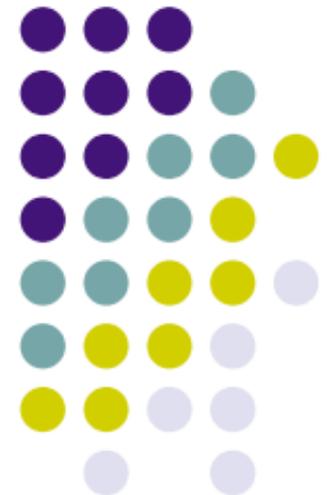


Open source integrated remote systems and network management with OpenRSM

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Contents

- Systems and network management
 - Aims, technologies
 - State of the art and open source solutions
- The case of the Greek School Network
 - Need for Scalable, installable, usable solution
 - Challenges
- Current state of the market/art
- OpenRSM
 - Architecture and components
 - Open technologies
 - Pilot installations
 - Extensions

System and network management



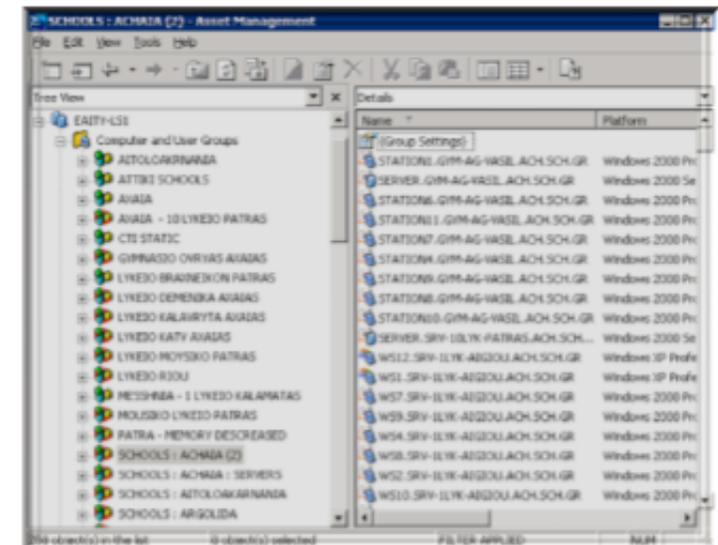
- Automation in large scale
 - Organizing the infrastructure and procedures
 - Management framework and methods
- Management systems
 - High level (strategic)
 - components: systems, business units/processes/functions, architectural domains, infrastructure elements, etc
 - references: information flow, landscape, portfolio, masterplan, etc
 - Low level (applications)
 - errors, configurations, performance security... et
 - SNMP, WBEM/CIM, WS-Management, SMASH, TMN, ASF, etc

The case of the School network

1/2



- Benefits from integrated management
 - School labs management
 - Fast resolution of problems, high response times
 - Central, systematic control
 - Organization, reports and stats
- Services
 - Assets management
 - Remote desktop control
 - Software distribution
 - Network management



Open, remote systems and network management with OpenRSM

The case of the School network

2/2



- EMS installation in 221 schools in 11 prefectures
- Problems
 - Organizational procedures could not sustain the project of scaled installation
 - Technical: low degree of automation, high complexity, insufficient installation procedure, low adaptation
- Solution: customisation
 - Size reduction, unattended procedures, custom installer options
- The next step: OpenRSM

OpenRSM

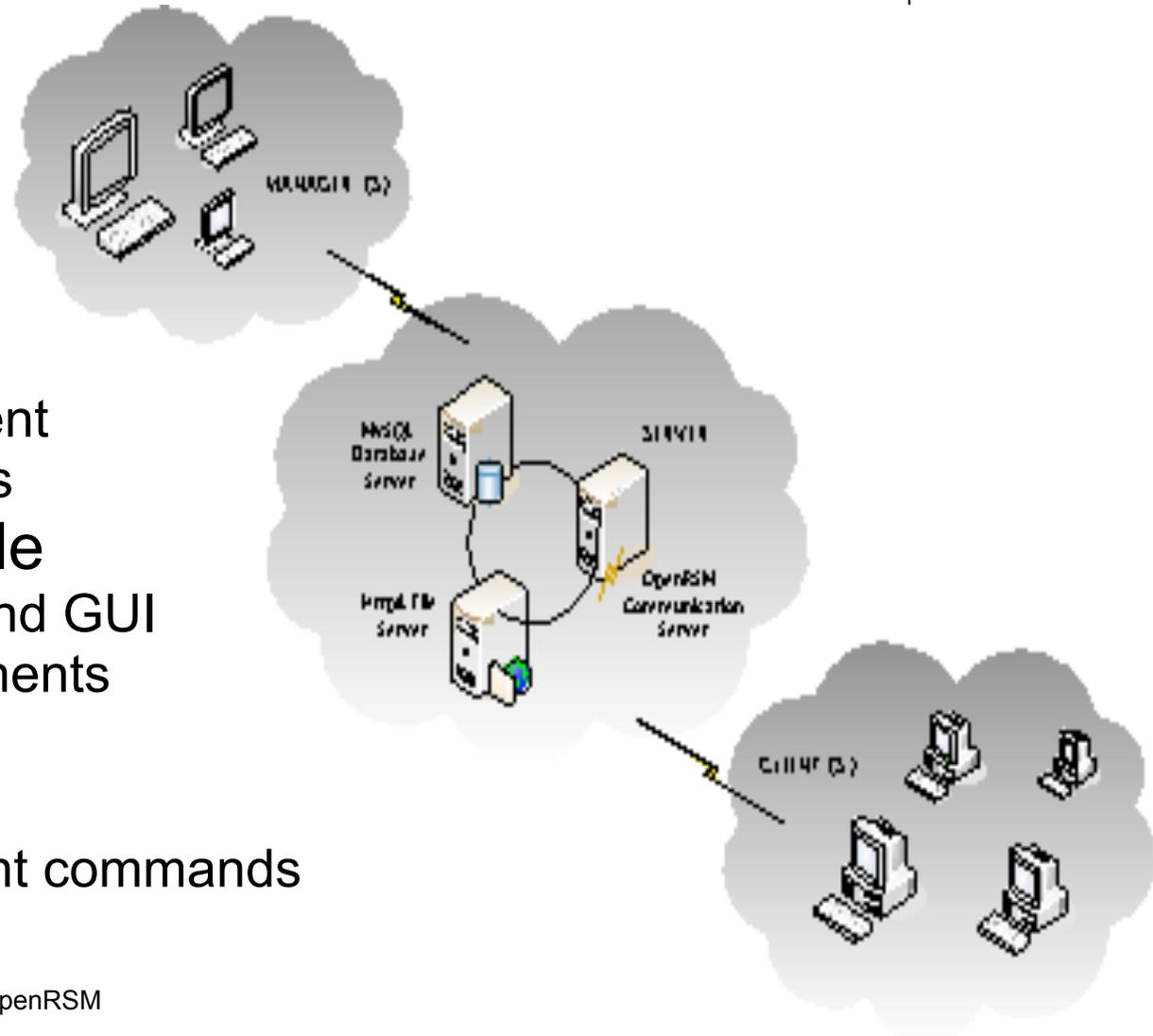


- Open source, integrated, multiplatform management
- Integrated systems
 - Assets management and reporting
 - Remote command execution, job management
 - Software management
 - Network management
 - Extensions for wireless
- Funded by the National Information society Operational programme



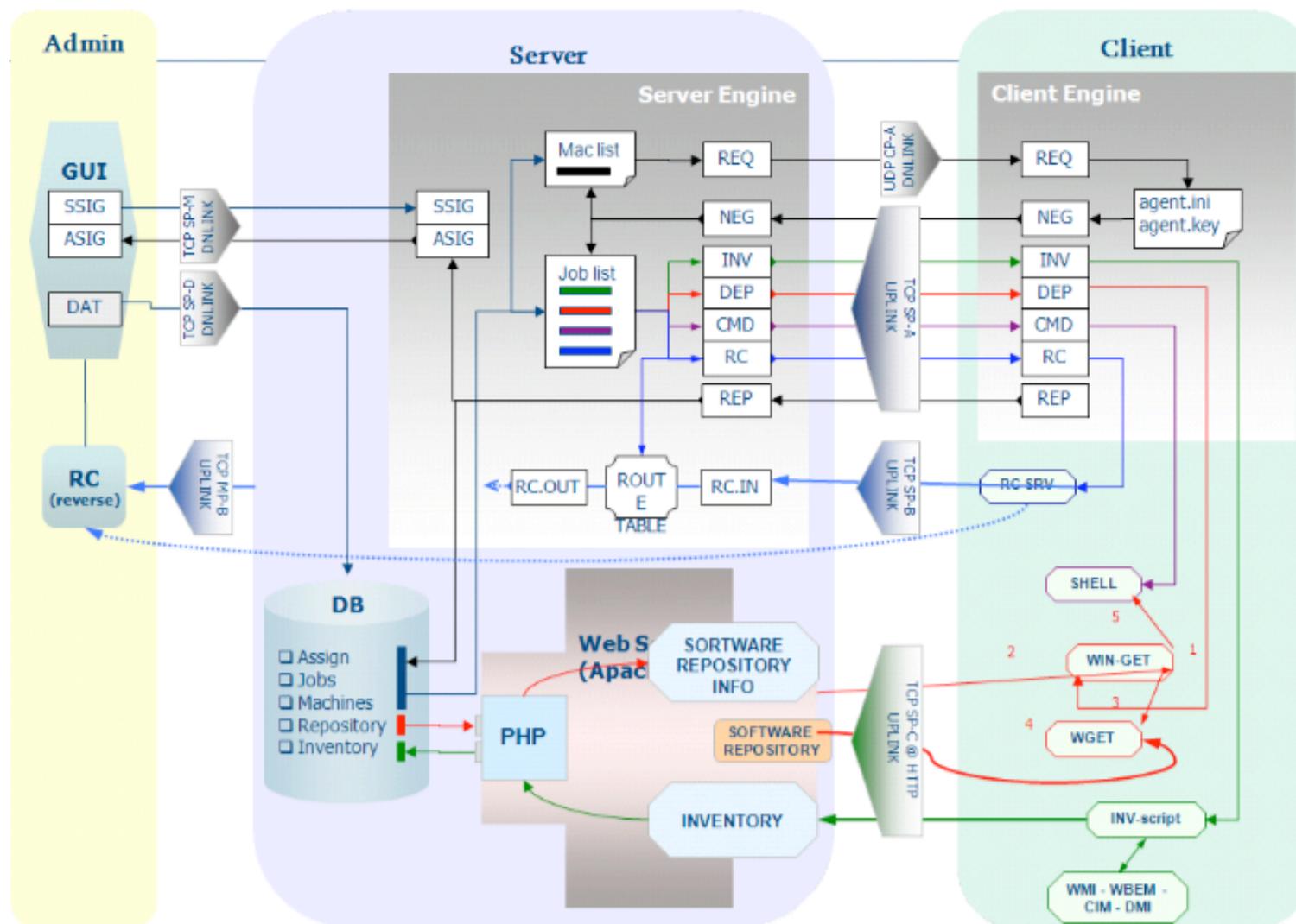
Component architecture 1/2

- **Server**
 - Control logic
 - Resource management
 - Informational systems
- **Management console**
 - Visual components and GUI
 - Integration of components
- **Agent**
 - Multiplatform
 - Conveys management commands





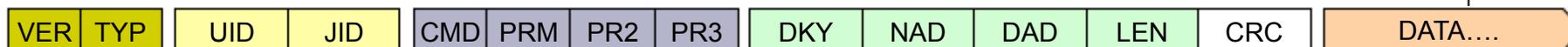
Component architecture 2/2



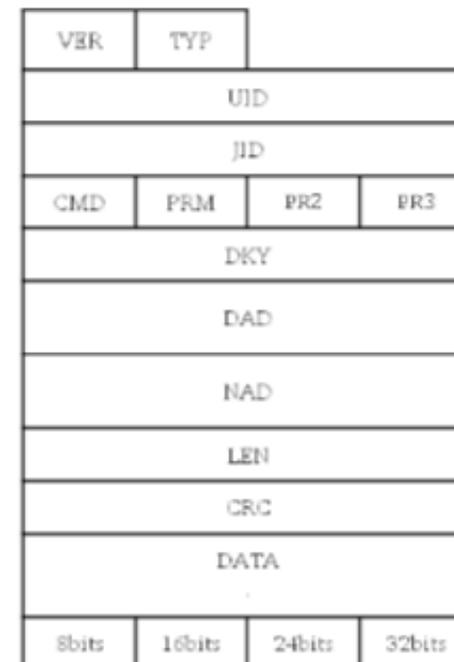
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Low level communication



DATA NAME	DATA TYPE	SIZE (bits)	SIZE (bytes)	INFO
VER	Byte	8	1	Protocol Version
TYP	Byte	8	1	Packet Type
UID	LongWord	32	4	Sender identification (for agents=MID)
JID	LongWord	32	4	Working JobsMachine ID
CMD	Byte	8	1	Command Type
PRM	Byte	8	1	Command Parameter 1
PR2	Byte	8	1	Command Parameter 2
PR3	Byte	8	1	Command Parameter 3
DKY	LongWord	32	4	Data Key (General Purpose)
DAD	String[16]	128	16	Discovery Address
NAD	String[16]	128	16	Next Address
LEN	LongWord	32	4	Length of data bytes coming next
CRC	LongWord	32	4	Head or Data CRC – Not Implemented yet
DAT	StringSteam	~	~	Additional Data – Variable length
SUM		464	58	



Για κάθε κύκλο διαχείρισης:

4 πακέτα client-server = $4 \times 58 = 232$ bytes

2 πακέτα server-admin = $2 \times 58 = 116$ bytes

Σύνολο: 348 bytes



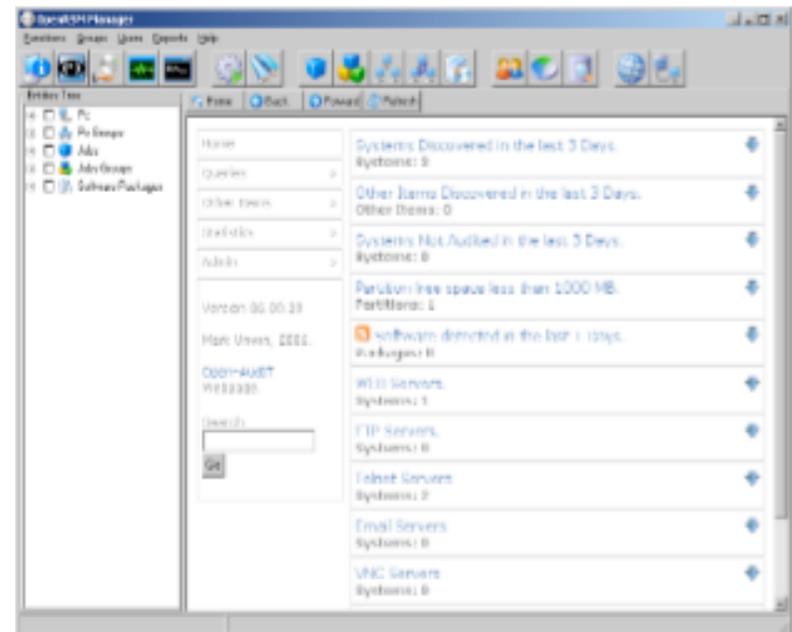
Functionality

- Assets management
- Remote control
 - Remote desktop
 - Std and reverse mode VNC
 - File transfer, messaging
 - Routing via the server
 - Client acknowledgements
- Command execution
 - Random command support
 - Command priority, visibility, type
- SNMP based network monitoring
- Network discovery
- Management console
 - Jobs prototyping and instantiation
 - Single job and batch mode execution
 - Static and dynamic groups for jobs and stations
 - Reports
 - Static / dynamic
 - Queries and stored queries
 - Exportable reports in various formats



Features

- Management for Linux/Windows
 - Different agents distributions
 - Common administrative console
- Lightweight
 - Low memory, CUP, network and disk consumption
 - Επιλογή για αποδοχή ελέγχου
- High performance
 - Real time task execution
 - ~150 ms/job
 - Scalable
- No prerequisites
 - Standard TCP/IP connectivity
 - Platform independent
- Security
 - Encrypted communication
- Custom communication protocols
 - UTP trigger, TCP handshake
 - Connections on demand
 - Support for active connections
 - Server locking



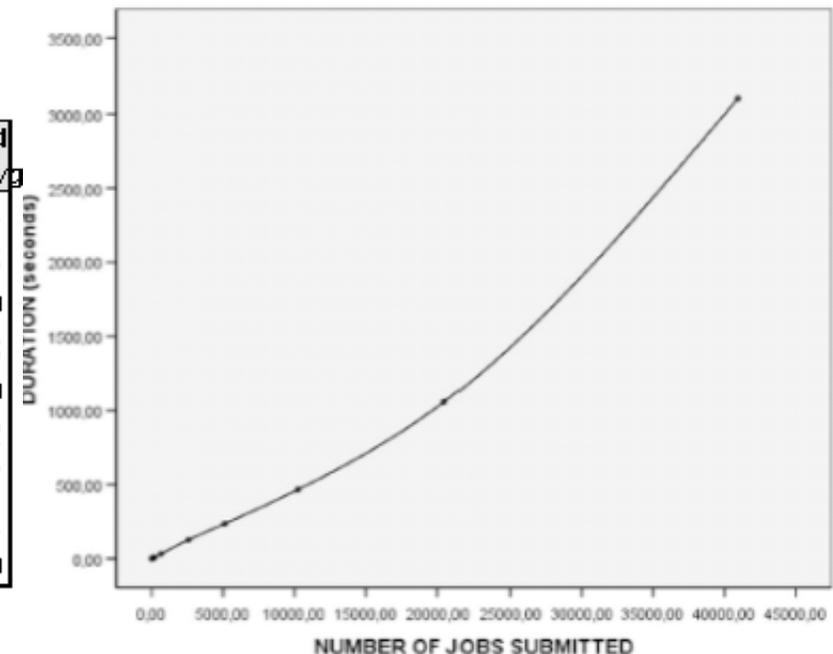
Open, remote systems and network management with OpenRSM



Stress and scale testing

- 22 jobs / sec, 35 msec / job
- 10 MB max memory fluctuation
- Linear behaviour with respect to load

Αριθμός Εργασιών	Διάρκεια (sec)	Troughput job/sec	RAM	CPU priv	CPU proc	CPU user	Netload Kbps avg
10	0,5	20,000	3605564	1,953	2,539	0,586	67,44
40	2	20,000	3605228	2,441	3,809	1,367	90,75
160	8	20,000	3604568	0,977	1,587	0,610	61,59
640	32	20,000	3604608	0,836	1,526	0,690	71,03
2560	126	20,317	3604922	1,146	1,927	0,781	65,60
5120	236	21,695	3604633	1,666	2,774	1,108	69,72
10240	466	21,974	3603102	2,833	4,457	1,624	73,07
20480	1058	19,357	3600419	4,709	7,074	2,364	57,11
40960	3104	13,196	3598928	9,980	13,697	3,717	54,80





Pilot installations

- Achaia prefecture
- Public administration control service
- Central citizen's disposition bureau offices
- <http://sourceforge.net/projects/openrsm/>
 - ~38000 downloads (Sept 2010)



Future work

- Extensions
 - Management for embedded devices
 - Sensor management
 - Integration with EGEE Grid technologies
- Single click, unattended installation
- Web based console
- Migration to middleware
 - High level programming frameworks
 - Enterprise level technologies

Questions?

