# The TINA Conformance Testing Framework

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## Content

- Introduction.
- The Concept of Reference Point Facets.
- Specification of Reference Point Facets.
- Testing of Reference Point Facets.
- Conclusions.

# The Beginning ...



# ...

- Interoperability is a key issue for the success of object-oriented (OO) technologies such as CORBA, TINA.
- CAT Compliance/Conformance Matrix.
- Conformance to standard specifications is essential for multi-vendor systems and a means towards interoperability.
- RM-ODP provides reference point concept to facilitate conformance assessment of OO systems.

## Motivation for RP-Facets

- A practical framework based on RM-ODP for conformance testing of TINA systems is needed.
- TINA has large and under-specified RPs.
- RPs must be refined to support incremental specification and implementation of TINA systems as self-contained, meaningful subsystems.



## ... A Plan ...

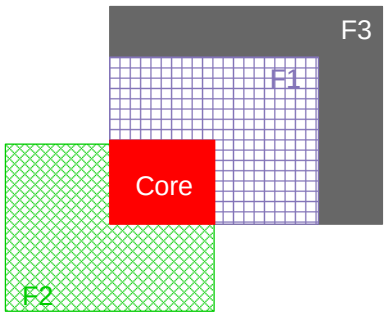
# RP-Facet Concept (1)

- A **RP-facet** is a subset of a reference point, which is **self-contained** in terms of functionality. The smallest element of a RP-facet is an **operation**.
- A RP-facet is always associated with one of the architectural parts separated by the RP, referred as **RP-facet role**.
- A RP-facet is defined in terms of **purpose-oriented scenarios** that describes potential interactions between the RP-facet role and its environment.



# RP-Facet Concept (2)

- A reference point has a **core** and may have zero or more **additional cohesive** facets.



## RP-Facet Specification

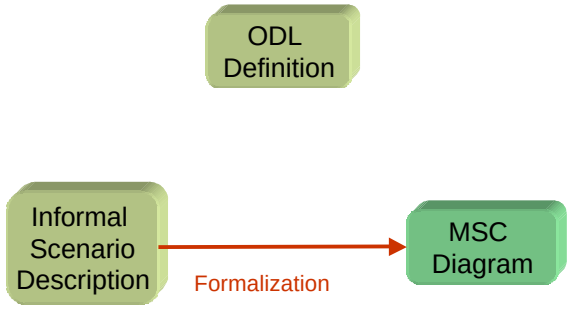
- Unambiguous specification, including static and dynamic model, is crucial for testability as formalism in the specification reduces misinterpretation and supports automated test generation.

- Integration of system specification and test specification is an important aspect so that reuse of available specification techniques is desired.



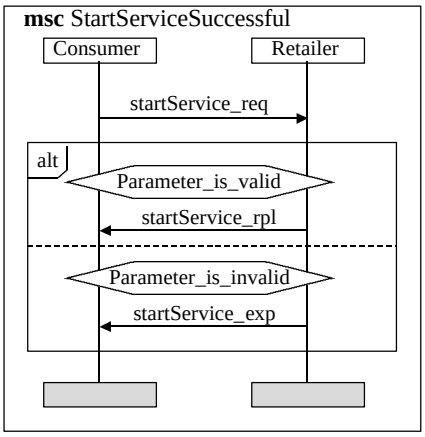
## ... An Installation ...

# The Specification Approach (1)

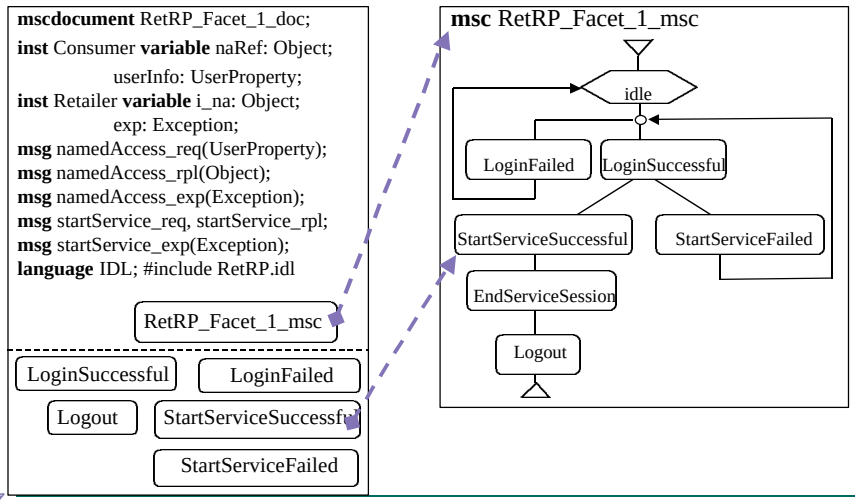





# Basic MSC

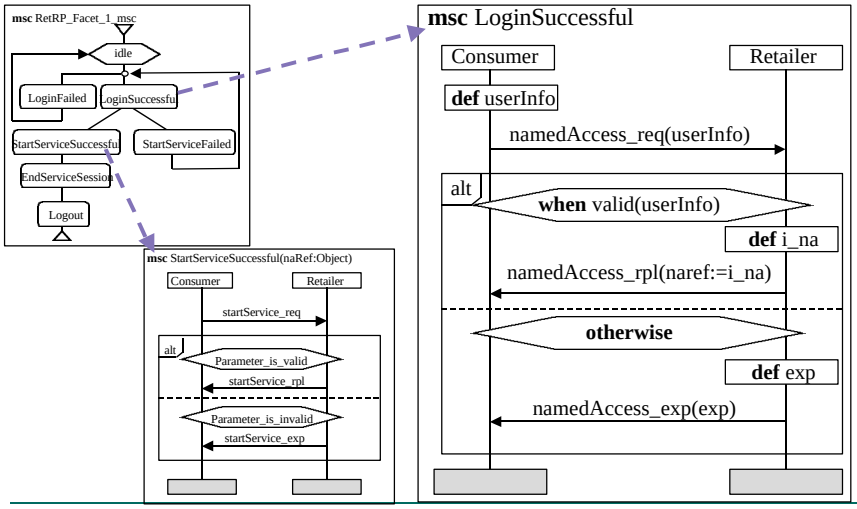


# MSC Document

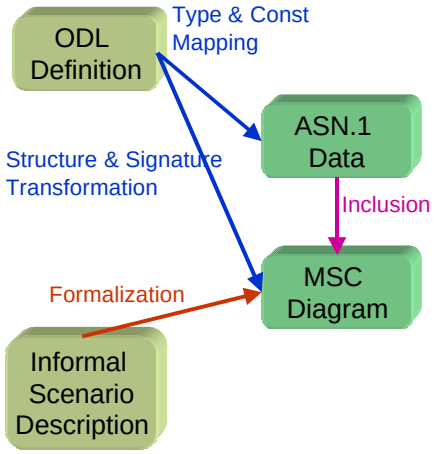





# MSC Reference and Data



# The Specification Approach (2)





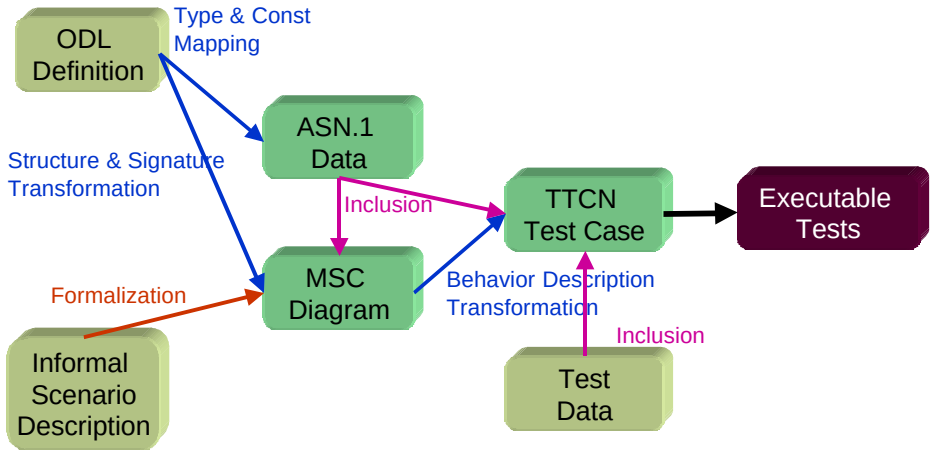

# ... First Results ...

# Testing of RP-Facets (1)

- Test campaign on the basis of dependencies between operations and facets.
- Tests specified in TTCN, which
  - describes interactions between testers and implementations under test in terms of message exchange at PCOs (Points of Control and Observation).
  - is part of the Conformance Testing Methodology and Framework on testing of OSI systems.
  - Concurrent TTCN addresses testing with parallel test components.
- Defined by ITU-T, ISO and ETSI.

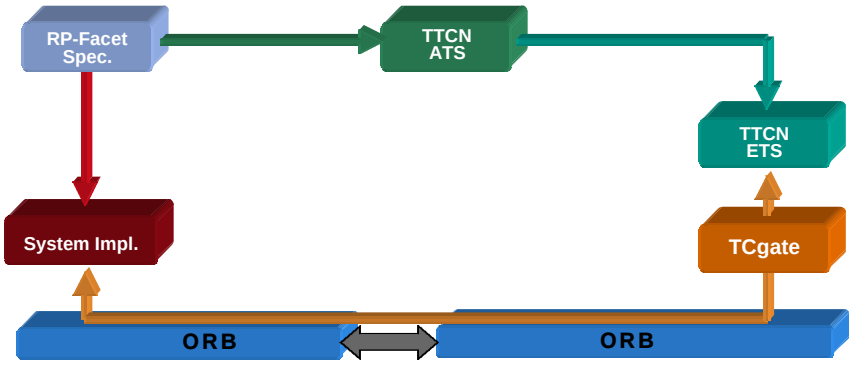


# The Specification Approach (3)



# Testing of RP-Facets (2)

Using e.g. the TTCN/CORBA gateway **TCgate**.






# ... The Finish ...

## TINA Conformance Testing Frw.

- RP-Facet Specification Template
  (Definition, Specification)
- Test Method
  (Test Specification, Test Campaign Derivation)
- Test Documentation
  (Test Reports)
- Testing in Practice
  (Tool Support)
- Demonstrate Usability
  (An Example)



## Dissemination and Further Work

- Presentation at OMG TM, Telecom DTF in Oslo, June 2000.
- Presentation on MSC and TTCN based Testing at OMG TM, Florida, Dec. 2000 to further the definition of a test notation for UML.
- Extension of the test framework towards TTCN 3rd edition, which will be launched by ETSI in Oct. 2000.

## ... Conclusions.

- RP-Facet concept was introduced to achieve unambiguous specifications for conformance testing of TINA products.
- RP-facets support the incremental development of TINA products.
- The testing approach for RP-facets is based on facet specification with structure, data (ODL) and behavior part (MSC).
- Test cases for RP facets are described in TTCN.



# Thank You.