Building up an Experimental Control Software @ BL14B2
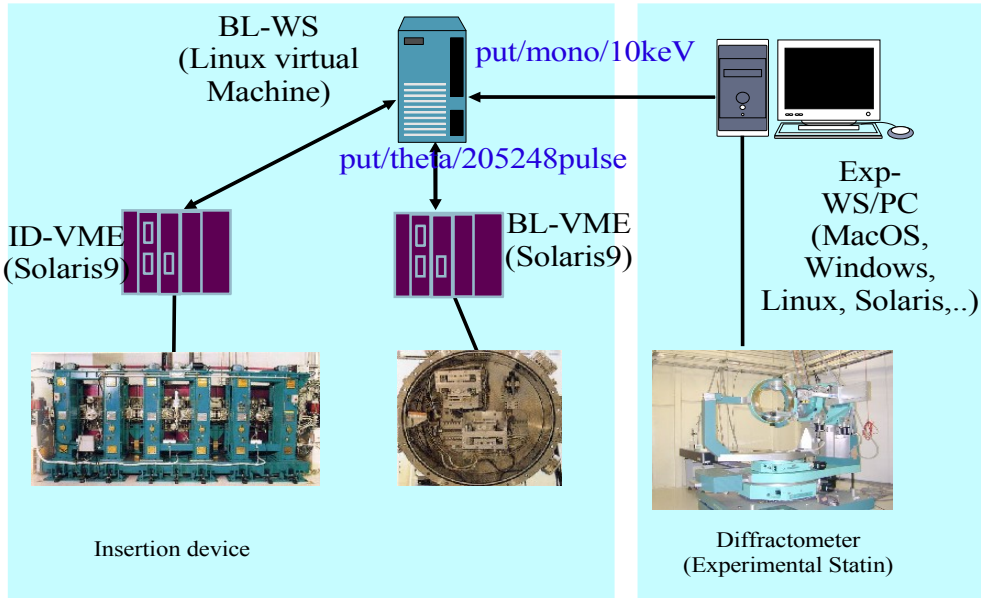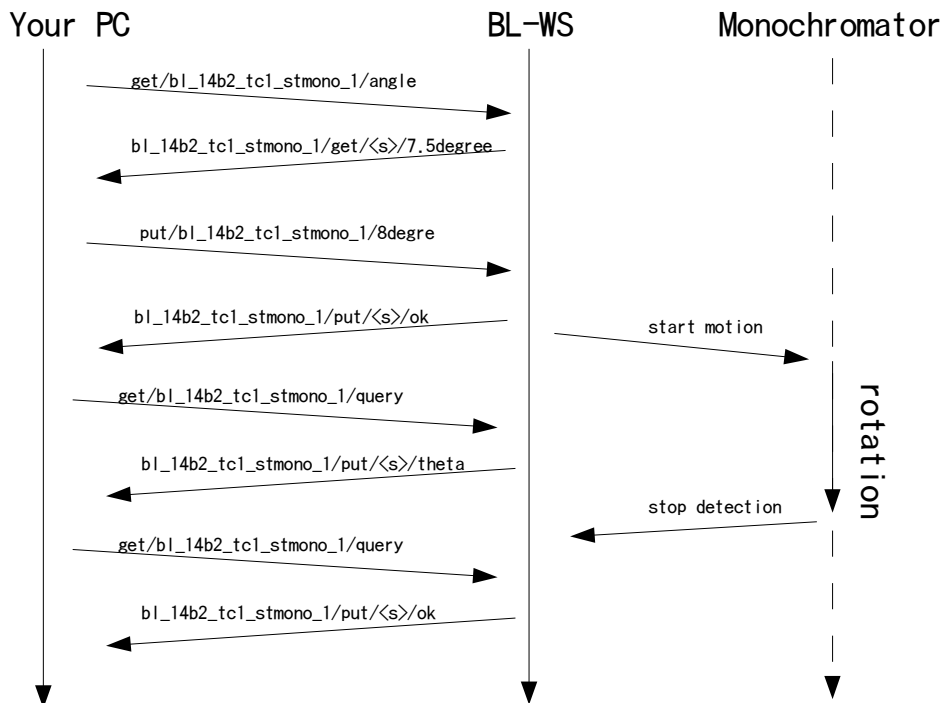
18, 19 Sep. 2007

1. Beamline Control System at SPring-8

- MADOCA (Message And Database Oriented Control Architecture) Framework
  Message Exchange based control system

Insertion device

Diffractometer
(Experimental Statin)

- Messages to control a monochromator @ BL14B2

2. Summary of messages for the monochromator and counters

V	O	C (send)	C (return)
put	bl_14b2_tc1_stmono_1	%fkev	ok / fail
put	bl_14b2_tc1_stmono_1	%fangstrome	ok / fail
put	bl_14b2_tc1_stmono_1	%fdegree	ok / fail
get	bl_14b2_tc1_stmono_1	energy	%fkev / fail
get	bl_14b2_tc1_stmono_1	wavelength	%fangstrome / fail
get	bl_14b2_tc1_stmono_1	angle	%fdegree / fail
get	bl_14b2_tc1_stmono_1	query	ok / theta / y1 / alpha1 / alpha2 / running / stoping / fail
put	bl_14b2_tc1_stmono_1	stop	ok / fail
put	bl_14b2_tc1_stmono_1	emstop	ok / fail
put	bl_14b2_tc1_stmono_1	recover	ok / fail
put	bl_14b2_tc1_stmono_1_netplane	111 / 311 /511	ok / fail
get	bl_14b2_tc1_stmono_1	netplane	si111 / si311 / si511 / fail

V	O	C (send)	C (return)
put	bl_14b2_st1_counter_1	clear	ok / fail
put	bl_14b2_st1_counter_1	%dsec	ok / fail
get	bl_14b2_st1_counter_1	query	inactive_%dcount... / counting_%dcount... / fail
get	bl_14b2_st1_counter_1	count	%dcount_%dcount_%dcount_%dcount / fail

    o Single message command for testing
tellms <command>

Example
>tellms get/bl_14b2_tc1_stmono_1/angle
tellms::received message=bl_14b2_tc1_stmono_1/get/5400_tellms_furukawa_vaios90s/0degree

<u>Try several commands and consider message sequence to obtain XAFS sepectra.</u>
NOTE: Please do not change the netplane today.

    o More details of control commands (in the SPring-8 site only)
      http://madoca/for_staff_and_users/beamline/usr_svoc/

3. Command Interpreter
    o Command interpreter (CI) accepts an abstract message like energy or wavelength for beamline components and decompose it into primitive messages which the VME computor can accept. (Primitive messages are

used to control individual axis of the beamline components like the monochromator, mirrors, slits.)
- o The CI refers a configuration file which describes how an abstract message is interpreted and how to decompose it into primitive messages.
- o You can describe the sequence to obtain XAFS spectra in the configuration file.
- o Example

```
 1: SUBSECTION FUNCTION
 2:  apply put/count_%dsec_%dtimes
 3:
 4:  function $i [ 0 ]
 5:  while [ $i < target(2) ]
 6:     function bl_14b2_st1_counter_1 [ "clear" ]
 7:     function bl_14b2_st1_counter_1 [ target(1) ] sec
 8:     sequence
 9:     print [ count_1 ] counts
10:     print [ new_line() ]
11:     function $i [ $i + 1 ]
12:   endwhile
13: ENDSUBSECTION
```

1: Declaration of New abstract message section
2: Abstract message, %d, %f and %s denote a integer number, real number and string, respectively.
4: Initialization of internal variable. "$" denotes a internal variable.
6: send "put/bl_14b2_st1_counter_1/clear"
7: send "put/bl_14b2_st1_counter_1/1sec", time length is described in t the second part of C of the abstract message from client.
8: Wait for counting end
9: Display on screen result. The variable "count_1" is described in other section.

Write a XAFS measurement sequence into the configuration file.