Open Federated Testbed:

Technical Overview and Live Demo

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OFTF: Why? (from the end user perspective)

Traditional approach

Analyze the technology (what it does, hw/sw requirements): 1-2 weeks → Allocate/buy/configure the hardware: 1-8 weeks → Install and test the testbed: 2 weeks → Start practicing

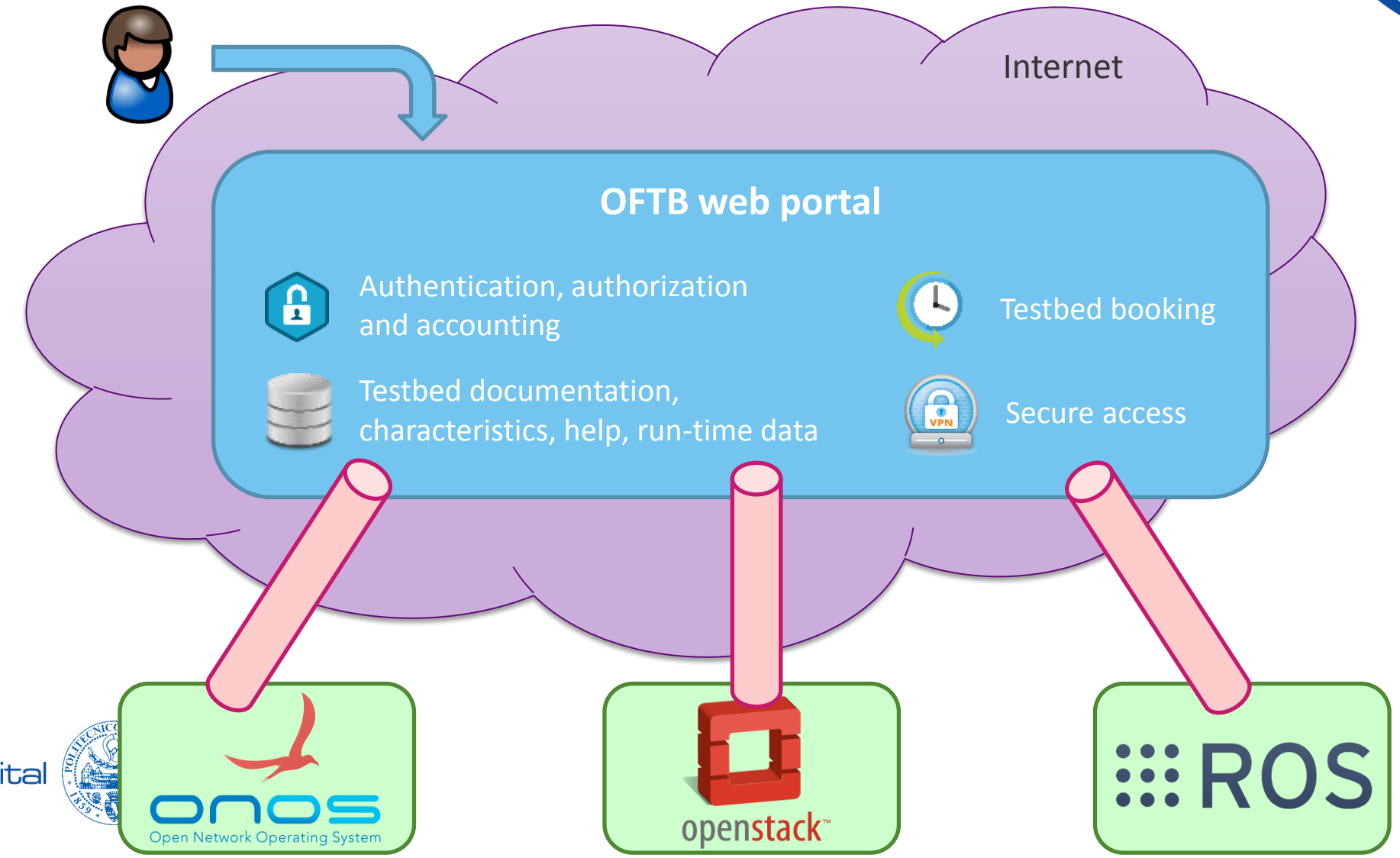
Open Federated Testbed

Buy access to the testbed: 1 hour → Start practicing

OFTF: Keywords

- Open
  - No limit on the technology we can add to the testbed: cloud, fog, NFV, IoT, etc.
  - No “take-or-leave” choices enforced by the OFTB framework
- Federated
  - Each testbed contributor can keep the control on its own infrastructure: users, authentication, access methods
- Testbed
  - Supports both production-ready and proof-of-concept technologies
    - Controlled access, private networks

OFTB: logical structure

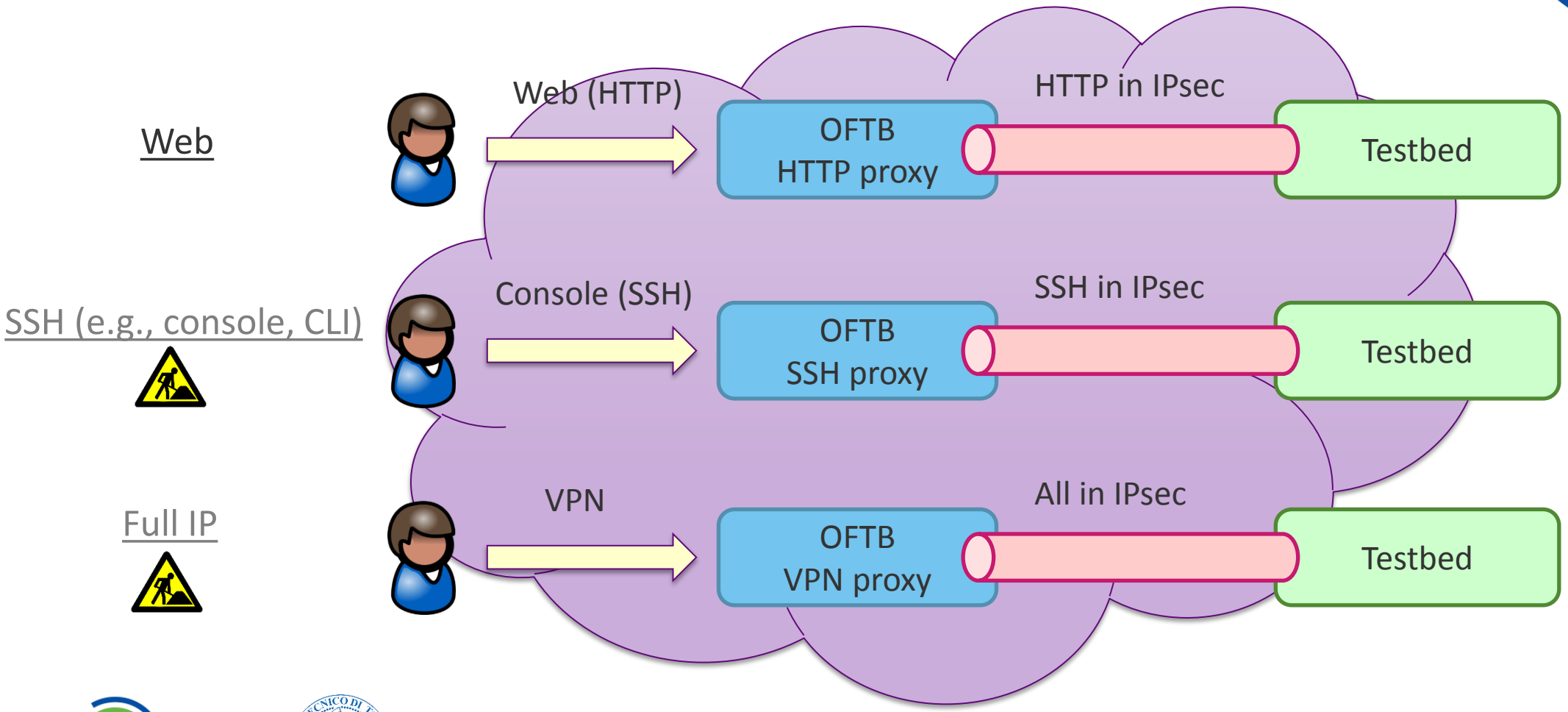


Requirements for the testbed owner

- Very minimal
  - VPN connection in order to reach the testbed
  - AAA: each testbed should accept tokens already created by the main OFTB service
    - Not implemented right now

- IP addressing
  - No limitations so far: private IP addresses are allowed in the testbeds
  - And user will connect through a proxy, managed by OFTB

Access methods



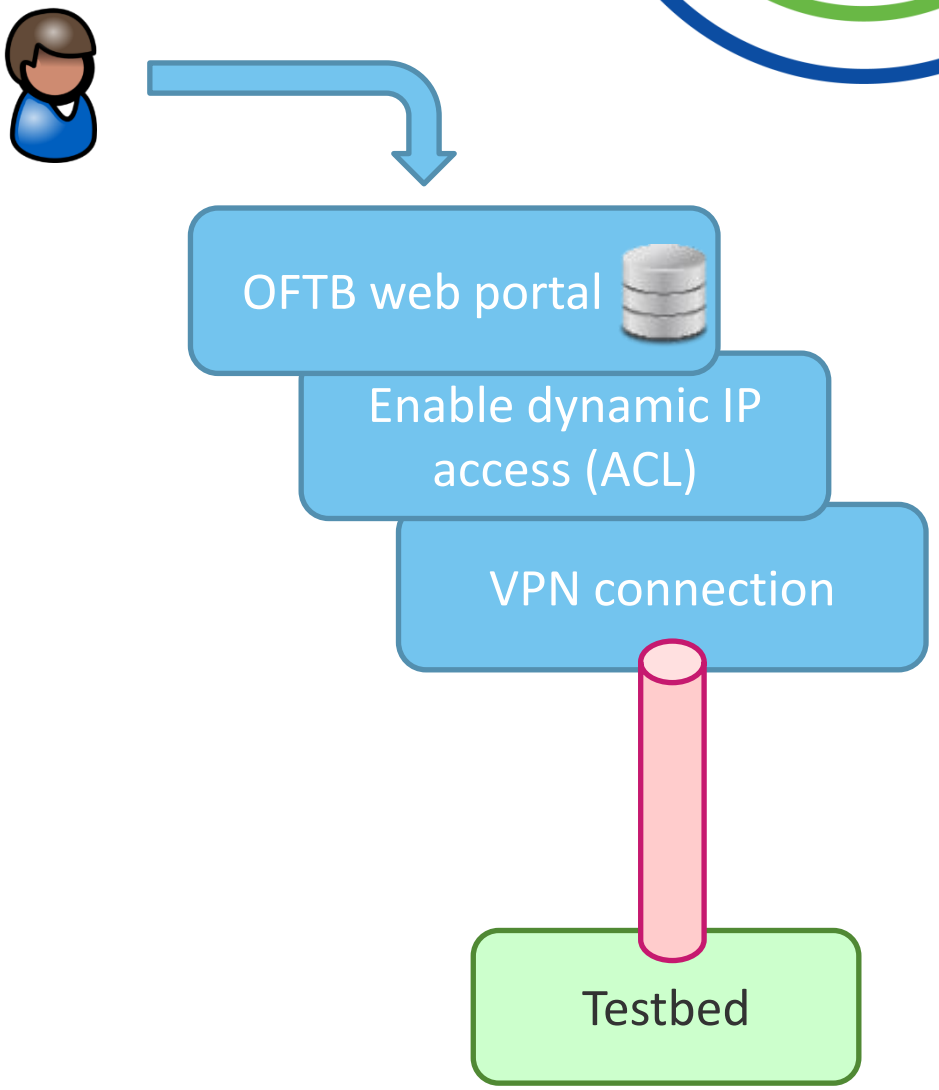
User access: workflow

1. User logs-in
   - OFTB checks user credentials and access rights

2. Dynamic update of the Access Control List in order to enable the previous IP address to connect to the correct set of testbeds

3. Establish VPN connection to the testbed (if not active)

4. Clean ACL when the inactivity period expires (or the user disconnects)

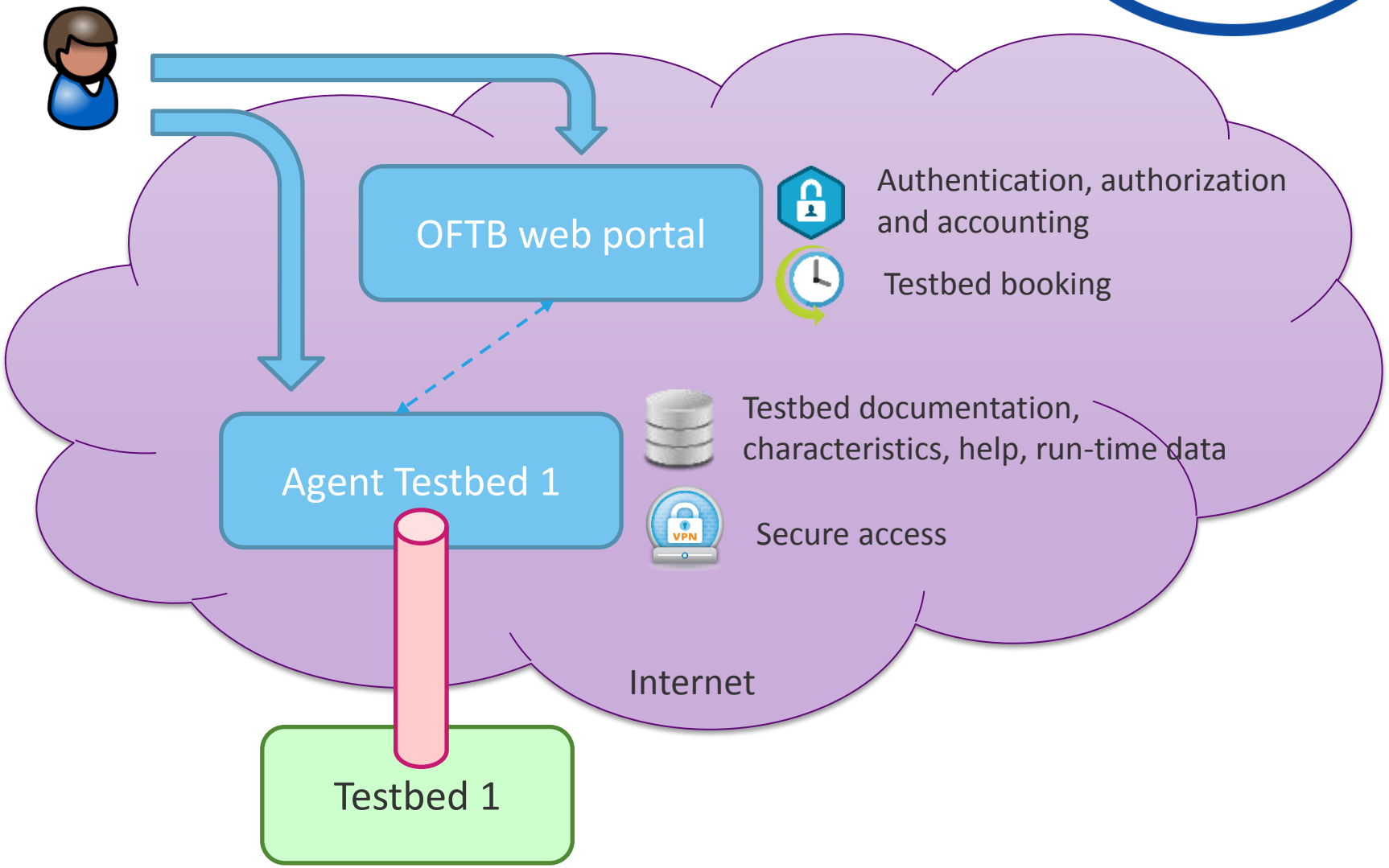


Demo

OFTB distributed architecture (planned)

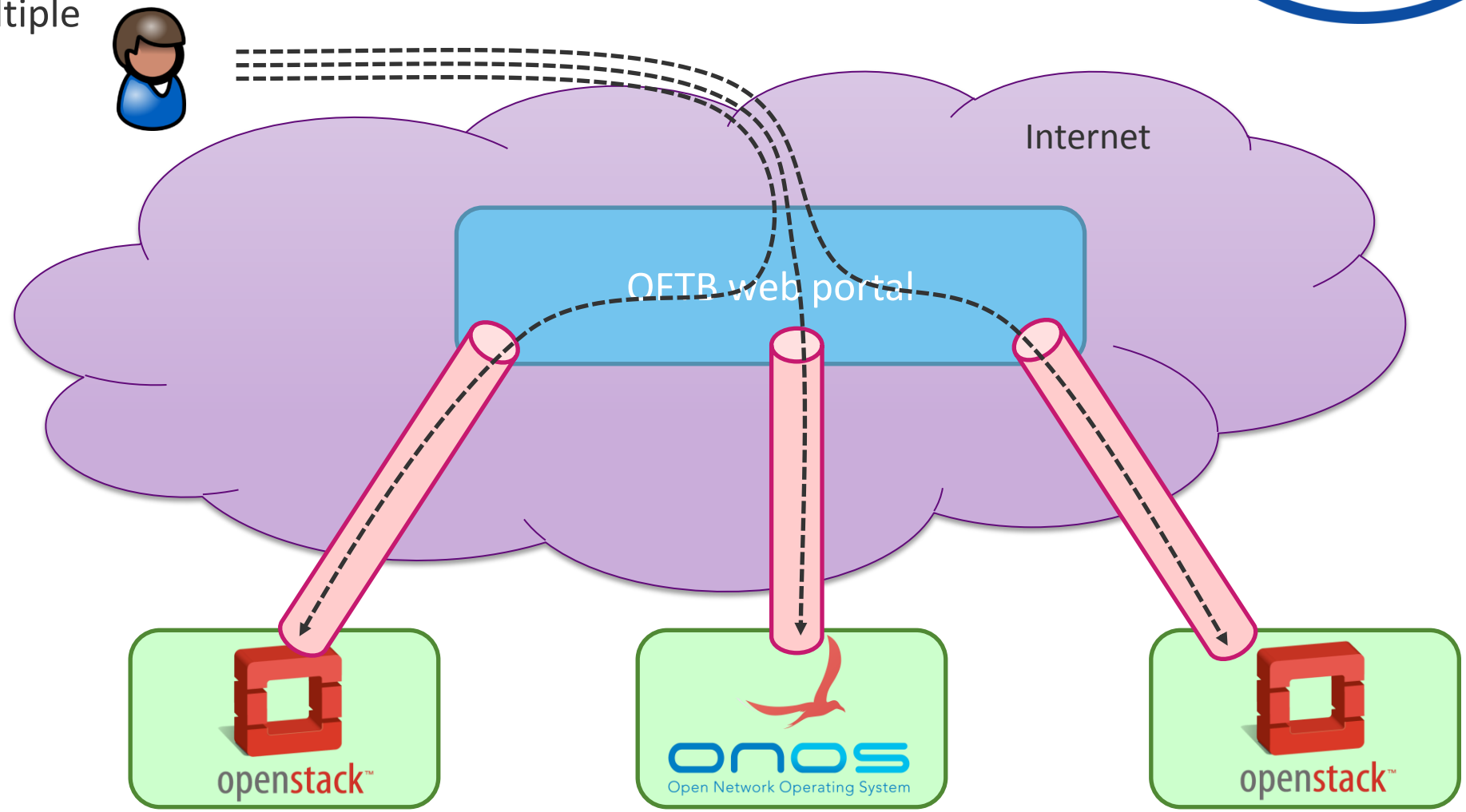
- OFTB only for “control” plane
- Agent handles “data” plane

- Scalability
- Some (sensitive?) data under the direct control of the TB owner



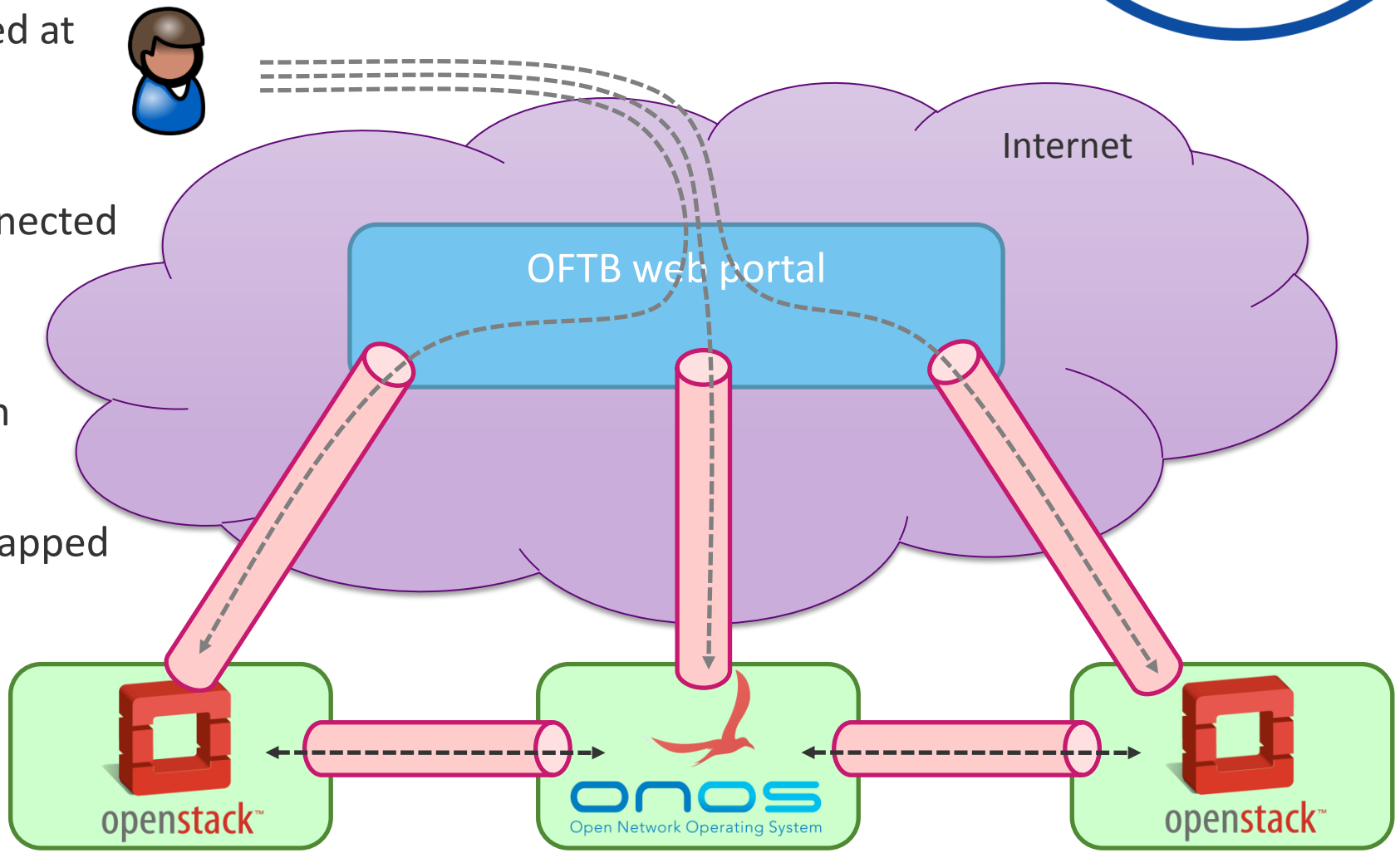
Multiple testbeds: control-plane enabled

- User can control multiple TB at the same time
- TBs run as “isolated silos”
- Already available



Multiple testbeds: data-plane enabled

- Testbed are also interconnected at the data-plane level
  - E.g., 2 VMs in different OpenStack instances, connected through an SDN network
- Need
  - VPN connections between testbeds
  - Capability to handle overlapped IP addressing spaces
- Not yet available

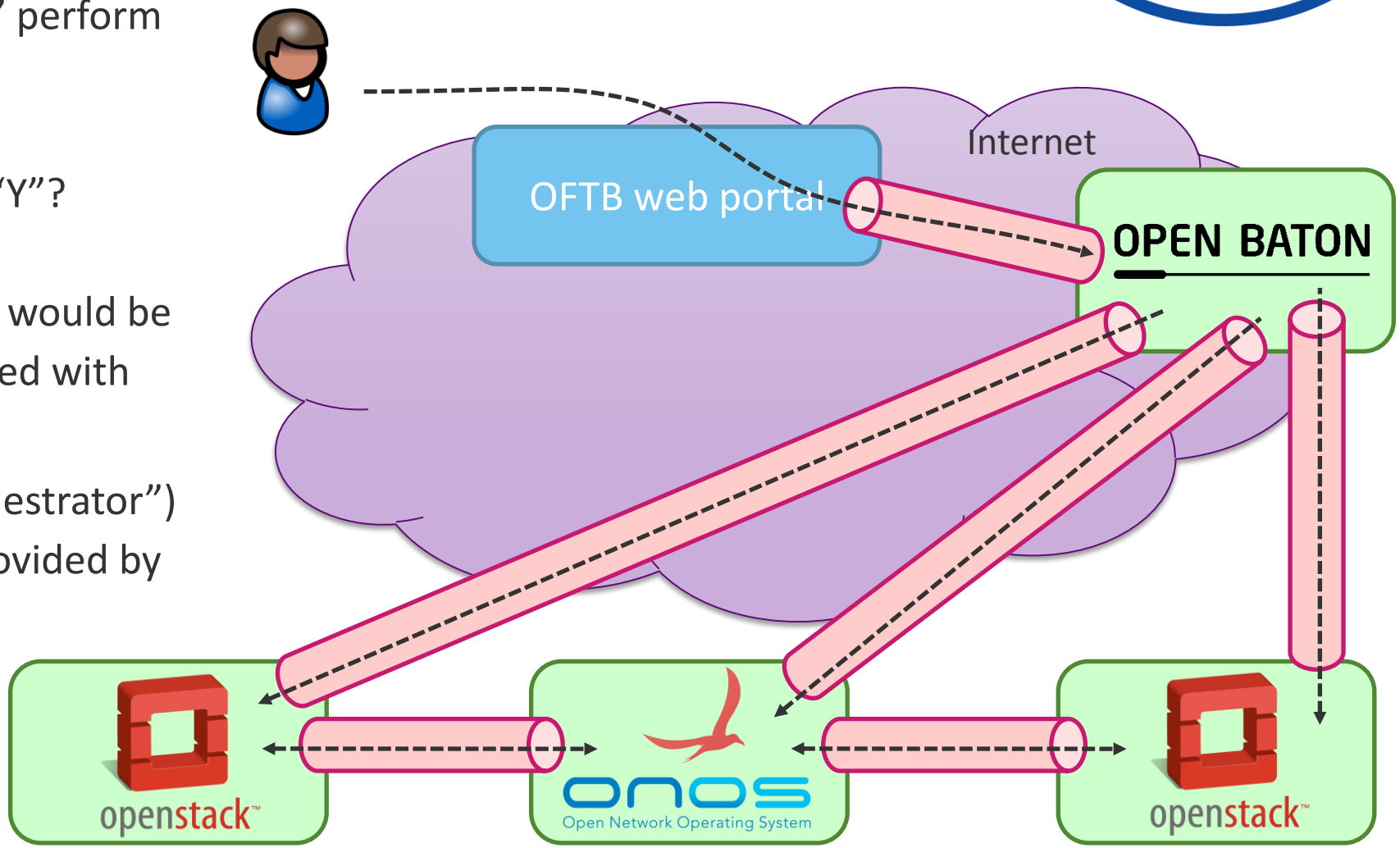


The future: open composition of testbeds

- How does the orchestrator “X” perform on a given set of testbeds?

- And what about orchestrator “Y”?

- Open composition of testbeds would be a nice, powerful feature, managed with *dependency graphs*
    - E.g., testbed A (e.g., “orchestrator”) can work on resources provided by testbeds B and C



Conclusions

- Proof-of-concept available at
  - http://www.openfederatedtestbed.org

- High-level technical architecture already defined
  - Open to suggestions

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