Talisma Enterprise

A Technical White Paper

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TALISMA™

Rel@tionships were never so easy

Contents

Executive Summary

In the rush to establish a presence on the World Wide Web, many businesses—whether traditional brick-and-mortar organizations or fully Web-based enterprises—failed to anticipate the effects a Web presence would have on their customer-service resources. As a result, they are now struggling to cope with customers' demands for fast and personalized service over the Internet.

If customers can't find what they're looking for on a company's site and are unable to get immediate help, they may abandon their shopping carts and click away to a competitor's site. If the company is lucky, the frustrated customer may choose to give it another chance, requesting help via an e-mail. But if that e-mail doesn't receive a prompt response, the customer most likely won't go back at all. In both cases, the company has not only lost potential sales but also damaged the reputation it has worked so hard to build. Customers who leave a Web site without finding what they're looking for—and who don't receive prompt responses to their electronic inquiries—may well conclude that the company does not care about its customer relationships.

Smart businesses realize that each and every interaction with a customer, whether in person or over the Internet, is an opportunity to build a life-long relationship. To survive in today's Internet-oriented business environment—and to turn the electronic customer-service challenge into a competitive advantage—companies need a solution that will help them efficiently manage their electronic interactions with their customers.

Talisma Enterprise 2.5 offers such a solution. An enterprise-level electronic relationship-management system, it enables businesses to deliver fast, accurate, and personalized e-service. The system consists of the following modules:

- **Web Self-Help.** Web Self-Help is a Web-based, customer service tool that empowers site visitors to answer their own questions by querying a knowledge base. The key to the success of this system is its natural language processing (NLP) engine, which uses not only word matching but also context, word order, and word meaning to respond to a user's query. The result is an easy-to-use system that generates highly accurate responses.

  The self-help system frees customer service representatives to handle more complex customer inquires while also serving as a knowledge base. In addition, the system automates the process of creating, managing, and deleting FAQs (frequently asked questions). Because the Self-Help module logs visitors' questions, departments can run

reports against the log to help them further improve their knowledge base. For example, they might run a report listing the most common questions that generate a "zero results" response. They can then create new entries in the knowledge base to address these particular questions.

- **E-mail.** For organizations trying to cope with the deluge of customer e-mail, Talisma E-mail offers an ideal solution. Powerful, scalable, and robust, it enhances your team's productivity, lets you personalize responses, and helps you streamline your customer service—all while ensuring that no customer inquiry slips through the cracks.

  The e-mail module automatically prioritizes incoming e-mails based on sender and content and routes them to the right representative, in accordance with rules you set up. The representative can then choose either to (1) retrieve a standard response from the integrated knowledge base; (2) have the system automatically suggest several possible responses and then choose the best one; or (3) use information from the knowledge base to write a response. In each case, the response can be personalized with the customer's name, reference to past purchases, and other information stored in the customer database.

- **Web Forms.** Web forms are another way in which customers can communicate with an organization. Similar to e-mail, they differ in that they ask the submitter to fill in specific fields, resulting in structured information that simplifies routing and response. For example, a form may ask the submitter to choose from a list of subjects, such as Complaint, Return, or Question. The structured nature of Web forms makes them an efficient way to collect all the information the company needs to resolve an issue quickly and effectively. It also helps companies more accurately route queries, more effectively select canned responses, and populate database fields with key customer information for future reference in responding to that customer.

  All the same Talisma capabilities that help you manage your e-mail more efficiently can also be applied to Web form management, resulting in greater productivity for the response team, more personalized responses, and more efficient handling processes.

- **Talisma Chat.** Studies show that 67 percent of all online shopping carts are abandoned before a purchase is made due to lack of real-time assistance. The Chat module is an answer to this problem. With Talisma Chat, you can provide proactive, real-time, personalized service to site visitors on a 24-by-7 basis and turn browsers into buyers.

Customer service representatives can open up a chat window with visitors the moment they come to your site. They can then access a knowledge base to research a visitor's query, locate predefined canned responses (or create new responses), and push them to the visitor—along with relevant Web pages. This approach not only results in fewer abandoned shopping carts, but also minimizes the need for visitors to go to a competitor's site to find the information they're looking for.

- **Talisma Voice Over IP (VoIP).** Through VoIP technology, your customers can use their Internet connection to speak directly to customer service representatives over a high-quality voice connection. Full-duplex communication allows users to converse naturally—even interrupt each other; and the module also supports conference calls, so customer service representatives can conference in other parties as needed. By enhancing your customers' online experience, this simple-to-use voice connection will help you further strengthen your customer relationships.

  To take advantage of this service, consumers need only a 28.8 kbps or higher Internet connection, speakers, and a microphone. The featherweight client is a one-time download that installs automatically, allowing users to communicate immediately over the Internet. Download and installation take less than a minute over a 28.8 kbps modem.

- **Talisma Phone.** The phone module allows customer service representatives who handle customer phone calls to manually enter phone notes into the system, threading the question and answer into the customer's existing case to create a complete customer history.

  Talisma can also use computer telephony integration to integrate the phone module with your phone system. With this capability, when a customer calls in, the system will look for a match between the caller ID and information in its database. If it finds a match, it will pop up a screen with a complete history of that customer's interactions, making it easier for the customer service representative to respond accurately to the customer's query.

- **Talisma Campaign.** This electronic outbound marketing module lets you leverage your customer information to build, manage, and refine electronic direct marketing campaigns that reach each of your e-customers with a personalized message targeted directly to that customer's needs. Powerful enough to handle a million or more outbound messages a day, Talisma Campaign can draw on both the Talisma customer database and external ODBC (open database connectivity) compatible databases to micro-target your messages according to whatever criteria you specify. For example, if you want to reach customers who haven't purchased from you in the past six months, you could send an e-

mail like this: "Kay, we haven't heard from you lately. Please use this $25 gift certificate toward any of the 250 new items on our site. In fact, this winter we've added the long-legged version of the hiking shorts you purchased last summer."

After sending out the e-mails, Campaign tracks and analyzes the results, gets rid of bad addresses that bounce back, compiles statistics on the response rate, and updates your database accordingly. For example, it can compare offer acceptance, URL click-through, and value of purchases made for each of several different offers. With this feedback, you can make each electronic direct marketing campaign more effective than the last.

Whether a customer communication comes in by e-mail, Web form, chat, VoIP, or phone, Talisma Enterprise threads all the interactions together into a single case to create a complete history of all interactions with that customer. This case history can then be accessed by customer service representatives to better answer follow-up queries and by Talisma Campaign to personalize marketing e-mails. Figure 1 shows an overview of Talisma Enterprise.

Key benefits of Talisma Enterprise include the ability to:

- Ensure that each customer gets an accurate, timely, and personal response, regardless of their chosen mode of interaction (e-mail, chat, VoIP, etc.)
- Offer differentiated levels of service based on a customer's value to your company—for example, giving priority treatment to customers that do a high volume of business with you or that have purchased a service plan for your product.
- Manage the entire life cycle of a customer communication, from the moment of entry into the system until its satisfactory resolution.
- Manage the team responsible for handling customer service, using a wide array of reports and metrics.
- Proactively use customer information stored in distributed databases to conduct outbound direct marketing campaigns.
- Integrate the management of e-relationships with external applications and databases, extending the functionality of these resources.
- Help you understand exactly how customer interaction information flows through your company, so you can adjust your workflow appropriately.

This white paper takes a detailed look at Talisma Enterprise: its architecture, ability to access external data, performance, scalability, reliability, security provisions, and ease of management.

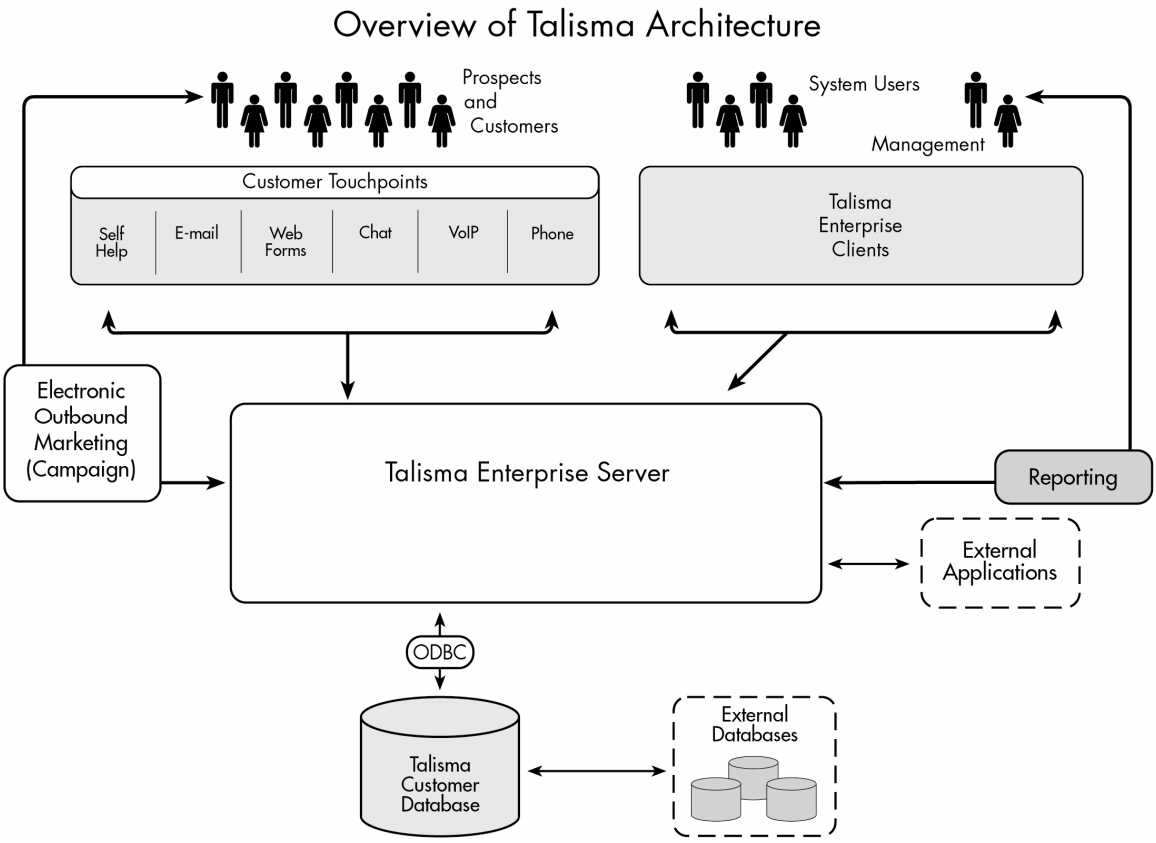

Figure 1. Talisma Enterprise simplifies the management of your electronic customer relationships, regardless of the channel by which the inquiries enter your system. It also offers personalized outbound marketing capabilities, provides you with a wide range of reports and metrics, and can be easily integrated with external databases and applications.

Talisma Enterprise Architecture

Unlike many traditional customer-relationship management systems, which added Internet integration after the fact, Talisma Enterprise was built from the ground up to be Internet-enabled. It provides broad access to customers through a variety of Internet-based customer touchpoints (including e-mail, Web forms, Web self-help, chat sessions, and voice over IP), and broad access to users through a variety of client systems (including Internet browsers, cell phones, and personal digital assistants). And because its browser interface, e-mail capabilities, chat support, and other Internet features were designed in from the start, Talisma is able to integrate these customer interactions with those from traditional channels, such as telephone. The result is a highly sophisticated system that provides a complete history of all of a customer's contacts with a company, regardless of the communication channel used for the contact.

Talisma Enterprise features an n-tier architecture, with the exact number of tiers and servers depending on how it is deployed. The n-tier architecture provides for easy scalability, offers a high degree of flexibility (for example, allowing different security provisions to be applied to different users), and simplifies maintenance, since each component can be modified independently of the others.

Functionally, the system is partitioned into three tiers:

- The presentation tier, consisting of a **Power Client**, **Remote Power Client**, **Web Client**, **Wireless Client**, and the **Talisma Enterprise Administrator**.
- The business logic tier, consisting of **Talisma Enterprise Server**.
- The data tier, consisting of the **Talisma Customer Database**, based on SQL Server 7.0.

A key feature of Talisma Enterprise is its **open architecture**, allowing it to be integrated with external systems at the client, business logic, or database level. The system's **Application Programming Interface** can be used to extend its basic capabilities as well as to integrate Talisma with external systems. Developers can easily create custom components—in any language they choose—that can talk to Talisma Enterprise. Talisma Enterprise can also talk to any ODBC-compliant database, allowing it to both access information from and send updates to third-party databases.

Figure 2 shows an overview of the system architecture. Each component is discussed in more detail below.

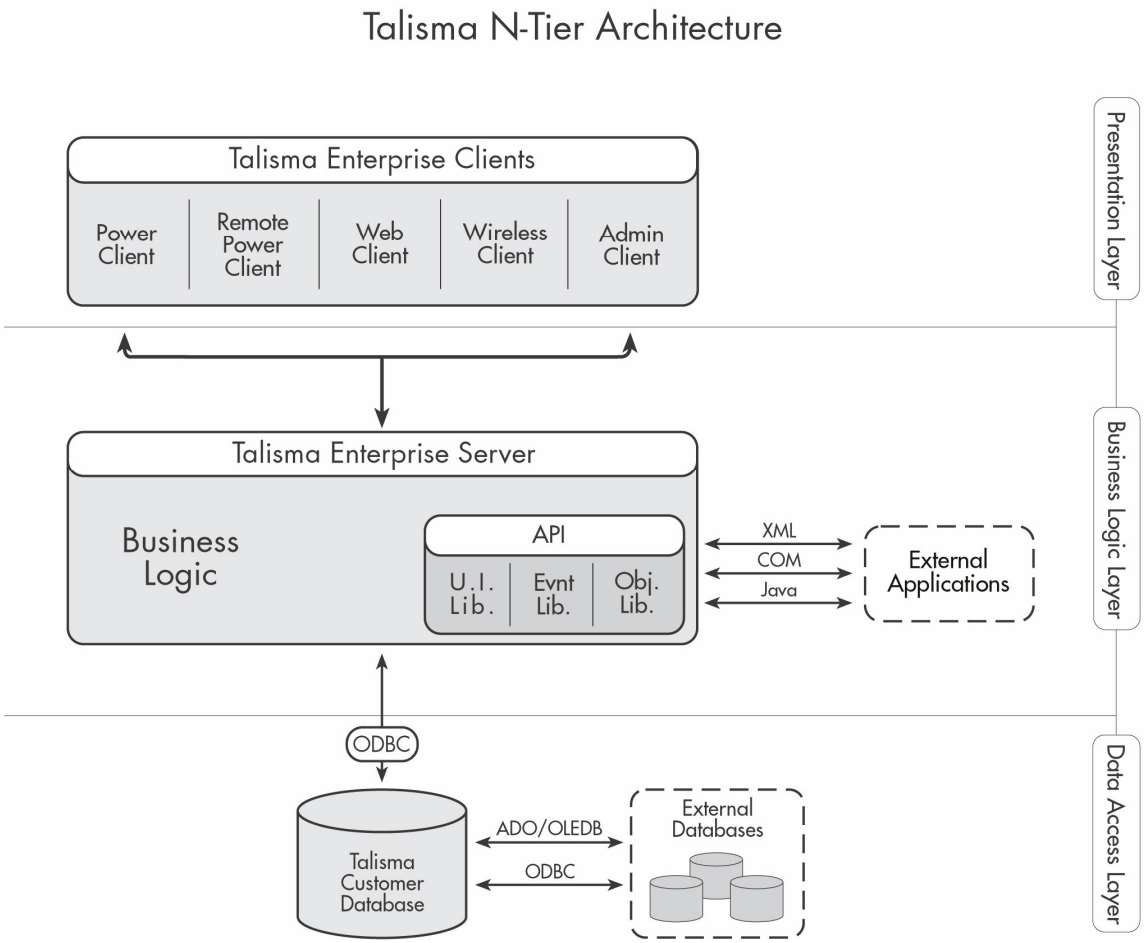

Figure 2. Talisma Enterprise features an n-tier architecture for easy scalability, flexibility, and maintainability.

Presentation Tier: Talisma Enterprise Clients

The Talisma Enterprise Client is the user's interface to the system. It enables users to log on to the system and carry out a wide range of tasks, from routing and responding to e-mails to interacting directly with a visitor via chat or VoIP technology.

The Talisma Enterprise Client layer includes five clients to meet a broad variety of user needs. Three of these—the Power Client, Remote Power Client, and Web Client—are full-featured clients. All three share the same core functionality, but the Power Client and Remote Power Client offer additional features designed for heads-down power users, such as automatic background spell checking and auto-text insertion (that is, the ability to type a short word or phrase, such as "standard close," and have the system insert text that you have previously associated with this word or phrase). The Web Client is designed for mobile users who perform

more routine tasks and need to access the system from offsite locations. Because it accesses the system through a standard Web browser interface, it does not have some of the advanced features available through the Windows user interface. The remaining two clients are the Wireless Client for mobile users and the Administrator Client for administrators. All five clients are discussed in detail below.

Power Client

The Power Client is written in Microsoft Visual C++ and MFC and runs under all versions of Windows, from Windows 95 to Windows 2000. Designed to provide the highest level of productivity, it is ideal for power users who spend many hours a day working with the system and therefore want the most advanced functionality and user interface. Figure 3 illustrates the advanced functionality available in the Power Client.

The Power Client includes five different workspaces, each equipped to handle a different set of tasks:

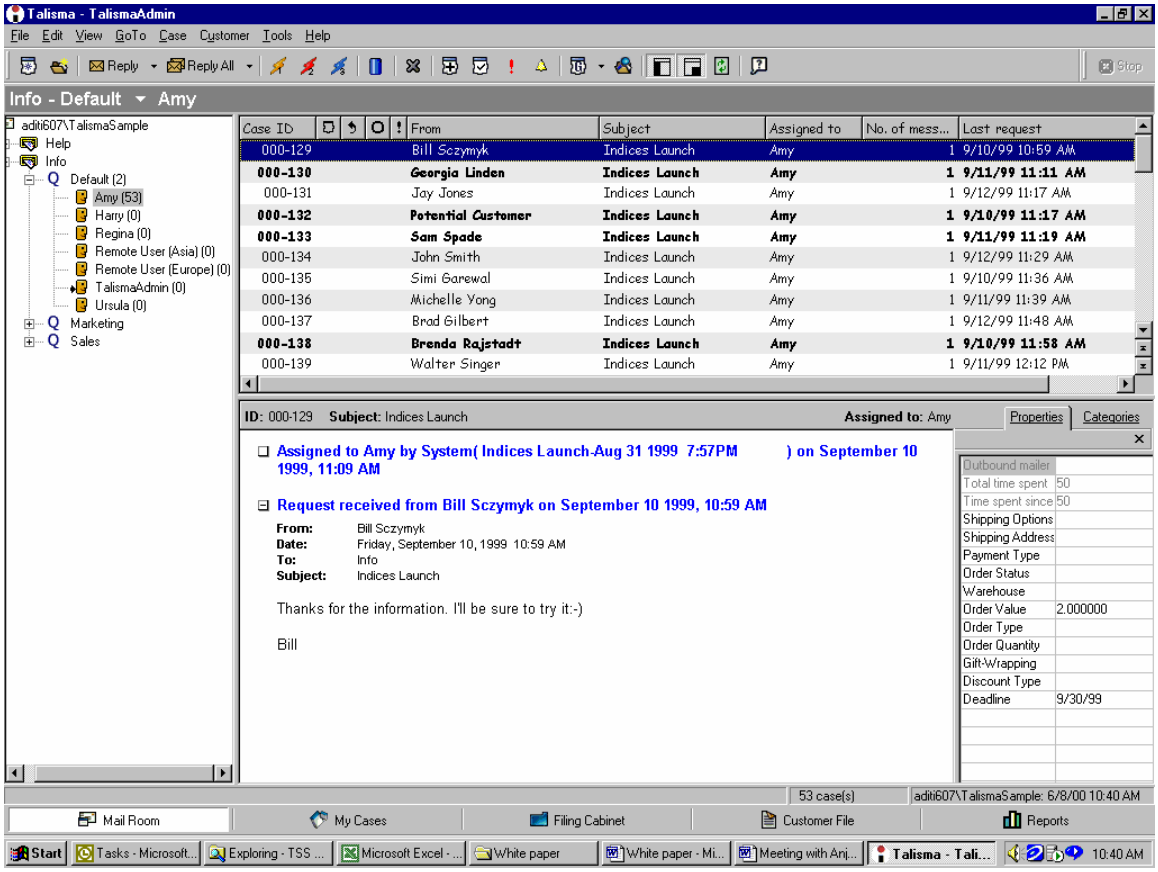

Figure 3. The Power Client offers advanced functionality for the power user. This screenshot shows the Mail Room workspace.

- **Mail Room**, where users can access all customer interactions within the system
- **My Cases**, where a particular customer service representative can access all of his or her own customer interactions
- **Filing Cabinet**, where users can search for customer interactions that have a specific set of properties (for example, requesting all customer interactions that involve Product X)
- **Customer File**, where users can search for customers that have a specific set of properties (for example, all customers that have bought Product X)
- **Reports,** where users can generate and view reports

As the user moves from one workspace to another, the menu choices change to fit the tasks carried out in that particular workspace.

Advanced functionality available in this client includes sophisticated word-processing capabilities (such as auto-text insertion, automatic spell-checking, and auto correction running in the background) as well as productivity-enhancing Windows capabilities (such as drag-and-drop, the ability to select and highlight multiple items at once, shortcut and accelerator keys, toolbars, and online help). In addition, representatives using this client are notified when key events occur—such as a new case being assigned to them.

Remote Power Client

The Remote Power Client has the same functionality as the Power Client but can be used to access the system from an off-site location or a non-Windows platform. Users who are off-site but want the added usability features of the Power Client can connect to the system through the Internet and then choose the Remote Power Client rather than the Web Client. Users on the LAN who are not on a Windows platform but want the advanced functionality of the Power Client can similarly choose the Remote Power Client.

Web Client

The Web Client, consisting of ASP pages written in Javascript and VBscript, is designed for mobile users who perform more routine tasks and need to access the system from offsite locations. It supports both Internet Explorer 4.01 and higher and Netscape Navigator 4.0 and higher and can be accessed from any system that supports a Web browser. As shown in Figure 4, the

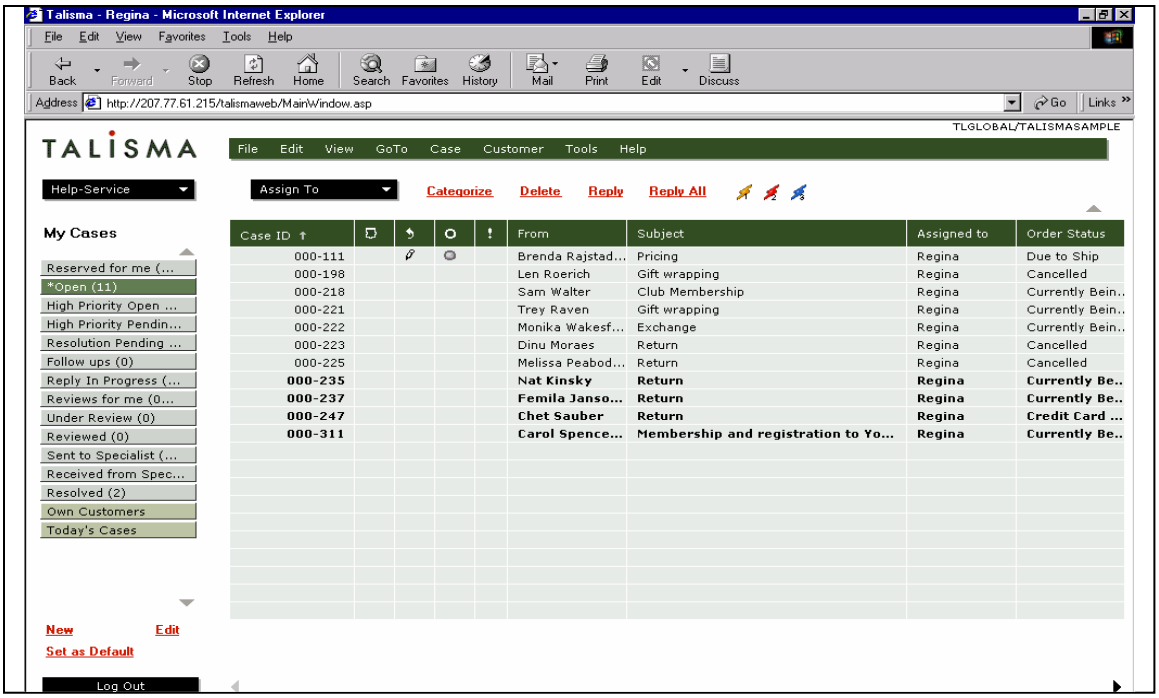

Figure 4. The Web Client is designed for mobile users who perform routine tasks and need to access the system from offsite locations.

Web Client features a user interface consisting of clean, simple, and intuitive Web pages. This client is optimized to minimize data transfer in order to maximize performance. For example, it pools connections back to the database and restricts the results that a query returns to a user-specified number. Also, if a customer service representative is viewing a case list, only the cases in the current window will be transferred from the server to the client (although the representative can see more cases by simply scrolling down to display a new set of cases).

Wireless Client

The Wireless Client, illustrated in Figure 5, lets a mobile user view customer information and send and receive messages via any device that supports the WAP (Wireless Application Protocol) standard, including PDAs (Personal Digital Assistants) as well as cell phones. It's ideal for those people within an organization who need timely, relevant customer information but are constantly mobile and therefore do not have traditional access to the organization's IT networks. For example, a sales representative may want to be automatically notified whenever a key account has a problem—or a field service technician may need to access system information.

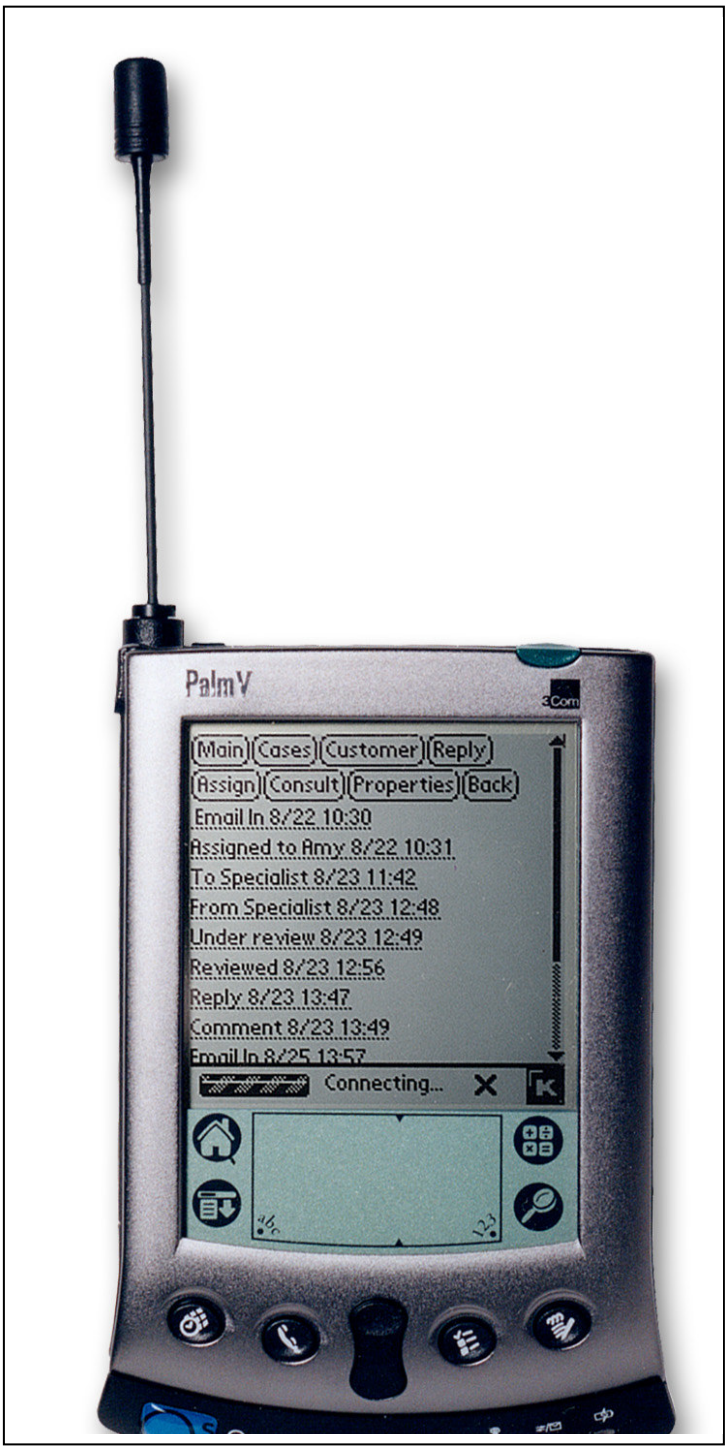

Figure 5. The Wireless Client provides a handy way to receive messages or view system information when the user is out of the office.

The Wireless Client allows the user to respond to customers as well as receiving customer queries. Responses can be entered either by manually inputting text or by using Talisma's canned or auto-suggested response capabilities. Either of the latter methods allow the user to enter a personalized response with just a few key-strokes. Users can also access customer information through the Wireless Client

The Wireless Client is optimized for small screens and low bandwidth, so users can quickly and easily obtain the information they need. Its functionality includes the ability to:

- Search for a customer
- Create a new customer
- View all cases for a customer
- View the properties of a customer or case
- View a case audit trail
- Read actions and details within a case

- Reply to a customer query via canned responses, auto-suggested responses, or manual responses
- Consult a specialist
- Resolve a case
- Switch between different aliases and queues
- Call a customer via one-touch dialing

The Wireless Client works through the wireless components in the server layer. These components convert Talisma information to Wireless Markup Language (WML) and send that information to the user's wireless device—which in turn reads the WML, notifies the user, and displays the information. Similarly, the wireless device sends user information and requests to the wireless components, which convert the WML format into ODBC record sets and pass it on to the business logic.

Administrator Client

The Administrator Client, illustrated in Figure 6, is an easy-to-use Microsoft Management Console snap-in that provides a simple and intuitive interface for managing all the entities that make up the system. It runs under all versions of Windows, from Windows 95 to Windows 2000.

System entities managed through the Administrator Client include:

- **Aliases.** This function lets the system administrator define routing rules for different e-mail aliases to expedite the handling of incoming queries. For example, a system administrator might set up three different queues for an alias such as sales@acme.com—one for Product X, one for Product Y, and one for Product Z. The administrator could then establish routing rules that would let the system automatically determine to which queue a particular query should be routed.
- **Users.** The system administrator uses this function to customize user permissions—first by defining different roles (i.e., security levels) and then by assigning a role to each user.
- **Customer rules.** Customer rules are used to trigger actions based upon changes in a customer's profile. For example, a rule could be set up to notify the director of customer

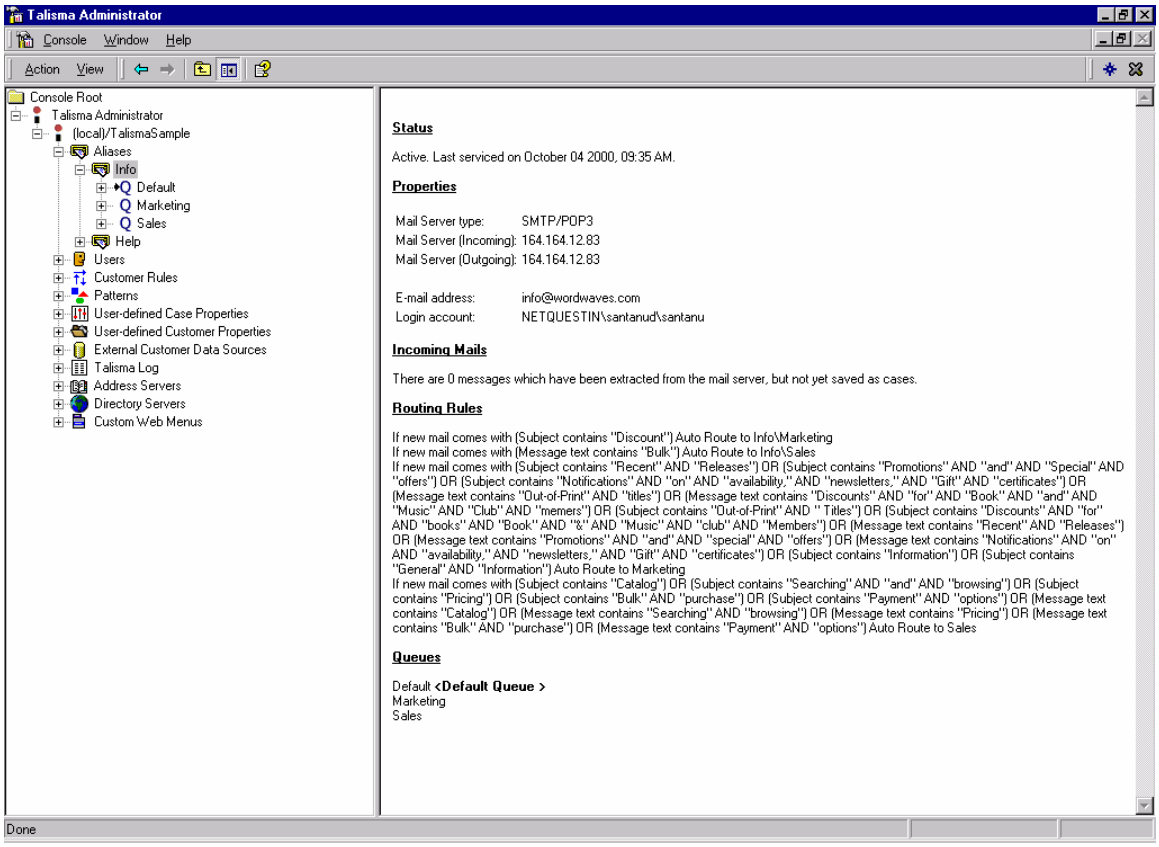

Figure 6. The Administrator Client provides an easy mechanism for managing all the entities that make up the system.

service whenever a high priority customer is deleted—or to generate an e-mail to a customer whenever the customer purchases an item through the company's Web site.

- **Patterns.** To simplify automatic categorization of queries, the system administrator can define specific patterns that the system is to look for—for example, three letters followed by four numbers can be defined as a part number; 16-digit numbers that adhere to credit card numbering rules (recognized by a built-in algorithm) can be defined as credit card numbers; and so forth.

- **Case and customer properties.** These functions make it easy for the system administrator to create customized properties both for customers (for example, identifying a customer's operating system and hardware configuration) and for cases (for example, specifying the value of the order that the case is dealing with). While customized customer properties are always global, customized case properties may be either global or specific to a particular queue. The latter are useful to avoid crowding a queue's properties tab with hundreds of properties that might not be relevant to that particular

queue. In addition, both customized customer and case properties can be easily linked to external data sources to integrate Talisma with ODBC-compliant legacy systems. For example, you could create a customized property specifying the customer's preferred shipping option and have Talisma pull this information from your legacy order-fulfillment system.

- **External customer data sources.** This function is used to define where different sets of external data reside.

- **Talisma log.** This function gives the system administrator access to the three logs that Talisma maintains—an administrative log for tracking such actions as changing user permissions or creating a new user; a customer rules log that can be used to test whether a new rule executes properly; and an error log that tracks system errors, such as a user's inability to log into his or her account.

- **Address and directory servers**. This function allows Talisma to work with external address and directory servers. For example, the system can synchronize its address book with that of a corporate mail server (such as Lotus Notes or Microsoft Exchange), and it can use the Lightweight Directory Access Protocol (LDAP) to retrieve customer information from a directory server (such as Four11, Bigfoot, or Microsoft Exchange).

Business Logic Tier: Talisma Enterprise Server

The Talisma Enterprise Server is the brains of the system, containing the business logic. Running under Windows NT Server or Windows 2000 Server, it acts as an intermediary between the presentation layer and the database layer, receiving requests from the various Talisma clients and accessing the Talisma Customer Database via ODBC to obtain the data needed to respond to these requests. Having all database access go through the business logic ensures that any modifications to the data are made in accordance with the business rules.

The business logic consists of a series of business objects that manage customer and user interactions with the system—from setting up new customer cases to routing incoming queries to the proper queue to threading follow-up queries into an existing customer history. The business logic also manages outbound marketing activities and generates reports.

A key piece of the Talisma Enterprise Server is the **Application Programming Interface (API)**, which offers several avenues for extending the system's functionality and integrating Talisma with a broad range of external systems and databases. These include e-commerce systems, online analytical processing systems and data marts, customer relationship management systems, sales

force automation systems, knowledge bases, workforce management systems, help desk systems, financial systems, computer telephony integration systems, enterprise resource planning systems, and legacy systems. Using the API, a developer could map such objects as a customer, user, buyer, employee, case, incident, ticket, opportunity, or sale in another application to their counterparts in Talisma Enterprise. In this way, additions or changes to the Talisma database could be automatically duplicated in the external database—and vice versa.

The API consists of three libraries:

- **User Interface Customization Library.** This library is used to add functionality to the user interface for the Power Client, Remote Power Client, and Web Client and to integrate Talisma clients with external applications. It lets you add new items to the standard menu and write components that will be invoked when the user clicks on these menu items. For example, you might add a menu item to bring up Excel, so users can further analyze or chart the data they retrieve. You can also use this library in conjunction with the Object Library (see below) to add new database features or operations.

- **Event Library.** This library lets you use event handlers—standard COM components that attach custom functionality to an event—to extend the capabilities of the Talisma Enterprise Server and integrate the business logic layer with external applications. For example, if you have an external customer database, you may want to create an event handler that adds a new entry to that database any time you add a new customer to the Talisma database. Or you may want to create an event handler that checks with an external database to determine if a customer is entitled to technical support before allowing a representative to respond to an e-mail support question. Once you have created an event handler and loaded it onto the Talisma Enterprise Server, Talisma will invoke that event handler whenever the specified event occurs. Event handlers may be written in Visual Basic, Visual C++, or any other COM-aware language.

- **Object Library**. This library exposes a set of COM objects (such as case, event, canned response, and customer) that can be used to perform new operations on database objects—for example, creating a new view of the data or moving data to or from an external system. The COM objects ensure that the new operations follow all the same business rules and logic as the operations performed by the standard system. For example, if you want to keep the Talisma customer database synchronized with an external customer database, you could use a COM object in this library to check the external database for new customer entries each night and add them to the Talisma database. Similarly, you could write code that would take information from an external

ordering system and then use an object from this library to import the information into a Talisma e-mail to let a customer know that an order has been sent.

NOTE: For ease in communicating with external systems, a free Microsoft toolkit will automatically convert COM objects to components based on the Simple Object Access Protocol (SOAP). SOAP-based components exchange data in XML format, communicate with external systems via HTTP, and can talk to external applications using Java or any other language.

Data Tier: Talisma Customer Database

The Talisma Customer Database runs under Microsoft SQL Server 7.0—a product that has proven its ability to handle large and demanding real-time transactional applications—and Windows NT Server or Windows 2000 Server. If SQL Server 7.0 is not already installed on the machine, the installation process for the Talisma Enterprise Server will install an embedded version of SQL Server 7.0.

The Talisma Customer Database natively supports communication with ODBC-compatible databases. Several types of connectivity are available through ODBC:

- **Import**: The system administrator can configure a JOIN condition to allow data to be imported into Talisma from any ODBC-compliant source.
- **Single field**: The system administrator can designate a JOIN field to allow users to see, from Talisma, the value of a single field in an external database.
- **Record**: The system administrator can designate a JOIN field to allow users to see, from Talisma, a complete record in an external database.

You can also use Active Data Objects (ADO) and OLE DB to talk to ODBC-compliant external databases.

If you want to integrate the Talisma Customer Database with an external database that is not ODBC-compatible, you can use the APIs to write custom code in any language supported by the external database.

A Closer Look at the System

Now that you're familiar with the basic components of the system, let's take a closer look at how it works. The following discussion describes key components illustrated in Figure 7.

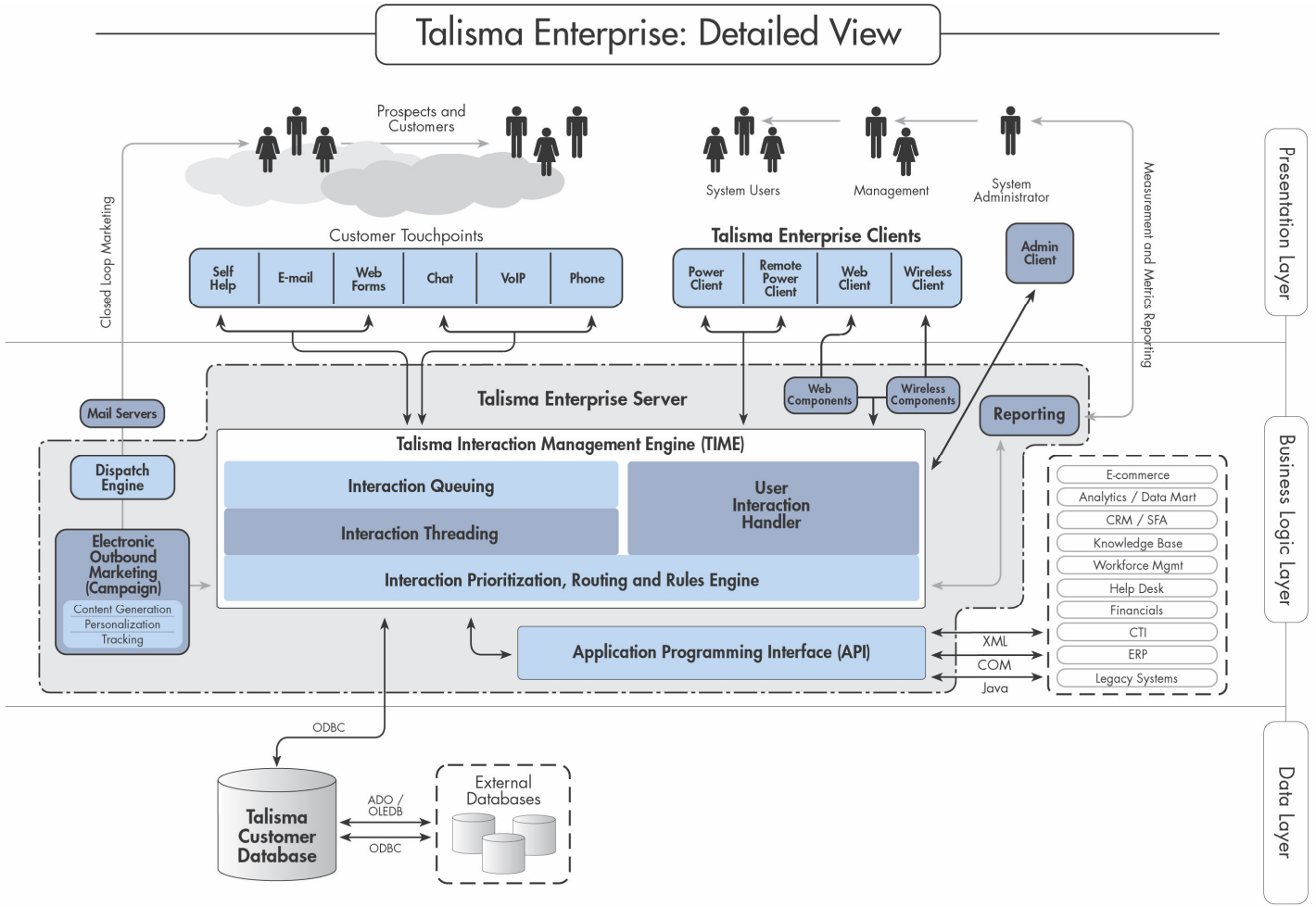

Figure 7. Talisma Enterprise is designed to provide a wide range of flexibility—both in how customers and users connect with the system and in its ability to integrate with external systems and databases. It also provides for closed-loop marketing and for measurement and metrics reporting.

Touchpoints

Talisma allows prospects and customers to interact with your Web site through a variety of touch-points, both non-real-time (e-mail and Web forms) and real-time (Web self-help, chat, VoIP, and phone).

Talisma Interaction Management Engine (TIME)

As queries from any of these channels arrive in the system, they enter the Talisma Interaction Management Engine, which contains the logic to manage all customer and user interactions, regardless of the channel through which they entered the system. TIME consists of several components:

- An **interaction queuing** component that routes customer queries to the right alias and queue. These aliases and queues are user-definable—so, for example, a company might set up aliases such as info@acme.com, service@acme.com, and support@acme.com; and, within the info alias, establish separate queues for marketing information, sales information, and technical information.

- An **interaction threading** component, which checks to see whether a case has already been opened for the customer in question—and, if it has, threads the new communication into the existing customer history.

- An **interaction prioritization, routing, and rules engine** that prioritizes and routes the interaction according to user-defined rules. For example, the company may set up the system so that e-mails on a particular subject or from a particular address are routed to a particular representative and are to receive high-priority treatment.

- A **user interaction handler**, which has two functions: (1) to inform the business logic of user availability and (2) to serve as an intermediary between system users and the database. In performing its first function, the user interaction handler tells the interaction prioritization, routing and rules engine which users are available, so that engine knows where to route incoming customer queries. In performing its second function, the user interaction handler accesses the database in response to user requests for information (for example, “Give me all the cases I’ve resolved in the past month”) and returns the response to the user.

Web and Wireless Components

The Talisma Enterprise Server contains two additional components that act as intermediaries between the Web and Wireless Clients and TIME:

- **Web components**. The Web components are hosted on the Web server and run under Internet Information Server (IIS) 4.0 or later and Windows NT or Windows 2000 Server. These components—which may or may not be on the same machine as the business logic—consist of Active Server Pages (ASPs), COM components, and Java applets. The Web Client communicates with the Web components via HTTP; the Web components, in turn, pass the request to TIME. When the Web components receive a response from TIME, they translate it into HTML format and send it back to the browser.

- **Wireless components.** The wireless components are also hosted on the Web server. These components, consisting primarily of ASP pages, pass queries on to TIME. When the wireless components receive a response from TIME, they convert it to WML and send it back to the Wireless Client.

Reporting

The Talisma Enterprise Server also includes a reporting module that lets users easily run a variety of reports, both standard and custom, covering everything from an overview of all aliases to the status of a particular alias or queue to the productivity of an individual user. These reports are so easy to generate that a manager who is unfamiliar with the actual operation of the system can easily create and run a report. Examples of standard reports include:

- The amount of traffic in the entire system.

- The status of all cases in a particular alias or queue, including the number of cases that have not yet been handled and how long they have been waiting.

- How many cases your department, or a particular customer service representative, has handled in a designated time period.

- The results of an outbound mailing—for example, the number of recipients who responded to a mailing, the number who clicked through to your URL, and the number of undelivered mails.

- Trend reports showing changes over time—for example, changes in the number of incoming messages, new cases, closed cases, and average response time.

If you can't find what you want in one of the more than 150 standard reports provided with the system, you can use any standard reporting or OLAP package (such as Crystal Reports) to create custom reports. You can also export Talisma data to Excel with a single mouse click and generate reports in Excel.

Outbound Marketing

The electronic outbound marketing module lets you generate mailers and track the response. The module includes:

- **A content generator**, consisting of a text editor and HTML editor, which you can use to create a text- or HTML-based e-mail. (You can also use an external editor if you prefer.)

- **Segmentation capabilities** that can help you select the recipients of a mailer—for example, all customers who purchased Product X in the last six months. This type of query is useful for creating targeted campaign lists, rather than using a "shotgun" approach to outbound marketing.

- **Personalization components** that merge specific database fields into your e-mail, so you can tailor the content of the mailing to each recipient. For example, you could include in your mailer such information as the customer's first name, date of last purchase, last item purchased, and even a personalized offer. Talisma can pull such personalization data not only from its own database, but also from any external database source that is ODBC-compliant.

- **Tracking components** that monitor the results of your mailing and update the database accordingly. These components can track, for example, how many recipients respond to your mailing, how they responded (interested, not interested, request to unsubscribe), and how many clicked through to your URL. If you have e-commerce software, you can easily integrate Talisma with that software to track actual purchases as well.

- **A dispatch engine** that queues up the mailings and sends them out to your mail server (which can be either your corporate mail server or a hosted ASP mail server). Since dispatching the mailings can use a lot of CPU power and disk I/O, if you are going to be sending out high-volume mailings, Talisma recommends that you install the dispatch engine on a separate server so as to not slow the performance of the main Talisma server.

Performance and Scalability

A mission-critical application such as customer response management requires high performance. Talisma Enterprise has been designed to provide robust performance under real-world work conditions.

One source of Talisma's high performance and scalability is the performance enhancements in SQL Server 7.0. These include:

- **Dynamic locking to enhance response times.** The dynamic locking capabilities of SQL Server 7.0 are a key feature in ensuring high performance because they reduce the likelihood of collisions between transactions (that is, the need for one transaction to wait until another transaction is completed before it can access the data it needs). By choosing, for each query or action, the lowest possible level of locking, SQL Server ensures the fastest possible response times. Locking may be done at the row, page, or table level, depending on the type of operation being performed.

- **Very large database (VLDB) improvements.** SQL Server 7.0 features numerous high-speed optimizations for VLDB environments, allowing it to support terabyte-size databases. These optimizations include the ability to:

  - Process imports from multiple databases—or export data to multiple databases—as a single operation.

  - Access multiple indexes concurrently.

  - Reduce disk I/O both by increasing the database page size and by mapping SQL Server databases directly to Windows files instead of having to access intermediate logical layers.

- **Improved query optimizer.** New access methods to speed query handling include:

  - The use of serial, read-ahead I/O for scanning tables and indexes.

  - The use of merge and hash algorithms for performing joins, instead of traditional algorithms, such as INNER join and OUTER join.

  - Native support for the prepare/execute model of executing SQL statements, which is faster than the previous execute model.

- Reduction of the resources needed to compile SQL statements into execution plans by using algorithms that match SQL statements with execution plans previously used for those statements.

- **Parallel processing of a single query.** When running on servers with multiple CPUs, SQL Server 7.0 can build parallel execution plans that split the processing of a SQL statement into several parts and run each part on a different CPU. This approach builds the complete result set more rapidly than if the different parts were executed serially.

- **Support for OLE DB.** In Transact SQL statements that link SQL Server data to data in external databases, SQL Server 7.0 supports OLE DB as well as ODBC. This support allows it to accept rowsets instead of requiring table references, resulting in faster execution.

Real-World Data

Hundreds of customers are using Talisma in real-world, production environments—some responding to more than 150,000 messages per week and sending out more than 1 million outbound mailings per week. Several customers have hundreds of users concurrently accessing the database. Many of them also have rapidly growing e-mail volumes—in some cases, volumes that double every six months. In every instance, Talisma has performed to the customer's complete satisfaction and has been able to handle the growing workload with no problem. See Appendix B for some quotes from our customers about the system's performance and scalability.

Laboratory Data

Talisma conducted performance tests in May and June 2000 to validate the ability of Talisma Enterprise 2.5 to efficiently handle large data volumes and workloads. A primary requirement was that user-perceived response times should not exceed 1 to 2 seconds.

To provide a realistic representation of the way an enterprise relationship management system is actually used, the test staff began by documenting actual business operations and workflow and then designed the test and workflow scenarios to match this real-world experience.

Client systems ranged from Pentiums to Pentium IIIs, running under all versions of Windows—95, 98, NT, and 2000. Servers were either a single-processor Pentium III with 256 MB of RAM running Windows NT Server, or a dual Pentium III with 512 MB of RAM running Windows 2000 Server. Clients and servers communicated over a 10 Mbps Ethernet network.

With an average workload of 5,000 operations per hour, Talisma Enterprise delivered exceptional performance, with response times ranging from sub-second levels to just over 2 seconds. If you assume that each customer service representative can handle 20 e-mails per hour, and you have 50 customer service representatives working a total of three 8-hour shifts a day, that means the system can easily handle 24,000 e-mails a day. The test results, described more fully in Appendix A, demonstrate conclusively that the product performs very well even at high user loads.

Hardware Recommendations for Maximum Performance

The two most important factors affecting system performance are the volume of work and the number of concurrent users. However, both real-world experience and laboratory data show that performance also depends heavily on several other factors, including:

- Number and complexity of the business logic rules
- Number of e-mail aliases
- Size and frequency of electronic direct marketing campaigns
- Use of the auto-response feature

As the factors that can slow performance increase, the easiest way to improve performance is to increase the hardware power. The following table provides some general hardware guidelines for different numbers of concurrent users and e-mail volumes. However, you should consult with Talisma to obtain a more in-depth analysis of your specific needs before determining your particular hardware requirements.

Number of Concurrent Users	**Number of e-mails/day.**	**Recommended hardware configuration**
5	2,500	Single-processor, 600+ MHz Pentium III with 512 MB of RAM and 10 GB available hard disk space
10	5,000	Single-processor, 600+ MHz Pentium III with 512 MB of RAM and 20 GB available hard disk space
20	10,00	Dual-processor, 600+ MHz Pentium III with 1 GB of RAM and 20 GB available hard disk space
40	19,000	Dual-processor, 600+ MHz Pentium III with 2 GB of RAM and 40 GB available hard disk space
60	29,00	Quad-processor, 600+ MHz Pentium III with 2 GB of RAM and 40 GB available hard disk space
80	38,000	Quad-processor, 600+ MHz Pentium III with 2 GB of RAM and 40 GB available hard disk space
100+	50,000+	Quad-processor, 600+ MHz Pentium III with 4 GB of RAM and 50 GB available hard disk space

Reliability and Availability

Companies that have large volumes of customer interactions need a system that can run continuously. Talisma Enterprise is designed to work in a 24-by-7 environment and has repeatedly demonstrated its high reliability and availability. See Appendix B to learn what our customers have to say about Talisma in this regard.

A key reason for the system's high reliability is the stability of the underlying platform. Windows NT, Windows 2000, and SQL Server were all designed to provide the robustness required by mission-critical applications. For example, an independent study by the Aberdeen Group found that nine early-adopter dot-com sites had a combined 99.95% uptime on Windows 2000. Aberdeen considers this level of availability to be outstanding—particularly since most of these sites had not yet fully optimized Windows 2000, upgraded to the final release, or built expertise in the product. (For more information, go to http://www.microsoft.com/windows2000/guide/server/reviews/dotcoms.asp.)

Some of the features of SQL Server that contribute to its high reliability and availability include:

- **Transaction logging.** SQL Server uses transaction logging to guarantee data integrity. A transaction, or a unit of work, can be as small as a single row INSERT or UPDATE operation—or as large as a collection of several different data modifications bound by BEGIN or COMMIT TRANSACTION statements. To guarantee that each unit of work will be accurately applied to the database regardless of any errors (whether caused by the system, an application, or a user), SQL Server writes Before and After images of any data pages affected by a transaction to a durable transaction log. That way, if a transaction roll-back or system failure occurs, SQL Server can use this log to restore the database to its previous state.

- **Transaction and snapshot replication.** This capability allows you to keep multiple copies of the database on either the same server or a hot standby database server, and to propagate transactions and database snapshots to these database copies—so that if anything goes wrong with the primary database, a current backup is immediately available.

- **Clustering.** SQL Server supports various clustering options to ensure data availability in the event of either planned or unplanned maintenance, providing 24-by-7 availability. These include:

- **Use of active and passive nodes.** With this approach, two servers—one an active node and the other a passive node—share access to a single hard disk. If the active node goes down, the passive node takes over.

- **Data mirroring.** Data mirroring can be used to replicate the database either on the same server or on a separate server. In the first case, if one copy of the database becomes corrupted, the server switches to the second copy. In the second case, if one server goes down or needs to be taken down for maintenance, the second one takes over.

Further redundancy can be achieved at the hardware level, using configurations such as RAID to improve reliability.

Talisma Enterprise also includes reliability features. These include:

- **Isolation of core Talisma components.** This feature ensures that the Talisma server can continue to function even if other systems—such as the corporate mail server—go down. For the highest reliability, install Talisma on a separate server.

- **A built in backup system.** This full-featured backup/recovery system can be used as-is, out of the box, to support point-of-failure recovery, or can be customized to meet your particular needs. It's based on native SQL Server backup capabilities and can run in the background without affecting Talisma's performance or functionality.

Security

With the explosion of Internet commerce, organizations are keeping a tight rein on the information in their databases. To achieve the high level of security that today's organizations demand, Talisma offers three levels of security:

- **Windows-level security**, which uses the security attributes established by Windows when the user logs onto the network.
- **Database-level security**, which may use a separate username and password (different from the Windows logon) and also includes a permissions validation step, specifying which database objects and commands the user can access.
- **Application-level security**, which further refines the permissions step, specifying which departmental aliases, queues, and products a user can access and which operations the user is allowed to perform on them. This step also sets up a Talisma Application Role to provide further protection against unauthorized access and ensures encryption of sensitive data.

Windows-Level Security

Most users will log onto Talisma using the same account that they use to log onto the Windows NT or Windows 2000 network. These users can save time by having SQL Server use the Windows NT/Windows 2000 security model—eliminating the need to enter a second login name and password to access the database.

When a user logs onto Talisma and selects Windows authentication, Talisma notifies SQL Server that it is to use the security attributes established at network login time to control login access to the Talisma database. These attributes are validated through the sophisticated Windows NT/Windows 2000 password encryption mechanism. After checking with Windows to determine whether the username is valid, SQL Server permits or denies login access.

Database-Level Security

Authentication

In the event that a user needs to log into Talisma using a different account from his or her Windows account (for example, if two or three users who work different shifts need to share the same Talisma account—or if a Talisma system administrator needs to log in using a user's account), the user will select SQL Server authentication at login time and will enter a SQL Server name and password, which will be different from the Windows login name and password. In this

case, Talisma passes the username and password to SQL Server, which checks to see if a SQL Server login account has been set up for this user—and, if so, whether the password the user entered matches the one recorded in the log. If SQL Server does not have a login account for this user or the user's password does not match the one in the login account, authentication fails and the user receives an error message.

Permissions Validation

After a user has been authenticated and allowed to log onto SQL Server (via either Windows or SQL Server authentication), SQL Server checks to see if the user has an account set up in the specific database he or she is trying to access. These database accounts, which are set up by the system administrator as part of establishing user permissions, specify, for each database to which the user is given access, the specific objects that the user is allowed to access (tables, views, stored procedures and so on), and the commands that the user is allowed to execute (for example, adding a customer, deleting a customer, or creating a new message). When the user attempts to access an object or enter a command, SQL Server checks to make sure the user has permission to do so before granting access or executing the command. If the user does not have permission, SQL Server returns a permissions error.

Application Level Security

Talisma also has its own application-level security, which is used for three purposes: to further fine-tune the types of actions the user is allowed to perform in a particular database, to define a Talisma Application Role that provides further protection against unauthorized access, and to encrypt sensitive data.

Talisma User Permissions

While the SQL Server-level permissions deal only with types of objects and commands within a database, the Talisma-level permissions define which specific types of data a user can access and which specific operations the user can perform on that data. Again, these permissions are set up by the system administrator as part of setting up the user's account.

Talisma-level security can specify, for example, the departmental aliases a user is authorized to access, the specific queues within those aliases, and even the specific products for which a user is authorized to view or respond to queries. In addition, it can specify the types of actions a user is allowed to perform in each instance. For example, a user may have permission to delete a case in a particular queue, but may not be able to delete cases in other queues.

Talisma Application Role

Talisma also takes advantage of SQL Server's role-defining ability, which allows all users to be collected into a single unit against which permissions can be applied, to define a Talisma Application Role. In this way, Talisma grants access to its objects and commands to the role rather to individual users. This security step prevents a user from connecting to SQL Server using an application such as SQL Server Query Analyzer and then accessing Talisma data. After completing authentication and permission validation at the database level, Talisma switches to the Talisma Application Role before allowing commands to be executed on the Talisma database.

Data Encryption

Talisma uses the Windows Crypto API to encrypt all sensitive data, whether system configuration data or sensitive customer information (such as credit card numbers). This data can be decrypted only by someone who has accesses the system through a Talisma client and has permission to view or edit the data—so even if an unauthorized person managed to gain access to the data, it would be meaningless.

Manageability

The Administrator Client has easy and intuitive interfaces for performing all management-related tasks, including customizing user permissions, identifying and handling patterns, setting up business rules, scheduling back ups, and troubleshooting the system.

Customizing User Permissions

As illustrated in Figure 8, the Administrator Client simplifies the process of setting up each user's permissions by allowing the system administrator to predefine roles (i.e., different sets of permissions) and then assign a role to each user or group of users.

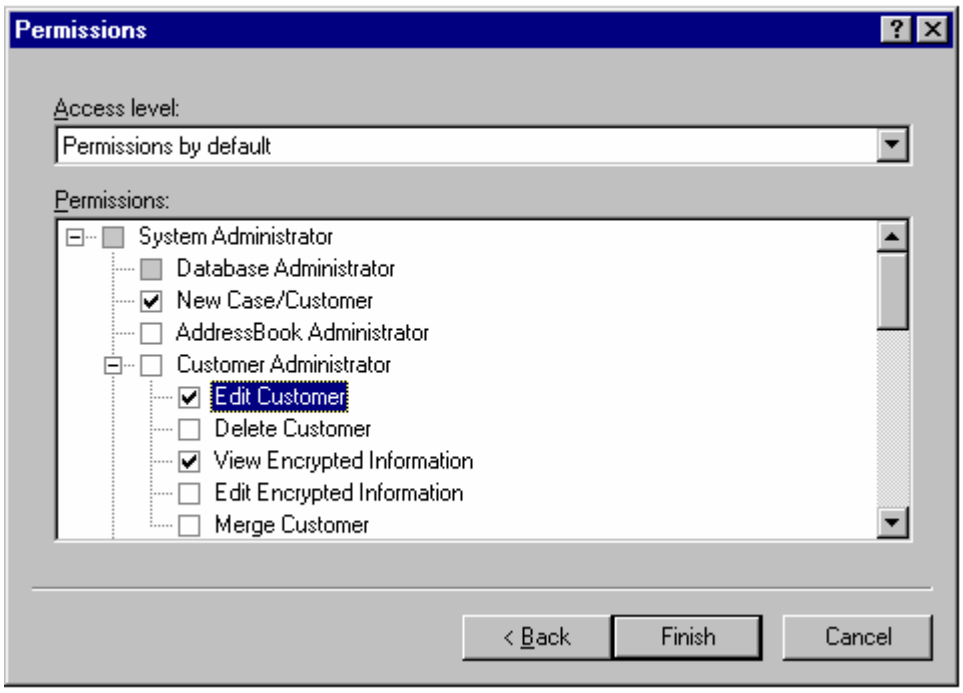

Figure 8. The Administrator Client simplifies the process of customizing user permissions by allowing the system administrator to assign a predefined role to each group of users.

Identifying and Handling Patterns

The Administrator Client makes it easy to identify specific text patterns in incoming e-mail and establish rules for handling them. For example, to have Talisma search for zip codes in incoming e-mail, the system administrator can identify a pattern consisting of only five numbers together. The administrator can then set up routing rules for particular instances of that pattern—for example, specifying that a 98029 zip code be routed to the West Coast queue (see Figure 9).

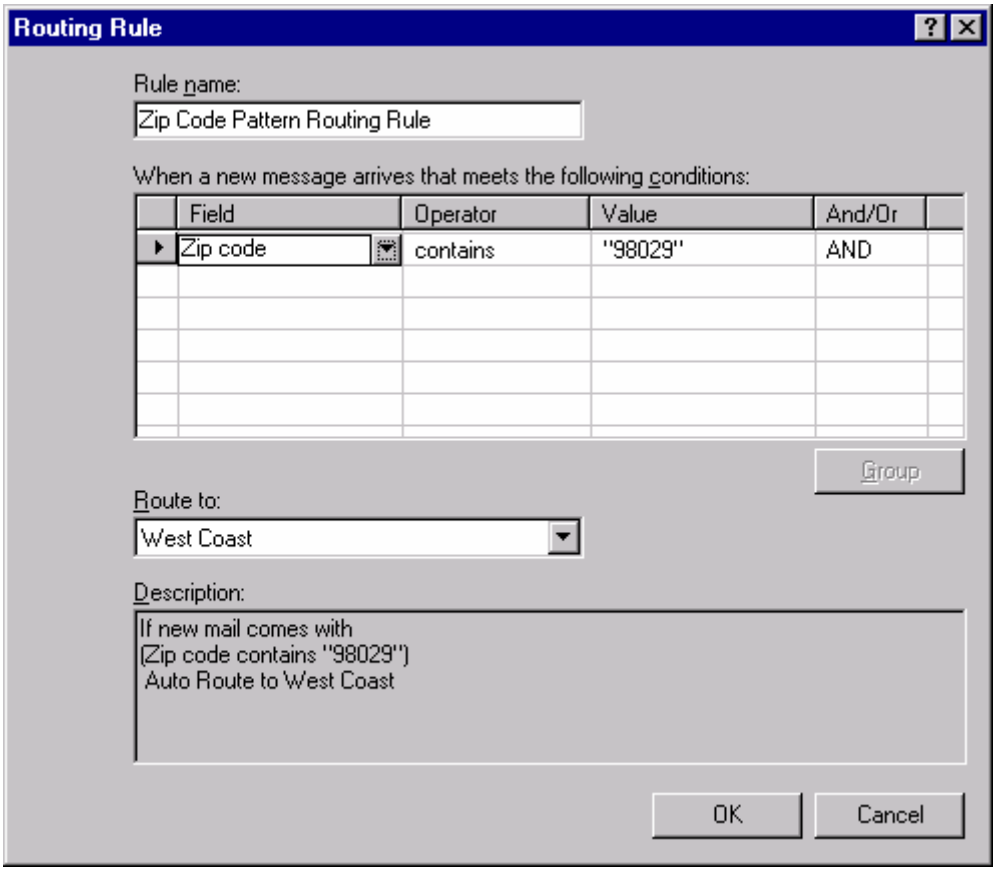

Figure 9. The Administrator Client makes it easy to identify text patterns and set up rules for handling them.

Establishing Business Rules

To automate tasks such as routing incoming e-mail, the system administrator sets up rules to define actions that are to be executed when certain events occur and certain conditions are met. The rules can be simple as:

[if the case is CATEGORIZED(“Networking”), ASSIGN(Peter)]

Or they can be more complicated, such as:

[if case contains “networking” and “problem” but not “cable modem”, then route to “Support” queue and update “priority” field to “normal”, except when customer is “Microsoft”]

But even with more complicated rules, the built-in Rules Wizard simplifies the process by providing a point-and-click interface for creating rules. Figure 10 shows examples of how the Rules Wizard works.

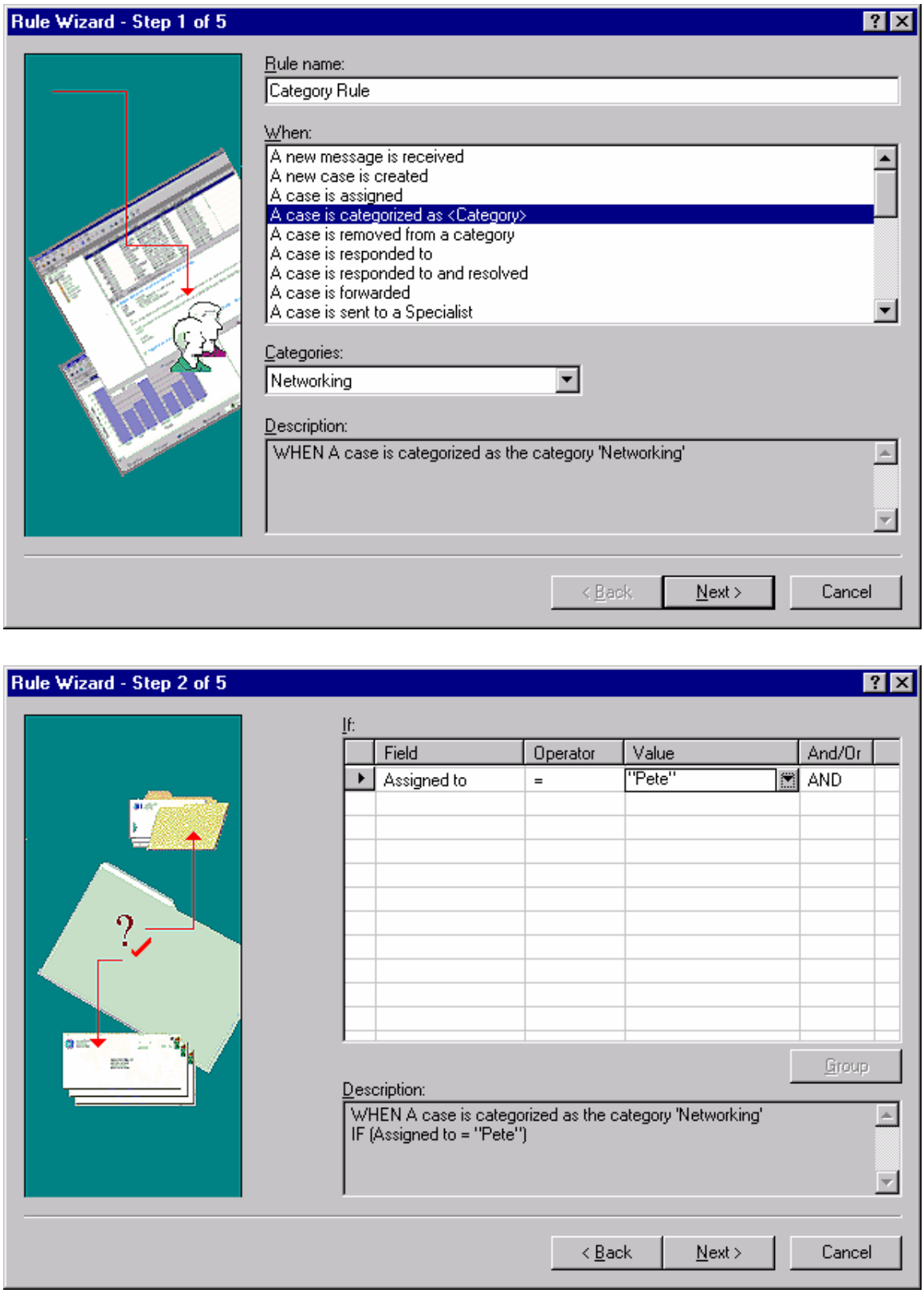

Figure 10. A built-in Rules Wizard simplifies the process of creating business rules.

The system administrator can also choose to turn on a predefined routing rule that preserves the customer-user relationship by routing a customer's follow-on queries to the same customer service representative that handled the first one. Figure 11 shows an example.

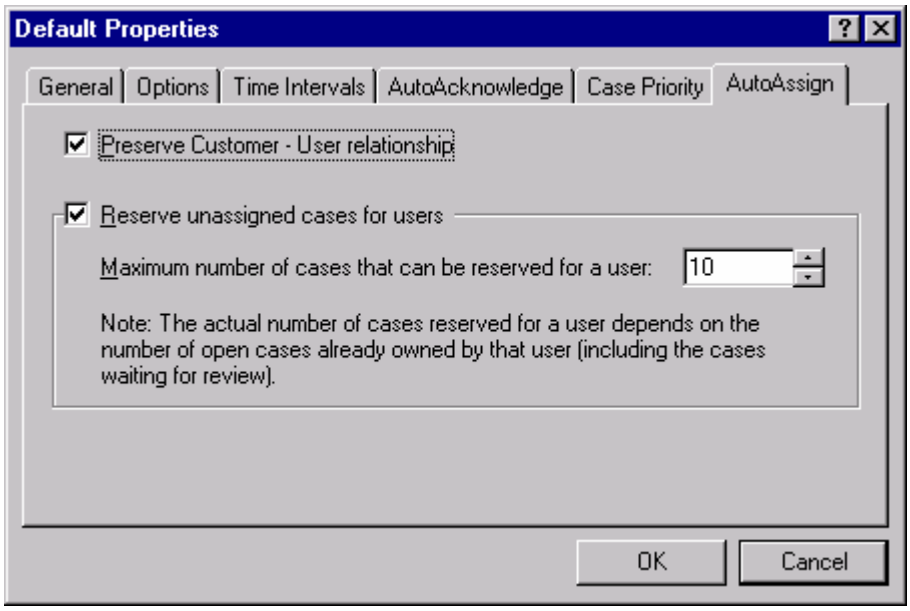

Figure 11. The system administrator can configure Talisma Enterprise to preserve customer-user relationships with a single click.

Prioritization rules are equally easy to set up with the Administrator Client. For example, Figure 12 illustrates a rule prioritizing cases based on their age.

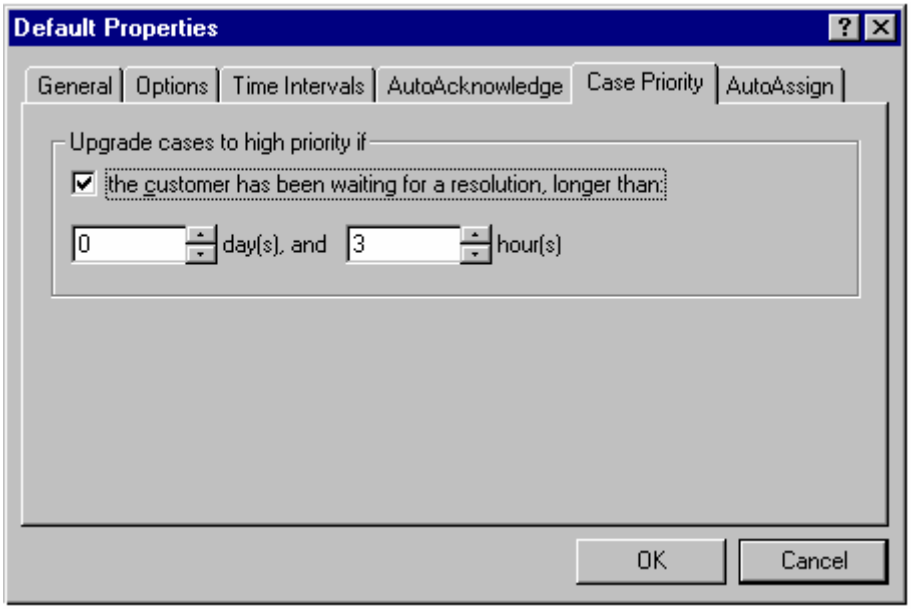

Figure 12. The ease of prioritizing response order ensures that no customers' queries fall through the cracks.

Scheduling Backups

The intuitive, point-and-click interface of Talisma Administrator, illustrated in Figure 13, makes it easy to perform routine tasks such as setting up a backup schedule.

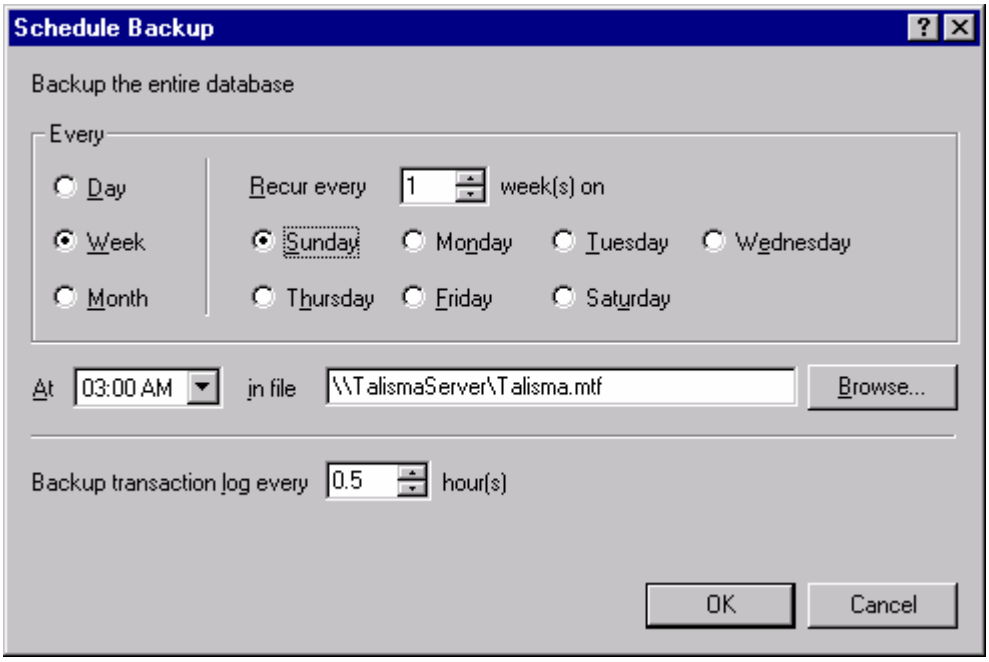

Figure 13. The intuitive user interface of Talisma Enterprise Administrator makes it easy to set up a backup schedule.

Troubleshooting

Troubleshooting is simplified by three logs that together save a record of all Talisma transactions:

- An **administrative log** that tracks administrative tasks, such as changing user permissions, creating a new user, or creating a new queue
- A **customer rules log** that the system administrator can check to see if a new rule is being executed properly
- An **error log** that tracks system errors, such as a user's inability to log into his or her account.

You can also launch the Windows NT application log from the Talisma Administrator. This log tracks activity on the entire machine, allowing a troubleshooter to determine if there is any connection between a system problem and external activities that may be going on at the same time.

Summary

Successful Web sites—just like successful stores—must offer superior customer service to remain in business. That means that companies doing business over the Internet must find ways to manage their customer relationships effectively, so that customers can receive prompt responses to their inquiries and feel that their concerns are being heard.

Talisma Enterprise offers a great solution for managing customer relationships electronically, whether your customers communicate with you by email, Web-forms, chat sessions, VoIP, or phone. The system not only offers robust performance, but also is highly scalable and reliable, as well as easy to manage. In addition, it features an open architecture, so it can be easily integrated with your current systems and databases. Talisma will help you build life-long relationships with your customers while improving your staff's productivity and your company's bottom line.

Appendix A:
Results of Talisma Performance Tests

This appendix describes in more detail the performance tests Talisma conducted in May and June of 2000 to validate the system's ability to handle large data volumes and high workloads.

Methodology

Test automation scripts were developed to design workflow processes for 50 concurrent users, writing the scripts in Rational Visual Test. The scripts and workflow were based on typical business processes, balancing them over the duration of the test to accurately simulate typical business loads. All tests were conducted at actual working speed, taking into account the normal pauses in human work behavior. In addition, the scenarios were staggered to ensure that not all user activities were happening simultaneously. All tests were conducted using randomized record access across all tables.

Test Environment

Clients

The test environment consisted of a variety of client configurations, ranging from Pentiums to Pentium IIIs. Operating systems included Windows 95, 98, NT, and 2000.

Servers

The server was a single-processor 500 MHz Pentium III with 256 MB of RAM, running Windows NT Server.

Network

The network was a 10-Mbps Ethernet.

Data Acquisition

The tests measured response times from the point at which a client submits a transaction to SQL Server for processing to the point at which the client is notified by SQL Server that the operation is complete.

Results

The following results were observed with 50 simultaneous users over a one-hour period. The first table shows results with the Auto Respond rule disabled; the second, with the Auto-Respond rule enabled. In the latter case, the system responded to half of the e-mails automatically, without human intervention.

Number of Users: **50** **Mails/hr:** **1000**

Replies/hr/user: **20** **Auto-respond rule set: NO**

Operation	Number of operations	Average time (sec)
Set state to Resolved	130	0.75
Assign Case	293	1.48
Categorize Case	654	0.32
Consult Specialist	137	1.26
Invoke Read Window	784	0.87
Invoke Reply Window	1136	0.72
Login	2	6.57
Send Reply	1136	1.06
Transfer Case	104	1.54

Number of users: **50** **Mails/hr:** **2000**

Replies/hr/user: **20** **Auto-respond rule set: YES**

Operation	Number of operations	Average time (sec)
Set state to Resolved	170	1.17
Assign Case	505	1.66
Categorize Case	969	0.44
Consult Specialist	263	2.08
Invoke Read Window	1233	1.34
Invoke Reply Window	1358	0.97
Login	4	8.80
Send Reply	1364	1.61
Transfer Case	91	1.71

Appendix B:
What Our Customers Have to Say About Talisma

"Talisma's performance has been outstanding from the beginning. Regardless of workload level, the system makes incoming customer inquiries immediately available to our customer service representatives and provides virtually instantaneous response time. This high performance has been consistent over the two years that we've had the system—despite the fact that our customer inquiry volume has gone up by more than 500 percent during that period. The system also has rock-solid reliability: we've been running it on a 24-by-7 basis from the beginning, and it has never once failed. The ease of customizing Talisma is another major plus: we've been able to tailor it to meet our specific needs, making it incredibly easy for representatives to know how to categorize an inquiry, how to respond to it, and which template to pull. The net result is a significant increase in our productivity: we can now respond to 80 percent of inquiries within 4 business hours and 100 percent within 12 hours."

Paul DeSousa, Vice President of Customer Experience, Netgrocer.com

"We've been very happy with Talisma's performance—it works just as it's supposed to. We get all our customer queries in a timely manner, and we've experienced no slowdowns, regardless of workload volume or the number of customer service representatives logged onto the system. Talisma is also easily scalable: we recently went from two to six servers to handle an anticipated increase in customer queries, and the scale-up process went very smoothly. As far as reliability is concerned, we run Talisma on a 24-by-7 basis and have never experienced any downtime at all—the system has been available 100 percent of the time."

Kelly Beiro, Manager of Customer Support, Bowstreet

"I really believe in Talisma. The architecture is very simple and straightforward, and the system is extremely reliable, scalable, and easy to maintain. We use it extensively—especially for e-mail—and we haven't had any issues with it at all. Although our call center isn't staffed on a 24-by-7 basis, we keep Talisma running 24-by-7, and we have never had it go down. We also keep adding more agents (the number has increased sixfold since we started) and more business uses for the system, and we haven't experienced any performance bottlenecks, capacity limitations, or impact on our corporate network. To scale up, all we have to do is add more user licenses and increase the size of our server. I wish all our software was this easy to work with."

Bob Paquin, COO and CIO, BlueNile

"We've been using Talisma for a couple of years. Over that time, we've gone from one customer service representative to 15, and our e-mail volume has increased by a factor of 25. Talisma has performed well throughout, with no slowdowns and no crashes. We're very pleased with Talisma—in fact, we don't know how we could handle our electronic customer relationships without it."

John Probst, President, ProHosting

"Talisma has really helped us streamline our workflow. We particularly like the ease of integrating it with our corporate database, so that it updates both it and the Talisma database at the same time. Despite this extra step—and despite a substantial increase in our e-mail volume—Talisma delivers top performance. As for reliability, we've had the product for nearly a year and have experienced no downtime at all."

Tina Schueller, Director of Customer Care, Imandi