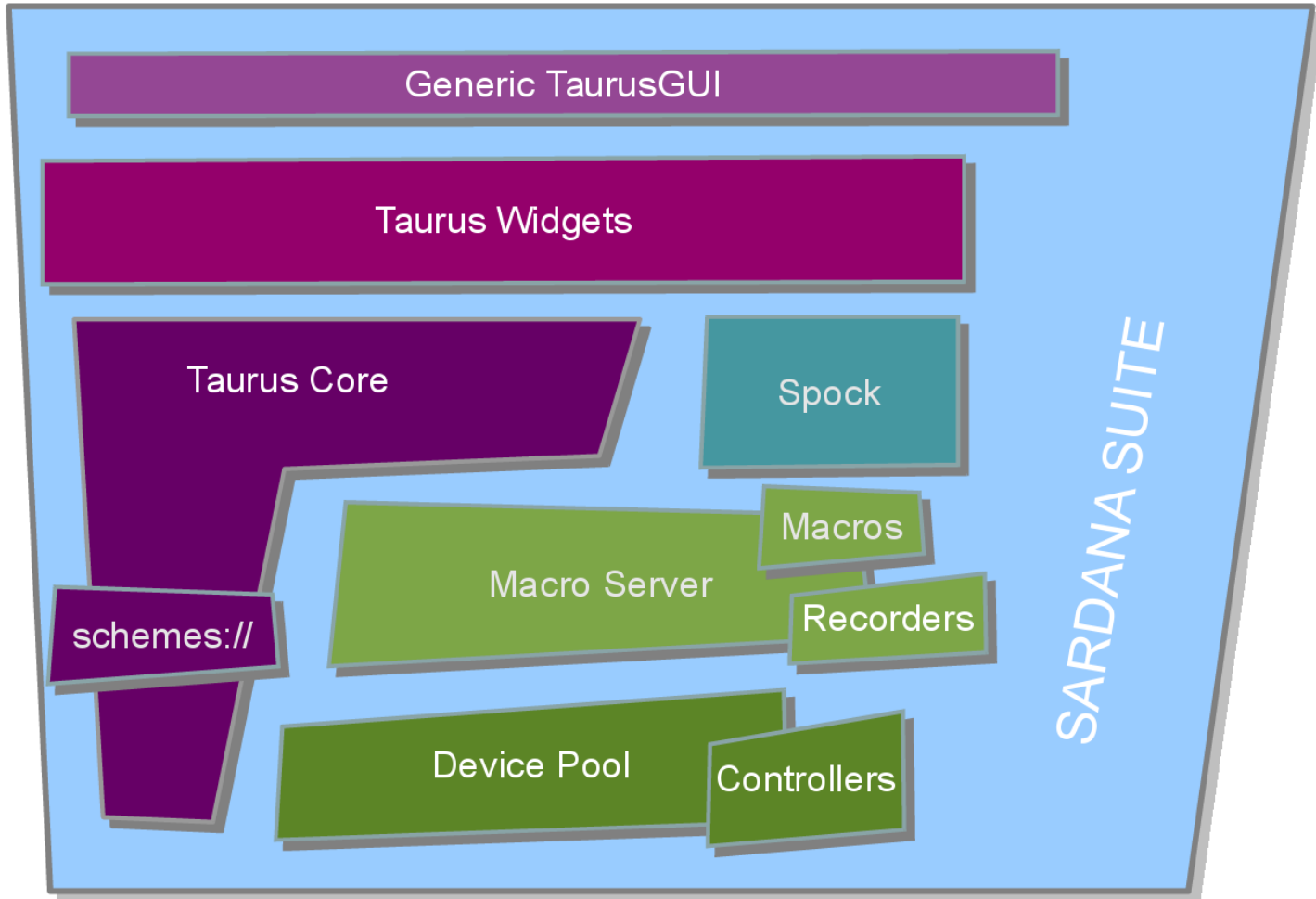


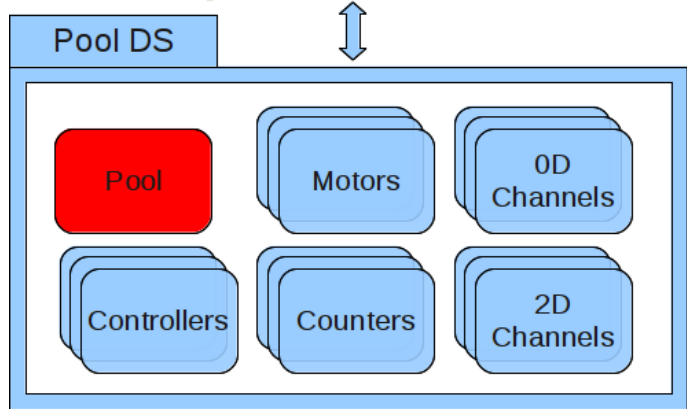
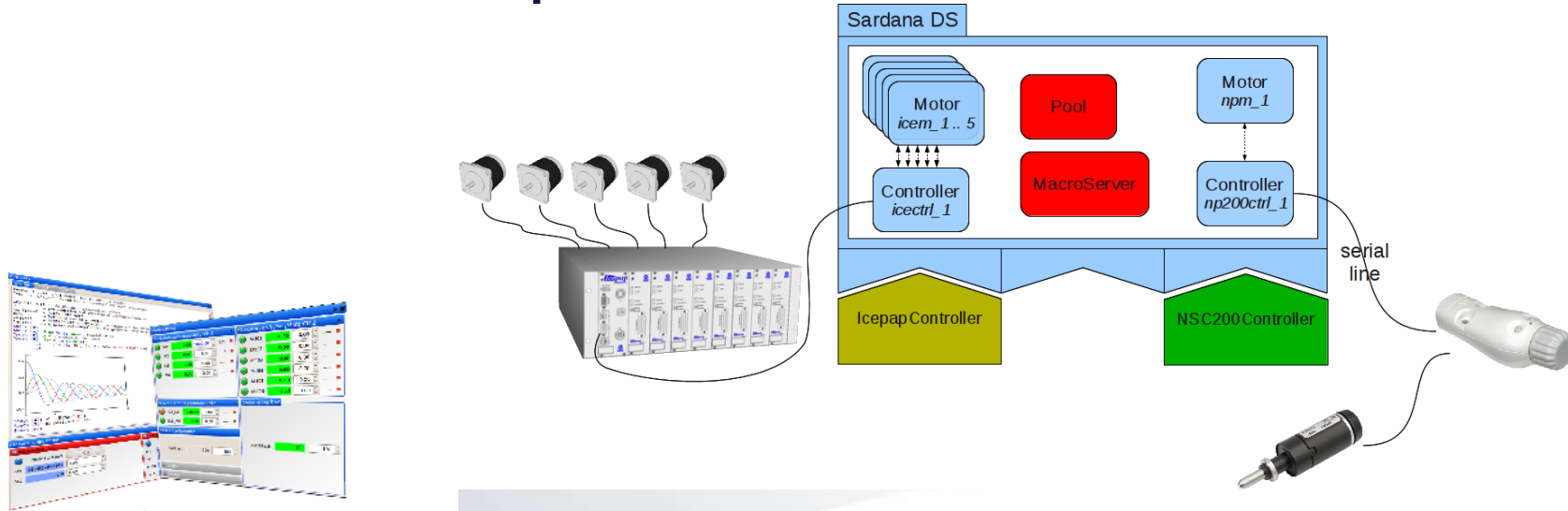
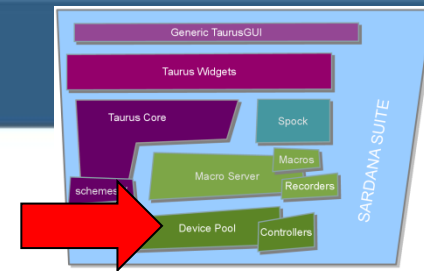
Sardana and the Sardana Community

Guifre Cuni on behalf of the ALBA Synchrotron Controls Group
NOBUGS 2014 – 24th-26th Sep 2014 – KEK

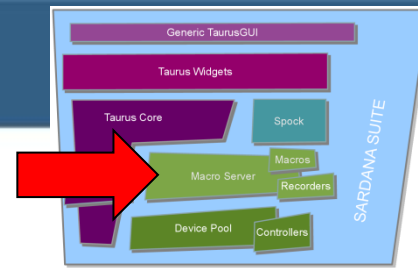
Supervision, Control and Data Acquisition in scientific installations



Pool: Objects related to motion control and data acquisition



Generic Motor Device
 States: ON, MOVING, ALARM, FAULT
 Commands: Stop, Abort
 Attributes: Position, Offset, Velocity, ...



A macro is a specific procedure that can be executed at any time

- Written in Python (function or class)
- The Door provides access for GUIs and CLIs
- Can have parameters and result
- Scientists can add macros

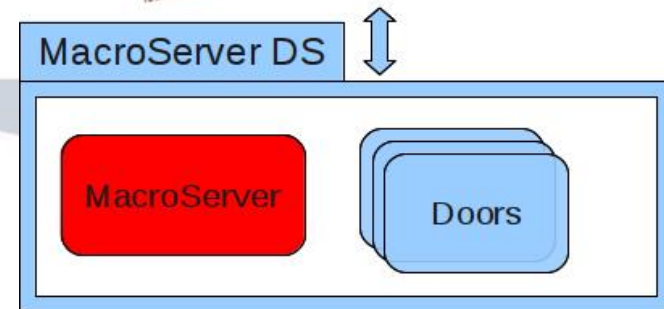
```
from sardana.macroserver.macro import macro

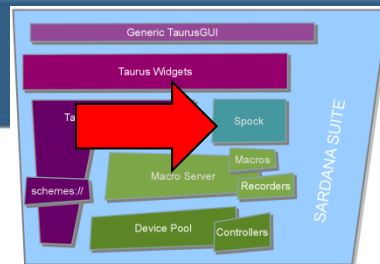
@macro()
def hello_world(self):
    self.output("Hello, World!")
```

```
from sardana.macroserver.macro import macro, Type

@macro([ ["moveable", Type.Moveable, None, "moveable to move"],
         ["position", Type.Float, None, "absolute position"] ])
def my_move(self, moveable, position):
    """This macro moves a moveable to the specified position"""

    moveable.move(position)
    self.output("%s is now at %s", moveable, moveable.getPosition())
```





- ❖ iPython based
- ❖ SPEC-like CLI

Standard Macros

listing information	lsend, dumpenv, lsa, lsm, lspm, lsexp, lsior, lsmeas, lsct, ls0d, ls1d, ls2d, lspc, lsctrl, lspc, lsi, lsctrllib, lsa, lsmac, scanhist
moving & acquiring	wa, wm, pwa, pwm, set_lim, set_lm, set_pos, mv, umv, mvr, umvr, ct, uct, settimer
scans step continuous	ascanc, a2scanc, a3scanc, a4scanc, amultiscan, dscanc, d2scanc, d3scanc, d4scanc, dmultiscan, meshc, fscan
other	(u)senv, (u)defmeas, (u)defelem, (u)defctrl, prdef, relmac, relmaclib

```

() controls02
File Edit View Bookmarks Settings Help
Spock 1.0.0 -- An interactive laboratory application.
help      -> Spock's help system.
object?   -> Details about 'object'. ?object also works, ?? prints more.

door/cpl1/l [1]: lsn
-----
Name      Type      Controller      Axis
-----
n_cpl_1   Motor     dunnymotorctrl_cpl_1  1
n_cpl_2   Motor     dunnymotorctrl_cpl_1  2
n_cpl_3   Motor     dunnymotorctrl_cpl_1  3
n_cpl_4   Motor     dunnymotorctrl_cpl_1  4
m_cpl_ipap_1 Motor     ipap_cpl_1         1

door/cpl1/l [2]: lsneas
Active    Name      Timer Experi. channels
-----
4         cp_ng1    ct_cp1_1 ct_cp1_1, ct_cp1_2, sys/tg_test/1/ulong_image_ro
         cp_ng2    ct_cp1_1 ct_cp1_1, ct_cp1_2
         cp_ng_xas timer timer, ct_cp1_1, ct_cp1_2

door/cpl1/l [3]: ascanc n_cpl_1 0 100 10 .1
Operation will be saved in /home/cpascual/example.h5 (w5)
Scan #166 started at Thu Sep 20 16:37:09 2012. It will take at least 0:00:09.034471
Moving to start positions...

              sys
              tg_test
              1
#Pt No      dt      m_cpl_1  ct_cp1_1  ct_cp1_2  ulong_image_ro
0           2.02592  0        0.1       0.2       (251, 251)
1           2.76325  10       0.1       0.2       (251, 251)
2           3.49855  20       0.1       0.2       (251, 251)
3           4.23898  30       0.1       0.2       (251, 251)
4           4.97804  40       0.1       0.2       (251, 251)
5           5.71485  50       0.1       0.2       (251, 251)
6           6.45196  60       0.1       0.2       (251, 251)
7           7.19135  70       0.1       0.2       (251, 251)
8           7.9308   80       0.1       0.2       (251, 251)
9           8.66339  90       0.1       0.2       (251, 251)
10          9.40609  100      0.1       0.2       (251, 251)
Operation saved in /home/cpascual/example.h5 (w5)
Scan #166 ended at Thu Sep 20 16:37:19 2012, taking 0:00:09.535636. Dead time 88.5% (notion dead time 84.9%)

door/cpl1/l [4]:

```


Taurus Core

“Container of unique models”

Objects for common access to control devices

Taurus Widgets

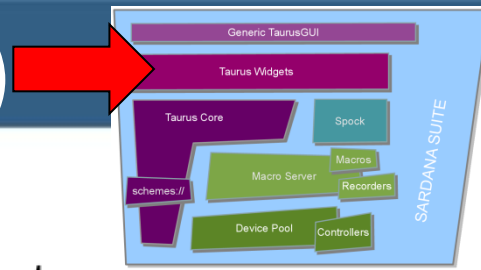
Taurus Core

Polling and Event mechanisms

Extendable to fulfil custom and specific requirements

schemes://

Schemes provide access to different type of data sources



Taurus provides General-purpose widgets

Tango attributes form

State

Status **The device is in ON state.**

Gap **10.000** mm

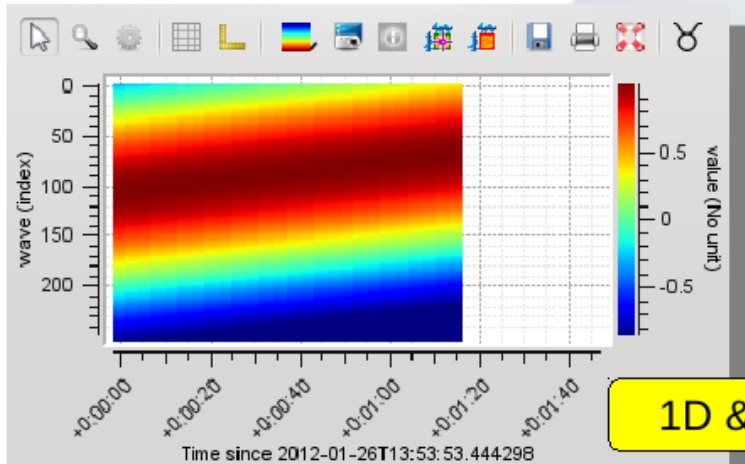
Speed **20.00** nm/s

Acceleration **50.00** nm/s/s

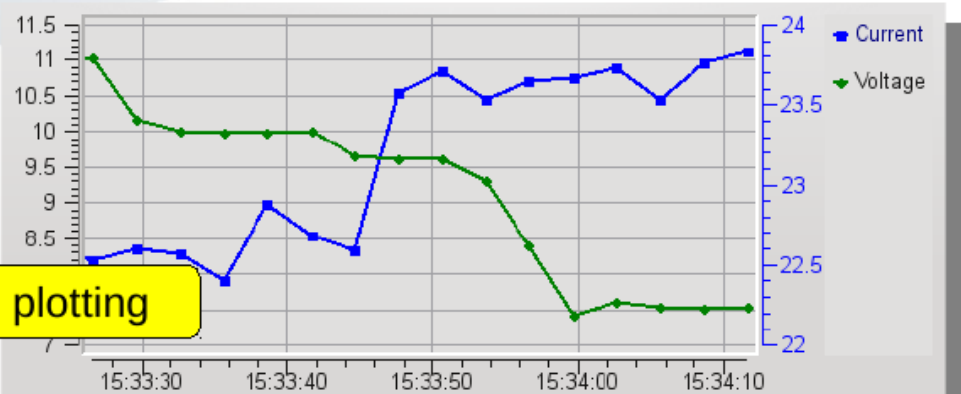
Reset Apply

NeXus file browser

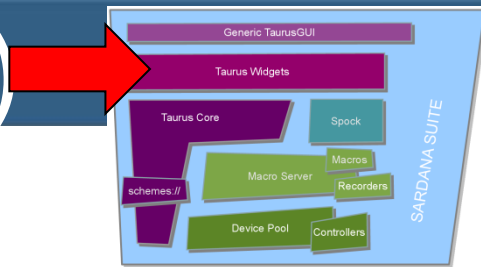
File/Group/Dataset	Description	Shape	DType
>- example3Ddata.h5	File		
>- example.h5	File		
>- entry165	ascan m_cp1_1 0.0 100.0 10 0.1		
>- definition	Dataset	1	S6
>- end_time	Dataset	1	S26
>- entry_identifier	Dataset	1	S3
>- instrument	NXinstrument		
>- monochromator	NXmonochromator		
>- measurement	NXcollection		
>- plot_1	NXdata		
>- ct_cp1_1	Dataset	11	float 64
>- ct_cp1_2	Dataset	11	float 64
>- m_cp1_1	Dataset	11	float 64
>- program_name	Dataset	1	S29
>- start_time	Dataset	1	S26
>- title	Dataset	1	S30
>- user	NXuser		
>- entry166	ascan m_cp1_1 0.0 100.0 10 0.1		



1D & 2D plotting



Taurus Widgets (ii)



Measurement Group Snapshot Group Storage

Active Measurement Group cp_mg1

Channel	output	Shape	Plot Type	Plot Axes
ct_cp1_1	true	[]	Spectrum	<mov>
ct_cp1_2	true	[]	Spectrum	<mov>
sys/tg_te...	true	[251, 251]	Image	<idx>, <idx>

Reset

Experiment configuration

And also some specific widgets for dealing with macros

ascan

Parameter	Value
motor	m_cp1_1
start_pos	0.0
final_pos	100.0
nr_interv	10
integ_time	0.1

ascan_m_cp1_1 0.0 100.0 10 0.1

72%

ascan_m_cp1_1 0.0 100.0 10 0.1

macro execution

ms/v3/1

- Macro libraries
 - training1
 - where_moveable_2
 - where_moveable
 - snapshot_ccd
 - set_scanId
 - scan_info
 - move_moveable
 - move_energy
 - move2
 - mandelbrot
 - hello_world_2
 - fixed_ascan
 - fft_freq
 - cosine
 - test01
 - submacros
 - standard
 - sequence
 - scans
 - scan
 - parameters
 - mca
 - lists
 - ioregister
 - hooks
 - funcs
 - expert
 - env
 - demo
 - communication

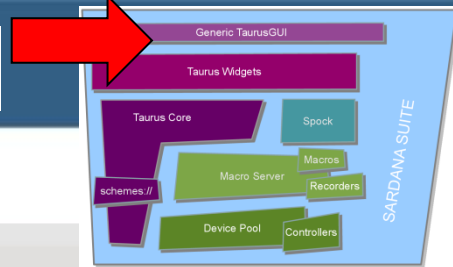
```

71 """This macro changes the current energy"""
72 E = self.getMoveable("Energy")
73 E.move(energy)
74 self.output("Energy is now at %s", E.getPosition())
75
76
77 @macro([ "ccd", Type.String, None, "ccd name"],
78         ["fname", Type.String, None, "filename to save" ] ]
79 def snapshot_ccd(self, ccd, fname):
80     """Saves the current ccd image to the specified file"""
81     ccd_dev = self.getDevice(ccd)
82     image = PIL.Image.fromarray(ccd_dev.image)
83     image.save(fname)
84
85 @macro([ "p1", Type.Float, None, "absolute position of mot
86         ["p2", Type.Float, None, "absolute position of mot
87 def move2(self, p1, p2):
88     motion = self.getMotion(["mot01", "mot02"])
89     motion.move([p1, p2])
90
91 @macro([ "moveable", Type.Moveable, None, "moveable to get
92 def where_moveable_2(self, moveable):
93     """This macro prints the current moveable position"""
94
95     self.wm(moveable)
96
97
98 @macro([ "moveable", Type.Moveable, None, "moveable to mov
99         ["position", Type.Float, None, "absolute position"
100 def move_moveable(self, moveable, position):
101     """This macro moves a moveable to the specified positio
102
103     self.mv(moveable, position)
104     self.output("%s is now at %s", moveable.getName(), move
    
```

Outline

- training1.py
 - fft_freq
 - hello_world_2
 - where_moveable
 - cosine
 - move_energy
 - snapshot_ccd
 - move2
 - where_moveable
 - move_moveable
 - fixed_ascan
 - scan_info
 - set_scanid

Live macro edition



BL22-CLAE88-GUI

File View Taurus Tools Panels Help

Load Perspectives

IOHDCM

Sequences

Full sequence plot

Macro: repeat

Macro	Parameters
ascan	[oh_dcm_energy, 8400.0, 8560.0, 50, 0.1]
ascan	[oh_dcm_energy, 8560.0, 8630.0, 250, 0.1]
ascan	[oh_dcm_energy, 8630.0, 8730.0, 200, 0.1]
consfscan	[oh_dcm_energy, 8730.0, 8430.0, 8608.0, 0.025]
extradLastEXAFS	[beamline.sib22.commissioning.scans/12_04/G

Parameter Value

Parameter	Value
outputFile	/beamlines/bl22/commissioning/scans/12_04/...
nRORegions	4
comment	Dummy comment

TrendID - <mov>

oh_dcm_energy

Sequences Macros

TrendID - <mov> Experiment Config

OH

FE22

FE close first valve

FE controls disabled

FE interlock

FE open

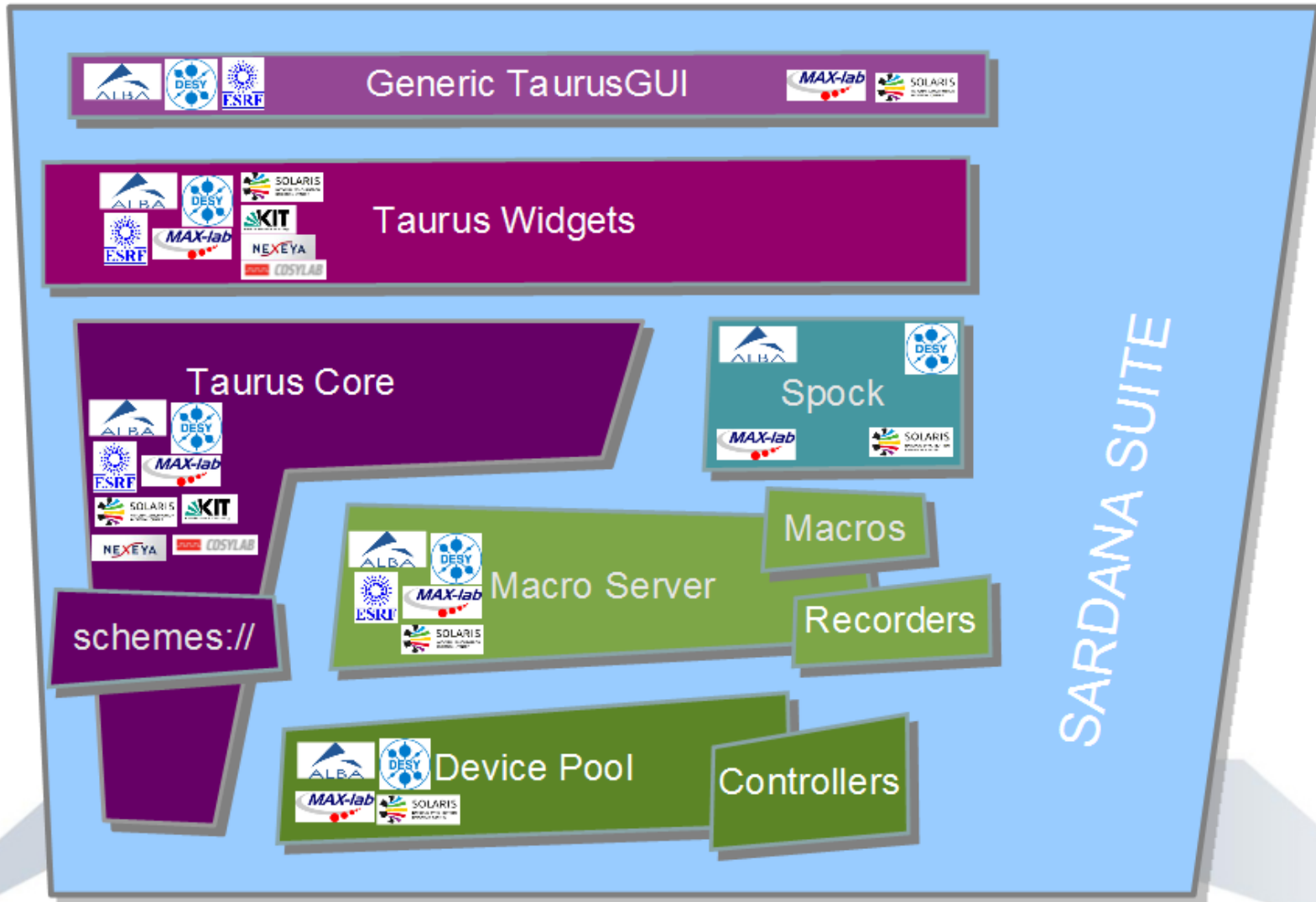
BL ready

FSMU

PSHU

Reset Apply

FE DoorOutput OH MacroDescription DoorDebug



<http://sf.net/p/sardana/tickets>

#	Summary▼	Miles	Status	Owner▼	Creator▼	Created▼	Updated▼	Vot
157	Error in 'export current panel configuration to xml'	Jul14	active	Carlos Pascual	marc	2014-05-08	2014-05-08	0
156	get_free_alias (Tango) does not work correctly	Jul14	waiting	Zbigniew Reszela	Zbigniew Reszela	2014-04-25	2014-04-25	0
155	Better API (and documented) for MacroButton	Jul14	active	Carlos Pascual	Carlos Pascual	2014-04-23	2014-04-23	0
154	Update spyder dependency	Jul14	waiting	Carlos Pascual	Carlos Pascual	2014-04-22	2014-04-22	0

Small Changes:

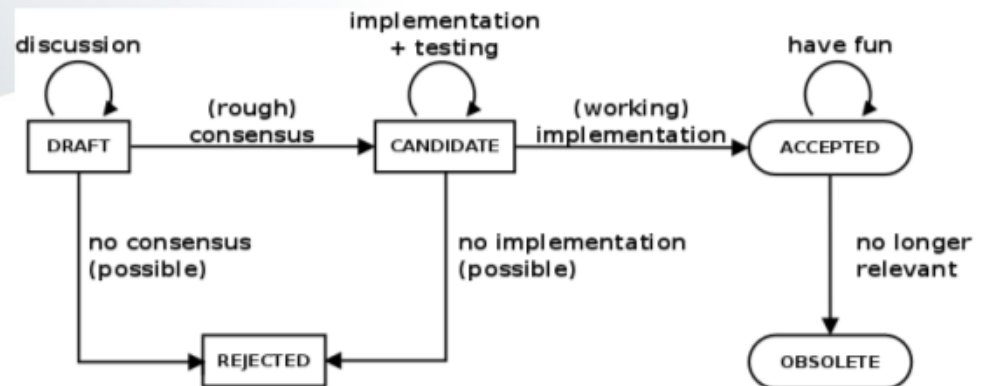
Ticket (feature-request) + patch

<http://sf.net/p/sardana/wiki/SEP>

Link	status	Title
[SEP0]	CANDIDATE	Introducing Sardana Enhancement Proposal
[SEP1]	ACCEPTED	Reorganization of code repos
[SEP2]	DRAFT	Lima integration
[SEP3]	DRAFT	Tango-independent
[SEP4]	DRAFT	HKL integration
[SEP5]	ACCEPTED	Implementation of tests infrastructure
[SEP6]	DRAFT	Continuous Scan Implementation
[SEP7]	ACCEPTED	Code contribution workflow
[SEP8]	DRAFT	Remove from Taurus objects the direct Logger dependence
[SEP9]	CANDIDATE	Compact Read+Write widgets in Taurus
[SEP10]	CANDIDATE	Taurus separation
[SEP11]	CANDIDATE	Direct load of .ui files
[SEP12]	CANDIDATE	Use python Enum instead of taurus Enumeration

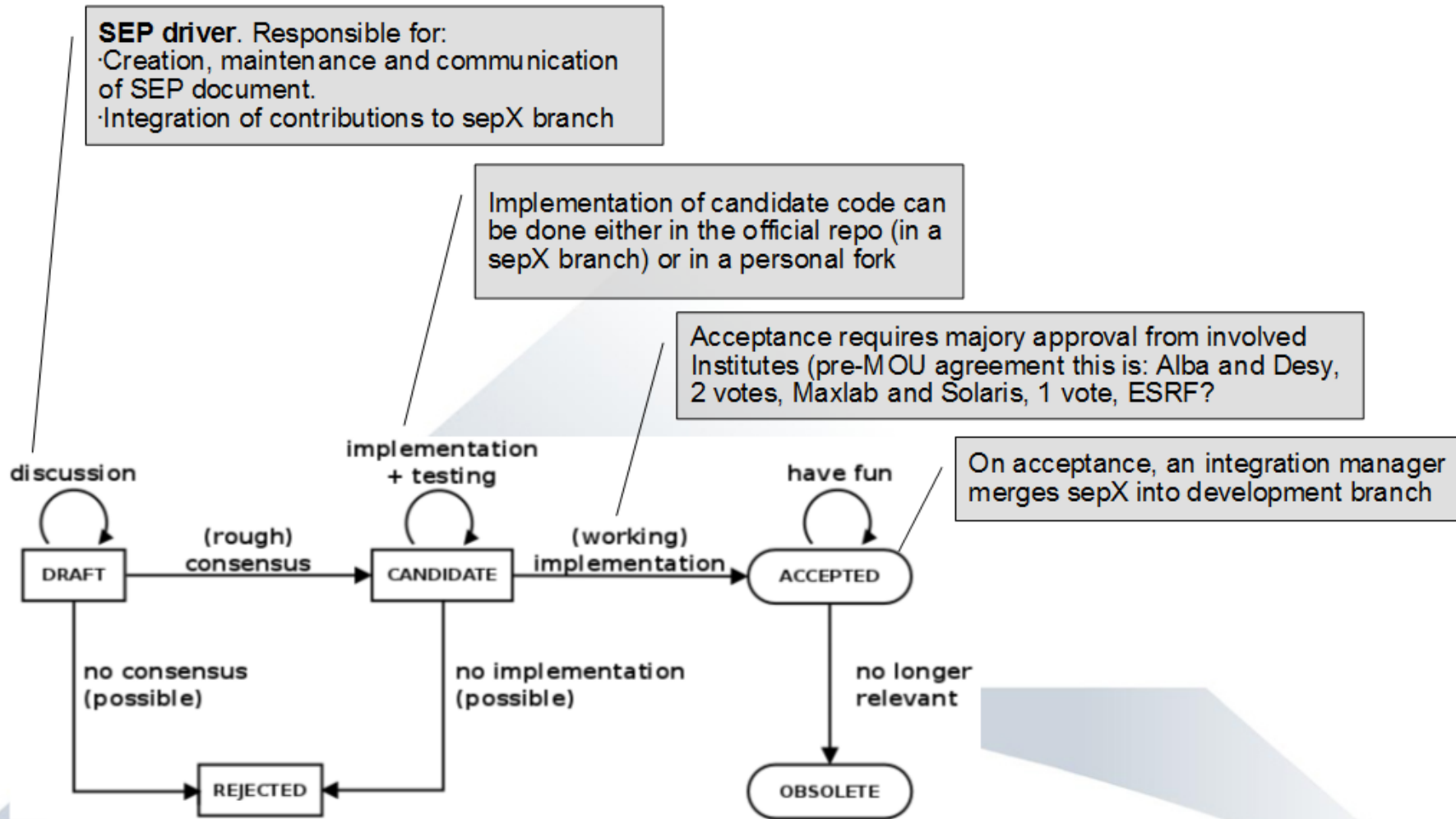
Large changes:

SEP
Sardana Enhancement Proposal



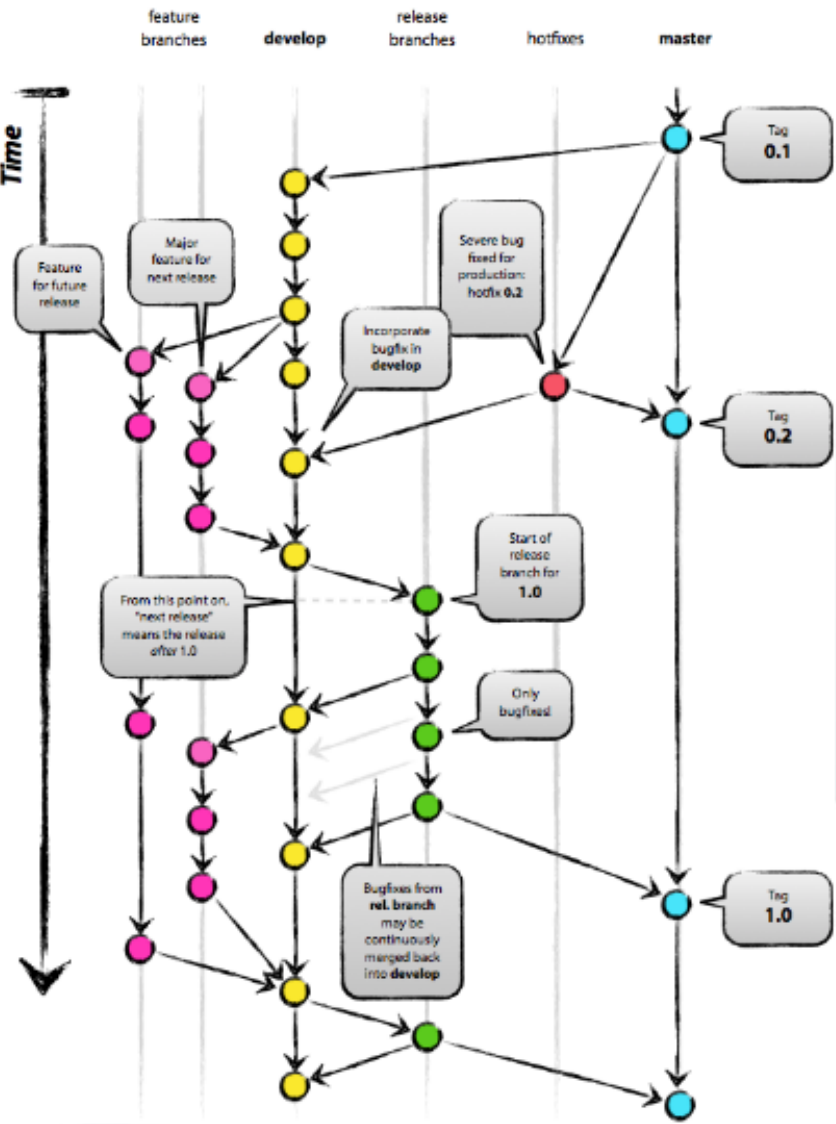
<http://sf.net/p/sardana/wiki/SEP0>

SEP Workflows

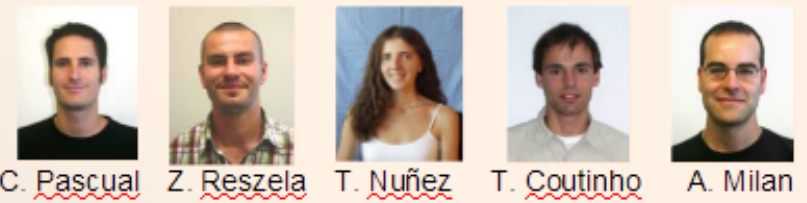


<http://sf.net/p/sardana/wiki/SEP0>
<http://sf.net/p/sardana/wiki/SEP7>

Contributing to core repos



- Core Sardana & taurus repos: GitFlow
 - Master branch is for releases only
 - Work done on feature branches
 - When finished, merge into develop branch
- All code pushed to develop is **reviewed**:
 - Patches sent to -devel mailing list
 - Reviewed publicly
 - Accepted & merged by an integration manager:



<http://sf.net/p/sardana/wiki/git-recipes>

contributor	{ git checkout -b (...) coding git commit git format patch git send-email (...) discussion on mailing list
Integration manager	
	{ git am git merge git push

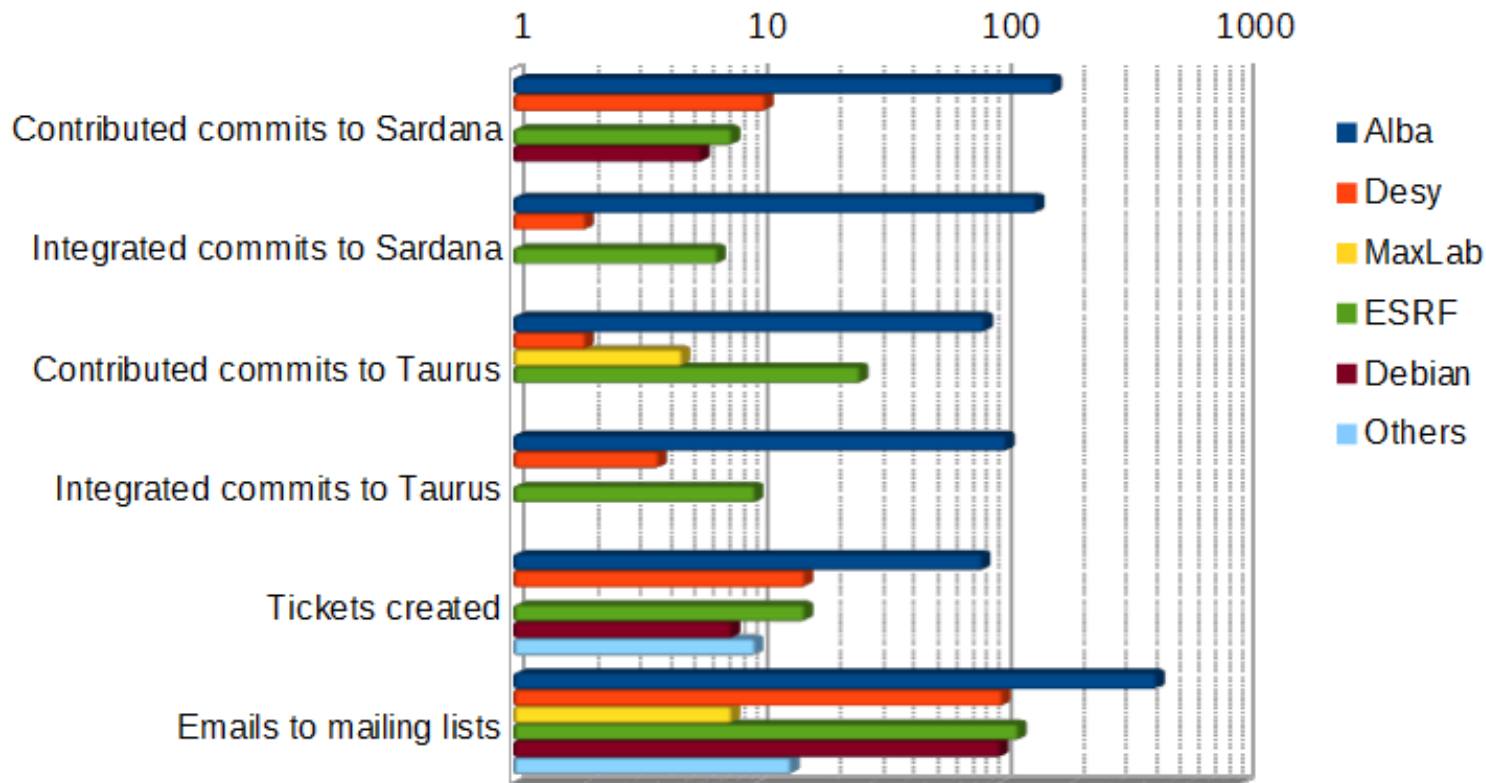
Contributing to 3rd party sardana repositories (e.g. Macros and Controllers)

- Heterogeneous contributors: write access granted liberally
- **Flexible** and **auto-organized**: collaborators decide workflows on a per-module basis
- Only a few conventions:
 - Each file/dir has a designated “**contact person**”
 - **Master** branch should be kept “**production-ready**”
 - Development may be done on **feature branches**
 - Changes to master should get the ok of the contact person
 - Relevant changes should be **announced** to the mailing list



git.code.sf.net/p/sardana/macros.git
git.code.sf.net/p/sardana/controllers.git

Contributions to Sardana Community August 2013 - May 2014



- Alba
- Desy
- MaxLab
- ESRF
- Debian
- Others



Sardana Beta

A python based control system

Brought to you by: [anmilan](#), [cpascual](#), [tere29](#), [tiagocoutinho](#), [zreszela](#)

[Summary](#) |
 [Files](#) |
 [Reviews](#) |
 [Support](#) |
 [Tickets](#) |
 [Wiki](#) |
 [Mailing Lists](#) |
 [Git](#) |
 [SVN \(Old\)](#) |
 [Macros](#) |
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[Formatting Help](#)

SEP

Sardana Enhancement Proposals

This is the main index of the Sardana Enhancement Proposals (SEP).

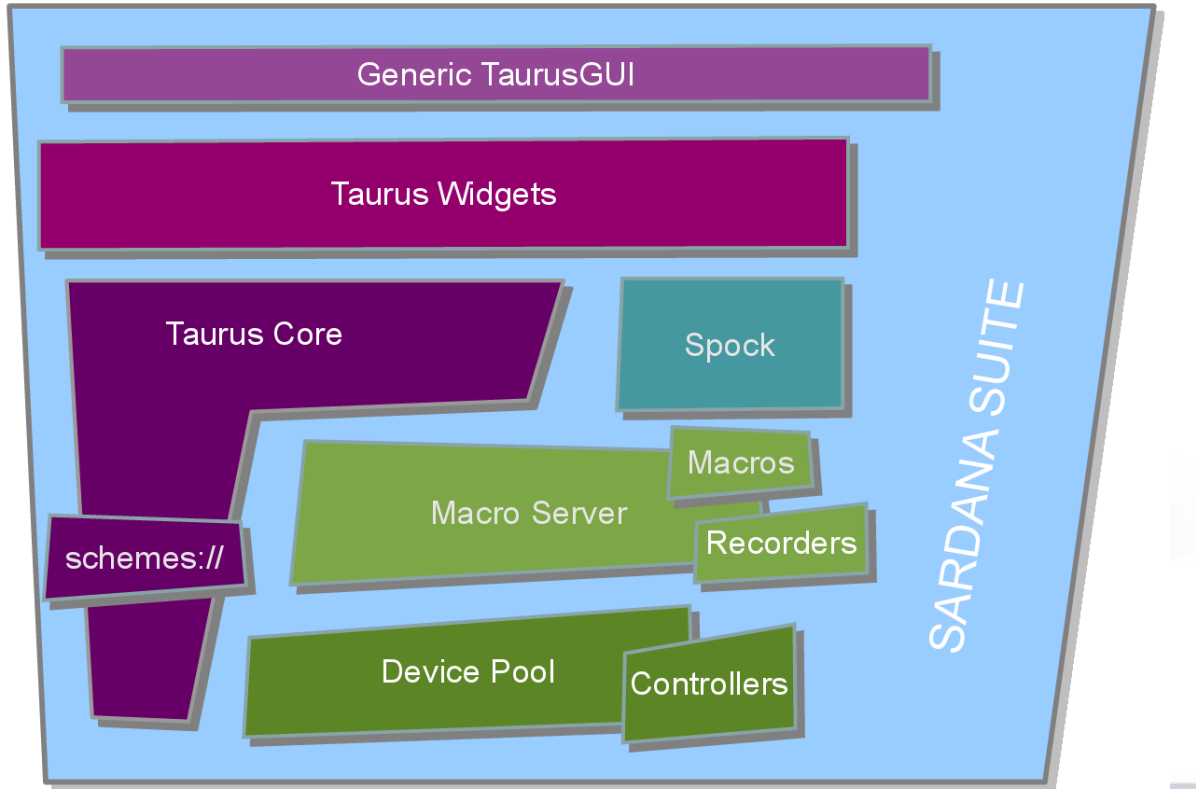
Please make sure you read the [instructions on how to create and work with SEPs](#). (note that this document is itself a SEP ([SEP0]) which is currently in CANDIDATE status, so it is not definitive yet)

Each proposal should be in a separate page and be linked in the following table

Proposals list

Link	status	Title
[SEP0]	CANDIDATE	Introducing Sardana Enhancement Proposal
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[SEP12]	CANDIDATE	Use python Enum instead of taurus Enumeration





The 10th NOBUGS

24-26 Sep. 2014

