

CSS – Workshop Summary

EPICS Meeting – CSS

DESY, April 26, 2006

Matthias Clausen, DESY / MKS-2

Agenda of the CSS-Workshop on the 24th

- Before we start: Get your CSS copy from the net
- Introduction/ Basic Ideas (Matthias Clausen - DESY)
- Core Utility Plugins (Matthias Clausen - DESY)
 - ScreenShot
 - XMPP-based Management
- Core Applications
 - DataViewer (Kay Kasemir - SNS)
 - Synoptic Display Studio (SDS) (Sven Wende – C1-WPS)
- Core Plugins
 - Namespace Tools (LDAP/ UNIX scripts) (Helge Rickens - DESY)
 - CSS Alarm/ Message Tools (Jan Hatje - DESY)
 - Post Mortem Data Analyzer (Albert Kagarmenov - DESY)
- Interfaces
 - Data Access Layer (DAL) (Igor Kriznar – Cosylab)
- Developers Corner
 - CSS-Update Site/ What makes a Plugin a CSS plugin (Jan Hatje - DESY)
 - Eclipse experience (ALL / Kay Kasemir – SNS/ Ken Evans - ANL)

Before we start:

Everybody should have a running version of CSS
on his notebook!

Please go to:

<http://css.desy.de> -> Download CSS-Core

(read instructions on the bottom of the web page to load the application
plugins from the DESY update site)

If you need a soft-IOC (Windows only):

<ftp://ftp.desy.de/pub/EPICS/CSS/OpclocShell.zip>

In CSS: Menu -> CSS -> Preferences -> CSS-Core -> EPICS -> addr_list:
localhost/ auto_addr_list: []

<http://css.desy.de> -> Download CSS-Core

Download CSS core Eclipse Application - Mozilla Firefox

http://css.desy.de/content/e413/index_eng.html

Download CSS core

Download CSS core Eclipse Application

Version	Date	OS	Comment	Download Link
CSS-0.9.4	19.04.2007	Windows	new login	CSS Core 0.9.4 (Windows)
CSS-0.9.4	19.04.2007	Linux GTK	new login	CSS Core 0.9.4 (Linux GTK x86)
CSS-0.9.4	19.04.2007	Mac PPC	new login	CSS Core 0.9.4 (Mac OSX PPC)
CSS-0.9.4	19.04.2007	Mac x86	new login	CSS Core 0.9.4 (Mac OSX x86)
CSS-0.9.3	27.03.2007	Windows	XMPP Communication	CSS Core 0.9.3 (Windows)
CSS-0.9.3	27.03.2007	Linux GTK	XMPP Communication	CSS Core 0.9.3 (Linux GTK x86)
CSS-0.9.3	27.03.2007	Mac PPC	XMPP Communication	CSS Core 0.9.3 (Mac OSX PPC)
CSS-0.9.3	27.03.2007	Mac x86	XMPP Communication	CSS Core 0.9.3 (Mac OSX x86)
CSS-0.9.2	17.01.2007	Windows	new release	CSS Core 0.9.2 (Windows)
CSS-0.9.2	17.01.2007	Linux GTK	new release	CSS Core 0.9.2 (Linux GTK x86)
CSS-0.9.2	17.01.2007	Mac PPC	new release	CSS Core 0.9.2 (Mac OSX PPC)
CSS-0.9.2	17.01.2007	Mac x86	new release	CSS Core 0.9.2 (Mac OSX x86)

Übertrage Daten von ftp.desy.de...

1. Select the CSS version for your operating system.
2. Read the instructions at the bottom of the web page.
3. Load the additional plugins from the DESY update site (do NOT load the DESY specific ones – unless you have access to the local DESY subnets)

Introduction

- Initiator(s)
- Basic Ideas
 - MB3 -> Eclipse Contribution Menu (for free)
Information on your fingertips
 - Definition of Data Types
 - Drag and Drop
 - Central Logging Facility
 - Authentication/ Authorization
 - Management
 - Using the CSS core for UI and for headless applications

CSS-Initiators

- Phase out old X-Window applications
- Write Once run (nearly) everywhere
- Start from a stable core with a well defined set of basic functionalities
- Open access policy:
 - Run all developments through cvs
 - Use Eclipse Update mechanism from the beginning
 - Allow remote developers to publish their plugins on DESY update site

Basic Ideas

- MB3 -> Eclipse Contribution Menu (for free)
'Information on your fingertips'
 - Definition of Data Types
 - Drag and Drop
- Central Logging Facility
- Authentication/ Authorization
- Management
- Using the CSS core for UI and for headless applications

Eclipse Contribution Menu 'Information on your Fingertips'

The screenshot shows the Control System Studio interface. The Eclipse Contribution Menu is open, listing several options: Name Space Search, Name Space Browser, Datenbrowser, PV Tabelle, Probe, and EPICS PV Hierarchie. The menu is highlighted with a red circle. The background shows the Workspace Explorer, Namespace Browser, and Console windows.

TYPE	EVENT TIME	NAME
event	2007-04-25 19:40:26,204	alarmTest:R
event	2007-04-25 19:40:20,886	alarmTest:R
event	2007-04-25 19:39:49,900	alarmTest:R
event	2007-04-25 19:40:24,203	alarmTest:R
event	2007-04-25 19:40:16,886	alarmTest:R
event	2007-04-25 19:38:39,891	alarmTest:R
event	2007-04-25 19:40:27,704	alarmTest:R
event	2007-04-25 19:40:25,287	alarmTest:R

Eclipse Contribution Menu 'Information on your Fingertips'

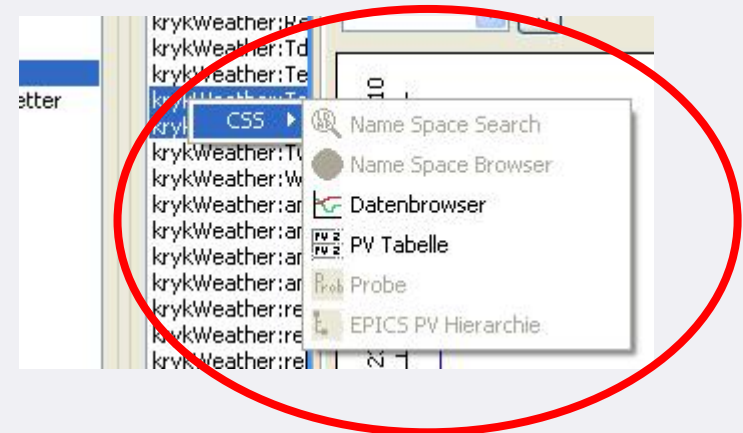
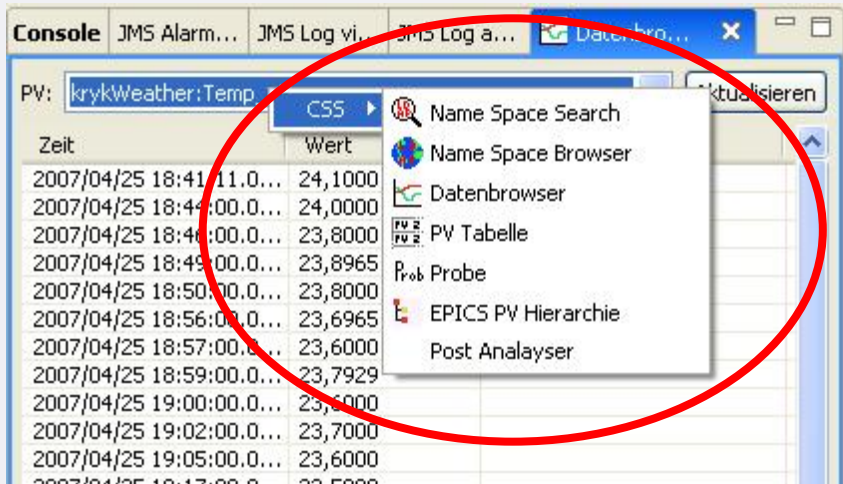
The screenshot shows the Eclipse IDE interface for Control System Studio. The main window displays a console with a table of events. The Eclipse Contribution Menu (ECM) is open, showing a list of tools available for the selected project, 'CSS'. The menu items are:

- Name Space Search
- Name Space Browser
- Datenbrowser
- PV Tabelle
- Probe
- EPICS PV Hierarchie

The console window shows the following table:

TYPE	EVENTTIME	NAME
event	2007-04-25 19:43:01.169	alarmTest-RAMPA_calc
event	2007-04-25 19:42:57.672	alarmTest-RAMPA_calc
event	2007-04-25 19:42:54.141	alarmTest-RAMPA_calc
event	2007-04-25 19:42:51.191	alarmTest-RAMPA_calc
event	2007-04-25 19:42:53.673	alarmTest-RAMPA_calc
event	2007-04-25 19:41:37.689	alarmTest-RAMPA_calc

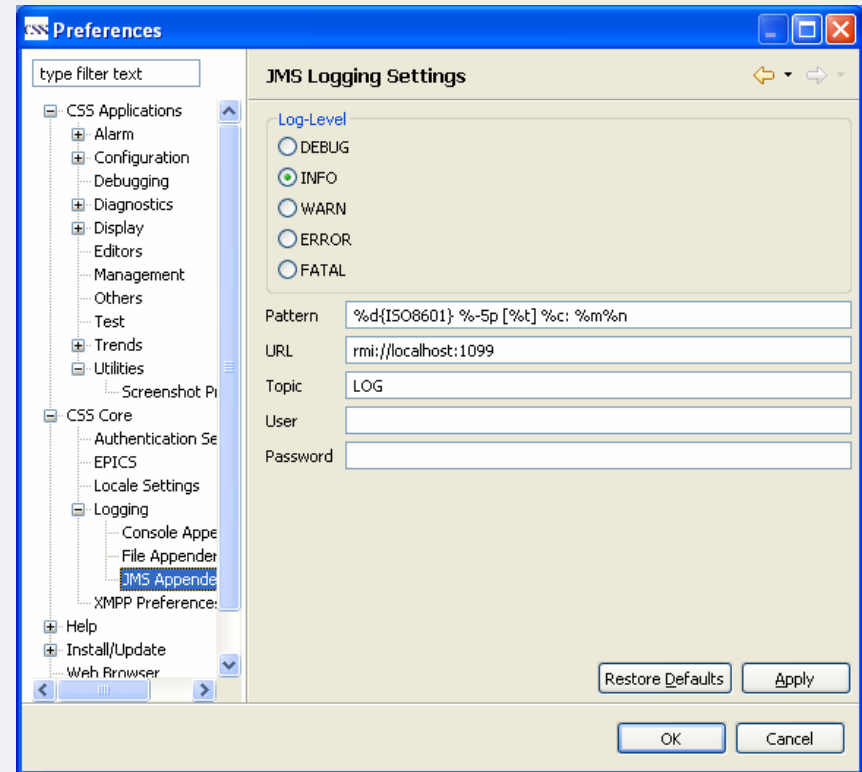
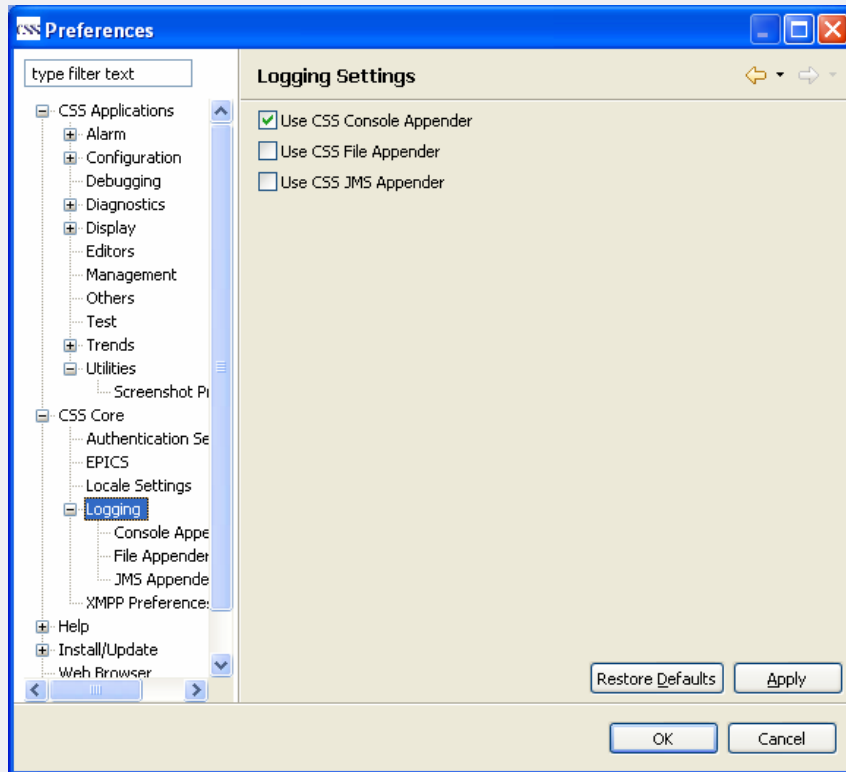
Eclipse Contribution Menu 'Information on your Fingertips'



Selecting a channel from PV list in the DataBrowser Table will add the Post Analyser to the Contribution Menu

Selecting two channels from the LDAP Viewer List (or any other list) will only highlight those Plugins that accept two channel names (more than one) at the same time.

Central Logging



Example:

`CentralLogger.getInstance().warn(this, "writeVector < 500 - resume writing");`

Basic Ideas

- MB3 -> Eclipse Contribution Menu (for free)
'Information on your fingertips'
 - Definition of Data Types
 - Drag and Drop
- Central Logging Facility
- Authentication/ Authorization
- Management
- Using the CSS core for UI and for headless applications

Authentication/ Authorization

Authentication:

- Implementation of an Interface
 - You can add your Implementation
 - DESY will implement Kerberos

Authorization:

- Implementation of an Interface
 - You can add your Implementation
 - DESY will implement an LDAP configuration server

Basic Ideas

- MB3 -> Eclipse Contribution Menu (for free)
'Information on your fingertips'
 - Definition of Data Types
 - Drag and Drop
- Central Logging Facility
- Authentication/ Authorization
- Management -> presentation
- Using the CSS core for UI and for headless applications

Using the CSS core for UI and for headless applications

The aim is to:

- Share the CSS-core functionality
 - Logging interfaces
 - Management interfaces
- Share preferences (settings) with other CSS-plugins
- One infrastructure for UI and headless applications
- To achieve this, it's necessary to clearly separate UI code from core (non UI) code.

Plans for future CSS developments (short term)

- Implement Authentication (DESY: Kerberos) based on existing interface.
- Implement Authorization (DESY: LDAP) based on existing interface
- Alarm Properties Editor
- SNL Editor
- Integration of Device Database (MB3 Information on your fingertips)
- Improvement of Management Plugin
- 'Save-Value' Extension Point
- SDS Conversion Tool (*.adl to *.CSS-SDS)

Save Value – Extension Point

- MB3 on the value of a channel
 - Activate Plugin(s) that implement Extension Point
- Save Value Plugin Instance:
 - Can be different implementation on different sites

At DESY:

- Save value in restore.caPut which is loaded after IOC-Init –or-
- Save value in ioc.db –and-
- Save in Oracle database
- Wait until actions are confirmed (transaction) to make sure that the value is really available for the next IOC – reboot.

Plans for future CSS developments (long term)

- SNL Debugger
- PID Auto-tuning Plugin
- Clipboard for CSS data-types (objects)
 - ScreenShot Images
 - CSS-Data objects
 - Exchange objects with remote XMPP instances
- Record/ Playback of Actions

Wish list for future CSS developments – volunteers?

- A ‘real’ J-Probe
- Save/ Restore Plugin

... more throughout this meeting

CSS – ScreenShot

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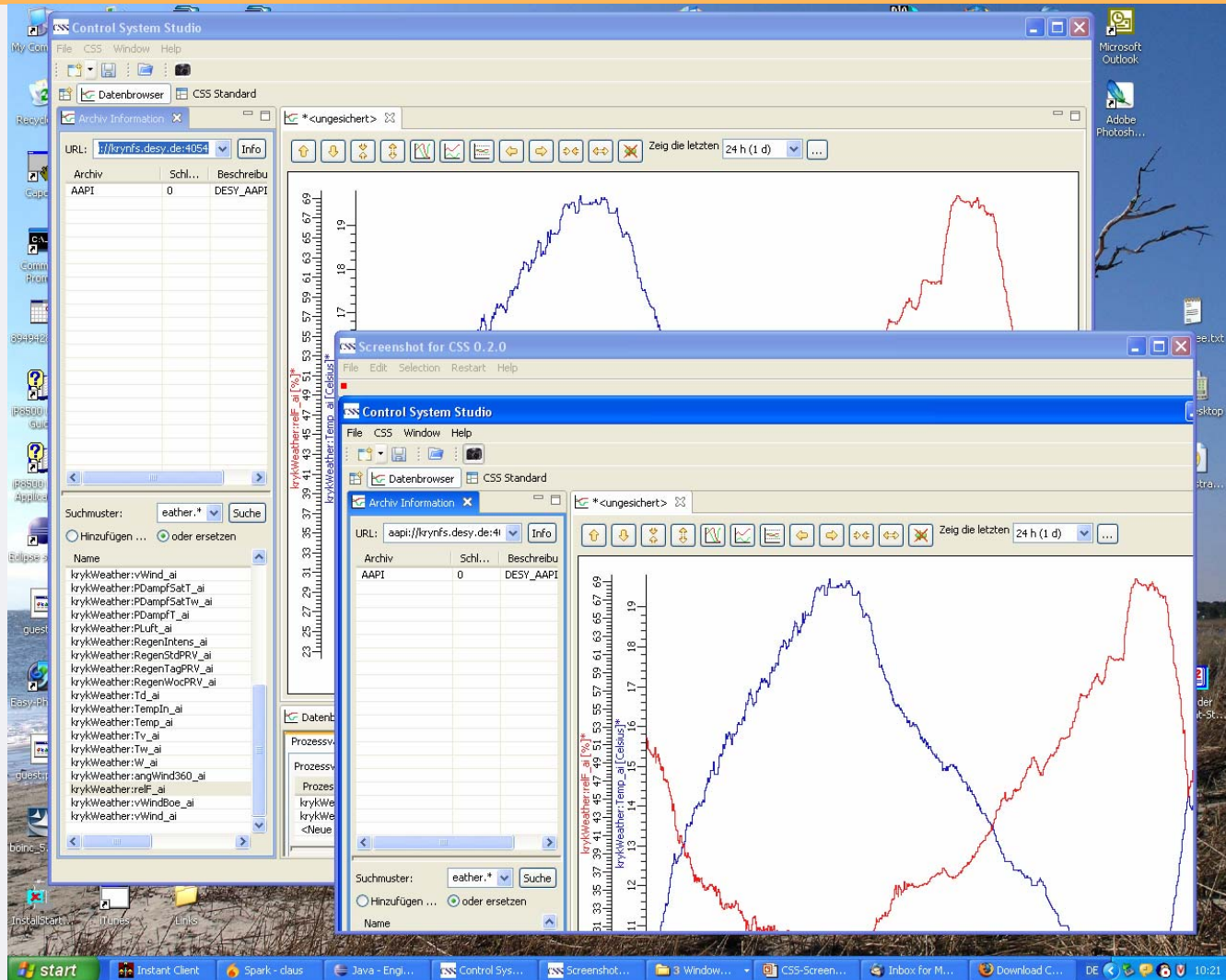
Matthias Clausen, DESY / MKS-2

For Markus Möller, DESY/ MKS-2

Currently implemented

1. Copy of:
 - A View
 - A whole CSS instance
 - The whole screen
2. Send image to email or elogbook
(define preferences in preference page)
3. Delete image from ScreenShot buffer.
4. Print Image

Screenshot in Action



Outlook

1. Add simple tool to edit image. (Add text, mark areas, delete selected areas ...)
2. Move image to CSS-Clipboard
3. Accept images from CSS-Clipboard
4. Save-As for local images. (Format: JPG, BMP, TIFF, GIF)
5. Add CSS-Data-Objects from CSS-Clipboard to send 'destinations' (mail, elogbook ...)
6. Implement Interface and Extension-Point for 'send' option.
(This will allow developers to add new send destinations without changing the ScreenShot code. The new destination can be loaded as a new plugin)

CSS – Management

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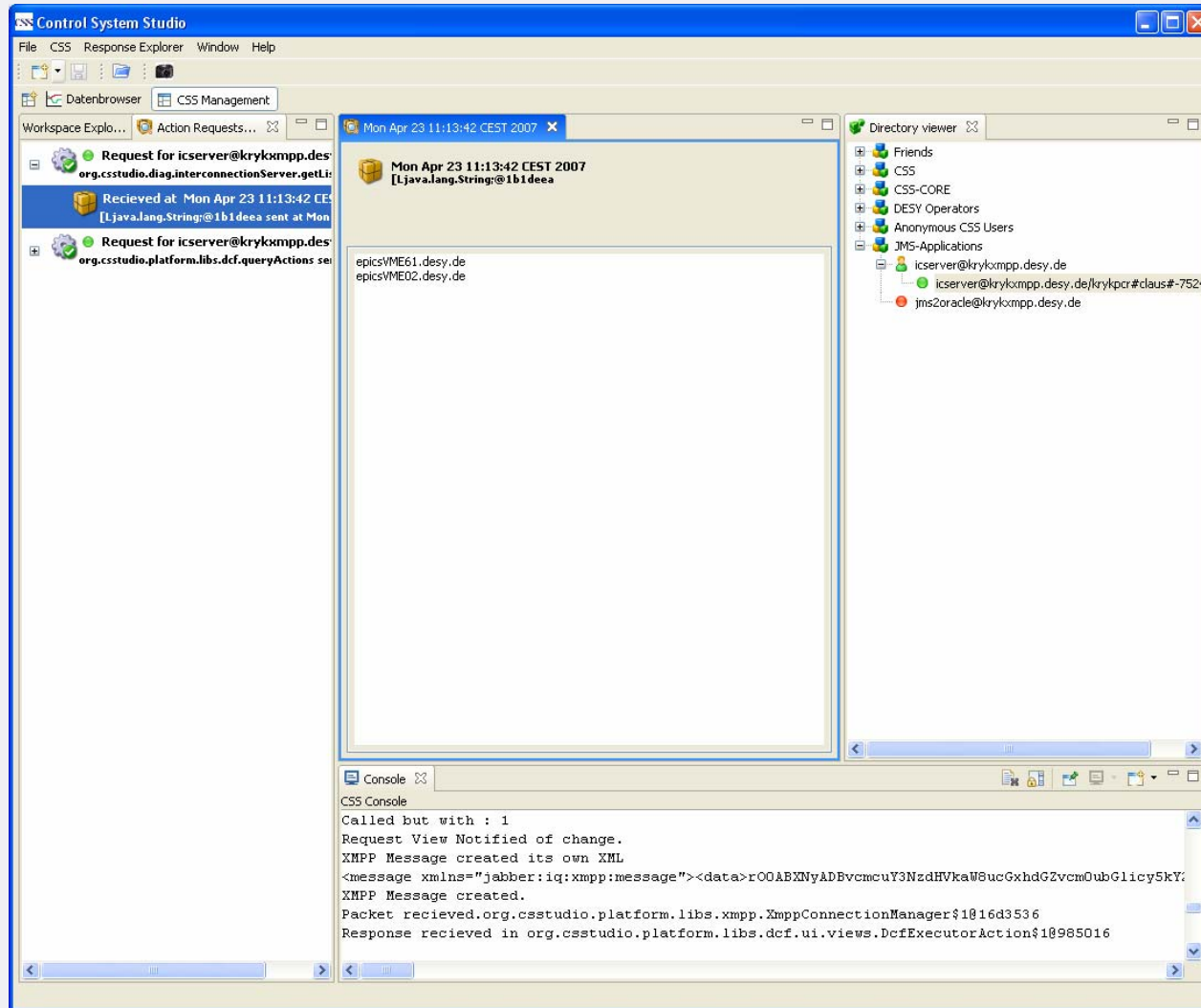
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Currently implemented:

- Login to XMPP Server (krykxmpp.desy.de)
- Directory Viewer
- (Inter) Action with other XMPP Clients

XMPP Directory Viewer in Action (implemented by: Anze Vodovnik (JSI))

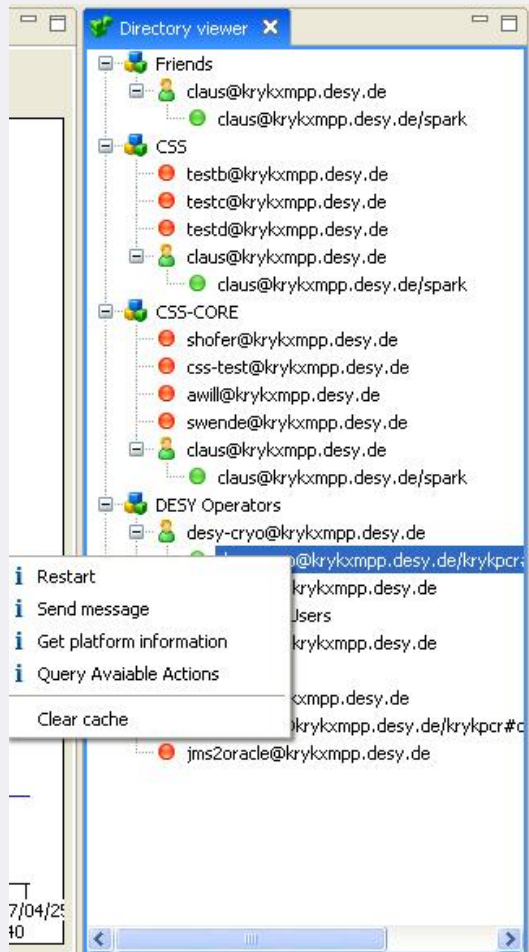


Management in Action

Management Actions available for a **CSS instance**.

Demonstration:

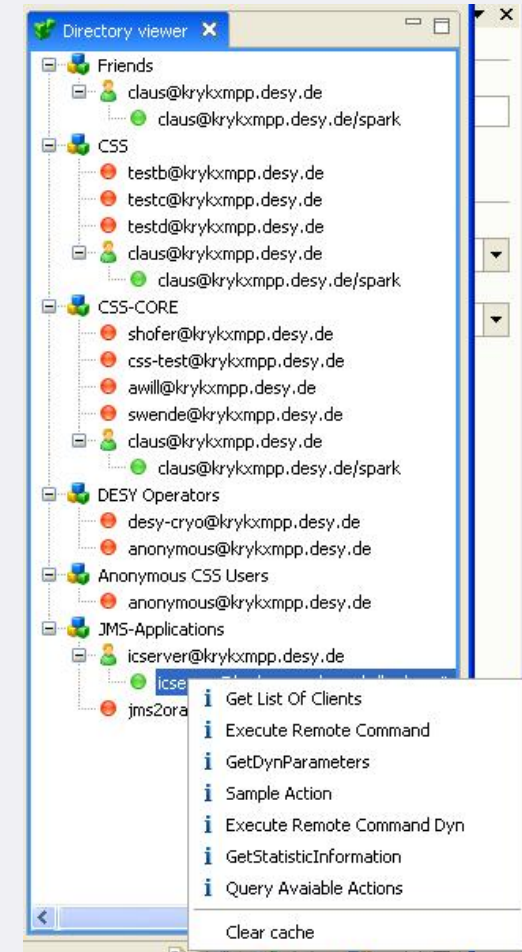
1. Send Message to Sharon's CSS
2. Restart Sharon's CSS remotely



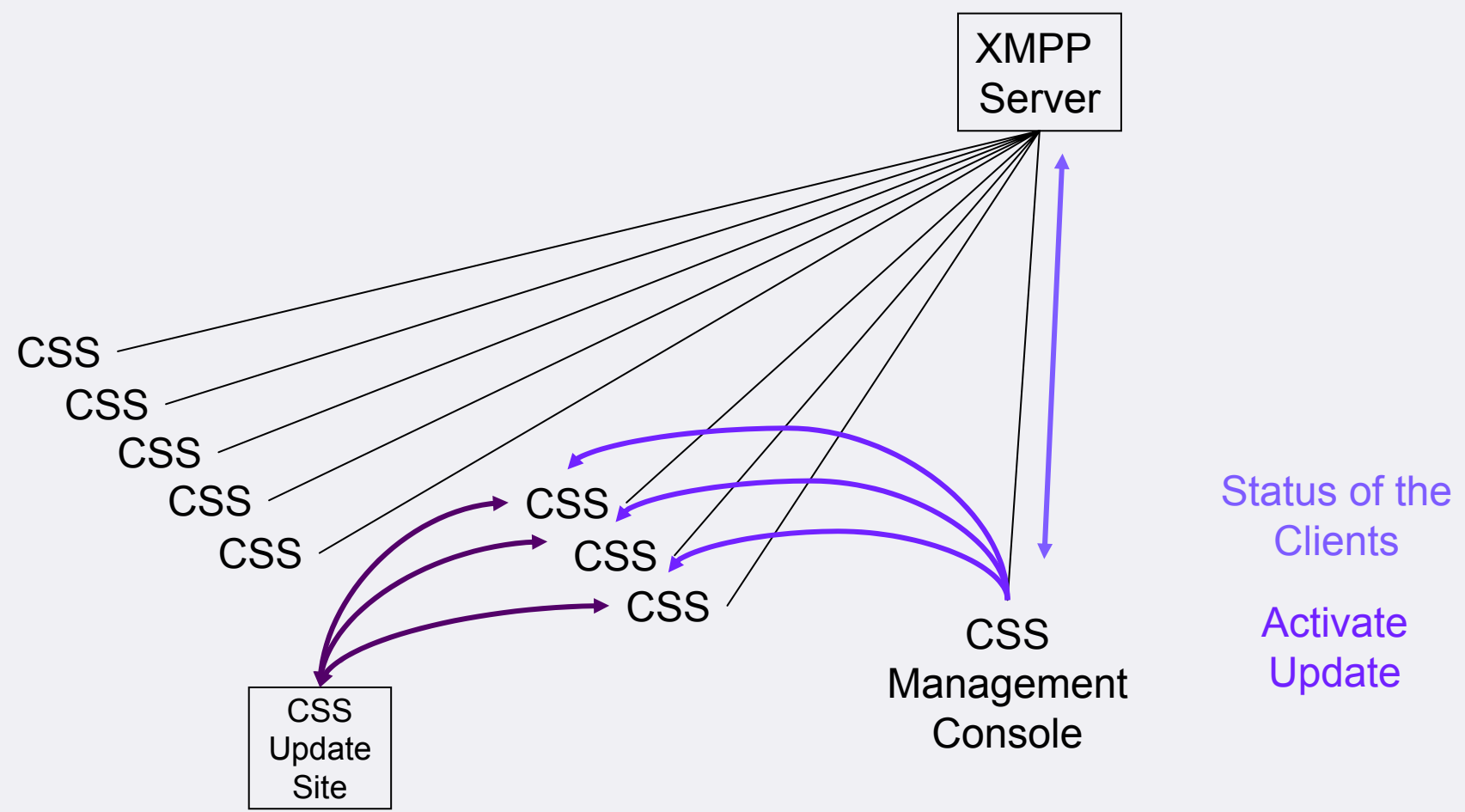
Management Actions available for a **headless CSS application**.

Here: The InterConnecti on-Server

Demonstration: Get list of currently connected IOCs



Management of CSS-Installations



Outlook

Extend Client / Client Communication

- Send File
 - Preference-Store/ Configuration
 - Screen Dump
 - ‘Any’ Object from the Clip Board
- Trigger Updates

Finally:

- Transparent CSS-CSS Communication
(Applications?)

Core Applications

DataViewer (Kay Kasemir – SNS)

- Live Demo on Kay's Mac

Synoptic Display Studio (SDS) (Sven Wende, Alexander Will – C1-WPS)

- Live Demo and presentation
(summary during this session)

CSS Alarm Displays (Jan Hatje – DESY) (summary during this session)

DataViewer



Namespace Tools (LDAP/UNIX scripts)

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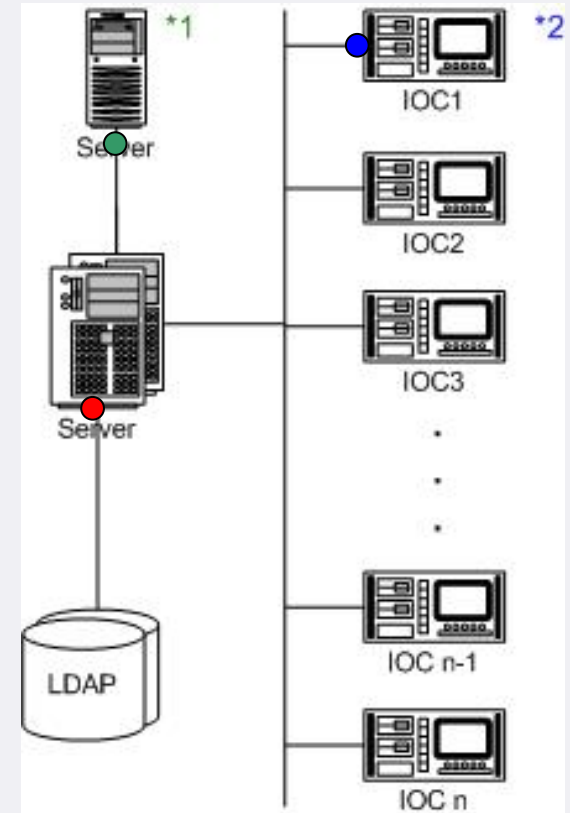
Helge Rickens, DESY / Mks-2

Fill the LDAP-Tree

Per Cron job the server takes the data

- from startup files (old method)^{*1}
- from IOC (new method)^{*2}

and data stored in LDAP.



Namespace Search

With the help of the Namespace Search tool you can find records.

With wildcards you can mask the records you need.

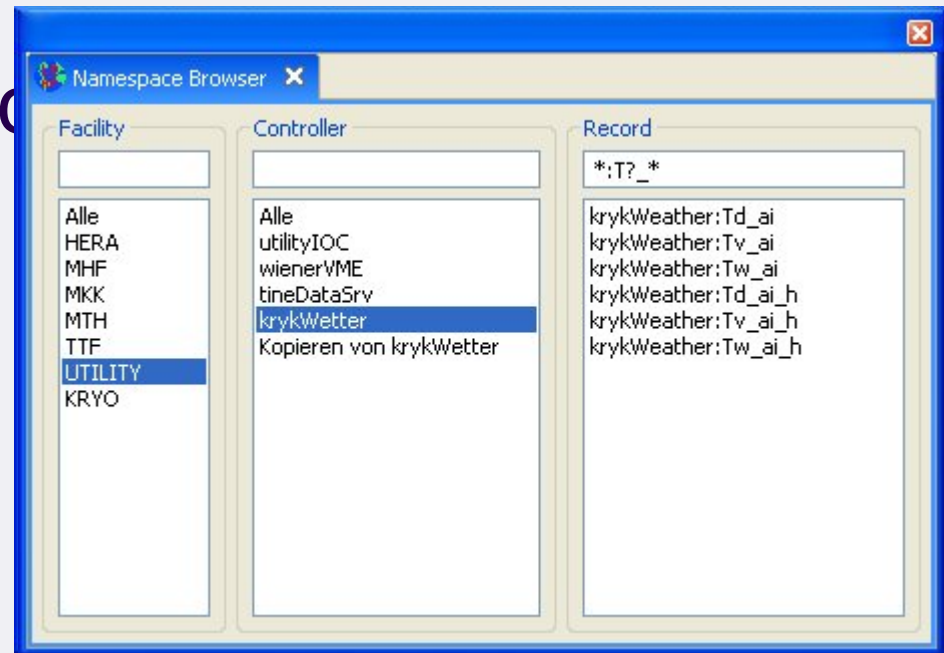
The screenshot shows a window titled "Namespace Search" with a search input field containing "*Weather*" and a "search" button. Below the search bar is a table with the following columns: Record (88), Controller, ecom, and Facility. The table lists various records related to weather data, all controlled by "krykWetter" and located in the "EPICS-IOC" facility at "UTILITY".

Record (88)	Controller	ecom	Facility
krykWeather:PDampfT_ai	krykWetter	EPICS-IOC	UTILITY
krykWeather:PLuft_ai	krykWetter	EPICS-IOC	UTILITY
krykWeather:RegenZ_ai	krykWetter	EPICS-IOC	UTILITY
krykWeather:Td_ai	krykWetter	EPICS-IOC	UTILITY
krykWeather:TempIn_ai	krykWetter	EPICS-IOC	UTILITY
krykWeather:Temp_ai	krykWetter	EPICS-IOC	UTILITY
krykWeather:Tv_ai	krykWetter	EPICS-IOC	UTILITY
krykWeather:Tw_ai	krykWetter	EPICS-IOC	UTILITY
krykWeather:W_ai	krykWetter	EPICS-IOC	UTILITY
krykWeather:angWindU1_ai	krykWetter	EPICS-IOC	UTILITY
krykWeather:angWindU2_ai	krykWetter	EPICS-IOC	UTILITY
krykWeather:angWindU3_ai	krykWetter	EPICS-IOC	UTILITY
krykWeather:angWind_ai	krykWetter	EPICS-IOC	UTILITY
krykWeather:relF1_ai	krykWetter	EPICS-IOC	UTILITY
krykWeather:relF2_ai	krykWetter	EPICS-IOC	UTILITY
krykWeather:relF_ai	krykWetter	EPICS-IOC	UTILITY
krykWeather:vWindBft_ai	krykWetter	EPICS-IOC	UTILITY
krykWeather:vWindBoe_ai	krykWetter	EPICS-IOC	UTILITY
krykWeather:vWindRaw_ai	krykWetter	EPICS-IOC	UTILITY
krykWeather:vWind_ai	krykWetter	EPICS-IOC	UTILITY
krykWeather:RegenZCtl_ao	krykWetter	EPICS-IOC	UTILITY
krykWeather:RegenZSet_ao	krykWetter	EPICS-IOC	UTILITY
krykWeather:PDampfT_ai_b	krykWetter	EPICS-IOC	UTILITY

Namespace Browser

All elements of an assortment are shown in a new list.

The list can be restricted through filters.



Outlook Namespace Tools

Namespace Search

- The search can be more restricted

Namespace Search and Browser

- The search can be used as a component for other views

CSS Post-Analysis Tool: FFT, Correlation Plot, Gaussian, etc.

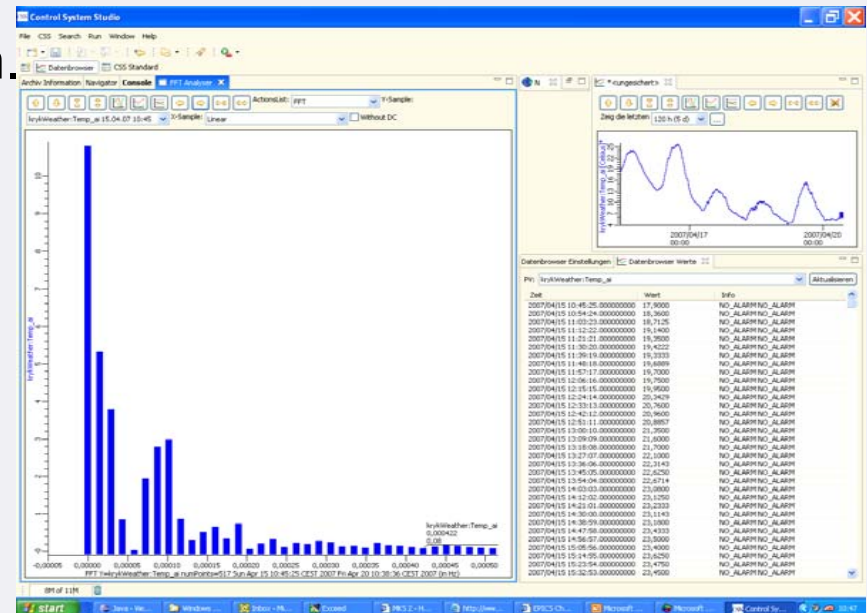
EPICS Meeting – Control System Studio

DESY, April 2007

Albert Kagarmenov, DESY / MKS-2

ArchiverData Analysis

- CSS has access to Archive Data (Databrowser).
- What's about immediate Analysis? (vs. Matlab, Mathematica etc)
- Small plugin for that was written.
- Preliminary name –"Post-Analysis"
- Currently we can handle
 - FFT (normal and Hamming, Bartlett, etc)
 - Correlation plot
 - Gaussian fitting

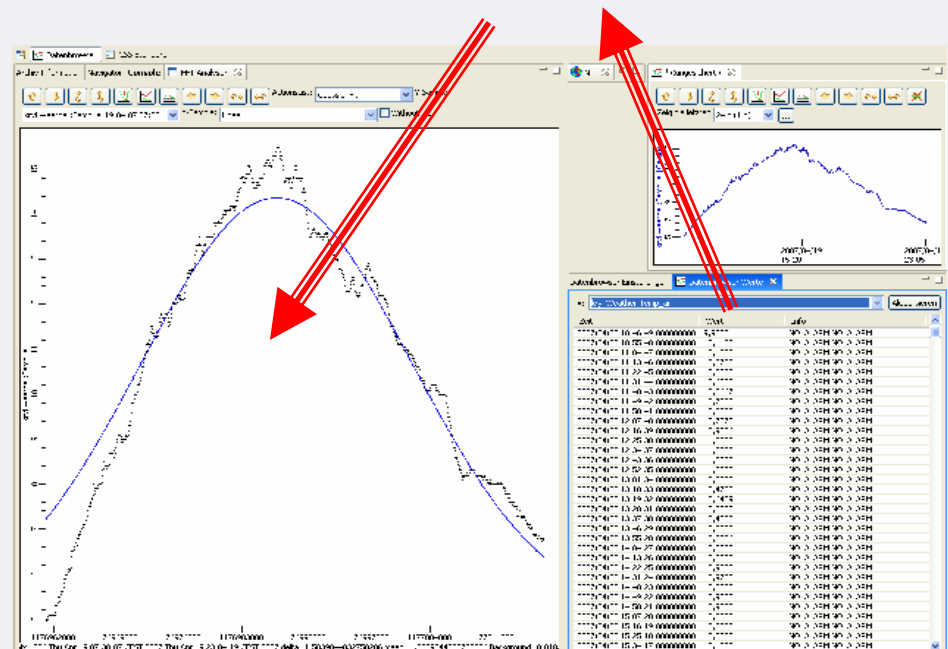
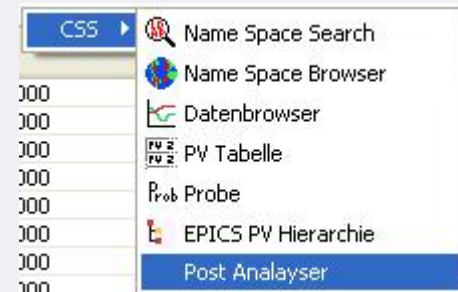


A Mechanism to Receive Data

How data coming from Databrowser to PostAnalysis Plugin?

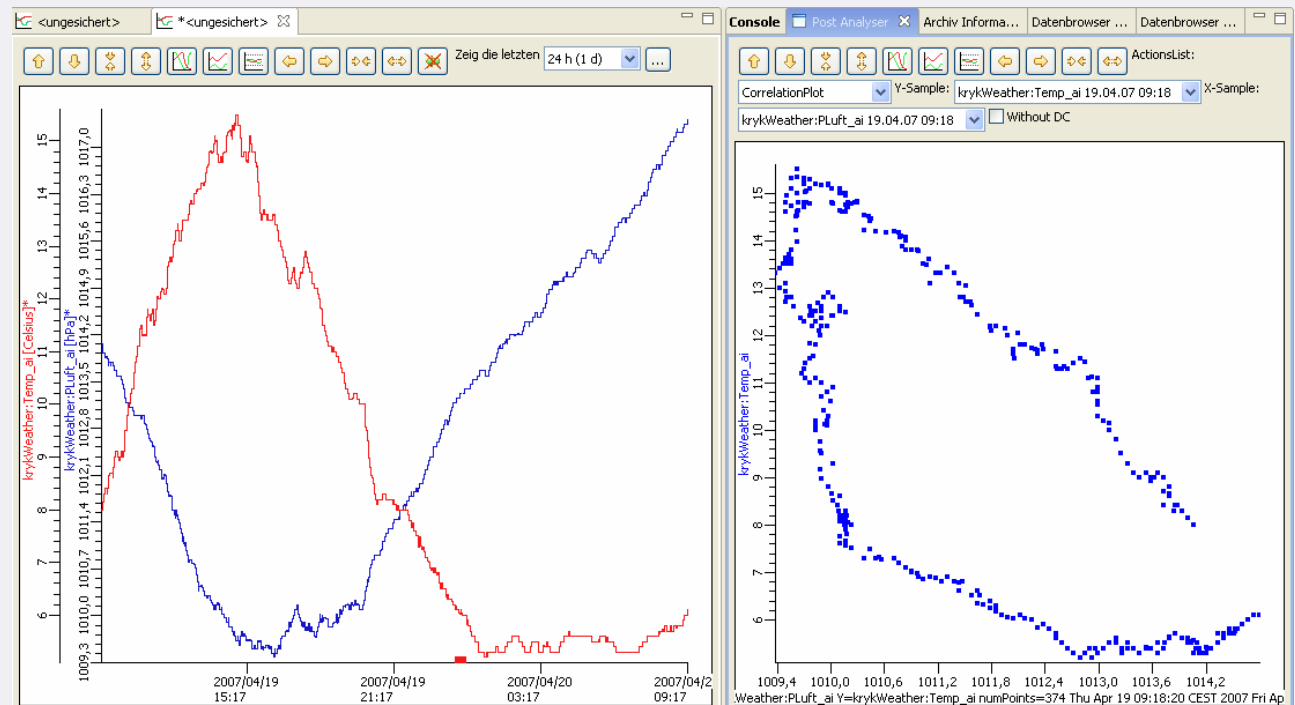
We're using 2 comfortable way –

1. By Mouse Button Click pull-down Menu (Object Contribution)
2. By Drag And Drop Mechanism



Correlation Plot

CorrelationPlot creates XY-plot from 2 archive samples $x(t)$ $y(t)$:

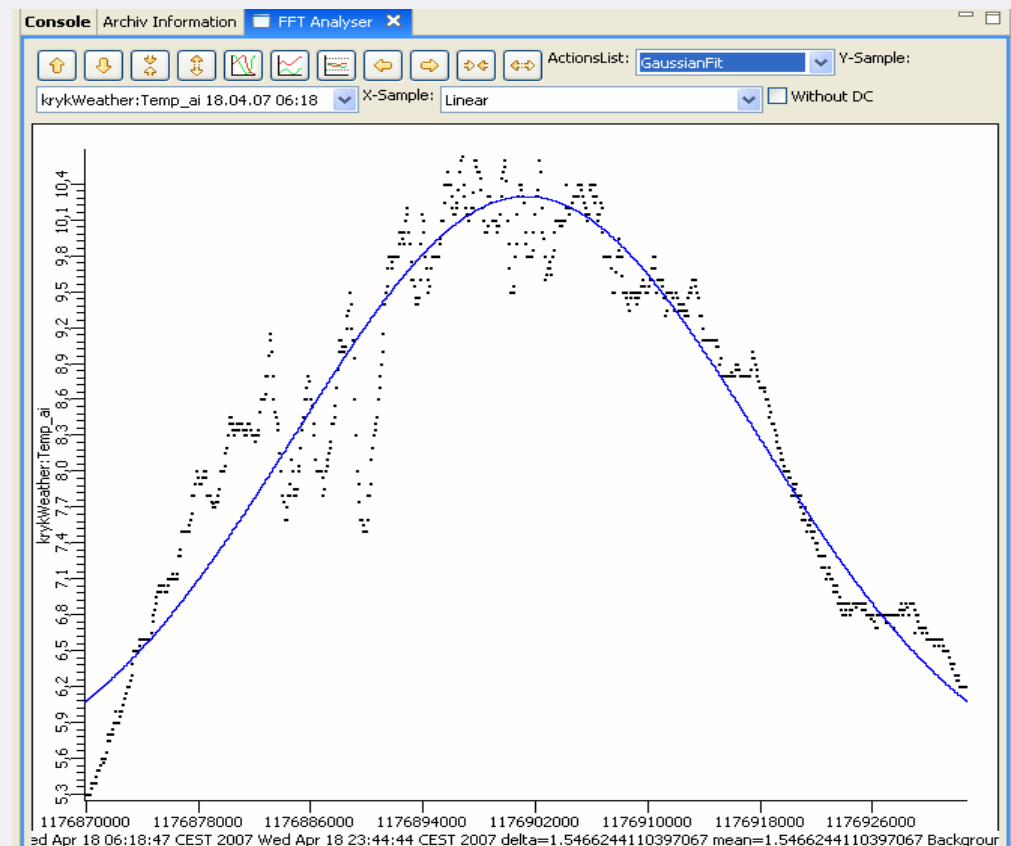


Gaussian Fitting:

GaussianFit tries to find best fit to

$$f(x) = ae^{-(x-b)^2/c^2}$$

Using LSF (least squares fitting algorithm)



**Data Access Layer
for CSS**

Igor Križnar
igor.kriznar@cosylab.com

DAL Design Goals

- Common API for accessing data from different CS sources
 - Based on interfaces rather than abstract classes
 - Covers both narrow and wide style access and both device and channel based CS
- Consistent OO and wide API design
 - simple access to the data (JavaBean style)
 - programming aids (auto-completion)
 - compile time error checking
 - easy debugging
- Narrow style access with introspection
 - metadata
 - for generic applications

DAL Device Features

- Access to commands
 - As objects in generic device
 - As methods for particular device API
 - Synchronous/asynchronous execution
- Access to properties (channels)
 - By name in generic device
 - By API for particular device
- Access to characteristics
 - Synchronous, asynchronous, group
- Connection state (connected, disconnected, failed)
- Property grouping

Pluggable Implementation of DAL

- Interfaces, no abstract classes
- Implementation from scratch
 - Full control
- By using common plug (glue) classes
 - More convenient
 - Easier to ensure DAL compliance
 - You have to extend from some common abstract classes or implement minimized set of interfaces

- Simulation
 - Side defect of design testing
- EPICS
 - Used at DESY
- TINE
 - In prototype stage, should work for most TINE channels
- GSI
 - Virtual accelerator number
 - First Java panels already build and used for commissioning of beamline

CSS-Update Site / What makes a plugin a CSS plugin

EPICS Meeting – Control System Studio SIG

DESY, April the 24th, 2007

Jan Hatje, DESY / MKS-2

Overview

Update site

- Eclipse update mechanism
- How to contribute a plugin on the css update site

Nature of a CSS - plugin

- Requirements and conventions for a CSS - plugin
- Development of a CSS - plugin

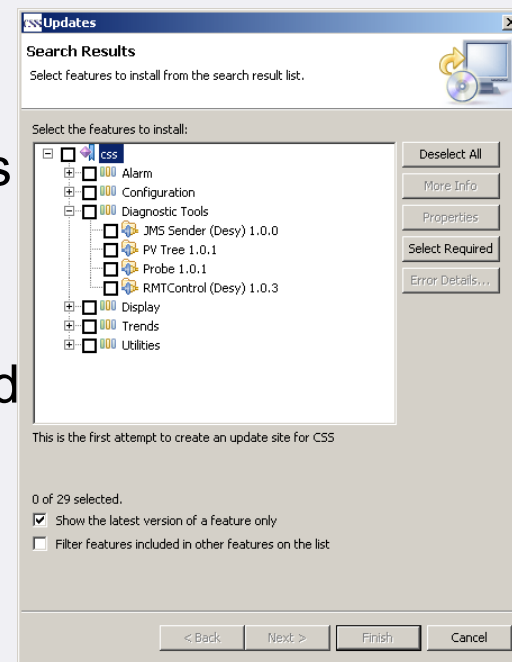
CSS update site I

CSS platform

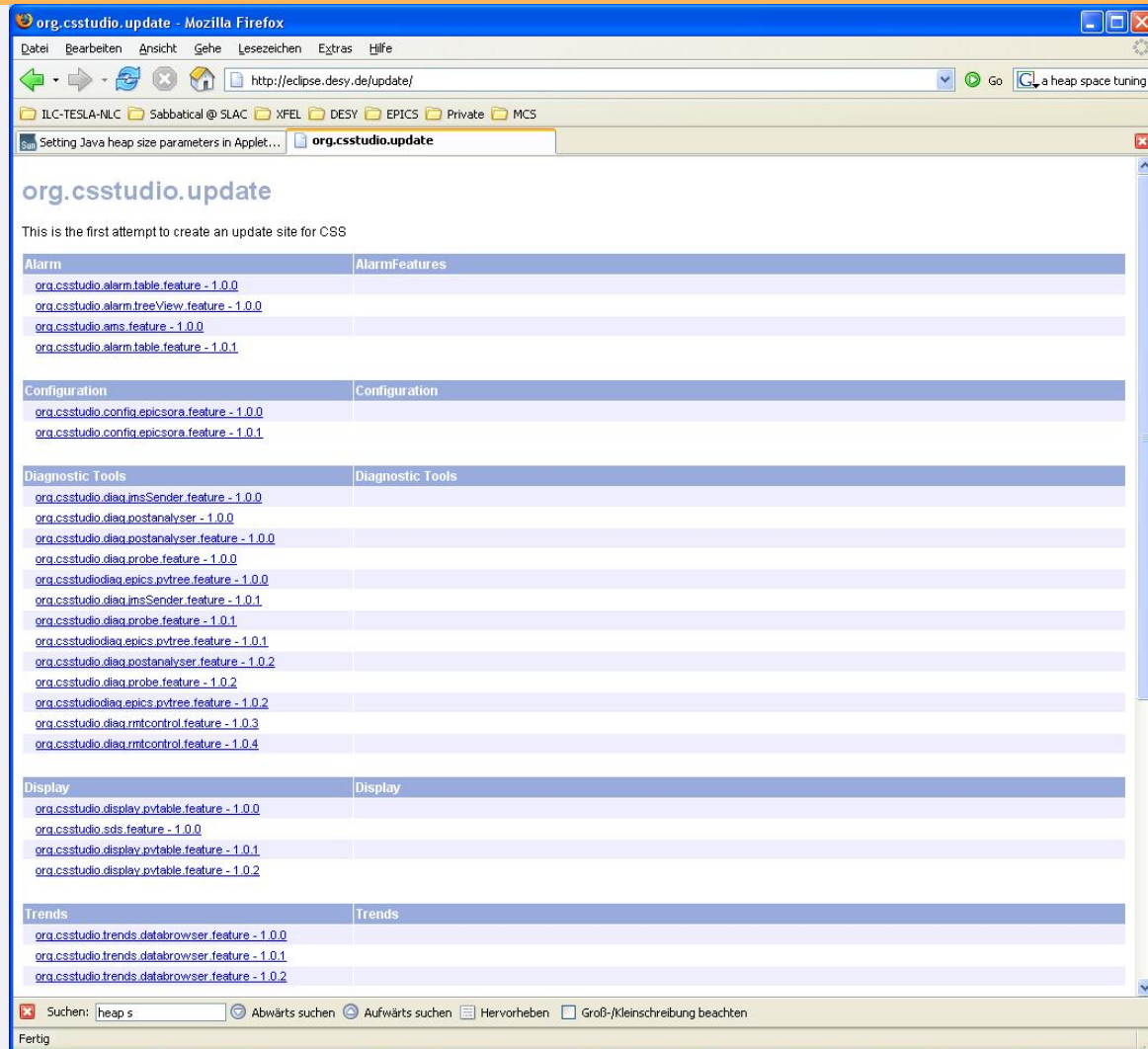
- CSS main application (Download from www.cs-studio.org)
- Provides the online update mechanism

CSS applications

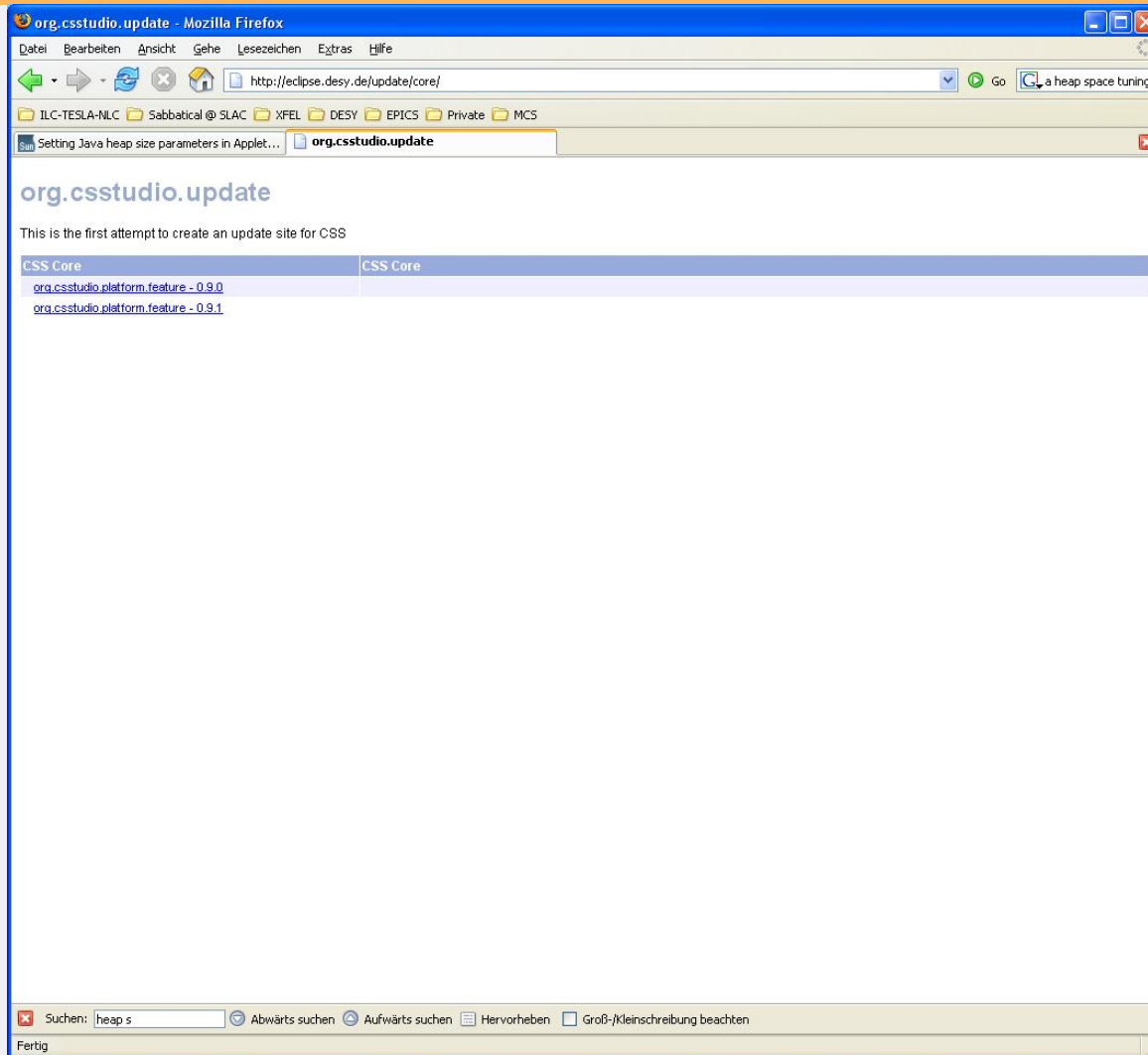
- CSS platform includes no applications
- Get CSS applications from <http://eclipse.desy.de/update>:
Help → Software Updates → Find and Install → Search for new features



(addition: <http://eclipse.desy.de/update>)

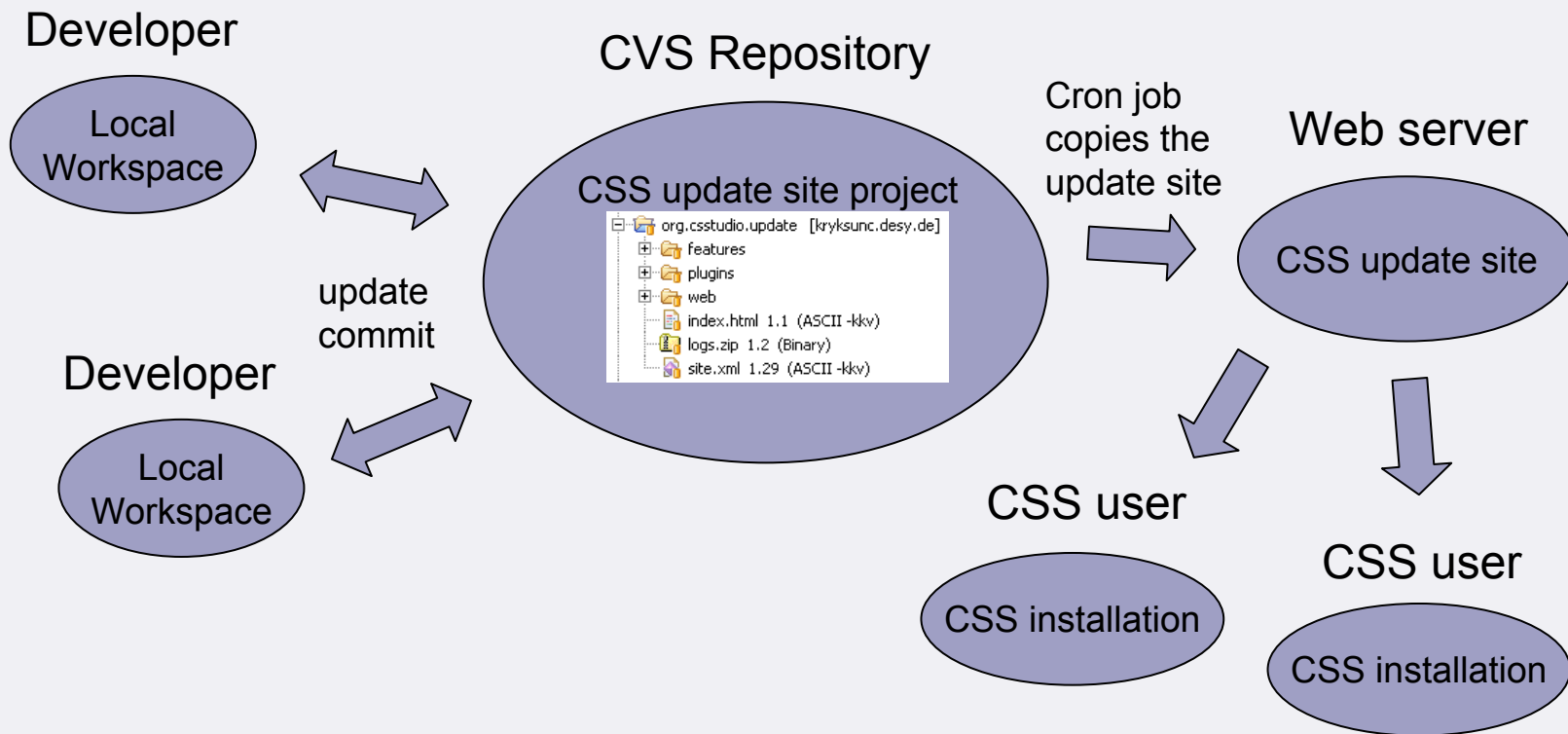


(addition: <http://eclipse.desy.de/update/core>)



CSS update site II

Organisation for the update site



Requirements for CSS plugins I

Technically a CSS plugin has to fulfill the requirements of an eclipse plugin

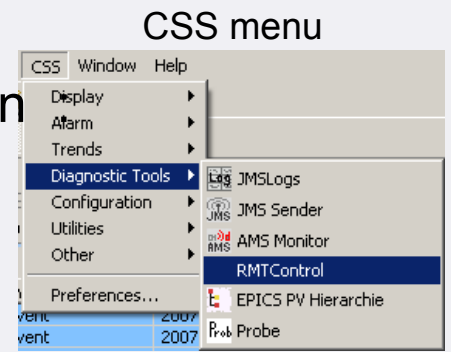
The CSS platform provides an infrastructure and conventions that a CSS application should use

- The structure of a CSS plugin as an eclipse project (Code style, Base class for Activator)
- Features of the CSS platform plugins for developers (Logging, Authorization, Authentication)
- A CSS application should be integrated in the CSS UI structure for a common L&F

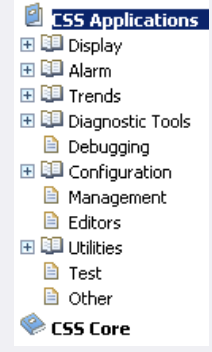
Requirements for CSS plugins II

Convention for a CSS plugin

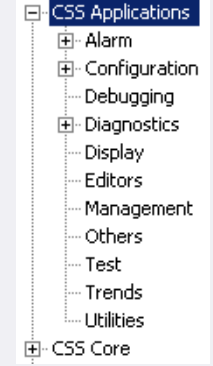
- Integration in



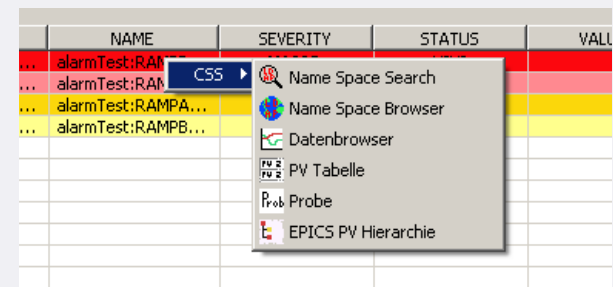
Help system



Preference pages



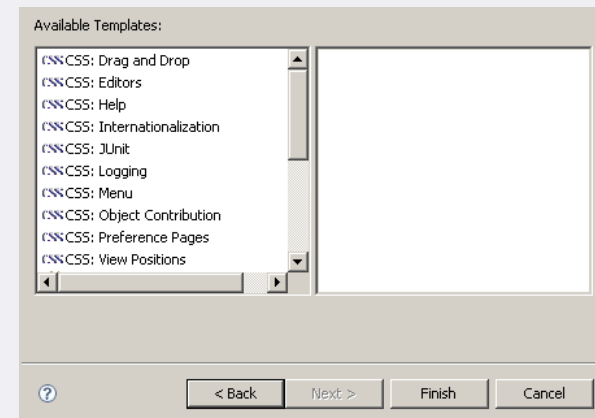
- Using centralised logging mechanism
- Implement CSS Datatypes for DnD and Object contribution



Development of a CSS plugin

Plugin for development support

- Copy plugin
“developmentssupport.jar” in the
plugin folder of your Eclipse IDE
- For new CSS plugins you can use
Templates



CVS repositories

- CSS – Core : Plugins for the CSS platform
- CSS – Applications : Plugins in productive use
- CSS – Sandbox : Plugins to test new applications
- CSS – SDS : Synoptic Display Studio Plugins

Plans for future CSS developments (short term)

From the Workshop:

- CSS core:
 - Plugin Example
Plugin with all the CSS features as a starting point for further developments
- SDS:
 - Widget Example
Widget with all the SDS features as a starting point for further developments
 - Collect requirements for 'button' widget
- DAL:
 - Check implementation with Igor
(has already started)
- Mandatory Applications:
 - JMS and LDAP for alarm and messaging
JMS and LDAP installation documentation and configurations files will be provided on the CSS web site
- Update Site:
 - CSS-Core as a feature on <http://eclipse.desy.de/update/core>
CSS-Core will be available from the update site as a feature

Plans for future CSS developments (long term)

From the Workshop:

SDS:

- Script driven generator for *.CSS-SDS files

Wish list for future CSS developments – volunteers?

From the Workshop:

- SDS:
 - Widget development by community