Using MBT to test Microsoft Lync Client conversation feature

Shirley Tan and Sergio Mera
Microsoft

ETSI MBT User Conference 2011, Berlin, Germany

Outline

- Lync and Spec Explorer (SE)
- Lync Test team and MBT: adoption strategy and blockers
- Model development and integration with Lync Test framework
- Takeaways of the experience and future testing plans using MBT

What is Lync?

- Microsoft Lync is a real time communication system that provides
  - Presence for self and contacts
  - Audio, video and instant messaging conferencing
  - Data collaboration: desktop and application sharing, white-boarding, etc..
- It allows workers stay connected with others from virtually anywhere
- Lync is part of Microsoft Office and currently being used by millions of enterprise customers

Case study: Lync Client and MBT

- The Lync system has to deal with a high load of concurrent users across the network, interacting in many possible ways
- This makes model-based testing a good approach for testing critical features of Lync
- We focused on the Lync Client and used Spec Explorer to model APIs in the conversation feature first

Adopting MBT in Lync Test team

- Lync Test team had no experience with MBT before
- Adoption is opt-in, so testers are not forced to use it
- We organized a MBT mini-workshop to facilitate adoption:
  - An initial kick-off SE model was developed as a proof of concept
  - A four 2-hour session workshop was carried out, involving other teams with experience in Spec Explorer
  - An online site with videos, meeting notes and training materials prepared
  - We encouraged testers to ask for help using the Microsoft Spec Explorer discussion list

Modeling feature states

- Active conversations and contacts define the states:

```
//Conversations
public static SequenceContainer<Conversation> ConversationList;

//Contacts
public static SequenceContainer<Contact> ContactList;
```

- A contact contains contact data, as name, presence, email, phone numbers, etc.
- A conversation contains participants and modality type (IM, VoIP, Video, etc.)

Modeling the interactions

- We focused on some specific actions from main scenarios
- The model describes possible user interactions with the Conversation feature:
  - Start conversations with different types of contacts
    - Using contact object, SIP address, phone number, etc.
  - Send/receive an instant message
  - Start/stop a call
  - Mute/unmute a contact
- We used the abstract identifier pattern to map conversation and contact IDs to real entities

Slicing the model

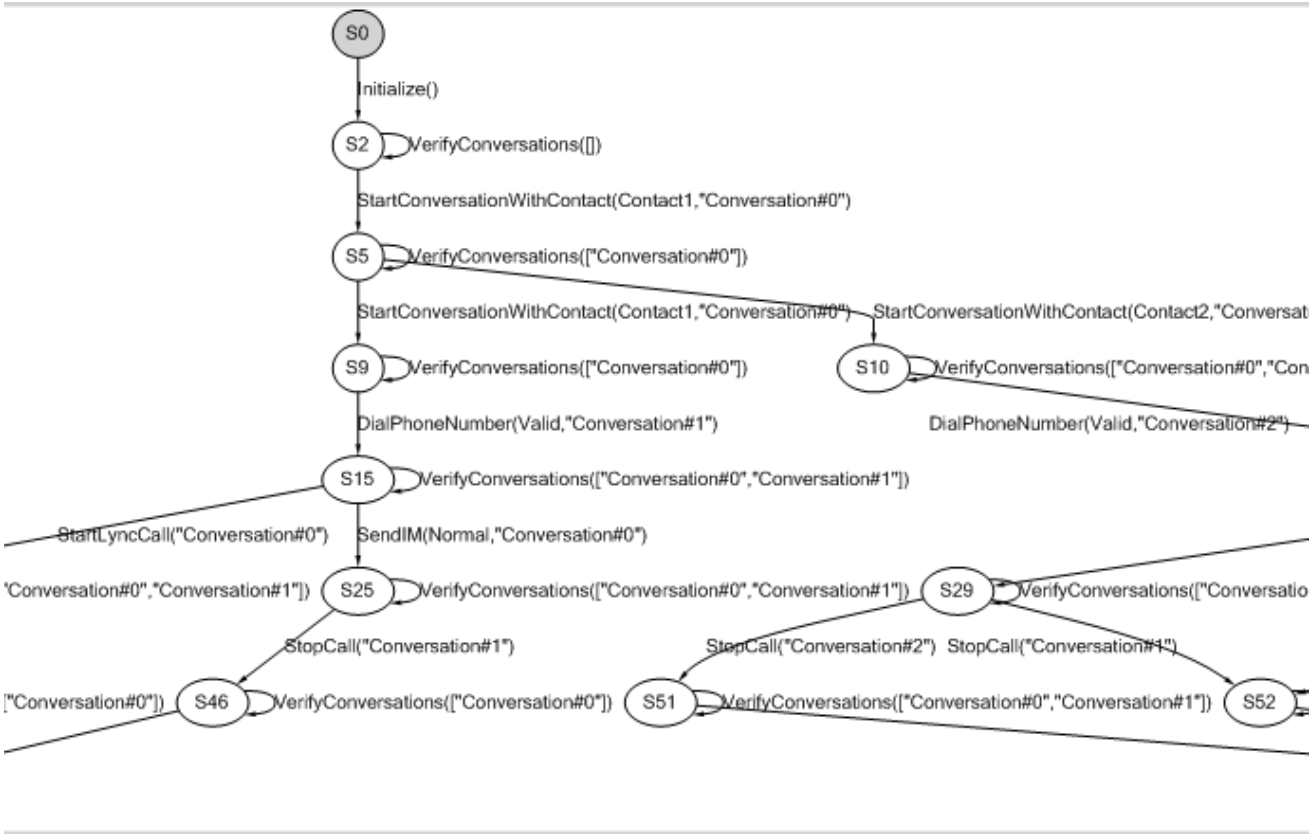
- We restricted all possible sequences to interesting slices

```
machine LynP2PConvoBVT() : Actions
{

   (
      let ContactIdentity c1, ContactIdentity c2
      where
      {.
         ConvoCanvas.SetDomain(c1, c2);
      .}
      in
      Initialize();
      StartConversationWithContact(c1,_);
      StartConversationWithContact(c2, _);

      DialPhoneNumber(InputString.Valid, _);
      (StartLyncCall? | SendIM(NormalSpecialString.Normal,_));
      StopCall;
      CleanUp;
   )

   |||
   VerifyConversations*
}
```

- We also restricted the domain to a fixed list of users

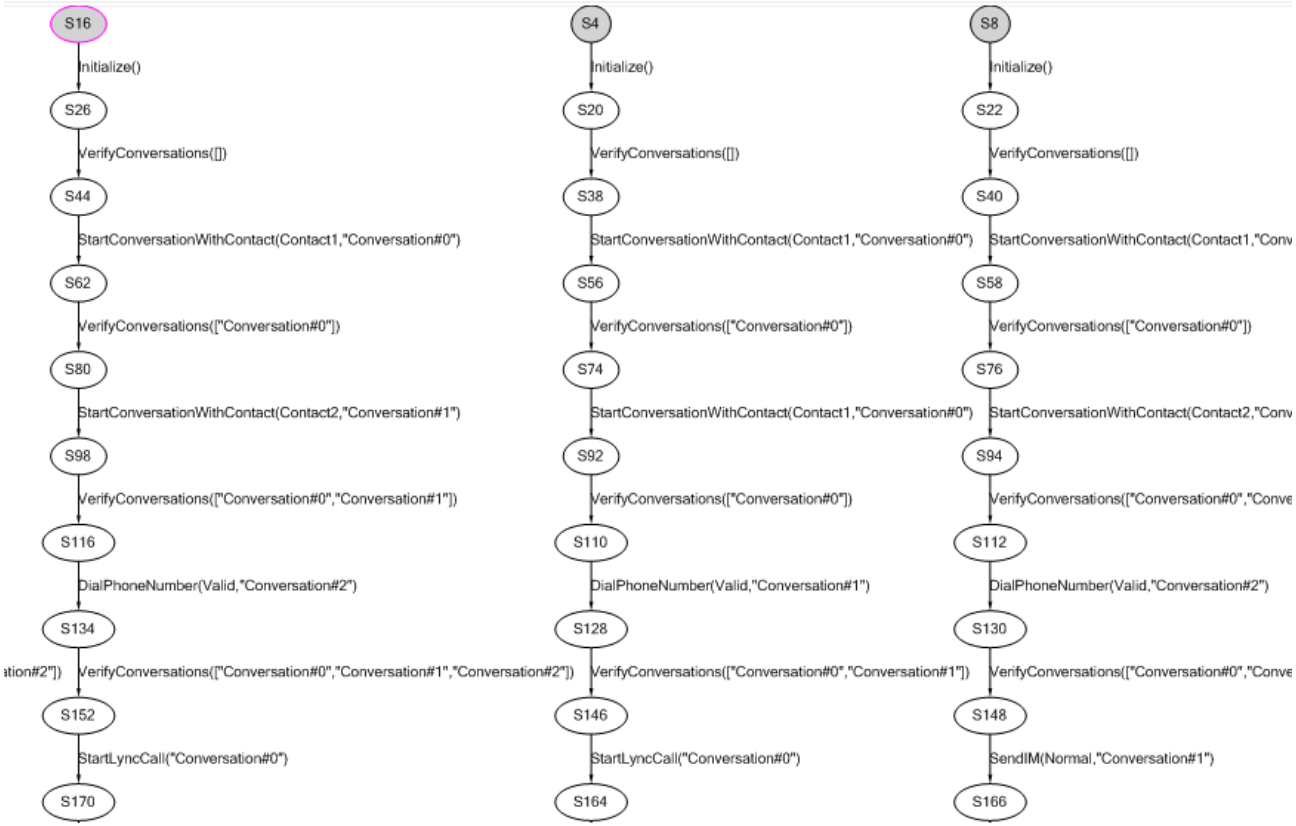
Verifying the model

- State graphs were verified and added into test plans for the feature team to review



Integrating test cases with the test framework

- Generated test cases were successfully integrated with Lync Test Framework and run against Lync implementation



Takeaways

- Approximately 15 testers followed the ramp-up process on MBT
- Piloted two test features, and found spec issues and ambiguities
- Generated test cases were part of the Lync test suites
- Collected best practice data and gained experience

Takeaways

- Adoption curve showed to be slow as the mind shift involved is not negligible
- The starting audience was 15 people; only 8 finished the workshop
- People find hard to invest time in learning MBT when their day-to-day work is focused on traditional testing and fast result
- This seems to match other Microsoft groups that already ramped up on MBT and are using it regularly: the learning process takes some time

Future plan

- We plan to continue the adoption process for Spec Explorer within the Lync Team
- We plan to expand models and test coverage
- We identified possible owners for different Lync features who are willing to push MBT adoption within their local test groups
- We will use a set of metrics to be able to evaluate success, including number of DCRs, coverage, time spent on design/spec changes, etc.

Questions

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