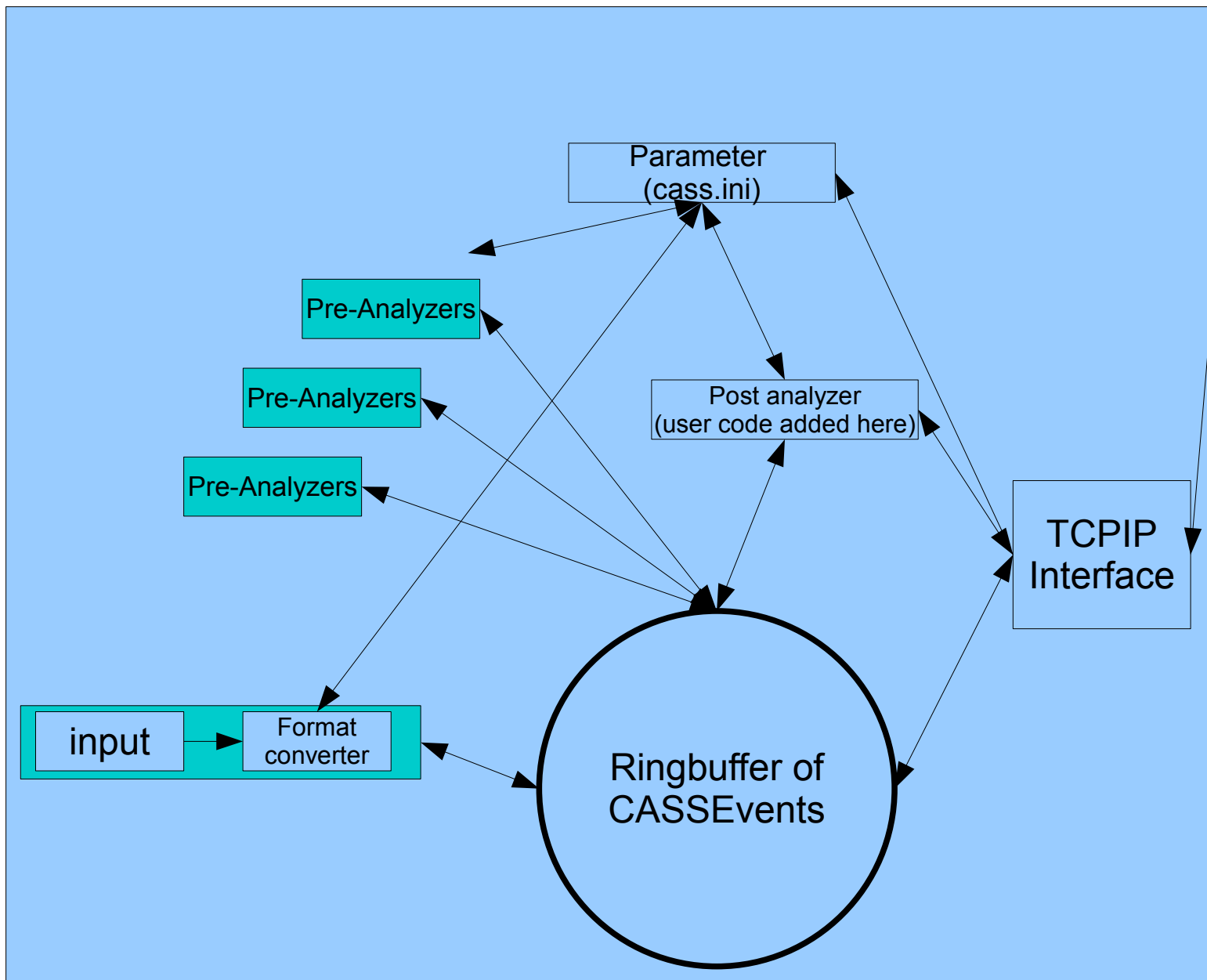➔ Lesson learned from this run:
- ➔ Network slow, such that its better to only have computation on blade and graphics on local computer
- ➔ pnCCDlib is for unknown reason in cass very slow
  - ➔ Need to decide whether we are going to use it or redo what is in there
- ➔ Naming of CASSEvents Parts / libraries does not reflect the real world
  - ➔ Should be renamed / reorganized to reflect the physical appearance of the devices
  - ➔ Should be build with more inheritance
  - ➔ Acqiris is the only device that can have multiple / very different detectors attached to it
- ➔ To be able to analyze the amount of data we need to share the work among the available cores
  - ➔ Need to make analyzers really reentrant (avoid static, lock shared resources, only have on analyzer instance per device that is shared by all pre-analyzers)
- ➔ People need to have an interface to the pre-analyzed data, so that they can include their own algorithms on the data
- ➔ To lower the network load on needs to do some of the post analysis (commonly used Histograms) on the blades.
  - ➔ These will be requested by another program running outside the blade
- ➔ Communication should be done via tcpip
- ➔ Need a concept that one only has to interchange the input type and then it will run on files and on the machine side input
- ➔ Different concepts of what should represent a framepixel have been proposed by different people (signed 16bit, unsigned 16bit, complex). We need to decide.

Outside program
(user definable)

Parameter
(cass.ini)

Pre-Analyzers

Pre-Analyzers

Pre-Analyzers

Post analyzer
(user code added here)

TCPIP
Interface

input

Format
converter

Ringbuffer of
CASSEvents

Tcpip interface:
➤Ask for next processed event
  ➤ Only retrieve the information one
     is looking for not the whole event
➤Ask for list of indexes in a given time-
interval
➤Ask for a event with index i
➤Signal that parameters have to be
loaded again
➤Ask for post process histogram

New Design of Cassevent:
list of devices (acqiris, opal / pulnix, machine, pnccd)

      devices:
            Acqiris:
            List of channels
            list of detectors (Tof(s), Delayline(s),Voltmeter,Intensitymonitor)

            Opal / Pulnix:
            Imagedetector

            PnCCD:
            List of Imagedetectors

            Machine Device:
            Map of Epics Variables / Beamline Data (BLD)

      detectors:
            Delaylinedetector:
            As before, but maybe a list of anodelayer (to take care of Hex/Quad Detectors)
            Add waveforms for the different anodeends (signals)

            Tof / Intensity detectors:
            Waveforms (more or less just a pointer to the right channel)

            Voltmeter(probably used for split mirrors, to get position):
            Value of the voltage

            Imagedetector:
            Frame
            List of photonhits (x,y,pixelvalue)

      others:
            Channel:
            Waveform

Format converter:
- Acqiris Converter
  - Fill channels with waveform and info
- Opal Converter
  - Get frame and info
- pnccd Converter
  - Get frame segments and align them to represent the right geometry of the detector

Analyzer:
- Acqiris
  - Intensity / ToF
    - Make a signal analysis (choosable) on demand
  - Voltmeter
    - Average over given amount of pixels to find the mean voltage value
  - Delayline
    - Analyse the waveforms to find the signals of the wireends / mcp using chosen code
    - Sort the signals to hits using the chosen method
- Opal / Pulnix
  - Go through the frame and extract the photon hits (this is only done on demand)
- Pnccd
  - Basically have the options that Xonline has right now to massage the data.
    - Create offset / noise map (offset could be created using the masked parts of det at the edges)
    - Offset correction for entire detector
    - Signal analysis + common mode correction on / off
    - Single event / Recombined event (with the proper sub selections)
  - Do all of the above with reentrant functions. Such that one can reuse an instance of the analyzer

- Check reason for crashes using the monshared server reading from file
  - Nicola, Lutz

- Find out how Chris O'Grady is going to implement the YAG on/off statement shot by shot
  - Lutz

- How is the decision about the Laser operation (is it going to be shut on / off with 30 / 60 Hz?)
  - Workshop results

- Create the tcpip interface
  - Someone that comes in new? Who can do this?

- Redesign cassevent
  - Lutz

- Redesign format converter
  - Lutz

- Redesign Acqiris analyzers
  - Lutz

- Redesign pnCCD analyzer
  - Nils? or Nicola / Stephan

- Add YAG on / off to Machine analyzer
  - Lutz

- Create the post processor files that people are able to fill in their own code
  - Lutz

- Add the possibility of having 3 states to Ringbuffer
  - Lutz

- Redo worker (move converter to input thread)
  - Lutz

- Need to decide what kind of pixel format should be used for the frames
  - Workshop results

- Add possibility to control what Formatconverters / Analyzers are active via parameters
  - Lutz

Timeline

February — March

Feb																															März																													
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W

Create Postprocessor files
Redo Worker

New CASSDesign
New FormatConverter

Tcp/ip interface done

Add 3 states to Ringbuffer

April — May

April																														Mai																													
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M	T	W	Th	F	S	Su	M

•Changed analyzers
•Control over Analyzers / Formatconverters via Parameters
•Check with Chris how YAG on / off works
•

Testing program
➔Make sure that the analyzer will work thread safe
➔Speed of whole program
➔Check whether variables have meaningful content

Beamtime