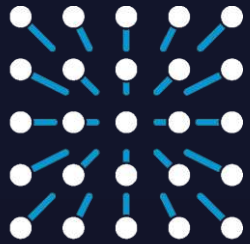


INSTRUMENTATION
TECHNOLOGIES

LIBERA

Sharing Source Code for Libera Instruments Using GitLab

Aleš Kete, April 17th, 2024

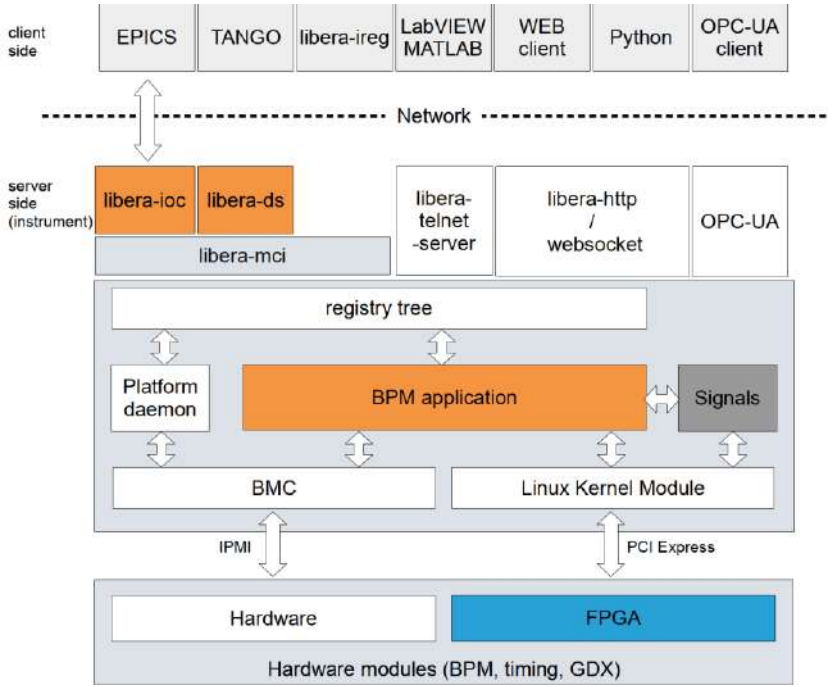
Summary

- Why sharing code with end user?
- Libera software stack
- How do we share code? Why Git(Lab)?
- How we build software components? Why Docker?
- Accessing resources
- Demo: accessing resources
- Conclusion

Why sharing code with end user?

- Understanding how instrument works
- Freedom of adding new functionality themselves
- More agile development by combining customer's domain knowledge and our knowledge of the instruments

Libera Software Stack



- **Libera BASE**: framework for applications and client tools
- **Application**: implements non-realtime functionalities and ireg interface
  - Ebpm (Brilliance+), LLRF, ...
- **Adapters**: implement interface for control systems
  - EPICS/IOC, Tango/DS, …
- **FPGA design**: implements real-time functionality

How do we share code?

Why Git?

- Sharing via ZIP files is cumbersome, versions are hard to track
  - Only suitable for ocassional, one-way exchange
- Tool of choice: Git
  - designed for collaborative development
  - designed for tracking multiple versions
  - open source tool, familiar not only to developers

How do we share code?

Why GitLab?

- Stable, proven product
- Suitable for large number of users
  - provides Git server with access control
- Provides other features
  - Docker image registry, …

How we build software components?

- Software is built using Docker containers
  - provided Docker images contain all required tools and build dependencies
- Instructions for building software using provided Docker image are available
- FPGA uses different toolchains with (own) licenses
  - code sharing process is the same

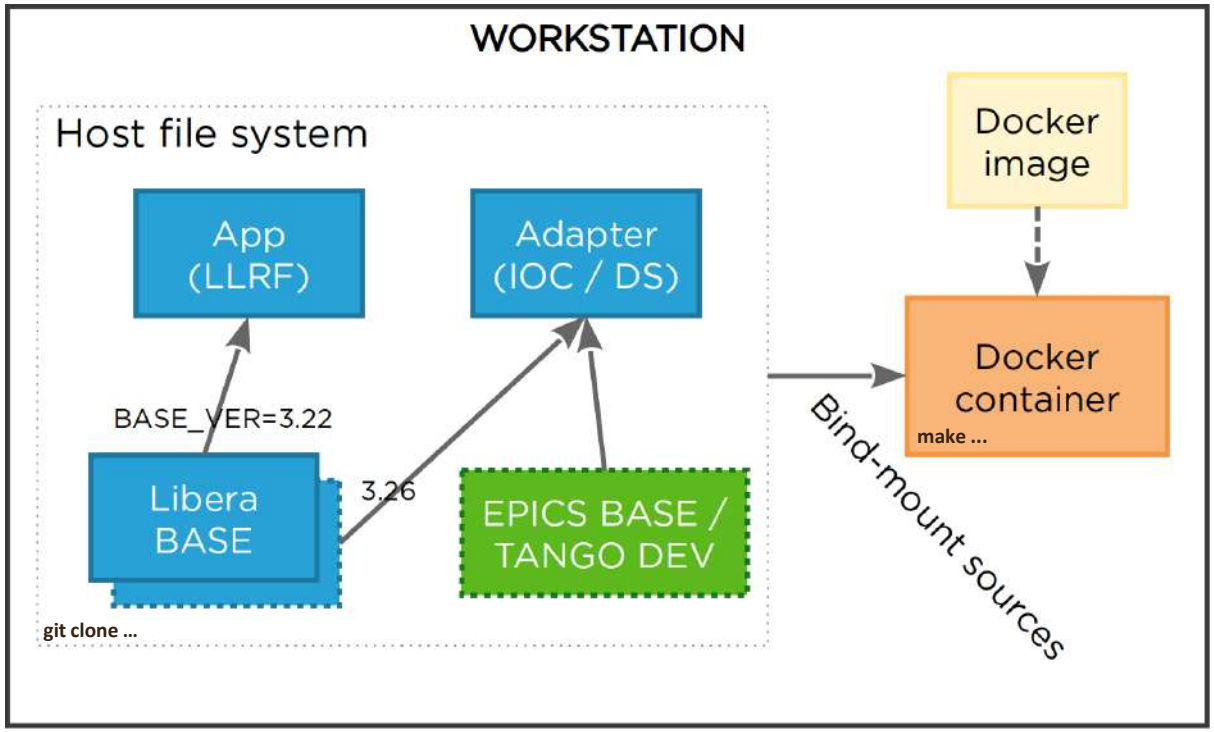
How we build software components?

Why Docker?

- Lower resource consumption
- Simpler and faster resource provisioning
- Simpler content sharing between workstation and build context
  - Bind mounts
- Simpler Docker image distribution
  - Docker container registry
- Workflow on workstations running Windows is not yet fully established

How we build software components?

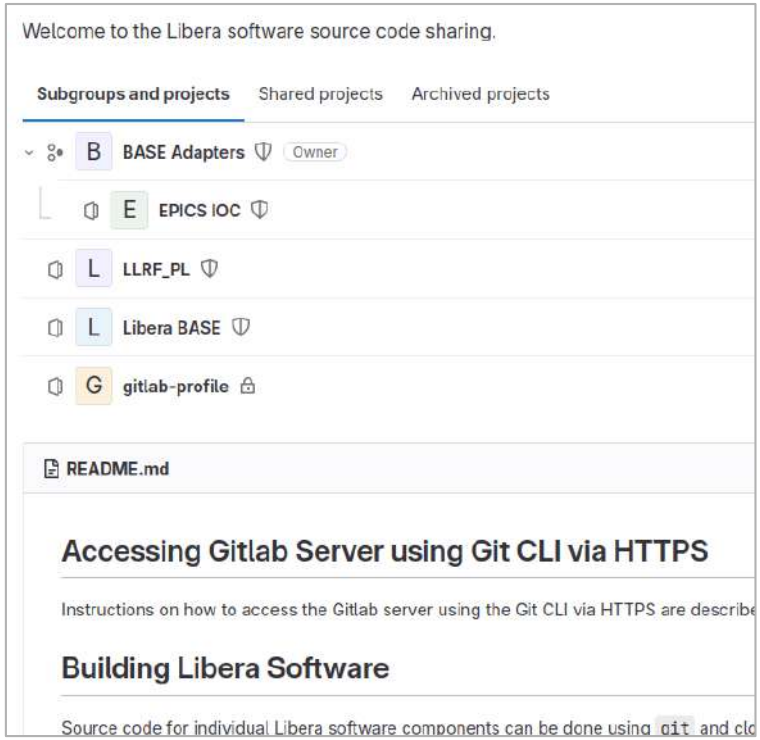
Setup overview



Accessing resources

- https://gitlab.i-tech.si
- Access is granted after NDA is defined and signed
- Resources are obtained using different tools:
  - Browser / web UI: documentation, viewing resources
  - **git** command line: source code for software and FPGA
  - **docker** command line: Docker image and container management
- Some initial setup is required for each of the tools
  - Server certificate, 2FA, access tokens

Demo: accessing resources



Conclusion

- A new way of sharing code is available
  - Supports different workflows, easier to maintain
- Already using it with few customers
  - Feedback gives us fresh perspective
- Along with instrumentation of code sharing process, other discussions usually take place
  - Debugging support, IP, instrument warranty
- Any questions?

Thank you for your attention!

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