PX Calculator Specification

Version 1.0

1. Purpose

The purpose of the document is to describe

* PxCalculator request and response specification.
* Product Detail JSON object

### Request and Response Object specification

Data formats

* Date: YYYY-MM-DD
* Real: string representing a decimal floating point number, where the decimal separator is ‘.’
* Integer: string representing an integer number
* Boolean: true/false (null is the same as false in some cases)

Structure element

A structure element is a JSON container element with some pre-defined behavior:

* It can have an id attribute
* It has a Features element
* It has a Links element

Common Request parameters to Embedded / Service based Calculator

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Request Parameter** | **Required** | **Type** | **Request Parameter Description** | **Valid Value** | **UI equivalent** |
| id | N | String | The Id attribute can be applied to any structure element. It represents an id that is internal to the message, and that is used to refer from one element in the message to another. |  | - |
| ref | N | String | The ref attribute can be applied to any structure element in output. It represents a reference to a structure element |  |  |
| Features | N | Container | Lists the inputs or outputs belonging to a structure element |  |  |
| Links | N | Container | Lists embedded structure elements or references to other structure elements according to their relationship to the parent structure element. An element under a link is always an array containing elements with the same name as the array. |  |  |
| CoverageTerm/PaymentTerm/PolicySustainabilityOptionTerm | N | Container element | Determines the term of coverage or term of payment of the policy , or the term of the sustainability option |  | - |
| TermType  (of CoverageTerm/PaymentTerm/ PolicySustainabilityOptionTerm) | Y | String | Determines if the term is age based or duration based | Duration, Age | Not clear if Age is needed for Malaysia at this point. |
| Term  (of CoverageTerm/PaymentTerm/ PolicySustainabilityOptionTerm) | Y | Integer | Age or duration of coverage/payment |  | Term (at policy level)  Rider term (at rider level) |

Request Attributes Details for Service based or Embedded Calculator (Input XML)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Request Parameter | Path | Reqd | Type | Request Parameter Description | Valid Value | UI equivalent |
| Calculate | Root | Y | Container element | Used to determine the type of service call. Contains the Calculate call to ProductXpress Calculator |  | - |
| clc:CalculationInput | Calculate | Y | Container element | Used to provide the input to the Calculate call |  | - |
| detailed-errors | Calculate/clc:CalculationInput | Y | String | Determines the way in which ProductXpress returns errors | Must be ‘true’ | - |
| clc:DeplR | Calculate/clc:CalculationInput | Y | Container element | Determines the product for which the Calculate call is performed |  | - |
| dep-name | Calculate/clc:CalculationInput/deplR | Y | String | Name of the product for which this Calculate call is performed | Must be one of the names returns from productList service | Product |
| ver-sel | Calculate/clc:CalculationInput/deplR | Y | String | Determines the version of the product to be selected (if there are multiple versions deployed) | ‘active on date’ ‘last’ | Not in the UI. For MOS the decision was made to use ‘last’. |
| act-date | Calculate/clc:CalculationInput/deplR | N | Date | Defines the current date, and is used for selecting the product version if ver-sel is set to ‘active on date’ |  | Current date from the back-end system |
| clc:CalculationData | Calculate/clc:CalculationInput | Y | Container element | Contains the data on which the illustration is performed |  | - |
| Policy | Calculate/clc:CalculationInput/clc:CalculationData | Y | Structure element | Represents the policy (or presumed policy at time of illustration) |  | - |
| PaymentFrequency | Calculate/clc:CalculationInput/clc:CalculationData/Policy | Y | String | Frequency with which the premium is paid | 1 : annually  2 : semi-annually  4 : quarterly  12 : monthly  13: Monthly EPP  14: Salary Deduction  15: Workside Marketing  16: Biro Angkasa  999 : single premium | Frequency Payment |
| PlanCode | Calculate/clc:CalculationInput/clc:CalculationData/Policy | N | String | Plan code of the policy. Only mandatory for products with multiple plans. | Product-dependent | Basic Plan (BTY)  Plan option (ALSB) |
| ProductCode | Calculate/clc:CalculationInput/clc:CalculationData/Policy | Y | String | Product code of the policy | Product-dependent | Product Code |
| CoverageTerm | Calculate/clc:CalculationInput/clc:CalculationData/Policy | N | Container element | Coverage term of the policy |  | - |
| PaymentTerm | Calculate/clc:CalculationInput/clc:CalculationData/Policy | N | Container element | Payment term of the policy |  | - |
| SustainabilityOptionTerm | Calculate/clc:CalculationInput/clc:CalculationData/Policy | N | Container element | Sustainability option term of the policy |  | - |
| ExtendedCoverageOption | Calculate/clc:CalculationInput/clc:CalculationData/Policy | N | Boolean | Indicated whether the extendedcoverageoption was selected or not | true/false (null is the same as false) |  |
| WithdrawalOption | Calculate/clc:CalculationInput/clc:CalculationData/Policy | N | String | ALSB specific attribute | 1: Leave with company  2: withdraw each year | With GAP option |
| TotalPremium | Calculate/clc:CalculationInput/clc:CalculationData/Policy | N | String | Total premium to be invested (ILP specific attribute) |  |  |
| TargetAge | Calculate/clc:CalculationInput/clc:CalculationData/Policy | N | String | Used to specifiy the target age for the value projection option |  |  |
| TargetValue | Calculate/clc:CalculationInput/clc:CalculationData/Policy | N | string | Specifies the value to be reached at the specified age |  |  |
| InsurancePortion | Calculate/clc:CalculationInput/clc:CalculationData/Policy | N | String | Insurance portion of the premium to be invested (ILP specific attribute) |  |  |
| Coverage | Calculate/clc:CalculationInput/clc:CalculationData/Policy/Coverage/Coverage | Y | StructureElement | Element representing a coverage, either the main coverage on a policy or a rider/waiver on a policy |  | - |
| CoverageCode | Calculate/clc:CalculationInput/clc:CalculationData/Policy/Coverage/Coverage/Features | Y | String | Coverage/rider code of the coverage/rider | Product-dependent | Rider Code |
| InsuredAmount | Calculate/clc:CalculationInput/clc:CalculationData/Policy/Coverage/Coverage/Features | N | Real | Amount of insurance provided by the coverage | Product-dependent | Sum Assured (for main coverage)  Rider Sum Assured (for rider) |
| PlanCode | Calculate/clc:CalculationInput/clc:CalculationData/Policy/Coverage/Coverage/Features | N | String | Plan code of the coverage. Only mandatory for coverages with multiple plans. | Product-dependent |  |
| CoverageTerm | Calculate/clc:CalculationInput/clc:CalculationData/Policy/Coverage/Coverage/Features | N | Container element | Coverage term of the coverage/rider/waiver |  | - |
| PaymentTerm | Calculate/clc:CalculationInput/clc:CalculationData/Policy/Coverage/Coverage/Features | N | Container element | Payment term of the coverage/rider/waiver |  | - |
| Insured | Calculate/clc:CalculationInput/clc:CalculationData/Policy/Insured/Insured | Y | Container element | Details about the insured on the policy |  |  |
| Owner | Calculate/clc:CalculationInput/clc:CalculationData/Policy/Owner/Owner | Y | Container element | Details about the owner of the policy |  |  |
| RoleCode | Calculate/clc:CalculationInput/clc:CalculationData/Policy/Insured/Insured/Features | Y | String | Identifies whether this is the main insured or the spouse | Insured, Spouse, Parent/ Guardian. Owner | - |
| Person | Calculate/clc:CalculationInput/clc:CalculationData/Policy/Insured/Insured/Links | Y | Container element | Container for the reference to the person who is the insured |  | - |
| clc:Reference | Calculate/clc:CalculationInput/clc:CalculationData/Policy/Insured/Insured/Links/Person | Y | Container element | Container for the reference to the person who is the insured |  | - |
| ref | Calculate/clc:CalculationInput/clc:CalculationData/Policy/Insured/Insured/Links/Person/clc:Reference | Y | String | Reference to the person. Must refer to an id of another structure element in the same message. |  | - |
| Person | Calculate/clc:CalculationInput/clc:CalculationData/Person | N | Structure element | A physical person |  | - |
| BirthDate | Calculate/clc:CalculationInput/clc:CalculationData/Person/Features | N | Date | Date of birth of the person. Either BirthDate or AgeNextBirthday must be provided |  | DOB, Spouse DOB |
| AgeNextBirthday | Calculate/clc:CalculationInput/clc:CalculationData/Person/Features | N |  | Age next birthday of the person. Either BirthDate or AgeNextBirthday must be provided |  | ANB, Spouse ANB |
| Gender | Calculate/clc:CalculationInput/clc:CalculationData/Person/Features | Y | String | Gender of the person | 1 : Male  2 : Female | Gender |
| OccupationClass | Calculate/clc:CalculationInput/clc:CalculationData/Person/Features | N | String | Occupation class of the person | 1/2/3/4 | Occupation Class |
| SmokingHabit | Calculate/clc:CalculationInput/clc:CalculationData/Person/Features | N | String | Identifies if a person is smoker or not | Y : Smoker  N : Non-smoker | Smoker Habit |
| FundInvestment | Calculate/clc:CalculationInput/clc:CalculationData/Policy | N | StructureElement | Defines a single fund investment |  |  |
| FundCode | Calculate/clc:CalculationInput/clc:CalculationData/Policy/Links/FundInvestment/FundInvestment/Features | Y | String | The fund code |  |  |
| FundPercentage | Calculate/clc:CalculationInput/clc:CalculationData/Policy/Links/FundInvestment/FundInvestment/Features | Y | Real | Percentage investment |  |  |
| TopUp | Calculate/clc:CalculationInput/clc:CalculationData/Policy | N | StructureElement | Defines a top up for a single year |  |  |
| TopUpYear | Calculate/clc:CalculationInput/clc:CalculationData/Policy/Links/TopUp/TopUp/Features | Y | String | Year in which the amount is invested |  |  |
| TopUpAmount | Calculate/clc:CalculationInput/clc:CalculationData/Policy/Links/TopUp /TopUp/Features | Y | Real | The amount |  |  |
|  |  |  |  |  |  |  |

Response parameters that are applied in multiple places

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Response Parameter** | **Required** | **Type** | **Request Parameter Description** | **Valid Value** | **UI equivalent** |
| ref | N | String | The ref attribute can be applied to any structure element in output. It represents a reference to a structure element in the input |  |  |
| Features | N | Container | Lists the inputs or outputs belonging to a structure element |  |  |
| Links | N | Container | Lists embedded structure elements or references to other structure elements according to their relationship to the parent structure element. An element under a link is always an array containing elements with the same name as the array. |  |  |
| PremiumPerMode | N | Container element | Provides the premiums for all payment frequencies on the policy |  | Total Annual Premium  Half Year Payment  Quarterly Payment  Monthly Payment  Installment premium |
| Frequency (of PremiumPerMode) | Y | String | Frequency with which the premium is paid | 1 : annually  2 : semi-annually  4 : quarterly  12 : monthly  13: Monthly EPP  14: Salary Deduction  15: Workside Marketing  16: Biro Angkasa  999 : single premium |  |
| Premium (of PremiumPerMode) | Y | Real | The premium corresponding to the frequency |  |  |
| Term | N | Container element | Determines the term of coverage of the policy |  | - |
| TermType  (of term) | Y | String | Determines if the term is age based or duration based | Duration, Age | Not clear if Age is needed for Malaysia at this point. |
| Term  (of term) | Y | Integer | Age or duration of coverage |  | Term (at policy level)  Rider term (at rider level) |
| Tables | Y | Container element | Represents the illustration tables |  |  |
| SetElement (of Tables) | Y | Array | Represents a table |  |  |
| TableName | Y | String | Represents the name of the table |  |  |
| TableData (of Tables) | Y | Container element | Represents the contents of the table of illustration values |  | TableData |
| SetElement (of TableData) | Y | Array | Represents a column in a table |  |  |
| Headers (of TableDate) | Y | Container element | Contains the header-structure of the columns. It is a flat list of all headers, including headers that span multiple columns. |  |  |
| SetElement (of Headers) | Y | Array | Represents a header |  |  |
| Id | Y | String | Id of the header |  |  |
| Name | Y | String | Name of the header |  |  |
| Column | Y | String | Identifies if there is a corresponding column under this, i.e. if this is the leaf-node in the tree of headers |  |  |
| Parent | N | String | Id of the parent of the header; if left empty then this is a top header of the table | If filled, must refer to an Id of another column |  |
| Columns (of TableDate) | Y | Container element | Contains the the columns. It is a flat list of all columns. |  |  |
| SetElement (of Columns) | Y | Array | Represents a column |  |  |
| Header-ref (of Element) | Y | String | Represents the name of the column | Product-dependent |  |
| Values (of Element) | Y | Container element | Contains the cell of the column |  |  |
| polYr (of Values) | Y | Integer | Represents the policy year of the cell-value |  |  |
| Value (of Values) | Y | Real | Represent the cell-value |  |  |

Response Attributes Details for Service or Embedded PX Calculator (Output XML)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Response Parameter** | **path** | **Reqd** | **Type** | **Response Parameter Description** | **Valid Value** | **UI equivalent** |
| Calculate | Root | Y | Container element | Used to determine the type of service call. Contains the Calculate call to ProductXpress Calculator |  | - |
| clc:CalculationOutput | Calculate | Y | Container element | Used to provide the input to the Calculate call |  | - |
| xmlns:xsi / xmlns:clc/ xmlns | Calculate/clc:CalculationOutput | Y | String | Fixed attributes that are needed to help the translation between json and XML. For contents see sample payloads | See sample payloads | - |
| detailed-errors | Calculate/clc:CalculationOutput | Y | String | Determines the way in which ProductXpress returns errors | Must be ‘true’ | - |
| clc:RuntimeConfiguration | Calculate/clc:CalculationOutput | Y | Container element | Determines the product for which the Calculate call is performed |  | - |
| id | Calculate/clc:CalculationOutput/ clc:RuntimeConfiguration | Y | String | Id of the product for which this Calculate call is performed |  |  |
| name | Calculate/clc:CalculationOutput/ clc:RuntimeConfiguration | Y | String | Name of the product for which this Calculate call was performed | Is one of the names returns from productList service | Product |
| version | Calculate/clc:CalculationOutput/ clc:RuntimeConfiguration | Y | String | The version of the product that was used for this Calculate call |  |  |
| clc:Calculation | Calculate/clc:CalculationOutput | Y | Container element | Contains the actual results of the illustration calculations |  | - |
| Policy | Calculate/clc:CalculationOutput/clc:Calculation | Y | Structure element | Represents the policy (or presumed policy at time of illustration) |  | - |
| ProductCode | Calculate/clc:CalculationOutput/clc:Calculation/Policy | Y | String | Product code of the policy | Product-dependent | Product Code |
| PolicyFee | Calculate/clc:CalculationOutput/clc:Calculation/Policy | Y | String | Fee for the policy |  | Policy fee |
| RequiredAmount | Calculate/clc:CalculationOutput/clc:Calculation/Policy | N | Container element | Contains the amounts needed to reach the target value on target age. Only applicable to products that have a projection option |  |  |
| ScenarioA | Calculate/clc:CalculationOutput/clc:Calculation/Policy/RequiredAmount | Y | Number | The value for scenario a |  |  |
| ScenarioB | Calculate/clc:CalculationOutput/clc:Calculation/Policy/RequiredAmount | Y | Number | The value for scenario b |  |  |
| PremiumPerMode | Calculate/clc:CalculationOutput/clc:Calculation/Policy | N | Container element | See above for definition |  | Total premium |
| TableData | Calculate/clc:CalculationOutput/clc:Calculation/Policy | N | Container element | See above for definition |  | TableData |
| Coverage | Calculate/clc:CalculationOutput/clc:Calculation/Policy/Coverage/Coverage | N | Container element | Element representing a coverage, either the main coverage on a policy or a rider/waiver on a policy |  | - |
| CoverageCode | Calculate/clc:CalculationOutput/clc:Calculation/Policy/Coverage/Coverage/Features | Y | String | Coverage/rider code of the coverage/rider | Product-dependent | Rider Code |
| InsuredAmount | Calculate/clc:CalculationOutput/clc:Calculation/Policy/Coverage/Coverage/Features | N | Real | Amount of insurance provided by the coverage | Product-dependent | Sum Assured (for main coverage)  Rider Sum Assured (for rider) |
| CalculatedInsuredAmount | Calculate/clc:CalculationOutput/clc:Calculation/Policy | N | Real | Calculated insured amount provided by the AmCapital | AmCapital | Main coverage |
| PremiumPerMode | Calculate/clc:CalculationOutput/clc:Calculation/Policy/Coverage/Coverage/Features | N | Container element | See above for definition |  | Premium |
| PaymentTerm | Calculate/clc:CalculationOutput/clc:Calculation/Policy/Coverage/Coverage/Features | N | Container element | See above for definition |  | - |
| CoverageTerm | Calculate/clc:CalculationOutput/clc:Calculation/Policy/Coverage/Coverage/Features | N | Container element | See above for definition |  | - |
| CommisionData | Calculate/clc:CalculationOutput/clc:Calculation/Policy/Coverage/Coverage/Features | N | Container Element | Overview of commission per year |  |  |
| SetElement | Calculate/clc:CalculationOutput/clc:Calculation/Policy/ CommisionData | N | Array |  |  |  |
| PolYr | Calculate/clc:CalculationOutput/clc:Calculation/Policy/CommisionData/SetElement | Y | Integer | See above |  |  |
| Value | Calculate/clc:CalculationOutput/clc:Calculation/Policy/CommisionData/SetElement | Y | Real | See above |  |  |
|  |  |  |  |  |  |  |

## Product Detail

This JSON will be will be used to get a list of all details for Products in scope.

Information received contains information such as names (product / marketing names), applicable riders and rules pertaining to the product.

Request Attributes Details for Service based calculator

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Request Parameter | Path | Reqd | Type | Request Parameter Description | Valid Value | UI equivalent |
| credentials | Root | Y | Container element | Used to provide credentials of to be used for this service call |  | - |
| username | Credentials/Username | Y | String | Specifies the username |  |  |
| password | Credentials/Password | Y | String | Specifies the password |  | - |
| Calculate | Root | Y | Container element | Used to determine the type of service call. Contains the Calculate call to ProductXpress Calculator |  |  |
| ProductDetailsList | Calculate/ProductDetailsList | Y | Container element | Specifies the productdetails list call will be made |  |  |
| Age | Calculate/ProductDetailsList/Age | N | Integer | Specifies the insured age, used for filtering if provided |  |  |
| Gender | Calculate/ProductDetailsList/Gender | N | String | Specifies the insured gender, used for filtering if provided | 1 : Male  2 : Female |  |

Response parameters that are applied in multiple places

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Response Parameter** | **Path** | **Reqd** | **Type** | **Request Parameter Description** | **Valid Value** | **UI equivalent** |
| rules | Rules | N | Container | Contains the set of rules |  |  |
| SetElement | rules/SetElement | Y | Array | Array of the rules |  |  |
| applicableAttribute | rules/SetElement/applicableAttribute | Y | String | The attribute that the rule applies to |  |  |
| bound | rules/SetElement/bound | Y | String | Specifies whether the rule describes an upper or lower bound | Min, Max, Dependency |  |
| unit | rules/SetElement/unit | N | String | If filled it, describes the unit of the value or result. For instance: the rule returns an age in days | Day, Month, Year |  |
| ruleExpression | rules/SetElement/ruleExpression | N | String | Javascript expression for validation rule |  |  |
| values | rules/SetElement/values | N | Container |  |  |  |
| SetElement | rules/SetElement/values/SetElement | Y | Array | Contains all possible values for the rule |  |  |
| features | Features | Y | Container element | features of a product, plan or rider |  |  |
| SetElement | features/SetElement | Y | Array | Array of the actual features |  |  |
| name | features/SetElement/name | Y | String | Name of the feature |  |  |
| value | features/SetElement/value | Y | String | Value of the feature |  |  |

Product Detail Response:

Response Attributes Details

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Response Parameter** | **Path** | **Reqd** | **Type** | **Response Parameter Description** | **Valid Value** | **UI equivalent** |
| Calculate | Root | Y | Container element | Used to determine the type of service call. Contains the result of the calculation to the service |  |  |
| productList | Calculate/productList | Y | Container element | Contains all products |  |  |
| SetElement | Calculate/productList/SetElement | Y | Array | Contains all products |  |  |
| product | Calculate/productList/SetElement/product/ | Y | Container element | Contains all the data for a single product |  |  |
| features | Calculate/ productList/SetElement /product/features | Y | Container element | Contains the features for a product. Refer to common attributes for more information. |  |  |
| plans | Calculate/ productList/SetElement/product/SetElement/plans | N | Container element | Plans that are defined for the product in question |  |  |
| SetElement | Calculate/productList/SetElement/product/SetElement/olans/SetElement | Y | Array | Array of all the plans |  |  |
| features | Calculate/productList/product/SetElement/plans/SetElement/feature | Y | Container element | Contains all the features for a plan. Refer to common attributes for more information. |  |  |
| rules | Calculate/productList/SetElement/product/SetElement/plans/SetElement/rules | Y | Container element | Refer to common attributes for more information. |  |  |
| riders | Calculate/productList/SetElement/product/SetElement/plans/SetElement/rules | Y | Container element | Riders for a plan |  |  |
| riders | Calculate/productList/SetElement/product/riders | Y | Container element | All riders for a product |  |  |
| SetElement | Calculate/productList/SetElement/product/riders | Y | Array | Array of all the riders |  |  |
| features | Calculate/productList/SetElement/product/SetElement/riders/SetElement/features | Y | Container element | Contains the features for a rider. Refer to common attributes for more information. |  |  |
| rules | Calculate/productList/SetElement/product/SetElement/rules | Y | Container element | Us Refer to common attributes for more information.ed to provide the input to the Calculate call |  |  |

## Rules variables

The RuleExpression uses JavaScript to express rules. Within those expressions. The names are typically relative to the Policy, i.e. if a value of a CoverageTerm on a Rider is needed, then the variable name is Riders [‘PRBX’].CoverageTerm.

There are two exceptions, two pre-defined variables are used:

* LifeAssuredAge
* PayorAge

LifeAssuredAge/PayorAge are special attributes that signify the age of the insured/payor at policy start. This is the same as ANB of insured/payor, but note that the interface for the illustration calculation allows either specifying the ANB or the date of birth of the insured.