**RESTful Web API调用设计文档**

艾普阳科技(深圳)有限公司

2017

# 概述

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# 用户行为设计

## JSON解析(JsonParser)

### 构造JSON

* **根据字符串构造JSON**

JsonParser lnv\_JsonParser

// 根据字符串构造JSON

String ls\_Error = lnv\_JsonParser.LoadString(ls\_Json)

if Len(ls\_Error) > 0 then

MessageBox(“Error”, ls\_Error)

end if

* **根据文件构造JSON**

JsonParser lnv\_JsonParser

// 根据文件构造JSON

String ls\_Error = lnv\_JsonParser.LoadFile(“c:\employee.json”)

if Len(ls\_Error) > 0 then

MessageBox(“Error”, ls\_Error)

end if

### 获取结点值

JsonParser lnv\_JsonParser

String ls\_Json =

{

"id": 1001,

"name": "evan",

"sex": true,

"salary": 100.55,

"image": "=F923LDF%$2KS0238D8G……BASE64",

"remark": null,

"date\_object":{"datetime":7234930293, “date”: "2017-09-21", "time": "12:00:00"},

"department\_array":[**999999**, {"name":"Website"}, {"name":"PowerBuilder"}, {"name":"IT"}]

}

// 根据字符串构造JSON

lnv\_JsonParser.LoadString(ls\_Json)

LongPtr llp\_RootObject = lnv\_JsonParser.GetRootItem()

// 获取root子结点值

Long ll\_id = lnv\_JsonParser.GetItemNumber(llp\_RootObject, “id”)

String ls\_name = lnv\_JsonParser.GetItemString(llp\_RootObject, “name”)

Boolean lb\_ sex = lnv\_JsonParser.GetItemBoolean(llp\_RootObject, “sex”)

Double ldb\_salary = lnv\_JsonParser.GetItemNumber(llp\_RootObject, “salary”)

Blob lblb\_image = lnv\_JsonParser.GetItemBlob(llp\_RootObject, “image”)

String ls\_remark = lnv\_JsonParser.GetItemString(llp\_RootObject, “remark”)

// 获取date\_object子结点值

LongPtr llp\_date\_object = lnv\_JsonParser.**GetItemObject**(llp\_RootObject, “date\_object”)

DateTime ldt\_datetime = lnv\_JsonParser.GetItemDateTime(llp\_date\_object , “datetime”)

Date ldt\_date = lnv\_JsonParser.GetItemDate(llp\_date\_object , “date”)

Time ldt\_time = lnv\_JsonParser.GetItemTime(llp\_date\_object , “time”)

// 获取department\_array子结点值

LongPtr llp\_department\_array = lnv\_JsonParser.**GetItemArray**(llp\_RootObject, “department\_array”)

LongPtr llp\_number\_item = lnv\_JsonParser.GetChildItem(llp\_department\_array, 1)

Long ll\_number = lnv\_JsonParser.GetItemNumber(llp\_number\_item) // 此结点没有key

LongPtr llp\_object\_item = lnv\_JsonParser.GetChildItem(llp\_department\_array, 2)

String ls\_name = lnv\_JsonParser.GetItemString(llp\_object\_item, “name”)

**……**

### 遍历记录集

JsonParser lnv\_JsonParser

String ls\_Json =

'[{"id":1, "name":"evan1", "birthday":2340323884}, {"id":2, "name":"evan2", "birthday":5340324801}]'

// 根据字符串构造JSON

lnv\_JsonParser.LoadString(ls\_Json)

LongPtr llp\_ArrayItem = lnv\_JsonParser.GetRootItem() // 根结点是JsonArrayItem!

Long ll\_ChildCount = lnv\_JsonParser.ChildCount(llp\_ArrayItem)

// 循环数组元素

for ll\_Index = 1 to ll\_ChildCount

// 获取数组元素

LongPtr llp\_ObjectItem = lnv\_JsonParser.GetChildItem(llp\_ArrayItem, ll\_Index)

// 数组元素是JsonObjectItem!

if lnv\_JsonParser.GetItemType(llp\_ObjectItem) = JsonObjectItem! then

Long ll\_Id = lnv\_JsonParser.GetItemNumber(llp\_ObjectItem, "id")

String ls\_Name = lnv\_JsonParser.GetItemString(llp\_ObjectItem, "name")

DateTime ldt\_Birthday = lnv\_JsonParser.GetItemDateTime(llp\_ObjectItem, "birthday")

end if

next

### 遍历对象结点

// \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*递归遍历结点入口\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**public event button1\_clicked()**

**{**

JsonParser lnv\_JsonParser

// 根据字符串构造JSON

lnv\_JsonParser.LoadString(ls\_Json)

// 获取根结点 (类型是JsonObjectItem!或JsonArrayItem!)

LongPtr llp\_RootItem = lnv\_JsonParser.GetRootItem()

// 递归每个结点 (这是个递归函数)

this.of\_ParseJson(lnv\_JsonParser, llp\_RootItem)

**}**

// \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*递归遍历结点函数\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**public function of\_ParseJson(JsonParser anv\_JsonParser, longptr alp\_Handle)**

**{**

// 获取结点类型

JsonItemType ljit\_JsonItemType = anv\_JsonParser.GetItemType(alp\_Handle)

// 根据结点类型递归或取结点的值

if ljit\_JsonItemType = JsonObjectItem! or ljit\_JsonItemType = JsonArrayItem! then

// 递归结点

ll\_ChildCount = anv\_JsonParser.GetChildCount(alp\_Handle)

for ll\_Index = 1 to ll\_ChildCount

llp\_Child = anv\_JsonParser.GetChildItem(alp\_Handle, ll\_Index)

of\_ParseJson(anv\_JsonParser, llp\_Child)

next

else // 取结点的值

choose case ljit\_JsonItemType

case JsonStringItem!

String ls\_value = anv\_JsonParser.GetItemString(alp\_Handle)

case JsonNumberItem!

Double ldb\_value = anv\_JsonParser.GetItemNumber(alp\_Handle)

case JsonBooleanItem!

Boolean lb\_value = anv\_JsonParser.GetItemBoolean(alp\_Handle)

case JsonNullItem!

SetNull(ls\_Null)

end choose

end if

**}**

## JSON构建(JsonGenerator)

### 构造JSON

* **创建根结点是Object的JSON**

JsonGenerator lnv\_JsonGenerator

// 创建根结点是Object的JSON

LongPtr llp\_RootObject = lnv\_JsonGenerator.CreateJsonObject ()

if llp\_RootObject <> -1 then

**……**

end if

* **创建根结点是Array的JSON**

JsonGenerator lnv\_JsonGenerator

// 创建根结点是Array的JSON

LongPtr llp\_RootArray = lnv\_JsonGenerator.CreateJsonArray ()

if llp\_RootArray <> -1 then

**……**

end if

### 增加Object的子结点

* **增加Value子结点**

JsonGenerator lnv\_JsonGenerator

// 创建根结点是Object的JSON

LongPtr llp\_RootObject = lnv\_JsonGenerator.CreateJsonObject ()

// 增加Value子结点

lvn\_JsonGenerator.AddItemString(llp\_RootObject, "string", "string")

lvn\_JsonGenerator.AddItemNumber(llp\_RootObject, "long", 100)

lvn\_JsonGenerator.AddItemBoolean(llp\_RootObject, "boolean", true)

lvn\_JsonGenerator.AddItemDateTime(llp\_RootObject, "datetime", 2017-09-21 12:00:00)

lvn\_JsonGenerator.AddItemBlob(llp\_RootObject, "blob", blob(“this is blob”))

lvn\_JsonGenerator.AddItemNull(llp\_RootObject, "remark")

// 输出JSON

ls\_Json = lvn\_JsonGenerator.GetJsonString()

// {“string”: “string”, “long”:100, “boolean”:true, “datetime”:2404934598, “blob”:“=2F38#5E&23”, “remark”:null}

* **增加Object和Array子结点**

JsonGenerator lnv\_JsonGenerator

// 创建根结点是Object的JSON

LongPtr llp\_RootObject = lnv\_JsonGenerator.CreateJsonObject ()

// 增加Object子结点

LongPtr llp\_ChildObject = lvn\_JsonGenerator.AddItemObject(llp\_RootObject, "object")

lvn\_JsonGenerator.AddItemNumber(llp\_ChildObject, "year", 2017)

lvn\_JsonGenerator.AddItemDate(llp\_ChildObject, "date", 2017-09-21)

lvn\_JsonGenerator.AddItemTime(llp\_ChildObject, "time", 12:00:00)

// 增加Array子结点

LongPtr llp\_ChildArray = lvn\_JsonGenerator.AddItemArray(llp\_RootObject, "array")

lvn\_JsonGenerator.AddItemNumber(llp\_ChildArray, 101)

lvn\_JsonGenerator.AddItemNumber(llp\_ChildArray, 102)

lvn\_JsonGenerator.AddItemNumber(llp\_ChildArray, 103)

// 输出JSON

ls\_Json = lvn\_JsonGenerator.GetJsonString()

// {“object”:{ “year”:2017, “date”:“2017-09-21”, “time”:“12:00:00”}, “array”:[101, 102, 103] }

### 增加Array的子结点

* **增加Value子结点**

JsonGenerator lnv\_JsonGenerator

// 创建根结点是Array的JSON

LongPtr llp\_RootArray = lnv\_JsonGenerator.CreateJsonArray()

// 增加Value子结点

lvn\_JsonGenerator.AddItemString(llp\_RootArray, "string")

lvn\_JsonGenerator.AddItemNumber(llp\_RootArray, 100)

lvn\_JsonGenerator.AddItemBoolean(llp\_RootArray, true)

lvn\_JsonGenerator.AddItemDateTime(llp\_RootArray, 2017-09-21 12:00:00)

lvn\_JsonGenerator.AddItemBlob(llp\_RootArray, blob(“this is blob”))

lvn\_JsonGenerator.AddItemNull(llp\_RootArray)

// 输出JSON

ls\_Json = lvn\_JsonGenerator.GetJsonString()

// [“string”, 100, true, 2404934598, “=2F38#5E&23”, null]

* **增加Object和Array子结点**

JsonGenerator lnv\_JsonGenerator

// 创建根结点是Array的JSON

LongPtr llp\_RootArray = lnv\_JsonGenerator.CreateJsonArray()

// 增加Object子结点

LongPtr llp\_ChildObject = lvn\_JsonGenerator.AddItemObject(llp\_RootArray)

lvn\_JsonGenerator.AddItemNumber(llp\_ChildObject, "year", 2017)

lvn\_JsonGenerator.AddItemDate(llp\_ChildObject, "date", 2017-09-21)

lvn\_JsonGenerator.AddItemTime(llp\_ChildObject, "time", 12:00:00)

// 增加Array子结点

LongPtr llp\_ChildArray = lvn\_JsonGenerator.AddItemArray(llp\_RootArray)

lvn\_JsonGenerator.AddItemNumber(llp\_ChildArray, 101)

lvn\_JsonGenerator.AddItemNumber(llp\_ChildArray, 102)

lvn\_JsonGenerator.AddItemNumber(llp\_ChildArray, 103)

// 输出JSON

ls\_Json = lvn\_JsonGenerator.GetJsonString()

// [{ “year”:2017, “date”:“2017-09-21”, “time”:“12:00:00”}, [101, 102, 103]]

### 输出JSON

JsonGenerator lnv\_JsonGenerator

// 创建根结点是Object的JSON

LongPtr llp\_RootObject = lnv\_JsonGenerator.CreateJsonObject()

// 增加Value子结点

lvn\_JsonGenerator.AddItemString(llp\_RootObject, "string", "string")

lvn\_JsonGenerator.AddItemNumber(llp\_RootObject, "long", 100)

lvn\_JsonGenerator.AddItemBoolean(llp\_RootObject, "boolean", true)

lvn\_JsonGenerator.AddItemDateTime(llp\_RootObject, "datetime", 2017-09-21 12:00:00)

lvn\_JsonGenerator.AddItemBlob(llp\_RootObject, "blob", blob(“this is blob”))

lvn\_JsonGenerator.AddItemNull(llp\_RootObject, "remark")

// 输出JSON

if lvn\_JsonGenerator.IsJsonValid() then

ls\_Json = lvn\_JsonGenerator.GetJsonString()

lblb\_Json = lvn\_JsonGenerator.GetJsonBlob()

lvn\_JsonGenerator.SaveToFile(“c:\test.json”)

end if

// {“string”: “string”, “long”:100, “boolean”:true, “datetime”:2404934598, “blob”:“=2F38#5E&23”, “remark”:null}

# 对象接口设计

## Enumeration

### JsonItemType

* **JsonStringItem!**：The type of json string node.
* **JsonNumberItem!**：The type of json number node.
* **JsonBooleanItem!**：The type of json boolean node.
* **JsonNullItem!**：The type of json null node.
* **JsonObjectItem!**：The type of json object node.
* **JsonArrayItem!**：The type of json array node.

## JsonParser

### Constructor Functions

#### LoadString

**Description**

Load json from string.

**Syntax**

String LoadString(string JsonData)

**Argument**

* JsonData. String specifying the json data.

**Return Value**

String. Returns the empty string (“”) if it succeeds and an error message if an error occurs.

#### LoadFile

**Description**

Load json from file.

**Syntax**

String LoadFile(string FileName)

**Argument**

* FileName. String specifying the file full name.

**Return Value**

String. Returns the empty string (“”) if it succeeds and an error message if an error occurs.

### Navigation Functions

#### GetRootItem

**Description**

Gets the root item handle.

**Syntax**

LongPtr GetRootItem()

**Argument**

None.

**Return Value**

LongPtr. Returns the root item handle if it succeeds and -1 if an error occurs.

#### GetChildItem

**Description**

Gets the child item handle.

**Syntax**

LongPtr GetChildItem(longptr ItemHandle, long Index)

**Argument**

* ItemHandle. LongPtr specifying the parent item handle which are JsonObjectItem and JsonArrayItem type.
* Index. Long specifying the index of child item.

**Return Value**

LongPtr. Returns the child item handle if it succeeds and -1 if an error occurs.

#### GetChildKey

**Description**

Gets the key name of child item.

**Syntax**

String GetChildKey(longptr ItemHandle, long Index)

**Argument**

* ItemHandle. LongPtr specifying the parent item handle which is JsonObjectItem type.
* Index. Long specifying the index of child item.

**Return Value**

String. Returns the key name of child item if it succeeds and empty string (“”) if an error occurs.

#### GetChildCount

**Description**

Gets child item count.

**Syntax**

Long GetChildCount(longptr ItemHandle)

**Argument**

* ItemHandle. LongPtr specifying the item handle which are JsonObjectItem and JsonArrayItem type.

**Return Value**

Long. Returns the child item count if it succeeds and -1 if an error occurs.

#### GetItemType

**Description**

Gets the type of item.

**Syntax**

JsonItemType GetItemType (longptr ItemHandle)

**Argument**

* ItemHandle. LongPtr specifying the item handle.

**Return Value**

JsonItemType. Returns the JsonItemType value if it succeeds and null value if an error occurs.

### Get Item Functions

#### GetItemString

**Description**

Gets the string value of the item.

**Syntax 1**

String GetItemString(longptr ItemHandle)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonStringItem type.

**Return Value**

String. Returns the string value of the item if it succeeds and null value if an error occurs.

--------------------------------------------------------------------

**Description**

Gets the string value of the child item.

**Syntax 2**

String GetItemString(longptr ItemHandle, string Key)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonObjectItem type.
* Key. String specifying the key of child item which is JsonStringItem type.

**Return Value**

String. Returns the string value of the child item if it succeeds and null value if an error occurs.

#### GetItemNumber

**Description**

Gets the double value of the item.

**Syntax 1**

Double GetItemNumber(longptr ItemHandle)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonNumberItem type.

**Return Value**

Double. Returns the double value of the item if it succeeds and null value if an error occurs.

--------------------------------------------------------------------

**Description**

Gets the double value of the child item.

**Syntax 2**

Double GetItemNumber(longptr ItemHandle, string Key)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonObjectItem type.
* Key. String specifying the key of child item which is JsonNumberItem type.

**Return Value**

Double. Returns the double value of the child item if it succeeds and null value if an error occurs.

#### GetItemBoolean

**Description**

Gets the boolean value of the item.

**Syntax 1**

Boolean GetItemBoolean(longptr ItemHandle)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonBooleanItem type.

**Return Value**

Boolean. Returns the boolean value of the item if it succeeds and null value if an error occurs.

--------------------------------------------------------------------

**Description**

Gets the boolean value of the child item.

**Syntax 2**

Boolean GetItemBoolean(longptr ItemHandle, string Key)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonObjectItem type.
* Key. String specifying the key of child item which is JsonBooleanItem type.

**Return Value**

Boolean. Returns the boolean value of the child item if it succeeds and null value if an error occurs.

#### GetItemDate

**Description**

Gets the date value of the item.

**Syntax 1**

Date GetItemDate(longptr ItemHandle)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonStringItem type.

**Return Value**

Date. Returns the date value of the item if it succeeds and null value if an error occurs.

--------------------------------------------------------------------

**Description**

Gets the date value of the child item.

**Syntax 2**

Date GetItemDate(longptr ItemHandle, string Key)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonObjectItem type.
* Key. String specifying the key of child item which is JsonStringItem type.

**Return Value**

Date. Returns the date value of the child item if it succeeds and null value if an error occurs.

#### GetItemTime

**Description**

Gets the time value of the item.

**Syntax 1**

Time GetItemTime(longptr ItemHandle)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonStringItem type.

**Return Value**

Time. Returns the time value of the item if it succeeds and null value if an error occurs.

--------------------------------------------------------------------

**Description**

Gets the time value of the child item.

**Syntax 2**

Time GetItemTime(longptr ItemHandle, string Key)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonObjectItem type.
* Key. String specifying the key of child item which is JsonStringItem type.

**Return Value**

Time. Returns the time value of the child item if it succeeds and null value if an error occurs.

#### GetItemDateTime

**Description**

Gets the datetime value of the item.

**Syntax 1**

DateTime GetItemDateTime(longptr ItemHandle)

**Argument**

* ItemHandle. LongPtr specifying the item handle which are JsonStringItem and JsonNumberItem type.

**Return Value**

DateTime. Returns the datetime value of the item if it succeeds and null value if an error occurs.

--------------------------------------------------------------------

**Description**

Gets the datetime value of the child item.

**Syntax 2**

DateTime GetItemDateTime(longptr ItemHandle, string Key)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonObjectItem type.
* Key. String specifying the key of child item which are JsonStringItem and JsonNumberItem type. If is JsonStringItem, the format such as ‘yyyy-yy-dd hh:mm:ss’ is supported.

**Return Value**

DateTime. Returns the datetime value of the child item if it succeeds and null value if an error occurs.

#### GetItemBlob

**Description**

Gets the blob value of the item.

**Syntax 1**

Blob GetItemBlob(longptr ItemHandle)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonStringItem type.

**Return Value**

Blob. Returns the blob value of the item if it succeeds and null value if an error occurs.

--------------------------------------------------------------------

**Description**

Gets the blob value of the child item.

**Syntax 2**

Blob GetItemBlob(longptr ItemHandle, string Key)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonObjectItem type.
* Key. String specifying the key of child item which is JsonStringItem type.

**Return Value**

Blob. Returns the blob value of the child item if it succeeds and null value if an error occurs.

#### GetItemObject

**Description**

Gets the handle value of the child object item.

**Syntax**

LongPtr GetItemObject(longptr ItemHandle, string Key)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonObjectItem type.
* Key. String specifying the key of child item which is JsonObjectItem type.

**Return Value**

LongPtr. Returns the handle value of the child object item if it succeeds and -1 if an error occurs.

#### GetItemArray

**Description**

Gets the handle value of the child array item.

**Syntax**

LongPtr GetItemArray(longptr ItemHandle, string Key)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonObjectItem type.
* Key. String specifying the key of child item which is JsonArrayItem type.

**Return Value**

LongPtr. Returns the handle value of the child array item if it succeeds and -1 if an error occurs.

### Other Functions

#### IsNullItem

**Description**

Determines the item if is null.

**Syntax 1**

Boolean IsNullItem(longptr ItemHandle)

**Argument**

* ItemHandle. LongPtr specifying the item handle.

**Return Value**

Boolean. Returns the boolean value if it succeeds and null value if an error occurs.

--------------------------------------------------------------------

**Description**

Determines the child item if is null.

**Syntax 2**

Boolean IsNullItem(longptr ItemHandle, string Key)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonObjectItem type.
* Key. String specifying the key of child item.

**Return Value**

Boolean. Returns the boolean value if it succeeds and null value if an error occurs.

## JsonGenerator

### Constructor Functions

#### CreateJsonObject

**Description**

Creates object as root item to initialize instance.

**Syntax**

LongPtr CreateJsonObject()

**Argument**

None.

**Return Value**

LongPtr. Returns the root item handle which is JsonObjectItem type if it succeeds and -1 if an error occurs.

#### CreateJsonArray

**Description**

Creates array as root item to initialize instance.

**Syntax**

LongPtr CreateJsonArray()

**Argument**

None.

**Return Value**

LongPtr. Returns the root item handle which is JsonArrayItem type if it succeeds and -1 if an error occurs.

### Add Item Functions

#### AddItemString

**Description**

Adds the child item of JsonStringItem type.

**Syntax 1**

LongPtr AddItemString(longptr ItemHandle, string Value)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonArrayItem type.
* Value. String specifying the value of child item.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

--------------------------------------------------------------------

**Description**

Adds the child item of JsonStringItem type.

**Syntax 2**

LongPtr AddItemString(longptr ItemHandle, string Key, string Value)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonObjectItem type.
* Key. String specifying the key of child item.
* Value. String specifying the value of child item.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

#### AddItemNumber

**Description**

Adds the child item of JsonNumberItem type.

**Syntax 1**

LongPtr AddItemNumber(longptr ItemHandle, double Value)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonArrayItem type.
* Value. Double specifying the value of child item.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

--------------------------------------------------------------------

**Description**

Adds the child item of JsonNumberItem type.

**Syntax 2**

LongPtr AddItemNumber(longptr ItemHandle, string Key, double Value)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonObjectItem type.
* Key. String specifying the key of child item.
* Value. Double specifying the value of child item.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

#### AddItemBoolean

**Description**

Adds the child item of JsonBooleanItem type.

**Syntax 1**

LongPtr AddItemBoolean(longptr ItemHandle, boolean Value)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonArrayItem type.
* Value. Boolean specifying the value of child item.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

--------------------------------------------------------------------

**Description**

Adds the child item of JsonBooleanItem type.

**Syntax 2**

LongPtr AddItemBoolean(longptr ItemHandle, string Key, boolean Value)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonObjectItem type.
* Key. String specifying the key of child item.
* Value. Boolean specifying the value of child item.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

#### AddItemDate

**Description**

Adds the child item of JsonStringItem type.

**Syntax 1**

LongPtr AddItemDate(longptr ItemHandle, date Value)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonArrayItem type.
* Value. Date specifying the value of child item.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

--------------------------------------------------------------------

**Description**

Adds the child item of JsonStringItem type.

**Syntax 2**

LongPtr AddItemDate(longptr ItemHandle, string Key, date Value)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonObjectItem type.
* Key. String specifying the key of child item.
* Value. Date specifying the value of child item.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

#### AddItemTime

**Description**

Adds the child item of JsonStringItem type.

**Syntax 1**

LongPtr AddItemTime(longptr ItemHandle, time Value)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonArrayItem type.
* Value. Time specifying the value of child item.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

--------------------------------------------------------------------

**Description**

Adds the child item of JsonStringItem type.

**Syntax 2**

LongPtr AddItemTime(longptr ItemHandle, string Key, time Value)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonObjectItem type.
* Key. String specifying the key of child item.
* Value. Time specifying the value of child item.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

#### AddItemDateTime

**Description**

Adds the child item of JsonNumberItem type.

**Syntax 1**

LongPtr AddItemDateTime(longptr ItemHandle, datetime Value)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonArrayItem type.
* Value. DateTime specifying the value of child item.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

--------------------------------------------------------------------

**Description**

Adds the child item of JsonStringItem or JsonNumberItem type.

**Syntax 2**

LongPtr AddItemDateTime(longptr ItemHandle, datetime Value, boolean Flag)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonArrayItem type.
* Value. DateTime specifying the value of child item.
* Flag. Boolean specifying the type of added child item. True is JsonNumberItem type and False is JsonStringItem type.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

--------------------------------------------------------------------

**Description**

Adds the child item of JsonNumberItem type.

**Syntax 3**

LongPtr AddItemDateTime(longptr ItemHandle, string Key, datetime Value)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonObjectItem type.
* Key. String specifying the key of child item.
* Value. DateTime specifying the value of child item.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

--------------------------------------------------------------------

**Description**

Adds the child item of JsonStringItem or JsonNumberItem type.

**Syntax 4**

LongPtr AddItemDateTime(longptr ItemHandle, string Key, datetime Value, boolean Flag)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonObjectItem type.
* Key. String specifying the key of child item.
* Value. DateTime specifying the value of child item.
* Flag. Boolean specifying the type of added child item. True is JsonNumberItem type and False is JsonStringItem type.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

#### AddItemBlob

**Description**

Adds the child item of JsonStringItem type.

**Syntax 1**

LongPtr AddItemBlob(longptr ItemHandle, blob Value)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonArrayItem type.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

--------------------------------------------------------------------

**Description**

Adds the child item of JsonStringItem type.

**Syntax 2**

LongPtr AddItemBlob(longptr ItemHandle, string Key, blob Value)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonObjectItem type.
* Key. String specifying the key of child item.
* Value. Blob specifying the value of child item.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

#### AddItemNull

**Description**

Adds the child item of JsonNullItem type.

**Syntax 1**

LongPtr AddItemNull(longptr ItemHandle)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonArrayItem type.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

--------------------------------------------------------------------

**Description**

Adds the child item of JsonNullItem type.

**Syntax 2**

LongPtr AddItemNull(longptr ItemHandle, string Key)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonObjectItem type.
* Key. String specifying the key of child item.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

#### AddItemObject

**Description**

Adds the child item of JsonObjectItem type.

**Syntax 1**

LongPtr AddItemObject(longptr ItemHandle)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonArrayItem type.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

--------------------------------------------------------------------

**Description**

Adds the child item of JsonObjectItem type.

**Syntax 2**

LongPtr AddItemObject(longptr ItemHandle, string Key)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonObjectItem type.
* Key. String specifying the key of child item.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

#### AddItemArray

**Description**

Adds the child item of JsonArrayItem type.

**Syntax 1**

LongPtr AddItemArray(longptr ItemHandle)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonArrayItem type.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

--------------------------------------------------------------------

**Description**

Adds the child item of JsonArrayItem type.

**Syntax 2**

LongPtr AddItemArray(longptr ItemHandle, string Key)

**Argument**

* ItemHandle. LongPtr specifying the item handle which is JsonObjectItem type.
* Key. String specifying the key of child item.

**Return Value**

LongPtr. Returns the added child item handle if it succeeds and -1 if an error occurs.

### Output Functions

#### GetJsonString

**Description**

Get json string data.

**Syntax**

String GetJsonString()

**Argument**

None.

**Return Value**

String. Returns the json string data if it succeeds and empty string (“”) if an error occurs.

#### GetJsonBlob

**Description**

Get json blob data.

**Syntax**

Blob GetJsonBlob()

**Argument**

None.

**Return Value**

Blob. Returns the json blob data if it succeeds and empty blob(“”) if an error occurs.

#### SaveToFile

**Description**

Saves json data to local file.

**Syntax**

Integer SaveToFile(string FileName)

**Argument**

* FileName. String specifying the file full name.

**Return Value**

Integer. Returns 1 if it succeeds and -1 if an error occurs.

### Other Functions

#### IsJsonValid

**Description**

Verifys the json data whether valid.

**Syntax**

Boolean IsJsonValid()

**Argument**

None.

**Return Value**

Boolean. Returns the boolean value.

# 代码设计

## PBJson LIB 库

### 代码结构

如图4.1 所示，PbJson lib 静态库组件实现了PB JsonParser, JsonGenerator对象的每个函数



图4.1 PbJson LIB 静态库组件

### 结构说明

代码调用关系如图4.2



图4.2 PbJson lib 内部调用结构

IJsonParser，IJsonGenerator 是PbJson dll 动态库导出的接口类。

JsonParser 对象调用IJsonParser接口类，实现对Json字符串的解析

JsonGenerator 对象调用IJsonGenerator接口类，生成Json 字符串

### 接口说明

|  |  |  |
| --- | --- | --- |
| 类 | 接口 | 说明 |
| JsonParser对象实现函数  （导出标准的C 函数接口） | fnJsonParser\_CreateObject | 创建 IJsonParser 对象 |
| fnJsonParser\_DestroyObjec | 销毁 IJsonParser 对象 |
| fnJPLoad | 加载解析Json字符串 |
| fnJPLoadFromFile | 加载解析Json文件 |
| fnJPGetErrorOffset | 获取出错位置，偏移量（字符） |
| fnJPGetError | 获取出错字符串信息 |
| fnJPHasChildNode | 节点是否有子节点，并返回获取子节点个数 |
| fnJPGetChildNode | 获取节点的子节点，返回子节点指针值和类型 |
| fnJPGetLongValue | 获取节点值，值类型为long |
| fnJPGetBoolValue | 获取节点值，值类型为 bool |
| fnJPGetByteValue | 获取节点值，值类型为 BYTE |
| fnJPGetShortValue | 获取节点值，值类型为 short |
| fnJPGetUnsignedShortValue | 获取节点值，值类型为 unsigned short |
| fnJPGetLongValue | 获取节点值，值类型为long |
| fnJPGetUnsignedLongValue | 获取节点值，值类型为 unsigned long |
| fnJPGetLongLongValue | 获取节点值，值类型为 int64 |
| fnJPGetUnsignedLongLongValue | 获取节点值，值类型为 unsigned int64 |
| fnJPGetFloatValue | 获取节点值，值类型为 float |
| fnJPGetDoubleValue | 获取节点值，值类型为 double |
| fnJPGetBlobData | 获取节点值，值类型为 blob |
| fnJPGetStringValue | 获取节点值，值类型为 string |
| fnJPGetDecimalValue | 获取节点值，值类型为 decimal |
| fnJPGetDateTimeValue | 获取节点值，值类型为 dateTime |

|  |  |  |
| --- | --- | --- |
| 类 | 接口 | 说明 |
| JsonGenerator对象实现函数  （导出标准的C 函数接口） | fnJsonGenerator\_CreateObject | 创建 IJsonGenerator 对象 |
| fnJsonGenerator\_DestroyObject | 销毁 IJsonGenerator对象 |
| fnJGWriterToFile | 将生成的Json字符串写入文件 |
| fnJGGetJsonString | 获取生成的Json字符串 |
| fnJGClearAll | 清空JsonGenerator对象 |
| fnJGCreateObject | 生成一个对象 |
| fnJGCreateArray | 生成一个数组 |
| fnJGAddBoolValue | 给对象或者数组添加 BOOL 类型值 |
| fnJGAddByteValue | 给对象或者数组添加BYTE 类型值 |
| fnJGAddShortValue | 给对象或者数组添加 short 类型值 |
| fnJGAddUnsignedShortValue | 给对象或者数组添加 unsigned short 类型值 |
| fnJGAddLongValue | 给对象或者数组添加 long 类型值 |
| fnJGAddUnsignedLongValue | 给对象或者数组添加 unsigned Short 类型值 |
| fnJGAddLongLongValue | 给对象或者数组添加 int64 类型值 |
| fnJGAddUnsignedLongLongValue | 给对象或者数组添加 unsigned int64 类型值 |
| fnJGAddFloatValue | 给对象或者数组添加 float类型值 |
| fnJGAddDoubleValue | 给对象或者数组添加 double类型值 |
| fnJGAddBlobValue | 给对象或者数组添加 blob类型值 |
| fnJGAddStringValue | 给对象或者数组添加 string 类型值 |
| fnJGAddNullValue | 给对象或者数组添加 null值 |
| fnJGAddDecimalValue | 给对象或者数组添加 decimal 类型值 |
| fnJGAddDateTimeValue | 给对象或者数组添加 dateTime 类型值 |

## PBJson DLL库

### 代码结构

****

图4.3 pbjson dll 库 结构图

### 结构说明

* **Json 业务逻辑**

1， IJsonParser , IJsonGenerator ，导出接口类，提供给外部调用

2， JsonParserImp, JsonGeneratorImp, 提供业务逻辑实现，通过调用IJson 抽象类接口实现

* **Json 功能实现**

1，IJson ，功能抽象类，提供给业务逻辑层调用

2，CRapidJsonImp， CLibJsonImp， 实现对第三方库的封装

### 接口定义

|  |  |  |
| --- | --- | --- |
| 类 | 接口 | 说明 |
| CJsonParserImp | Load | 解析Json字符串, |
| LoadFromFile | 解析Json 文件 |
| HasError | 解析是否出错 |
| GetErrorOffset | 解析出错位置，Json 字符串或者文件的偏移量（字符） |
| GetError | 获取解析出错信息 |
| ItemCount | 获取对象或者数组元素个数 |
| HasToken | 是否有下一个标记 |
| NextToken | 获取下一个标记，返回标记类型 |
| GetCurrentToken | 获取当前标记类型 |
| HasNode | 是否有下一个节点 |
| NextNode | 获取下一个节点，返回节点类型 |
| GetNameText | 获取当前节点名称 |
| HasChildNode | 是否有子节点，返回节点个数 |
| GetNodeType | 获取节点类型，参数为节点指针 |
| GetChildNode | 通过索引或者名称获取子节点（返回节点指针值） |
| GetByteValue | 获取节点值，值范围 (0---- (28-1)) |
| GetShortValue | 获取节点值，值范围 (-215---- (215-1)) |
| GetUnsignedShortValue | 获取节点值，值范围 (0----(216-1)) |
| GetBoolValue | 获取节点值，值范围 (true，false) |
| GetLongValue | 获取节点值，值范围 (- 231----(231-1)) |
| GetUnsignedLongValue | 获取节点值，值范围 (0---- (232-1)) |
| GetLongLongValue | 获取节点值，值范围 (-263---- (263-1)) |
| GetUnsignedLongLongValue | 获取节点值，值范围 (0----(264-1)) |
| GetFloatValue | 获取节点值，值范围 ( -2127----2128) |
| GetDoubleValue | 获取节点值，值范围 (-21023----21024) |
| GetBlobData | 获取节点值，值为二进制数据 |
| GetStringValue | 获取节点值，值为字符串 |

|  |  |  |
| --- | --- | --- |
| 类 | 接口 | 说明 |
| CJsonGeneratorImp | WriterToFile | 将生成的Json字符串写入文件 |
| GetJsonString | 获取生成的Json字符串 |
| ClearAll | 清空JsonGenerator对象 |
| CreateObject | 生成一个对象，参数为父亲节点指针，值为0生成根节点 |
| CreateArray | 生成一个数组，参数为父亲节点指针，值为0生成根节点 |
| AddBoolValue | 给对象或者数组添加 BOOL 类型值 |
| AddByteValue | 给对象或者数组添加BYTE 类型值 |
| AddShortValue | 给对象或者数组添加 short 类型值 |
| AddUnsignedShortValue | 给对象或者数组添加 unsigned short 类型值 |
| AddLongValue | 给对象或者数组添加 long 类型值 |
| AddUnsignedLongValue | 给对象或者数组添加 unsigned Short 类型值 |
| AddLongLongValue | 给对象或者数组添加 longlong 类型值 |
| AddUnsignedLongLongValue | 给对象或者数组添加 unsigned longlong 类型值 |
| AddFloatValue | 给对象或者数组添加 float类型值 |
| AddDoubleValue | 给对象或者数组添加 double类型值 |
| AddBlobValue | 给对象或者数组添加 blob类型值 |
| AddStringValue | 给对象或者数组添加 string 类型值 |
| AddNullValue | 给对象或者数组添加 null值 |
| WriteStartObject | 生成对象标记: { |
| WriteEndObject | 生成对象标记: } |
| WriteStartArray | 生成数组标记:[ |
| WriteEndArray | 生成数组标记:] |
| WriteKeyName | 给对象值添加Name |
| WriteBoolValue | 给对象或者数组添加BOOL 类型值 |
| WriteByteValue | 给对象或者数组添加BYTE 类型值 |
| WriteShortValue | 给对象或者数组添加 short 类型值 |
| WriteUnsignedShortValue | 给对象或者数组添加 unsigned short 类型值 |
| WriteLongValue | 给对象或者数组添加 long 类型值 |
| WriteUnsignedLongValue | 给对象或者数组添加 unsigned Short 类型值 |
| WriteLongLongValue | 给对象或者数组添加 longlong 类型值 |
| WriteUnsignedLongLongValue | 给对象或者数组添加 unsigned longlong 类型值 |
| WriteFloatValue | 给对象或者数组添加 float类型值 |
| WriteDoubleValue | 给对象或者数组添加 double类型值 |
| WriteBlobValue | 给对象或者数组添加 blob类型值 |
| WriteStringValue | 给对象或者数组添加 string 类型值 |
| WriteNullValue | 给对象或者数组添加 null 值 |