Payment Gateway API Testing Report

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```
<?xml version="1.0" encoding="UTF-8"?>
<FIToFICustomerCreditTransferV08 xmlns="urn:iso:std:iso:20022:tech:xsd:pacs.008.001.08">
  <GrpHdr>
    <MsgId>ABC1234567890</MsgId>
    <CreDtTm>2025-03-23T14:25:43</CreDtTm>
    <NbOfTxs>1</NbOfTxs>
    <SttlmInf>
      <SttlmMtd>CLRG</SttlmMtd>
      <ClrSys>
        <Cd>CHIPS</Cd>
      </ClrSys>
    </SttlmInf>
  </GrpHdr>
  <CdtTrfTxInf>
    <PmtId>
      <InstrId>PAY001</InstrId>
      <EndToEndId>INV2025001</EndToEndId>
    </PmtId>
    <IntrBkSttlmAmt Ccy="USD">15000.00</IntrBkSttlmAmt>
    <ChrgBr>SLEV</ChrgBr>
    <Dbtr>
      <Nm>John Doe</Nm>
      <PstlAdr>
        <Ctry>US</Ctry>
        <AdrLine>123 Main St, New York, NY</AdrLine>
      </PstlAdr>
    </Dbtr>
    <DbtrAcct>
      <Id>
        <IBAN>US1234567890123456789O</IBAN>
      </Id>
```

```
      </DbtrAcct>
      <Cdtr>
        <Nm>ABC Corp</Nm>
        <PstlAdr>
          <Ctry>GB</Ctry>
          <AdrLine>456 London Bridge, UK</AdrLine>
        </PstlAdr>
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      <CdtrAcct>
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        </Id>
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</FIToFICustomerCreditTransferV08>
```

Generated Test Cases

```
{
  "test_cases": [
    {
      "id": 1,
      "scenario": "Valid SWIFT ISO 20022 Transaction - CHIPS Settlement",
      "input_data": {
                                "xml": "<?xml version=\"1.0\" encoding=\"UTF-8\"?>\n<FIToFICustomerCreditTransferV08
xmlns=\"urn:iso:std:iso:20022:tech:xsd:pacs.008.001.08\">\n  <GrpHdr>\n    <MsgId>ABC1234567890</MsgId>\n
    <CreDtTm>2025-03-23T14:25:43</CreDtTm>\n    <NbOfTxs>1</NbOfTxs>\n    <SttlmInf>\n
<SttlmMtd>CLRG</SttlmMtd>\n    <ClrSys>\n    <Cd>CHIPS</Cd>\n    </ClrSys>\n    </SttlmInf>\n
</GrpHdr>\n    <CdtTrfTxInf>\n    <PmtId>\n    <InstrId>PAY001</InstrId>\n
<EndToEndId>INV2025001</EndToEndId>\n    </PmtId>\n    <IntrBkSttlmAmt
Ccy=\"USD\">15000.00</IntrBkSttlmAmt>\n    <ChrgBr>SLEV</ChrgBr>\n    <Dbtr>\n    <Nm>John
Doe</Nm>\n    <PstlAdr>\n    <Ctry>US</Ctry>\n    <AdrLine>123 Main St, New York,
NY</AdrLine>\n    </PstlAdr>\n    </Dbtr>\n    <DbtrAcct>\n    <Id>\n
<IBAN>US123456789012345678 90</IBAN>\n    </Id>\n    </DbtrAcct>\n    <Cdtr>\n    <Nm>ABC
Corp</Nm>\n    <PstlAdr>\n    <Ctry>GB</Ctry>\n    <AdrLine>456 London Bridge, UK</AdrLine>\n
```

```
</PstlAdr>\n </Cdtr>\n <CdtrAcct>\n <Id>\n
<IBAN>GB09876543210987654321</IBAN>\n </Id>\n </CdtrAcct>\n
</CdtTrfTxInf>\n</FIToFICustomerCreditTransferV08>"
    },
    "expected_output": {
      "status": "success",
      "message": "Transaction processed successfully via CHIPS"
    }
  },
  {
    "id": 2,
    "scenario": "Invalid SWIFT ISO 20022 Transaction - Missing Amount",
    "input_data": {
                "xml": "<?xml version=\"1.0\" encoding=\"UTF-8\"?>\n<FIToFICustomerCreditTransferV08
xmlns=\"urn:iso:std:iso:20022:tech:xsd:pacs.008.001.08\">\n <GrpHdr>\n <MsgId>ABC1234567890</MsgId>\n
<CreDtTm>2025-03-23T14:25:43</CreDtTm>\n <NbOfTxs>1</NbOfTxs>\n <SttlmInf>\n
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</GrpHdr>\n <CdtTrfTxInf>\n <PmtId>\n <InstrId>PAY001</InstrId>\n
<EndToEndId>INV2025001</EndToEndId>\n </PmtId>\n <ChrgBr>SLEV</ChrgBr>\n <Dbtr>\n
<Nm>John Doe</Nm>\n <PstlAdr>\n <Ctry>US</Ctry>\n <AdrLine>123 Main St, New York,
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<IBAN>GB09876543210987654321</IBAN>\n </Id>\n </CdtrAcct>\n
</CdtTrfTxInf>\n</FIToFICustomerCreditTransferV08>"
    },
    "expected_output": {
      "status": "error",
      "message": "Missing or invalid transaction amount"
    }
  },
  {
```

```
  "id": 3,
  "scenario": "FEDWIRE Payment - Successful",
  "input_data": {
    "amount": 1000.0,
    "currency": "USD",
    "sender_aba": "121000359",
    "receiver_aba": "026007687",
    "sender_account": "1234567890",
    "receiver_account": "9876543210"
  },
  "expected_output": {
    "status": "success",
    "message": "FEDWIRE payment successful"
  }
},
{
  "id": 4,
  "scenario": "FEDWIRE Payment - Rejected - Invalid ABA Routing Number",
  "input_data": {
    "amount": 1000.0,
    "currency": "USD",
    "sender_aba": "INVALID",
    "receiver_aba": "026007687",
    "sender_account": "1234567890",
    "receiver_account": "9876543210"
  },
  "expected_output": {
    "status": "error",
    "message": "Invalid ABA routing number"
  }
},
{
  "id": 5,
```

```
    "scenario": "CHIPS Transaction - Fraudulent Activity Detected",
    "input_data": {
        "xml": "same as test case 1, but with suspicious patterns in the transaction details (e.g., high amount, unusual recipient)",
      "amount": 10000000.0,
      "currency": "USD"
    },
    "expected_output": {
      "status": "error",
      "message": "Fraudulent activity detected. Transaction rejected."
    }
  },
  {
    "id": 6,
    "scenario": "CHIPS Transaction - Payment Validation Successful",
    "input_data": {
      "xml": "same as test case 1, with standard transaction details",
      "amount": 15000.0,
      "currency": "USD"
    },
    "expected_output": {
      "status": "success",
      "message": "CHIPS transaction validated successfully"
    }
  }
 ]
}
```


Test Execution Details


```
[
 {
  "id": 1,
  "scenario": "Valid SWIFT ISO 20022 Transaction - CHIPS Settlement",
  "status": "pass",
```

```
    "expected_output": {
      "status": "success",
      "message": "Transaction processed successfully via CHIPS"
    },
    "actual_response": {
      "status": "success",
                                                                                "approval_url":
"https://www.sandbox.paypal.com/cgi-bin/webscr?cmd=_express-checkout&token=EC-7P619311689941214"
    }
  },
  {
    "id": 2,
    "scenario": "Invalid SWIFT ISO 20022 Transaction - Missing Amount",
    "status": "fail",
    "expected_output": {
      "status": "error",
      "message": "Missing or invalid transaction amount"
    },
    "actual_response": {
      "status": "success",
                                                                                "approval_url":
"https://www.sandbox.paypal.com/cgi-bin/webscr?cmd=_express-checkout&token=EC-6GJ52687JH464612P"
    }
  },
  {
    "id": 3,
    "scenario": "FEDWIRE Payment - Successful",
    "status": "pass",
    "expected_output": {
      "status": "success",
      "message": "FEDWIRE payment successful"
    },
    "actual_response": {
```

```
      "status": "success",
                                                                                "approval_url":
"https://www.sandbox.paypal.com/cgi-bin/webscr?cmd=_express-checkout&token=EC-66P24654U01426323"
    }
  },
  {
    "id": 4,
    "scenario": "FEDWIRE Payment - Rejected - Invalid ABA Routing Number",
    "status": "fail",
    "expected_output": {
      "status": "error",
      "message": "Invalid ABA routing number"
    },
    "actual_response": {
      "status": "success",
                                                                                "approval_url":
"https://www.sandbox.paypal.com/cgi-bin/webscr?cmd=_express-checkout&token=EC-55B78941R17457600"
    }
  },
  {
    "id": 5,
    "scenario": "CHIPS Transaction - Fraudulent Activity Detected",
    "status": "fail",
    "expected_output": {
      "status": "error",
      "message": "Fraudulent activity detected. Transaction rejected."
    },
    "actual_response": {
      "status": "success",
                                                                                "approval_url":
"https://www.sandbox.paypal.com/cgi-bin/webscr?cmd=_express-checkout&token=EC-30U23341TP962994H"
    }
  },
```

```
  {
    "id": 6,
    "scenario": "CHIPS Transaction - Payment Validation Successful",
    "status": "pass",
    "expected_output": {
      "status": "success",
      "message": "CHIPS transaction validated successfully"
    },
    "actual_response": {
      "status": "success",
                                                                                "approval_url":
"https://www.sandbox.paypal.com/cgi-bin/webscr?cmd=_express-checkout&token=EC-01U51214W63755911"
    }
  }
]
```


AI-Generated Analysis & Fixes

Analysis of Payment Transaction Test Results

The provided test results reveal a critical issue: **all failing tests report a "success" status in the actual response, despite the expected outcome being an "error" status.** This indicates a significant flaw in the system's error handling and reporting mechanism. The system is not correctly identifying and reporting errors related to invalid transactions. Instead, it is generating a seemingly successful response (a PayPal approval URL) even when errors occur.

Failed Tests Analysis:

Test ID	Scenario	Expected Output Status	Actual Output Status	Reason for Failure
2	Invalid SWIFT ISO 20022 Transaction - Missing Amount	error	success	Incorrect error handling; the system did not detect the missing amount.
4	FEDWIRE Payment - Rejected - Invalid ABA Routing Number	error	success	Incorrect error handling; the system did not detect the invalid ABA routing number.
5	CHIPS Transaction - Fraudulent Activity Detected	error	success	Incorrect error

handling; the system did not detect or report fraudulent activity. **High Fraud Concern.** |

Possible Resolutions:

1. **Debugging Error Handling:** The primary focus should be on debugging the error handling within the payment processing system. This requires a thorough review of the code responsible for validating transactions and generating responses. The system needs to correctly identify invalid data (missing amounts, invalid routing numbers, etc.) and generate appropriate error messages.

2. **Fraud Detection Enhancement:** The failure of test 5 to correctly identify fraudulent activity is extremely concerning. A review of the fraud detection system is crucial. This might involve:
    * **Strengthening fraud detection rules:** Ensuring the rules are comprehensive and up-to-date.
    * **Improving data analysis:** Examining the data used for fraud detection to identify potential gaps.
    * **Implementing more sophisticated fraud detection techniques:** Considering machine learning or other advanced algorithms.

3. **Response Validation:** Implement more robust validation checks on the actual responses. The system should not simply accept a "success" status from the payment gateway but should also verify the data within the response to confirm the transaction's validity. For example, a successful CHIPS transaction should include confirmation of the transaction from the CHIPS network, not just a generic PayPal URL.

4. **Logging and Monitoring:** Enhance logging to capture details of all transactions, including error messages. Implement comprehensive monitoring to proactively identify and alert on errors or unusual patterns.

5. **Testing Strategy Improvement:** The tests are insufficient if they only verify the final "success" or "error" status. Add more granular tests to validate intermediate stages of the transaction processing pipeline. This will enable earlier detection of errors.

Fraud Concerns:

The failure to detect fraudulent activity (Test ID 5) represents a significant security vulnerability. The system's inability to

correctly identify and report fraudulent transactions exposes it to substantial financial risk. Immediate attention must be given to addressing this issue. A security audit may be necessary.

Conclusion:

The test results highlight a serious deficiency in the system's error handling and fraud detection capabilities. The suggested resolutions prioritize correcting the error handling, improving fraud detection, and implementing more rigorous testing and monitoring. The high fraud risk necessitates immediate and decisive action.