CELF Open Test Lab

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CELF Test Lab

- Shared resource for CELF members and open source community
- Goal is to support 4 use cases:
  - Regression testing (multi-version testing)
  - Multi-platform testing
  - Remote Interactive testing
  - Private testing

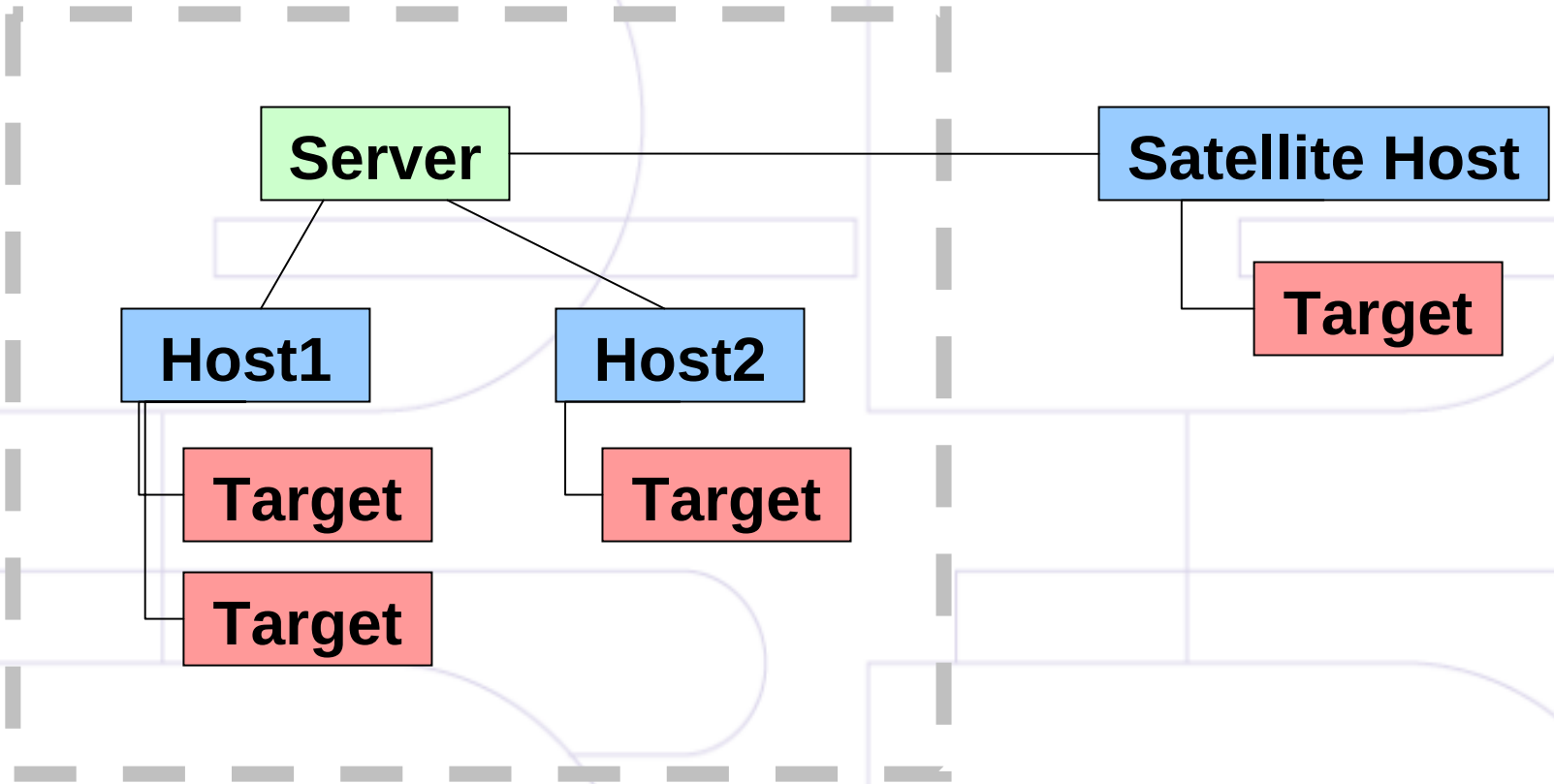
Vision

- Show community developers trouble spots that affect embedded use of Linux
  - e.g. Size growth of kernel over time
- Allow vendors to show off supported features to customers
  - e.g. power management or realtime performance
- Support developers who can’t get access to hardware
  - e.g. community developer wants to test project on multiple architectures
- Provide embedded developers easy access to tests to check their own work
  - e.g. corporate developer wants to check that no system calls are broken due to kernel changes

CELF Test Lab Info

- Defines an architecture for host-target style testing (not found in other test systems)
- Uses 3-tier architecture
  - Server
  - Host
  - Target

Lab Diagram


Server
Satellite Host
Target
Host1
Host2
Target
Target
Target

Server

- Server provides test materials and test scheduling
- Has web interface showing:
  - test systems
  - test tasks (current jobs)
    - test results
  - test software
    - OpenEmbedded software
    - individual test suites
- Allows users to schedule jobs, check job status, examine results

Host

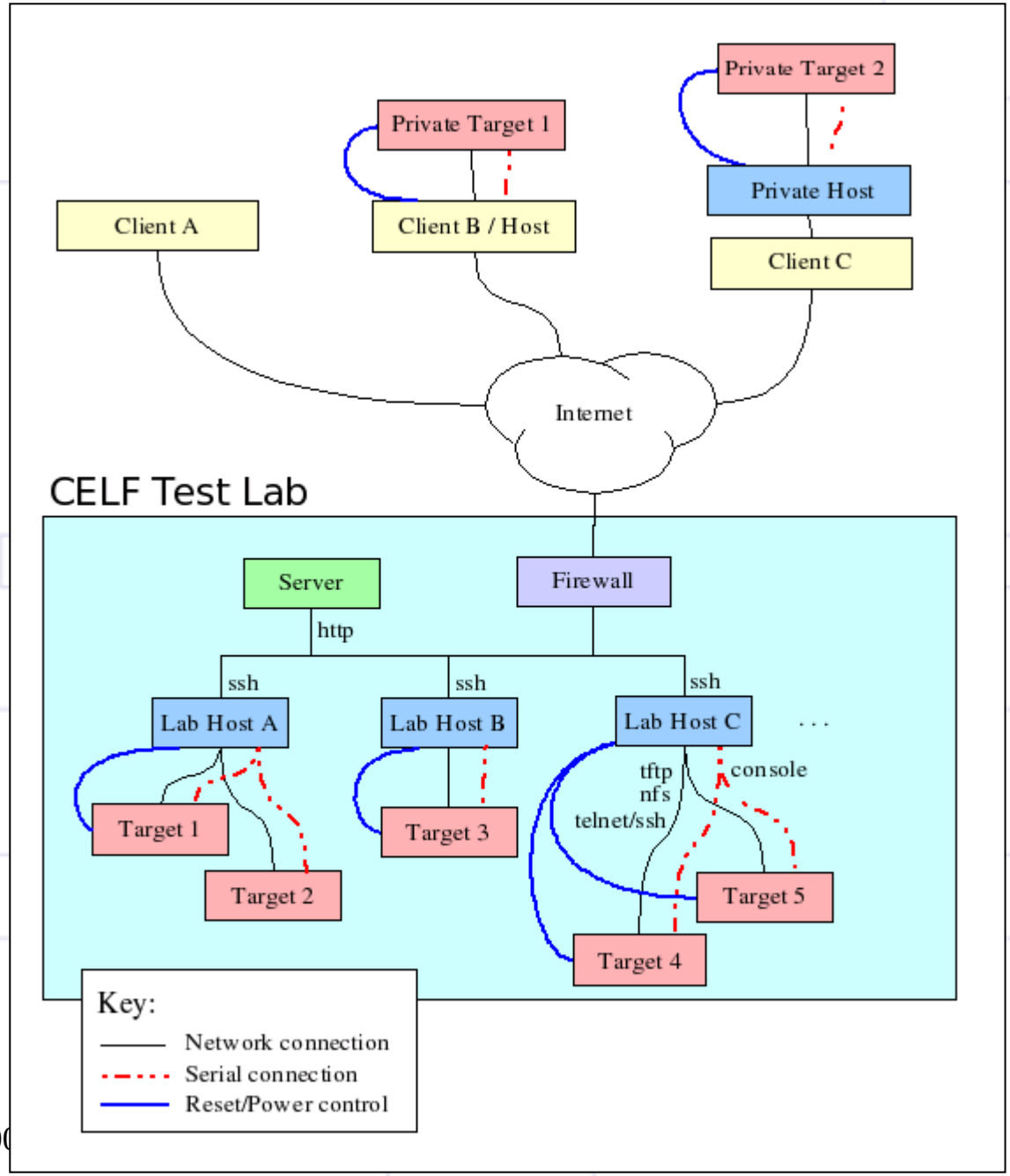
- Downloads and executes test from the server
- Provides network services to target
- Can be in lab, or remote machine (satellite node)
- Has web interface for examining:
  - target status
  - installed tests
  - locally-scheduled jobs
- Performs software builds and controls target

Target

- Is actual target board
- Required features for automation:
  - ability to load new kernel without manual steps
  - ability to reboot board with out manual steps
  - way to login to target from host (serial console is strongly preferred)
- Normal setup:
  - tftp boot kernel from host
  - nfs root filesystem mounted on host
  - console over serial port
  - programmatic control of power

Interconnections Detail

- One server, residing in San Jose
- Hosts can be internal or external
- Multiple targets per host
- Each target has:
  - network connection to host
  - serial connection to host
  - power controlled from host


Private Target 2
Private Target 1
Private Host
Client A
Client B / Host
Client C
Internet
CELF Test Lab
Server
Firewall
http
ssh
ssh
ssh
Lab Host A
Lab Host B
Lab Host C
. . .
tftp
nfs
telnet/ssh
console
Target 1
Target 3
Target 2
Target 5
Target 4
Key:
Network connection
Serial connection
Reset/Power control

Protocols

- In order to support corporate developers, only HTTP is used between host and server
  - Only protocol guaranteed to work through corporate firewalls
  - Still need to work on OpenEmbedded build using only HTTP (outstanding issue)
- Interactive testing (accessing boards in lab) uses ssh
  - Corporate developers need outbound ssh
  - May need to write web interface to in-lab ssh

Status

- Basic lab infrastructure is set up
  - Recently moved to new facility in San Jose
  - 1 Server, 2 2osts, 6 targets, +supporting equipment
- Supported features:
  - Tests can be scheduled to run on multiple boards
  - Can schedule a recurring test (specify repeat interval)
  - Builds OpenEmbedded distribution from scratch

Issues

- Not many boards right now
  - Working on satellite host/target support
- Have a few tests:
  - LTP - Linux Test Project
  - printk-times test
- Plan to expand tests in coming months

Satellite Nodes

- Not supported yet - work in progress
- Will be able to register your host/target with the lab
  - Can register for part-time use (e.g. at night)
- Host polls server for jobs, and runs them on target
- Can schedule local jobs through local interface

Test Lab Demo

- Demonstration of running a test in the lab
  - Web Interface
    - Requesting a test
    - Examining test results
  - Interactive use
    - ssh and target
  - Bloatwatch results

What's next?

- Reservation system for interactive use
- Need to populate tests specific to CELF requirements
- Need more systems - Satellite nodes
- Integration with other Linux automated test systems.

What can you do?

- We want to test satellite host software by the end of the year.
- Are looking for volunteers with host/target systems to be “guinea pigs”
- Please contact me, or join the mailing list:
  - opentestlab@tree.celinuxforum.org

Resources

- Lab information: http://tree.celinuxforum.org/CelfPubWiki/OpenTestLab
- Lab web site: http://testlab.celinuxforum.org/
- Lab wiki: http://testlab.celinuxforum.org/otlwiki
- Lab mailing list: http://tree.celinuxforum.org/mailman/listinfo/opentestlab

Thanks!

Questions and Answers.