
Subject: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [sergeynikitin](#) on Mon, 23 Jan 2017 01:28:11 GMT

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Huge error of Postgresql!

Double fields by transmission to the program from sql table lose a fractional part!

The decision is extremely simple. To scan a string not as int (atoi), but as Double (ScanDouble).
The request to correct quickly as soon as it is possible!

Place to correct:

file PostgreSQL.cpp

Fucntion: void PostgreSQLConnection::GetColumn(int i, Ref f) const

Line: 644

Now:

```
switch(info[i].type)
{
case INT64_V:
f.SetValue(ScanInt64(s));
break;
case INT_V:
f.SetValue(atoi(s));
break;
case DOUBLE_V:
f.SetValue(atoi(s));    //<=====THIS LINE NEED TO CORRECT
break;
case BOOL_V:
f.SetValue(*s == 't' ? "1" : "0");
break;
case DATE_V:
f.SetValue(sDate(s));
break;
case TIME_V: {
Time t = ToTime(sDate(s));
t.hour = atoi(s + 11);
t.minute = atoi(s + 14);
t.second = atoi(s + 17);
f.SetValue(t);
}
break;
default: {

.....
```

Must be:

```
switch(info[i].type)
```

```

{
case INT64_V:
f.SetValue(ScanInt64(s));
break;
case INT_V:
f.SetValue(atoi(s));
break;
case DOUBLE_V:
f.SetValue(ScanDouble(s));
break;
case BOOL_V:
f.SetValue(*s == 't' ? "1" : "0");
break;
case DATE_V:
f.SetValue(sDate(s));
break;
case TIME_V: {
Time t = ToTime(sDate(s));
t.hour = atoi(s + 11);
t.minute = atoi(s + 14);
t.second = atoi(s + 17);
f.SetValue(t);
}
break;
default: {

.....

```

Thanks!

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [unodgs](#) on Mon, 23 Jan 2017 06:34:20 GMT

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That proves one thing - noone uses double fields

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [sergeynikitin](#) on Mon, 23 Jan 2017 07:38:18 GMT

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There is a way that I had to first use. It was necessary to specify in the query string conversion.

```
SQL.Execute("DBL_FIELD::text FROM SOMETABLE");
```

But yesterday I thought: Yes, how am I going to suffer. Opened in debugger with incremental execution. And I horrified, how all of this is simple.

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [Klugier](#) on Mon, 23 Jan 2017 08:38:02 GMT

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Hello,

It seems like release blocker Added to redmine - I believe we should fix this before release - <http://www.ultimatepp.org/redmine/issues/1617>.

Sergey can you monitor redmine ticket?

Sincerely,
Klugier

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [sergeynikitin](#) on Mon, 23 Jan 2017 08:46:41 GMT

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Yes. I can. I've Add myself to this issue.

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [mirek](#) on Wed, 25 Jan 2017 10:30:17 GMT

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sergeynikitin wrote on Mon, 23 January 2017 09:46 Yes. I can. I've Add myself to this issue.

I really wonder what U++ revision you are using, because in trunk it is:

```
void PostgreSQLConnection::GetColumn(int i, Ref f) const
{
    if(PQgetisnull(result, fetched_row, i))
    {
        f = Null;
        return;
    }
}
```

```

}
char *s = PQgetvalue(result, fetched_row, i);
switch(info[i].type)
{
case INT64_V:
    f.SetValue(ScanInt64(s));
    break;
case INT_V:
    f.SetValue(atoi(s));
    break;
case DOUBLE_V:
    f.SetValue(atof(s));
    break;

```

and it is really really unlikely that this bug could get there in last 8 years, because in that period my major project is PGSQL and customers would really notice this within hours...

I have checked svn history and oldest revision available from 2009 has "atof" there...

Mirek

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [sergeynikitin](#) on Wed, 25 Jan 2017 17:18:08 GMT

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mirek wrote on Wed, 25 January 2017 13:30sergeynikitin wrote on Mon, 23 January 2017 09:46Yes. I can. I've Add myself to this issue.

I really wonder what U++ revision you are using, because in trunk it is:

```

void PostgreSQLConnection::GetColumn(int i, Ref f) const
{
    if(PQgetisnull(result, fetched_row, i))
    {
        f = Null;
        return;
    }
    char *s = PQgetvalue(result, fetched_row, i);
    switch(info[i].type)
    {
    case INT64_V:
        f.SetValue(ScanInt64(s));
        break;
    case INT_V:

```

```
f.SetValue(atoi(s));  
break;  
case DOUBLE_V:  
f.SetValue(atof(s));  
break;
```

and it is really really unlikely that this bug could get there in last 8 years, because in that period my major project is PGSQL and customers would really notice this within hours...

I have checked svn history and oldest revision available from 2009 has "atof" there...

Mirek

I use summer svn code. (with c++11 support).

If all correct, - it's OK! I've locally corrected version of PostgreSQL.cpp.

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [sergeynikitin](#) on Wed, 25 Jan 2017 17:35:13 GMT

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I've just tested variant of atof(s):

Result on picture:

May be ScanDouble with language settings can be accurater?...

File Attachments

1) [PostgreSQL_ScanDouble_problem.png](#), downloaded 1352 times

PostgreSQL.cpp with atof(s);

анция	Вес
1	62,00
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1	173,00
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1	83,00
1	83,00
1	26,00
1	76,00
1	79,00
1	88,00
1	90,00
1	118,00
1	75,00
1	82,00
1	77,00
1	66,00
1	76,00
1	94,00
1	110,00
1	109,00
1	68,00

PostgreSQL

анция			
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Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [sergeynikitin](#) on Wed, 25 Jan 2017 17:37:22 GMT

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Sorry... I do it best regards, and with hope.

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [Klugier](#) on Wed, 25 Jan 2017 17:42:09 GMT

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Hello Sergey,

The issue was closed on redmine as "Rejected".

Sincerely and thanks for feedback,
Klugier

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [sergeynikitin](#) on Wed, 25 Jan 2017 17:54:23 GMT

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Why closed? I place there picture, where error is still exists!

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [mirek](#) on Wed, 25 Jan 2017 18:02:55 GMT

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sergeynikitin wrote on Wed, 25 January 2017 18:54Why closed? I place there picture, where error is still exists!

Actually, I have suspicion here...

Can you check how that 's' looks like? (E.g. put DUMP(s) before atof).

I suspect that maybe, your PGSQL is returning decimal comma and atof is unable to handle that, which ScanDouble is.

It would be strange borderline issue, but really worth fixing.

(OTOH, 'atoi' was NEVER there, sorry. You can check svn log....)

Mirek

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [Klugier](#) on Wed, 25 Jan 2017 18:03:45 GMT

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Hello,

Upps sorry, please close it by yourself when everything will be ok. I will not touch this issue any more.

Sincerely,
Klugier

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [sergeynikitin](#) on Wed, 25 Jan 2017 18:31:32 GMT

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When I place there code of, I mistaken, because already correct in my home code. But atof return same result as you can see at picture.

May be will different result if use other Set Language

(I use

```
SetLanguage(LNGFromText("RU-RU"));
```

```
SetDateFormat("%3:02d.%2:02d.%1:4d");
```

It's not tested yet. But ScanDouble work fine!

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [mirek](#) on Wed, 25 Jan 2017 18:49:18 GMT

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Sure, but I need to know the root of the problem...

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [sergeynikitin](#) on Wed, 25 Jan 2017 19:31:17 GMT

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I'll try to prepare test case tonight .

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [mirek](#) on Wed, 25 Jan 2017 19:40:17 GMT

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sergeynikitin wrote on Wed, 25 January 2017 20:31'I'll try to prepare test case tonight .

You do not understand...

I need to know what your PostgreSQL instance returns (before atof), so that I am sure we are doing the right fix.

Because very likely the problem is that your PostgreSQL is configured somehow differently than my PostgreSQL.

So pretty please, place DUMP(s) before atof (or ScanDouble), like

```
switch(info[i].type)
{
  case INT64_V:
    f.SetValue(ScanInt64(s));
    break;
  case INT_V:
    f.SetValue(atoi(s));
    break;
  case DOUBLE_V:
    DUMP(s);
    f.SetValue(ScanDouble(s));
    break;
```

then post here a log (a couple of lines is enough).

Thanks,

Mirek

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [sergeynikitin](#) on Thu, 26 Jan 2017 00:00:26 GMT

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I see, I will.

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Modified code (while lang settings SetLanguage(LNGFromText("RU-RU")));:

```
char *s = PQgetvalue(result, fetched_row, i);
switch(info[i].type)
{
case INT64_V:
f.SetValue(ScanInt64(s));
break;
case INT_V:
f.SetValue(atoi(s));
break;
case DOUBLE_V:
RLOG("===start analysis===");
RDUMP(s);
double da,dS;
da = atof(s);
dS = ScanDouble(s);
RDUMP(da);
RDUMP(dS);
static String test_format_and_lang_settings;
test_format_and_lang_settings = Format("%f",dS);
RDUMP(test_format_and_lang_settings);
RLOG("====end analysis====");
RLOG(" ");
f.SetValue(ScanDouble(s));
break;
case BOOL_V:
f.SetValue(*s == 't' ? "1" : "0");
break;
case DATE_V:
```

Log:

```
26.01.2017 03:22:15 ===start analysis===
26.01.2017 03:22:15 s = 90
26.01.2017 03:22:15 da = 90
26.01.2017 03:22:15 dS = 90
26.01.2017 03:22:15 test_format_and_lang_settings = 90,000000
26.01.2017 03:22:15 ====end analysis====
26.01.2017 03:22:15
26.01.2017 03:22:15 ===start analysis===
26.01.2017 03:22:15 s = 40
26.01.2017 03:22:15 da = 40
26.01.2017 03:22:15 dS = 40
```

```
26.01.2017 03:22:15 test_format_and_lang_settings = 40,000000
26.01.2017 03:22:15 =====end analysis=====
26.01.2017 03:22:15
26.01.2017 03:22:15 =====start analysis=====
26.01.2017 03:22:15 s = 269.96336996337
26.01.2017 03:22:15 da = 269
26.01.2017 03:22:15 dS = 269.96336996337
26.01.2017 03:22:15 test_format_and_lang_settings = 269,963370
26.01.2017 03:22:15 =====end analysis=====
26.01.2017 03:22:15
26.01.2017 03:22:15 =====start analysis=====
26.01.2017 03:22:15 s = 381.556455240666
26.01.2017 03:22:15 da = 381
26.01.2017 03:22:15 dS = 381.556455240666
26.01.2017 03:22:15 test_format_and_lang_settings = 381,556455
26.01.2017 03:22:15 =====end analysis=====
26.01.2017 03:22:15
26.01.2017 03:22:15 =====start analysis=====
26.01.2017 03:22:15 s = 282.083413662361
26.01.2017 03:22:15 da = 282
26.01.2017 03:22:15 dS = 282.083413662361
26.01.2017 03:22:15 test_format_and_lang_settings = 282,083414
26.01.2017 03:22:15 =====end analysis=====
```

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program
lose a fractional part!

Posted by [sergeynikitin](#) on Thu, 26 Jan 2017 00:33:10 GMT

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While lang settings SetLanguage(LNGFromText("EN-US"));:

```
26.01.2017 03:26:34 =====start analysis=====
26.01.2017 03:26:34 s = 40
26.01.2017 03:26:34 da = 40
26.01.2017 03:26:34 dS = 40
26.01.2017 03:26:34 test_format_and_lang_settings = 40,000000
26.01.2017 03:26:34 =====end analysis=====
26.01.2017 03:26:34
26.01.2017 03:26:34 =====start analysis=====
26.01.2017 03:26:34 s = 269.96336996337
26.01.2017 03:26:34 da = 269
26.01.2017 03:26:34 dS = 269.96336996337
26.01.2017 03:26:34 test_format_and_lang_settings = 269,963370
26.01.2017 03:26:34 =====end analysis=====
26.01.2017 03:26:34
26.01.2017 03:26:34 =====start analysis=====
```

```
26.01.2017 03:26:34 s = 59.95115995116
26.01.2017 03:26:34 da = 59
26.01.2017 03:26:34 dS = 59.95115995116
26.01.2017 03:26:34 test_format_and_lang_settings = 59,951160
26.01.2017 03:26:34 ====end analysis====
26.01.2017 03:26:34
26.01.2017 03:26:34 ====start analysis===
26.01.2017 03:26:34 s = 222.435897435897
26.01.2017 03:26:34 da = 222
26.01.2017 03:26:34 dS = 222.435897435897
26.01.2017 03:26:34 test_format_and_lang_settings = 222,435897
26.01.2017 03:26:34 ====end analysis====
26.01.2017 03:26:34
```

Both test under UBUNTU 16.04 (with Russian main language)

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [sergeynikitin](#) on Thu, 26 Jan 2017 00:43:56 GMT

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But if I start
LC_ALL=en_US.UTF-8 ./ProgramName
or
LANG=en_US.UTF-8 ./ProgramName

than all correct.

```
26.01.2017 03:41:15 ====start analysis===
26.01.2017 03:41:15 s = 40
26.01.2017 03:41:15 da = 40
26.01.2017 03:41:15 dS = 40
26.01.2017 03:41:15 test_format_and_lang_settings = 40.000000
26.01.2017 03:41:15 ====end analysis====
26.01.2017 03:41:15
26.01.2017 03:41:15 ====start analysis===
26.01.2017 03:41:15 s = 269.96336996337
26.01.2017 03:41:15 da = 269.96336996337
26.01.2017 03:41:15 dS = 269.96336996337
26.01.2017 03:41:15 test_format_and_lang_settings = 269.963370
26.01.2017 03:41:15 ====end analysis====
26.01.2017 03:41:15
26.01.2017 03:41:15 ====start analysis===
26.01.2017 03:41:15 s = 59.95115995116
26.01.2017 03:41:15 da = 59.95115995116
```

26.01.2017 03:41:15 dS = 59.95115995116
26.01.2017 03:41:15 test_format_and_lang_settings = 59.951160
26.01.2017 03:41:15 =====end analysis=====

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [sergeynikitin](#) on Thu, 26 Jan 2017 00:45:33 GMT

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It's repeated same results on different computer (but always under UBUNTU 16.04)

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [sergeynikitin](#) on Thu, 26 Jan 2017 00:57:53 GMT

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Postgresql (Server v. 9.5) language settings are default.

fragment of postgres config:

```
# These settings are initialized by initdb, but they can be changed.  
lc_messages = 'ru_RU.UTF-8' # locale for system error message  
# strings  
lc_monetary = 'ru_RU.UTF-8' # locale for monetary formatting  
lc_numeric = 'ru_RU.UTF-8' # locale for number formatting  
lc_time = 'ru_RU.UTF-8' # locale for time formatting
```

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [sergeynikitin](#) on Thu, 26 Jan 2017 01:04:54 GMT

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I change postgresql setting to (/etc/postgresql/9.5/main/postgresql.conf)
en_US:

```
# These settings are initialized by initdb, but they can be changed.  
#lc_messages = 'ru_RU.UTF-8' # locale for system error message
```

```
# strings
#lc_monetary = 'ru_RU.UTF-8' # locale for monetary formatting
#lc_numeric = 'ru_RU.UTF-8' # locale for number formatting
#lc_time = 'ru_RU.UTF-8' # locale for time formatting

lc_messages = 'en_US.UTF-8' # locale for system error message
# strings
lc_monetary = 'en_US.UTF-8' # locale for monetary formatting
lc_numeric = 'en_US.UTF-8' # locale for number formatting
lc_time = 'en_US.UTF-8' # locale for time formatting
```

```
Result is zero!
26.01.2017 03:59:52 ===start analysis===
26.01.2017 03:59:52 s = 40
26.01.2017 03:59:52 da = 40
26.01.2017 03:59:52 dS = 40
26.01.2017 03:59:52 test_format_and_lang_settings = 40,000000
26.01.2017 03:59:52 =====end analysis=====
26.01.2017 03:59:52
26.01.2017 03:59:52 ===start analysis===
26.01.2017 03:59:52 s = 269.96336996337
26.01.2017 03:59:52 da = 269
26.01.2017 03:59:52 dS = 269.96336996337
26.01.2017 03:59:52 test_format_and_lang_settings = 269,963370
26.01.2017 03:59:52 =====end analysis=====
26.01.2017 03:59:52
26.01.2017 03:59:52 ===start analysis===
26.01.2017 03:59:52 s = 59.95115995116
26.01.2017 03:59:52 da = 59
26.01.2017 03:59:52 dS = 59.95115995116
26.01.2017 03:59:52 test_format_and_lang_settings = 59,951160
26.01.2017 03:59:52 =====end analysis=====
```

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program
lose a fractional part!

Posted by [sergeynikitin](#) on Thu, 26 Jan 2017 01:23:09 GMT

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I test timings:

Test code:

```
#include <Core/Core.h>
```

```
using namespace Upp;
```

```
CONSOLE_APP_MAIN
{
    double a;
    String s = "269.96336996337";
    #define LOOPS 1000000
    for(int i = 0; i < LOOPS; i++){
        RTIMING("Using atof");
        a = atof(s);
    }
    for(int i = 0; i < LOOPS; i++){
        RTIMING("Using ScanDouble");
        a = ScanDouble(s);
    }
}
```

TIMING results:

TIMING Using ScanDouble: 1.12 s - 1.12 us (1.22 s / 1000000), min: 0.00 ns, max: 1.00 ms, nesting: 1 - 1000000

TIMING Using atof : 337.45 ms - 337.45 ns (439.00 ms / 1000000), min: 0.00 ns, max: 1.00 ms, nesting: 1 - 1000000

It's not dramatically slower! But standard settings (on various environments) show right results!

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [mirek](#) on Thu, 26 Jan 2017 08:09:21 GMT

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OK, so it seems like the moral of the story is to never trust or use 'atof'.

Makes me want to do add to Core.h either

```
#define atof @ // never use atof, as it has unpredictable results
```

or even

```
#define atof Atof
```

Atof being U++ upcoming equivalent of atof, basically Nvl(ScanDouble(x)).

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [mirek](#) on Thu, 26 Jan 2017 13:10:50 GMT

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sergeynikitin wrote on Thu, 26 January 2017 02:23I test timings:

Test code:

```
#include <Core/Core.h>
```

```
using namespace Upp;
```

```
CONSOLE_APP_MAIN
```

```
{
    double a;
    String s = "269.96336996337";
    #define LOOPS 1000000
    for(int i = 0; i < LOOPS; i++){
        RTIMING("Using atof");
        a = atof(s);
    }
    for(int i = 0; i < LOOPS; i++){
        RTIMING("Using ScanDouble");
        a = ScanDouble(s);
    }
}
```

TIMING results:

TIMING Using ScanDouble: 1.12 s - 1.12 us (1.22 s / 1000000), min: 0.00 ns, max: 1.00 ms, nesting: 1 - 1000000

TIMING Using atof : 337.45 ms - 337.45 ns (439.00 ms / 1000000), min: 0.00 ns, max: 1.00 ms, nesting: 1 - 1000000

It's not dramatically slower! But standard settings (on various environments) show right results!

BTW, have you tried in Release? MSC14 32-bit release I am getting:

TIMING Using ScanDouble: 120.72 ms - 120.72 ns (148.00 ms / 1000000), min: 0.00 ns, max: 2.00 ms, nesting: 1 - 1000000
TIMING Using atof : 281.72 ms - 281.72 ns (309.00 ms / 1000000), min: 0.00 ns, max: 1.00 ms, nesting: 1 - 1000000

I really would not like U++ being slower...

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [mirek](#) on Thu, 26 Jan 2017 14:01:26 GMT

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rc4 should have this fix. Can you check please so that we can close this issue?

Mirek

Subject: Re: Huge error of Postgresql! Double fields by transmission to the program lose a fractional part!

Posted by [sergeynikitin](#) on Thu, 26 Jan 2017 14:25:45 GMT

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Ok, I'll ckeck it tonight (a few later).
