

CEDES

Cost Efficient Dependable Electronic Systems

Examensarbeten med GAST inom CEDES.

Genomförda och pågående

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Översikt

Pettersson/ Uvesten	A distributed FlexRay-based research platform	2005-09-09 2006-03-31
Fernström/ Ungerdahl	TTCAN Reference Application An investigation of time-triggered network performance	2006-01-25 2006-06-20
Källvik/ Eriksson	Microprocessor control of a permanent-magnet motor with fault-detection, suited for an electromechanical brake system	2005-11-23 2006-06-20
Bengtsson	Implementation of Flexray and GAST G1	2005-09-16 2006-09-26
Archer/ Sjöblom	Membership implementations on time triggered architectures	2006-02-03 2006-08-18
Nilsson/ Hammarström	Generating C-code from Simulink models	2006-02-03 2006-10-06
Bergström/ Högberg	Implementation of Membership algorithms in GASTcluster with FlexRay	2006-09-04 2007-03-20

Översikt, fortsättning

Bjöörn	On mapping the J1939 message set to Flexray – elaboration on performance and feasibility in a GAST cluster	2006-12-11 2007-04-20
Harrysson/ Lindgren	An evaluation of FlexRay and its impact on the network design process at Volvo Cars by development of a CAN/FlexRay-gateway	2006-09-22 2007-04-10
Svenningsson/ Chandry	Communication of diagnostics on Flexray in a GAST-cluster	2006-12-11
Pettersson/ Wikner	Experimental system: CEDES - Brake-by wire	2007-02-06
Moro/ Kuisma	Experimental system: CEDES – Environmental simulator	2007-06-04

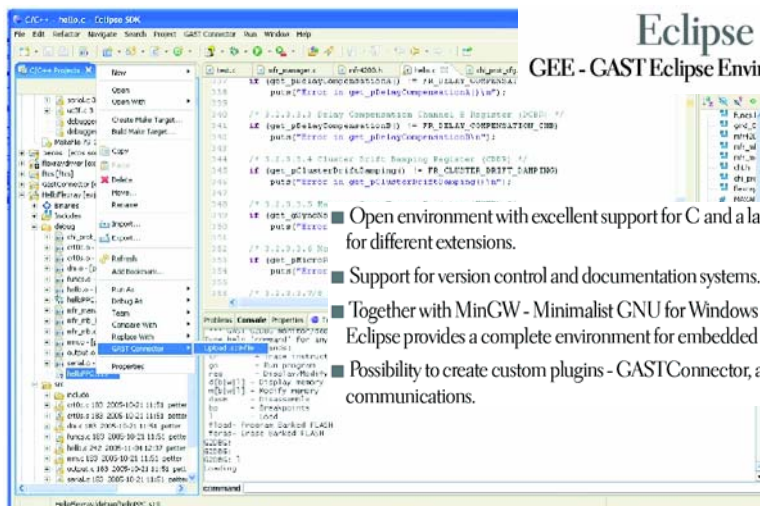
Galleri...



Axlock av resultat...

- Pettersson/Uvesten:
 - Komplet utvecklingsmiljö GAST G2/Flexray
 - Drivrutiner GAST G2/Flexray
 - Demonstrator, Enkelt distribuerat RTOS med Flexraykommunikation

Pettersson/Uvesten: Utvecklingsmiljöer för G1 och G2



Eclipse
GEE - GAST Eclipse Environment

- Open environment with excellent support for C and a large number of plugins for different extensions.
- Support for version control and documentation systems.
- Together with MinGW - Minimalist GNU for Windows and GNU compilers Eclipse provides a complete environment for embedded development.
- Possibility to create custom plugins - GASTConnector, a plugin for serial communications.

■ Fernström/Ungerdahl:

- TT schemalaggnings påverkan på bandbreddsutnyttjandet

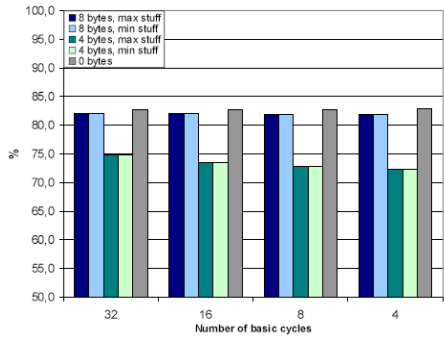


Figure 6.10. Minimal bus loads for the sparse TT/ET schedules.

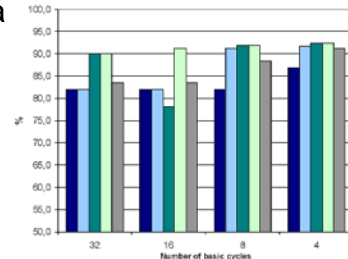


Figure 6.12. Minimal bus loads for the ET schedules.

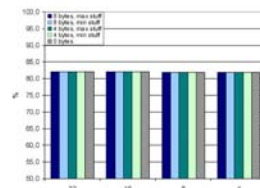
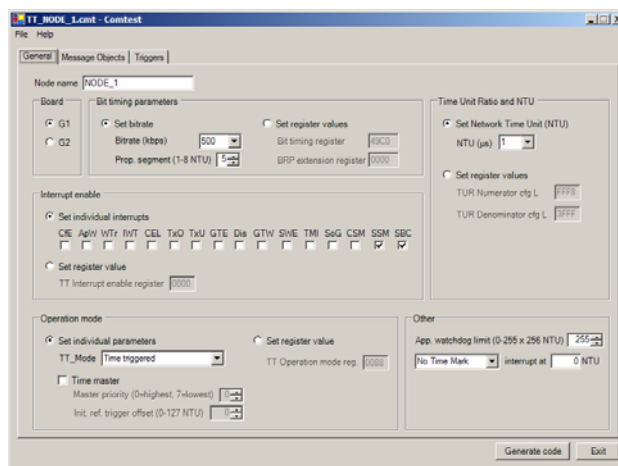


Figure 6.9. Minimal bus loads for the TT schedules.

■ Fernström/Ungerdahl:
- Konfigureringsverktyg för TTCAN



Msg. ID	Type	Priority	Cycle code	Count	Time mark	Msg. ID	Type	Priority	Cycle code	Count	Time mark
0:0	Tx_Sync	255	A	2	1000	16:0	Rx_Sync	255	A	2	1000
0:1	Rx	255	A	2	1000	17:0	Rx	255	A	2	1000
1:0	Tx_Sync	255	B	2	1000	18:0	Rx_Sync	255	B	2	1000
1:1	Rx	255	B	2	1000	19:0	Rx	255	B	2	1000
2:0	Tx_Sync	255	C	2	1000	20:0	Rx_Sync	255	C	2	1000
2:1	Rx	255	C	2	1000	21:0	Rx	255	C	2	1000
3:0	Tx_Sync	255	D	2	1000	22:0	Rx_Sync	255	D	2	1000
3:1	Rx	255	D	2	1000	23:0	Rx	255	D	2	1000
4:0	Tx_Sync	255	E	2	1000	24:0	Rx_Sync	255	E	2	1000
4:1	Rx	255	E	2	1000	25:0	Rx	255	E	2	1000
5:0	Tx_Sync	255	F	2	1000	26:0	Rx_Sync	255	F	2	1000
5:1	Rx	255	F	2	1000	27:0	Rx	255	F	2	1000
6:0	Tx_Sync	255	G	2	1000	28:0	Rx_Sync	255	G	2	1000
6:1	Rx	255	G	2	1000	29:0	Rx	255	G	2	1000
7:0	Tx_Sync	255	H	2	1000	30:0	Rx_Sync	255	H	2	1000
7:1	Rx	255	H	2	1000	31:0	Rx	255	H	2	1000
8:0	Tx_Sync	255	I	2	1000	32:0	Rx_Sync	255	I	2	1000
8:1	Rx	255	I	2	1000						

Msg. ID	Type	Priority	Msg. ID	Type	Priority
1:0	Tx_Sync	255	17:0	Rx_Sync	255
1:1	Rx	255	18:0	Rx	255
2:0	Tx_Sync	255	19:0	Rx_Sync	255
2:1	Rx	255	20:0	Rx	255
3:0	Tx_Sync	255	21:0	Rx_Sync	255
3:1	Rx	255	22:0	Rx	255
4:0	Tx_Sync	255	23:0	Rx_Sync	255
4:1	Rx	255	24:0	Rx	255
5:0	Tx_Sync	255	25:0	Rx_Sync	255
5:1	Rx	255	26:0	Rx	255
6:0	Tx_Sync	255	27:0	Rx_Sync	255
6:1	Rx	255	28:0	Rx	255
7:0	Tx_Sync	255	29:0	Rx_Sync	255
7:1	Rx	255	30:0	Rx	255
8:0	Tx_Sync	255	31:0	Rx_Sync	255
8:1	Rx	255	32:0	Rx	255

■ Archer/Sjöblom
 – “Membership” och TTCAN

bit number in vector (represented by a unsigned short)
 message identifier number
 local membership matrices [binary]
 Membership vectors
 binary MS vector representation
 decimal MS vector representation
 hexadecimal MS vector representation
 actual global membership (for comparison)
 calculated global membership for a specific node [hex]

node 1's MS matrix
 node 2's MS matrix
 node 3's MS matrix
 node 4's MS matrix
 node 5's MS matrix

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■ Bergström/Högberg
 – “Membership” och Flexray

```

    graph LR
      Start(( )) --> WaitNewCycle[Wait for new cycle]
      WaitNewCycle --> SendStatic[Send static message]
      SendStatic --> WaitStatic[Wait for static messages]
      WaitStatic --> WaitMembership[Wait for WAITING_FOR_MEMBERSHIP message]
      WaitMembership --> SendStatic
      WaitMembership --> End(( ))
    
```

The result of this thesis are going to be delivered to members of the GAST project and the CEDES project. The package available for delivery is the following:

- A functioning Host Application used to run and perform automated testing in a GAST cluster.
- A GAST cluster Node Application, containing a membership algorithm implementation. The Node Application utilizes the FlexRay Light drivers and the ODEEP FlexRay Configurator developed by earlier thesis workers. Many aspects of the Node Application are fully functioning. As described in the “Problems” section, however, one major problem related to the timing of FlexRay messages has not been resolved.

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Examensarbeten med GAST inom CEDES.

Spännande fortsättning följer...