Introduction to Chor

A video tutorial

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About Chor

• A new programming language for concurrent communicating systems.

• Based on **choreographies**: global descriptions of systems.

• Formally specified.

• Supported by an Eclipse-based IDE.

• Developed following discussions both in the Academia and the Industry.

• Open source.

• Still a prototype, but rapidly evolving.
Why Chor? Some problems it solves...

- **Protocols**: multiparty protocols are usually informally specified, and can be hard to implement.
- **Solution**: Chor allows you to write protocol specifications, and check your programs for compliance.

- **Deadlocks**: concurrent programming is prone to writing deadlocks, and these can be very hard to detect.
- **Solution**: Chor programs are statically checked to be deadlock-free.

- **Productivity**: prototyping complex distributed systems can be a long process, when there are many entities to be implemented.
- **Solution**: Chor defines the behaviour of all entities in a single program, and then generates their code automatically.

- **Clarity**: understanding how distributed entities will interact can be hard, since you have to match their I/O communications manually.
- **Solution**: Chor programs make this matching explicit.
Development methodology

Artifacts

Chor program

Global Protocol specifications

Choreography (protocol implementations)

Examples

A -> B: hi( string )

t1."Hello!" -> t2.x : hi( s )

Endpoint Projection (compilation)

Endpoint executable implementation
Distributed Authentication

- A distributed authentication protocol, inspired by OpenID.

- A service (called Relying Party) delegates authentication to another service (called Identity Provider).

(1) User requests access to RP;
(2) RP asks IP to authenticate U;
(3) U sends her password to IP;
(4) IP notifies RP of the authentication result.
Endpoint Implementation

- Our projection supports the Jolie language.

- You can edit the projected Jolie code to integrate it with many different deployment setups, e.g. HTTP sockets or Bluetooth.

- Through Jolie, we support many application domains, from multicore applications to distributed service-oriented architectures.

- Chor is language independent, so we plan to extend projection to other frameworks in the future.
More information at...

- Website: http://www.chor-lang.org/

- Mailing List: chor-devel@lists.sourceforge.net