FORMALIZING SHIM6
AN IETF PROPOSED INTERNET STANDARD IN UPPAAL
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reduced incorrectness upon receiving pay-
A technique to increase the reliability of a
features redundancy, load sharing, performance and policy.
Current multihoming practices (IPv4) impose a threat on address and routing scalability.
SHIM6 is a proposal by the IETF to provide multihoming.
No formal methods have been applied to the

Aim: improve the quality of the specification by applying formal methods.

IP roles SHIM6 splits the two semantics of an IP address (end point identifier and loca-

contextual contact Normal data communication between end point identifiers, no SHIM6

context establishment Communication to exchange multihoming information.
Data communication remains normal.
Failure detection Messages are transmitted to detect a link failure.
Locator pair exploration In case of a link failure, a new locator needs to be selected.
Locators are mapped back at the host to the

end point identifier. Transport session remains stable. Communication resumes with SHIM6 data packets that provide mapping information.

An integrated tool environment for modelling, validation and verifica-
tion of real-time systems modelled as networks of timed automata, extended with data types.

Properties:
A[] not deadlock
exists(h1:HostType) exists(h2:HostType)
(h1 != h2 and heuristics[h1][h2]) -->
forall(h3:HostType) forall(h4:HostType)
(h3 != h4 imply Context(h3, h4).established)

UPPAAL:

Upcoming Work

Improve the quality of the specification by applying formal methods.

Future Work

Improve model to verify on scale.
Add failure detection and exploration.
Extend UPPAAL verifier language.
Indicate model state space.

SHIM6:
Implementations.
Add HBA and CGA, Context Forking, INTEROP test.
Traffic engineering issues.

Further Information

SHIM6:
http://www.shim6.org
http://tools.ietf.org/wg/shim6/
http://www.ietf.org/html.charters/shim6-charter.html

UPPAAL:
http://www.uppaal.com