



TINE Release 4.0 News

(March 5, 2010: That was the month that was !)

“What a long, strange trip it’s been”

From last time ...

TINE Kernel Release 4

- **Remaining planned feature:**
 - Histories of variable length types !
- ***To Consider:***
 - 'Double exclusive READ' ?
 - Property Registration with CA_XXREAD
 - READ requests follow same Access Control as WRITE requests
 - Device List calls (a la CDI style) ?
 - Property Registration with CA_ALLOWLIST
 - Can only apply to single valued properties
 - e.g. "Device1,Device2,Device5" loops over 3 calls and returns an array.
 - device-oriented hierarchy vs property-oriented hierarchy ...

[Exclusive Read]

- Use same security for READ calls as for WRITE calls for *selected* properties.
- Register a Property with CA_XREAD
 - CA_READ|CA_XREAD
 - Exclusive READ only when an *ACCESSLOCK* is in place
 - CA_XREAD
 - Exclusive READ always in force
 - Conditions given by users and nets security determine access
- Otherwise: everyone has READ access.

[Other New Features]

- Set/GetMinimumAllowedPollingInterval()
 - Server can fix the minimum polling interval for contracts.
 - Default = 10 msec (maximum = 1000 msec)
 - Applies to all managed equipment modules
 - Smaller requested intervals
 - Return code *'invalid_interval'*
 - Re-negotiated 'underneath the hood.'
 - Forced to use the 'minimum'

[Example :

- Server is scheduling data @ 6.25 Hz
 - e.g. [/DESY2/MagnetStrom-VEE/MAGNET\[AlleWFM\]](#)
- But Clients persist in requesting 10 Hz !
 - Causing unnecessary data access and transmission
- Server uses
 - `SetMinimumAllowedPollingInterval(1000)`
- Everyone is Happy!

A Server Takes control of its Clients ...

- Register Property with *CA_NETWORK*
 - Enforces (!) *CM_NETWORK* access (multicast)
- Make use of
 - *SetMinimumAllowedPollingInterval()*
- Enforce data sizes
 - Return '*dimension_error*' if not 'correct'.
- Force contracts for a property to collapse to one and the same contract!
- Provide the necessary data as efficiently as possible to as many as possible !

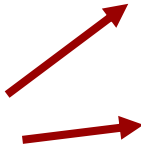
[Contract Identity (an important Aside)]

- Contracts are **equal** if :
 - Requested **Equipment Modules** are equal
 - Requested **Properties** are equal
 - Requested **Device Names** are equal
 - Requested **Data Access** is equal
 - Requested **Output Data Sets** are equal
 - **Sizes** are equal
 - **Tags** are equal
 - **Formats** are equal
 - Requested **Input Data Sets** are equal
 - **Sizes** are equal
 - **Tags** are equal
 - **Formats** are equal
 - **Input Data is equal !!!!!**

These are different :

Get Property "**VALUE**" for Device "**Device1**" for (input) **cycle = 3**

Get Property "**VALUE**" for Device "**Device1**" for (input) **cycle = 5**



[Feature-of-the-Month AWARD]

MSK

- For their persistent pursuit of controlling their clients !



[New Java Features]

- If Problems with Address Resolution
 - TLink cannot be properly instantiated
 - Exception message now contains entire resolution history :

```
int[] nbunches = new int[1];
TDataType nbdout = new TDataType(nbunches);
TLink nblink2 = new
    TLink("/PETRA/BunchServerGuy/Keyword", "NumberOfBunches", nbdout, null, TAccess.CA_READ);
nblink2.attach(TMode.CM_POLL, new TLinkTestCallback(), 1000);
```

```
class de.desy.tine.exceptions.UnresolvedAddressException
Could not resolve address for /PETRA/BunchServerGuy/Keyword
address unknown to ENS#0 at 131.169.120.41 : host not resolved
address unknown to ENS#1 at 131.169.120.46 : host not resolved
address not found in file cache C:\tine\cache\eqpdbase.csv
address not found in file cache C:\tine\servers\eqpdbase.csv
address is unresolved
```

[New Java Features]

■ Explicit Exceptions

- Some standard java exception (*IOException*, etc.) in TQuery class, etc.
- Only Exception from the TINE Kernel was a simple *RuntimeException* during TLink instantiation upon Address resolution failure.
- Now can throw the following (unchecked)
 - *UnresolvedAddressException*
 - *InvalidDataReferenceException*,
 - *BoundToInactiveLinkException*, and
 - *InputDataLockedException*
- These are 'unlikely' and if they occur, something is 'wrong' and should be fixed.
 - But you can always **catch** and try to recover.

[New Java Features]

- UnresolvedAddressException
 - replaces the simple RuntimeException thrown when a TLink constructor cannot instantiate itself correctly.

New Java Features

- InvalidDataReferenceException
 - replaces the linkStatus = TErrorList.invalid_reference
 - (TLink construction)
 - Seldom checked against
- Scenario:

```
float[] myOutputData = new float[10];
TDataType dout = new TDataType(myOutputData);
TLink lnk1 = new TLink("/TEST/SineServer/Sine1", "Amplitude", dout, null, TAccess.CA_READ);
TLink lnk2 = new TLink("/TEST/SineServer/Sine1", "Frequency", dout, null, TAccess.CA_READ);
```

```
class de.desy.tine.exceptions.InvalidDataReferenceException
/TEST/SineServer/Sine1[Frequency] is attempting to use data object from /TEST/SineServer/Sine1[Amplitude]
double xx=1;
```

New Java Features

- BoundToInactiveLinkException
 - replaces the linkStatus = TErrorList.link_exists returned from the TLink.execute()
- Scenario:

```
float[] myFirstInputData = new float[1];
float[] mySecondInputData = new float[1];
TDataType din1 = new TDataType(myFirstInputData); // input data object
TDataType din2 = new TDataType(mySecondInputData); // input data object
// contents of 'someUnitializedData' and 'someOtherUnitializedData' are identical
TLink lnk1 = new TLink("/TEST/SineServer/Sine1", "Amplitude", null, din1, TAccess.CA_WRITE);
TLink lnk2 = new TLink("/TEST/SineServer/Sine1", "Amplitude", null, din2, TAccess.CA_WRITE);

lnk2.execute();
```

```
class de.desy.tine.exceptions.BoundToInactiveLinkException
attempt to execute synchronous bound link before parent is active
```

New Java Features

- InputDataLockedException
 - replaces the return code 'TErrorList.not_allowed'
 - returned from calls to TDataType.putData(...).
- Scenario:

```
int[] myInputData = new int[2];
myInputData[1] = (int) (System.currentTimeMillis()/1000);
myInputData[0] = myInputData[1] - 3600;
TDataType din = new TDataType(myInputData); // input data object
float[] myOutputData = new float[10];
TDataType dout = new TDataType(myOutputData);
TLink lnk = new TLink("/TEST/SineServer/Sine1", "Amplitude.HIST", dout, din, TAccess.CA_READ
);

lnk.attach(TMode.CM_POLL, instance, 1000); // starts the link -> the input data are now 'loc

myInputData[0] = myInputData[1] - 7200;
din.putData(myInputData);
```

```
class de.desy.tine.exceptions.InputDataLockedException
attempt to change locked input data set has been rejected
```

[Java Bug Fixes]

- mini-Deadlock concerning address resolution (resulting in connection timeouts to ENS) fixed
 - Many MCA single element links initiated at startup
 - Hand-shaking resulted in synchronization problem

Ante-Linac Chopper

Ante Linac Chopper

Datei Optionen Hilfe

Betriebszustand

Prepuls
Ein

Hochspannung
Ein

Gitter
Ein

Heizung
Ein

Lüfter
Ein

Tine Status Viewer

Links Messages Exceptions

1267729793196 0 attach link (10) /LINAC2/Chop.Par/HV1[CurrentTarget] : poll
 1267729793196 140 add /LINAC2/Chop.Par/HV1[CurrentAdjustmentActual] to McaLink /LINAC2/Chop.Par/#0[CurrentAdjustmentActual]
 1267729793196 0 attach link (40) /LINAC2/Chop.Par/HV1[CurrentActual] : poll
 1267729793196 140 add /LINAC2/Chop.Par/HV2[CurrentAdjustmentActual] to McaLink /LINAC2/Chop.Par/#0[CurrentAdjustmentActual]
 1267729793196 140 add /LINAC2/Chop.Par/T1G2[CurrentAdjustmentActual] to McaLink /LINAC2/Chop.Par/#0[CurrentAdjustmentActual]
 1267729793196 0 remove /LINAC2/Chop.Par/HV1[CurrentMaximum] from group
 1267729793196 140 add /LINAC2/Chop.Par/T1G1[CurrentAdjustmentActual] to McaLink /LINAC2/Chop.Par/#0[CurrentAdjustmentActual]
 1267729793196 0 remove /LINAC2/Chop.Par/HV1[CurrentMinimum] from group

Tine Status Viewer

Links Messages Exceptions

Time	Success	Link
Thu Mar 04 20:12:19 CET 2010	success	/LINAC2/Chop.Par/#0/CurrentAdjustmentActual
Thu Mar 04 20:12:19 CET 2010	success	/LINAC2/Chop.Par/#0/VoltageAdjustmentActual
Thu Mar 04 20:12:19 CET 2010	success	/LINAC2/Chop.Par/#0/CurrentTarget
Thu Mar 04 20:12:19 CET 2010	success	/LINAC2/Chop.Par/#0/VoltageTarget
Thu Mar 04 20:12:18 CET 2010	success	/LINAC2/ChopperTraces/Timing/Trace
Thu Mar 04 20:12:15 CET 2010	success	/LINAC2/ChopperTraces/Timing/Trace.REF
Thu Mar 04 20:11:58 CET 2010	success	/LINAC2/Chop.Par/#0/NALARMS
Thu Mar 04 20:12:19 CET 2010	success	/LINAC2/Chop.Power/#0/State
Thu Mar 04 20:12:19 CET 2010	success	/LINAC2/Chop.Par/#0/CurrentActualDisplay
Thu Mar 04 20:12:19 CET 2010	success	/LINAC2/Chop.Par/#0/VoltageActualDisplay
Thu Mar 04 20:12:18 CET 2010	success	/LINAC2/ChopperTiming/GEMEINSAM/Time
Thu Mar 04 20:12:18 CET 2010	success	/LINAC2/ChopperTiming/PULSBREITE/Time
Thu Mar 04 20:12:19 CET 2010	success	/LINAC2/Chop.FanAnCo/#0/ActualDisplay
Thu Mar 04 20:12:18 CET 2010	success	/LINAC2/Chop.Par/#0/CurrentActual
Thu Mar 04 20:12:18 CET 2010	success	/LINAC2/Chop.Par/#0/VoltageActual
Thu Mar 04 20:12:18 CET 2010	success	/LINAC2/ChopperTraces/Timing/ErrorString

Close Clear Refresh Debug Debug level: 1 2 History

Chop.Par/#0[CurrentAdjustmentActual]
 Chop.Par/#0[CurrentAdjustmentActual]
 p.Par/#0[CurrentAdjustmentActual]
 Chop.Par/#0[VoltageAdjustmentActual]
 Chop.Par/#0[VoltageAdjustmentActual]
 status:
 veranwahl [Default] (5)KeinIniDatei

[Other Bug Fixes]

- Re-establishing 'lost' TCP link to a server when server goes down.
- CF_AIMAGE (adjustable IMAGE) now works in IMAGE arrays and within tagged structures.

Weirdness of the Month

■ Win32: FormatMessage()

Back Forward Stop Refresh Home Print

value as a pointer to a null-terminated string.

By default, the *Arguments* parameter is of type **va_list***, which is a language- and implementation-specific data type for describing a variable number of arguments. If you do not have a pointer of type **va_list***, then specify the **FORMAT_MESSAGE_ARGUMENT_ARRAY** flag and pass a pointer to an array of values; those values are input to the message formatted as the insert values. Each insert must have a corresponding element in the array.

Windows 95: No single insertion string may exceed 1023 characters in length.

Return Values

If the function succeeds, the return value is the number of **TCHARs** stored in the output buffer, excluding the terminating null character.

If the function fails, the return value is zero. To get extended error information, call [GetLastError](#).

Remarks

The **FormatMessage** function can be used to obtain error message strings for the system error codes returned by **GetLastError**, as shown in the following sample code.

```
LPVOID lpMsgBuf;
FormatMessage(
    FORMAT_MESSAGE_ALLOCATE_BUFFER |
    FORMAT_MESSAGE_FROM_SYSTEM |
    FORMAT_MESSAGE_IGNORE_INSERTS,
    NULL,
    GetLastError(),
    MAKELANGID(LANG_NEUTRAL, SUBLANG_DEFAULT), // Default language
    (LPTSTR) &lpMsgBuf,
    0,
    NULL
);
// Process any inserts in lpMsgBuf.
// ...
// Display the string.
MessageBox( NULL, (LPCTSTR)lpMsgBuf, "Error", MB_OK | MB_ICONINFORMATION );
// Free the buffer.
LocalFree( lpMsgBuf );
```

Within the message text, several escape sequences are supported for dynamically formatting the message. These escape sequences and their meanings are shown in the following table. All escape sequences start with the percent character (%).

Weirdness of the

The image shows a Windows Control Panel window with the 'Regional and Language Options' link selected in the left-hand navigation pane. The main content area displays a list of system settings with their respective comments. Overlaid on the right side of the Control Panel is a dialog box titled 'Regional and Language Options'. The dialog box has three tabs: 'Regional Options', 'Languages', and 'Advanced'. The 'Languages' tab is active, showing options for text services and supplemental language support. The 'Language used in menus and dialogs' dropdown menu is set to 'English'.

Name	Comments
Java	Java(TM) Control Pa
Keyboard	Customize your keyb
Mail	Microsoft Outlook Pr
Mouse	Customize your mou
Network Connections	Connects to other c
NVIDIA nView Desktop Manager	Configure your NVID
Phone and Modem Options	Configure your telep
Power Options	Configure energy-sa
Printers and Faxes	Shows installed print
Regional and Language Options	Customize settings f
Scanners and Cameras	Add, remove, and c
Scheduled Tasks	Schedule computer t
Security Center	View your current se
Sounds and Audio Devices	Change the sound s
Speech	Change settings for text-to-speech and for speech recognition (if installed).
System	See information about your computer system, and change settings for hardware,...
Taskbar and Start Menu	Customize the Start Menu and the taskbar, such as the types of items to be displ...
User Accounts	Change user account settings and passwords for people who share this computer.
Windows Firewall	Configure the Windows Firewall
Wireless Network Setup Wizard	Set up or add to a wireless network for your home or office

Regional and Language Options

Regional Options Languages Advanced

Text services and input languages
To view or change the languages and methods you can use to enter text, click Details.

Details...

Supplemental language support
Most languages are installed by default. To install additional languages, select the appropriate check box below.

Install files for complex script and right-to-left languages (including Thai)

Install files for East Asian languages

Language used in menus and dialogs

English
English
Deutsch

OK Cancel Apply

Weirdness of the Month

- Hangs/Crashes on Winsock error output !

```
void soperror(const char *txt)
{
# if defined(WIN32)
LPVOID lpMsgBuf;
DWORD lastErr = GetLastError();
# if (FormatMessage(
    FORMAT_MESSAGE_ALLOCATE_BUFFER | FORMAT_MESSAGE_FROM_SYSTEM | FORMAT_MESSAGE_IGNORE_INSERTS,
    NULL, lastErr,
    MAKELANGID(LANG_ENGLISH, SUBLANG_ENGLISH_US),
    (LPTSTR) &lpMsgBuf, 0, NULL) > 0)
    {
        dbglog("%s : %s", txt, lpMsgBuf);
    }
# else
    {
        dbglog("%s : winsock error %d", txt, lastErr);
    }
LocalFree( lpMsgBuf );
# elif defined(UNIX)
    dbglog("%s : %s", txt, strerror(errno));
# else
    perror(txt); printf(">");
# endif
}
...
```

Work-Around solution

[Weirddness-of-the-Month AWARD]

MHF

- For their dogged determination to get to the bottom of this !

