Describe complex columns

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Version: v1

Background: Currently describe formatted displays the column information of a table and some additional information. When complex types such as ARRAY, STRUCT, and MAP types are present in the table, column definition can be long and it's difficult to read in nested format.

Solution:

For complex types available, the DESCRIBE output can be formatted to avoid long lines for multiple fields. We can pass the complex field name to the command and visualize its structure as if it were a table.

[DESCRIBE | DESC] column fieldname[.nestedFieldNames] ON [db_name.]table_name;

In order to get the high level view of column datatypes of a table, add option 'short' to the command. This does not display all nested levels and datatypes, shows only the outermost level.

[DESCRIBE | DESC] short [db_name.]table_name;

<u>Example:</u>

The below table is 'complexcarbontable' which consists of different complex columns.

```
create table complexcarbontable
(deviceInformationId int,
channelsId string,
ROMSize string,
purchasedate string,
mobile struct<imei:string, imsi:string>,
MAC array<string>,
```

locationinfo array<struct<ActiveAreaId:int, ActiveCountry:string, ActiveProvince:string, Activecity:string, ActiveDistrict:string, ActiveStreet:string, ActiveNeighbourhoodPlaces:array<string>>>,
proddate struct<productionDate:string,activeDeactivedate:array<string>>,
gamePointId map<string,struct<a:int, b:struct<c:string>>>,
contractNumber double,
decimalColumn map<string,struct<d:decimal(10,3)>>)
STORED AS carbondata;

When DESCRIBE specifies the table name.

describe complexcarbontable;

col_name	data_type
deviceinformationid	int
channelsid	string
romsize	string
purchasedate	string
mobile	struct<imei:string,imsi:string>
mac	array<string>
locationinfo	array<struct<activeareaid:int,activecountry:string,activeprovince:string,activecity:string,activedi
proddate	struct<productiondate:string,activedeactivedate:array<string>>
gamepointid	double
contractnumber	double
decimalcolumn	map<string,struct<d:decimal(10,3)>>

1. Column having struct with some primitive child elements: struct<>

   To read a simple structure of mobile column,

   Describe column mobile on complexcarbontable;

```
+-----------------------------+-----------------------------
|col_name                     |data_type  |comment|
+-----------------------------+-----------------------------
|mobile                       |struct     |null   |
|## Children of channelsId:   |           |
|imei                         |string     |null   |
|imsi                         |string     |null   |
+-------------------+-----------------------------------
```

2. Column having 2 nested levels: map<key, struct<>>

When DESCRIBE specifies the name of the complex column, *decimalcolumn*, can show how an MAP is represented with columns key and value. Here STRUCT is present in nested level of MAP .

Describe column decimalcolumn on complexcarbontable;

```
+-------------------------------+---------------------------------------
|col_name                       |data_type                  |comment|
+-------------------------------+---------------------------------------
|decimalcolumn                  |map                        |null   |
|## Children of decimalcolumn:  |                           |       |
|key                            |string                     |null   |
|value                          |struct<d:decimal(10,3)>    |null   |
+-------------------------------+---------------------------------------
```

Describe column decimalcolumn.value on complexcarbontable;

```
+-----------------------------------+-----------------------------------------
|col_name                            |data_type                  |comment|
+-----------------------------------+-----------------------------------------
|decimalcolumn.value                 |struct                     |null   |
|## Children of decimalcolumn.value: |                           |       |
|d                                   |decimal(10,3)              |null   |
+-----------------------------------+-----------------------------------------
```

3. Columns with 3 nested levels :
    a. array<struct<array<>>>

When DESCRIBE specifies the name of the complex column, *locationinfo*, can show how an ARRAY is represented with column ITEM.

Describe column locationinfo on complexcarbontable;

```
+---------------------------+-----------------------------------------------------------------------------------------------------------
|col_name                   |data_type
+---------------------------+-----------------------------------------------------------------------------------------------------------
|locationinfo               |array
|## Children of locationinfo:|
|item                       |struct<activeareaid:int,activecountry:string,activeprovince:string,activecity:string,activedistrict:string,activestre
+---------------------------+-----------------------------------------------------------------------------------------------------------
```

To see the further nested structure of column, when DESCRIBE specifies the name of the ITEM of the ARRAY column, as the ARRAY contains a STRUCT, the layout of the STRUCT is shown.

Describe column locationinfo.item on complexcarbontable;

```
+-------------------------------------+------------------------+-------+
|col_name                             |data_type               |comment|
+-------------------------------------+------------------------+-------+
|locationinfo.item                    |srtuct                  |null   |
|## Children of locationinfo.item:    |                        |       |
|activeareaid                         |int                     |null   |
|activecountry                        |string                  |null   |
|activeprovince                       |string                  |null   |
|activecity                           |string                  |null   |
|activedistrict                       |string                  |null   |
|activestreet                         |string                  |null   |
|activeneighbourhoodplaces            |array<string>           |null   |
+-------------------------------------+--------------------------------+--
```

To read 3rd nested level of locationInfo column, we can use

Describe locationinfo.item.activeneighbourhoodplaces on complexcarbontable;

```
+-------------------------------------------------------------+----------------------+-------+
|col_name                                                     |data_type             |comment|
+-------------------------------------------------------------+----------------------+-------+
|locationinfo.item.activeneighbourhoodplaces                  |array                 |null   |
|## Children of locationinfo.item.activeneighbourhoodplaces:  |                      |       |
|item                                                         |string                |null   |
+-------------------------------------------------------------+------------------------------+--
```

b. Column having 3 nested levels: map<struct<struct<>>>

When DESCRIBE specifies the name of the complex column, *gamePointId*, can show how an MAP is represented with columns key and value.

Describe column gamepointid on complexcarbontable;

```
+-------------------+-------------------------------------------------------------
|col_name           |data_type                                      |comment|
+-------------------+-------------------------------------------------------------
|key                |string                                         |null   |
|value              |struct<a:int, b:struct<c:string>               |null   |
+-------------------+-------------------------------------------------------------
```

Describe column gamepointid.value on complexcarbontable;

```
+--------------------+-------------------------------------------------------------
|col_name            |data_type                                          |comment|
+--------------------+-------------------------------------------------------------
|a                   |int                                                |null   |
|b                   |struct<c:string>                                   |null   |
+--------------------+-------------------------------------------------------------
```

Describe column gamepointid.value.b on complexcarbontable;

```
+--------------------+-------------------------------------------------------------
|col_name            |data_type                                          |comment|
+--------------------+-------------------------------------------------------------
|c                   |string                                             |null   |
+--------------------+-------------------------------------------------------------
```

4. Display short version of table columns.

Describe short complexcarbontable;

```
+--------------------+------------------+-------+
|col_name            |data_type         |comment|
+--------------------+------------------+-------+
|deviceinformationid|int                |null   |
|channelsid          |string            |null   |
|romsize             |string            |null   |
|purchasedate        |string            |null   |
|mobile              |struct<..>        |null   |
|mac                 |array<..>         |null   |
|locationinfo        |array<..>         |null   |
|proddate            |struct<..>        |null   |
|gamepointid         |double            |null   |
|contractnumber      |double            |null   |
|decimalcolumn       |map<..>           |null   |
+--------------------+------------------+-------+
```