



# FAULT SEARCH DC

DPC monitoring and control system

## PURPOSE OF THE MONITORING AND CONTROL SYSTEM

AUTOMATION OF TASKS OF CENTRALIZED MONITORING, OPERATION, SUPPORT AND MAINTENANCE OF DPC COMPUTING, TELECOMMUNICATIONS AND ENGINEERING INFRASTRUCTURE



# FUNCTIONS OF THE MONITORING AND CONTROL SYSTEM

- Automatic search, identification of controlled equipment and network topology construction
- Monitoring of workability of controlled equipment and other controlled objects with troubleshooting, including identification of failures, root cause analysis (event correlation).
- Performance control, including collection and display of equipment operating parameters statistics as well as assignment and control of threshold values of operating parameters.
- Equipment configuration control (system integrity).
- Mailing of accident notifications.
- Communication of the information on infrastructure condition and statistical data to related systems.



# CONTROLLED PARAMETERS OF DPC FUNCTIONING

More than 1000 types of controlled parameters enabling to assess current condition of the DPC equipment:

## Network equipment parameters

- QoS
- Current loading of network interfaces (netflow)
- Network collisions

## Engineering systems parameters

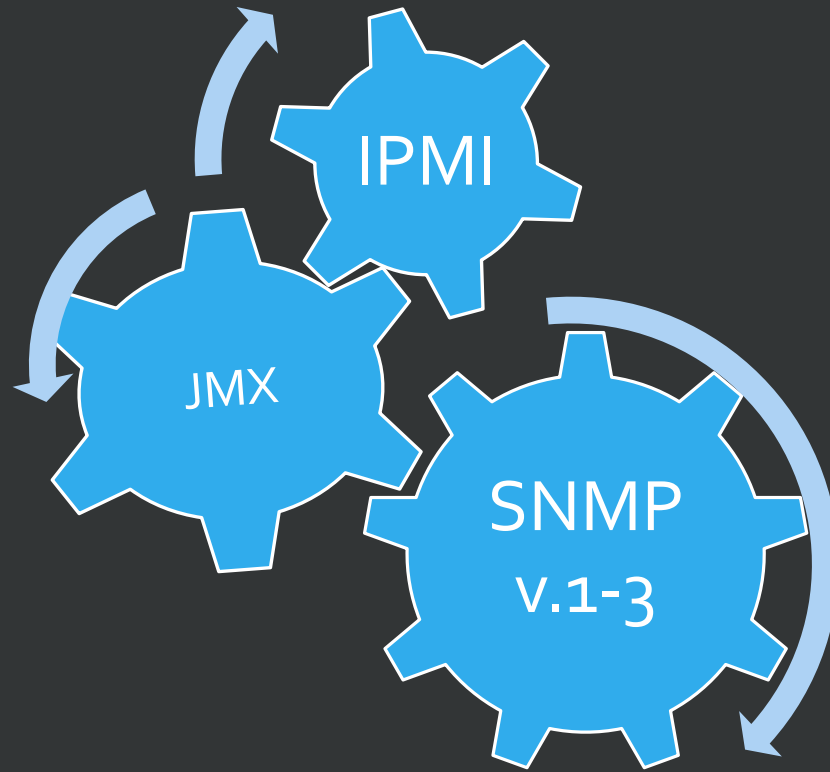
- Monitoring of cooling systems parameters
- Monitoring of power supply systems
- ACS control
- CCTV control

## Computing equipment parameters

- Recycling of storage, processor
- Network services availability
- Disk subsystem queue status



# MONITORING AND CONTROL PROTOCOLS



Native control protocols support:

- SNMP v.1-3
- Modbus
- Canbus
- SSH
- telnet
- ICMP
- IPMI
- JMX



Possibility to install an agent to control the equipment not supporting standard protocols

## FUNCTION OF EQUIPMENT INVENTORY RECORD KEEPING

- Record keeping of materials, including indication of accountable persons and persons responsible for equipment functioning
- Registration of current state and service bulletin (at a warehouse, in use, undergoing scheduled maintenance, under repair, written off, etc.)
- Record keeping of hard disks in DSS with notification of their attributes changing (for example, series number)



# DATA BASE MONITORING

## AVAILABILITY CONTROL

- Tasks performance
- Backupping

## PERFORMANCE CONTROL

- Response time
- Status of indeces

## TREND ANALYSIS

- Recommendations on performance improvement



## JMX MONITORING AND CONTROL OF JAVA APPLICATIONS

- view and modification of application configuration
- collection and publication of statistical data on application operation
- notification of any wrong changes of status



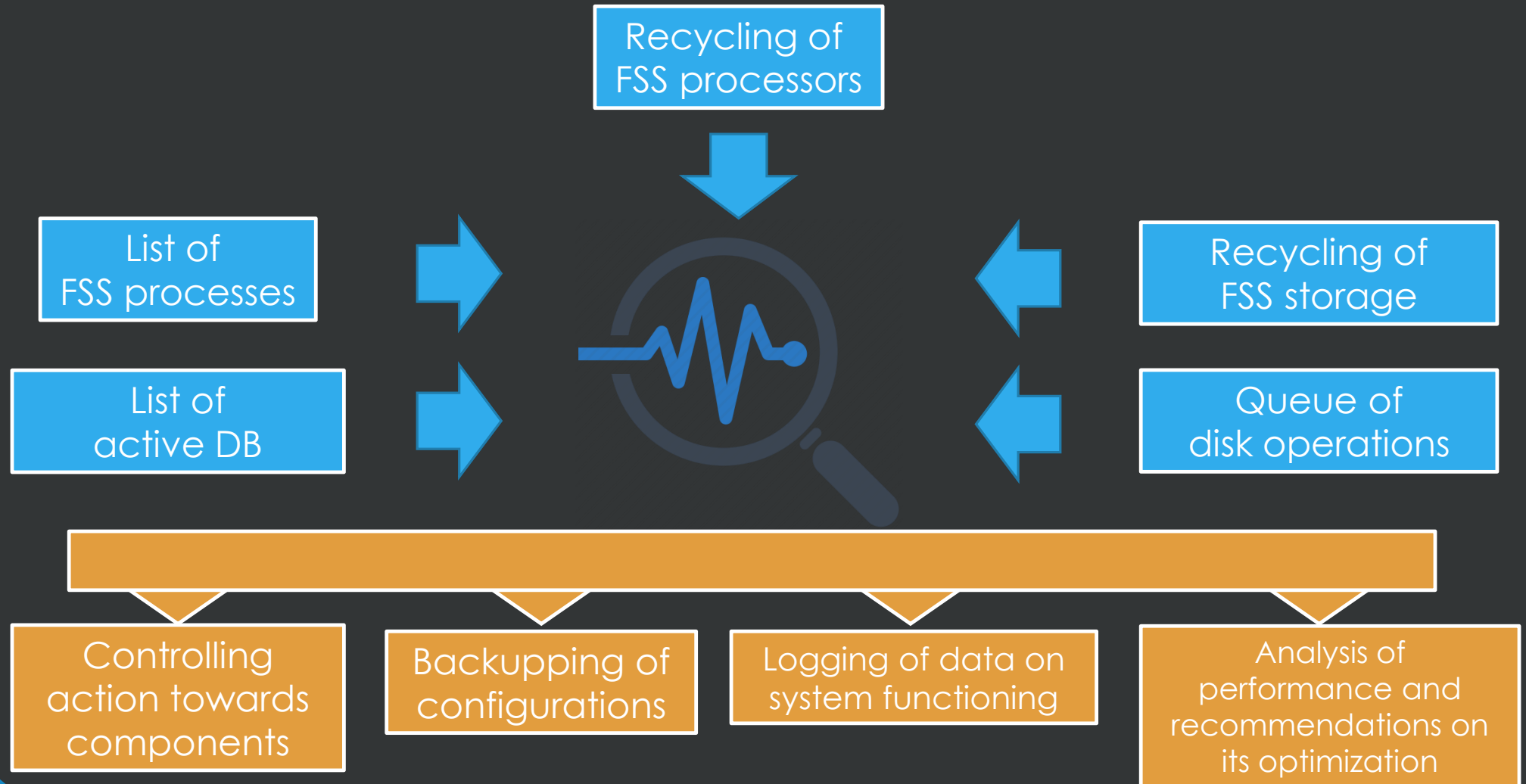


## CROSS-PLATFORM



Agents for MS Windows OS family, MAC OS and Linux allow to arrange monitoring and control of computing equipment with any operational system

# MECHANISM OF SUPPORT AND CONTROL OF SELF-PERFORMANCE



# AUTOMATED SETTING UPON DEPLOYMENT

Data on network topology received by ARP, STP, AFT, CDP, LLDP and SNMP protocols



Automatic detection of network devices  
Automatic network topology construction



Recommended setting data for FSS server

# POSSIBILITY OF CORRELATION OF EVENTS AND ALARMS

The system keeps record of equipment interdependence. In case of de-energization of an equipment rack an operator will be informed on a root cause of the fault and will not be deluged with reports on consequences.

The screenshot displays a monitoring dashboard titled "Центр событий" (Event Center). At the top, there is a navigation bar with "Меню" (Menu), a search icon, a notification bell, and a user profile for "Константин Белоусов" (Konstantin Belousov), Operator. Below the navigation bar is a progress bar with four segments: 47% (blue), 24% (green), 17% (yellow), and 12% (red). To the right of the progress bar is a date selector for "31 марта 17" and a filter menu with options: "День" (Day), "Неделя" (Week), "Месяц" (Month), and "Период" (Period).

The main section is titled "Актуальные отклонения" (Current Deviations). It contains a list of events for "Сервер local.host.197" (Server local.host.197) located in "Зал 1534, Стойка 2525, Юнит №10" (Room 1534, Rack 2525, Unit №10). The events are as follows:

Time	Severity	Value	Description	Duration
25 мар 17 16:05	Warning (Yellow)	0,68	Отклонение параметра <Название параметра> от нормы! Работает с отклонением от нормы	45 мин
25 мар 17 16:05	Critical (Red)	0,48	Критичное отклонение параметра <Название параметра> от нормы! Есть критические проблемы	2 дня
25 мар 17 16:05	Critical (Red)	0,48	Критичное отклонение параметра <Название параметра> от нормы! Есть критические проблемы	5 мин
Отклонение параметра повлияло на отклонения параметров 17 зависимых объектов!				
25 мар 17 16:05	Warning (Yellow)	0,68	Отклонение параметра <Название параметра> от нормы! Работает с отклонением от нормы	5 мин
25 мар 17 16:05	Critical (Red)	0,48	Критичное отклонение параметра <Название параметра> от нормы! Есть критические проблемы	5 мин
Отклонение параметра повлияло на отклонения параметров 17 зависимых объектов!				

Red arrows in the image highlight the correlation between the critical deviation and the summary box, and between the summary box and the subsequent warning and critical deviations.

# USER'S GRAPHIC INTERFACE

FSS server

Monitoring data



Operation commands



The screenshot displays two main panels. The left panel, titled 'Список' (List), shows a table of four objects (ЦОД М1, М2, М3, М4) with their status, location, and a 'View object card' button. The right panel, titled 'Расположение' (Location), shows a map of Russia with markers for the objects. The interface is designed for operators to monitor and manage data centers.

Object Name	Location	Status	Count	Action
ЦОД М1	РФ, Москва, Варшавское шоссе, 125	0,68 Работает с отклонением от нормы	175 Объектов	В карточку объекта
ЦОД М2	РФ, Москва, Варшавское шоссе, 125	0,48 Есть критичные проблемы	175 Объектов	В карточку объекта
ЦОД М3	РФ, Москва, Варшавское шоссе, 125	0,78 Работает, проблем нет	175 Объектов	В карточку объекта
ЦОД М4	РФ, Санкт-Петербург, ул. Биржевая, 5	0,78 Работает, проблем нет	175 Объектов	В карточку объекта

Interactive web interface based on widgets. Operators arrange their working area by themselves in accordance with their tasks at the workplace

# INTEGRATED REPORTING MECHANISM

Monitoring data



Reporting engine



The report form description language allows to enlarge a set of reports "out of the box" with reports that are specific for a company operating DPC

# SLA CONTROL SUBSYSTEM

The screenshot displays the SLA Control Subsystem interface. At the top, there is a navigation bar with a 'Меню' dropdown, 'Соглашения SLA', a search icon, a notification bell, and a user profile for 'Константин Белоусов' (Operator). Below this, a document icon is followed by the title 'Номер, название договора 1' and the dates '01 января 2016 – 01 января 2055'. A text block describes the SLA agreement: 'Текст описания соглашения SLA. Соглашение об уровне предоставления услуги (англ. Service Level Agreement, SLA) — термин методологии ITIL, обозначающий формальный договор между заказчиком (и в рекомендациях ITIL заказчик и потребитель — разные понятия) услуги и её поставщиком, содержащий описание услуги, права и обязанности сторон и, самое главное, согласованный уровень качества предоставления данной услуги.' Below the text is a section titled 'Показатели качества' with a '+ показатель' button. It contains four cards, each showing a current value and a standard value. The first two cards show percentages: 95,7% (current) vs 95,5% (standard) and 94,3% (current) vs 95,5% (standard). The last two cards show speeds: 110 Мбит/сек (current) vs 100 Мбит/сек (standard). Each card also includes a 'История показателя' button and a parameter name: 'Концентратор local.host. 197.10.0.0.255' with the note 'Зал 1534, Стойка 2525, Юнит №10' and 'Название параметра XXXX.XX значение в норме'.

possibility of service quality monitoring including comparison with preset quality parameters

notification of operator about lower quality of services provided

possibility of service quality monitoring including comparison with preset quality parameters

notification of operator about lower quality of services provided

configuration of IP SLA tests and analysis of their implementation

# INFORMATION SUPPORT SUBSYSTEM

Information access control

Quick search for information



Quick access to operation documents

Centralized content formation and updating

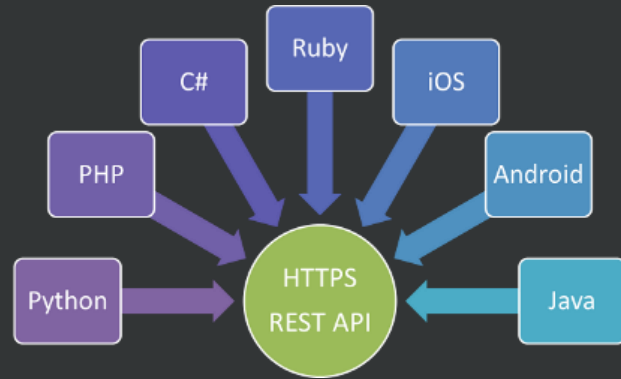
Each type of alarm has a link to an article in the integrated wikipedia. The article describes actions in case of this alarm and its possible causes. A log for this alarm is also kept here.

The interactive learning system will promptly prepare personnel for watchstanding at the monitored facility



# INTERACTION WITH EXTERNAL SYSTEMS OF INVENTORY

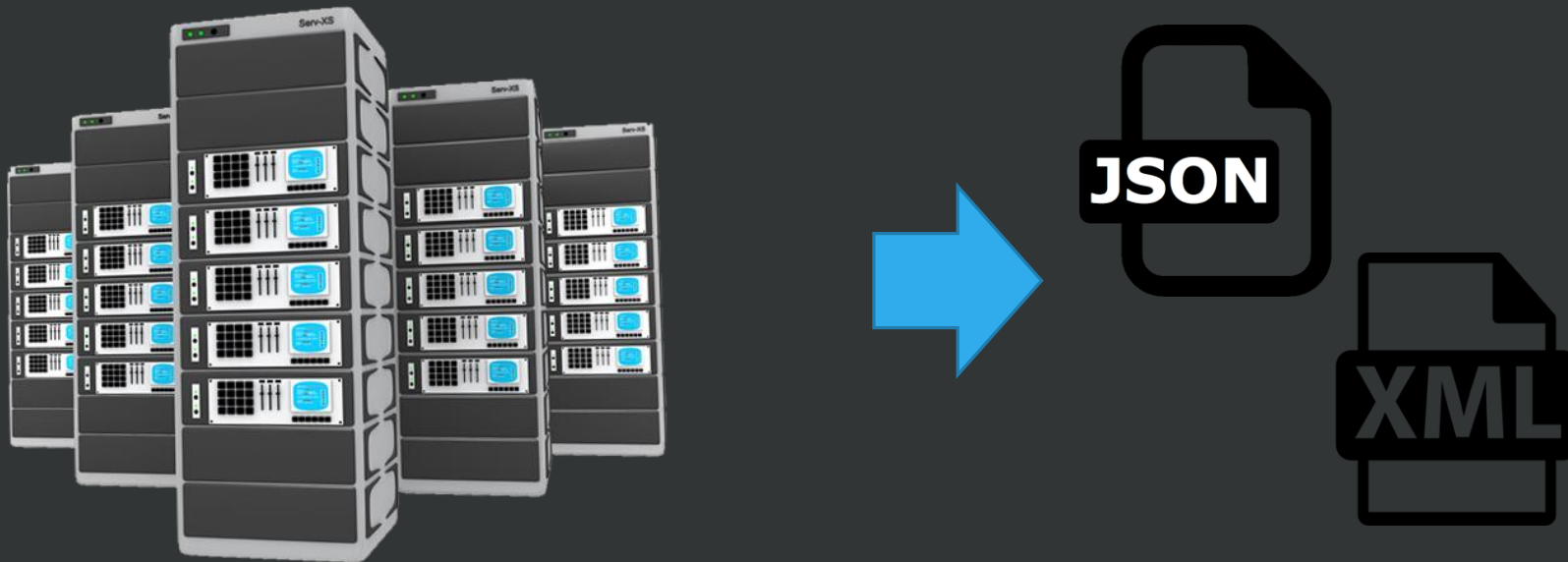
SYSTEMS OF INVENTORY AND RECORD  
KEEPING OF MATERIALS



REST API allows to quickly import inventory data from the system at customer's facility to FSS

## INTERACTION WITH EXTERNAL SYSTEMS

Integrated modules of export to JSON or XML formats provide for interaction with external systems functioning at a customer's facility.



# INTERACTION WITH GEOINFORMATION SYSTEMS

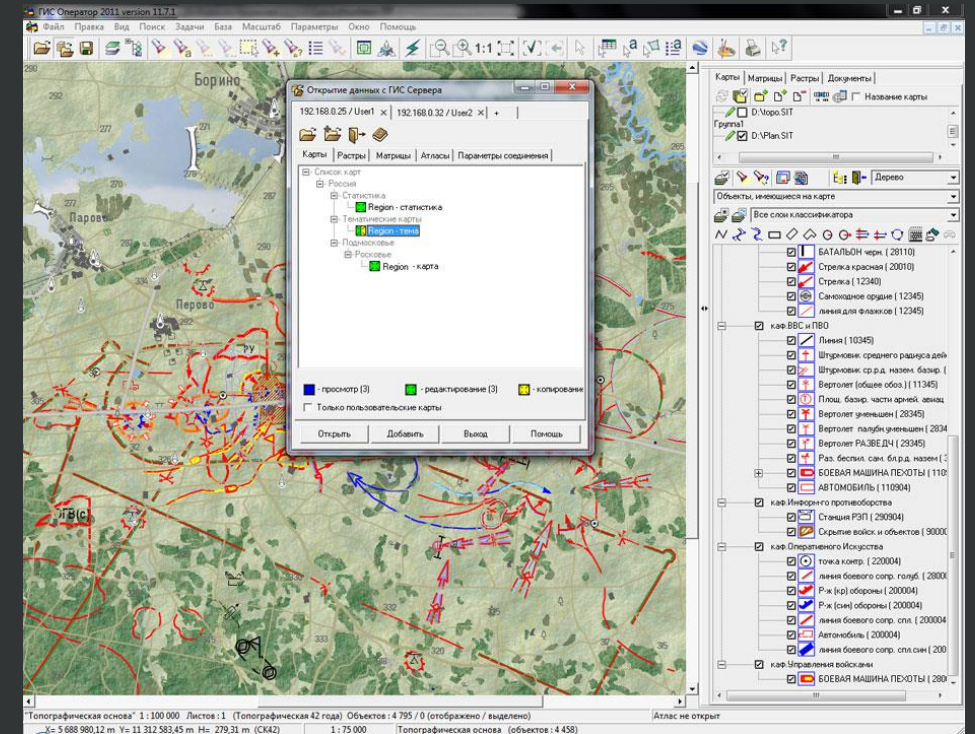


It is possible to display monitored facilities on a map for geographically dispersed DPC:

- Operator GIS mapping service.
- Integrated openstreetmap-based mapping.



API call





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