



12. Connecting Peripheral Devices

You can connect a variety of optional RS-232 compatible peripheral devices to the NURIT 8210.

Caution

You can connect to up to two external peripheral devices to the NURIT 8210. Consult with your Lipman distributor for information about the peripheral devices that you can connect to your specific model.

Note

Peripheral devices may require special adapter cables for their connection to the NURIT 8210. In addition, certain peripheral devices require an external power supply. Refer to the product documentation of the specific peripheral devices, or contact your local Lipman representative for further details.

To connect an RS-232 peripheral device to the NURIT 8210.

1. Disconnect the AC/DC Power Adapter from the electrical power outlet.
2. Remove the connections panel cover, as instructed in “**Removing and Replacing the Connections Panel Cover**” on page 21.
3. Connect a peripheral device to one end of its adapter cable.



NURIT 8210

4. Connect the other end of the adapter cable to either the **COM-1** or **COM-2** connector on the connections panel.
5. Replace the connections panel cover, as described on **page 22**.
6. Reconnect the AC/DC Power Adapter to the electrical power outlet.

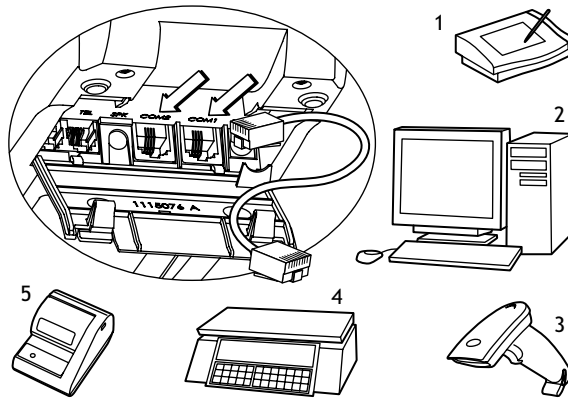


Figure 12-1 NURIT 8210 -
Peripheral Device Connection

- | | |
|---|--------------------------|
| 1 | Signature Capture Device |
| 2 | PC |
| 3 | Barcode Reader |
| 4 | Electronic Scale |
| 5 | Check Reader |



15. Replacing the Base Unit

The handover unit of the NURIT 8210 terminal performs all the critical transaction functions. The base unit holds the printer and connection ports, which may require replacement. It may be detached from the handover unit, along with the interconnection cable.

To replace the base unit and interconnection cable:

1. Remove the handover unit from the base unit and place it facing down on a flat stable surface.
2. Remove the connections panel cover on the base unit, as instructed in “**Removing and Replacing the Connections Panel Cover**” on page 21, and disconnect the terminal from the power supply, telephone connection, and all peripheral devices, speakers, or other connections.
3. Using a 4 mm Phillips head screwdriver, unscrew the two screws that fasten the interconnection cable cover.

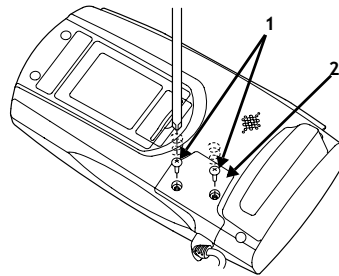


Figure 15-1 Removing the Cable Cover Screws

1	Fastening Screws	2	Cable Cover
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4. Remove the interconnection cable cover to expose the cable plug and swivel connector.

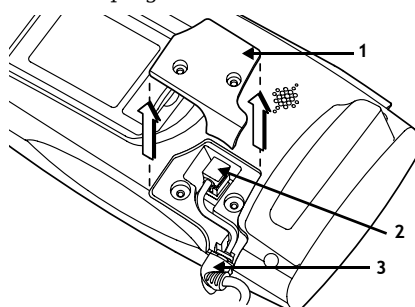


Figure 15-2 Removing the Interconnection Cable Cover

1	Cable Cover	2	Cable Plug
3	Swivel Connector		

5. Lift the interconnection cable's swivel connector up from its socket
6. Unplug the interconnection cable from the connector in the handover unit.

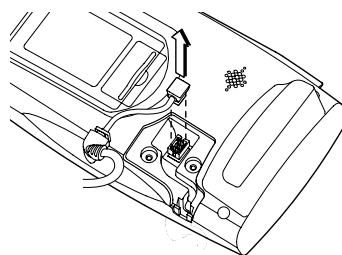


Figure 15-3 Unplugging the Interconnection Cable from the Handover Unit



7. Extract the replacement base unit from its box and remove from it any packing material and wrapping.
8. Insert the interconnection cable plug into the connector in the handover unit.

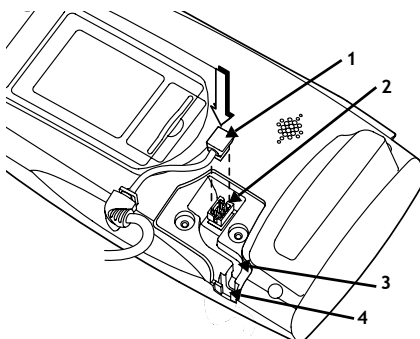


Figure 15-4 Connecting the Replacement Cable

1	Cable Plug	2	Cable Connector
3	Cable Channel	4	Connector Socket

9. Carefully press the cable down into the cable channel between the plug and the swivel connector.
10. Push the swivel connector into its recess in the side of the handover unit.

Note

Verify that the coiled interconnection cable is directed towards the back of the handover unit.

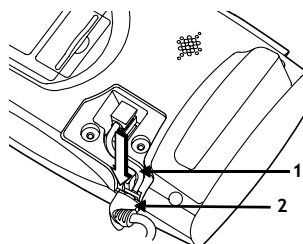


Figure 15-5 Pushing the Swivel Connector into Place

1 Cable Channel	2 Swivel Connector
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11. Place the interconnection cable cover over the cable, covering the plug and holding the swivel connector in place.
12. Insert the two fastening screws into their holes and tighten them using a 4 mm Phillips head screwdriver.

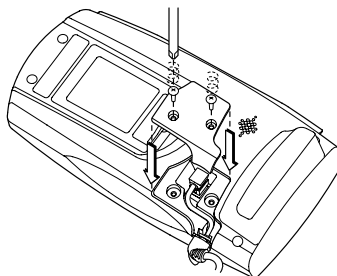


Figure 15-6 Covering the Interconnection Cable and Connector

13. Reconnect the power supply, telephone line connection, speakers, and any peripheral devices as required.



Chapter 3: Overview

This chapter provides an overview of mobile data services. This includes the following topics:

- Mobile data services and their market
- General Packet Radio Service (GPRS) systems
- The challenges encountered in delivering data services on a mobile network deals with these challenges
- How the *CellGlide GPRS Mobile Traffic Shaping™ (MTS)* solution overcomes the data services challenges

3.1 Introduction

The rapid growth in mobile communication networks, in the use of cellular telephones and in the availability of digital data services has created a demand for a new category of communication services: Mobile Data Services. Consumers of mobile communication services have begun demanding the same access to data, such as Internet connectivity, messaging services, and access to corporate VPNs, as they are receiving from wireline connections.

The GPRS system for cellular communication was developed to provide digital data access over existing TDMA and GSM networks. The GPRS system, though, is not designed to overcome some of the challenges and conflicts inherent in mobile data communications. These challenges are different than the issues associated with voice communications, and can overburden the mobile data network to the point of severe degradation of the service quality and the network performance.

The *CellGlide Mobile Traffic Shaper™ (MTS)* is designed to mediate and overcome major challenges, and efficiently deliver data services to mobile handsets, while maintaining a high quality of service and enjoyable user experience.

3.2 Mobile Data Services

Mobile data services, like their wireline counterparts, provide information and messaging services, such as Internet access, Instant Messaging, entertainment content, VPNs, and corporate applications.

3.2.1 Limitations of Wireless Communications

Unlike wireline communications, mobile data communications are limited by the very nature of the wireless media, namely radio interference, large buffering and delays and limited bandwidth.

Wireless communications transmit data over radio waves that travel through the atmosphere. Atmospheric changes, physical barriers, and other disturbances often disrupt these transmissions. Portions of the digital data are often lost when transmitted over radio airwaves.

Data services are often sent in bursts. Wireless data communications therefore requires large buffering along the data path, to support smooth and consistent data flow when bursts of data are lost and must be retransmitted. Large buffering is also required to support persistent data flow during cell handovers, when mobile users move between geographical cells. The large buffering results in excessive delays and jitter, which in turn results in a poor user experience and performance degradation of applications.

The spectrum necessary to carry wireless communications is also limited by nature and regulatory restrictions. The frequency band dedicated to cellular networks has a limited bandwidth that cannot be expanded, unlike wireline networks.

Data services often use common digital protocols such as TCP and UDP. The TCP protocol, for example, has a built-in confirmation mechanism to guarantee data integrity, which requests a confirmation reply after the transmission of each packet. If the correct confirmation is not received from the packet recipient, it is retransmitted.

The structure of digital protocols, coupled with the limitations of wireless communications, forces data to be retransmitted repeatedly, wasting valuable bandwidth.

3.2.2 Data Traffic Bursts

The atmospheric and bandwidth limitations of wireless communications are compounded by the nature of digital data services, their inconsistency or *burstiness*.

Digital data is commonly transmitted in peaks, also referred to as bursts. This is especially true with interactive services and Internet browsing. The bursts often push aside and disrupt rate-sensitive services like streaming data.

The repeated retransmission of packets, as described above, increases the intensity and frequency of these data bursts, further overloading limited resources.

3.2.3 Varied Data Services and Sensitivities

Different digital data services have varying requirements and priorities, in terms of data transfer rates, disruptions, delay time, security, and other considerations.

3.2.3.1 Streaming Media

Streaming media, such as music and video clips, require a constant, uninterrupted bandwidth. Any disruptions or delay in the data transfer causes the music to sound choppy and causes video transmissions to jitter.

3.2.3.2 Interactive Games and Applications

Interactive communications, such as games, instant messaging, and corporate applications send short bursts of data. The users who interact with these applications expect an immediate response, with little delay. Any delay of more than a few seconds degrades the user experience.

3.2.3.3 Downloads

Download activity, such as e-mail and graphics downloads, often require the transfer of large data files in a short period of time. Downloaded data may be disrupted periodically, as long as the user receives the entire file or message within a reasonable time period. File or mail downloads do not have to stream at a constant pace, like streaming media, or arrive immediately, like interactive applications, but require an average bitrate that guarantees reasonable download time.

All file and e-mail downloads must also arrive complete. If the complete file is not received, it will be retransmitted. This requires allocation of resources until the successful completion of the download is required.

3.2.3.4 Web Browsing and WAP

Web browsing and WAP (Wireless Application Protocol – the mobile version of web browsing) requires the transmission of web pages that are composed of a variety of file and data formats, text, graphics, sound, video, etc. Some of these data formats are transferred in bursts. Each piece of information on a single web page is usually sent as an individual file, and a disruption in the transfer of that file will cause an incomplete web page to appear. This type of data transfer is not sensitive to short disruptions, but the entire web page, with all its components, must transfer within a reasonable time span.

As noted above, each data service has different and sometimes conflicting requirements. If not properly managed, these conflicts severely degrade the user experience, or even halt data services on the mobile network.

3.3 GPRS Topology and Architecture

The GPRS (General Packet Radio Service) mobile network is a 2.5G cellular network that was developed as an adaptation of the TDMA and GSM networks. GPRS was designed to allocate data services into the time slots that are unused by voice calls. The available bandwidth for data services in each cell is constantly changing, dependent on the number of currently connected voice conversations.

3.3.1 Typical GPRS Network

Most existing GPRS networks were built as voice-only TDMA or GSM mobile networks that were later converted to GPRS. The voice communication architecture and cell infrastructure remained unchanged.

The following sections describe the data services side in the GPRS mobile network. The data services side includes the components that were added on to existing networks. The *CellGlide GPRS Mobile Traffic Shaper™* technology is applied to this part of the GPRS network.

3.3.1.1 GPRS Network Components

The GPRS network is composed of a core, with various components, and cells that are distributed across the network's coverage area.

The key components in the network core are:

- **MSC** (Mobile Switching Center) is the mobile equivalent of a telephone company's Central Office (CO). It manages all switching of voice calls and SMS messages.
- **GMSC** (Gateway MSC) is the switching center that connects the mobile network to other voice networks, such as to PSTN (Public Service Telephone Networks) and to other mobile networks.
- **HLR** (Home Location Register) is an active database of all the subscribers registered in the network and their location.
- **VLR** (Visitor Location Register) is a database that holds selected administrative information on roaming subscribers (callers connecting to a network that they are not subscribed to).
- **AuC** (Authentication Center) is a secure database that holds a copy of the secret key stored in each subscriber's SIM card, which is used for authentication and ciphering of the radio channel.
- **EIR** (Equipment Identity Register) is a database that holds a list of all the valid mobile equipment permitted to connect to the network.
- **SGSN** (Serving GPRS Support Node) connects the digital data services to the Base Station Subsystems (BSS), the distributed communication centers that control the antennas.
- **GGSN** (Gateway GPRS Support Node) is the mobile network's gateway to IP networks, such as the Internet.

The key components of the cells that are distributed in the coverage area are:

- **BSS** (Base Station Subsystem) is composed of the BSC and PCU. Each BSS controls the traffic of several cells.
- **BSC** (Base Station Controller) controls the antennas.
- **PCU** (Packet Control Unit) merges packeted data (from data services) into the streaming data of voice communication, and submits it to the BSC for transmission to the handsets.
- **BTS** (Base Transceiver Station) is the antenna.
- **MS** (Mobile Station) is any mobile telephone handset, PDA or other communication device.

3.3.1.2 GPRS Network Architecture

The GPRS mobile network is composed of a centralized core and distributed cells, as noted above. The core is divided into two distinct areas, voice and data.

Figure 1 below illustrates the architecture of the data services area of the GPRS mobile network.

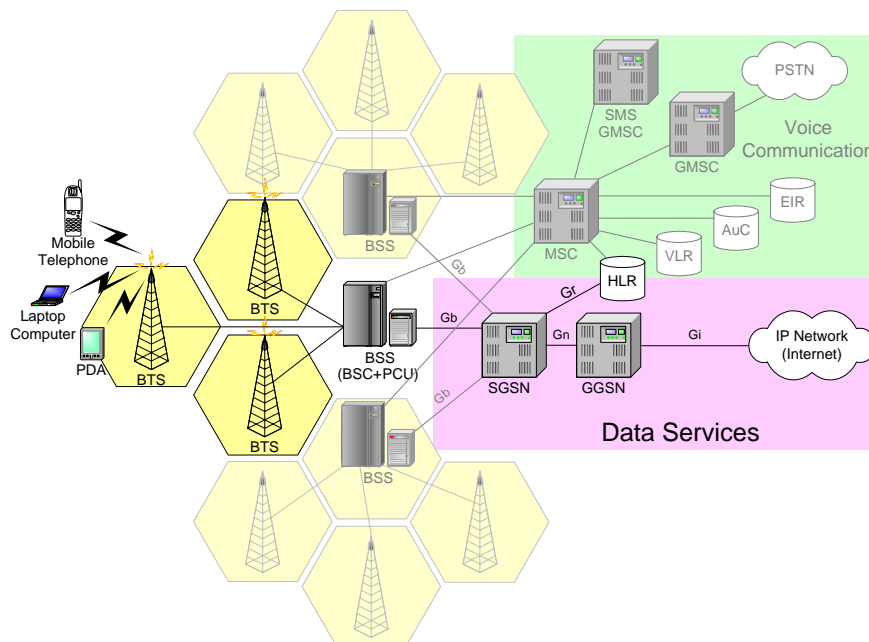


Figure 1: Architecture of GPRS Mobile Network

The network core's voice area includes the same components as traditional TDMA and GSN networks, MSC, BMSC, HLR, VLR, AuC, and EIR. Its role is the same as that of a regular telephone central office, to switch calls between network subscribers within the network and outside to other mobile and landline telephone networks.

The network's data services area is dedicated exclusively to the digital data that flows between IP networks and the subscribers. The components in this area, the SGSN and the GGSN, switch and route the data packets between an external IP network and the BSSs (Base Station Subsystems).

The voice and data services share the network's cell infrastructure. The network's cell system is composed of Base Station Subsystems (BSSs), which include

several cells with all the equipment required to switch and transmit from those cells.

Most conflicts, congestion, and bottlenecks in GPRS networks occur at the cell level. See section 3.4 and 3.5 for a full explanation of the challenges, and a description of how the *CellGlide MTS™* relieves them.

3.3.1.3 Data Services Flow in the GPRS Network

Mobile data services and content, such as messaging services (Instant Messaging, Multimedia Messaging, SMS), Internet access, and streaming content (video and music), is delivered to subscribers through the following path:

1. The data enters the GPRS network from a connected IP network through the Gi interface.
2. The GGSN receives the data in the Gi interface, translates it to the Gn interface, and transmits it to the SGSN (Serving GPRS Support Node).
3. The SGSN locates the destination MS (Mobile Station – handset) on the network and directs the data to the BSS (Base Station Subsystem) which is in contact with the handset, using the Gb interface.
4. The BSS's PCU (Packet Control Unit) accepts the data hands it to the BSC (Base Station Controller).
5. The BSC's role is to merge the voice and data services signals and send them to the BTSs (Base Transceiver Stations – antenna) that are communicating with the connected subscribers. The BSC identifies which BTS is communicating with a particular MS and sends it the appropriate data.
6. The BTS receives both voice and data connections and transmits them to the receiving MS.

3.3.1.4 Bottleneck at the Cell

The mobile telephone and data networks are most heavily loaded at their cells. Cells are frequently overloaded due to a combination of the following factors.

- Limited available resources
- Radio transmission disturbances
- Voice communications and data services are merged into the same cell resources

The network core is, in reality, a landline network and is not affected by any of the above limitations. It is not limited by radio frequencies and their disturbances, adding additional capacity is as easy as adding more wires, and the voice conversations are carried over separate infrastructures from data services.

The bottleneck that forms at the cell is particularly problematic for data services. Most data services, such as streaming media and web browsing, are downloaded, meaning the data flows in one direction, from the IP network to the subscriber's handset.

The bottlenecks at the cells are located near the end of the path. This causes the data that is in-route to back up, filling all the buffers along the route, causing them to overflow. Overflow data is often lost.

Additionally, many of the IP protocols require the recipient to send a confirmation message to the sender. If a confirmation is not received, the sender resends the same data. If data is buffered or lost, and cannot reach its destination, the recipient cannot send a confirmation. The sender then resends the data, adding further to the network's congestion.

3.3.2 GPRS Cell Capacity

GPRS mobile networks are an adaptation of the TDMA (Time Division Multiple Access) and GSM (Global Standard for Mobile communications) standards for mobile communications. The wireless connections between the handsets (MS) and the antennas (BTS) are all at the same frequency. To allow many concurrent connections, each caller is allocated a time slot. Each TDMA cell has a total of 8 time slots. Time slot 0 is reserved for synchronization, and time slots 1 and 7 are each reserved for voice and data services, respectively.

3.3.2.1 Limited Capacity

The TDMA standard limits cell capacity to a certain number of time slots. This time slot capacity is shared by voice and data communications.

- The operator plans the cell capacity based on the Erlang model, with a predefined blockage probability for voice calls.
- The actual Blocking Rate for voice call during peak use can reach 10%.
- The actual remaining capacity for data services is approximately 1-2 time slots during peak use and 3-4 at regular hours, since voice traffic has a priority over data.

3.3.2.2 Dynamic Cell Capacity Changes

Voice connections are given priority over data services. The number of time slots available for data services constantly changes, as illustrated in Figure 2 below.

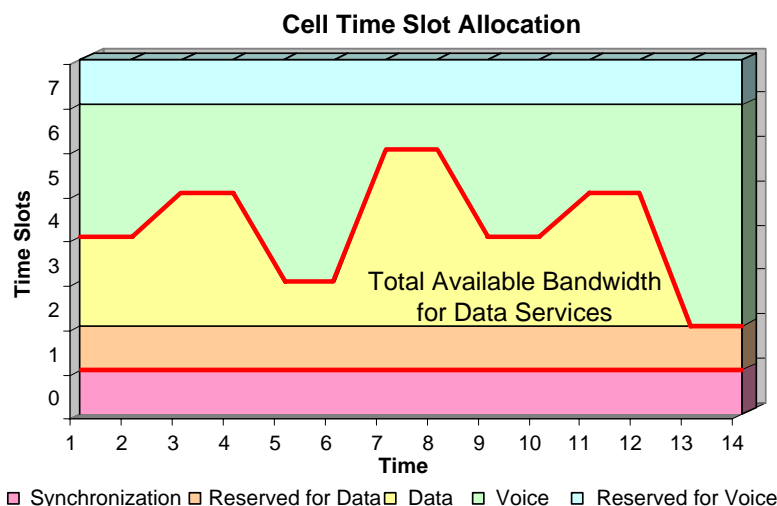


Figure 2: Available Cell Capacity

- The figure presents a small cell with one TRX.
- A total of seven time slots are available for both voice and data traffic. One time slot is reserved for synchronization.

- Connection and termination of voice calls changes the resources allocated for data services.

3.3.2.3 Cell Resource Allocation Mechanism

The various data types require cell resources to be allocated to them differently.

- **Streaming data** requires a consistent, uninterrupted bandwidth.
- **Interactive games** and **applications** often send and received in bursts. They require an immediate response (short delay time), which requires a large capacity (high bandwidth) for a short time period.
- **WAP, web browsing** and **downloads** require data to download at an acceptable average bitrate and arrive within a reasonable time.

All the data types must share and coexist within the same available bandwidth, without disrupting or preempting each other.

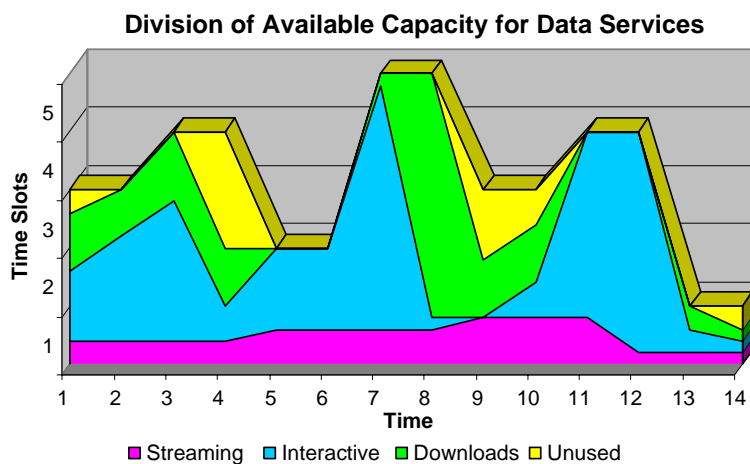


Figure 3: Capacity Division for Data Services

3.4 GPRS Challenges

All the cellular network types (AMPS, CDMS, TDMA, GSM) have been used, until recently, primarily for voice communications, where the service requirements were quite uniform. In voice communications cell resources are allocated into time slots, which does not require traffic shaping. Each voice call is allocated one time slot. New calls are refused connection if all the time slots are filled. All callers are given identical priority, in a first-come-first-served basis.

When data services are introduced to a previously voice-only network, the conflicts between voice and data communication, as well as conflicts between the various data types, form bottlenecks in the network cells and service degrades. The mobile network suddenly has to face a new set of challenges.

3.4.1 Inefficient Resource Allocation

Without traffic shaping, the limited resources available are allocated on a *best effort* basis. Each subscriber that connects to data services is allocated a share of the total bandwidth, regardless of availability or user experience.

3.4.2 Inefficient Response to Disruptions

GPRS networks do not have a built-in mechanism that identifies transmission disruptions. When a disruption occurs, not only is the sent data lost, but the sender does not know of the disruption and sends more data, which is also lost.

This problem is compounded by the confirmation mechanism built into most IP protocols. This mechanism, which is intended to insure data integrity, requires the recipient to send a confirmation message to the sender for each packet. The sender waits a certain period of time for the confirmation, and if it is not received, resends the packet. If the connection is unstable or disconnected, the same packet is resent repeatedly, until the sender is instructed to stop sending.

3.4.3 Unpredictable Resource Allocation

As noted above, GPRS data services use the time slots that are left over from voice calls. The number of time slots changes constantly, as callers connect and disconnect.

Without traffic shaping, the GPRS network cannot adjust the data flows according to changes in the number of available time slots. If new voice connections are made when the entire bandwidth of data services is in use, the required time slots are taken from data services. When this occurs, all the data flows will have some of their packets dropped (lost) to fit into the narrower bandwidth.

3.4.4 Inefficient Response to Buffer Overflows

The most frequent and serious bottleneck in the GPRS network is located at the cell level. This commonly develops into chronic congestion, and cannot be relieved easily.

The cells are also located near the end of the data flow path. Congestion at the cell level can cause the buffers all along the path, up to the IP network, to fill and overflow. Buffer overflow data is commonly dropped or lost.

3.4.5 Degraded User Experience Due to Inefficient Resource Allocation

GPRS networks without traffic shaping do not have a minimum blocking rate for data sessions. The session is not terminated automatically if the data flow rate drops to a level where the experience is no longer enjoyable. This results in both an inefficient use of resources and a bad user experience to the subscriber.

Additional subscribers are allowed to connect even when all the cell's resources are used to their full capacity. Each user is given a decreasing share of the total bandwidth, and the user experience of all the connected users suffers.

3.4.6 Need of a Safety Margin to Ensure Efficient TBF Functionality

GPRS networks need to allocate a large safety margin for each data flow. This margin remains unused most of the time, and is only used when data is sent in bursts. This causes an inefficient use of network resources.

Additionally, this margin may not be large enough for particularly heavy data bursts. Some of the data in large data burst is lost if a queuing mechanism does not exist to hold the data and release it gradually.

3.4.7 Quality of Service

GPRS networks cannot implement an effective Quality of Service (QoS) mechanism for data services. All existing QoS mechanisms for mobile networks are intended for voice communications, which is less varied and prioritized than data services. These networks, therefore, cannot guarantee a certain QoS for particular data types.

3.4.8 Affected User Experience

Each data type requires a different set of data transfer characteristics for the user experience to be enjoyable. A standard GPRS network without traffic shaping does not differentiate between different data types.

3.4.8.1 Streaming

Streaming data requires a constant and uninterrupted bandwidth. If the bandwidth is narrowed or interrupted, the user will experience jitter.

3.4.8.2 Interactive

Interactive games and applications often send and receive data in short bursts. If the available bandwidth cannot accommodate the sharp peaks in data transmission, some data is lost. The sharp peaks also cut into and disrupt other data transmissions, such as streaming, which affects the other users.

3.4.8.3 Downloads

File and application downloads do not require an uninterrupted or steady connection. A downloaded application or file has to be complete in order to be usable.

The GPRS network cannot identify if a download has completed, and at what point it was interrupted. If a download is interrupted, the download process starts over at the beginning. An unstable connection causes downloads to be repeatedly retransmitted, using valuable and limited bandwidth.

3.4.9 Network Visibility

The elements in the GPRS network communicate with the adjacent elements, but are not aware of the entire network. It is not possible to view an entire GPRS network yet, including all elements and connections.

3.4.9.1 Monitoring Tools

The addition of GPRS onto existing TDMA and GSM networks added a new digital domain to the network's activity. Existing mobile network monitoring tools are designed to monitor voice communication activity on the network. Data services activity, which behaves differently than voice, is not monitored like voice calls. New tools are required to monitor data services activity on mobile networks, and how data services interact with voice communication.

3.4.9.2 Network Dimensioning

Voice communication on mobile networks is much more homogeneous and predictable than data services. Each type of data service provided, such as streaming, interactive, downloads, and web browsing, has different requirements for bandwidth, connection quality, and stability.

The behavior of data services and their subscribers cannot be predicted at present. An accurate network dimensioning and prediction tool for data services that are provided on mobile networks is required.

3.4.9.3 Service Plans

The limited availability of network resources, especially at the cell level, forces operators to prioritize data and subscribers. Operators need the ability to block or delay data that is of lower priority, so that the higher priority data will reach the subscribers.

Operators need service plans that define subscriber profiles (high value customers, corporate, families, infrequent users, etc.), data types (streaming, interactive, web browsing, downloads), and the priorities and service levels allocated to each of them.

3.5 Mobile Traffic Shaping Technology™ – A New Mobile Networking Domain

The *CellGlide Mobile Traffic Shaper™ (MTS)* is the first traffic shaping technology implemented on mobile networks. The *MTS* allocates the available cell resources to data flows in a way that resolves the conflicts between the data types and best suits their requirements.

3.5.1 Existing Domains of Data Traffic Improvement

The *CellGlide MTS™* opens a new domain in data traffic improvement. All the previous attempts to improve data transmission over mobile networks concentrated in the following areas:

- Data compression
- Content reduction
- Caching and pre-fetching
- RF planning
- RF optimization

None of these attempts tried to prioritize the data according to requirements. These attempts also ignored some of the conflicts inherent in data transmission over a limited bandwidth, such as burstiness, retransmitted packets, or acceptable delay times.

3.5.2 The CellGlide Mobile Traffic Shaping™ Technology

The *CellGlide MTS™* adds a new dimension in the effort to increase and optimize data transmission over mobile networks. It prioritizes the data according to its characteristics, requirements, and sensitivities.

Mobile Traffic Shaping™ operates as a system that monitors and controls the data that flows between the content providers and the mobile network's subscribers. The *MTS* monitors, at one end, the capacity and load of the mobile network's cells, where the data bottleneck most often occurs, and at the other end, the data that is sent through the network by content providers.

The *MTS* then controls a series of transmission queues and buffers, where data packets are kept, based on the information gathered from monitoring the network. The queues and buffers hold and release the data packets according to service policies that are configured by the operator.

3.5.2.1 Cell and Traffic Monitoring and Dimensioning

The *MTS* monitors the mobile network at two points:

- Gb interface between the SGSN and the BSC.
- Gi interface between the GGSN and the external IP network.

The Gb interface provides information on the existing capacity and load conditions of each cell in the mobile network. The *MTS* monitors the Gb interface in real-time, for information on the total capacity and current load of each cell in the network. The number leftover of time slots available for data services is calculated from this monitoring.

The *MTS* also monitors the Gi interface, at the other end of the data services path. The Gi interface connects the mobile network to external IP networks. At this end,



the *MTS* monitors the actual data content and identifies the data types by how they flow.

The *CellGlide Mobile Traffic Shaper™ (MTS)* is designed to ease the congestion at the network's cells. It intercepts, prioritizes, queues, and blocks the data traffic in the Gi interface, where it enters the mobile network. This prevents the data from backing up inside the mobile network, and filling the buffers.

The *MTS™* identifies the type of data being transmitted and allocates the available bandwidth according to each data type's requirements. The limited resources are divided so that each data type is allocated bandwidth according to its requirements and within the limits of the available time slots.

3.5.2.2 Service Policies

Service policies are sets of rules that guide the *MTS* how to allocate cell resources. Service policies aim to provide the highest level of service possible for each data type by allocating parts of the available bandwidth and prioritizing the flows.

Streaming data, for example, is allocated a steady, uninterrupted bandwidth. The data bursts of interactive or corporate applications is buffered and flattened, to minimize the sharp peaks in the flow.

The service policies also provide access control, which blocks access to new sessions when cell capacity has reached its limit. This prevents a situation where current users suffer a substantial degradation in the user experience because a new user has connected and taken a portion of their bandwidth.

3.5.2.3 Queue Control

The *MTS* applies the service policies to the queues and buffers that hold and transmit the data packets. The data that flows from the IP networks to the mobile handsets are held in *MTS* queues that are controlled according to the service policies. These queues hold and release packets at a time and rate determined by the *MTS* service policies, and dependent on available cell resources.

The total volume of data sent through a particular cell at any moment should not exceed available cell resources for data services. This data volume must be divided to provide an acceptable service level among all the connected subscribers.

3.5.3 GPRS Mobile Traffic Shaping™ Values

The *CellGlide GPRS Mobile Traffic Shaper™ (MTS)* is a system that shapes mobile data traffic and optimizes the resource allocation of GPRS cells. This shaping and optimizing is done in real time, based on resource availability, service characteristics, and the operator's defined service classes and policies.

The *MTS* provides the essential technology that allows the efficient delivery of GPRS data services with the following benefits:

- Efficient data delivery and significantly improved user experience
- Increased cell utilization and *billable goodput*
- GPRS network monitoring, visibility and dimensioning
- Grade-of-Service differentiation.

3.5.3.1 Efficient Delivery and Improved User Experience

The *MTS* allocates cell resources in a way that enables network operators to efficiently deliver data services to subscribers, with an improved user experience:

- Delay sensitive interactive services, such as WAP browsing, instant messaging, and mobile gaming, can be delivered with little or no delay.
- Stable and predictable downloads may be executed with confidence, without the common service instability problems, such as stalled sessions, disconnections, and partially downloaded pages or files.
- Bitrate sensitive corporate applications and streaming services can be delivered consistently and without interruptions or jitter.
- TCP based services, such as Web browsing, e-mails and downloads, are improved. These services often suffer from radio interference and cell handover, causing disconnections, stalled sessions, and data loss, especially when multiple users in the same cell concurrently access bandwidth intensive services.

3.5.3.2 Increased Cell Utilization and *Billable Goodput*

The *MTS* optimizes the allocation of cell resources in real-time, preventing uncontrolled cell over-utilization, which results in severe service degradation (delays, stalled sessions, jitter, etc.). As a result, the *MTS* increases the amount of billable data traffic.

The *MTS* allows operators to reclaim reserved cell resources that were devoted to large bandwidth safety margins, previously required to support bursts in data traffic.

The *MTS* also implements the admission control of the operator's service policies. Admission control serves both to prevent unauthorized access to certain data services, and it blocks access to bandwidth intensive flows when the resources are not available.

3.5.3.3 Network Visibility, Monitoring and Efficient Dimensioning

The *MTS* monitors data traffic in real-time, ranging from the individual cell level, continuing with routing/location areas, and up to the network-wide level. The *MTS* provides a detailed analysis of service demand, service quality and blocking rates.

The *MTS* analysis identifies network hotspots and provides the vital detailed statistics required for optimal network dimensioning, such as the amount of bandwidth (or time slots) necessary to support the required service level for each service type per cell or across routing/location areas.

3.5.3.4 Service Level and Class Differentiation

The *MTS* enables and enforces Grade-of-Service differentiation for different applications, subscriber profiles, APNs, traffic sources, devices, locations and time parameters.

Leveraging on this functionality can provide differentiated levels of data service and pricing plans, and can optimize the use of the limited radio resources.

Chapter 8

DTE User Interface

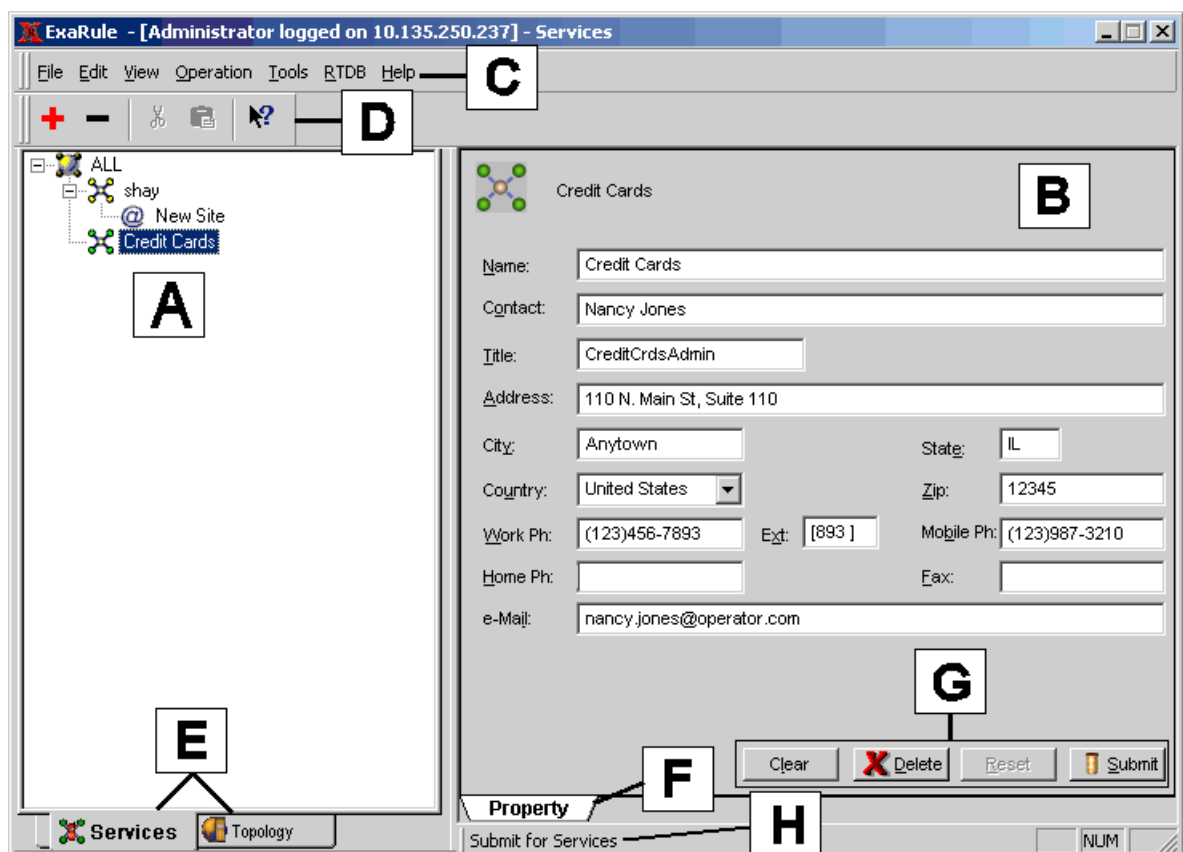
1. Overview

This chapter describes the Data Tariff Engine application's user interface and includes explanations on the different areas on the DTE screen and how to perform basic operations in the system.

2. Main Screen Area

The DTE screen is divided into different areas as shown in Figure 8-1 below:

Figure 8-1 Sample DTE Screen



Tree Area (A) shows the tree structure of current tab (services or topology). A completely expanded tree branch is shown by a – symbol. To collapse a branch of the tree, click on the – (minus) symbol. To expand a branch of the tree, click on the + symbol.

Details Area (B) shows the details of the selected tree branch. For example, if a service is selected, the service's details are presented in the Details area. At the bottom of this area, several buttons are displayed. These are used to delete, clear, reset or submit changes. Refer to “Standard DTE Operations” in Chapter 8, Section 3 for details.

Menu Bar (C) shows the DTE menu bar. Each menu item contains several suboptions. Refer to “The Menu Bar” in Chapter 8, Section 4 for details on all the options.





Toolbar (D) shows the DTE toolbar icons. Each icon corresponds to a specific option. Refer to “The Toolbar” in Chapter 8, Section 5 for details.

DTE Tabs (E) shows the two DTE tabs: Services and Topology. The purpose and use of these tabs are described in Chapter 10 and Chapter 11.

Tabs (F) show the different parameters that you need to define to set up the Services or Topology. When you select a tab, the Details Area changes accordingly. In the DTE Client application, only the **Property** tab is visible.

Buttons (G) appear in the Detail Area. Up to four buttons may appear as shown in the following table.

Table 8-1 Detail Area Buttons

Button Icon	Button Name	Description
	Clear	Press this button to clear the data fields in the details area. Refer to “Clearing the Data in a Record” in Chapter 8, Section 3.3 for details.
	Delete	Press this button to delete the current record. Refer to “Deleting a Record” in Chapter 8, Section 3.4 for details.
	Reset	Press this button to reset the data fields to their last saved values. Refer to “Resetting a Record” in Chapter 8, Section 3.7 for details.
	Submit	Press this button to save changes made to the data fields.

Status Bar (H) shows messages relating to the last operation you performed. For example:

Department data was restored.

3. Standard DTE Operations

This section describes the procedure used to perform standard operations throughout DTE.

3.1. Defining a New Record

To define a new record (service or site):

- 1 Move the cursor to the corresponding tree branch.


- 2 Click the right mouse button and select the New option.

OR:

Click the + (plus) button on the menu bar.

- 3 The new record is added under the tree branch and is assigned the default name (New Service or New Site).

Note: If a second new record is added, it is assigned the name New Site(2), etc.

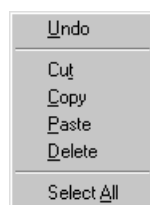
- 4 Change the record's name and details in the Details area.
- 5 The record name displayed at the top of the Details area is marked with an asterisk (e.g., New Site*) showing that changes have been made and the record has not been saved yet. The window title is also marked with an asterisk.
- 6 New records can also be added using the Operations menu.
- 7 Click the **Submit** () button to save the new record.

3.2. Filling in Data Fields

To fill in data fields:

- 1 Use the standard editing keys to type/edit information in the data field.
- 2 Move between the fields using the mouse or <Tab> key.
- 3 Press the right mouse button to open the Edit menu as shown in Figure 8-2.

Figure 8-2 The Edit Menu



INS04523

- 4 To use the Edit menu, select an option from the menu as described below:

Undo: Undo the last editing operation performed.

Cut: Cut the highlighted text and place it on the clipboard.

Copy: Copy the highlighted text to the clipboard.

Paste: Paste text from the clipboard to the current cursor location.

Delete: Delete the highlighted text.

Select All: Select all the text in the current field.

Note: An unavailable option is grayed, and cannot be selected.

- 5 After filling in all the mandatory fields, you can save the data. Refer to “Saving a Record” in Chapter 8, Section 3.5.

3.3. Clearing the Data in a Record

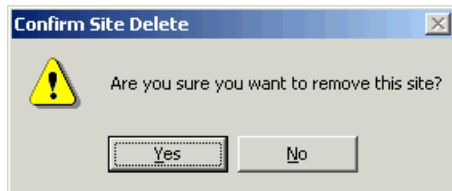
To clear all the data in the data fields of the current record:

- Press the **Clear** button.

All the data fields in the record are cleared.

3.4. Deleting a Record

To delete an entire record, press the Delete button. A confirmation message is displayed:



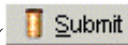
Press **Yes** to delete the record or **No** to cancel the deletion.

Note: You can also delete a record by clicking the right mouse button on the item in the tree area and selecting the **Delete** option.


If the record contains subrecords, a warning message is displayed. For example:



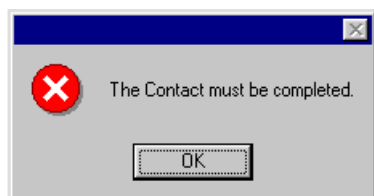
INS04604

Note: After pressing **Yes**, you must press the **Submit** () button to physically delete the record from the database. If you do not press the **Submit** button, the record will remain in the database.

3.5. Saving a Record

To save a record, after filling in the fields, press the **Submit** () button.

Note: If you try to save a record without filling in all the mandatory fields, an appropriate message is displayed. For example:

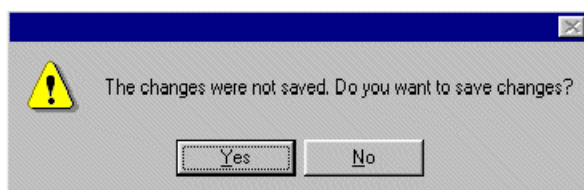


Make sure you fill in all the mandatory fields and try again.

After the record is saved, a corresponding status message is displayed.

3.6. Exiting a Record

If you try to select another component or record without saving the current record, the following dialog box is displayed:



Select **Yes** to save the record or **No** to exit the record without saving.

3.7. Resetting a Record

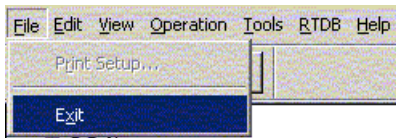
To reset the data fields in a record to their last saved values, press the **Reset** button. All unsaved data entered will be lost. After **Reset** is pressed, the data is reset and the following status message is displayed:

Information restored successfully

4. The Menu Bar

By default, the Menu Bar displayed at the top of the DTE screen contains seven menus: File, Edit, View, Operations, Tools, RTDB and Help.

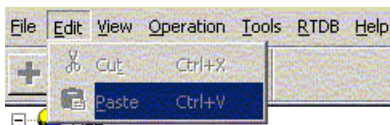
4.1. The File Menu



The File Menu is used to perform file and print operations. It contains the following options:

- **Print Setup**, used to select a printer to be used to print DTE records, and define the printer settings.
- **Exit**, used to exit the DTE client.

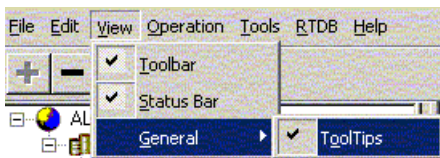
4.2. The Edit Menu



The Edit Menu is used to perform cut and paste operations on items. It contains the following options:

- **Cut**, used to cut the currently selected item and save it in the clipboard.
- **Paste**, used to paste an item from the clipboard to the current location.

4.3. The View Menu



The View Menu is used to define whether or not to display the toolbar (at the top of the screen), the status bar (at the bottom of the screen), and the tooltips (next to each option when the mouse is moved over it).

- To display the toolbar, select the **Toolbar** option.
- To display the status bar, select the **Status Bar** option.
- To display tooltips, select the **General --> Tooltips** option.

These **Options** are toggle options. When displayed, the option is marked by a check symbol (✓). Select the option again to hide the toolbar/status bar.

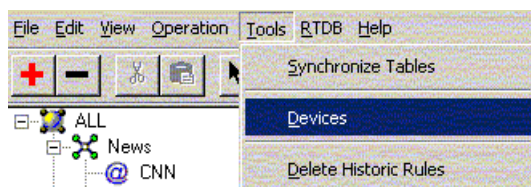
4.4. The Operation Menu



The Operation Menu is used to define new records (service or site) and to delete existing records.

- To define a new record, select the + option. For details, refer to “Defining a New Record” in Chapter 8, Section 3.1.
- To remove an existing record, select the – option. For details, refer to “Deleting a Record” in Chapter 8, Section 3.4.

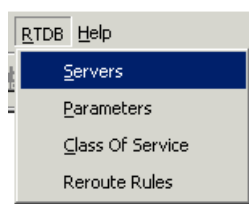
4.5. The Tools Menu



The Tools Menu contains two options:

- **Synchronize**, used to synchronize data between the DTE server and the gateways. For details, refer to Chapter 13, "Synchronizing the DTE Server and Gateways".
- **Device**, used to access the device table containing a list of mobile devices defined in the system.
- **Delete Historic Rules**, used to delete routing rules defined in earlier DTE versions.

4.6. The RTDB Menu

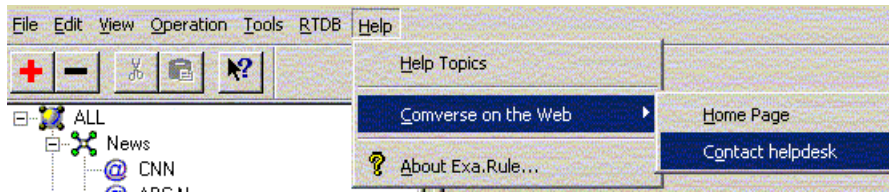


The RTDB Menu is used to configure parameters and perform RTDB related commands. For details, refer to Chapter 9.

The RTDB Menu contains four options:

- **Servers**, used to define connection between the RTDB and PrePaid Services (PPS) servers. This command opens a list of all the PPS servers that are connected to the RTDB system, where each server's parameters may be set. For information, refer to Chapter 9, Section 2.
- **Parameters**, used to configure the RTDB's parameters. For information, refer to Chapter 9, Section 3.
- **Class of Service (CoS)**, used to define the classes of service to which subscribers may be associated. For information, refer to Chapter 9, Section 4.
- **Reroute Rules**, used to define the default reroute rules that are automatically applied in specific cases. For information, refer to Chapter 9, Section 5.

4.7. The Help Menu









The Help Menu contains several options used to help you work with DTE:

- **Help Topics**, displays the DTE online help system.
- **Comverse on the Web**, contains two suboptions for accessing information on Comverse via the Internet:
 - ◇ **Home Page**, displays the Comverse home page (www.comverse.com).
 - ◇ **Contact Helpdesk**, displays information on how to contact Comverse.
- **About**, displays DTE version and copyright information.

5. The Toolbar

The Toolbar contains icons that perform various DTE operations. Up to 11 icons can be added to the toolbar:

Table 8-2 Toolbar Icons

Icon	Option	Description
	Add record	Add a new record.
	Delete record	Delete a new record.
	Help	Access the About DTE window.
	Context sensitive help	Access context-sensitive help to display help on a specific option.
	Cut	Cut the selected record/item and place it on the clipboard.
	Paste	Paste the record/item from the clipboard to the current location.

Chapter 5 Routine Operation

Commit is an integrated account interaction recording and management system. The system records and tracks all customer interaction that is scheduled and/or performed, such as service calls, product sales, correspondence, and telephone conversations, which are then billed according to the products, services, and expenses. It can then extract statistics, print reports, and track business processes. In addition to conventional contact management features, Commit is specially designed for computer service companies, and includes the following unique features that ease the administrative tasks associated with providing services and developing business contacts:

- **Creating new accounts and employees** is the process of adding new business contacts and employees to the Accounts list.
- **Ticketing** is the procedure of registering requests for services, scheduling service calls, and following through their implementation.
- **Dispatcher** is a scheduling feature that displays the daily schedules of all your employees and provides easy and intuitive ticket dispatching.
- **Sales Opportunities** lists all the opportunities you have to increase business and sales, with all the tasks, documents, and information required to maintain contact with your new and existing customers.
- **Document Management** lets you attach contracts, service warranties, time sheets, and the like, to accounts, opportunities, and tickets, and open them directly from Commit.
- **Integrated Ticketing, Sales, and Billing** lets you follow-up on products and services you provided customers and manage their billing.
- **Contact Interaction History** displays a chronological list of all account interactions, progress, and changes to opportunities and tickets.

5.1 Creating Accounts

The heart of the Commit system is its account management and differentiates between two contact types:

- **External Accounts** are your organization's customers, suppliers, business partners, competitors, and other external contacts.
- **Employees** are the people in your organization who are in contact with and service your customers. They are the users who access and use the Commit system, and the customers are billed for their work.

Most of the fields for all the contacts are the same, except that tickets and charges are linked to accounts, and every employee has a labor rate for his/her work and access privileges to Commit.

Page 5-1

The procedure below instructs how to create a new external account (customer, supplier, etc.). The procedure after it instructs how to create a Commit employee and activate him/her to be an active user.

5.1.1 Creating a New Account

External accounts are your customers, business partners, subcontractors, suppliers, competitors, and other contacts. Commit can open a ticket and dispatch service to every external account, as well as follow through and charge for the products and services provided.

Follow the procedure below to create and configure an external account.

1. Log on to Commit.
2. Click **Accounts** in the left icons bar. Or click the **View** menu and select **Accounts**. The Accounts window opens by default in the List and Details view, as displayed in Figure 5-1 below.

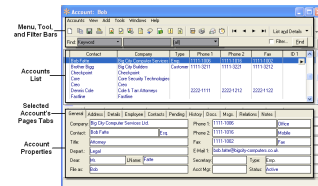


Figure 5-1: Accounts Window

The window includes the following components:

Area	Description
Menu and Tool Bars	Menus and command buttons that execute commands on selected accounts or link them to other categories
Filter Bar	Find accounts according to specific conditions
Accounts List	List of all registered accounts or accounts filtered in the filter bar above
Page Tabs	Tabs that display account details according to certain categories
Properties Pages	Detailed account information

Note: The Accounts window displays all accounts, both employees and external accounts. The employees appear with *Emp.* (Employee) in the Type field. See the next section Creating a New Employee (Commit User) for a description of the Employees window.

Page 5-2

3. Click the New Account (📄) icon on the tool bar or click the **Accounts** menu and select **New Account**. An empty New Account dialog box appears, as displayed in Figure 5-2 below.

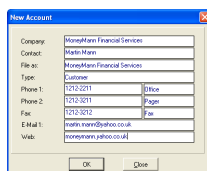


Figure 5-2: New Account Dialog Box

4. Enter the account's company name and the name of the contact person in the corresponding fields. A single company may have more than one contact person. The name you enter in this dialog box will be the account's **Primary Contact**. You can add additional **Secondary Contacts** in the account's **Contacts** page (see 5.1.2 below).
5. Click the **File as** field and select if the account will appear by the company name or the contact person's name throughout Commit and in the generated reports.
6. Click the **Type** field and select the account type. This value will appear in other parts of Commit.
7. Enter the new account's telephone numbers and select the number type (office, mobile, pager, etc.), fax number, E-Mail address, and Web address. The information in this dialog box will appear again in the account details page described below. Entering information in either the **Company** or **Contact** fields is mandatory.
8. Click **OK** to create the new account or **Cancel** to cancel. The Account window appears, as displayed in Figure 5-3 below.

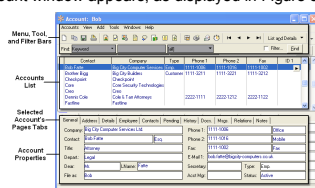


Figure 5-3: New Account Details Window

The top half of the window displays the general account information, most of which you entered in the previous dialog box. The bottom half

Page 5-3

shows a row of tabs, each representing a page with data fields associated to the new account.

The table below describes the pages displayed for external accounts, such as customers, suppliers, and the like.

Page	Description
General	Basic account information, such as company name, primary contact's name, job title, department, telephone and fax numbers, and email address, as you entered in the New Account dialog box. Also included is your business' account manager, the employee in your organization who is responsible for the account.
Address	Mailing address, Web site, and other information.
Details	More detailed account information, including customizable fields.
Service (Accounts only)	Description text fields for entering customer and service information, such as contract, ongoing projects, and service history.
Employee (Employees only)	Employee activation and billing information, such as nickname, labor rate, and active status.
Contacts	Secondary contact people in the account company.
Pending	Pending activity that has not yet been completed, such as tasks, appointments, tickets, and opportunities
History	Complete history of all interactions, transaction, and changes to the account and to linked activity
Opportunities	Sales opportunities, their value, and tracking details
Tickets	Service calls made to the customer
Charges	Products, services, and expense provided and charge to the customer
Documents	Documents associated with the customer, such as faxes, E-Mails, scanned documents, contracts, correspondence, and price lists
Messages	Internal messages sent between your company's employees regarding the account
Relations	Other accounts who have some relationship with the selected account, such as consultants, partners, etc.
Notes	Free text notes regarding the account

9. Fill in the fields in each of the pages listed above.
10. Click the **Accounts** menu and select **Save**. Or Click **Save** (💾) in the tool bar to save changes to the account. Or Pres the Ctrl+S keys.

Page 5-4

5.1.2 Creating a Secondary Contact

Some accounts (companies and organizations) have more than one contact person, who may be in different departments or different roles. Commit enables you to include a primary contact person for a particular account, and add additional contact for the same account. This enables you, for example, to provide products and services to several departments within a single organization, but consolidate all the charges into a single report.

Creating a Secondary Contact to an Existing Account

1. Log on to Commit and open the Accounts window by clicking the **Accounts** icon in the left icons bar.
2. Select an account from the list in the top part of the window. If the account information has not yet been entered, follow the procedure above, in section 5.1.1, to create an account with a primary contact person.
3. Click the **Contacts** tab over the bottom half of the Account window, displaying a table with the account's secondary contacts.
4. Click the **New** icon (□) at the bottom-left corner of the page. A Secondary Contact window appears, as displayed in Figure 5-4 below.

Figure 5-4: New Secondary Contact Window

The window displays the fields that appear in an account's General and Address pages. The Company field is already includes the name of the primary account. All the other fields are empty.

5. Enter the name of the new contact person, along with other relevant contact information, such as phone numbers, E-Mail address, or other important information.
6. Click **OK** to save the new contact or **Cancel** to close the window without saving. The window closes and the Accounts window reappears.
7. Scroll in accounts list in the top part of the window until the name of the new contact appears. Note that an asterisk (*) appears in the Type column next to the contact's name, which indicates a secondary contact.
8. Click the **General** tab in the Accounts window. The page at the bottom of the window displays the account's primary contact, as displayed in Figure 5-5 below.

Figure 5-5: Secondary Contact in the Accounts Window

9. Click the **Contacts** tab. The secondary contact appears in the table at the bottom of the page. Below the table are a series of command buttons to view the contact's information and contact him/her directly, as displayed in Figure 5-6 below.

Figure 5-6: Secondary Contacts Table with Contact Buttons

5.2 Creating a New Employee (Commit User)

The procedure to create an employee or user account operates similarly to creating an external account for a customer, supplier or business partner. The primary differences between internal and external accounts are:

- Internal accounts may be Commit users, but may also be regular service employees who do not access or use Commit. Every active employee may be assigned access privileges, a user name to log on, and a password.
- Internal accounts are your employees. They are the people who perform the work for which you bill your customers. Every employee who provides a billable service must be associated with a particular labor rate by which you charge for his or her time.

Creating a new Employee

1. Log on to Commit and click the **Finance** or **General** icon group buttons in the left icons bar.
2. Click **Employees** in the icons bar. Or Click the **View** menu and select **Accounts**. The Employees window opens, as displayed in Figure 5-7 below.

Figure 5-7: Employees Window

The window includes the following components:

Area	Description
Menu and Tool Bars	Menus and command buttons that execute commands on selected accounts or link them to other categories
Filter Bar	Find accounts according to specific conditions
Employees List	List of all registered employee accounts or employees filtered in the filter bar above
Page Selection Tabs	Tabs that display account details according to certain categories
Account Details Page	Detailed account information

3. Click the New Employee (□) icon on the tool bar. Or click the **Accounts** menu and select **New Employee**. An empty New Account dialog box appears, as displayed in Figure 5-8 below.

Figure 5-8: New Employee Dialog Box

The **Company** field automatically shows the name of your company and the **Type** field shows the new account as a company employee.

4. Enter the employee details into the appropriate fields. The information in this dialog box will appear again in the employee's details page described below. You must enter the employee's name in the **Contact** field.
5. Click **OK** to create the new employee or **Cancel** to close the window without saving. The new employee's details appear in the Accounts window, as displayed in Figure 5-9 below.

Figure 5-9: New Employee Details Window

The top half of the window displays the basic information you entered in the previous dialog box. The bottom half shows a row of tabs, each representing a page with data fields associated to the new account.

The table below describes the pages displayed for external contacts, such as customers, suppliers, and the like.

Page	Description
General	Primary employee information, such as company name, person's name, job title, department, telephone and fax numbers, email address, and manager
Address	Mailing address, Web site, and other information
Details	More detailed employee information, including customizable fields
Employee	Employee details as described in step 8 below
Contacts	Other people with whom the employee is in contact, such as wife, friends, etc.
Pending	Events scheduled for the employee that have yet to be completed
History	Employee interactions, transactions, or changes in status of tickets, opportunities
Documents	Documents associated with the employee, such as timesheets, contracts, and correspondence
Messages	Internal E-Mail messages sent to or received from the employee
Relations	Other accounts who have some relationship with the employee
Notes	Free text notes regarding the employee

6. Fill in the fields in each of the pages listed above.
7. Click the **Employee** tab over the bottom area of the Accounts window. The User Details page displays information specific to the newly created employee, as displayed in Figure 5-10 below.

Figure 5-10: Employee Details Page

- A. Enter the date the employee started working in the **Start** field. If the employee is temporary or is on a contract that ends at a particular time, enter the last employment day in the **End** field.
- B. Enter the employee's nickname in the **Nickname** field. The employee's nickname will appear in all opportunities and tickets linked to him/her, in addition to messages, charges, and reports.
- C. Click the **Labor Rate** drop-down list and select the rate customers will be charged for the employee's services. This list displays all the labor rates defined in the Rates window.
- D. Click **Make Active** towards the right side of the Employee page. Activating the employee makes it possible to schedule him/her in appointments, tasks, and tickets, register opportunities, charges, and interactions to his/her credit, and send messages to him/her.

- E. Click **Configure User** button that appears under Make Active. The Update User dialog box appears, as displayed in Figure 5-11 below.

Figure 5-11: Configure User Dialog Box

- F. Enter the employee's log on user name in the **User Name** field and select his/her access privileges in the **Group** drop-down list.
- G. Click **Set Password**. The Change Password window appears, as displayed in Figure 5-12 below.

Figure 5-12: Change Password and Initial Log-On Window

- H. Enter the new user's password in the **Password** field and enter it again in the **Confirm** field. Make sure to enter exactly the same password in both fields. Write down the password in a safe place and click **OK**. The Update User dialog reappears, as displayed in Figure 5-11 above.
8. Click the **Accounts** menu and select **Save**. Or Click **Save** (floppy icon) in the tool bar to save changes to the account. The new employee's information now appears in the list with the other company employees.

5.3 Ticketing

Your computer service company operates by providing services to your customers and billing them according to time, procedure, fixed fee, some other billing plan, or a combination of billing plans. Each service call your employees perform for a customer registers a **ticket**, which holds such information as the customer being serviced, employee performing the service, priority, service rendered, cost of service, time the ticket was opened and closed, ticket status, and other details.

Once the service is completed, the ticket is closed and the information is transferred for billing. Commit facilitates scheduling, servicing, and billing computer services by integrating the ticketing and billing workflow into an easy to manage, intuitive, and automated procedure. The procedure below instructs how to open a new ticket and follow through all the required tasks until the service is completed, the ticket is closed, and you can continue billing the customer.

Opening a new ticket:

1. Log on to Commit and select the **General** or **Service** categories group in the categories bar along the left edge of the screen.
2. Click the **Tickets** icon (floppy icon) in the categories bar. The **Ticket** window appears, as displayed in Figure 5-13 below.

Figure 5-13: Tickets Window

The Ticket window includes the following areas:

Area	Description
Menu and Tool Bars	Menus and command buttons that execute commands on selected opportunities or link them to other categories
Filter Bar	Find tickets according to specific conditions
Tickets List	List of all registered tickets or those filtered in the filter bar above
Page Selection Tabs	Tabs that display ticket details according to certain categories
Ticket Details Page	Detailed ticket information

3. Click the **File** menu and select **New**. OR Click the **Open Ticket** icon (floppy icon) on the tool bar. The New Ticket dialog box appears, as displayed in Figure 5-14 below.

Figure 5-14: Open Ticket Dialog Box

4. Enter information into the following fields:

Field	Description
Account	Customer name: Click the down arrow (v) to select from recently ticketed accounts or the search icon (magnifying glass) in the field and select the customer.
Contact	If you work with more than one contact person within a customer's organization, select the specific person who ordered the service.
Description	Enter a brief description of the service requested.
Manager	Ticket manager: Select the employee who is responsible for this ticket
Type	Select the service type from the drop-down list
Source	Select the ticket source (how the customer contacted you)

5. Click **OK** to open the new ticket or **Cancel** to cancel the new ticket. The dialog box closes and the Tickets window reappears.

The new ticket's details appear at the top half of the window, as displayed in Figure 5-15 below.

Figure 5-15: New Ticket Details Window

6. Enter information into the fields that have not been filled yet:

Field	Description
Ticket #	An automatically generated sequential number that identifies the new ticket. It appears in the title bar of every ticket view, and in appointments, tasks, charges, and reports linked to the ticket.
Type	Describes service type, such as installation, hardware, delivery, and the like
Status	<p>Received – Default status for new ticket</p> <p>Dispatch – Automatically lists ticket in the dispatcher window for scheduling</p> <p>Scheduled – Ticket is scheduled and assigned a service employee</p> <p>In office – Service to be performed in office</p> <p>On Site – Service to be performed on site</p> <p>Lab – Service to be performed in laboratory</p> <p>Hold – Ticket on hold</p> <p>Cancelled – Ticket cancelled and closed</p> <p>Completed – Ticketed service performed, closed, and transferred for charging</p>
	The empty field to the right of the Status field is for entering a free text note about ticket status
Duration	The expected duration of this ticket in minutes
Priority	Service priority level. High-level priorities receive attention before lower priorities.
Manager	Employee responsible for this ticket
Open / Close	Date and time ticket was opened and closed.

7. Click **Details** tab and continue entering additional ticket information:

Field	Description
Cause	Reason for opening ticket
Contract	Service contract implemented for ticket
Category	Service category
Source	How the customer requested the service
Field 1, 2, 3	User defined fields for custom descriptions, such as service contract type, order types, and the like

8. The remaining tabs in the detailed data area relate to other categories in Commit and connect the specific ticket to those categories. The table below describes the other tabs and their data categories:

Tab	Description
Pending	Lists pending tasks and appointments related to this ticket
Resolution/History	Displays the entire history of all interactions related to the ticket.

The page is divided to two areas, as displayed below.

The top area is a free text field for describing how the ticket was resolved. The bottom area is a chronological list of all interactions, status changes, and other events related to the ticket

Charges	Services completed, products and parts sold to the customer, and expenses resulting from the ticket
Documents	Documents and files associated with the ticket
Messages	Internal messages relating to the ticket
Notes	Free text notes associated with ticket

9. Continue to the next section, Dispatcher, for instructions how to schedule service calls for specific employees.

5.4 Dispatcher

The Commit Dispatcher integrates drag-and-drop ticketing and scheduling to the familiar calendar window we have become familiar from other scheduling applications. Its window displays a calendar of all your employees' daily meetings and service calls together with a list of all the tickets designated for dispatching. The dispatcher can send employees to service customers by simply clicking on an open ticket that is listed at the bottom of the window and dragging it to a time slot under an employee's name.

5.4.1 Dispatcher Window

You can access the Dispatcher window by clicking the **Dispatcher** icon in the left icons bar, visible in the Service and General icons groups, or by clicking the Calendar icon and clicking the Dispatcher tab in the Calendar window.

The Dispatcher window, displayed in Figure 5-17 below, is one of the available Calendar views and displays a daily calendar above a list of the day's tickets.

Figure 5-16: Dispatcher Window Components

The window displays the following components:

Component	Description
Calendar Menu and Tool bars	Menu and tool bars activate commands on the calendar and its items.
View Tabs	Selects the calendar view displayed:
Daily	Daily calendar with list of currently open tasks
Dispatcher	Daily calendar with list of tickets
Weekly	Weekly calendar
Appointments	List of appointments and service calls
Tasks	List of tasks to be performed
Daily Calendar	Daily calendar with half-hour time segments. Dispatcher view displays employee schedules separately.
Monthly Calendar	View of current month with current day.
Tickets for Dispatching	List of all tickets received that have been designated for dispatching and have not been assigned and scheduled yet.
Ticket Tool and Filter Bar	Tool buttons to open and view tickets, and print, fax, or email ticket details. The Filter fields filter tickets according to status and manager.

5.4.2 Scheduling Service

You can schedule customer service by opening a ticket in either the *Tickets* window, as described in section 5.3, or directly in the *Dispatcher* window. The following procedure is divided into three (3) sections.

- Ticketing:** The first section instructs how to open a new ticket in the Dispatcher, which is similar to the procedure in section 5.3, Ticketing, with a few minor differences.
- Dispatching:** The second section instructs how to schedule the ticket into the daily schedule of an employee.
- Resolving:** The third section instructs how to resolve a ticket and send it to billing.

5.4.2.1 Opening a Ticket in the Dispatcher Window

Note: This procedure is almost identical to the ticketing procedure in section 5.3. If you already know how to open a new ticket, continue to the next section, 5.4.2, to schedule the ticket to a specific employee.

1. Log on to Commit and select the **Service** or **General** icons group buttons in the icons bar along the left edge of the screen.
2. Click the **Dispatcher** icon (🚚) in the icons bar.

The *Dispatcher* window appears, as displayed in Figure 5-17 below.

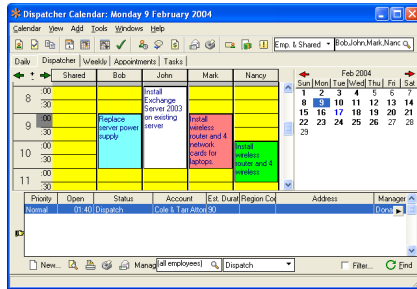


Figure 5-17: Dispatcher Window

3. Click the **New Ticket** icon (📄) in the Dispatcher commands tool bar, at the bottom of the window.

The Open Ticket dialog box appears, as displayed in Figure 5-18 below.

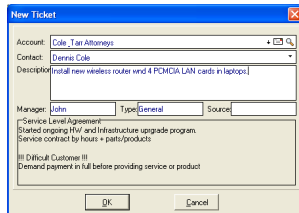


Figure 5-18: Open Ticket Dialog Box

4. Enter information into the following fields:

Field	Description
Account	Customer name: Click the down arrow (▼) to select from recently ticketed accounts or the search icon (🔍) in the field and select the customer.
Contact	If you work with more than one contact person within a customer's organization, select the specific person who ordered the service.
Description	Enter a brief description of the service requested.
Manager	Ticket manager: Select the employee who is responsible for this ticket
Type	Select the service type from the drop-down list
Source	Select the ticket source (how the customer contacted you)

5. Click **Ok** to open the new ticket or **Cancel** to cancel the new ticket. The dialog box closes and the Tickets window appears in *Complete Details* view, as displayed in Figure 5-19 below.

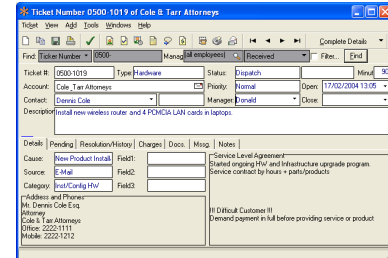


Figure 5-19: New Ticket Details

Enter information into the fields that have not been filled yet:

Field	Description
Ticket #	An automatically generated sequential number that identifies the new ticket. It appears in the title bar of every ticket view, and in appointments, tasks, charges, and reports linked to the ticket.
Type	Describes service type, such as installation, hardware, delivery, and the like
Status	<p>Ticket status:</p> <ul style="list-style-type: none"> Received – Default status for new ticket Dispatch – Automatically lists ticket in the dispatcher window for scheduling Scheduled – Ticket is scheduled and assigned a service employee In office – Service to be performed in office On Site – Service to be performed on site Lab – Service to be performed in laboratory Hold – Ticket on hold Cancelled – Ticket cancelled and closed Completed – Ticketed service performed, closed, and transferred for charging

The empty field to the right of the Status field is for entering a free text note about ticket status

Duration The expected duration of this ticket, in minutes

Priority Service priority level. High-level priorities receive attention before lower priorities.

Manager Employee responsible for this ticket

Open / Close Date and time ticket was opened and closed.

Note By default, the Dispatcher window only shows *Dispatch* status tickets in the tickets list. Select *Dispatch* when opening a new ticket. You can view other tickets by clicking the drop-down status list and selecting the status.

6. Click **Details** tab and continue entering additional ticket information:

Field	Description
Cause	Reason for opening ticket
Contract	Service contract implemented for ticket
Category	Service category
Source	How the customer requested the service
Field 1, 2, 3	User defined fields for custom descriptions, such as service contract type, order types, and the like

7. Click the **File** menu and select **Save**
OR
Click the **Save Ticket** icon (💾) on the toolbar.

The new ticket has now been opened but not yet scheduled.

Tickets that have been opened and the status set for **Dispatch**, as displayed in Figure 5-20 below.

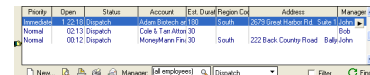


Figure 5-20: Dispatch Tickets Table

The table displays the most important information to the dispatcher on each ticket, as described below:

Column	Description
Priority	Service priority
Time Open	Counts the number of days, hours, and minutes since the ticket was first opened
Status	Ticket status
Account	Account being serviced
Est. Duration	Expected service duration in minutes. When the ticket is dragged to a time slot in the calendar, it will automatically show the amount of time required.
Region	Geographical region where the customer is located and the service employee must be dispatched, such as 'Downtown', 'East End', etc.
Address	Account's address
Manager	Employee responsible for this ticket
Type	Service type, such as Installation, Mechanical, OS
Description	Description of service
Ticket #	Ticket number, as generated automatically when the ticket is opened.

2. Select the ticket from the table.
You can double-click to view the ticket's details.

3. Drag the ticket to an employee's time slot in the calendar above.
The New Appointment dialog opens with information from the ticket, as displayed in Figure 5-21 below.

Figure 5-21: New Appointment Dialog Box

- A. The ticket number, account, and contact information appear as defined when the ticket was opened.
 - B. The *Employee* field shows the name of the employee who was scheduled to service the ticket.
 - C. The Start date and time fields display the time slot where the ticket was dragged. The End date and time shows when the ticket is scheduled to end, depending on the duration set when the ticket was opened.
4. You can change any of the ticket properties:
 - A. Schedule reminders to alert the employee before the scheduled time.
 - B. Attach a previously written document to the appointment.
 - C. Enter values and lists into user-defined fields.
 5. Click **OK** to schedule the ticket, **Cancel** to cancel scheduling (keeps *To Schedule* status), or **Delete** to delete the ticket without scheduling it. Clicking **OK** automatically changes the ticket status from *Dispatch* to *Scheduled* and the ticket disappears from the Dispatch table and appears as an appointment in the daily calendar above, as displayed in Figure 5-22 below.

Figure 5-22: Dispatcher Daily Calendar with Scheduled Tickets

The appointment automatically spans time slots in the calendar according to the ticket duration. For example, if the estimated duration

- was set to 90 minutes (1½ hours), the appointment will span three (3) half hour time slots.
6. Every change to the ticket, such as when it was received/created and scheduled is automatically recorded as an *Audit* record for the ticket, the account, and the employee. Every time an employee performs any service, interacts with the customer, or charges the account for parts, products, services, or expenses, it should be entered into the ticket history.
 - A. Open the Tickets window by clicking the Tickets icon (📁) in the left icon bar.
 - B. Click the **Resolution/History** tab, which displays the automatically and manually entered interactions and events for the ticket, as displayed in Figure 5-23 below.

Figure 5-23: Ticket Resolution/History Page

- C. Enter descriptions of the events related to the ticket in the free text field above the list of events.
- D. Click the New (📄) button.
A drop-down menu of history events and interactions appears.
- E. Select the item or interaction, as described below:

Item	Description
Message	Opens a new message window - to send an internal message to another employee
Document	Creates or attaches an existing document to the ticket
Interaction/Interaction Audit...	Opens a new interaction window, as displayed in Figure 5-24 below, where you can enter information concerning the ticket.
Charge	Opens a New Charge window, depending on the charge type you select. You can charge parts, products, labor, and expenses to the ticket as service of the ticket progresses. See section 5.8 for charging instructions.

Figure 5-24: New Interaction Window

- F. Click **Save and Close** (💾) to save the new interaction with the ticket.

5.4.2.3 Resolving Tickets

The dispatcher or service employee can close a ticket and send it to be charged to the customer after it has been scheduled and the customer received the required service.

1. Open the Tickets window by clicking the Tickets icon (📁) in the left icon bar.
2. Select and the ticket from the list of open tickets in the top part of the window.
3. Click the **Resolution/History** tab and enter a description of how the ticket was resolved. Add relevant charges for parts, products, services and expenses.

Figure 5-25: Open Ticket Dialog Box

4. Click the **Done** (✓) button in the toolbar.
The ticket disappears from the list of open tickets.
5. Go to the **History** window, which displays all the interactions and changes recorded for the ticket, such as when it was received, scheduled, performed, and closed.