HUD IMS/PIC
Modernization
System
API Submission
Developer Guide

U.S. Department of Housing and Urban Development

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Document History

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</thead>
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</tr>
</tbody>
</table>
Table of Contents

1. Overview: HUD IMS/PIC platform ............................................................................................................. 3
   1.1 HUD IMS/PIC API Developer Guide ........................................................................................................ 3

2. Overview: Form Submission API .................................................................................................................. 4
   2.1 Business Workflow .................................................................................................................................. 4
   2.2 Technical Summary .................................................................................................................................. 4

3. Integration Testing with Software Vendors .................................................................................................. 5
   3.1 Pre-Integration Prerequisites .................................................................................................................... 5
   3.2 Integration Testing Account Set Up .......................................................................................................... 5
   3.3 Integration Testing .................................................................................................................................... 5

4. User Roles and Integration Security ............................................................................................................ 6
   4.1 Transport Security ..................................................................................................................................... 6
   4.2 IMS/PIC Modernization System User Roles and Credentials .................................................................... 6
   4.3 Application access Tokens ....................................................................................................................... 6

5. API Details .................................................................................................................................................... 7
   5.1 Domain Model and Business Logic .......................................................................................................... 7
   5.2 Technical Workflow Diagram ................................................................................................................... 8
   5.3 Method: Form Submission Request & Response: .................................................................................... 8

1. Appendix A: Single Form Submission Request JSON Format ......................................................................... 9
2. Appendix B: Single Form Submission Response JSON Format ........................................................................ 14
3. Appendix C: IMS/PIC Modernization System Form Submission Data Dictionary ......................................... 16
1. Overview: HUD IMS/PIC platform

This IMS/PIC Modernization System will provide Public Housing Authorities (PHAs) the ability to electronically submit and process the HUD-50058 and the HUD-50058 MTW Expansion.

The IMS/PIC Modernization System will allow agencies and these agencies’ vendors to more seamlessly submit the HUD-50058 and the HUD-50058 MTW Expansion form data through API and validate these form submissions against PIH business rules. The new transmission mechanism should result in fewer fatal errors and facilitate the reporting of any changes to the HUD-50058 and the HUD-50058 MTW Expansion.

The HUD-50058 and the HUD-50058 MTW Expansion includes new and altered data elements regarding edit checks and error codes organized by the fields on the form, and other information such as HUD requested questions as defined in the Technical Reference Guide (TRG).

1.1 HUD IMS/PIC API Developer Guide

The IMS/PIC Modernization System will help PHAs electronically submit data in the correct format to HUD via a cloud-based system leveraging the Salesforce platform that will provide a better user experience for Public Housing Authorities (PHAs) and to significantly enhance the collection, use and analysis of both building and unit and household data while ensuring all data is in the correct format for transmission to HUD.

The new digital avenue using Application Programming Interface (API) will allow PHA agencies and these agencies’ vendors to more seamlessly submit the HUD-50058 and the HUD-50058 MTW Expansion data to the IMS/PIC Modernization System and even validate these forms prior to submission all through the vendors’ software application. This Application Programming Interface (API) Developer Guide provides a way for PHA agencies and these agencies’ vendors to build easy, secure integration with the IMS/PIC Modernization System. The API is intended for MTW Expansion agencies and these agencies’ vendors only. Your data is secured using a private API key. This document is designed for developers building integrations to the IMS/PIC Modernization System.

The application uses standard Salesforce cloud services:

- Salesforce Communities
2. Overview: Form Submission API

2.1 Business Workflow

The IMS/PIC Modernization System API submission Developer Guide provides the technical information needed to establish a system-to-system interface between the IMS/PIC Modernization System, and the PHA agencies and/or these agencies' vendors. Authorized Parties to use the following APIs:

- Form Submission

2.2 Technical Summary

The IMS/PIC Modernization System supports technical integration using OAUTH-2 based authentication and a REST API for all interactions using JavaScript Object Notation (JSON). All API interaction with the IMS/PIC Modernization System is initiated by the integrating system, to which the IMS/PIC Modernization System responds synchronously. The IMS/PIC Modernization System does not initiate interactions to integrate systems.

The IMS/PIC Modernization System: Form submission APIs provide support to the following workflow methods:

From Submission Request & Response:

**POST /services/apexrest/testPostV2**

1. PHA agencies and these agencies’ vendors can submit Forms for the following Form types:
   - MTWEX
   - 50058
2. Responds with a unique Tracking ID, Form Number and validation error messages if any
3. Integration Testing with Software Vendors

3.1 Pre-Integration Prerequisites
For integration testing, software vendors must be set up in advance in the IMS/PIC Modernization System with appropriate permissions to access or submit the HUD-50058 and the HUD-50058 MTW Expansion. In order to establish a system connection to the IMS/PIC Modernization System for integration testing purposes, software vendors will need to complete, sign, and submit a Memorandum of Understanding/Agreement and Interconnection Security Agreement to HUDITVendorComms@hud.gov.

For more information, refer to the IMS/PIC Modernization Technical Information Page or contact HUDITVendorComms@hud.gov.

3.2 Integration Testing Account Set Up

Provide your test account information for the partner test environment to HUDITVendorComms@hud.gov, HUD staff will provide you the partner test environment endpoints for the Form submission APIs and explain how to obtain the required OAUTH-2 access token issuance credentials.

When you receive your test account information, please complete the setup of your account promptly to avoid the expiration of your temporary credentials.

3.3 Integration Testing

The IMS/PIC Modernization System requires all integration partners to successfully complete an initial integration test suite.

All custom application development and testing must be formed using the IMS/PIC Modernization System Customer portal environment. This environment exposes the same API as the IMS/PIC Modernization System PROD environment, but the functionality provided can vary slightly to facilitate development and testing. Integration testing must be performed with test data. Do not use production or real-world information for integration testing.

Due to the variety and volume of participants using the environment, we ask that Partners limit their interaction for the number of submissions needed to functionally test the integration. In other words, please do not use the Partner test environment for any type of load or performance testing.
4. User Roles and Integration Security

4.1 Transport Security

IMS/PIC Modernization System exposes a set of web services that are secured with industry standard encryption protocols and cipher suites. Integration systems must be able to create a connection to an HTTPS enabled website. The IMS/PIC Modernization System site uses TLS 1.2 and an SSL Certificate from a publicly trusted issuer.

4.2 IMS/PIC Modernization System User Roles and Credentials

As part of an IMS/PIC Modernization System organizational account, IMS/PIC Modernization System provides separate accounts for human end users and client applications. PHA Agencies and their Authorized Parties can use the IMS/PIC Modernization System Form Submission API. PHA Agencies will be able to view all Form submission information uploaded or processed on their behalf by the Authorized Party when they log into the IMS/PIC Modernization System Customer portal website.

Software that uses the IMS/PIC Modernization System API must present two sets of credentials: one set of credentials identifies the client application and permits system to system communications and the other credentials identifies the end user(s) submitting the Form.

4.3 Application access Tokens

The IMS/PIC Modernization System requires a valid access token for any API call that involves the submission of data. Using system tokens greatly reduces the need to exchange system access credentials when using the API. The access token has an expiration date that you can read from the token; your system must be able to request a new token when the previously issued token has expired in order to avoid interruption in the business processes.

In order for requests to be successfully authorized by the IMS/PIC Modernization System services, a valid access token must be sent in the headers of every HTTP request.

Any request that does not include a valid security token will receive an HTTP 403 error for a response.
5. API Details

5.1 Domain Model and Business Logic

The IMS/PIC Modernization System Form Submission API uses the JSON payload to create a Form Submission and associate the PHAs with PHA Code provided in the JSON payload. Once Form Submission is created with related child objects data, a validation process will be initiated to evaluate the present validation rules. In case of any validation errors, all the error messages will be returned as response to the API calls along with the unique tracking ID and Form Number.

Note: Please refer to Appendix C for the IMS/PIC Modernization System Form submission Data Dictionary.
5.2 Technical Workflow Diagram

The sequence diagram shows the interaction between a client being a PHA Agency application and the *IMS/PIC Modernization System* APIs.

5.3 Method: Form Submission Request & Response:

Method: **HTTP POST /services/apexrest/testPostV2**

- a. Submit a Form request file submitted as a JSON file.
- b. IMS/PIC Modernization System API responds with a unique Tracking ID and error messages in case of any
- c. Single claim request to be sent within the request payload.

Please find below Appendix A for sample JSON for request, and Appendix B for sample JSON response.
1. Appendix A: Single Form Submission Request JSON Format

```
{
   "header": {
      "submissionType": "MTWEX"
   },

   "agency": {
      "phaName": "Test Authority",
      "phaCode": "DC123",
      "program": "P",
      "projectNumber": "DC123123456",
      "buildingNumber": "221",
      "entranceNumber": "1",
      "unitNumber": "904",
      "realEstateId": "DC1230007078"
   },

   "action": {
      "actionDate": "1",
      "effectiveDate": "11302019",
      "isCorrection": "N",
      "correctionReason": "",
      "admissionDate": "11302019",
      "reexaminationDate": "11302019",
      "rentUpdateDate": "",
      "isFssParticipant": "N",
      "specialProgram": "",
      "specialOther1": "",
      "specialOther2": "",
      "isMtwwsParticipant": "N",
      "mtwwsAdmissionDate": "",
      "eopReasons": "",
      "interimReexamReasons": ""
   },

   "household": {
      "members": [
      {
         "memberNumber": "1",
         "lastName": "Test",
         "firstName": "Zeroai",
         "middle": "A",
         "dob": "07181985",
         "age": "34",
         "sex": "M",
         "relationCode": "H",
         "citizenshipCode": "EC",
         "isDisabled": "N",
         "raceCode": [
            "2"
         ],
         "ethnicityCode": "2",
         "ssn": "001010001",
         "alienNumber": "",
         "communityCode": "1",
         "avgHoursWorked": "5"
      },
      {
         "memberNumber": "2",
         "lastName": "Test",
      }
      ]
   }
```
"firstName": "Zerobi",
"middle": "B",
"dob": "03181988",
"age": "31",
"sex": "F",
"relationCode": "S",
"citizenshipCode": "EN",
"isDisabled": "N",
"raceCode": [
  "2"
],
"ethnicityCode": "2",
"ssn": "001020001",
"alienNumber": "",
"communityCode": "3",
"avgHoursWorked": "5"
},
{
"memberNumber": "3",
"lastName": "Test",
"firstName": "Zeroci",
"middle": "C",
"dob": "05182008",
"age": "11",
"sex": "F",
"relationCode": "Y",
"citizenshipCode": "EC",
"isDisabled": "N",
"raceCode": [
  "2"
],
"ethnicityCode": "2",
"ssn": "001030001",
"alienNumber": "",
"communityCode": "4",
"avgHoursWorked": "1"
}],
"workRequirementCompliance": "2",
"totalHousehold": "3",
"subsidyStatus": "E",
"subsidyEffectiveDate": "",
"formerHeadOfHouseholdSsn": ""
},

"background": {
"waitingListEntryDate": "01202018",
"zipBeforeAdmission": "11120",
"isHomelessAtAdmission": "N",
"isVeryLowIncomeLimit": "N",
"isContinuallyAssisted": "N"
},

"unitOccupied": {
"address": {
  "street": "123 Awesome Drive",
  "apartment": "2099",
  "city": "Lucknow",
  "state": "MD",
  "zip": "20223"
},
"isMailingAddressSame": "N",
"mailingAddress": {
  "street": "7890 Delhi Street",
  "apartment": "201",
  "city": "Whoknows",
  "state": "DC",
  "zip": "21110"
},
"bedrooms": "2",
"isAccessible": "Y",
"isAccessibleRequested": "N",
"accessibleReceived": "1",
"lastHqsPassDate": "20120101",
"lastAnnualHqsDate": "20120101",
"yearBuilt": "1988",
"structureType": "5"
},
"assets": {
  "memberAssets": [
    {
      "memberName": "Zeroai Test",
      "memberNumber": "1",
      "assetType": "Toyota Prius",
      "cashValue": "5000",
      "anticipatedIncome": "100"
    },
    {
      "memberName": "Zeroai Test",
      "memberNumber": "1",
      "assetType": "Honda Civic",
      "cashValue": "2500",
      "anticipatedIncome": "0"
    },
    {
      "memberName": "Zerobi Test",
      "memberNumber": "2",
      "assetType": "Apple Watch",
      "cashValue": "300",
      "anticipatedIncome": ""
    }
  ],
  "totalCashValue": "7800",
  "totalAnticipatedIncome": "100",
  "passBookRate": "0150",
  "imputedIncome": "117",
  "finalIncome": "117"
},

"income": {
  "memberIncome": [
    {
      "memberName": "Zeroai Test",
      "memberNumber": "1",
      "dollarsPerYear": "6500",
      "incomeCode": "B",
      "incomeExclusions": "500",
      "afterExclusions": "6000"
    },
    {
      "memberName": "Zeroai Test",
      "memberNumber": "1",
      "dollarsPerYear": "4000",
      "incomeCode": "B",
      "incomeExclusions": "500",
      "afterExclusions": "6000"
    }
  ]
}
"incomeCode": "W",
"incomeExclusions": "500",
"afterExclusions": "3500"
},
{
"memberName": "Zerobi Test",
"memberNumber": "2",
"dollarsPerYear": "8000",
"incomeCode": "F",
"incomeExclusions": "500",
"afterExclusions": "7500"
}
],
"totalIncomeAfterExclusions": "17000",
"priorCurrentYrIncome": "C",
"totalAnnualIncome": "17117"
},

"expectedIncome": {
"permissibleDeductions": [{
"memberName": "",
"memberNumber": "",
"deductionType": "",
"amount": ""
},
{
"memberName": "",
"memberNumber": "",
"deductionType": "",
"amount": ""
}]
],
"totalPermissibleDeduction": "",
"disabilityThreshold": "",
"unreimbursedDisabilityExpense": "",
"maximumDisabilityAllowance": "",
"disabilityAssistanceEarnings": "",
"allowableDisabilityAssistance": "",
"unreimbursedMedicalExpense": "",
"totalDisabilityAndMedical": "",
"disabilityAllowance": "",
"elderlyAllowance": "",
"dependents": "1",
"allowancePerDependent": "480",
"totalDependent Allowance": "480",
"childcareCost": "2500",
"deductionsNotAbove": "",
"totalAllowances": "2980",
"adjustedAnnualIncome": "14137"
},

"totalTenantPayment": {
"totalMonthlyIncome": "1426",
"ttpBasedOnAnnualIncome": "143",
"adjustedMonthlyIncome": "1178",
"adjustedMonthlyIncomePercent": "3000",
"ttpBasedOnAdjustedAnnualIncome": "353",
"welfareRentPerMonth": "0",
"minimumRent": "50",
"enhancedVoucherMinimumRent": "",
"ttp": "353",
"totalDependentAllowance": "480",
"adjustedMonthlyIncome": "1178",
"adjustedMonthlyIncomePercent": "3000",
"ttp": "353",
"totalDependentAllowance": "480",
"totalDependent Allowance": "480",
"childcareCost": "2500",
"deductionsNotAbove": "",
"totalAllowances": "2980",
"adjustedAnnualIncome": "14137"
},

"expectedIncome": {
"permissibleDeductions": [{
"memberName": "",
"memberNumber": "",
"deductionType": "",
"amount": ""
},
{
"memberName": "",
"memberNumber": "",
"deductionType": "",
"amount": ""
}]
],
"totalPermissibleDeduction": "",
"disabilityThreshold": "",
"unreimbursedDisabilityExpense": "",
"maximumDisabilityAllowance": "",
"disabilityAssistanceEarnings": "",
"allowableDisabilityAssistance": "",
"unreimbursedMedicalExpense": "",
"totalDisabilityAndMedical": "",
"disabilityAllowance": "",
"elderlyAllowance": "",
"dependents": "1",
"allowancePerDependent": "480",
"totalDependent Allowance": "480",
"childcareCost": "2500",
"deductionsNotAbove": "",
"totalAllowances": "2980",
"adjustedAnnualIncome": "14137"
},

"totalTenantPayment": {
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"adjustedMonthlyIncomePercent": "3000",
"ttpBasedOnAdjustedAnnualIncome": "353",
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"deductionsNotAbove": "",
"totalAllowances": "2980",
"adjustedAnnualIncome": "14137"
},

"totalTenantPayment": {
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"adjustedMonthlyIncomePercent": "3000",
"ttpBasedOnAdjustedAnnualIncome": "353",
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"minimumRent": "50",
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"ttp": "353",
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"adjustedMonthlyIncomePercent": "3000",
"ttp": "353",
"totalDependent Allowance": "480",
"childcareCost": "2500",
"deductionsNotAbove": "",
"totalAllowances": "2980",
"adjustedAnnualIncome": "14137"
},

"totalTenantPayment": {
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"ttpBasedOnAnnualIncome": "143",
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"adjustedMonthlyIncomePercent": "3000",
"ttpBasedOnAdjustedAnnualIncome": "353",
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"minimumRent": "50",
"enhancedVoucherMinimumRent": "",
"ttp": "353",
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"adjustedMonthlyIncomePercent": "3000",
"ttp": "353",
"totalDependent Allowance": "480",
"childcareCost": "2500",
"deductionsNotAbove": "",
"totalAllowances": "2980",
"adjustedAnnualIncome": "14137"
},

"totalTenantPayment": {
"totalMonthlyIncome": "1426",
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"adjustedMonthlyIncomePercent": "3000",
"ttpBasedOnAdjustedAnnualIncome": "353",
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"minimumRent": "50",
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"adjustedMonthlyIncomePercent": "3000",
"ttp": "353",
"totalDependent Allowance": "480",
"childcareCost": "2500",
"deductionsNotAbove": "",
"totalAllowances": "2980",
"adjustedAnnualIncome": "14137"
},

"totalTenantPayment": {
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"adjustedMonthlyIncome": "1178",
"adjustedMonthlyIncomePercent": "3000",
"ttpBasedOnAdjustedAnnualIncome": "353",
"welfareRentPerMonth": "0",
"minimumRent": "50",
"enhancedVoucherMinimumRent": "",
"ttp": "353",
"totalDependentAllowance": "480",
"adjustedMonthlyIncome": "1178",
"adjustedMonthlyIncomePercent": "3000",
"ttp": "353",
"totalDependent Allowance": "480",
"childcareCost": "2500",
"deductionsNotAbove": "",
"totalAllowances": "2980",
"adjustedAnnualIncome": "14137"
},

"totalTenantPayment": {
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"adjustedMonthlyIncome": "1178",
"adjustedMonthlyIncomePercent": "3000",
"ttpBasedOnAdjustedAnnualIncome": "353",
"welfareRentPerMonth": "0",
"minimumRent": "50",
"enhancedVoucherMinimumRent": "",
"ttp": "353",
"totalDependentAllowance": "480",
"adjustedMonthlyIncome": "1178",
"adjustedMonthlyIncomePercent": "3000",
"ttp": "353",
"totalDependent Allowance": "480",
"childcareCost": "2500",
"deductionsNotAbove": "",
"totalAllowances": "2980",
"adjustedAnnualIncome": "14137"
}}
"mostRecentTtp": "",
"isHardshipExemption": "N"
},

"rentCalculation": {
"unitFlatRent": "1200",
"lowerTtpOrFlatRent": "353",
"utilityAllowance": "150",
"tenantRent": "203",
"publicHousingMaximumRent": "0",
"familyMaximumSubsidy": "0",
"totalEligible": "0",
"totalFamily": "0",
"eligibleSubsidy": "0",
"mixedFamilyTtp": "0",
"utilityAllowanceProrated": "0",
"mixedFamilyTenantRent": "0",
"rentType": "F",
"overIncomeDate": "",
"altTenantRent": ""
}
2. Appendix B: Single Form Submission Response JSON Format

```
{
  "Results" : [ {
    "submissionsSfRef" : "Form-0005059",
    "submissionsSfRefId" : "a0I35000005S2DIEA0",
    "submissionRefCode" : "",
    "submissionStatus" : "Validation Error",
    "errorMessages" : [ {
      "errorId" : "4046",
      "errorMessage" : "The submitted combination of Building Number, Building Entrance Number & Unit Number does not exist for selected development number, and the submitted Real Estate ID does not exist, or this information has not been provided.",
      "path" : "1h",
      "submissionDetErrId" : "",
      "errorType" : "",
      "lineNumber" : "",
      "fieldContent" : ""
    }, { 
      "errorId" : "5459",
      "errorMessage" : "If 2c equals Y, must equal 1,2,3, or 4",
      "path" : "2d",
      "submissionDetErrId" : "",
      "errorType" : "",
      "lineNumber" : "",
      "fieldContent" : ""
    }, { 
      "errorId" : "4292",
      "errorMessage" : "Year Unit Was Built should be blank for program type P."
    }, { 
      "errorId" : "5040",
      "errorMessage" : "Structure Type should be blank for program type P."
    }, { 
      "errorId" : "3165",
      "errorMessage" : "Correction must be valued"
    }, { 
      "errorId" : "4102",
      "errorMessage" : "ReExam Date should be later than effective date"
    }
  ]
}
```
"path" : "2i",
"submissionDetErrId" : "",
"errorType" : "",
"lineNumber" : "",
"fieldContent" : ""
},
{
"errorId" : "3166",
"errorMessage" : "Reexamination Date must be valued",
"path" : "2i",
"submissionDetErrId" : "",
"errorType" : "",
"lineNumber" : "",
"fieldContent" : ""
}]
3. Appendix C: *IMS/PIC Modernization System Form Submission* Data Dictionary

HUD Form 50058 and Form 50058 MTW Json Mapping
050521.xlsx

FORM HUD-50058 TECHNICAL REFERENCE GUIDE