| | **BISON**
IST-2001-38923

Biology-Inspired techniques for
Self Organization in dynamic Networks |

Periodic Progress Report: 2
Covering period 1 January 2004 – 31 December 2004

1   Executive Summary

We report on the state of the Project after two years of activity. Main objectives for the reporting period were:

- to define precise evaluation criteria for the "goodness" of our solutions in dynamic networks,

- to implement algorithms for routing, searching, and monitoring on dynamic and mobile ad hoc networks,

- to implement algorithms for resource sharing on dynamic and mobile ad hoc networks,

- to further develop the simulation environment architecture.

- to initiate the demonstrator activities to be further developed in the final year.

Technical progress during the reporting period has been excellent, achieving the stated goals and milestones. We note the following as highlights of our results:

- Development of working definitions for evaluation criteria, including "nice properties" for our solutions to problems in dynamic and mobile ad hoc networks,

- Full implementation and evaluation of BISON basic services: *routing, topology management, collective computations*, and *monitoring*,

- Full implementation and evaluation of BISON advanced services: *search* and *load balancing*,

- Development and evaluation of a novel biology-inspired protocol called T-MAN for structured topology management in overlay networks,

- Further enhancement of the PeerSim overlay network simulation environment into a fully-functional product, capable of running time-driven, event-driven and trace-driven simulations,

- Examination of a specific function, epidemic spreading, in an attempt to better understand the link between the structure and function of complex networks.

- Design and implementation plan of demonstrator "network monitoring and path management".

During 31 May – 2 June 2004, the project organized a successful mid-term meeting called "SELF-STAR: International Workshop on Self-* Properties in Complex Information Systems" held in Bertinoro, Italy in cooperation with projects COSIN and DELIS that was attended by 65 researchers from 17 countries. Post-proceedings of the meeting have been edited by a board

including three members of BISON and will be published by Springer-Verlag as LNCS Hot Topics Volume no. 3460 during 2005. The project participated actively in numerous international technical meetings and conferences, including the Torino Conference on Complex Systems organized by the EXYSTENCE network, to disseminate its results.

Project management has not encountered any major obstacles during the reporting period. During the second year, there have been two contract amendments: the first one was necessitated by a change in the coordinating partner's bank coordinates, while the second amendment was due to partner SFI exiting the project on 31/12/2003 and partner Telenor changing its legal name. While enacting the amendments have consumed significant amounts of time and energy of the partners, the changes involved have not implied any deviations from the work plan.