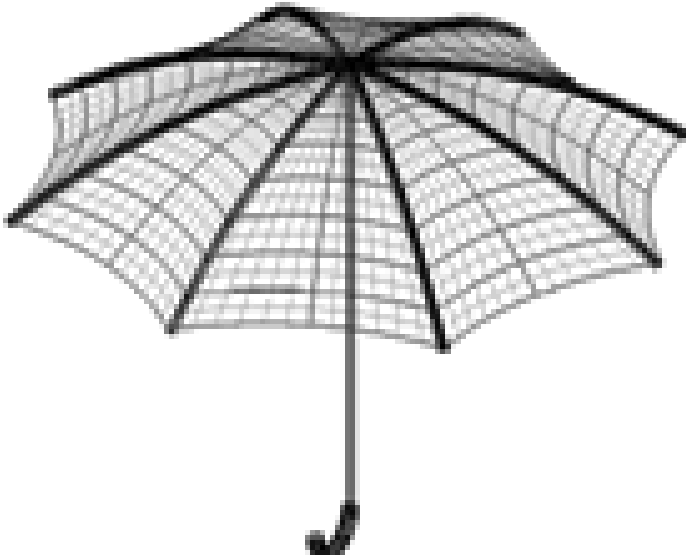


Open Source Umbrella Management Center

A sophisticated UMC Concept Guide



*Powered by
Dipl.-Ing. Ralf Steffler*



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For Marvin and Deborah!

Frankfurt/Main, 27.01.2008

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Introduction

The theory of binary logic was designed 300 years, ago. For the author, the German mathematician Gottfried Wilhelm Freiherr von Leibniz, the theory meant a divine revelation, because God created the World in 7 days, which is three times one without the devilish zero in binary logic and he believed, his theory could even be used to convert mankind to Christianity.

Leibniz designed the first Computer, some kind of a mechanic calculating device, which could not be built, because of technical problems. The problems remained unsolved until the German civil engineer Konrad Zuse, obsessed like Edison, realized his dream of the first computer based on binary logic, shortly before World War II.

Today, all computers are based on binary logic and the dual number system. However, computers differ in many other respects. Different architectures from 8 to 64 bit set the principle rules for the various operating systems, which run the powerful computers.

In spite of the great variety of computer systems, connected through the internet, there is one thing, they have in common :

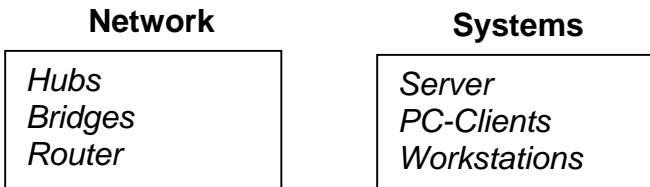
In the World Wide Web all computers talk IP !

That's why the Umbrella Management Center is based on the Internet Protocol, which current dialect is still Version 4.

UMC-Overview

The FCAPS

The umbrella management is supposed to monitor the quality of all systems centrally, making sure that they work at an optimum. Umbrella Management encompasses:



The system management tasks are generally expressed in the acronym FCAPS, which stands for:

Fault
Configuration
Accounting
Performance
Security

The importance of the tasks corresponds to the order of the letters. Usually, you have to fix faults in the first place and security issues at the latest.

Fault Management

Pro- and reactive Fault Management implies the workflow needed to avoid, fix and log faults. The awkward thing about Fault Management is, that you are always unprepared and under time pressure when you fix problems.

Configuration Management

Configuration Management describes all the tasks, which are necessary to setup up, backup and restore a system. If Configuration Management works, a system can crash and be restored with a standard procedure.

Accounting Management

Accounting Management is supposed to ascertain the costs for the systems provided, with the final objective to bill them to anybody, who is willing to pay for the whole lot.

For example DSL connections are billed by data volume. Every MByte is billed.

Performance Management

Usually Performance Management is work for special agents, because the special work is usually very complicated and requires in depth knowledge and understanding. Performance Management encompasses excellent design work, enthusiastic performance analysis and finally sophisticated tuning.

Security Management

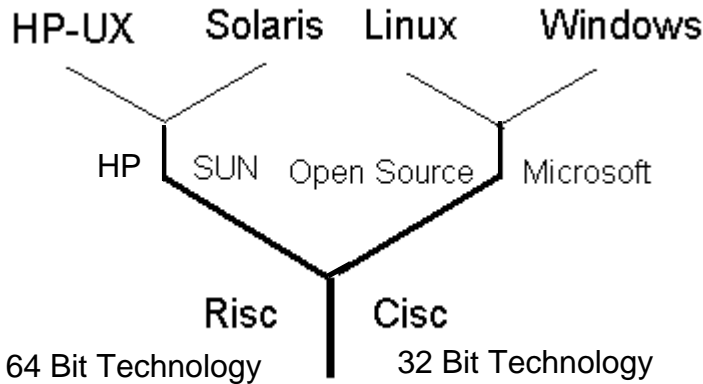
Security always comes last, though it is of utmost importance. The main problem with security is, that Unix-Systems are not secure by default.

There are *Security Officer Accounts* with no or well known passwords and talky sailman, who tell a WebPirate anything about the precious WebShip, he wants to enter. Generally, IP-traffic is sent over the network in clear text. That's why it's quite hard to make a computer network really secure.

Anyway, a secure network is always less performing and more complex to use than a standard computer network. Extra Expenses, which are hard to claim, are the main reason for the poor security, which is not the exception but the rule.

Umbrella Management

In the past 20 years computing has grown like a tree, driven by competing companies, which all tried to enforce their own operating systems, network protocols and applications. However, today, there is not one winner, but still many companies competing for the best or more often cheapest computer systems.



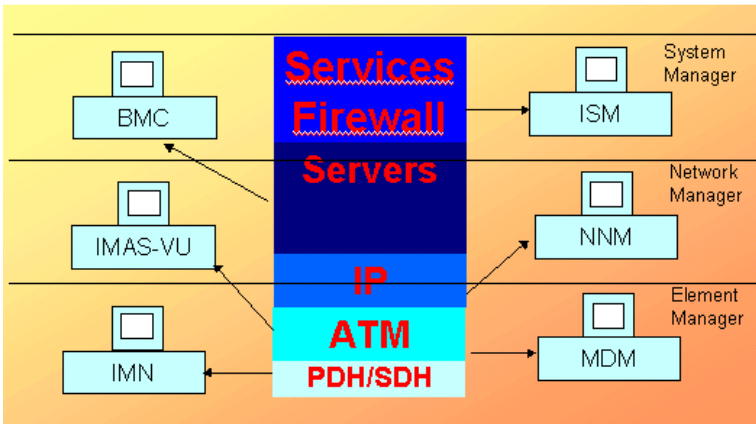
Unix Systems run on 64 bit Risc processors while MS Windows is still on 32 bit.

This is the reason why a system manager comes across a lot of different equipment, which he has somehow to manage.

Of course Microsoft Windows and Unix have become the most modern and popular Systems. However, the system manager still has to get a long with different versions of software from various manufactures.

Apart from that, there is a lot of sophisticated hardware around, which is hard to manage, too. Basically before you start to manage, you should gather all relevant information for the systems you have to manage.

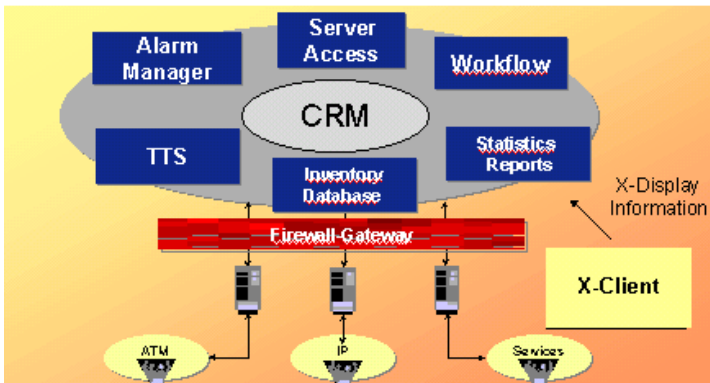
System Management today



Umbrella Management encompasses all System-Layers.

Luckily, the computing industry has agreed on one Network Protocol, namely the Internet Protocol. This Protocol runs the internet and it seems, that in some years the IP-Protocol will have superseded all other Protocols around. It even sets about to replace the telephone Network, by running *Voice over IP*.

Umbrella-Management A concept rather than a product



Umbrella Management Center

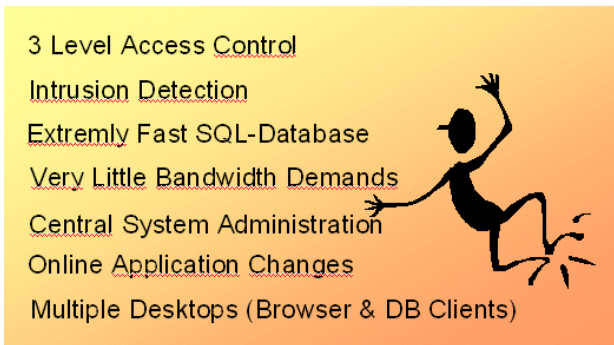
UMC Quality Management

The UMC can monitor and improve the quality of your system management significantly by reducing alarms and structuring the workflow. Information is always up-to-date and stored centrally.

The system is easy to use and provides standardized alarm handling and an effective Alarm Correlation.

Every action will be logged in order to improve communication between team members and find standard solutions for known problems and configuration issues.

UMC-Features



The 7 main UMC features .

UMC-Architecture

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 the UMC, PHP is more than sufficient.

The Lamp Platform

The Umbrella Management Center is supposed to be the *Central Point of Information* in a System Management Center. With the UMC the System Manager can easily organize his SMC, 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)

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

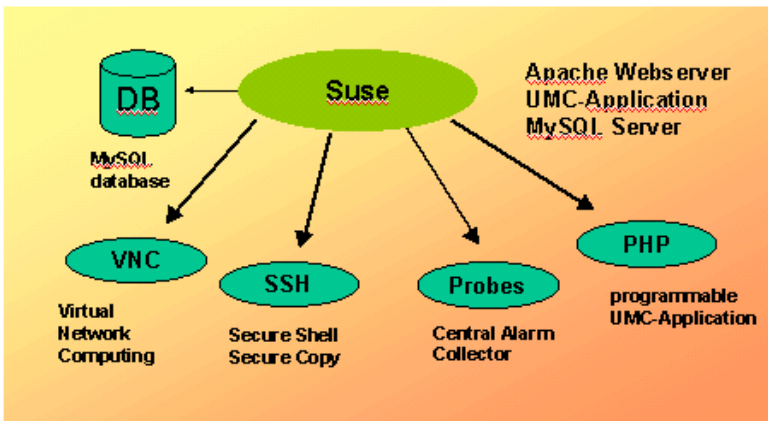
UMC-System Components

The UMC consists of 3 system components

- UMC-GUI*
- UMC-Probes.*
- UMC-Frontend*

The UMC Architecture is very modern. It is based on SuSE Linux 9, because SuSE provides all the software needed for running a UMC. Moreover, the software is freely available at no costs.

SuSE Linux Enterprise Server 9



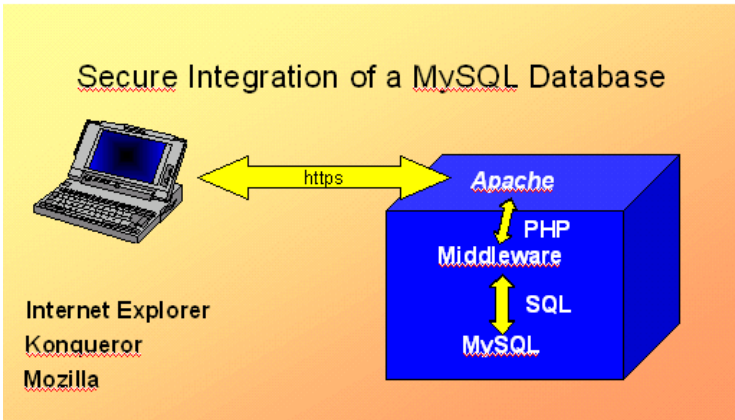
The UMC System Components

Since all *UMC System Components* were written in TCL/TK and PHP, it is very easy to extend the functionality of the UMC application, even for non-programmers.

3 Tier Architecture

The UMC 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 *UMC-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

UMC Software Design

The UMC Application is neatly divided up into

- data*
- metadata*
- program logic*

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

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.

UMC-Scalability

The UMC-Architecture scales up to 4 CPUs and 4 GByte of RAM on standard PC hardware. In order to group disks to one large partition and protect against disk failures, the use of a Raid System is recommended. However, the Operating system supports much more CPUs and RAM. Thus, it is just a matter of how big the box can be. By the way, SLES 9 can run on both 32 and 64 bit Architecture since 2004.

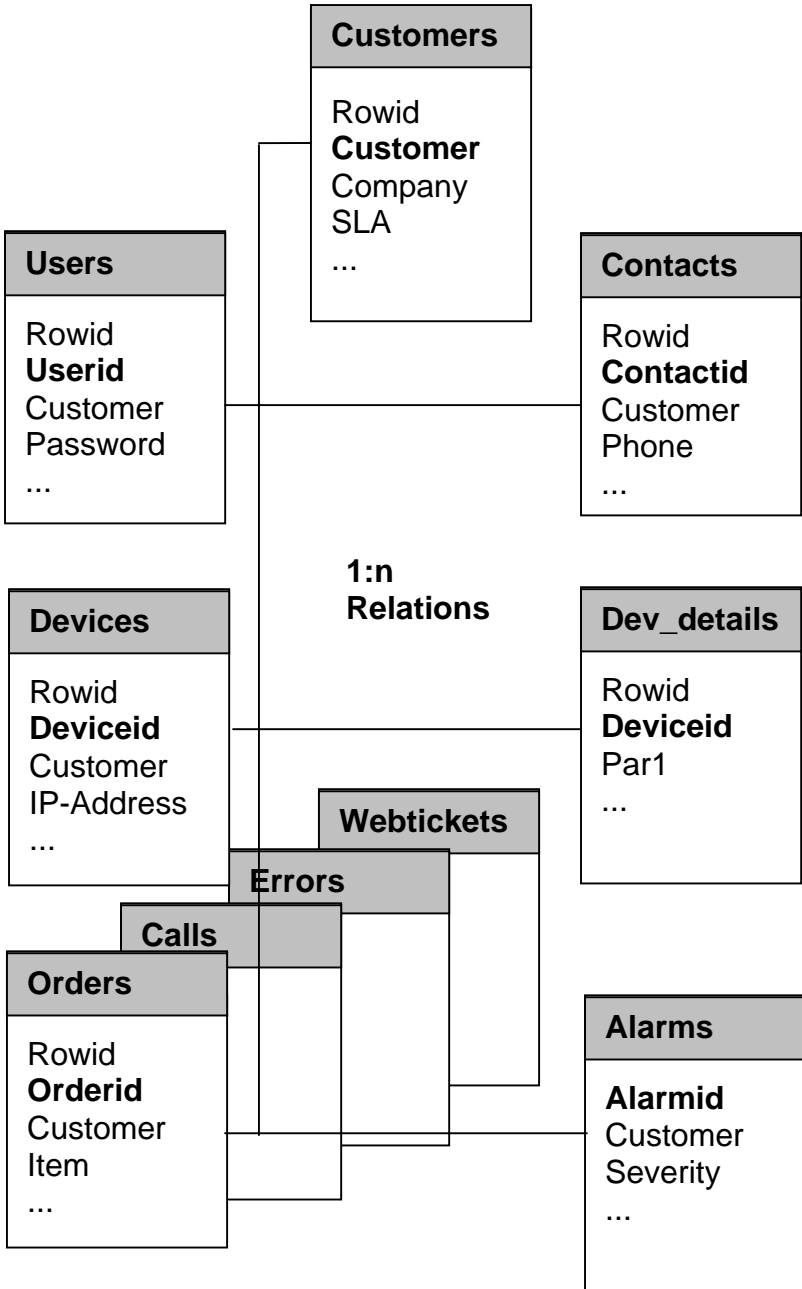
The UMC-Database

The UMC 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 UMC 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, the UMC is able to process more than 100.000 Alarms per hour, while users are working on the UMC database.



The UMC database main tables.

UMC Database Modell

UMC is based on an object oriented database modell. The UMC Database Modell 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.

UMC Workflow

The UMC implements a 3 level workflow in order to process technical requests, network alarms and system failures, effectively.

1. First Level

- ☉ Customer Support by phone, fax, email or online through WebTickets
- ☉ Create Trouble Tickets

2. Second Level

- ☉ Monitor Alarms
- ☉ Process Trouble Tickets
- ☉ Perform Online Diagnostics
- ☉ Analyze Logfiles

3. Third Level

- ☉ Maintain Hardware
- ☉ Work on Operating System Level
- ☉ Use of System administration tools
- ☉ Apply Application Software Changes

The First Level is the primary customer interface, which is supported by the Calls and Contact Forms or much better, the Web Ticket System. The Web Ticket System can also serve as a central online information system.

Requests which cannot be concluded in the first level within an appropriate time frame, will be forwarded to the second level by creating trouble tickets, orders or emails.

The problems will be qualified, and if still not resolved, dispatched to the third level by assigning the task to a systems specialist.

The UMC provides quick and easy forms, which should be used to log any taken action in order to propagate the status of the requests and keep the service level agreements. Furthermore, the data records can be used to rate and improve the quality of service and run statistics. Thus, any request or problem can be sorted out in a structured, well defined way, which is automatically logged for later use.

UMC-Security

The UMC Server is designed as a *Bastion Host*, which means that the UMC-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.

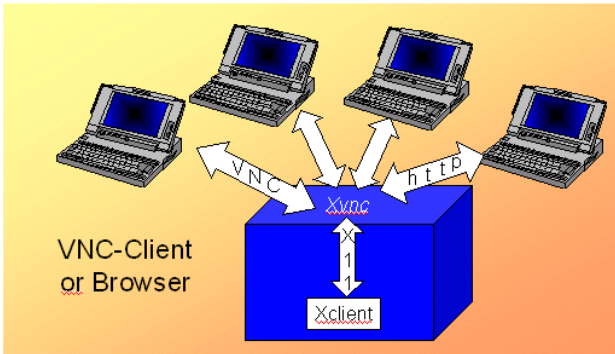
Thus, even X-Traffic is encrypted.

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

Virtual Network Computing

Virtual Network Computing swings X communication around by 180°. In contrast to X-Terminals, the VNC-Clients connect to a virtual X-Server on the host, that can distribute X-Applications to multiple Clients simultaneously.

Virtual Network Computing



Multiple VNC-Clients can connect to the virtual X Server simultaneously.

However, the access to the virtual X-Server cannot be protected in a really secure way. Besides, the VNC-Clients tend to grasp a lot of bandwidth.

Thus, you should use *Virtual Network Computing* in high speed secure LANs, only.

Nevertheless VNC is ideal for training courses and remote support, because a virtual X-Server can be shared among multiple Desktops. For example you can run *Yast* against a virtual X-Server and access it through several browsers at the same time. Furthermore you can run multiple virtual X-Servers on one host, just by typing in

`vncserver`

The program will automatically pick up the next free port for the Virtual X-server on

http: 580x

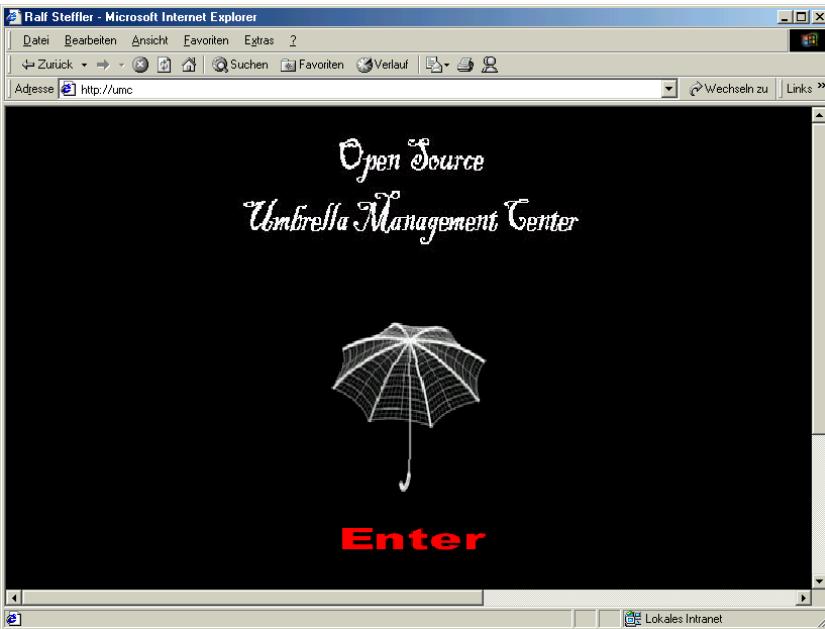
VNC: 590x

X11: 600x

The UMC-Application

The UMC Welcome Page

The UMC Welcome Page runs on standard *Http-Port 80*. However, when you enter the UMC-Application, you are automatically put on *https*. Thus, all data transfer is encrypted.



The UMC Welcome Page

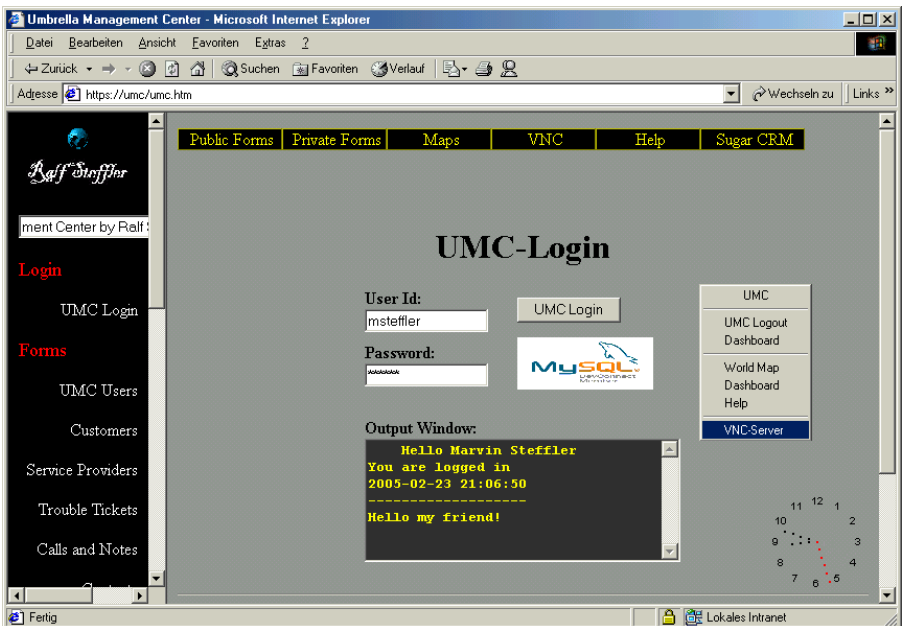
UMC-Features

The UMC comes with a lot of features out-of-the-Box. In contrast to client-server applications, the system is centrally managed and nearly maintenance free. Application changes are distributed immediatly, when the browser gets the corresponding

url. However, the UMC is designed for low bandwidth networks, so that it even performs well on a 56 kbit/sec modem connection.

3 Level Access Control

Before you can start, you need an UMC-Login, which you will get from the UMC-Manager, by creating a user in the User-Form. The UMC-Login is just an application Login, not passed to the MySQL database underneath. In high security environments, the UMC 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.



UMC 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 the UMC 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 the UMC, 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.

UMC-Forms

UMC Form Layouts

The UMC 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, the UMC can use multiple Layouts to support forms in different languages.

Standard Forms

Customer Information is typed in or collected by probes automatically. In order to type in Information and display it, there are 15 Standard Forms:

Service Providers

Trouble Tickets

TCP-Services

UMC Users

WebTickets

Customers

Meetings

Licenses

Contacts
Projects
Devices
Alarms
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 insensitiv 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.

The screenshot displays the 'Customers' form in the UMC application. The browser window shows the URL 'https://umc/umc.php?layout=extended'. The sidebar on the left contains navigation options, with 'Customers' highlighted. The main form area includes a 'Customer' section with input fields for 'Loginname' (containing 'umc'), 'Rowid' (containing '0'), 'Customer', and 'Form Password'. Below this is a 'Customer Details' section with fields for 'SLA', 'Street', 'Company', 'City', 'Zipcode', 'Country', 'Contact', 'Phone', 'Fax', and 'Email'. To the right of the details is a 'Sorting Options' section with 'Sorted By: Order / Limit', a 'Rowid' dropdown, a 'desc' dropdown, and a '10' dropdown. At the bottom right, there is an 'Output' table showing 'max Rowid: 13' and a 'Note' field.

The UMC Customers Form

Private Forms

The UMC Form Generator can easily create private Forms, which automatically integrate in the UMC 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.

UMC Right Button

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

UMC Pictures

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

UMC Hotkeys

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

alt + first letter of button label

UMC Dynamic Lookup Lists

The UMC Application provides both, static and dynamic lookup lists. Dynamic lookup lists are created on the fly by looking up the current entries of the corresponding tables, while static lookup lists are hardcoded in the HTML Page.

UMC 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.

UMC Virtual Notepad

Each Form incorporates a *virtual Notepad*, which allows you, to easily note down each taken action. The virtual 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 UMC Informer

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

UMC 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 UMC 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

UMC Listings are coloured by their corresponding priority.

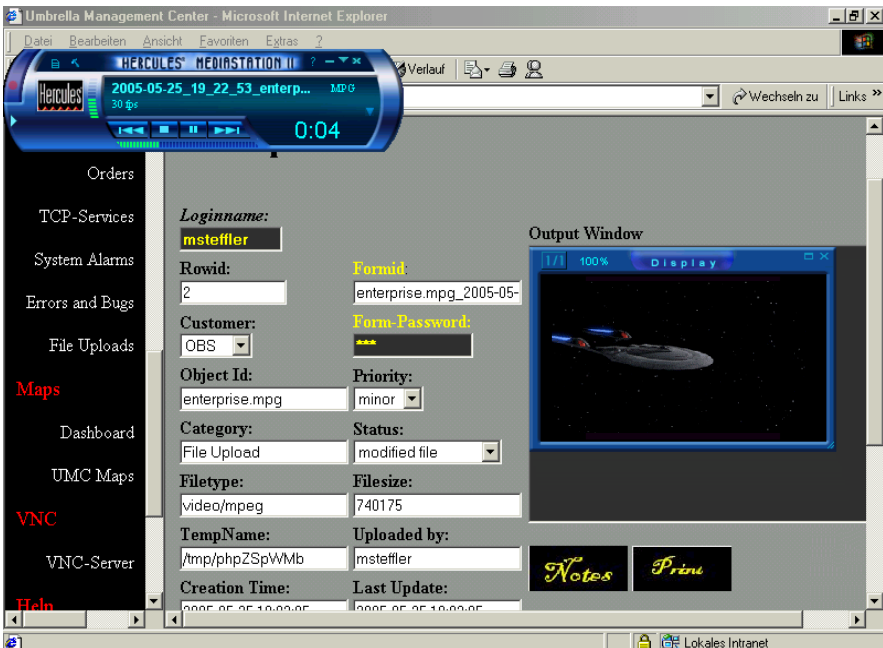
When you click on a record, the record will be automatically loaded into the form. You can also return to the form, change the search criteria and repeat the search with different options very quickly. Moreover, it is very easy to add or remove columns to the UMC listings. In fact, this can be done in a minute.

UMC-Trouble Ticket System

The UMC incorporates a *generic Trouble Ticket System*. Selected Alarms can be electronically passed to the Trouble Ticket System, which will generate a corresponding Trouble Ticket. However, it is also possible to create Trouble Tickets manually for any problem you want to trace. Trouble Tickets can be forwarded to a mobile Telephone by *Short Message Service*, provided the UMC-Station is connected to the internet.

UMC File Sharing

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



UMC File Upload Form

The UMC 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 the UMC Server.

UMC-Probes

Alarm Processing

Probes will process any kind of alertfile in order to deliver all sorts of alarms to the Umbrella Management Center automatically. Probes can be configured to filter, categorize and deduplicate alarms. Through Alarm deduplication the amount of alarms can be reduced significantly. For example the *Oracle Alertfile Probe* can reduce Alarms of a heavily used database by default by factor 1:10.000 over some month's time. There are 4 Out-of-the-Box Probes and 2 Watchdogs available:

Ping Probe

Generic Probe

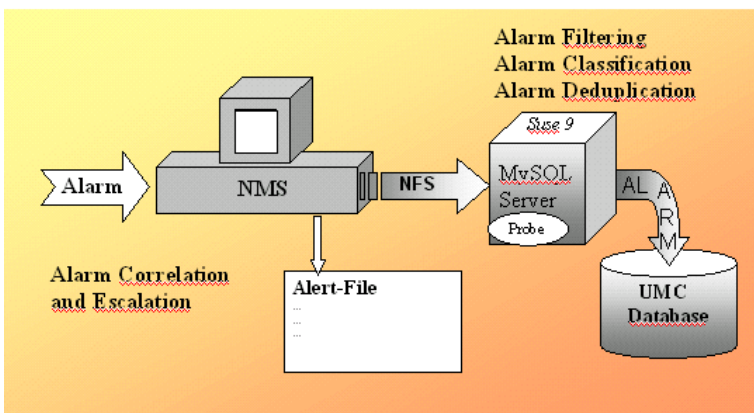
Syslog Probe

Oracle Probe

Service Checker

Threshold Watchdog

Alarm Processing By Probe



The UMC filters, classifies and deduplicates alarms.

Alarm Correlation

There are 3 ways to correlate alarms. You can easily correlate alarms by their source, which is usually the hostname or the time range they were created. A more sophisticated way to correlate alarms, however, is to take even the network into account, which is done by the system manager and cannot be automated for the time being.

The UMC provides an Alarm Correlation Button, which will correlate alarms, which were created within the correlation window, grouping the alarms by customer and hostname.

Alarmid	Customer	Severity	Message
asterix oracle system error	OBS	critical	System Error Ora-600
asterix system filesystem	OBS	major	filesystem full
test-computer oracle error	OBS	minor	System Error Ora-7475

Alarms correlated by Customer

Alarm History

The UMC keeps the History of any Alarm. Thus, the System Manager can easily check out, when the alarm came up first time and the intervals at which it occurred.

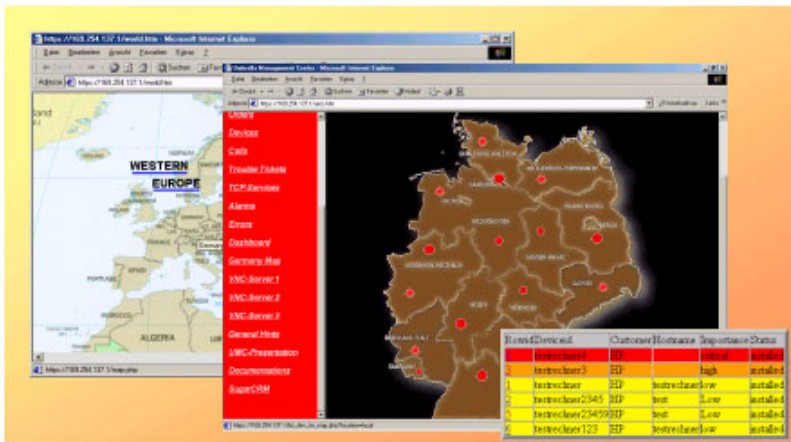
Threshold Watchdog

The Threshold Watchdogs generates an alarm, when logical limits have exceeded. For example a threshold watchdog could check the number of jobs in the print queue or the used space of a filesystem. The watchdog will automatically clear the threshold alarm, when the critical value subsides under the logical limit.

The UMC-Maps

The UMC-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.

UMC-Map



The UMC Map lists 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

UMC-Dashboard

The UMC provides a dashboard, which monitors the UMC database. The UMC dashboard refreshes each minute. Thus, the users can easily monitor the UMC database tables rather than permanently querying the UMC forms for new entries.

UMC fast hot backup

Of course, you can run hot backups of the umc database. A backup of the umc 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 the umc server crashes between two hot backups.

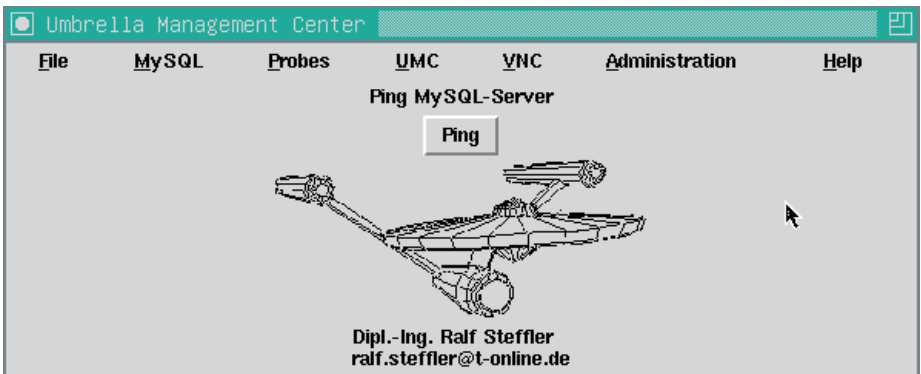
In the case of a server crash, you can fail over to the backup system and carry on by reentering the lost records from paper, with minimum downtime.

UMC-Accessories

The UMC- GUI

The UMC provides a Graphical User Interface for both, the UMC database and the UMC Application.

Thus, you can manage the UMC in an easy to use X-Environment rather than tripping over sql or unix syntax problems. However, experienced sytem managers can still access the UMC directly by using the command line interface, writing their own scripts and batch jobs to automate workflow.



The UMC GUI

The UMC-GUI is supposed to be the *UMC Glue*, which keeps all UMC system components necessary, to run the UMC, together. Of course you can easily extend the functionality of the UMC-GUI. From the UMC-GUI you can start the UMC Installation, the UMC Form Generator, start probes or any other graphical management tool such as the *MySQL Control Center* or *Yast*. Furthermore, you can easily run a *hot backup* of the umc database just by clicking a button.

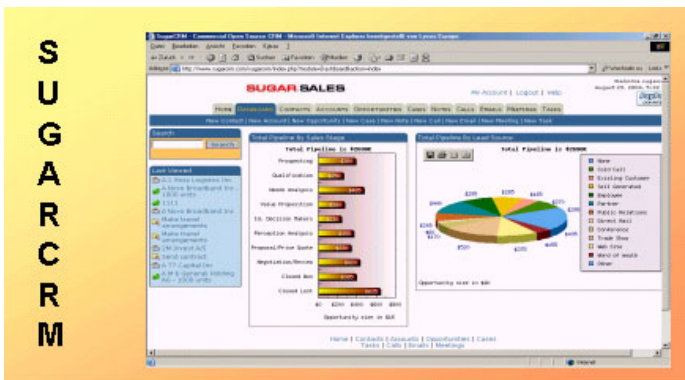
UMC Cold Standby Server

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 umc database. Of course, this can be automated completely and performed in a very secure way.

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

CRM-Integration

You can easily integrate the Open Source Product *SugarCRM* in the UMC, just by installing it in the same *DocumentRoot-Directory*. Of course, *SugarCRM* will use its own new *Su-garCRM* database for its MySQL- tables.



Open Source SugarCRM

UMC Reports & Statistics

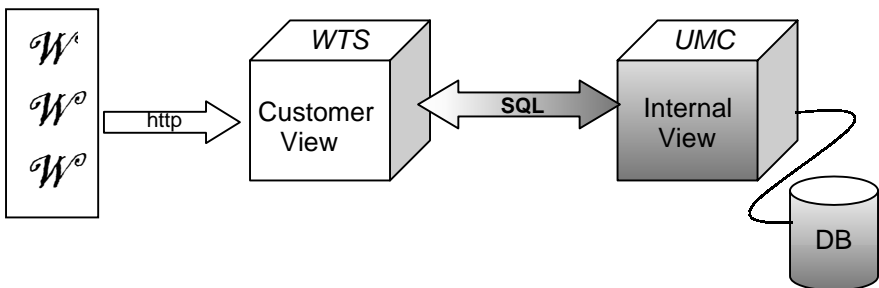
Internal Users can easily retrieve data from the UMC database through the standard ODBC interface. All you need, is the MySQL-odbc-driver. The Odbc User will only have select rights on the tables, in order to protect the database from misuse.

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

In addition to that, the UMC provides integrated printout pages, which are especially designed for easy but elegant printouts.

UMC Web Ticket System

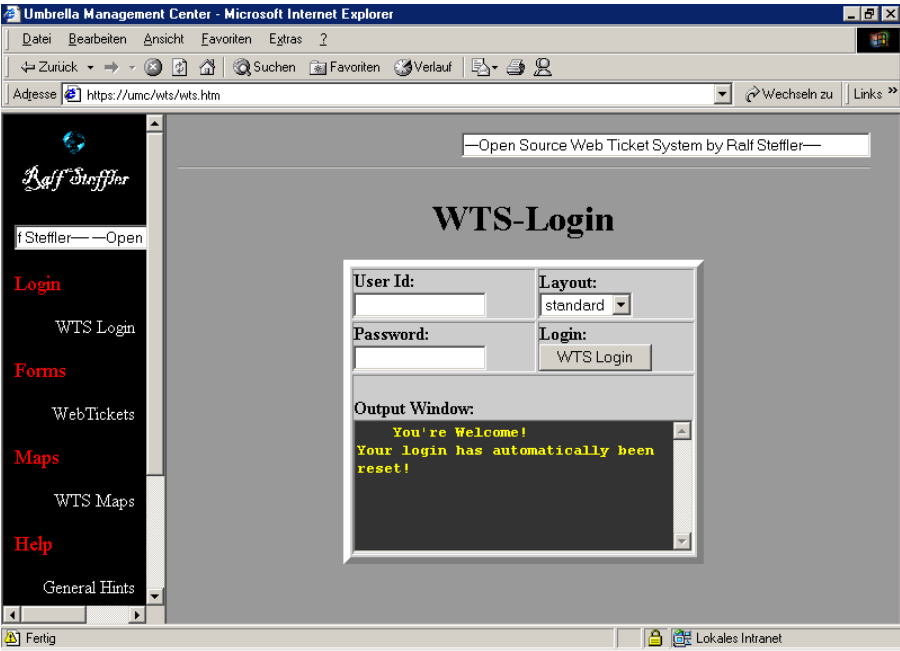
The UMC *Web Ticket System* allows external users to access the UMC in a very secure way over the *World Wide Web*. Thus, customers can send *WebTickets* directly to the UMC, getting status information from anywhere in the World in real time. The *UMC Web Ticket System* can also provide individual customer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



The UMC Web Ticket System provides very secure customer Views for the UMC 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 UMC WebTicket System

UMC-Installation

Installation Overview

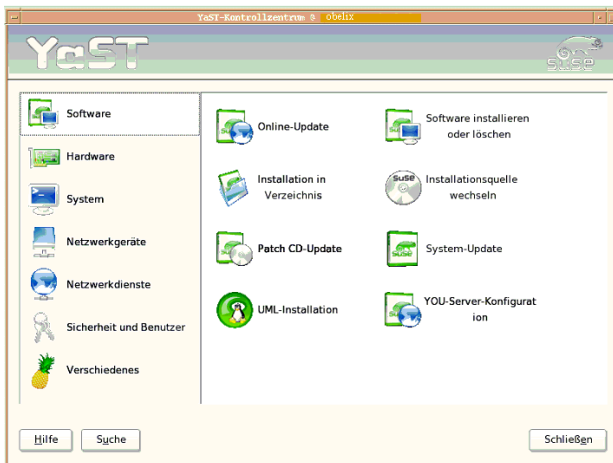
The installation of the UMC is performed in 3 steps.

1. *Installation of SuSE 9 professional.*
2. *Install and run the UMC scripts*
3. *Configure and start the probes*

Installation of SuSE 9 professional

In order to install SuSE 9 professional, you basically have to insert the first CD and boot the computer. You will need to install

Apache 2.0
MySQL 4.x
PHP 4.x



Software installation through Yast

Once SuSE is installed, you have to make sure, that Apache and MySQL starts automatically, when the computer is rebooted. You should verify access to the Apache WebServer through a Browser. Last but not least, you can configure the Firewall, in order to restrict access to *http* and *https*.

Install and run the UMC Scripts

You just have to copy the Installation Scripts into an empty-subdirectory, e.g. `</umc>` and run the UMC-GUI from the gui-subdirectory. According to the installation directory you have to set the `UMC_HOME` environment variable in the `umc-Startscript`, which is `</umc>` by default.

```
export UMC_HOME=/umc
```

Configure and run the probes

Once everything is up and running, you can configure the probes in the *probes* subdirectory for the corresponding logfiles, and start the probes.

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(col1, col2,...)  
values (val1,val2,...)
```

Update Records

```
update tablename  
set col1=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.

Bridge

Device, which passes Ethernet Frames on Level 2.

Computer

Sophisticated System, which can run various software.

Element Manager

System, that manages system components through any kind of protocol.

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.

Simple Network Management Protocol (SNMP)

Standard Protocol to manage IP-Networks.

Router

Sophisticated Device, which routes IP-Packtes through IP-Networks like the Internet.

SNMP

Simple Network Management Protocol

SQL

Standard language for querying relational databases.

Switch

Sophisticated Bridge, that is designed for maximum speed.

System Manager

Sophisticated Software, that can manage Computer Systems.

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.

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