Modelling and Analysis of Communications Services

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CRESS

- Communication Representation Employing Systematic Specification:
  - graphical service notation - voice, web, grid, ...
  - language-independent - LOTOS, SDL, BPEL, ...
  - portable toolset - Windows, MacOS, Linux, ...
  - automated formalisation - specification, validation, verification
  - automated implementation - code generation, functional/performance testing
  - mature - under development for 13 years
Related Tools

- **diagram editing:**
  - CHIVE (CRESS Home-grown Interactive Visual Editor)

- **formal validation:**
  - MUSTARD (Multiple-Use Scenario Test And Refusal Description)

- **formal verification:**
  - CLOVE (CRESS Language-Oriented Verification Environment)

- **implementation validation:**
  - MINT (MUSTARD Interpreter)
CRESS Methodology

Service Diagram

- Automatic specification
- Automatic compilation
- Validation/verification
- Design corrections
- Scenario evaluation

Formal Specification

Implementation Code

Formal Analysis

Behaviour, Performance
Root Diagram (Interactive Voice)

1 Audio
"Book your room"

2 Request arrival
"What date?" Date

3 Request stay
"How many nights?" Number

4 Audio "Say your arrival date"

Filled
Catch "Help NoInput"
Feature Diagram (Interactive Voice)

1. Submit Url Variable

2. Request contact "Your number?" Phone
   - Filled
     - 3 Audio "We'll call you on $contact"
     - 4 Submit contact.jsp contact
       - Finish
   - Catch "Help NoMatch"
     - 5 Audio "Please give a phone number"
       - 6 Reprompt
         - Finish
CRESS Applications

- **Intelligent Network:**
  - Plain Old Telephone Service + features

- **Session Initiation Protocol:**
  - User Agent, Proxy/Redirect Server + features

- **Voice over Internet Protocol:**
  - Call Processing Language services

- **Interactive Voice Response/Prompting:**
  - VoiceXML services + features

- **Device/Grid/Web Services:**
  - Business Process Execution Language services + features