

# ***UIMON to LEMON migration***

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# *Outline*

- ➔ UIMON and LEMON features
- ➔ Porting to Solaris
- ➔ CMDaemon and recovery action schema
- ➔ Recovery action features
- ➔ To do list
- ➔ Problems

# *UIMON features*

**#1**

- ➔ Monitoring sets of system parameters
  - Memory usage, disk usage, CPU utilisation
  - Daemons availability
    - is process on processes list
    - is daemon responding
- ➔ Taking care that the above metrics' values are in proper range
  - possibility to set low and high trigger level (for alarm on/off)
- ➔ Launch recovery action if something goes wrong

# *UIMON Features*

**#2**

- ⇒ Robust system of notification
  - Customized responsible person (per service)
  - Customized active (measure) time
  - Customized notification (email) time
- ⇒ Written in Perl
- ⇒ Working on Linux, Solaris and others UNIX systems
  - initially developed on Digital Unix

# ***LEMON project features***

- ➔ Monitoring tasks similar to UIMON
- ➔ Store samples in central repository
  - Central repository of metrics on Oracle Database
- ➔ Use dedicated protocol to exchange data
- ➔ Use modular architecture  
(measuring, data collection, storage and visualisation are separate parts of the project)

# ***LEMON project features***

*continued*

- ➔ Provide graphical visualisation
  - Lemon Status Page
  - Anamon (web accessed metrics' graphs)
- ➔ Originally deployed and mostly maintained on Linux
- ➔ Written in C and C++
  - Sensors could be written in any language (most of them are written in Perl)
- ➔ project web page: <http://lemon.web.cern.ch/>

# Screenshots

CERN Monitoring Web Pages - CERN Computing center informations - Mozilla

http://ccs003d.cern.ch/lemon-status/info.php?host=sundev014

## Host info: sundev014

25 Aug 2004 Wed 09:52:52

### Host Information

5.8  
2  
36 days, 0h:23m (boots per host)  
Tue, 20 Jul 2004 09:29:03 +0200  
OK

### Information

137.138.216.186  
MHz  
MB  
sundev  
SUN  
hm32412921  
s001  
0513 R-0050  
undefined  
[View template](#)

Cluster:  rack:  hardware model:   
Power location:   
2004 16:17:40.

PHP version: 4.3.4

**EDG-fabric monitoring analysis display**

SOAP endpoint URL: http://lcmmon001d:12  
Service definition:   
Select metric

- NumberOfUsers (id: 4105)
- LoadAvg (id: 20002)**
- CPUUtil (id: 9011)
- interrupts (id: 9012)
- pagingIO (id: 9023)
- swapIO (id: 9022)
- /tmp.use (id: 20012)
- networkIO\_lo (id: 9203)
- networkIO\_eth0 (id: 9202)
- memoryUsed (kB) (id: 9021)
- memoryUsed (%) (id: 9021)
- createdProcesses (id: 9032)
- existingProcesses (id: 9031)
- contextSwitches (id: 9013)
- DiskIO partition size (id: 9101)
- DiskIO (% used) (id: 9101)
- DiskIO read rate (id: 9101)
- DiskIO write rate (id: 9101)
- DiskIO use rate (id: 9101)
- numberOfSockets (id: 9201)

Cluster name:   
Nodename(s):   
Start time:   
End time (empty = forever):   
Plot:

LoadAvg 6 points

# ***LEMON – changes on Solaris***

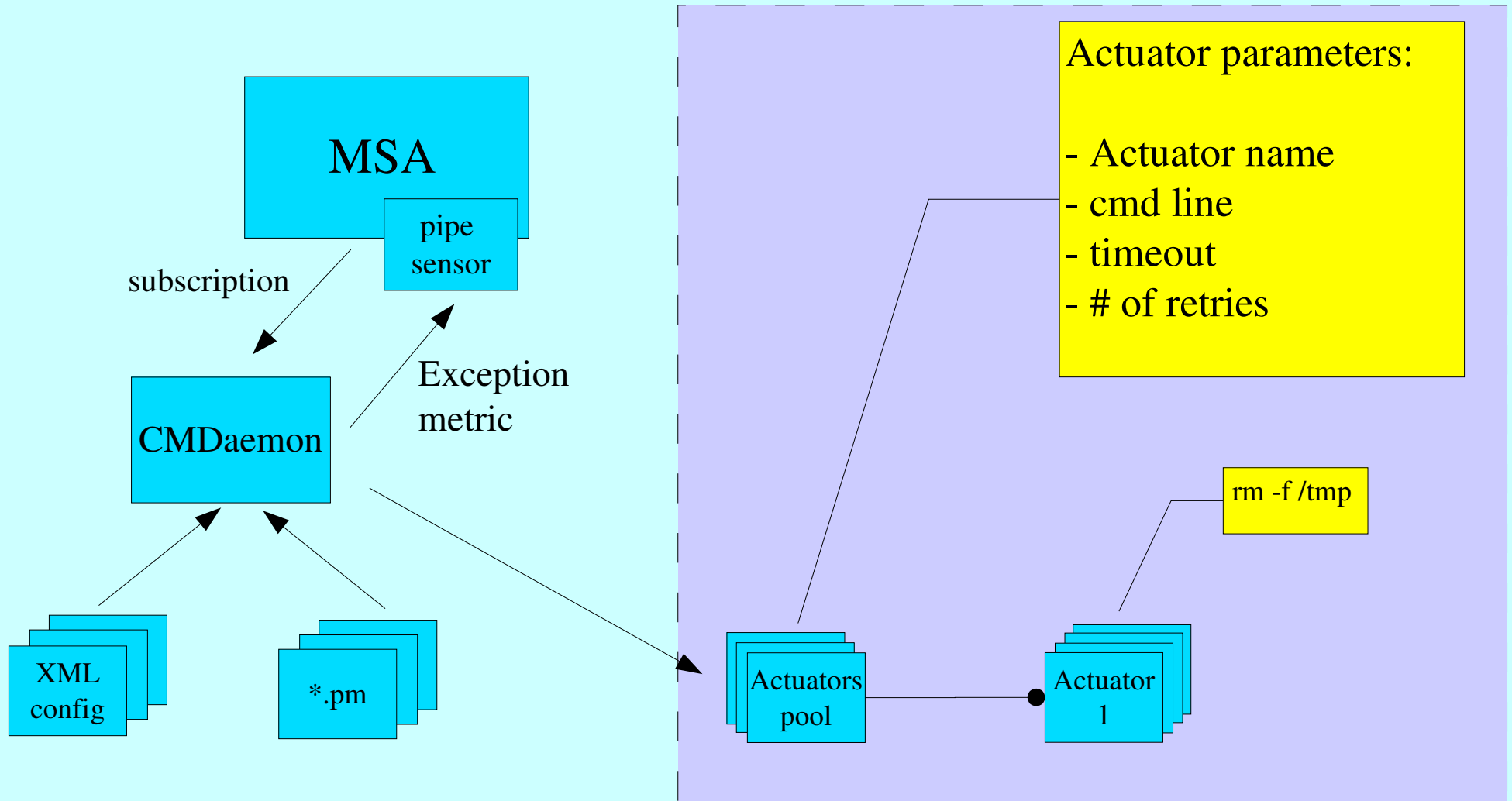
- ➔ **Compilation problems (Fixed)**
  - non-POSIX code in source code
  - system specific parts of code (sensors)
- ➔ **Bugs in internal sensors (Fixed)**
  - memory leaks
- ➔ **Write or rewrite system specific metrics (done)**
  - System utilisation metrics
  - System specific metrics (usage of discs)
  - Remove Linux specific metrics (in MSA config file)



# ***LEMON – changes on Solaris***

- ⇒ Packaging for Solaris 8 and 9 (partly done)
  - Solaris 8 SUE Feature (done)
  - Solaris 9 components (will use Quattor)
- ⇒ Correct configuration to enable data visualisation (<http://lemon-status.web.cern.ch>)  
(done)
- ⇒ Provide recovery actions (to be done)

# ***CMDaemon enhanced architecture***



# *Recovery action features*

- ➔ Configurable number of runs
- ➔ Check if previous instance is still running
- ➔ Action timeout (configurable)
- ➔ Customized responsible person (per service)
- ➔ Notification active time
- ➔ Part of CMDaemon framework
- ➔ Feedback to MSA
- ➔ Written in perl (Solaris and Linux)

# *To be done*

- ➔ Recovery framework
  - based on CMDaemon
  - provide at least features present in UIMON
- ➔ Testing (run in parallel to UIMON)
- ➔ Translating configuration files into CDB templates
- ➔ Packaging on Solaris 9

# *Problems*

- ➔ Perl modules
  - Solaris 8 and 9 compatibility problems (DBI)
  - Modules installation problems
    - XML Xerces on Solaris 8
- ➔ Linux and Solaris compatibility

# *Observation*

- ➔ Lemon is very modular, it is easy to add new components
- ➔ Stores data in central repository -
  - informations are easily accessible
    - Access-API for various languages
- ➔ Well know metric's format definition and repository API – even Windows can send metrics
- ➔ Exception metrics (alarm metrics)

# *Advantages of Lemon*

- ➔ LEMON is common at CERN
  - Easy to find help from more experience users
- ➔ possibility of reuse software and resources
  - Storing samples in common repository
  - Lemon status page
  - Alarm display (not ready yet)
- ➔ Well documented and stable APIs
  - Sensor – MSA API
  - MSA – Central Repository API

# *Disadvantages of UIMON*

- ➔ Only basic graphs in UIMON
- ➔ No easy access to measured statistics and historical data
- ➔ Small set of metrics
  - Measures only a few system parameters
  - No easy way to add new metrics
- ➔ UIMON does not use system calls to collect data
  - parse “top” output instead
  - bad performance impact



***Thank You!***

Any Questions?