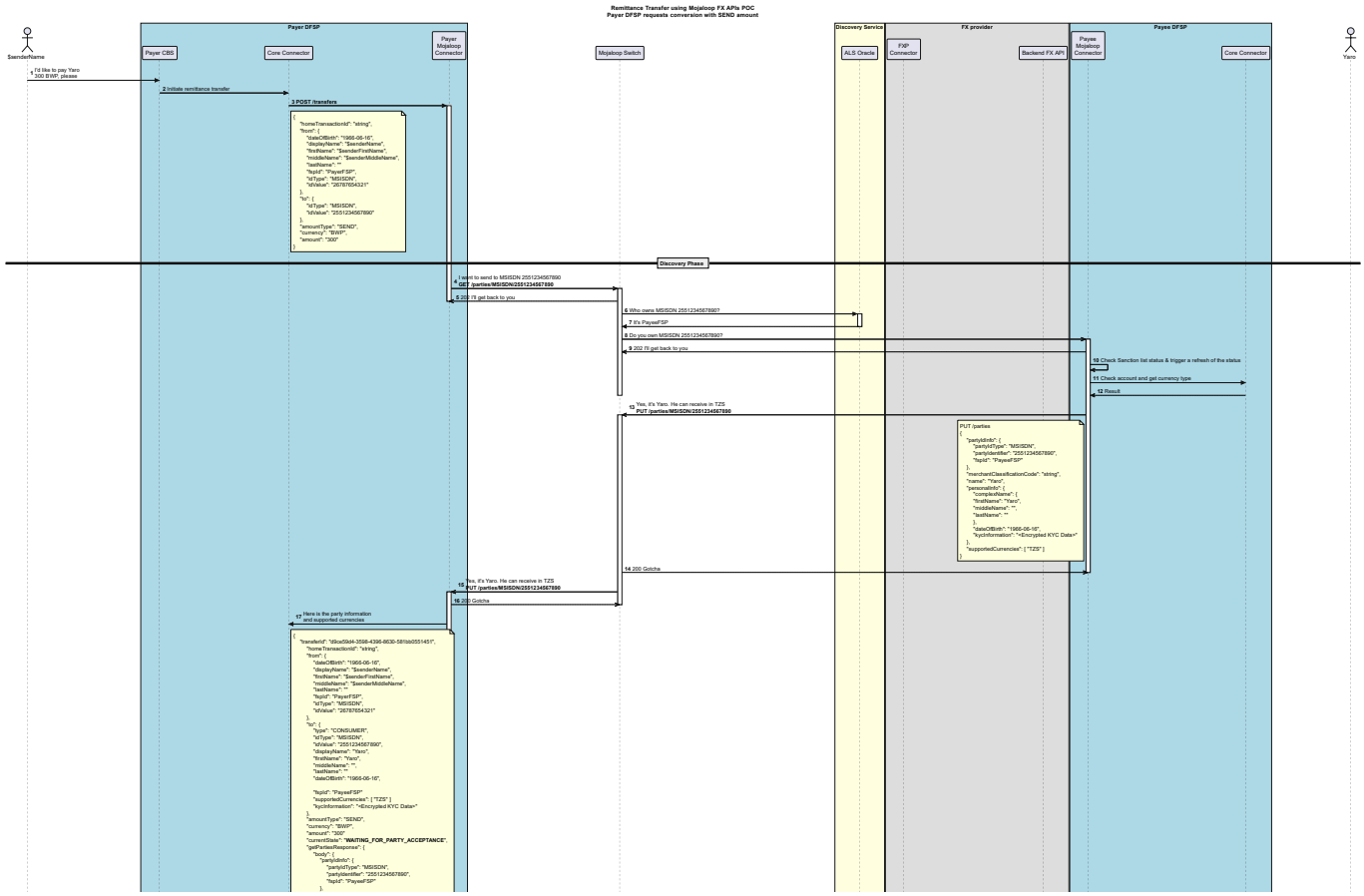


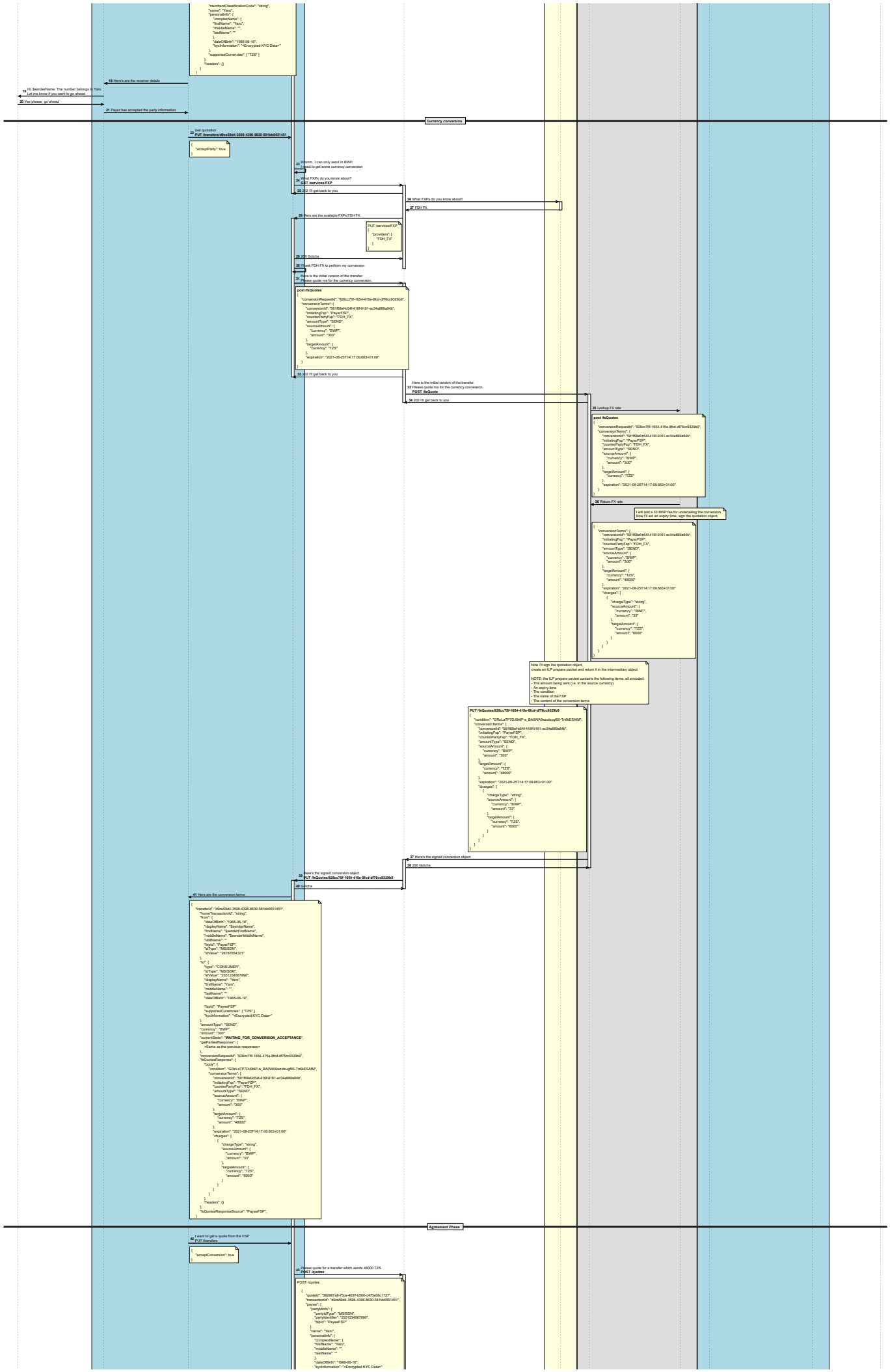

}
}
Here is the initial version of the transfer.
15 Please quote me for the currency conversion.
POST /fxQuote
I will add a 33 BWP fee for undertaking the conversion.
Now I'll set an expiry time, sign the quotation object,
Now I'll sign the quotation object,
create an ILP prepare packet and return it in the intermediary object.
NOTE: the ILP prepare packet contains the following items, all encoded:
- The amount being sent (i.e. in the source currency)
- An expiry time
- The condition
- The name of the FXP
- The content of the conversion terms
PUT /fxQuotes/828cc75f-1654-415e-8fcd-df76cc9329b9
{
"condition": "GRzLaTP7DJ9t4P-a_BA0WA9wzzIsugf00-Tn6kESAfM",
"conversionTerms": {
"conversionId": "581f68ef-b54f-416f-9161-ac34e889a84b",
"initiatingFsp": "PayerFSP",
"counterPartyFsp": "FDH_FX",
"amountType": "SEND",
"sourceAmount": {
"currency": "BWP",
"amount": "300"
},
"targetAmount": {
"currency": "TZS",
"amount": "48000"
},
"expiration": "2021-08-25T14:17:09.663+01:00"
"charges": [
{
"chargeType": "string",
"sourceAmount": {
"currency": "BWP",
"amount": "33"
},
"targetAmount": {
"currency": "TZS",
"amount": "6000"
}
}
]
}
}
16 Here's the signed conversion object
17 Here's the signed conversion object
PUT /fxQuotes/828cc75f-1654-415e-8fcd-df76cc9329b9
Agreement Phase
18 Please quote for a transfer which sends 48000 TZS.
POST /quotes
19 POST /quotes
20 OK, so I will charge 4000 TZS for this.
Now I create terms of the transfer
21 Now I will sign the transaction object
22 Here's the signed quote
put /quotes/382987a8-75ce-4037-b500-c475e08c1727
{
"transferAmount": {
"currency": "TZS",
"amount": "48000"
},
"payeeReceiveAmount": {
"currency": "TZS",
"amount": "44000"
},
"payeeFspFee": {
"currency": "TZS",
"amount": "4000"
},
"expiration": "$payeeQuoteExpiration",
"ilpPacket": "
<This is encoded transaction object. It contains data from quote request and response.>
",
"condition": "HOr22-H3AfTDHrSkPjJtVPRdKouuMkDXTR4ejlQa8Ks"
}
23 Here's the signed quote
PUT /quotes/382987a8-75ce-4037-b500-c475e08c1727
24 OK, I can see that there are going to be 4000 TZS in charges.
Sender Confirmation
Hi, $senderName: I can do the transfer.
It'll cost you 55 BWP(10000 TZS) in fees
25 and Yaro will receive
44000 TZS.
Let me know if you want to go ahead
26 Great! Yes please, go ahead
27 Payer has accepted the terms please proceed
Transfer Phase
28 Please confirm your part of the transfer
POST /fxTransfers
{
"commitRequestId": "77c9d78d-c26a-4474-8b3c-99b96a814bfc",
"determiningTransferId": "d9ce59d4-3598-4396-8630-581bb0551451",
"initiatingFsp": "PayerFSP",
"counterPartyFsp": "FDH_FX",
"amountType": "SEND",
"sourceAmount": {
"currency": "BWP",
"amount": "300"
},
"targetAmount": {
"currency": "TZS",
"amount": "48000"
},
"condition": "GRzLaTP7DJ9t4P-a_BA0WA9wzzIsugf00-Tn6kESAfM"
}
29 OK, so this is an FX confirmation.
30 Is there any transfer with determiningTransactionId?
No, it does'nt.
31 Liquidity check and reserve on Payer DFSP's account
Reservations:
PayerFSP has a reservation of 300 BWP
32 Please confirm the currency conversion part of the transfer
POST /fxTransfers
33 Reserve funds for FX conversion
34 Confirmed. Here's the fulfilment
PUT /fxTransfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc
{
"fulfilment": "188909ceb6cd5c35d5c6b394f0a9e5a0571199c332fbd013dc1e6b8a2d5fff42",
"completedTimestamp": "2021-08-25T14:17:08.175+01:00",
"conversionState": "RESERVED"
}
35 Conversion succeeded subject to transfer success
PUT /fxTransfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc
36 OK, so that's all right
Now I can send the transfer itself
37 Please do the transfer POST /transfers
38 Is there a dependent transfer? Yes

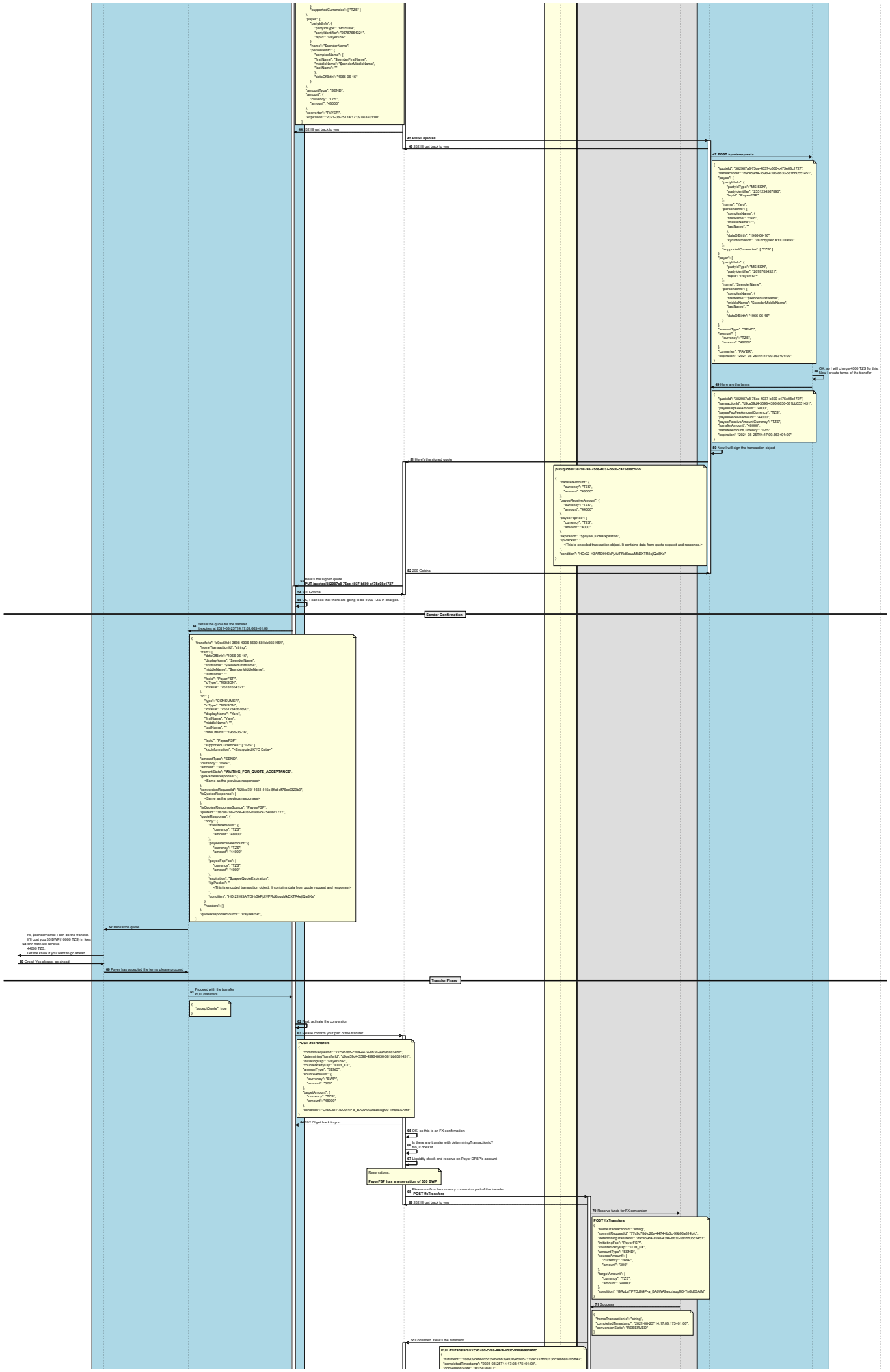


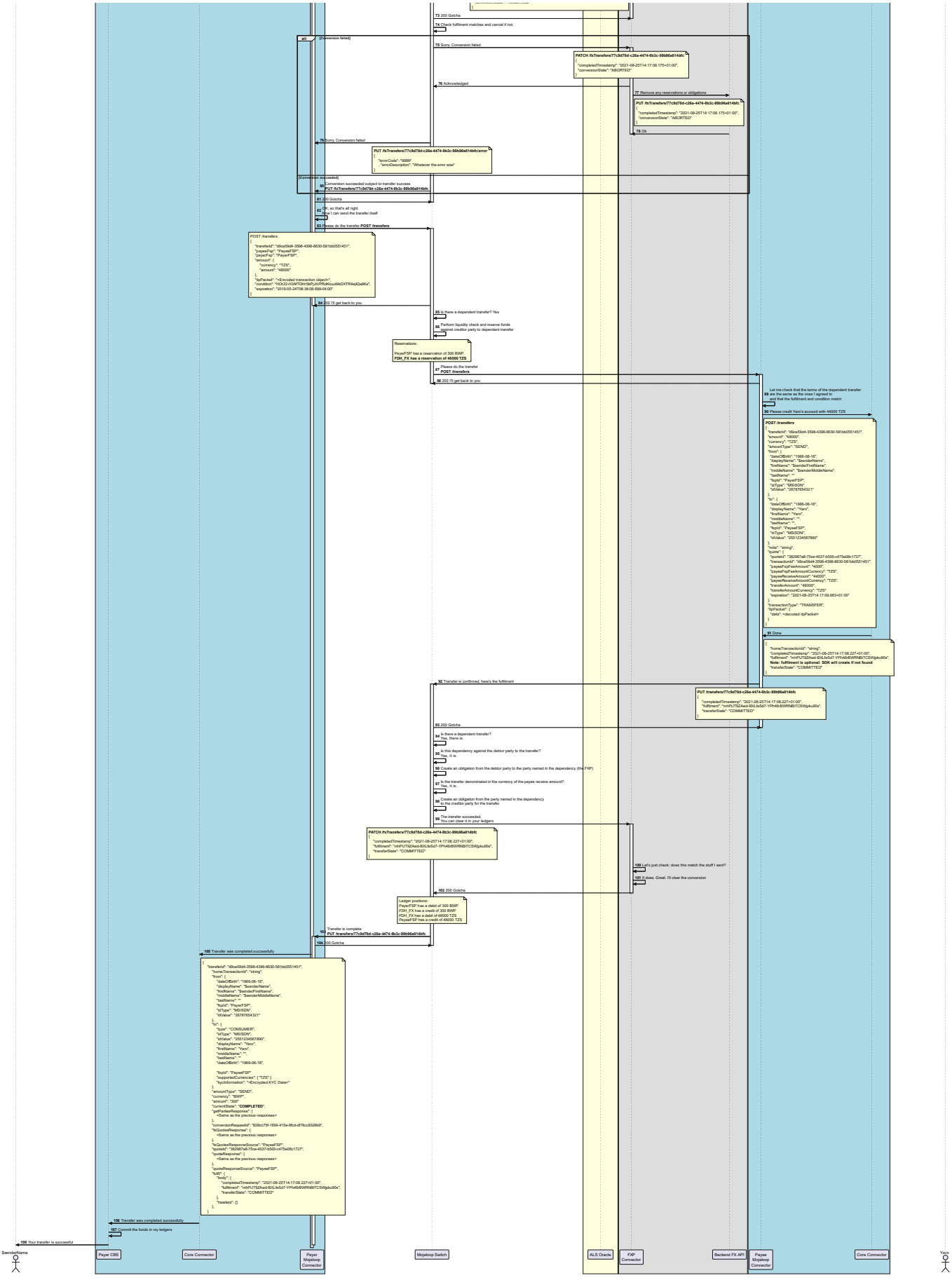
Detailed Send Money Diagram

Below is a detailed sequence diagram that shows the complete flow, and includes the **Mojaloop Connector** and integration APIs for all participant organizations. (This is a useful view if you are building integrations as a participant organization.)




"merchantClassificationCode": "string",
"name": "Yaro",
"personalInfo": {
"complexName": {
"firstName": "Yaro",
"middleName": "",
"lastName": ""
},
"dateOfBirth": "1966-06-16",
"kycInformation": "<Encrypted KYC Data>"
},
"supportedCurrencies": ["TZS"]
},
"headers": {}
}
}
18 Here's are the receiver details
19 Hi, SwenderName: The number belongs to Yaro
Let me know if you want to go ahead
19
20 Yes please, go ahead
21 Payer has accepted the party information
Currency conversion
22 Get quotation
PUT /transfers/d8ce5fd4-3598-4396-8630-581bb0551451
{
"acceptParty": true
}
23 Hmmm. I can only send in BWP.
I need to get some currency conversion
24 What FXPs do you know about?
GET /services/FXP
25 202 I'll get back to you
26 What FXPs do you know about?
27 FDH FX
28 Here are the available FXPs:FDH FX
PUT /services/FXP
{
"providers": [
"FDH_FX"
]
}
29 200 Gotcha
30 I'll ask FDH FX to perform my conversion
31
Here is the initial version of the transfer.
Please quote me for the currency conversion.
post /fxQuotes
{
"conversionRequestId": "828cc75f-1654-415e-8fcd-df76cc9329b9",
"conversionTerms": {
"conversionId": "581f68ef-b54f-416f-9161-ac34e889a94b",
"initiatingFsp": "PayerFSP",
"counterPartyFsp": "FDH_FX",
"amountType": "SEND",
"sourceAmount": {
"currency": "BWP",
"amount": "300"
},
"targetAmount": {
"currency": "TZS"
},
"expiration": "2021-08-25T14:17:09.663+01:00"
}
}
32 202 I'll get back to you
Here is the initial version of the transfer.
33 Please quote me for the currency conversion.
POST /fxQuote
34 202 I'll get back to you
35 Lookup FX rate
post /fxQuotes
{
"conversionRequestId": "828cc75f-1654-415e-8fcd-df76cc9329b9",
"conversionTerms": {
"conversionId": "581f68ef-b54f-416f-9161-ac34e889a94b",
"initiatingFsp": "PayerFSP",
"counterPartyFsp": "FDH_FX",
"amountType": "SEND",
"sourceAmount": {
"currency": "BWP",
"amount": "300"
},
"targetAmount": {
"currency": "TZS"
},
"expiration": "2021-08-25T14:17:09.663+01:00"
}
}
36 Return FX rate
I will add a 33 BWP fee for undertaking the conversion.
Now I'll set an expiry time, sign the quotation object,
{
"conversionTerms": {
"conversionId": "581f68ef-b54f-416f-9161-ac34e889a94b",
"initiatingFsp": "PayerFSP",
"counterPartyFsp": "FDH_FX",
"amountType": "SEND",
"sourceAmount": {
"currency": "BWP",
"amount": "300"
},
"targetAmount": {
"currency": "TZS",
"amount": "48000"
},
"expiration": "2021-08-25T14:17:09.663+01:00"
"charges": [
{
"chargeType": "string",
"sourceAmount": {
"currency": "BWP",
"amount": "33"
},
"targetAmount": {
"currency": "TZS",
"amount": "6000"
}
}
]
}
}
Now I'll sign the quotation object,
create an ILP prepare packet and return it in the intermediary object.
NOTE: the ILP prepare packet contains the following items, all encoded:
- The amount being sent (i.e. in the source currency)
- An expiry time
- The condition
- The name of the FXP
- The content of the conversion terms
PUT /fxQuotes/828cc75f-1654-415e-8fcd-df76cc9329b9
{
"condition": "GRzLaTP7DJ84P-a_BA0WAlwzdsugB0-TnSkESARM",
"conversionTerms": {
"conversionId": "581f68ef-b54f-416f-9161-ac34e889a94b",
"initiatingFsp": "PayerFSP",
"counterPartyFsp": "FDH_FX",
"amountType": "SEND",
"sourceAmount": {
"currency": "BWP",
"amount": "300"
},
"targetAmount": {
"currency": "TZS",
"amount": "48000"
},
"expiration": "2021-08-25T14:17:09.663+01:00"
"charges": [
{
"chargeType": "string",
"sourceAmount": {
"currency": "BWP",
"amount": "33"
},
"targetAmount": {
"currency": "TZS",
"amount": "6000"
}
}
]
}
}
37 Here's the signed conversion object
38 200 Gotcha
39 Here's the signed conversion object
PUT /fxQuotes/828cc75f-1654-415e-8fcd-df76cc9329b9
40 Gotcha
41 Here are the conversion terms
{
"transferId": "d8ce5fd4-3598-4396-8630-581bb0551451",
"homeTransactionId": "string",
"from": {
"dateOfBirth": "1966-06-16",
"displayName": "SwenderName",
"firstName": "SwenderFirstName",
"middleName": "SwenderMiddleName",
"lastName": "",
"fspId": "PayerFSP",
"idType": "MSISDN",
"idValue": "26787654321"
},
"to": {
"type": "CONSUMER",
"idType": "MSISDN",
"idValue": "25512345678901",
"displayName": "Yaro",
"firstName": "Yaro",
"middleName": "",
"lastName": "",
"dateOfBirth": "1966-06-16",
"fspId": "PayeeFSP",
"supportedCurrencies": ["TZS"]
"kycInformation": "<Encrypted KYC Data>"
},
"amountType": "SEND",
"currency": "BWP",
"amount": "300",
"currencyState": "WAITING_FOR_CONVERSION_ACCEPTANCE",
"getPartiesResponse": {
<Same as the previous responses>
},
"conversionRequestId": "828cc75f-1654-415e-8fcd-df76cc9329b9",
"fxQuotesResponse": {
"body": {
"condition": "GRzLaTP7DJ84P-a_BA0WAlwzdsugB0-TnSkESARM",
"conversionTerms": {
"conversionId": "581f68ef-b54f-416f-9161-ac34e889a94b",
"initiatingFsp": "PayerFSP",
"counterPartyFsp": "FDH_FX",
"amountType": "SEND",
"sourceAmount": {
"currency": "BWP",
"amount": "300"
},
"targetAmount": {
"currency": "TZS",
"amount": "48000"
},
"expiration": "2021-08-25T14:17:09.663+01:00"
"charges": [
{
"chargeType": "string",
"sourceAmount": {
"currency": "BWP",
"amount": "33"
},
"targetAmount": {
"currency": "TZS",
"amount": "6000"
}
}
]
}
},
"headers": {}
},
"fxQuotesResponseSource": "PayeeFSP",
}
Agreement Phase
42 I want to get a quote from the FSP
PUT /transfers
{
"acceptConversion": true
}
43 Please quote for a transfer which sends 48000 TZS.
POST /quotes
POST /quotes
{
"quoteId": "382987a8-75ce-4037-b000-c475e08c1727",
"transactionId": "d8ce5fd4-3598-4396-8630-581bb0551451",
"payee": {
"partyIdInfo": {
"partyIdType": "MSISDN",
"partyIdentifier": "25512345678901",
"fspId": "PayeeFSP"
},
"name": "Yaro",
"personalInfo": {
"complexName": {
"firstName": "Yaro",
"middleName": "",
"lastName": ""
},
"dateOfBirth": "1966-06-16",
"kycInformation": "<Encrypted KYC Data>"

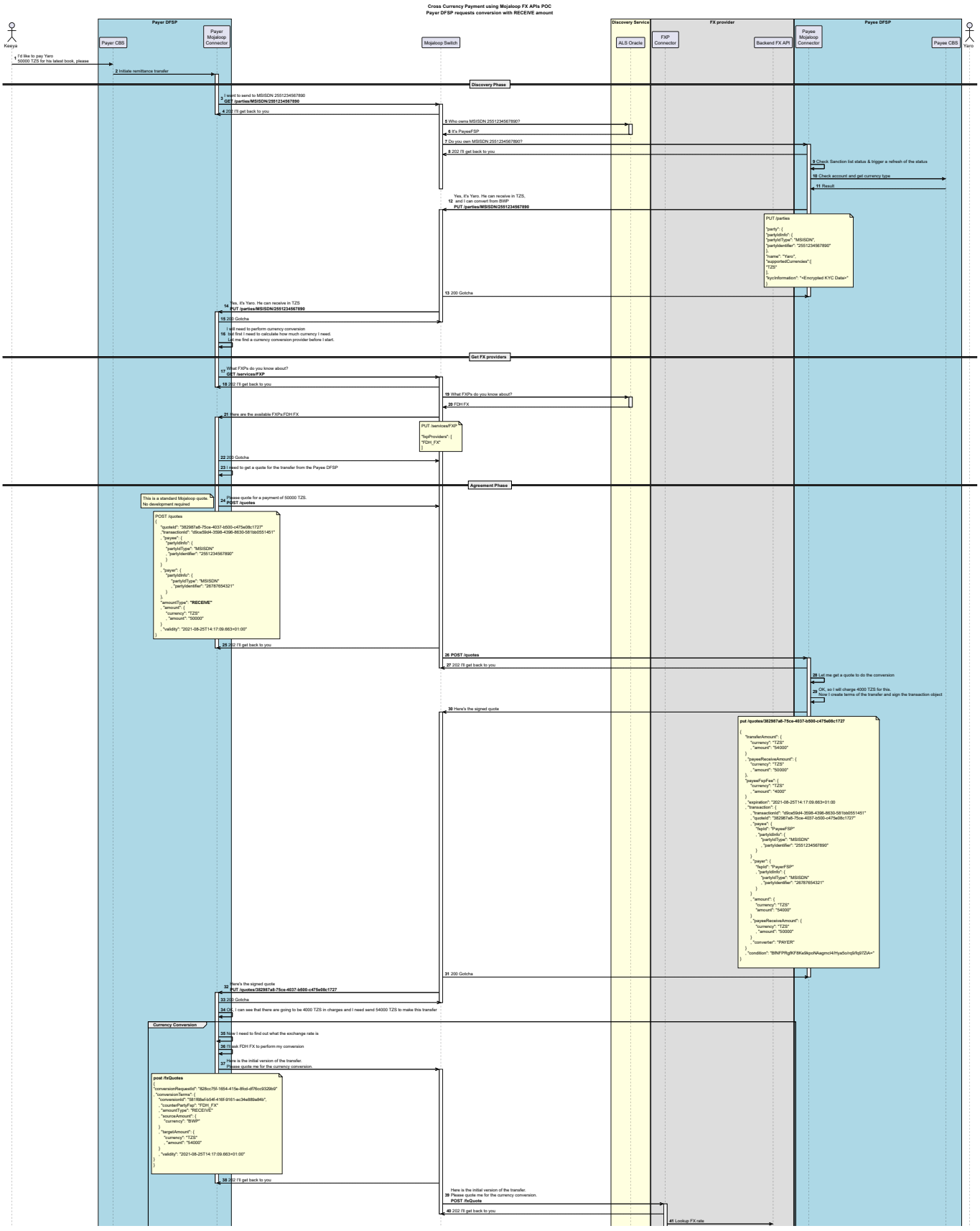

Sender Confirmation
Transfer Phase
POST /fxTransfers
PUT /fxTransfers/77c9d78d-c26a-4474-8b3c-99b98a814bfc
POST /fxTransfers
PUT /quotes/382987a8-75ce-4037-b500-c475e08c1727

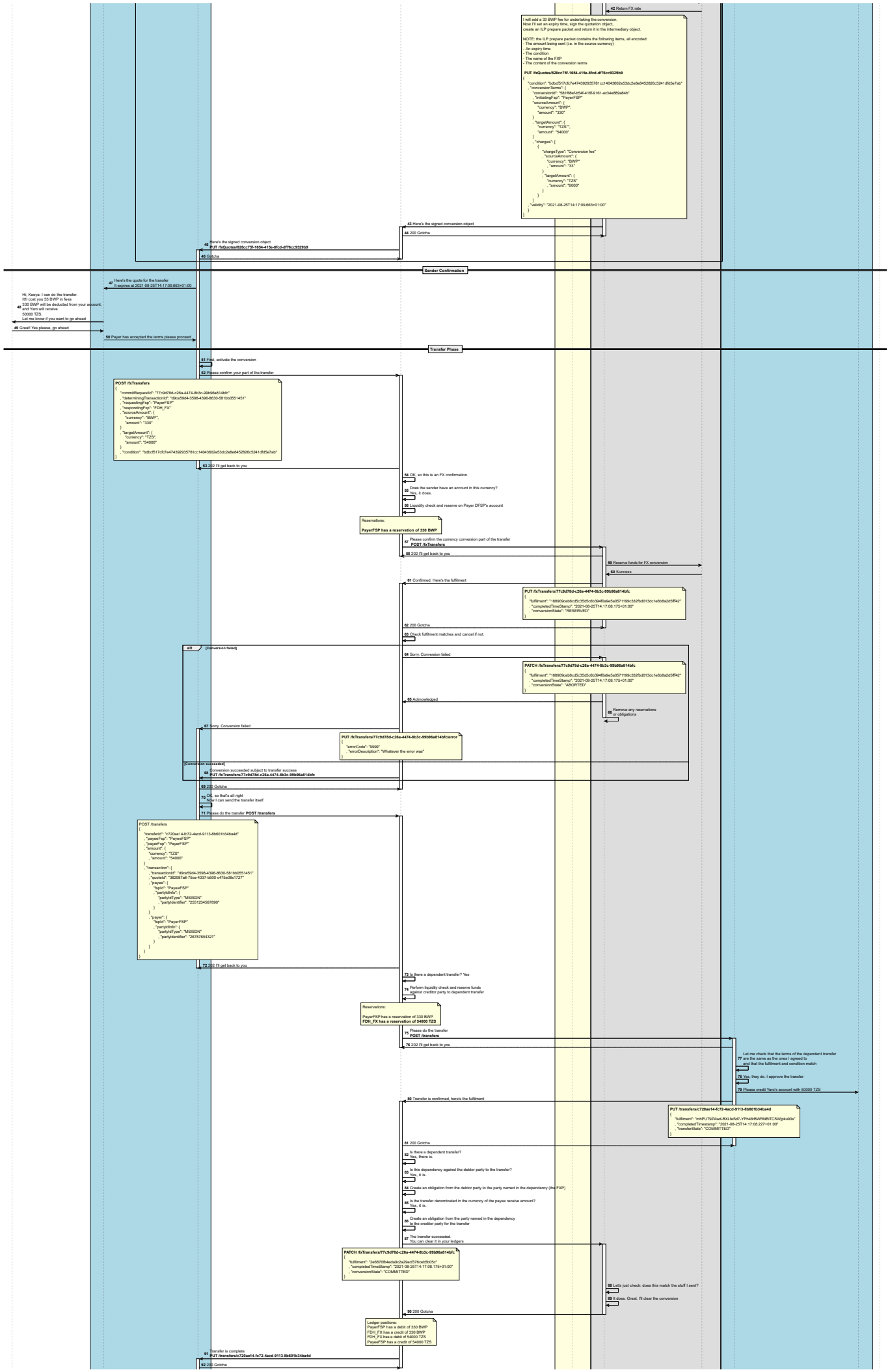

SwenderName
Payer CBS
Core Connector
Payer Mojaloop Connector
Mojaloop Switch
ALS Oracle
FXP Connector
Backend FX API
Payee Mojaloop Connector
Core Connector
Yaro
73 200 Golcha
74 Check fulfilment matches and cancel if not.
alt
[Conversion failed]
75 Sorry, Conversion failed
PATCH /fxTransfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc
{
"completedTimestamp": "2021-08-25T14:17:08.175+01:00",
"conversionState": "ABORTED"
}
76 Acknowledged
77 Remove any reservations or obligations
PUT /fxTransfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc
{
"completedTimestamp": "2021-08-25T14:17:08.175+01:00",
"conversionState": "ABORTED"
}
78 Ok
79 Sorry, Conversion failed
PUT /fxTransfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc/error
{
"errorCode": "9999",
"errorDescription": "Whatever the error was"
}
[Conversion succeeded]
80 Conversion succeeded subject to transfer success
PUT /fxTransfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc
81 200 Golcha
82 OK, so that's all right
Now I can send the transfer itself
83 Please do the transfer POST /transfers
POST /transfers
{
"transferId": "d8ce5944-3598-4396-8630-581bb0551451",
"payeeFsp": "PayeeFSP",
"payerFsp": "PayerFSP",
"amount": {
"currency": "TZS",
"amount": "48000"
},
"ilpPacket": "=Encoded transaction object=",
"condition": "HO22-IS4TDlnSbfYjUcRzRcouMkOXTR4ejlQx6Ka",
"expiration": "2016-05-24T08:38:08.699-04:00"
}
84 202 I'll get back to you
85 Is there a dependent transfer? Yes
86 Perform liquidity check and reserve funds against creditor party to dependent transfer
Reservations:
PayerFSP has a reservation of 300 BWP.
FDH_FX has a reservation of 48000 TZS
87 Please do the transfer
POST /transfers
88 202 I'll get back to you
89 Let me check that the terms of the dependent transfer are the same as the ones I agreed to and that the fulfilment and condition match
90 Please credit Yaro's account with 44000 TZS
POST /transfers
{
"transferId": "d8ce5944-3598-4396-8630-581bb0551451",
"amount": "44000",
"currency": "TZS",
"amountType": "SEND",
"payer": {
"dateOfBirth": "1966-06-16",
"displayName": "SwenderName",
"firstName": "SwenderFirstName",
"middleName": "SwenderMiddleName",
"lastName": "",
"fspId": "PayerFSP",
"idType": "MSISDN",
"idValue": "26787654321"
},
"to": {
"dateOfBirth": "1966-06-16",
"displayName": "Yaro",
"firstName": "Yaro",
"middleName": "",
"lastName": "",
"fspId": "PayeeFSP",
"idType": "MSISDN",
"idValue": "25512345678990"
},
"note": "string",
"quote": {
"quoteId": "382987a8-75ce-4037-b500-c475e08c1727",
"transactionId": "d8ce5944-3598-4396-8630-581bb0551451",
"payeeFspFeeAmount": "4000",
"payeeFspFeeAmountCurrency": "TZS",
"payeeReceiveAmount": "44000",
"payeeReceiveAmountCurrency": "TZS",
"transferAmount": "48000",
"transferAmountCurrency": "TZS",
"expiration": "2021-08-25T14:17:09.683+01:00"
},
"transactionType": "TRANSFER",
"ilpPacket": {
"data": =decoded ilpPacket=
}
}
91 Done
{
"homeTransactionId": "string",
"completedTimestamp": "2021-08-25T14:17:08.227+01:00",
"fulfilment": "mtPUTSZAed-BXLfeSd7-YPh46vBWRNBTCSWgkuS0s",
Note: fulfilment is optional. SDK will create if not found
"transferState": "COMMITTED"
}
92 Transfer is confirmed, here's the fulfilment
PUT /transfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc
{
"completedTimestamp": "2021-08-25T14:17:08.227+01:00",
"fulfilment": "mtPUTSZAed-BXLfeSd7-YPh46vBWRNBTCSWgkuS0s",
"transferState": "COMMITTED"
}
93 200 Golcha
94 Is there a dependent transfer?
Yes, there is.
95 Is this dependency against the debtor party to the transfer?
Yes, it is.
96 Create an obligation from the debtor party to the party named in the dependency (the FXP)
97 Is the transfer denominated in the currency of the payee receive amount?
Yes, it is.
98 Create an obligation from the party named in the dependency
Is the creditor party for the transfer
99 The transfer succeeded.
You can clear it in your ledgers
PATCH /fxTransfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc
{
"completedTimestamp": "2021-08-25T14:17:08.227+01:00",
"fulfilment": "mtPUTSZAed-BXLfeSd7-YPh46vBWRNBTCSWgkuS0s",
"transferState": "COMMITTED"
}
100 Let's just check: does this match the stuff I sent?
101 It does. Great, I'll clear the conversion
102 200 Golcha
Ledger positions:
PayerFSP has a debit of 300 BWP
FDH_FX has a credit of 300 BWP
FDH_FX has a debit of 48000 TZS
PayeeFSP has a credit of 48000 TZS
103 Transfer is complete
PUT /transfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc
104 200 Golcha
105 Transfer was completed successfully
{
"transferId": "d8ce5944-3598-4396-8630-581bb0551451",
"homeTransactionId": "string",
"from": {
"dateOfBirth": "1966-06-16",
"displayName": "SwenderName",
"firstName": "SwenderFirstName",
"middleName": "SwenderMiddleName",
"lastName": "",
"fspId": "PayerFSP",
"idType": "MSISDN",
"idValue": "26787654321"
},
"to": {
"type": "CONSUMER",
"idType": "MSISDN",
"idValue": "25512345678990",
"displayName": "Yaro",
"firstName": "Yaro",
"middleName": "",
"lastName": ""
"dateOfBirth": "1966-06-16",
"fspId": "PayeeFSP"
"supportedCurrencies": ["TZS"]
"kycInformation": "=Encrypted KYC Data="
},
"amountType": "SEND",
"currency": "BWP",
"amount": "300",
"currentState": "COMPLETED",
"getParties Response": {
<Same as the previous responses>
},
"conversionRequestId": "828cc75f-1654-415e-8fcd-d76cc9328b9",
"toQuotesResponse": {
<Same as the previous responses>
},
"toQuotesResponseSource": "PayeeFSP",
"quoteId": "382987a8-75ce-4037-b500-c475e08c1727",
"quoteResponse": {
<Same as the previous responses>
},
"quoteResponseSource": "PayeeFSP",
"fulfil": {
"body": {
"completedTimestamp": "2021-08-25T14:17:08.227+01:00",
"fulfilment": "mtPUTSZAed-BXLfeSd7-YPh46vBWRNBTCSWgkuS0s",
"transferState": "COMMITTED"
},
"headers": {}
}
}
106 Transfer was completed successfully
107 Commit the funds in my ledgers
108 Your transfer is successful

Making a payment in another currency

For this use case, the Payer DFSP will specify the transfer with amount type **RECEIVE** and define the transfer amount in the **Payee's local currency** (the target currency). An secondary use case example for this is a cross boarder Merchant Payment.

Below is a detailed sequence diagram that shows the complete flow, and includes the Mojaloop connector and integration APIs for all participant organizations.

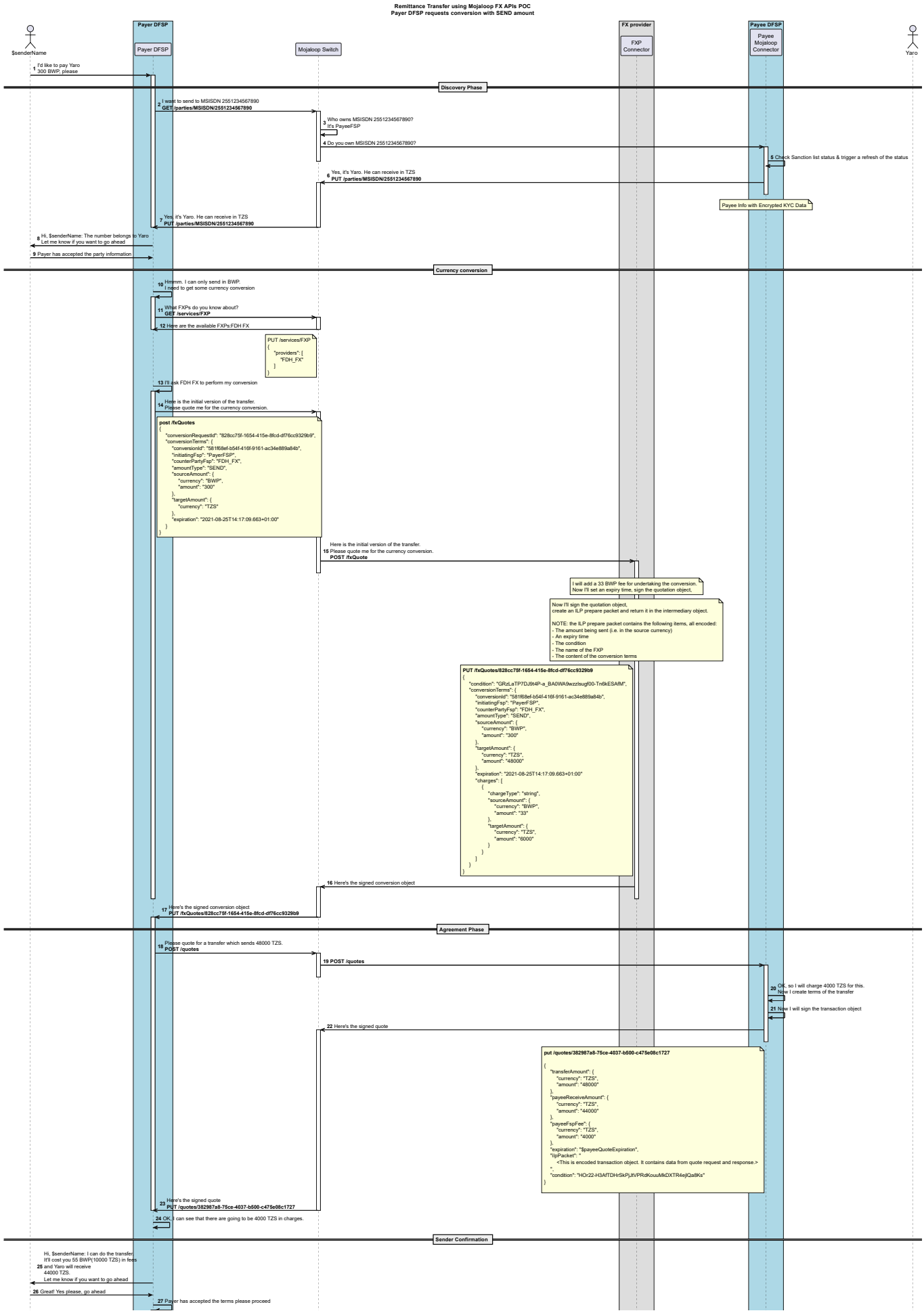


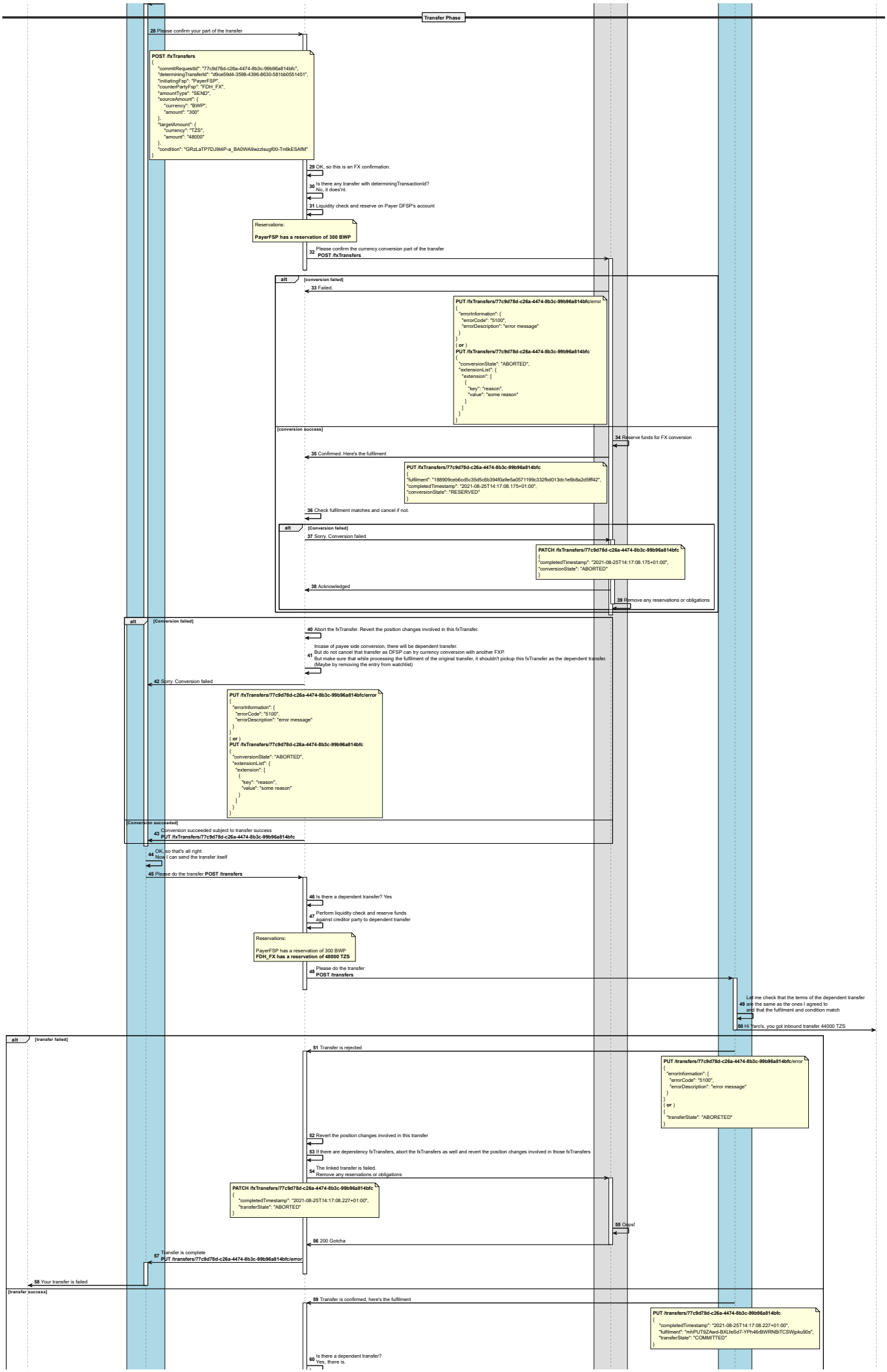

42 Return FX rate
I will add a 33 BWP fee for undertaking the conversion.
Now I'll set an expiry time, sign the quotation object,
create an ILP prepare packet and return it in the intermediary object.
NOTE: the ILP prepare packet contains the following items, all encoded:
- The amount being sent (i.e. in the source currency)
- An expiry time
- The condition
- The name of the FXP
- The content of the conversion terms
PUT /fxQuotes/828cc75f-1654-415e-8fcd-df76cc9329b9
{
"condition": "bdbd517c8c7e47439293578 1cc14043602e53dc2e8e8452826fc5241d6d5e7ab"
, "conversionTerms": {
"conversionId": "581f68bf-b54f-4165-9161-ac34e889a84b"
, "initiatingFsp": "PayerFSP"
"sourceAmount": { |
"currency": "BWP",
"amount": "330"
}
, "targetAmount": {
"currency": "TZS",
"amount": "54000"
}
, "charges": [
{
"chargeType": "Conversion fee"
, "sourceAmount": {
"currency": "BWP"
, "amount": "33"
}
, "targetAmount": {
"currency": "TZS"
, "amount": "6000"
}
}
]
, "validity": "2021-08-25T14:17:09.663+01:00"
}
}
43 Here's the signed conversion object
44 200 Gotcha
45 Here's the signed conversion object
PUT /fxQuotes/828cc75f-1654-415e-8fcd-df76cc9329b9
46 Gotcha
Sender Confirmation
47 Here's the quote for the transfer
It expires at 2021-08-25T14:17:09.663+01:00
Hi, Keelya. I can do the transfer.
It'll cost you 55 BWP in fees
48 330 BWP will be deducted from your account,
and Yaro will receive
50000 TZS.
Let me know if you want to go ahead.
49 Great! Yes please, go ahead
50 Payer has accepted the terms please proceed
Transfer Phase
51 First, activate the conversion
52 Please confirm your part of the transfer
POST /fxTransfers
{
"commitRequestId": "77c9d78d-c26a-4474-8b3c-99b96a814bfc"
, "determiningTransactionId": "d8ce59d4-3598-4396-8630-581bb0551451"
, "requestingFsp": "PayerFSP"
, "respondingFsp": "FDH_FX"
, "sourceAmount": {
"currency": "BWP",
"amount": "330"
}
, "targetAmount": {
"currency": "TZS",
"amount": "54000"
}
, "condition": "bdbd517c8c7e47439293578 1cc14043602e53dc2e8e8452826fc5241d6d5e7ab"
}
53 202 I'll get back to you
54 OK, so this is an FX confirmation.
55 Does the sender have an account in this currency?
Yes, it does.
56 Liquidity check and reserve on Payer DFSP's account
Reservations:
PayerFSP has a reservation of 330 BWP
57 Please confirm the currency conversion part of the transfer
POST /fxTransfers
58 202 I'll get back to you
59 Reserve funds for FX conversion
60 Success
61 Confirmed. Here's the fulfilment
PUT /fxTransfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc
{
"fulfilment": "189909ceb6cd5c35d5c6b3945e8e5a0571199c332fbd013dc1e6b8a2d5ff42"
, "completedTimeStamp": "2021-08-25T14:17:08.175+01:00"
, "conversionState": "RESERVED"
}
62 200 Gotcha
63 Check fulfilment matches and cancel if not.
alt
[Conversion failed]
64 Sorry. Conversion failed
PATCH /fxTransfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc
{
"fulfilment": "189909ceb6cd5c35d5c6b3945e8e5a0571199c332fbd013dc1e6b8a2d5ff42"
, "completedTimeStamp": "2021-08-25T14:17:08.175+01:00"
, "conversionState": "ABORTED"
}
65 Acknowledged
66 Remove any reservations
or obligations
67 Sorry, Conversion failed
PUT /fxTransfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc/error
{
"errorCode": "9999"
, "errorDescription": "Whatever the error was"
}
[Conversion succeeded]
68 Conversion succeeded subject to transfer success
PUT /fxTransfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc
69 200 Gotcha
70 OK, so that's all right
Now I can send the transfer itself
71 Please do the transfer POST /transfers
POST /transfers
{
"transferId": "c720ae14-fc72-4acd-9113-8b601b34ba4d"
, "payeeFsp": "PayeeFSP"
, "payerFsp": "PayerFSP"
, "amount": {
"currency": "TZS"
"amount": "54000"
}
, "transaction": {
"transactionId": "d9ce59d4-3598-4396-8630-581bb0551451"
, "quoteId": "382987a8-75ce-4037-b500-c475e08c1727"
, "payee": {
"fspId": "PayeeFSP"
, "partyIdInfo": {
"partyIdType": "MSISDN"
, "partyIdentifier": "255123456789O"
}
}
, "payer": {
"fspId": "PayerFSP"
, "partyIdInfo": {
"partyIdType": "MSISDN"
, "partyIdentifier": "26787654321"
}
}
}
}
72 202 I'll get back to you
73 Is there a dependent transfer? Yes
74 Perform liquidity check and reserve funds
against creditor party to dependent transfer
Reservations:
PayerFSP has a reservation of 330 BWP
FDH_FX has a reservation of 54000 TZS
75 Please do the transfer
POST /transfers
76 202 I'll get back to you
77 Let me check that the terms of the dependent transfer are the same as the ones I agreed to and that the fulfilment and condition match
78 Yes, they do. I approve the transfer
79 Please credit Yaro's account with 50000 TZS
80 Transfer is confirmed, here's the fulfilment
PUT /transfers/c720ae14-fc72-4acd-9113-8b601b34ba4d
{
"fulfilment": "mhPUT9ZAwd-BXLfe5d7-YPh49rBWRNBTCSWjpkd0Ia"
, "completedTimestamp": "2021-08-25T14:17:08.227+01:00"
, "transferState": "COMMITTED"
}
81 200 Gotcha
82 Is there a dependent transfer?
Yes, there is.
83 Is this dependency against the debtor party to the transfer?
Yes, it is.
84 Create an obligation from the debtor party to the party named in the dependency (the FXP)
85 Is the transfer denominated in the currency of the payee receive amount?
Yes, it is.
86 Create an obligation from the party named in the dependency
to the creditor party for the transfer
87 The transfer succeeded.
You can clear it in your ledgers
PATCH /fxTransfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc
{
"fulfilment": "2e6870fb4edad0c2a29ecf376ceb5b05c"
, "completedTimeStamp": "2021-08-25T14:17:08.175+01:00"
, "conversionState": "COMMITTED"
}
88 Let's just check: does this match the stuff I sent?
89 It does. Great. I'll clear the conversion
90 200 Gotcha
Ledger positions:
PayerFSP has a debit of 330 BWP
FDH_FX has a credit of 330 BWP
FDH_FX has a debit of 54000 TZS
PayeeFSP has a credit of 54000 TZS
91 Transfer is complete
PUT /transfers/c720ae14-fc72-4acd-9113-8b601b34ba4d
92 200 Gotcha

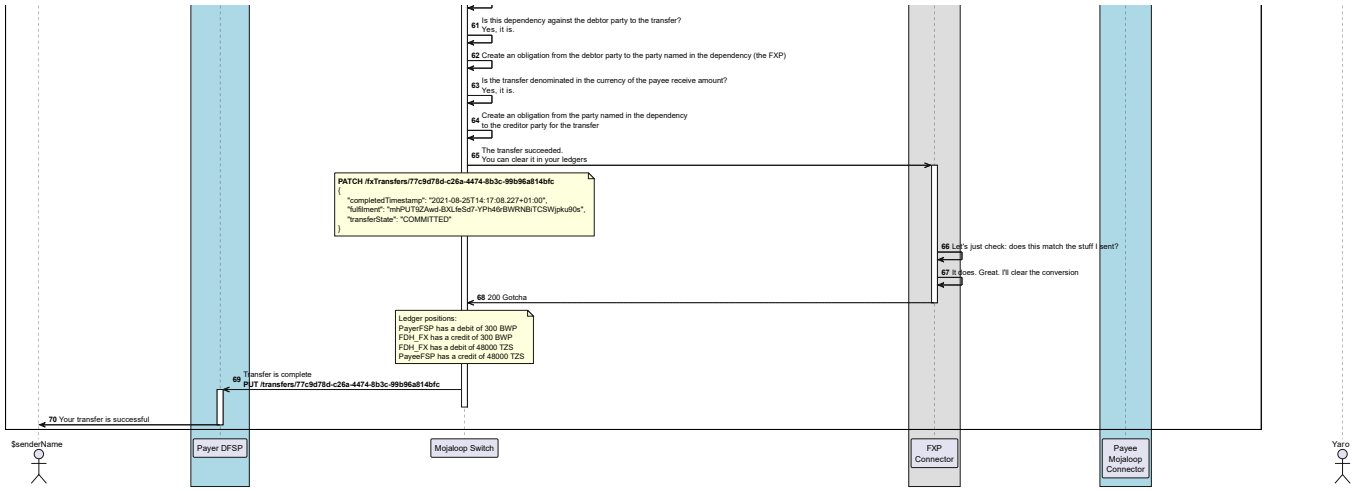
93 Commit the funds in my ledgers
94 Transfer was completed successfully
Kenya
Payer CBS
Payer Mojaloop Connector
Mojaloop Switch
ALS Oracle
FXP Connector
Backend FX API
Payee Mojaloop Connector
Payee CBS
Yaro

Abort flows

This sequence diagram show how the design implements abort messages.




Transfer Phase
28 Please confirm your part of the transfer
POST /fxTransfers
{
"commitRequestId": "77c9d78d-c26a-4474-8b3c-99b96a814bfc",
"determiningTransferId": "d9ce59d4-3598-4396-8630-581bb0551451",
"initiatingFsp": "PayerFSP",
"counterPartyFsp": "FDH_FX",
"amountType": "SEND",
"sourceAmount": {
"currency": "BWP",
"amount": "300"
},
"targetAmount": {
"currency": "TZS",
"amount": "48000"
},
"condition": "GRzLaTP7DJ94P-a_BA0WA9wzzlsugf00-Tn6kESAfM"
}
29 OK, so this is an FX confirmation.
30 Is there any transfer with determiningTransactionId?
No, it does'nt.
31 Liquidity check and reserve on Payer DFSP's account
Reservations:
PayerFSP has a reservation of 300 BWP
32 Please confirm the currency conversion part of the transfer
POST /fxTransfers
alt
[conversion failed]
33 Failed.
PUT /fxTransfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc/error
{
"errorInformation": {
"errorCode": "5100",
"errorDescription": "error message"
}
}
(or)
PUT /fxTransfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc
{
"conversionState": "ABORTED",
"extensionList": {
"extension": [
{
"key": "reason",
"value": "some reason"
}
]
}
}
[conversion success]
34 Reserve funds for FX conversion
35 Confirmed. Here's the fulfilment
PUT /fxTransfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc
{
"fulfilment": "188909ceb6cd5c35d5c6b3940a9e5a0571199c332fbd013dc1e6b8a2d5fff42",
"completedTimestamp": "2021-08-25T14:17:08.175+01:00",
"conversionState": "RESERVED"
}
36 Check fulfilment matches and cancel if not.
alt
[Conversion failed]
37 Sorry, Conversion failed
PATCH /fxTransfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc
{
"completedTimestamp": "2021-08-25T14:17:08.175+01:00",
"conversionState": "ABORTED"
}
38 Acknowledged
39 Remove any reservations or obligations
alt
[Conversion failed]
40 Abort the fxTransfer. Revert the position changes involved in this fxTransfer.
41 Incase of payee side conversion, there will be dependent transfer.
But do not cancel that transfer as DFSP can try currency conversion with another FXP.
But make sure that while processing the fulfilment of the original transfer, it shouldn't pickup this fxTransfer as the dependent transfer.
(Maybe by removing the entry from watchlist)
42 Sorry, Conversion failed
PUT /fxTransfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc/error
{
"errorInformation": {
"errorCode": "5100",
"errorDescription": "error message"
}
}
(or)
PUT /fxTransfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc
{
"conversionState": "ABORTED",
"extensionList": {
"extension": [
{
"key": "reason",
"value": "some reason"
}
]
}
}
[Conversion succeeded]
43 Conversion succeeded subject to transfer success
PUT /fxTransfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc
44 OK, so that's all right
Now I can send the transfer itself
45 Please do the transfer POST /transfers
46 Is there a dependent transfer? Yes
47 Perform liquidity check and reserve funds
against creditor party to dependent transfer
Reservations:
PayerFSP has a reservation of 300 BWP
FDH_FX has a reservation of 48000 TZS
48 Please do the transfer
POST /transfers
49 Let me check that the terms of the dependent transfer
are the same as the ones I agreed to
and that the fulfilment and condition match
50 Hi Yaro's, you got inbound transfer 44000 TZS
alt
[transfer failed]
51 Transfer is rejected
PUT /transfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc/error
{
"errorInformation": {
"errorCode": "5100",
"errorDescription": "error message"
}
}
(or)
{
"transferState": "ABORETED"
}
52 Revert the position changes involved in this transfer
53 If there are dependency fxTransfers, abort the fxTransfers as well and revert the position changes involved in those fxTransfers
54 The linked transfer is failed.
Remove any reservations or obligations
PATCH /fxTransfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc
{
"completedTimestamp": "2021-08-25T14:17:08.227+01:00",
"transferState": "ABORTED"
}
55 Oops!
56 200 Gotcha
57 Transfer is complete
PUT /transfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc/error
58 Your transfer is failed
[transfer success]
59 Transfer is confirmed, here's the fulfilment
PUT /transfers/77c9d78d-c26a-4474-8b3c-99b96a814bfc
{
"completedTimestamp": "2021-08-25T14:17:08.227+01:00",
"fulfilment": "mhPUT9ZAwd-BXLfeSd7-YPh46rBWRNBiTCSWjpku90s",
"transferState": "COMMITTED"
}
60 Is there a dependent transfer?
Yes, there is.



Open API References

These Open API references are designed to be readable for both software an review person. The show the detailed requirements and implementations of the API design.

- FSPIOP specification Open Api definition.
- API Snippets Open Api definition
- Mojaloop Connector backend Open Api definition
- Mojaloop Connector outbound Open Api definition