



PhonEX[®] ONE

Architectural Overview

July 2004

MIND CTI

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Windows, as used in this manual, shall refer to the *Microsoft*[®] implementation of a *Windows*[™] system.

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Solution Highlights

PhonEX ONE is a comprehensive fully web-based solution for call-accounting management and control. It provides an intelligent tracking of all calls in your enterprise network, both traditional and VoIP.

PhonEX ONE is the best choice for monitoring the call traffic in multinational organizations, as it can be adjusted to the local languages and currencies in one click of a mouse. Interoperable with traditional and IP PBXs such as Siemens, Cisco Systems, Ericsson, Avaya Inc., Nortel Networks, Alcatel, 3com and many more, PhonEX ONE provides 100% reliable information, online, anywhere, anytime.

In addition PhonEX ONE has the 'know-how' for working with many other system elements like Gateways, Gatekeepers and Routers which usually populate large and complex networks, and can support you with an unlimited number of extensions as your organization keeps on growing.

Based upon advanced Microsoft .NET technology, and the standard MS-SQL database, PhonEX ONE is designed with a modular architecture, residing on one or several servers, according to the enterprise size. Customized for specific organization needs, the system may collect data from many sites simultaneously, thus creating information in shortest periods of time.

PhonEX ONE 2.0 includes the following abilities:

- Web-based system, providing full functionality using any web browser, from anywhere inside or outside the organization
- Scalable system architecture, supporting an unlimited number of sites and extensions
- Enhanced modularity for various types of installations, providing flexibility for both centralized and distributed networks, with the best processing per each site
- Supports the Microsoft SQL database and uses an advanced ASP.NET technology
- Event log for tracking system logs and system administration
- System monitor, displaying online information about: the CDRs collection from the different data sources, the CDRs process status and other changes in the system
- Reports drill-down ability, for viewing the different hierarchies of the enterprise in just one report
- Enhanced security: access limitation to capabilities and functions on a user and group basis.
- Access control and system violations logs together with password complex algorithms and SSL (secured socket layer) encryption to provide a complete protection from hackers

Web-based Solution

The PhonEX ONE fully web-based solution enables managers and users to conveniently access their accounting system anytime and anywhere, using a Web browser. PhonEX ONE enables managers to run department and personal reports and to configure and use administration tools via a Web browser. It permits

straightforward configuration and system monitoring. PhonEX ONE is designed using the Microsoft .Net technology and has extensive configuration capabilities using XML files with Server – Client interaction.

The entire administration process is handled through Web-based tools that allow managers to create user accounts, review reports and logs, edit configuration files etc.

The SSL encryption protects the security of all sessions passwords, thus ensuring the safety of the administrator’s and user’s information.

SQL Database

The PhonEX ONE database benefits from the power of the standard and open database architecture. Users will be able to query the database using their own tools. The integration with other systems will be simpler. The SQL database allows several users to have simultaneous access to the PhonEX database. The dual databases architecture – detailed and summary - is also part of the SQL product. This architecture increases the report production speed.

Dynamic Hierarchy

PhonEX ONE features a dynamic hierarchy structure with an unlimited number of hierarchy levels. These features allow the implementation of any complex hierarchy in the PhonEX hierarchy tables. Extensions can be associated to any hierarchy level, including the Organization level, as described below:

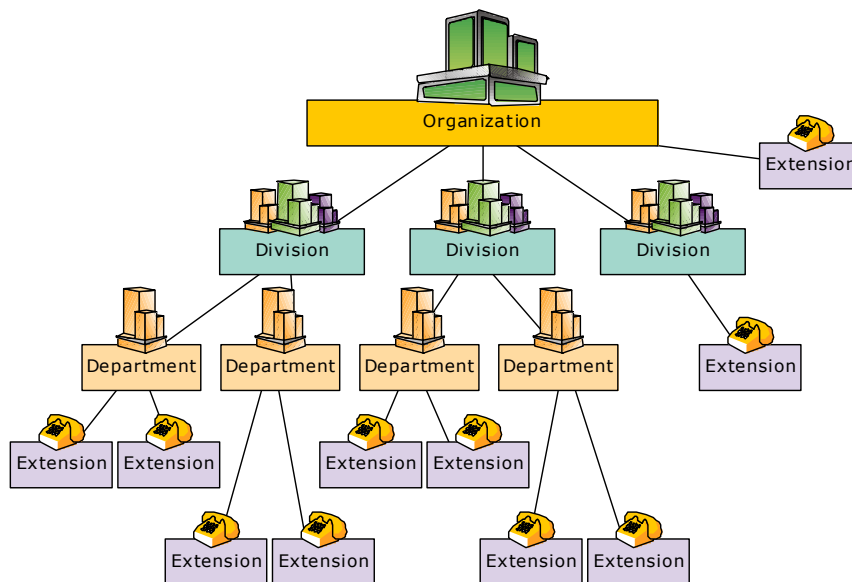


Figure 1- Organization Hierarchy

Daily Extensions List

PhonEX ONE holds a daily extension table. This feature is crucial for those organizations that have rapid changes in personnel or host several external employees.

Daily Services List

PhonEX ONE keeps services charged on daily resolution and calculated according to the valid dates in a month.

Daily Currency Table

The PhonEX ONE system allows you to redefine currency rates on a daily basis.

Report Enhancements

PhonEX ONE has the following enhancements:

- Summary only option in the cross-site report at all Queries/Reports.
- Cross-site option in Extension Details Report.
- Option to filter by extension type in the Extension Details Reports and Summary Reports.
- Option to filter by existence of employee ID in Extension Details Report.

System Architecture

The flexibility of PhonEX ONE's modular architecture, its configuration and the operating platform options enables to completely customize the best solution to meet the unique needs of each and every enterprise. The modularity enables further configuration even while the system is running, without interrupting traffic; for example, the architecture may change from a central processing unit into several collection and processing units that work in parallel sessions. This solution suites large enterprise with many data sources or sites with heavy traffic.

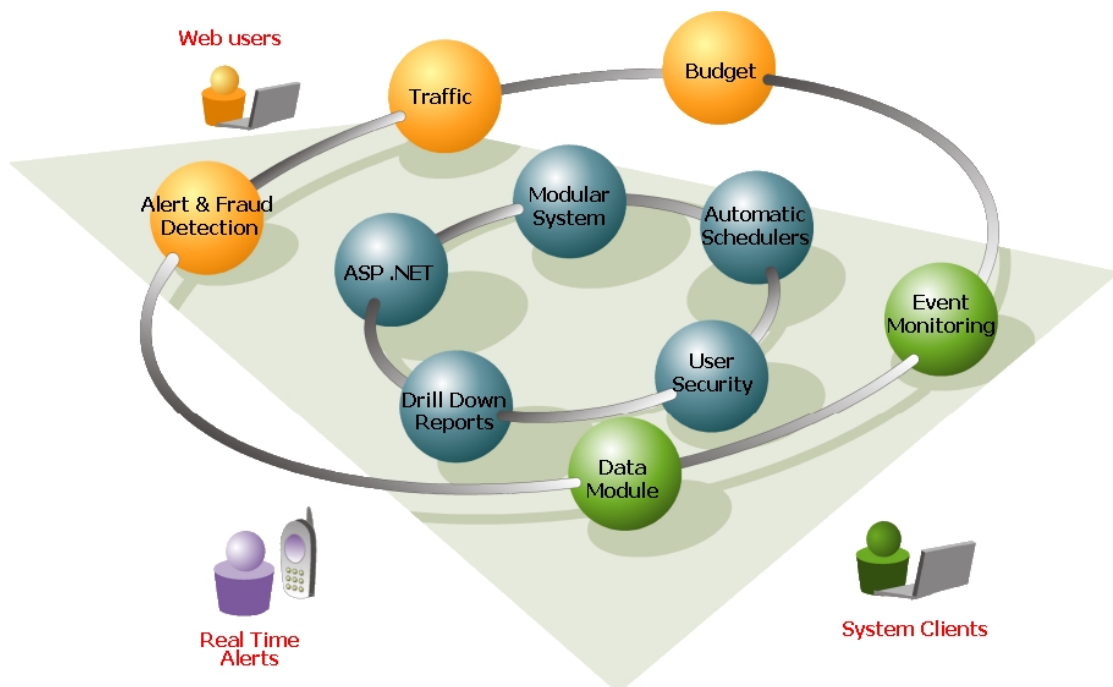


Figure 2- PhonEX ONE Architecture

System modularity

The PhonEX ONE system consists of three key servers: a Database server, an Applications server and a Web server. The entire PhonEX ONE system can be installed on one server or on separate servers.

The following sections briefly describe several common hardware configuration options:

Single Server

The Single Server configuration integrates all three PhonEX ONE servers in one server. This is typical basic installation which is suitable for small to medium-size organizations.

Multiple Servers

The Multiple Servers configuration consists of three servers: A Web Server, An Application Server, and A Database Server. This configuration is most suitable for large enterprises, as it allows for a large storage capacity, and an increase of the processing power. This configuration also solves performance and scalability issues that occur when using a single physical server, even if equipped with additional memory and/or increased processor speed. Multiple servers' additional advantage is for cases of large number of users accessing the Web simultaneously, while inquiring the Database and requiring reports. In this case the Web Server, Application Server and Database Server may be installed on separate hardware servers so that data collection and call costing jobs, which run on the Application Server, are not affected by a large number of Web users.

Multiple Application Servers

The Multiple Application Servers configuration is useful for increasing the scalability of the collection and costing processes of PhonEX ONE. For example, data can be collected and rated simultaneously from multiple Sites.

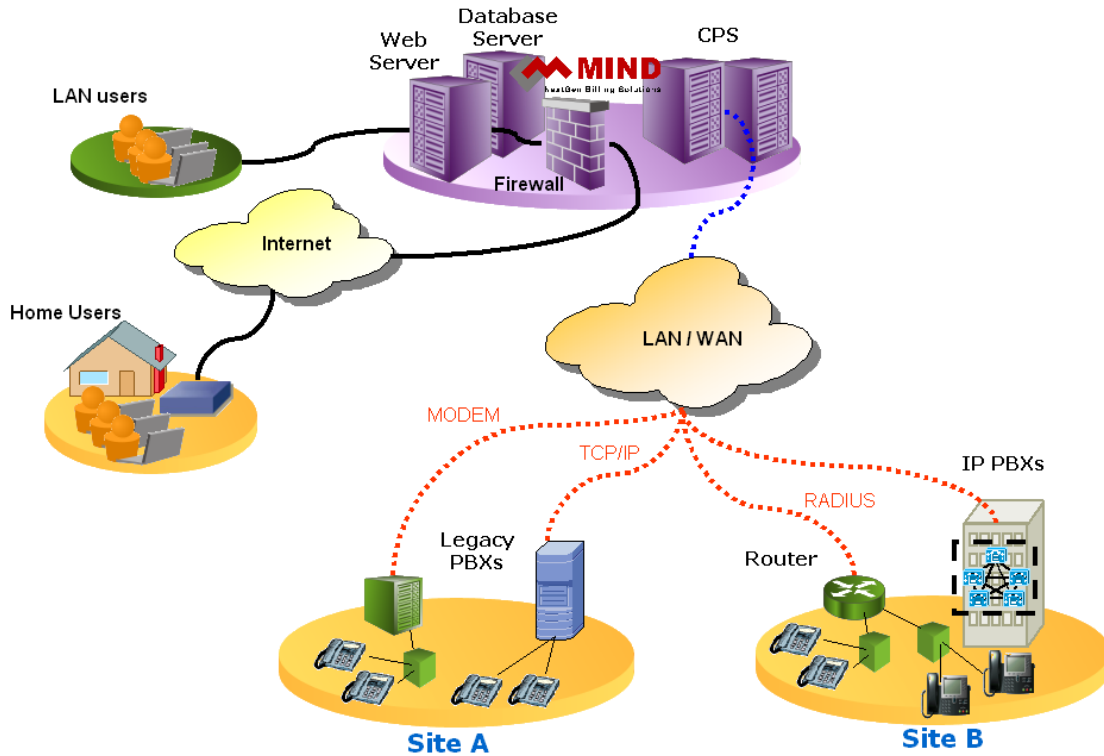


Figure 3- PhonEX® ONE Solution Architecture

Event Log Viewer

The PhonEX ONE system stores the most recent actions regarding the system use. It shows when the system was used and who used it. The Event Log viewer is an effective management tool based on the Microsoft Event Viewer, for system administrators to easily observe and track any suspicious behavior.

Drill Down Reports

PhonEX ONE web-based drill down reporting features give users simple, flexible and faster access to database information. The extensive reporting drill-down capabilities help users to better monitor their summary report information. Once a report is produced, administrator may drill into different hierarchies without needing to reproduce the same report over and over again.

Monitor Status

Users and system administrators are able to view the system's status online. The monitor displays the real time status of the different system elements, providing information on disconnects, errors, processes, and all other changes in the system. Whenever a problem occurs, it is immediately shown on the monitor.

The Monitor is an essential tool to audit and control the system's behavior and to observe the system's faults the minute they happen. Some of the statuses shown are: Data sources, Data process, Scheduler, New Trunk Groups etc.

System Security

Management, Control and Security

PhonEX ONE is designed to enable a smooth and easy management and control over the system. PhonEX ONE controlling entity is the Administrator. The Administrator manages and controls all the system's users throughout the entire organization. PhonEX ONE enables the following abilities:

- System's rules may be configured only by administrator having view/edit/delete permissions.
- Administrator may manage and restrict users from having certain privileges..
- Users have their own privileges and security groups. Sensitive features can be disabled for selected users.
- Administrator is provided with full control for managing users easily. Using an online view of each of the users' status, each change in any of the tables' status (add, remove, import) is immediately written into the system log event and generates a detailed audit trail. Support for unlimited levels of web users accounts to accommodate complex organizational and business models. This ability makes it easier to define and manage accounts or P&L (Profit and Loss) units by allowing an unlimited hierarchy within the organization's structure and an unlimited number of system rules allocated to users or user groups.
- This ability suits not only large enterprises, but also SMEs with a complex hierarchy of web users.

Web Security

The enhanced user security features make PhonEX ONE a perfect solution for the enterprise.

PhonEX ONE allows online users to access the system from a Web browser anywhere. To maximize the access security, PhonEX ONE uses a Secured Socket Layer protocol (SSL). This security protocol provides data encryption, server authentication, and message integrity for a TCP/IP connection between the Microsoft Internet Information Server service protocols (SHTTP) and the browsers. The scope of this technology includes key exchange, encryption, message integrity and messaging support for authenticating a remote party using a security model that is based on digital certificates and certificate authorities. Certificate Authorities (CA) can either be a third-party such as Verisign or Thawte, or exist internally.

Whether the CA exists internally or externally, its function is to serve as a trusted authority that issues and verifies the validity of the digital certificate. The SSL on the IIS web server platform provides secure end-to-end encrypted communications between the PhonEX ONE web server and the users' Internet Explorer, which has built-in SSL functionality.

In addition to the protocol level security, there are some more features that support the security of the Web applications, such as:

- Tiered security interface, which allows complete control over access rights.
- Ann encrypted passwords, which consists of a minimum of 6 alphanumeric characters.

- Passwords are disabled after ix consecutive attempts; detailed log events are generated, allowing the Administrator to easily track such attempts.
- PhonEX ONE supports system segregation and security administration.

Database Security

All sensitive information and restricted data (such as customer passwords) are stored encrypted in the database, since the Database security is one of the most vital components of the overall security requirements. PhonEX ONE uses the Microsoft Frameworks security functionality. Static password authentication information is protected by cryptographic hash algorithms, safe from hacking or removal.

System Logs

The PhonEX ONE system stores the most recent actions regarding the system use. It shows when the system was used and who used it. The Event Log viewer is an effective management tool based on the Microsoft Event Viewer, a system administrator that can easily observe and track the system's suspicious behavior.

All-important operations performed by the user are logged. The term "important operations" includes all logins, logoffs, failed attempts to provide the correct password - that lead to account suspending, and operations dealing with the database (insert/update/delete). The information in the log file will include the date/time, the IP and the message about the operation performed.

The default log level is considered to be WARNING. The Administrator can change this level. Only events of this level and up will be written in the log event. For example, if the selected level is WARNING, the events with VERBOSE level will not be logged, while the CRITICAL and WARNING ones will be.

Mediation

Data Collection

PhonEX ONE processes the call records retrieved from the PBX and stores them in its Microsoft SQL database. Each call record received is stored in its raw format in case further investigation is required.

- The system saves data on calls that do not pass user-defined threshold requirements. It is simple to change the threshold parameter and repeat the sorting.
- Undefined lines (the result of different communication problems) are stored in a separate file on a daily basis. This file is used to identify problems and is erased automatically after several days (the amount of days is defined by the user).
- Statistics are stored on data collection and percentage of calls that are below defined thresholds as well as bad calls.
- All these tools allow for absolute reliability and avoid data loss.

PhonEX ONE Collector

The PhonEX ONE Collector is part of the CPS (Collect and Process Server) and responsible for configuring the system's sites and data sources (DS). An option to install and integrate the PhonEX ONE Collector on a separate server is

recommended. The PhonEX ONE collector, working in the background, is capable of transferring the usage records files by using a FTP or TCP/IP protocol, Modem, Shared file, ODBC, HTTP, Syslog and Radius. The key features of the PhonEX ONE collector are:

- Password protected connection
- File transfer recovery mechanism
- Fully safe data transfer
- Backup of transferred data
- Comprehensive logging of the transfer sessions

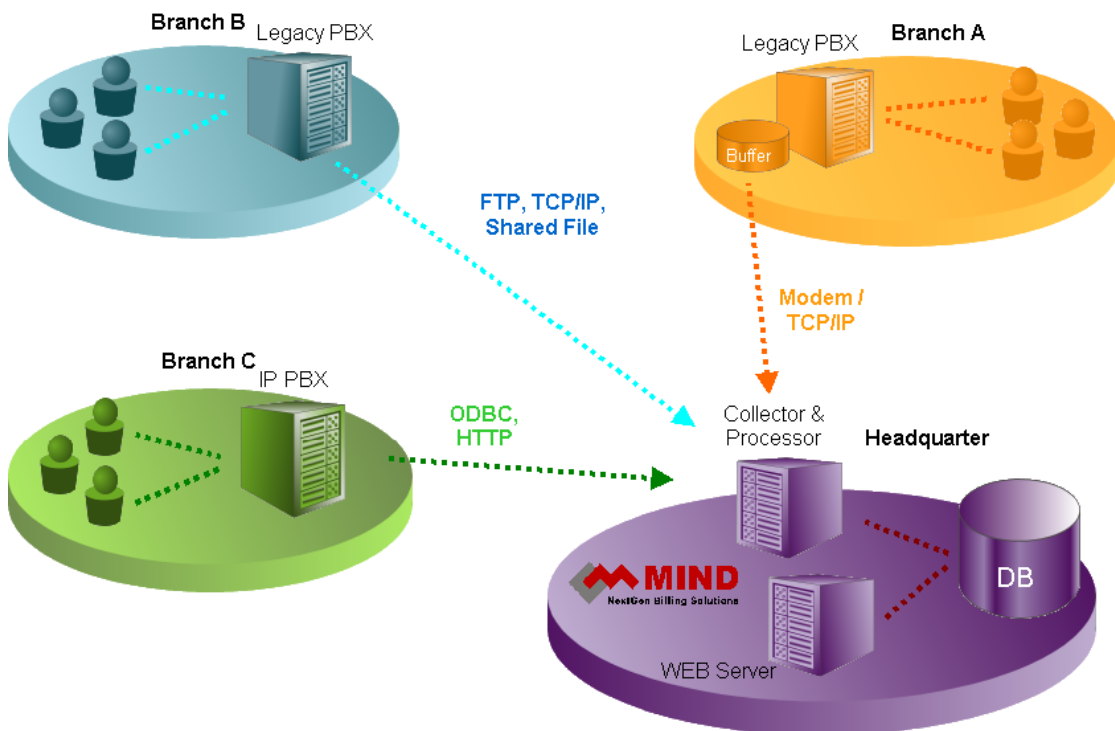


Figure 4 – General MultiSite Environment

The Collector enables configuration of several data sources within a single site, this option enables support of special system configuration and much flexible options with sites management.

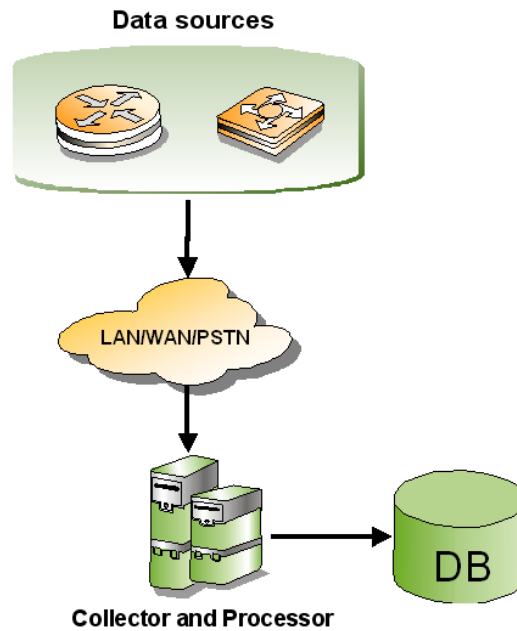


Figure 5- PhonEX ONE Collector

Buffers

The common way of collecting the call detail record from a remote PABX site is by using a local buffer; this buffer collects and stores all information until the collector initiates a collection session and pulls down the records. Mind CTI recommends of using a 3rd party vendor buffer - the Scannex Modem Buffers (<http://www.scannex.co.uk>) or the Scannex Net Buffer. These buffers were found very reliable and with good resilience capabilities. As an alternative solution, there is an option to use a PC with MIND CTI's Winsite software.

PhonEX ONE Network Receiver

PhonEX ONE's Network Receiver mediation component is able to collect the different raw calls data for each session and data source, aggregate and filtrate the different events related to the same session from different sources, and transform them into valuable and billable records. The PhonEX ONE is able to collect call records from different vendors and sources, based on UDP, TCP/IP, Syslog and RADIUS, within a single billing and accounting system. Currently, the PhonEX ONE supports the AVAYA Reliable Session Protocol (RSP), which is a unique tool for Mind CTI, Cisco Syslog and RADIUS and AudioCodes Syslog.

Process

PBX Integrated

PhonEX ONE is easily integrated with all PBXs through the CDR/SMDR port or via network connection. The exclusive system architecture allows for fast and easy installation and configuration for each Call Detail Record (CDR) format provided by any PBX, including multiple line call data records.

Major PBX vendors are supported, including 3Com, Alcatel, AVAYA, BT, Bosch, Cisco, Ericsson, Lucent, Matra, Mitel, NEC, Nortel, Panasonic, Phillips, SDX, Siemens and others.

PBX CDR Data Interface

PhonEX ONE has a flexible interface to interconnect to PBXs. PhonEX ONE supports unlimited number of CDR formats, includes several common default interfaces, uses flexible user interface for easy definition or editing of CDR formats.

Rating

PhonEX ONE offers a flexible and powerful rating engine that allows enterprises unlimited number of rating schemes and billing plans. Administrators can set different tariffs for individual trunks or trunk groups and update system with future tariffs changes and updates. The Charges feature enables the Administrator to define and maintain the dialing prefixes for the system, define all the telephone companies (carriers) that work with the organization, define a daily profile for each telephone company, specifying telephone operation schedule (working days, non-working days and holidays), define various day types that differ in charges, specify various tariffs (i.e. inexpensive, standard, peak, international) for each telephone company, create a call destination list according to various tariffs and call destinations and define prefixes that are charged identically.

The costs feature allows different types of taxes to be defined. Taxes are charges that are added on to the cost of the call, based on the calculated cost of the call.

PhonEX supports different methods of call cost calculation:

Charge Method	Description
Charge by Duration	Charge By Duration is used to describe Charge Rates that have graduated fees based on the duration of the call. Additionally, the duration of the call may be based on pulses or on length (number of seconds).
Fixed Charge	Tariff is based on a flat fee.
Charge by destination	Charge by destination code received from the Carrier, supports the extension mobility feature.

Reports

PhonEX ONE offers a series of advanced features that enhance and ease report production and viewing.

Relative Dates

For user convenience, PhonEX ONE has an option to use date codes in both the Query and Pre-defined Report options. For example, to produce a report on the previous months telephone usage, -m in the From and To date fields should be entered in the report dialog box.

Report Output Options

All reports has the option to be printed, emailed and saved as a Text file (*.TXT), Word document (*.DOC), Excel document (*.XLS), Acrobat Reader file (*.PDF), Web page (*. HTML) and as a Rich Text Format document (*.RTF). In addition, a user-friendly interface allows report formats to be created according to the requirements of various accounting applications.

Multi Currency Capabilities

PhonEX ONE can be used in a global telecommunication environment since it allows report generation in any currency as defined by the user. PhonEX ONE can configure each site and tariff company with local currency parameters. PhonEX ONE can generate reports in two currencies simultaneously (i.e. Euro and USD), fulfilling the Multisite environment in different countries.

Query Generator

The PhonEX ONE query generator is a fast and flexible reporting tool that allows the user to create unlimited custom reports using the query tool. With the query tool the user selects the data required, chooses how the data is to be sorted and summarized, and selects the format of the report. Custom queries can be saved for future use. You can define customized report layouts, selecting the fields and their length and position in the page. This option, combined with the export mode, enables the user to export information to any external system in any possible format.

Reports

The PhonEX ONE produces quick and clear reports on virtually every aspect of the communications system, tailored to suit individual needs. PhonEX ONE provides with full or partial monitoring capability of telephone, fax, and modem usage for the entire enterprise. Whether required minute-by-minute updates, monthly reports, or data on long-term usage patterns, PhonEX ONE supplies with this information. Reports can be produced for any hierarchical level of the enterprise. PhonEX ONE supports unlimited number of hierarchical levels. Reports are presented in tabular form, and summary reports have a graph option.

What If... Report

The What If report allows the user to compare the real cost of selected calls with the cost of the same calls as if they were made using an alternate carrier, or an alternate origin of call. The user can see at a glance if it is cheaper to use a different carrier for certain calls to a specific destination. The report displays the difference between the real cost and the calculated cost for the selected carrier as a percentage. It lists the real cost of the call alongside the cost according to the alternate carrier. PhonEX ONE can prepare a summary report showing the call cost information for up to six different carriers simultaneously.

Advanced Report Scheduler

The PhonEX ONE Scheduler allows queries and reports to be programmed to run at specific times. The Scheduler keeps track of each task and generates the queries and reports at the designated time. Can perform a task on a one-time basis, or schedule it to run at regular intervals. The output of the task can be sent automatically to a printer, file, or electronic mail.

Report Formats

The PhonEX ONE includes several pre-defined standard report formats often required by a telecommunications manager. These reports were designed following close consultation with customers. In addition, a user-friendly interface allows report formats to be created according to specific user needs.

Predefined Reports

PhonEX ONE provides the following built-in, predefined reports to easily track inappropriate telephone use. These reports are specially designed for accelerated report generation using the system's intelligent database:

- Summary.
- Summary for Projects.
- Overrun Calls.
- Top Extensions.
- Top Destinations.
- Cost Distribution by Department.
- Cost Distribution by Extension.
- Undefined Extensions.
- Extension Details.
- Undefined Accounts.
- Account Details.
- Account Summary.

Summary Reports

PhonEX ONE provides the user with a built-in tool for the easy generation of summary reports. The user can generate a full summary in a matter of seconds for the complete enterprise, or for any one of the enterprise's departments or hierarchy levels. The summary reports include fixed monthly costs for extensions and taxes as defined by the user. Automatic distribution of summary reports via e-mail is available.

Summary Report for Projects

This report includes all telephone calls for a selected project. The report includes all calls that are associated with extensions linked to a project. The user can generate a general report for the entire enterprise, or specify a specific project.

Overrun Calls

This report provides up-to-the-minute information on the specific extensions that are exceeding user-defined set limits.

Top Extensions

This report includes the extensions most extensively used in an enterprise. Calls are sorted by duration and by cost.

Top Destinations

This report includes the destinations most extensively called in an enterprise. Calls are sorted by duration and by cost.

Cost Distribution by Department

This report shows the percentage of total call costs as distributed among the different levels of an enterprise, sorted by division and department.

Cost Distribution by Extension

This report shows the percentage of total call costs as distributed among extensions within a department. It also shows the percentage of total call costs as distributed among destination types for a single extension.

Undefined Extensions

This report provides the user with a summary of the calls on all the extensions within the system that have not been assigned to any department. This report is useful to find new extensions installed in the IP PBX which have not yet been defined in PhonEX ONE.

Extension Details

This report provides a detailed listing of all the outgoing and incoming calls for a specified extension. This report has several formats, including a letter format. The letter format can be addressed to an employee, based on the associated extension's information.

Undefined Accounts

This report allows the user to access a summary of the calls made on accounts that have not been defined in the system.

Account Details

This report provides details of all of the defined accounts; the calls placed on every account and a report about the budget of each account.

Account Summary

This report produces a summary of the activity of all defined accounts.

Monthly Activity

This report details call activity (cost, calls, and hours) per month, beginning with the last month in report and going back a designated number of months. An average of the months is listed.

Organizational Monthly Activity

This report details call activity per month, beginning with the last month in report and going back a designated number of months for each of the designated levels of the report.

