



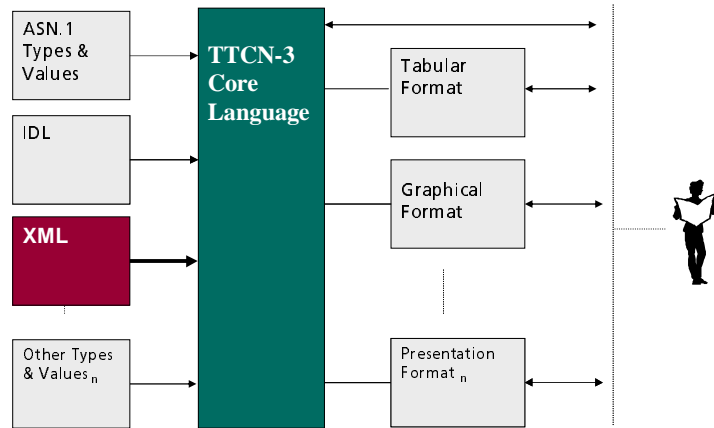
An XML to TTCN-3 Mapping

Proposal for a New Work Item

The Motivation

- XML-based documents, interfaces and systems are spreading and need testing
- For example, Web services
 - As a technology for „...self-contained, modular applications that can be described, published, located, and invoked over a network ...“
 - As a new middleware paradigm for Internet applications
- TTCN-3 based testing of XML-based systems requires a mapping of XML to TTCN-3
- The standardization of this mapping enables
 - A unified approach how to use TTCN-3 for XML-based interfaces and systems
 - generic, reusable TRI/TCI adapters
 - lowers the efforts for users to apply TTCN-3

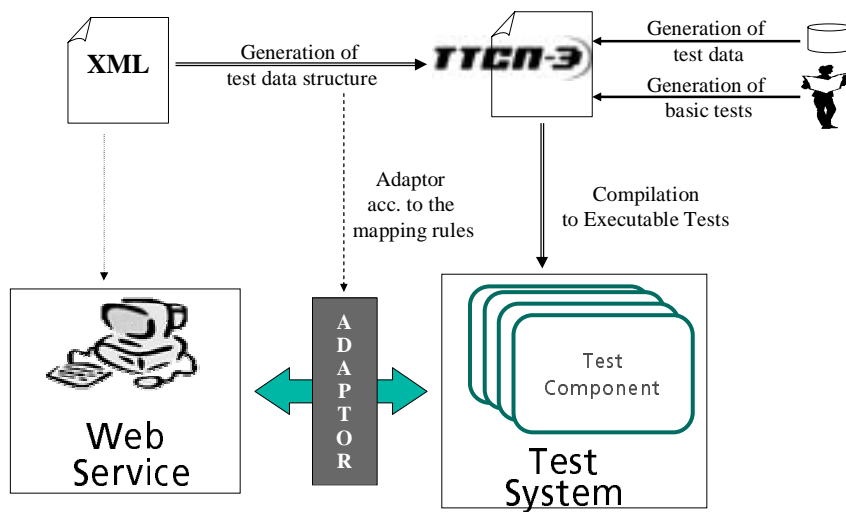
TTCN-3 and Software Testing



ETIS MTS #36, Budapest, Mar. 2003

I. Schieferdecker: XML to TTCN-3

Overall Picture



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I. Schieferdecker: XML to TTCN-3

Mapping XML to TTCN-3

➤ Map element tags and attributes to TTCN-3 fields

- Different grammar definitions and mappings
 - Schemas
 - Embedded approach
 - Flat-Catalog approach
 - Named Type approach
 - DTDs

Mapping XML to TTCN-3

```
<schema>
  <element name="weather">
    <complexType>
      <sequence>
        <element name="location">
          <complexType >
            <sequence>
              <simpleType name="city">
                <restriction base="string">
                  <pattern value="[a-zA-Z]"/>
                </restriction>
              </simpleType>
              <element name="country" type="string"/>
            </sequence>
          </complexType>
        </element>
        <element name="temperature" type="integer"/>
        <element name="barometric_pressure" type="integer"/>
        <element name="conditions" type="string"/>
      </sequence>
    </complexType>
  </element>
</schema>
```

XML Schema

TTCN-3 Types

```
type record weather
{
    location_Type location,
    integer temperature,
    integer barometric_pressure,
    charstring conditions
}
type record location_Type
{
    charstring city ("a".. "z", "A".. "Z"),
    charstring country
}
```

Mapping XML to TTCN-3

XML	TTCN-3
Basic types	Basic types with additional attributes
Extensions and restrictions	Flattened, duplicated types
DTD - elements, attributes, sequence, choice	Mapping to records, fields, set, union and separate types
Named type schema	One-to-one mapping to records and fields
Embedded schema - local types	Explicit types for local ones
Flat-catalog schema - type substitution	According to the above rules