Rack of Labs (RoL)

Share, deploy, test

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Ultimate goals

- Share devices in a lab across a team
- Automated test execution on bare metal systems
- Bulk deployment of EVE-OS
- Give trusted partners an access to hardware

Automated test execution on bare metal

- Support both BMC quipped devices and single board computers
- Support for x86, ARM and RISC-V architectures
- Automatic device allocation

Bulk deployment of EVE-OS

- Can be used during manufacturing by OEMs
- No special HW is required
- Plug and Play (no need to babysit the device)

Device sharing

- Share the limited number of devices among team members
  - Reserve
  - Release
  - Notify

Requirements and constraints

- A fleet of devices under test (DUT) is located in a remote lab
- Need a unified solution for
  - Device reservation
  - Grouping a subset of devices into a cluster within the same VLAN
  - Isolating devices in same lab (if some shared with partners)
  - Deployment of OS (EVE, Windows, Linux, etc) onto DUT over iPXE
  - Remote device control

Alternative solution considered -- Tinkerbell

- Tinkerbell is used and supported by Equinix Metal
  - Pros
    - Well known and stable solution for device provisioning
    - Community support
  - Cons
    - BMC support is experimental
    - Deployment only, no device sharing ability
    - No network management
    - No UI

RoL current status

- UI skeleton is ready
  - Device reservation
  - Device provisioning (RPi)
- CLI application is almost ready
- TFTP/DHCP with custom callbacks
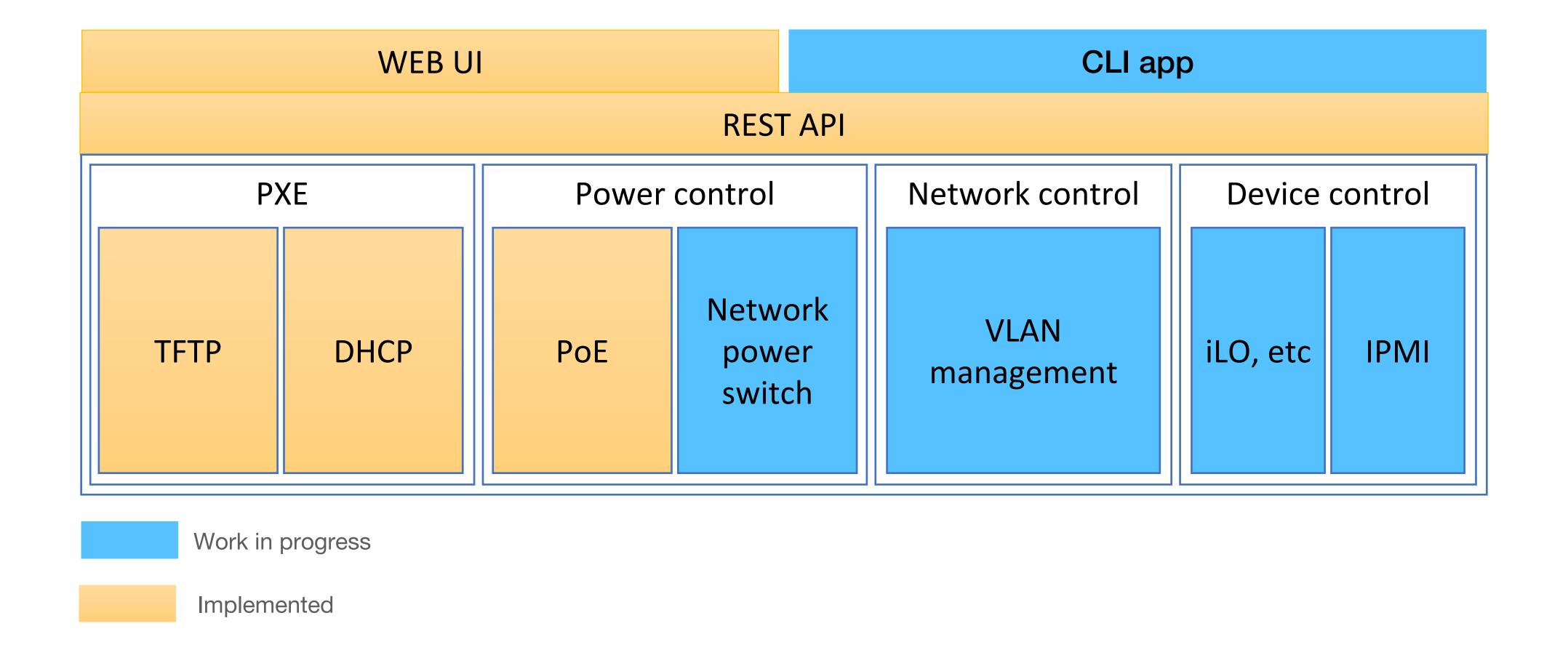- RPi power control using PoE

RoL plans

Short-term
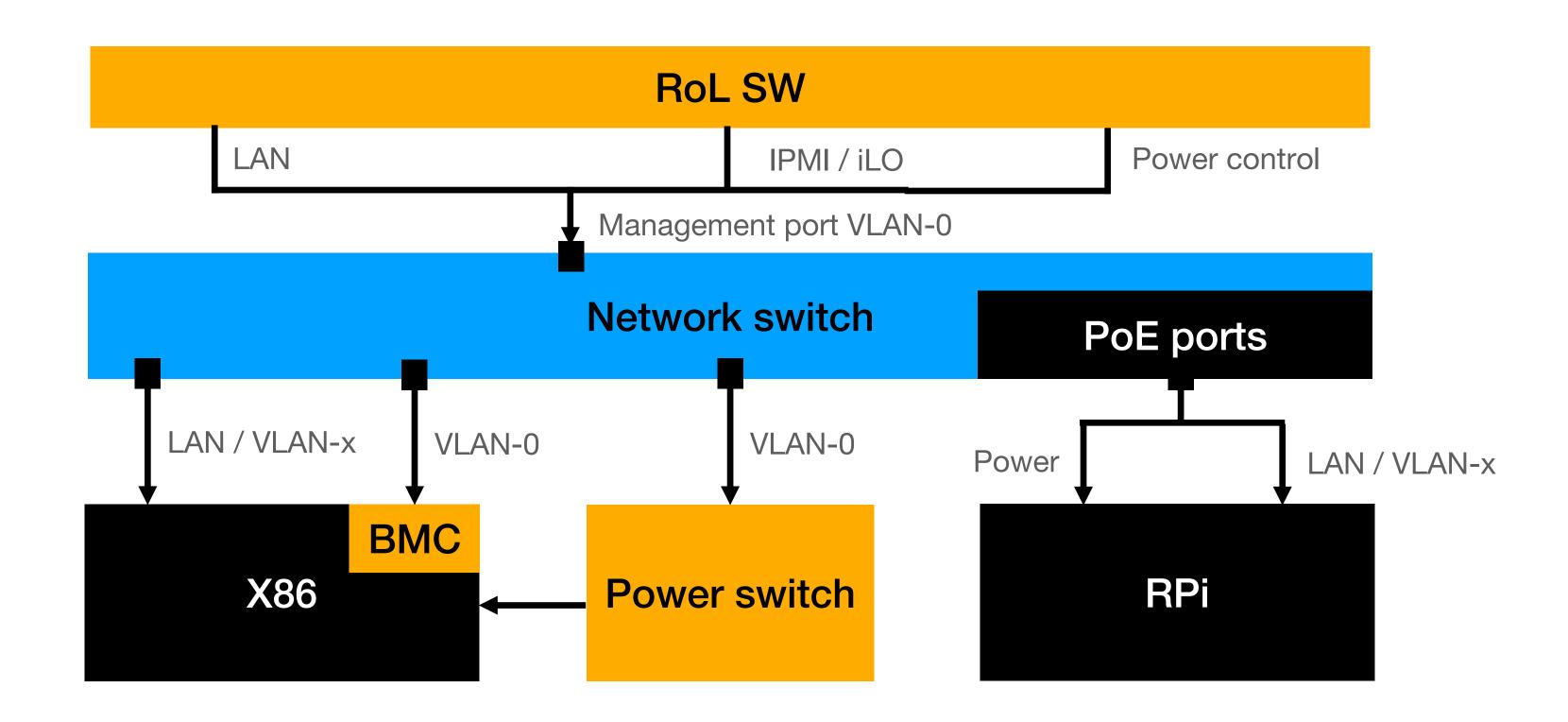
- Run CI/CD on ARM boards
- Automatic VLAN creation

Long-term

- Bulk deployment of EVE-OS
- HW sharing
- Support for BMC and x86 boot scenarios

High level architecture

Topology

Device template

- Describes how the device is controlled
  - IPMI commands
  - iLO or other proprietary REST API calls
- One template can be derived from another. (e.g. RPi-8GB is derived from RPi)
- Boot stages
  - Stages for x86 and single board computers are quite different
  - Files published on TFTP depends on current device state

Teams and projects

- Team is a group of users
- Each team can see all the devices and who reserved them
- Each user can have multiple projects
- Each project is a group of devices
  - Sometimes devices might not be available
- A reserved device owner is notified when the device is requested
  - Reservation owner can either decline or release the device to a new owner

Device reservation

- Two scenarios
  - Manually pick a device from a pool (used for projects)
  - Get a first available device by specified criteria (e.g. Model and RAM size). Used for CI/CD projects

Summary, future work, feedback

- Summary bullets
  - Fills a current void in EVE-OS Arm testing
  - Etc.
- Future work
  - Summarize ideas
  - Any other thoughts
- Your suggestions???