

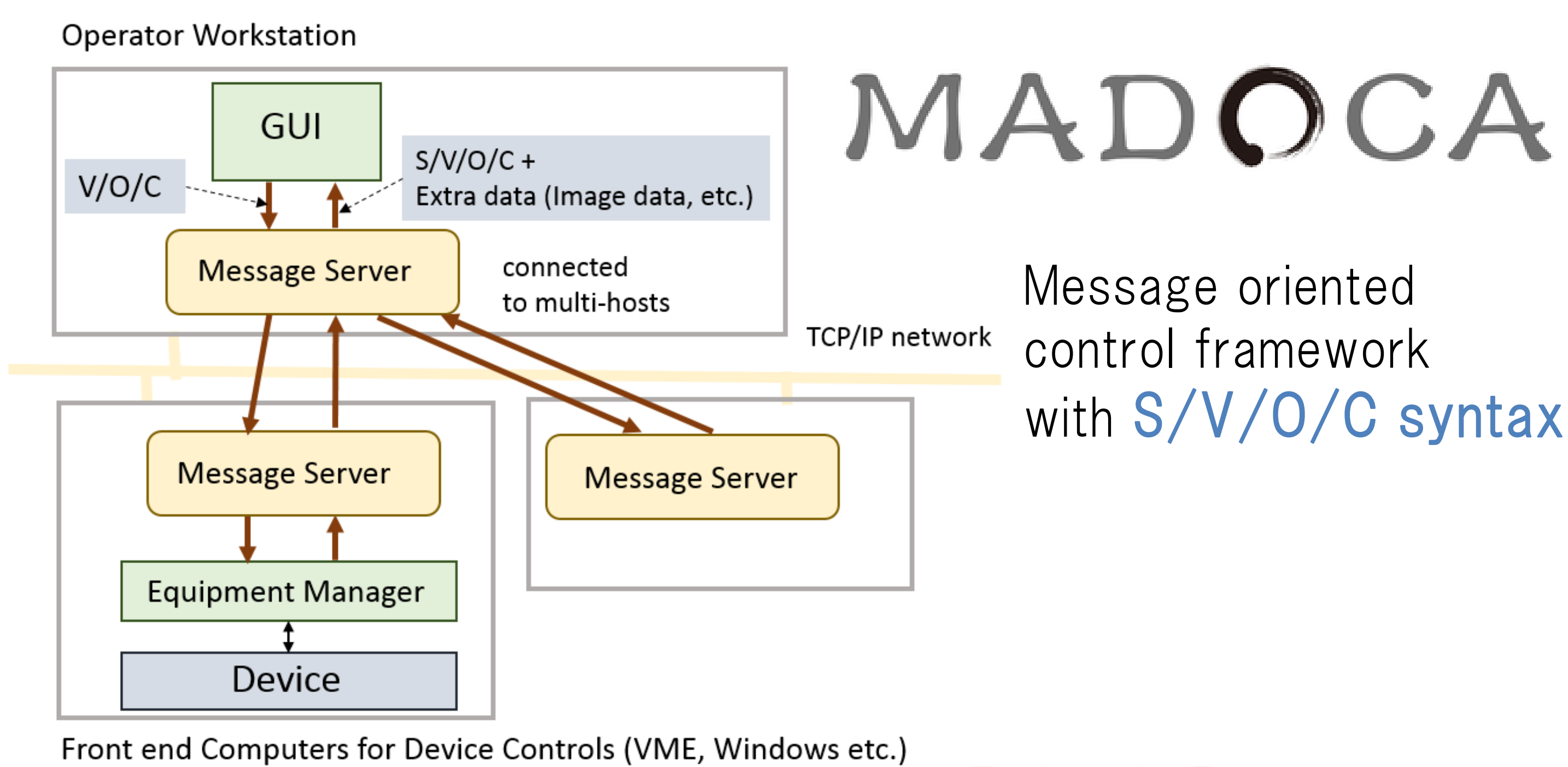


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Abstract

We redesigned MADDOCA II-LabVIEW interface for easy to use to spread the benefits of MADDOCA II into many LabVIEW users in SPring-8. LabVIEW VIs were built with Dynamic Link Libraries for better maintainability. Message and various data in MADDOCA II are easily accessed with key-value stores and messaging processes are simply decomposed with the VI. MADDOCA II applications can be easily built with the new LabVIEW interface. We plan to apply MADDOCA II-LabVIEW in control applications in SPring-8 such as image monitoring at experimental stations.

MADDOCA II

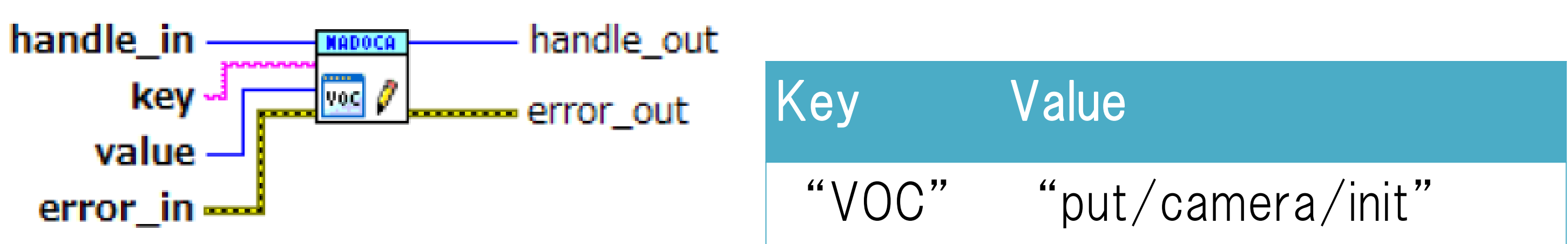


Message oriented control framework with S/V/O/C syntax

- Improved for the flexibilities with **OMQ**
 - Various data (image data etc.) attached in a message
 - Control applications on Windows
- Implemented into SPring-8 and SACLA DAQ system in 2013

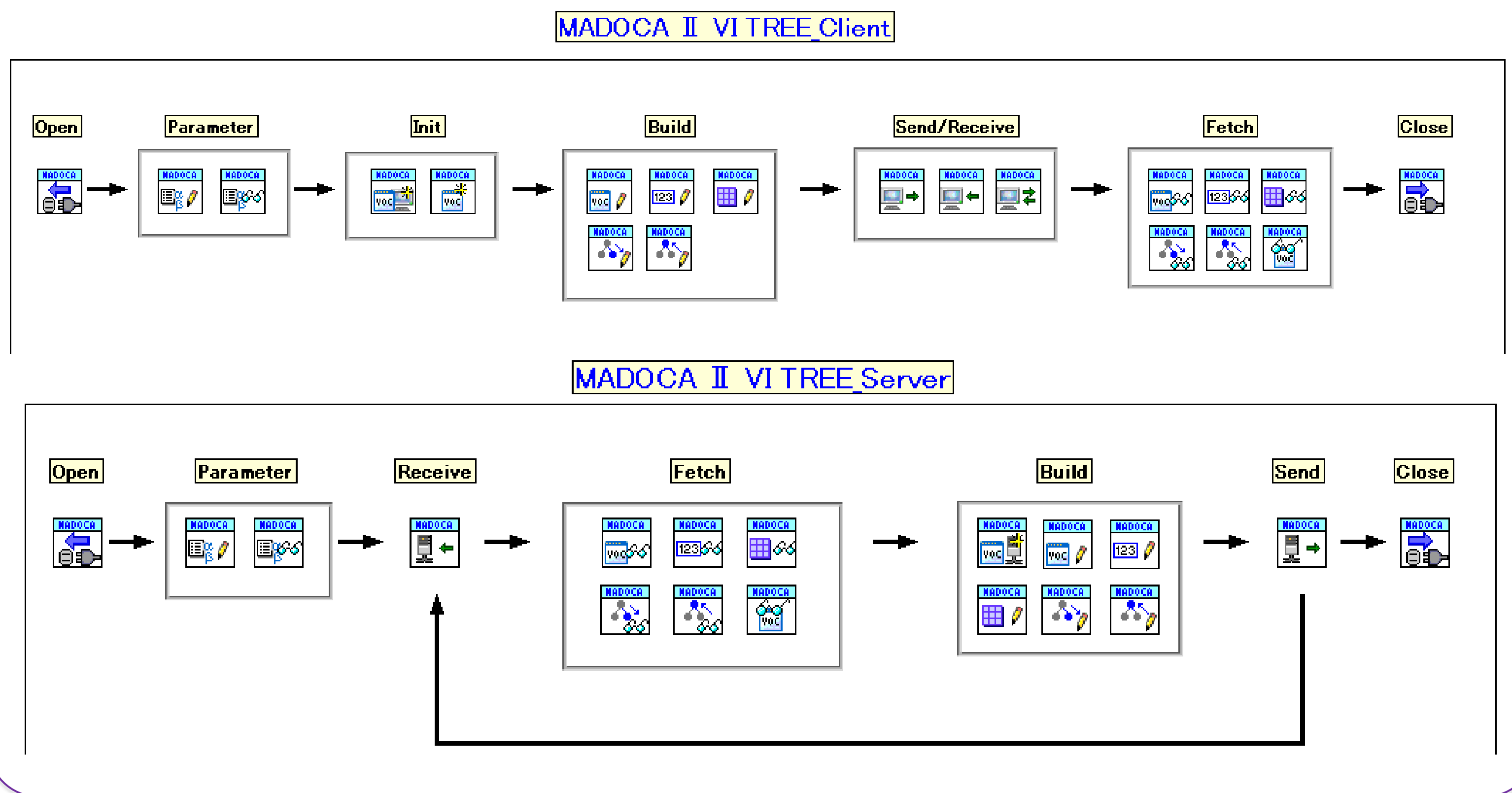
MADDOCA II LabVIEW Interface

- Benefits to have unified control framework in SPring-8
 - Many LabVIEW users especially in experimental stations
 - Developed easy to use interface
- Dynamic Link Library (DLL) is used to build LabVIEW VIs
 - Easily upgraded by replacing the DLL
 - Python interface is also available from the DLL
- Key-Value Stores are used to easily manage message and various data in MADDOCA II
 - An internal buffer in the DLL to intermediate the information



Developed VI components of MADDOCA II

- Messaging processes are simply decomposed for clients and servers (Equipment Manager)
- Easily programmed with 23 VIs in total
 - Open/Close, Send/Receive, Parameter, Error
 - Message Interface (SVOC message + Various data)



Available Data Format

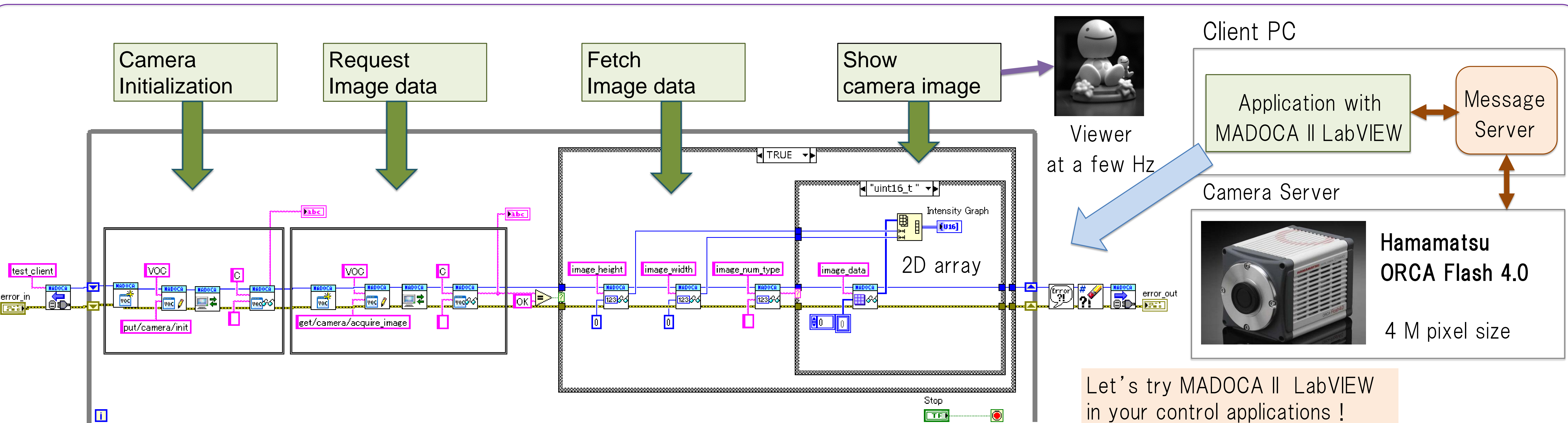
- Data can be accessed through Key-Value Stores
 - Value, Array, Hierarchical structure
- MessagePack to serialize the data in the messaging
- Data format is defined for an each case
 - Image data, Waveform data, Camera controls etc.

ex.) Data format for the image data

Key	Data type	Value
"image_data_type"	string	"MONO" , " RGB" , " RGBA"
"image_width"	int32_t	
"image_height"	int32_t	
"image_depth"	int32_t	
"image_num_type"	string	"uint8_t" , " uint16_t" , " uint32_t" , "..." , " float" , " double"
"image_data"	defined by image_num_type	
"image_pixel_order"	string	"lefttop" , " leftbottom"

- Applied to image data in two-dimensional interferometer with MADDOCA II
 - A. Kiyomichi et. al, Proc. of ICALEPCS 2013, p.78

Camera Image Viewer with MADDOCA II LabVIEW Interface



Let's try MADDOCA II LabVIEW in your control applications!
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