InvisibleHand Networks, Inc.

Merkato Fact Sheet

Merkato™ is InvisibleHand Networks' distributed software platform for real-time market-based resource allocation, using mobile autonomous agents.

- Merkato is a platform with definitions and hardware interfaces adapted to each application/service. The core offers an extensible API for network resource allocation and pricing systems.

- Merkato is a middleware platform, i.e. rather than being an application with an end in itself, it enables and supports a variety of applications and services (such as IP transit/peering, web-hosting, etc.) by allocating and pricing bandwidth. It can also be viewed as an application, for bandwidth trading and risk management, and for network economic analysis.

Merkato Agents

Merkato consists of highly distributed and decentralized web-enabled server- and client-side components. The key behavioral components of Merkato are software agents representing buyers, sellers, brokers and goods (resources) in a real-time marketplace.

- The extensible design allows agents a wide range of behavior, from simply transmitting manual bids/asks to running in fully automated mode using programmed strategies, valuations and budgets.
- The agents range from simplified "wizard" like agents which allow buyers and sellers to specify their requirements in a few easy steps, to sophisticated versions offering full power and flexibility in managing bandwidth quality and cost.
- The agents run the marketplace by computing the prices and allocations. They also deliver the bandwidth by controlling network hardware for in real-time allocations.

The agents are mobile, allowing them to move back and forth between client web browsers as well as any number of remote servers for fully automated operation.

Auction and Reservation Pricing Mechanisms

We have designed market mechanisms and protocols based on the state of the art in economic theory, which enable efficient, decentralized, market-based pricing of shared resources. Our Progressive Second Price Auction has been shown to achieve fast convergence to value-efficient allocations. We have also invented the Hold Option Reservation, a novel optimally fair bandwidth reservation pricing mechanism analogous to derivative financial instruments.

Software Implementation

At its core, Merkato implements an extensible architecture that can be used with any system where networked resources need to be allocated and priced. It leverages the latest in Java technology, and combines proven architectural concepts with innovative design to create a lightweight and fast implementation of a distributed market system for real-time bandwidth allocation. It features:

- A decentralized architecture making it scaleable to thousands of users, and hundreds of shared resources.
- Web-based user interfaces, allowing clients to bid, and managers to monitor and control the markets, from ordinary browsers (Netscape, MSIE).
- Platform independence (Java implementation), allowing any component of Merkato to run on Unix (Linux, Solaris), Windows, and other operating systems.
- Implementations and/or integration of, (and compatibility with) industry standards in: network monitoring, management and control protocols (COPS, SNMP), allowing it to mesh seamlessly with existing infrastructure.
- State-of-the-art security using industry standard solutions (SSL).
- Compatibility with existing billing systems through open database connectivity.
- Extensible and modular design makes it efficiently customizable to specific applications.
- A formal extensible agent and resource description and mobility framework using XML, putting Merkato in an ideal position to become the standard for real-time markets in bandwidth and other shareable resources.

Patents & Copyrights

The Progressive Second Price Auction and the Hold Option Reservation are the basic spot and derivative market mechanisms and are subjects of two pending patents. The Merkato architecture is also protected by a provisional patent.

For more information on Merkato or how InvisibleHand Networks can help you,
please call us at 781 221-4800 or email us at info@invisiblehand.net or
visit our website at www.invisiblehand.net