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Second Progress Report on Formal Models  
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Responsible Partner: UCAM  
Participating Partners: EPFL, INRIA, KTH, UCAM, UCL  
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Title:	Second Progress Report on Formal Models
Workpackage no:	WP1
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This deliverable presents a summary of the progress made in Workpackage 1, Formal Models, during the year 2003. (Note that the WP1 work on programming languages is now unified into the *Resource Control, Versioning, and Modularity* task of WP3, and so is reported there. It includes an experimental language Acute.)

The main achievements are:

- Very substantial progress on rigorous low-level interaction and failure semantics, with a draft specification of TCP/UDP sockets completed and released internally to the project partners.
- A new failure detector model has been proposed, that we consider easier to understand, easier to work with, and more natural than existing models.
- Work is in progress on an implementation of the Chord P2P algorithm in Acute, drawing together the WP1 low-level TCP semantics, the WP3 work on language design, and an existing P2P algorithm.
- Work is in progress on a formalization of the DKS P2P algorithm of WP2. This will need failure detector models, and we also intend to make an executable model (with a tight relationship to the verification) above the UDP/TCP/Socket semantics, building on our previous work on Chord.
- Analysis of P2P and Hybrid architectures for connection-based anonymity systems has been completed.
- Work on transaction axiomatization has been completed.

By the end of the project we expect to have exemplar *fully specified systems*, with rigorous semantic foundations for the underlying TCP/UDP/Sockets networking, for the Acute programming language with marshalling support, and for the P2P algorithms written therein.