NOKIA Bell Labs

WEB interface for oai softmodem

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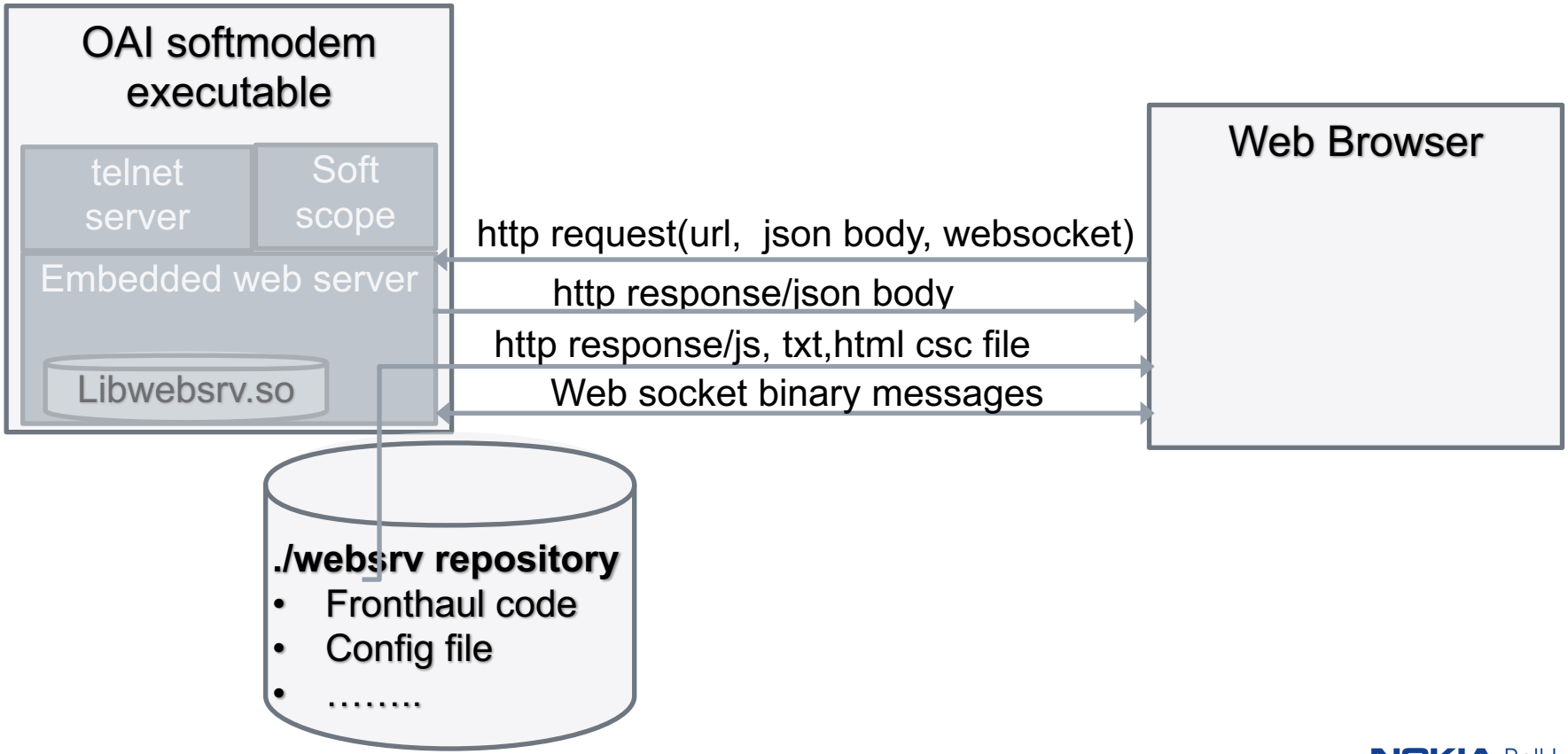
Requirements

1. Provide some nice interface when oai softmodem's included in demo's
   - Oai has already a set of tools for debugging and monitoring
   - Console or X11 interfaces: convenient for debugging or test automation, web interface easier to deploy (remote access, platform agnostic client), easier to make it "user friendly"
2. Not a new tool but a single point of access to oai softmodem's monitoring and debugging tools
   - Keep existing tools functionalities, they have their advantages and their supporters
   - Provide an easy access to oai functionalities
3. Optional, build and use it if interested and when it can help
4. Evolutive, flexible
   - Available for eNB, gNB and UE's
   - Easy addition of new functionalities
   - Minimize adaptation work when softmodem's are updated

Architecture



implementation

1. Two new targets in oai build
   - defined in common/utils/websrv/websrv_CMakeLists.txt
   - websrv, optional shared lib: the embedded web server (backend)
   - websrvfront, the user interface implementation, executed by the browser and downloaded from the backend.
2. websrv
   - C code, linked with libulfius-dev and libjansson-dev (ubuntu packages)
   - Source files in common/utils/websrv
   - url requests are mapped to callbacks
   - url used for connection triggers frontend code delivery to the client and interface customization depending on softmodem functionalities and configuration
   - User interface objects (buttons…) trigger callbacks in charge of interfacing with softmodem modules
   - Websocket, initialized using a specific url can be used for backend-initiated update of interface

implementation

2. websrvfront
   - Angular application (typescript, html, css,scss)
   - The most difficult part: angular imply knowing web development technologies and adds it's specificities, with lots of optional packages.
   - Source files in common/utils/websrv/websrvfront
   - User interface functionalities received from the server, interface dynamically built depending on backend responses to initial url requests
   - triggers http requests depending on user actions, update user interface when receiving http responses
   - Support to websocket has been added to allow interfacing with softscope or any module which needs to receive unsolicited interface updates from the server.

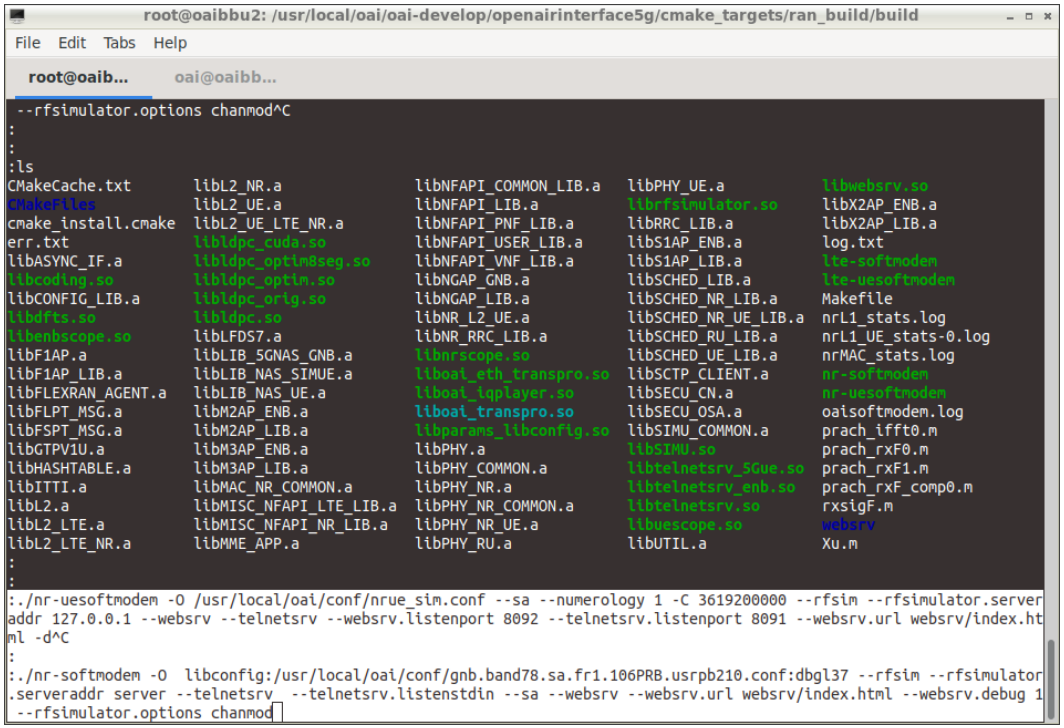
status

1. completed
   - Implementation and test performed on ubuntu20, restrictions on ubuntu 18 (no https, websockets ?)
   - Generic functions in websrv.c and telnet server (enhancements) to map any telnet server module and command to menu option and button in the browser interface
   - Generic functions in websrv.c and telnet server enhancements to build 3 kind of responses
     a) Simple result pages, containing command results, as printed in telnet interface
     b) Automatically updated result pages
     c) Table pages with modifiable field
   - Frontend building blocks
     a) Interface objects created dynamically depending on back-end responses
   - Back-end/front-end interface
     a) Json message body in requests and responses
     b) Websocket initialization, message creation/reception

status

1. On-going
   - Investigation to build a softscope interface
     a) Feasibility is proved, performance to be evaluated
   - Https support: implemented but not working
   - Build and test on non ubuntu distrib
2. To be done, ideas for future
   - Rebase to develop and merge request
   - Help implementation
   - Tests with lte softmodem's
   - Interface to new measurement mechanism
   - Interface to edit config file
   - Interface to analyze logfile
   - Alarm notifications via websocket

Screenshots: running with the web server



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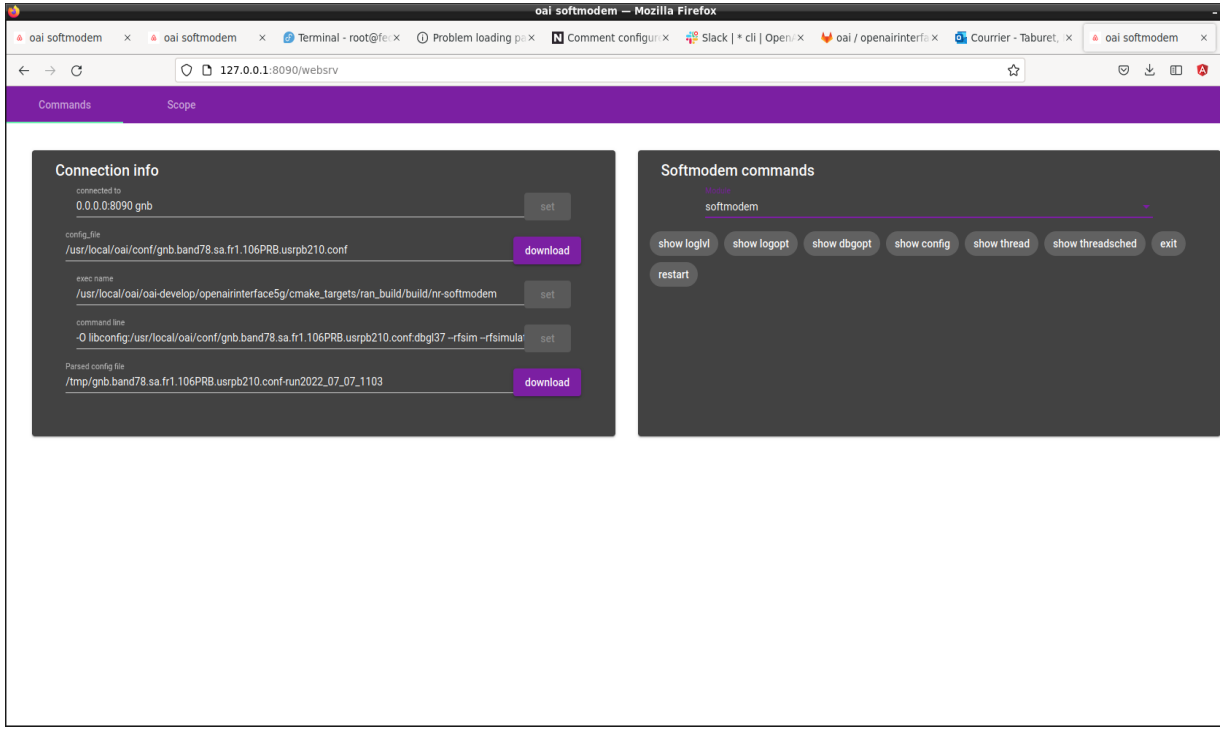
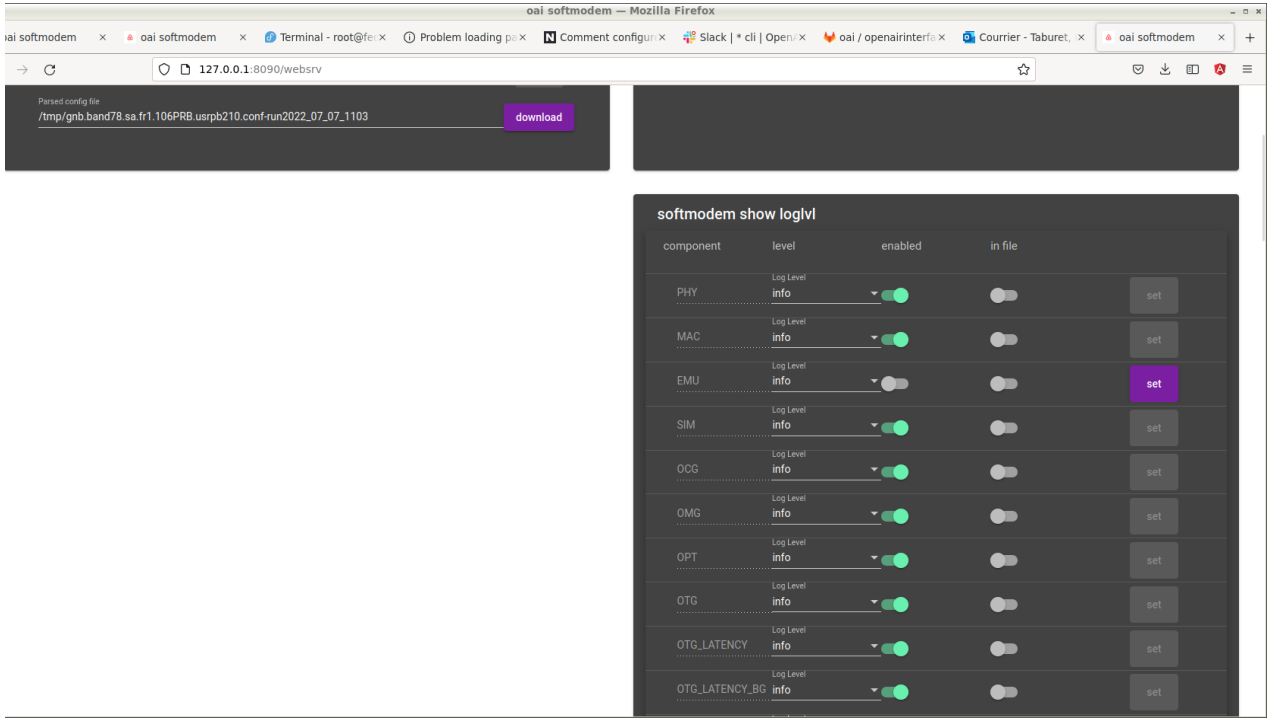
Screenshots: Main window



Screenshots: modify parameters



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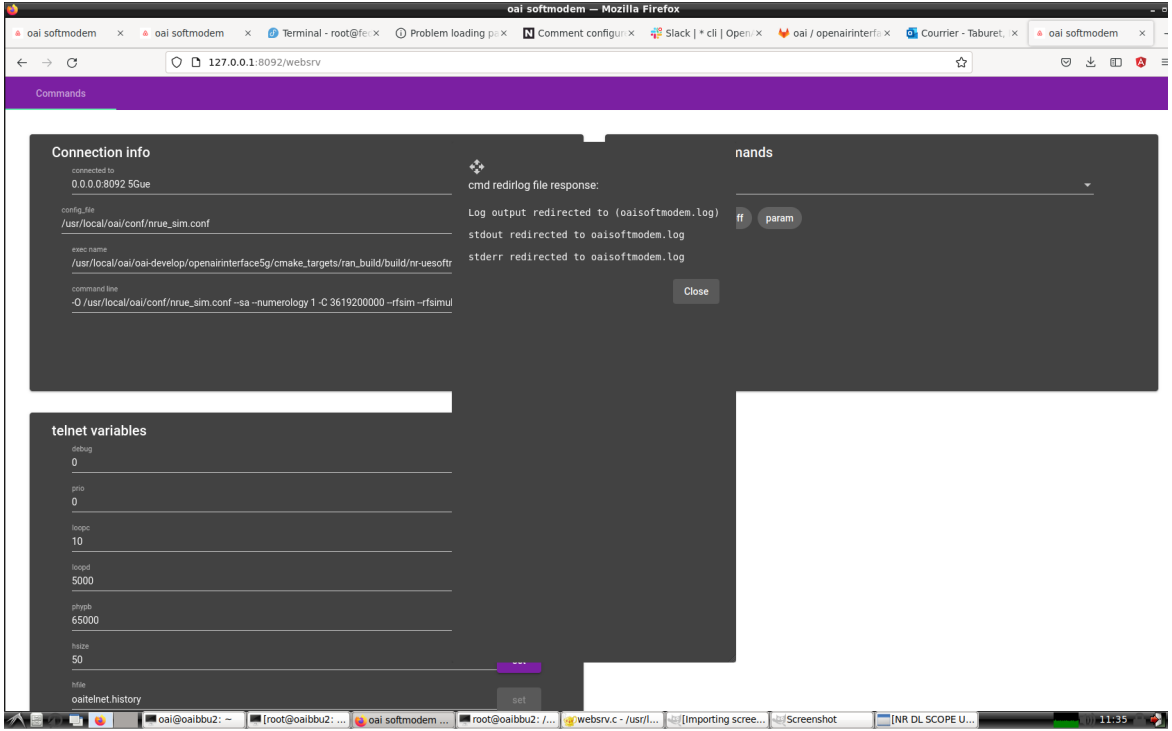
Screenshots: logs redirection



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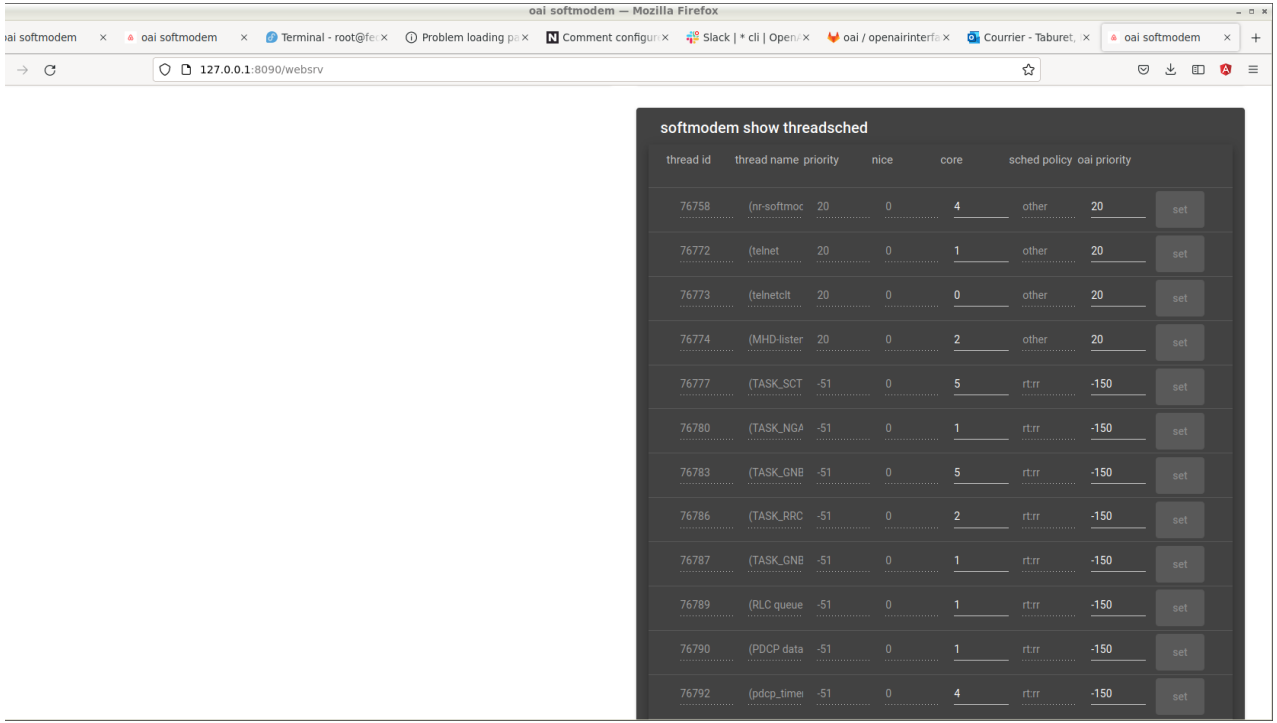
Screenshots: modify parameters



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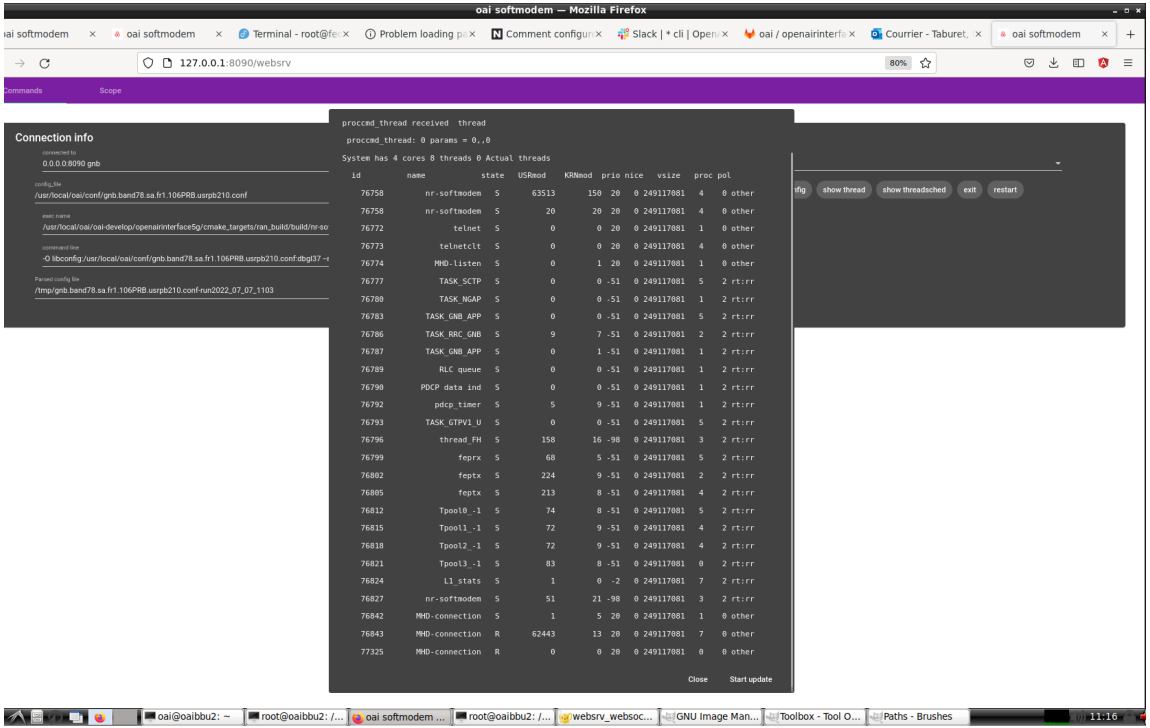
Screenshots: monitoring



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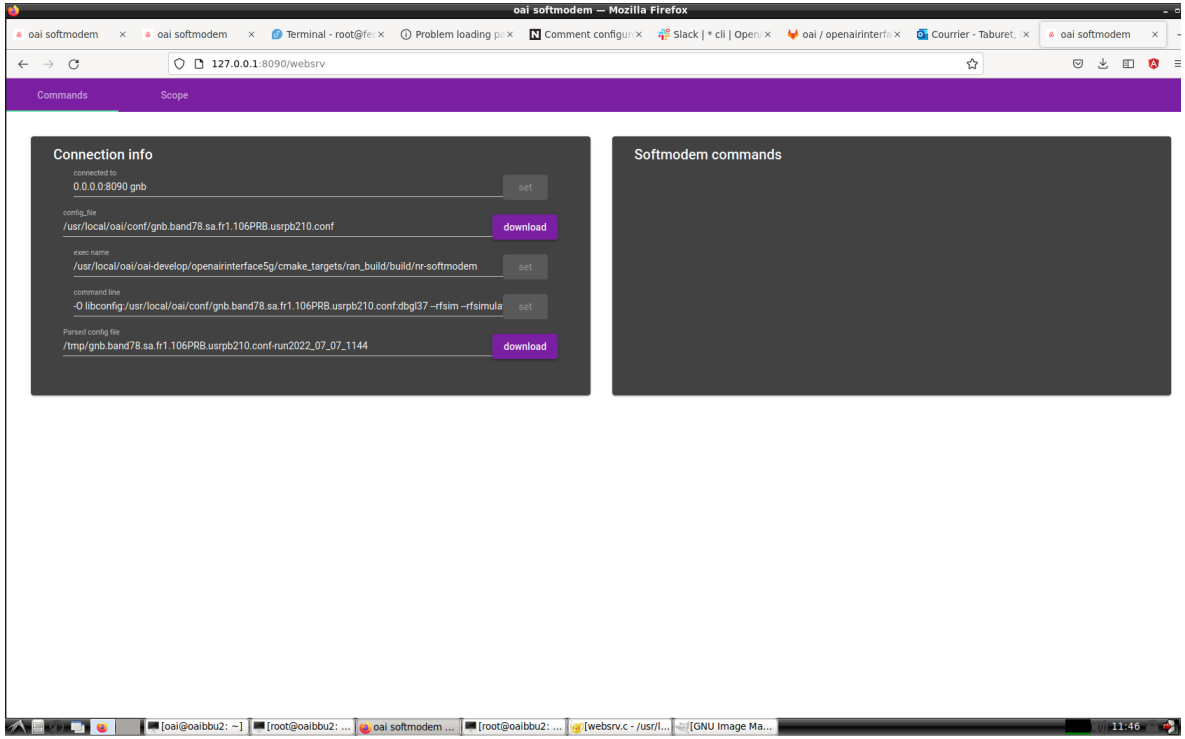
Screenshots: adaptable interface, ex: no telnet



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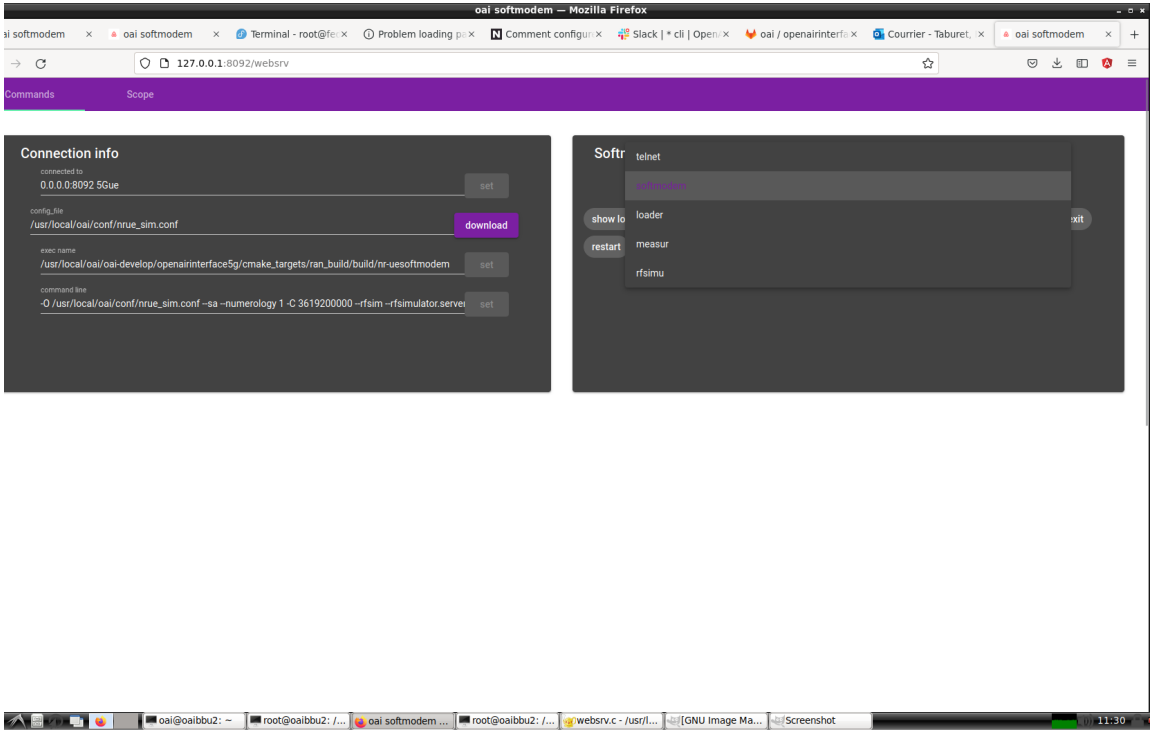
Screenshots: adaptable interface, ex: UE...



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