Subject: [FIXED]HttpRequest hangs when Chunked response, without trailer, and KeepAlive is set. (patch & TC)
Posted by omari on Fri, 08 Apr 2016 17:44:07 GMT
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Hi,

When HttpRequest is in TRAILER phase, he call ReadingHeader().

buf if there is no trailer, the socket contain only two charachter: \r\n.
because ReadingHeader() read at least three characters, il hangs waiting a third one.

Here a Test Case:

```
HttpRequest r("http://dev.alt.cloudappsportal.com/_api/web/lists");
r.KeepAlive().Execute();
```

A solution is to check if there is a trailer, and if not, read only \r\n and finish:

in the file Core\Http.cpp
Line : 385
replace :

```
case TRAILER:
 if(ReadingHeader())
  break;
 header.ParseAdd(data);
 Finish();
 break;
case FINISHED:
```

by

```
case TRAILER:
 if(TcpSocket::Peek() == '\r') // if the next line is empty (then no trailer)
 {
  TcpSocket::Get();
  c2 = TcpSocket::Get();
  if(c2 != '\n')
   HttpError("missing ending CRLF");
  Finish();
  break;
 }

 if(ReadingHeader())
  break;
```

```
  header.ParseAdd(data);
  Finish();
  break;
 case FINISHED:
```

Subject: Re: [BUG]HttpRequest hangs when Chunked response, without trailer, and KeepAlive is set. (patch & TC)
Posted by mirek on Sun, 17 Apr 2016 06:58:36 GMT
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Thanks. In the end, I have used a little bit more complete fix (appears that using ReadingHeader was wrong, so added new ReadingTrailer function sintead).

Should be now fixed. Please check.

Mirek

Subject: Re: [BUG]HttpRequest hangs when Chunked response, without trailer, and KeepAlive is set. (patch & TC)
Posted by omari on Sun, 17 Apr 2016 09:37:24 GMT
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Thanks Mirek,

it missing a call to Finish() when ReadingTrailer() returns true.

for example :

```
  case TRAILER:
  if(!ReadingTrailer())
    header.ParseAdd(data);
   Finish();
   break;
```

instead of

```
  case TRAILER:
  if(ReadingTrailer())
    break;
   header.ParseAdd(data);
   Finish();
   break;
```

Subject: Re: [BUG]HttpRequest hangs when Chunked response, without trailer, and KeepAlive is set. (patch & TC)
Posted by mirek on Sun, 17 Apr 2016 12:43:53 GMT
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I am not sure that what you say is correct...

Finish sets "http request finished" state. ReadingTrailer returns true if trailer is not yet read (or error, which is handled elsewhere) - basically it means ReadingTrailer should be called again on next Do (or error handled).

Mirek

Subject: Re: [BUG]HttpRequest hangs when Chunked response, without trailer, and KeepAlive is set. (patch & TC)
Posted by omari on Sun, 17 Apr 2016 20:10:31 GMT
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the trailer part of http response is optional.

an empty line("\r\n") after the last chunk, mean that there is no trailer at all.

in this case, we should go to the next phase : Finish().

Subject: Re: [BUG]HttpRequest hangs when Chunked response, without trailer, and KeepAlive is set. (patch & TC)
Posted by mirek on Mon, 18 Apr 2016 15:44:35 GMT
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omari wrote on Sun, 17 April 2016 22:10the trailer part of http response is optional.

an empty line("\r\n") after the last chunk, mean that there is no trailer at all.

in this case, we should go to the next phase : Finish().

```
bool HttpRequest::ReadingTrailer()
{
 for(;;) {
  int c = TcpSocket::Get();
  if(c < 0)
   return !IsEof();
```

If there is no trailer (or less than 2 characters at the end of stream), it should return false, right?

I believe that calling Finish in all cases is simply wrong - if there is not trailer, it is possible it does not get read. Now obviously, it perhaps does not matter much, unless you are in KeepAlive mode, where you IMO really need trailer to tell the end of each HTTP request.

Mirek

Subject: Re: [BUG]HttpRequest hangs when Chunked response, without trailer, and KeepAlive is set. (patch & TC)
Posted by omari on Mon, 18 Apr 2016 17:02:21 GMT
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yes i am in KeepAlive mode.

in this case, TcpSocket::Get() does not return (-1), but it block.

Subject: Re: [BUG]HttpRequest hangs when Chunked response, without trailer, and KeepAlive is set. (patch & TC)
Posted by mirek on Tue, 19 Apr 2016 09:01:11 GMT
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Thanks. You were (mostly) right all the time, I was wrong. I got messed up the trailer and the empty line.

Anyway, deeper digging into HTTP specs revealed that in theory, (main) HTTP header can be empty just as well as chunked trailer. So perhaps the really correct fix should be in ReadingHeader:

```
bool HttpRequest::ReadingHeader()
{
 for(;;) {
  int c = TcpSocket::Get();
  if(c < 0)
   return !IsEof();
  else
   data.Cat(c);
  if(data.GetCount() == 2 && data[0] == '\r' && data[1] == '\n') // header is empty
```

```
   return false;
  if(data.GetCount() >= 3) {
   const char *h = data.Last();
   if(h[0] == '\n' && h[-1] == '\r' && h[-2] == '\n') // empty ending line after non-empty header
    return false;
  }
  if(data.GetCount() > max_header_size) {
   HttpError("HTTP header exceeded " + AsString(max_header_size));
   return true;
  }
 }
}
```

(now on svn...)

Do you think this is correct?

Subject: Re: [BUG]HttpRequest hangs when Chunked response, without trailer, and KeepAlive is set. (patch & TC)
Posted by omari on Tue, 19 Apr 2016 09:36:24 GMT
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Mirek, you are right,

when ReadingTrailer return true, we do not call Finish().

but the actual implementation of ReadingTrailer fail when a Trailer is present.

it miss the part :

```
 if(data.GetCount() > 3) {
   const char *h = data.Last();
   if(h[0] == '\n' && (h[-1] == '\r' && h[-2] == '\n' || h[-1] == '\n'))
    return false;
  }
```

(as ReadingHeader)

```
bool HttpRequest::ReadingTrailer()
{
 for(;;) {
  int c = TcpSocket::Get();
  if(c < 0)
```

```
   return !IsEof();
  else
   data.Cat(c);
  if(data.GetCount() == 2) {
   if(data[0] == '\r' && data[1] == '\n')
    return false;
  }
  if(data.GetCount() > 3) {
   const char *h = data.Last();
   if(h[0] == '\n' && (h[-1] == '\r' && h[-2] == '\n' || h[-1] == '\n'))
    return false;
  }
 }
}
```

Subject: Re: [BUG]HttpRequest hangs when Chunked response, without trailer, and KeepAlive is set. (patch & TC)
Posted by omari on Tue, 19 Apr 2016 09:42:48 GMT
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here a test case for chunker response with and without trailer:

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

using namespace Upp;

// base source :
http://www.tcpipguide.com/free/t_HTTPDataLengthIssuesChunkedTransfersandMessageTrai-3.htm
String chunked_with_trailer = "HTTP/1.1 200 OK\r\nDate: Mon, 22 Mar 2004 11:15:03
GMT\r\nContent-Type: text/html\r\nTransfer-Encoding: chunked\r\nTrailer:
Expires\r\n\r\n29\r\n<html><body><p>The file you requested is \r\n5\r\n3,400\r\n23\r\nbytes long
and was last modified:\r\n\r\n1d\r\nSat, 20 Mar 2004 21:12:00
GMT\r\n13\r\n.</p></body></html>\r\n0\r\nExpires: Sat, 27 Mar 2004 21:12:00 GMT\r\n\r\n";

// base source : https://en.wikipedia.org/wiki/Chunked_transfer_encoding?oldid=430331176
String chunked_without_trailer = "HTTP/1.1 200 OK\r\nContent-Type:
text/plain\r\nTransfer-Encoding: chunked\r\n\r\n26\r\nThis is the data in the first
chunk\r\n6\r\n1C\r\nand this is the second one\r\n\r\n3\r\ncon\r\n8\r\nsequence\r\n0\r\n\r\n";

static void Server(String r)
{
 TcpSocket   server;
```

```
 if(server.Listen(4000, 10)) {

  TcpSocket socket;
  LOG("Waiting...");
  bool b = socket.Accept(server);
  if(b) {
   LOG("Connection accepted");
   HttpHeader http;
   http.Read(socket);
   socket.Put(r);
   socket.Close();
  }
 }
}


GUI_APP_MAIN
{
 StdLogSetup(LOG_COUT|LOG_FILE);
 Thread a;

 LOG("chunked_without_trailer");
 LOG("****************");
 LOG(chunked_without_trailer);
 LOG("---------------");

 a.Run(callback1(Server, chunked_without_trailer));
 HttpRequest r1("localhost:4000");/*r1.Trace();*/ LOG(r1.GET().Execute());
 a.Wait();


 LOG("chunked_with_trailer");
 LOG("****************");
 LOG(chunked_with_trailer);
 LOG("---------------");

 a.Run(callback1(Server, chunked_with_trailer));
 HttpRequest r2("localhost:4000");/*r2.Trace();*/ LOG(r2.GET().Execute());
 a.Wait();

 LOG("================ OK");

}
```

Subject: Re: [BUG]HttpRequest hangs when Chunked response, without trailer, and KeepAlive is set. (patch & TC)
Posted by mirek on Fri, 22 Apr 2016 07:33:51 GMT
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omari wrote on Tue, 19 April 2016 11:36Mirek, you are right,

when ReadingTrailer return true, we do not call Finish().

but the actual implementation of ReadingTrailer fail when a Trailer is present.

it miss the part :

```
 if(data.GetCount() > 3) {
   const char *h = data.Last();
   if(h[0] == '\n' && (h[-1] == '\r' && h[-2] == '\n' || h[-1] == '\n'))
    return false;
  }
```

(as ReadingHeader)

```
bool HttpRequest::ReadingTrailer()
{
 for(;;) {
  int c = TcpSocket::Get();
  if(c < 0)
   return !IsEof();
  else
   data.Cat(c);
  if(data.GetCount() == 2) {
   if(data[0] == '\r' && data[1] == '\n')
    return false;
  }
  if(data.GetCount() > 3) {
   const char *h = data.Last();
   if(h[0] == '\n' && (h[-1] == '\r' && h[-2] == '\n' || h[-1] == '\n'))
    return false;
  }
 }
}
```

I suspect you were not testing with latest svn - there is no ReadingTrailer anymore...

I have tested with your testcase and it works as expected (great testcase BTW! adding it to autotest).

Mirek

Subject: Re: [BUG]HttpRequest hangs when Chunked response, without trailer, and KeepAlive is set. (patch & TC)
Posted by omari on Fri, 22 Apr 2016 15:08:14 GMT
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Thanks Mirek, it work well for this scenario.

there are two other small bugs that appears with KeepAlive:

1 - Finish() calls Close() (at line 833), but in keep_alive mode, it should not

```
 if(!keep_alive)Close();
```

2 - there is a blocking, when response has Content-Length = 0, for example:

```
HTTP/1.0 200 OK
Date: Fri, 31 Dec 1999 23:59:59 GMT
Server: Apache/0.8.4
Content-Type: text/html
Content-Length: 0
Expires: Sat, 01 Jan 2000 00:59:59 GMT
Last-modified: Fri, 09 Aug 1996 14:21:40 GMT
```

a possible solution (tested) is in ReadingBody()
replace:

```
 if(count > 0)
  n = (int)min((int64)n, count);
```

by

```
 if(count == 0)
  return false;
 n = (int)min((int64)n, count);
```

Subject: Re: [BUG]HttpRequest hangs when Chunked response, without trailer, and KeepAlive is set. (patch & TC)
Posted by mirek on Mon, 25 Apr 2016 11:52:52 GMT
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Thanks. I have checked the code and this simple version should work:

```
bool HttpRequest::ReadingBody()
{
 LLOG("HTTP reading body " << count);
 String s = TcpSocket::Get((int)min((int64)chunk, count));
 if(s.GetCount() == 0)
  return !IsEof() && count;
```

BTW, if you have some fixed testing server that returns zero content, please let me know - I would like to ass it to nightly tests.

Subject: Re: [BUG]HttpRequest hangs when Chunked response, without trailer, and KeepAlive is set. (patch & TC)
Posted by mirek on Mon, 25 Apr 2016 11:57:00 GMT
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Ah, here we go:

https://httpbin.org/bytes/0