Middle layer server for loaded Q characterization

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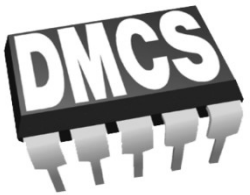
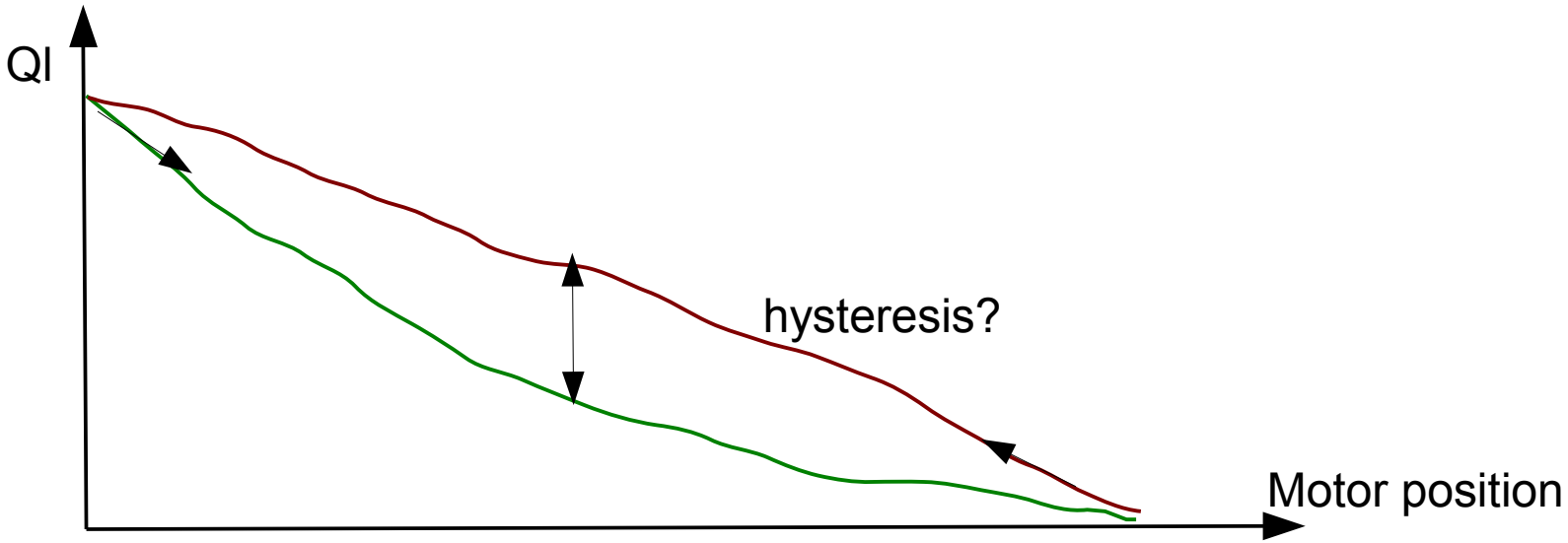
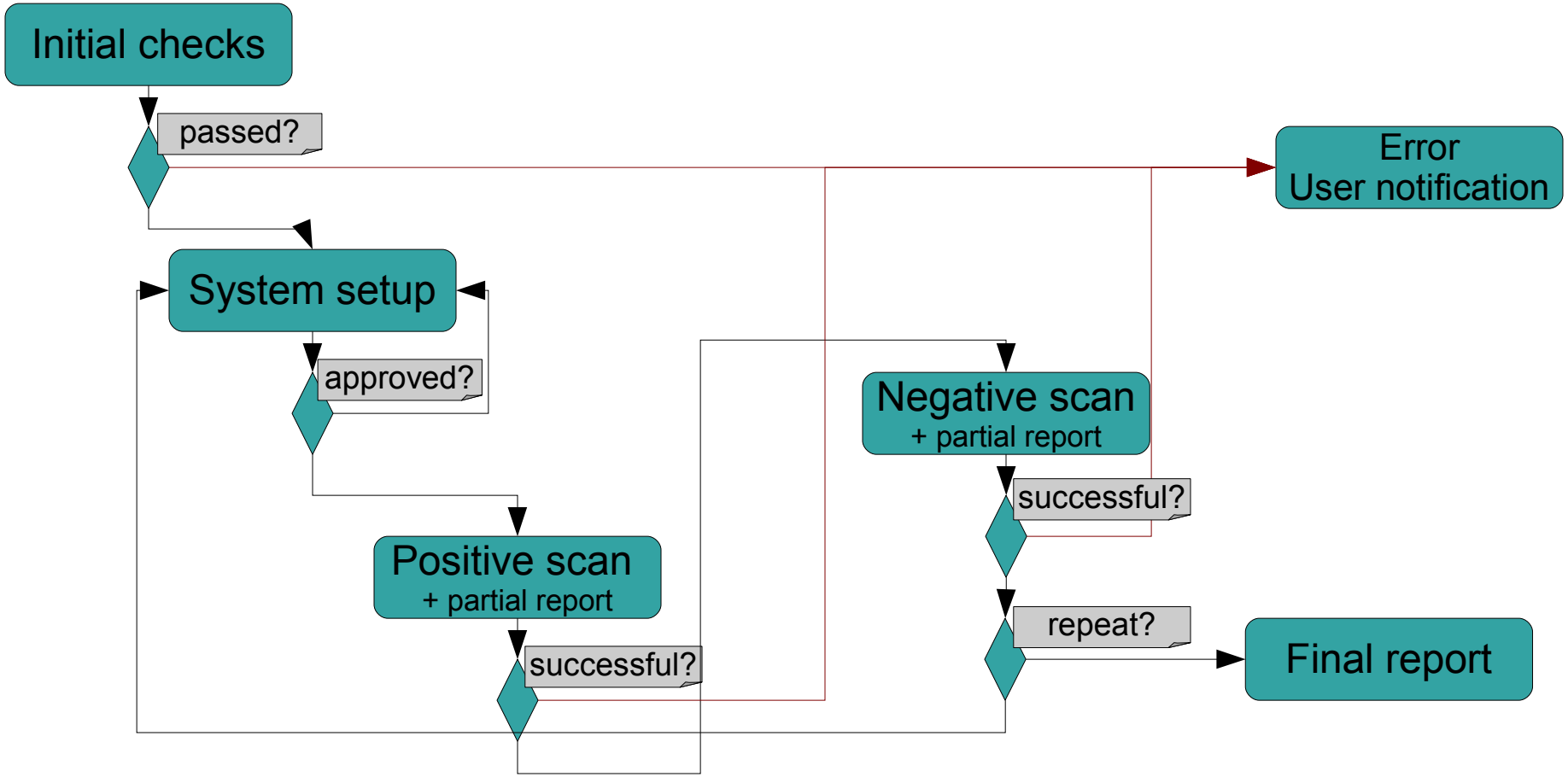


Idea of Q_l characterization

- Output: Q_l vs motor position transfer function
- Other parameters : end switch motor position, Q_l range
- For each cavity, each cryomodule
- May be different gradients



Test schema


Initial checks
passed?
Error
User notification
System setup
approved?
Negative scan
+ partial report
successful?
Positive scan
+ partial report
repeat?
successful?
Final report

Challenges

- To ensure all the parameters are correctly set and the conditions are steady during the test
- Important to foresee all possible exceptions
  - What kind of exceptions?
  - How to handle them?
- Clear and reliable reports/notifications
- Yet – not to bother user with constant requests for approval and manual adjustments
- To ensure there is no risk of endless loop - timeouts

Exception recognition

Possible kinds of problems:

- interactions with other servers (~ read/write exception)
- motor position related – end is reached?, correct movement, busy/ready
- necessity of timeouts
- ...?

```
[* INITIAL CHECKS *]    location: C1.ACC7       Tue Aug 14 09:31:23 2012
[ ]                     location: C1.ACC7       Q1 server up
[ ]                     location: C1.ACC7       motor server up
[ ]                     location: C1.ACC7       LLRF server up
[ ]                     location: C1.ACC7       piezo server up
[ ]                     location: C1.ACC7       cavity slow tuners server up
[* SYSTEM SETUP *]      location: C1.ACC7       Tue Aug 14 09:31:23 2012
[ ]                     location: C1.ACC7       SP settings reachable.
[ ]                     location: C1.ACC7       status_detuning : 0
[ ]                     location: C1.ACC7       Cavity on resonance
[* RECORDING *]         location: C1.ACC7       ( Motor position, Q1 ) = ( -117717, 3.01796e+06 )
```

```
[* INITIAL CHECKS *]    location: C1.ACC2       Tue Aug 14 09:47:32 2012
[ ERROR ]               Initial tests FAILED !  Read Exception. TTF2.RF/LLRF.QLSET/C1.ACC2/ERROR
[* INITIAL CHECKS *]    location: C1.ACC3       Tue Aug 14 09:47:32 2012
[ ERROR ]               Initial tests FAILED !  Read Exception. TTF2.RF/LLRF.QLSET/C1.ACC3/ERROR
```

```
[* SYSTEM SETUP *]      location: C1.ACC6       Tue Aug 14 10:33:00 2012
[ ]                     location: C1.ACC6       SP settings reachable.
[ ]                     location: C1.ACC6       status_detuning : 1
[ ERROR ]                                       Tuning Exception. Check tuning.
```

Implementation strategy

How to implement it in a DOOCS server?

- Dedicated classes of exceptions for each possible problem
- Test conditions checked all the time during testing
- Simultaneous tests for a number of modules in one cavity/ one module/ modules in different cavities if necessary

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Thank you for your attention