Presentation on developments for the period Oct 2006 - Feb 2007

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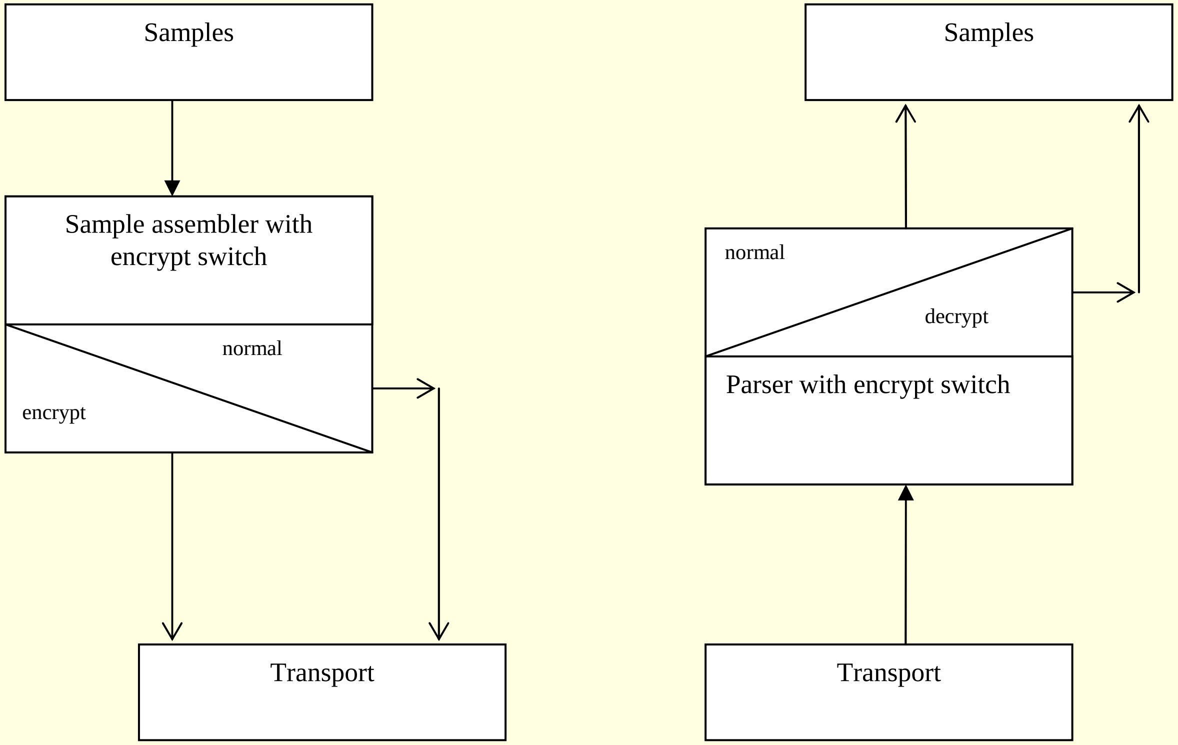
Lemon Security - Encryption

- Encryption using RSA asymmetric keys
- Available for both UDP and TCP transport
- Fine grain on/off control
  - Global level
  - Sensor level
  - Metric level
  - Transport level
- No extra keys other than host keys

Lemon Security - Encryption

Contd…



Samples
Sample assembler with encrypt switch
normal
encrypt
Transport
Samples
normal
decrypt
Parser with encrypt switch
Transport

Lemon client

Lemon Server

Lemon Security - Encryption

Contd…

Encrypt/Decrypt timings table

Server/Client configuration: Dual Xeon 2.8GHz, 2GB RAM

Type of key	Data size (bytes)	Encryption time (Approx milli seconds)	Decryption time (Approx milli seconds)
RSA1024	500	2	25
	1000	3.5	55
	1500	5.5	85
RSA2048	500	2.5	60
	1000	4.1	140
	1500	6.5	221

Lemon Transport Re-engineering

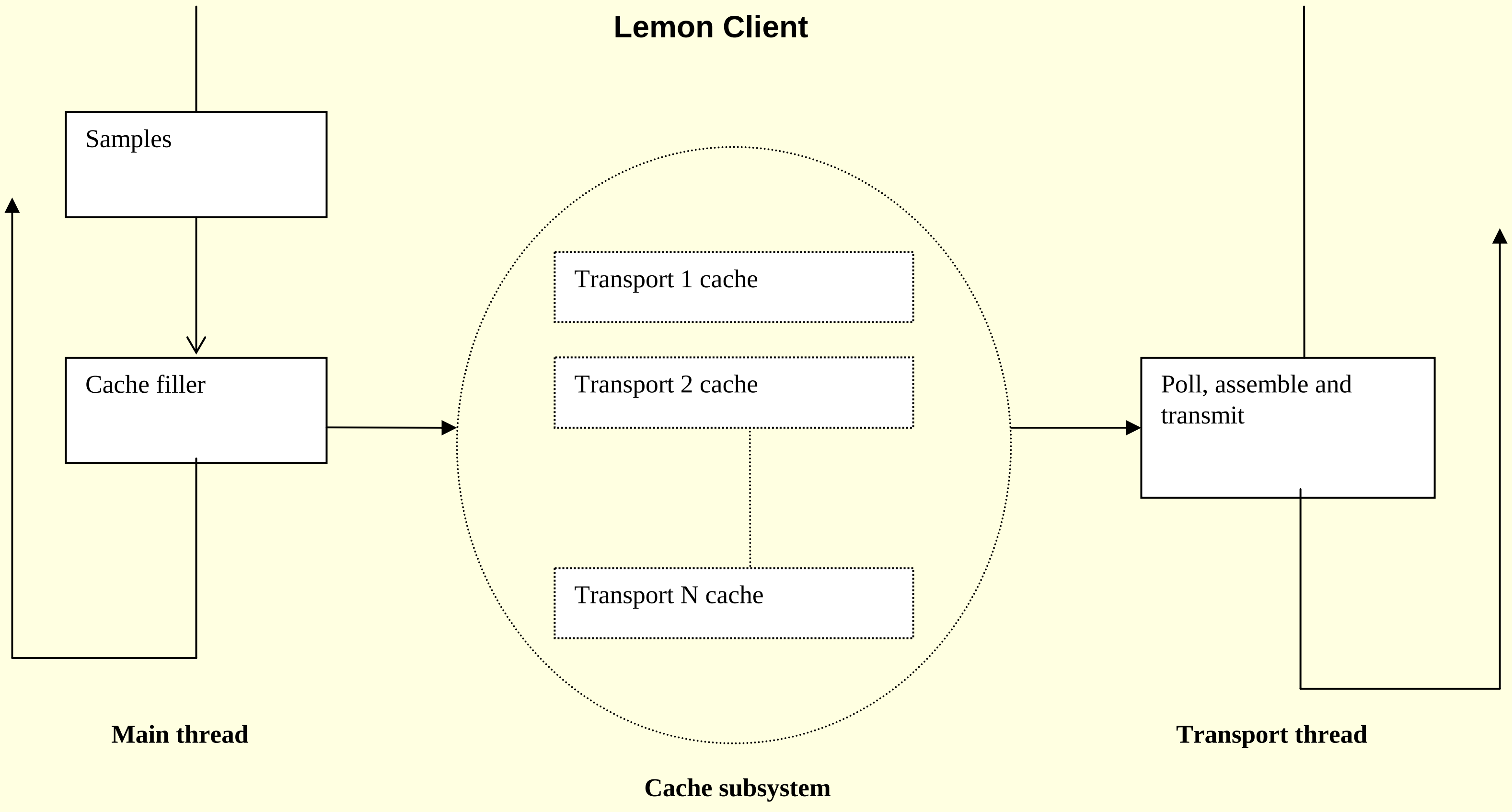
Contd…

Current shortcomings

- No support for aborting idle connections (A strong DOS possibility)
- As many threads as the number of TCP transports
- Multi stage cache mechanism
- Very complex client/server protocol
- Difficult to maintain code

Lemon Transport Re-engineering

Contd…



Lemon Transport Re-engineering

Contd…

Re-engineering salient features

- TIMEOUT configuration in both server and client
- Only one thread for transport in agent
- Single cache for each transport
- No DNS resolution on each transmit
- Simple protocol and easy to maintain code

Lemon XML-API

- Lemon XML-API is developed in C++.
- It provide users an interface:-
  - To fetch XML data from remote server, and
  - To query the downloaded data.
- Uses 'libxml2' for XML parsing.
- Uses 'libcurl' for fetching HTTP requests.

Lemon XML-API

Contd…

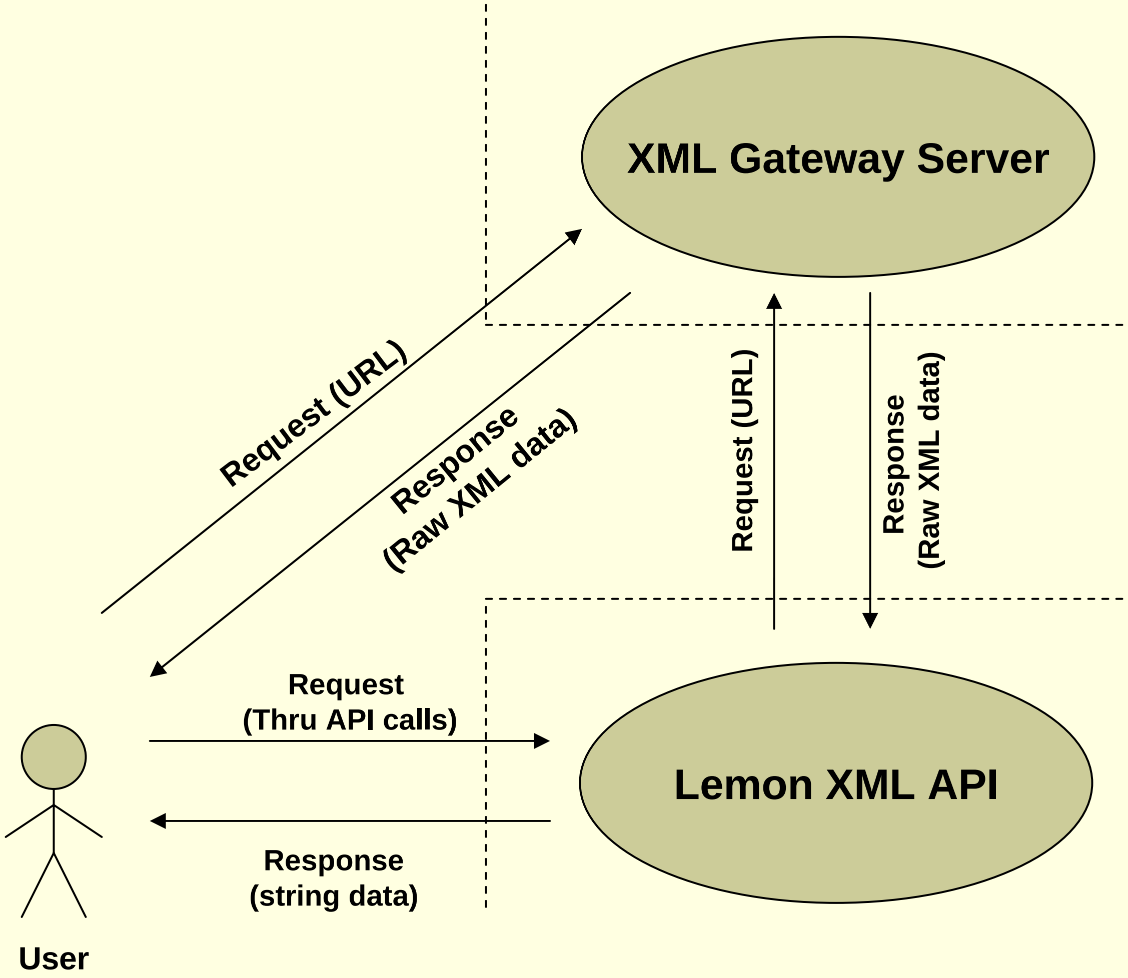


Fig. Request-Response plot

Lemon XML-API

Contd…

- API calls are divided into two broad categories: -
  - Calls which deals with setting request parameters, such as:

    `set_source(), set_metric(), set_start(), set_interval(), set_entity(), etc.`

  - Calls which deals with querying downloaded data, such as:

    `get_all_metrics(), get_metric_names(), get_column_meta_data(), get_entities(), etc.`

Lemon XML-API

Contd…

- In addition the API also provide Iterators.
- Iterators can be used to iterate over samples contained in downloaded data set.
- Three types of Iterators are supported:-
  - Sample Iterator,
  - Entity Iterator, &
  - Metric Iterator.
- API is designed to keep memory and CPU consumption low.
- API usage documentation is available.

Lemon XML-API

Contd…

- Lemon XML-API is also available in Perl.
- *SWIG is used to generate Perl interface to the C++ XML-API.
- Work involved:-
  - Writing SWIG interface file,
  - Defining SWIG typemaps, &
  - Defining SWIG typechecks.
- Example code is written in Perl on how to use API calls through this interface.

*Software Wrapper & Interface Generator

Lemon XML-API

Contd…

- Work going on to incorporate ‘local-cache access’ in the current API.
- Subset of available API calls will be used to access data from ‘local-cache’.

Wassh2 Re-engineering

- Wassh2 has been deployed in CERN – CC
- Added features are:
  - Support for sub clusters
  - Support for comma separated cluster list
  - Support to execute –list option even without specifying shell command

SWRepSOAP

- SOAP based implementation of Software Repository (SWRep) for Quattor
- Allows to manage software packages(RPMs)
  - Store in different platforms
  - Add, remove, query etc. stored packages
  - Authentication and Authorization of users
- Generates template with package list

SWRepSOAP – New Features

- Savannah #20044: Support for Kerberos based authentication
- Savanna #18324: Support for registering operation authorship
- Savannah #20506: Support for MD5 checksum verification
- Savannah #11061: Support for package signature check at the time

SWRepSOAP – New Features

- Savannah #13383: Support for source RPMs
- Support to upload/delete packages to/from multiple platforms in one go
- Savannah #20039: Support for “last updated” timestamp for platforms
- Savannah #20040: One more level of authorization

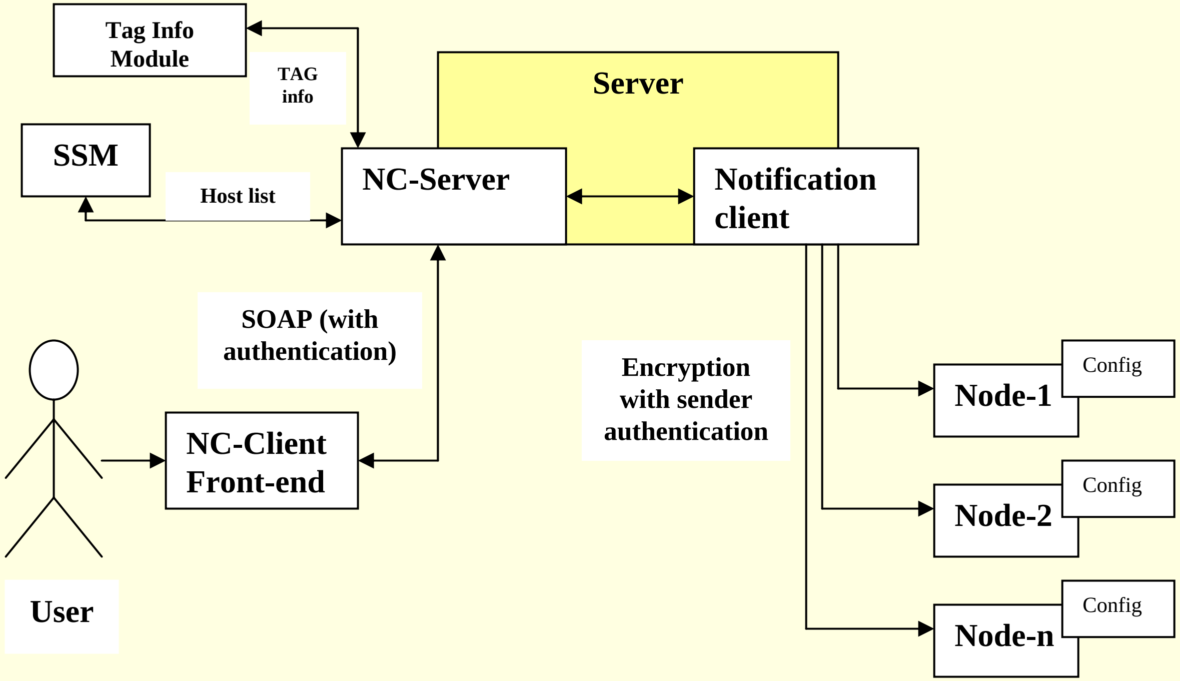
Notification System Re-Engineering

- Notification framework running in CERN computer center
- Notifies individual nodes for predefined tasks
- Nodes can subscribe or unsubscribe for notification depending upon their state
- More features are required

Notification System - Task

- User need not to login to server (as root) to notify nodes
- Facility to select target hosts
- Authentication
- Node to task relation ship should be extracted from CDB
- Notification flow should be encrypted for integrity and authentication

Notification System - Design



Notification System – Work Done

- Detailed design document has been prepared
- First prototype has been developed and deployed on test machine
- Modifications suggested have been incorporated

CCM (Configuration Cache Manager)

- CCM is responsible for downloading and caching of the local node profile
- Provides NVA API to access local profile
- It is needed to extend CCM to cache non-local profiles and allow them to be accessed
- Work is going on for this

CCTracker

CCTracker 1.5 released on 24 Oct, 2006

Features

- Updating of machine room information

  Ability to add/update/remove racks, PDUs and tape silos
- Display empty, populated and planned racks differently
- New "CC at a glance" tab with summary of objects

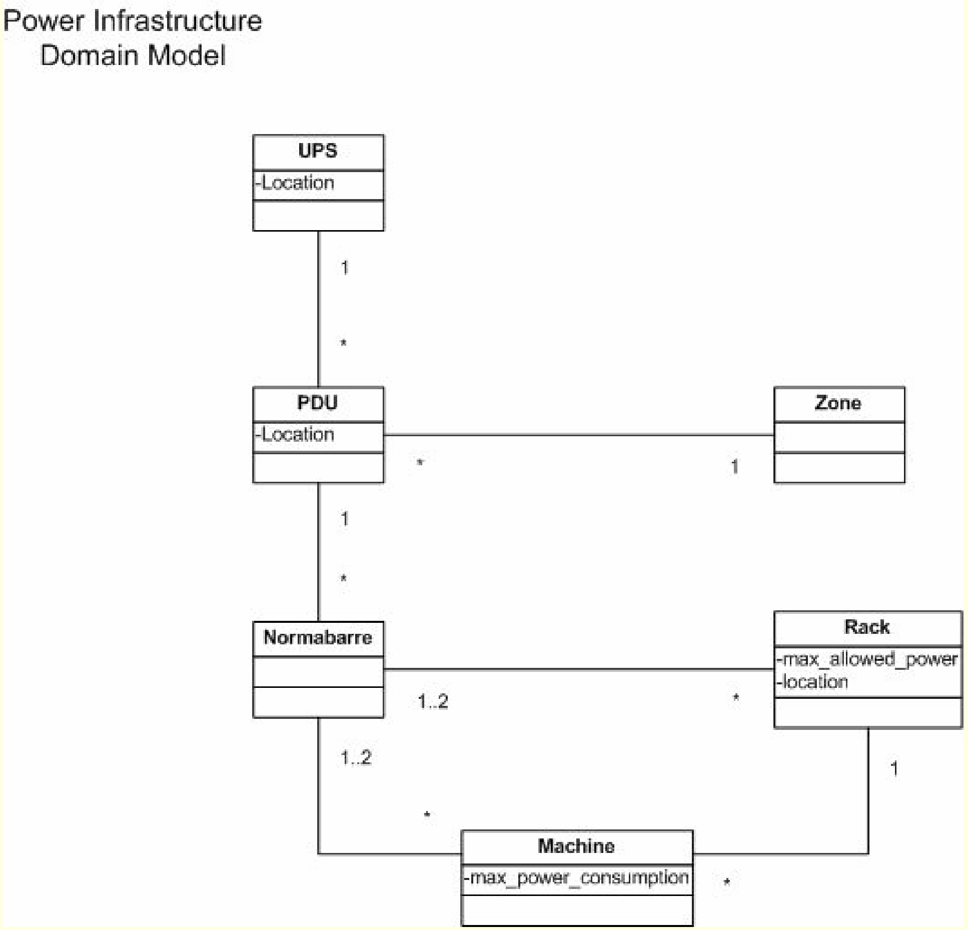
CCTracker

CCTracker release 1.6 is in progress

Features

- New object supported
  - UPS
  - Normabarre
  - Zone
- Power Infrastructure Domain model
- Power consumption view
- GUI to link different type of objects

CCTracker Power Infrastructure Domain Model



Developments

- **CCTracker client xml parser enhancement**
  - New objects ups, zone, normabarre
  - Addition attributes :description, power
  - Power domain model: Linking of objects
- **CCTracker client view**
  - Power Consumption view
    - Room->UPS->PDU->Rack->Machine hierarchy
  - Properties of UPS, PDU, Rack, Normabarre shows objects linked to it

Developments

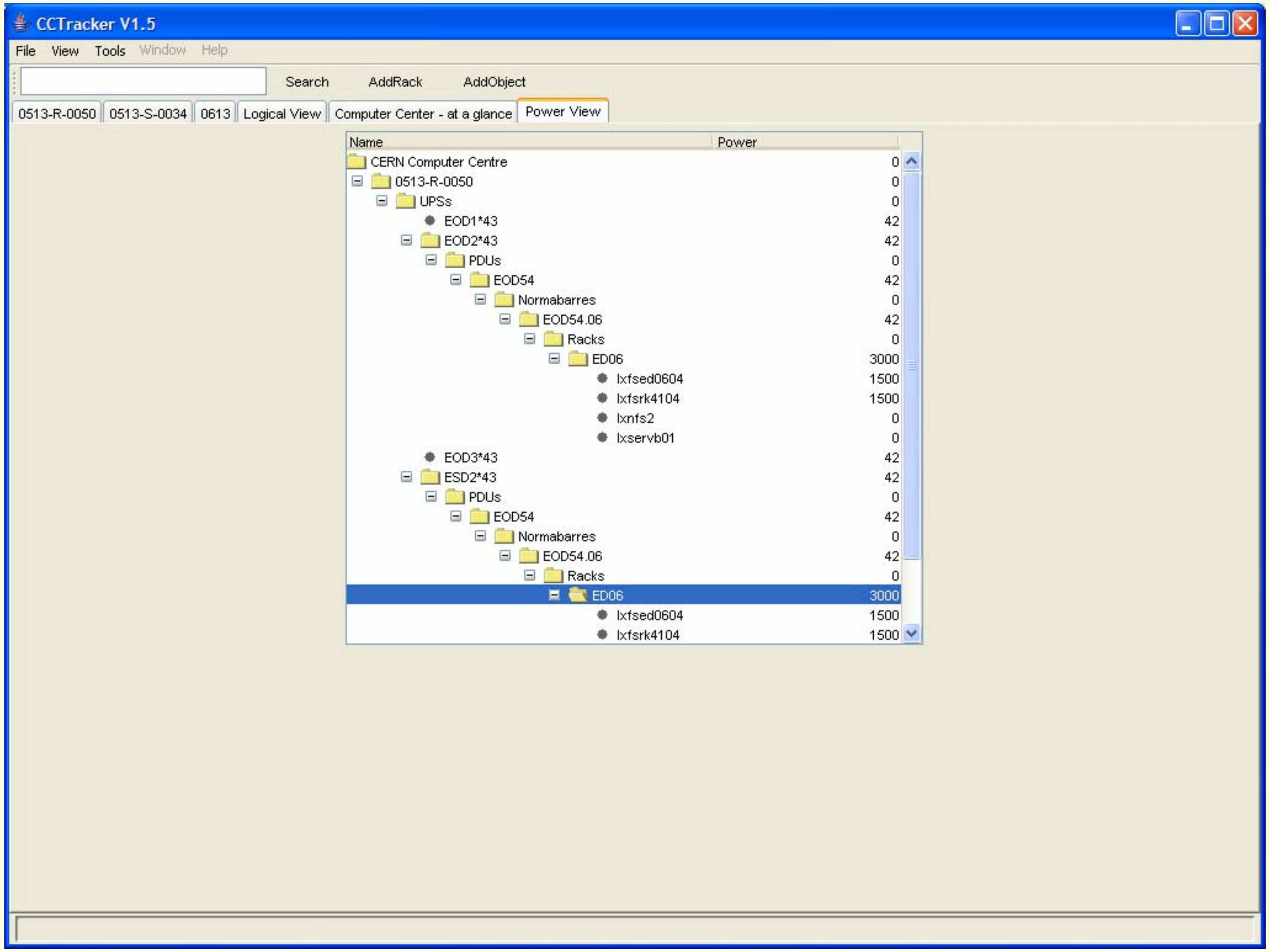
  - Properties update/modification
  - Context sensitive Popup to link

    Rack->Normabarre

    Normabarre->PDU

    PDU->UPS
- **CCTracker Server enhancement (CERN)**
  - Object linking
  - Updates
- **The CCTracker release steps are automated**
  - The ant tasks created
    - Generate key
    - Signing of jars

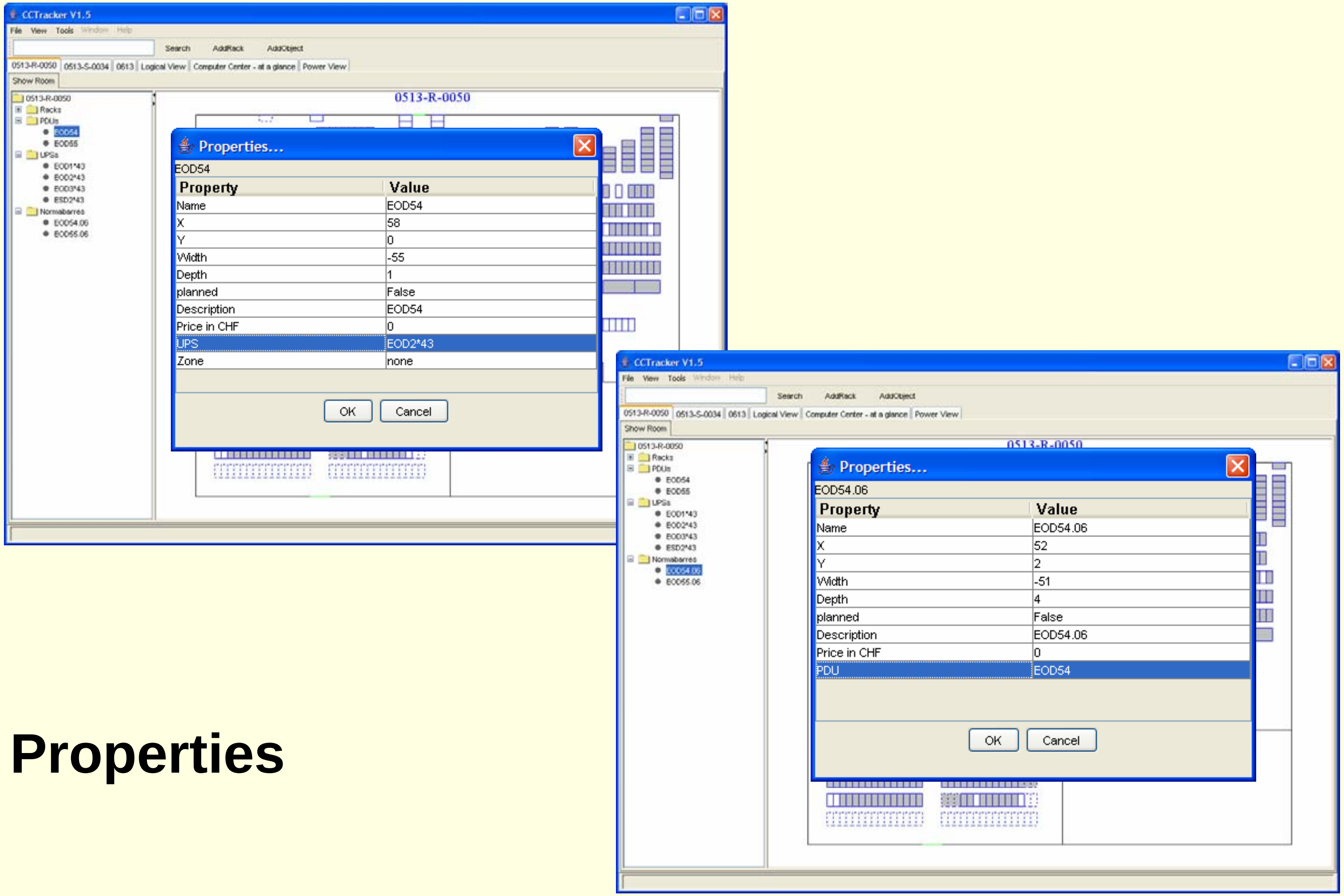
Snapshots


CCTracker V1.5
File View Tools Window Help
Search AddRack AddObject
0513-R-0050 | 0513-S-0034 | 0613 | Logical View | Computer Center - at a glance | Power View

Name	Power
CERN Computer Centre	0
0513-R-0050	0
UPSs	0
EOD1*43	42
EOD2*43	42
PDUs	0
EOD54	42
Normabarres	0
EOD54.06	42
Racks	0
ED06	3000
lxfsed0604	1500
lxfsrk4104	1500
lxnfs2	0
lxservb01	0
EOD3*43	42
ESD2*43	42
PDUs	0
EOD54	42
Normabarres	0
EOD54.06	42
Racks	0
ED06	3000
lxfsed0604	1500
lxfsrk4104	1500

Power View

Snapshots



EOD54

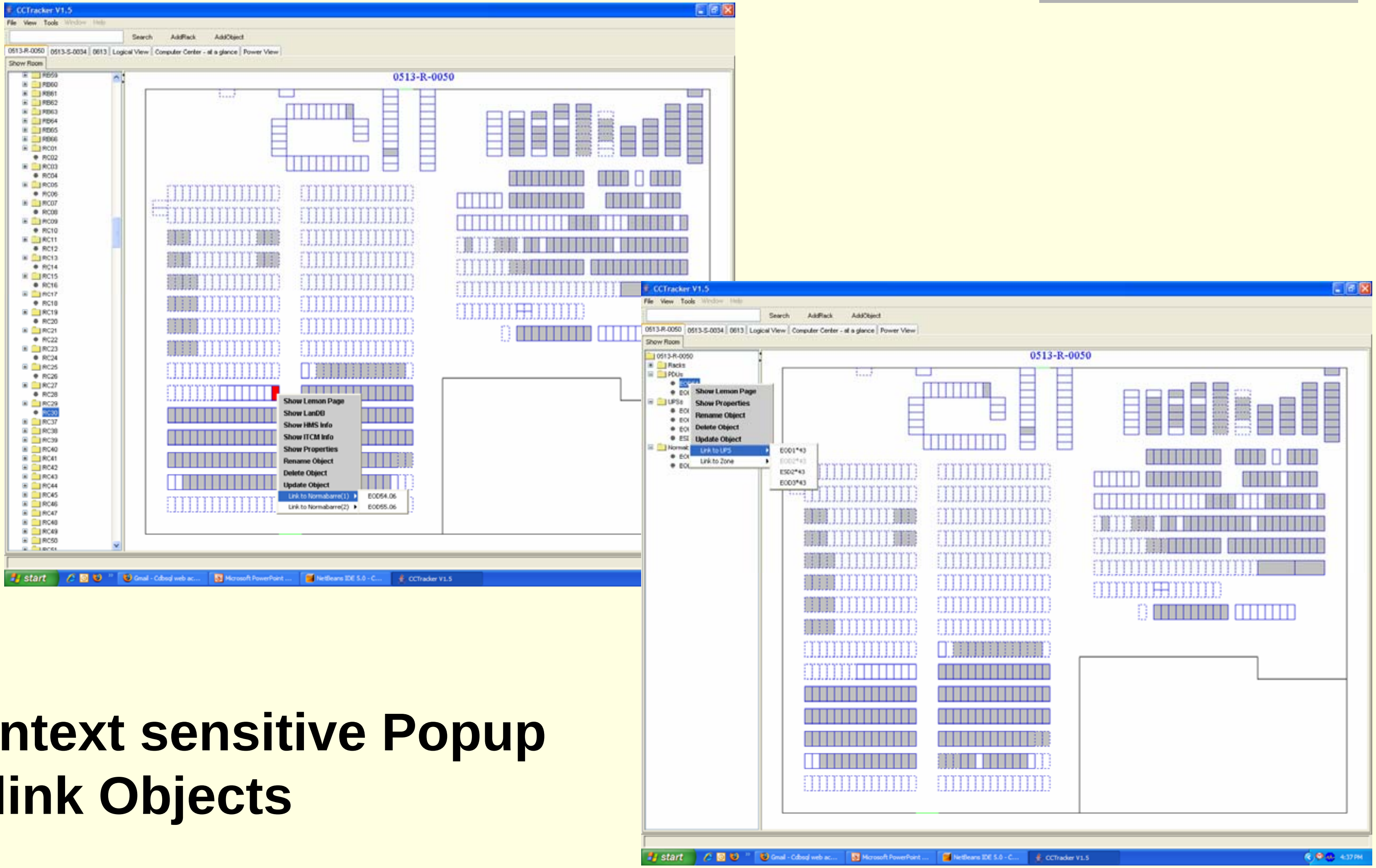
Property	Value
Name	EOD54
X	58
Y	0
Width	-55
Depth	1
planned	False
Description	EOD54
Price in CHF	0
UPS	EOD2*43
Zone	none

EOD54.06

Property	Value
Name	EOD54.06
X	52
Y	2
Width	-51
Depth	4
planned	False
Description	EOD54.06
Price in CHF	0
PDU	EOD54

View Properties

Snapshots



Context sensitive Popup to link Objects

Thank You…