



STF 492: TD-LTE Phase 3

Status Report

Document History

- 2015-09-15: Revised for SG#3
- 2015-07-15: Revised for SG#2
- 2015-06-02: Document submitted for MTS #65
 - long form for TDL Technical Session
 - short form to be submitted for MTS #65

TPT Status

TPT: Launch Event

- Keynote
 - Main speaker: ?
 - Philip, Stephan, others?
 - Content: focus, scope, duration?
 - Guest speaker line-up: ?
 - MetaCase, CEA, Ericsson, Elvior, Siemens, Conforimiq?
 - preparation and scope guidelines?

TPT: Launch Event

- Panel / Couch discussion
 - Moderator: ?
 - Philip, Stephan, Andrej, others? same as main speaker?
 - Topics: focus, scope, specific questions
 - Line-up: ?
 - MetaCase, CEA, Ericsson, Elvior, Siemens, Conforimiq?
 - going beyond guest speakers

TPT: Launch Event

- Demos
 - Reference implementation
 - UML Profile
 - MetaCase implementation
 - Transformations?
 - basic TTCN-3 skeletons?
 - TO to Word export?
- Others?

TPT: Outreach

- Contact interested parties regarding participation at launch event
 - sent invitation e-mail to ~40 parties on June 25
 - limited responses: VTT, MetaCase, Aalborg University; **decline: TF 160**
 - conference call postponed, **request for information from MetaCase**
 - **next steps?**
- Leaflet / flyer
- **Poster?**

TPT: Leaflet



Test Description Language

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ETSI membership is composed of manufacturers and network operators – all the “big names” and many smaller companies too – plus national administrations, ministries, regulators, universities, research groups, consultancies and user organizations. A powerful and dynamic mix of skills, resources and ambitions, all working together to bring the very best ICT solutions to the global marketplace. Geographically, our membership of over 700 companies and organizations is drawn from more than 60 countries on 5 continents.

ETSI is independent of all other organizations and structures, a key feature for ensuring neutrality and trustworthiness. That brings benefits not only in the acceptance of our standards and other publications, but also in our growing range of ancillary services, such as interoperability testing. And because standardization inevitably draws upon the bright ideas of our members, we have an Intellectual Property Rights (IPR) policy in place that has become the model for many other organizations.

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ETSI <http://www.etsi.org>
 ETSI Technical Committee MTS <http://portal.etsi.org/MTS>

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The ETSI Test Description Language

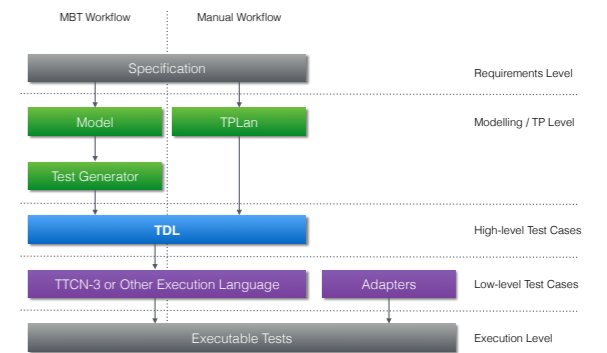
The process of stepwise development of tests from requirement specifications is well established and used in both, standardization and industry. Methods and languages produced by TC MTS, such as the Testing and Test Control Notation version 3 (TTCN-3) and the Test Purpose Language (TPLan) have been designed to support this process.

The Test Description Language (TDL) is the newest addition to these methods and languages acting as an intermediary between TPLan for the specification of test purposes and TTCN-3 for the specification of test cases. TDL is designed to bridge the gap between declarative test purpose specifications (what shall be tested?) and imperative test case specifications (how shall it be tested?) by offering a standardized language for the specification of test descriptions. TDL also contributes to the ongoing activities by MTS towards establishing standardised Model-based Testing (MBT) technologies within ETSI and the industry.

TDL aims to ease the development of executable tests by enabling:

- Specification of easy-to-understand test case descriptions that can be presented in different representation formats suitable for different audiences (graphical, textual, user-specific)
- Development of test cases by testers lacking programming knowledge
- Iterative test development along all product development phases, from requirements clarification, via design, to system testing
- Independence from execution languages and platforms and hiding of test case implementation details
- Integration of automatically generated and manually developed test cases within a common information platform

To accelerate the adoption of TDL, MTS has commissioned a reference implementation of TDL in order to lower the barrier to entry for both users and tool vendors in getting started with using TDL. The reference implementation comprises graphical and textual editors, as well as validation facilities based on semantics refinements, and a UML profile for TDL to enable the application of TDL in UML-based working environments.



List ETSI TDL Standards

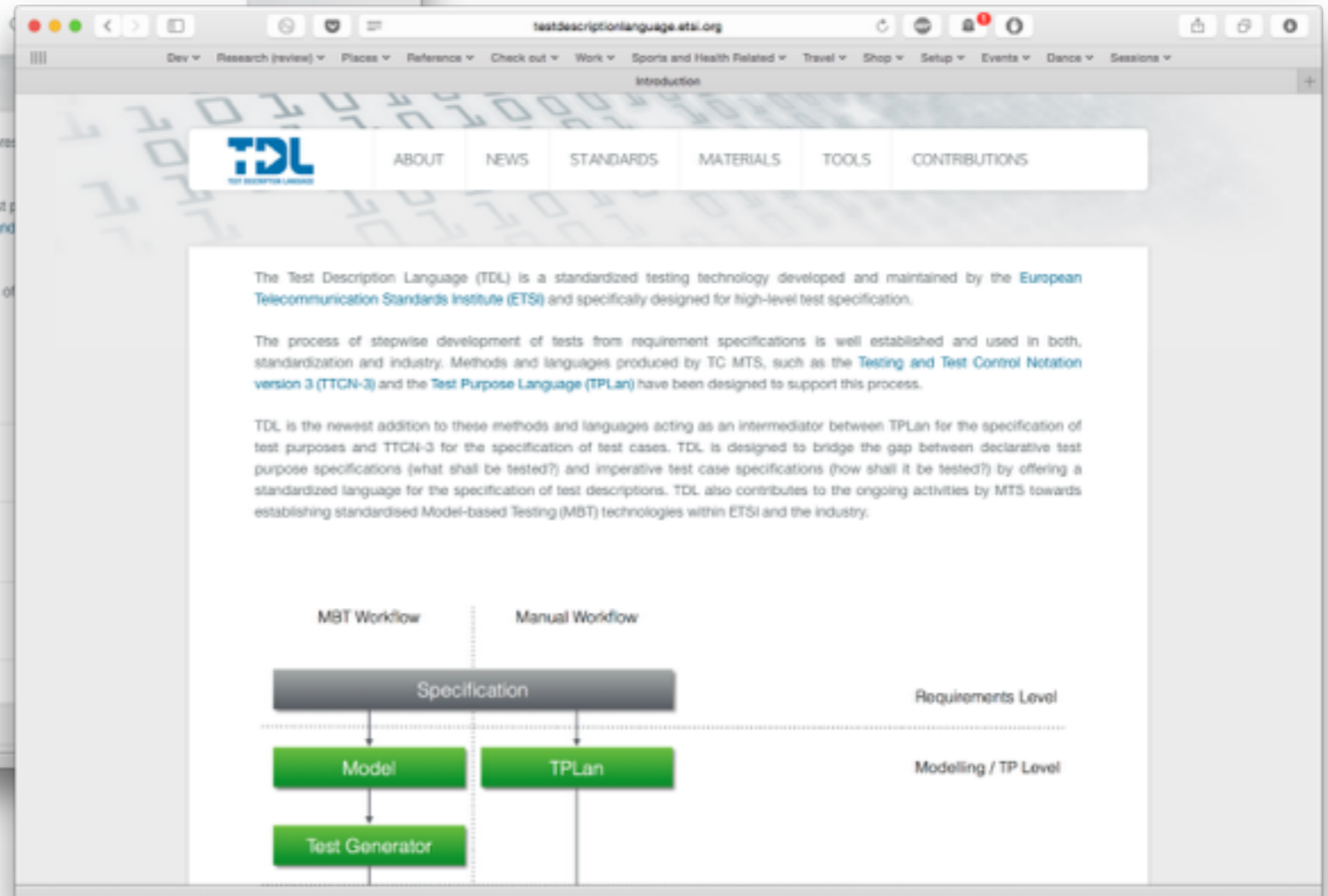
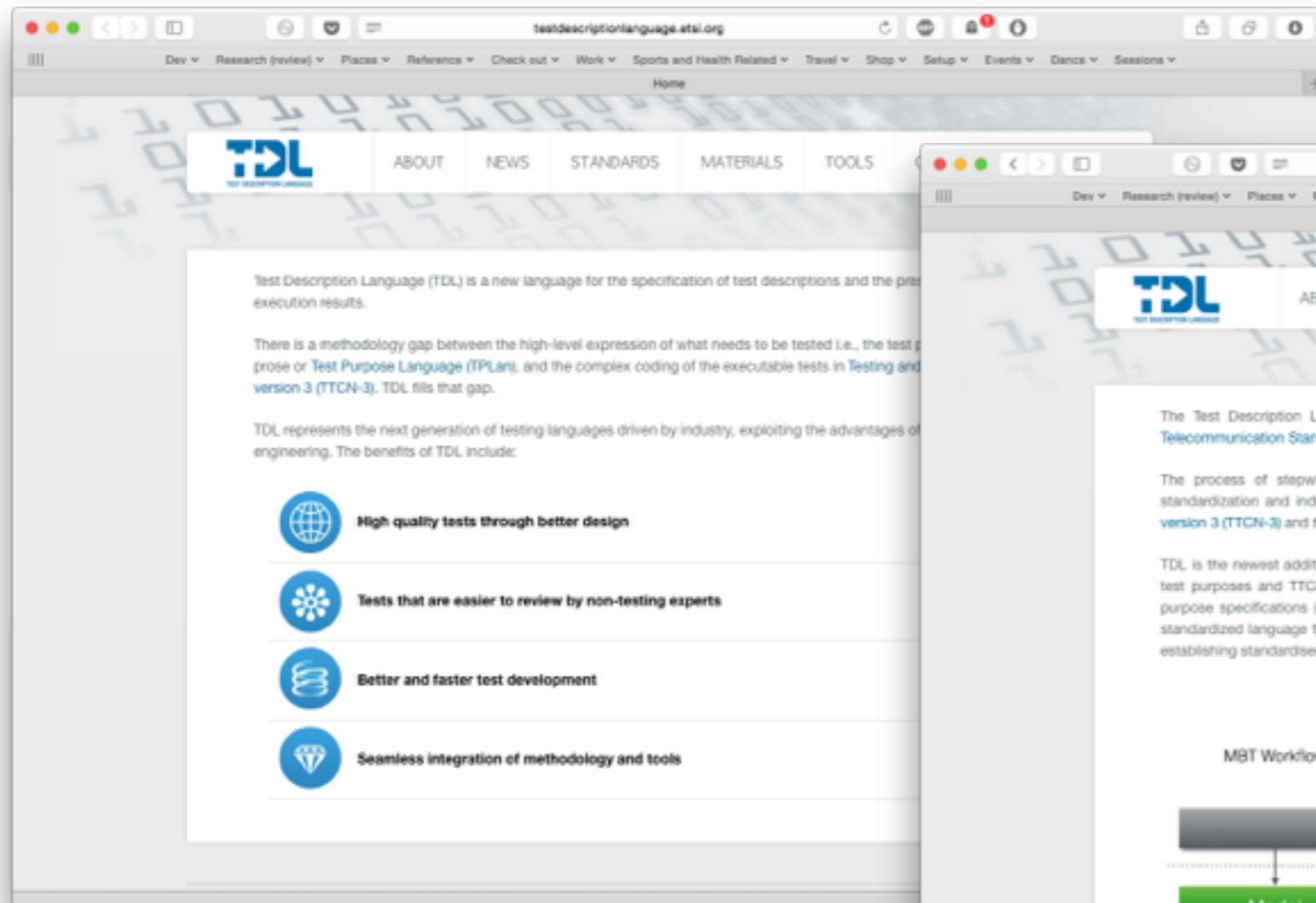
- ES 203 119-1 TDL: Abstract Syntax and Associated Semantics
- ES 203 119-2 TDL: Graphical Syntax
- ES 203 119-3 TDL: Exchange Format
- ES 203 119-4 TDL: Structured Test Objective Specification

Further information and the change history of the standards are available at:

<http://www.testdescriptionlanguage.etsi.org>

TPT: Website

- about -> flatten?
 - introduction
 - why use TDL?
 - TDL in context (where does TDL fit in, reference architecture)
 - references -> later point or based on endorsement?
 - history
- learn / materials -> flatten?
 - tutorials and presentations
 - bibliography
- downloads -> flatten?
 - standards
 - examples
 - experience package? (or under tools?)
- tools -> flatten?
 - reference implementation
 - uml profile
 - non-commercial
 - commercial
- development -> maybe later
- community -> flatten?
 - editorial team
 - news
 - events
 - links
 - change requests
 - mailing list
- Current URL: - <http://testdescriptionlanguage.etsi.org>
- Need for change?



- Current URL: - <http://testdescriptionlanguage.etsi.org>
- Need for change?

TPT: So far...

- Prep call on May 13, discussion at MTS#65
- OCG slides preparation
 - also for pitching launch event participation and for the launch event itself
- TDL tutorial accepted for UCAAT 2015
- TDL logo
- TDL leaflet
- TDL website



Status Update

Task 0: Work Plan

- Timescale: June 9, 2015 (+4 months) - March 31, 2016 (+2 months)
- 5 sessions planned so far (6 according to ToR)
 - WK24 Jun 09-12 Session 1 @ ETSI (4 days, with MTS#65)
 - WK36 Aug 31-Sep 04 Session 2 @ CEA (5 days)
 - WK41 Oct 06-09 Session 3 @ ETSI (4 days)
 - WK48 Nov 23-27 Session 4 @ ETSI (TBC)
 - WK05 Feb 01-05 Session 5 @ Ericsson (TBC)
- more homework (delay, summer vacations, nature of work involved)

Task 0: Milestones and Timescale

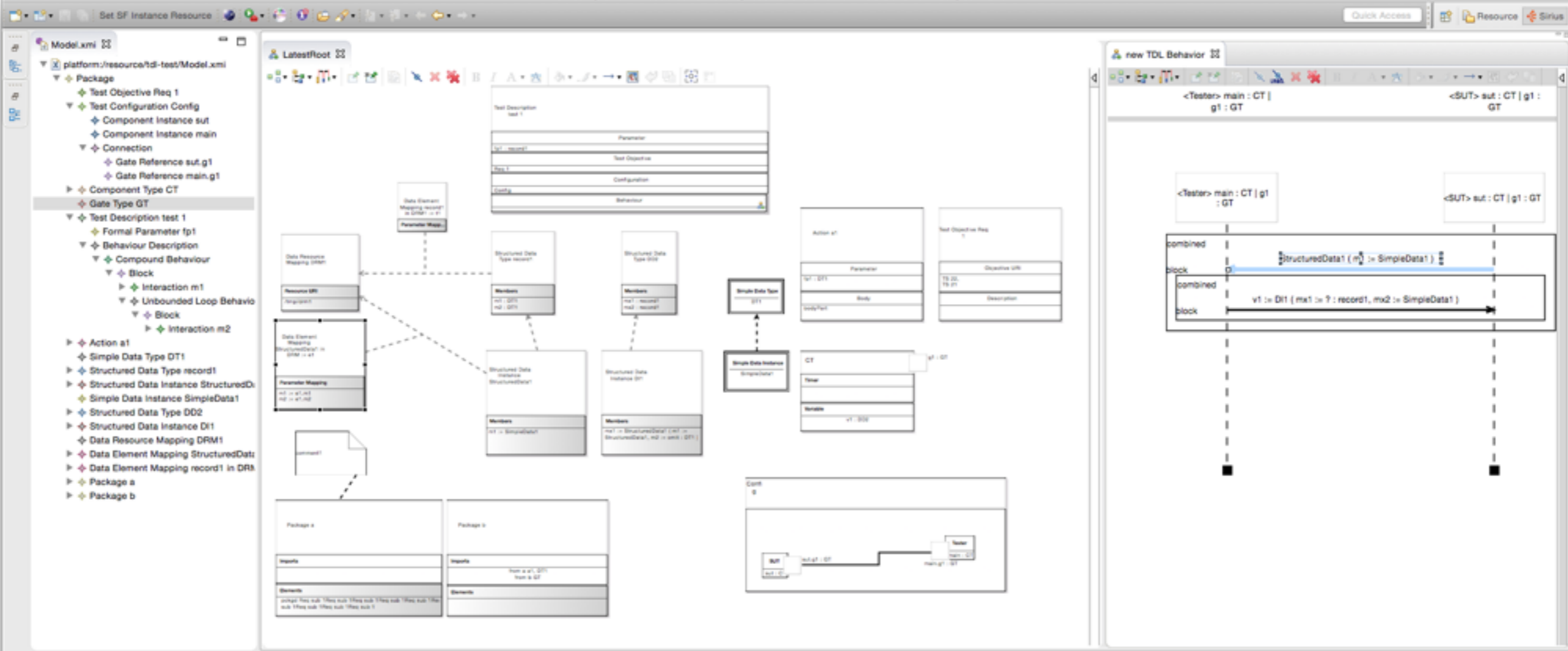
- Milestone 1: Jul 24 2015
 - Early Drafts: Part 1, TR
- Milestone 2: Oct 21 2015 (TDL Launch)
- Milestone 3: Dec 18 2015
 - Stable Drafts: Part 1, Part 3, TR
 - Early Drafts: Part 2, Part 4

Task 0: Milestones and Timescale

- Milestone 4: Mar 01 2016
 - Stable Drafts: Part 2, Part 4
- Milestone 5: Mar 31 2016
 - Final Drafts: Part 1, Part 2, Part 3, Part 4, TR

Task 1

GR Viewer Implementation Tasks (until UCAAT 2015)	Effort (days)	Color Codes
1. Mappings for elements with simple shapes: Comment, AnnotationType, SimpleDataType, Time, SimpleDataInstance, GateType, GateInstance, ComponentInstance, Connection, TestObjective	0.5	Done
2. Composite shapes - rectangles inside rectangles laid out according to custom algorithm specified in GR.	1	Partially Done
2.1. Mappings for elements with composite shapes: Package, Annotation, TestObjective, StructuredDataType, StructuredDataInstance, Action, DataResourceMapping, DataElementMapping, TestConfiguration, ComponentType, TestDescription	0.5	Already provided
3. Sequence diagram	2	Next target
3.1. Viewer specific ViewerMM extensions needed to represent lifelines	0.5	
3.2. Viewer specific ViewerMM extensions needed to represent both begin and end of blocks	0.5	
3.3. Mappings: Interaction	1	
4. Action shapes across all lifelines - by default, actions are placed on a single life-line, but TDL GR specifies that actions should cover all life-lines	1	
4.1. left aligned icons in actions shapes - need custom layout policy	0.5	
4.2. Mappings: Wait, Quiescence, TimerStart, TimeOut, TimerStop, Break, Stop, VerdictAssignment, Assertion, ActionReference, InlineAction, Assignment, TestDescriptionReference	0.5	
5. Block shapes (combined fragments)	1	
5.1. Floating labels in blocks (guard, period)	0.5	
5.2. Mappings: CombinedBehaviour, Block, CompoundBehaviour, BoundedLoopBehaviour, UnboundedLoopBehaviour, AlternativeBehaviour, ConditionalBehaviour, ParallelBehaviour, DefaultBehaviour, InterruptBehaviour, PeriodicBehaviour	0.5	
6. Data expressions in sequence diagram	1	
6.1. Integration with Xtext-based serializer	1	
6.2. Mappings: DataUse and sub-classes	0.5	
7. Automation: diagram creation, image export	2	
8. Mixed font labels	0.5	
8.1. Mappings: Function	1	
9. Nodes attached to lifelines in sequence diagrams	1	
9.1. Mappings: TimeLabel, TimeConstraint	1	
10. Nested block shapes	2	
11. Coincident arrow shapes for multicast interactions	1.5	
12. Floating variable assignment labels for interactions (only required for multicast interactions)	0.5	
13. Layout inside multipart containers	2	
Optimistic total	24	
Pessimistic (+20%)	4.8	
Expected total	28.8	



Properties <> Interpreter Problems Project Explorer Console Error Log

Interaction m1

Semantic	Property	Value
	Interaction m1	
Style	Is Trigger	false
	Name	m1
	Source Gate	Gate Reference sut.g1
	Test Objective	

Sirius - tdl-test/Model.xml - Eclipse Platform

Model.xml

```

1 <?xml version="1.0" encoding="UTF-8" ?>
2 <tdl:Package
3   xmlns:xmi="http://www.omg.org/spec/TDL/2.0/"
4   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
5   xmlns:tdl="http://www.etsi.org/spec/TDL/2.0/"
6   xmi:id="_e1hUyF19EeW1xI10e"
7   <packagedElement
8     xsi:type="tdl:TestObject"
9     xmi:id="_e1kXDF19EeW1xI11"
10    name="Req 1">
11    <objectiveURI>TS 22</objectiveURI>
12    <objectiveURI>TS 21</objectiveURI>
13  </packagedElement>
14  <packagedElement
15    xsi:type="tdl:TestConfig"
16    xmi:id="_e1k4F19EeW1xI12"
17    name="Config">
18    <componentInstance
19      xmi:id="_e1mNAF19EeW1xI13"
20      name="sut">
21      type="_e1m0E119EeW1xI14"
22    </componentInstance>
23    <componentInstance
24      xmi:id="_e1mNAV19EeW1xI15"
25      name="main">
26      type="_e1m0E119EeW1xI14"
27      role="Tester"/>
28  </packagedElement>
29  <connection
30    xmi:id="_e1mNA119EeW1xI16"
31    <endPoint
32      xmi:id="_e1m0F119EeW1xI17"
33      name="sut.g1"
34      component="_e1mNAF19EeW1xI13"
35      gate="_e1nbIF19EeW1xI18"
36    </endPoint>
37    <endPoint
38      xmi:id="_e1m0E119EeW1xI19"
39      name="main.g1"
40      component="_e1mNAV19EeW1xI15"
41      gate="_e1nbIF19EeW1xI18"
42    </endPoint>
43  </connection>
44  </packagedElement>
45  <packagedElement
46    xsi:type="tdl:ComponentType"
47    xmi:id="_e1m0E119EeW1xI14"
48    name="CT">
49    <gateInstance
50      xmi:id="_e1m0E119EeW1xI14"
51      name="g1"
52      type="g1"
53    </gateInstance>
54  </packagedElement>
55  </tdl:Package>

```

Latestfloat

new TDL Behavior

```

<Tester> main : CT | g1 : GT
<SUT> sut : CT | g1 : GT

```

Properties

Property	Value

Writable Smart Insert 1:1 [0]

Task 1: Status

- Most shapes mapped
 - still rough around the edges - borders, labels, overall look needs tuning
- Basic layout feasible for UCAAT
 - manual layout still needed (benefit of using Sirius)

Task 2

Task 2: Status

- Profile implementation
 - in progress: binding between lifelines and gate-references
 - still missing: time concepts
 - minor changes to ComponentInstanceBinding and GateReference
- Profile documentation
 - Annex C of Part 1, pending updates according to latest changes

Task 2: Status

- Profile overview
 - Foundation - no stereotypes for most concepts, rely on UML Foundation
 - TestConfiguration - follow suggestions by MFW, use CompositeStructure
- Test Description
 - CombinedBehaviour -> UML::CombinedFragment
 - Interaction -> UML::Message
 - ActionReference -> UML::BehaviourExecutionSpecification
 - AtomicBehaviour -> UML::OccurrenceSpecification

Task 2: Status

- Profile overview
 - Data - stereotypes for DataMapping, Function (handling return type)
 - DataUse - extend UML::Expression, UML::InstanceValue (DataInstance)
 - Time - follow suggestions from MFW, not implemented yet

Task 2: Status

- Papyrus-Based Editor for the UML Profile for TDL
 - Basic semantic Element types for the creation of TDL concepts
 - Initial palette for the TestConfiguration Diagram in progress
 - Priority for UCAAT : Shape implementation

Task 2: Status

- Profile application example
 - show the applicability of the profile
 - based on example from collaboration with Sherpa Engineering
 - demonstrating interest in TDL from Sherpa
 - test specification in hybrid system modelling tool (PhiSystem)
 - focus on benefits from DataUse
 - exceptional and periodic behaviour not yet in the example

Task 2: Status

- Profile application example structure
 - Composite Diagram for the TestConfiguration representation
 - TestConfiguration, ComponentType, ComponentInstance, Variable, GateType, GateInstance
 - Class Diagram for the Data representation
 - DataType, DataInstance, Function, FormalParameter
 - Sequence Diagram for the TestDescription representation
 - TestDescription, Assignment, Interaction, CompoundBehaviour, UnboundedLoopBehaviour, ConditionalBehaviour, VerdictAssignment, Target

Task 3

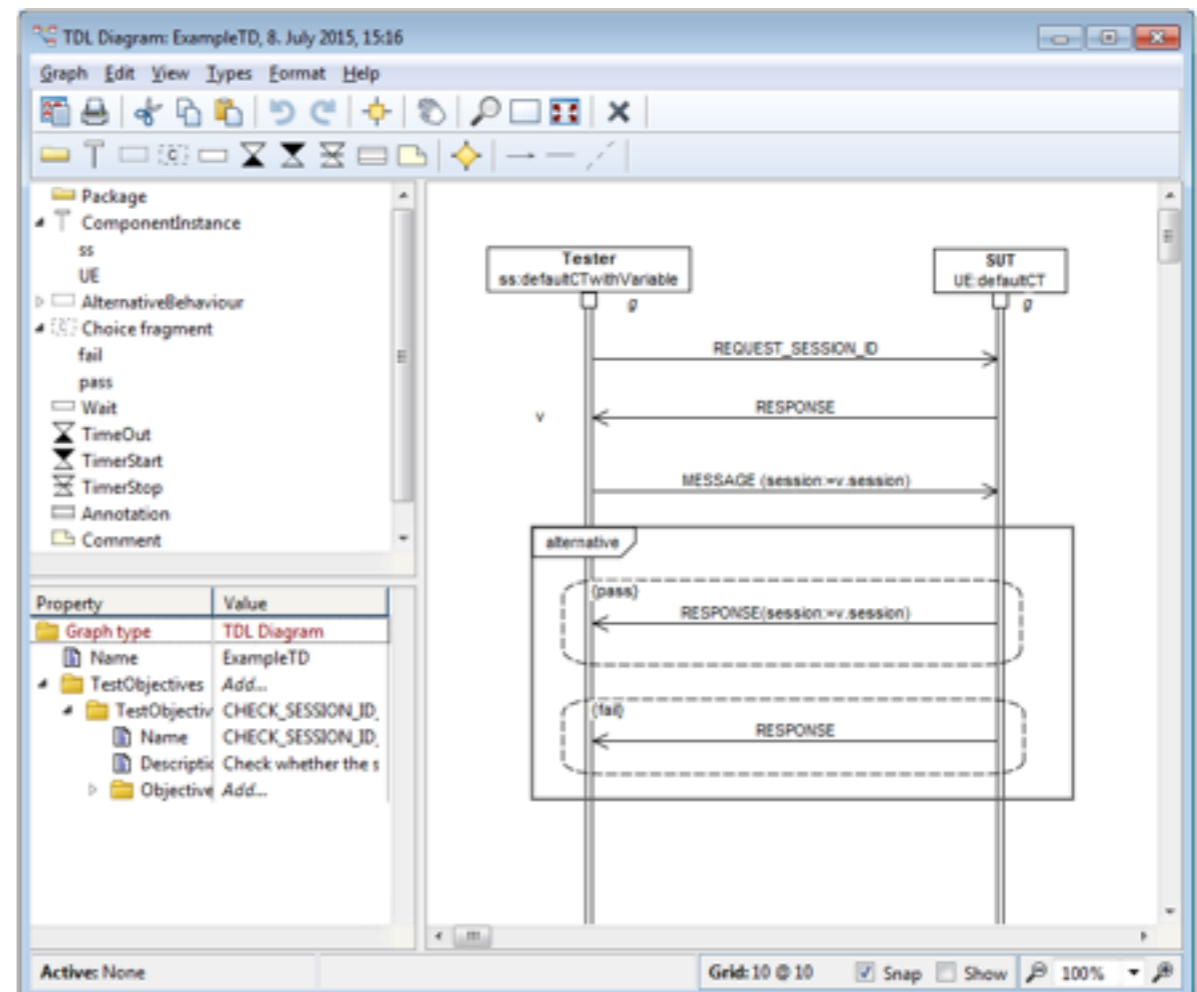
Task 3: Status

Clause	# constraints	# constraints done
Foundation	8	8
Data	19	17
(Data definition)	7	7
(Data use)	12	10
Time	9	7
Test Configuration	6	6
Test Behaviour	35	26
(Test Description)	0	0
(Combined Behaviour)	14	9
(Atomic Behaviour)	21	17
Total # constraints	77	64

Further OCL constraints and validation pending

Task 3: Status

- Feedback received from MetaCase
 - related to standard as a whole, not just Part 1
 - will be transferred to Mantis
- additional CR raised in Mantis
- work on editor under way



Task 3: Status

- Raised several minor CRs
 - move and refine constraint for `StaticDataUse` to `DataInstanceUse`
 - add usage restriction to `AnyValueOrOmit` (similar to `Omit`)
 - change `dataType` multiplicity for `SpecialValueUse`

Task 4

Task 4: Status

- Additional discussion with CTI in September
 - final format for OneM2M to be determined
 - potential changes to syntax with different options
 - PlugTests as further target for adoption of TDL
 - use TDs rather than TPs, update of TDL in addition to TO
 - target timeframe early/mid 2016
- Some progress on new features for TO
 - multiple arguments, iterative and periodic behaviour, event patterns

Task 4: Status

- **Medium** priority until UCAAT
- OneM2M, ITS, SmartM2M as potential short term users
 - examples and early prototype for OneM2M next meeting (July)
 - prototype for SmartM2M (September)
 - refined prototype for OneM2M / ITS (October)
- Potentially different notation (waiting for examples)
 - **Word export based on user-supplied templates**

Task 4: Status

- Raised several minor CRs for GR
 - typo in DataElementMapping
 - support specifying optional data type in AnyValue
 - alternative syntax for “lifelines” - one lifeline per gate instance
- Raised several minor CRs for TO
 - fix errors with examples and BNF

Any other business?

- New ToR for 1st allocation for 2016?
 - deadline October 1 (MTS#66)