

Online_v2 – An upgraded control & monitor software for GMRT

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Online_v2 Team :-

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Features of Online_v2



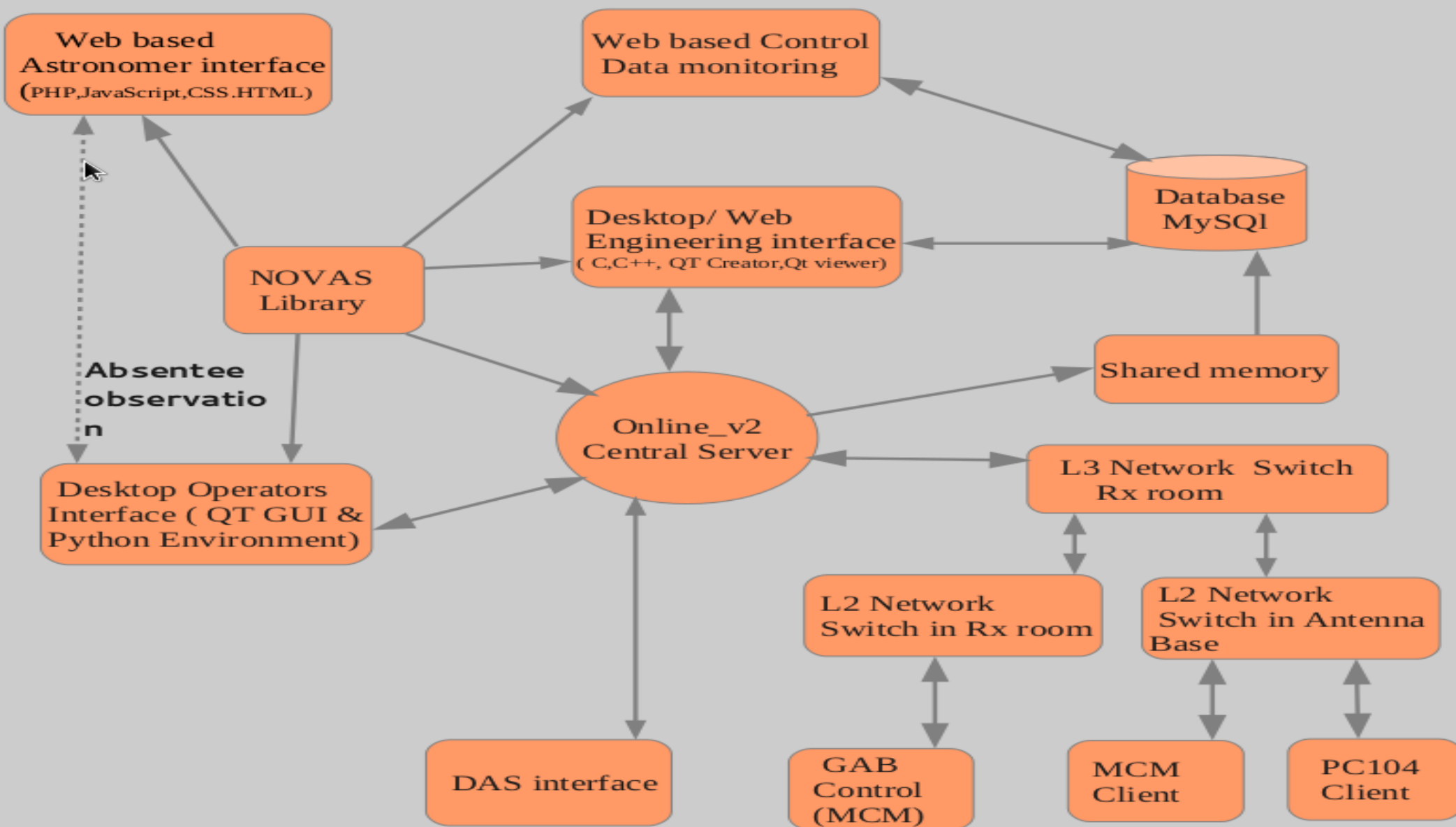
The features of OnlineV2 include :

- (1) Parallel & fast control of 30 antenna
- (2) Extensive web-based control data monitoring tools allowing for real time and statistical studies
- (3) Full web based tools & support for observing in absentia
- (4) Generalized & modular framework to support future expansion
- (5) Customized graphical interfaces for operators, engineers and astronomers
- (6) Fast background monitoring of system parameters
- (7) Higher level Python Environment

Online_v2 Architecture diagram



Architectural block diagram of Online_v2



Online_v2 core software

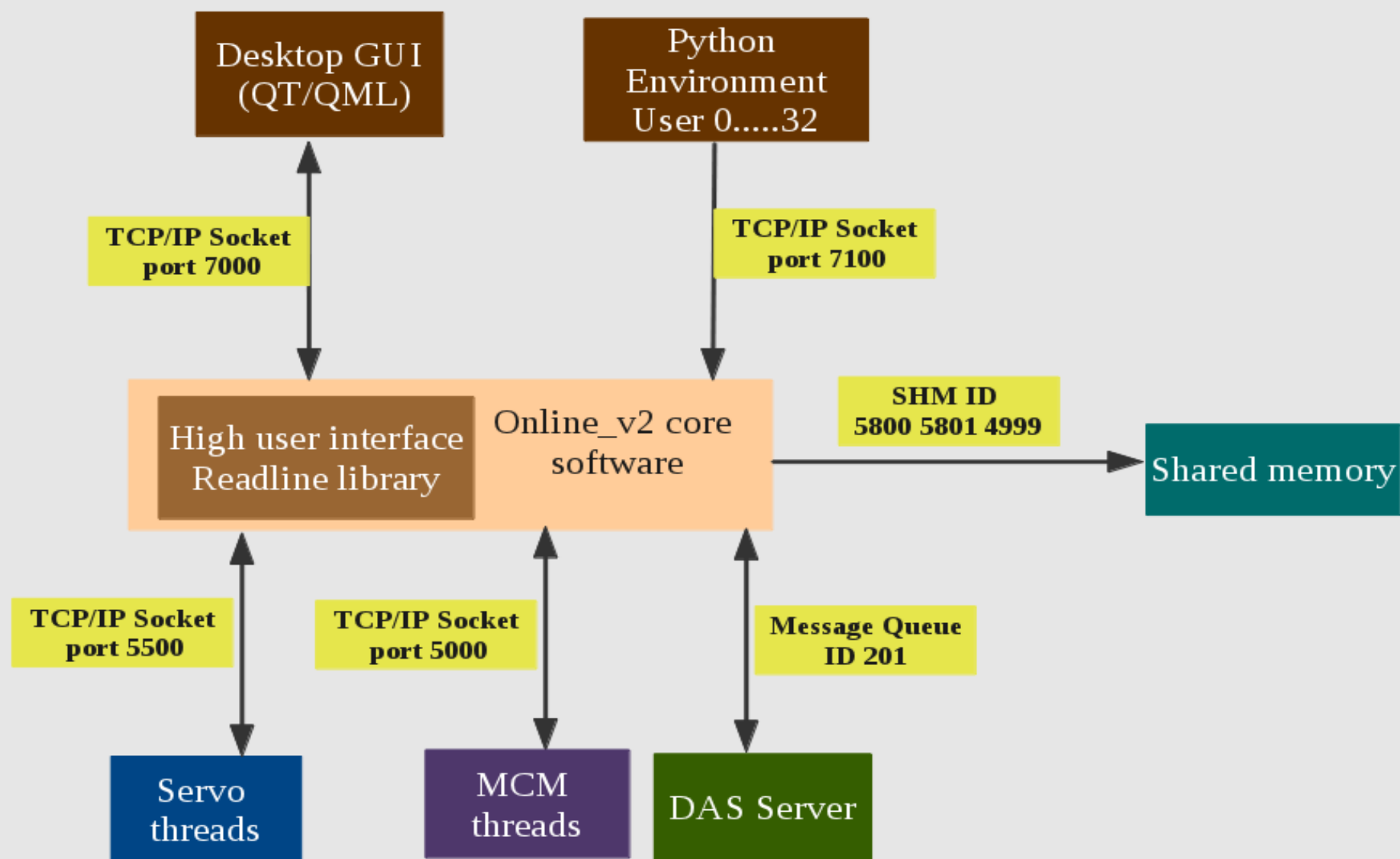


Fig : Block Diagram of Online_v2 core Software

Python Environment

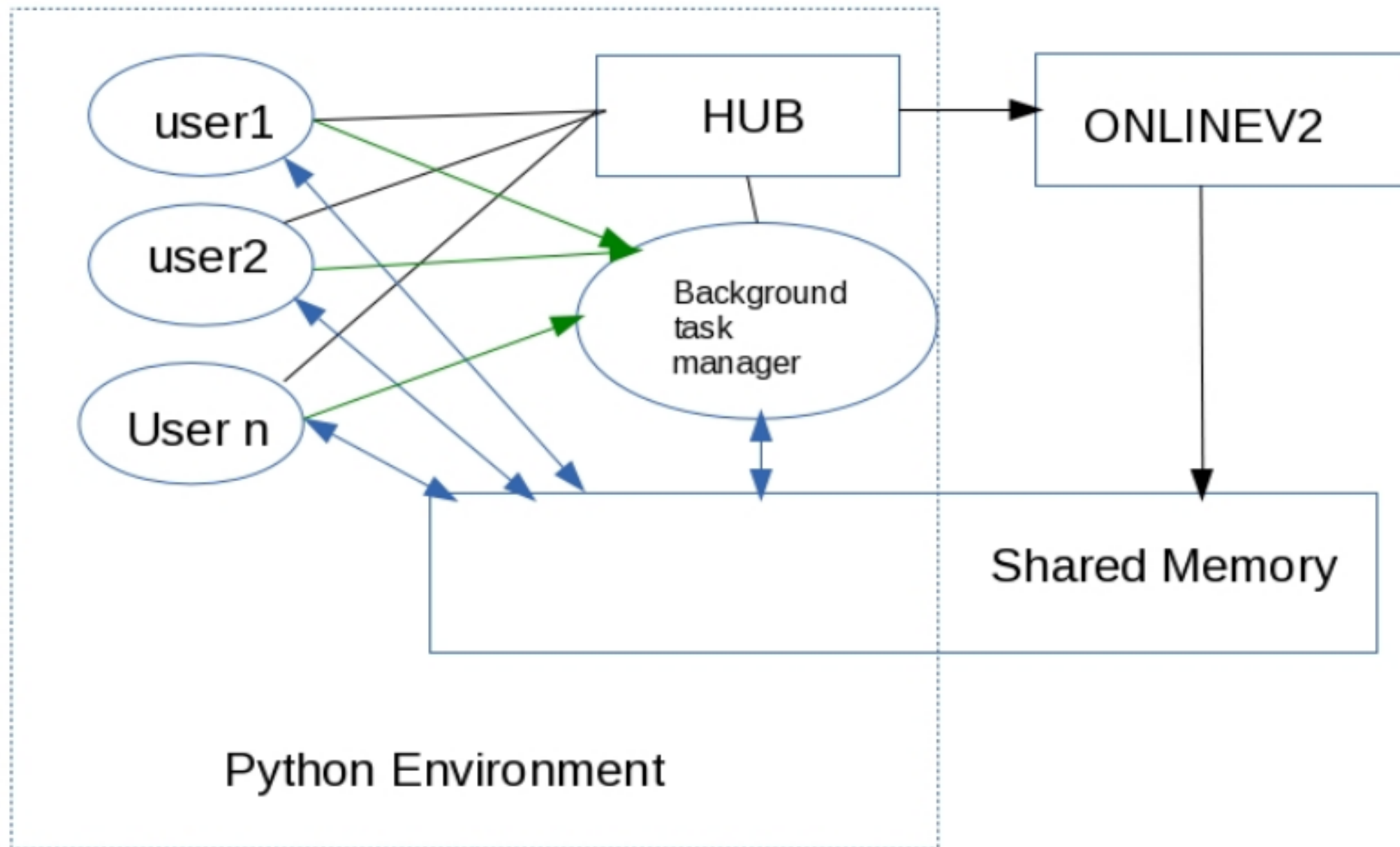


1. Interactive command line environment for Online_v2 using Ipython.
2. Grouping of commands, custom procedure and automation in execution of science observations and system tests.
3. Power of Python is utilized in decision making on basis of complex logic of tasks.
4. Python package is developed to control all GMRT subsystems using Object oriented Programming. It provides API to control and monitor systems.
5. Exmample :

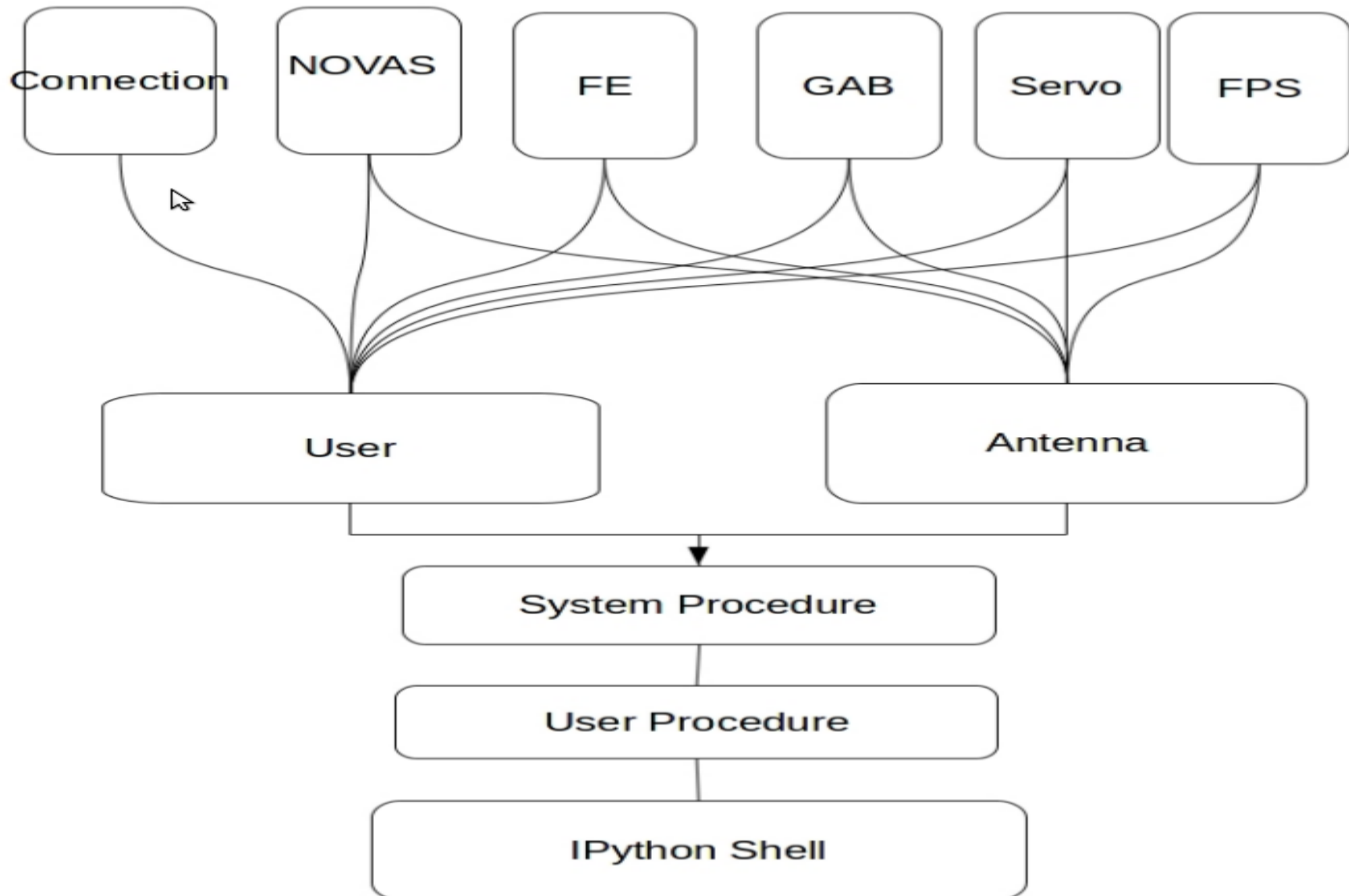
Move servo of C00 antenna in elevation by +10 degree
\$ C00.servo.mvelev(10d)

GAB setting command to define sub array of antennas
\$ gab.set()

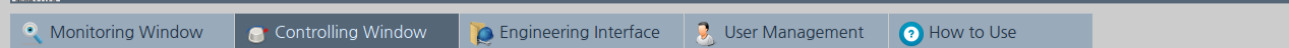
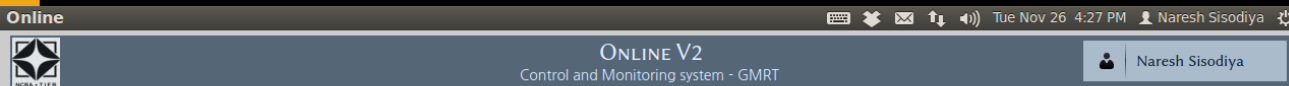
Python Scripting Environment



Object Oriented Design of API



Online_v2 : QT/QML GUI



Select SubArray

- Master Array
- Sub Array 1
- Sub Array 2
- Sub Array 3
- Sub Array 4
- Sub Array 5
- Antennas

FRONT END

Frequency Band	50 MHz	50 MHz
Solar Attenuation	0 dB	0 dB
Filter	1	1
L Band Filter	1060	1060
Calibration Noise	Low	Low
RF Power	Off	Off
Channel	Unswap	Submit FE

OPTICAL FIBER

RF Attenuation 1 dB 1 dB Submit OF

SENTINEL

Digital Mask 0000 0000 Submit Sentinel

ANALOG BACK END

LO Frequency	600 MHz	600 MHz
Attenuation	0 dB	0 dB
Filter	0	0
Low Pass Filter	0	0
Path	Direct	Direct
Source	SigGen	SigGen
Signal	Antenna	Antenna
Channel	1	Submit GAB

SERVO

Break None None Stow None

Cold Start Close Abort Reset HW Submit Servo

DIGITAL

Mode Realtime

Stokes Full Stokes

Beam 1 Off 30

F Stop On

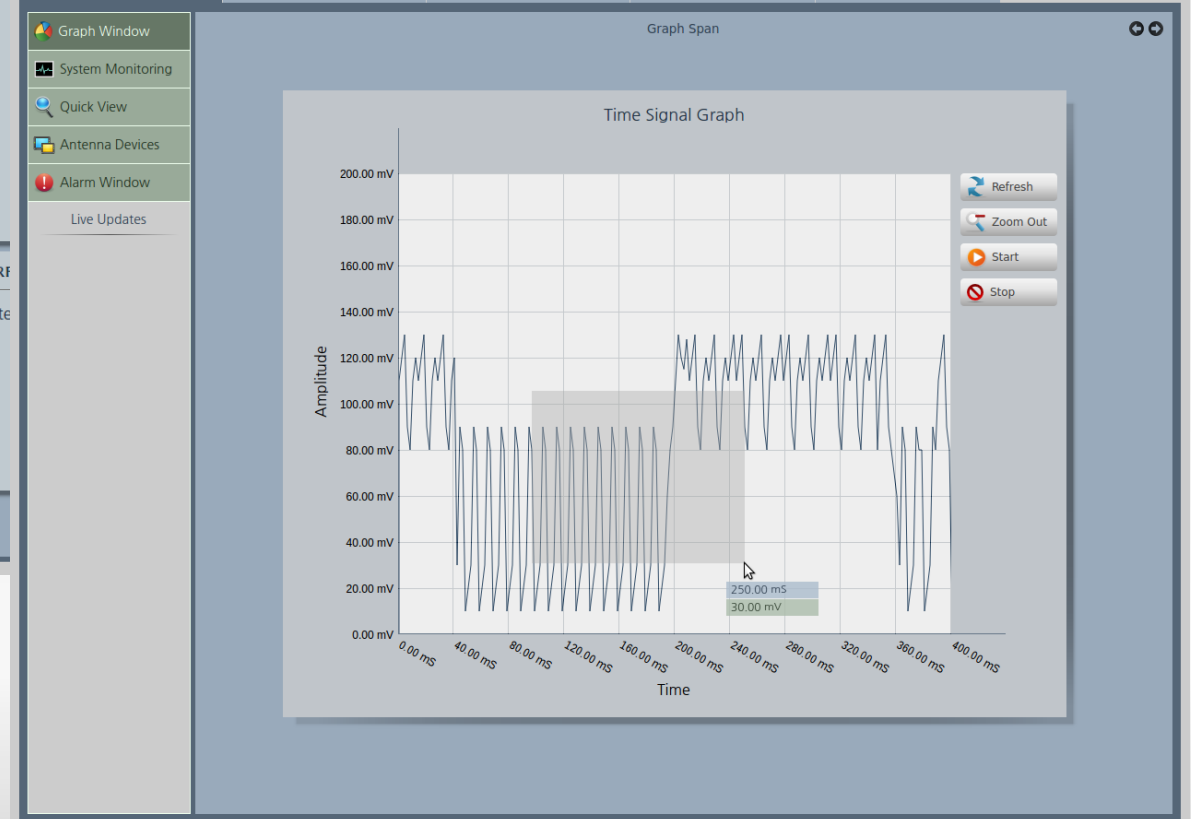
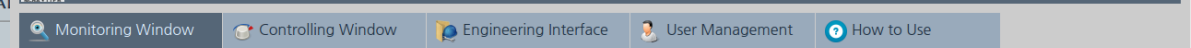
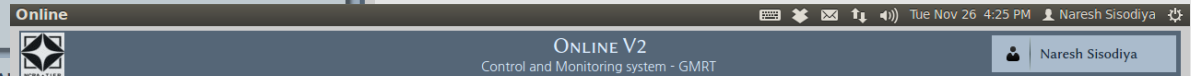
BaseBand LO 32 MHz

Final Bandwidth 0

Max Channel 256

INTERF

Settings for Inte



Online_v2 monitoring tools



c) Temperature monitor test:

One temperature monitoring unit was connect to the MCM card at C03 antenna. The data behavior was similar like existing online with higher resolution.

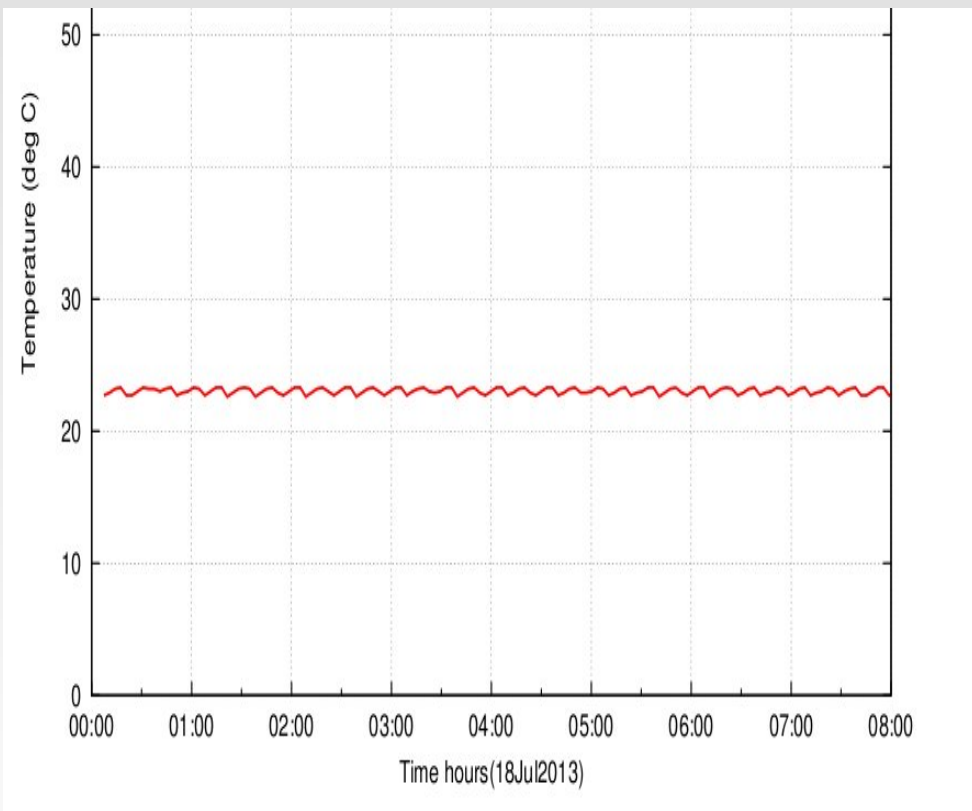


Fig. existing online temperature monitoring @
C03 antenna

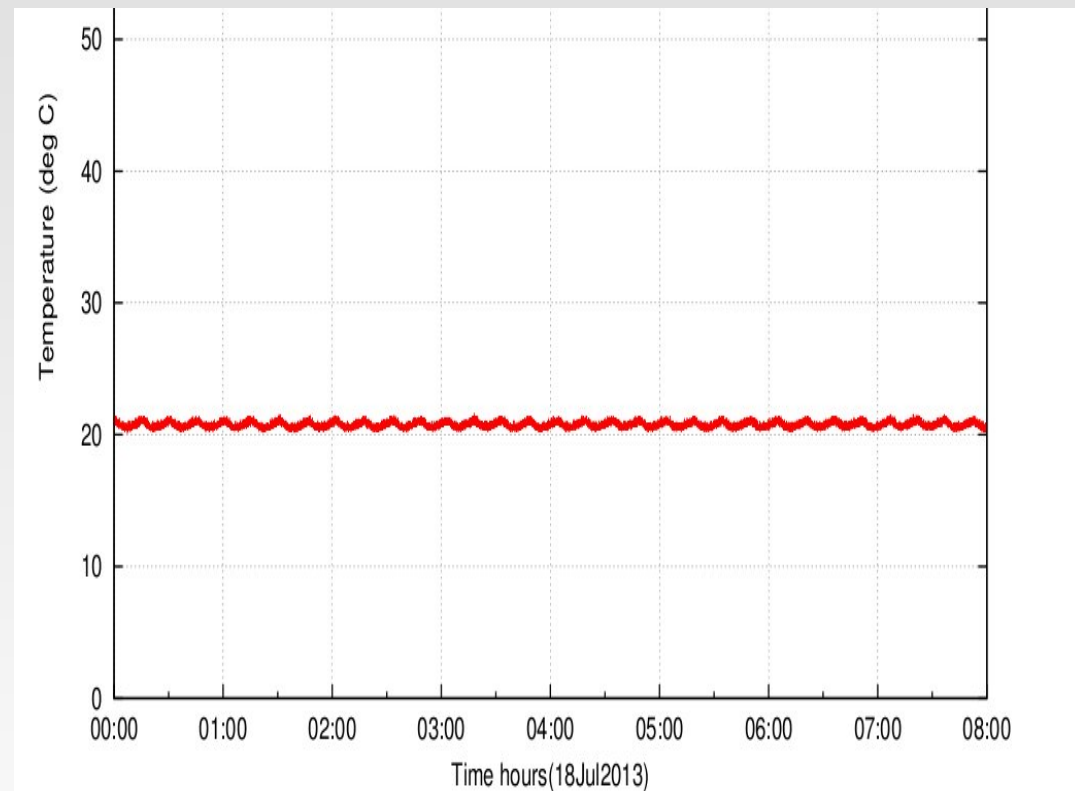


Fig. online_v2 temperature monitoring @ C03
antenna

Software Languages used :

Insistence on using Open Software - LAMP

Software Language used: C, C++, Dynamic C, Perl, Python, PHP, HTML, Javascript, gnuplot, QT/QML

Database: MySQL

Libraries: XML, Readline, TCP/IP, HTTP, Pthread

Time Line



Project started: October 2012

Prototype Demonstration: April 2014

Three antennae tested software: October 2014

16 Antennae tested software : April 2015