

OBS Enterprise Information Server

A sophisticated EIS Concept Guide



*Powered by
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For Marvin and Deborah!

Frankfurt/Main, 23.04.2006

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Introduction

When I started with PC databases some 10 years ago, I was immediately amazed by the possibility to store great amounts of data in a very structured way. Even more I was fascinated by the way, how fast stored information could be retrieved, analyzed and graphically displayed.

Perhaps it was the vision of a nearly paperless office that drove me on all these years. In fact, for some years I haven't bought newspapers anymore, but get nearly all information from the World Wide Web without leaving my desk. I am still amazed by the speed and quality, *Google* finds relevant webpages on whatever subject I want. To *goggle* has already become hype.

However, reading from a database his one thing, writing to it another. If many users write to a database, they run run into consistency, security and performance issues.

Even after 20 years of intensive computing, it is very difficult to run a multiuser database with excellent performance and security at a reasonably price.

Commercial solutions work but lack of security, because all information is sent in clear text over the lines. Oracle is very expensive and difficult to manage. MS Access is much cheaper but really not designed for multiuser environments.

In contrast to both, Oracle and MS Access the OBS Enterprise Information Server based on MySQL is a Out-Of-The-Box solution, which runs a multiuser dabase application from the very first day. It's optimized in terms of performance and security and minimizes maintenance to the utmost.

All you have to do is, use it!

EIS Overview

Managing data

Each big company or authority has lots of data, which needs to be managed, somehow. While some 20 years ago, data was usually managed by paper, in today's world wide web more and more companies and authorities try to manage their data electronically, by computers.

Managing data electronically is much faster, more effective and very sophisticated, of course. To structure great amounts of data, applications use databases. However, central database applications based on Oracle are generally very expensive to develop, customize and maintain. Basically, Oracle solutions take ages to get installed and are very difficult to manage, especially, if they run on unix systems.

Since it is such a hassle to develop database solutions based on Oracle, many companies use Excel for managing their data, instead. Excel is very easy to use, cheap and preinstalled on many PCs. However, Excel is a single user application, which soon exceeds its low limits. Since Excel is not a real database, managing data with Excel can become a real nightmare, easily. Though MS Access is a real database, it is really not designed for a multi user environment, either.

In contrast to that, OBS can deliver out of the box solutions based on MySQL, which can compete with Oracle database applications in terms of performance and scalability, however, being much cheaper, easier to install and to manage.

Thus, the OBS database application can be described as a cheap Swiss army knife made in software for medium sized database projects.

Espresso instead of Java

In the beginning of the World Wide Web in 1995, Java was becoming more and more popular for 3 reasons:

Firstly, Java was designed to run on any platform. „*Write once, run everywhere!*“ was the main motto of that time.

Secondly, with Java you could make boring static HTML-Pages amazing dynamic.

Thirdly, Java is part of the Open Source movement, which stands for free software in great amounts.

Soon, a new Hype, called *Network Computing*, became the trend of the time. The new generation of young software developers dreamt of thin Browsers rather than fat Windows Clients. However, since then Java has lost a lot of ground again for 3 reasons.

Firstly, Java programs are very complex and run in a *Java Virtual Machine*, which makes both, Programmers and their Programs, pretty slow. Much too slow in many cases.

Secondly, downloading Java Applets from a WebServer requires lots of bandwidth. Much more than the mean WebBrowser can get.

Thirdly, In real life, Java programs are not platform independent, but work for one make of browser. For example Oracle Web Connect works on Internet Explorer Version 6, only, requires Active X in addition and you might ask yourself, what happened to Rock 'n' Roll ?

Because bandwidth is such a big problem in the *World Wide Web*, more and more programs were put back on the server

side. Rather than running Java Applets within the Browser, modern applications use *Java Server Pages* or even *Java Script* on the browser side. Both methods use little bandwidth, which speeds up the application significantly.

Anyway, speed is the main reason why many programmers have jumped on PHP. Even a mean programmer can learn PHP in some days and write his first impressive WebApplication. Besides, PHP-Programs are very easy to maintain, run much faster than Java Programs and are really platform independent, if you do not mess them up with Java Script.

There is just one drawback, namely functionality. PHP programs use HTML functions, which restrict your possibilities. However, for most database applications like EIS, PHP is more than sufficient.

The Lamp Platform

The Enterprise Information Server is supposed to be the *Central Point of Information* in any environment. With EIS the Enterprise can easily organize its company, coordinate and control the daily work. The powerful Open Source Application is based on LAMP

Linux (SuSE 9)

Apache (2.0)

MySQL (4.0)

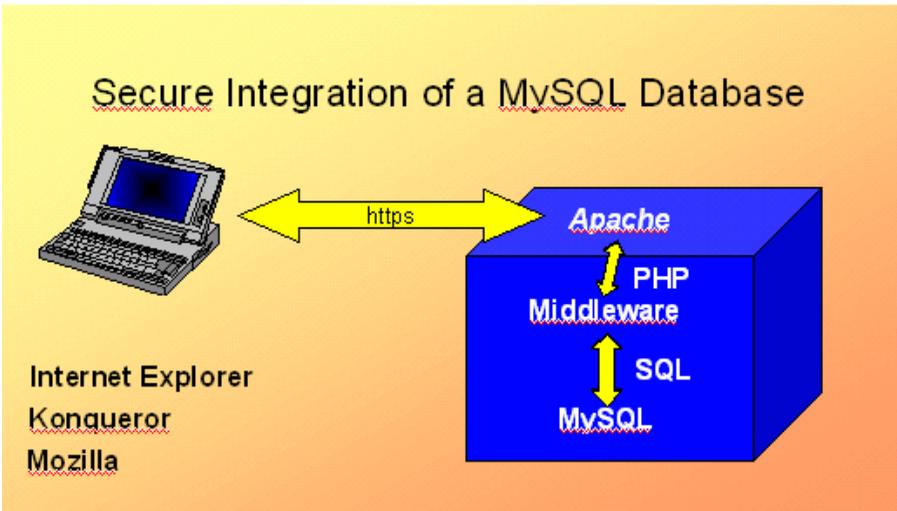
PHP (4.x)

EIS can store easily some million records and is designed to provide best possible performance.

3 Tier Architecture

The Enterprise Information Server runs on a 3-tier Architecture in order to provide best possible performance and security. Thus, all SQL-queries are passed through http and https, respectively. Users cannot access the MySQL database underneath directly, but have to go through the *EIS-Forms*, which are controlled by the business logic. All sql-queries and updates have been optimized in terms of performance and are centrally controlled.

PHP-Middleware



3-Tier Architecture based on LAMP

EIS Features

The EIS Application is a very lean database application, which provides the forms you request. By default, there are more than 10 standard forms to begin with.

On the Login Page the EIS NewsTicker informs about the today's most important news.

Each form is linked to a virtual Notepad, which allows EIS-users to add additional text to any form record. Furthermore EIS-Users can upload files to the Enterprise Information Server, which are automatically categorized, sorted and timestamped. Thus, you have an easy to use version control system for any file-type.

EIS Features

3 Level Access Control

Intrusion Detection

Extremely Fast SQL-Database

Very Little Bandwidth Demands

Central System Administration

Online Application Changes

Multiple Desktops (Browser & DB Clients)



EIS features

Software Design

The EIS Application is neatly divided up into

data

metadata

program logic

Thus, it is very easy to understand, modify and enhance the functionality of the EIS application.

While all raw data is stored in the mysql database as tables, the metadata is provided by easy to understand html files, which are processed and displayed by the PHP-Scripts.

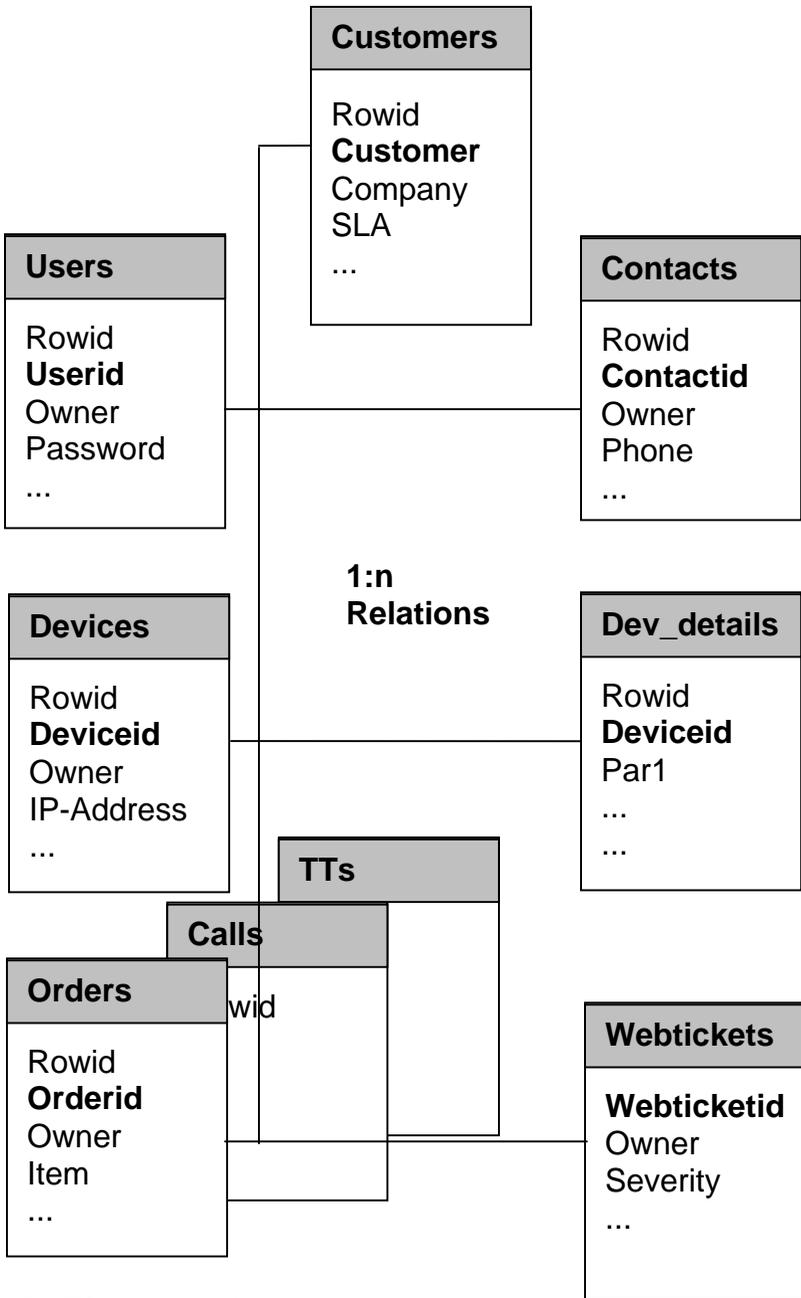
EIS Database

The EIS relational database is based on the Open Source Software MySQL. Thus, it incorporates standard SQL-database features as:

1. *SQL-Interface*
2. *Tables & Indexes*
3. *Mutiuser Access*

The MySQL-database belongs to the fastest SQL-databases of the world. However, it is very easy to manage. The EIS database can easily store some million records at best performance, i.e. the response time is always under 3 sec.

On a 1 CPU Computer, EIS is able to process more than 100.000 Inserts per hour, while users are working on the EIS database.



The EIS database main tables.

EIS Database Model

EIS is based on an object oriented database model. The EIS Database Model is a 3 level tree-like data structure. Thus, you can virtually store any object, with its properties in containers, which are represented by tables with 1:n relations.

For example you can assign any number of routers with all their interfaces and configuration parameters to a customer, who hopefully pays for that equipment, promptly.

EIS for Oracle

For really large environments EIS can run on Oracle databases, using the Zend Core for Oracle Technology . With Oracle, EIS exceeds all MySQL limits, leveraging the advantages of an industrial database, i.e.

- 1. unlimited Tablespace,*
- 2. Real Application Clustering,*
- 3. sophisticated Backup & Recovery*

Thus, EIS is suited for very large installations with thousands of users, too. However, EIS for Oracle for free is limited to

- 1 CPU,*
- 1 GByte of Ram*
- 4 GByte of tablespace*

EIS For Oracle fully integrates *Application Express*, which means you can run reports on EIS Tables through HTTP, using the sophisticated Application Express Development Environment

Transaction Collision Detection

If many users modify the same tables, one user can easily overwrite the changes of another user, performed some seconds before.

However, the EIS Transaction Collision Detection can automatically detect transaction collisions and rollback the corresponding transactions. Thus, EIS makes sure, that a change of one user is not overwritten by another user without notice.

EIS Table Loader

The EIS table loader fully integrates into the EIS form generator to automatically fill new forms with data. Thus, the system manager can easily load, reload and synchronize EIS tables with ascii files. Basically the whole EIS application can be filled with the EIS Table Loader. Of course, the EIS Table Loader can export tables, as well. Thus, EIS provides an universal out of the box bidirectional interface for the EIS Database.

EIS-Security

Bastion Host Concept

EIS is designed as a *Bastion Host*, which means that the EIS-Application is highly protected against any kind of attacks. By default. It uses <https>, only .

The internal Firewall can block all other access. However, for remote access you can switch on secure shell and tunnel the X-Terminals through it.

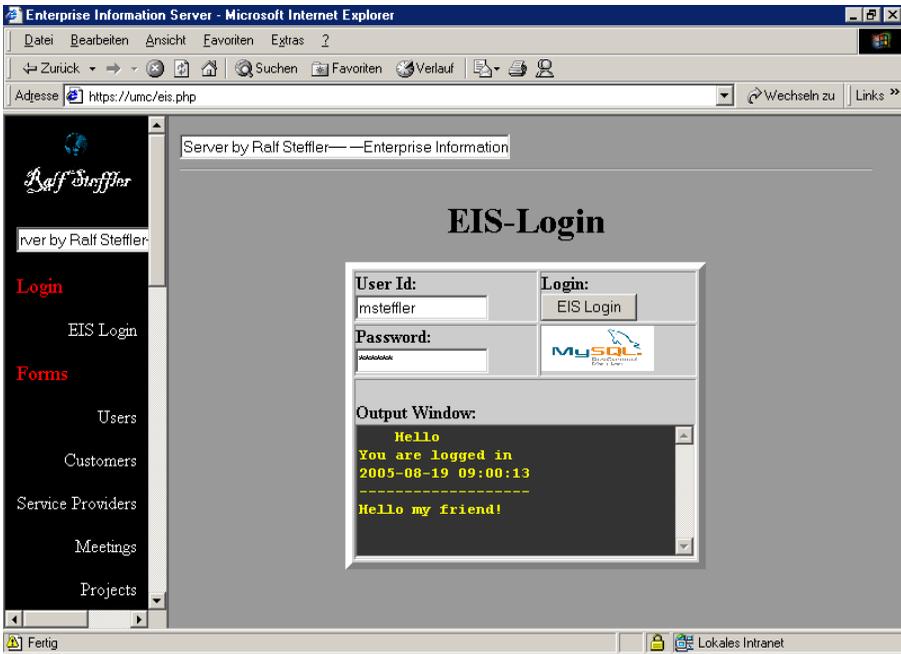
Thus, even X-Traffic is encrypted.

Besides, any hacking attempts are logged, which enables the EIS Manager to track down extremely stubborn hackers.

3 Level Access Control

Before you can start, you need an EIS-Login, which you will get from the EIS-Manager, by creating a user in the User-Form.

The EIS-Login is just an application Login, not passed to the MySQL database underneath. In high security environments, EIS will log each Login attempt checking the user's ip-address to exclude, that another user is trying to hack your account. For security reasons, your account will be locked, after 3 bad logins.



EIS secure Login

Moreover, each Input Form is protected by a form-password. Bad form-passwords will also lock your account after 3 attempts, of course. If EIS locks an account, it will also create an Alarm, which will rise in severity, if 10 Bad Logins have been exceeded.

Thus, it is impossible to hack EIS, without notice, provided you use at least not easy to guess 6 byte passwords. Apart from that, in standard configuration it is technically impossible to login to the MySQL database from the network.

EIS-Forms

EIS Form Layouts

EIS can provide multiple Form Layouts. By default there is a standard layout for basic Browsers and an extended Layout for Browsers, that fully comply with the HTML 4 Standard. Furthermore, EIS can use multiple Layouts to support forms in different languages.

Standard Forms

Customer Information is typed in. In order to type in Information and display it, there are 11 Standard Forms:

Service Providers

Trouble Tickets

WebTickets

Customers

EIS Users

Meetings

Contacts

Licenses

Projects

Devices

Orders

Errors

Calls

Before you start a search, you should clear the form by clicking on the Clear-Button. When you click the List- Button, most fields, like the customer field, are included in the search. The search will be case insensitive and many entries are extended by the SQL-Wildcard sign '%' automatically.

Thus, in many cases, you will only need to enter the very first characters. Non-indexed fields like the phone number are also preceded by the wildcard sign, which allows to search for substrings. If the search returns more than one row, the records are listed in a table ordered by, for example, rowid.

Private Forms

EIS Form Generator can easily create private Forms, which automatically integrate in the EIS application. Thus, each user can have a private form for his personal use, which is protected by a personal form password..

The Output Window

Any kind of output information and additional notice is displayed in the output window. For example, each User can be posted an individual *Welcome Message*, which is automatically displayed, when he logs in. Furthermore, each update or insert will be confirmed through the Output Window.

EIS Right Button

EIS Right Button provides short cuts in the EIS application. For example, you can return to the login Page or connect to the VNC Server just by clicking the EIS right Button.

EIS Hotkeys

EIS Users can use hotkeys rather than clicking on the corresponding buttons, by pressing:

alt + first letter of button label

EIS Printouts

Each Form can be displayed in a printable letter format. The design for the printouts can be different for each form. Thus, you can have high quality printouts without using extra application software.

EIS Virtual Notepad

Each Form incorporates a *virtual Notepad*, which allows you, to easily note down each taken action. The Notepad will automatically store the timestamp and userid for the action. Thus, it is very easy to follow up what has been yet done on a certain item. Moreover, it will be of great help, if you search for a solution for a similar or already analyzed problem. Besides, there is a Form for Troubleshooting, in order to define standard actions for well-known errors.

The EIS Informer

The EIS Informer is a timer based background job, that will relay, escalate, or auto-close open trouble tickets not being processed in a certain time frame.

However, the EIS informer can basically work on any form to forward obsolete records. For example the EIS informer might automatically escalate orders, not closed within 30 days, to the Order Manager.

EIS Pictures

You can easily deploy Pictures to the EIS-Application. The pictures should be in jpeg format, in order to reduce bandwidth demands to a absolute minimum.

EIS Listings

Each form incorporates at least one listing button in order to list the underlying records. In most forms you also have a button to show *open* or *suspended* records, only.

The records are coloured automatically according to their priority. Of course, each EIS Form can have its own 3 out of some million possible colours. The colours can also be linked to another column, for example <status> rather than <priority>.

The listings, which are limited to 10, 50 or 100 rows by default, can be sorted by any column, dynamically.

Rowid	WebTicket Id	Customer	Object Id	Priority	Category	Status
1	webticket1	Cisco	testrechner	critical	Hardware	open
6	webticket10	Cisco	testrechner	critical	Hardware	open
7	webticket11	Cisco	testrechner	critical	Hardware	suspended
8	webticket12	HP	testrechner	critical	Hardware	suspended
9	test123	Toyota	testob	critical	Hardware	open
10	test123rt	HP	testobject	critical	Hardware	open
2	webticket2	Cisco	testrcher	major	Hardware	open
4	webticket4	Cisco	testrcher	major	Hardware	open
5	webticket5	Cisco	testrcher	major	Hardware	open
3	webticket3	Cisco	testrcher	minor	Hardware	open

EIS Listings are coloured by their corresponding priority.

When you click on a record, the record will be automatically loaded into the form. You can also return to the form, change the search criteria and repeat the search with different options very quickly.

Moreover, it is very easy to add or remove columns to the EIS listings. In fact, this can be done in a minute.

EIS Project Management

EIS can easily manage all tasks of a project. Each task can be prioritized, scheduled and assigned.

The project management system can list all tasks according to their priority, status or deadline. Thus, the project manager can keep track of all the tasks very easily and calculate the costs.

Furthermote each EIS user can easily list his specific tasks just by clicking the button <My Tasks>.

Projects

All Projects

3 rows selected!

Rowid	Taskid	Customer	Project	Task	Priority	Deadline
3	UMC_3	OBS	UMC	Install Patch	minor	2001-09-20 05:00:00
2	UMC_2	OBS	UMC	Install Patch	critical	2001-09-20 05:00:00
1	UMC_1	OBS	UMC	Install Patch	major	2001-09-22 05:00:00

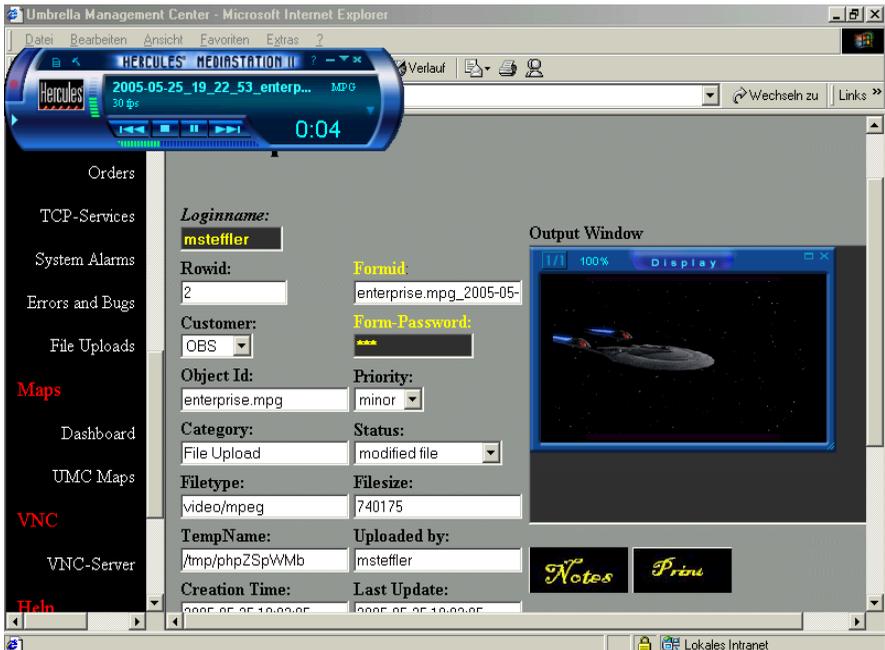
List all Project Tasks

EIS Phonetic Search

Sometimes you do not know, how a surname is spelled correctly. This is why, you can run a *phonetic search* on Contact Names, which will find all surnames, which sound similiar to the name you have entered. Of course, basically a phonetic search can be applied on any other fieldname, too.

EIS File Sharing

EIS Users can easily upload files through an encrypted communication channel into a shared directory. Thus, EIS users can easily share all sorts of files by uploading them to EIS. For example EIS users can upload pdfs, word documents or even sound files and video clips



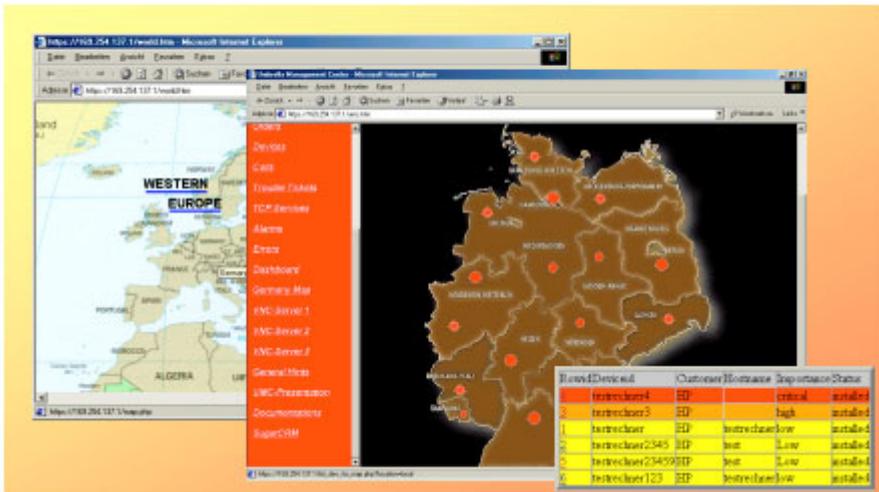
EIS File Upload Form

EIS provides an Upload Form, in order to keep track of the file uploads and an easy to use User Interface to list, download and view the files. However, for security reasons, in default configuration MS Office files, images, pdfs, sound files and video clips are accepted, only. Thus, it is impossible to upload programs and execute them on EIS.

EIS Maps

EIS Maps display location information graphically. There is an icon for each location. When you click on the icon, all devices, assigned to that location, will be listed ordered by importance.

EIS-Maps



EIS Maps list all devices assigned to that Location.

Of course, when you click on the row, the corresponding Device with its picture will be loaded into the Devices Form. Furthermore, alarms for a location will turn the corresponding location icon into the color of the highest alarm. Clicking on the location Icon will return all alarms for that location.

Frankfurt

London

Paris

New York

EIS Grid

The Enterprise Information Server scales up to as many servers as you like by building a large grid. For example, the EIS Web-Ticket System runs on a dedicated Webserver that connects back to the central EIS Database Server. Moreover, you can run an EIS Cold Backup or EIS Statistics in an EIS grid.

EIS fast hot backup

Of course, you can run hot backups of the EIS database. A backup of the EIS database will take only a few seconds. However, in *mission critical environments* you should make a hard copy for each new data record in addition, by printing it out. Thus, you won't lose records, even when EIS crashes between two hot backups.

In the case of a server crash, you can fail over to the backup system and carry on by reentering the lost records from paper, with minimum downtime.

EIS Cold Standby

You should install a second cold standby server, in order to compensate hardware failure. You might also use the cold standby server for running statistics and reports or software tests. Usually, you would update the cold standby server each evening with the current EIS database. Of course, this can be automated completely and performed in a very secure way.

With the EIS cold standby server and running EIS on a raid 5 system, you can have a low cost high availability system with 99,999% uptime.

EIS Reports & Statistics

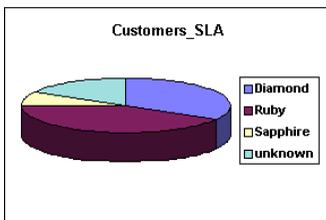
Internal Users can easily retrieve data from the EIS database through the standard ODBC interface. All you need, is the MySQL-odbc-driver. The Odbc User will only have select rights on the tables, in order to protect the database from misuse.

However, for performance reasons, it's much better to run statistics and Reports on a backup database, to avoid locking contentions.



Reports and Statistics Fontend

With the report wizard, to create a new report or diagram is very easy and can be done in some seconds. You can create all sorts of reports and diagrams. Of course, EIS provides a lot of reports and diagrams *out of the box*.



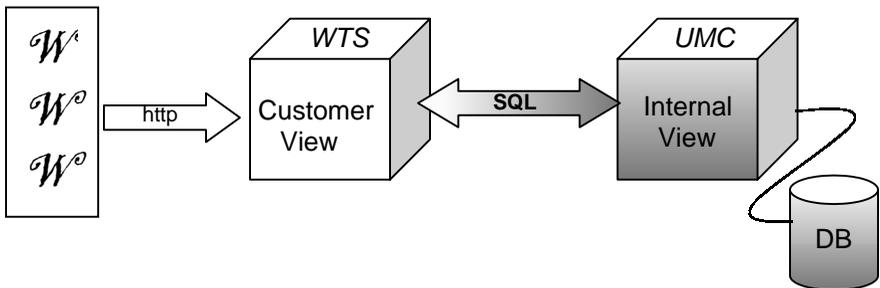
Statistics can easily be displayed in colourful diagrams.

EIS Multiple Language Support

EIS offers Multiple Language Support through the EIS Web Ticket System, which provides forms in English, German, French and Spanish by default. However, it is quite easy to add additional languages. In fact, for the time being, all EIS forms are available in English and German, being well prepared for additional languages.

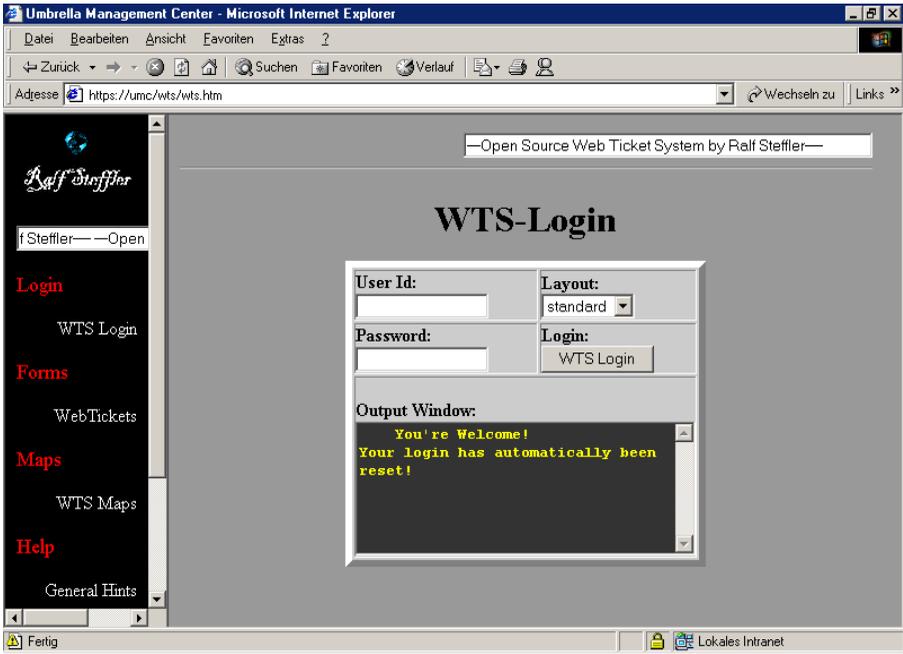
EIS Web Ticket System

The *EIS Web Ticket System* allows external users to access EIS in a very secure way over the *World Wide Web*. Thus, customers can send *WebTickets* directly to EIS, getting status information from anywhere in the World in real time. The *EIS Web Ticket System* can also provide individual customer Views for the corresponding customer networks.



The EIS Web Ticket System provides very secure customer Views for EIS over the World Wide Web in 4 different languages.

Moreover, WebTicket forms can be displayed in any language. All you have to do, is, to translate the labels and the form column values. By default, there are WebTicket Forms in English, German, French and Spanish.



The EIS WebTicket System

SQL-Command Set

MySQL

Table structure

describe table

Show system configuration

show variables

Show execution plan

explain select ...

DCL

System Rights

Grant Right

`grant systemright to user/role`

Revoke Right

`revoke systemright from user/role`

Object Rights

Right

select, insert, update, delete, execute on object

Add Right

`grant right on object to user/role`

Revoke Right

`revoke right on object from user/role`

DDL

create/alter/drop

database

index

table

truncate table

DML

Select Records

```
select * from tablename  
where ...
```

Insert Records

```
insert into tablename(coll1, coll2,...)  
values (val1, val2, ...)
```

Update Records

```
update tablename  
set coll1=value, ...  
where ...
```

Delete Records

```
delete from tablename  
where ...
```

System Management Glossar

Bit

Smallest information Unit

Byte

Smallest data transfer unit of 8 Bits, that make a character.

Computer

Sophisticated System, which can run various software.

Enterprise Information Server

Server, that stores the information of an enterprise.

Ethernet

Very popular LAN Topology, which runs on 10, 100 and 1000 Mbit/sec.

Firewall

Device, that controls IP-Traffic.

GUI

Graphical User Interface

Hub

Central Device, which all devices on a lan segment connect to.

Internet

World Wide IP-Network

Internet Protocol

Communication Protocol, which runs on the internet.

Network Node Manager

Sophisticated Software, which uses SNMP to manage IP-Devices

Operating System

Basic Software, which drives the hardware of a computer.

SQL

Standard language for querying relational databases.

Umbrella Management System

Central Management System, residing on top of all other Management Systems.

World Wide Web

Virtual Network of WebServers, that connect to the Internet.