


???? ??????????BLOBs?CLOBs?

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???? ??????????BLOBs?CLOBs?

???? ??????????BLOBs?CLOBs?

InterSystems SQL?????????InterSystems Iris @DataPlatform????? BLOBs????????? CLOBs?????????????

????SQL

InterSystems SQL?????????

- ??? Character streams?????????
- ??? Binary streams?????????????

BLOBs and CLOBs

InterSystems SQL???BLOBs?????????CLOBs????????????????????? BLOBs?????????????????????CLOBs????????????
BLOBs?CLOBs?????????4?????????JDBC?ODBC?????????????

?????????????????ODBC?JDBC?????????????????????Unicode?????????BLOB?????????????????????????????????????CLOB?
?????????????????????????

????????????BLOB????????????\$CHAR(0)?????????????????????"?????????????????????null?????????0?

?????????

InterSystems SQL?????????????????????InterSystems?????????????????????????????

- ??????????LONGVARCHAR????????stream.globalcharacter??ODBC / JDBC?????-1?
- ??????????LONGVARBINARY????????Stream.GlobalBinary??ODBC / JDBC?????-4?

??InterSystems?????????????????????no-op???

?????????????????????????

```
CREATE TABLE Sample.MyTable (
  Name VARCHAR(50) NOT NULL,
  Notes LONGVARCHAR,
  Photo LONGVARBINARY)
```

?????????????????????????

?????

Stream?????????????????

????????? NOT NULL?

?????????????????????

????????????????????idkey?????????SQLCode -400?????????MSG???:ERROR #5414: Invalid index attribute: Sample.MyTable::MYTABLEUNIQUE2::Notes, Stream property is not allowed in a unique/primary key/idkey index > ERROR #5030: An error occurred while compiling class 'Sample.MyTable'.

?????????COLLATE ??????????????????SQLCode -400?????????MSG???:ERROR #5480: Property parameter not declared: Sample.MyTable:Photo:COLLATION > ERROR #5030: An error occurred while compiling class 'Sample.MyTable'.

??????????????

??????????????????

- ?Stream.Globalcharacter?????????????????????

```
INSERT INTO Sample.MyTable (Name,Notes)
VALUES ('Fred','These are extensive notes about Fred')
```

???? ??????????BLOBs?CLOBs?

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The screenshot shows the InterSystems Developer Studio interface. On the left, the 'System Objects' tree is expanded to 'Tables (4530)'. The main window displays a SQL script in a 'Script 1*' editor. The script defines a table 'Sample.MyTable' with columns 'Name' (VARCHAR(50) NOT NULL), 'Notes' (LONGVARCHAR), and 'Photo' (LONGVARBINARY). It includes a SELECT statement and an INSERT statement. Below the script, a table grid shows the data for 'Sample.MyTable'.

```

1 CREATE TABLE Sample.MyTable (
2     Name VARCHAR(50) NOT NULL,
3     Notes LONGVARCHAR,
4     Photo LONGVARBINARY)
5
6
7 SELECT * FROM Sample.MyTable
8
9
10 INSERT INTO Sample.MyTable (Name,Notes)
11     VALUES ('Fred','These are extensive notes about Fred')
12
13

```

	Name	Notes	Photo
	VARCHAR (50)	LONGVARCHAR	LONGVARBINARY
1	Fred	These are extensive notes about Fred	NULL

```

Class Sample.MyTable Extends %Persistent [ ClassType = persistent, DdlAllowed, Final,
  Owner = {yx}, ProcedureBlock, SqlRowIdPrivate, SqlTableName = MyTable ]
{
  Property Name As %Library.String(MAXLEN = 50) [ Required, SqlColumnNumber = 2 ];
  Property Notes As %Stream.GlobalCharacter [ SqlColumnNumber = 3 ];
  Property Photo As %Stream.GlobalBinary [ SqlColumnNumber = 4 ];

  /// Bitmap Extent Index auto-
  generated by DDL CREATE TABLE statement. Do not edit the SqlName of this index.
  Index DDLBEIndex [ Extent, SqlName = "%DDLBEIndex", Type = bitmap ];

  Storage Default
  {
    <Data name="MyTableDefaultData">
    <Value name="1">
    <Value>Name</Value>
    </Value>
    <Value name="2">
    <Value>Notes</Value>
    </Value>
    <Value name="3">
    <Value>Photo</Value>
    </Value>
    </Data>
    <DataLocation>^Sample.MyTableD</DataLocation>
    <DefaultData>MyTableDefaultData</DefaultData>
    <IdFunction>sequence</IdFunction>
  }
}

```


???? ??????????BLOBs?CLOBs?

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```

SET myf="E:\temp\game.jpg"
OPEN myf:("RF"):10
USE myf:0
READ x(1):10
&sql(INSERT INTO Sample.MyTable (Name,Photo) VALUES ('George',:x(1)))
IF SQLCODE<0 {
    WRITE "SQLCODE ERROR:"_SQLCODE_" "_%msg" QUIT
} ELSE {
    WRITE "????",!
}
CLOSE myf
}

```

DHC-APP>d ##class(PHA.TEST.SQL).StreamField1()

```

WRITE "????",!
^

```

<WRITE>zStreamField1+11^PHA.TEST.SQL.1
DHC-APP 2d0>g

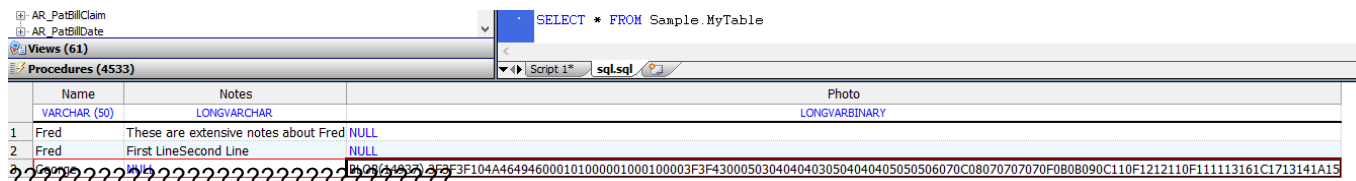
```

WRITE "????",!
^

```

<WRITE>zStreamField1+11^PHA.TEST.SQL.1
DHC-APP 2d0>g

DHC-APP>



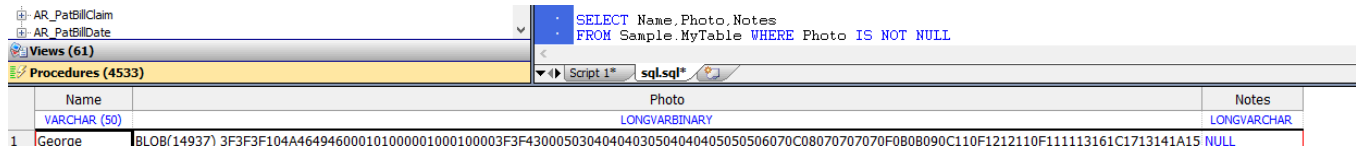
???????

?????????????????????OID???ID???????????

```

SELECT Name,Photo,Notes
FROM Sample.MyTable WHERE Photo IS NOT NULL

```



OID??? %List ????????????????\$lb("1", "%Stream.GlobalCharacter", "^EW3K.Cn9X.S")?

- - OID?????????????????(?1??)?????????????????
 - ?????1?????Photo?Notes????????????1?2?
 - ???2?????Notes?????????3?
 - ???Photo?Notes?????3?????????4?5?

???? ??????????BLOBs?CLOBs?

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????????????????????INSERT?????????????
????????????????????????????????????
????????????????????????????????

- ????????????????
DELETE????????????????????????????????
??DELETE????????????????????????
????????????????StreamLocation????TRUNCATE TABLE????????????????
????TRUNCATE????????(%SerialObject)????????????

- OID????????????????????%Stream.GlobalCharacter ?%Stream.GlobalBinary?

- OID????????????????????
????????????????????????????????????
??"S"(???)????
 - ??????SQL CREATE TABLE????????????????????????????4???(??^EW3K.Cn9X.S)?
????????????????????????????????
????????????????????TRUNCATE TABLE????????????????????????????
◦ ??????StreamLocation????????????????????(??^Sample.MyTableS)?
????????StreamLocation????<StreamLocation>^Sample.MyTableS</StreamLocation> ???

????????????????^Sample.MyTableS????????????????????????????????(??)????????????Sample.MyTable????????????????????
?Sample.MyTable????????10????????^Sample.MyTableS????????10??
????????????????????????????????

????????????????????????????????Property Note2 As %Stream.GlobalCharacter (LOCATION="^MyCustomGlobalS")????
????^MyCustomGlobalS????????????(????)????????????????????????????????(^Sample.MyTableS)????????????
??

????????????????????????????????^EW3K.Cn9X.S(3)????????????????^EW3K.Cn9X.S(3?0)????????^EW3K.Cn9X.S(3?1)?
????????

????????OID?RowID?Reference????OID????%OID????RowID????OID??%OID????????????????????????????%OID????
?SQLCODE-37???

????WHERE???HAVING????????????????????????????????????(=, !=, <, >)????(I)????(I)????????????????????????????????SQLCODE-313???

Result Set Display

- ??????SQL?\$lb("6", "%Stream.GlobalCharacter", "^EW3K.Cn9X.S").????OID?
- SQL Shell????SQL????\$lb("6", "%Stream.GlobalCharacter", "^EW3K.Cn9X.S")????OID?
- ???SQL????OID????%LIST????????\$LISTTOSTRING????OID????????????6?%Stream.GlobalBinary^EW3K.Cn9X.S?

????SQL????????????OID????????
- ?????????????100????????????100????????(??)????100????????SUBSTRING(cstream field?1,100)?
- ?????????<binary>?

????????SQL????????????

????SQL????OID????????????????SELECT Name, "||Photo, "||Notes FROM Sample.MyTable?

???? ????BLOBs?CLOBs?

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	Name	Expression_2	Expression_3
	VARCHAR (50)	VARCHAR	VARCHAR
1	Fred	NULL	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> %Stream.GlobalCharacter <input type="checkbox"/> <input type="checkbox"/> ^Sample.MyTableS
2	Fred	NULL	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> %Stream.GlobalCharacter <input type="checkbox"/> <input type="checkbox"/> ^Sample.MyTableS
3	George	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> %Stream.GlobalBinary <input type="checkbox"/> <input type="checkbox"/> ^Sample.MyTableS	NULL

DISTINCT, GROUP BY, and ORDER BY

?????????OID?????????????????????
 ??SELECT?????????OID?????????????
 ??????????????????:
 - ??????????????????
 DISTINCT?????????NULL?????????NULL???
 - GROUP BY?????????????????????
 GROUP BY?????????????????????????????
 - ORDER BY?????????OID?????????????????
 ORDER BY?????????????????????????????????

???????

IS [NOT] NULL?????????????????????????????:

```
SELECT Name,Notes
FROM Sample.MyTable WHERE Notes IS NOT NULL
```

BETWEEN, EXISTS, IN, %INLIST, LIKE, %MATCHES, and %PATTERN ??????????????OID?????????:

```
SELECT Name,Notes
FROM Sample.MyTable WHERE Notes %MATCHES '*[0-9]*GlobalChar*'
```

?????????????????????????????SQLCODE -313???

???????

COUNT???:

```
SELECT COUNT(Photo) AS PicRows,COUNT(Notes) AS NoteRows
FROM Sample.MyTable
```

PicRows	NoteRows
INTEGER	INTEGER

?????????COUNT(DISTINCT)?

?????????????????????
 ??????????????????????SQLCODE -37???

???? ??????????BLOBs?CLOBs?

??????

??%OBJECT?CHARACTER_LENGTH(?CHAR_LENGTH?DATALENGTH)?SUBSTRING?CONVERT?XMLCONCA
T?XMLELEMENT?XMLFOREST??INTERNAL????InterSystems SQL??????????????
????????????????SQL????????SQLCODE -37????

????????????????SQL????????SQLCODE -37????

- %OBJECT????????(????OID)???oref(????)?????:

```
SELECT Name,Notes,%OBJECT(Notes) AS NotesOref
FROM Sample.MyTable WHERE Notes IS NOT NULL
```

The screenshot shows the SQL IDE interface. The query editor contains the following SQL code:

```
SELECT Name,Notes,%OBJECT(Notes) AS NotesOref
FROM Sample.MyTable WHERE Notes IS NOT NULL
```

The result table is displayed below the editor:

	Name	Notes	NotesOref
	VARCHAR (50)	LONGVARCHAR	LONGVARCHAR
1	Fred	These are extensive notes about Fred	These are extensive notes about Fred
2	Fred	First LineSecond Line	First LineSecond Line

- CHARACTER_LENGTH?CHAR_LENGTH?DATALENGTH?????????????????????????????:

```
SELECT Name,DATALENGTH(Notes) AS NotesNumChars,DATALENGTH(Photo) AS PhotoNumChars
FROM Sample.MyTable
```

The screenshot shows the SQL IDE interface. The query editor contains the following SQL code:

```
SELECT Name,DATALENGTH(Notes) AS NotesNumChars,DATALENGTH(Photo) AS PhotoNumChars
FROM Sample.MyTable
```

The result table is displayed below the editor:

	Name	NotesNumChars	PhotoNumChars
	VARCHAR (50)	INTEGER	INTEGER
1	Fred	36	NULL
2	Fred	25	NULL
3	George	NULL	14937

SUBSTRING???:

```
SELECT Name,SUBSTRING(Notes,1,10) AS Notes1st10Chars
FROM Sample.MyTable WHERE Notes IS NOT NULL
```

The screenshot shows the SQL IDE interface. The query editor contains the following SQL code:

```
SELECT Name,SUBSTRING(Notes,1,10) AS Notes1st10Chars
FROM Sample.MyTable WHERE Notes IS NOT NULL
```

The result table is displayed below the editor:

	Name	Notes1st10Chars
	VARCHAR (50)	VARCHAR
1	Fred	These are
2	Fred	First Line

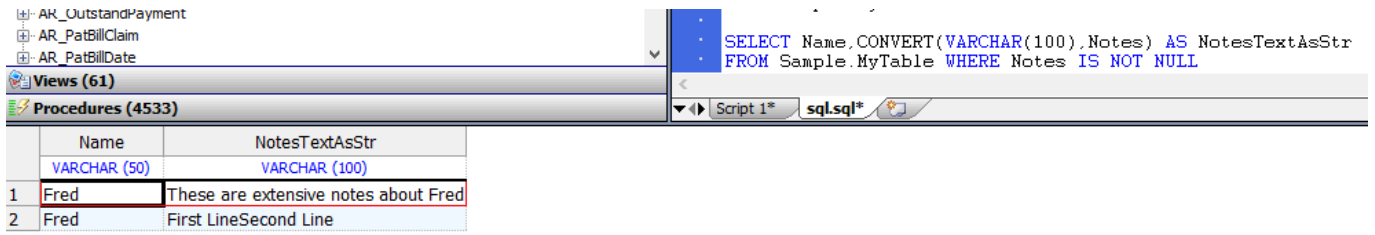
?????SQL Execute????????????????????????100?????????
????????????????100????????100????????(....)???

- CONVERT????????????????VARCHAR?????:

???? ??????????BLOBs?CLOBs?

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```
SELECT Name, CONVERT( VARCHAR(100), Notes) AS NotesTextAsStr  
FROM Sample.MyTable WHERE Notes IS NOT NULL
```



```
CONVERT(datatype,expression)??????????  
??VARCHAR?????????????????????????VARCHAR???  
??VARCHAR?????????????????????????????  
???????
```

```
{fn CONVERT(expression,datatype)}??????????;  
?????SQLCODE -37???
```

- %INTERNAL?????????????????????????

???????

InterSystems IRIS????????????????????????????????

InterSystems IRIS????????????????????????????
????????????????????

?????????????InterSystems IRIS??????
??

?InterSystems??????IRIS??

???InterSystems
Iris????????????SQL??SQL??BLOB?CLOB?;????SQL??Blob?Clob????????????AbstractStream????????????

????ODBC????

ODBC??????BLOB?CLOB????????????????
InterSystems SQL?ODBC??CLOB????????LONGVARCHAR(-1)??
BLOB????????LONGVARIABLE(-4)?
????????ODBC/JDBC????????InterSystems SQL reference????????????????

ODBC????/????????????????BLOB?CLOB??
????ODBC????????????????CLOB?BLOB??;
????????????????

????JDBC????

?Java????????????JDBC BLOB?CLOB??BLOB?CLOB????????
??:

???? ??????????BLOBs?CLOBs?

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```
Statement st = conn.createStatement();
ResultSet rs = st.executeQuery("SELECT MyCLOB,MyBLOB FROM MyTable");
rs.next();      // fetch the Blob/Clob

java.sql.Clob clob = rs.getClob(1);
java.sql.Blob blob = rs.getBlob(2);

// Length
System.out.println("Clob length = " + clob.length());
System.out.println("Blob length = " + blob.length());

// ...
```

?:???BLOB?CLOB????????free()????Java????????????????????(????)?
???Java????????????????????????

[#SQL](#) [#Caché](#) [#InterSystems IRIS](#) [#InterSystems IRIS for Health](#)

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? URL: <https://cn.community.intersystems.com/post/%E7%AC%AC%E5%8D%81%E4%B9%9D%E7%AB%A0-%E5%AD%98%E5%82%A8%E5%92%8C%E4%BD%BF%E7%94%A8%E6%B5%81%E6%95%B0%E6%8D%AE%EF%BC%88blobs%E5%92%8Cclobs%EF%BC%89>