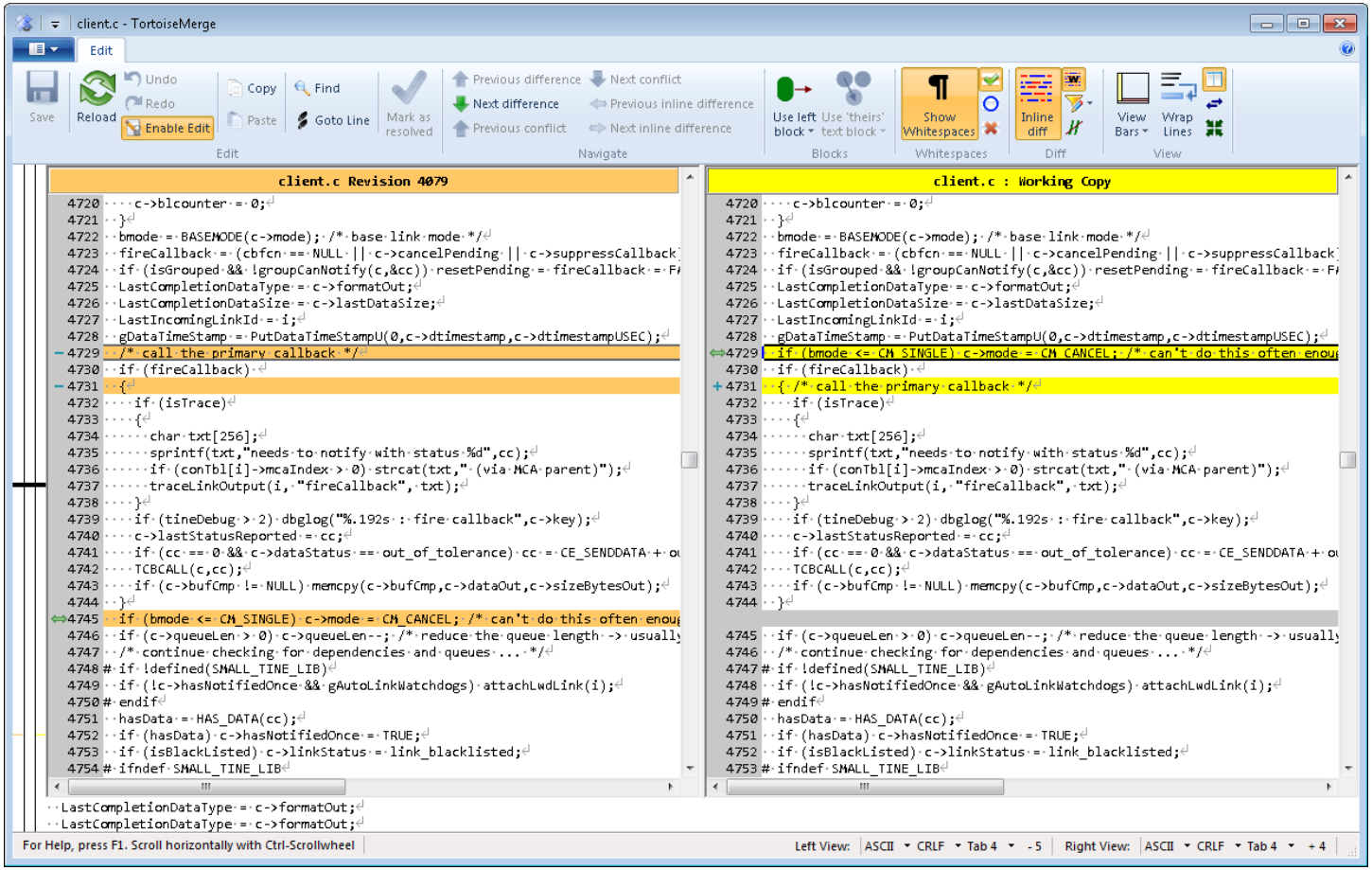
TINE CORE MEETING

2.8.2018

4.6.3 Fixes and Features…

- In NotifyClient() (client.c) :
  - Unit stress test failing with too many link timeouts (TCP/STREAM mode)



4.6.3 Java

- Local History relative tolerance.

```
6361  class hstTolHndlr implements csvHandler
6362  {
6363    private hstRowHndlr rHndlr;
6364    hstTolHndlr(hstRowHndlr rowHndlr) { rHndlr = rowHndlr; }
6365    public int process(String strValue,int index)
6366    {
6367      int i=0;
6368      try
6369      {
6370        if ((i=strValue.indexOf('%')) == -1)
6371        { // absolute tolerance !
6372          rHndlr.aTolerance = Float.parseFloat(strValue);
6373          rHndlr.pTolerance = 0;
6374        }
6375        else
6376        {
6377          rHndlr.aTolerance = 0;
6378          rHndlr.pTolerance = Float.parseFloat(strValue.substring(0,i));
6379          if (rHndlr.pTolerance  >= 1) rHndlr.pTolerance /= 100.0;
6380        }
6381      }
6382      catch (NumberFormatException e)
6383      {
6384        rHndlr.pTolerance = 0;
6385        rHndlr.aTolerance = 0;
6386      }
6387      return 0;
6388    }
6389  }
```

4.6.3 Java

- TLinkFactory.userType (String)
  - In advance of Release 5.0 :

```
public boolean isDoocsClient()
{
  if (userType == null) return false;
  if (userType.compareToIgnoreCase("JDDD") == 0) return true;
  if (userType.contains("DOOCS")) return true;
  return false;
}
```

  - => jddd Workarounds only apply to actual jddd clients !

Odds and Ends

- Tutorials
  - Interest in tutorials (Python, Acop.NET, ?)
- Acop.NET News
  - AcopForm, 3-D charts, etc.
  - PCaPAC presentation as early alpha @ Wednesday meeting in a few weeks; as beta @ TINE Users Meeting in September …
- Central Archive News:
  - Master/Slave role reversals …
    - PETRA, XFEL
    - Coming soon: anybody else?

Release 5.0

- Release 5.0 …
  - Preliminary versions (C and Java) in SVN.
  - C Unit Client and Servers tested (with even more tests!)
    - R5 server – R5 client
    - R5 server – R4 client
    - R4 server – R5 client
  - Java server and clients tested
    - No ‘java unit server’
    - Numerous unit tests by hand …

Release 5.0 Transport headers

```
typedef struct /* struct is passed over the net (legacy) */
{
  UINT16 totalSize; /**< total packet size in bytes (must match the bytes read) */
  char userName[USERNAME_SIZE]; /**< caller name */
  short tineProtocol; /**< tine protocol level (modern: 6 for contracts, 4 for globals) */
  UINT16 number; /**< tine version number (contracts) or number of incoming keywords (globals) */
} PktHdr;
#define PKTHDR_SIZE  22

/**
 * \internal
 * \brief The top level header which defines the incoming request (or globals) data packet.
 *
 */
typedef struct PayloadHeader/* struct is passed over the net (modern, little endian) */
{
  UINT32 totalSizeInBytes;  /**< total packet size in bytes (must match the bytes read) */
  UINT32 headerSizeInBytes; /**< size of this header in bytes (allows for dynamic extension ?) */
  UINT32 pid;               /**< process ID of caller */
  SINT32 tineVersion;       /**< encoded specific version information */
  SINT16 numberSegments;    /**< number of following segments (contract requests, globals keywords) */
  SINT16 tineProtocol;      /**< tine protocol level (modern: 7) :: still at position 18 */
  UINT16 endianness;        /**< endianness of caller : 0 or 1 (little or big) -> all subsequent header
  UINT16 encoding;          /**< character encoding: ascii, utf-8, uni-code ? -> requires byte swapping
  char   userName[USERNAME_SIZE]; /**< caller name */
  char   userType[USERTYPE_SIZE]; /**< application type tag : 8 characters */
} ReqHdr, GlbHdr;
```

Release 5.0 Transport headers

- Response (Server -> Client)
  - Legacy: just single unsigned short with sizeInBytes …
  - Modern:

```
/**
* \internal
* \brief The top level header which defines the incoming response data packet.
*
*/
typedef struct
{
  SINT32 tineProtocol; /**< incoming tine protocol as integer -> distinct from legecy response of total
  UINT32 totalSizeInBytes; /**< total packet size in bytes (must match the bytes read) */
  UINT32 headerSizeInBytes; /**< size of this header in bytes (allows for dynamic extension ?) */
  SINT16 numberSegments; /**< number of following segments (contract responses) */
  UINT8  endianness; /**< endianness of FEC : 0 or 1 (little or big) -> all subsequent headers and data
  UINT8  encoding;   /**< character encoding: ascii, utf-8, uni-code ? -> requires byte swapping */
  char   fecName[USERNAME_SIZE]; /**< FEC name */
} RspHdr;
#define RSPHDR_SIZE 32
```

Release 5.0 Transport headers

- Handling legacy responses :

```
int prepIncomingResponseHdr(RspHdr *hdr, RspSpecs *spc, BYTE *stream, UINT32 totalSizeInBytes)
{
  UINT32 p = PeekDWord(*(UINT32 *)stream);
  if (p > DEFAULT_TRANSPORT_PROTOCOL_LEVEL)
  { /* indicative of legacy system (pre Release 5); 1st 2 bytes contain total size */
    p = PeekWord(*(UINT16 *)&stream[PHDR_PROT_OFFSET+2]) == 6 ? 6 : 5;
  }
  if (p < MINIMUM_REQHDR_PROTOCOL)
  { /* map to modern request header */
    ConTblEntry *c = NULL;
    int id = -1;
    UINT16 hsiz = 2;
    hdr->tineProtocol = p;

    if (totalSizeInBytes == 0)
    { /* normal (reassembly) case */
      totalSizeInBytes = (UINT32)PeekWord(*(UINT16 *)stream);
    }
    else
    { /* stream case (it's all in) */
      UINT32 msgsiz = PeekDWord(*(UINT32 *)stream);
      if (msgsiz > totalSizeInBytes) totalSizeInBytes = msgsiz;
      hsiz = 2; /* this is artifically still 2 ! */
    }
    hdr->totalSizeInBytes = totalSizeInBytes;
    hdr->endianness = BO_LITTLE_ENDIAN;
```

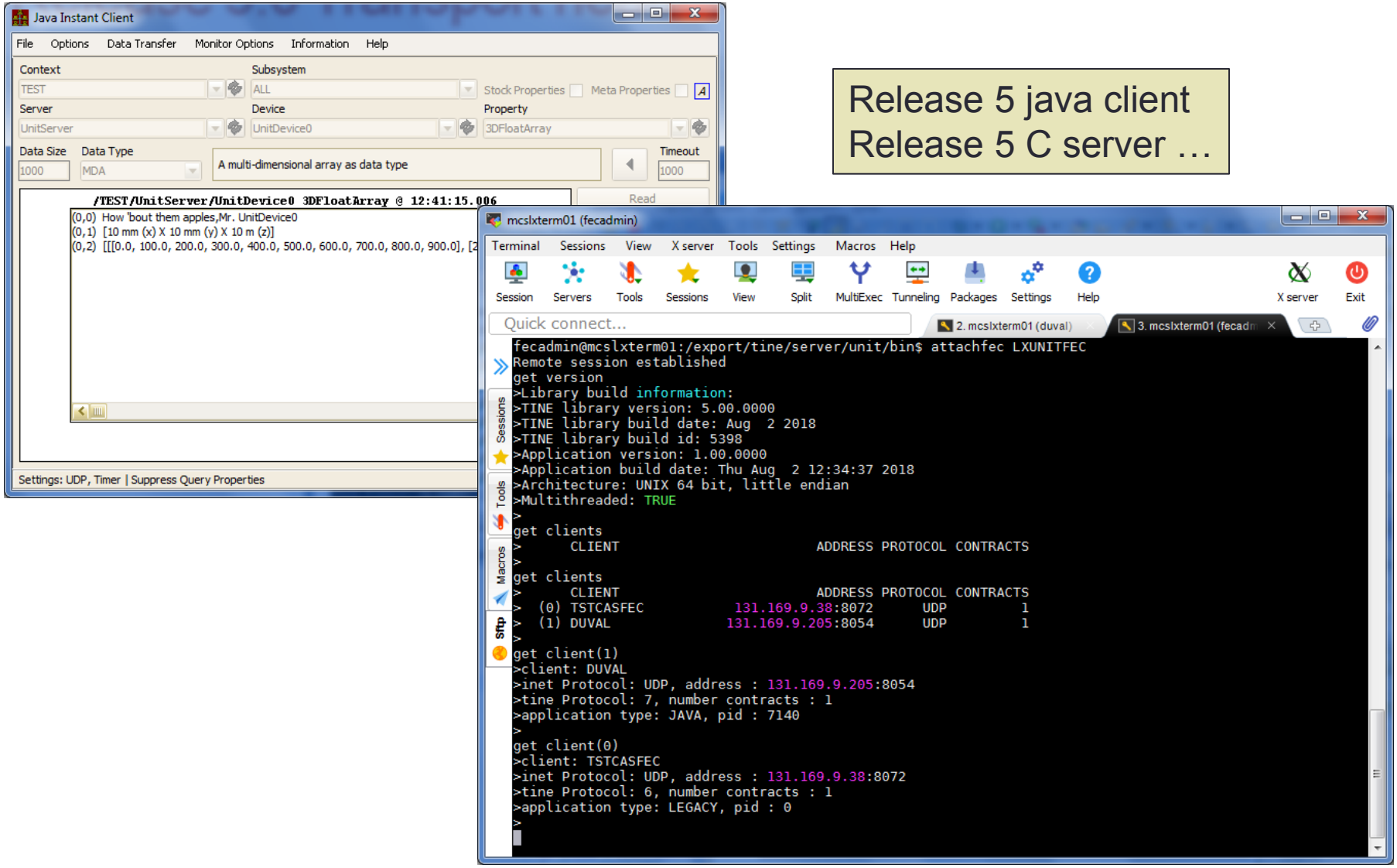
Release 5.0 Transport headers

- Subscription header(s) follow the Response header:

```
/**
 * \internal
 * \brief subscription response header struct (reply to client)
 *
 * modern : release 5.xx era
 * msgsize and mtu are now UINT32
 * separate fields for returned data size in bytes and size in elements
 * struct is passed over the net : tineProtocol 7 (out)
 */
typedef struct
{
  UINT32 msgSize;       /**< this message size in bytes */
  UINT16 subId;         /**< supplied by the consumer upon registration (con tbl id) */
  UINT16 retCode;       /**< return completion code from the eqm */
  UINT16 numblks;       /**< total number of message blocks */
  UINT16 blknum;        /**< block number of this message */
  UINT32 mtu;           /**< maximum transport unit */
  UINT16 dataFormat;    /**< format of contract data */
  UINT16 counter;       /**< subscription counter (how much is left) */
  UINT16 tineProtocol;  /**< tine protocol level */
  UINT16 xferReason;    /**< transfer reason flag (one of the CX_ codes above) */
  UINT32 starttime;     /**< supplied by the consumer upon registration (@ byte 20)*/
  UINT16 stssize;       /**< size of error/status string space */
  UINT16 stscode;       /**< access status code */
  UINT32 timestamp;     /**< data timestamp (UTC wraps in 2038) */
  UINT32 timestampUSec; /**< usec fraction of data timestamp */
  UINT32 userstamp;     /**< application setable data stamp */
  UINT32 sysstamp;      /**< systematic data stamp (wraps every 13 years @ 10 Hz continuous */
  UINT32 dataSize;      /**< size of contract data */
  UINT32 msgSizeInElements; /**< number of elements (of type format) returned in this message */
} SubRspHdr;
#define SUBRSPHDR_SIZE (9*4 + 10*2) /* 56 bytes */
```

sysstamp and userstamp still 32-bit integer and NOT 64-bit integer.

Release 5.0 Transport headers



Release 5 java client
Release 5 C server …

Release 5.0 Transport headers

- Java: same transport headers and compatibility must be present!

Release 5.0 Transport headers

- Other embellishments …
- C side:
  - Many macro #defines (which have been around since ‘the beginning’) have moved to enums
  - Many macros -> functions
    - Forget about being nice to MS-DOS !

```
/** \def Error Number Definitions */
enum Errors
{
  operation_success       = 0,  /**< successful completion */
  illegal_line            = 1,  /**< illegal line number */
  illegal_format          = 2,  /**< illegal format or data type */
  illegal_arithmetic      = 3,  /**< illegal arithmetic expression */
  ambiguous               = 4,  /**< ambigous input information */
  illegal_delimiter       = 5,  /**< illegal delimiter in expression */
  zero_divide             = 6,  /**< divide by zero */
  work_area_full          = 7,  /**< working area buffer is full */
  non_existent            = 8,  /**< requested target does not exist */
  invalid_transport       = 9,  /**< transport medium is not valid */
  data_size_mismatch      = 10, /**< incoming data payload larger than requested ? */

  no_data_in_range        = 11, /**< no data found in input range */
  un_allocated            = 12, /**< requested target is not allocated in the given cor
  no_such_line            = 13, /**< expected line not found in database */
  illegal_data_size       = 14, /**< give data size is illegal or not valid */
  io_error                = 15, /**< bus or network io error */
  illegal_context         = 16, /**< given context is illegal */
  runtime_error           = 17, /**< runtime error */
  system_error            = 18, /**< system internal error */
  hardware_busy           = 19, /**< hardware is busy */
  argument_list_error     = 20, /**< input argument or parameter is invalid (alias for
  invalid_parameter       = 20, /**< input argument or parameter is invalid */

  file_error              = 21, /**< file access error */
  use_stream_transport    = 22, /**< datagram message size exceeds the allowable mtu (r
```

Release 5.0 Transport headers

- C Side:
  - No more clashes with STL or MFC headers !
  - Works with or without namespace wrapper

```
namespace tine
{
   #include “tine.h”
}
```

Release 5.0 Transport headers

- C and Java:
  - New format types for strong typing:
    - CF_UINT16
    - CF_UINT32
    - CF_UINT64
  - Auto-grow the connection table by default.
  - Not yet making use of the endianness or encoding information.