



TINE Release 4.0 News


(June 13, 2008: That was the week that was !)

“What a long, strange trip it’s been”

TINE Kernel 4.0.2 !

■ New Globals Header

- Globals Keyword now **64 chars** (was 16)
- timestamp now includes **milliseconds**
- **status**
- **data stamp, system stamp**
 - (not used at present)
- size, format as before



LINAC2 Globals	
keyword	value
BeamPermText	Nicht vorhanden
MachineStateText	Aus.Wartung
MachineTypeText	LINAC2
ParticleTypeText	Elektronen
MessageText	Die Globals sind z.Zt. stat...
BeamPerm	2.0
MachineState	401.0
MachineType	1.0
ParticleType	1.0
Energy	0.0
NumParticles.L2	0.0
NumParticles.PIA	0
Globals Time	12.06.08 23:30:59.471 CEST

■ New stock property “SRVGLOBALS”

- Servers other than a “GLOBALS” server usually won’t be sending globals; but if they do ...
- allow FEC_GCAST_ADDR env. variable to set GCAST address (to that of the “GLOBALS” server).

[TINE Kernel 4.0.2]

- Introduce access bit CA_REPEAT
 - Used when the equipment module handler returns 'not_ready'
 - CA_FIRST removed anyway
 - CA_LAST removed and does not reappear unless the (polling) call is cancelled explicitly.

Brief Digression: ACCESS bits

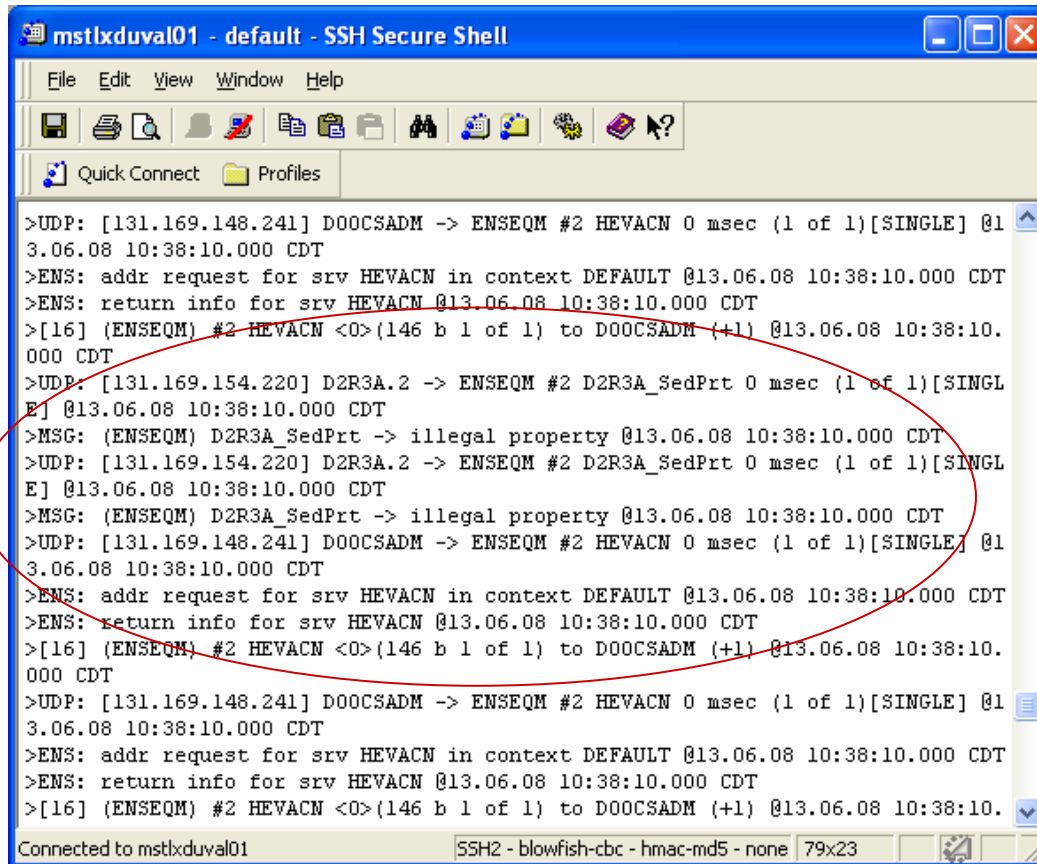
- Seen at both Client and Server:
 - CA_READ
 - CA_WRITE
- Set and seen at the server equipment module only
 - CA_FIRST (coming into scope)
 - CA_LAST (going out of scope)
 - CA_REPEAT (repeat of a 'not_ready' call)
 - CA_ALARM (call is coming from the local alarm server)
 - CA_HIST (call is coming from the local history server)
 - CA_QUERY (call is coming from a stock property)
 - CA_LOCKED (caller has an ACCESS Lock)
- Set and seen at the client only
 - CA_RETRY (retry 2 time before signalling link_not_open)
 - CA_CONNECT (synchronous call should use TCP/IP)
 - CA_MUTABLE (synchronous call can change the output data object parameters)
 - CA_SYNCNOTIFY (do NOT defer the event callback)
 - CA_SYNC (used in the 'listener' API : i.e. LabView)
- Used at the Server in scheduling a property (defines the scope for signaling an event)
 - CA_NETWORK
 - CA_ALARM
 - CA_HIST

[TINE Kernel 4.0.2]

- Link Table “black list”
 - Client Side Table
 - Calls that return certain errors will place the link in the local black list.
 - address_unknown
 - non_existent, non_existent_elem, non_existent_fec
 - illegal_property
 - No effect on client code, but ...
 - e.g. Server restarts and now the ‘property’ is ‘legal’ -> either restart the client or flush the address list.
 - Servers and Services are much happier !

What will be 'black-listed':

Calls to the ENS for Servers that do NOT exist !



```
mstlxduval01 - default - SSH Secure Shell
File Edit View Window Help
Quick Connect Profiles
>UDP: [131.169.148.241] DOOCSADM -> ENSEQM #2 HEVACN 0 msec (1 of 1)[SINGLE] @13.06.08 10:38:10.000 CDT
>ENS: addr request for srv HEVACN in context DEFAULT @13.06.08 10:38:10.000 CDT
>ENS: return info for srv HEVACN @13.06.08 10:38:10.000 CDT
>[16] (ENSEQM) #2 HEVACN <0>(146 b 1 of 1) to DOOCSADM (+1) @13.06.08 10:38:10.000 CDT
>UDP: [131.169.154.220] D2R3A.2 -> ENSEQM #2 D2R3A_SedPrt 0 msec (1 of 1)[SINGLE] @13.06.08 10:38:10.000 CDT
>MSG: (ENSEQM) D2R3A_SedPrt -> illegal property @13.06.08 10:38:10.000 CDT
>UDP: [131.169.154.220] D2R3A.2 -> ENSEQM #2 D2R3A_SedPrt 0 msec (1 of 1)[SINGLE] @13.06.08 10:38:10.000 CDT
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Connected to mstlxduval01 SSH2 - blowfish-cbc - hmac-md5 - none 79x23
```

What will be 'black-listed':

```
mstlxduval01 - default - SSH Secure Shell
File Edit View Window Help
Quick Connect Profiles
>UDP: [131.169.216.127] MAYS -> G00018 linac2AbrkIntrlk ready 1000 msec (1 of 1)[POLL] @13.06.08 10:41:25.000 CDT
>MSG: (G00018) ready -> illegal property @13.06.08 10:41:25.000 CDT
>UDP: [131.169.216.127] MAYS -> G00018 strlwAbrkIntrlk isConfirmRequired 1000 msec (1 of 1)[POLL] @13.06.08 10:41:25.000 CDT
>MSG: (G00018) isConfirmRequired -> illegal property @13.06.08 10:41:25.000 CDT
>UDP: [131.169.216.127] MAYS -> G00018 mtraumAbrkIntrlk confirmQuestionDe 1000 msec (1 of 1)[POLL] @13.06.08 10:41:25.000 CDT
>MSG: (G00018) confirmQuestionDe -> illegal property @13.06.08 10:41:25.000 CDT
>UDP: [131.169.216.127] MAYS -> G00018 mtraumAbrkIntrlk labelDe 1000 msec (1 of 1)[POLL] @13.06.08 10:41:25.000 CDT
>MSG: (G00018) labelDe -> illegal property @13.06.08 10:41:25.000 CDT
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Connected to mstlxduval01 SSH2 - blowfish-cbc - hmac-md5 - none 79x23
```

**Calls to the GENS for group member that do NOT exist.
(please note the timestamps)**

[TINE Kernel 4.0.2]

- don't check for redirection for stock property "DEVICES"
 - DOOCS calls with device name = "*" and property = "DEVICES"
 - allow latching of export name + context in csv read of fecid.csv.
 - 2 server processes use the same fecid.csv
 - Have identical exported device server names
 - But have different contexts.
 - protect against file names containing a "CON.", "PRN." or "AUX.".ul> - fopen() returns a file pointer, but reads/writes wait indefinitely!
- CSV parser:
 - treat an empty entry in a column the same as if the column is not present.

[Recent Bug fixes]

- Several alarms query bugs fixed.
- Solaris 2.6 bug with `NO_MUTEX_TIMEDLOCK` #defined.
- Server-side mutex protection for local windows clients.
- Exotic client-side bug regarding a 'magic' data size returning data with status.

[Bug Feature: Multiple identical links]

- Same contract active more than once:
 - e.g. `AttachLink("ABC","XYZ",dout,din,...)` is active and the same application calls `ExecLink("ABC","XYZ",dout,din,...)`
- There is only ever ONE line of communication for a contract, client-server.
- In the old days: 2nd link receive error code 'link_exists'.
- The 1st Link in the link table is designated the "Parent" link.
- All other links are "Dependent" links.
- In the above example, the `ExecLink()` returns immediately with the most recent contents of the output data buffer!

[Multiple identical links]

- In the C library, there is no “Link” object.
 - Order of procedural calls `AttachLink()`, `ExecLink()` is unimportant.
- In the Java library, there is a “Link” object.
 - First Link object in the link table is the parent, BUT ...
 - If there is/was no activity on the Link, then there is no data to forward to dependent links!

Multiple identical links: Java

```
TLink lnk1 = new TLink("ABC","XYZ",dout,din,...);  
TLink lnk2 = new TLink("ABC","XYZ",dout,din,...);  
lnk2.execute(); // does not succeed ! (link_exists)
```

```
TLink lnk1 = new TLink("ABC","XYZ",dout,din,...);  
lnk1.execute(); // or lnk1.attach();  
TLink lnk2 = new TLink("ABC","XYZ",dout,din,...);  
lnk2.execute(); // now it's okay !
```

Central Services: ENS

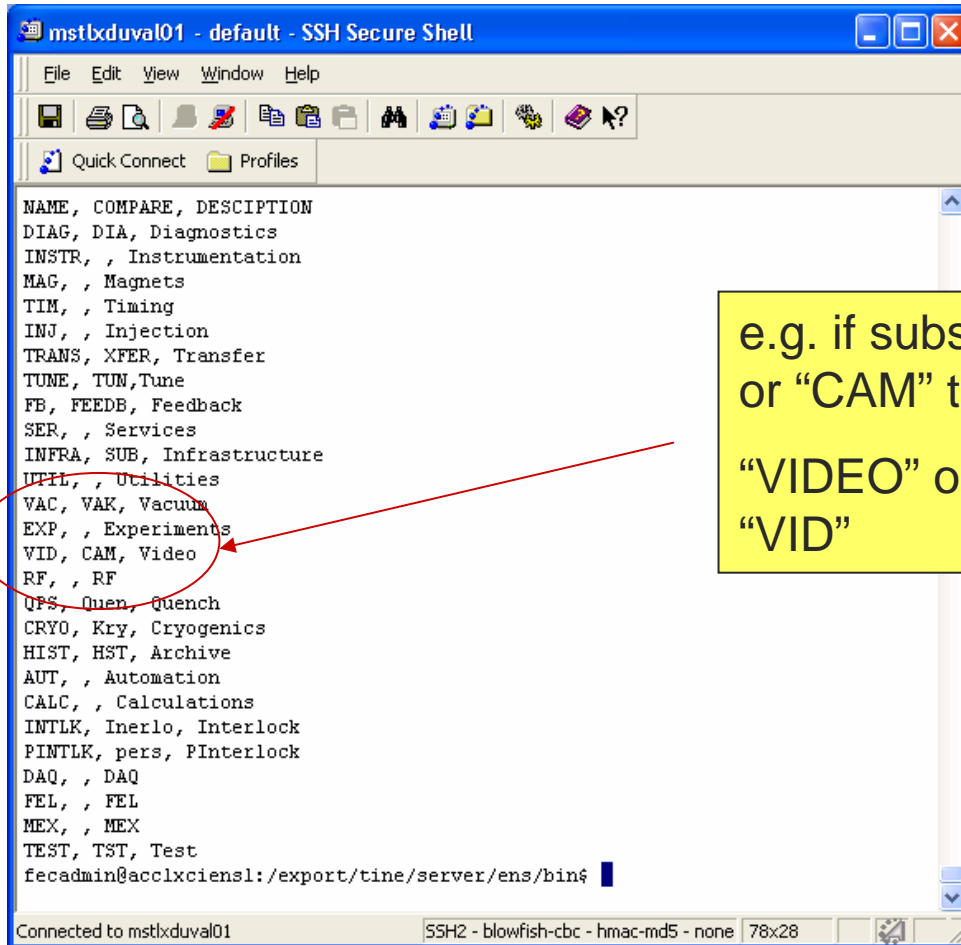
ENS: allow an “official” list of allowed subsystems (subsystems.csv)

The screenshot shows the 'FEC Remote Control' application window. The main area displays a grid of subsystems with columns for various identifiers. Below the grid, there is a 'Selected Facility' dropdown set to 'LINAC2' and a 'Ping All' button. The 'Selected Subsystems' section contains a list of checkboxes for various subsystems, with 'maass's Sequence' and 'Trigger module Li' circled in red. The right-hand side of the window shows detailed information for the selected subsystem, including 'Front End', 'OS', 'Address', 'Host Computer', 'Responsible', 'EQP Modules', and 'Description'. The 'Description' field contains 'Post Linac Chopper Scope'. At the bottom, there are options for 'OS Color Code' and 'Select Importance Level'.

ACCXPTTFOTDR.1	ACCXPL2R5B	CHOPPER	CHOPPER.CDI
D2HSTSRV	D2PMARCH	GENS	IECOOL.4
IECOOL.8	IELMINT.4	IELTEMP.2	L2.MODUL
L2ALMSTATE	L2CASFEC	L2CORMAG	L2CORMAG1
L2FECSTATS	L2FECSTATSRV	L2GLOBSRV	L2HSTSRV
L2KICKPIA.1	L2KICKPIA.1.100	L2MAGNETS	L2MARCH
L2MODCHARGE.1	L2MODPULSE.1	L2MODPULSE.1.100	L2R1C.1
L2R1E.2	L2R1E.3	L2R2C.8	L2STATSRV
L2STEER	L2TRC.1	L2TRIM1	L2LWEGI.1
L2LWEGI.1.100	LTG-SRV1	MSTXPHINSC1.4	MSTXPPOL2.2
MSTXPPOL2.4	MSTXPPOL2.5	PIAIAC.2	PIAIDC.1
PIAIDC.1.100	PIASCOPE.2	RF.ATTENUATOR	RF.MODULATOR
RF.MULTIPLEXER	RF.PULSECHAR.100	RF.PULSECHARGE	RF.PULSEMOD.100
RF.PULSEMOD.1	RF.PULSERF.1	RF.PULSERF.1.100	RF.PHASE
RF.SLED	RF.VARIOUS	RF104-PIA	RF125-PIA
TRIM_SEDAC_L2	TARGET.3	ACCLXPILINAC2	CHOPSRV
PILO_LINAC2			

Probably: miss-aligned columns in fecid.csv ?

Central Services: ENS

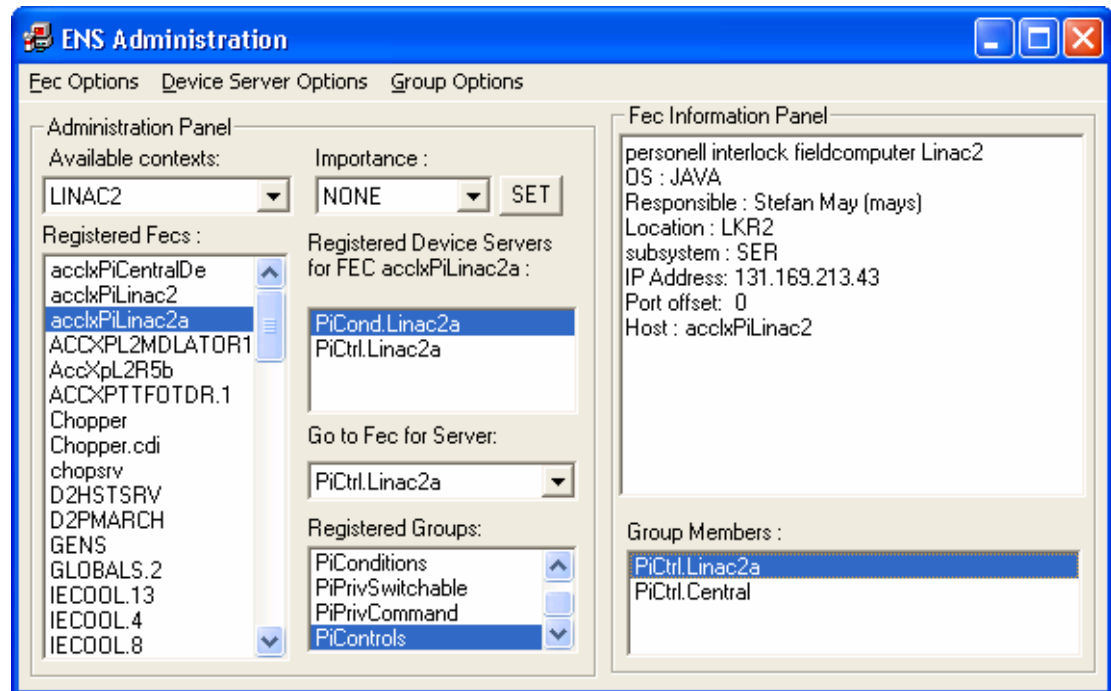


```
mstlxduval01 - default - SSH Secure Shell
File Edit View Window Help
Quick Connect Profiles
NAME, COMPARE, DESCRIPTION
DIAG, DIA, Diagnostics
INSTR, , Instrumentation
MAG, , Magnets
TIM, , Timing
INJ, , Injection
TRANS, XFER, Transfer
TUNE, TUN, Tune
FB, FEEDB, Feedback
SER, , Services
INFRA, SUB, Infrastructure
UTIL, , Utilities
VAC, VAK, Vacuum
EXP, , Experiments
VID, CAM, Video
RF, , RF
QPS, Quen, Quench
CRYO, Kry, Cryogenics
HIST, HST, Archive
AUT, , Automation
CALC, , Calculations
INTLK, Inerlo, Interlock
PINTLK, pers, PInterlock
DAQ, , DAQ
FEL, , FEL
MEX, , MEX
TEST, TST, Test
fecadmin@acclxcien1:/export/tine/server/ens/bin$
```

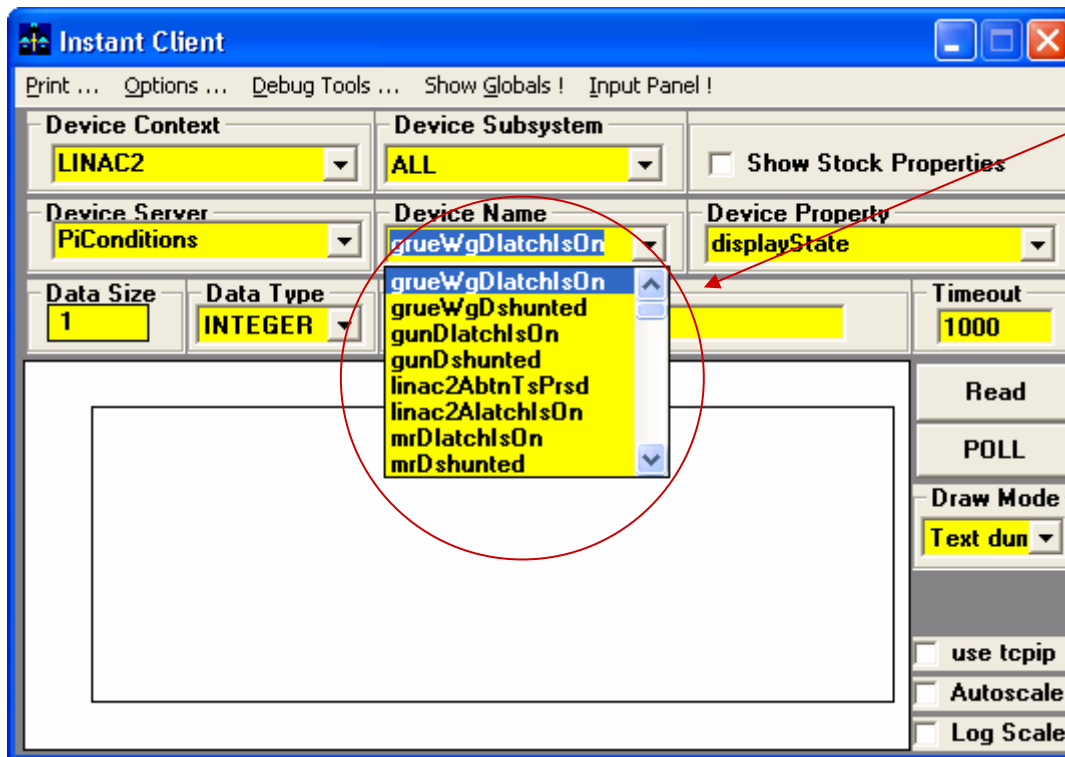
e.g. if subsystem begins with “VID” or “CAM” then it’s subsystem “VID”
“VIDEO” or “CAMERA” both land in “VID”

Central Services : GENS

- Now does not assume the device list for a 'member' is known when the member server reboots.
- GENS information now in the (windows) FEC admin tool:



Central Services : GENS



Devices all live on constituent member servers!

Problem:

Some client asks for property "displayState" from a device "abc" that isn't in the list.

There is no redirection information for "abc" so the call fails at the GENS with 'illegal_property'.

Central Service: Archive

- Hard-coded filters only include the likes of
 - NEVER
 - ONCE
 - ALWAYS
 - FAST
 - SLOW
 - etc.
- The Machine Archive Server now takes its filter set from a configuration file (which defines how to determine validity).
 - BEAM
 - RUNNING
 - LUMI
 - SASE
 - etc.

e.g. ->

	A	B	C	D	E	F
1	FILTER	KEYWORD	Format	MIN_VALID	MAX_VALID	
2	BEAM	ChargeBunch	float	0.1	1.00E+10	
3	RUNNING	Energy	float	0.1	1.00E+10	
4	RUNNUM	RunNumber	int32	1	1.00E+10	
5	RAMP	Status	NAME16	Ramp*	Ramp*	
6	SASE	Status	NAME16	Sase*	Sase*	
7	INJECTION	Status	NAME16	Injection*	Injection*	
8						
9						