



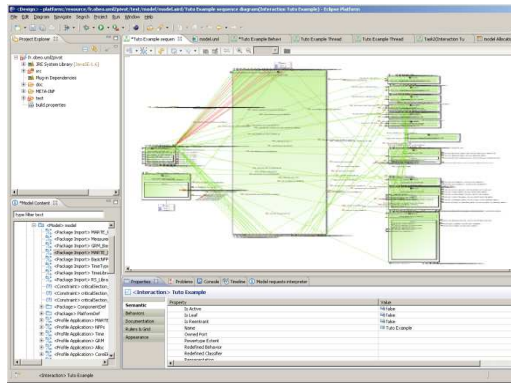
TEMPO: Integrating Scheduling Analysis in Industrial Design Practices

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Thales Research & Technology

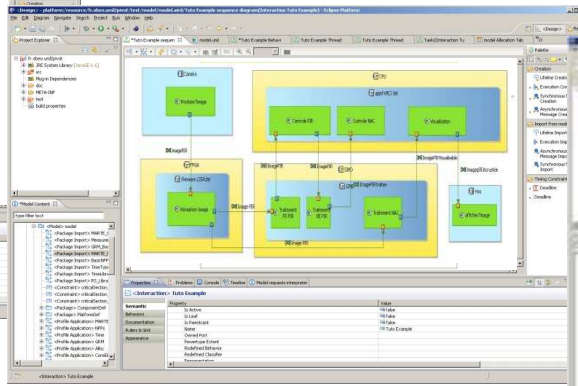
THALES

How to Benefit from Existing Timing Analysis Techniques and Tools ?

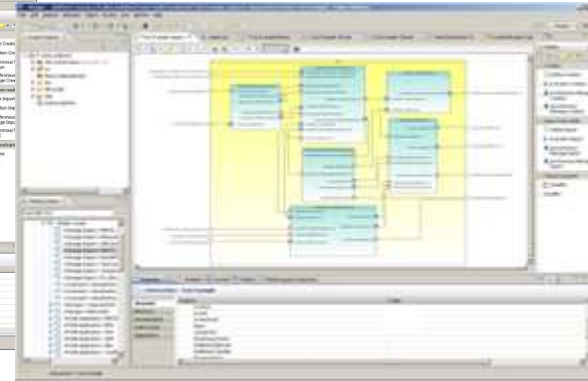
Modeling tools



TAS

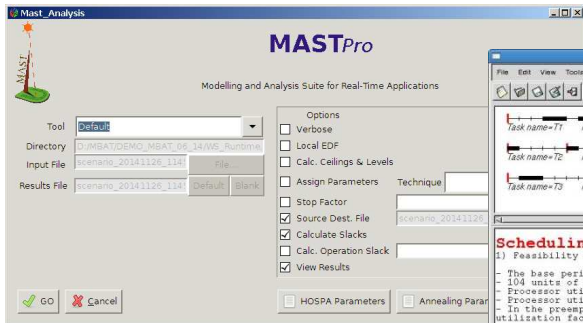


TOSA/CAPELLA

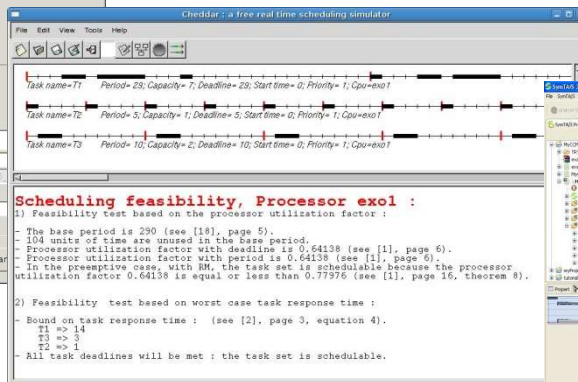


TCS

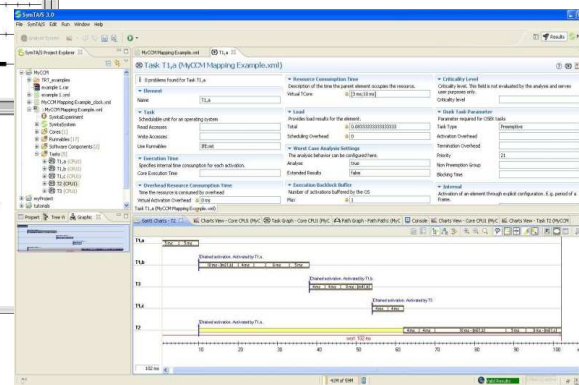
Timing verification tools



MASTPro

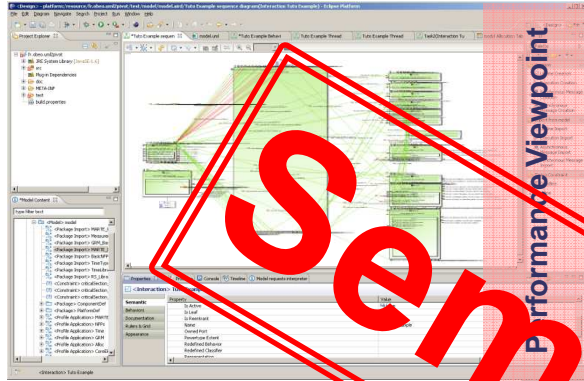


Cheddar



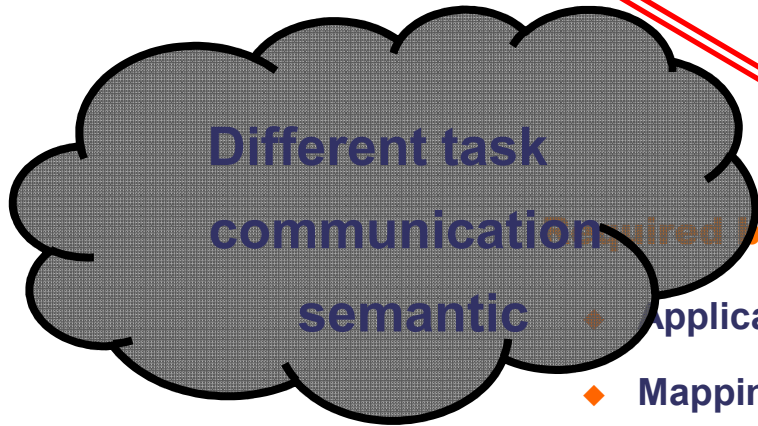
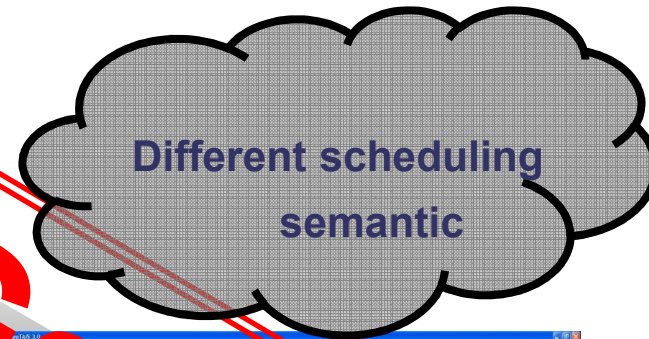
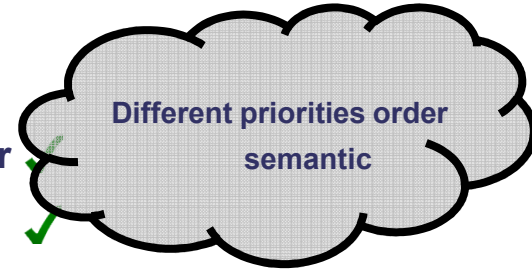
SymTA/S

Modeling tool



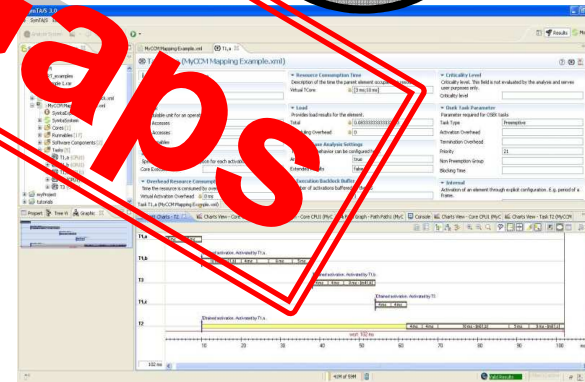
Available in modeling tool

- ◆ Application model & behavior ✓
- ◆ Mapping ✓
- ◆ Timing characteristics ✓
- ◆ Scheduling characteristics ✓



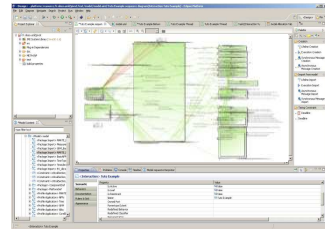
Required by analysis tool

- ◆ Application model & behavior
- ◆ Mapping
- ◆ Timing characteristics
- ◆ Scheduling characteristics

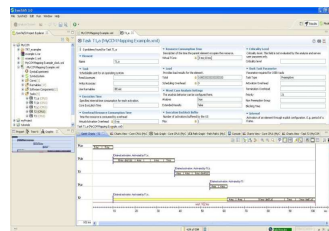
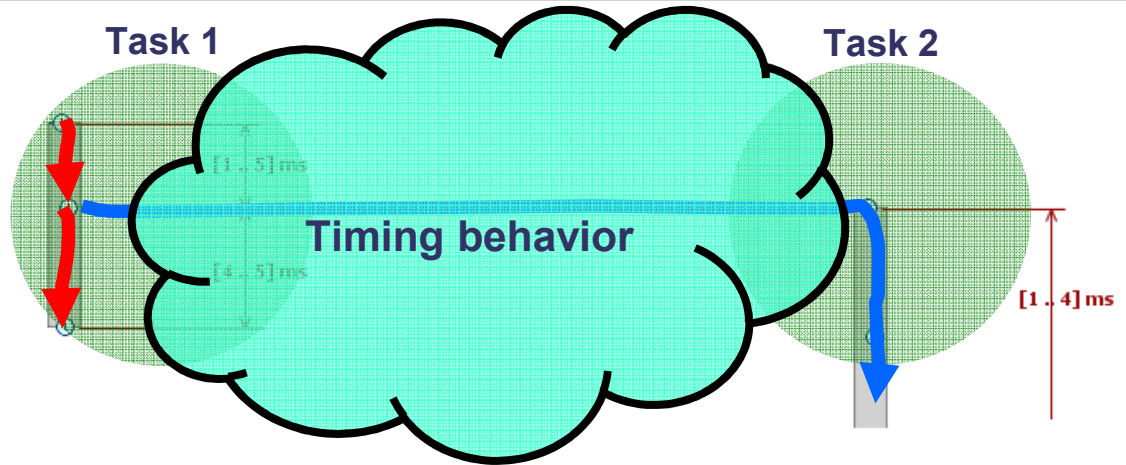


SymTA/S

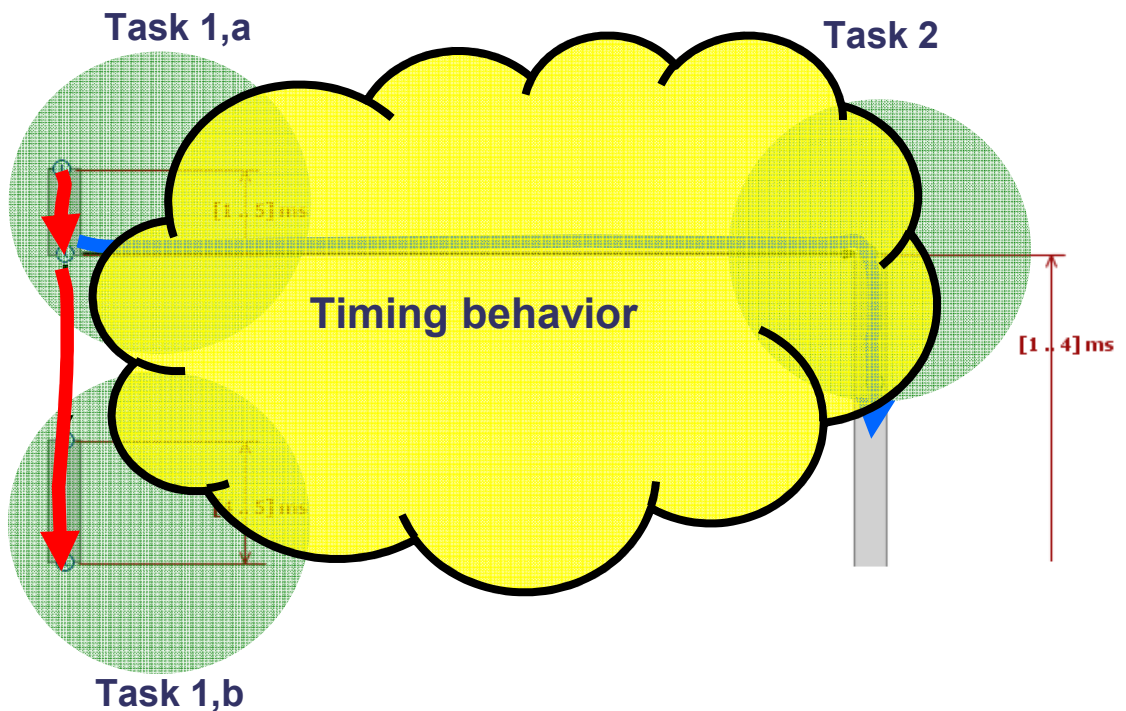
Semantic Gaps

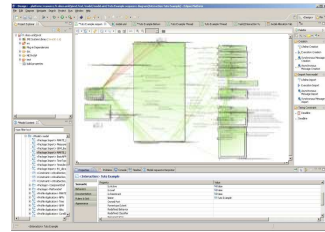


Modeling tool

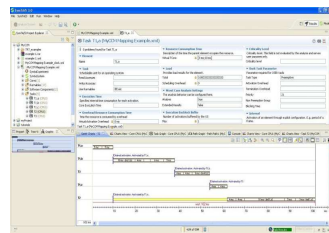
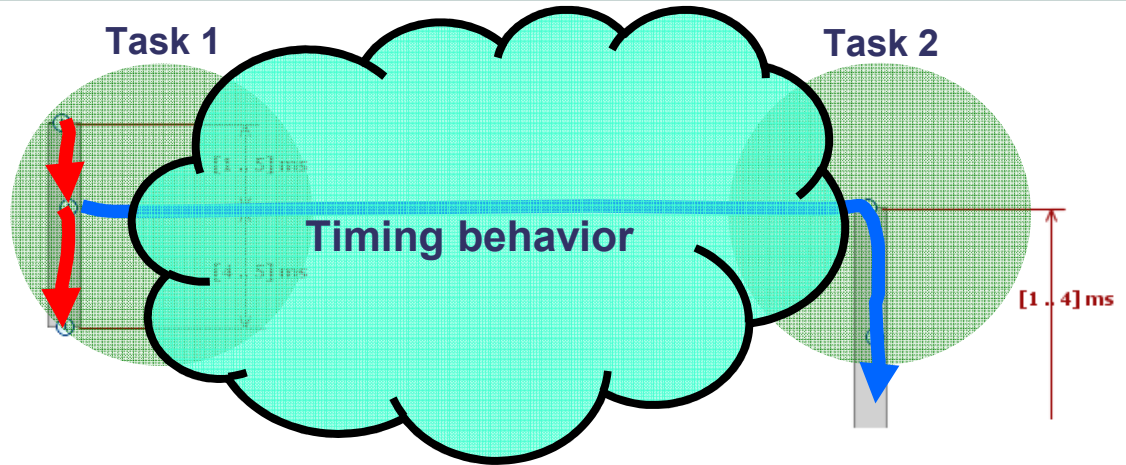


SymTA/S

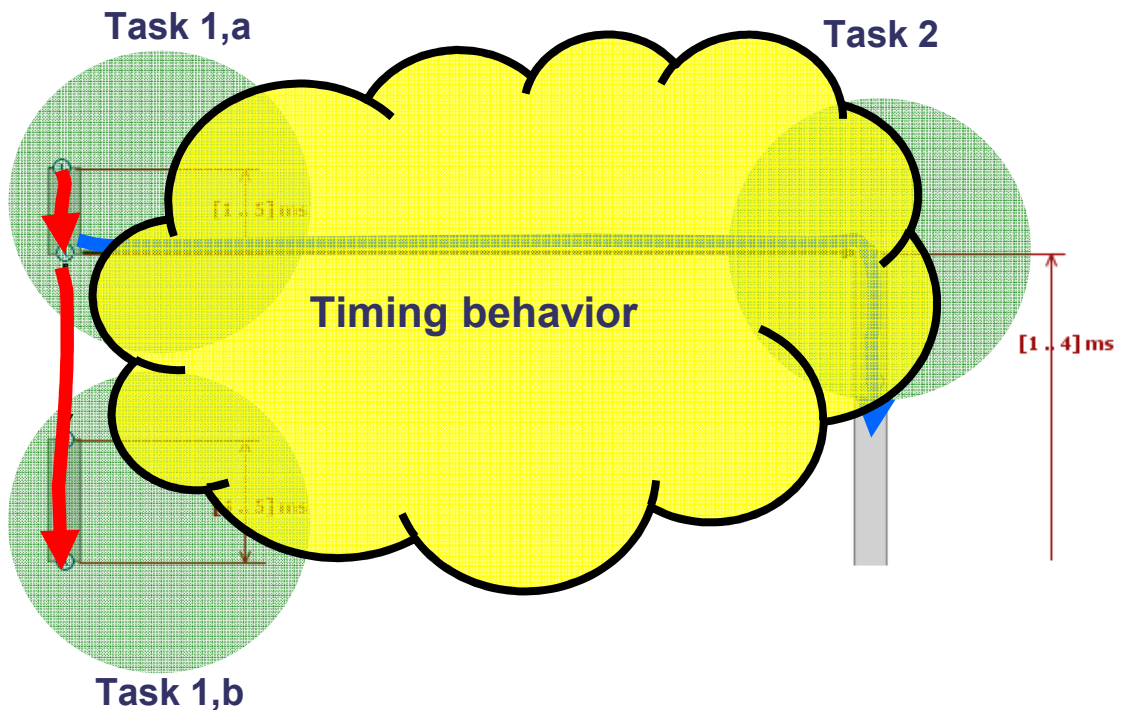




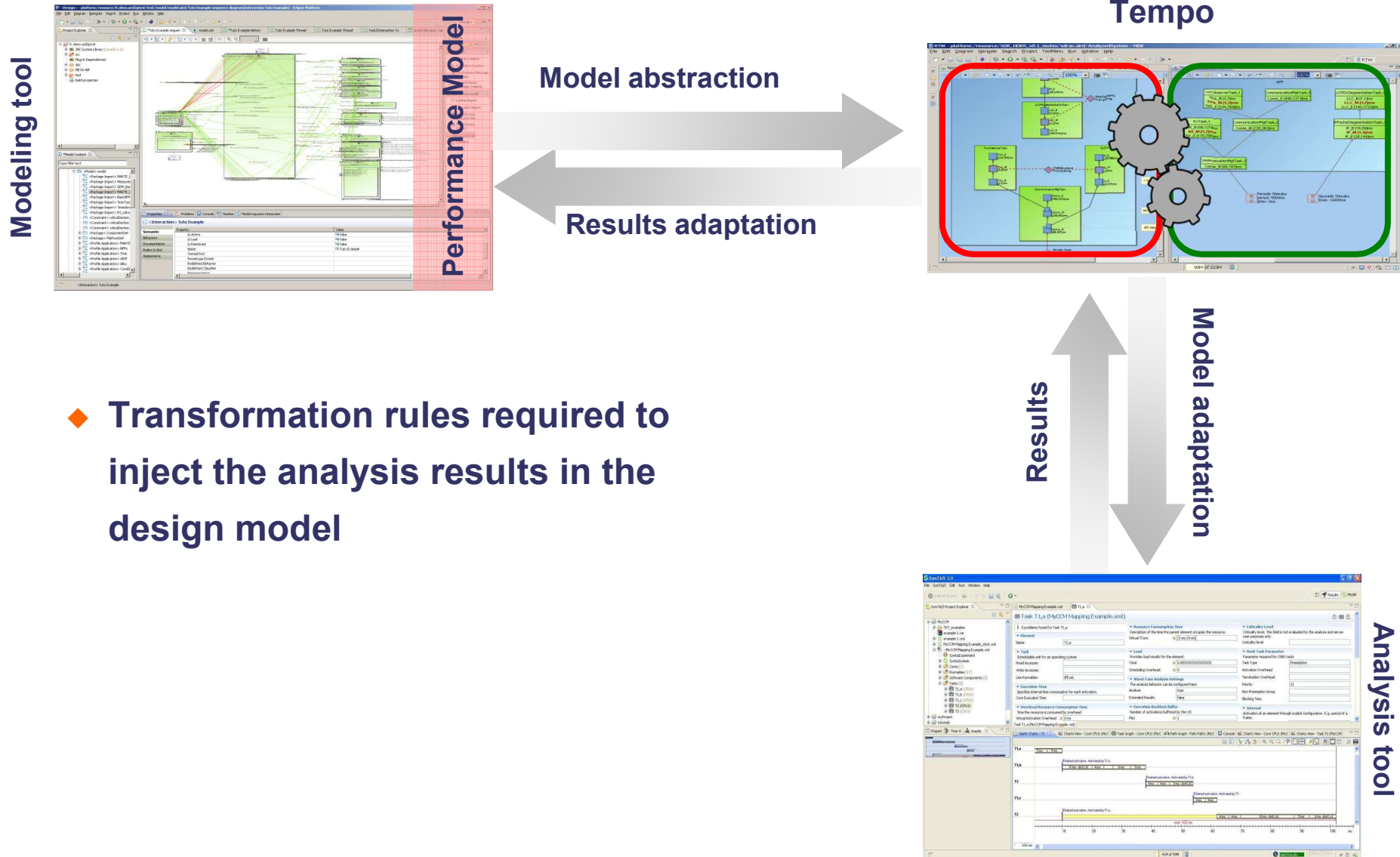
Modeling tool



SymTA/S



From Timing Verification Back to Design Model via Tempo



Conclusion: Full integration of Scheduling analysis

Modeling tool

	Priority	Period	Offset	Jitter	CET	Load	Response Time	Deadline
LEON2						69,6%		
HK_1000	30	1000ms	0ms	0ms	[95,100]ms	10%	[95,249]ms	250ms
HK_125	40	125ms	80ms	0ms	[15,20]ms	16%	[95,167]ms	200ms
AO_Task	50	125ms	40ms	0ms	[30,37]ms	29,6%	[70,107]ms	350ms
TC_RECEIVER	120	250ms	0ms	0ms	[20,25]ms	10%	[20,32]ms	200ms
ACQ_1553	150	125ms	0ms	0ms	[5,5]ms	4%	[5,7]ms	200ms

Analysis tool

GMAST Results

System-file Results-file

Modeling and Analysis Suite for Real-Time Applications

Current System application_elem0

System Processing Resources Transactions Shared Resources Operations Scheduling Servers

Model Name application_elem0

Model Date 2001-01-01T00:00:00

Generation Tool MAST Schedulability Analysis, version 1.5.0.1

Generation Profile D:\MBAT\Melody-CCM-MyCCM-DSP-1.6.0-custo\mast-bin-win\mast

Generation Date 2014-11-26T16:26:00

Slack 42.97% -> The system is schedulable

Thank you for your attention!

