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## Start-up's software mines untapped bandwidth

**By Jim Duffy**  
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BURLINGTON, MASS. -- Service providers that overbuilt during the past three years and now have capacity to burn may find a gold mine in those untapped assets.

A New England start-up is shipping a new version of software designed to help service providers squeeze dollars from idle bandwidth by pinpointing, trading and allocating unused IP capacity.

InvisibleHand has harnessed computerized gaming theory -- like Internet-based auctions or wagering -- to help service providers get some return on the investment of \$655 billion they made overbuilding their networks the past few years. At the same time, bandwidth prices are falling, and customers don't want to be tied to long-term contracts, InvisibleHand argues.

The market needs to move to flexible pricing strategies for data services -- whether it's off-peak discounts for weekend backups, or higher-priced quality-of-service guarantees -- the same way voice is priced differently for businesses and consumers, and for different times of day, says InvisibleHand CEO Jim Brown.

The Merkato software is intended to provide open-market pricing of bandwidth in five-minute increments to let service providers, exchanges and collocation/hosting facilities dynamically price, sell and allocate bandwidth that would otherwise be wasted. By contrast, traditional circuit-based pricing and allocation methods dedicate a fixed portion of each point-to-point circuit to each customer.

The majority of the time, customers do not use the full amount of their fixed portion. Merkato enables service providers to aggregate traffic on each circuit and dynamically sell the excess capacity, InvisibleHand claims.

"IP flows are where service providers are feeling the most pain," Brown says. "Merkato allows service providers to be the Alan Greenspan of their network."

But InvisibleHand's challenge will be to get carriers to do a 180-degree turn from the way they've done business and made money, says Seth Libby, an analyst at Yankee Group in Boston.

"Carriers want to sell you a pipe at a fixed price and with more bandwidth than you need," which runs counter to InvisibleHand's business proposition, Libby says. "This is about a new way of doing business, so InvisibleHand's challenge will be in convincing carriers that they have to be on board, getting their participation."

Libby says InvisibleHand may compete against Internet data center service provider Equinix, which routes and balances traffic loads between multiple ISPs.

In addition to gaming technology, Merkato 2.1 uses software agents and patented algorithms to locate, price and allocate idle bandwidth. The software agents run on Cisco routers. The Merkato server -- which communicates with the agents through a rate-limiting API, records all bandwidth transactions, and exports data to billing systems -- sits on the edge of a network between the provider and customer.

Merkato also includes an HTML user interface with which service providers can monitor price fluctuations and track their allocations, traffic levels, and billing information.

The software supports both spot-market -- or real-time -- and reservation-based pricing. Spot-market pricing is intended for immediate allocations; reservation lets buyers reserve capacity in advance.

For the spot market, the software agents represent buyers and sellers to facilitate transactions and allocate bandwidth at fair-market prices in five-minute intervals. These agents execute a variety of tasks, from transmitting pre-determined bids to bidding and selling based on budget or capacity need.

Merkato's reservation market allows buyers to reserve a specific amount of capacity in advance at a pre-arranged price.

The software is currently being used by collocation provider Telehouse America. It is just wrapping up lab trial with a Tier 1 service provider, and beginning trials with another Tier 1 and some Tier 2s, Brown says.

Merkato 2.1 is priced in the "low six figures" at entry, and then on a per-transaction or per-participant basis, Brown says. The server costs \$5,000.

InvisibleHand was founded in 1998 by Nemo Semret, who conceived the company while pursuing a Ph.D. in electrical engineering at Columbia University's Center for Telecommunications Research. Semret researched the use of game theory and other economic methods to design and analyze networks, focusing in particular on auctions and other market-based algorithms for decentralized network control and management.

The company has raised \$11 million to date from Polaris Venture Partners. The company anticipates raising between \$10 million and \$15 million in another round of funding from Polaris and some new investors, Brown says.

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