

voipac



fayn Solution



fayn - Complex Solution

Voipac is presenting complex solution for VoIP infrastructure intended for ISP and CATV providers and telecommunication operators. Implementation of Fayn gets you able to provide voice, fax and instant messaging services. Fayn solution offers you: Softswitch, billing, NOC, e-commerce portal, terminal equipment, implementation services and customization.



Solution for the next generation networks

The logical outcome of pace in telecommunication development seems to be merging of voice and data networks. Network and service merging, price reduction pressure, and arbitrage options force the shift from PSTN switched network model to the next generation model that is inevitable for success of telecommunication and data services providers. Fayn complex solution comprises these basic products and services:

- Voipac Softswitch
- E-commerce web portal
- Network Operating Center (NOC)
- Billing, Admin Module
- Terminal equipment (Start Pack)
- Implementation services
- Customization

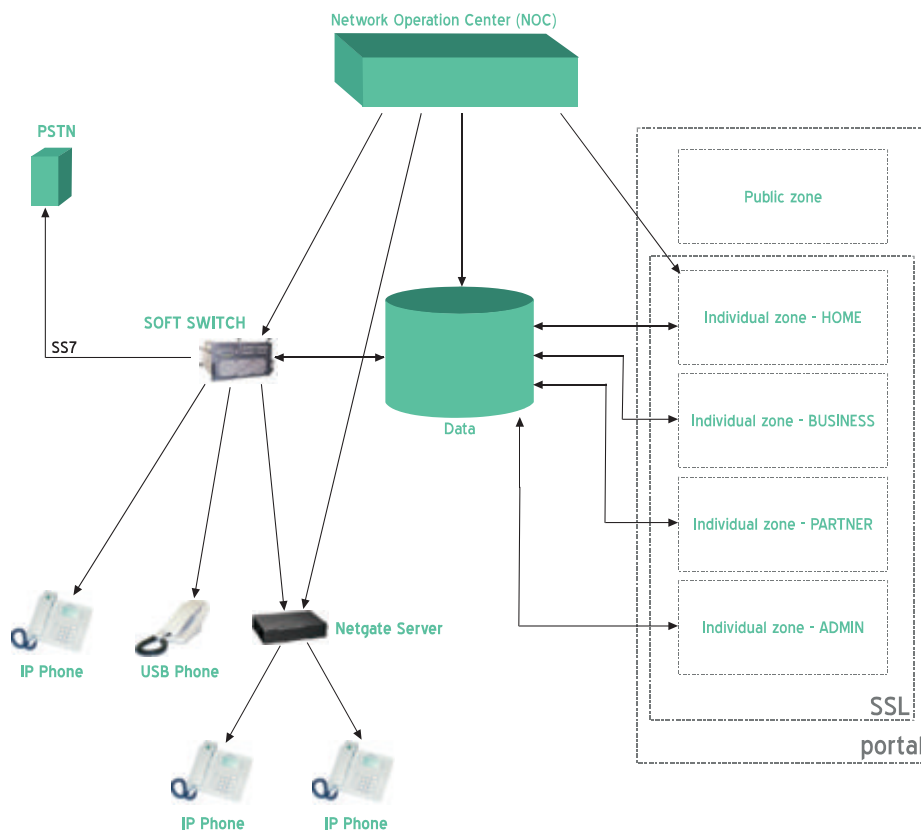
Voipac Softswitch

Voipac Softswitch is robust, highly scalable solution for delivering of VoIP services determined by the Internet Service Provider, CATV and telecommunication operator. After implementation of Voipac Softswitch, you will be able to simultaneously provide new generation converged voice services and the Internet-based and data transmission services on packet networks. Voipac SoftSwitch consists of two components - Voipac Command Center and Voipac Gatekeeper. Number of simultaneously running Command Centers and Gatekeepers is not limited. Individual doubled components within the Voipac Softswitch are commonly sharing load and are backing up each other. Because Command Centers are run on independent servers, service providers may create fault-tolerant IP phone networks with continuous network operating time.

Voipac Command Center

In Voipac networks, Voipac Command Center along with central ODBC database provides subscriber authentication, user account network administration, dynamic call routing, flexible call charging and centralized billing. These services are inevitable for telephone operators, ISP, CATV and other providers, because these services are vital for distributed network administration from one location.

Voipac Command Center is specially designed to provide intelligent network control of Voipac Softswitch solutions. It means simple billing and call record check for all types of networks, regardless to type of gateway they use. Such heavy flexibility supports hundreds of thousands of simultaneous phone calls and can be configured to support PSTN and Edge access of Softswitch solutions supplied by Voipac Company. Voipac Command Center provides easy access to routing tables, call charge tables, subscriber information, call category and call billing information. All of these are orderly collected in the central database. Because current information is stored in the central database, administrators can easily add gateways and subscribers, modify charge call tables and execute other administrative functions within the highly-scalable and distributed network architecture. You may view or change content by SQL statements or by Voipac Management Console. Voipac Command Center supports Oracle and MS SQL as well as MySQL databases with ODBC interface and it allows for export of database information into existing operation support systems and billing systems that use



SQL statements. Command Center is running under Linux or Microsoft NT/2000 operating systems.

Management through the Web - all Voipac's network elements, including Command Center, can be managed by Voipac Management Protocol (VOMP), which uses SSH to achieve top security level possible. Network Operation Center (NOC) permits service providers the following: centralized network management, including alert handling and administrator notification by e-mail or SMS. All properties are accessible via Voipac Management Console, which uses VOMP protocol for safe communication. Because all controls are Java™ platform based they are not dependent on any operating system.

Dynamic Call Routing - Voipac Command Center is routing each call upon complete phone number, or abbreviated digit form of any other number. Large-capacity complex dialing plans can be easily implemented by means of digit translation function. For one destination can be specified any number for an alternative dial of call diverting. Such type of checking can also be used for load distribution among gateways.

Flexible Call Charging - call charge rate is specified by particular phone number and it is possible to set different charges for incoming and outgoing calls, intracompany calls and for out-of-network calls. The charge rate may depend on current time and day. You may set up free of charge calls for particular destinations.

Domain Management - for selected customers and groups you can generate special routing and charge rate tables.

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Domain Management - for selected customers and groups you can generate special routing and charge rate tables. Billing Options - Voipac Command Center supports standard open account billing and prepaid cards billing, while it adopts real-time billing to avoid duplicate use of prepaid cards in the same time.

Call Detail Report - in database is stored incoming and outgoing call information along with many parameters - customer account, time and duration of a call, destination code and more.

Fault-Tolerant - multiple Voipac Command Centers running on independent machines allow service providers to create highly robust and large-scale fault-tolerant IP phone networks with continuous network operating time.

The following are elementary features of Voipac Command Center

- Password based authentication, which distinguishes between authorized and unauthorized users. In addition to user authentication, the Command Center authenticates gateways and Gatekeepers.
- Domain identification allows formation of logical groups comprising gateways, subscribers, routings and call charge rates. For example, a company with branch offices can create domain, for these offices, possessing its own routings and intracompany call charge rates.
- Dynamic call routing is routing calls dynamically upon the selected gateway, domain, user-defined dialing rules, predefined local area codes and many other factors.
- Dynamic call routing ensures continuous phone service. Server groups provide duplication within gateway group, while secondary server groups provide duplication for primary server groups for the purpose to keep operation running round the clock.
- Load balance is balancing the transmission at each call, which results in faster and more reliable communication.
- Flexible call charging allows defining both individual and uniform rates.
- It is possible to separately charge domestic, regional, or urban calls. The system is able to distinguish between calls made within the network and calls being routed out-of-network. You can also set different charges for incoming and outgoing calls.
- Monitoring, status detection, and gateway and Gatekeeper status statistics verification.

Voipac Gatekeeper

Voipac Gatekeeper provides open architecture for smooth integration of H.323 terminations of various brands. Voipac Gatekeeper provides access control, address translation and functions for call management of all H.323 v4 compatible gateways within the network.

Voipac Gatekeeper allows H.323 gateways to access dynamic call routing, flexible call charging, billing information and other Voipac functions.

Interoperability Based on Standards - Voipac Gatekeeper maintains ITU-T H.323-v4 recommendations, including H.225-v2 for RAS (Registration, Admission and Status), H.225.0/Q.931 and Fast Start Procedure for call signaling and making, H.245-v3 with H.245 tunneling for call management, gatekeeper routed call signaling model and locating services (LRQ).

Call Detail Report - Voipac Gatekeeper generates H.323 call information in the form of call detail report (CDR). Such reports include call ID, time and call duration, call cost, dialed number and call termination code. You can order Voipac Gatekeeper hardware platform either as software product or as pre-installation on Voipac NetGate Server hardware.

Management - Voipac Gatekeeper is designed to use Voipac Management Protocol (VOMP), which is used to manage all Voipac network elements. VOMP defines, how to acquire and update network information, e.g. Gatekeeper setting parameters.

In order to ensure top security level possible the VOMP uses SSH. All Gatekeeper's components are available via SSH (VpacAdm tool), Voipac Management Console or graphical Web-based interface. Voipac Management Console is based on Java™ platform and Swing library. It means that Gatekeeper can be managed via any OS supporting Java™. Voipac Gatekeeper generated alerts and alerts generated by other Voipac network elements are collected in Network Operating Center (NOC), which provides centralized network management. You may configure NOC in a way, so it will notify administrators via e-mail or SMS.

Voipac Exchange Gateway

Voipac Exchange Gateway serves as a connection point among H.323 networks. Exchange Gateway will divert signaling transmission (and voice potentially) from one network to the suitable endpoint in the partner network.

Voipac ExGateway represents complex software and hardware solution providing reliable calling via the Internet. Gateway software is preinstalled and configured in Voipac' plant according to your specific telephony requirements. Voipac ExGateway may operate as the following:

- Exchange Gateway service providers will be allowed to interconnect H.323 networks, so that they will register themselves to Gatekeepers on both sides.
- H.323 Proxy allows users to phone beyond firewall, because it translates addresses and customizes H.323 protocol (NAT + RTP translation).
- Voipac Gateway provides the following functions:
 - Handles incoming and outgoing calls,
 - Confirms connection establishment requests.

Bidirectional H.323 - signaling the gateway allows bidirectional communication of H.323 units scattered in various H.323 networks.

RTP translation - the gateway captures RTP data into the required length.

Password authentication - the gateway allows to use MD5 or SHA1 H.235 Annex D authentication algorithm. This provides for H.323 terminal equipment full mobility, while the high level security remains well preserved.

Frequency Width Control with Max. Call Settings is used to limit frequency width that is used by a gateway.

Duplicity - Voipac Softswitch solution permits operation of multiple gateways for the same destination, which provides doubled security and load distribution.

Two interfaces - gateway is able to route H.323 voice signaling and voice data between two network interface cards (NIC) units or it shares one NIC for both.

Multiple instances per host - gateway may also have multiple instances running at one machine, where it is run as a service or daemon.

www.voipac.com

Voipac, s.r.o., Janka Kráľa 3
911 01 Trenčín, Slovak Republic
Phone: +421 32 653 85 55
Fax: +421 32 653 85 33
Email: info@voipac.com
Web: www.voipac.com

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Alerts - are generated when abnormal conditions are detected within the network, or when the connection between gateway and Gatekeeper is lost.

Full remote control - remote reconfiguration, restart, and shutdown of a gateway could be executed via SSH client and SSH secured protocol. Upon the request, the SSH console client operating in command line mode can be substituted for Java GUI application, which is wrapping VOMP protocol.

TOS insertion allows labeling of voice RTP payload packets so a switch or a router can give them higher priority over other IP packets.

Firewall traversal - the gateway is able to customize RTP payload and pass transparently through firewalls while using UDP masquerade. Even, when it is used as exterior border gateway, the kernel built-in prioritizing rules could be enabled, which will result in maximum quality of voice for narrow frequency band connections that are also being shared by other IP transmissions. The gateway may also be located beyond a firewall. In such a case it will still provide sharing of one public IP address by multiple users.

CLIR - if enabled, all information involving source H.323 endpoint will be cleared and H.323 signaling will be shifted to the partner network.

Characteristics

- Dynamic call routing
- Subscriber management
- Password or static IP address authentication
- Real time call category matching
- Call charging
- Load balancing on call routes, resulting in faster and more reliable communication.
- Support of prepaid and reverse payment phone card application
- Windows NT/2000 operating environment
- MySql, MS SQL or Oracle databases

e-commerce portal

Fayn Internet portal serves as information, purchasing and administrative center for products and services. The portal is divided in two general parts: Public and Administrative part. Each part provides different functionality and its own access. The public part includes individual zones that are subdivided according to type of registered user into home and business users segment and partners segment.



Public Part

Part of www.fayn.sk portal dedicated to general public serves mainly as information center. Prospect customers, however, can purchase a product in e-shop on the portal. The prospects can use various payment methods ranging from classic COD (Cash On Delivery) to electronic payment orders.

Fundamental are sections describing Fayn products and solutions. After learning how the Fayn network works a user may directly view current charge rates that are listed in special section.

In Downloads section all users can download Fayn client application and lots of various utilities, skins, manuals, etc.

The portal also contains Job Opportunities, About Us and Contacts sections. There are recent and archived freely accessible press releases on the main page.



Activation

One of the most important sections in the public part of fayn.sk portal is activation. It is unbreakable part of new registered user account activation. After purchasing one of the StartPack packages, the only choice how to activate user's product before its first use is through this section. During the activation the user will pick out his/her user name and password, which he/she will use for logging to his/her individual zone, and will accept terms and conditions of the Fayn service provider. Immediately, after activation, the user can start using voice services.

Individual Zone: Home

Individual zone - Home is intended for registered home users of Fayn service. It is the only place where they can charge their credit, modify their registration data a view the list of made calls. Individual section offers troubleshooting provided by experts within Forum subsection. Last of this section's specialties is Fayn Directory, where users are allowed to view and administer their contacts.



Credit Charging

Fayn service users can charge their credit either by purchasing Fayn card and use it consequently on the portal, or by using one of the various way for electronic money transfer. At the moment we support the following Tatra Banka products: TatraPay and EliotPay, through which is the credit charged immediately. The last option is to pay by bank payment order. In this case the Fayn portal will only generate data required for realization of such payment order by the user. When charging Fayn credit by the prepaid card, you must enter PIN, specified on the flipside of the card, to the portal and thus enhance your credit with amount corresponding to one on purchased card.

Fayn Directory

The Directory provides administration of personal contacts of the user. Here you can delete, add, import (from the client application) or search for contacts. The user can always see status of each contact, so he is able to see, whether a user whose contact is viewing, is now online or offline, or is beyond firewall. When you click phone number in the contact you can directly call this number. The Directory also provides option to block (ignore) certain numbers, in the event that the user does not want to be disturbed by specific people.

Individual zone: Business

The Business zone is intended for registered companies and their users. Functionally it is divided in two parts: Part for the business account owner and part for individual employees. The Business zone provides functions similar to Home zone functions; the one exception is Web Bill subsection, which contains tools for business account owner.

Web bill

Subsection Web Bill is intended for business account owners only. The user is able to view list of invoices for past billing periods. Particular invoices can be printed out.

Individual Zone: Partner

The Partner zone is intended for contractual partners of Fayn service only. In addition to standard options similar to options in aforementioned sections they are allowed to view price lists for dealers and call statistics.

List of Commissions

Subsection price list for dealers includes list of countries and their international codes and current commissions paid to the just logged in partner. For better and faster navigation within the price list, the user can view the list of countries by initial letter.

Statistics

This section allows partner user to view summary and individual call statistics of all users who belong to just logged in partner. For better navigation, the time filter and name and surname database search is allowed. Thus, user is able to see number of calls, minutes being called, total costs and his commissions.

Administrative zone

Administrative part is general public restricted section intended for full administration of Fayn portal and other issues concerning Fayn service operation. It is exclusively reserved for Fayn service provider.

User interface of the administrative part is due to standard maintenance reason designed in English. The entire administrative zone is protected by secured SSL connection and multi-account policy. It means that each Fayn administrator has activated his own account for the administrative zone access and assigned particular authorities for various functions and information. This ensures high security and impossibility of unauthorized access to the information and data. Administrative environment is thus becoming a universal tool for all Fayn workers.



Products

Products section is intended for administration of the offered products. When the administrator enters into this section he can, right away, see list of all products that are in the Fayn database at the moment. The most important information are listed to distinguish between products. There are important functions, such as Add, Edit and Delete product that are used for adding of new products to the database and for deleting and editing of products in the database. To edit existing products, click „Edit“ button next to the product you (as administrator) want to edit. The same procedure applies for deleting of a product.

Product information	
Part no:	Active: <input type="checkbox"/>
Name:	Saleable: <input type="checkbox"/>
Description:	Dealers only: <input type="checkbox"/>
Price Price [CZK]: <input type="text"/> DPH [%]: <input type="text"/>	
Uploads Pictures (jpg 80x119): <input type="text"/> <input type="button" value="Browse..."/> Large pict.: (500x1-500) <input type="text"/> <input type="button" value="Browse..."/> PDF file: <input type="text"/> <input type="button" value="Browse..."/>	
<input type="button" value="SAVE PRODUCT"/>	

Each product has specific properties, which determine its presence in the public part of the portal. In addition to standard information such as, Part no., Name, Description, Picture, PDF file, Price, etc you may specify whether the product can be purchased in e-shop in the public part or it is available for dealers only. You may also specify whether it is actively displayed on fayn.sk portal.

ID	Symbol	Status	Added	Calendar							Action		
16	9911	New	2002-11-08 13:23										DEL
19	9942	New	2002-12-09 13:46										DEL
23	9949	New	2002-12-17 13:07										DEL
25	9952	New	2002-12-18 15:13										DEL
26	9953	New	2002-12-18 15:14										DEL
27	9954	New	2002-12-18 15:38										DEL
31	9974	New	2003-01-15 18:31										DEL
32	9977	New	2003-01-15 19:16										DEL
35		Incompleted	2003-02-03 13:50	645		192.168.1.53							EDIT DEL
36		Incompleted	2003-02-03 13:50	645		192.168.1.53							EDIT DEL
39	9978	New	2003-02-03 17:59	kih		192.168.1.53							MORE DEL
40	9979	New	2003-02-03 18:27	frda		192.168.1.52							MORE DEL
41	9980	New	2003-02-03 18:59	frda		192.168.1.52							MORE DEL
42	9981	New	2003-02-03 19:17	test		192.168.1.52							MORE DEL
43	9982	New	2003-02-03 19:21	frda		192.168.1.52							MORE DEL

Orders

Orders section is closely connected with e-shop in the public part. All of the orders placed in e-shop are coming right here. When the administrator enters into this section he can, right away, see list of all orders. Then administrator can view either new, all, or already processed orders for any given time period.

User environment allows administrator to sort out the list by any item (status, time, name, etc.).

Administrator is allowed to create new order directly in this section. But usually it is used for processing of accepted orders. Consequently, administrator can delete or process orders. Delete function is useful especially for incomplete orders. Processing, in general, means execution of an order to put it in other words delivering a product to a customer, subsequent filling of a form with particular data and confirmation of the order by clicking „Processed“ button.

Symbol	Added	Status	Payment	Type	Amount	IP address	User	Order	Action
9912	2002-11-27 15:43	Not paid	transaction	recharge	200.00 SKK	192.168.1.52	114	N/A	RECH REFUSE
9913	2002-12-02 09:42	Not paid	EliotPay	recharge	200.00 SKK	192.168.1.52	114	N/A	RECH REFUSE
9920	2002-12-06 13:51	Not paid	EliotPay	recharge	200.00 SKK	192.168.1.52	114	N/A	RECH REFUSE
9921	2002-12-06 13:51	Not paid	TetraPay	recharge	200.00 SKK	192.168.1.52	114	N/A	RECH REFUSE
9922	2002-12-06 13:52	Not paid	EliotPay	recharge	200.00 SKK	192.168.1.52	114	N/A	RECH REFUSE
9923	2002-12-06 13:55	Not paid	TetraPay	recharge	200.00 SKK	192.168.1.52	114	N/A	RECH REFUSE
9924	2002-12-06 13:55	Not paid	EliotPay	recharge	200.00 SKK	192.168.1.52	114	N/A	RECH REFUSE
9925	2002-12-06 13:55	Not paid	TetraPay	recharge	200.00 SKK	192.168.1.52	114	N/A	RECH REFUSE
9926	2002-12-06 13:56	Not paid	EliotPay	recharge	200.00 SKK	192.168.1.52	114	N/A	RECH REFUSE

Transactions

There are records for all transaction performed on fayn.sk portal in this section. At the moment, the following two types of transactions are recorded here: orders and credit charging. Depending on facility for credit charging, administrator, after checking if a transaction is correct, is authorized to increase given credit for charged amount, or reject the charging. Charging paid by TetraPay or EliotPay increase the credit automatically and Transactions sections holds just records about their execution. In other payment methods, when payment had been made and money was transferred to the operator's account, the administrator is required to increase credit manually by clicking "RECH" button.

Downloads

In Downloads section are administered all the materials that could be downloaded from the public part. According to kind of material it is further subdivided into categories "client", "client skin", "utilities" and "manuals". All of these categories have almost identical functionality; the main concern is for materials categorization. Skins category also includes thumbnails. Administrator is authorized to add new files, edit their parameters and delete them.

Credits/payments

The section is used as list of credit charging records for home users. Administrator can see list of all credit charging made either for all users, or specific single user for specific time period. The administrator is also offered to manually charge credit for selected user according to his/her phone number.

Date	Amount [SKK]	Payment type	Added by admin
2002-12-2 9:57	200.00	undefined	N/A
2002-12-2 15:40	400.00	undefined	N/A
2002-12-2 15:40	200.00	undefined	N/A
2002-12-2 16:10	200.00	undefined	N/A
2002-12-2 16:20	400.00	undefined	N/A
2002-12-3 14:16	400.00	undefined	N/A
2002-12-3 14:16	200.00	undefined	N/A
2002-12-6 13:48	200.00	undefined	N/A
2002-12-6 13:48	200.00	undefined	N/A
2002-12-10 10:23	1,000.00	transaction	supervisor
2002-12-10 11:10	400.00	undefined	N/A
2002-12-10 18:51	200.00	TatraPay	supervisor
2002-12-11 14:14	400.00	undefined	N/A
2002-12-11 14:14	200.00	undefined	N/A
2003-1-15 17:39	200.00	undefined	N/A
2003-1-15 17:55	200.00	undefined	N/A
2003-1-23 16:26	200.00	undefined	N/A
2003-1-23 16:27	200.00	undefined	N/A
2003-2-12 17:45	200.00	TatraPay	supervisor

Invoices

This section is analogy to Credits/Payments section, in respect to business users. Those users need invoice for payments they made. Invoices section is used for invoice issuing, printing and archiving.

Clients/partners

The section is intended for partial administration of Fayn service registered users' accounts. It is pursuant to type of user subdivided into three subsections: home, business and partner. When entering each subsection, administrator can see almost identical interface showing list of all users of given type. The environment allows the administrator to sort out the list by any item, searching in particular database fields and execution of basic functions such as, add, edit and delete accounts.

Edit function allows the administrator to modify users' personal data, in business section he can also administer all the accounts associated with master account of the company, and in partner section he can administer all the users belonging to selected partner's account. In business and partner subsections is the administrator authorized to create new account manually.

Statistics

Statistics serve for summary listing of total minutes dialed, credits and number of calls. Here you can also find total amount paid in commissions to Fayn partners, comprehensive information regarding number of users of each type and phone numbers. When viewing number of calls, total minutes dialed and credit information you may also specify a time period you require. Statistics for business and partner user information can be viewed separately by individual users.

Settings: fayn operator

Settings section is used for fayn.sk portal parameters and properties settings and it is further subdivided into seven subsections. Fayn Operator subsection is designed for setting of Fayn service provider information. That information is important because it will appear on invoices and orders, etc. Administrator specifies all important company data here, such as company name and address, phone and fax numbers, Company Registration Number, Tax Identification Number, bank name, account number, etc. The administrator can also enter template text, which will appear on invoices for business and home users.

Operator information	
Name:	<input type="text"/>
Address:	<input type="text"/>
ZIP:	<input type="text"/>
City:	<input type="text" value="select city"/>
ICD:	<input type="text"/>
DIC:	<input type="text"/>
Telephone:	<input type="text"/>
Fax:	<input type="text"/>
fayn:	<input type="text"/>
Finance institute:	<input type="text"/>
Account no:	<input type="text"/>
Telecommunication licence no:	<input type="text"/>
Text of invoice Telecommunication services:	<input type="text"/>
Text of invoice Card Fayn:	<input type="text"/>
<input type="button" value="SAVE OPERATOR"/>	

Settings: administrators

This section is very important from the portal security viewpoint. Administrator accounts are defined here for all administrators who will then access administrative environment. Authorities and access rights to various sections are being defined here. Upon entrance in this section detailed list of all administrators, containing basic information

needed for distinguishing between accounts, will be displayed. The administrator is then authorized to add, edit and delete them. Database also stores administration section last access information for each administrator. Each administrator is assigned to one of the defined groups, which will determine his options. Then groups are administered in special section.

Settings: admin groups

Abovementioned groups are defined in this section. Each group is having its name and authorities and options definition. In each section can be set read and write authority. Then, you can create, rename and delete the groups and edit their definitions.

Settings: VIP groups

VIP groups are intended for Fayn partners. Each partner is assigned to one of the defined groups. The group includes information about partner's percentage of income from telephone calls made by users, who belong to him. You can define:

Settings: E-mails

Administrators define all of the e-mail addresses existing in the public and administrative part of fayn.sk portal in this section.

Settings: cities

List of cities that are shown in menu in the public part in Outlets section. You may add, edit, and delete cities.

Settings: Agreements

You can define and modify agreement concluded with each of the Fayn service users in this section. This agreement is displayed at user's account activation.

Content management

The section is intended for content administration in almost entire public zone of fayn.sk portal. Here you can edit texts, add questions and answers to FAQ section, moderate various forums, add and edit press releases, etc. You can also define partners here.

Network Operations Center - NOC

Network Operations Center (NOC) is central nervous system of Fayn Softswitch solution. Fayn NOC is very sophisticated monitoring center operating on powerful hardware and utilizing large set of software tools. Fayn NOC guarantees to the service provider (telecommunication operator), from the operation intensity viewpoint, above standard, stable and proactive administration of the entire Fayn infrastructure, which is inevitable for providing of continuous operation as well as all other activities for this VoIP telecommunication service. NOC provides real-time monitoring of the entire infrastructure and assures attendance staff that all servers, applications, communication links, switches/routers as well as all other active components of the Fayn Softswitch solution are working properly and correctly. NOC attendance staff is able upon various records of current state, activity and performance of each component elaborate detailed analyses. NOC is running 24 hours a day and 7 days a week and its attendance staff consists of qualified supervisor and technicians, who maintain optimal performance of the entire Fayn system and are able to promptly solve potential unexpected problems. For failure detection and alarm monitoring, NOC is using a sophisticated distributed system, which consists of many different applications. Each of such applications has been developed with its specific purpose for monitoring of specific parameters of specific element within Fayn Softswitch solution in mind.

How NOC works

NOC is fully equipped with sophisticated network management, various Data Collection Agents, monitoring and analyzing tools. Each of the Fayn Softswitch solution components contains Data Collection Agent, which is collecting various system data from given element and submitting them to NOC via proprietary protocol. Data Collection Agent is configured with threshold values for parameters being monitored. If during the system operation, a monitored parameter has reached such threshold value, agent will generate a message which will pass across Alert Center into NOC via secured encrypted channel, encrypted e-mail, or via SMS gateway to a mobile phone. Using of this method ensures that important warning will not be lost in the mess of other monitoring data.

Multiplatform Solution

Fayn NOC is multiplatform solution, which provides service provider with flexibility in respect to hardware and operating system, because it can adopt hardware and operating system which will meet provider's needs. This is the principal benefit, which allows Fayn NOC operation on hardware and under operating system that is operator using right now and attendance staff is familiar with. Fayn NOC supports WindowsNT, various distributions of Linux as well as Unix platforms. NOC federated design also allows for flexibility in costs in comparison to infrastructure size of Softswitch solution.

Topological Mapping and Configuration Options of System Elements.

Fayn NOC application software allows graphical view of the entire system by using of topology maps that visually and clearly show mutual logical dependability of server processes in Fayn Softswitch solution as well as bonds among system network elements.

Change in configuration of any parameter of a system element is done in Navigation Tree window (Figure 3). It is simple and graphical interface between attendance staff and system, which makes configuration clear and very easy. Navigation Tree application database allows storing/backing up of configuration data for all of system elements. If necessary, such stored system element configuration can be easily retrieved from the database.

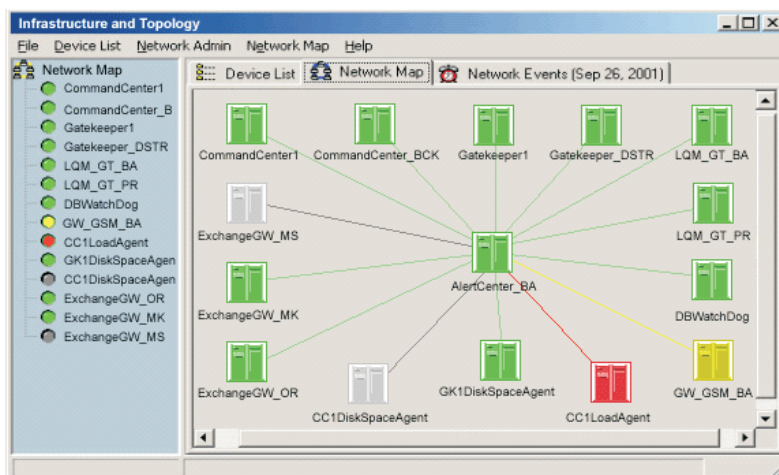


Figure 1. Network Topology Map

Topology map allow the operator to preview system of basic components as well as their associated elements graphically. Click the component and Parameter Navigation Tree for given component will open. Furthermore in case of failure the topological mapping allows fast identification of a bottleneck and speeds up execution of desired intervention. Graphical preview also improves communication between supervisor and technicians. Various topological mappings either allow focusing on individual elements or smaller units, which makes the monitoring even more transparent. By topology preview functions can be also shown subrack of used hardware and performed monitoring of physical state of devices by means of their LED indicators (Figure 2).

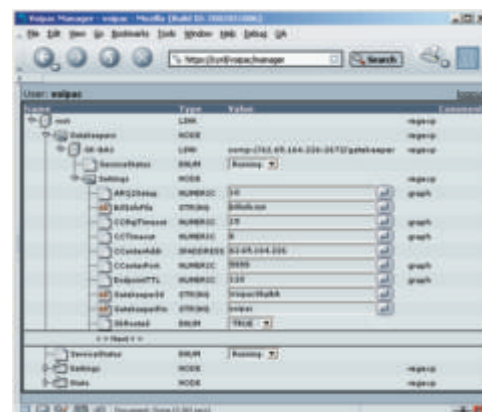


Figure 3: Parameter Navigation Tree Window

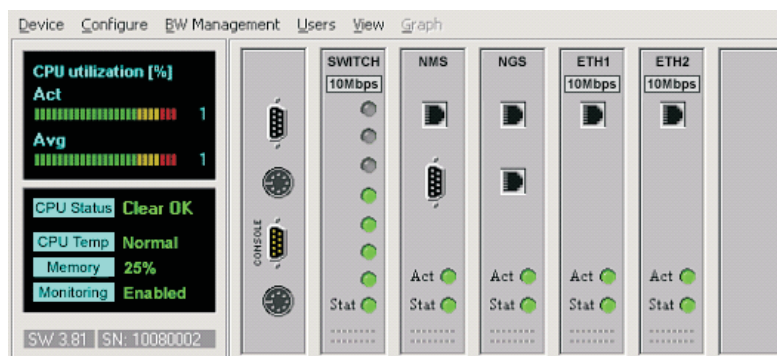


Figure 2: Device Status Map

Performance Management

Performance Management makes continual evaluation of permanently collected performance data for each element of Fayn Softswitch solution. This information is sent to NOC by Data Collection Agents. NOC Performance Management is able to make graphical representation of these data and store them into Oracle/SQL database. These data can be later retrieved from the database and analyzed by the set of various Performance Management functions. The data can be, of course, evaluated by means of other standard tools. Performance Management is able to process data statistics and make comparisons. Performance Management also provides NOC attendance staff with detailed communication and communication quality summaries (number of transmitted frames, number of lost packets, number of resubmitted packets, and many more). These data are evaluated separately for data and separately for voice packets. This way Performance Management is able to provide complex view of utilization, load distribution as well as quality of each system communication element. It also allows measuring and evaluation of incoming and outgoing data stream and discloses potential bottlenecks, and the like. Consequently, attendance may take preventive measures prior line "fall-down" which directly results in stable availability of the service and customer satisfaction.

Fault Management

Fault Management is, primarily, the most observed part of NOC. Because Fayn Softswitch system is monitored remotely and contains great amount of various elements, furthermore great amounts of various data is routed into NOC, so it is necessary that supervision system includes Alerting System, which will be able to monitor and administer alarms and events. The Alerting System manages pre-specified alert (alarm) sets to assist supervision attendance staff in potential problem diagnostics anywhere in the Fayn Softswitch system (Figure 4). Alarm sets contain large scale of alerts ranging from power outage, hardware failure, connection breakdown up to, e.g. reach of the full disc threshold value of a computer. Activation of alarm suppression or alarm correlation for some types of system elements allows filtration of alarms to consecutive alarms and interrelated alarms. Such method of alarm filtration is very useful, because unimportant alarms are suppressed and alarms generated due to critical state of any component are highlighted. This feature allows NOC attendance staff to react effectively to arisen problem and by contrast not paying attention to unimportant alarms, which markedly shortens time required to discover nature of the problem.

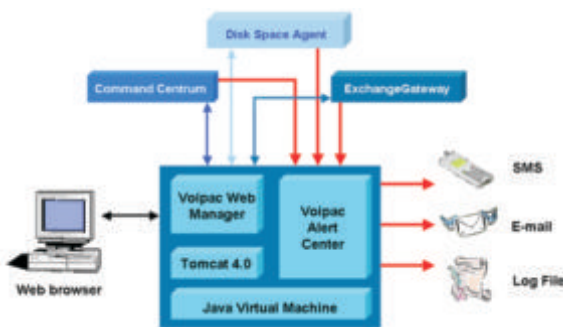


Figure 4: Alerting System

Modular design of the Alerting System allows its integration into the existing system, which is used by the operator for providing other types of services. Alarms can be then submitted to this system in different ways.

NOC Security

This is the most frequently asked question concerning remote monitoring and administration: "If data routed from telehouse to NOC are transmitted across public network, is there a possibility that the data will be attacked and misused?" Answer to this question is resolute NO. NOC is using Point-to-Point communication. If these two points are connected across the Internet, then simulation of virtual private network (VPN) is used for this connection. VPN tunneling is key security element in communication. NOC and remote operator's telehouse are using private IP addresses (source and target IP address) in each packet. Firewall is consequently used for private address translation to public ones. Furthermore, digital authorization, password protection and data encryption make the communication even more secure. We may say, that remote system has better security than standard bank account accessible through the Internet-banking! The last but not least NOC security measure is delivery of a firewall, which can be configured by operator to make sure that even Voipac cannot access delicate protected data of the operator.

Technical Specifications

- Monitoring of each infrastructure element and every device 24 hours a day / 7 days a week
- Monitoring of all lines and network elements 24 hours a day / 7 days a week, connection quality monitoring
- Providing continual operation for all servers and services
- Off-line statistics as well as real-time statistics availability

- Remote software installation and upgrade
- Remote software and hardware stocktaking
- Alert Center system based on predefined threshold values of monitored parameters
- Communication safety based on advanced and proved principles
- VPN tunneling communication, protected by digital authorization, password and encryption
- Flexible processing of emergency alerts and fast operation recovery
- Majority of system and network problems can be solved remotely
- Problem solving monitoring and documentation
- Periodic backups

NOC Principal Benefits

- Centralized management of Fayn Softswitch solution is resulting in low operating costs (small staff), because overwhelming majority of operations/interventions is done remotely.
- NOC management is designed and customized to the used technology; therefore even large system administration can be carried out with minimum cost.
- Progressive Fault Management affects increase in revenues, because it helps to minimize downtimes.
- Easy-to-operate configuration management makes remote administration even more efficient.
- Large scale of monitored data and its efficient management allows NOC attendance staff to discover overloaded elements or potential problems prior they can come true.
- Automatic software upgrade, which can be planned in advance, minimizes time for service tasks and does not influence service availability.
- Alerting System integration to existing operator's management system provides for smooth startup of supervision over Fayn Softswitch.
- NOC management safety structure grants access to system elements for authorized supervisory personnel only.
- NOC management is designed as federated solution, which let operator decide what hardware and operating system to use.