Merkato™

Buyer's User Guide

Merkato Version 2.2

July 2002

Contents

Starting Merkato

Before you start, be sure you have a username and password for Merkato. You will need the URL (web address) of the Merkato portal.

Note: Merkato has been tested on Internet Explorer version 6.0 and later versions. While Merkato may work on other browsers, we have not verified this.

Logging In

Point your browser to the Merkato portal. The opening page looks like the one in Figure 1.

Enter your username and password and click **Login**.

(If you need a username and password, contact your Merkato administrator.)

When you successfully log in, the Merkato Agent screen appears, displaying the Express interface. (See Figure 2.)

From this top-level agent page you can get to the various screens that make up the portal, and to the desktop interface and the wizard (see page 12).
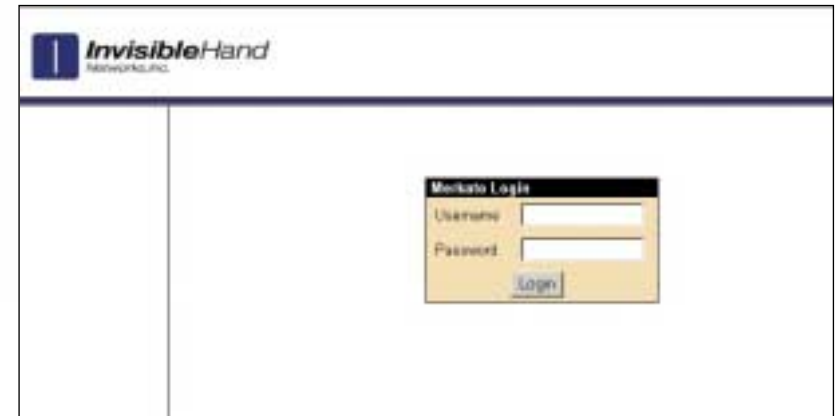

Figure 1: *The Merkato Login Screen*
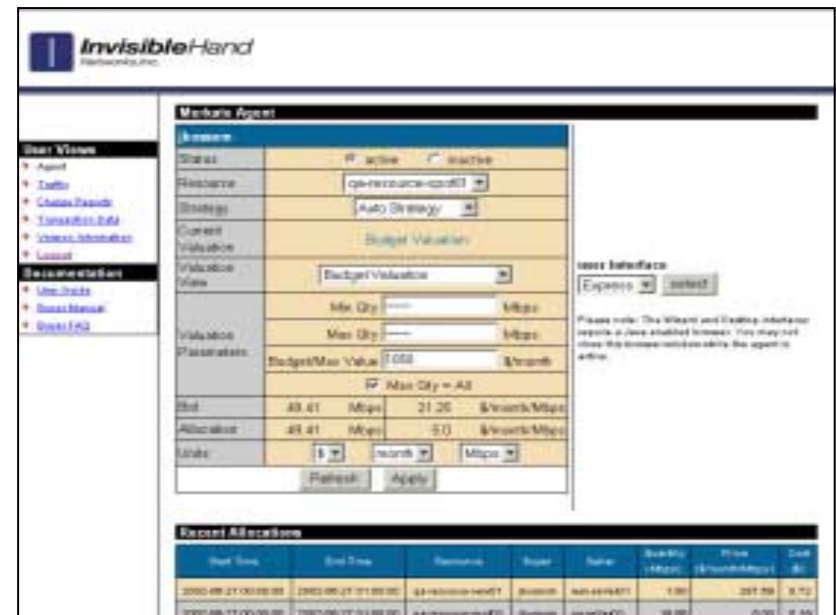
Figure 2: *The Opening Merkato Portal Screen*

Planning For Your Bandwidth Needs

Before you buy bandwidth you should plan your bandwidth needs.

A good way to determine your bandwidth needs is to calculate your data transfer rate requirements. Merkato specifies the rate in Kbps, Mbps, or Gbps. (See "Units Conversion Chart" on page 34.)

Reserved or Spot-Market Bandwidth?

There are two ways to purchase bandwidth in a Merkato system.

You can create a bidding strategy and bid for bandwidth with other buyers, establishing a *fair market price* based on supply and demand.

You can request and reserve a fixed amount of bandwidth, at a fixed price, for a fixed term.

The first method is called the Spot market and uses a Spot market agent. The second method is called the Reservation market and uses a Reservation agent.

To get bandwidth from the Spot market, you configure your Merkato agent to bid on your behalf in a continuous bandwidth auction. To get bandwidth in the Reservation market, use your Merkato agent to ask for a fixed-price quote, based on the quantity and duration you specify. Bandwidth may be obtained on both markets simultaneously and combined into a single allocation.

(For a complete description of each method, see *Merkato Buyer's User Manual*, "Spot Market and Reservation Market Agents.")

Buying Reserved Bandwidth

The reservation agent allows you to obtain an allocation of bandwidth that begins and ends at dates and times you specify.

Reservations must be bought on the Merkato desktop interface. To buy reserved bandwidth, perform the following procedures.

Log in to the Merkato portal. (See "Logging In" on page 1.)

From the user interface pull-down menu in the browser window, select *Desktop* and click select.
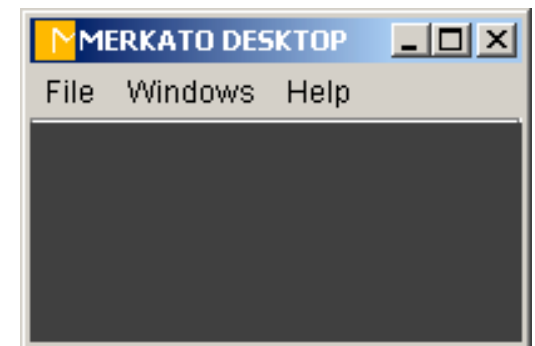
Figure 3: *The Merkato Desktop*

If the Java plug-in works correctly, you see a series of download messages. The Merkato Desktop window appears (Figure 3).

Downloading the Desktop Agent

The Desktop interface allows you to control your agent and observe the auction in progress. Your agent is brought to your PC and bids on your behalf from the Merkato desktop.

Java on Your Browser

If your browser is not configured for Java version 1.3.1 you must download it before you can run a Desktop agent. You can allow Merkato to do this automatically, or you can download it directly from the source whose link is provided in the login page.

There are later versions of Java, but we do not recommend using them.

Automatic Download

If your browser doesn't have Java version 1.3.1, the first time you attempt to download a Desktop agent you are guided through the installation of the Java plug-in.

Reply "Yes" to all security permission requests.

Active Download

If you encounter problems, you can download Java free from Sun Microsystems. The URL is:

```
http://java.sun.com/products/plugin/
```

Note: As of this writing, to get the plug-in, you must download the entire Java Run Time Environment, which is greater than 5 MB. Netscape version 6.1 for Windows appears to support the Merkato Java applications, but it is not fully tested for Merkato version 2.1. Merkato supports all versions of Internet Explorer. Likewise, the Java 1.3.1 plug-in for Macintosh OS X appears to work as well, but is not fully tested for Merkato version 2.1.

Download Procedure

To download an agent follow these steps:

1. In the Agent Download window (Figure 5) enter the username and password.

   By default, this is the same as the username and password you used to access the Desktop interface from the initial login; the fields are populated with this information. You may specify another valid username and password to download another agent.

2. If the Agent Download window is not available, from the File pull-down menu (Figure 4), select *Download Agent*.

   The Download Agent window appears.
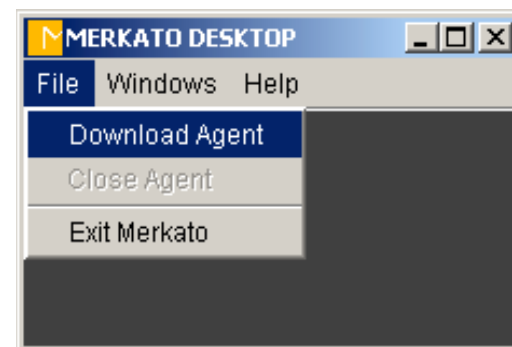
Figure 4: The Desktop Agent Download Menu
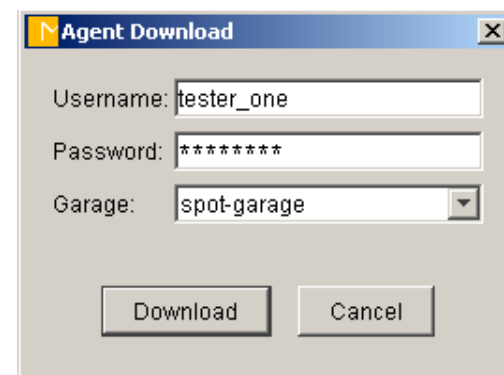
Figure 5: The Desktop Agent Download Window

If there are Garage choices on a pull-down list that indicates both spot and Reservation marketplaces, select the reservation garage and click Download. (See Figure 6.)

If you have a single choice in the Garage field, your Merkato administrator will have given you two distinct usernames and passwords—one for each market. In this case, make sure that the username and password correspond to the Reservation market and click Download.
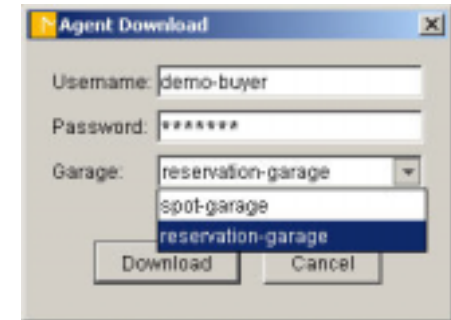
Figure 6: *The Garage Selection Pull-Down Menu*

The Desktop Agent window appears (Figure 7). This is the Agent interface through which you make your reservation.
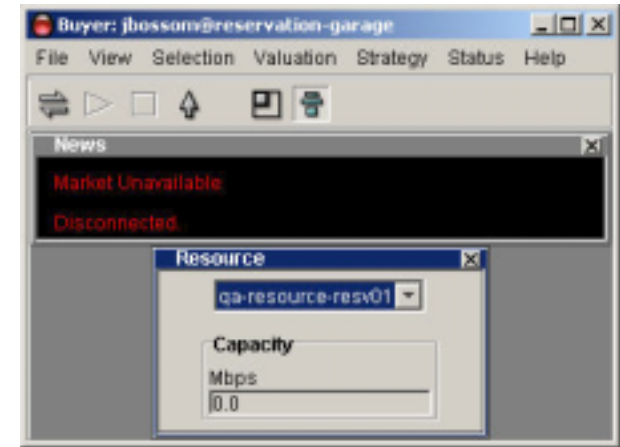
Figure 7: *The Desktop Agent Window*

Making the Reservation

1. Connect to the marketplace by clicking on the Connect icon (⇆).

2. If the News window is not visible, select *News* from Status pull-down menu. (See Figure 8.) The News window appears.

3. Click the Start icon (▷).

4. Read the available bandwidth capacity from either the News or the Resource window. If this capacity is greater than or equal to what you want, proceed. (If not, you can either attempt to obtain what is available or consider buying bandwidth on the spot market.)

5. From the Strategy pull-down menu, select Reservation Strategy. (See Figure 9.) Expand the display area, if necessary, to see the Reservation Strategy window at the bottom.

6. Click the pack icon (▣) on the menu-bar or select *Pack* from the View pull-down menu. The agent window resizes itself to accommodate the windows you are currently displaying.

7. In the Reservation Strategy window, make sure the **Current Strategy** button is selected.

8. If the quantity (Mbps) or time units (month) do not suit your needs, you can change the units. Select *Units* from the Selection pull-down menu. The Units box lets you use Kbps, Mbps, or Gbps, as well as minutes, hours, days, or months, and dollars and cents.
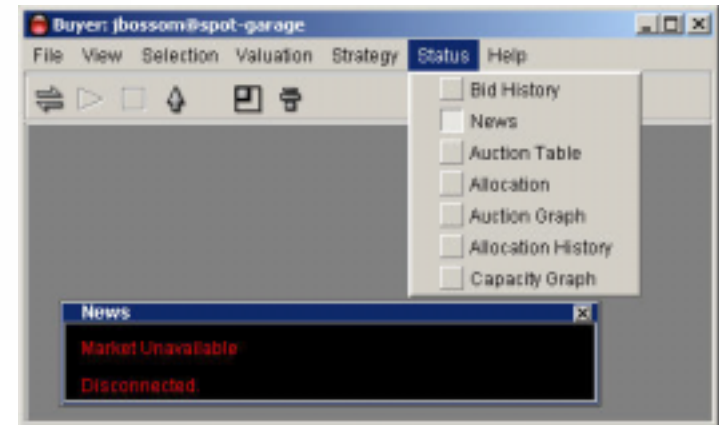
Figure 8: *The News Window*
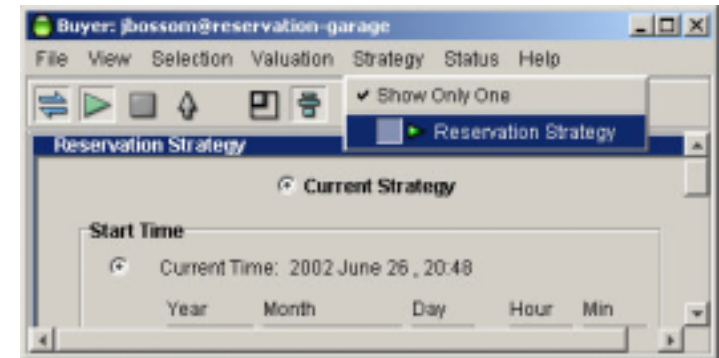
Figure 9: *The Reservation Strategy Window*

9. In the Start Time panel, select when you want the reservation to begin. There are three choices for the start time of your reservation:

- Current Time: If you select Current Time, the reservation, if accepted, begins immediately. To select the present as a start time click the radio button on the left.

- Future time: If you want the reservation to start at a certain future time, enter the year, month, day, hour, and minute at which you want the reservation to start. You must make sure that the date is valid (not February 30th, for example). Should you inadvertently enter an invalid date, Merkato attempts to determine your intent and present an equivalent valid date. If this is not what you intended to specify, you will have the chance to refuse the reservation and return to the date selection window. To select a future start time click the radio button on the left.

- End time of a reservation: If you have already created one or more reservations, they appear in this pull-down list. You can select the end of one of these existing reservations as the start time of the new reservation you are making. Select it from the list and click the radio button on the left.

10. In the End Time panel, select when you want the reservation to end. There are two choices for the end time of your reservation:

- Future time: Enter the year, month, day, hour, and minute at which you want the reservation to end. You must make sure that the date is valid (not February 30th, for example). Should you inadvertently enter an invalid date, Merkato attempts to determine your intent and present an equivalent valid date. If this is not what you intended to specify, you will have the chance to refuse the reservation and return to the date selection window.

Figure 10: *The Reservation Strategy Window*

- Start time of a reservation: If you have already created one or more reservations, they appear in this pull-down list. You can select the start of one of these existing reservations as the end time of the new reservation you are making. Select it from the list and click the radio button on the left.

11. Enter the amount of bandwidth you want in the Reservation portion of the box.

12. If you are satisfied that the quantity and duration specified, click **Get Quote**. A confirmation box appears. (See Figure 11.)

13. If the price and cancellation fee are acceptable, click **Accept**. Otherwise, click **Refuse** and revise your reservation request.

Once you click **Accept** your reservation is activated.

Figure 11: *The Reseration Confirmation Box*

- To review or cancel your reservation, select *Reservation Table* from the Status pull-down menu. The Reservation Table appears (Figure 12).

- To cancel a reservation, select it from the Reservation Table and click Cancel Reservation.

Figure 12: *The Reservations Table*

Exiting Merkato

To exit the Merkato desktop, click the close-box tab at the upper right hand corner of the window (×), or select *Exit Merkato* from the File pull-down menu.

Merkato gives you the option of uploading your agent when you close it on the desktop. If you upload you agent, the next time you download it the agent will retain the same units configuration.

You can leave the portal page in the browser open to monitor your agent status or click Logout in the list on the left side of the window.

Buying Bandwidth on the Spot Market

On the spot market, bandwidth is distributed by a system that ranks bidders by the price they offer, but charges them based on the price offered by the lowest bidder who receives an allocation of bandwidth (the "fair market price" for bandwidth at that time). If you bid too low in an auction you will be out-bid by other buyers.

The bidding process can be automated and run continuously without your intervention.

The spot market lets you get allocations of bandwidth to be used immediately; it provides bandwidth-on-demand. The changes you make to your agent's bidding profile take effect immediately and a resulting allocation will be granted in less than five minutes—at the close of the auction in progress. You may start or stop bidding at any time.

Note: Bidding From the Garage or From the Desktop

Although the auction allocation process runs continuously, there is no need for you to be directly involved at all times. Your agent can bid automatically for you after you configure it with figures indicating the value you place on bandwidth. Your agent communicates with the seller's agent on a Merkato platform called the Garage. The Garage is Merkato's name for auction services it runs from a server.

Once you configure your agent, you can either bid from your PC using a Java-based application, or communicate remotely with your agent as it bids from the Garage.

Bidding from your PC and operating a remote agent each has advantages. On your PC, the Merkato desktop display gives you real-time information about the auction and its participants. If you are not interacting with the agent, you can configure it and upload it to the garage. It will continue to run, and you avoid the chance of ceasing to bid if your PC crashes or you have network connectivity problems.

Choosing an Interface

You can chose from among three interfaces to get information and handle transactions. The User Interface menu lets you make the choice. (See

The Desktop interface allows you to purchase bandwidth through a series of user-selectable windows. Your agent is brought to your PC and bids on your behalf from there. On the desktop, monitoring features let you watch the Merkato auction in real time.

The Express interface lets you get status information from—and send configuration information to—an agent in the garage. The Express interface is at the top of the Portal page when you log in. The Express interface is considered advanced because the fields are less interactive, less annotated, and less graphical than the Java-based Merkato Desktop interface. Note that the Express interface does not support creation or cancellation of reservations.

The Wizard interface walks you through the steps for setting up your Merkato agent to obtain bandwidth through the spot market. The settings are automatically transferred to your agent. Changes made through the Wizard are applied to both the Desktop and Express agents. You can later change the settings from the agent interfaces, or return to the Wizard and make changes there.

When you first log in, the Express interface appears in the browser window.

We recommended that you start with the Wizard interface to make basic buying choices. When you become more advanced in your use of Merkato you can make further changes on the Desktop interface. The Desktop interface also gives you the most detailed status information. As you become more proficient with Merkato, you may want to use the Express interface to make quick configuration changes and status checks without downloading your agent to your PC.

Using the Wizard

The Wizard interface walks you through the steps to set up Merkato to obtain bandwidth. You can use the Wizard to set up bidding on the Express interface.

If you launch the Wizard from the Merkato portal it will configure an agent in the garage.

If you start the Desktop interface and launch the Wizard, it configures the desktop interface. (This configuration is applied to your Garage agent profile when you save or upload.)

To access the Wizard from the Merkato portal, select it from the portal user interface menu, as shown below.

The Wizard window appears (Figure 13). The Wizard takes you step-by-step through configuration of your Merkato spot-market agent. It provides detailed help on each page. You can activate the Help display by clicking the check box at the bottom of the screen, between the Next and Apply buttons).

Figure 13: *The Wizard Window*

When you reach the final screen of the Wizard, you have:

- specified the bandwidth resource which you would like to obtain

- selected units for display of currency, bandwidth quantity, and time

- set a minimum amount of bandwidth that you would like to obtain

- set a maximum amount of bandwidth that you would like to obtain

- Set a budget that you do not want to exceed when bidding for bandwidth between your minimum and maximum thresholds

The final Wizard screen lets you confirm your choices and apply them to your agent. It gives you the option to begin bidding after it applies configuration changes are applied to your agent.

To begin obtaining bandwidth in the spot market immediately, do the following:

1. Select *Apply settings and start bidding* from the pull-down list. (See Figure 14.)

2. Click **Apply** at the bottom of the screen.

If you launched the Wizard from the Merkato Desktop, the Desktop agent is active and bidding.

If you launched the Wizard from the Merkato portal:

1. In the confirmation window, click **Yes** to indicate that you want to quit the Wizard and apply the settings.

2. Select *Express* from the user interface selection pull-down menu.
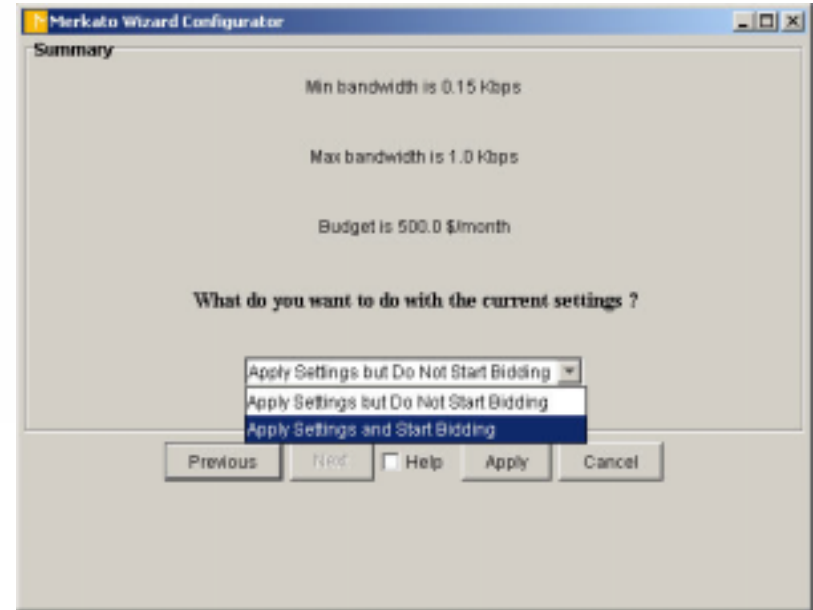
Figure 14: *The Apply Settings Menu in the Wizard*

The configuration you set using the Wizard appears in the Express interface, shown in Figure 15.

The Status selection in the Express interface indicates that the Agent is active, showing that the Agent is currently bidding.
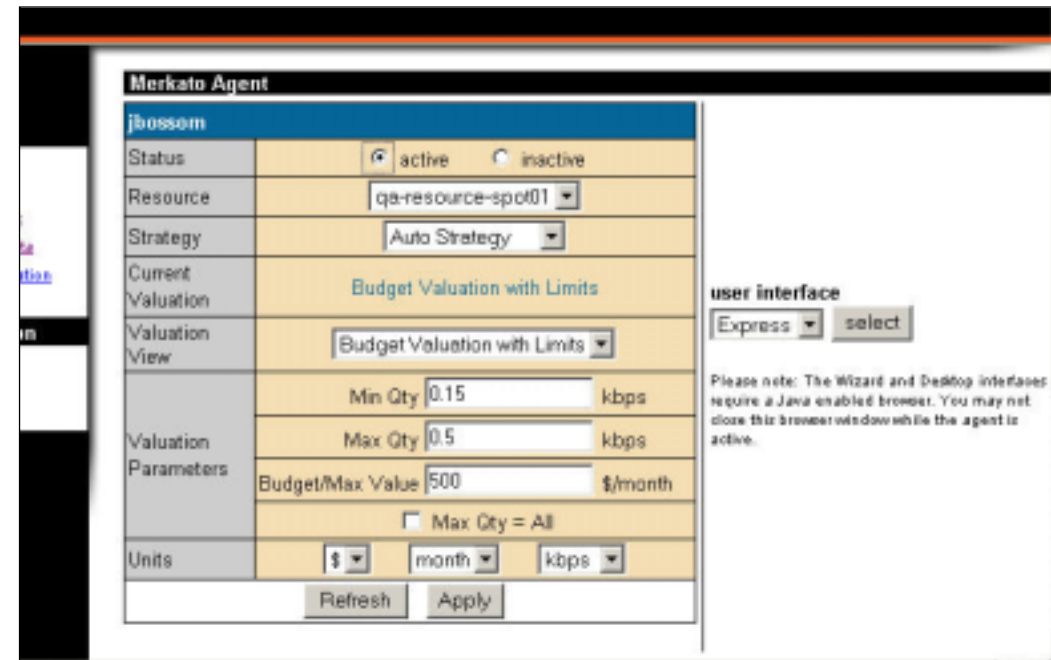
Figure 15: *The Express Agent interface With Values Configured*

Using the Desktop Agent

You can use a Desktop agent to bid from your PC. You can also use the desktop to conveniently make setting changes, and then upload your configured Desktop agent and bid from a garage. (See "Note: Bidding From the Garage or From the Desktop" on page 10.)

For a complete description of fields in the Desktop agent, see *Merkato Buyers' Reference Manual,* "Desktop Interface."

Downloading the Desktop Agent

To bid using the Desktop agent, do the following:

1. From the Merkato portal, select Desktop from the user interface menu and click **select**.

   If Java 1.3.1 is not installed on your PC, Merkato will prompt you to download it.
   The Desktop window appears, as shown in Figure 16.

2. If the Agent Download window is not available, from the File pull-down menu, select *Download Agent (*Figure 17*)*. The Agent Download login box appears (Figure 18).

3. In the Agent Download window, enter the username and password.

   By default, these are the same as the username and password you used to access the Desktop interface from the initial login; the fields are populated with this information. You may specify another valid username and password to download another agent.
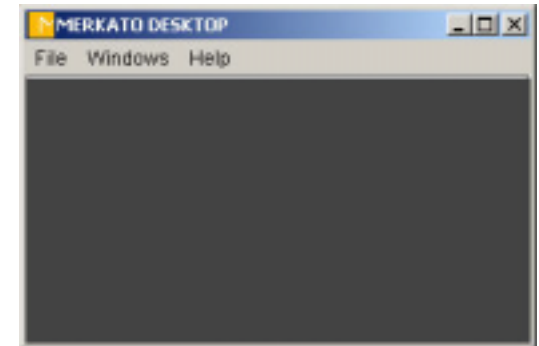
Figure 16. The Merkato Desktop
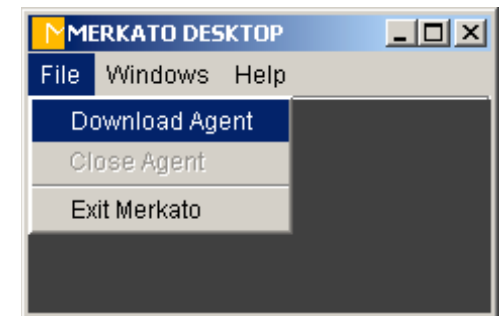
Figure 17. The File Pull-Down Menu
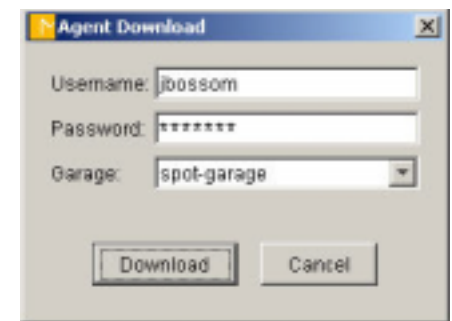
Figure 18. The Agent Download Login Box

4. Select a garage from the pull-down menu (Figure 19). Make sure the garage you select is the one that contains the desired Spot market agent.

   You may have a separate garage for your Reservations agent, as well as garages for multiple Spot market agents (if you are allowed to purchase bandwidth from multiple markets simultaneously). (See "Note: Bidding From the Garage or From the Desktop" on page 10.)

5. Click **Download**. When the agent finishes downloading it appears on the Merkato desktop, as shown in Figure 20.
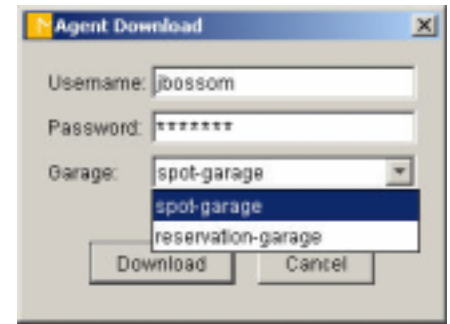
Figure 19: Garage Selection on the Agent Download Login Box
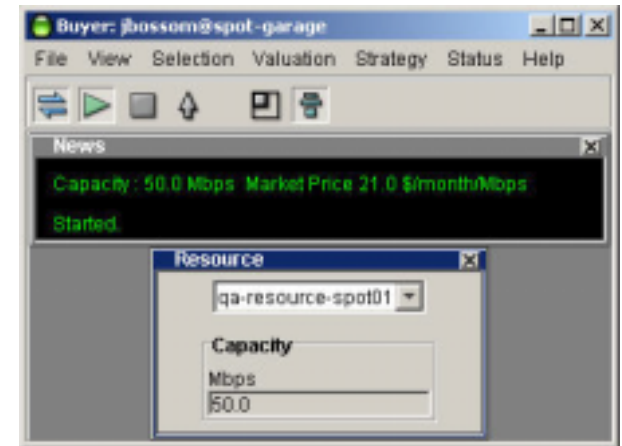
Figure 20: The Merkato Desktop Agent

Arranging Sub-Windows within the Agent Window

The agent window consists of smaller sub-windows, each of which can be displayed or closed as you wish. By default, windows are stacked vertically in the agent window, as shown in Figure 21.

Each time a window is selected for viewing it appears beneath the previously activated window. To close a window click the close-box tab at the upper right hand corner of the window (❌). The window closes and the other windows move up to fill in the spot it occupied.

To freely drag boxes within the agent window, de-select the Stack (🔧) icon or go to the View pull-down menu and de-select Stack. You can arrange the boxes as you like. (See Figure 22.)

To resize the agent window to exactly match the windows displayed, click the Pack icon (🔲 second from right) or select Pack from the View pull-down menu.

Note: To arrange Agent windows on the Merkato desktop, see *Merkato Buyers' Reference Manual,* "Arranging Agent Windows."
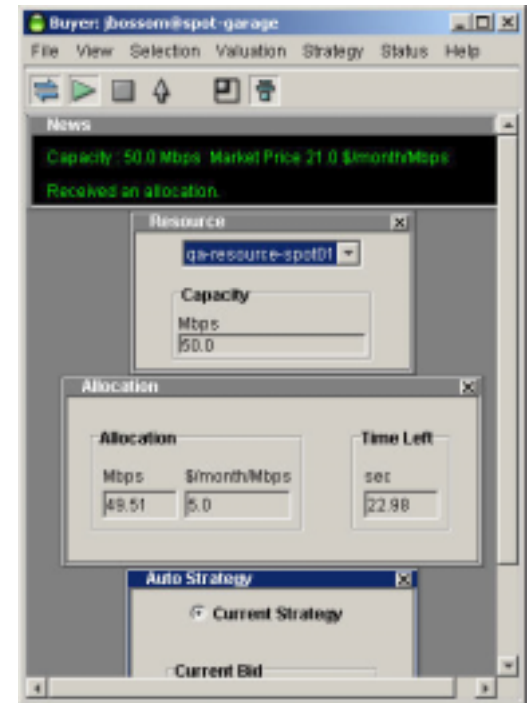
Figure 21: *The Desktop Agent With Stacking Enabled*
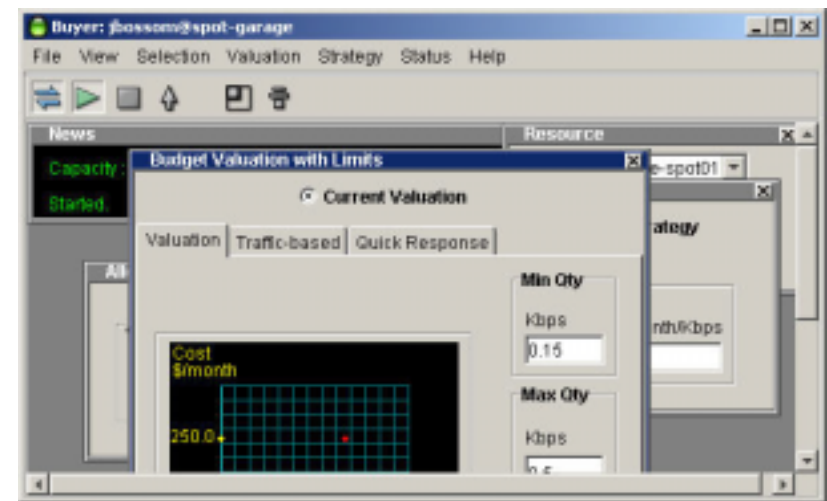
Figure 22: *The Desktop Agent With Stacking Disabled*

Select Bidding Units

In the Units fields, you can make changes to money, time, or bandwidth units. Changing units doesn't change your bid—it converts the displayed values to the ones you choose.

From the Selection pull-down menu, select Units. The Units box appears (though you may have to expand the agent box to see it). (See Figure 23.)

Use the pull-down menus in the Currency, Quantity, and Time fields to pick the units you want to see in the other desktop agent windows.

For details, see "Units Conversion Chart" on page 34.
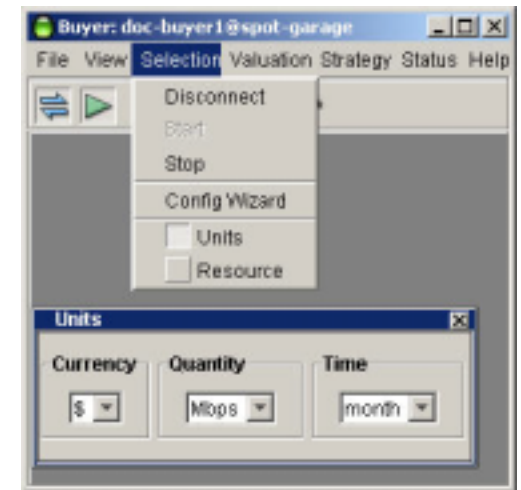
Figure 23. *The Units Window*

Select a Valuation

Your valuation settings indicate the maximum amount you are willing to pay for a range of desired bandwidth. In the course of an auction, your agent uses this valuation information, together with the market price, to determine how much to bid and how much bandwidth to ask for, in response to changing market conditions.

For a description of the methods of valuation, see *Merkato Buyers' Reference Manual,* "Valuation Overview."

1. From the Valuation pull-down menu, select a valuation method. (See Figure 24.)

2. Create your valuation by filling in the fields. The fields are different depending on which valuation method you select. For an automated approach to setting quantities see "Using Traffic Based Bidding" on page 20 and "Using Traffic Based Bidding" on page 22.

3. Select **Current Valuation** to activate the valuation.

4. Click **Apply**. (The Apply button is only available after you make a change.)

Changes to valuations only affect bidding if that particular valuation is active—indicated by the **Current Valuation** radio button at the top of the window and the green arrow in the pull-down menu list. If a valuation is not active, the changes are stored until you activate that valuation.
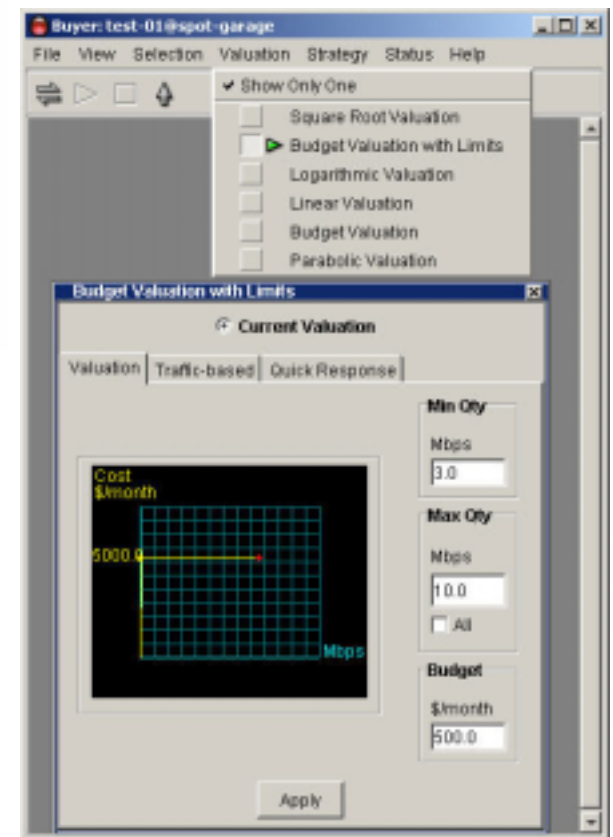
Figure 24: *Selecting a Valuation*

Traffic-Based Bidding

If you enable the Traffic-based tab in the valuation window, your agent changes its maximum quantity by checking the usage at intervals. The agent measures the amount of traffic at intervals you set (in the Time Window field). The agent bids for that amount of bandwidth, plus a quantity margin you set (in the Qty Margin field). The quantity margin can prevent your agent's maximum bid quantity from reaching zero at times of no traffic.

The diagrams in Figure 25 and Figure 26 show the relationship between the settings.

Figure 25: *Traffic-Based Bidding Measurements*

Figure 26: *The Traffic-Based Bidding Time Window*
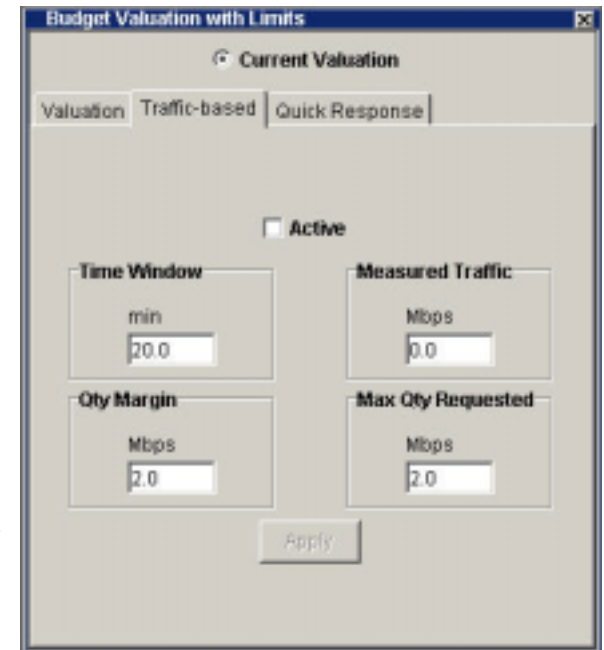
Using Traffic Based Bidding

Each valuation window has a Traffic-based tab (shown in Figure 27), and each serves the same function.

To use Traffic-based valuation, do the following.

1. In the Meas. Window field, enter the time interval at which you want your agent to adjust its bidding based on traffic volume. (You may want to change the units shown in the field to a shorter period. The smallest interval you can select is six minutes.)

2. In the Qty Margin field, enter the amount you want the agent to add to the measured traffic in calculating the requested quantity.

3. Check the **Active** check box.

4. Click **Apply** to active the changes you made to your agent.

Raising the quantity your agent bids for will increase your allocation if your bid is in accordance with market rates. If you find you agent consistantly being out-bid, you should raise the value or budget in your valuation.

Figure 27. The Traffic-Based Valuation Tab

Quick Response Bidding

Traffic-based valuation makes the Merkato Buyer agent respond to changes in network traffic. As traffic fluctuates, the Buyer agent reacts by changing the quantity of bandwidth it bids for. This change is incremental; the agent bids for the measured traffic (plus the quantity margin) for the duration of the Time Window.

However, traffic may increase dramatically during that time.

The Quick Response feature is useful for buyers who know, when traffic reaches a certain threshold, that the agent should increase its bidding quantity to a specific peak. This is the peak traffic the buyer expects.

The Quick Response feature works with Traffic-based bidding to make Merkato bidding jump to a certain quantity. It works only when Traffic-based bidding is activated.

Example of Quick Response Bidding

As shown in Figure 28, Traffic-based bidding tracks usage and causes the agent to bid at this rate (plus the quantity margin). Then traffic exceeds the traffic threshold. Immediately, the agent begins bidding for the estimated peak amount (plus the quantity margin). The agent continues bidding at this rate. Every five minutes Merkato examines the usage rate for the duration of the traffic window. When all traffic in the traffic window falls below the treshold, the agent resumes Traffic-based bidding.

Figure 28. *Quick Response Bidding Over Time*

Using Quick Response Bidding

When Quick Response is enabled (as well as Traffic-based valuation), your agent reacts to bursts of traffic by starting immediately to bid at the Est. Peak Traffic level (plus the Qty. Margin).

An agent with Quick Response enabled uses the values you place in two fields (see Figure 29):

Traffic Threshold—The quantity of traffic that triggers the Quick Response. When Merkato detects this level of traffic it changes the amount of bandwidth that the agent bids for.

Estimated Peak Traffic —When Quick Response is triggered, the amount the agent bids for is the amount you enter in the Est. Peak Traffic field, plus the quantity margin.

Note: Est. Peak Traffic cannot exceed the amount in the valuation window's Quantity field. The agent will not bid for an amount larger than is entered in the Quantity field.

Active check box—Checking this box enables Quick Response bidding on your agent.

Apply—Clicking Apply makes the numbers entered in the fields of the Quick Response tab active.

The signals mean the following:

Not Ready: Quick Valuation has been engaged, but there has not yet been a Time Window during which all traffic is below the Traffic Threshold. If a Traffic Window ends with no traffic above the threshold, the signal returns to Ready.

Ready: Quick Response is active, but no traffic above the Traffic Threshold been detected.

Engaged: Merkato has detected traffic above the Traffic Threshold and Quick Response is active. This state remains for at least the duration of the Traffic Window.

There is no guarantee of getting an amount of bandwidth equal to your estimated peak traffic. There are two reasons for this:

- The Estimate Peak Traffic may exceed the amount the Seller is offering.

- The Estimate Peak Traffic may exceed your budget (for instance, if demand is higher than you anticipated and your budget does not cover the cost). Your Agent will still try to acquire as much bandwidth as it can.
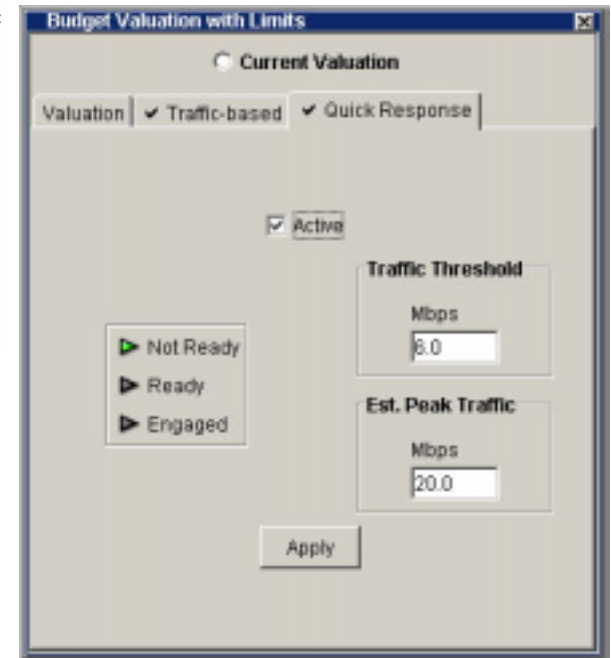
Figure 29. The Quick Response Valuation Tab

Select a Strategy

You can bid using an automatic strategy or a manual strategy.

An automatic strategy changes your bid continually according to market conditions and your valuation settings.

A manual strategy lets you make single bids at a set quantity and price.

(For a complete description of Merkato strategies, see *Merkato Buyers' Reference Manual,* "Strategy Overview.")

Note: If the quantity (Mbps, for example) or time units (month, for example) displayed do not suit your needs, you can change the units. Select Units from the Selection pull-down menu. The Units box lets you use Kbps, Mbps, or Gbps, as well as minutes, hours, days, and months. (See "Select Bidding Units" on page 17.)

Automatic Strategy

From the Strategy pull-down menu, select Auto Strategy.

The Auto Strategy window appears. (See Figure 30.)

With Automatic Strategy selected your agent starts bidding for you immediately and does not stop until you disable it.

The Auto Strategy window lets you see your bids as they are submitted. With Auto Strategy active, your agent bids, if it has a sufficient budget, every time the market price exceeds its last submitted bid. (Since the market price is determined by the price offered by the lowest successful bidder, a bid under this price does not receive an allocation.)

Figure 30: The Automatic Strategy Window

1. Select the **Current Strategy** radio button.

2. Enter the amount of bandwidth you want to bid for in the left field (quantity).

3. Enter the maximum you are willing to spend in the right field (cost).

Manual Strategy

From the Strategy pull-down menu, select *Manual Strategy*. The displayed quantity and unit price are those of your last bid.

1. Select the Current Strategy radio button.

2. Enter the amount of bandwidth you want to bid for in the left field (quantity).

3. Enter the maximum you can spend in the right field (cost).

When you are connected to the garage and ready to bid, click **Bid**. This sends your bid to the auction. Note that this is a one-time event. The submitted bid is not carried over to the next auction round. If you wish to place a single take-it-or-leave-it bid each auction round, use the Linear valuation with the Automatic strategy.

Figure 31: *The Manual Strategy Window*

Connecting and Starting Your Agent

The three icons at the upper left of the icon bar are, (from left to right) "Connect," "Start," and "Stop."

When you first download an agent it may not be connected to the auction. Your agent cannot bid when it is disconnected, although you can set its configuration. When the connect symbol on the icon bar (on the far left) is un-depressed and un-colored the agent is disconnected.

When you connect to the auction, until you click the Start icon, you may observe the auction but you are not participating in it.

When you want to start bidding click the Start icon (second from left on the icon bar). Bidding starts immediately with the current settings.

To stop bidding, click the Stop icon (third from left on icon bar). Your agent stops bidding and is disconnected. To begin viewing the auction again you must connect again.

Viewing Your Allocations

The Allocation window (Figure 32) provides information about the quantity of bandwidth bought and the price paid for that bandwidth at the close of each successive auction. It also monitors the time left in the current auction.

To view the Allocation window, select Allocation from the Status pull-down menu.

During an auction, the Time Left field counts down the seconds left in the auction. The auction does not close until all agents have stopped bidding.

When the auction ends and an allocation is made to your agent, its quantity and cost appear in the left-hand side of the Allocation window. It remains displayed until you get another allocation.

If You Fail To Get an Allocation

If market conditions are such that you get no allocation (or choose not to bid), your traffic still has bandwidth available to it. The data streams of agents that do not bid (or do not win any allocation) are generally funneled through a single, shared amount of permanently allocated bandwidth. This bandwidth is shared by all buyers who fail to get allocations. Ask your Merkato administrator how much bandwidth is allocated to this "best effort queue" so that you can make the best decision of when to stop bidding on the low end (see Budget Valuation with Limits).
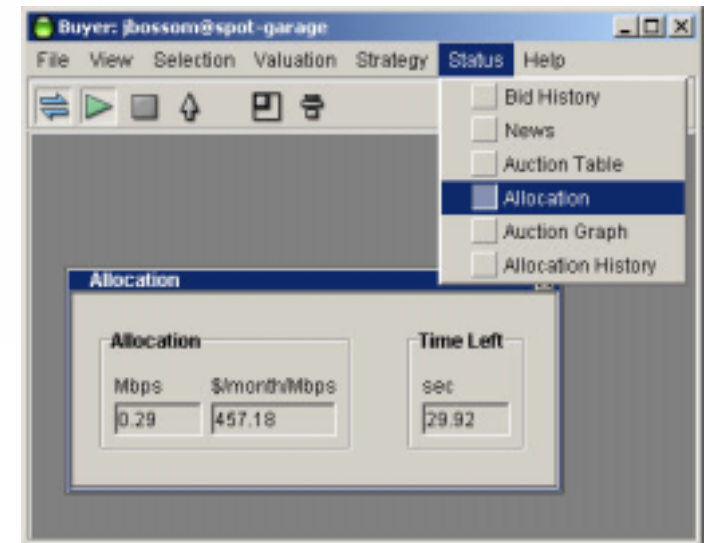
Figure 32: *The Allocation Window*

Viewing Auction History and Current Data

In addition to the Allocation window, Merkato provides a variety of other tools to let you view past and current auction data. These include the following:

Auction Graph—Indicates the state of the Merkato auction in progress, for all agents actively bidding. Colors and shapes on the graph indicate each bidder's last bid, your previous allocation, your proposed allocation, a graph of you valuation, and the activity of other bidders.

Auction Table—Shows a quantitative, real-time view of the auction in progress.

News Window—Shows the real-time status of your agent and the capacity and price currently offered in the market (if the agent is connected).

You can use this information to optimize your bidding strategy in relation to other bidders in the auction.

See the *Merkato Buyers' Reference Manual* for details about these tools.

Letting Your Agent Bid Without You (Uploading)

You can set your agent to bid continually for you. You don't need to monitor it and you don't need to run it on your PC. You can upload it to the garage, where it remains active and continues to bid on your behalf. This ensures that you continually get the bandwidth you need at the best price, based on the valuation you set when you configure the agent. Simply upload your agent to the garage. You can continue to monitor it via the Express interface on the Portal, but if you close the desktop or shut off your PC, the agent continues to function as you have set it.

To upload and exit, do the following:

Click the up-arrow icon (![up-arrow icon]). The confirmation message indicates the garage where your agent will be placed. (See Figure 33.)

When the confirmation box appears (**Figure 33**), click **OK**.

The agent window closes but the Merkato desktop window remains.
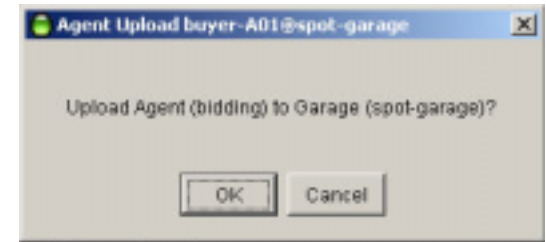
Figure 33. The Upload Confirmation Box

Saving Your Configuration

You may want to save the settings you made on the desktop agent, to your garage agent profile, without exiting from the desktop agent. We recommend this to ensure that if your PC freezes or reboots, your configuration changes are not lost.

If you want to save the way your agent is configured, but not transfer your agent to the garage, do the following:

1. From the File menu, select *Save Configuration*:
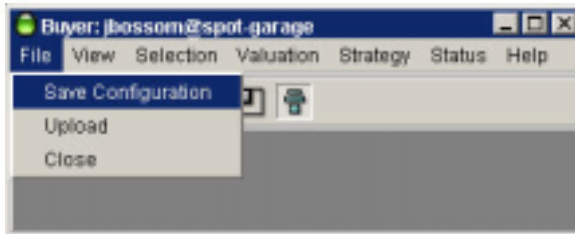
A confirmation box appears (Figure 34), showing which garage your configuration will be saved to. (If multiple garages are available, they will appear in a pull-down list.)

2. Make sure the garage listed is the one you want to save to (generally the garage you downloaded the agent from), and click OK.
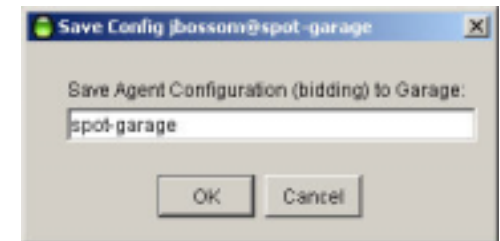
Figure 34. The Save Configuration Confirmation Box.

Exiting the Merkato Desktop

To exit Merkato, click the close-box tab at the upper right hand corner of the window (☒), or select *Exit Merkato* from the File pull-down menu.

You can leave the portal page in the browser open to monitor your agent status (via the Express agent), or click Logout in the list on the left side of the window.

Using the Express Agent

The Express interface is an HTML version of the Desktop interface, with some significant differences:

- It leaves your agent in the garage and controls it remotely. (See "Note: Bidding From the Garage or From the Desktop" on page 10.)

- The screen is not updated in real time. You must click Refresh to update information in status displays.

- You may not create or cancel reservations through this interface. Nor can you submit manual bids or make changes to traffic-based valuation settings. (Existing settings made in these areas through the Desktop interface are not affected by using the Express interface to change other settings.)

The Express interface is meant to support advanced users who know what the fields mean and wish to have a quick way to check agent status or make configuration changes.

(See *Merkato Buyers' Reference Manual*, "Express Agent.")

The Express agent is the first screen you see when you log in on the Merkato Portal.

When you first log in, the window looks like the one in Figure 35.
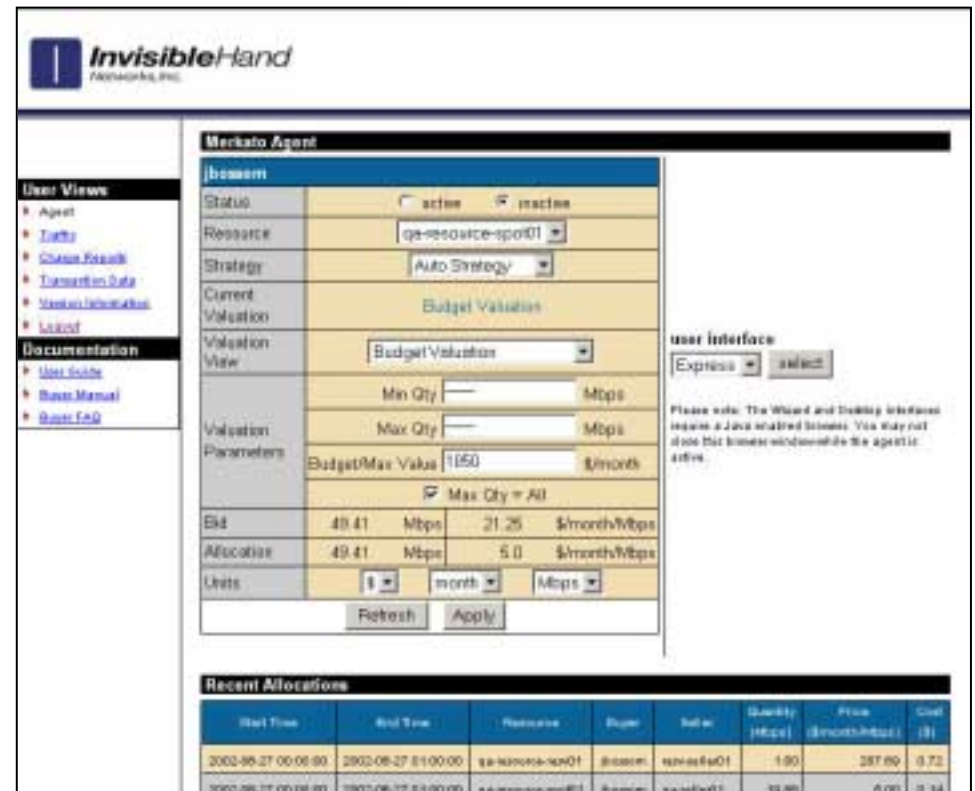
Figure 35: *The Merkato Portal Showing the Express Agent*

Valuation and Strategy

You must configure the Express agent to bid using an automatic strategy. (Manual is available but not supported.) An automatic strategy changes your bid continually according to your valuation settings and market conditions. It bases the bid on the market price, your valuation parameters, and the amount it is informed it would receive if no more bids were submitted (and this auction round closed).

Use of a manual strategy (submitting each bid manually) is not supported through the Express interface, but this strategy setting will be indicated if previously configured (and uploaded) via the Desktop interface.

(See Merkato Buyers' Reference Manual, "Strategy Overview.")

You must also configure the Express agent with a valuation method.

Your valuation settings indicate the maximum you are willing to pay for a range of bandwidth. In the course of an auction, your agent uses this valuation information to determine whether to bid, how much bandwidth to ask for, and how much to offer, in response to changing market conditions.

In the Express interface, you can view and change settings for inactive or the active valuation. You do this by making a selection under the "Valuation View" pull-down menu. The valuation parameters automatically change to reflect the selected valuation. To make the new valuation active, click Apply. The "Current Valuation" display changes to the valuation currently being viewed, and the agent begins bidding using the new valuation profile and settings.

(See Merkato Buyers' Reference Manual, "Valuations Overview.")

Controlling the Express Agent

The **Active** and **Inactive** radio buttons at the top of the window control whether the Express agent is running.

The **Refresh** and **Apply** buttons at the bottom of the window control communication with your agent:

- **Refresh** updates the read-only status fields in the windows without sending configuration changes to the Agent. All values saved the last time changes were applied are restored.

- **Apply** sends configuration changes to the Agent.

For a complete description of fields in the Express Agent, see *Merkato Buyers' Reference Manual,* "Express Agent."

Bidding From the Express Agent

To bid for bandwidth from the Express agent, follow these steps:

1. Make sure the spot market is selected in the Resource field.

2. Select Auto bidding strategy in the Strategy field.

3. Select a valuation in the Valuation View field. (For a description of the methods of valuation, see *Merkato Buyers' Reference Manual,* "Valuation Overview.")

4. In the Units fields, you can make changes to money, time, or bandwidth units. Changing units doesn't change your bid—it changes the display to show the units you choose.

5. In the Min Qty field, enter the Minimum bandwidth you want to buy. (A line through this field means that no entry is necessary.)

6. In the Max Qty field, enter the maximum bandwidth you want to buy. (A line through this field means that no entry is necessary.) If the maximum quantity is the all the seller is selling, check the Max Qty = All check box.

7. In the Budget/Max Value field, enter the appropriate currency per unit/time value for the valuation you selected. For budget-based valuations, this is the maximum amount of money you are willing to spend on the acceptable range of bandwidth you want to buy. For other valuations, this value is related to the maximum you are willing to spend, but does not directly correspond to it. The *Merkato Buyers' Reference Manual,* "Valuation Overview" explains how to configure these details for each valuation.)

8. When you are satisfied with all entries, click **Apply**. The "Current Valuation" display changes to the Valuation View you configured.

9. If you want to begin bidding now, click the active radio button in the Status area.

10. Click **Apply** to begin bidding. A Bid field appears in the display, indicating the amount of your current bid. Click Refresh to update this display at any time.

11. In five to ten minutes, click **Refresh** again. The Allocation field appears. It displays the bandwidth you have won, and its cost, in the completed auction. Click Refresh to update this display.

Figure 36 shows the Express interface, as it appears after you complete these procedures.

Figure 36: The Express Agent

Viewing Historical Information

The Recent Allocations table is part of the Merkato Portal. It appears under the Express Agent. (See Figure 37.)

The Recent Allocations table shows bandwidth allocated to the current loggedin user and the amount charged for this bandwidth. Allocations are shown in order, most recent at the top (sorted by End Time). Each row corresponds to a single reservation (for Reservation market resources), and for an hourly roll-up of auction results (for Spot market resources). The Allocation Table indicates that Merkato auctions have been providing the desired results.

For a full description of Express agent fields, see *Merkato Buyers' Reference Manual,* "Express Agent."

Recent Allocations

Start Time	End Time	Resource	Buyer	Seller	Quantity (Mbps)	Price ($/month/Mbps)	Cost ($)
2002-07-17 17:00:00	2002-07-17 18:00:00	qa-resource-spot01	julia0	qa-seller01	0.15	256.61	0.05
2002-07-17 17:00:00	2002-07-17 18:00:00	qa-resource-resv01	julia0	qa-seller01	3.50	270.98	1.32
2002-07-17 16:00:00	2002-07-17 17:00:00	qa-resource-spot01	julia0	qa-seller01	0.15	256.65	0.05
2002-07-17 16:00:00	2002-07-17 17:00:00	qa-resource-resv01	julia0	qa-seller01	3.50	270.98	1.32
2002-07-17 15:00:00	2002-07-17 16:00:00	qa-resource-resv01	julia0	qa-seller01	3.50	270.98	1.32
2002-07-17 15:00:00	2002-07-17 16:00:00	qa-resource-spot01	julia0	qa-seller01	0.15	256.65	0.05
2002-07-17 14:00:00	2002-07-17 15:00:00	qa-resource-spot01	julia0	qa-seller01	0.15	256.65	0.05
2002-07-17 14:00:00	2002-07-17 15:00:00	qa-resource-resv01	julia0	qa-seller01	2.50	270.98	0.94
2002-07-17 13:00:00	2002-07-17 14:00:00	qa-resource-spot01	julia0	qa-seller01	0.15	256.64	0.05

Figure 37: *The Recent Allocations Table*

Appendix

This section contains information you may find useful as you configure your agent.

Units Conversion Chart

If you find it more convenient to think of bandwidth in terms of transfer time for files of various sizes, which are expressed on bytes rather than bits, the following chart may be helpful.

GigaBytes/month (GB/mo)	MegaBytes/month (MB/mo)	Megabits/sec (Mbps)	Kilobits/sec (Kbps)	Telco Standard
150	150,000	0.5	463	
166	166,000	0.5	512	512K
250	250,000	0.8	772	
500.3	500,300	1.5	1,544	T-1
1,000	1,000,000	3.1	3,086	
5,000	5,000,000	15.4	15,432	
10,000	10,000,000	30.9	30,864	
14,495	14,494,500	44.7	44,736	T-3
15,000	15,000,000	46.3	46,296	
16,796	16,796,000	51.8	51,840	OC-1
20,000	20,000,000	61.7	61,728	
25,000	25,000,000	77.2	77,160	
30,000	30,000,000	92.6	92,593	
40,000	40,000,000	123.5	123,457	
50,389	50,388,500	155.5	155,520	OC-3
75,000	75,000,000	231.5	231,481	
100,000	100,000,000	308.6	308,642	

Valuation Summary Chart

	Linear	Square Root	Budget	Budget With Limits	Logarithmic	Parabolic
Bandwidth Quantity	Flexible, depending on availability	Fluctuates with market	Fluctuates with market	Uses minimum and maximum range	Fluctuates with market	Fluctuates with market
Price	Fixed – price per unit	Fluctuates with market	Fluctuates with market	Fluctuates with market	Fluctuates with market	Fluctuates with market
Cost	Proportional to quantity received	Decreases with decreasing quantity	Constant regardless of quantity received	Constant if quantity received is within range	Peaks at middle of quantity range	Peaks at middle of quantity range
Agent Actions	Agent bids at constant unit price regardless of quantity.	Agent increases bandwidth request as market price drops, and decrease request as price increases.	Agent purchases all bandwidth possible for $XX.	Agent will purchase bandwidth only up to X amount, even if price drops.	Agent bids aggressively at the mid-point of a quantity range. Use if you want a certain bandwidth amount, but will take more at lower cost.	Agent bids aggressively at the mid-point of a quantity range. Use if you want a certain bandwidth amount, but will take more at lower cost. Bids less aggressively than the Log valuation at lower amounts of bandwidth.

Glossary

agent: The program that interacts with the rest of Merkato on behalf of buyers and sellers. Buyers can acquire bandwidth by configuring their agents to offer the price they are willing to pay for a range of available quantity, or use their agent to request a quote for a fixed-price bandwidth reservation. Sellers configure their agents with a quantity of bandwidth for sale and a minimum price they are willing to accept for that quantity.

allocation: An amount of bandwidth available for your use. Depending on the type of service being offered through Merkato, this can represent the maximum bandwidth available to you or a minimum guarantee of bandwidth available to you.

bandwidth: The amount of data transmitted or received per unit of time. When we refer to acquiring or selling bandwidth, we mean the amount of information that can be sent over a connection at one time, at the allowed speed, without packet loss or excessive delay. Bandwidth is measured in bits-per-second.

bumping: Bumping occurs when a user logs in using the ID and password of an active agent. The user who is logging-in sees a message that an agent with this login ID is already active. If the new user procedes, the old user is disconnected. The agent uses the saved configuration of the agent, not necessarily the configuration of the previously active agent.

Buyer agent: The program that interacts with the rest of Merkato on behalf of buyers. Buyers can acquire bandwidth by configuring their agents with the price they are willing to pay for a range of bandwidth (on the spot market), or with a time-frame and desired quantity (on the Reservation market). In a Merkato auction, Buyer agents signal what they are willing to pay for bandwidth in the form of bids, consisting of a unit price and a quantity.

capacity: In the Merkato interface, the term capacity refers to the total amount of bandwidth available from the Seller.

data transfer rate: The speed at which data is transferred from one port to another. See Kbps, Mbps, and Gbps.

Desktop agent: The Merkato application for buyers or sellers that runs on a Windows PC. Merkato desktop agents bid for bandwidth from the user's PC using a Java-based application. Alternatively, Merkato agents can run as an application on a server, called the "Garage." Users can interact with these remote agents through an HTML browser interface.

Express agent: The Merkato HTTP application for buyers or sellers that configures and obtains status from Merkato agents running from a remote location. Accessing the agent in this way is an alternative to

bringing the agent to the user's desktop and using the Java-based interface. The Express agent is accessible through the Portal.

floor price: The lowest price the seller will accept for bandwidth. The seller can establish the floor price through the Seller agent.

garage: A server from which buyer and seller agents can bid when they are not actively bidding on a user's PC desktop. The garage is generally installed on the Merkato server, providing maximum performance and reliability.

Gbps: One of the ways of expressing units of bandwidth; Gigabits-per-second (1,000,000,000 bits-per-second).

Java: A programming language, useful for internet and networking applications. The environment used for the Merkato Desktop Interface.

Kbps: One of the ways of expressing units of bandwidth–kilobits-per-second (1,000 bits-per-second).

market price: The price for something that buyers and sellers agree on. Merkato establishes a market price for bandwidth during each spot market auction round. There is a fixed amount for sale, so as demand increases, prices rise. The market price is reached when the cumulative demand of all the buyers is exactly equal to the amount of bandwidth being offered by the seller.

Mbps: One of the ways of expressing units of bandwidth–Megabits-per-second (1,000,000 bits-per-second).

Merkato desktop: The Merkato desktop is the first window that appears when the user begins to bring the Merkato buyer or seller agent to their desktop. It lets users specify which Merkato agent or agents they want to download to the desktop.

Merkato: InvisibleHand's software platform, which dynamically prices, sells, and allocates IP bandwidth in real time. Merkato means "market" in Esperanto.

Player: A buyer or seller in the Merkato auction.

Portal: The main access point to all Merkato applications. It is an HTML-based interface accessible from a standard web browser.

progressive second price auction: The unique market mechanism by which Merkato allocates bandwidth to potential buyers at an optimal market price. An auction is established, where each bid consists of a unit price and the quantity desired at that price. Bidders are ranked according to the unit price they offer. Bidders who get an allocation pay the unit price offered by the lowest accepted bidder. (This is the "second price" aspect of the auction.) Bidders who don't get an allocation can re-bid at a higher unit price,

in an attempt to improve their ranking in the auction. (This is the "progressive" aspect of the auction.) An auction round closes when all bidders are either successful, based on their last bid, or cannot match the price offered by the current lowest successful bidder.

PSP: See "progressive second price auction."

Reservation market agent: A buyer agent connected to the Reservation market.

Reservation market: The Merkato market mechanism by which a specified quantity of bandwidth, for a specific duration, is sold for a firm price specified by the seller and agreed to by the buyer. This is an automated process based on a rate sheet that the seller establishes in advance.

Resource agent: The application that manages the Merkato marketplaces, where bids are received and allocations issued (the spot market) or where price quotes for reservations are generated and accepted quotes for reservations are processed.

Seller agent: The program that interacts with the rest of Merkato on behalf of sellers. Sellers configure their agents with a quantity of bandwidth capacity for sale and a minimum price for that quantity. Buyer agents then express what they are willing to pay for bandwidth in the form of bids, consisting of a unit price and a quantity. Currently, there is no seller agent for the Reservation market, but one will be supported in a future release.

Spot market: The Merkato mechanism by which bandwidth is traded, in a progressive second price auction. An optimal fair market price is established and bandwidth is allocated to buyers, based on their bids relative to other buyers.

Spot Market agent: A Buyer agent or Seller agent connected to a spot market. There are also reservation agents (for buyers only).

valuation: The value a buyer or seller places on bandwidth. Setting a valuation is part of setting a purchasing strategy. Valuation settings within a buyer agent let buyers specify the amount they are willing to pay for varying amounts of bandwidth. This information is used by the agent to respond to changing market conditions during a Merkato progressive second price auction.

Wizard: In Merkato, an automated series of inquiry screens that walks you through the process of creating and configuring a Spot market Buyer agent.