

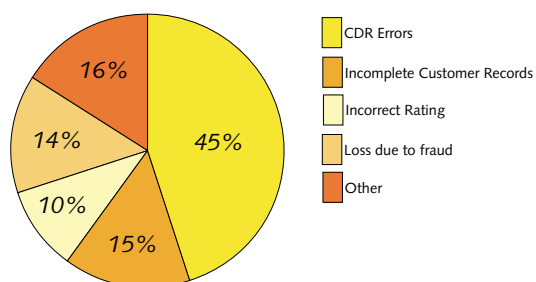
# Network Control Suite

*"Where are you losing money?"*

## Network Control Suite

Telecom operators estimate that their companies lose between 1 and 10% of their total revenue to preventable problems and inefficiencies (Source: Deloitte & Touche). In today's competitive world, such severe revenue loss could mean the difference between business success and failure.

According to a recent study from the Philips Group, the root causes of losses are split as follows:

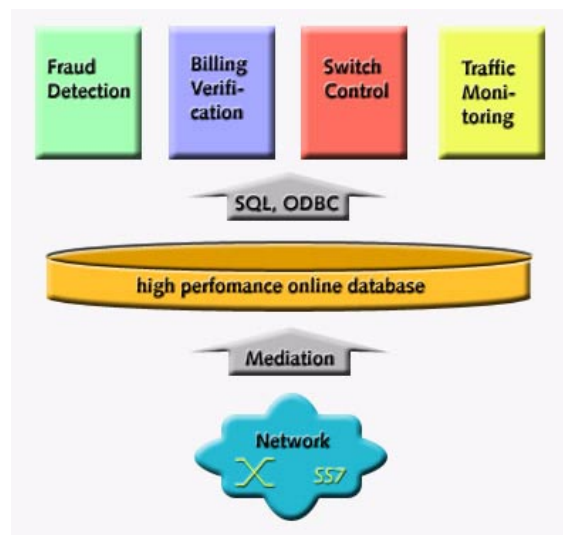


The Ergon Network Control Suite is designed to counter the problems listed above by providing real-time Quality of Service (QoS) and network traffic information.

The Control Suite consists of components offering the following four services:

- Fraud Detection
- Billing Verification
- Switch CDR Control
- Traffic Monitoring

As a foundation for all four of these applications serves Ergon's high performance online CDR database optimized for telecommunication data.



## A High-Performance Foundation: The Ergon CDR Database

Ergon's Network Control Suite offers a high performance online database which produces custom information by correlating and analyzing data from multiple sources. These sources may consist of network devices such as switches, test equipment from different vendors and SS7 based data.

The CDR database delivers the desired data with the aid of a mediation process that reads CDRs from SS7 signaling units. It can handle diversely routed calls and can collate partial CDRs to maximize the number of complete CDRs available for analysis.

*Ergon's CDR database exhibits:*

- significant performance benefits over other commercial databases when managing CDR data.
- high performance insertion and retrieval of CDRs.
- fast CDR correlation when preparing records for further use (e.g. billing).
- intelligent query management to query the database with different mechanisms (e.g. sql, odbc).

In addition, the database system hides the underlying network topology, making it easy for applications to select calls from specific locations. By simplifying access to call information, the system allows one to ignore often uninteresting details and to focus instead on the most important information. Since all components of the Network Control Suite build upon this database system, they too enjoy this data simplification.

## Network Control Suite Applications

The Control Suite contains the following four applications:

### Switch Control

The most crucial unit of the telecommunications network is the switch - the hardware and software that handles network traffic, writes and records the origin, destination, and duration of a call. It is essential that such traffic data be dependable, both to record telephone activity and to plan infrastructural growth based on this activity.

Unfortunately, with the already high volume of calls increasing each day, and with the number of telephony services growing due to new wireless and wired technologies, the

The **Switch Control Unit (SCU)** is designed to improve CDR recording accuracy. The SCU ensures that:

- switches record all billable events.
- every switch writes each record accurately.
- the mediation device operates correctly.
- all billing scenarios are applied correctly.

switch often fails to record all CDR's properly. Moreover, a CDR that is written can still contain flaws that often go undetected. This may occur if the terminating switch does not record the end of a call or if the originating switch does not record the beginning of it.

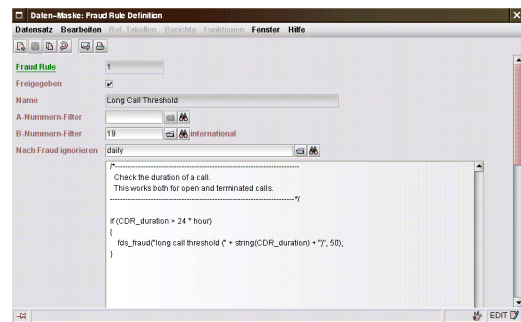
The Switch Control Unit represents a “double-check” mechanism to verify the existing CDR records as written by switches. The SCU

detects both incorrectly billed traffic as well as unauthorized traffic that congests the network and hinders legitimate network use.

### Fraud Detection

Network operators lose an estimated \$1 billion or about 2 to 5 % of their gross revenue each month to fraudulent calls that are not paid for (Source: International Forum of Irregular Network Access, FIINA). The **Fraud Detection System (FDS)** helps to minimize this revenue loss. It analyses the call pattern of individual subscribers in the network, detects fraud in real time as it occurs, and gives immediate notification of any suspicious events. Administrators can be notified via e-mail, SMS, or pager, allowing immediate action to be taken.

Users of FDS can provide it with rules - from simple to complex - describing the kinds of conditions that should be considered noteworthy. FDS then monitors network traffic using conventional CDRs from switches and partial CDRs from SS7 messages. Whenever a rule is violated, FDS gives warning. The FDS can later quantify the averted errors and prevented money-loss.



The *Ergon FDS* enables telecom administrators to:

- spot and stop immediately any abuse of the network using FDS' real-time alert system.
- save money by avoiding costly debit administration of fraudsters.
- provide greater security for customers by preventing unauthorized use of their accounts.
- learn how customers use telephony services.

## Billing Verification

Billing discrepancies damage both profit and company reputation among customers. Industry experts estimate that an average of 5% of all billable minutes are either never recorded for billing, or are billed incorrectly. The **Billing Verification System (BVS)** of the NCS helps to prevent these costly billing mistakes.

The BVS operates by calculating billing invoices using SS7 signalling or mediated switch data. It then compares its own results with those of the telecom company's standard billing system at various stages of the billing process. For any particular discrepancy, a BVS user can quickly obtain detailed in-

In summary, the *Billing Verification System* can reduce the damage caused by billing mistakes by:

- showing billing discrepancies and revenue leakage.
- indicating revenue loss due to improper verification of new price plans or value added services.
- detecting tariff implementation errors.
- using SS7 signalling or mediated switch data as an independent source from which to calculate invoices for comparison with the company's standard billing system.
- enabling telecom operators to search - quickly and accurately - through billing errors to isolate and resolve variances in invoices.
- generating customized and scheduled reports detailed at the call-by-call level and sorted by carrier, destination, or trunk group.

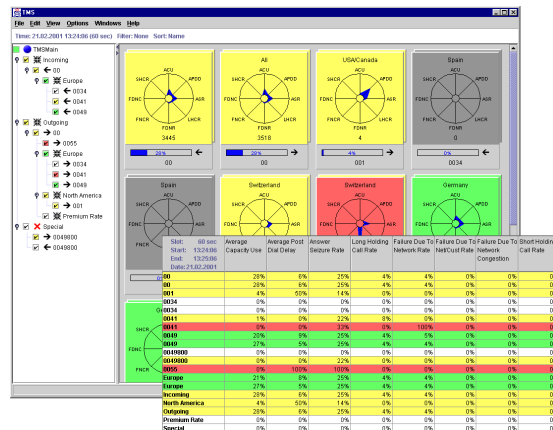
formation about the origin of the error. Customized reports of billing inaccuracies can also be generated.

The BVS also provides further benefits by:

- helping to determine optimum call routing based on a database of billing rates. This in turn can help companies to plan upgrades in infrastructure.
- maintaining accuracy statistics on metering, charging, and billing as required by public telecommunication ordinances

## Traffic Monitoring

The Control Suite's **Traffic Monitoring System (TMS)** is a powerful tool that provides detailed real-time and historical network traffic information that presents a clear view of how the network is being used. It helps to pinpoint network problems and to locate Quality of Service (QoS) issues.



TMS is based on a highly-scalable, distributed client-server architecture. It continuously monitors all links either in the entire network or a subset chosen by the user. Given thresholds for various conditions as set by the user, the TMS provides instant notification of any problems or noteworthy conditions.

In short, the *TMS* enables telecom administrators to:

- monitor all parts of the network in real time to detect and identify financially threatening conditions and errors quickly before they affect customers.
- increase network productivity and user satisfaction through consistent network performance monitoring and troubleshooting.
- plan for network infrastructure growth more intelligently by increasing capacity where it is needed.
- provide special services to customers based on the TMS' real-time information, such as QoS monitoring and immediate troubleshooting.
- chart and report network performance measurements for greater visual comprehension.
- export network performance measurements in such formats as HTML or CSV.

## About Ergon

Ergon Informatik AG (<http://www.ergon.ch>), is a leading software development company with headquarters in Zurich, Switzerland, and a subsidiary in Sausalito, California. Its staff of 70 professional software engineers is dedicated to the development of mission-critical solutions for the telecommunication and financial markets.

As a specialist in business solutions for heterogeneous computing environments, Ergon is a leading developer of several large-scale applications. One such application area is the extremely demanding field of telecommunications. Ergon has developed customer care and billing solutions for various telecom companies including tesion (Germany), AugustaKom (Germany), Grapes (Italy), Nodalis (Italy) and many more. Ergon has also a long standing partnership with Acterna, the world's second largest communications test company. All in all, "Ergon Software Solutions" are deployed all over the world: from Germany to Norway to China.

## Further Information:

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