

DE LA RECHERCHE À L'INDUSTRIE



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**IAEA**

International Atomic Energy Agency

# WestBox: an object-oriented software component for WEST CODAC

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12TH TECHNICAL MEETING ON CONTROL, DATA ACQUISITION AND REMOTE  
PARTICIPATION FOR FUSION RESEARCH

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Since 2013 => start to **re-factoring CODAC source code**.

Goals :

- Modernize legacy implementations (C / Makefiles),
- Create a framework by main features:
  - Data Acquisition,
  - Timing Network,
  - Finite States Machines,
  - Shared Memory Network,
  - etc.
- Make cross-plaform code (Cmake / Qt).
- Create a new component named **WestBox**:
  - Object-oriented conception (C++),
  - Integrate non native fast controller,
  - Easily support external collaborations,
  - Migrate to open technologies (Websocket, Mqtt).

## WestBox client:

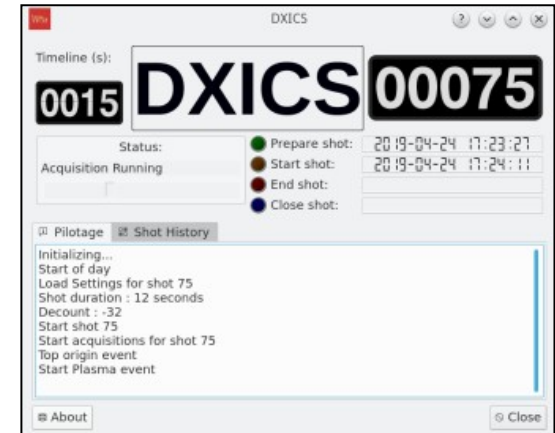
- Fast controller.
- Use framework features on demand,

## Goals:

- Read / Write settings from database,
- Acquire Plasma discharge data,
- Receive timing network events,
- Follow pulse sequence (finite-states machine),
- Shares data for plasma discharge control,
- Write large files to database.

## Extended:

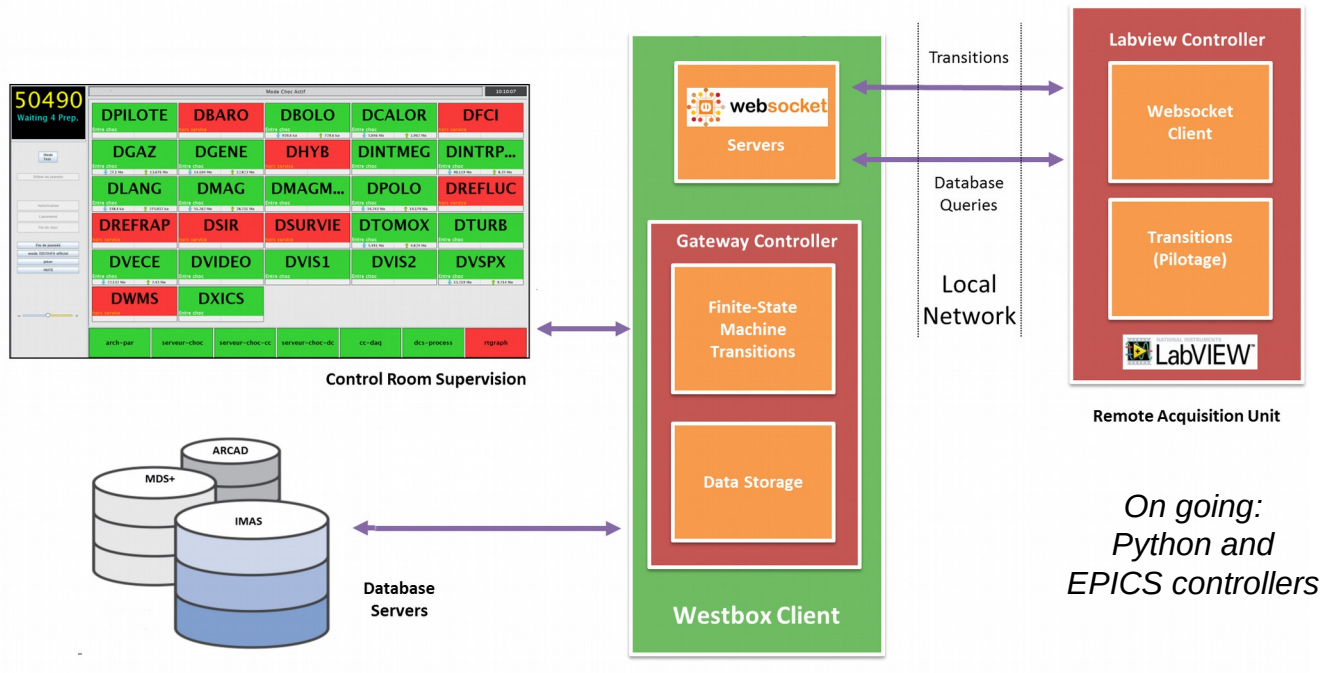
- Provide local GUI (Qt),
- Integrate **Websocket** server:
  - Stream acquisition,
  - Stream states/events,
  - Stream log-files,
- Provide remote Web interface.



<pre> [DXICS] DEBUG: 2019-04-24T14:47:21: westbox.mstates : Requested goal: ACQUISITION_EN_COURS [DXICS] DEBUG: 2019-04-24T14:47:21: westbox.mstates : ..... [DXICS] DEBUG: 2019-04-24T14:47:27: westbox.mstates : Message come from "supervision" : Request : "ETAT COMPTE RENDU" [DXICS] DEBUG: 2019-04-24T14:47:27: westbox.mstates : STATUS REPORT [DXICS] DEBUG: 2019-04-24T14:47:27: westbox.mstates : Message come from "supervision" : Request : "ETAT_PHASE" [DXICS] DEBUG: 2019-04-24T14:47:27: westbox.mstates : STATUS PHASE [DXICS] DEBUG: 2019-04-24T14:47:42: westbox.mstates : Message come from "supervision" : Request : "ETAT COMPTE RENDU" [DXICS] DEBUG: 2019-04-24T14:47:42: westbox.mstates : STATUS REPORT [DXICS] DEBUG: 2019-04-24T14:47:42: westbox.mstates : Message come from "supervision" : Request : "ETAT_PHASE" [DXICS] DEBUG: 2019-04-24T14:47:42: westbox.mstates : STATUS PHASE [DXICS] DEBUG: 2019-04-24T14:47:49: westbox.momlister : Reception of RTworks message "acquisition donnees" : "99" [DXICS] DEBUG: 2019-04-24T14:47:53: westbox.momlister : Reception of RTworks message : "msg" : "4" [DXICS] DEBUG: 2019-04-24T14:47:53: westbox.momlister : ACQThread "AcquisitionsManager" start mesurements from jobs: [DXICS] DEBUG: 2019-04-24T14:47:53: westbox.acquisitions : " AcquisitionsManager(1) ==&gt; job1-(800ms)" [DXICS] DEBUG: 2019-04-24T14:47:53: westbox.acquisitions : " AcquisitionsManager(2) ==&gt; job1-(500ms)" [DXICS] DEBUG: 2019-04-24T14:47:55: westbox.momlister : Reception of RTworks message : "msg" : "99" [DXICS] INFO : 2019-04-24T14:47:56: westbox.client.acquisitions : Total Data Acquired (bytes) : 28848 [DXICS] DEBUG: 2019-04-24T14:47:57: westbox.mstates : Message come from "supervision" : Request : "ETAT COMPTE RENDU" [DXICS] DEBUG: 2019-04-24T14:47:57: westbox.mstates : STATUS REPORT [DXICS] DEBUG: 2019-04-24T14:47:57: westbox.mstates : Message come from "supervision" : Request : "ETAT_PHASE" [DXICS] DEBUG: 2019-04-24T14:47:57: westbox.mstates : STATUS PHASE [DXICS] INFO : 2019-04-24T14:47:59: westbox.client.acquisitions : Total Data Acquired (bytes) : 58938 [DXICS] INFO : 2019-04-24T14:48:02: westbox.client.acquisitions : Total Data Acquired (bytes) : 87595 [DXICS] INFO : 2019-04-24T14:48:05: westbox.client.acquisitions : Total Data Acquired (bytes) : 116590 [DXICS] INFO : 2019-04-24T14:48:08: westbox.client.acquisitions : Total Data Acquired (bytes) : 145955 [DXICS] INFO : 2019-04-24T14:48:11: westbox.client.acquisitions : Total Data Acquired (bytes) : 175440 [DXICS] DEBUG: 2019-04-24T14:48:12: westbox.mstates : Message come from "supervision" : Request : "ETAT COMPTE RENDU" [DXICS] DEBUG: 2019-04-24T14:48:12: westbox.mstates : STATUS REPORT [DXICS] DEBUG: 2019-04-24T14:48:12: westbox.mstates : Message come from "supervision" : Request : "ETAT_PHASE" [DXICS] DEBUG: 2019-04-24T14:48:12: westbox.mstates : STATUS PHASE [DXICS] INFO : 2019-04-24T14:48:14: westbox.client.acquisitions : Total Data Acquired (bytes) : 205325 [DXICS] INFO : 2019-04-24T14:48:17: westbox.client.acquisitions : Total Data Acquired (bytes) : 234480 [DXICS] INFO : 2019-04-24T14:48:20: westbox.client.acquisitions : Total Data Acquired (bytes) : 263825 [DXICS] INFO : 2019-04-24T14:48:23: westbox.client.acquisitions : Total Data Acquired (bytes) : 293365                 </pre>		<p>Acquisitions Unit</p> <h2>DXICS</h2> <p>[ - ]</p> <p><b>Acquisition Running</b></p> <p>Current Shot: 93</p> <p>Prepare shot: 2019-04-24 14:47:15 Start shot: 2019-04-24 14:47:53 End shot: ---</p> <p>Close shot: ---</p> <p>Data acquired: 0 Data uploaded: 0</p> <p>Get Status Get Version Get History System Info</p>
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Non native device:

- Integrated as remote controller (ex Labview),
- WestBox become a Websocket gateway :  
  - Delegate finite-states,
  - Delegate database access.
- Simple XML based protocol,
- Easy to hack with web browser.



*On going:  
Python and  
EPICS controllers*

# Thanks for your attention

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